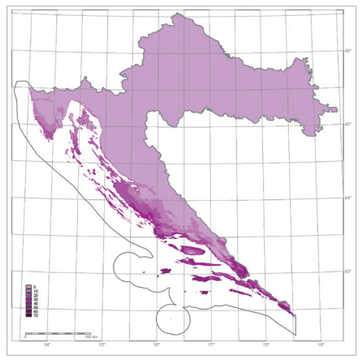
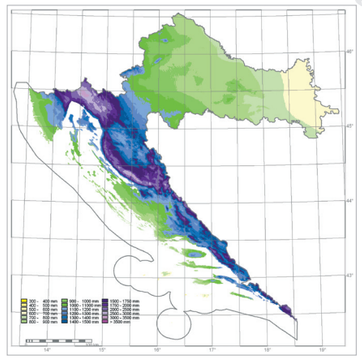
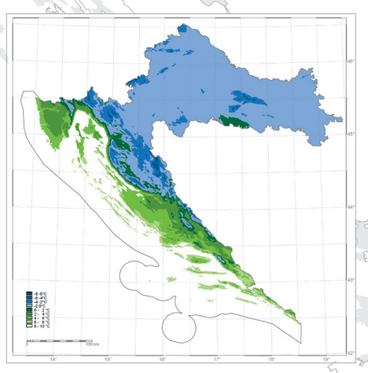
Klimatski atlas Hrvatske

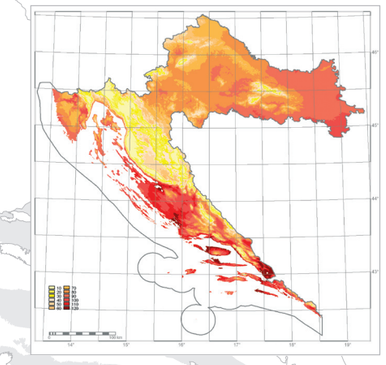
Climate atlas of Croatia

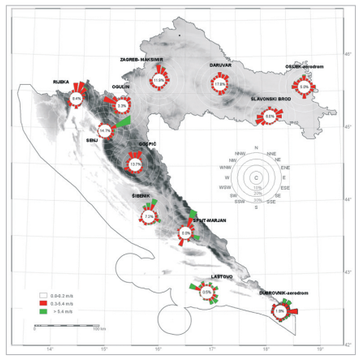
1961 – 1990.
1971 – 2000.

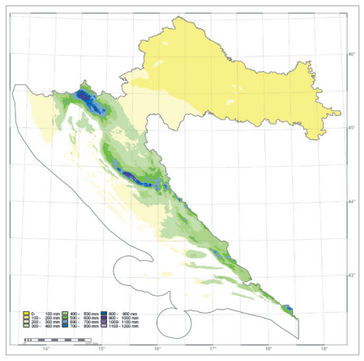


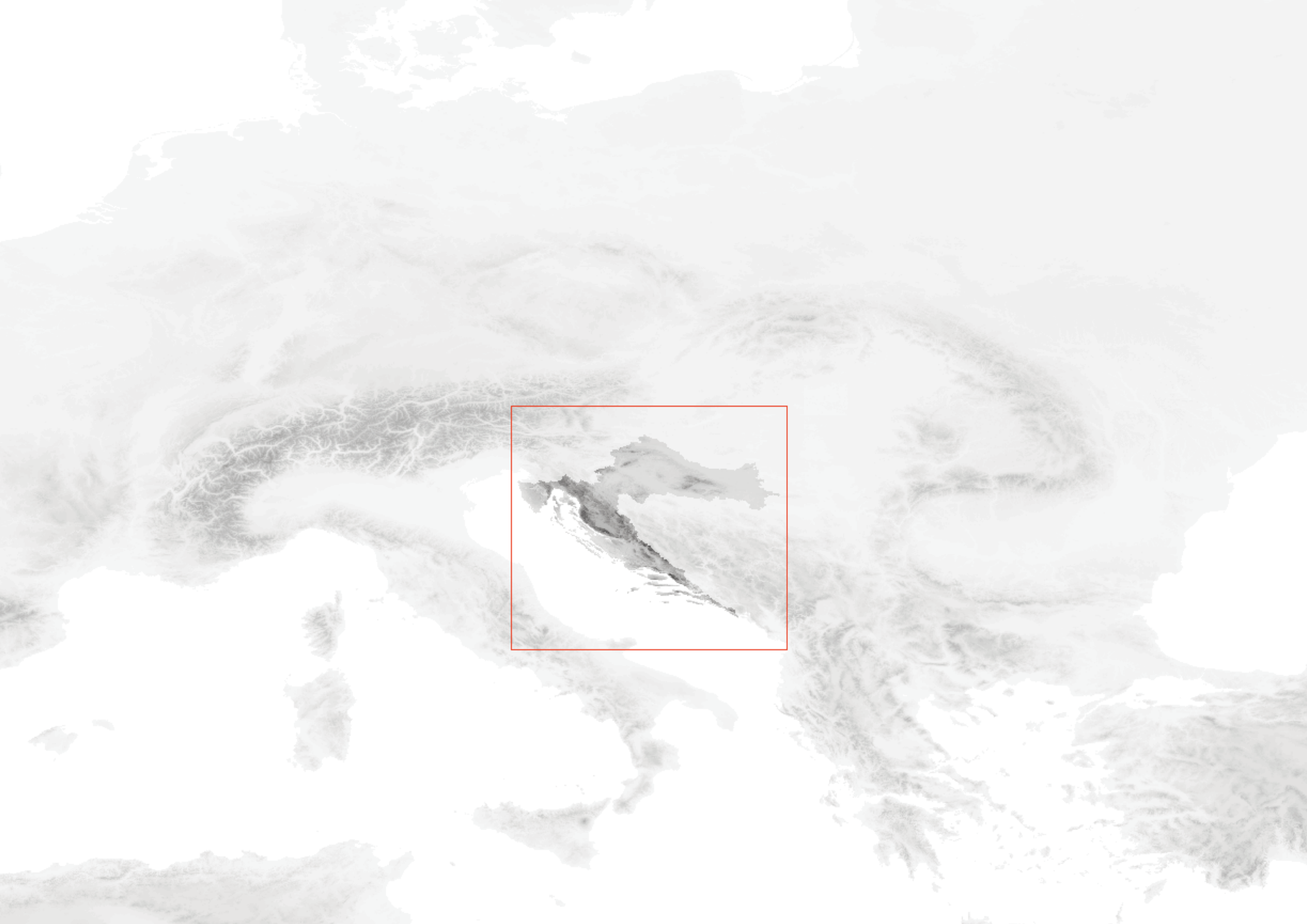












Klimatski atlas Hrvatske

Climate atlas of Croatia

1961 – 1990.

1971 – 2000.

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Ksenija Zaninović

Zagreb, 2008.

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  - Srednji godišnji broj dana s količinom oborine ≥1 mm Mean annual number of days with precipitation ≥1 mm
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Klima je jedna od najvažnijih sastavnica životnog okoliša na Zemlji. Na klimu utječu mnogi prirodni činitelji: Sunčevo, Zemljino i atmosfersko zračenje, sastav atmosfere, oceanske i zračne struje, razdioba kopna i mora, nadmorska visina, razdioba vječnog leda, živa bića pa i djelovanje samog čovjeka. Klimi se treba prilagoditi i učinkovito se zaštititi od eventualnih štetnih utjecaja, a istovremeno iskoristiti prednosti koje ona pruža, pa se klima može promatrati kao prirodni izvor koji treba dobro proučiti i zaštititi od nekontroliranog ljudskog djelovanja.

Svjetska meteorološka organizacija (WMO – World Meteorological Organization) u suradnji s ostalim međunarodnim organizacijama provodi različite programe u okviru *Povjerenstva za klimatologiju (CCl – Commission for Climatology), Službi za klimatske informacije i predviđanje klime (CLIPS – Climate Information and Prediction Services), Svjetskog klimatskog istraživačkog programa (WCRP – World Cimate Research Programme), Svjetskog klimatskog programa (WCP – World Climate Programme)*, te razvija nove metode i dostignuća u proučavanju mehanizma klime, klimatskih promjena i poboljšanju predviđanja klime. *Međuvladin panel o klimatskim promjenama (IPCC – Intergovernmental Panel on Climate Changes)*, koji je utemeljila *Svjetska meteorološka organizacija* i *Program Ujedinjenih naroda za okoliš (UNEP – United Nation Environmental Programme)*, redovito prikuplja najnovija znanstvena saznanja u proučavanju klime i objavljuje ih u razmacima od nekoliko godina. *Četvrto izvješće procjene stanja klime na Zemlji* dovršeno je 2007. godine. Prema tim najnovijim procjenama *Međuvladinog panela o klimatskim promjenama*, neprijeporan je utjecaj čovjeka na recentno globalno klimatsko zatopljenje koje rezultira sve češćim vremenskim ekstremima kao što su jake grmljavinske oluje praćene razornim vjetrom i pijavicama, sušna razdoblja, intenzivne oborine praćene poplavama, toplinski valovi i drugi ekstremi.

U praćenju globalne klime nezaobilazna je uloga nacionalnih meteoroloških službi. Slijedom te činjenice, a s ciljem što učinkovitijeg praćenja klime na globalnoj ljestvici, *Svjetska meteorološka organizacija* je izdala preporuke nacionalnim meteorološkim službama za periodičkim izdavanjem klimatskih atlasa za tridesetogodišnja (standardna) razdoblja. Kao prvo takvo standardno razdoblje određeno je razdoblje 1901–1930. godina. U Državnom hidrometeorološkom zavodu (DHMZ) izrađen je "Atlas klime SR Hrvatske" za sljedeće klimatsko razdoblje 1931–1960, koji je objavljen povodom obilježavanja tridesetogodišnjice DHMZ-a 1977. godine. Sukladno suvremenim mogućnostima, pred nama je priređeno novo izdanje *Klimatskog atlasa Hrvatske* koje se odnosi na standardno klimatsko razdoblje 1961–1990, i na razdoblje 1971–2000. U njemu su također prikazane klimatske karte osnovnih klimatskih elemenata, a za prostornu interpolaciju klimatskih elemenata korištene su suvremene digitalne metode pa je većina analognih prikaza raspoloživa u digitalnom obliku.

Klimatski atlas Hrvatske je temeljni priručnik za sve korisnike koji u svom radu trebaju uvažiti klimatke karakteristike određenog mjesta, županije ili čitave države. On je namijenjen gotovo svim granama gospodarstva: poljodjelstvu, vodnom gospodarstvu, energetici, turizmu, zdravstvu, športu, zaštiti okoliša, građevinarstvu i drugima. Dakako, klimatski atlas bi trebao biti sastavnica edukacijskih programa od osnovnog do visokog obrazovanja. Konačno, to je hrvatski doprinos općem mozaiku praćenja globalne klime čime je ostvarena jedna od temeljnih međunarodnih obveza DHMZ-a i Republike Hrvatske kao članice Svjetske meteorološke organizacije.

Ravnatelj:

mr.sc. Ivan Čačić

Climate is one of the most important elements of the Earth's living environment. It is affected by many natural factors: solar, terrestrial and atmospheric radiation, the composition of the atmosphere, ocean and air currents, land and sea distribution, altitude, perennial ice distribution, living beings and even human activity. We have to adapt to our climate and protect ourselves from its possible adverse influences but at the same time avail ourselves of the advantages it offers. Therefore, climate can be regarded as a natural resource to be thoroughly studied and protected from uncontrolled human actions.

The World Meteorological Organisation (WMO), together with other international organisations, has been implementing different programmes through its *Commission for Climatology (CCl), Climate Information and Prediction Services (CLIPS), World Climate Research Programme (WCRP)* and *World Climate Programme (WCP)*, developing new methods for the study of climate mechanisms and climate changes and the improvement of climate prediction. *The Intergovernmental Panel on Climate Changes (IPCC)*, established by the *World Meteorological Organisation* and the *United Nation Environmental Programme (UNEP)* continually collect all new scientific research in climate, publishing the results every few years.

The Fourth Assessment Report On Climate Changes was completed in 2007. According to the *Intergovernmental Panel on Climate Changes*, recent global climate warming is very likely the result of anthropogenic influence on the climate system, resulting in increasingly frequent weather extremes such as severe thunderstorms accompanied by violent wind and spouts, heat waves, drought periods, intensive precipitation accompanied by floods and other extremes.

The role of National Meteorological Services in the monitoring of global climate is essential and, to enhance climate monitoring on a global scale, the *World Meteorological Organisation* has issued a recommendation to all National Meteorological Services to periodically publish climate atlases covering 30-year (standard) periods. The period 1901–1930 was defined as the first standard period. The Meteorological and Hydrological Service of Croatia (DHMZ) developed the *Climate Atlas of the Socialist Republic of Croatia* for the next climatological period 1931–1960. The Atlas was published in 1977, on the thirtieth anniversary of the DHMZ. New technology has now enabled to produce an advanced version of the Climate Atlas of Croatia for the standard period 1961–1990, and for the period 1971–2000. It still contains climate charts of basic climatic elements; however, modern digital methods have been used for the spatial interpolation of these climatic elements so that most analogous displays are now available in digital form.

The *Climate Atlas of Croatia* is an essential publication for all those users whose work must take into consideration the climatic characteristics of a particular place, county or even the whole state. It is intended to support all economic activities: agriculture, water management, energy supply, tourism, health care, sport, environment protection, building and many more. The climate atlas of Croatia should also be incorporated in educational curricula, from primary to tertiary education.

To conclude: this is the Croatian contribution to the general global climate monitoring puzzle by which the DHMZ and the Republic of Croatia have met one of the basic requirements of the World Meteorological Organisation.

Director

Ivan Čačić, M.Sc.

Uvod
Introduction

Klima je jedna od prirodnih osobitosti neke zemlje. O njoj ovise život i zbivanja u prirodi, a gotovo da nema ljudske djelatnosti koja ne ovisi o vremenu i klimi. Stoga je poznavanje klimatskih osobitosti važno zbog planiranja razvoja i aktivnosti u mnogim društvenim i gospodarskim djelatnostima.

Izrada klimatskog atlasa je prema preporuci Svjetske meteorološke organizacije obaveza meteorološke službe svake zemlje. Klimatski atlas izrađuje se za standardna 30-godišnja klimatska razdoblja. Za prethodno klimatsko razdoblje 1931–1960. područje Hrvatske obuhvaćeno je u okviru Atlasa klime Jugoslavije iz 1969. godine, a samo manji dio karata objavljen je posebno za Hrvatsku u publikaciji Atlas klime SR Hrvatske iz 1977. godine.

Klimatski atlas Hrvatske za razdoblje 1961–1990. 1971–2000. obuhvaća karte prostorne razdiobe klimatskih elemenata, grafikone godišnjih hodova klimatskih elemenata na deset odabranih meteoroloških postaja te tekstualni dio u kojem su opisane klimatske značajke i njihovi uzroci. Na kraju se nalaze tablice s prosječnim 30-godišnjim mjesečnim, sezonskim i godišnjim vrijednostima klimatoloških elemenata na 20 postaja koje reprezentiraju klimatsku raznolikost Hrvatske. Obzirom na vremensku varijabilnost klimatskih parametara i uočeno zatopljenje u posljednjoj dekadi dvadesetog stoljeća tablični prikazi prošireni su i na klimatsko razdoblje 1971–2000.

Opće klimatske značajke opisane su u poglavlju „Klima Hrvatske“. Posebno poglavlje posvećeno je mreži meteoroloških postaja u Hrvatskoj te načinu obrade, kontrole i arhiviranja motrenih meteoroloških podataka. Slijede detaljniji opisi pojedinih klimatskih elemenata u posebnim poglavljima. Na temelju prostorne razdiobe različitih parametara pojedinih klimatskih elemenata te grafikona na kojima su prikazani hodovi, vjerojatnosti, percentili ili procjene ekstrema opisane su klimatske značajke te uzroci koji do njih dovode, a dana je i usporedba s podacima iz prethodnog klimatskog razdoblja 1931–1960. te s razdobljem 1971–2000. Grafikoni su na neki način povezani s kartama uz koje se nalaze. Tako je, primjerice, uz kartu srednje temperature zraka za siječanj na grafikonima uz kartu prikazana procjena apsolutnih minimalnih temperatura zraka, ili godišnji hod sušnih razdoblja uz oborinsku kartu za ljeto. Osobitost ovog atlasa su prilozi koji se rjeđe nalaze u klimatskim atlasima. Tu je poglavlje o vremenskim tipovima, u kojem su tekstualno opisane i kartografski prikazane karakteristične sinoptičke situacije za vremenske tipove koji se pojavljuju u Hrvatskoj, a dana je i njihova statistička obrada za kontinentalnu Hrvatsku te sjeverni i srednji Jadran. Turističkim djelatnicima može biti korisno poglavlje „Biometeorologija“ koje sadrži karte kombiniranog biometeorološkog indeksa kao pokazatelja osjeta ugode za siječanj, travanj, srpanj i listopad te grafikone s godišnjim hodom osjeta ugode i vjerojatnostima pojavljivanja različitih osjeta ugode ujutro, popodne i navečer. Za poljoprivredu može biti korisno poglavlje „Agrometeorologija“ gdje se mogu naći podaci o temperaturama tla, trajanjima razdoblja s temperaturama zraka i tla iznad određenih pragova te fenofaze odabranih biljaka. U posljednjem poglavlju su prikazane metode korištene za proračune i izradu karata u atlasu. Tu su prikazani rezultati ispitivanja homogenosti srednje godišnje temperature zraka na meteorološkim postajama korištenim u atlasu. Način izrade karata opisan je u dijelu o geostatističkom kartiranju klimatskih varijabli. Na kraju je prikazana i metoda analize ekstremnih vrijednosti koja je korištena za procjenu godišnjih apsolutnih maksimalnih i minimalnih temperatura zraka te maksimalnih dnevnih količina oborine.

Klimatski atlas je fundamentalni doprinos poznavanju klime Hrvatske. Izrada klimatskog atlasa je zahtjevan posao i rezultat je višegodišnjeg rada klimatologa DHMZ-a. Njegovom konačnom izgledu i obliku doprinijeli su dizajneri te recenzenti, prevoditelji i lektori svojim primjedbama, sugestijama i prijedlozima. Nadamo

Climate is the natural characteristic of a country. Life and natural processes depend on it and there is almost no human activity which does not depend on weather and climate. Therefore, awareness of particular climate characteristics is especially important when planning development activities in many social and economic areas.

Following the recommendation of the World Meteorological Organisation, each member state meteorological service is expected to develop a Climate Atlas. The Atlas is based on standard 30-year climate periods. For the previous climate period (1931–1960) the area of Croatia was covered by the Climate Atlas of Yugoslavia, published in 1969, and only a small number of maps were published specifically for Croatia in the Croatian Climate Atlas of 1977.

The Climate Atlas of Croatia for the period 1961–1990, 1971–2000 comprises maps of the spatial distribution of climatological elements, graphs of the annual course of climatological elements at ten chosen meteorological stations and a textual description of the relevant climate characteristics and their causes. It ends with tables of the mean 30-year monthly, seasonal and annual values of climatological elements at 20 stations representative of the climate diversity of Croatia. Because of the time variability of climatological parameters and the perceived warming in the last decade of the 20th century, the tables have been expanded to include the 1971–2000 climate period.

The general climate characteristics have been described in the chapter on climate. A chapter has been devoted to the meteorological station network and to the system of processing, controlling and archiving meteorological data. Detailed descriptions of particular climatological elements are given in separate chapters. The climatological characteristics and their causes have been described in accordance with the spatial distribution of the different parameters of particular climatic elements and the graphs showing courses, probability, percentiles and estimation of extremes. Also, a comparison has been made with the previous climate period 1931–1960 and the period 1971–2000. The graphs are linked to the adjacent maps. Thus, for example, the map showing the mean air temperatures for January is accompanied by the graph showing the estimation of absolute minimal air temperatures; or, the annual course of drought periods stands by the summer precipitation map. An important feature of this Atlas are its contributions, rarely found in climate atlases. They include a chapter on weather types presenting the weather types existing in Croatia, with a textual description and maps of characteristic synoptic situations together with a statistical analysis of data for continental Croatia and the northern and middle Adriatic. The chapter on biometeorology could be interesting to the tourist community because it contains maps of the combined biometeorological index as an indicator of thermal sensation for January, April, July and October and graphs with the annual course of the thermal sensation and the probability of occurrence of different thermal sensations in the morning, afternoon and evening. Agriculturists should find the chapter on agrometeorology interesting, as it contains data on soil temperatures, the duration of periods with air and soil temperature exceeding certain thresholds, and the phenophases of chosen plants. In the last chapter presents the methodology used for the calculations and production of the maps in the Atlas. It presents the result of the analyses of mean annual air temperature homogeneity at the meteorological stations used to produce the Atlas. The chapter on the geostatistical mapping of climatological variables describes how the maps were produced. Finally, the methodology is presented of the extreme value analysis used to predict the annual absolute maximal and minimal air temperatures and the daily maximal precipitation amounts.

This Climate Atlas is a fundamental contribution to the study of climate in Croatia and it is the result of the

se da će on koristiti stručnjacima iz različitih područja utjecaja klime u njihovom istraživačkom i stručnom radu radi prilagodbe na lokalne klimatske uvjete. Time se smanjuje rizik od meteoroloških uvjeta, doprinoseći zaštiti okoliša te društvenom i gospodarskom razvoju zemlje.

Urednica

work of the Meteorological Service climatologists over many years. Many other people have contributed to its final version with their commentaries and suggestions: designers, reviewers, translators and language-editors. We hope the Atlas will help experts engaged in the study of the effects of climate change to adapt their research and professional work to local climate conditions thus mitigating meteorological risks and contributing to environmental protection and to the social and economic development of the country.

Editor

Zgrada Državnog hidrometeorološkog zavoda u Zagrebu na Griču.
The building of the Meteorological and Hydrological Service in Zagreb, Grič.
Fotografija Photo by: Ivan Lukac

Klima Hrvatske
Climate of Croatia

Marjana Gajić-Čapka
Ksenija Zaninović

Klimu Hrvatske određuje njezin položaj u sjevernim umjerenim širinama i pripadni vremenski procesi velikih i srednjih razmjera. Najvažniji modifikatori klime na području Hrvatske jesu Jadransko i šire Sredozemno more, orografija Dinarida sa svojim oblikom, nadmorskom visinom i položajem prema prevladavajućem strujanju, otvorenost sjeveroistočnih krajeva prema Panonskoj ravnici, te raznolikost biljnog pokrova.

Kontinentalna Hrvatska ima umjereno kontinentalnu klimu i cijele se godine nalazi u cirkulacijskom pojasu umjerenih širina, gdje je stanje atmosfere vrlo promjenjivo: obilježeno je raznolikošću vremenskih situacija uz česte i intenzivne promjene tijekom godine. Te promjene izazivaju putujući sustavi visokog ili niskog tlaka, često slični vrtlozima promjera više stotina i tisuća kilometara. Zimi prevladavaju stacionarni anticiklonalni tipovi vremena s čestom maglom ili niskim oblacima, s vrlo slabim strujanjem što predstavlja povoljne uvjete za stvaranje inja. Za proljeće su karakteristični brže pokretni ciklonalni tipovi vremena (ciklone i doline), što dovodi do čestih i naglih promjena vremena, izmjenjuju se oborinska razdoblja s bezoborinskima, tiha s vjetrovitima, hladnija s toplijima. U travnju se obično pojavljuje desetak uzastopnih dana s umjerenim, čak i jakim hladnim sjevernim vjetrom koji vlada na prednjoj strani meridionalno položene anticiklone što se proteže od Skandinavije do srednje, pa i južne Europe. Ljeti su barička polja s malim gradijentom tlaka i osvježavajućim noćnim povjetarcem niz gorske obronke isprekidana prolascima hladne fronte koja dovodi svjež zrak s Atlantika uz jako miješanje zraka, pojačan vjetar, grmljavinu i pljuskove iz gustih oblaka vertikalnog razvoja. Labilna stratifikacija atmosfere i konvekcijski oblaci zadržavaju se obično još dan ili dva nakon prodora, dok se nova zračna masa ne ugrije od podloge. Za jesen su karakteristična razdoblja mirna anticiklonalnog vremena, ali i kišoviti dani u ciklonama koje prelaze baš preko naših krajeva. Anticiklonalno vrijeme se u ranoj jeseni odlikuje toplim i sunčanim danima i svježim noćima s obilnom rosom i niskim prugama magle nad potocima i rijekama, koja u jutro brzo nestaje. U kasnoj pak jeseni za anticiklone je hladno, maglovito i tmurno; u ravnicama sunce se kroz maglu probija tek na kratko, oko podneva, a na gorskim je vrhuncima, naprotiv, sunčano vrijeme po cijele dane.

Klima kontinentalnog dijela Hrvatske modificirana je maritimnim utjecajem sa Sredozemlja, koji se u području južno od Save ističe jače nego na sjeveru i sve više slabi prema istočnom području. Sljedeći lokalni modifikator klime jest orografija (Medvednica, gore u Hrvatskom Zagorju i oko Požeške kotline), koja npr. dovodi do intenzifikacije kratkotrajnih jakih oborina na navjetrinskoj strani prepreke ili stvaranja oborinske sjene u zavjetrini. To se događa, primjerice, u istočnom dijelu grada Zagreba, gdje Medvednica djeluje kao prepreka za sjeverozapadne kišonosne prodore. Sličan učinak uočen je i u nizinskom području istočno od Kalnika.

Na višim nadmorskim visinama dinarskih planina u Gorskom kotaru, Lici i dalmatinskom zaleđu prisutna je planinska klima koja se razlikuje od šireg područja prvenstveno po temperaturnom i snježnom režimu.

Primorska Hrvatska nalazi se veći dio godine također u cirkulacijskom području umjerenih širina, s čestim i intenzivnim promjenama vremena. Ljeti, naprotiv, pod utjecajem azorske anticiklone koja sprečava prodore hladnog zraka na Jadran, to područje dolazi pod utjecaj suptropskog pojasa. Jedan od najvažnijih modifikatora klime tog područja jest more, pa se ona može nazvati primorskom. Uz neposredan utjecaj ciklogenetičkog djelovanja sjevernog Jadrana, klimu tog područja izrazito modificira jako razvijena orografija dinarskog planinskog lanca.

Ljeti na Jadranu prevladava dugotrajno vedro vrijeme u polju izjednačenog tlaka oko 1015 hPa. U skladu s općim baričkim gradijentom na Sredozemlju i s položajem Jadranskog mora, tada na pučini struji sjeverozapadnjak (etezija), na sjevernom Jadranu slab, pri sredini umjeren, a bliže Otrantu povremeno jak vje-

Croatia's climate is determined by its position in the northern mid-latitudes and the corresponding weather processes on a large and medium scale. The most important climate modifiers over Croatia are the Adriatic and the Mediterranean, the Dinarides' orography with their form, altitude and position relative to the prevailing air flow, the openness of the north-eastern parts to the Pannonian plain, and the diversity of vegetation.

Continental Croatia has a temperate continental climate and throughout the whole year it is in a circulation zone of mid-latitudes, where the atmospheric conditions are very variable. They are characterised by a diversity of weather situations with frequent and intense exchanges during the year. These are caused by moving systems of low or high air pressure, often resembling vortices hundreds and thousands of kilometres in diameter. During the cold part of the year, stationary anticyclonic weather types, with foggy weather or low clouds and a very gentle air flow, are prevalent. In spring, fast-moving cyclonic weather types (cyclone and trough) are characteristic, resulting in frequent and sudden weather changes, from rainy to dry periods, from calm to windy, from colder to warmer. In April, there are usually about ten successive days with a moderate, even strong cold northern wind at the front side of the meridional anticyclone stretching from Scandinavia to Central and even Southern Europe. In summer, the zero pressure gradient fields and a cooling night breeze blowing down mountain slopes are interrupted by cold fronts passing through. They bring in fresh air from the Atlantic, with very strong air mixing, increased wind, thunder and showers from dense clouds with vertical development. This unstable atmosphere stratification and convective clouds usually stay for a day or two after the cold air outbreak, until the new air mass is warmed by the land surface. In autumn, periods of calm anticyclonic weather are very common, but there are also rainy days as cyclones pass over this territory. Calm weather in early autumn is characterised by warm and sunny days and fresh nights with heavy dew and low fog patches over streams and rivers, which dissipate quickly by the morning. In late autumn, calm weather is cold, foggy and gloomy; in open plains and in the hills, where there is light wind, rime sticks to branches and wires, and there is a short period of sunshine through fog around noon. On mountain peaks, however, the weather is sunny throughout the whole day.

The climate of continental Croatia is modified by the maritime influence of the Mediterranean, which is stronger in the area south of the Sava River than in the north, and which weakens towards the east. The next local climate modifier is orography (the Mount Medvednica, the mountains in the NW part of Croatia - Hrvatsko Zagorje, the mountains around the Požega Valley), which, for example, facilitates the intensification of short-term heavy precipitation on the windward side of the orographic obstacle or the appearance of precipitation shadow on the leeward side. This, for example, happens in the eastern part of Zagreb, where the Mount Medvednica acts as an obstacle to the northwestern precipitation outbreaks. A similar effect can be observed in the lowland area east of Mount Kalnik.

At higher altitudes, in the mountainous districts of Gorski kotar and Lika and the Dinaric Alps, there is a mountain climate that differs from the wider area primarily by its air temperature and snow regime.

The Croatian Littoral is also in a circulation area of mid-latitudes with frequent and intense weather changes most of the year. In summer, however, this area comes under the influence of the subtropical zone, as a result of the influence of the Azorean anticyclone, which prevents cold air outbreaks to the Adriatic. One of the most important climate modifiers in this area is the sea, so the climate can be referred to as maritime. With the direct influence of the Northern Adriatic cyclogenetic effect, the climate in this area is extremely modified by the highly developed orography of Gorski kotar and the Dinarides.

tar. U isto se vrijeme na većim otocima i obali, zbog nejednake brzine grijanja i hlađenja mora i kopna te brda i susjedne nizine, razvijaju lokalne dnevne periodične cirkulacije zraka. Njihovi najizraženiji dijelovi jesu redoviti danji vjetar s mora na kopno i noćni s kopna i niz obronak prema moru. Sve to omogućuje jaku turbulencijsku razmjenu zračnih svojstava, a time i uspostavu homogenih prostornih razdioba meteoroloških parametara i ublažavanje ekstrema.

U hladnom dijelu godine kao i noću za mirna vremena turbulencija je mala pa su lokalni uvjeti dominantni, zbog čega su razlike u vrijednostima, hodovima i prostornoj raspodjeli meteoroloških parametara međusobno blizih postaja velike. Tako npr. meteorološka postaja Pazin u središnjoj Istri ukazuje na specifične lokalne prilike pojačanog hlađenja u anticiklonalnim situacijama tijekom noći i zimi u udolini u kojoj je smještena. Za hladan dio godine, osobito zimu, tipičan je vjetar sjevernog Jadrana bura, koja puše iz sjeveroistočnog kvadranta i poznata je po svojoj mahovitosti, velikim brzinama i trajanju. Bura ne nastaje samo na rubu zimske kopnene anticiklone, koja seže do primorskih planina, nego i inače kad se hladniji zrak nad kopnom ruši niz te planine u toplije područje iznad mora. Najjača je kad i opći gradijent tlaka potiče zračno strujanje preko planinskog lanca. Tada čini razorne štete i kao vjetar koji udara o morsku površinu i raspršuje vrhove površinskih valova dopire daleko od obale. Prosječna brzina bure iznosi više desetaka kilometara na sat, a brzina pojedinih udara mnogo je veća; najveća izmjerena bila je 69 ms^{-1}, odnosno 248 kmh^{-1}. Ona je prevladavajući vjetar, najjači u podvelebitskom području, slabi s udaljavanjem od obale, dominira i na istarskom priobalnom području, ali je slabija i rijetka u unutrašnjosti Istre. Na srednjem i južnom Jadranu bura je obično vjetar manje intenzivan i svakako rjeđi nego na sjevernom Jadranu, a po jačini je poznata bura u kliškim vratima, Vruljama, makarskom primorju i Rijeci dubrovačkoj. Ondje je intenzitet i učestalost juga veća.

In summer, on the Adriatic, stationary clear weather prevails in the zero pressure gradient field of about 1015hPa. Due to the general pressure gradient in the Mediterranean and the position of the Adriatic, there are north-western winds (*etesians*) in the open sea, a gentle wind in the Northern Adriatic, moderate wind in the Middle Adriatic, and, occasionally, strong wind closer to the Strait of Otranto. At the same time, local daily periodic circulation is developed on the larger islands and the coast, due to the unequal warming (and cooling) speed of the sea and the land, as well as on the hills and the surrounding valleys. Its most important characteristics are a regular daily wind from sea to land and, at night, wind blowing down hill slopes towards the sea. All this enables a strong turbulent exchange of air characteristics, the establishment of a homogenous spatial distribution of meteorological parameters and the mitigation of extremes.

During the cold part of the year (and at night), in calm weather, turbulence is gentle, so local conditions are dominant, and, therefore, there are great differences in the values, courses and spatial distribution of meteorological parameters at adjacent stations. For example, due to its position in the valley, the Pazin weather station in the centre of the Istrian Peninsula shows specific local conditions of increased cooling in anticyclonic situations during the night and in winter.

During the cold part of the year, especially in winter, the typical Northern Adriatic wind is *bura.* It blows from the north-eastern quadrant and is known for its gustiness, high speed and duration. *Bura* is not formed only on the edge of winter inland anticyclones, which stretch to the coastal mountains, but also when cold air from the ground layer descends from the mountains into the warmer area above the sea. *Bura* is the strongest when the general pressure gradient stimulates an air flow over the mountain ridge. Then it causes great damage, and, as a wind blowing to the open sea and dispersing surface wave tips, it reaches remote distances from the

Motrilište opservatorija Zagreb-Grič.
The Zagreb-Grič observatory enclosure.
Fotografija Photo by: Ana Šantić

Jugo je postojan i snažan jugoistočnjak koji puše ravnomjerno brzinom sličnoj prosječnoj brzini bure, najvećom u povoljno položenim morskim kanalima. Pojavljuje se u sklopu zračnog strujanja iz južnoga kvadranta koje na pučini često ima južni smjer, a obalne ga planine u donjem dijelu atmosfere skreću u SE. Na vanjskim otocima i pučini prevladavaju vjetrovi iz smjera NNW te S i SSE.

Ciklonalna aktivnost tipična za zimu, rano proljeće i kasnu jesen jednako je značajna za oblačni i oborinski režim obale i zaleđa, s tim da u najhladnijem razdoblju ciklone uglavnom ne prelaze s Jadrana na kopno.

Preostala vremenska stanja po učestalosti nisu česta, ali se po manifestacijama ističu levantara, lebićada, garbinada i pulentada.

Prema Köppenovoj klasifikaciji klime, koja uvažava bitne odlike srednjeg godišnjeg hoda temperature zraka i količine oborine najveći dio Hrvatske ima umje-

shore. The average wind speed during *bura* is several tens of kilometres per hour, but the speed of individual wind gusts is much higher. The highest speed recorded was 69ms^{-1}, i.e. 248 km/h. *Bura* is the prevalent and the strongest wind in the sub-Velebit area and it weakens as it moves away from the shore. It is also a dominant wind in the coastal area of Istria, although it is weaker and it is not present in the hinterland of the peninsula. On the Middle and Southern Adriatic, *bura* is usually less intense and less frequent than on the Northern Adriatic. *Jugo* (*sirocco)* is a more intense and frequent wind in these areas. *Jugo* is a steady and strong wind which blows evenly with a speed similar to the *bura* average speed, being the highest in the conveniently positioned channels between the islands and the coastland. The wind occurs in the air flow from the southern quadrant and often has a southward direction into the open sea, while the coastal mountains turn it to SE. Winds from the NNW, S and SE are prevalent over the open sea and the outer islands.

Cyclonic activity, typical of winter, early spring and late autumn, is equally significant for the cloud and precipitation regime of the coast and the hinterland. In the cold period, cyclones mostly do not pass from the Adriatic to the mainland.

Other weather situations are not typical of the coastal climate. However *levantara*, *lebićada, garbinada, and pulentada* can be expected to occur.

According to the Köppen climate classification, where the mean annual temperature course and precipitation amount are considered, most of Croatia has a temperate rainy climate with an average monthly temperature higher than -3°C and lower than 18°C (symbol C) in the coldest month. Only the highest mountain areas (>1200 m asl) have a snow-forest climate with an average temperature lower than 3°C in the coldest month (symbol D). Inland, the warmest month of the year has an average temperature lower than 22°C (symbol b), in the coastal area higher than 22°C (sym-

reno toplu kišnu klimu sa srednjom mjesečnom temperaturom najhladnijeg mjeseca višom od -3°C i nižom od 18°C (oznaka C). Samo najviša planinska područja (>1200 m nm) imaju snježno-šumsku klimu sa srednjom temperaturom najhladnijeg mjeseca nižom od -3°C (oznaka D). U unutrašnjosti najtopliji mjesec u godini ima srednju temperaturu nižu od 22°C (oznaka b), u priobalnom području višu od 22°C (oznaka a), a više od četiri mjeseca u godini imaju srednju mjesečnu temperaturu višu od 10°C.

Nizinski kontinentalni dio Hrvatske ima klimu Cfwbx". Uz spomenute temperaturne karakteristike (oznake C i b), tijekom godine nema izrazito suhih mjeseci, a mjesec s najmanje oborine u hladnom je dijelu godine (fw). U godišnjem hodu oborine javljaju se dva maksimuma (x"). Lika i Gorski kotar te viši dijelovi Istre spadaju u klasu klime Cfsbx", a vršni dijelovi planina (viši od 1200 m nm) u klimu Dfsbx". U tim područjima nema sušnih razdoblja, najviše oborine padne u mjesecu hladnog dijela godine (fs), a zimsko je kišno razdoblje široko rascijepano u jesensko-zimski i proljetni maksimum (x"). Na otocima i na obalnom području srednjeg i južnog Jadrana prevladava klima masline (Csa), u kojoj je suho razdoblje u toplom dijelu godine, najsuši mjesec ima manje od 40 mm oborine i manje od trećine najkišovitijeg mjeseca u hladnom dijelu godine (oznaka s), a u većem dijelu toga područja također se javljaju dva maksimuma oborine (x").

Prema Thornthwaiteovoj klasifikaciji klime baziranoj na odnosu količine vode potrebne za potencijalnu evapotranspiraciju i oborinske vode – postoji pet tipova, od perhumidne do aridne klime. U Hrvatskoj se javljaju perhumidna, humidna i subhumidna klima. U najvećem dijelu nizinskog kontinentalnog dijela Hrvatske prevladava humidna klima, a samo u istočnoj Slavoniji subhumidna klima. U gorskom području prevladava perhumidna klima. U primorskoj Hrvatskoj pojavljuju se perhumidna, humidna i subhumidna klima. Na sjevernom i srednjem Jadranu prevladava humidna klima, pri čemu su unutrašnjost Istre, Kvarner i dalmatinsko zaleđe vlažniji nego istarska obala i Srednji Jadran. U Kvarnerskom zaljevu, uz ciklogenetičko djelovanje poseban utjecaj na velike količine oborine ima planinsko zaleđe s orografskim efektom intenzifikacije oborine, što se posebno očituje u široj riječkoj regiji. Stoga se riječka klima prema vrijednostima Thornthwaiteova indeksa svrstava u perhumidnu klimu kakva prevladava u gorskom dijelu Hrvatske. U dijelovima srednjeg i na južnom Jadranu prevladavaju subhumidni uvjeti, ali najjužniji dijelovi oko Dubrovnika zbog više oborine imaju humidnu klimu.

bol a), and more than four months within one year have a monthly average temperature higher than 10°C.

The lowland, continental part of Croatia has a Cfwbx" climate. With the previously mentioned temperature characteristics (symbols C and b), there are no extremely dry months during the year, and the month with the smallest amount of precipitation is in the cold part of the year (fw). In the annual course of precipitation there are two maxima (x"). The mountainous area of Lika and Gorski kotar, and the higher parts of Istria belong to the Cfsbx" climate class, while the mountain peaks (higher than 1200 m asl) belong to the Dfsbx" class. In these areas there are no dry periods, the highest monthly amount of precipitation is in the cold part of the year (fs), and the winter rainy period is divided into the autumn-winter and the spring maximum (x"). On the islands and in the coastal area of the Middle and Southern Adriatic, there is a prevalent olive climate (Csa), which means that the dry period is in the warm part of the year, and the driest month has even less than 40 mm of precipitation, less than a third of the amount in the rainiest month in the cold part of the year (symbol s). There are also two precipitation maxima (x") in the larger part of the area.

According to the Thornthwaite climate classification, based on the relation between the amount of water necessary for potential evapotranspiration and obtained from precipitation, there are five types of climate, from perhumid to arid. Croatia has perhumid, humid and subhumid climates. In the largest part of lowland, continental Croatia there is a prevalent humid climate, and a subhumid climate only in Slavonia. The perhumid climate prevails in the highlands. In coastal Croatia, there are perhumid, humid and subhumid climates. In the Northern and Middle Adriatic, a humid climate prevails in inland Istria, the hinterland of the Kvarner Bay and in Dalmatia, which is more humid than the Istrian coast and the Middle Adriatic. In the Kvarner Bay, beside the cyclogenetic effect, the mountainous hinterland generates high amounts of precipitation, because of its orographic effect that intensifies precipitation, which is specially manifested in the wider region of Rijeka. Therefore, according to the Thornthwaite index values, Rijeka has a perhumid climate, similar to that which is prevalent in the highland part of Croatia. In some parts of the Middle Adriatic and on the Southern Adriatic, subhumid conditions prevail. However, the southernmost parts, around Dubrovnik, towards the hilly hinterland, have a humid climate because of high precipitation amounts.

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Mreža meteoroloških postaja, obrada, kontrola i pohranjivanje podataka

Meteorological station network, data processing, controlling and archiving

Zvonimir Katušin
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Skup postaja koje na širem prostoru, prema standardiziranim pravilima obavljaju motrenja (vizualna opažanja i instrumentalna mjerenja) čini mrežu meteoroloških postaja. Mreža meteoroloških postaja koju održava Državni hidrometeorološki zavod dio je Globalnog motriteljskog sustava Svjetske meteorološke organizacije.

Pojedinačna meteorološka motrenja u Hrvatskoj obavljana su na više mjesta tijekom srednjeg vijeka i provodili su ih pojedinci. Jedan od poznatijih bio je liječnik Santorio Santorio, koji je osobno konstruiranim instrumentima u razdoblju od 1587. do 1599. obavljao motrenja u Senju, Novom Vinodolskom, Ozlju i Karlovcu.

Motrilište na visinskoj glavnoj meteorološkoj postaji Zavižan.
The Zavižan high elevation main meteorological station enclosure.
Fotografija Photo by: Ante Vukušić

The meteorological station network consists of a number of stations which, according to standardised procedures, perform observations (visual observations and instrument measurements) over a wider area. The meteorological station network maintained by the Meteorological and Hydrological Service of Croatia (DHMZ) is part of the World Meteorological Organisation Global Observing System.

In the middle ages, particular meteorological observations in Croatia were performed at several locations and they mostly depended on individual persons. One of the better known observers was a physician named Santorio Santorio who, in the period from 1587 to 1599, performed observations, with instruments constructed by himself, in Senj, Novi Vinodolski, Ozalj and Karlovac.

The first meteorological station networks in Europe started emerging after a meteorological society, named Societas Meteorologica Palatina, had been established in Mannheim in 1781. In 1829/1830 and in 1841/1842, meteorological observations were performed and published in contemporary newspapers in Zagreb. Such measurements also existed in other Croatian cities and towns, e.g. Zadar, Hvar, Osijek, Mali Lošinj.

Organised meteorological station networks in Europe were established in the second half of the 19th century. In the majority of European countries observations were organised in 1880, and, therefore, that year has been chosen as the beginning of the period of organised observations in Europe.

The central meteorological service in Vienna published the first annual meteorological report in 1848, for the area of the Habsburg Monarchy, and the first meteorological data for Dubrovnik were published in the annual report for 1851. Immediately after that, new meteorological stations were founded: Zavalje (near Bihać) in 1852, Stara Gradiška and Zagreb in 1853, Zadar and Zemun in 1854, Korčula in 1855, Vis in 1857, Hvar in 1858, Osijek, Split and Varaždin in 1859, Rijeka in 1860.

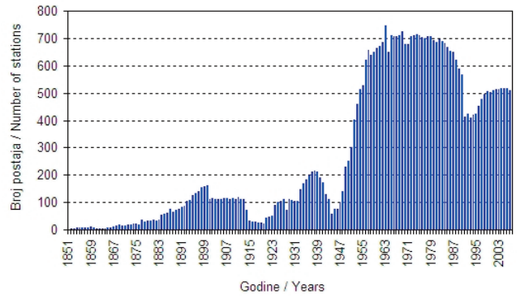
Prve mreže meteoroloških postaja počinju se u Europi pojavljivati nakon 1781, kad je u Mannheimu osnovano meteorološko društvo Societas meteorologica Palatina. U Zagrebu su 1829/1830 te 1841/1842 obavljana meteorološka motrenja koja su objavljivana u tadašnjim novinama. Takvih mjerenja bilo je i u drugim gradovima, kao primjerice u Zadru, Hvaru, Osijeku, Malom Lošinju.

Organizirane mreže meteoroloških postaja u Europi osnivane su tijekom druge polovine 19. stoljeća, a u većini europskih zemalja 1880. godine postoje organizirana motrenja, pa se ta godina uzima kao početak razdoblja organiziranih meteoroloških motrenja u Europi.

Središnji meteorološki ured u Beču objavio je 1848. prvi meteorološki godišnjak za područje habsburške monarhije, a u godišnjaku iz 1851. objavljeni su meteorološki podaci za Dubrovnik. Odmah nakon toga osnivane su nove meteorološke postaje: 1852. Zavalje (kod Bihaća), 1853. Stara Gradiška i Zagreb, 1854. Zadar i Zemun, 1855. Korčula, 1857. Vis, 1858. Hvar, 1859. Osijek, Split i Varaždin, 1860. Rijeka.

Na tadašnjem području Hrvatske 1900. radilo je 146 meteoroloških postaja, od toga 88 kišomjernih. Daljnji razvoj i broj meteoroloških postaja bitno je ovisio o povijesnim događajima, pa se broj meteoroloških postaja smanjio za vrijeme i nakon prvog i drugog svjetskog rata te domovinskog rata (Slika 1).

Najviše meteoroloških postaja bilo je u Hrvatskoj u razdoblju od 1963. do 1980. godine, kada je ukupan broj meteoroloških postaja prelazio 700, a prosječna udaljenost između postaja bila u skladu s propisima Svjetske meteorološke organizacije.



Slika 1. Ukupan broj meteoroloških postaja od 1851–2007. godine na području Hrvatske.
Figure 1. Total number of meteorological stations in 1851–2007 in Croatia.

There were 146 meteorological stations on the territory of Croatia at the time, out of which 88 precipitation stations. Further development and the number of meteorological stations depended significantly on historical events: the number of meteorological stations decreased during and after the First and Second World Wars, as well as after the Patriotic War from 1991 to 1995 (Figure 1).

Croatia was best covered by meteorological stations in the period from 1963 to 1980, when the number of stations was over 700, and the average distance between them was in accordance with World Meteorological Organisation regulations.

According to their **organisation**, meteorological stations are divided into: *main meteorological stations,* with 2 to 5 professional observers, *ordinary (climatological) meteorological stations,* with amateur observers and observations at 7 am, 2 pm and 9 pm local time and with 24-hour observations of meteorological

Slika 2. Mreža glavnih meteoroloških i klimatoloških postaja dana 31. prosinca 2007.
Figure 2. Main meteorological and climatological stations network on 31 December 2007.

Prema **organizaciji**, meteorološke postaje se dijele na ove: *glavne meteorološke postaje* s 2 do 5 profesionalna motritelja, *obične (klimatološke) meteorološke postaje* s neprofesionalnim motriteljima i motrenjima u 7, 14, 21 h lokalnog vremena te opažanjem meteoroloških pojava tijekom 24 sata, *kišomjerne postaje* s neprofesionalnim motriteljima i mjerenjem oborine u 7 h te motrenjem meteoroloških pojava tijekom 24 sata, *totalizatore* za prikupljanje godišnjih količina oborine, *automatske meteorološke postaje* s automatskim bilježenjem meteoroloških elemenata i neposrednom vezom u informacijski sustav. Današnja mreža meteoroloških postaja (31. 12. 2007.) sastoji se od 41 glavne meteorološke postaje, 113 klimatoloških (Slika 2), 333 kišomjernih postaja, 23 totalizatora i 63 automatske meteorološke postaje.

Prema **programu motrenja** meteorološke postaje dijele se na ove: sinoptičke postaje, visinske (radiosondažne i pilotbalonske) postaje, klimatološke postaje, zrakoplovne postaje, agrometeorološke postaje, postaje za kvalitetu zraka, specijalne meteorološke postaje, koje se dijele na: radarske postaje, postaje za Sunčevo zračenje, postaje za mjerenje količine ozona, postaje za mjerenje radioaktivnosti zraka te postaje za mjerenje atmosferskog elektriciteta i električnog pražnjenja

Osim navedenih postaja, DHMZ skrbi i o mreži hidroloških postaja, pomorskim brodskim meteorološkim postajama i postajama za mjerenje temperature mora.

U atlasu su korišteni podaci glavnih meteoroloških, klimatoloških i kišomjernih postaja te totalizatora.

Program rada *glavne meteorološke postaje* obuhvaća opažanja i mjerenja sadašnjeg i prošlog vremena, smjera i brzine vjetra, naoblake, vrste oblaka, visine podnice oblaka, vidljivosti, temperature zraka, vlažnosti zraka, atmosferskog tlaka, iznosa i oblika tendencije tlaka, minimalne i maksimalne temperature, količine oborine, stanja tla, snježnog pokrivača, trajanja sijanja Sunca, minimalne temperature zraka na 5 cm,

phenomena, *precipitation stations,* with amateur observers, measuring precipitation at 7 am and observing meteorological phenomena over 24 hours, *storage rain-gauge stations,* collecting annual amounts of precipitation, *automatic stations,* with automatic registration of meteorological elements and direct connection to the information system. The current meteorological station network (data from 31 December 2007) consists of 41 main meteorological stations, 113 climatological stations (Figure 2), 333 precipitation stations, 23 storage rain-gauge stations, and 63 automatic stations.

According to **observation programmes**, meteorological stations are divided into: synoptic stations, upper-air stations (radio-sonde and pilot-balloon) stations, climatological stations, aeronautical stations, agrometeorological stations, air quality measurement stations and special meteorological stations, which are further divided into: radar stations, solar radiation measurement stations, ozone quantity monitoring stations, air radioactivity measurement stations and stations for measuring atmospheric electricity and electric discharge.

Besides these, the DHMZ administers the hydrological station network, marine meteorological stations and sea temperature measurement stations.

In this Atlas, data from the main meteorological, climatological and precipitation stations have been used.

The *main meteorological station* programme of activities includes observations and measurements of present and past weather, wind direction and speed, cloud amount, type of cloud, cloud base height, visibility, air temperature, air humidity, atmospheric pressure, pressure tendency amount and shape, minimal and maximal temperature, precipitation amount, state of soil, snow cover, sunshine duration, minimum air temperature at 5 cm height, soil temperature at 2, 5, 10, 20, 30, 50 and 100 cm. Observations are performed every hour during working time of observers, depending on the number of observers at the station. The ma-

Glavna meteorološka postaja Bjelovar.
The main meteorological station Bjelovar.
Fotografija Photo by: Zvonko Žibrat

temperature tla na 2, 5, 10, 20, 30, 50 i 100 cm. Motrenja se obavljaju svaki sat za vrijeme dežurstva koja ovise o broju motritelja na postaji. Na većini glavnih meteoroloških postaja postavljene su i automatske meteorološke postaje, a na njima se obavljaju i različiti drugi programi rada.

Obvezni program rada *klimatoloških postaja jest cjelodnevno motrenje vremena* u terminima motrenja u 7, 14, 21 h po mjesnom vremenu smjera i jačine vjetra, naoblake, terminskih i ekstremnih temperatura zraka, vlažnosti zraka, količine oborine, visine ukupnog i novog snijega. Takva su motrenja temelj svih dugogodišnjih postojećih klimatoloških nizova podataka, od 1851.

Na *kišomjernoj postaji* obvezno se motri vrijeme tijekom dana, te količina oborine i visina ukupnog snijega ujutro u 7h.

jority of main meteorological stations include automatic meteorological stations connected to the DHMZ information system. Main meteorological stations perform some other observation programmes.

The *ordinary (climatological) meteorological station* obligatory programme of activities consists of 24-hour observations of weather phenomena, and observations at climatological observation hours (7 am, 2 pm and 9 pm, local time) of wind direction and force on the Beaufort scale, total cloud amount and air temperature as well as of extreme air temperatures, air humidity, amount of precipitation, height of total and new snow. Since 1851, such observations have been the basis for all existing climatological data series.

At *precipitation stations*, weather phenomena are observed during the day while the amount of precipitation and the height of total snow is measured at 7 am.

All measurements: conventional measurements at the main meteorological stations as well as remote automatic, radar and satellite measurements are brought together by a common telecommunication and computer system.

Until the end of 1967, meteorological data were only available as written records in observation diaries, which included basic statistical analyses. These data were also used to produce, on paper, multi-annual surveys of particular elements from different stations. Computer storing, controlling and processing was introduced in 1968. Data processing started at the Federal Hydrometeorological Institute in Belgrade and was carried out there for all the ex-Yugoslav republics until 1980. At the very beginning, data were stored on punch cards and when they were later transferred to magnetic tape part of the data was lost.

Since January 1981, data processing and the storage of climatological data from both main meteorological and climatological stations (observations at 7 am, 2 pm and 9 pm, local time) have been performed in Zagreb. By then, the DHMZ had prepared all the programmes

Sva mjerenja, konvencionalna na glavnim meteorološkim postajama, daljinska automatska, radarska i satelitska povezana su u jedinstveni telekomunikacijski i računalni sustav.

Do kraja 1967. postojali su samo zapisi meteoroloških podataka u dnevnicima motrenja koji su sadržavali i osnovne statističke obrade. Na temelju toga radili su se, također u papirnatom obliku, višegodišnji pregledi pojedinih elementima po postajama. Od 1968. prelazi se na unos, kontrolu i obradu klimatoloških podataka računalom. Računalna obrada podataka počela je i obavljala se u Beogradu za sve države bivše Jugoslavije sve do 1980. U samim počecima računalne obrade podaci su se pohranjivali na izbušene papirnate kartice. Pri promjeni načina pohranjivanja podataka, na magnetske trake, došlo je do gubitka dijela podataka pohranjenih na karticama.

Od siječnja 1981. računalna obrada i pohranjivanje klimatoloških podataka glavnih i klimatoloških postaja (motrenja tri puta dnevno u 7, 14 i 21 sat, lokalno vrijeme) obavlja se u Zagrebu. Tad su u Zavodu napravljeni svi potrebni programi za unos, različite vrste kontrola i ispisa obrađenih i kontroliranih podataka. Od 1981. u digitalnom obliku nalaze se klimatološki podaci svih postaja. Deset godina poslije, u siječnju 1991., počinje unos i računalna obrada podataka kišomjernih postaja. Iste godine počinje unos i kontrola satnih vrijednosti različitih meteoroloških elemenata.

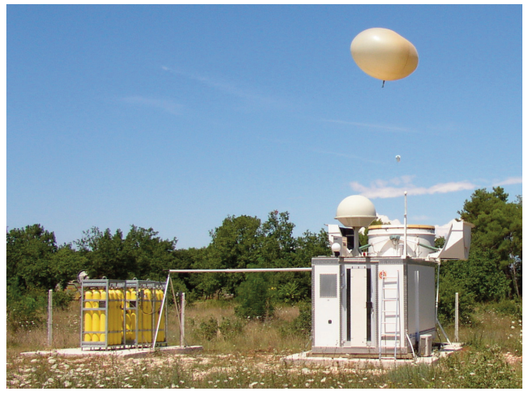
Podaci iz razdoblja prije računalne obrade i kontrole, u obliku različitih dnevnika i izvještaja te zapisi autografa čuvaju se u našem arhivu. Zbog nedostatka prostora, arhivska građa nije pohranjena samo u Zagrebu već i u Križevcima, Karlovcu i Gospiću. Ti podaci unose se i kontroliraju prema vlastitim potrebama ili zahtjevima i potrebama investitora i drugih korisnika.

Danas podaci s glavnih, automatskih i radiosondažnih postaja pristižu u Zavod u realnom vremenu i digitalnom obliku. Podaci s klimatoloških i kišomjernih postaja pristižu po završetku svakog mjeseca u obliku

Klimatološka postaja na jadranskom pučinskom otoku Palagruži.
The climatological station on the remote Adriatic island of Palagruža.
Fotografija Photo by: Davor Tomšić

required for data input, different controls and the printing of processed and controlled data. Since then, all climatological data from all stations have been digitally stored. Ten years later, in January 1991, entry and processing of data from precipitation stations was introduced. The same year saw the entry and control of the hourly values of different meteorological elements.

Data collected before the introduction of computer processing and control, such as diaries, reports and autographic records are kept in the DHMZ archives. Due to lack of space in Zagreb, part of the archival material has been stored also in Križevci, Karlovac and Gospić. These records have been and are being entered in the computer system as necessary, for internal purposes or when required by investors and other users.



Radiosondažna postaja Zadar-Zemunik
Radiosonde station Zadar-Zemunik.
Fotografija Photo by: Anđelko Vidović

dnevnika i izvještaja, te se kontroliraju i ručno unose u računalo. Podaci s glavnih meteoroloških postaja u pravilu su kvalitetniji od onih s klimatoloških i kišomjernih postaja. Jedan od razloga svakako je i to što na glavnim postajama rade školovani ili doškolovani meteorološki tehničari, a na klimatološkim i kišomjernim postajama priučeno osoblje odnosno volonteri.

Svi prikupljeni meteorološki podaci podvrgavaju se različitim vrstama provjera i kontrola prije pohranjivanja u računalo. Podaci iz klimatoloških termina (glavnih i klimatoloških postaja) i oborinski podaci s kišomjernih postaja, važni su za proučavanje klime, pa se ukratko navode načini njihove kontrole. Kontrola tih podataka provodi se na mjesečnoj bazi, a po završetku godine i nakon svih kontrola pohranjuju se u bazu.

Kontrole klimatoloških podataka mogu se u grubo podijeliti u dvije grupe. U prvoj grupi kontrola koriste se samo podaci postaje koja se kontrolira a sastoje se od:

• kontrole znakova (program provjerava da li su na određenim mjestima upisani dozvoljeni znakovi, te daje popis gdje taj uvjet nije ispunjen);

• kontrole potpunosti (program pronalazi ˝praznine˝ u slogu podataka i ukoliko one postoje ispisuje upozorenja koja se zatim provjeravaju);

• logičke kontrola (provjerava logički odnos između podataka motrenih na jednoj postaji i daje popis poruka koje mogu biti provjere, uvjetni ispravci ili ispravci).

Drugu grupu kontrola čine kontrole gdje se koriste i podaci drugih postaja, a sastoji se od:

• prostorne kontrole 1 (uspoređuje 16 parametara za postaje koje su sličnih klimatskih karakteristika, pronalazi sumnjive, a opravdanost prostornog odstupanja procjenjuje se subjektivnom metodom, uvažavajući klimatske karakteristike postaja);

• prostorne kontrole 2 (program na osnovu mjesečnih srednjaka ili suma 13 meteoroloških elemenata i zemljopisnih koordinata i nadmorske visine, određuje za svaku postaju 3 postaje s najsličnijim vremenskim prilikama u mjesecu, te u odnosu na srednjake tih usporednih postaja računa odstupanja i ispisuje postaje s najvećim odstupanjima);

• grafičke kontrole (grafičkom usporedbom pronalaze se prostorna odstupanja u terminskim ili dnevnim vrijednostima, a podaci sumnjive postaje uspoređuju se s podacima postaje s najsličnijim klimatskim karakteristikama, te sa srednjim vrijednostima dvije, tri ili četiri okolne postaje).

Istovrsne kontrole primjenjuju se na tekuće podatke ali i na povijesne nizove podataka.

Provjereni i kontrolirani podaci pohranjuju se u bazu podataka i raspoloživi su za daljnju upotrebu. Do 1999. svi kontrolirani podaci pohranjivani su na MicroVAX-u, a od 1999. podaci su pohranjeni i na UNIX operativnom sustavu.

Nowadays, data from the main and radio-sonde stations reach the DHMZ in real time and in digital form. Data from the climatological and precipitation stations are delivered at the end of each month as diaries and reports and are controlled and manually entered into the system. Main station data are usually of higher quality than those from the climatological and precipitation stations, one of the reasons being that the observers at the main stations are educated and trained meteorological technicians while the staff at climatological and precipitation stations consists mainly of trained-on-the-job, amateur observers.

All the data collected undergo different checks and controls before being entered into the computer. Data collected at climatological observation hours (at the main and climatological stations) and precipitation data from the precipitation stations are important for the study of climate and, thus, a short survey must be given of the control process.

These data are controlled monthly and stored annually, at the end of the year.

There are basically two sets of climatological data checks. The first set is carried out on data collected from the station being controlled and it includes:

• character control (the programme checks whether the relevant characters have been inserted in the right places and produces a list showing where this requirement has not been met);

• completeness control (the programme looks for “gaps” in the data record and, if any are found, it produces warnings which lead to further checks);

• logic control (the programme checks the logical relationship of data observed at a certain station and produces a list of messages leading to checks, conditional corrections or corrections).

The next set of checks takes into consideration also data from other stations and it includes:

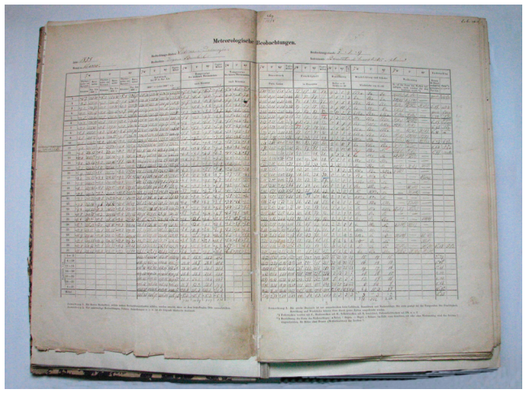
• spatial control 1 (the programme compares 16 parameters from stations with similar climatic characteristics and detects suspicious parameters. Spatial deviation adequacy is evaluated subjectively, taking into account the stations’ climatic characteristics);

• spatial control 2 (for each station, taking the monthly means or the sum of 13 meteorological elements and the geographic coordinates and altitude, the programme identifies three other stations with the most similar weather conditions in a particular month and by comparison with the means of these parallel stations it calculates possible deviations and lists the stations with the greatest deviations);

• graphic control (by comparing graphics, spatial deviations in term and daily values are detected and the data of the “suspicious“ station are compared with the data of the station with the most similar climatic chara-

Motrilište na meteorološko aerološkom opservatoriju Zagreb-Maksimir.
The enclosure of the Zagreb-Maksimir meteorological and aerological observatory.
Fotografija Photo by: Ivan Lukac

Arhivska građa pohranjena pri glavnoj agrometeorološkoj postaji Križevci.
Archival material stored at the Križevci main agrometeorological station.
Fotografija Photo by: Zdravko Koščević



Meteorološko mjesečno izvješće postaje Hvar za ožujak 1858. iz arhive DHMZ-a.
Monthly meteorological report, Hvar station, March 1858 (DHMZ archives).
Fotografija Photo by: Marko Vučetić

cteristics and the mean values of two, three or four neighbouring stations).

The same controls are applied both to current data and to historical data series. Checked and controlled data are stored in the data-base, ready for further use. Until 1999, all controlled data were stored in MicroVAX and, since, they have been also stored in the UNIX operating system.

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Temperatura zraka
Air temperature

Ksenija Zaninović

Temperatura zraka jedan je od najvažnijih klimatskih elemenata i o njoj ovisi život prirode i brojne ljudske djelatnosti. Godišnji hod temperature zraka utječe na vegetacijski ciklus, a o temperaturi zraka ovisi količina energije potrebna za grijanje ili hlađenje unutarnjeg prostora, odabir materijala za gradnju, mogućnost boravka i obavljanja radova na otvorenom, a u velikoj mjeri utječe i na turizam.

Na temperaturu zraka prvenstveno djeluje podloga od koje se zrak grije ili hladi kao i ižaravanje topline samog zraka. Stoga su prostorno-vremenske karakteristike temperature zraka u Hrvatskoj, uz opću cirkulaciju atmosfere i geografsku širinu, prvenstveno uvjetovane raspodjelom kopna i mora, zbog razlike u akumuliranju topline u njima, i nadmorskom visinom. Temperaturu zraka može promijeniti zračno strujanje ukoliko na neko mjesto dovodi hladniji ili topliji zrak od onog što se tamo prije nalazio i u manjoj mjeri sastav tla i vegetacija.

Prema standardima Svjetske meteorološke organizacije temperatura zraka se mjeri u termometrijskoj kućici na visini 2 m iznad tla, pri čemu su vrata kućice postavljena prema sjeveru. Temperatura zraka se mjeri u tri klimatološka termina dnevno (7h, 14h i 21h), a dnevni srednjak računa se ovako:

$$\bar{t} = \frac{t_7 + t_{14} + 2 \times t_{21}}{4}$$

Temperatura zraka u pravilu se smanjuje s visinom, ali vertikalni gradijenti nisu u čitavoj Hrvatskoj jednaki, a mijenjaju se i s vremenom (godišnja doba, dijelovi dana). Promjena srednje godišnje temperature zraka s visinom najmanja je u kopnenom dijelu Hrvatske koji obuhvaća čitav nizinski dio te Liku i Gorski kotar i ona iznosi 0,5°C/100 m. Visok planinski lanac Dinarida koji odvaja kontinentalni dio od mora djeluje kao prepreka i na taj način smanjuje utjecaj mora na temperaturne prilike na kopnu. Zbog toga je i promjena temperature zraka s visinom u Istri i dalmatinskom zaleđu veća nego u kontinentalnom dijelu zemlje, ali manja nego uz obalu i iznosi 0,6°C/100 m. Linearno opadanje temperature zraka s nadmorskom visinom najbrže je u priobalnim zonama, gdje vertikalni gradijent iznosi 0,7°C/100 m.

Srednja godišnja temperatura zraka na području Hrvatske kreće se od 3°C na najvišim planinskim predjelima do 17°C uz samu obalu i na otocima srednje i južne Dalmacije zbog njihovog geografskog položaja i neposrednog utjecaja mora.

Ravničarski dio kontinentalne Hrvatske ima blage razlike u srednjoj godišnjoj temperaturi zraka uz prevladavajuću temperaturu zraka od oko 11°C. Veće srednje godišnje temperature zraka (12°C) uočavaju se samo u najistočnijim predjelima Hrvatske kao posljedica najtoplijih ljeta u tom najkontinentalnijem dijelu Hrvatske, te na području Zagreba zbog utjecaja toplinskog otoka grada. Niže temperature zraka, između 8°C i 11°C, javljaju se na većim nadmorskim visinama zapadnoslavonskog gorja (Psunj, Papuk, Krndija, Požeška i Dilj gora). U sjeverozapadnoj Hrvatskoj temperatura zraka također je niža uz obronke Bilogore, Kalničkog gorja, Ivanščice i Medvednice, na čijim je vrhovima najniža temperatura zraka od 8°C. Najniže srednje godišnje temperature zraka od 6°C pojavljuju se u tom dijelu Hrvatske na vršnom području Žumberačke gore.

Južno od Save srednje godišnje temperature zraka kreću se između 7°C i 11°C s najnižim vrijednostima na vrhovima Zrinske i Petrove gore.

Zbog velike orografske razvedenosti područja Like i Gorskog kotara, raspon srednjih godišnjih temperatura zraka na tom je području najveći, pa se srednja godišnja temperatura zraka u Lici kreće između 5°C i 9°C, a u Gorskom kotaru od 3°C do 11°C. Najniže godišnje temperature zraka od 2°C do 3°C pojavljuju se na vrhovima Risnjaka, Bjelolasice i sjevernog Velebita na visinama iznad 1700 m. Na najvišoj meteorološkoj postaji, na Zavižanu (1594 m) srednja godišnja temperatura zraka iznosi 3,5°C. Zbog ovisnosti temperature

Air temperature is one of the most important climatological elements that nature, life and numerous human activities depend on. The annual temperature cycle affects the vegetation cycle, and air temperature also affects the amount of energy required for heating or cooling, the selection of material and insulation material for construction, as well as the possibility of living and working outside. To a large extent, it also affects tourism.

Air temperature is mostly influenced by the ground base, which either warms or cools the air, as well as by mere warm-air radiation. This is the reason why, besides the general atmospheric circulation and geographical latitude, the air temperature space and time features in Croatia are mostly influenced by the distribution of sea and land, because of the difference in warmth accumulation above them, as well as by the height above sea-level. Air temperature can be changed by air flow, if it brings to some place cooler or warmer air than the one which was there before, and, to a smaller extent, by soil structure and vegetation.

According to the standards of the World Meteorological Organization, air temperature is measured in thermometer shelters at a height of 2 m above ground, with the shelter door turned towards the north. Air temperature is measured daily, at three climatological terms (7 am, 2 pm and 9 pm), and the daily mean temperature is calculated as follows:

$$\bar{t} = \frac{t_7 + t_{14} + 2 \times t_{21}}{4}$$

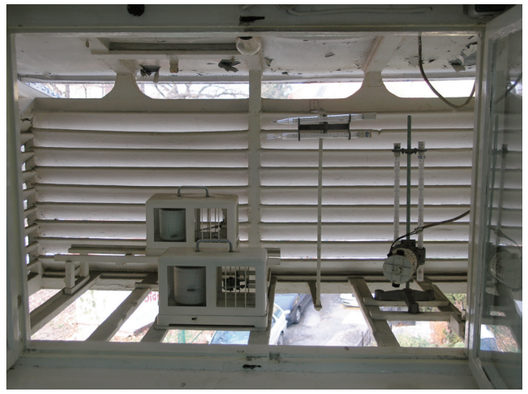
In general, air temperature decreases with altitude, but the air temperature vertical gradients are not the same all over Croatia, and also differ over time (seasons, parts of the day). The change of air temperature with altitude is the least in the continental part of Croatia, which includes the whole lowland area, as well as Lika and Gorski kotar, where it reaches 0.5°C/100m. The high mountain range of the Dinarides separates the mainland from the coast, acting as a barrier and diminishing the sea influence on the continent. This is why the air temperature gradient is greater in Istria and the Dalmatian hinterland than in the continental part of the country, but still smaller than on the coast, its value being 0.6°C/100m. The linear decrease of air temperature related to altitude is the fastest in the coastal regions, where the vertical gradient is 0.7°C/100m.

The mean annual temperature in Croatia ranges from 3°C in the highest mountain areas, to 17°C along the coast and on the islands of the middle and southern Adriatic, due to geographical position and the influence of the sea.

The lowland part of continental Croatia shows mild differences in mean annual air temperature, the most dominant temperature being about 11°C. Higher mean annual air temperatures (12°C) have been noticed only in the easternmost part of Croatia as a result of very warm summers in this, the most continental, part of Croatia, and in the Zagreb area, because of the urban heat island. Lower air temperatures, 8°C to 11°C, occur at higher altitudes in the hills of western Slavonia (Psunj, Papuk, Krndija, Požeška gora, Dilj gora). In north-western Croatia, air temperature is also lower on the slopes of Bilogora, Kalničko gorje, the Ivanščica and Medvednica mountains, whose tops have the lowest air temperature of 8°C. The lowest mean annual air temperatures of 6°C in this part of Croatia occur in the peak area of Žumberačka gora.

In the area south of the Sava River, the mean annual air temperatures range from 7 to 11°C, with the lowest values on the tops of Zrinska gora and Petrova gora.

Due to the substantial orographic indentedness of the area of Lika and Gorski kotar, the span of mean annual air temperatures is the greatest there; the mean annual air temperature in Lika ranges from 5°C to 9°C, and in Gorski kotar from 3°C to 11°C. The lowest annual air temperatures, 2°C to 3°C, occur on the tops of



Termometrijska kućica na opservatoriju Zagreb-Grič.
The Zagreb-Grič observatory thermometer shelter.
Fotografija Photo by: Željko Lončar

o nadmorskoj visini i velikih promjena nadmorske visine prostorna promjena temperature na tom je području vrlo velika. Zbog zagrijavajućeg utjecaja mora osnovni temperaturni potencijal (temperatura zraka na nadmorskoj visini 0 m) na primorskoj je strani planinskoga masiva znatno viši (14,8°C) od onoga u zaleđu (11,1°C). Stoga je i prosječni vertikalni gradijent temperature zraka s primorske strane veći (0,7°C na 100 m) od onoga u unutrašnjosti (0,5°C na 100 m). Izoterma 10°C nalazi se s jugozapadne strane planinskog masiva na nadmorskoj visini 600 do 700 m, dok je sa sjeveroistočne na prosječno 200 do 300 m nad morem. Na ličkoj visoravni, čija je nadmorska visina između 500 i 600 m, prosječna godišnja temperatura zraka kreće se između 8°C i 9°C.

Obala poluotoka Istre ima srednju godišnju temperaturu zraka oko 13°C, a njezine se vrijednosti smanjuju prema unutrašnjosti. U Pazinskoj kotlini i dolini Raše srednja je godišnja temperatura zraka oko 11°C. Najniže vrijednosti godišnje temperature zraka u Istri su na vrhovima Učke i Ćićarije i iznose oko 8°C.

Otoci sjevernog primorja imaju srednju godišnju temperaturu zraka u rasponu 13°C – 15°C pri čemu su najtopliji uz more i prema jugu najistureniji dijelovi Cresa, Malog Lošinja i Raba.

Na primorskom području Hrvatske srednja godišnja temperatura zraka kreće se između 14°C i 15°C na sjevernom i srednjem Jadranu, a od doline Krke na jug te na otocima srednjeg i južnog Jadrana do 17°C.

U dalmatinskom zaleđu kao i u zaleđu Biokova utjecaj mora je još uvijek velik pa je osnovni temperaturni potencijal relativno visok i iznosi 15°C. Na području Sinjske i Imotske krajine koje su na oko 400 m nad morem srednja godišnja temperatura zraka kreće se između 13°C i 14°C. Temperatura zraka smanjuje se prosječno za 0,6°C na 100 m i na vrhovima Mosora i Svilaje kreće se između 6°C i 7°C, na Biokovu oko 4,5°C, a najmanje vrijednosti ima na vrhovima Dinare gdje iznosi oko 3°C.

Usporedba srednjih godišnjih temperatura zraka za razdoblje 1961–1990. s prijašnjim razdobljem 1931–1960. koje je korišteno za izradu karata u Atlasu klime SFR Jugoslavije a potom i u Atlasu klime SR Hrvatske, pokazuje da je na većini postaja novo razdoblje hladnije od prethodnoga (73,5% postaja), dok je na podjednakom broju postaja novo razdoblje toplije (14,7%), odnosno nije došlo do promjene temperature (11,8%). Posljedica je to toplog razdoblja 50-tih godina.

Klimatsko razdoblje 1971–2000. u čitavoj je Hrvatskoj toplije od razdoblja 1961–1990. sudeći prema podacima za 20 postaja danih u tablicama u prilogu. Porast temperature u posljednjem klimatskom razdoblju uočava se u svim godišnjim dobima s izuzetkom jeseni. Razlike su najveće između zimskih temperatura i veće su u kontinentalnom dijelu Hrvatske nego na moru.

Godišnji hod temperature zraka ima oblik jednostrukog vala s maksimumom ljeti, najčešće u srpnju,

Risnjak, Bjelolasica and northern Velebit, at altitudes above 1700 m. At the highest meteorological station of Zavižan (1594 m), the mean annual air temperature is 3.5°C. Due to temperature dependence on altitude and due to the great changes in this altitude, the spatial temperature change in this area is also very large. The basic temperature potential (i.e. air temperature at an altitude of 0 m) is much higher on the coastal side of the mountain massif (14.8°C) than in the hinterland (11.1°C) because of the warming effect of the sea. This is why the vertical air temperature gradient is higher on the coastal side (0.7°C/100 m) than on the mainland (0.5°C/100 m). An isotherm of 10°C is situated at an altitude of 600 m to 700 m above sea level on the southwestern side of the mountain range, while it is, on average, at an altitude of 200 m to 300 m above sea level on the north-eastern side. On the Lika plateau, which is at an altitude of 500 to 600 m, the mean annual air temperature spans between 8°C and 9°C.

The coast of the Istrian Peninsula has a mean annual air temperature of about 13°C and its values decrease towards the hinterland. In the Pazin basin and the Raša valley, the mean annual air temperature is about 11°C. The lowest values of annual air temperature in Istria are on the tops of Učka and Ćićarija: they are at about 8°C.

The mean annual air temperature on the islands of the northern Adriatic varies from 13°C to 15°C, with the parts of Cres, Mali Lošinj and Rab protruding into the sea and to the south being the warmest.

On the coast, the mean annual air temperature ranges between 14°C and 15°C, in the northern and middle Adriatic, to 17°C in the area of the Krka River valley to the south and on the islands of the middle and southern Adriatic.

In the Dalmatian, as well as in the Biokovo hinterland, the sea influence is still high and, therefore, the basic temperature potential is relatively high, at about 15°C. In the Sinj and Imotski regions, which are situated at an altitude of 400 metres, the mean annual air temperature ranges between 13°C and 14°C. Air temperature decreases by 0.6°C/100 m on average and on the Mosor and Svilaja tops it ranges between 6°C and 7°C; on Biokovo it is at about 4.5°C, and it has the lowest values on the Dinara tops, where it is at about 3°C.

A comparison of the mean annual temperatures in the period 1961-1990 with those in the period 1931–1960, used for the climate atlas of Yugoslavia and Croatia, shows that the latter period was cooler at most stations (73.5%), warmer at 14.7% of the stations, while 11.8% of the stations show no changes in temperature. It is the consequence of the warm period in 1950's.

Throughout Croatia, the climate period 1971–2000 was warmer than the 1961–1990 period according to 20 stations (see the tables in the supplement). In the more recent period, a temperature increase is evident in all seasons except autumn. The differences are greatest in the winter temperatures and are also greater on the mainland than on the coast. However, all differences are smaller than standard deviation, and one can assume that the temperatures in the two periods do not differ significantly.

The annual air temperature course has a shape of a one-strand wave with a peak in summer, most often in July, more rarely in August, and with a minimum in winter, in January (graphs next to the mean annual air temperature map). The sea warms and cools more slowly than the land, and that is why its vicinity reduces the difference in temperature. This is also why the differences in temperature between the warmest and the coldest month are the highest in the lowland, continental part of Croatia (about 21 to 22°C). In the mountainous part of Lika and Gorski kotar and in the Dalmatian hinterland they vary between 18°C and 20°C and on the coast they are about 16°C or 17°C. The warming effect of the sea in winter manifests itself with great temperature differences between the continental

rjeđe u kolovozu, te minimumom zimi u siječnju (grafikoni uz kartu srednje godišnje temperature zraka). More se grije sporije i hladi sporije nego kopno, pa blizina mora ublažava temperaturne razlike. Stoga su temperaturne razlike između najtoplijeg i najhladnijeg mjeseca najveće u nizinskom kontinentalnom dijelu Hrvatske (oko 21°C do 22°C), u planinskom dijelu Like i Gorskog kotara te u dalmatinskom zaleđu kreću se između 18°C i 20°C, a na moru oko 16°C ili 17°C. Zagrijavajući utjecaj mora zimi očituje se u velikim temperaturnim razlikama između kontinentalnih i priobalnih regija, koje se kreću oko 10°C. Ljeti međutim ohlađujuće djelovanje mora smanjuje razlike između kontinentalnih i priobalnih temperatura zraka, koje u srpnju pretežno ne premašuju 5°C. Utjecaj mora očituje se i u razlikama između proljetnih i jesenskih temperatura zraka. U predjelima koji su pod jačim utjecajem mora jesen je toplija od proljeća, a s udaljavanjem od mora razlike između jesenskih i proljetnih temperatura zraka sve su manje. U nizinskom dijelu proljeće je do 0,5°C toplije od jeseni. U gorskom području jesen je pak oko 1°C do 2°C toplija od proljeća, dok je u primorskom dijelu jesen pretežno 2°C do 3°C toplija od proljeća.

U **dnevnom hodu temperature zraka** maksimum nastupa između 14h i 15h, a minimum neposredno prije izlaska sunca što je u hladnom dijelu godine oko 7h, a od travnja do kolovoza u 5h (grafikoni uz kartu srednje temperature zraka za travanj). Dnevni hod izraženiji je ljeti nego zimi, te izraženiji u unutrašnjosti nego na primorju. Prosječne razlike između najnižih i najviših dnevnih vrijednosti temperature zraka kreću se u unutrašnjosti između 4°C u siječnju i 11°C do 12°C u srpnju ili kolovozu, a na moru od oko 2°C ili 3°C zimi i 6°C ili 7°C ljeti.

Apsolutni minimumi temperature zraka u Hrvatskoj zabilježeni su u kontinentalnim dijelovima i kreću se između -21,7°C izmjerenih 1985. godine na Pargu i -28,9°C koliko je zabilježeno 1963. godine u Gospiću

and the coastal regions, which vary by about 10°C. In summer, though, the cooling effect of the sea diminishes the differences between the continental and the coastal air temperatures, which do not rise above 5°C. The influence of the sea manifests itself also in the differences between the spring and autumn air temperatures. In the regions under a stronger influence of the sea, autumn is warmer than spring, and the further away from the sea, the more the differences between the autumn and spring air temperatures decrease. In the lowland area, spring is warmer than autumn by 0.5°C. On the other hand, in the mountainous area, autumn is sometimes warmer than spring by about 1°C to 2°C while on the coast autumn is mostly 2°C to 3°C warmer than spring.

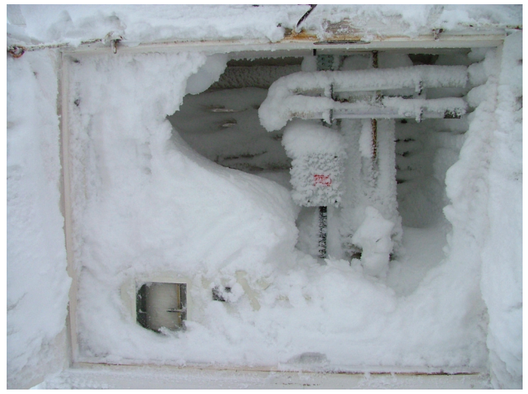
In **the air temperature daily course**, the maximal temperature occurs between 2 and 3 pm, and the minimum immediately before sunrise - at about 7 am in the cold part of the year, and, from April to August, at 5 am (graphs next to the mean air temperature map for April). The daily run is more pronounced in summer than in winter, and inland more than on the coast. Inland, the average differences between the lowest and the highest daily air temperature values range between 4°C in January and 11°C and 12°C in July or August, and at the seaside from about 2°C to 3°C in winter to 6°C or 7°C in summer.

Air temperature absolute minima in Croatia have been registered in the continental parts and they range between -21.7°C, in 1985, in Parg, to -28.9°C, registered in 1963, in Gospić (graphs next to the mean air temperature map for January). The lowest air temperatures occur during the winter anticyclones, when, due to temperature inversion, the valleys are colder than the surrounding mountains. This is evident from the comparison of minimal air temperatures: -24.5°C registered on Zavižan (1594 m) and -28.9°C in neighbouring Gospić (564 m). Because of the warming effect of the sea in winter, the minimal air temperatures are 10°C

(grafikoni uz kartu srednje temperature zraka za siječanj). Najniže temperature zraka javljaju se za zimskih anticiklona, kada su zbog temperaturne inverzije doline hladnije od okolnih planina, o čemu svjedoče i minimalne temperature zraka zabilježene u Gospiću (564 m) i na susjednom Zavižanu (-24,5°C). Zbog zagrijavajućeg utjecaja mora zimi, u primorju su minimalne temperature zraka za 10°C do 15°C više nego u unutrašnjosti i kreću se od -15°C u Rovinju do -7°C na južnom Jadranu i otocima. Minimalne temperature zraka iz godine u godinu mnogo se više mijenjaju u kontinentalnom dijelu nego na moru. Tako su se u ravničarskoj unutrašnjosti minimalne temperature zraka kretale u rasponu od 15°C do 20°C, u planinskom dijelu od 10°C do 15°C te od 7°C do 12°C na moru. Prema proračunu ekstrema godišnjih apsolutnih minimalnih temperatura zraka, izmjerenim apsolutnim minimumima na području Hrvatske u razdoblju 1961–1990. pripadaju povratni periodi većinom između 60 i 100 godina.

Izmjereni **apsolutni maksimumi temperature** zraka kretali su se u Hrvatskoj između 27,6°C na Zavižanu i 39,2°C u Slavonskom Brodu. Maksimalne temperature mnogo se manje razlikuju između kontinentalnih i obalnih dijelova Hrvatske nego minimalne, pa su u nizinskom dijelu Hrvatske maksimalne temperature bile između 37°C i 39°C, u Lici i Gorskom kotaru 33°C do 37°C, a 36°C do 38°C na moru. Promjenjivost maksimalnih temperatura zraka iz godine u godinu u kontinentalnom dijelu Hrvatske iznosi 6°C do 10°C, a na obali 5°C do 7°C. Prema proračunu očekivanih godišnjih maksimalnih temperatura zraka, povratni periodi zabilježenih maksimalnih temperatura iznose od 34 godine (Rovinj) do 180 godina (Hvar) (grafikoni uz kartu srednje temperature zraka za srpanj).

U **godišnjem hodu percentila** srednjih dnevnih temperatura zraka razlike između srednjih dnevnih temperatura percentila 98 i 2 veće su zimi nego ljeti (grafikoni uz kartu srednje temperature zraka za listo-



Zaleđena termometrijska kućica na Zavižanu.
Frozen thermometer shelter on Zavižan.
Fotografija Photo by: Ante Vukušić

to 15°C higher than inland, ranging from -15°C in Rovinj to -7°C on the southern Adriatic and on the islands. The minimal air temperatures change much more on the mainland than on the coast. Accordingly, in the low mainland, the range of minimal temperatures varies between 15°C and 20°C, in the mountainous part from 10°C to 15°C and on the coast from 7°C to 12°C. According to the estimation of extremes, the measured minima in Croatia in the period from 1961–1990 appear, generally, once in 60 to 100 years.

Absolute air temperature maxima in Croatia range between 27.6°C on Zavižan and 39.2°C in Slavonski Brod. The differences between maximal temperatures in the continental and coastal regions of Croatia are much smaller than between minimal temperatures, with maximal temperatures in the lowland part of Croatia between 37°C and 39°C, in Lika and Gorski kotar from 33°C to 37°C, and from 36°C to 38°C

pad). Najveće su razlike na većini postaja u siječnju i smanjuju se idući od kopna prema moru. U unutrašnjosti te razlike iznose oko 20°C do 22°C, a na moru od 13°C do 16°C. Na nekim postajama najveće su razlike u ožujku (Rijeka, Zavižan i Split Marjan), vjerojatno s jedne strane zbog vrlo niskih temperatura povezanih sa situacijama s burom i s druge strane zbog porasta temperature početkom proljeća. Najmanje razlike između gornjeg (98) i donjeg (2) percentila obično se pojavljuju u srpnju, rjeđe u kolovozu i iznose 11°C do 13°C u unutrašnjosti te 8°C do 10°C u primorskom dijelu.

Minimalna temperatura zraka na visini 5 cm iznad tla važna je zbog procjene uvjeta pogodnih za stvaranje poledice i nepovoljnih posljedica u poljoprivredi (grafikoni uz kartu broja hladnih dana). U prosjeku minimalne temperature na visini 5 cm niže su od 0°C od studenog ili prosinca do ožujka, na većim nadmorskim visinama do travnja (Zavižan), a u dalmatinskom zaleđu (Sinj) do veljače. Međutim, gledajući najniže minimalne temperature uz tlo, one u nizinskom kontinentalnom dijelu mogu biti negativne od rujna do lipnja, u zaleđu (Pazin i Sinj) do travnja, ali u Lici i Gorskom kotaru izostaju samo u srpnju (Gospić), dok se na većim nadmorskim visinama mogu pojaviti tijekom čitave godine. Na većini postaja zimi (od prosinca do veljače) ima više od 20 dana s temperaturama uz tlo nižim od 0°C, dok su od svibnja do rujna takvi dani vrlo rijetki. Međutim, pojava takvih dana u vegetacijskom razdoblju, pa makar i rijetka, nanosi štete u poljoprivredi, napose u voćarstvu, vinogradarstvu, povrćarstvu i cvjećarstvu.

Ledeni ($t_{min} \leq$ -10°C) i **studeni** dani (t_{maks} < 0°C) javljaju se isključivo u kontinentalnom dijelu Hrvatske i to uglavnom samo u zimskim mjesecima (od prosinca do veljače) kada ih uglavnom ima manje od 5 (ledenih) odnosno 10 (studenih) na mjesec (grafikoni uz kartu broja toplih dana). **Hladni** dani, s minimalnim temperaturama zraka nižima od 0°C, u unutrašnjosti se javljaju od listopada do travnja, a na moru od prosinca do ožujka i mnogo su rjeđi. **Topli** dani ($t_{maks} \geq$ 25°C) pojavljuju se u kontinentalnom dijelu od travnja do listopada, a u primorju zbog utjecaja mora koje je početkom proljeća još hladno od svibnja do listopada. S porastom nadmorske visine sve su rjeđi pa ih je tako u promatranom razdoblju na Zavižanu zabilježeno samo 6 i to samo ljeti. **Vrući** dani ($t_{maks} \geq$ 30°C) su na moru mnogo češći nego u unutrašnjosti, a u nizinskom dijelu Hrvatske najviše ih je u istočnom dijelu. **Toplih noći** ($t_{min} \geq$ 20°C) u unutrašnjosti praktički i nema, a u primorju ih je ljeti 10 do 20 na mjesec.

Usporedbom klimatskih razdoblja 1961–1990. i 1971–2000. uočava se da je u novijem razdoblju smanjen broj dana u hladnom dijelu skale (ledeni, studeni i hladni), a povećan broj dana u toplom dijelu skale (topli, vrući i tople noći).

Prema vjerojatnostima pojavljivanja srednjih dnevnih temperatura zraka, od studenoga do veljače u kontinentalnom dijelu su najčešće srednje dnevne temperature zraka između -5°C i 5°C, na sjevernom Jadranu od 5°C do 10°C, a na srednjem Jadranu do 15°C. U proljeće su razlike između unutrašnjosti i Jadrana manje izražene (grafikoni uz kartu broja toplih noći). U svibnju su na Jadranu temperature zraka najčešće u intervalu od 15 do 20°C, a u unutrašnjosti podjednako često od 10°C do 15°C i od 15°C do 20°C. Ljeti na moru prevladavaju srednje dnevne temperature zraka između 20°C i 25°C te, osobito u južnoj Dalmaciji, više od 25°C. U unutrašnjosti su temperature najčešće između 15°C i 25°C, rijetko prelaze 25°C, dok su u Lici i Gorskom kotaru rijetke srednje dnevne temperature zraka više od 20°C. Zbog zagrijavajućeg utjecaja mora, u jesen su razlike između unutrašnjosti i Jadrana veće nego u proljeće. Na Jadranu su još u rujnu i listopadu temperature najčešće između 15°C i 25°C, dok je u kontinentalnom dijelu Hrvatske istovremeno najčešće 5°C do 15°C.

Temperatura mora ne mjeri se na svim postajama, a raspoloživi nizovi na nekim su postajama bili kraći ili

on the coast. The fluctuation of maximal air temperatures from year to year is 6°C to 10°C on the mainland and from 5°C to 7°C on the coast. According to the estimation of expected annual temperature maxima, the return periods of registered maximal temperatures range from 34 years (Rovinj) to 180 years (Hvar) (graphs next to the mean air temperature map for July).

In the **annual percentile course** of mean daily air temperatures, the differences between the mean daily temperatures of percentiles 98 and 2 are greater in winter than in summer (graphs next to the mean air temperature map for October). At the majority of stations, the greatest differences occur in January and they decrease when going from the mainland to the sea. On the mainland, those differences are from about 20°C to 22°C, and, at the seaside, from 13°C to 16°C. At some stations, the greatest differences occur in March (Rijeka, Zavižan and Split-Marjan), on the one hand, probably due to extremely low temperatures related to situations with the *bura* wind, and on the other hand, because of the temperature increase at the beginning of spring. The smallest differences between the upper (98) and the lower (2) percentile usually occur in July, more rarely in August, and they are from 11°C to 13°C inland, and from 8°C to 10°C on the coast.

The minimal air temperature at a height of 5 cm above ground is important for the estimation of conditions favourable to slipperiness, as well as of unfavourable consequences for agriculture (graphs next to the map of mean number of cold days). On average, the minimal temperatures at a height of 5 cm are lower than 0°C from November or December to March, or April at higher altitudes (Zavižan), or to February in the Dalmatian hinterland (Sinj). Still, if one looks at the lowest minimal temperatures close to the ground, those in the lowland, continental part can be negative from September to June, in the hinterland (Pazin and Sinj) to April, but in Lika and Gorski kotar they are absent only in July (Gospić), whereas at higher altitudes there is a possibility of their occurrence during the whole year. At the majority of stations, in winter (from December to February), there are more than 20 days with temperatures close to the ground lower than 0°C, while from May to September such days are very rare. The occurrence of such days in the vegetation period, though, even if rare, causes damage to agriculture, especially fruit growing, viticulture, vegetable farming and floriculture.

Days with $t_{min} \leq$ -10°C and **icy** days (t_{max} < 0°C) occur only in the continental part of Croatia and in most cases only in the winter months (from December to February), when there are mostly less than 5 days with $t_{min} \leq$ -10°C i.e. 10 icy days per month (graphs next to the map of mean number of warm days). **Frosty** days, with minimal air temperatures lower than 0°C, occur inland from October to April, and on the coast from December to March and they are not very frequent. **Warm** days ($t_{max} \geq$ 25°C) occur in the continental part from April to October, and on the coast from May to October, because of the influence of the sea, which is still cold at the beginning of spring. With a rise in altitude, those days are less frequent, and thus only 6 such days were registered on Zavižan during the monitored period, and only in summer. **Hot days** ($t_{max} \geq$ 30°C) are much more frequent on the coast than on the mainland whereas in the lowlands they are the most frequent in the eastern part. There are almost no **tropical nights** ($t_{min} \geq$ 20°C) on the mainland, while on the coast there are 10 to 20 warm nights per month during summer.

The comparison of the climate periods 1961–1990 and 1971–2000 points at less frequent days with $t_{min} \leq$ -10°C, icy and frosty days and more frequent warm and hot days and tropical nights in the latter period.

According to **the probabilities of occurrence**, from November to February, the most frequent mean daily air temperatures on the mainland are those between -5°C and 5°C, on the northern Adriatic from 5°C to 10°C,

Plutača osjetnika temperature mora u Nacionalnom parku Mljet.
A see temperature sensor buoy in the Mljet national park.
Fotografija Photo by: Davor Tomšić

manjkavi. U tablicama su dana razdoblja na koja su odnose temperature mora. Temperatura mora ima manji raspon od temperature zraka, a vrijeme nastupa ekstrema je u odnosu na temperaturu zraka pomaknuto, pa najniže vrijednosti temperatura mora ima u veljači, a najviše u kolovozu. U većem dijelu godine more je toplije od zraka, izuzev od svibnja do kolovoza kada je temperatura mora je u prosjeku niža od temperature zraka.

and on the southern Adriatic to 15°C (graphs next to the map of mean number of warm nights). The differences between the hinterland and the Adriatic coast are less evident in spring. In May, air temperatures on the Adriatic are usually within the interval of 15°C to 20°C, and, inland, the probabilities of mean temperatures being between 10°C and 15°C and from 15°C to 20°C are about equal. In summer, the prevailing mean daily air temperatures on the coast are from 20°C to 25°C and, especially on the southern Adriatic, >25°C. On the mainland, air temperatures vary most frequently between 15°C and 25°C, they are rarely over 25°C, while in Lika and Gorski kotar the mean daily air temperatures rarely exceed 20°C. Due to the warming effect of the sea, the differences between the mainland and the coast are greater in autumn than in spring. In September and October, the temperatures on the Adriatic are still most often between 15°C and 25°C, while in the continental part of Croatia, at the same time, they most frequently vary between 5°C and 15°C.

Sea temperature is not measured at all stations and the available data series at some stations were either shorter or incomplete. The periods that the sea temperatures are related with are shown in the table. Sea temperature varies to a lesser extent than air temperature and its extremes are dislocated, compared to air temperature. So, sea temperatures have the lowest values in February and reach their highest in August. During most of the year, the sea is warmer than the air, and air temperature is higher than sea temperature from May to August.

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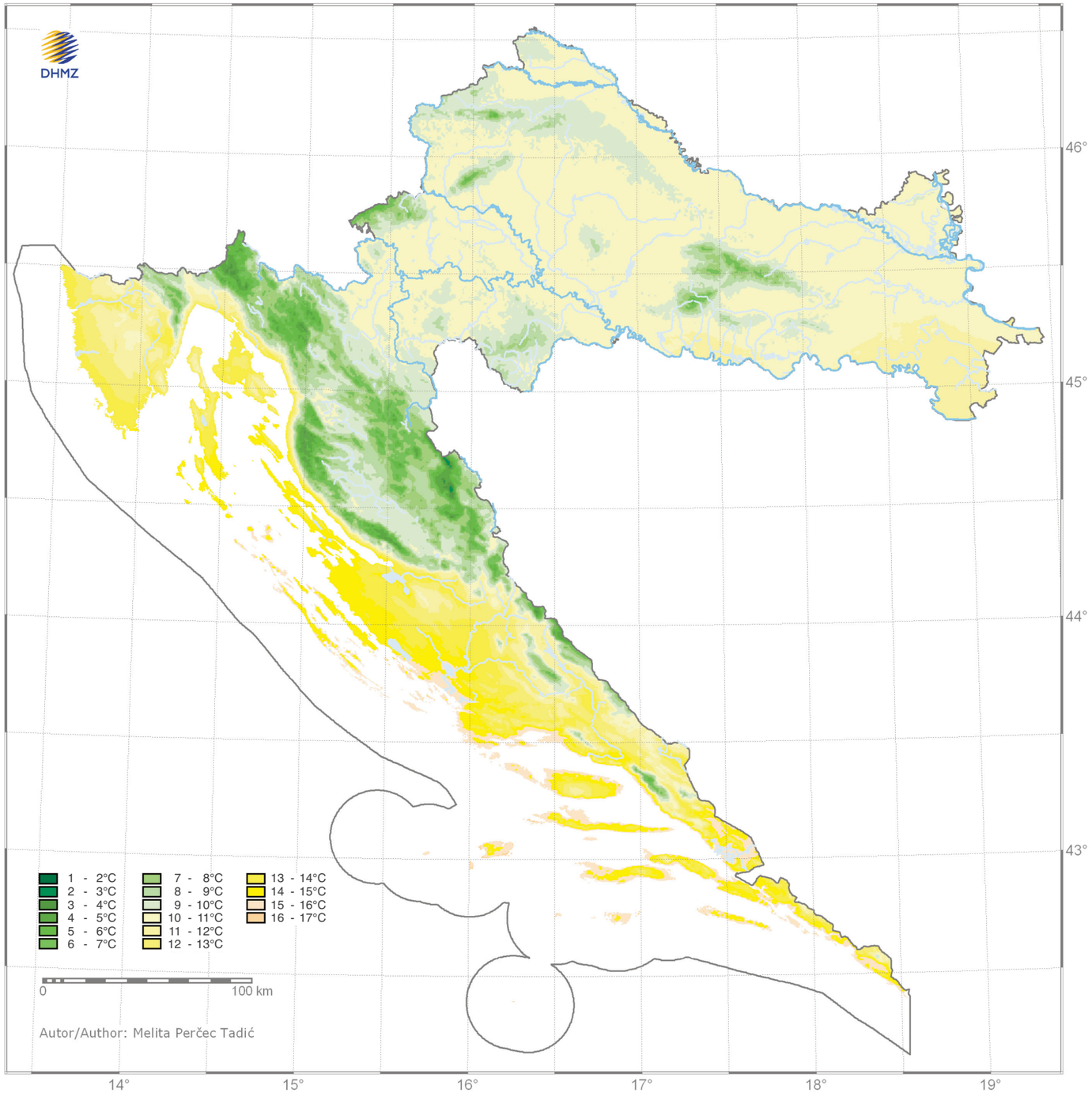
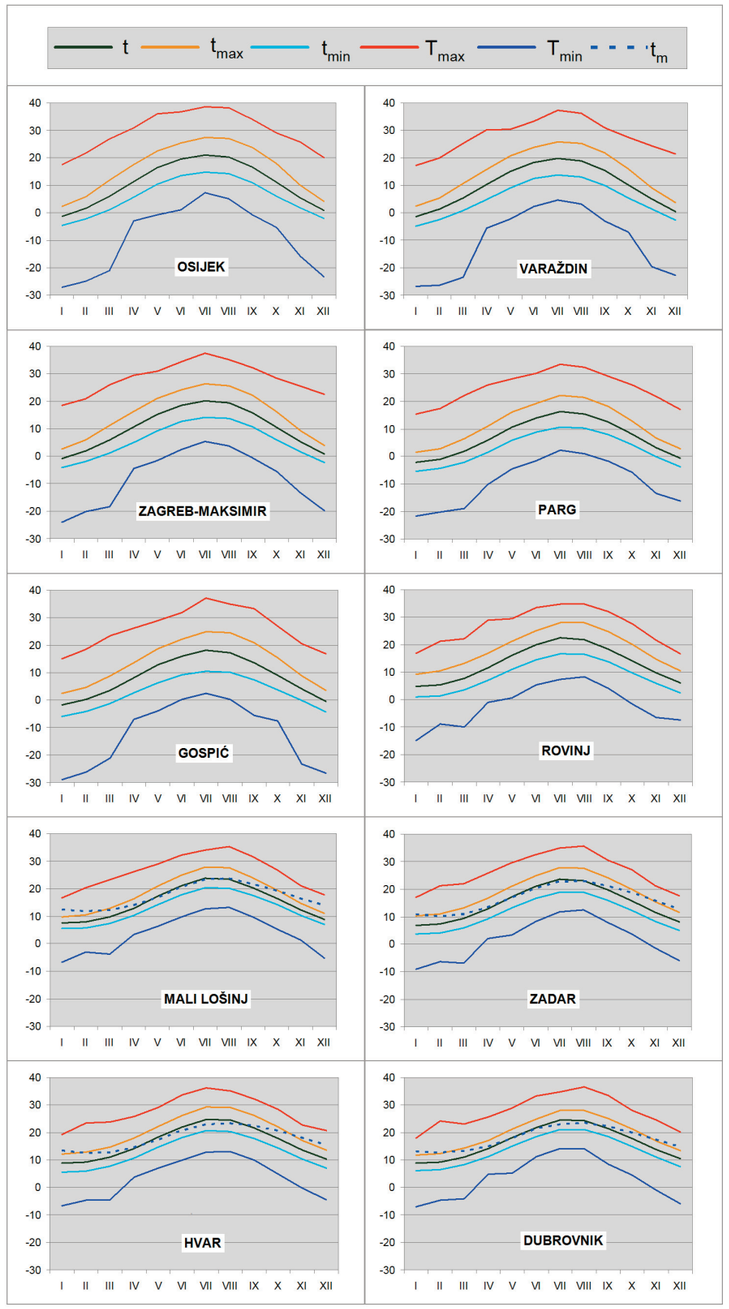
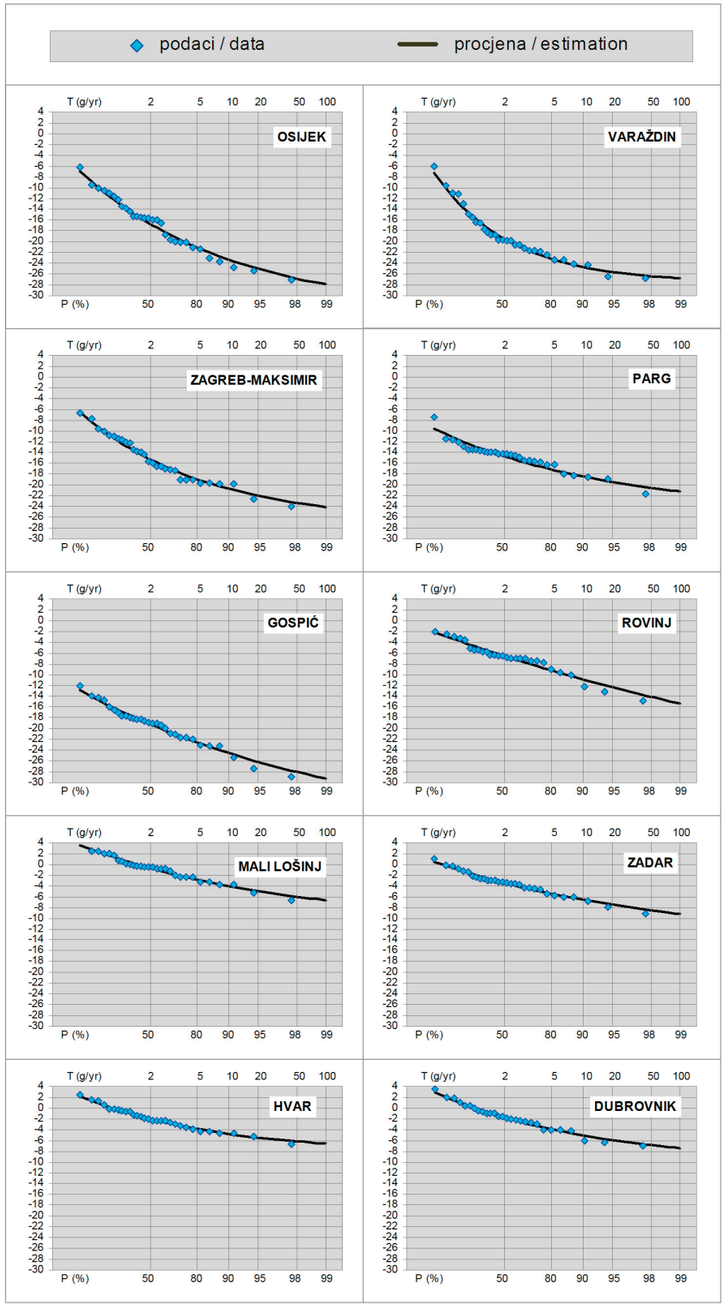
Srednja godišnja temperatura zraka Mean annual air temperature





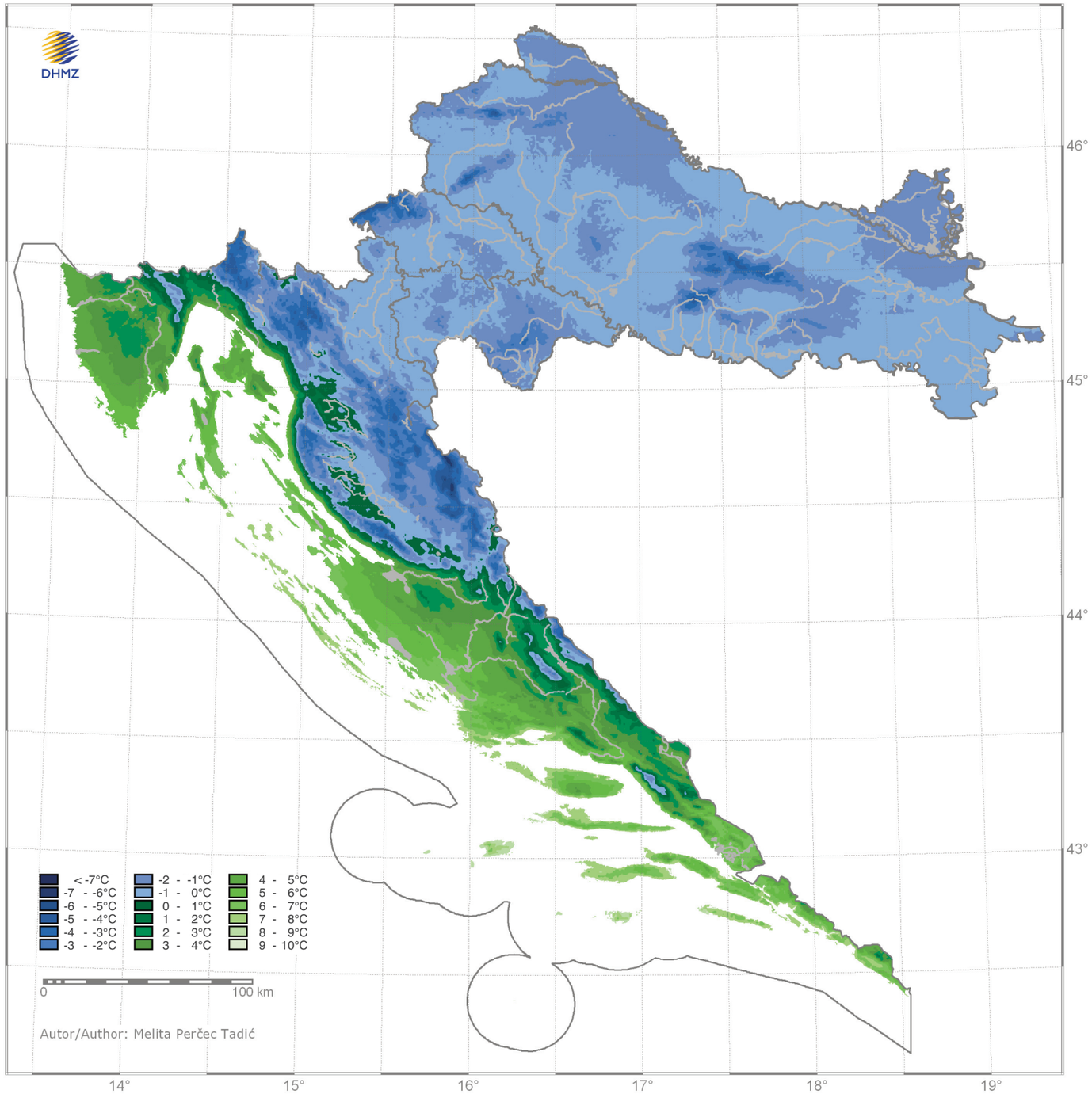
Godišnji hod srednje (t), srednje minimalne (t_{min}) i maksimalne (t_{max}) i apsolutne minimalne (T_{min}) i maksimalne (T_{max}) temperature zraka i temperature mora (t_m), °C.

Annual course of mean (t), mean minimum (t_{min}) and maximum (t_{max}) and absolute minimum (T_{min}) and maximum (T_{max}) air temperature and sea temperature (t_m), °C.

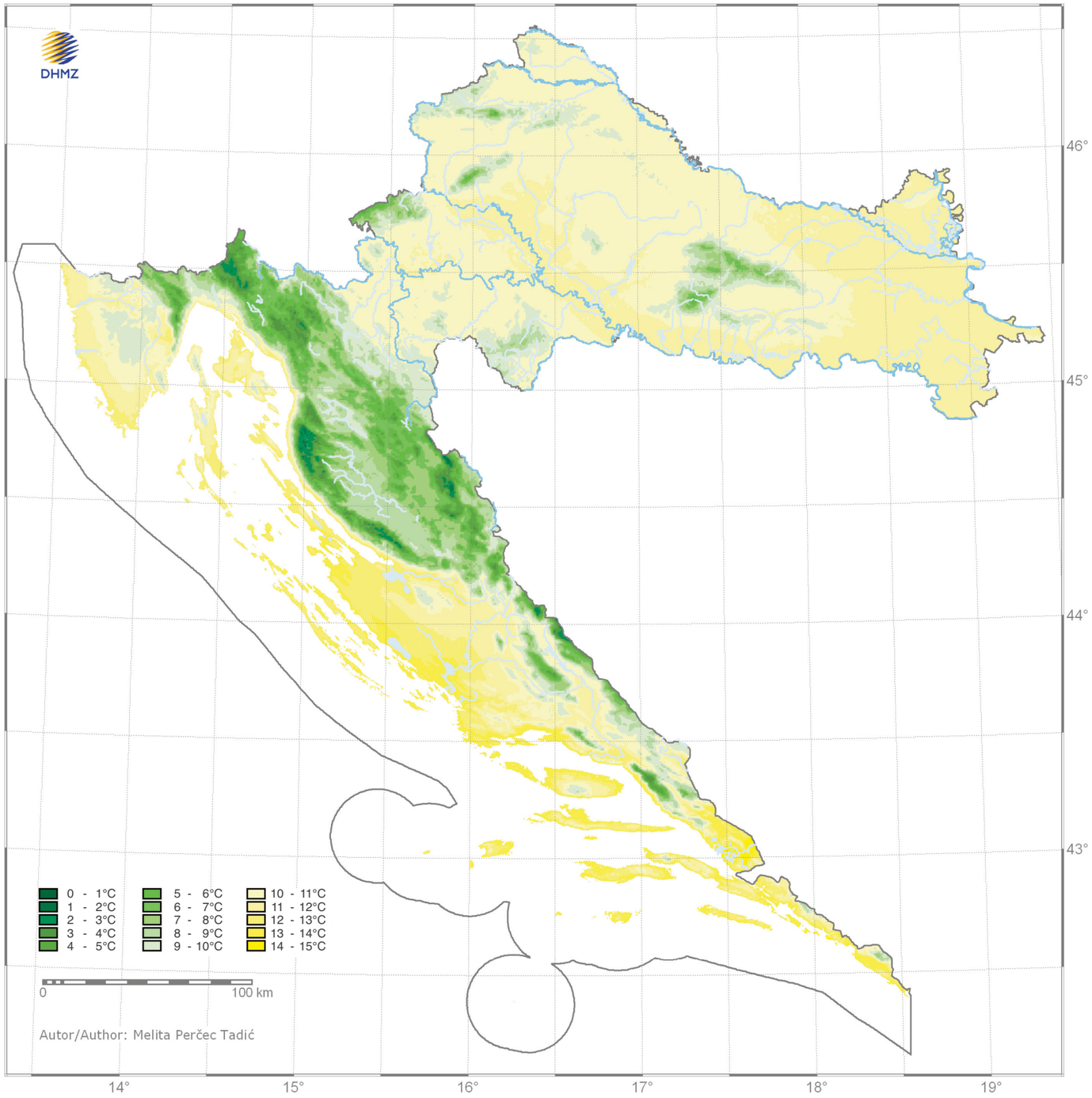


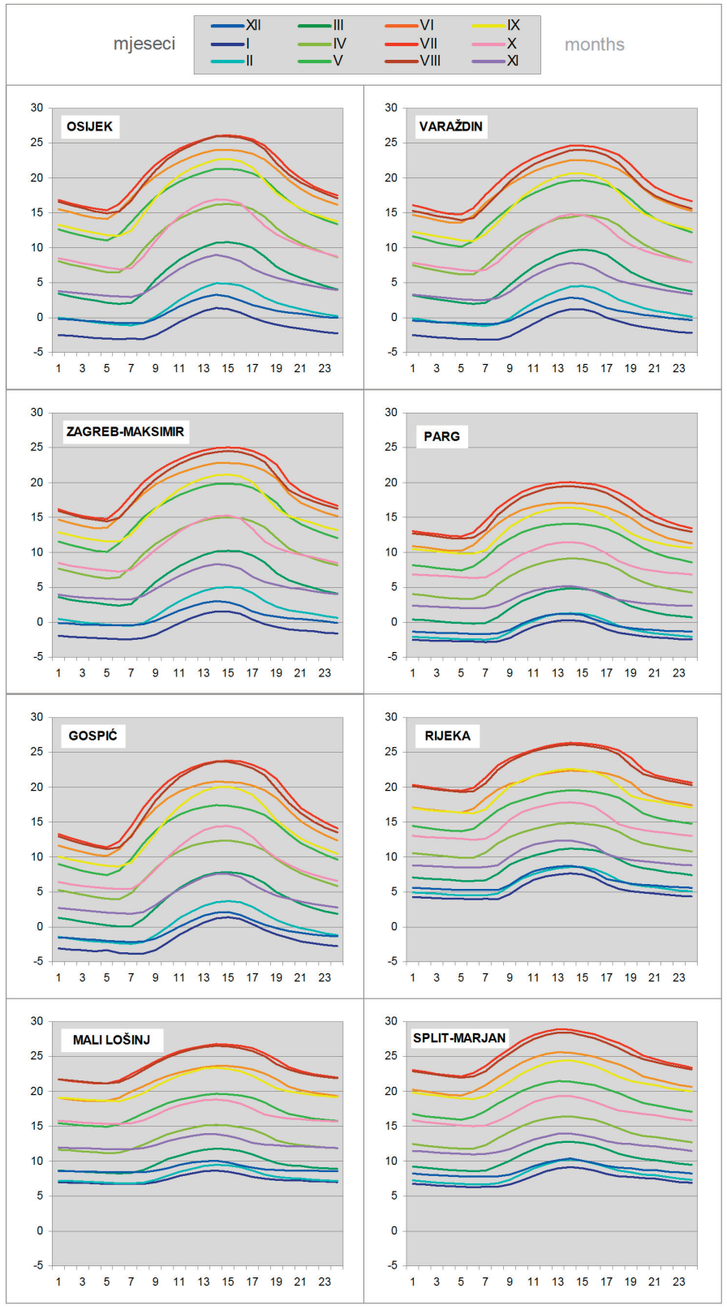
Izmjerene apsolutne minimalne temperature zraka i procjene minimuma pomoću opće razdiobe ekstremih vrijednosti (GEV), °C.

Observed absolute minimum temperatures and estimated minima according to the Generalized Extreme Value (GEV) distribution, °C.



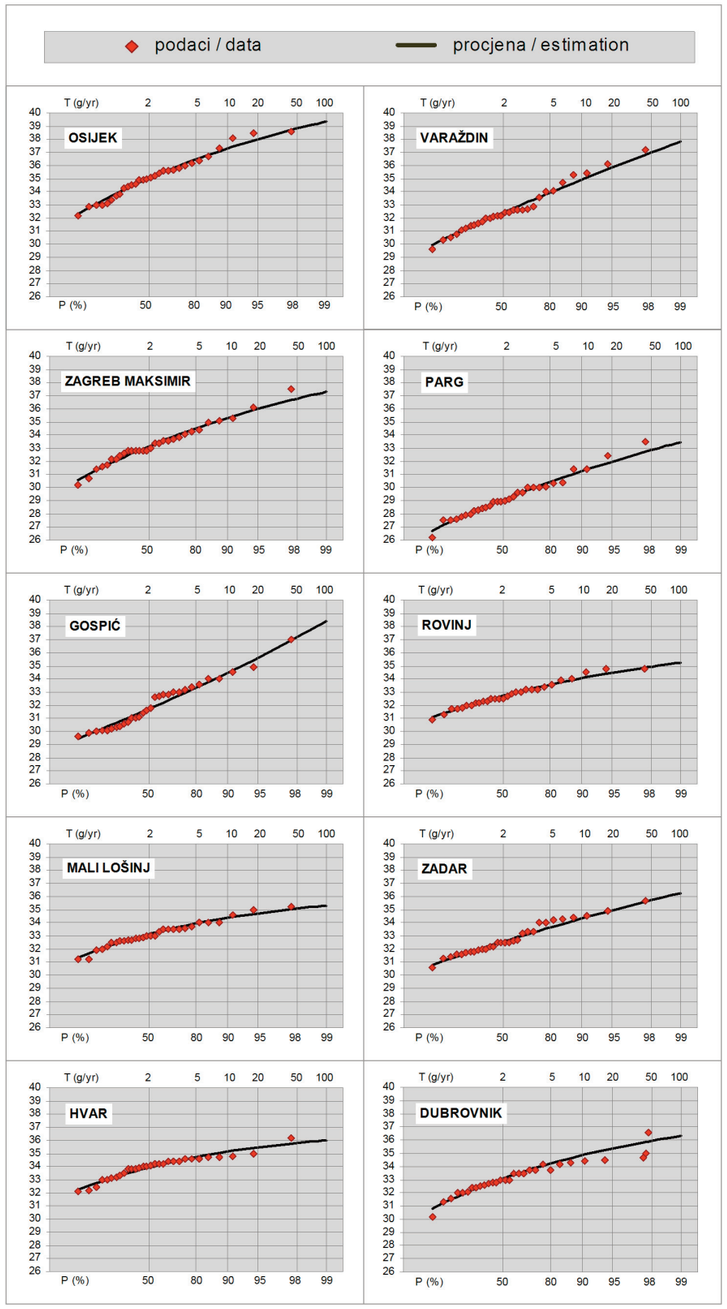
Srednja temperatura zraka za travanj Mean air temperature in April





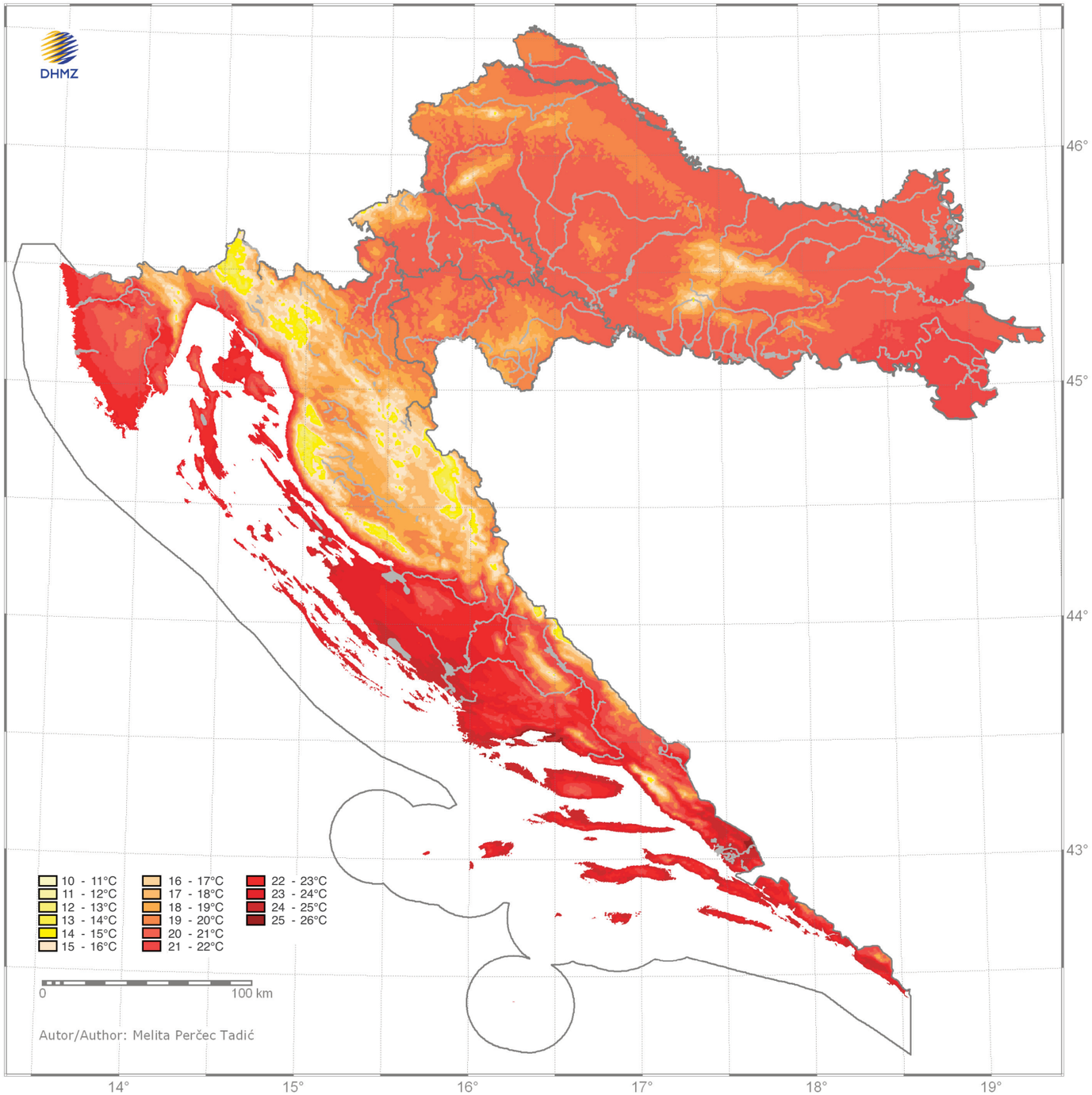
Dnevni hod temperature zraka (°C) po mjesecima.

Diurnal course of the air temperature (°C) by months.

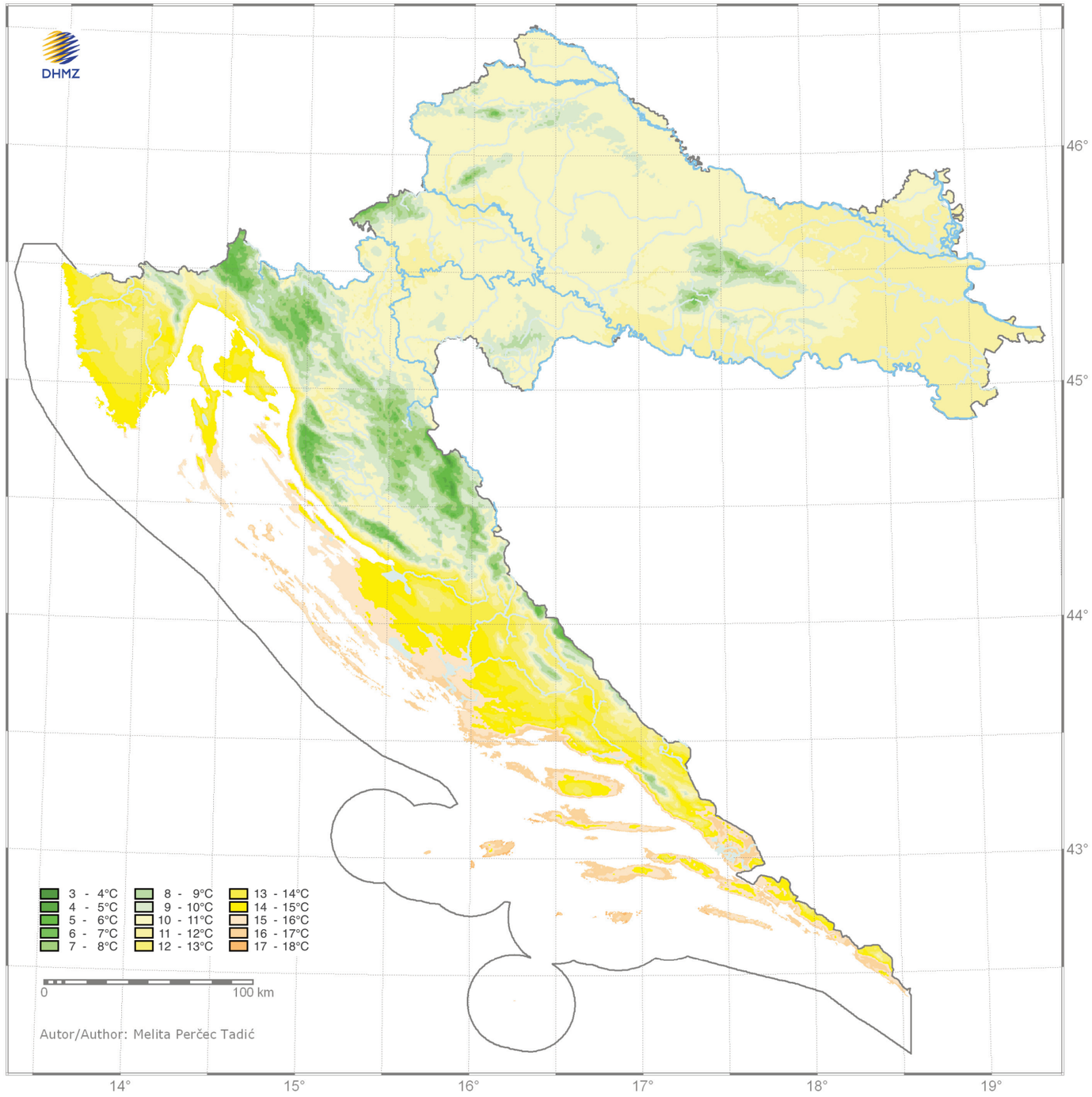


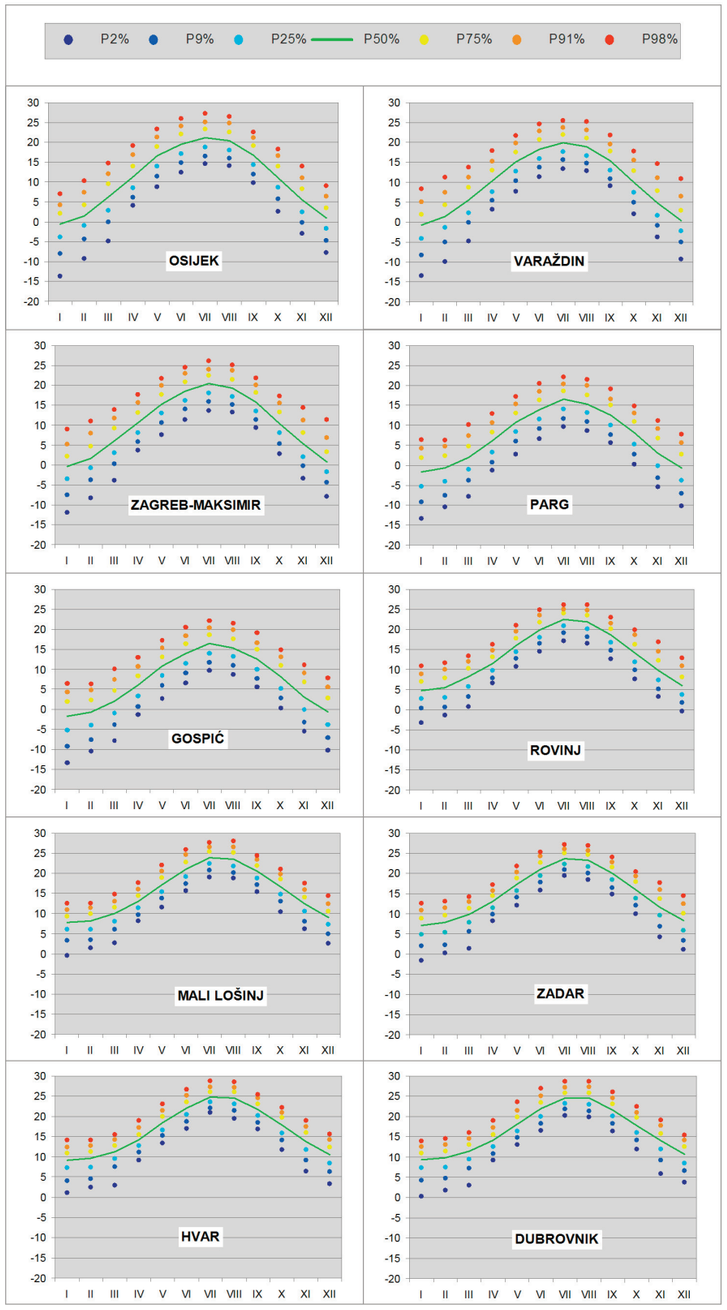
Izmjerene apsolutne maksimalne temperature zraka i procjene maksimuma pomoću opće razdiobe ekstremih vrijednosti (GEV), °C.

Observed absolute maximum temperatures and estimated maxima according to the Generalized Extreme Value (GEV) distribution, °C.



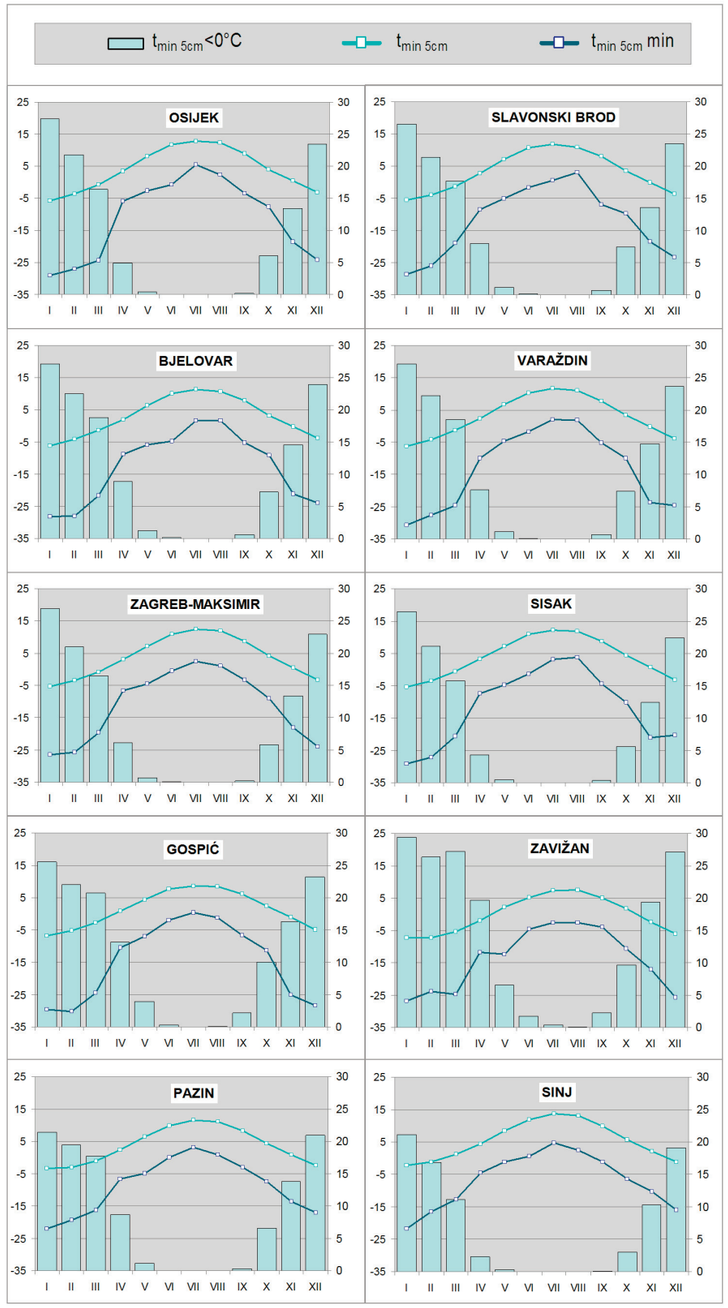
Srednja temperatura zraka za listopad Mean air temperature in October





Godišnji hod 2, 9, 25, 50, 75, 91. i 98. percentila srednjih dnevnih temperatura zraka, °C.

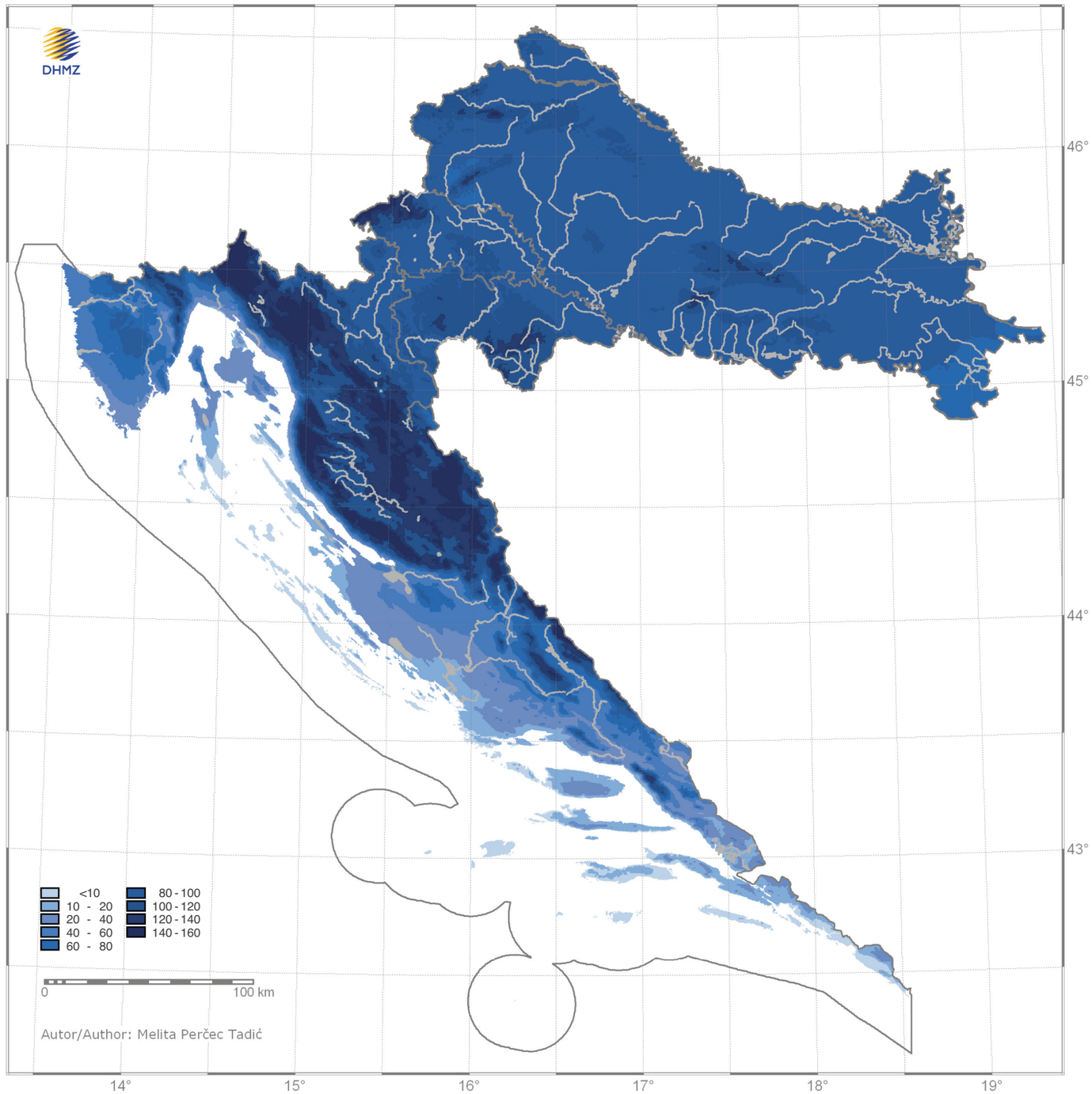
Annual course of the 2nd, 9th, 25th, 50th, 75th, 91st and 98th percentile of mean daily temperatures, °C.



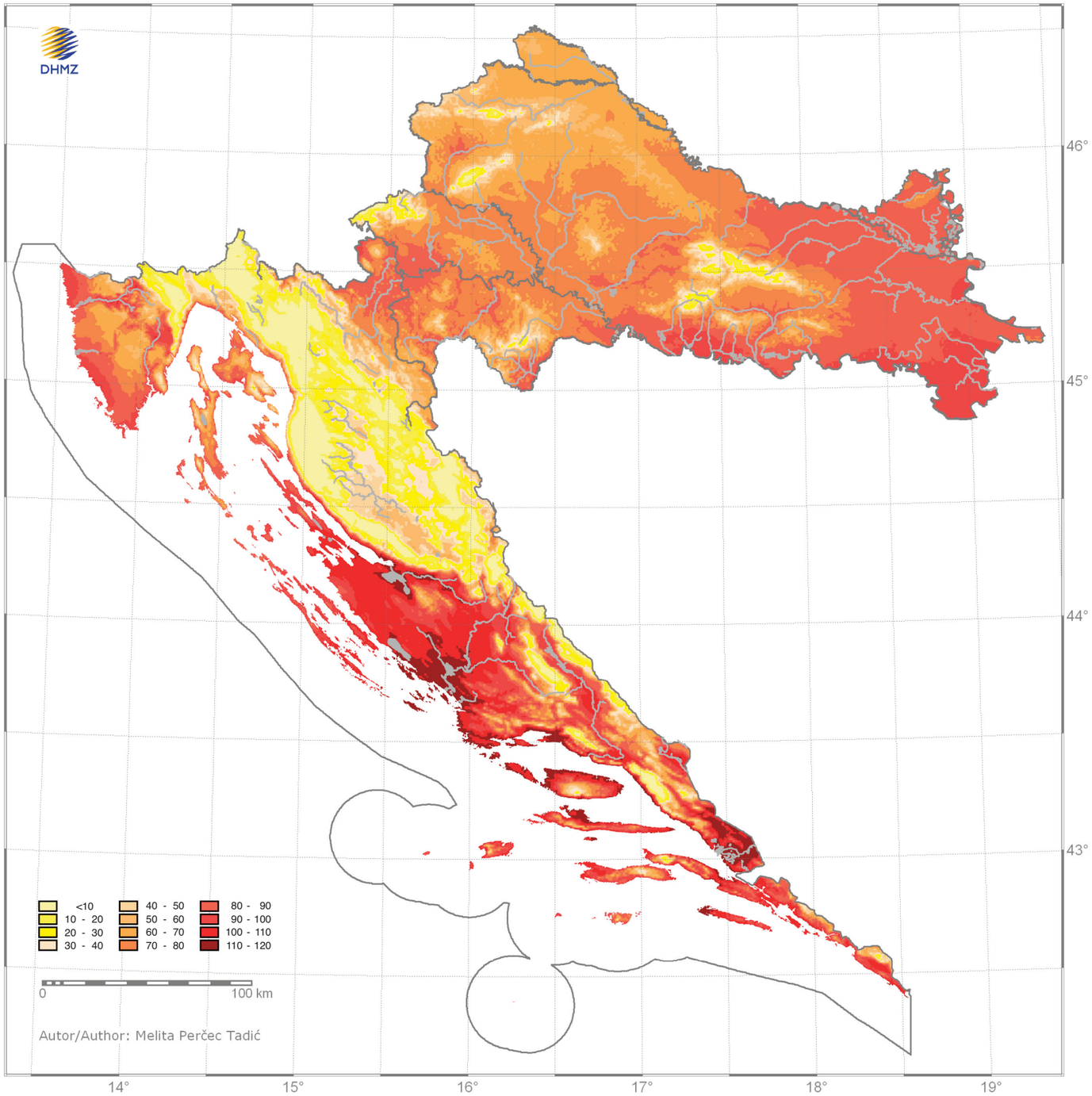
Godišnji hod srednje ($t_{min\ 5cm}$) i najniže minimalne temperature zraka na 5 cm iznad tla ($t_{min\ 5cm}$ min) (lijeva skala, °C) te broja dana s minimalnom temperaturom na 5 cm nižom od 0°C ($t_{min\ 5cm}$<0°C) (desna skala, dani).

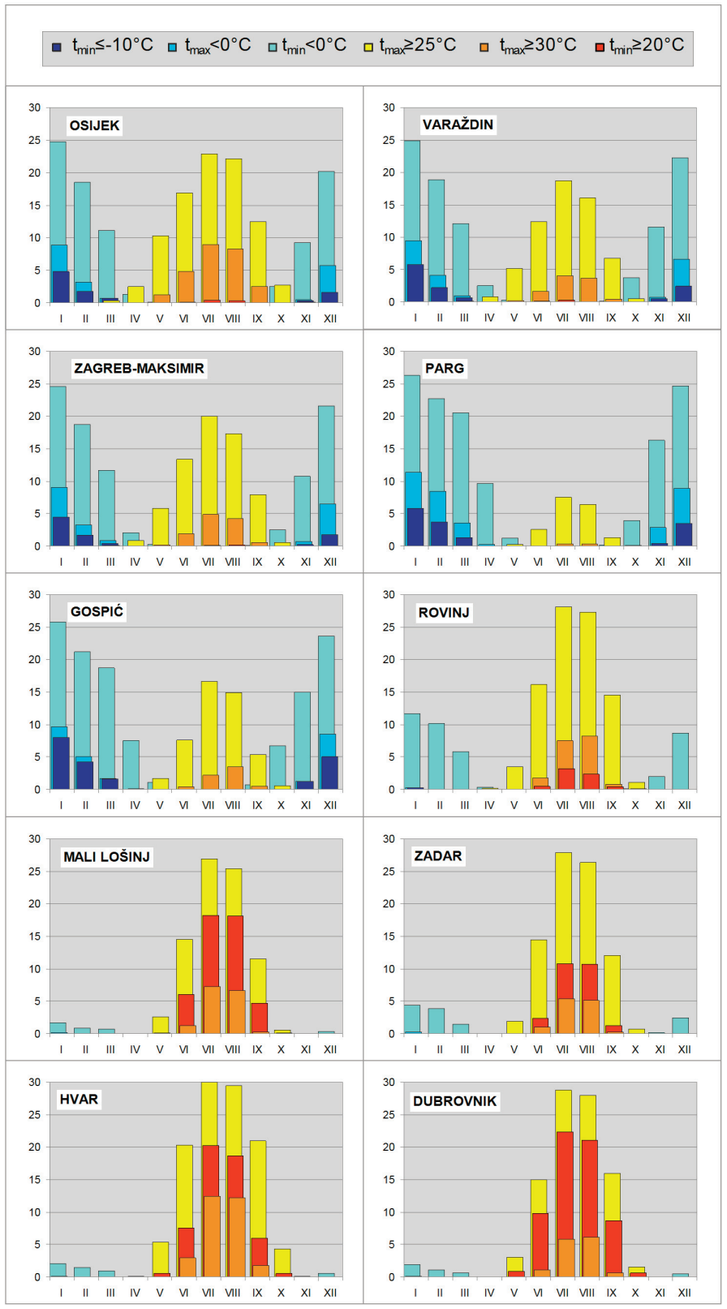
Annual course of mean (tmin 5cm) and the lowest minimum air temperature at 5 cm ($t_{min\ 5cm}$ min) (left scale, °C) and the number of days with minimum air temperature at 5cm below 0°C ($t_{min\ 5cm}$<0°C) (right scale, days).

Srednji godišnji broj hladnih dana (t_{min}<0°C) Mean annual number of frost days (t_{min}<0°C)

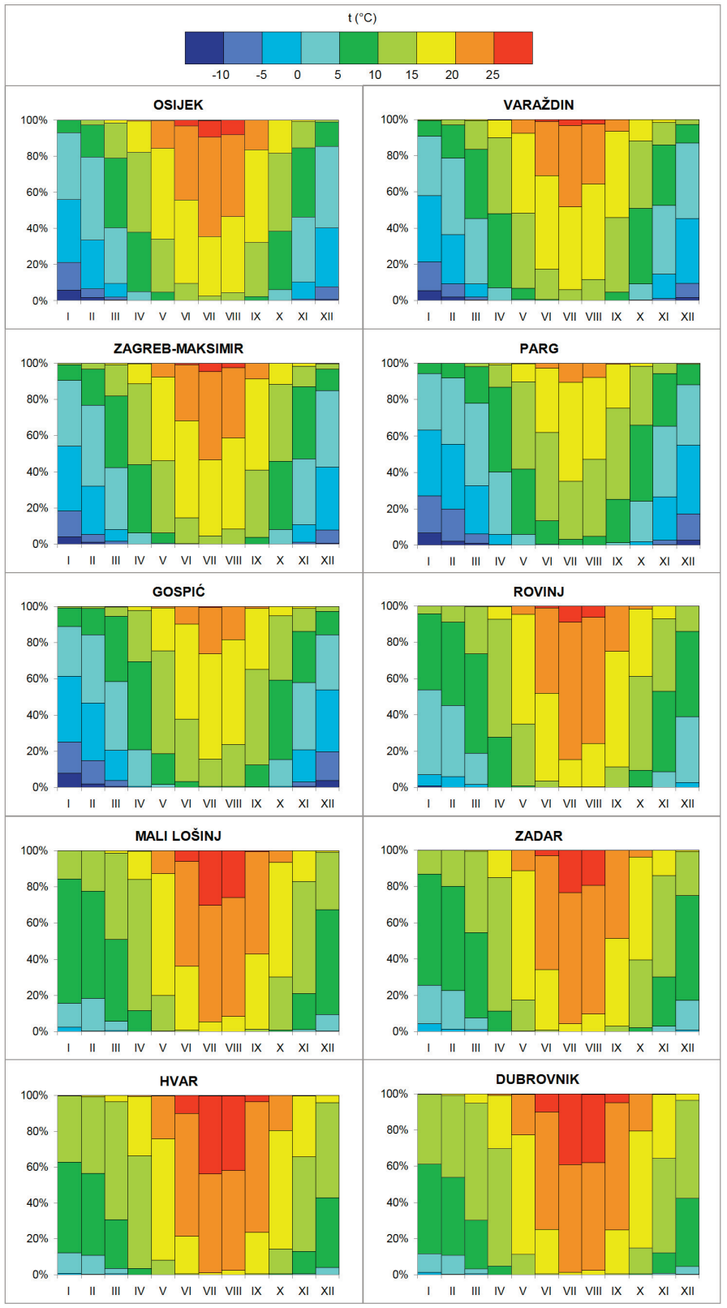


Srednji godišnji broj toplih dana (t_{maks}≥25°C) Mean annual number of warm days (t_{max}≥25°C)



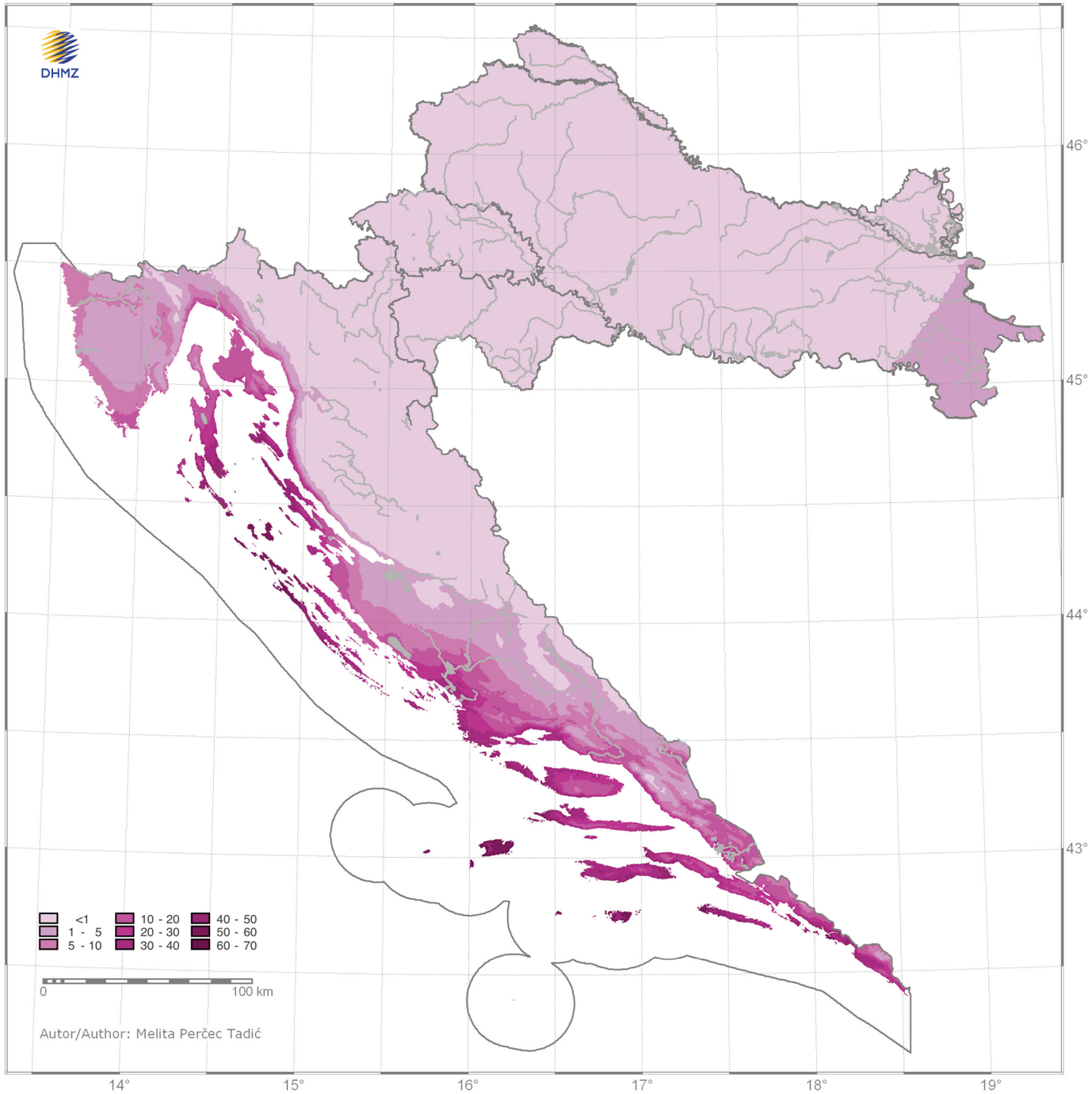


Godišnji hod srednjeg broja ledenih (t_{min}≤-10°C), studenih (t_{maks}<0°C), hladnih (t_{min}<0°C), toplih (t_{maks}≥25°C), i vrućih dana (t_{maks}≥30°C), te toplih noći (t_{min}≥20°C).
Annual course of mean number of days with t_{min}≤-10°C, icy (t_{max}<0°C), frost (t_{min}<0°C), warm (t_{max}≥25°C), hot days(t_{max}≥30°C), and tropical nights (t_{min}≥20°C).



Vjerojatnost pojavljivanja srednjih dnevnih temperatura zraka tijekom godine.
Probability of occurence of mean daily temperatures during the year.

Srednji godišnji broj toplih noći (t_{min}≥20°C) Mean annual number of tropical nights (t_{min}≥20°C)



Oborina
Precipitation

Marjana Gajić-Čapka
Ksenija Cindrić
Domagoj Mihajlović

Oborina koja padne na području Hrvatske posljedica je prolaska ciklona i s njima u vezi atmosferskih fronti u sklopu opće cirkulacije atmosfere. Hoće li na pojedinom mjestu oborina pasti i u kojoj količini, ovisi o vlažnosti zračne mase i intenzitetu i smjeru zračne struje, ali i o vertikalnoj komponenti njezina gibanja, koju lokalni utjecaji mogu znatno modificirati. Lokalni čimbenici koji mogu pojačati ili oslabiti proces razvoja oblaka i stvaranja oborine posebno su prisutni u Hrvatskoj. To su odnos kopna i mora, odnosno udaljenost pojedinih lokacija od mora, zatim vrlo razvijena orografija Dinarida, koja je prepreka za maritimne zračne mase pri prijelazu sa Sredozemnog mora odnosno Jadrana na kopno i isto tako za kontinentalne zračne mase prema Sredozemlju. Istovremeno planine, ali i manja brda, u pojedinim vremenskim situacijama prisiljavaju zračne mase na dizanje, pri čemu dolazi do kondenzacije i intenziviranja oborine. Sve to utječe na režim promjene količine oborine s nadmorskom visinom i daje različite vertikalne gradijente oborine i na malim horizontalnim udaljenostima što je vidljivo i na srednjoj godišnjoj karti izohijeta.

Srednja godišnja količina oborine na području Hrvatske u rasponu je od oko 300 mm do nešto iznad 3500 mm. Najmanje godišnje količine oborine padnu na vanjskim otocima srednjeg Jadrana (Palagruža, 311 mm). Na otocima i obali srednje i sjeverne Dalmacije te na zapadnoj obali Istre može se očekivati oko 800 do 900 mm oborine na godinu. Što se više približavamo obali, količina oborine povećava se, posebno uz obronke planina zbog prisilnog dizanja zračnih masa.

U Istri su najveće količine oborine na obroncima Učke (od 2000 do 2500 mm), a jednake vrijednosti mogu se očekivati i na sjevernom dijelu Biokova.

Najveće godišnje količine oborine u Hrvatskoj prima Gorski kotar (od 3000 mm do iznad 3500 mm) te Velebit i sjeveroistočni obronci Konavoskog polja (od 3000 do 3500 mm).

Precipitation in Croatia is the consequence of passing cyclones and related atmospheric fronts, within the general circulation of the atmosphere. Whether there will be precipitation, in what amount and where, depends on the humidity of the air mass, on the intensity and course of the air current, as well as on the vertical component of its movement, which can be significantly modified by local factors. Quite a number of local factors that can strengthen or weaken the process of cloud formation and the development of precipitation are present in Croatia. One of these is the distance of some locations from the sea and another is the extremely developed orography of the Dinarides – an obstacle for maritime air masses as they move from the Mediterranean Sea or the Adriatic to the mainland, and also for continental air masses headed towards the Mediterranean. At the same time, in certain weather situations, mountains and smaller hills cause air masses to lift, resulting in condensation and intensified precipitation. All these factors affect the varying pattern of precipitation amounts at different altitudes and result in different vertical gradients of precipitation even at small horizontal distances, which can be seen on the map of the spatial distribution of the mean annual precipitation totals.

The mean annual amount of precipitation in Croatia ranges from 300 mm to slightly over 3500 mm. The smallest annual amounts fall on the outer islands of the southern Adriatic (Palagruža, 311 mm). About 800 mm to 900 mm of precipitation can be expected on the islands and the coast of central and northern Dalmatia as well as on the west coast of the Istrian Peninsula. The amount of precipitation increases towards the coast, especially near the mountainsides due to the forced elevation of air masses.

The highest amount of precipitation in Istria falls on the slopes of Mount Učka (from 2000 mm to 2500 mm). Equal amounts can be expected on the northern part of Mount Biokovo.

The largest annual amounts of precipitation in Croatia fall in Gorski kotar (from 3000 mm to over 3500 mm), on Mount Velebit and the north-eastern slopes of the Konavle Plain (Konavosko polje) (from 3000 mm to 3500 mm).

Gorski kotar je u neposrednoj blizini ciklogenetičkog područja sjevernog Jadrana i Genovskog zaljeva, koje daje obilne oborine pojačane orografskim utjecajem gorovitog zaleđa duž primorja. Na tom području količina oborine naglo se povećava s nadmorskom visinom na navjetrini od obale do Risnjaka i Snježnika. Najveće količine oborine izmjerene u Gorskom kotaru jesu na postajama Lividraga (3728 mm), Žilavi Dolci (3522 mm), Risnjak (3449 mm) i Snježnik (3302 mm). U dubinu Gorskog kotara količina oborine se smanjuje (Parg, 1849 mm).

Na vršnom području sjevernog Velebita padne na godinu u prosjeku oko 3000 mm oborine, a na istim nadmorskim visinama na primorskim i ličkim obroncima padnu podjednake količine oborine. Vršno područje južnog Velebita prima veće godišnje količine oborine (oko 3500 mm) i ima veće vertikalne gradijente od sjevernog Velebita. Na ličkoj strani južnog Velebita osnovni oborinski potencijal, tj. količina oborine koja bi pala na nadmorskoj visini h=0 m, veći je zbog orografskog utjecaja gorovitog zaleđa nego na primorskoj strani. Stoga na ličkim obroncima južnog Velebita u prosjeku padnu nešto veće količine oborine nego na istim nadmorskim visinama na primorskoj strani.

Sjeveroistočni obronci Konavoskog polja, gdje se mogu očekivati godišnje količine oborine od 3000 do 3500 mm, leže u podnožju crnogorskih planina koje prisiljavaju vlažne južne zračne mase na dizanje. To je područje Krivošija, gdje su zabilježene godišnje količine oborine i do 5000 mm, što je najviše u Europi.

U kontinentalnom području Hrvatske godišnja količina oborine smanjuje se od zapada prema istoku jer vlažne zračne mase koje dolaze s jugozapada i zapada izgube vlagu dok dođu do tog područja, a one zračne mase koje dolaze sa sjeveroistoka, iz unutrašnjosti, suhe su pa ne daju obilne oborine. Za lipanj, koji je u tom dijelu Hrvatske u godišnjem hodu oborine mjesec s najvećom količinom, pokazano je da najviše oborine daju ciklone u kombinaciji s frontom te da oborina koju

Gorski kotar is exceptionally close to the cyclogenetic area of the northern Adriatic and the Genoa Bay, which gives abundant precipitation intensified by the orographic influence of the mountainous hinterland which stretches along the coast. The amount of precipitation in this area increases abruptly with altitude on the windward side from the coast to the Risnjak and Snježnik Mountains. The largest amounts of precipitation in Gorski kotar have been recorded at the following stations: Lividraga (3728 mm), Žilavi Dolci (3522 mm), Risnjak (3449 mm) and Snježnik (3302 mm). Going further inland, the amount of precipitation in Gorski kotar decreases (Parg, 1849 mm).

The peak area of northern Velebit averages about 3000 mm of precipitation per year, as do the coastal and Lika slopes at the same altitudes. The peak area of southern Velebit receives larger amounts of precipitation (around 3500 mm) per year and has higher vertical gradients than northern Velebit. The southern side of Velebit in Lika has a higher basic precipitation potential, i.e. the precipitation amount that would fall at an altitude of 0 m is higher than on the coastal side as a result of the orographic influence of the mountainous hinterland. Because of that, the Lika slopes of southern Velebit receive slightly larger amounts of precipitation than the coastal side at the same altitude.

The north-eastern slopes of the Konavle Plain (Konavosko polje), where 3000 mm to 3500 mm of precipitation can be expected annually, are located at the foot of the Montenegrin mountains, which force moist air masses to lift. This area, called Krivošije, is where annual precipitation amounts of up to 5000 mm have been recorded – the highest in Europe.

The annual amount of precipitation in continental Croatia decreases from west to east because the moist air masses coming from the west and south-west lose their humidity on the way, while those air masses that

Totalizator na glavnoj meteorološkoj postaji Zavižan.
Totaliser at the Zavižan main meteorological station.
Fotografija Photo by: Ante Vukušić

donose frontalni poremećaji sa sjeverozapada padne u zapadnom dijelu kontinentalne Hrvatske, a na istočni dio dođe zračna masa sa smanjenim sadržajem vlage. U sjeverozapadnoj Hrvatskoj najveće su količine oborine u Zagorju, na području Medvednice, Kalnika, Žumberačkog i Samoborskog gorja (1000 do 1500 mm). I dok na navjetrinskim stranama gorja za kišonosnu struju, koja u sjevernim krajevima Hrvatske pretežito dolazi sa sjeverozapada, dolazi do orografske intenzifikacije oborine s visinom, u zavjetrinskoj strani javlja se oborinska sjena. To je prisutno u istočnom dijelu grada Zagreba, gdje Medvednica djeluje kao prepreka za sjeverozapadne kišonosne prodore. Sličan učinak vidi se i u nizinskom području istočno od Kalnika. U Slavoniji količine oborine poput onih u Hrvatskom zagorju (1000 do 1500 mm) ima samo brdsko područje zapadne Slavonije (Psunj, Papuk, Krndija, Požeška gora i Dilj). U istočnoj Slavoniji u prosjeku padne oko 600 do 700 mm oborine, dok se nešto veće količine oborine mogu očekivati samo na uskom dijelu na obroncima Fruške gore i na području uz Savu (700 do 800 mm).

Usporedba prostorne raspodjele godišnje količine oborine za razdoblje 1961–1990. i razdoblje 1931–1960., koje je bilo osnovno razdoblje za Atlas klime SFR Jugoslavije (1969.) i Atlas klime SR Hrvatske (1977.), ukazuje na veće godišnje količine na vršnom području južnog Velebita, Plješevice i Ivanščice u novijem razdoblju, a manje na području Biokova. To se pripisuje gušćoj mreži mjerenja pomoću totalizatora u planinskim krajevima u razdoblju 1961–1990. Usporedbom srednje godišnje količine oborine u razdoblju 1961–1990. s prethodnim klimatološkim razdobljem 1931–1960. utvrđeno je smanjenje oborine od 10 do 20% na dijelu postaja u istočnoj Slavoniji te sjevernoj i srednjoj Dalmaciji. Povećanje od 10% do 20% uočeno je na dijelu postaja u Istri i sjeverozapadnoj Hrvatskoj.

U novijem 30-godišnjem razdoblju 1971–2000. srednja godišnja količina oborine gotovo se nije promijenila. U kopnenim područjima smanjenje se pretežito javlja u sjeverozapadnim krajevima (4% u Varaždinu), a bez promjene ili povećanje u istočnim ravničarskim i gorskim predjelima (4% na Zavižanu). Na obali i otocima prisutno je smanjenje, nešto jače izraženo u unutrašnjosti Istre (Pazin 7%) i na južnom dalmatinskom primorju (Dubrovnik 11%). To je rezultat promjena tijekom godine, koje na sezonskoj skali pokazuju smanjenje količine oborine tijekom tri godišnja doba (zimi, u proljeće i ljeti) u cijeloj Hrvatskoj, posebno izraženo zimi i ljeti u primorju. Tijekom jeseni došlo je do povećanja količine oborine, više izraženo u kopnenim područjima.

Godišnji hod mjesečnih količina oborine na području Hrvatske može se podijeliti u dva tipa s obzirom na dio godine u kojem se nalazi mjesec s minimumom oborine: tip godišnjeg hoda u kojem najmanje oborine padne u toplom dijelu godine (travanj do rujan) i tip hoda u kojem najmanje oborine ima mjesec u hladnom polugodištu (listopad do ožujak)

come from the north-east, from the mainland, are dry and do not give abundant precipitation. It has been shown that in June, the month with the largest amounts of precipitation in this part of Croatia, cyclones combined with a front give the most abundant precipitation. Precipitation that comes with frontal disturbances from the north-west falls in the western part of continental Croatia and air masses with decreased humidity arrive to the eastern part. The highest amounts of precipitation in north-western Croatia fall in Zagorje, in the area of Mount Medvednica, Mount Kalnik, and the Žumberak and Samobor Mountains (1000–1500 mm). When the precipitation of rain-bearing current, which in northern Croatia usually comes from the north-west, on the windward side of the mountains intensifies with altitude, a rain shadow is formed on the leeward side of the mountains. This occurs in the eastern part of Zagreb, where Mount Medvednica forms an obstacle to the penetration of rain from the north-west. A similar effect can be seen in the lowland area, east of Kalnik. Only the hilly parts of western Slavonia, (Psunj, Papuk, Krndija, Požeška gora and Dilj) receive as much precipitation as the Zagorje area (Hrvatsko zagorje) (1000–1500 mm), Eastern Slavonia averages around 600 to 700 mm of precipitation while slightly larger amounts can be expected only on a narrow strip of the slopes of Fruška gora and on the banks of the Sava River (700–800 mm).

Comparison of the spatial distribution of annual precipitation for the periods 1961–1990 and 1931–1960, which was the basic period for the climate atlas of SFR Yugoslavia (1969) and the climate atlas of SR Croatia (1977), indicates larger annual amounts over the summit area of southern Velebit, Plješevica and Ivanščica in the more recent period, and smaller ones over Mount Biokovo. This is attributed to a denser storage (totaliser) rain-gauge network in the mountainous areas during 1961–1990. A decrease of 10% to 20% was identified at some stations in eastern Slavonia and northern and middle Dalmatia in the period 1961–1990. An increase of 10% to 20% was observed at some stations in Istria and north-western Croatia.

During the more recent 30-year period (1971–2000), the mean annual precipitation amount hardly changed. Over land areas, there was a decrease, predominantly in the north-western parts (4% in Varaždin), and no change, or an increase, in the eastern lowland and highland areas (4% on Zavižan, northern Velebit). On the coast and on the islands, there was a decrease, which is somewhat more pronounced in the hinterland of the Istrian Peninsula (Pazin 7%) and in southern, coastal Dalmatia (Dubrovnik 11%). This is a result of the changes during the year, which, looking on a seasonal scale, show a decrease in precipitation amounts during three seasons (winter, spring and summer) all over Croatia, especially pronounced in winter and summer in the coastal area. In autumn, there was an increase in precipitation amount, more pronounced in the mainland areas.

The annual course of monthly precipitation amounts in Croatia can be divided into two types, depending on the time of year when the month with the lowest precipitation amount occurs: the maritime type of annual course, with the lowest precipitation amount occurring during the warm period of the year (April to September), and the continental annual course, with the lowest precipitation amount occurring during the cold half of the year (October to March) (graphs next to the mean annual precipitation map). Lika, Gorski kotar, the whole of the Adriatic coast, the islands and the Dalmatian hinterland belong to the first type. The remaining areas of Croatia have the other type of annual variation. The main maximum in the area with the first type of annual variation of monthly precipitation occurs in November and the main minimum occurs in July. The areas of Istra, Lika and Dalmatinska zagora also have a secondary maximum in April and a secondary minimum in March or February. The areas of Karlovac and

(grafikoni uz kartu srednje godišnje količine oborine). Prvom tipu pripadaju Lika i Gorski kotar te cijelo jadransko priobalje i otoci i dalmatinsko zaleđe. Ostala područja Hrvatske imaju drugi tip godišnjeg hoda oborine. Na području s prvim tipom godišnjeg hoda mjesečnih količina oborine glavni maksimum nastupa u studenom, a glavni minimum u srpnju. Pored glavnog maksimuma i minimuma, na području Istre, Like i Dalmatinske zagore pojavljuju se i sekundarni maksimum u travnju i sekundarni minimum u ožujku ili veljači. Na ogulinskom i karlovačkom području glavni maksimum ostaje u studenom, ali glavni minimum nastupa u kasnu zimu (siječanj ili veljača). Udaljavanjem od mora, pojavljuju se dva podjednaka maksimuma u studenom i lipnju, a glavni minimum krajem zime. Dublje u kontinentu maritimni je utjecaj sve slabiji pa u sjeverozapadnom kopnenom području ljetni maksimum postaje glavni, a onaj u studenom sporedni. Glavni minimum nastupa na kraju zime, a sporedni u listopadu. Sličan godišnji hod ima i područje Slavonije s tim da se razlike minimuma krajem zime i onog u listopadu smanjuju kako se pomičemo prema istoku.

U odnosu na ove prosječne oborinske prilike tijekom godine, u pojedinim godinama mogu se javiti znatna **odstupanja mjesečnih količina** (grafikoni uz kartu srednje količine oborine za proljeće). Mjesečne količine oborine koje će biti premašene jednom u 50 godina (percentil 98) najviše odstupaju od medijana u kontinentalnim nizinskim krajevima u kolovozu (Osijek 165 mm, Zagreb-Maksimir 250 mm) kada su rezultat pretežito pljuskovitih frontalnih oborina, te u listopadu i studenom kao rezultat dugotrajnijih kiša (Varaždin 220 mm, Zagreb-Maksimir 240 mm). S jačanjem maritimnog utjecaja i učinka planina povećavaju se i vrijednosti mjesečnih percentila oborine i njihovo odstupanje od vrijednosti medijana (veći rasap), posebice u jesenskim mjesecima i zimi. Tako se na većim visinama Gorskog kotara mogu očekivati jednom u deset godina mjesečne količine oborine u listopadu i studenom veće

Ogulin have their main maximum in November, but the minimum in these areas occurs in late winter (January or February). Areas further from the sea have two similar maxima in November and June and their main minimum at the end of winter. The deeper-inland maritime influence becomes progressively weaker so that in the north-western continental area the summer maximum becomes the main one, while the November maximum becomes secondary. The main minimum occurs at the end of winter and the secondary minimum in October. The area of Slavonia has a similar annual course – the differences between the end-of-winter minimum and the October minimum decreasing as we move towards the east.

Certain years can witness a significant **deviation in monthly amounts** from the average precipitation conditions above (graphs next to the map of mean precipitation in Spring). The monthly precipitation amounts which will be exceeded once in 50 years (percentile 98) show the greatest deviation from median in the continental, lowland areas in August (Osijek 165 mm, Zagreb-Maksimir 250 mm), when they are a result of mostly showery frontal precipitation, and in October and November, a result of long-term rains (Varaždin 220 mm, Zagreb-Maksimir 240 mm). As the maritime influence and that of the mountains grow stronger, the values of monthly precipitation percentiles and their deviation from median also increase (greater dispersion), especially during the autumn months and during winter. At higher altitudes, in Gorski kotar, precipitation amounts of over 400 mm can be expected once in ten years, in October and November, as well as precipitation amounts of over 600 mm (October) and 540 mm (November) once in 50 years, according to data from Parg. Along the Adriatic coast, the southern coastal area has the highest values of monthly precipitation percentiles during the autumn and winter months. In Dubrovnik, percentile 90 of monthly precipitation amount in October is 295 mm and percentile 98 even 475 mm.

od 400 mm, a jednom u 50 godina veće od 600 mm (listopad) i veće od 540 mm (studeni) prema podacima Parga. Duž jadranske obale južno priobalje ima najveće vrijednosti mjesečnih percentila oborine jesenjih i zimskih mjeseci. U Dubrovniku percentil 90 količina oborine u listopadu iznosi 295 mm, a percentil 98 čak 475 mm.

Ekstremno sušni mjeseci, čije su količine oborine manje od percentila 2 i u godišnjem hodu imaju najmanje vrijednosti, javljaju se u ravničarskoj unutrašnjosti zimi i iznose do oko 10 mm. U Gorskom kotaru najmanje vrijednosti percentila 2 javljaju se u listopadu i siječnju, kada se može očekivati da oborina uopće ne padne, te u veljači kada percentil 2 iznosi oko 20 mm. U Istri ovim mjesecima se pridružuju i ljetni mjeseci srpanj i kolovoz čija vrijednost percentila 2 iznosi manje od 10 mm. Na kvarnerskom priobalju i ekstremno sušni ljetni mjeseci mogu primiti i do 20 mm oborine. U Dalmaciji ekstremno sušni mjeseci s najmanjim količinama tijekom godine javljaju se od srpnja do listopada, kada mjesečna oborina može i izostati. Od toga odstupa listopad u južnoj Dalmaciji kada ekstremno sušan mjesec može primiti i oko 40 mm oborine.

Ekstremne oborine i vjerojatnost njihova pojavljivanja važna su svojstva oborinskog režima. Analiza i procjena jakih oborina na razini dnevnih količina zahtijeva korištenje duljih nizova od 30-godišnjih, koji se koriste za mjesečne vrijednosti, zbog njihove velike vremenske promjenjivosti (grafikoni uz kartu srednje količine oborine za jesen). Ispitivanje klimatološke normale pokazalo je da se niz godišnjih maksimalnih dnevnih količina oborine (Rd_{max}) stabilizira tijekom 50 godina u istočnoj nizinskoj Hrvatskoj, a u gorskoj i priobalnoj Hrvatskoj još u duljem razdoblju. Kako je niz maksimalnih dnevnih količina oborine na području Hrvatske za veći broj postaja raspoloživ za razdoblje 1951–2000., on je korišten za prostornu analizu godišnjeg hoda i procjenu očekivanih maksimalnih dnevnih količina oborine za različite povratne periode.

Najveće godišnje Rd_{max} izmjerene su duž jadran-

Snijeg u Nacionalnom parku Plitvička jezera, 19. 11. 2005.
Snow in National park Plitvice lakes, 19. November 2005.
Fotografija Photo by: Čedo Branković

Extremely dry months with precipitation amounts lower than percentile 2 and the lowest values in the course of annual variation occur during winter in the continental lowlands and receive around 10 mm precipitation. The lowest values of percentile 2 in Gorski kotar occur in October and January, when there may be no precipitation, and in February, when percentile 2 is around 20 mm. In Istria, during these months, as well as the summer months of July and August, the value of percentile 2 is less than 10 mm. In the extremely dry summer months, the Kvarner Littoral can receive up to 20 mm precipitation. Extremely dry months, with the lowest amounts during the year, occur in Dalmatia from July to October, when there may be no monthly precipitation. In the southern Adriatic, October differs from this pattern, when an extremely dry month can receive as much as 40 mm precipitation.

Ombrograf na glavnoj meteorološkoj postaji Ogulin.
An ombrograph at the Ogulin main meteorological station.
***Fotografija** Photo by: Marjana Gajić-Čapka*

ske obale (352,2 mm u Zadru 11. rujna 1986. godine, 315,0 mm u Crikvenici 25. rujna 1987. god, 201,5 mm u Cavtatu 19. kolovoza 1979. god), na kvarnerskim otocima (250,8 mm 5. rujna 1993. god i 231,7 mm u Cresu 25. rujna 1951. god), na obroncima planinskog zaleđa koji su navjetrinska strana za kišonosnu struju (Gorski kotar: 319,5 mm u Marčeljima 27. rujna 1956. god, 254,0 mm u Gerovu 14. studenog 1987. god), na navjetrinskoj strani planine Sniježnice uz Konavosko polje u Pridvorju 225,9 mm 17. listopada 1976., te na prijevoju između Mosora i Biokova u Zadvarju 225,6 mm 7. srpnja 1992. god. Vrijednosti najvećih izmjerenih Rd_{max} smanjuju se prema unutrašnjosti, te u sjevernoj Hrvatskoj od zapada prema istoku (Gospić: 120,9 mm – 24. kolovoz 1969 god, Bjelovar: 104,4 mm – 7. lipanj 1951.god, Slavonski Šamac: 80,2 mm – 10. lipnja 1973. god). Najmanje godišnje Rd_{max} kretale su se od 17,4 mm u Lastovu do 87,5 mm u Klani. Prema vrijednostima koeficijenta varijacije promjenljivost Rd_{max} od godine do godine najmanja je u središnjemu dijelu Hrvatske u pojasu južno od Save, u što su uračunati Gorski kotar i Lika (20–30%). Na području Hrvatske sjeverno od Save koeficijent varijacije Rd_{max} iznosi 30% do 50%, a na području Istre, Primorja i Dalmacije 30% do 40%. Kao što ukazuju slučajevi Zadra, Crikvenice i Cresa, i na ovome području može se očekivati veće kolebanje vrijednosti Rd_{max}. Na tim lokacijama izmjerene su u promatranom razdoblju u jednoj godini velike Rd_{max} koje znatno odstupaju od količina u ostalim godinama. Njima pripadaju povratni periodi oko 240 godina (Zadar), oko 120 godina (Crikvenica) i oko 165 godina (Cres). Iako su takvi slučajevi rijetki i mogu se očekivati s malom vjerojatnošću, na njih treba računati.

Najveće godišnje Rd_{max} javljaju se u kontinentalnome dijelu Hrvatske sjeverno od Save najčešće ljeti (lipanj, srpanj, kolovoz) ili krajem jeseni (studeni), u prijelaznome području prema gorskoj Hrvatskoj uglavnom u kolovozu i studenom, a u područjima s maritimnom klimom (jadranska obala i otoci) i onima pod njezinim jakim utjecajem (Gorski kotar, Lika, Dalmatinska Zagora) najintenzivnije dnevne oborine mogu se najčešće očekivati u jesen (rujan, listopad, studeni) ili u prvome dijelu zime (prosinac).

Učestalost oborine tijekom godine izražena brojem oborinskih dana različitih dnevnih količina ukazuje na značajne prostorne razlike u ukupnoj godišnjoj "ki-

Extreme precipitation amounts and the probability that they will occur are important characteristics of the precipitation regime (graphs next to the map of mean precipitation in Autumn). The analysis and estimation of heavy precipitation at daily amount level requires the use of data series longer than thirty-year periods, which are used for monthly values because of their high time variability. Research in climatological normals has shown that the series of annual maximal daily precipitation amounts (Rd_{max}) has been stabilising for 50 years in eastern lowland Croatia and even longer in mountainous and coastal Croatia. As the series of maximal daily precipitation amounts for Croatia were available for more stations in the period from 1951 to 2000, they have been used for a spatial analysis of the annual course and for estimation of the expected maximal daily precipitation amounts for different return periods.

The largest annual Rd_{max} have been recorded along the Adriatic coast (352.2 mm in Zadar, on 11 September 1986, 315.0 mm in Crikvenica, on 25 September 1987, 201.5 mm in Cavtat, on 19 August 1979), on the Kvarner islands (250.8 mm, on 5 September 1993, and 231.7 mm in Cres, on 25 September 1951), on the slopes of the mountainous hinterland – the windward side for the rain-bearing current (Gorski kotar: 319.5 mm in Marčelji, on 27 September 1956, 254.0 mm in Gerovo, on 14 November 1987), on the leeward side of Mount Sniježnica near the Konavle Plain (Konavosko polje) in Pridvorje: 225.9 mm, on 17 October 1976, and on the mountain pass between Mount Mosor and Mount Biokovo in Zadvarje: 225.6 mm, on 7 July 1992. The highest recorded Rd_{max} values decrease as we move inland and from west to east in northern Croatia (Gospić: 120.9 mm – 24 August 1969, Bjelovar: 104.4 mm – 7 June 1951, Slavonski Šamac: 80.2 mm – 10 June 1973). The lowest annual Rd_{max} values range from 17.4 mm in Lastovo (the Island of Lastovo) to 87.5 mm in Klana (Gorski kotar). According to the coefficient of variation values, the year-to-year variability of Rd_{max} is the lowest in central Croatia, in the area south of the Sava River, including Gorski kotar and Lika (20–30%). North of the Sava, the Rd_{max} coefficient of variation is 30% to 50% and in Istria, on the coast and in Dalmatia 30% to 40%. As the cases of Zadar, Crikvenica and Cres show, greater fluctuation of Rd_{max} values can be expected in this area as well. Over an observation period of one year, high Rd_{max} values were recorded at these locations, which differed significantly from the amounts recorded in other years. Return periods of around 240 years (Zadar), around 120 years (Crikvenica) and around 165 years (Cres) correspond to these values. Although such cases are rare, with low probability of occurrence, they need to be taken into account.

The highest annual Rd_{max} values in continental Croatia occur north of the Sava River, most often in summer (June, July, and August) and at the end of autumn (November). In the transitional area, as we move towards mountainous Croatia, the highest annual Rd_{max} values occur mostly in August and November. In areas with maritime climate (the Adriatic coast and the islands) and areas where maritime climate has a strong influence (Gorski kotar, Lika and the Dalmatian hinterland (Dalmatinska zagora), the heaviest daily precipitation can most often be expected in autumn (September, October and November) or in the first part of winter (December).

Precipitation frequency during the year, expressed in the number of precipitation days with different daily amounts, points to significant spatial differences in total annual "raininess" and in the form of its annual variation between the continental, mountainous and coastal areas (graphs next to the map of mean annual number of days with precipitation Rd≥1 mm). The annual number of precipitation days with at least 0.1 mm precipitation ranges from an average of 100 days (27% of all days in a year) on the Dalmatian

šovitosti" i u obliku njihova godišnjeg hoda između kontinentalnog, planinskog i primorskog područja (grafikoni uz kartu srednjeg godišnjeg broja dana s Rd≥1 mm). Godišnji broj oborinskih dana u kojima padne barem 0,1 mm oborine, javlja se u prosjeku od oko 100 dana (27% dana u godini) na dalmatinskim otocima, 140 dana (38% dana u godini) u nizinskom dijelu istočne Hrvatske do oko 170 dana (47% dana u godini) u gorskim krajevima. Dnevne količine oborine većih količina od barem 5,0 mm mogu se u prosjeku očekivati u 30% do 40% oborinskih dana u nizinskoj unutrašnjosti, u 40 do 50% oborinskih dana u primorskim krajevima, te u oko 50% oborinskih dana u brdsko – planinskom području, a na njihovim vršnim područjima i češće.

U unutrašnjosti učestalost oborinskih dana najveća je od travnja do lipnja (prosječno 12 do 14 dana na mjesec), s maksimumom u lipnju, kada je kiša i količinski najizrazitija. Najmanje oborinskih dana ima u rujnu i listopadu (9 do 12 dana na mjesec). U gorskim predjelima oborina najčešće pada od studenog do lipnja s malim razlikama u mjesečnom broju oborinskih dana (13 do 16 dana). Česte oborine u kasnu jesen i zimi posljedica su ciklona i ciklonalnih vrtloga nad morem, ciklona koje se premještaju nad kopno i atmosferskih fronti povezanih s udaljenim ciklonama. Kao i duž jadranske obale, kiša najrjeđe pada u srpnju (Gospić - 8 dana, Parg - 12 dana). Na jadranskom području najkišovitije je razdoblje od studenog do svibnja u Istri, Primorju i srednjoj Dalmaciji (9 do 12 dana na mjesec), a na dalmatinskim otocima i južnoj Dalmaciji kiša je u svibnju rjeđa. Područje kvarnerskog priobalja ljeti i dubrovačkog priobalja zimi je nešto kišovitije od ostalog dijela obale. I dok se dani s većim dnevnim količinama oborine javljaju na kopnenim područjima češće ljeti kao posljedica kratkotrajnih jakih oborina, u gorskim krajevima i na jadranskom području češće se javljaju u hladnom dijelu godine i uglavnom su rezultat dugotrajnih oborina.

U novijem klimatskom razdoblju 1971–2000. došlo je do promjene kišovitosti tijekom godine i to do smanjenja broja oborinskih dana tijekom zime, proljeća i ljeta, te povećanja u jesen. Te promjene su male i izraženije kod kišnih dana manjeg intenziteta, pa su upravo oni i dali doprinos sezonskim i godišnjim promjenama količine oborine .

Vremenska i prostorna promjenjivost **sušnih razdoblja**, definiranih kao neprekidni niz dana u kojima je palo najviše 1 mm oborine, analizirana je za sušna razdoblja dulja od 10 dana (grafikoni uz kartu srednje količine oborine za ljeto). Ona imaju veće praktično značenje od kraćih, osobito kad su povezana s drugim vremenskim uvjetima, kao što je visoka temperatura zraka, jak vjetar i niska relativna vlažnost zraka. Takvi meteorološki uvjeti mogu izazvati značajne štetne posljedice u poljodjelstvu, vodoprivredi, turizmu, te u drugim gospodarskim djelatnostima. Analizirani su godišnji hodovi učestalosti pojavljivanja sušnih razdoblja različitih trajanja (11 do 20 dana, 21 do 30 dana i > 30 dana).

U nizinskoj Hrvatskoj razdioba učestalosti sušnih razdoblja ukazuje da se sušna razdoblja u trajanju od 11 do 20 dana podjednako javljaju tijekom cijele godine. Međutim, ipak se na području Slavonije nešto češće javljaju u listopadu, rujnu i siječnju (po 10% do 13% ukupnog godišnjeg broja takvih sušnih razdoblja) dok se u središnjoj Hrvatskoj takva sušna razdoblja mogu očekivati najčešće u veljači kao i u rujnu, listopadu i studenom (po 10% do 14%). Dulja sušna razdoblja u trajanju do 30 dana u cijeloj nizinskoj Hrvatskoj najčešća su u listopadu (do 41%). Vrlo duga sušna razdoblja, koja traju više od 30 dana, javljaju se rijetko. U analiziranom 30-godišnjem razdoblju uglavnom su zabilježena u rujnu, listopadu, prosincu i siječnju i to najviše po 2 puta. U nizinskoj Hrvatskoj najdulje sušno razdoblje od 69 dana zabilježeno je u Sisku, a počelo je u prosincu 1988. godine.

Na području gorske Hrvatske sušna razdoblja u trajanju od 11 do 20 dana u godišnjem hodu su najčešća u srpnju (12% do 16% ukupnog godišnjeg broja takvih

islands, 140 days (38%) in the lowland areas of eastern Croatia, up to 170 days (47%) in the mountainous areas. Daily precipitation amounts of over 5.0 mm can be expected, on average, on 30–40% of precipitation days in the continental lowlands, on 40–50% of precipitation days in the coastal area and on around 50% of precipitation days in the highland area – even more often in their peak area.

Inland, the frequency of precipitation days is the greatest from April to June (an average of 12 to 14 days per month), with the maximum in June, when precipitation is the most abundant. September and October have the fewest precipitation days (9 to 12 days per month). Frequent precipitation in late autumn and in winter is the result of cyclones and cyclonic vortices over the sea, cyclones moving towards the mainland and atmospheric fronts connected with distant cyclones. Along the Adriatic coast, precipitation is least frequent in July (Gospić – 8 days, Parg – 12 days). The rainiest period on the Adriatic is from November to May in Istria, on the coast, and in central Dalmatia (9 to 12 days per month). Rain is less frequent in May on the Dalmatian islands and in southern Dalmatia. The Kvarner Littoral in summer and the Dubrovnik coast in winter get slightly more rain than the rest of the coast. While, inland, days with greater daily precipitation amounts occur more often during summer, as a result of short-term heavy precipitation, in the mountainous areas and on the Adriatic they occur more often during the cold part of the year and are a result of long-term precipitation.

In the climate period 1971–2000 there was a change in precipitation during the year. There was a decrease in the number of precipitation days in winter, spring and summer, and an increase in autumn. These changes are smaller and more pronounced, with low-intensity rainy days, which have, actually, contributed to the changes in seasonal and annual precipitation amounts.

The temporal and spatial variability of **dry spells**, defined as a sequence of consecutive days with precipitation equal or less than 1 mm, has been analysed for dry spells exceeding 10 days (graphs next to the map of mean precipitation in Summer). These long spells are more significant than shorter ones, particularly when associated with other climatic factors such as high air temperature, strong wind and low relative humidity. Such meteorological conditions can seriously affect agriculture, water management, tourism and other economic branches. The annual courses of the frequency of dry spells of different lengths (11 to 20 days, 21 to 30 days and over 30 days) have been analysed.

In lowland Croatia, the frequency distribution of dry spells indicates that dry spells lasting 11 to 20 days occur evenly over the whole year. However, in Slavonia, they are slightly more frequent in September, October and January (10% to 13% of the total yearly number of such dry spells per each of these months) whereas in central Croatia such dry spells can be expected mostly in February and, again, in September, October and November (10% to 14% per each month). In lowland Croatia, longer dry spells, lasting up to 30 days, are most frequent in October (up to 41%). Very long dry spells, exceeding 30 days, are very rare. In the analysed 30-year period they were mainly recorded in September, October, December and January, maximally two times in each of these months. The longest dry spell in lowland Croatia was registered in Sisak. It started in December 1988 and lasted 69 days.

In highland Croatia, dry spells lasting 11 to 20 days in the annual course are most frequent in July (12% to 16% of the annual number of such dry spells). Dry spells lasting 21 to 30 days are rare. In the northern part of the highlands these can be expected mainly in October and also in March and September. During the analysed 30-year period, at the Parg station, there were five dry spells lasting up to 30 days. In the rest of

sušnih razdoblja). Rijetka su sušna razdoblja koja traju od 21 do 30 dana. U sjevernom dijelu gorske Hrvatske mogu se očekivati uglavnom u listopadu, te u ožujku i rujnu. U analiziranih 30 godina na postaji Parg pet puta su sušna razdoblja trajala do 30 dana. Na ostalom području gorske Hrvatske takva sušna razdoblja mogu se očekivati uglavnom u srpnju i rujnu. S podjednakom učestalošću zabilježena su i vrlo duga sušna razdoblja (dulja od 30 dana). Na području gorske Hrvatske, u analiziranom razdoblju, najdulje sušno razdoblje trajalo je 67 dana na postaji Parg, a započelo je u prosincu 1988. godine.

Vjerojatnost pojavljivanja sušnih razdoblja najveća je u primorskoj Hrvatskoj. Na sjevernom Jadranu sušna razdoblja u trajanju od 11 do 20 dana, iako se mogu očekivati tijekom cijele godine, najčešća su u srpnju i kolovozu (12% do 13% ukupnog godišnjeg broja takvih sušnih razdoblja) dok su u Dalmaciji i na otocima takva sušna razdoblja najčešća u lipnju (do 13%), kao i u rujnu i listopadu (do 11%). Posebno je izražena razdioba čestina sušnih razdoblja u trajanju od 21 do 30 dana gdje se jasno uočava maksimum njihovog pojavljivanja u mjesecu srpnju, a koji se povećava idući od sjevernog prema srednjem i južnom dijelu Jadrana i otocima (14–26%). U primorskoj Hrvatskoj su češća i vrlo duga sušna razdoblja (dulja od 30 dana) nego u ostalim dijelovima Hrvatske. Na sjevernom Jadranu najčešća su u rujnu i prosincu dok su na južnom dijelu najčešća od lipnja do rujna. U analiziranom 30-godišnjem razdoblju najviše je zabilježeno do pet takvih razdoblja u navedenim mjesecima. Na otocima se vrlo duga sušna razdoblja mogu pojaviti u svim mjesecima u godini osim u siječnju i studenom. Najdulje sušno razdoblje u primorskoj Hrvatskoj trajalo je 84 dana u Splitu, a započelo je u lipnju 1962. godine.

Tijekom oborinskih dana oborina može padati u tekućem, čvrstom ili mješovitom obliku. U Hrvatskoj oborina najčešće dolazi u obliku kiše. Pojava oborine u obliku snijega najčešća je u gorskom području gdje snijeg pada u oko 30% do 50% oborinskih dana. Nešto je rjeđa pojava u nizinskoj unutrašnjosti gdje pada u 15% do 20% oborinskih dana. Na obali i otocima bliže obali javlja se samo u 3% do 5% oborinskih dana (3 do 7 dana na godinu), dok je na vanjskim otocima vrlo rijetka pojava ili do sada nije zabilježen.

Nije svako padanje snijega nužno povezano sa zadržavanjem snijega na tlu i stvaranjem **snježnog pokrivača**. Ostaje li snijeg koji pada na tlu ili se topi ovisi o količini snijega, temperaturi zraka i tla, izloženosti terena vjetru i sunčevu zračenju. Tijekom razdoblja s niskim temperaturama zraka, kada je dulji dio dana temperatura zraka ispod 0°C, snijeg će se zadržati na tlu dulje vrijeme i nakon što je prestao padati.

Na području Hrvatske prisutna je značajna prostorna promjenjivost pojave snježnog pokrivača (grafikoni uz kartu srednjeg godišnjeg broja sa snježnim pokrivačem ≥ 1 cm). Isto tako njegovo zadražavanje na tlu vrlo je promjenjivo od godine do godine. Godišnji broj dana sa snježnim pokrivačem visine barem 1 cm iznosi u prosjeku 35 do 40 dana u nizinskoj unutrašnjosti. To trajanje povećava se s porastom nadmorske visine u brdsko-planinskim krajevima. Na vršnim područjima Gorskog kotara iznosi i više od 100 dana, a na Velebitu i 170 dana. Duž jadranske obale i na otocima zadržavanje snježnog pokrivača rijetko je i kratkotrajno, iako s njim treba računati, posebice u unutrašnjosti Istre, kvarnerskom priobalju i dalmatinskom zaleđu.

Javljanje snježnog pokrivača većih visina može se očekivati tijekom kraćih razdoblja, posebice u nizinskoj unutrašnjosti. Tu je zadržavanje snježnog pokrivača od barem 30 cm prilično jednoliko i iznosi do 5 dana, a na vršnom području izdvojenih planina oko Požeške kotline, na Medvednici i Ivanščici do preko 40 dana. U dinarskom brdsko-planinskom području njegovo javljanje je stabilnije i dugotrajnije. Na ličkoj visoravni snježni pokrivač visine barem 30 cm zadražava se na tlu u prosjeku oko 18 dana, u Gorskom kotaru oko 30 dana, a

the highlands, such droughts can be expected mainly in July and September. The same frequency distribution applies to very long dry spells (exceeding 30 days). In highland Croatia, in the period analysed, the longest dry spell started in December 1988 at the Parg station and lasted 67 days.

The probability of drought occurrence is the highest in littoral Croatia. On the northern Adriatic, dry spells lasting 11 to 20 days may be expected throughout the year although they are most frequent in July and August (12% to 13% of the total annual number of such dry spells). In Dalmatia and on the islands, such dry spells are most frequent in June (up to 13%) and in September and October (up to 11%). The frequency distribution of 21-to-30-day dry spells is particularly pronounced, showing their maximal occurrence in July and increasing from the northern to the middle and southern Adriatic and the islands (from 14% to 26%). Compared to the rest of the country, even very long dry spells (exceeding 30 days) are more frequent in littoral Croatia. On the northern Adriatic, they are most frequent in September and December whereas on the southern Adriatic they occur most frequently from June to September. In the considered 30-year period, up to five such dry spells were recorded in these months. On the islands, very long dry spells can occur in all months except January and November. The longest dry spell in littoral Croatia was recorded in Split, starting in June 1962, and lasting 84 days.

During precipitation days, precipitation can fall as liquid, solid or mixed precipitation. Every snowfall does not necessarily result in the accumulation of snow on the ground and the formation of **snow cover**. Whether snow will remain on the ground or melt depends on the amount of snow, the air and soil temperature and the exposure of the area to wind and solar radiation. During a period with low air temperatures, with air temperature below 0 °C for the longer part of the day, snow will remain on the ground for a longer period of time after it has stopped snowing.

Jesenska kiša.
Autumn rainfall.
Fotografija Photo by: Marko Vučetić

There is a significant spatial variability of snow cover occurrence in Croatia (graphs next to the map of mean annual number of days with snow cover ≥1 cm). Snow cover retention is also highly variable from year to year. The annual number of days with snow cover at least 1 cm high is 35 to 40 days on average in the continental lowlands. This number increases with altitude in the highland area. In the peak areas of Gorski kotar the number exceeds 100 days and amounts to as much as 170 days on Mount Velebit. Snow cover retention along the Adriatic coast and on the islands is rare and short-term, although it has to be taken into account, especially in continental Istria, the Kvarner Littoral and the Dalmatian hinterland.

A higher snow cover can be expected during short periods, especially in the continental lowlands. Snow cover retention of ≥ 30 cm is quite uniform in this area and lasts for 5 days. In the peak area of the isolated mountains around the Požega Valley (Požeška kotlina),

na vršnom području Velebita i dulje od 140 dana.

Tijekom hladnog dijela godine snježni pokrivač se u prosjeku javlja u ravničarskoj unutrašnjosti u razdoblju od studenog do travnja s najduljim trajanjem u siječnju. U gorskim i planinskim krajevima s porastom nadmorske visine snježno razdoblje se produljuje i traje od rujna do svibnja. Na vršnom području Velebita može se očekivati u svim mjesecima, iako je ljeti izrazito rijetka i kratkotrajna pojava. Snježni pokrivač većih visina češći je u siječnju i veljači, a na Velebitu i početkom proljeća (ožujak).

Tijekom zadnjeg klimatološkog razdoblja 1971–2000. došlo je do smanjenja broja dana sa snježnim pokrivačem zimi i u proljeće i do povećanja u jesen, što je rezultiralo kraćim godišnjim trajanjem snježnog pokrivača. To je posljedica sezonskih promjena količina i učestalosti oborine i temperature zraka.

Maksimalne visine snježnog pokrivača kreću se oko 60 cm u nizinskom području sjeverne Hrvatske, rastu s nadmorskom visinom i na vršnom području dosižu oko 140 cm (Medvednica) (grafikoni uz kartu srednje količine oborine za zimu). U području južno od Kupe i Save prema Gorskom kotaru i Lici maksimalne visine snježnog pokrivača rastu od oko 100 cm, do oko 120 cm na ličkoj visoravni, 160 cm na 900 m nadmorske visine u Gorskom kotaru, te više od 200 cm na vrhovima Gorskog kotara i Velebita. Najveća visina od 320 cm zabilježena je na Zavižanu u ožujku 1984. Na priobalnim obroncima planina maksimalne visine snježnog pokrivača znatno su manje od onih na istim nadmorskim visinama kontinentalnih obronaka. U dalmatinskom zaleđu snježni pokrivač može biti 30 do 40 cm, u sjevernom i srednjem priobalju 20 do 30 cm, a na otocima i jugu Dalmacije manje od 10 cm.

and on the Medvednica and Ivanščica mountains, it lasts longer than 40 days. In the highland area of the Dinarides, its occurrence is more stable and long-lasting. Snow cover of at least 30 cm remains on the ground for an average of 18 days on the Lika Plateau (lička visoravan), around 30 days in Gorski kotar and over 140 days in the peak area of Velebit.

During the cold part of the year, snow cover occurs in the continental lowland, on average from November to April, its duration the longest in January. In hilly and mountainous areas the period of snow lasts longer as the altitude rises – from September to May. In the peak areas of Velebit it can be expected during the whole year, although in summer it occurs extremely rarely and is short-term. At high altitudes, snow cover occurs more often in January and February and on Mount Velebit even at the beginning of spring (in March).

During the 1971–2000 climate period there was a decrease in the number of days with snow cover in spring, and an increase in autumn, which resulted in a shorter yearly duration of snow cover. This is a consequence of the seasonal changes in precipitation amount and frequency and air temperature.

The maximal snow cover ranges from 60 cm in the lowland area of northern Croatia, it grows with altitude and reaches around 140 cm in the peak area (Medvednica) (graphs next to the map of mean precipitation in Winter). In the area south of the Sava and Kupa Rivers, towards Gorski kotar and Lika, the maximal snow cover starts at around 100 cm, reaches around 120 cm on the Lika plains, 160 cm at the altitude of 900 m in Gorski kotar and over 200 cm on the peaks of Gorski kotar and Mount Velebit. The highest depth of 320 cm was recorded on Zavižan in March 1984. The maximal snow cover on the coastal slopes of the mountains is far lower than on the continental slopes at the same altitudes. Snow cover in the Dalmatian hinterland can be 30 to 40 cm high, along the northern and middle coastline 20 to 30 cm and lower than 10 cm in southernmost Dalmatia and on the islands.

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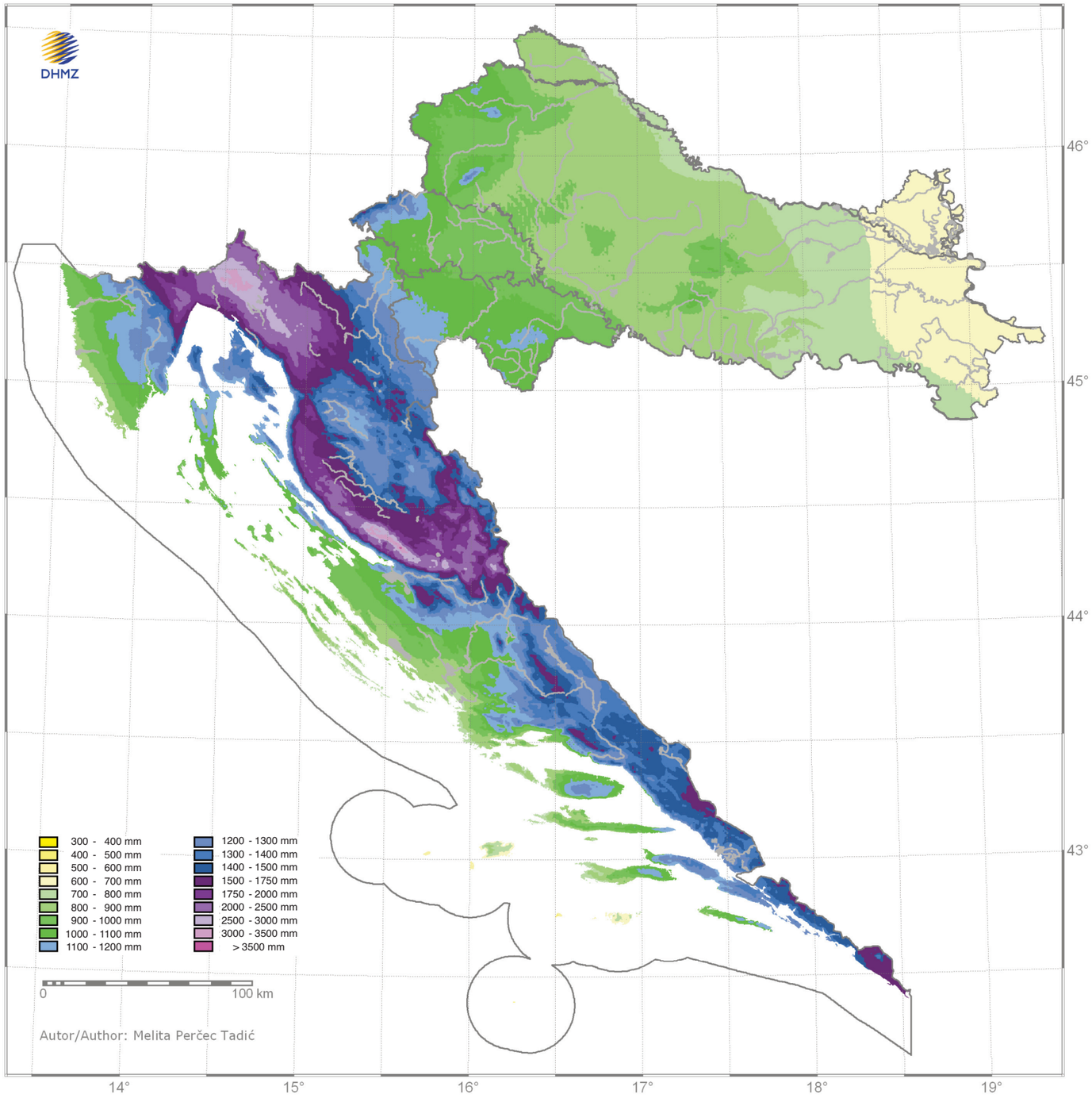
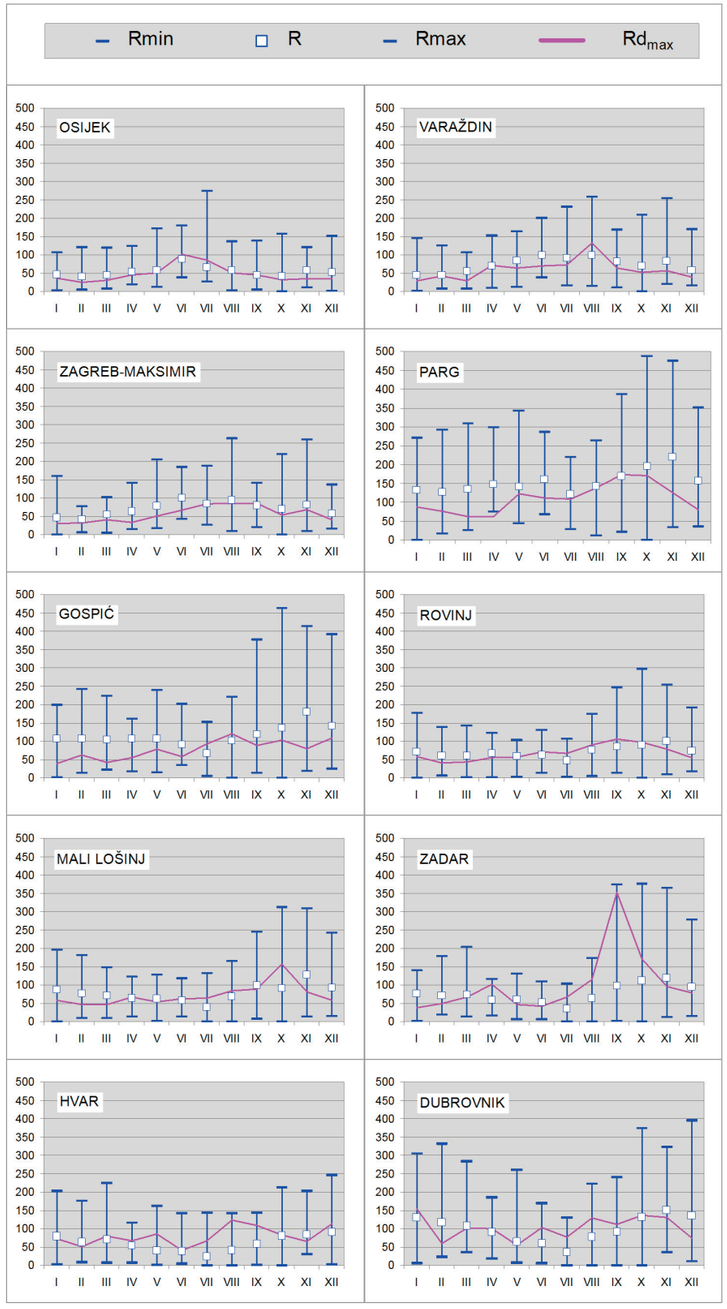
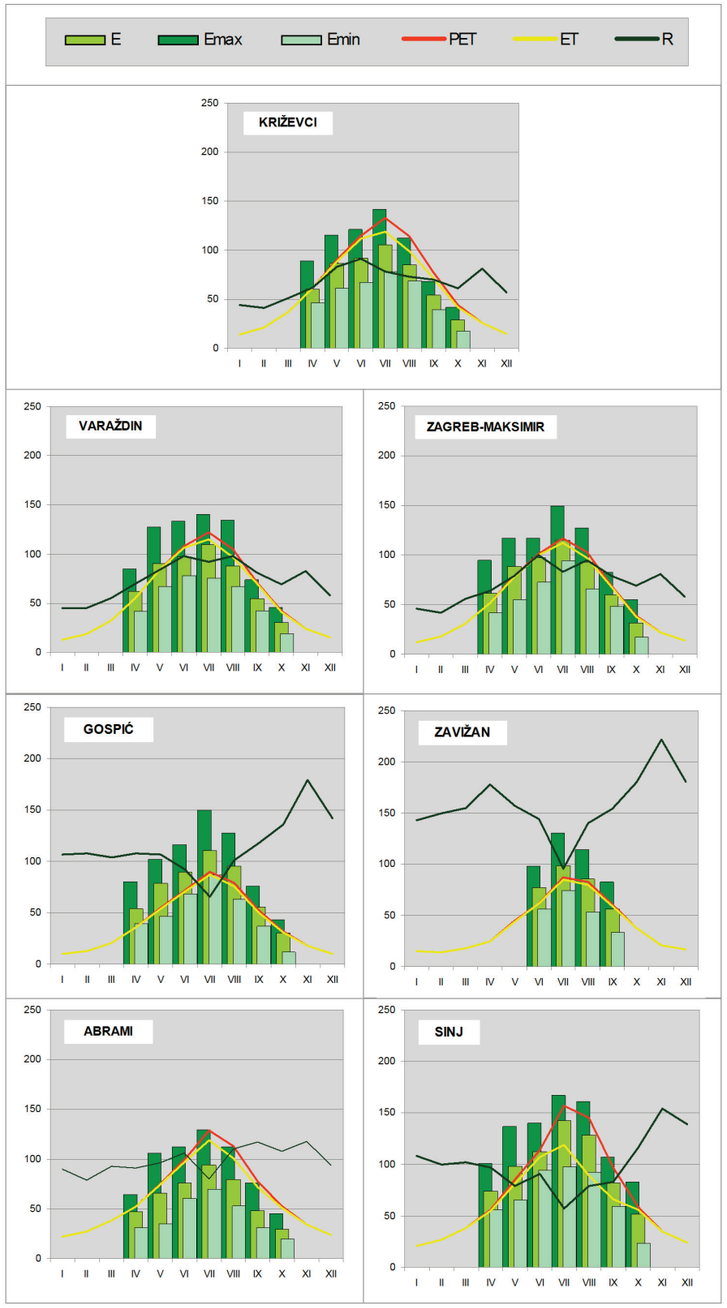
Srednja godišnja količina oborine Mean annual precipitation



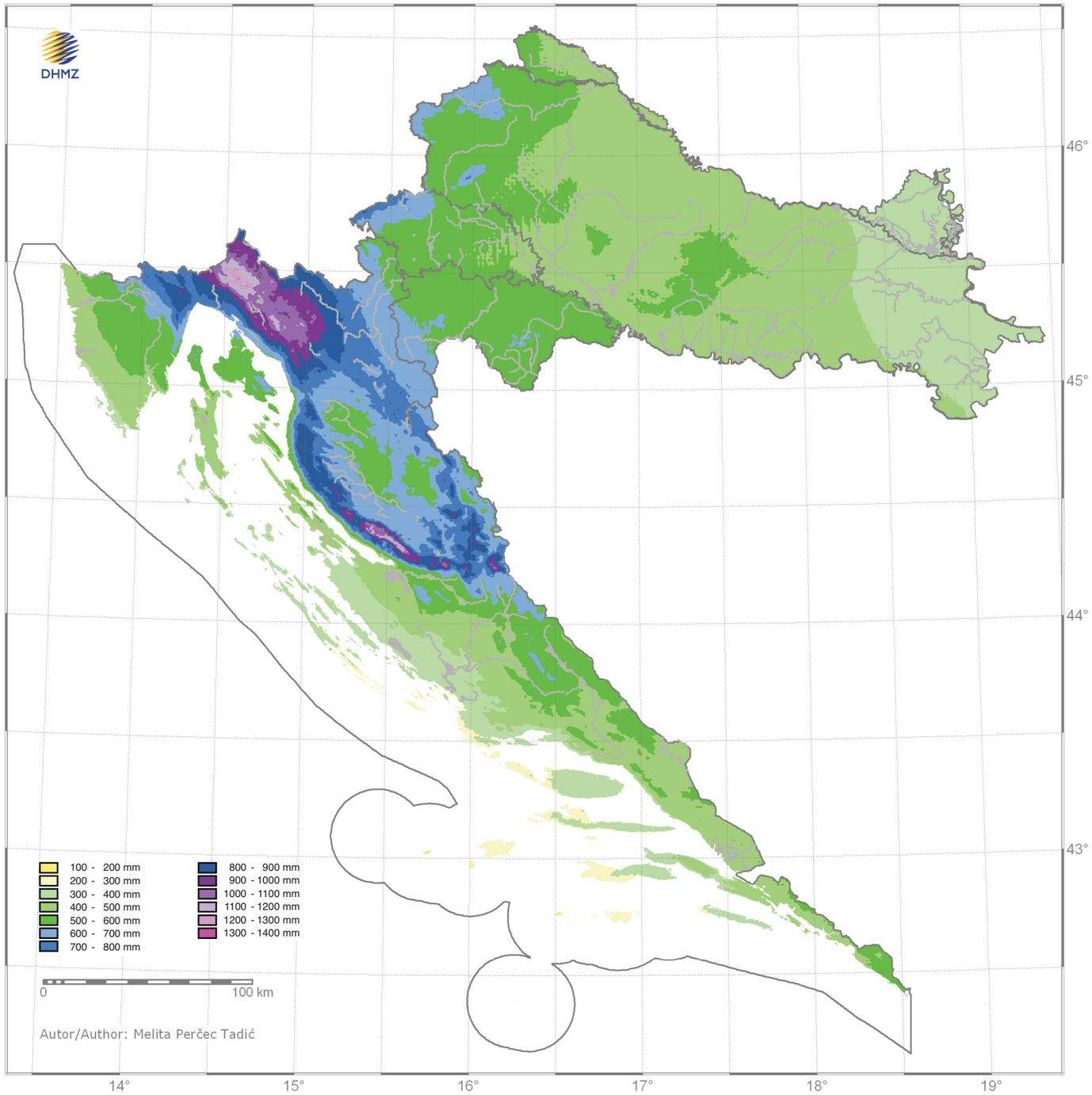


Godišnji hod srednje (R), minimalne (Rmin) i maksimalne (Rmax) mjesečne količine oborine i maksimalne dnevne količine oborine (Rd_{max}), mm.

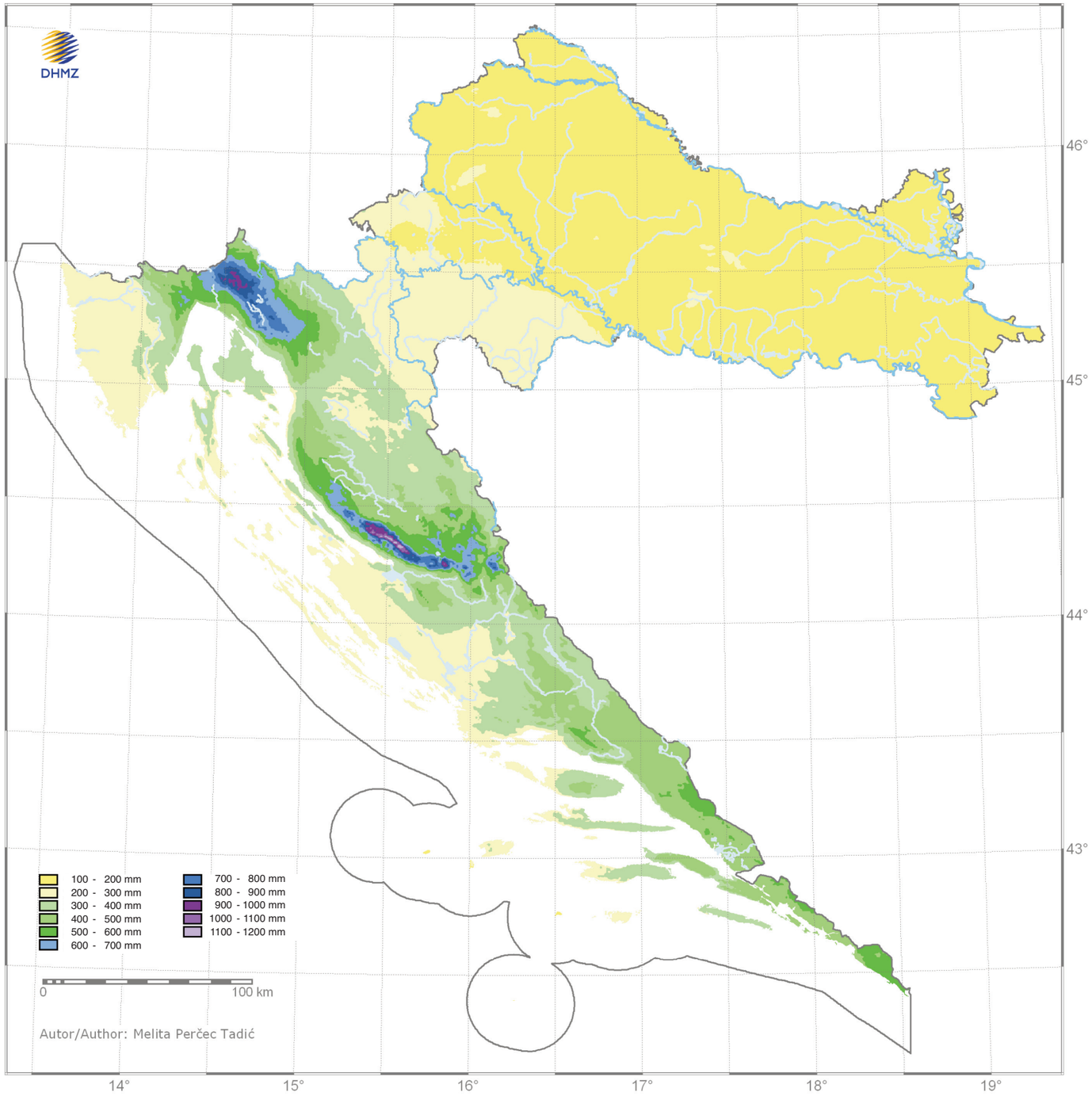
Annual course of mean (R), minimum (Rmin) and maximum (Rmax) monthly precipitation amounts and maximum daily precipitation (Rd_{max}), mm.

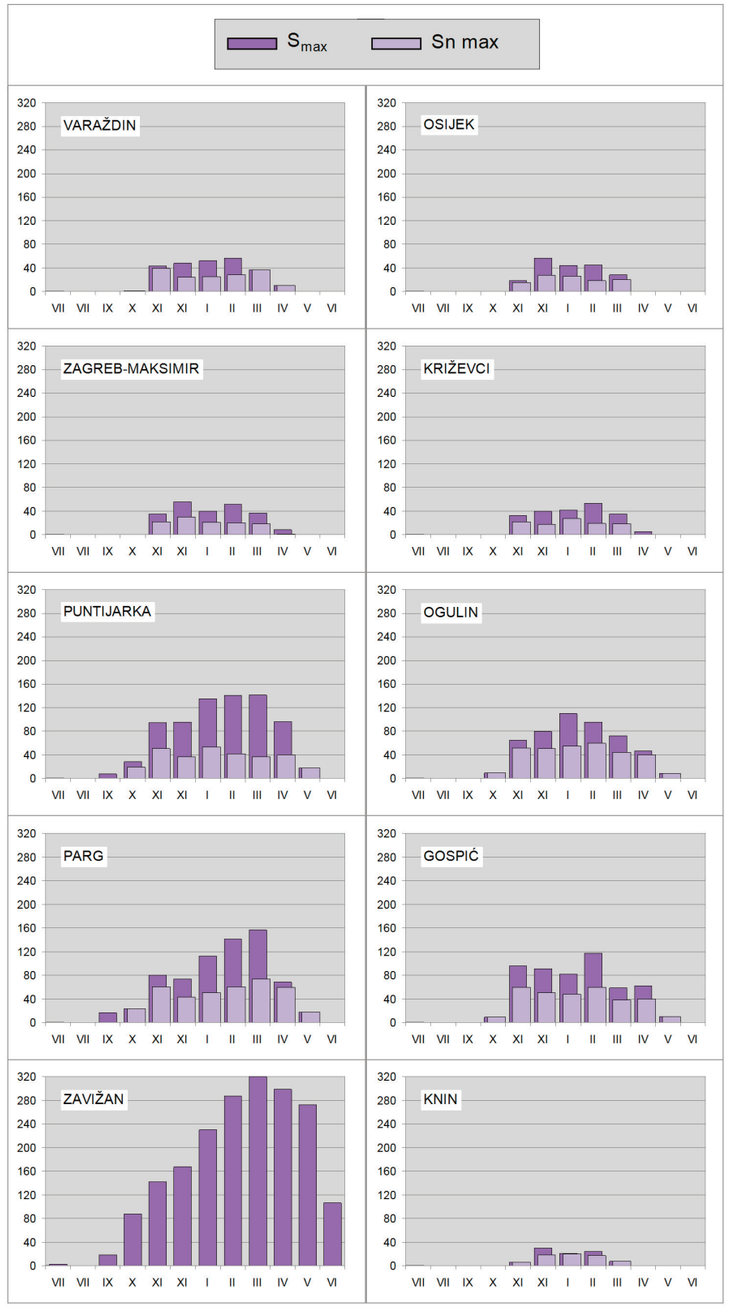


Godišnji hod srednjeg (E), maksimalnog (Emax) i minimalnog (Emin) isparavanja s otvorene vodene površine (koeficijent redukcije 0.70), evapotranspiracija (ET) i potencijalna evapotranspiracija (PET) prema Palmeru te količine oborine (R), mm.
Annual course of mean (E), maximum (Emax) and minimum (Emin) evaporation from the free water surface (coefficient of reduction 0.70), evapotranspiration (ET) and potential evapotranspiration (PET) according to Palmer and precipitation (R), mm.



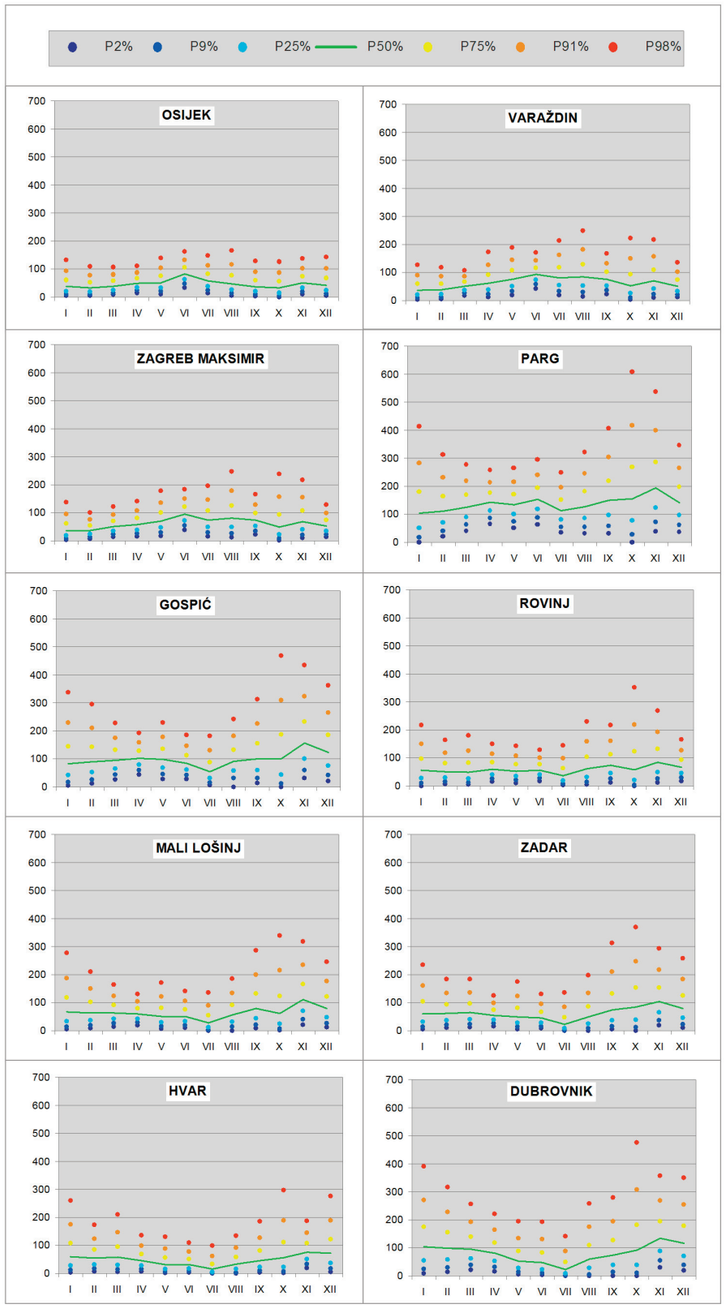
Srednja količina oborine za zimu Mean precipitation in Winter



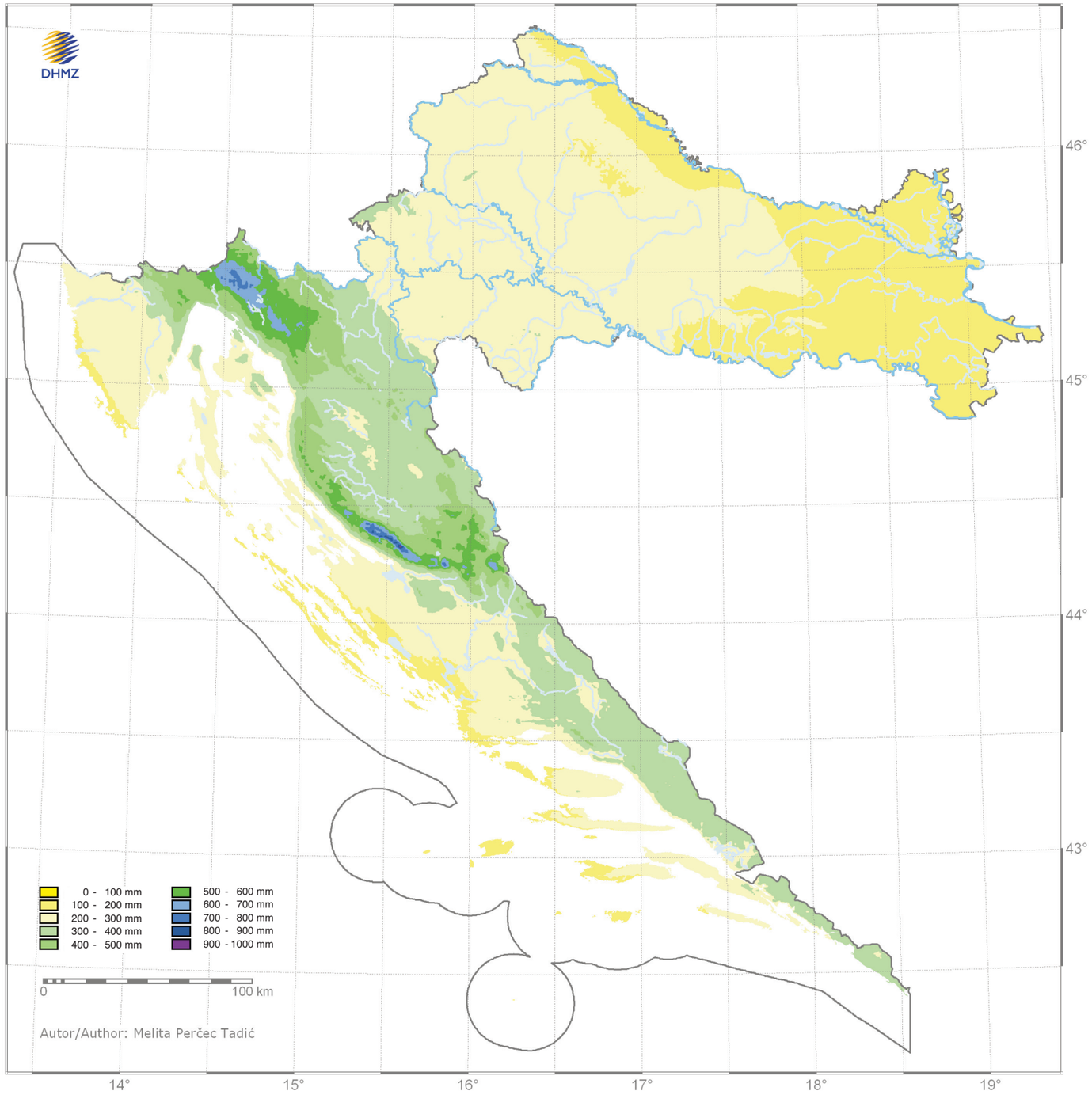


Godišnji hod maksimalnih visina snježnog pokrivača (Smax) i maksimalnih visina novog snijega (Sn max), cm, zima 1961/62 – 1990/91.

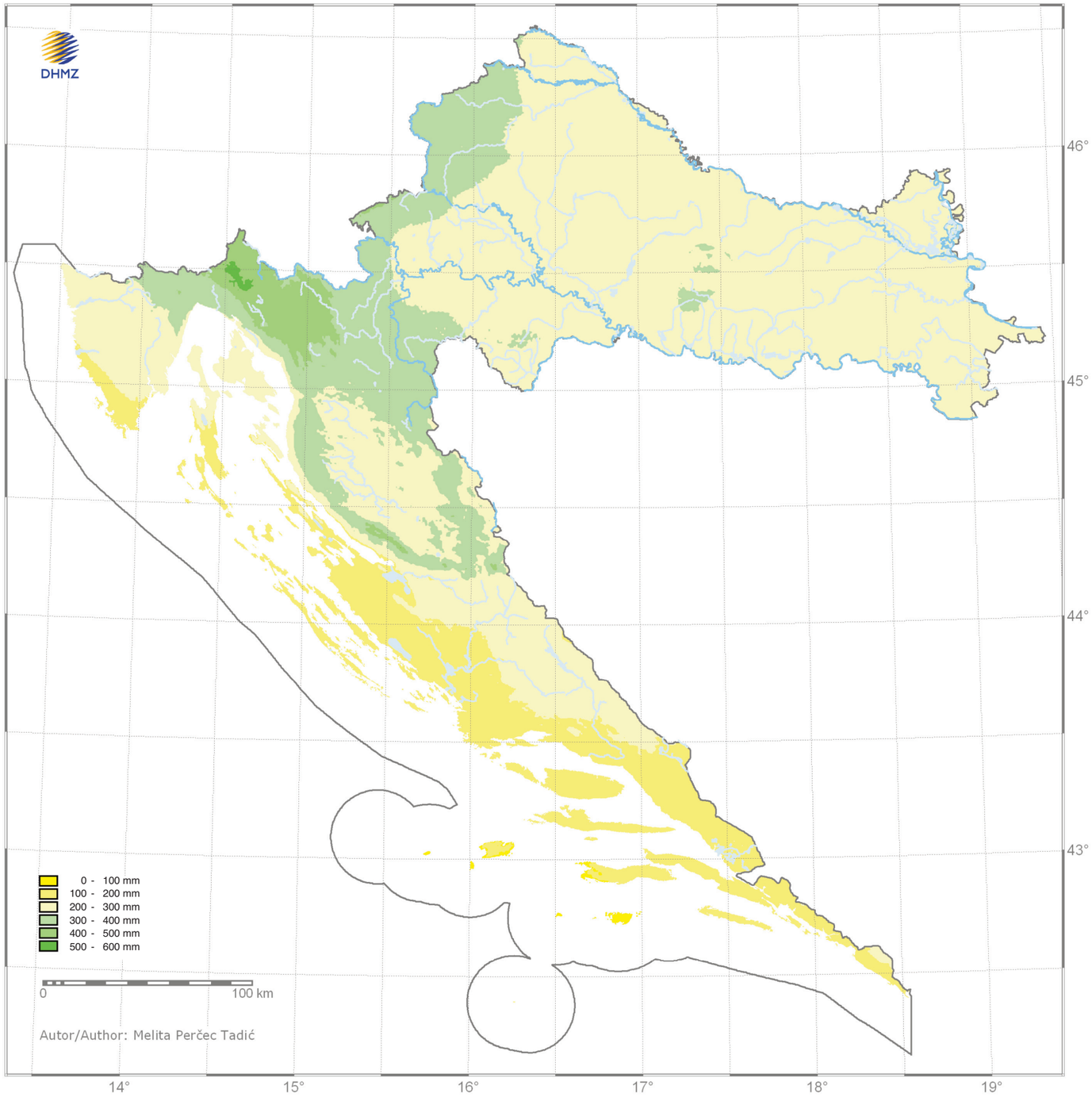
Annual course of maximum snow cover (Smax) and maximum fresh snow (Sn max), cm, winter 1961/62 – 1990/91.

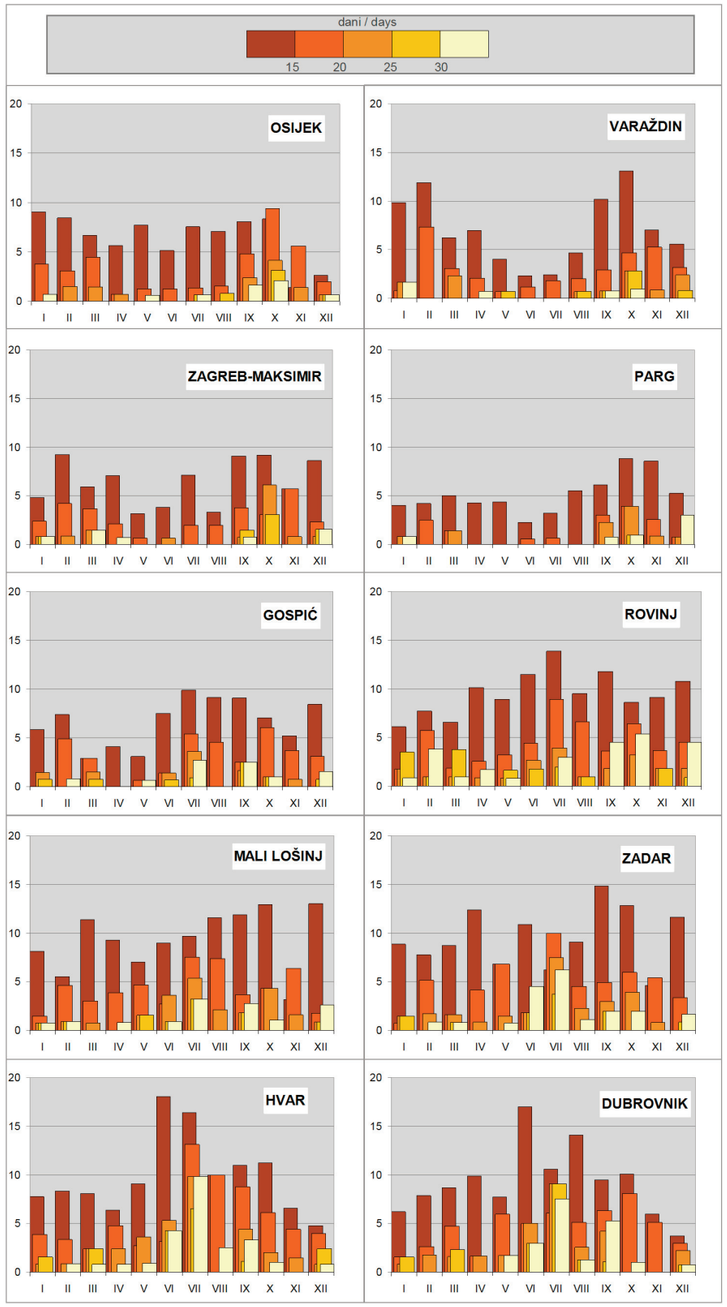


Godišnji hod 2, 9, 25, 50, 75, 91. i 98. percentila mjesečnih količina oborina (mm).
Annual course of 2nd, 9th, 25th, 50th, 75th, 91st i 98th percentile of the monthly precipitation amounts (mm).



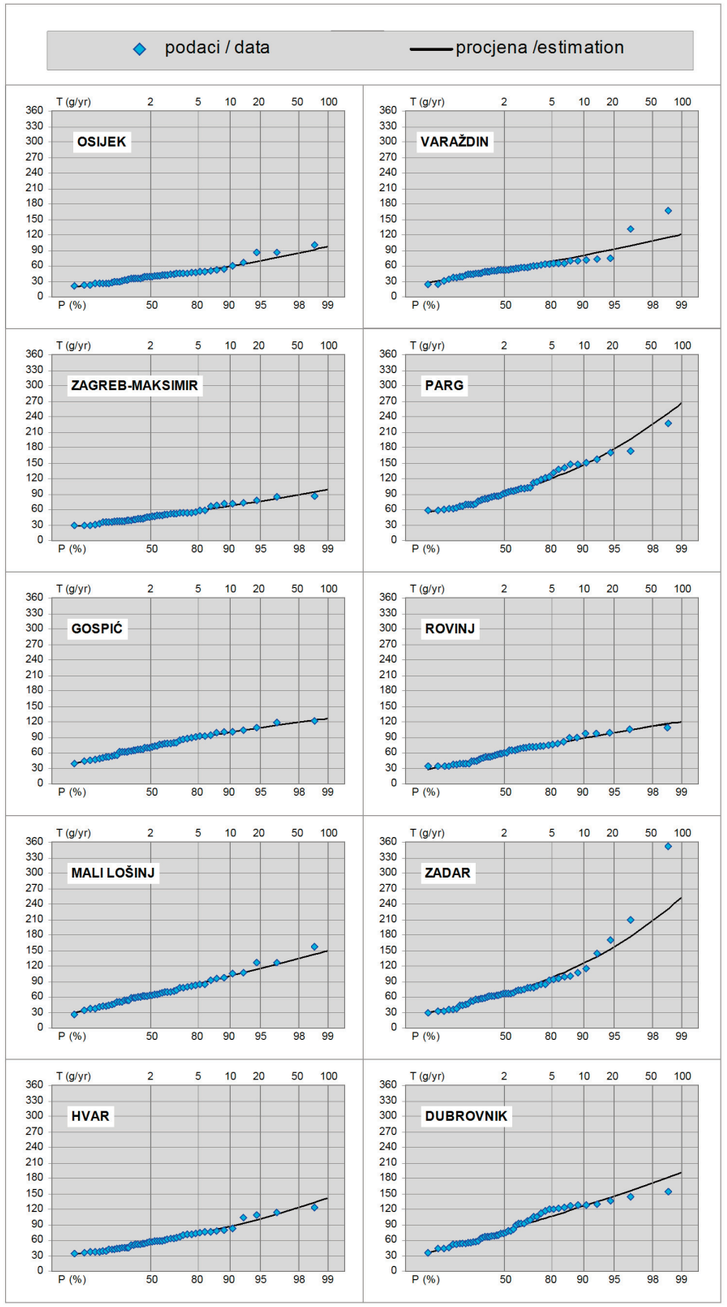
Srednja količina oborine za ljeto Mean precipitation in Summer



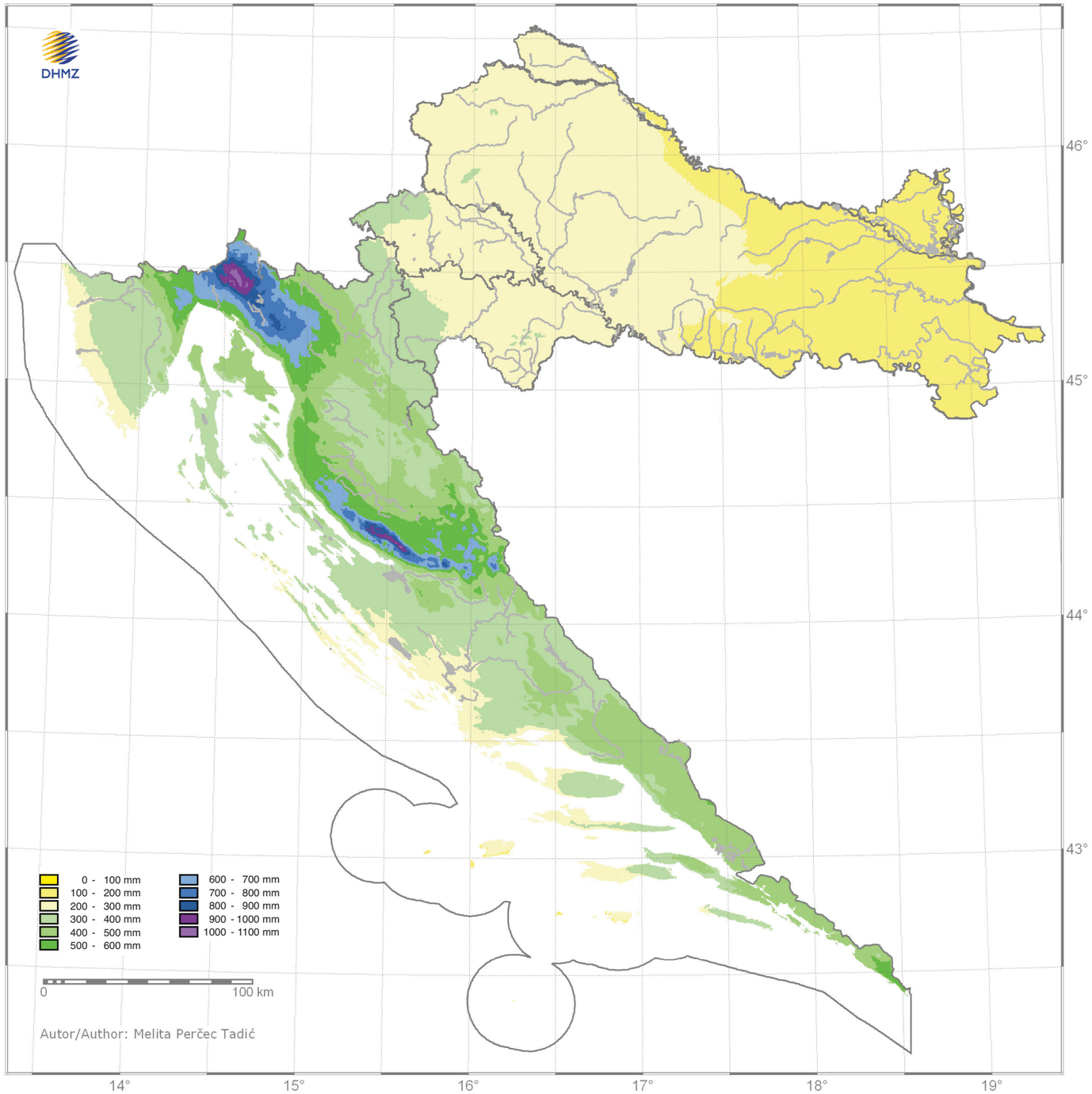


Godišnji hod učestalosti (%) sušnih razdoblja trajanja 11–15 dana, 16–20 dana, 21–25 dana, 25–30 dana i ≥30 dana.

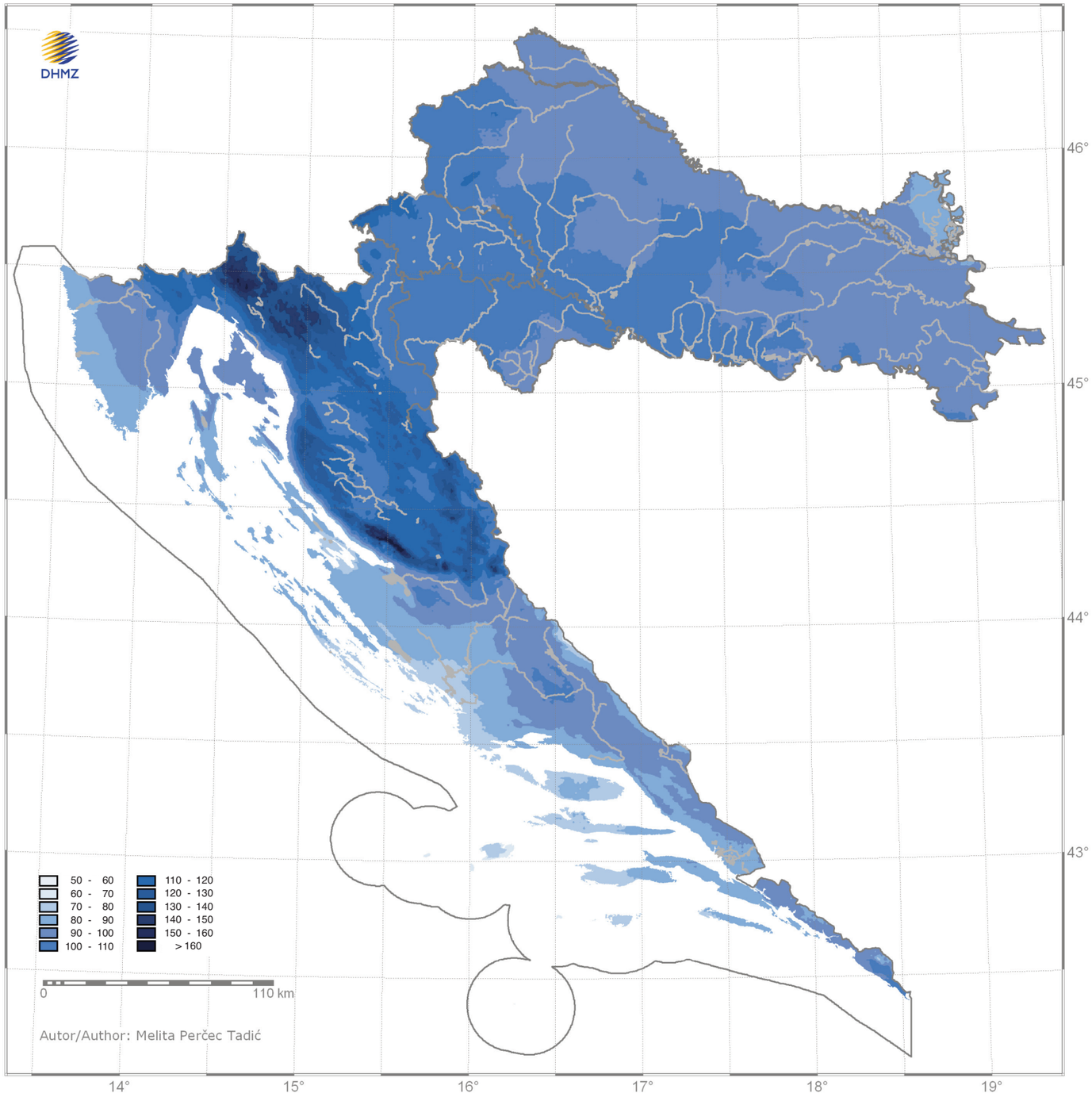
Annual course of dry period frequencies (%) with length 11–15 days, 16–20 days, 21–25 days, 25–30 days and ≥30 days.

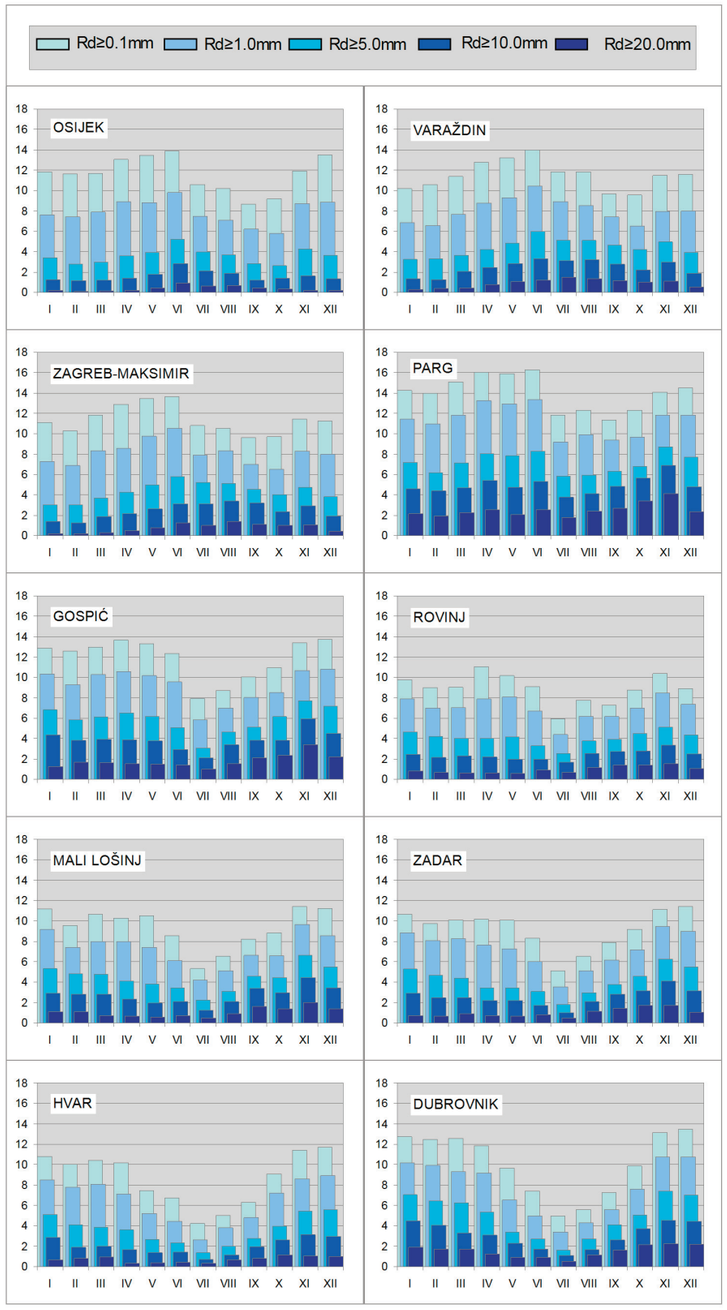


Izmjerene godišnje maksimalne dnevne količine oborine i procjene maksimuma pomoću opće razdiobe ekstremnih vrijednosti (GEV), 1951–2000.
Empirical annual maximum daily precipitation amounts and estimated maxima according to the Generalized Extreme Value (GEV) distribution, 1951–2000.



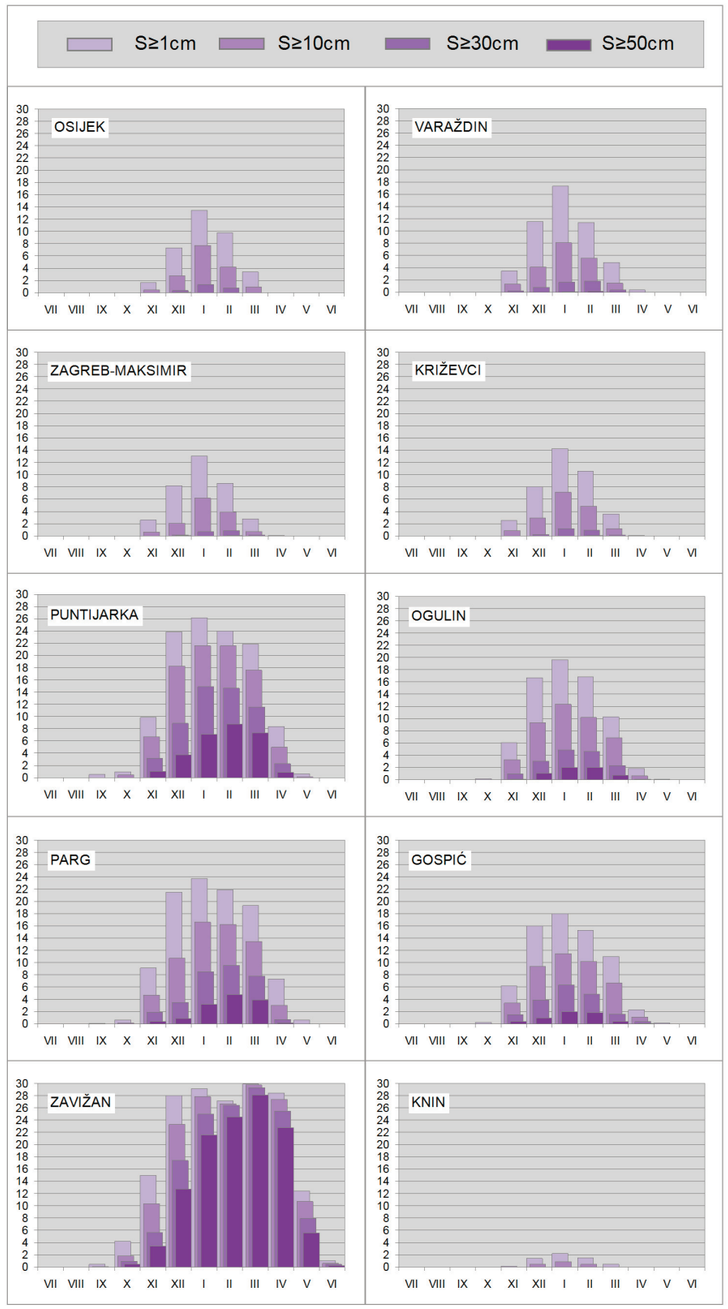
Srednji godišnji broj dana s količinom oborine ≥1 mm Mean annual number of days with precipitation ≥1 mm





Godišnji hod srednjeg broja dana s količinom oborine Rd ≥ 0,1 mm, Rd ≥ 1,0 mm, Rd ≥ 5,0 mm, Rd ≥ 10,0 mm i Rd ≥ 20,0 mm.

Annual course of the mean number of days with precipitation amounts Rd ≥ 0.1 mm, Rd ≥ 1.0 mm, Rd ≥ 5.0 mm, Rd ≥ 10.0 mm i Rd ≥ 20.0 mm.

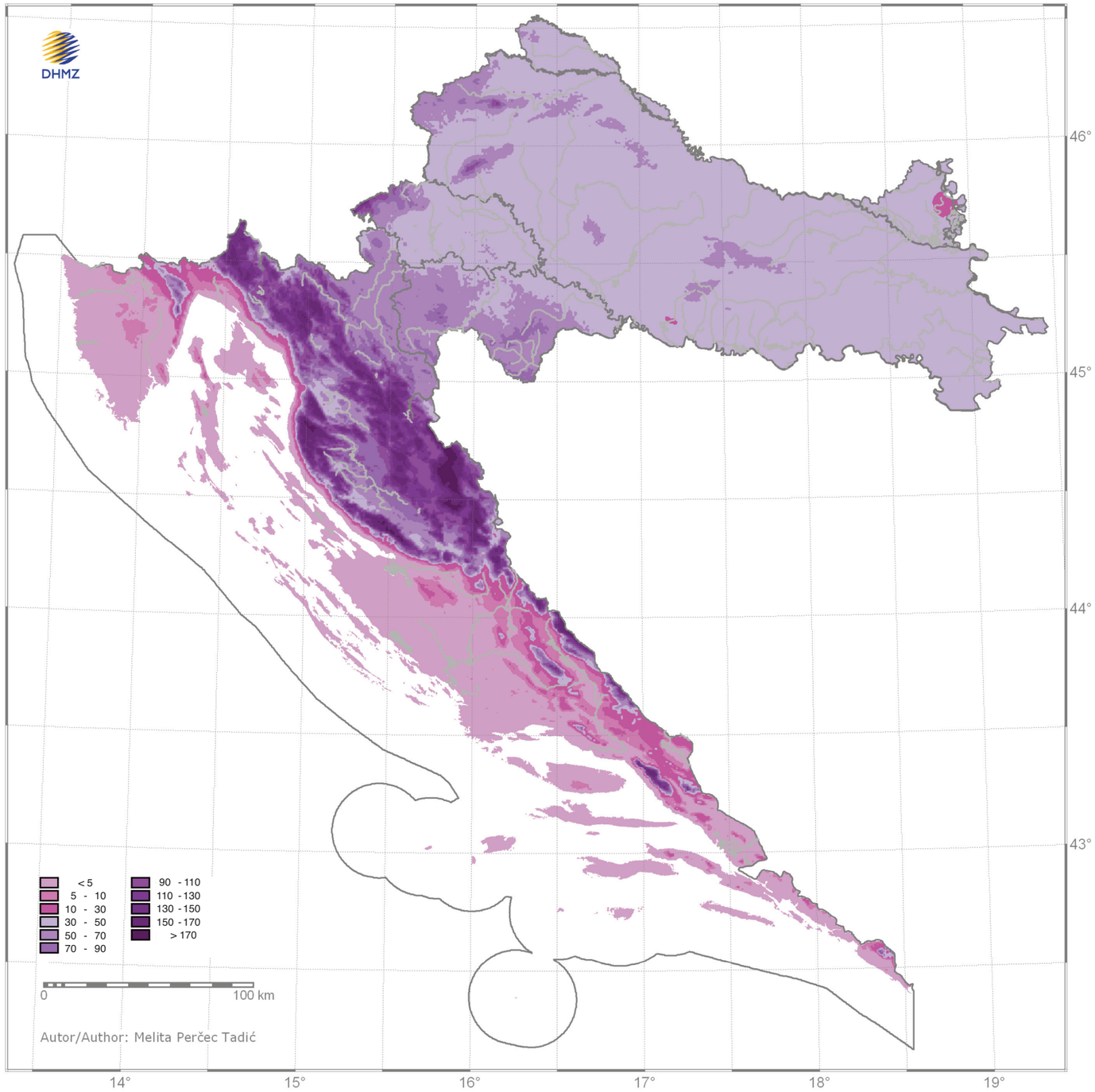


Godišnji hod srednjeg broja dana sa snježnim pokrivačem S ≥ 1 cm, S ≥ 10 cm, S ≥ 30 cm i S ≥ 50 cm, zima 1961/62 – 1990/91.

Annual course of the mean number of days with snow cover S ≥ 1 cm, S ≥ 10 cm, S ≥ 30 cm and S ≥ 50 cm, winter 1961/62 – 1990/91.

Srednji godišnji broj dana sa snježnim pokrivačem ≥1 cm

Mean annual number of days with snow cover ≥1 cm



Isparavanje
Evaporation

Janja Milković
Ksenija Zaninović

Na svakoj graničnoj plohi između vode u tekućem ili čvrstom stanju (ili nekog drugog vlažnog tijela, tla, biljaka, snježnog pokrivača) i zraka, molekule vode odlaze u zrak kao para, a druge se pak vraćaju iz zraka. Isparavanje prvenstveno ovisi o energiji Sunčeva zračenja, brzini vjetra i količini raspoložive vlage u prizemnom sloju zraka, tj. o sposobnosti zraka da primi isparenu tekućinu.

Isparavanje je važan dio ciklusa kruženja vode u atmosferi o kojem se relativno malo zna, a i s mjerenjem isparavanja krenulo se relativno kasno, šezdesetih godina. Poznavanje količine isparene vode važno je ne samo za meteorologiju, već je potrebno i drugim strukama kao što su npr. hidrologija i agronomija za izradu vodne bilance. Pojedine grane gospodarstva sve teže mogu podnijeti da budu bez podataka o tom kompleksnom meteorološkom elementu. To naročito dolazi do izražaja kod dugoročnih i većih projekata planiranja, projektiranja i održavanja vodnih akumulacija, drenažnih sustava, navodnjavanja, njihova utjecaja na okoliš i sl.

Količina isparene vode s otvorene vodene površine može se određivati na dva načina: mjerenjem instrumentima – evaporimetrima različitih tipova, i/ili računanjem posredno pomoću drugih meteoroloških elemenata.

Evaporimetri su posude različitih dimenzija, napunjene vodom, koje mogu biti postavljene na drvenom postolju na površini zemlje, biti ukopane u zemlju ili postavljene na plutajuće splavi na vodenoj površini. Svaki spomenuti tip evaporimetra ima dobre i loše osobine, različite verzije i izvedbe koje se koriste u pojedinim zemljama. Najčešći tipovi evaporimetara u upotrebi jesu GGI 3000 (ukopan u zemlju), i evaporimetar razreda A koji je postavljen na drveno postolje na površini zemlje. Usporedbe podataka dobivenih različitim tipovima evaporimetara širom svijeta pokazale su da se najbolji rezultati dobiju mjerenjima u velikom bazenu površine 20 m^2 ukopanom u zemlju. Te su vrijednosti najbliže onima s otvorene vodene površine većih akumulacija, no to je ujedno i najskuplji i najteži način mjerenja isparavanja. Zato su takvi evaporimetri vrlo često postavljani samo na odabranim, karakterističnim lokacijama, i služe za dobivanje koeficijenata kojima se korigiraju podaci standardnih evaporimetara.

Od samih početaka mjerenja standardni instrument za mjerenje količine isparene vode s otvorene vodene površine u mreži meteoroloških postaja u Hrvatskoj je evaporimetar razreda A. Mjerenje isparavanja obavlja se dva puta na dan u 7 i 19 sati svakog dana od travnja do listopada ili studenog, kad se s mjerenjima prestaje zbog mogućnosti zamrzavanja vode u evaporimetru i pucanja evaporimetra. Evaporimetar razreda A okrugla je posuda, promjera 120 cm, duboka 25 cm, obično izrađena od pocinčanog lima, i postavljena na ravnu po-

From every surface found between water in liquid or solid state (or any other element with moisture: soil, plants, snow-pack) and air, some water molecules are released into the air as vapour while others are attracted from the air. If more molecules are released into the air than attracted, this is evaporation. Evaporation primarily depends on solar radiation energy, wind velocity and the amount of disposable humidity in the ground layer of air, i.e. on the capacity of air to absorb evaporated liquid.

Evaporation is an important part of the cycle of water circulation in the atmosphere. Relatively little is known about it: evaporation measurements also started rather late – in the 1960's. Knowledge of the amount of evaporation is important not only for meteorology but also for other sciences (e.g. in hydrology and agronomy it is used to calculate water balance). Certain fields of the economy increasingly rely on information about this complex meteorological element. This is especially obvious in large, long-term projects involving the planning, design and maintenance of water accumulations, drainage systems, irrigation etc. and their influence on the environment.

The amount of evaporation from a free water surface can be measured in two ways; by instruments – evaporimeters of different types – and/or calculated indirectly by other meteorological elements.

Evaporimeters are pans of different dimensions, filled with water, which can be placed on a wooden base on the ground surface, sunk into the ground or placed on rafts floating on a water surface. Each type of evaporimeter has its good and bad sides and different versions and constructions are used in different countries. The types of evaporimeters most often used are the GGI 3000 (sunk into the ground) and the class A evaporimeter, which is placed on a wooden base on the ground surface. A comparison of data obtained from different types of evaporimeters around the world has shown that the best results are achieved by measurements carried out in a large basin sunk into the ground, with a surface area of 20 m^2. These values are the closest to those obtained from free water surfaces of larger accumulations but it is also the most expensive and the most difficult method of evaporation measurement. Therefore, these evaporimeters are placed only at select and characteristic locations and are used to get coefficients for the data obtained from standard evaporimeters to be corrected by.

Posuda i komora za umirenje evaporimetra klase A na glavnoj meteorološkoj postaji Osijek.
The pan and stilling well of a class A evaporimeter at the Osijek main meteorological station.
Fotografija Photo by: Janja Milković

Since the beginning of measurements, the class A evaporimeter has been the standard instrument for measuring the amount of evaporated water from free water surfaces at meteorological stations in Croatia. Evaporation measurements are taken two times a day, at 7 am and 7 pm, every day, from April to October or November, when they are discontinued because the water in the evaporimeter may freeze or the evaporimeter may burst. The class A evaporimeter is a round pan, with a diameter of 120 cm, 25 cm deep, usually made of galvanized sheet and placed on a flat surface – a wooden base. The evaporimeter contains a 20 cm high cylindrically shaped stilling well, with a diameter of 9 cm, which stands on a triangular base with three valves that allow the well to rest horizontally. When measurements are being taken, a micrometer valve is placed into the well to measure the amount of water which has evaporated from the evaporimeter (in mm) between two successive measurements. Additional measurements carried out are precipitation amount, water temperature in the evaporimeter (this is done by a regular thermometer) and wind speed (usually done by an anemometer, which records the distance covered and is located next to the evaporimeter, 2 m above the ground).

The advantages of class A evaporimeters are ease of installation and maintenance. It is easily noticed if the evaporimeter pan leaks and it can quickly and easily be mended. Its shortcoming, as with all evaporimeters placed on the surface of the ground, is that,

Veliki ukopani evaporimetar – etalon (površina 20 m²) u Slovačkoj.
A large evaporimeter – etalon sunk into the ground (20 m² surface area) in Slovakia.
Fotografija Photo by: Janja Milković

dlogu – drveno postolje. U evaporimetru se nalazi komora za umirenje, koju čini valjkasta posuda, visine 20 cm i promjera 9 cm, koja stoji na trokutastom postolju na tri vijka koji omogućavaju postavljanje komore u vodoravan položaj. Prilikom mjerenja u posudu komore stavlja se mikrometarski vijak koji mjeri količinu isparene vode iz evaporimetra (u mm), između dva uzastopna mjerenja. Uz to mjeri se i količina oborine, temperatura vode u evaporimetru, običnim termometrom za vodu, te brzina vjetra (obično anemometrom koji bilježi prijeđeni put, i nalazi se uz evaporimetar na visini 2 m iznad tla).

Prednosti evaporimetra razreda A jesu jednostavno postavljanje i održavanje, lako je vidljivo ako posuda evaporimetra curi i može se brzo i lako pokrpati. Nedostatak mu je, kao i kod svih evaporimetara postavljenih na površini zemlje, da zbog relativno male količine vode u posudi evaporimetra čije stjenke nisu termički izolirane daje povećane vrijednosti isparavanja, pa podatke za korištenje u daljnjim proračunima treba korigirati. Međutim, kako je to često korišten tip evaporimetra u različitim klimatskim područjima, na različitim geografskim širinama i nadmorskim visinama, njegovi su podaci uspoređeni s podacima mjerenima u velikim bazenima i drugim tipovima evaporimetara da bi se odredio koeficijent korekcije za preračunavanje vrijednosti isparavanja za veće vodne akumulacije. Vrijednosti koeficijenta korekcije mijenjaju se tijekom sezone, a iz višegodišnjih nizova mjerenja je kao srednja vrijednost za cijelu sezonu u umjerenim geografskim širinama određen koeficijent korekcije 0,70.

Podaci u ovom Atlasu su iz razdoblja 1963–1990., za sedam postaja koje su u tom razdoblju mjerile isparavanje, a u tablicama i za razdoblje 1971–2000. za deset postaja. Nedostajući podaci (mjesečne vrijednosti) interpolirani su grafičkim putem prema susjednim postajama, a srednje mjesečne vrijednosti pomnožene su koeficijentom korekcije 0,70.

Osim podataka izmjerenih pomoću evaporimetra, dani su i podaci **evapotranspiracije** i **potencijalne evapotranspiracije** dobiveni proračunom pomoću Palmerova modela vodne ravnoteže u koju su uvedene korekcije koje uvažavaju brzinu vjetra. Model je napravljen za potrebe agronomije, pa se u proračunu komponenata vodne ravnoteže pored meteoroloških parametara (količine oborine, temperature zraka i relativne vlažnosti) koriste i podaci maksimalnog kapaciteta tla.

Potencijalna evapotranspiracija jest isparavanje koje bi se ostvarilo kada bi bilo na raspolaganju dovoljno vode, pa je stoga potencijalna evapotranspiracija praktički jednaka isparavanju s otvorene vodene površine. Evapotranspiracija kod biljaka jest isparavanje iz biljaka koje ovisi o raspoloživoj količini vode od oborine i zaliha vode u tlu. Naime, ako je količina obo-

because there is a relatively small amount of water in the pan and its walls are not thermally insulated, the evaporimeter gives higher evaporation figures and, therefore, the data to be used in further analyses need to be corrected. However, as it is a frequently used type of evaporimeter in different climatological areas, at different latitudes and altitudes, its data are compared with the data obtained in large basins and other types of evaporimeters to determine the correction coefficient to be used to recalculate evaporation values for larger water accumulations. The correction coefficient figures change during the season and, based on several-year series of measurements, the correction coefficient of 0.70 has been determined as the mean for the whole season in moderate latitudes.

The data in the Atlas are for the period 1963–1990, from seven stations which took evaporation measurements during that period, and the data in the tables are from ten stations, for the period 1971–2000. The missing data (monthly values), have been interpolated graphically using data from neighbouring stations and the mean monthly values have been multiplied by the correction coefficient 0.70.

Besides the data obtained from evaporimeters, data on evapotranspiration and potential evapotranspiration, calculated using Palmer's model of water balance, corrected to allow for wind speed, have also been given. The model was developed for agronomic needs and, therefore, when calculating the water balance components, data on maximal soil capacity have been used along with meteorological parameters (precipitation amount, air temperature and relative humidity). Potential evapotranspiration is the evaporation that would occur given a sufficient amount of water, so it is practically the same as evaporation from a free water surface. Plant evapotranspiration is the evaporation from plants, which depends on the amount of water available from precipitation and soil water reserves. If the precipitation amount is equivalent to potential evapo-

Evaporimetar klase A i anemometar na glavnoj meteorološkoj postaji Zavižan.
An evaporimeter class A and an anemometer at the Zavižan main meteorological station.
Fotografija Photo by: Branko Cividini

transpiration, evapotranspiration is equivalent to potential evapotranspiration. However, if there is less precipitation than there is plant need for evaporation, evapotranspiration is lower than potential evapotranspiration and this is compensated for by using the soil water reserves. If this condition persists, drought occurs, because the soil cannot satisfy the needs of plants for water.

For most of the year, in continental Croatia, there is enough precipitation for the needs of plants and shortage occurs mostly during the summer months (graphs next to the map of mean precipitation in vegetation period). In the highlands, there is enough precipitation for the needs of plants during the whole year. On the coast, however, the precipitation deficit is more pronounced, it lasts longer and becomes greater as we

rine jednaka potencijalnoj evapotranspiraciji, tada je evapotranspiracija jednaka potencijalnoj evapotranspiraciji. Međutim, ako je oborine manje nego što su potrebe biljaka za isparavanjem, evapotranspiracija je manja od potencijalne, a manjak se nadoknađuje trošenjem zaliha vode iz tla. Ako takvo stanje potraje dulje, dolazi do suše, jer više ni u tlu nema vode koja bi zadovoljila potrebe biljaka.

U kontinentalnom dijelu Hrvatske u većem dijelu godine ima dovoljno oborine za potrebe biljaka, a manjak se pojavljuje uglavnom u ljetnim mjesecima (grafikoni uz kartu srednje količine oborine za vegetacijsko razdoblje). U gorskim predjelima tijekom čitave godine ima dovoljno oborine za zadovoljavanje potreba biljaka za vodom. Međutim, na obali je oborinski deficit izraženiji i traje dulje, a povećava se od sjevernog prema južnom Jadranu. Na sjevernom se Jadranu uglavnom javlja ljeti, na otocima nešto dulje. Na srednjem Jadranu počinje u travnju ili svibnju i traje do rujna a na otocima i do listopada, pa je i u godišnjem prosjeku potencijalna evapotranspiracija veća od količine oborine.

move from the northern to the southern Adriatic. It occurs mostly during summer in the northern Adriatic and lasts a little longer on the islands. On the southern Adriatic, the precipitation deficit begins in April or May and lasts until September, on the islands of the middle Adriatic as long as October, so that on an annual average potential evapotranspiration exceeds precipitation amount.

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Vlažnost zraka
Air humidity

Lidija Cvitan

Vlažnost zraka jest količina vodene pare u zraku. Može se izraziti na razne načine. Ovdje se prikazuje tlak vodene pare i relativna vlažnost zraka. Tlak vodene pare (e u hPa) je parcijalni tlak kojim vodena para pridonosi ukupnom tlaku zraka. Iako nije mjera apsolutne vlažnosti zraka, ukazuje na apsolutnu količinu vlage u zraku. Relativna vlažnost zraka (U u %) kao omjer stvarnog i maksimalnog tlaka vodene pare pri postojećoj temperaturi, ukazuje na stupanj zasićenosti zraka vodenom parom.

Vodena para dolazi u zrak isparavanjem (evapotranspiracijom) sa Zemljine površine, pa je pri tlu ima više nego u visini, a gibanjem zraka (turbulencija, vjetar i konvekcija) raznosi se po atmosferi. Stoga sve okolnosti koje utječu na isparavanje i zračno gibanje posredno utječu i na vlažnost zraka.

Za mirna i tiha vremena, tlak vodene pare veći je nad vodenim površinama i u područjima gdje se zadržava voda (jezera, ribnjaci, močvare, potoci, rijeke), odnosno gdje je tlo vlažnije i više obraslo raslinjem (udubljenja na terenu, kotline, podnožja obronaka, rubovi vodotoka i sl.). Manje vodene pare sadrži zrak nad suhim tlom i oskudnom vegetacijom. Kad puše vjetar, on miješa zrak i vodena se para svugdje izjednači bez obzira na oblike terena. Ako ima dovoljno vode koja isparava, više se vode digne u obliku pare u zrak ako je temperatura zraka viša, a manje ako je temperatura niža. Stoga s porastom nadmorske visine, s kojom se temperatura zraka u pravilu snižava, smanjuje se i količina, pa i tlak vodene pare. S druge strane, zrak s manjom količinom vodene pare ne mora uvijek biti i relativno manje vlažan, odnosno nije njome uvijek manje zasićen, jer relativna vlažnost zraka pada i raste suprotno rastu i padanju temperature zraka. Na relativnu vlažnost zraka reljef djeluje posredno i drukčije nego na tlak pare. Kako je u ohlađenom zraku relativna vlažnost veća, nad onim dijelovima terena koji pogoduju ohlađivanju tla i zraka ili gdje se zadržava hladan zrak, u prosjeku je relativna vlažnost veća. To su s jedne strane mrazišta i uopće udubljenja na terenu, a s druge strane viši dijelovi planina, osobito na navjetrinskoj strani. Tijekom godine nad pojedinim područjem tlak vodene pare raste i pada vrlo slično, a relativna vlažnost zraka upravo suprotno rastu i padanju temperature zraka. Kao i drugdje u umjerenim zemljopisnim širinama na sjevernoj Zemljinoj hemisferi, i u Hrvatskoj se zbog snižavanja temperature zraka od juga prema sjeveru, i tlak pare smanjuje, a relativna vlažnost raste u istom smjeru. Mjesne promjene tlaka pare i relativne vlažnosti mogu uzrokovati i advekcije suhog ili vlažnog zraka, te pristizanje zraka dizanjem ili spuštanjem u sklopu gibanja većih ili manjih zračnih masa. U Hrvatskoj su među vjetrovima najpoznatiji bura kao ona pri kojoj dolazi do advekcije hladnog i suhog zraka iz unutrašnjosti, koji se spuštanjem prema morskoj površini grije i dodatno isušuje, jugo kao advekcija toplog i vlažnog zraka, te fen kao topao i suh silazni vjetar planinskog područja.

Vlažnost zraka je važna za odvijanje mnogih procesa i pojava u atmosferi, nužna za razvoj i održanje života na Zemlji, a djeluje izravno i posredno i na neživu prirodu. Stvaranje oblaka, magle, kiše, rose i druge oborine ovisi ponajprije o vlažnosti zraka. O njoj ovise i količina vode u tlu i stanje vodotoka. Stoga vlažnost zraka utječe na mnoge ljudske djelatnosti (poljoprivredu, stočarstvo, gospodarenje vodama, promet, planiranja u graditeljstvu, itd.), kao i na čovjekovu radnu sposobnost, zdravlje i raspoloženje.

Na primorskom području, uz more, kao stalno prisutnu izvoru vodene pare, **prosječne godišnje vrijednosti** tlaka vodene pare uglavnom su 11–13 hPa i ujedno su najveće u Hrvatskoj. Iako je količina vodene pare velika, zrak je na tom području Hrvatske njome prosječno najmanje zasićen, jer su ondje temperature zraka najviše, a na velikom se dijelu tog područja zrak dodatno isušuje pri čestom puhanju bure. Stoga je to područje najmanje relativne vlažnosti zraka u Hrvatskoj s prosječnim godišnjim vrijednostima uglavnom između

Air humidity is the amount of water vapour in the air. It can be expressed in many different ways. In this chapter, water vapour pressure and relative air humidity are described. Water vapour pressure (e in hPa) is the partial pressure by which water vapour contributes to the total air pressure. Although it is not a measure of absolute air humidity, partial pressure of water vapour points at the absolute amount of moisture in the air. Relative humidity (U in %), as the ratio of actual and maximal water vapour pressure at the existing temperature, indicates the degree to which air is saturated with water vapour.

Water vapour comes in the air by evaporation (evapotranspiration) from the Earth's surface, so there is more of it near the ground than higher in the air. Air motion (turbulence, wind and convection) carry it through the atmosphere. Therefore, the conditions which affect evaporation and air motions indirectly affect air humidity.

During quiet and calm weather, water vapour pressure is higher above water surfaces and in areas where there is water (lakes, ponds, swamps, brooks, rivers), and where the ground is wet and covered with more vegetation (terrain depressions, basins, foothills, watercourse edges, etc). There is less water vapour in the air above dry ground and barren vegetation. When there is wind, it mixes the air and water vapour is equalised everywhere regardless of terrain configuration. If there is enough evaporating water, more water rises as vapour in the air if the air temperature is higher and less if the air temperature is lower. Therefore, as altitude increases, and air temperature decreases, the amount and pressure of water vapour also decrease. On the other hand, air with lower water vapour content does not always have to be relatively less humid, i.e., it is not always less saturated with water vapour, because relative air humidity falls and rises in inverse proportion to the rise and fall of air temperature. Relief has an indirect and different effect on relative air humidity.

Sumaglica nad jezerom Bajer pokraj Fužina 20.9.2004.
Mist above the Bajer Lake near Fužine, 20 September 2004.
Fotografija Photo by: Zorislav Zaninović

Since relative air humidity is higher in cold air, there is a higher relative air humidity average above those terrains which enable ground and air cooling or where the cold air is retained. These are, for example, frost points and terrain depressions on the one hand, and, on the other hand, higher mountainous parts, especially on the windward side. Over the year, water vapour pressure and air temperature increase and decrease in the same parts of the year, while the yearly course of relative air humidity does the opposite. As anywhere else at mid-latitude in the Earth's Northern Hemisphere, in Croatia, water vapour pressure falls and relative humidity rises due to a decrease in air temperature from south to north. Local changes in water vapour pressure and relative humidity can also be caused by dry or humid air advections and the ingress of air by ascending or descending within a large or small air mass movement. In Croatia, the most famous winds are *bura*,

Jesenja magla u Hrvatskom zagorju.
Autumn fog in Hrvatsko zagorje.
Fotografija Photo by: Zorislav Zaninović

65% i 75%. Vrijednosti opadaju od sjevera prema jugu. U Istri variraju od najvećih na području Učke (84%) i Ćićarije, manjih u Pazinskoj kotlini (75–80%) do najmanjih (manje od 75%) na obali. U podnožju Velebita vrlo uzak obalni pojas ima godišnju relativnu vlažnost između 65% i 75%, uz Velebit se vrijednosti povećavaju vrlo brzo s visinom, a mnogo sporije se povećavaju s udaljavanjem od obale prema otocima. Na srednjem dijelu primorskog područja najveće su prostorne promjene relativne vlažnosti zraka u Hrvatskoj – od oko 60% na šibenskom i splitskom području do 85% na najvišim vrhovima Dinare. Na najjužnijem dijelu primorskog područja relativna vlažnost uglavnom ne prelazi 70%, a na Dubrovačkom području iznosi 63%.

Gorsko područje Hrvatske, gdje je obalnim lancem Dinarida otežano miješanje s vlažnim morskim zrakom, otvorenije je strujanju manje vlažnog zraka iz unutrašnjosti. Ujedno, temperatura zraka se s visinom smanjuje, pa su na tom području najvećih nadmorskih visina srednje godišnje vrijednosti tlaka vodene pare, od 7 hPa do 10 hPa, najniže u Hrvatskoj. Ipak, jak utjecaj hlađenja s visinom uzrok je da je ovo također i područje najveće srednje godišnje relativne vlažnosti zraka. Njene se vrijednosti uglavnom kreću između 75% i 85%, a mjestimično na većim visinama premašuju 85%. U velikim i najnižim dolinama smještenima u sjevernim podnožjima Velike i Male Kapele i Velebita, srednja je godišnja relativna vlažnost zraka uglavnom u rasponu od 75% do 80%. U gorskom se području s najnižim vrijednostima od 70% do 75% izdvaja samo uzak prijevoj sjevernog Velebita preko kojeg se iz unutrašnjosti najčešće suhi zrak za vrijeme bure slijeva na obalno senjsko područje. U Krbavskom polju, kao i u drugim višim, manjim i zatvorenijim dolinama i kotlinama, prosječna relativna vlažnost je u rasponu od 80% do 85%, zato jer su zatvorene ličke doline često, zimi kao i noću tijekom godine pri vedrom vremenu, područja skupljanja i taloženja hladnog i vlažnog zraka. Neka najviša područja Gorskog kotara i Plješevice, te rijetka na Velikoj i Maloj Kapeli imaju relativnu vlažnost zraka veću od 85%, a samo mjestimično u Gorskom kotaru i na Plješevici veću od 90%. Tome najviše doprinosi prisilno dizanje (uz obalne planine) tople i vlažne zračne struje koja dolazi s juga, preko Sredozemlja i Jadrana. Relativno velikoj vlažnosti i na mnogo nižoj Zrinskoj gori u unutrašnjosti pridonose strujanja iz ne mnogo nižih, ali vlažnih riječnih dolina kojima je okružena.

Ravničarski dio kontinentalne Hrvatske je područje najjednoličnije prostorne razdiobe vlažnosti zraka. Srednji godišnji tlak vodene pare uglavnom je svugdje oko 11 hPa. Vrijednosti srednje godišnje relativne vlažnosti zraka smanjuju se od zapada prema istoku, jer vlažne zračne mase, krećući se s Atlantskog oceana ili Sredozemnog mora prema unutrašnjosti kontinenta, stižu manje vlažne do udaljenijih istočnih predjela. Također,

based on the advection of cold, dry air from the hinterland, which gets even drier and warmer as it descends towards the sea surface, *jugo* (sirocco), a warm and moist air advection, and foehn a warm, dry and descending wind in a mountainous area.

Air humidity is very important for many processes and phenomena in the atmosphere; it is necessary for the development and preservation of life on Earth, and it has a direct and indirect effect on material things. The formation of clouds, fog, rain, dew and other precipitation is firstly dependent on air humidity. Soil water content and the state of watercourses also depend on it. Because of this, air humidity influences a number of human activities (agriculture, livestock farming, water management, traffic, construction planning, etc.) as well as human health, mood and ability to work.

The average annual values of water vapour pressure in the coastal area, near the sea – a constant source of water vapour – are mostly 11–13 hPa and the highest in Croatia. Although there is a large amount of water vapour in this part of the country, the air is less saturated with it because air temperatures are the highest and the *bura* wind often blows over a large part of the area, bringing less-moist air from the hinterland, additionally drying the air. Therefore, this is the area of lowest relative air humidity in Croatia, with average annual values mostly between 65% and 75%. Values decrease from north to south. In Istria, values range from the highest in the area of Mount Učka (84%) and Ćićarija, to lower values in the Pazin Valley (Pazinska kotlina) (75% to 80%) and the lowest (less than 75%) on the Istrian coast. A very narrow coastal area at the foot of Mount Velebit has an annual relative humidity between 65% and 75%. On Velebit, values quickly increase with height, but they increase much more slowly as we move away from the coast to the islands. The largest spatial changes of relative air humidity occur in the central part of the coastal area, where they range from around 60% in the areas of Šibenik and Split to 85% on the highest peaks of the Dinara. In the southernmost coastal area relative air humidity mainly does not exceed 70%, and in the areas of Dubrovnik it is 63%.

The highlands, where the coastal range of the Dinarides obstructs the mixing of air with moist sea air, are more open to the inflow of less-moist air from the hinterland. At the same time, temperature decreases with height (altitude) and that is why in this area, where altitudes are the highest (on average), the mean annual water vapour pressure values, ranging from 7 hPa to 10 hPa, are the lowest. However, the strong effect of cooling with height results in the highest mean annual relative air humidity in this area. Relative air humidity values range mostly between 75% and 85% and exceed 85% somewhere at higher altitudes. The mean annual relative air humidity in the largest and lowest valleys at the northern foot of the Velika Kapela, Mala Kapela and Velebit is mostly 75%–80%. In the highlands, a narrow mountain pass on northern Velebit stands out with the lowest values from 70% to 75%. It is mostly across this pass that dry air flows from the interior to the coastal area of Senj during the *bura* wind. The average relative humidity in the Krbava Field (Krbavsko polje) is 80%–85%, as it is in other higher, smaller and more enclosed valleys and basins because the enclosed valleys of Lika are areas where cold and moist air often gathers and settles during the winter and on clear nights during the year. Relative air humidity exceeds 85% in some highest areas of Gorski kotar and Plješevica, as well as in few places of Velika Kapela and Mala Kapela. In only few locations of Gorski kotar and Plješevica relative air humidity even exceedes 90%. The forced orographic lift of warm and moist southern air masses (coming over the Mediterranean and the Adriatic Sea) up the heights of the Adriatic coastal mountains contributes mostly to high relative air humidity there. The inland mountain Zrinska gora is considerably lower, but air flowing from the not

istočni dio je izloženiji strujanju suhog zraka sa sjeveroistoka iz unutrašnjosti kontinenta, pa je ondje gotovo svugdje, a u sjeverozapadnoj Hrvatskoj djelomice, relativna vlažnost zraka najmanja i kreće se u rasponu od 75% do 80%. Dijelovi Međimurja, Posavine, te Turopolje i Lonjsko polje, uz rijeke kao stalni izvor vodene pare, imaju nešto veću relativnu vlažnost (80–85%). Godišnja relativna vlažnost zraka samo mjestimično na najvišim i najhladnijim dijelovima Žumberačke gore može biti veća od 85%, dok na njenim nižim dijelovima, te nekim brežuljkastim područjima Bilogore, Moslavačke Gore, Hrvatskog Zagorja i Medvednice iznosi od 80% do 85%.

Razlike vlažnosti zraka između dva tridesetogodišnja razdoblja, 1961–1990. i 1971–2000., ukazuju na većem dijelu Hrvatske na prosječno godišnje malo veći tlak vodene pare (0,1–0,3 hPa) i malo manju relativnu vlažnost zraka (0,2–2,1%) u novijem razdoblju. Takve su promjene u skladu s uočenim povećanjem temperature zraka u razdoblju 1971–2000. Razlike kako srednjih godišnjih, tako i srednjih mjesečnih i sezonskih vrijednosti tlaka vodene pare i relativne vlažnosti zraka iz dva razdoblja su male, odnosno manje od pripadnih standardnih devijacija za razdoblje 1961–1990.

Godišnji hod srednjeg mjesečnog tlaka vodene pare na cijelom je području Hrvatske vrlo pravilna valnog oblika koji prati rast i pad temperature zraka, s minimumom u siječnju i maksimumom uglavnom u srpnju u ravničarskom dijelu kontinentalne Hrvatske i gorskoj Hrvatskoj, a u kolovozu u primorskoj Hrvatskoj. Kolovoški je maksimum posljedica toga što se more grije sporije nego kopno. Kako je more najtoplije u kolovozu, ono se tada i najjače isparava i najviše doprinosi povećanju količine vodene pare u primorskom zraku. Prosječne mjesečne vrijednosti se kreću u primorskoj Hrvatskoj od 6 do 20 hPa, u gorskoj Hrvatskoj od 4 do 16 hPa i u ravničarskom dijelu kontinentalne Hrvatske od 5 do 18 hPa. Prosječna je amplituda godišnjeg hoda najmanja u gorskoj (7–11 hPa), veća u primorskoj (10–12 hPa), a najveća u ravničarskoj Hrvatskoj (12–13 hPa).

Godišnji hod srednje mjesečne relativne vlažnosti zraka u Hrvatskoj ima dva osnovna oblika (grafikoni uz kartu srednje godišnje relativne vlažnosti). Na primorskom je području nepravilan i ima oblik dvostrukog vala s vrlo izraženim glavnim minimumom u srpnju i glavnim maksimumom uglavnom krajem jeseni ili zimi, te, na velikom dijelu, sekundarnim minimumom u veljači, a sekundarnim maksimumom u svibnju. Specifičan je godišnji hod vršnog područja Velebita (Zavižan), koji ima izraženi minimum u srpnju (75%) i podjednake maksimume u veljači (84%) i studenom (83%). Ostali krajevi Hrvatske imaju u godišnjem hodu glavni maksimum u prosincu, a puno slabiji u lipnju, te dva minimuma, jedan minimum u travnju koji je izraženiji u ravničarskoj Hrvatskoj, i drugi u srpnju, izraženiji ponegdje u gorskoj Hrvatskoj. Glavni je maksimum relativne vlažnosti u primorskom području Hrvatske velikim dijelom posljedica znatne ciklonalne aktivnosti u jesen popraćene povećanjem naoblake i padanjem oborine, ali i duga noćnog hlađenja i kratka danjeg grijanja zraka, koje u prosincu najviše doprinosi pojavi glavnog maksimuma u unutrašnjosti. U prosječno svugdje najtoplijem srpnju, glavni je minimum relativne vlažnosti zraka izraženiji u primorskom području nego u gorskoj Hrvatskoj, a u ravničarskoj je Hrvatskoj u srpnju tek sekundarni minimum. To je posljedica kratkotrajnih prodora svježeg zraka koji ljeti često prolaze sjevernom Hrvatskom donoseći oblake i kišu, a teško se i rijetko prebacuju preko planina na Jadran. Lipanjski prodori svježeg zraka su, uz nešto niže temperature zraka nego u srpnju, čak uzrok sekundarnog lipanjskog maksimuma relativne vlažnosti u unutrašnjosti Hrvatske. Travanjski minimum relativne vlažnosti pojavljuje se kao posljedica naglog proljetnog zagrijavanja zraka, te barem djelomično kao posljedica smanjene transpiracije prije početka listanja polovinom travnja. U primorskoj je Hrvatskoj pojavljivanje sekundarnog minimuma

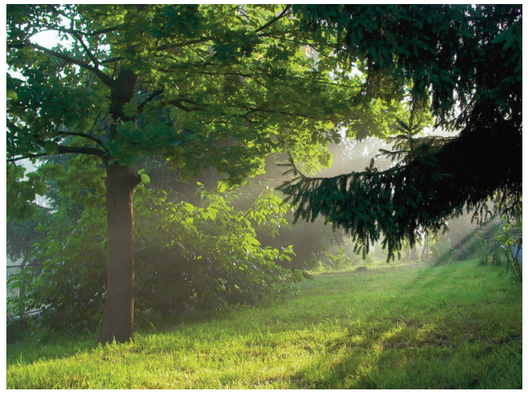
much lower and moist river valleys surrounding it contributes to relatively great level of humidity.

Lowland, continental Croatia is the area of the most uniform spatial distribution of air humidity. Mean annual water vapour pressure is around 11 hPa almost everywhere. The values of mean annual relative air humidity decrease from west to east because moist air masses (coming from the Atlantic Ocean or the Mediterranean Sea), on their way towards the interior, reach the remote eastern regions with decreased humidity. The eastern part is also more exposed to the flow of dry air from the north-east of the continental hinterland so relative humidity is the lowest there, as it is in certain areas of north-western Croatia, mostly ranging from 75% to 80%. Parts of Međimurje, Posavina, as well as Turopolje and the Lonja Plain (Lonjsko polje), located close to rivers (a constant source of water vapour), have a slightly higher relative air humidity (80%–85%). Annual relative air humidity can be higher than 85% only in some parts of the highest and coldest areas of the Žumberak Mountains, while it is 80% to 85% in the lower parts of these mountains and on some hilly terrains of Bilogora, Moslavačka gora, Croatian Zagorje (Hrvatsko zagorje) and Medvednica.

The differences in humidity between the two 30-year periods (1961–1990 and 1971–2000), point to a slightly higher yearly water vapour pressure average (0.1 hPa to 0.3 hPa higher) and a slightly lower relative air humidity (0.2 –2.1% lower) in the latter period, in most of Croatia. These changes coincide with the observed air temperature increase in the 1971–2000 period. The differences in the mean annual, as well as in the average monthly and seasonal values of water vapour pressure and relative humidity are small, that is, smaller than the corresponding standard deviations in 1961–1990.

The annual course of average monthly water vapour pressure has a very regular wave-type form throughout Croatia, which coincides with the annual course of air temperature, with a minimum in January and a maximum mostly in July (in the lowland, continental part and in the highlands) and in August (on the coast). The August maximum is a consequence of the fact that the sea warms more slowly than the land. And the sea being the warmest in August, it evaporates the most and contributes largely to the increase in water vapour amount in the coastal air. The average monthly values range from 6 hPa to 20 hPa on the coast, from 4 hPa to 16 hPa in the highlands and from 5 hPa to 18 hPa in the lowland, continental part. The average annual course amplitude is the lowest in the highlands (7 hPa to 11 hPa), higher on the coast (10 hPa to 12 hPa) and the highest in lowland Croatia (12 hPa to 13 hPa).

The annual course of mean monthly relative air humidity has two basic forms (graphs next to the mean annual humidity map). In the coastal area, it is irregular and has the form of a twofold wave with a very pronounced main minimum in July and a main maximum mostly at the end of autumn or in winter. Over a large part of the area, there is a secondary minimum in February and a secondary maximum in May. The annual course in the peak area of Velebit (Zavižan) is specific – it has a pronounced minimum in July (75%) and similar maximum values in February (84%) and November (83%). The annual course in other parts of Croatia has its main maximum in December, a much weaker maximum in June and two minimum values: in April, more pronounced in the lowlands, and in July, pronounced in some parts of the highlands. The main relative humidity maximum on the coast is mostly a consequence of significant cyclone activity in autumn (followed by an increase in convection and precipitation) and also of the long night cooling and short daily air warming, which contributes mostly to the main inland maximum in December. In July, on average the warmest month, the main minimum of relative air humidity is more pronounced in the coastal area than in the highlands, while in the lowlands, the minimum in July is only a secondary one. This is a consequence of



Jutarnja sumaglica.
Morning mist.
Fotografija Photo by: Zorislav Zaninović

u veljači vjerojatno dijelom posljedica česte bure, te činjenice da je tada more prosječno najhladnije pa se i najmanje isparava. Pojavljivanju sekundarnog maksimuma u svibnju doprinosi još neisušeno tlo. Specifičnost zavižanskih srednjih vrijednosti relativne vlažnosti zraka u prosincu i siječnju, manjim nego u susjednim mjesecima, posljedica je zimskih radijacijskih temperaturnih inverzija, kad su kotline i doline zastrte maglom i niskim oblacima, dok su planinski vrhunci iznad oblaka. Srednje mjesečne vrijednosti relativne vlažnosti u ravničarskoj Hrvatskoj kreću se od 69% do 90% s najmanjom amplitudom godišnjeg hoda na sjevernom dijelu (11%) i najvećom na istočnom dijelu (18%). U godišnjem hodu gorske Hrvatske raspon srednjih mjesečnih vrijednosti jest od 70% do 87% s najmanjom amplitudom godišnjeg hoda na najvišim predjelima (10%) i najvećom u Ličkom polju (15%). Prema podacima s 9 analiziranih postaja, primorska Hrvatska ima srednje mjesečne vrijednosti relativne vlažnosti u rasponu od 49% do 81%, uz najmanju amplitudu godišnjeg hoda na zadarskom području (7%), najveću na splitskom (15%), te amplitude od 9% do 13% na najvećem dijelu primorske Hrvatske.

Minimalna terminska relativna vlažnost zraka ima na najvećem području Hrvatske najmanje vrijednosti uglavnom u proljetnim ili jesenskim mjesecima. Okolnosti koje tomu doprinose jesu s jedne strane temperatura zraka koja je viša nego zimi i znatno manji tlak vodene pare nego ljeti. Najniže vrijednosti relativne vlažnosti pod osjetnim su utjecajem danjeg grijanja zraka pa se obično bilježe u popodnevnom terminu (tj. u 14 sati), a ponekad i fenski efekt u blizini planina dodatno snižava relativnu vlažnost zraka. Tijekom godine minimalne se terminske vrijednosti javljaju uglavnom pri izraženom spuštanju suhog zraka iz velike visine. Na području ravničarske kontinentalne Hrvatske minimalna je vlažnost tijekom godine uglavnom u rasponu od 20% do 30%, u gorskoj Hrvatskoj na vršnom području Velebita od 5% do13% a na ogulinskom i području Gorskog Kotara od 11% do 33%. Na većem je dijelu primorske Hrvatske minimalna vlažnost zraka uglavnom između 10% i 20%, na Kvarnerskim otocima i zapadnoj obali Istre dosiže do 26%, a u dalmatinskom zaleđu spušta se do 6%.

Izrazito vlažni dani, kad se relativna vlažnost zraka niti u 14 sati (kad je inače najmanja) ne spušta ispod 80%, najčešće se mogu očekivati u gorskoj Hrvatskoj (od 86 do 188 dana), rjeđe u ravničarskim kontinentalnim krajevima (od 75 do 99 dana), a najrjeđe u primorskim (od 32 do 61 dan). Najčešće se pojavljuju u razdoblju od listopada do ožujka. Najviše dana izrazito velike vlažnosti zraka na mjesec ima uglavnom u prosincu ili siječnju, a najmanje ih je u srpnju, kad se na pojedinim primorskim područjima ne pojavljuju svake godine. Opisane su osobine posljedica jake ovisnosti izrazito velike vlažnosti zraka o temperaturi. Ta je ovisnost vidljiva i iz relativno pravilna godišnjeg hoda sre-

short-term fresh air outbreaks, which in summer often pass through northern Croatia bringing in clouds and rain, but rarely and with difficulty crossing over the mountains to the Adriatic. Fresh air outbreaks in June, when air temperature is somewhat lower than in July, cause the June secondary relative humidity maximum inland. The April relative humidity minimum is a consequence of sudden spring warming of the air, and, at least partly, of reduced transpiration before leafing in mid-April. In the coastal area, the occurrence of a secondary minimum in February is probably partly caused by frequent bura and the fact that the sea is then the coldest on average, so it evaporates the least. The occurrence of a secondary maximum in May is enabled by the still not dried-up soil. The specificity of the mean relative air humidity values in December and January at Zavižan, which are lower there than in November and February, is a consequence of winter radiation temperature inversions, when the basins and valleys are covered with fog and low clouds, while the mountain peaks are above the clouds. The mean monthly relative humidity values in lowland Croatia range from 69% to 90%, with the lowest annual course amplitude in the northern part (11%) and the highest amplitude in the eastern part of the area (18%). The range of average monthly values in the annual course in the highlands is from 70% to 87%, with the lowest annual course amplitude in the highest parts (10%) and the highest amplitude in the Lika Plain (Ličko polje) (15%). According to the analysed data from 9 meteorological stations, the mean monthly relative humidity values on the coast range from 49% to 81%, with the lowest annual course amplitude in the area of Zadar (7%), the highest amplitude in the area of Split (15%) and amplitudes from 9% to 13% in most of the coastal area.

The minimal-term relative air humidity has the lowest values mainly in the spring and autumn months over most of the country. The circumstances which contribute to this are air temperature on the one hand, which is higher than in winter, and, on the other hand, water vapour pressure which is significantly lower than in summer. The lowest values of relative air humidity are significantly influenced by the daily warming of the air and are, therefore, often recorded in the afternoon term (at 2 pm). Sometimes the foehn-effect in the vicinity of mountains additionally lowers relative air humidity. During the year, minimal values at the time of observation are recorded mostly when there is a pronounced descent of dry air from high altitudes. Minimal humidity in lowland, continental Croatia, during the year, ranges mostly from 20% to 30%, while in the highlands ranges from 5% to 13% (the peak area of Velebit) and from 11% to 33% (the Ogulin area and Gorski kotar). Along most of the coast, minimal humidity ranges mainly from 10% to 20%, while values have been known to reach 26% on the Kvarner islands and on the western coast of Istria. In the Dalmatian hinterland, values as low as 6% and 7% have been measured.

Extremely humid days, when relative air humidity does not go below 80%, even at 2 pm (when it is usually at its lowest), can most often be expected in the highlands (86 to 188 days), less often in the lowland, continental areas (75 to 99 days) and least frequently in the coastal area (32 to 61 days). They most often occur from October to March. The months of December and January have most often the greatest number of extremely humid days while July has the fewest – in certain coastal areas they do not occur every year in July. The described characteristics are a consequence of the very pronounced dependence of extremely high humidity on air temperature. This dependence is visible from the relatively regular annual course of the mean monthly number of extremely humid days which is opposite to the regular annual temperature course, and also from the greater differences in the number of extremely humid days over the year in places where the temperature differences between the coldest and the

dnjeg mjesečnog broja izrazito vlažnih dana koji je suprotan od godišnjeg hoda temperature, te po većim razlikama u broju izrazito vlažnih dana što je veća temperaturna razlika između najtoplijeg i najhladnijeg mjeseca. Zimi znatno većoj količini izrazito vlažnih dana u unutrašnjosti nego u primorju pridonosi s jedne strane jače ohlađivanje zraka nad kopnom nego nad morem, koje povećava relativnu vlažnost u unutrašnjosti, i s druge strane bura, pri kojoj se u primorju relativna vlažnost jako smanjuje. U ostalim su godišnjim dobima u unutrašnjosti, a na Jadranu cijele godine, izrazito vlažni dani najčešće povezani s ciklonalnim aktivnostima, odnosno najčešće s padanjem oborine. Kako su te aktivnosti na Jadranu rjeđe, cijele je godine manje izrazito vlažnih dana na Jadranu nego u unutrašnjosti. U ravničarskim kontinentalnim krajevima takvih je dana u prosincu od 15 do 19, u gorskoj Hrvatskoj od 15 do 22, a u primorskoj Hrvatskoj od 5 do 10. Izrazito vlažnih dana u srpnju ima od 2 do 3 u ravničarskim kontinentalnim krajevima, od 2 do 7 u gorskoj Hrvatskoj, a najviše 2 dana u primorskim krajevima. Naglo smanjivanje broja izrazito vlažnih dana od siječnja do ožujka, te naglo povećavanje od listopada do prosinca osobito je izraženo u ravničarskim kontinentalnim krajevima i gorskoj Hrvatskoj.

Broj dana izrazito velike vlažnosti zraka u razdoblju 1971–2000. u odnosu na razdoblje 1961–1990. uglavnom je smanjen osobito zimi (za do 5 dana), manje u proljeće (za do 2 dana) i najmanje ljeti, dok je u jesen gotovo u cijeloj Hrvatskoj povećan u odnosu na starije razdoblje (uglavnom za do 2 dana).

Dani izrazito male vlažnosti zraka, u kojima se u jednom od klimatoloških termina motrenja izmjeri relativna vlažnost manja ili jednaka 30%, u Hrvatskoj su uglavnom rijetki, a nešto su češći u primorskoj Hrvatskoj. Tomu je uzrok advekcija suhog zraka za vrijeme učestale bure ponajviše početkom proljeća, a ljeti visoka temperatura zraka, suho tlo zbog izostanka kiše i ponekad spuštanje zraka iz visine. Na Kvarnerskim otocima, zapadnoj obali Istre i u zadarskom području izrazito se mala vlažnost zraka pojavljuje u 4 do 6 dana, na južnijim otocima u oko 15 dana, a na preostalom dijelu obale i dalmatinskom zaleđu u 24 do 49 dana na godinu. Na velikom je dijelu Hrvatske izvan primorskog područja prosječno na godinu manje od 6 dana izrazito male vlažnosti zraka. Nešto ih je više u gorskoj Hrvatskoj na vršnom području Velebita (18) i Ličkog polja (16), te u središnjem (13) i istočnom (10) dijelu ravničarske kontinentalne Hrvatske. Godišnji hod dana izrazito male vlažnosti zraka uglavnom je nepravilan. Obično ih ima najviše početkom ili sredinom proljeća i sredinom ili krajem ljeta. Jedino su na vršnom području Velebita i u dubrovačkom području najčešći u hladnom dijelu godine.

Dani izrazito male vlažnosti zraka su u razdoblju 1971–2000. u svim godišnjim dobima prosječno češći nego u razdoblju 1961–1990. na gotovo cijelom području Hrvatske (za do 7 dana po godišnjem dobu). Njihova je učestalost najmanje povećana, a u nekim godišnjim dobima mjestimično i malo smanjena na ravničarskom području kontinentalne Hrvatske. Prosječno je broj dana izrazito male vlažnosti najviše povećan na primorskom području, no ljeti su na tom području velika povećanja u odnosu na ranije razdoblje samo u: središnjoj Istri, riječkom, kninskom i dubrovačkom području, dok drugdje promjena gotovo i nema

warmest month are also greater. In winter, the number of extremely humid days is significantly higher in the hinterland than on the coast, primarily because of stronger air cooling above the land than above the sea, which increases relative humidity in the hinterland, and, secondly, because of the *bura* wind. When the bura blows, relative humidity decreases significantly on the coast. In the other seasons (autumn, spring and summer), in the hinterland, and during the whole year on the Adriatic coast extremely humid days are most commonly linked to cyclonic activities, especially when they are associated with precipitation. Since these activities are more rare on the Adriatic, throughout the year there are fewer extremely humid days on the coast than inland. In December, 15 to 19 such days occur in the lowland, continental areas, 15 to 22 days in the highlands and 5 to 10 days on the coast. In July, 2 to 3 extremely humid days occur in the lowland, continental areas, 2 to 7 days in the highlands and not more than 2 days on the coast. An abrupt decrease in the number of extremely humid days in the period from January to March and a rapid increase in the period from October to December is especially pronounced in the lowland, continental areas and the highlands.

The number of days with extremely high air humidity in the period 1971–2000 generally decreased in relation to the period 1961–1990, especially in winter (up to 5 days), less in spring (up to 2 days) and the least in summer, while in autumn it increased almost throughout the country (mostly up to 2 days).

Days with extremely low air humidity, when relative humidity equal to or below 30% can be measured in one of the climatological terms of observation, are generally infrequent in continental Croatia but slightly more frequent in the coastal area. This is caused by cold air advection during frequent *bura*, mostly at the beginning of spring, and by high air temperature, dry ground (due to lack of rain) and the occasional descending air from high altitudes, in summer. Extremely low air humidity on the Kvarner islands, the western coast of Istria and in the area of Zadar occurs for 4 to 6 days, on the islands further south for around 15 days, and on the other parts of the coast and in the Dalmatian hinterland for 24 to 49 days yearly. On average, there are fewer than 6 days per year of extremely low air humidity in most of the country, apart from the coastal areas. Such days occur with somewhat greater frequency in the highlands – in the peak area of Velebit (18) and the Lika Plain (Ličko polje) (16), and in the central (13) and eastern (10) part of lowland, continental Croatia. The annual course of days with extremely low air humidity is mostly irregular. They usually occur at the beginning or in the middle of spring or in the middle or at the end of summer. They are most frequent during the cold part of the year only in the peak area of Mount Velebit and in the area of Dubrovnik.

Days with extremely low air humidity in the period 1971–2000, in all seasons, were more frequent on average than in the period 1961–1990 almost throughout the country (up to 7 days per season). The smallest increase in their frequency is in the lowlands of the continental part, in some seasons, and in some places even a decrease can be noted. The average number of days with extremely low humidity increased the most in the coastal area. However, in summer, a substantial increase can be seen only in central Istria and the areas of Rijeka, Knin and Dubrovnik, while in other areas the changes are hardly noticeable.

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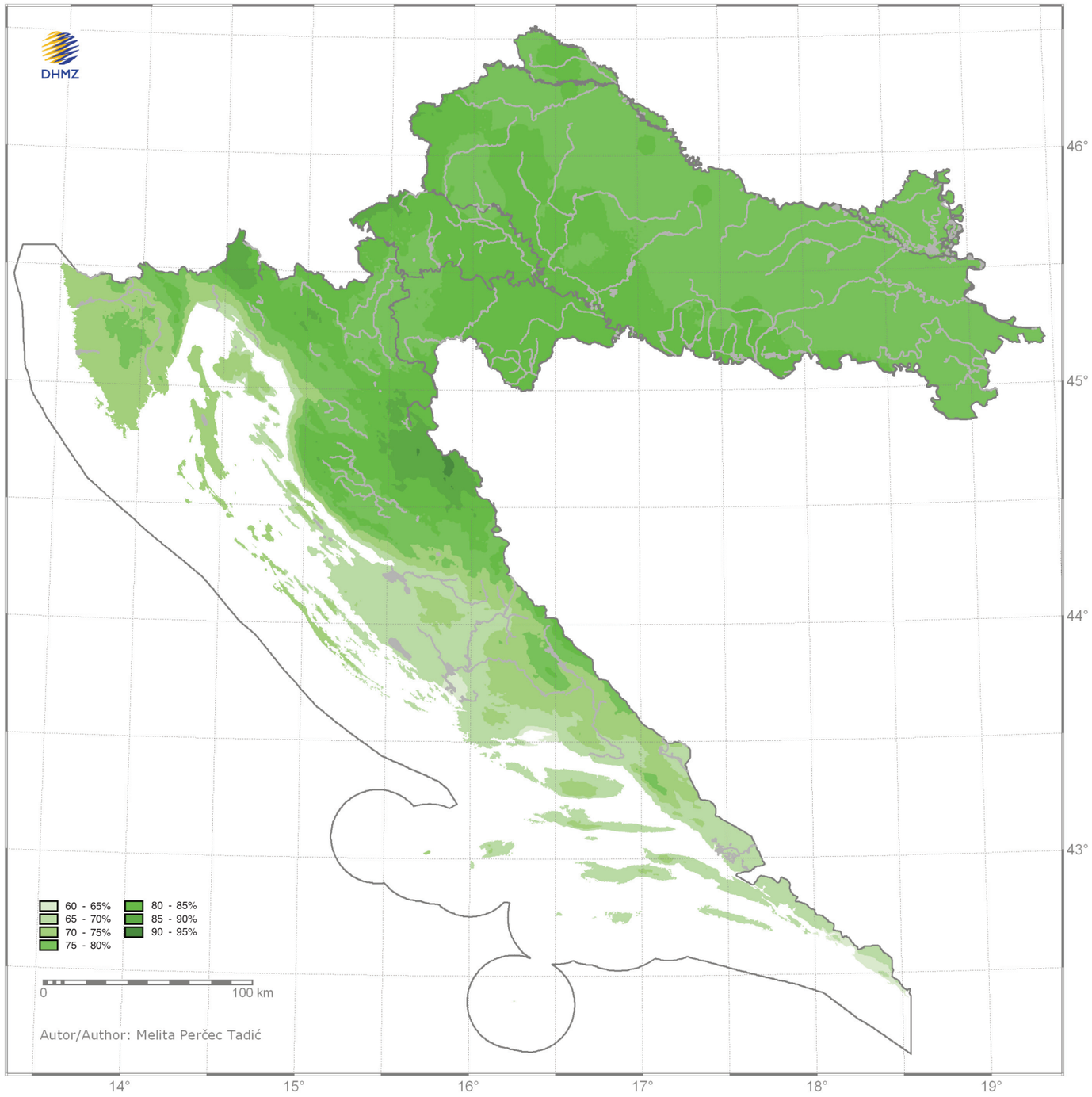
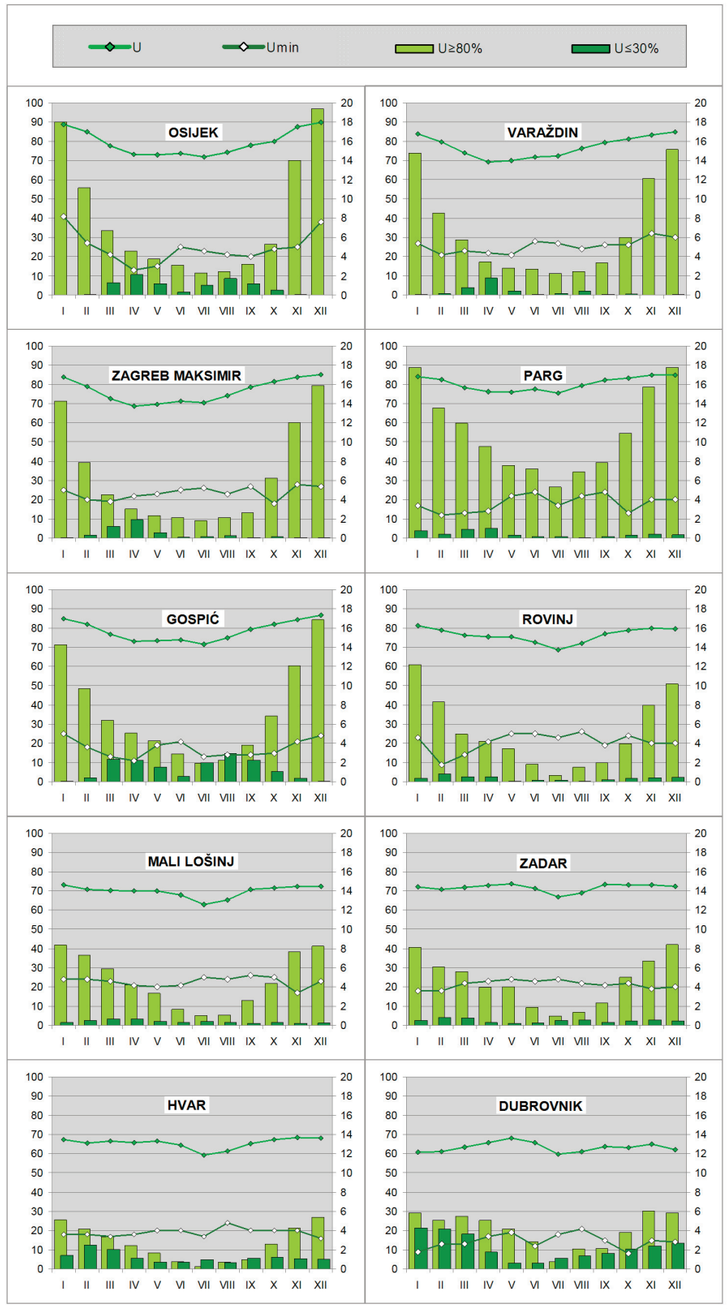
Vlažnost zraka Air humidity





Godišnji hod srednje (U) i minimalne terminske (Umin) relativne vlažnosti zraka (%; lijeva skala), te srednjeg broja dana s relativnom vlažnošću ≥80 % u 14 sati i ≤ 30% u 7, 14 ili 21 sat (desna skala).

Annual course of mean (U) and minimum measured at 7 am, 2 pm or 9 pm (Umin) relative air humidity (%; left scale), mean number of days with relative humidity ≥80% at 2 pm and ≤30% at 7 am, 2 pm or 9 pm (right scale).

Sunčevo zračenje
Solar radiation

Melita Perčec Tadić

Pri srednjoj udaljenosti Zemlje od Sunca, intenzitet Sunčeva zračenja koje padne u jedinici vremena na jediničnu površinu okomitu na smjer Sunčevih zraka, na gornjoj granici atmosfere, iznosi 1367 Wm^{-2}. Ta vrijednost Sunčeva ozračenja na vrhu atmosfere poznata je kao Sunčeva konstanta. Teorijska prostorna raspodjela godišnje dozračene sunčane energije na horizontalnoj plohi pokazivala bi u skladu s astronomskim zakonima, za slučaj Rayleigheve atmosfere (bez vodene pare, oblaka i aerosola), smanjivanje vrijednosti od ekvatora prema polovima.

Međutim, na svom putu do Zemljine površine, dio zračenja se apsorbira na plinovima i primjesama u atmosferi, a dio se zračenja raspršuje. Tako na površinu Zemlje osim direktnog Sunčeva zračenja, dolazi i difuzno, a na nagnute plohe i reflektirano zračenje, što daje ukupno Sunčevo ozračenje neke plohe. Najveći utjecaj na prolazak Sunčevih zraka kroz atmosferu imaju vodena para i kapljice vode, na čiju prisutnost u zraku ukazuje naoblaka. Naoblaka ovisno o vrsti može pridonijeti smanjenju direktne komponente, ali i povećanju difuzne komponente ukupnog ozračenja. Ako se vrijednosti ozračenja [Wm^{-2}] promatraju kroz neko vremensko razdoblje, npr. dan, mjesec ili godinu, tada se govori o dnevnoj, mjesečnoj ili godišnjoj ukupnoj dozračenoj sunčanoj energiji [Jm^{-2}] na plohu. U unutrašnjosti Hrvatske smanjenje dozračene energije u godišnjem hodu vezano je uz povećanu nisku naoblaku u zimskim anticiklonama, dok su manje vrijednosti godišnje ukupne dozračene energije na obali rezultat povećane naoblake prilikom prolaska ciklona.

Zbog utjecaja koji na naoblaku ima orografija, i prostorna je razdioba ukupne dozračene sunčane energije posredno modificirana reljefom. Utjecaj planina na Sunčevo zračenje mijenja se ovisno o tome da li u godišnjem hodu naoblake prevladava ljetni ili zimski učinak ili se međusobno poništavaju. Ljeti povećana naoblaka na planinama, koja nastaje u svježoj zračnoj masi s Atlantika koja je došla iza repa hladne fronte, smanjuje vrijednosti ukupne dozračene sunčane energije, dok su zimi planine vedrije zbog karakterističnih zimskih prizemnih inverzija u kojima se oblaci formiraju na visinama nižim od vrhova planina. To doprinosi većim vrijednostima ukupne dozračene sunčane energije na planinskim vrhovima zimi. Više planine tako u godišnjoj slici imaju manje vrijednosti ukupne dozračene energije zbog prevladavajućeg ljetnog učinka oblaka, dok su kod nižih planina ovi učinci podjednaki te se po vrijednostima primljene energije one ne razlikuju bitno od okolnih dolina.

Mjerenja ukupnog ozračenja u Hrvatskoj započela su 1948. godine na opservatoriju Zagreb-Grič Robitzschevim aktinografom. Podacima Sunčeva zračenja općenito je pridavana mala pažnja, s povremenim razdobljima većeg interesa. Tako je 1983. godine mjerenja obavljalo osam postaja, da bi 1989. godine mjerenja ukupnog ozračenja u nadležnosti Državnog hidrometeorološkog zavoda bila potpuno obustavljena. Mreža postaja počinje se ponovno formirati 2003. godine. Međutim i tako malobrojna i rijetka mjerenja mogu se korištenjem statističkih metoda regresijske, te novije metode geostatističke analize podataka, iskoristiti za proračun dozračene sunčane energije na području cijele Hrvatske, za izradu digitalne karte srednje godišnje ukupne dozračene sunčane energije kao i za proračun dozračene energije na nagnute plohe.

Dozračenu sunčanu energiju za područje Hrvatske, na postajama na kojima se ozračenje ne mjeri, moguće je procijeniti na temelju veze između srednje dnevne ukupne dozračene energije i srednjeg dnevnog trajanja sijanja Sunca, tj. osunčavanja. Te su veze uspostavljene na temelju mjerenja ukupnog ozračenja u desetogodišnjem razdoblju 1970–1979. na šest postaja u Hrvatskoj kao i na pet postaja s drugih područja bivše SFR Jugoslavije te proračuna relativnog osunčavanja.

Vrijednosti osunčavanja za 131 postaju u Hrvatskoj dobivene su na temelju modificirane prostorne razdiobe osunčavanja. Niti taj parametar ne mjeri se na svim tim

At mean distance between the Earth and the Sun, the intensity of incoming solar radiation per unit area perpendicular to the solar beam, in a unit of time, at the outer margin of the Earth's atmosphere, is 1367 Wm^{-2}. This value of solar irradiance on the outer surface of the Earth's atmosphere is known as solar constant. A theoretical spatial distribution of annual global solar irradiation on a horizontal surface would, in accordance with the laws of astronomy, in Rayleigh's atmosphere (without water vapour, clouds and aerosols), show a decrease in value from the equator towards the poles.

However, on its way to the Earth's surface, part of the radiation is absorbed by the greenhouse gasses and vapours in the atmosphere and part of it is scattered. Therefore, solar radiation reaching the Earth is not only direct but also scattered and reflected (on inclined surfaces), resulting, together, in global solar irradiance at ground level. If irradiance values [Wm^{-2}] are observed over a time period of, for example, a day, month or year, then we deal with daily, monthly or yearly global irradiation [Jm^{-2}] on a surface. Water vapour and water droplets, whose presence in the air is suggested by cloud cover, have the biggest influence on the incoming Sun rays through the atmosphere. Depending on the type, cloudiness can contribute to the decrease of the direct component or the increase of the diffuse component of global irradiance. In inland Croatia, the decrease in the annual course of global irradiation is connected with increased low cloudiness in the winter anticyclones, while the lower values of global irradiation on the coast are connected with increased cloudiness during the passage of cyclones.

As orography influences cloud cover, the spatial distribution of global solar irradiation is also indirectly modified by relief. The influence of mountains on solar radiation differs depending on whether there is a prevailing summer or winter effect in the annual course of cloudiness or whether they are mutually exclusive. In summer, cloudiness formed in a colder air mass coming from the Atlantic at the back of a cold front reduces global irradiation, whereas in winter, the sky is clearer in the mountains due to the characteristic winter inversions where a cloud cover forms at altitudes lower than the mountain peaks. This increases the global irradiation values on the mountain peaks in winter. Higher mountains have lower annual global irradiation values because of the prevailing summer effect of cloudiness, whereas lower mountains have equal summer and winter effects and do not differ considerably in irradiated energy from the surrounding valleys.

Measurements of global solar irradiance in Croatia started in 1948, at the Zagreb-Grič observatory, by means of a Robitzsch actinograph. Information on solar radiation was usually given little attention at the time, with only occasional periods of increased interest. In

Mjerenje raspršenog Sunčevog zračenja piranometrom sa sjenilom u obliku prstena na opservatoriju Split-Marjan. The measuring of diffuse solar radiation by pyranometer with shadow ring at the Split-Marjan observatory.
Fotografija Photo by: Krunoslav Premec

postajama, već je dobiven na temelju regresijske veze između osunčavanja i naoblake uspostavljene na podacima s 37 postaja. Relativno osunčavanje proračunato je za 20-godišnje razdoblje 1961–1980. Usporedbom veze relativnog dnevnog osunčavanja i relativne dnevne dozračene energije na postajama Zagreb-Maksimir (kontinentalna Hrvatska) i Split-Marjan (primorska Hrvatska) za razdoblja 1970–1979. i 1961–1980. pokazano je da se odnos ta dva elementa nije bitno promijenio u tim razdobljima, te je zaključeno da se isto može pretpostaviti i za ostale postaje. To je omogućilo da se podaci srednje dnevne dozračene energije dobiveni iz kraćeg 10-godišnjeg razdoblja svedu na 20-godišnje za sve postaje uključene u analizu (131). Tako gusta mreža postaja s proračunatom srednjom dnevnom ukupnom dozračenom energijom omogućila je izradu karata srednje mjesečne i godišnje ukupne dozračene sunčane energije za razdoblje 1961–1980. za područje Hrvatske.

U okviru Klimatskog atlasa prezentirana je nova, digitalna karta, srednje godišnje ukupne dozračene sunčane energije na horizontalnu plohu za razdoblje 1961–1980. uz uvažavanje digitalnog modela reljefa (DMR) i karata srednjih mjesečnih i srednje godišnje temperature zraka. Karta je izrađena s rezolucijom 1000 m u skladu s rezolucijom digitalnog modela reljefa i karata srednjih mjesečnih i godišnje temperature zraka. Osnovna svrha takva prikaza jest procjena iznosa dozračene energije i na prostorima na kojima ozračenje nije mjereno. Daljnje primjene vezane su uz procjene isplativosti upotrebe sunčane energije kao alternativnog oblika energije. U sklopu GIS-a (Geografskog informacijskog sustava) karta se u digitalnom obliku može koristiti za direktan proračun meteoroloških i fenoloških parametara koji ovise o srednjoj godišnjoj ukupnoj dozračenoj sunčanoj energiji ili iz nje izvedenih veličina, kao što su, npr. prosječna temperatura tla, vlažnost tla, vlažnost zraka i sl.

U skladu s vrijednostima srednje godišnje ukupne dozračene sunčane energije, za područje Hrvatske definirano je pet razreda dozračene energije unutar raspona od 3961–5760 MJm^{-2} (1,1 do 1,6 MWhm^{-2}) s intervalom od 360 MJm^{-2} (100 kWhm^{-2}). Izuzetak je Komiža na otoku Visu, gdje se može očekivati dozračena energija i nešto veća od 5760 MJm^{-2} na godinu, ali zbog lokalnog karaktera nije formiran još jedan razred, nego je Komiža pridružena razredu s najvišom vrijednošću dozračene energije.

Analiza podataka srednje godišnje ukupne dozračene energije i digitalne karte pokazuje da je u kontinentalnom dijelu Hrvatske dozračene sunčane energije na horizontalnu plohu manje na zapadu, prvenstveno zbog veće naoblake u dolini Drave, te na području od istočnih obronaka Medvednice i Kalnika do Križevaca. Srednja godišnja vrijednost najmanja je u Križevcima (4175 MJm^{-2}), a najveća u Đurđevcu (4567 MJm^{-2}), što je razlika od 392 MJm^{-2} na godinu. Manje su vrijednosti također u Zagorju i na Samoborskom gorju, te na vrhovima planina Gorskog kotara i Like. U Istri, Hrvatskom primorju i Dalmaciji dozračena energija se povećava od sjeverozapada prema jugoistoku s minimumom u Rijeci (4807 MJm^{-2}), a maksimumom u Hvaru (5705 MJm^{-2}), što je razlika od 898 MJm^{-2}, prvenstveno zbog većeg raspona zemljopisnih širina u usporedbi s unutrašnjošću Hrvatske, ali i zbog veće naoblake na sjevernom Jadranu, osobito u ciklogenetičkom području Kvarnerskog zaljeva (Rijeka). Tako se na karti u kontinentalnoj Hrvatskoj mogu zamijetiti dva, a uz obalu tri razreda ukupne dozračene energije.

Godišnji hodovi srednjih mjesečnih vrijednosti dozračene sunčane energije na horizontalnu plohu te na plohu nagnutu za 45° i orijentiranu prema jugu pravilnog su oblika jednostrukog vala s minimumom u prosincu, a maksimumom u srpnju u skladu s astronomskim položajem Sunca i geografskim položajem mjesta (grafikoni uz kartu dozračene sunčane energije).

Najmanje sunčane energije u prosincu primaju nizinski kontinentalni dijelovi Hrvatske (69–95 MJm^{-2}) što

1983, there were eight stations performing such measurements, but already in 1989 global irradiation measurements run by the Meteorological and Hydrological Service (DHMZ) were completely stopped. In 2003, the network of stations was reinstated. Using statistical regression methods and newer geostatistical data analysis methodology, even such a small number of measurements can now be used to calculate irradiated solar energy throughout Croatia, to produce a digital map of mean annual global solar irradiation and also to calculate the irradiated energy on inclined surfaces.

Irradiated solar energy in some parts of Croatia, in stations where this parameter is not being measured, can be evaluated from the relationship between mean daily global solar irradiation and mean sunshine duration. This approach is justified by the results of 10 years of measurements of global solar irradiance in the period 1970–1979, at six stations in Croatia and at five stations in other areas of former Yugoslavia. The values of sunshine duration for 131 stations in Croatia have been obtained on the basis of a modified spatial distribution of sunshine duration. However, even this parameter is not measured at all the stations, but has been obtained from the regression relationship between sunshine duration and cloudiness at 37 stations. Relative sunshine duration was calculated for a 20-year period (1961–1980). The relationship between relative sunshine duration and relative daily global solar irradiation at the Zagreb-Maksimir station (continental Croatia) and the Split-Marjan station (coastal Croatia) was compared for the periods 1970–1979 and 1961–1980, and the results showed that the relationship had not essentially changed in those two periods, so it was safe to conclude that a similar supposition can be also made for other stations. Therefore, the daily global solar irradiation data obtained from the shorter 10-year period could be expanded to a 20-year period for all the stations included in the analysis (131). Such dense network of stations with calculated mean daily global solar irradiation allowed the production of maps of mean monthly and annual global solar irradiation for the period 1961–1980, for the whole country.

The Atlas includes a new digital map of mean annual global solar irradiation on a horizontal surface for the period 1961–1980. The map has a resolution of 1000 m, in accordance with the resolution of the digital elevation model and the maps of mean monthly and annual temperatures. The basic purpose of this map is to estimate the amount of irradiated energy even on those areas where it has not been measured, which can further be used to evaluate the cost-effectiveness of the use of solar energy as an alternative energy form. Within the GIS (Geographical Information System) the map can be used in a digital form to directly calculate the meteorological and phenological parameters which depend on mean annual global solar irradiation or the values derived from it, such as average ground temperature, ground humidity, air humidity and others.

In accordance with the values of mean annual global solar irradiation, five irradiation classes have been defined for Croatia within the range of 3961–5760 MJm^{-2} (1.1 to 1.6 MWhm^{-2}) a year, with an interval of 360MJm^{-2} (100 kWhm^{-2}). Komiža on the Island of Vis is an exception, where a slightly higher incoming energy of 5760 MJm^{-2} a year can be expected; however, because of its local character, a new class was not formed, and Komiža has been attached to the highest irradiation value class.

The data analysis of mean annual global solar irradiation and the digital map of mean annual global solar irradiation on a horizontal surface demonstrate that, in continental Croatia, irradiated energy on a horizontal surface is lower in the west, particularly because of increased cloudiness in the Drava Valley, and also in the area spanning from the east hillsides of Mount Medvednica and Mount Kalnik to Križevci. The mean annual value is the lowest in Križevci (4175 MJm^{-2}), and the

Mjerenje izravnog Sunčevog zračenja pirheliometrom na opservatoriju Split-Marjan.
The measuring of direct solar radiation by pyrheliometer at the Split-Marjan observatory.
Fotografija Photo by: Krunoslav Premec

je posljedica tmurnoga vremena za zimskih inverzija. U gorskom dijelu srednje mjesečno ukupno Sunčevo zračenje se zimi povećava s nadmorskom visinom, pa u Pargu u prosincu prosječno ukupno dozračena energija iznosi 109 MJm^{-2}, a na Zavižanu 127 MJm^{-2}. Primorska Hrvatska prima u prosincu prosječno 141 MJm^{-2}, od 122 MJm^{-2} u Rijeci do 165 MJm^{-2} u Dubrovniku. U srpnju se vrijednosti srednje mjesečne dozračene energije kreću između 599–670 MJm^{-2} u nizinskom dijelu te od 663–687 MJm^{-2} u gorskom dijelu. Na obali se dozračena energija na horizontalnu plohu u srpnju kreće između 705 MJm^{-2} u Rijeci do 807 MJm^{-2} u Hvaru.

U većem dijelu godine južno orijentirane plohe nagnute za 45° primaju više sunčane energije od horizontalnih ploha, osim od svibnja do kolovoza, kada zbog visokog položaja Sunca na nebeskom svodu, zrake Sunca na nagnutu plohu dolaze pod oštrijim kutem nego na horizontalnu plohu čime je ozračenje smanjeno. Analiza srednje mjesečne ukupne dozračene energije na odabranoj nagnutoj plohi pokazuje da mjesta u nizinskoj unutrašnjosti u prosincu primaju 92–152 MJm^{-2}. U gorskom dijelu srednje mjesečno dozračena sunčana energija se povećava s nadmorskom visinom od 140 MJm^{-2} u Gospiću do 223 MJm^{-2} na Zavižanu, a na obali sa smanjenjem geografske širine od 214 MJm^{-2} na sjevernom Jadranu do oko 300 MJm^{-2} na južnom Jadranu. U srpnju se vrijednosti kreću u rasponima 529–589 MJm^{-2} u nizinskoj unutrašnjosti, između 583–604 MJm^{-2} u gorskoj Hrvatskoj te od 619 MJm^{-2} na sjevernom do 695 MJm^{-2} na južnom Jadranu.

highest in Đurđevac (4567 MJm^{-2}), which makes a difference of 392 MJm^{-2} a year. Low values can also be found in Zagorje and the Samobor Mountains, as well as on mountain peaks in Gorski kotar and Lika. Along the coast, in Istria, the Croatian Littoral and Dalmatia the irradiated energy increases from north-west to south-east, starting with a minimum in Rijeka (4807 MJm^{-2}), and ending with a maximum in Hvar (5705 MJm^{-2}), which makes a difference of 898 MJm^{-2} a year, primarily because of the wider range of latitudes in this area compared with inland Croatia and also because of greater cloudiness in the northern Adriatic, especially in the cyclogenetic area of the Kvarner Bay (Rijeka). Because of this, on the map, two global solar irradiation classes appear in continental Croatia and three irradiation classes along the coast.

The annual courses of mean monthly global irradiation on a horizontal surface and on a southward oriented surface inclined at 45° have the regular shape of a one-fold wave with a minimum in December and a maximum in July, according to the astronomical position of the Sun and the geographical position of the locale (graphs next to global solar irradiation map).

The lowest value of solar irradiation in December is in the lowland, continental parts of Croatia (69–95 MJm^{-2}), which is a consequence of gloomy weather during winter inversions. In the mountainous parts, radiation increases with altitude in winter, so that global irradiation is 109 MJm^{-2} in Parg, in December, and 127 MJm^{-2} on Zavižan. The coast receives on average 141 MJm^{-2} in December (from 122 MJm^{-2} in Rijeka to 165 MJm^{-2} in Dubrovnik). In July, mean monthly solar irradiation ranges from 599 MJm^{-2} to 670 MJm^{-2} in the lowlands, and from 663 MJm^{-2} to 687 MJm^{-2} in the highlands. On the coast, the irradiated energy on a horizontal surface in July ranges from 705 MJm^{-2} in Rijeka to 807 MJm^{-2} in Hvar.

During the greater part of the year, southward oriented surfaces inclined at 45° receive more solar irradiation than horizontal surfaces, except from May to August, when, because of the high position of the Sun in the sky, the Sun rays come in under a more acute angle than on a horizontal surface, which results in a lower irradiance level. The comparison of mean monthly global irradiation on given inclined surfaces shows that, in December, the inland lowlands receive from 92 MJm^{-2} to 152 MJm^{-2}. The amount increases with altitude in the mountainous parts, from 140 MJm^{-2} in Gospić to 233 MJm^{-2} on Zavižan, and reciprocally with latitude on the coast, from 214 MJm^{-2} in the northern Adriatic to around 300 MJm^{-2} in the southern Adriatic. In July, the values range from 529 MJm^{-2} to 589 MJm^{-2} in the inland lowlands, from 583 MJm^{-2} to 604 MJm^{-2} in the highlands, and from 619 MJm^{-2} on the northern to 695 MJm^{-2} in the southern Adriatic.

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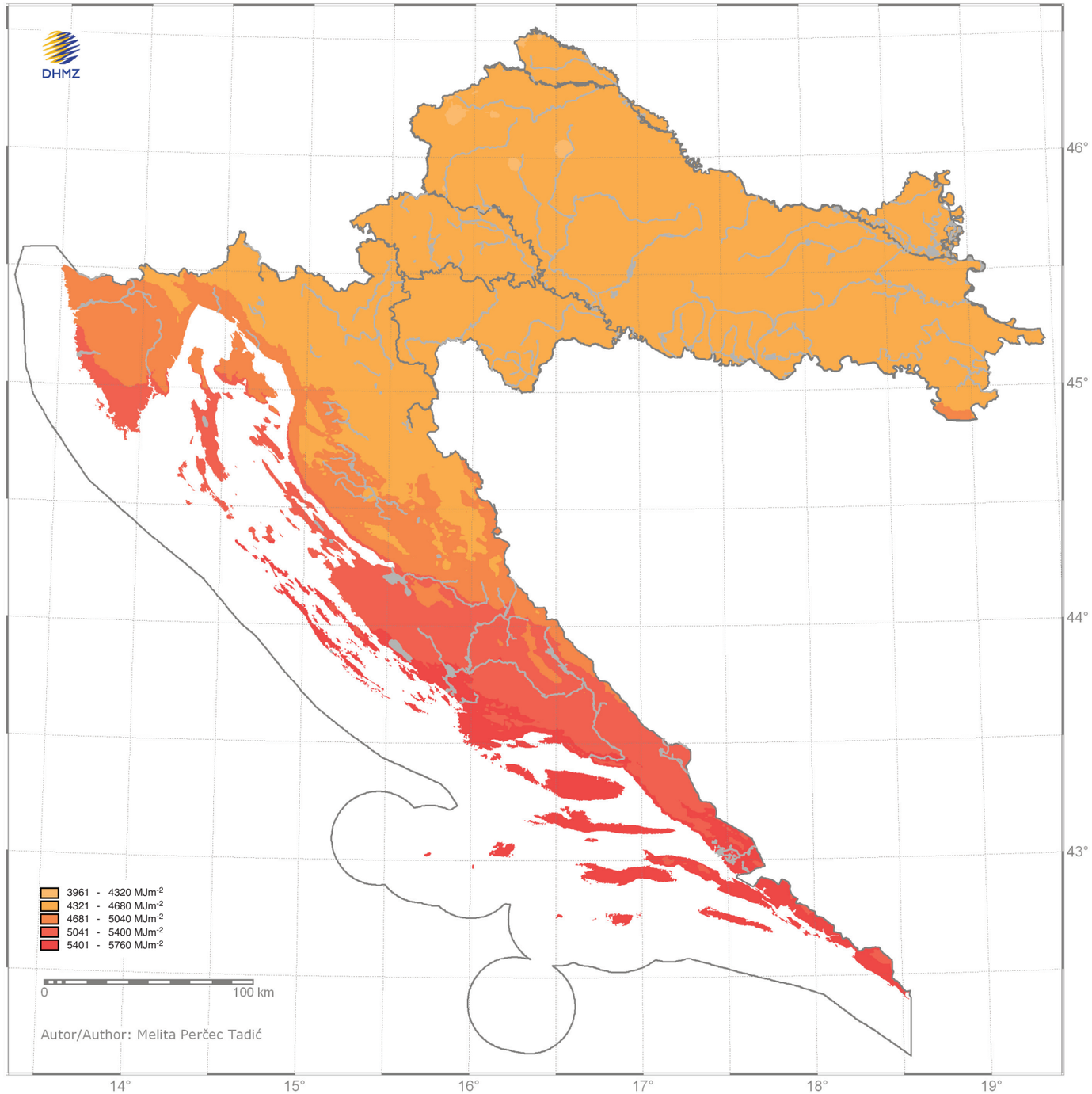
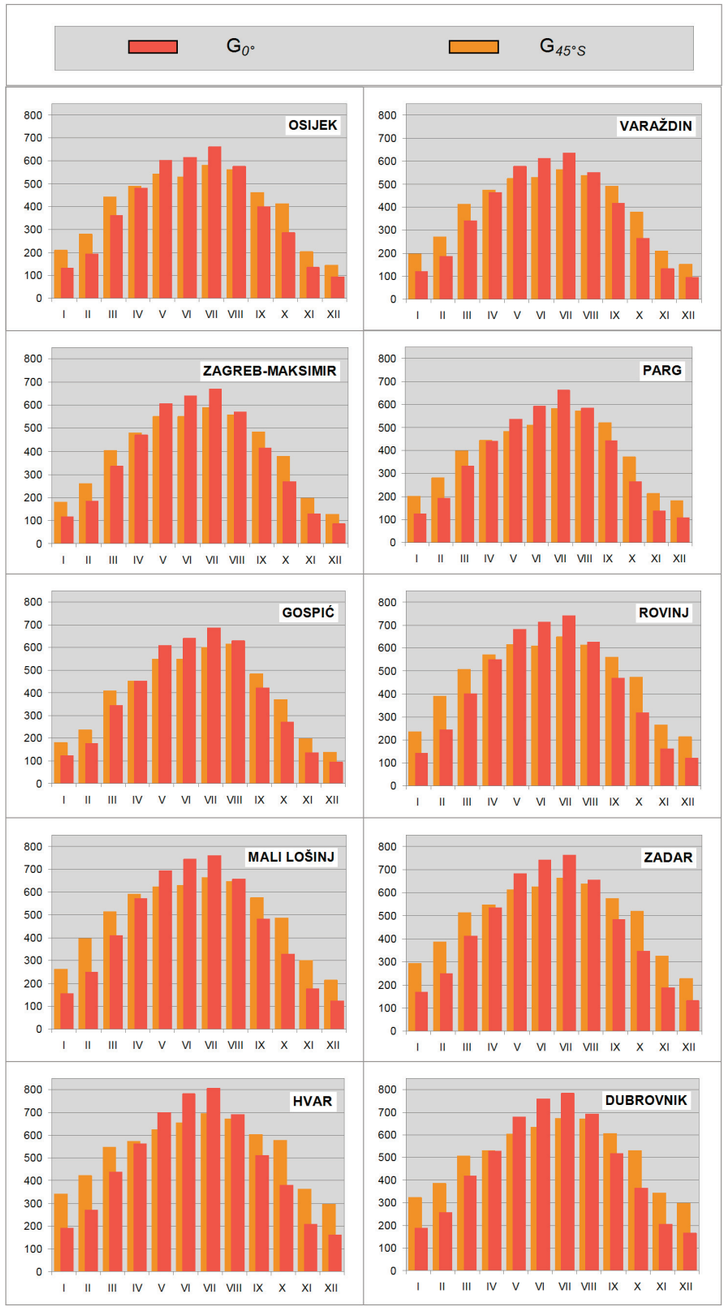
Srednja godišnja ukupna dozračena sunčana energija Mean annual global solar irradiation





Godišnji hod srednje mjesečne ukupne dozračene sunčane energije na horizontalnu plohu ($G_{0°}$) te na plohu nagnutu za 45° i orijentiranu prema jugu ($G_{45°S}$), MJm^{-2}.

Annual course of mean monthly sum of global solar radiation on horizontal plane ($G_{0°}$) and on the plane inclined for 45° and oriented to south ($G_{45°S}$), MJm^{-2}.

Osunčavanje
Insolation duration

Lidija Srnec

Trajanje insolacije odnosno trajanje sijanja Sunca nazivamo osunčavanjem. Ono se mjeri heliografom a izražava se u satima i dijelovima sata u danu, mjesecu ili godini. Budući da heliografom raspolaže samo manji broj postaja u Hrvatskoj, na postajama gdje nema instrumenta trajanje sijanja Sunca procjenjuje se pomoću odnosa naoblake i trajanja sijanja Sunca na najbližoj susjednoj postaji koja raspolaže heliografom. Razlikuje se stvarno i moguće osunčavanje. Stvarno osunčavanje ovisi o otvorenosti vidljivog horizonta, duljini vidljivog dijela dana, zemljopisnoj širini i o naoblaci. Moguće osunčavanje ovisi samo o duljini svijetlog dijela dana, dakle pripada mu potpuno vedro nebo uz sijanje Sunca svakoga dana neprekidno od izlaska do zalaska. Radi bolje slike o trajanju sijanja Sunca na području Hrvatske izračunato je i relativno osunčavanje, odnosno omjer između stvarnog i najvećeg mogućeg trajanja sijanja Sunca. Budući da se najveće moguće trajanje sijanja Sunca određuje iz dnevnih vrijednosti, relativno osunčavanje određeno je samo za postaje koje su imale na raspolaganju potpune nizove mjerenja.

Osunčavanje je vrlo važan element klime budući da ima neposredno biološko djelovanje na život na Zemlji. O njemu ovisi dnevna rasvjeta, ono utječe na zagrijavanje podloge, određuje razdiobu topline u tlu te temperaturne prilike u zraku i vodi. Stoga je vrlo važno za mnoge ljudske djelatnosti, osobito za poljoprivredu i općenito svijet raslinja, turizam, graditeljstvo.

Ukupno **godišnje trajanje sijanja Sunca** pokazuje da je Hrvatska vrlo sunčana zemlja, pri čemu se Hrvatsko primorje svrstava u red najsunčanijih europskih pokrajina. Duž Jadrana je godišnje trajanje sijanja Sunca svugdje veće od 2000 sati, odnosno kreće se između 5,9 sati na dan u Rijeci i 7,4 sata na dan na postaji Hvar. Otoci srednje i južne Dalmacije ujedno su najsunčaniji dio Hrvatske i stoga vrlo pogodan za turizam. Vrlo sunčana jest unutrašnjost Istre s 5,6 sati na dan. S udaljavanjem od mora prema kopnu broj sati sijanja Sunca se smanjuje, iako je i dalje razmjerno velik. Dinarski masiv ima snižene vrijednosti srednjeg godišnjeg osunčavanja. Te su vrijednosti naročito smanjene na sjevernom dijelu masiva, tako da su u tom dijelu ujedno i najniže u Hrvatskoj. Na postaji Parg godišnja suma sijanja Sunca iznosi 1643 sati, odnosno prosječno 4,5 sati na dan. Planinske postaje Zavižan i Skrad sunčanije su, s 5,4 odnosno 5,3 sati na dan. Karakteristike raspodjele srednjeg godišnjeg trajanja sijanja Sunca nizinskog dijela kontinentalne Hrvatske jesu blagi porast vrijednosti od zapada prema istoku i sjeveru. Vrijednosti se kreću od oko 1825 sati na godinu u Slavonskom Brodu (5 sati na dan) do 2044 sata na godinu u Đurđevcu (5,6 sati na dan). Prostorna raspodjela osunčavanja ukazuje da na raspodjelu najviše utječu reljef, geografska širina te magla u nižim kontinentalnim dijelovima Hrvatske, pri čemu je u toplom dijelu godine dominantan utjecaj reljefa, a zimi utjecaj magle.

Godišnji hod trajanja sijanja Sunca pokazuje da je maksimalno trajanje ljeti, a minimum zimi, što odgovara i naoblaci i duljini dana (grafikoni uz kartu sred-

Insolation duration, or sunshine duration, is termed “bright sunshine duration”. It is measured with a heliograph and expressed in parts of hours in a day, a month or a year. As just a small number of stations in Croatia have a heliograph at their disposal, bright sunshine duration at the stations that do not have it is determined by looking at the relationship between cloudiness and bright sunshine duration at the nearest station with a heliograph. We can distinguish actual and possible bright sunshine duration. Actual sunshine duration depends on the visible horizon openness, length of the bright part of the day, latitude of the station and cloudiness. Possible bright sunshine duration depends only on the visible length of the day and represents continuous sunshine duration under a completely clear sky from sunrise to sunset. For the purpose of comparison, relative bright sunshine duration, i.e., the ratio between the actual and the longest possible bright sunshine duration was also calculated. The longest possible bright sunshine duration being determined by daily values, the relative bright sunshine duration was determined only for stations which had complete sequences of measurements at their disposal.

Insolation duration is a very important element of climate because of its direct biological effect on life on Earth. Daylight depends on it, it also influences the heating of the planet’s surface, determines the distribution of heat on the ground and the air and water temperature conditions. It is, therefore, very important for many human activities, especially agriculture, the world of vegetation in general, tourism and construction.

The **total annual insolation duration** shows that Croatia is a very sunny country with the Croatian Littoral as one of the sunniest European regions. Everywhere along the Adriatic, annual bright sunshine duration is longer than 2000 hours, ranging from 5.9 hours a day in Rijeka to 7.4 hours a day on the Island of Hvar. The southern Adriatic is also the sunniest part of Croatia and, therefore, very suitable for tourism. Inland Istria is, likewise, very sunny, with 5.6 hours a day. Going from the coast towards the mainland, the number of hours of sunshine decreases, although it is still considerably high. The Dinara massif has lower mean annual insolation duration, particularly in the northern part of the massif, which makes it also the lowest in Croatia. At the Parg station, the yearly sum of sunshine is 1643 hours, which is an average of 4.5 hours a day. The Zavižan and Skrad mountain stations have a little more sun, with 5.4 and 5.3 hours a day, respectively. A characteristic of the distribution of mean annual bright sunshine duration in the lowland part of continental Croatia is a mild rise in values moving from the west towards the east and the north. The values range from about 1825 hours a year in Slavonski Brod (5 hours a day) to 2044 hours a year in Đurđevac (5.6 hours a day). The spatial distribution of insolation duration indicates that distribution is mostly influenced by relief, latitude and fog in the lower, continental parts of Croatia. The influence of relief is dominant during the warm part of the year and the influence of fog during winter.

The annual course of insolation duration indicates that the maximal duration is in summer and the minimal in winter, which corresponds to cloudiness and day-length (graphs next to the mean annual insolation duration map). In spring, the increase in cloudiness, which reduces sunshine, is compensated by increased day-length. The sunniest month of the year is July, when, at the Hvar station, on one of the sunniest islands, the Sun shines for as long as 11.7 hours a day, while inland it shines around 9 hours a day. The minimal bright sunshine duration at all stations was registered in December, with the lowest values in the lowland, continental parts of Croatia (around 1.5 to 2.5 hours a day) and with 3–4 hours a day on the Adriatic.

Bright sunshine duration was analysed for the period 1951–1970 in the Climate Atlas of Yugoslavia. A comparison of that period with the normal climatic period 1961–1990 shows that the changes in bright sun-

Zalaz sunca nad Kornatima.
Sunset over the Kornati islands.
Fotografija Photo by: Marjana Gajić-Čapka

Heliograf na glavnoj meteorološkoj postaji Zavižan.
Heliograph on Zavižan main meteorological station.
Fotografija Photo by: Ante Vukušić

njeg godišnjeg osunčavanja). U proljeće se povećanje naoblake koje smanjuje sijanje Sunca kompenzira produljenjem dana. Najsunčaniji mjesec u godini jest srpanj kada na postaji Hvar, jednom od najsunčanijih otoka Hrvatske, Sunce sija čak 11,7 sati na dan. U unutrašnjosti Hrvatske prosječno je osunčavanje u srpnju oko 9 sati na dan. Minimum trajanja sijanja Sunca na svim je postajama zabilježen u prosincu, uz najniže vrijednosti u nizinskim kontinentalnim dijelovima Hrvatske (oko 1,5 do 2,5 sata dnevno) do oko 3 do 4 sata dnevno na Jadranu.

Trajanje sijanja Sunca u Atlasu klime SFR Jugoslavije obrađivano je za razdoblje 1951–1970. Usporedba tog razdoblja s normalnim klimatskim razdobljem 1961–1990. pokazuje da su promjene višegodišnjeg trajanja sijanja Sunca vrlo male i kreću se u granicama do 0,3 sata dnevno. U proljeće se osunčavanje najmanje promijenilo, zimi i u jesen na većini je postaja malo dulje a ljeti kraće u razdoblju 1961–1990. u odnosu na prethodno razdoblje.

shine duration over the years were very small, in the range of up to 0.3 hours a day. In spring, insolation duration changed the least, in winter and autumn it was slightly longer at most stations and in summer it was shorter in the period 1961–1990, compared to the previous period.

In the period 1971–2000, insolation duration increased slightly compared to the normal climatic period 1961–1990. The insolation duration increase in the period 1971–2000 is very pronounced in winter, it is slightly less pronounced in spring and summer, while it is a bit shorter in autumn than insolation duration in the period 1961–1990.

The **annual relative insolation duration** has been calculated for 11 stations with a heliograph and continuous measurements, resulting in a complete 30-year succession of daily values. The minimal annual relative bright sunshine duration is on Parg (41%), and the maximal is on the Island of Hvar (64%). In summer, the mountainous parts are cloudier than the lowlands but in winter they are clearer and receive more sun. In the annual course, this is reflected in decreased relative bright sunshine duration at higher latitudes. All the stations on the Adriatic have a relative bright sunshine duration higher than 50%, with the earlier mentioned rise from the north towards the south. In the lowland part of continental Croatia, the annual relative bright sunshine duration is between 45% and 49%, with a mild rise in value from the west towards the east and the north. The relative bright sunshine duration in the annual course increases inland from 20% to 30% in January up to about 60% to 70% in the summer months, and, on the coast, from the winter 40–50% to 70–80%, or even 83% on Hvar, in July.

The differences in relative bright sunshine duration between the period 1971–2000 and the period 1961–1990 range from 0.5% to 2.1%.

U razdoblju 1971–2000. osunčavanje je uglavnom malo povećano u odnosu na normalno klimatsko razdoblje 1961–1990. Porast osunčavanja u razdoblju 1971–2000. najizraženiji je zimi, nešto je manji u proljeće i ljeto, dok je u jesen osunčavanje uglavnom malo kraće od osunčavanja u razdoblju 1961–1990.

Godišnje relativno trajanje sijanja Sunca izračunato je za 11 postaja na kojima postoji heliograf a ujedno nisu imale prekid u mjerenjima, pa raspolažu potpunim 30-godišnjim nizom dnevnih vrijednosti. Od tih postaja najmanje godišnje relativno osunčavanje ima Parg (41%) a najveće Hvar (64%). Planinski su predjeli ljeti mnogo oblačniji od nizina, ali su zimi vedriji i sunčaniji. U godišnjem relativnom osunčavanju to se odražava na smanjeno relativno osunčavanje na većim nadmorskim visinama. Sve postaje na Jadranu imaju relativno trajanje sijanja Sunca veće od 50%, uz već ranije spomenut porast od sjevera prema jugu. U nizinskom dijelu kontinentalne Hrvatske godišnje relativno trajanje sijanja Sunca jest između 45% i 49% s blagim porastom od zapada prema istoku i sjeveru Hrvatske. U godišnjem hodu u unutrašnjosti se relativno trajanje sijanja Sunca povećava od 20–30% u siječnju do oko 60–70% u ljetnim mjesecima, a na obali od zimskih 40–50% do srpanjskih 70–80%, ili čak 83% na Hvaru.

Relativno osunčavanje je u razdoblju 1971–2000. uglavnom između 0,5% i 2,1% veće nego u razdoblju 1961–1990.

Mjerenje globalnog zračenja piranometrom i osunčavanja heliografom na opservatoriju Split-Marjan.
The measuring of global radiation by pyranometer and of insolation by heliograph at the Split-Marjan observatory.
Fotografija Photo by: Krunoslav Premec

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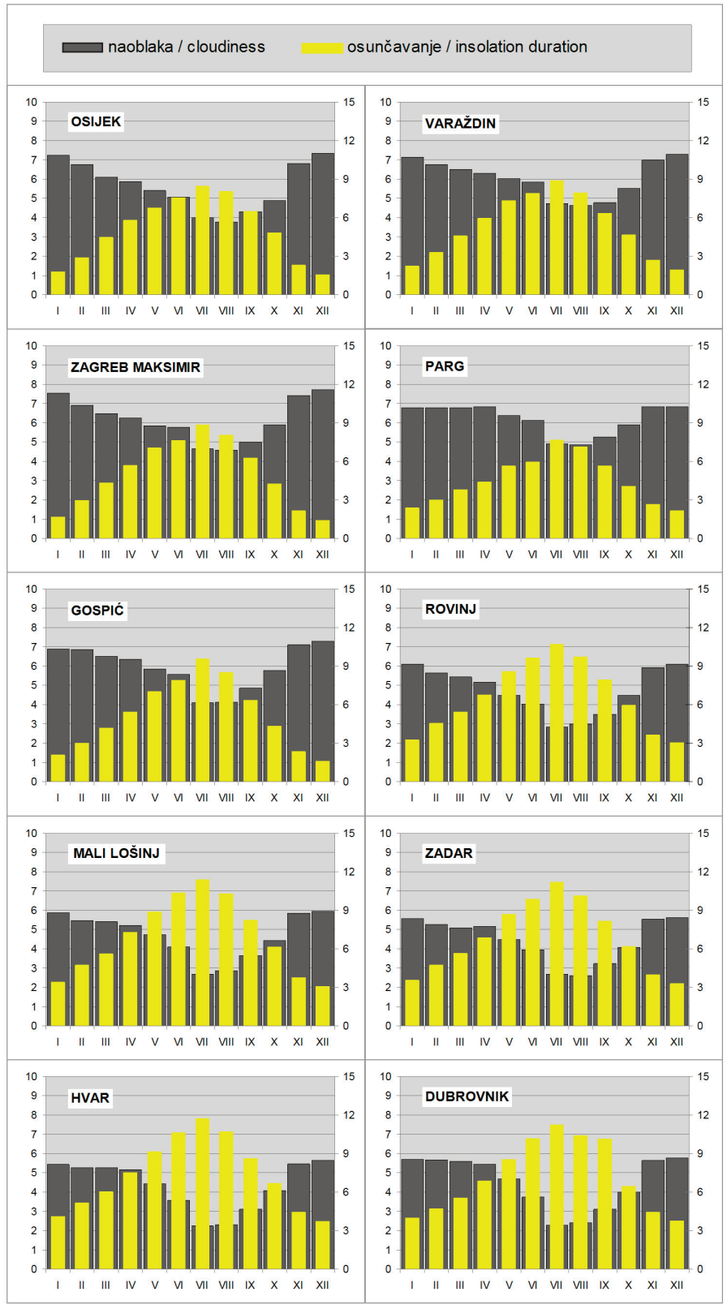
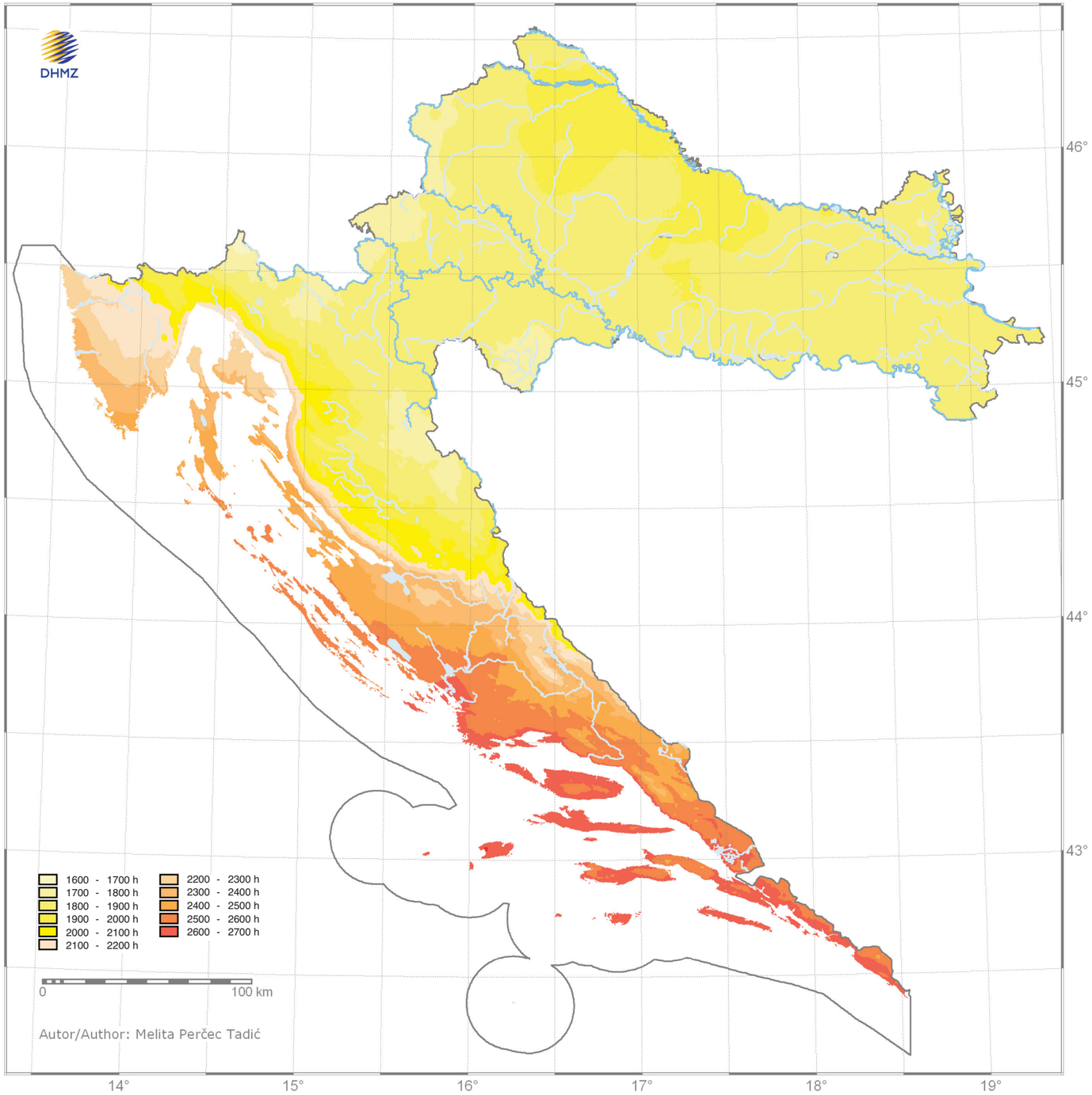


Godišnji hod naoblake (desetine) i osunčavanja (sati po danu).

Annual course of cloudiness (tenths) and insolation duration (hours per day).



Naoblaka
Cloudiness

Lidija Srnec

Količina oblaka koja pokriva nebo zove se naoblaka. Naoblaka se procjenjuje vizualno u dijelovima neba zaklonjenim oblacima i ta količina se izražava u desetinama neba. Tako je potpuno vedro nebo prikazano s nula desetina, a potpuno oblačno s 10 desetina.

Naoblaka je vrlo važan element klime jer izravno sudjeluje u stvaranju bilance zračenja Zemlje i atmosfere. S jedne strane oblaci smanjuju Sunčevo zračenje prema tlu tako da ga upijaju ili odbijaju, a s druge strane zadržavaju dugovalno zračenje od tla u atmosferu. Stoga naoblaka danju doprinosi sniženju a noću povećanju temperature zraka.

Karakteristike naoblake usko su vezane s geografskim smještajem Hrvatske od južnih predjela Panonske nizine, preko dinarskih planina do istočne obale Jadrana. **Prosječna godišnja naoblaka** uglavnom je između 4 i 7 desetina. Razlika naoblake od 3 desetine u godišnjem srednjaku ukazuje na veliku raznolikost na relativno malom području Hrvatske. Općenito se Hrvatska može podijeliti na oblačniji dio s godišnjom naoblakom većom od 5 desetina i na vedriji dio u kojem je manje od polovice neba zastrto oblacima. Vedriji dio obuhvaća zapadno priobalje Istre, vanjske otoke Kvarnerskog zaljeva te srednji i južni Jadran i njegovu unutrašnjost. Istra i sjeverni Jadran imaju nešto veću naoblaku, pri čemu je ona u Kvarnerskom zaljevu veća nego u unutrašnjosti Istre. Područje oko Zadra, Šibenika i Splita te južno od Makarske i otoci najvedriji su dio Hrvatske, s naoblakom manjom od 4,5 desetina. Godišnja naoblaka raste od obalnog područja Hrvatskog primorja prema planinskom području Hrvatske. Razlog za to jesu zračne mase koje dolaze sa Sredozemlja i bogate su vlagom. Prilikom nailaska na južne obronke planina taj se zrak diže, njegova para kondenzira a naoblaka povećava. Ljeti planine pomažu termičku konvekciju, pa zbog dizanja lakšeg i toplijeg zraka te njegovog hlađenja i kondenzacije na određenim visinama također dolazi do povećanja naoblake. Srednja godišnja naoblaka tog dijela Hrvatske jest između 5,5 i 6,5 desetina. U nizinskom dijelu Hrvatske naoblaka se povećava od istoka prema sjeverozapadnom i središnjem dijelu Hrvatske. U najistočnijem dijelu Hrvatske srednja godišnja naoblaka iznosi oko 5,5 desetina dok je na sjeverozapadu Hrvatske 6 desetina. Središnji je dio Hrvatske nešto oblačniji uz srednju godišnju naoblaku između 6 i 6,5 desetina. U nizinskom dijelu, zbog česte magle i niskih oblaka u jesen i zimi, godišnja naoblaka može biti povećana u odnosu na okolno gorje.

U **godišnjem hodu** najoblačnija je zima, najvedrije ljeto, a proljeće je nešto oblačnije od jeseni (grafikoni uz kartu srednje godišnje naoblake). Naoblaka je najveća u prosincu, kad se u kontinentalnom nizinskom dijelu zemlje kreće između 7 i 7,5 desetina, u Lici i Gorskom kotaru oko 7, a na obali od 5,5 do 6 desetina. Srpanj i kolovoz imaju najmanje oblaka, s time da je u unutraš-

Cloudiness is defined as the amount of clouds that cover the sky. It is determined visually as parts of the sky covered in clouds and expressed in tenths. Cloudiness 0 means that the sky is completely clear and cloudiness 10 that the sky is completely covered.

Cloudiness is a very important element of the climate because it directly participates in creating a balance between the radiation of the Earth and the atmosphere. On the one hand, clouds reduce downward solar radiation by absorbing or reflecting it, and, on the other hand, they retain long-wave radiation from the surface into the atmosphere. Because of that, cloudiness contributes to the decrease in air temperature during the day and its increase during the night.

The characteristics of cloudiness are closely connected with the geographical position of Croatia, from the southern region of the Pannonian plain, through the Dinarides to the eastern Adriatic coast. The **average annual amount of cloudiness** ranges from 4 to 7 tenths. This difference of 3 tenths in cloudiness in the annual average indicates great variety in the relatively small area of Croatia. Generally, Croatia can be divided into a cloudier part, with annual cloudiness higher than 5 tenths, and a clearer part, where less than half the sky is covered in clouds. The clearer part covers the western coastal area of Istria, the outer islands of the Kvarner Bay, and the middle and southern Adriatic and its hinterland. Istria and the northern Adriatic have a slightly higher cloudiness, the cloudiness over the Kvarner Bay being somewhat higher than the one in inland Istria. The areas around Zadar, Šibenik, Split and south of Makarska, along with the islands, are the clearest parts of Croatia, with cloudiness less than 4.5 tenths. The annual amount of cloudiness increases from the coastal area of the Croatian Littoral towards the mountainous part of Croatia. This happens because of air mass invasions from the Mediterranean, which are rich in moisture. Upon coming to the southern slopes of the mountains, this air is uplifted and condenses, leading to an increase in cloudiness. In summer, the mountains develop thermal convection, which also leads to an increase in cloudiness because of the rising of lighter and warmer air and its cooling and condensation at certain altitudes. The mean annual cloudiness in this part of Croatia is between 5.5 and 6.5 tenths. In the lowland part of Croatia, cloudiness increases from the eastern towards the north-western and central part of Croatia. In the easternmost part of the country, mean annual cloudiness is around 5.5 tenths, and it is 6 tenths in the north-west. The central part is somewhat cloudier, with a mean annual cloudiness of 6 to 6.5 tenths. In the lowlands, annual cloudiness can be higher than in the surrounding mountains because of frequent fogs and low cloudiness in autumn and winter.

In the **annual course**, winter is the cloudiest, summer is the clearest, and spring is somewhat cloudier than autumn (graphs next to the mean annual cloudiness map). Cloudiness is the highest in December, with 7 to 7.5 tenths in the lowland, continental part of the country, around 7 in Lika and Gorski kotar, and from 5.5 to 6 tenths on the coast. July and August have the least clouds, while there are somewhat fewer clouds inland in August and on the coast in July.

The highest annual number of **clear days**, with a mean daily cloudiness less than 2 tenths, can be expected on the islands of central Dalmatia (graphs next to the mean annual insolation duration map). There are 125 days in average at the Hvar station, that is, more than 30% of all days in the year. As mean annual cloudiness increases moving towards northern and inland Croatia, the number of clear days decreases. On the northern Adriatic, the number of clear days increases from the Rijeka Bay towards the west coastal area of Istria and the outer islands of the Kvarner Bay. There are around 80 clear days in Rijeka, which is 22% of all days in the year. In the eastern part of continental Croatia, the number of clear days is slightly lower

Oblaci raznih rodova na različitim visinama prekrivaju nebo.
Different cloud genera at different altitudes covering the sky.
Fotografija Photo by: Joško Vučetić

njosti nešto manje oblaka u kolovozu a na obali i u srpnju.

U godini, najveći broj **vedrih dana**, u kojima je srednja dnevna naoblaka manja od 2 desetine, može se u Hrvatskoj očekivati na srednjedalmatinskim otocima (grafikoni uz kartu srednjeg godišnjeg osunčavanja). Na postaji Hvar ih u prosjeku ima 125, odnosno više od 30% dana u godini. S porastom srednje godišnje naoblake prema sjeveru i unutrašnjosti Hrvatske smanjuje se broj vedrih dana. Na sjevernom Jadranu broj vedrih dana raste od Riječkog zaljeva prema zapadnom priobalju Istre i vanjskim otocima Kvarnerskog zaljeva. U Rijeci ima na godinu oko 80 vedrih dana, odnosno 22% dana u godini. Nešto manje vedrih dana ima u istočnom dijelu kontinentalne Hrvatske (72 u Osijeku), dok ih se najmanje može očekivati u sjevernoj i središnjoj Hrvatskoj (55 u Varaždinu, 45 u Slavonskom Brodu), prosječno 15% odnosno 12% dana u godini. U gorskoj je Hrvatskoj broj vedrih dana dosta promjenjiv i kreće se između 53 (Parg) i 73 (Skrad). Budući da je u čitavoj Hrvatskoj najvedrije ljeti, mjesec s najvećim brojem vedrih dana jest kolovoz, kada se najmanji broj vedrih dana javlja u gorskoj Hrvatskoj (na Pargu ima prosječno 7 vedrih dana) a najveći na dalmatinskim otocima (na postaji Hvar ima čak 19 vedrih dana). Najmanje vedrine imaju studeni i prosinac, kada u kontinentalnom dijelu Hrvatske u prosjeku ima samo 1 do 3 vedra dana, u planinskom dijelu 3 do 4 a na priobalnom području 6 do 7 dana.

Najviše **oblačnih dana**, s prosječnom dnevnom naoblakom većom od 8 desetina, ima u gorskoj Hrvatskoj gdje tijekom godine ima oko 35% do 40% oblačnih dana (oko 120–140 dana). U nizinskom dijelu Hrvatske oblačnih je dana nešto manje, od oko 30% u istočnoj Hrvatskoj do 35% u središnjoj Hrvatskoj (Zagreb). Najmanje oblačnih dana ima na Jadranu, a učestalost im se smanjuje od sjevera prema jugu, od oko 30% na sjevernom Jadranu do samo 20% oblačnih dana na srednjedalmatinskim otocima. Najmanje oblačnih dana ima u srpnju (1 u Dubrovniku, 6 u Ogulinu), dok ih je najviše u prosincu (oko 10 u Hvaru, 20 u Slavonskom Brodu).

Usporedba naoblake u razdoblju 1961–1990. s razdobljem 1946–1970. koje je korišteno u Atlasu klime SFR Jugoslavije ukazuje na blagi porast naoblake uz dolinu Save i u Istri te smanjenje na južnom Jadranu u novijem razdoblju, a posljedica toga jest smanjenje broja vedrih dana u kontinentalnom dijelu Hrvatske te povećanje na Jadranu. Gledajući po sezonama, u novijem razdoblju 1961–1990. hladni dio godine obilježen je smanjenjem naoblake i broja oblačnih dana te povećanjem broja vedrih dana, i obratno povećanjem naoblake i broja oblačnih dana te smanjenjem broja vedrih dana u toplom dijelu godine.

U razdoblju 1971–2000. naoblaka je u većem dijelu Hrvatske smanjena u odnosu na prijašnje referentno klimatsko razdoblje, pa je u skladu s tim smanjen i broj oblačnih dana, dok se vedri dani nisu mijenjali jednoznačno. Smanjenje naoblake uočeno je u svim sezonama osim jeseni, kada je i povećan broj oblačnih i smanjen broj vedrih dana.

(72 in Osijek), and it is the lowest in northern and central Croatia (55 in Varaždin, 45 in Slavonski Brod), an average of 15–12% of all days in the year. In the highlands, the number of clear days is quite variable and ranges between 53 (Parg) and 73 (Skrad). Croatia being the clearest in summer, the month with the largest number of clear days is August, ranging from the lowest number in the mountainous part of the country (with an average of 7 clear days in Parg) to the highest number in southern Dalmatia (19 clear days in Hvar). The months with least sunshine are November and December, when there is only an average of 1 to 3 clear days in the continental part, 3 to 4 days in the mountainous parts, and 6 to 7 days in the coastal area.

The largest number of **cloudy days**, with average daily cloudiness higher than 8 tenths, can be found in the highlands, where there is around 35–40% of cloudy days (around 120 to 140 days) in a year. The number of cloudy days is slightly lower in the lowlands, from around 30% in eastern Croatia to 35% in central Croatia (Zagreb). The lowest number of cloudy days has been recorded on the Adriatic, and their frequency decreases from the north towards the south, from around 30% on the northern Adriatic to only 20% on the islands of central Dalmatia. The lowest number of cloudy days is in July (1 in Dubrovnik, 6 in Ogulin), and the highest number is in December (around 10 in Hvar, 20 in Slavonski Brod).

A comparison of cloudiness during the period 1961–1990 with cloudiness in the period 1971–2000 (used in the Climate Atlas of Yugoslavia) shows a mild increase in cloudiness along the Sava Valley and in Istria, and a decrease in the southern Adriatic, during the latter period. This has consequently caused a decrease in the number of clear days in continental Croatia and an increase on the Adriatic. Looking at the seasons in the period 1961–1990, the cold part of the year was characterised by a decrease in cloudiness and the number of cloudy days, and an increase in the number of clear days, while the warm part of the year was exactly the opposite – there was an increase in cloudiness and the number of cold days, and a decrease in the number of clear days.

In the period 1971–2000 cloudiness in a large part of Croatia decreased, compared with the earlier reference climatic period, so the number of cloudy days also decreased, while the number of clear days seems not to have changed. A decrease in cloudiness was recorded in all seasons except in autumn, when there was an increase in the number of cloudy and a decrease in the number of clear days.

Kumulusi nad Splitskim kanalom.
Cumuli over Split channel.
Fotografija Photo by: Zorislav Zaninović

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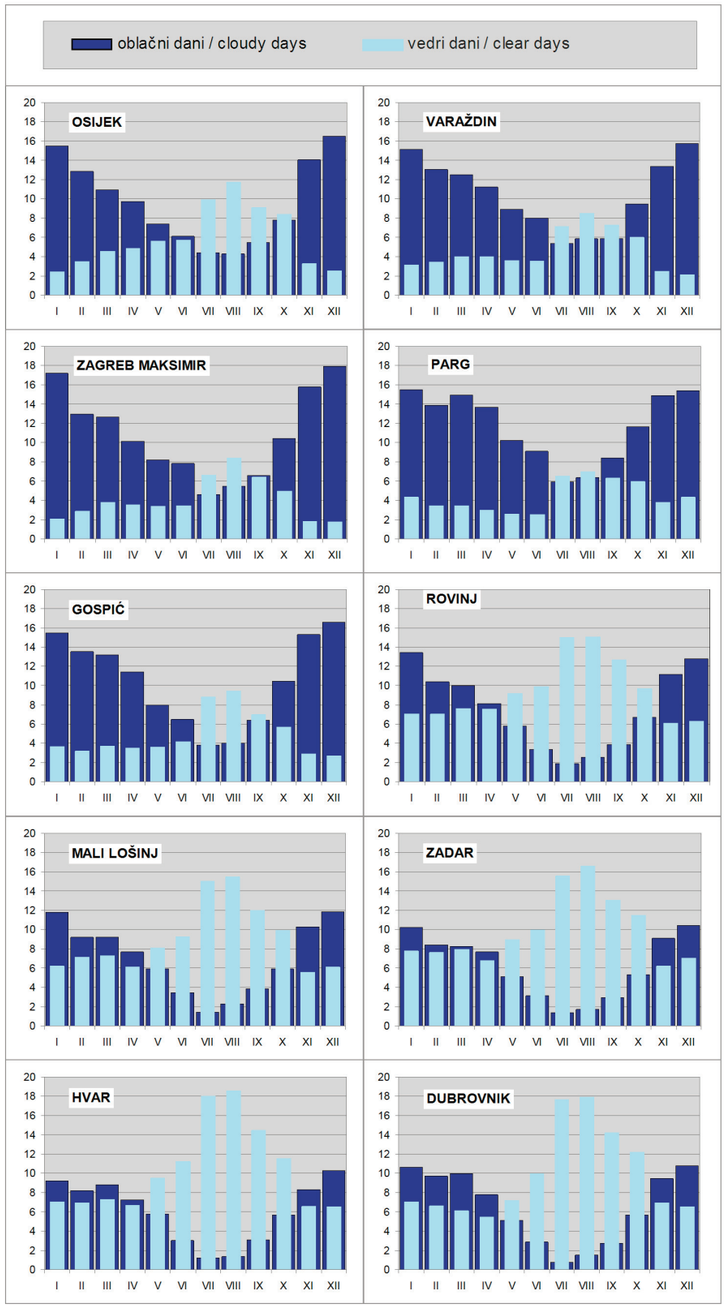
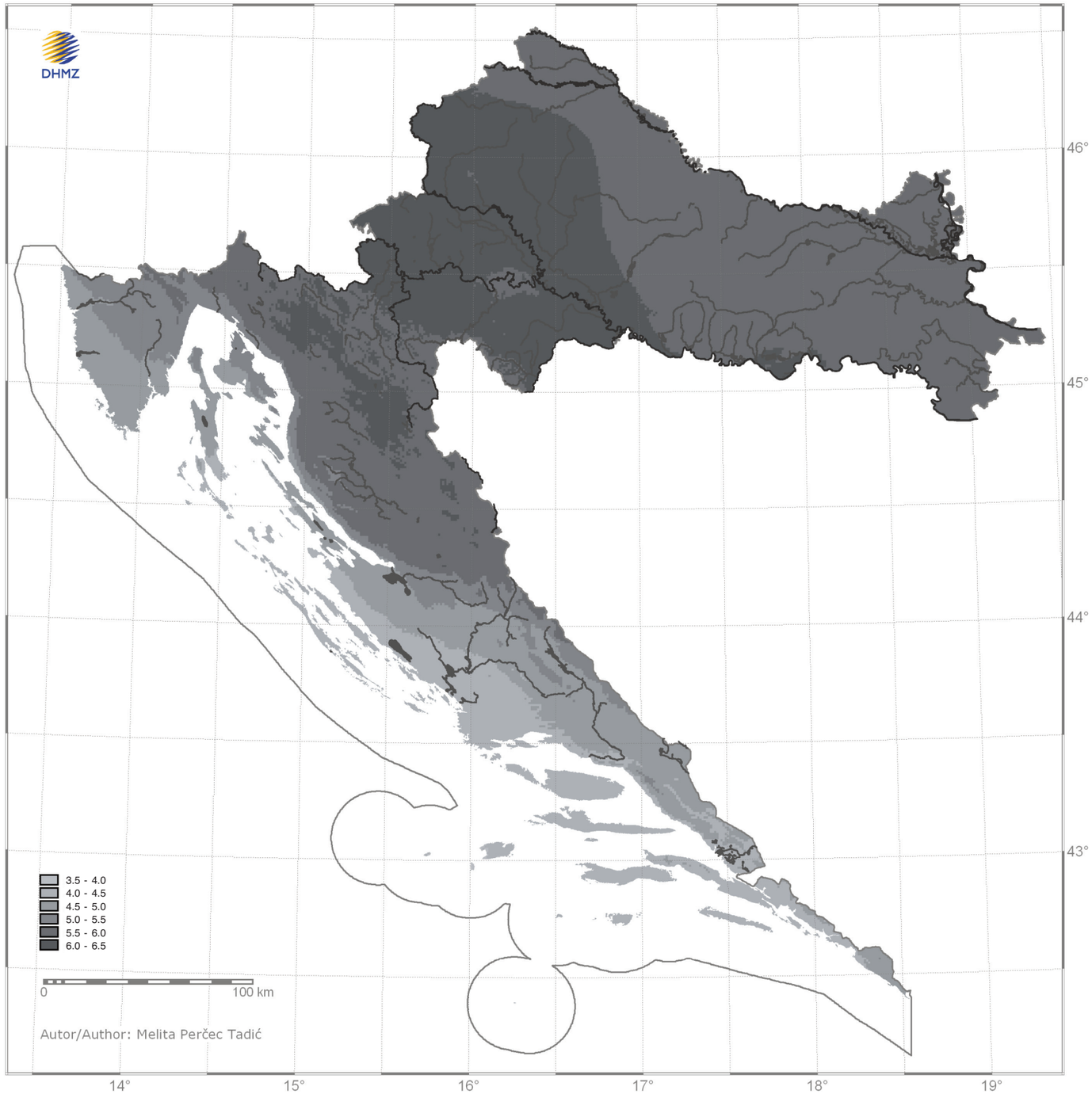


Godišnji hod broja vedrih (N<2/10) i oblačnih dana (N>8/10).
Annual course of number of clear (N<2/10) and cloudy days (N>8/10).



Meteorološke pojave
Meteorological phenomena

Mirta Patarčić

Za potrebe klimatskog atlasa analizirane su sljedeće meteorološke pojave: magla, rosa, mraz, inje, grmljavina i tuča. Na meteorološkim postajama pojave se osim u terminima motrenja bilježe i izvan termina, pa se dan s nekom meteorološkom pojavom definira kao dan u kojem je pojava zabilježena bez obzira na vrijeme opažanja.

Magla su sitne vodene kapljice koje lebde u zraku tvoreći oblak u dodiru s tlom i smanjujući horizontalnu vidljivost na manje od 1 km. Nastaje kad je relativna vlažnost zraka pri tlu blizu 100% i postoji dovoljno kondenzacijskih jezgara koje omogućuju stvaranje kapljica. Magla nastaje za vedrih noći sa slabim vjetrom prilikom ohlađivanja tla, a zatim kondenzacije vodene pare u okolnom zraku (radijacijska magla) ili prelaskom vlažnog zraka preko hladne podloge (advekcijska magla). Može nastati i kod adijabatskog hlađenja zraka koji se diže uz orografsku prepreku ili u planinskim kotlinama kao rezultat temperaturne inverzije kada hladni zrak leži u dolini, a okolni su obronci topliji. Magla također može nastati u frontalnom pojasu, ispred tople i iza hladne fronte, kao posljedica padanja kiše u hladnom stabilnom zraku i povišenja rosišta. Pri samoj fronti može nastati zbog miješanja topla i hladna zraka ili zbog naglog ohlađivanja zraka nad vlažnim tlom. Na moru magla nastaje kad je rosište nad morem niže od temperature mora, a uzrok može biti radijacijsko ohlađivanje, advekcija hladnog zraka ili kombinacija ta dva uzroka. Advekcijske magle nad Jadranom nastaju u toploj i vlažnoj zračnoj masi sa Sredozemlja u proljeće kad je more razmjerno hladno ili u hladnom zraku koji dođe nad toplo more u jesen. Magla sprečava prolazak Sunčevih zraka pa njeno duže zadržavanje snižava temperaturu zraka. Budući da smanjuje vidljivost, magla predstavlja opasnost za zračni, cestovni i pomorski promet. U gradovima može biti vrlo opasna za zdravlje jer nastaje ukapljivanjem na jezgrama koje potječu iz ispušnih plinova automobila ili industrijskih i kućnih dimnjaka stvarajući smog.

The following weather phenomena were analysed for the climatic atlas: fog, dew, frost, rime, lightning with thunder and hail. At weather stations, the phenomena are not only recorded at the standard terms of observations but also at other times, so a day with a weather phenomenon is defined as a day when the phenomenon was recorded no matter when it was observed.

Fog is defined as small water droplets floating in the air, forming a cloud in contact with the ground, reducing horizontal visibility to less than 1 km. It occurs at relative humidity of 100% of the air at ground level and when there is a high enough amount of condensation nuclei which allow droplets to form. Fog forms during clear nights, when the wind is light and the ground is chilled, when water vapour in the surrounding air condenses (radiation fog) or when moist air flows across a cold surface (advection fog). Fog can also be formed because of adiabatic cooling of the air due to the orographic lift or in mountain ravines, as a result of temperature inversion, when cold air lies in the ravine and the surrounding hillsides are warmer. Fog can also form in the frontal zone, in front of a warm and behind a cold front, as a consequence of rain falling in cold stable air and a higher dew point. Within the front itself, fog can form because of the mixing of cold and warm air or because the air has been cooled suddenly above wet soil. At sea, fog forms when the dew point temperature of air above the sea is lower than the sea temperature. This can be caused by radiative cooling, cold air advection or a combination of these two causes. Advection fog over the Adriatic forms in warm and moist air masses advancing from the Mediterranean in spring, when the sea is relatively cold, or in cold air masses moving over the warm sea in autumn. Fog prevents the Sun rays from getting to the ground and, therefore, its longer duration lowers air temperature. As it reduces visibility, fog represents a hazard for air, road and sea traffic. In cities, it can be a health hazard because it forms by

U kontinentalnom dijelu Hrvatske magla je češća u hladnom dijelu godine, od listopada do ožujka, nego u toplom. Najviše magle zabilježeno je na Zavižanu (191 dan na godinu) i Skradu (98) te na području uz Savu gdje u Slavonskom Brodu prosječno ima 130 dana s maglom, a u Sisku 81 dan. Sjeverozapadna Hrvatska, Lika i unutrašnjost Istre imaju više od 50 dana s maglom, a u istočnoj Slavoniji ima ih 32. U obalnom pojasu magla nastaje daleko rjeđe, pri čemu godišnje vrijednosti opadaju od sjevernog (8 dana) prema južnom Jadranu gdje se na postajama Hvar i Dubrovnik magla prosječno pojavljuje samo jednom u godini. Na sjevernom Jadranu magla je češća u razdoblju od studenog do ožujka, a na južnom Jadranu u svibnju i rujnu.

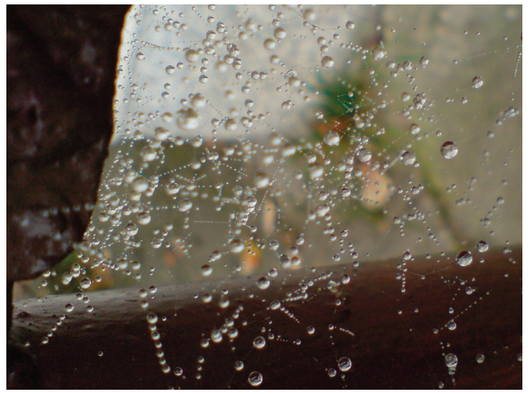
Rosa i mraz su oborine koje nastaju pri tlu. Rosa nastaje na tlu i predmetima blizu tla u vedrim noćima i pri slabijem vjetru kad se uz hladno tlo prizemni sloj zraka bogat vodenom parom dovoljno ohladi da se vodena para kondenzira, pri temperaturi višoj od 0°C. Ako je temperatura niža od 0°C, izravnim prijelazom vodene pare u led (depozicijom) na tlu, niskom bilju i predmetima koji nisu dobri vodiči topline nastaje naslaga bijelih ledenih kristala koju nazivamo mraz. Mraz najčešće nastaje u dolinama u koje se slijeva hladan zrak s okolnih obronaka. Rosa i mraz iščezavaju nakon izlaska Sunca, kad se tlo i sloj zraka uz tlo zagriju. U vlažnim područjima rosa ne doprinosi znatno ukupnoj količini oborine, ali u beskišnim razdobljima i na vodopropusnom krškom terenu predstavlja glavni izvor vlage životinjama i biljkama. S biološkog gledišta rosa može biti štetna jer napose kod kultiviranih biljaka pospješuje razvoj biljnih bolesti.

Kako je za nastanak rose potrebna temperatura iznad 0°C, ta je pojava najčešća u toplom dijelu godine, od travnja do rujna. U kontinentalnom dijelu najviše rose ima ljeti i u ranu jesen, dok je na obali najčešća u jesen i proljeće. Na obalnom području u ljetnim, toplim

Magla uz jezero Jarun u Zagrebu 30. 12. 2006.
Fog near the Jarun lake in Zagreb, 30 December 2006.
Fotografija Photo by: Helena Lebo

condensation in nuclei which come from car exhaust gasses or industrial and house chimneys.

In the continental part of Croatia, fog is more frequent in the cold part of the year, from October to March, than in the warm one. The highest number of occurrences was recorded in Zavižan (191 days a year), Skrad (98), and the area around the Sava River where there are on average 130 foggy days in Slavonski Brod and 81 days in Sisak. North-western Croatia, Lika and inland Istria have more than 50 foggy days, while eastern Slavonia has 32. Fog is formed far more rarely in the coastal zone, with a decrease in annual values from the northern (8 days) towards the southern Adriatic, where at the Hvar and Dubrovnik stations fog occurs on average only once a year. In the northern Adriatic, fog is more frequent from November to March, and in the southern Adriatic it is more frequent in May and September.



Kapljice rose na paukovoj mreži.
Dew droplets on spiderweb.
Fotografija Photo by: Zorislav Zaninović

i relativno kratkim noćima tlo i zrak uz tlo ne ohlade se dovoljno da bi došlo do kondenzacije vodene pare pa je rosa na obali rjeđa nego u unutrašnjosti. Rosom je najbogatija sjeverozapadna Hrvatska s više od 200 dana na godinu, a broj dana s rosom smanjuje se prema istoku (126 dana u Osijeku). Među postajama s najvećim godišnjim brojem dana s rosom ističe se Pazin s 233 dana. Zbog specifičnog položaja Pazina, u kotlini, rosa je ondje češća nego u drugim dijelovima unutrašnjosti Istre jer u udubljenim terenima noćnim hlađenjem prizemnog sloja zraka dolazi do kondenzacije vodene pare i nastanka rose, a u hladnom dijelu godine nastaje mraz. U Lici (183 dana) ima više rose nego u Gorskom kotaru (86 do 147 dana). Na obali rosa se pojavljuje u oko 80 do 130 dana u godini, a u Splitu samo 36 puta na godinu.

Na svim postajama mraz se pojavljuje u hladnom dijelu godine kad su najpovoljniji uvjeti za njegov nastanak, a najčešći je u prosincu i siječnju (grafovi uz kartu srednjih datuma početka i svršetka razdoblja s mrazom). Najviše dana s mrazom ima na postaji Pazin (95), koji je, uz Zalesinu u Gorskom kotaru, najpoznatije mrazište u mreži meteoroloških postaja. U gorskoj Hrvatskoj godišnji broj dana s mrazom je smanjen zbog dugotrajne pokrivenosti tla snijegom. To najviše dolazi do izražaja na Zavižanu, gdje se u prosjeku mraz pojavljuje samo 6 puta u godini i to u ranu jesen i kasno proljeće, te u većem broju dana s mrazom u Gospiću i Ogulinu u studenom i ožujku nego za zimskih mjeseci. U nizinskoj Hrvatskoj mraz je u zapadnom dijelu, gdje se pojavljuje u 40 do 72 dana na godinu, češći nego u Slavoniji, gdje na istoku ima oko 46 dana s mrazom, a na području uz Savu 61 dan. Na Jadranu je mraz mnogo rjeđi nego u unutrašnjosti, a broj dana s mrazom smanjuje se od sjevernog prema južnom Jadranu. Zapadna obala Istre ima oko 40 takvih dana, riječko područje 25, a srednja Dalmacija sa zaleđem od 21 do 34, dok se u južnoj Dalmaciji mraz pojavljuje tek 3 do 5 puta na godinu.

Inje je naslaga ledenih kristalića na granama i predmetima, osobito na strani okrenutoj prema vjetru. Nastaje pri temperaturi nižoj od 0°C u struji magle ili oblaka sastavljenima od prehladnih kapljica koje se u dodiru s preprekom trenutačno smrzavaju. Na žicama dalekovoda stvara dodatni teret, koji može prouzročiti veliku štetu.

Inje je pojava vezana za kontinentalnu Hrvatsku. Najčešće nastaje u gorskim predjelima, ali i u nizinskim za maglovita i vrlo hladna vremena. Na Zavižanu, gdje se inje pojavljuje u svim mjesecima osim srpnja i kolovoza ima prosječno čak 87 dana s tom pojavom. U Gorskom kotaru i Lici ima ga u 6 do 11 dana na godinu. U nizinskom dijelu Hrvatske najmanje inja ima u istočnoj Slavoniji (2 dana na godinu), te na sjeverozapadnom području (4 do 9 dana). U dolini Save zbog češće magle u hladnom dijelu godine povoljni su uvjeti za stvaranje inja pa se prema podacima s postaje u Sla-

Dew and frost are types of precipitation formed at ground level. Dew forms on the ground and on objects near the ground on clear nights with light wind when a ground layer of air, close to the cold ground and abundant in water vapour, gets cold enough for the water vapour to condense, at a temperature higher than 0°C. If the temperature is lower then 0°C, a deposit of white ice crystals, i.e. frost, is formed, when water vapour turns directly into ice (by deposition) on the ground, low vegetation and objects which are not good heat conductors. Frost is most commonly formed in valleys, where cold air descends from the surrounding hillsides. Dew and frost dissipate after sunrise, when the soil and the layer of air close to the ground get warmer. In most humid areas, dew does not contribute significantly to the total precipitation amount but in periods without rain and on permeable karstic terrain it represents the main source of moisture to animal and plant life. From a biological point of view, dew can be harmful because it enhances the development of plant diseases, especially in cultivated plants.

As temperature above 0°C is necessary for dew to occur, this phenomenon is most common in the warm part of the year, from April to September. In the continental part of Croatia, dew is most frequent in summer and early autumn, while on the coast it comes in autumn and spring. In the costal area, in summer, during warm and relatively short nights, the ground and the ground air layer do not cool down enough for water vapour to condense so dew is less frequent on the coast than inland. North-western Croatia experiences dew the most, with over 200 days in a year, whereas moving towards the east this number decreases (126 days in Osijek). Looking at stations with the highest number of days with dew in a year, there is also Pazin, which stands out with 233 days. Because of the specific position of Pazin, in a ravine, dew is more frequent there than in other parts of inland Istria because it forms

Inje, Zagreb 23.12.2007.
Rime, Zagreb 23 December 2007.
Fotografija Photo by: Miroslav Jagušt

when water vapour condenses in terrain depressions, when ground air cools at night. In the cold part of the year, this results in frost. There is more dew in Lika (183 days) than in Gorski kotar (86 to 147 days). On the coast, dew occurs in 80 to 130 days a year and in Split it comes only 36 times a year.

At all stations, frost occurs in the colder part of the year, when the conditions for its occurrence are the most favourable, most frequently in December and January (graphs next to the map of mean dates of the beginning and the end of period with frost). The highest number of days with frost has been recorded at the Pazin station (95), which is, together with Zalesina in Gorski kotar, our most famous frost hollow. In the mountainous parts of Croatia, the annual number of days with frost is lower because the ground is covered with snow over long periods. This can be seen in Zavižan, where frost comes on average only 6 times a

Munja.
Lightning.
Fotografija Photo by: Jakša Kuzmičić

vonskom Brodu inje pojavljuje u prosječno 13 dana u godini. U obalnom pojasu u 30-godišnjem razdoblju inje je zabilježeno samo nekoliko puta, u unutrašnjosti Istre i dalmatinskom zaleđu.

Grmljavina i tuča pojave su vezane uz oblake vertikalnog razvoja, kumulonimbuse, koji najčešće nastaju u nestabilnoj atmosferi dizanjem zraka zbog jakog zagrijavanja od podloge ili nailaskom zraka na orografsku prepreku. U takvim oblacima razdvaja se električni naboj pa u samom oblaku ili između oblaka i površine Zemlje izbija munja odnosno na zemlju udara grom. Takvu pojavu električnog izbijanja, koja je praćena i karakterističnim zvukom (grmljenjem), nazivamo grmljavinom. Za potrebe klimatskog atlasa analizirani su dani u kojima je zabilježena grmljavina ili grmljenje.

Grmljavinska aktivnost najveća je u ljetnim mjesecima u kojima su izražena uzlazna gibanja toplog i vlažnog zraka. U kontinentalnom dijelu Hrvatske, Istri i na sjevernom Jadranu godišnji hod broja grmljavinskih dana ima oblik jednostrukog vala s maksimumom u kasno proljeće i rano ljeto, najčešće u lipnju. U unutrašnjosti to je posljedica naglog zagrijavanja kopna u proljeće i rano ljeto, što pogoduje dizanju zraka i nastanku grmljavinskih oblaka. U gorskim područjima prisilno dizanje zračne struje uz obronak pospješuje razvoj kumulonimbusa. Na sjevernom Jadranu kumulonimbusi nastaju na rubu hladnih fronti koje ljeti zahvaćaju većinom samo taj dio Jadrana. U kontinentalnom dijelu čestina grmljavinskih dana raste od sjevera prema jugu. U nizinskom dijelu kreće se od 24 dana u istočnoj Slavoniji do 39 u sjeverozapadnoj Hrvatskoj, dok je na području Like i Gorskog kotara zabilježeno od 38 do 50 grmljavinskih dana. Na većini postaja jadranskog područja ima više od 40 dana s grmljavinom, u Dubrovniku čak 56, što je najviše među analiziranim postajama. Najmanje ih je na zapadnoj obali Istre (25) i otocima sjevernog Jadrana (31). Godišnji hod broja grmljavinskih dana na otocima sjevernog Jadrana i u Dalmaciji nema izraženog maksimuma, a najveći broj grmljavinskih dana javlja se u razdoblju od svibnja do studenog. Na južnom Jadranu to je posljedica češćeg razvoja kumulonimbusa u jesen, kad je more najtoplije, na hladnoj fronti gdje hladnija zračna masa potiskuje toplu. Iako su u zimskom razdoblju grmljavinski dani rjeđi, znatno su češći nego u kontinentalnom dijelu.

Osim tople podloge koja zagrijava vlažan zrak i omogućava konvekciju, za nastanak tuče potrebna je niska temperatura u visini i jake uzlazne i silazne zračne struje u oblaku (brzine i do 15 ms^{-1}). Intenzivnim vertikalnim miješanjem zraka u kumulonimbusima ledeni kristali nastaju zaleđivanjem prehladnih kapljica vode. Zrna tuče rastu depozicijom vodene pare na kristalima leda, njihovim združivanjem i sudarima s kapljicama. Zrna tuče mogu biti promjera 5 mm ili većeg, a mogu narasti i nekoliko centimetara. Tuča je pojava lokalnog karaktera i zahvaća usko područje ispod gr-

year, in early autumn and late spring. There is also a somewhat higher number of days with frost in Gospić and Ogulin in November and March than during winter. In lowland Croatia, frost is somewhat more frequent in the western part, with 40 to 72 days per year, than in Slavonia, where, in the eastern part, it occurs on 46 days, and on 61 days in the area around the Sava River. On the Adriatic, frost is much less frequent than inland and the number of days with frost decreases going from the northern to the southern Adriatic. The west coast of Istria has around 40 such days, the area around Rijeka has 25, central Dalmatia, together with the hinterland, has from 21 to 34, while frost occurs only 3 to 5 times a year in southern Dalmatia.

Rime is a deposit of ice crystals on branches and objects, especially on the windward side. It forms at a temperature lower then 0°C, in a fog current or in a cloud cover made of supercooled water droplets which freeze instantaneously in contact with an obstacle. Rime creates additional weight on power-transmission lines, which can cause grave damage.

Rime is a phenomenon associated with continental Croatia. It most frequently occurs in the highlands, although it can occur in the lowlands during very cold and foggy weather. On Zavižan, there are as many as 87 days with rime, because it occurs in all months, except July and August. It occurs from 6 to 11 days a year in Gorski kotar and Lika. In the lowland part of Croatia, eastern Slavonia has the lowest number of days with rime (2 days a year), while the north-western area has about 4 to 9 days. In the Sava Valley, the conditions for rime occurrence are also favourable because of frequent fog in the cold part of the year. Therefore, in Slavonski Brod, rime occurs 13 times a year. In the coastal area, rime was recorded only a couple of times in a 30-year period in inland Istria and the Dalmatian hinterland.

Lightning with thunder and hail are phenomena connected with clouds with vertical development, cu-

Uzburkana površina mora padanjem velikih zrna tuče. Hvarska luka 25.8.2006.
Large hailstones rippling the sea surface, Hvar harbour, 25 August 2006.
Fotografija Photo by: Joško Vučetić

mulonimbi, which are most frequently formed by updrafts in an unstable atmosphere because of intense heating of the ground or because of orographic lift. In such clouds there is an electric discharge and within a cloud or between clouds and the surface of the Earth a flash of lightning, i.e. a thunderbolt, strikes the ground. This electrical discharge, which is accompanied by a characteristic sound (thunder), is called lightning with thunder. Days with lightning with thunder or only thunder were analysed so they could be entered into the climatic atlas.

Thunder activity is most frequent during the summer months, when there is a pronounced updraft of warm and moist air. In the continental part of Croatia, in Istria and on the northern Adriatic, the annual course of the number of thunder days has a form of a one-fold

Zrna tuče na tučomjeru.
Hailstones on a hail pad.
Fotografija Photo by: Stjepan Buneta

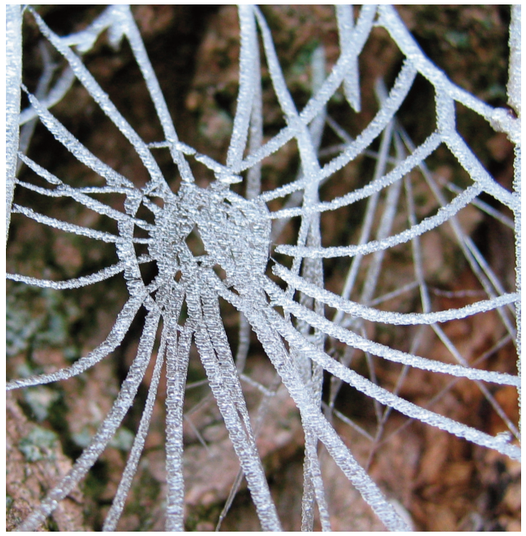
mljavinskog oblaka. Može izazvati velike štete, osobito u poljoprivrednim područjima.

Tuča se u Hrvatskoj vrlo rijetko pojavljuje. U većem dijelu zemlje pada jednom ili dva puta na godinu. U južnoj Dalmaciji nešto je češća te se pojavljuje 3 do 4 puta u godini, a na Zavižanu 5 puta na godinu. U skladu s opisanim uvjetima za nastanak kumulonimbusa, na kontinentalnim postajama, u Istri i na postajama sjevernog Jadrana tuča većinom pada u toplom dijelu godine. Ostatak obalnog pojasa više je izložen tuči u hladnom razdoblju. Na južnom Jadranu za vrijeme zimskih ciklona puše jugo noseći vlažan i topao zrak. Kad takav zrak dođe nad planine, prisiljen je dizati se. Nad planinama tada nastaju gusti oblaci pa u situacijama u kojima je dizanje zraka jako, može padati tuča. Treba napomenuti da se od početka sedamdesetih godina u ravničarskom dijelu Hrvatske provodi organizirana obrana od tuče.

wave with a maximum in late spring and early summer, most commonly in June. Inland, this is the consequence of sudden warming of the surface in spring and early summer, which is favourable to updrafts and the forming of thunderclouds, while in the highlands, in the mountains, there is an orographic lift of the air flow, which contributes to the forming of cumulonimbi. In the northern Adriatic, cumulonimbi form at the edge of cold fronts, which in summer affect mostly this part of the Adriatic. In the continental part, the frequency of thunder days increases going from the north towards the south. In the lowlands, their frequency is from 24 in eastern Slavonia to 39 in north-western Croatia, while there are 38 to 50 thunder days in Lika and Gorski kotar. At most stations in the Adriatic, there are more than 40 days with thunder, and even 56 in Dubrovnik, which is the highest number among the stations analysed. The lowest number of days is on the west coast of Istria (25) and on the northern Adriatic islands (31). There is no maximum in the annual course of the number of thunder days on the northern Adriatic islands and in Dalmatia, and the highest number of thunder days is in the period between May and November. On the southern Adriatic it is the consequence of more frequent cumulonimbi formation in autumn, when the sea is the warmest, with cold fronts, where the cooler air mass pushes back the warm one. Although thunder days are less common in winter, they are significantly more frequent than in the continental part.

Aside from a warm surface which heats moist air and makes convection possible, low temperature at a certain altitude and strong updrafts and downdrafts in the clouds (which can reach the speed of 15 ms^{-1}) are also important for the formation of hail. When the air is intensely vertically mixed in the cumulonimbi, ice crystals form when the supercooled water droplets freeze. Hailstones grow when water vapour is deposited on the ice crystals, then they join together and collide with the water droplets. Hailstones can measure 5 mm in diameter, and can grow up to a few centimetres. Hail is a local phenomenon and it covers the narrow area below the thundercloud. It can cause severe damage, especially in agricultural areas.

Hail occurs very rarely in Croatia. In most of the country it falls once or twice a year. In southern Dalmatia, it is somewhat more frequent and it occurs 3 to 4 times a year, while in Zavižan it occurs 5 times a year. Because of the conditions leading to cumulonimbus formation, at the continental and northern Adriatic stations and in Istria, hail is more common in the warm part of the year. The rest of the coastal area usually experiences hail in the cold period. On the southern Adriatic, during the winter cyclones, *jugo* carries humid and warm air. When such air passes over the mountains, it is forced to lift. Dense clouds then form above the mountains so that in situations when updrafts are intense there can be hail. It is worth mentioning that there has been an organised anti-hail defence in the lowland part of Croatia since the beginning of the 1970s.



Zaleđena paučina.
Frozen spiderweb.
Fotografija Photo by: Helena Lebo

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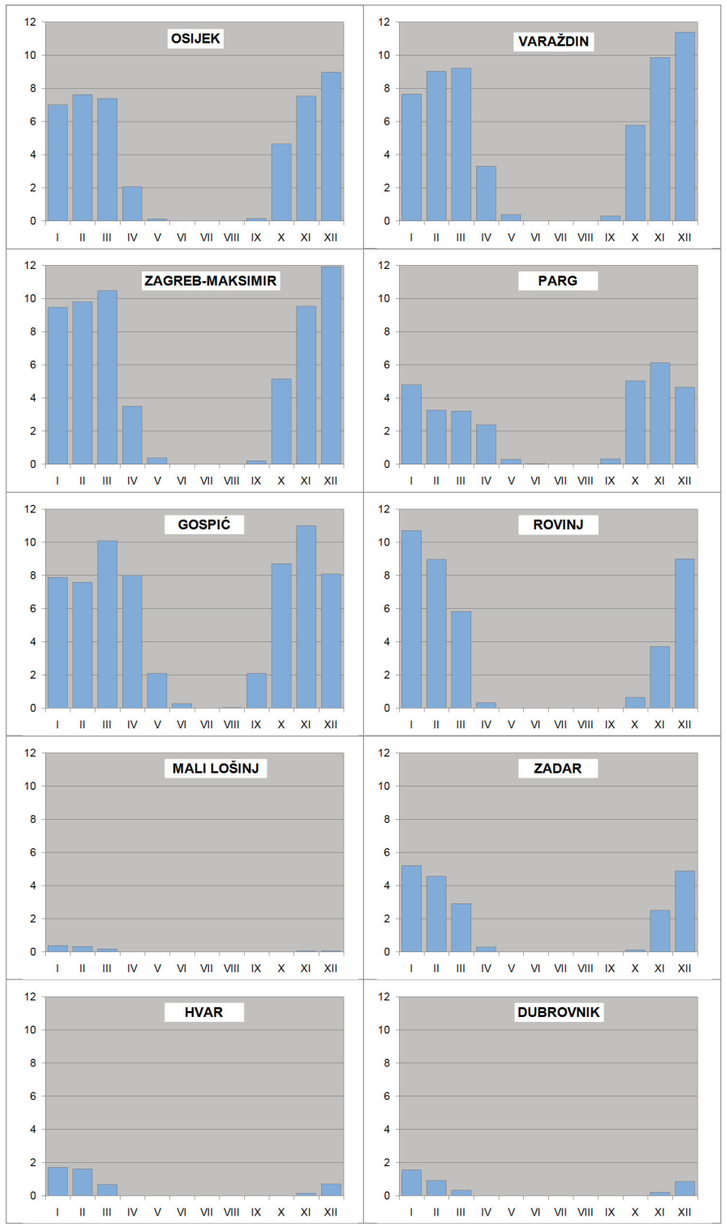
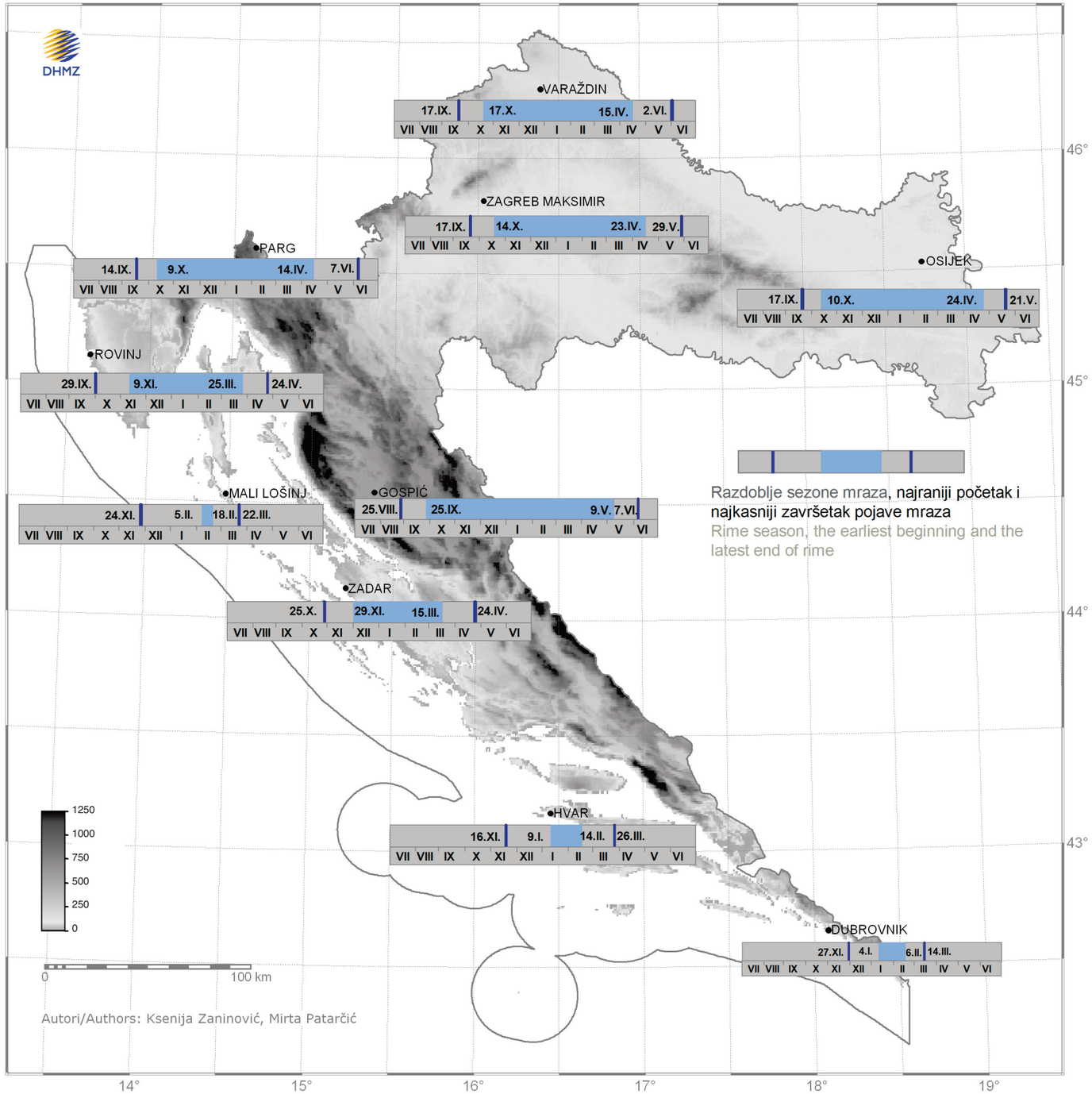


Godišnji hod broja dana s mrazom.

Annual course of the number of days with frost.



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Tipovi vremena
Weather types

Višnja Vučetić
Edita Lončar

Tipovi vremena klasificirani prema Poji određuju se za područje Hrvatske već više od 40 godina. Ta tipizacija prikladna je za određivanje tipova vremena za relativno mala i raznolika područja poput Hrvatske, a sadrži dvadeset i devet tipova vremena, koji su prikazani i opisani ispod slika. Na kartama u prilogu područja niskog tlaka označena su s *N*, a područja visokog tlaka s *V*.

Dugi nizovi tih podataka za jadranski i kontinentalni dio Hrvatske pridonijeli su njihovoj primjeni koja omogućuje odabir srodnih slučajeva već prema zahtjevima istraživanja, i to ne samo u meteorologiji, nego i u drugim znanstvenim disciplinama. Tipizacija vremena prema prizemnoj razdiobi tlaka razlikuje četiri osnovne grupe baričkih konfiguracija. To su područje niskog tlaka (ciklona i dolina), područje visokog tlaka (anticiklona, greben i most visokog tlaka), bezgradijentna polja (mali gradijent tlaka sa slabim strujanjem ili tišinama) i prijelazna stanja s advekcijom iz nekog od osam smjerova N, NE, E, SE, S, SW, W, NW. Veliki barički sustavi ciklone i anticiklone dijele se na prednju (N_1, V_1), donju (N_2, V_2), stražnju (N_3, V_3) i gornju stranu (N_4, V_4) te središte (N_c,V_c), a doline na prednju (Dol_1, $Zodol_1$) i stražnju (Dol_3, $Zodol_3$) stranu te na os doline (Dol_2, $Zodol_2$) (Slika 3)

Unutar istog tipa atmosferske cirkulacije vremenske prilike u unutrašnjosti Hrvatske razlikuju se od onih na njezinu obalnom području prvenstveno zbog diskontinuiteta kopno-more, a zatim i zbog reljefa tla duž naše obale. Miješanje maritimnih i kontinentalnih utjecaja tipično je za Istru, bura za podvelebitsku obalu, a jugo pretežito u hladnom dijelu godine i etezija ljeti za srednji i južni Jadran. Budući da karakteristične razlike u iznosima, hodovima i ponašanju i drugih meteoroloških veličina (osunčavanja, naoblake, tlaka zraka, oborine,

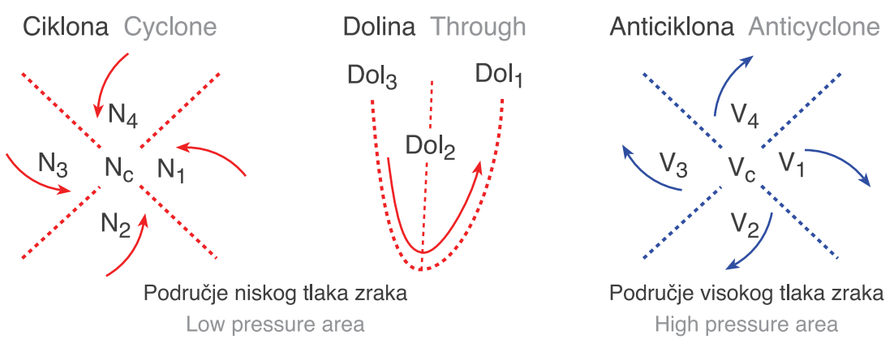
Weather types in Croatia have been determined according to the Poje typification for over 40 years. This typification is used to determine weather types for relatively small and diverse areas like Croatia and is regularly applied in determining weather types in this country. The typification consists of twenty-nine weather types, which are shown and described in the appendix. Low pressure areas are marked *N* in the charts, and high pressure areas are marked *V*.

The existing long data series of weather types for coastal and mainland Croatia, have contributed to their application, making possible a choice of related cases according to the requirements of research, not just in meteorology, but also in other scientific disciplines. In the weather typification according to surface distribution of pressure there are four basic groups of baric configurations. These are: low-pressure area (cyclone and trough), high-pressure area (anticyclone, high pressure ridge and bridge), zero-pressure gradient field (small pressure gradient with a weak air stream or calm) and transitional states with advection from one of the eight circulation directions N, NE, E, SE, S, SW, W, NW. The great baric cyclone and anticyclone systems are divided into front (N_1, V_1), down (N_2, V_2), rear (N_3, V_3), upper side (N_4, V_4) and centre (N_C, V_C), and the trough is divided into a front (Dol_1, $Zodol_1$) and a rear side (Dol_3, $Zodol_3$), along with the trough axis (Dol_2, $Zodol_2$) (Figure 3).

Within the same type of atmospheric circulation, weather conditions in inland Croatia differ from those in the coastal area primarily because of the land-sea discontinuity, and also because of the relief along the coast. A mixture of maritime and continental influences is typical of Istria, *bura* of the sub-Velebit coast, *sirocco* mostly in the cold part of the year and *etesian* winds in the summer, on the middle and southern Adriatic. As the characteristic differences between amounts, variations, behaviour and other meteorological values (in-

Prolaz hladne fronte iznad Kvarnera 12.7.2007. u rano poslijepodne.
Cold front passage over the Kvarner Bay in the early afternoon on 12 July 2007.
Fotografija Photo by: Marjana Gajić-Čapka

Radijacijska magla u NP Plitvička jezera.
Radistion fog in NP Plitvice lakes.
Fotografija Photo by: Marko Vučetić



Slika 3. Shematski prikaz podjele ciklone, doline i anticiklone
Figure 3. Scheme of a cyclone, through and anticyclone

Oblaci Altocumulus castellanus koji najavljuju nailazak tople zračne struje.
Altocumulus castellanus clouds announcing the arrival of a warm airflow.
Fotografija Photo by: Joško Vučetić

temperature zraka, a ne samo vjetra) pokazuju sličnu podjelu, tipovi vremena određuju se za kontinentalnu Hrvatsku i posebno za svaki dio hrvatskog Jadrana (za Istru i sjeverno Hrvatsko primorje kao sjeverni Jadran te Dalmaciju kao srednji Jadran).

Svi se tipovi vremena određuju na osnovi prizemne razdiobe tlaka zraka u jednom od sinoptičkih termina (00, 06 ili 12 UTC), a po potrebi se rabe i vremenski najbliže visinske situacije prikazane na kartama AT 850 hPa u 00 ili 12 UTC.

Određujući tipove vremena za kontinentalnu Hrvatsku i sjeverni Jadran iz razdoblja 1971–2000. te srednji iz razdoblja 1981–2000. dana je prednost prizemnoj razdiobi tlaka zraka prikazanoj na sinoptičkim kartama dnevnih termina (06 ili 12 UTC) njemačke meteorološke službe (*Europäischer Wetterbericht – Deutschen Wetterdienstes*) kad su one bile dostupne. Sinoptičke karte noćnog termina (00 UTC) te meteorološke službe upotrebljavale su se u nedostatku drugih ili u problematičnim slučajevima koji su zahtijevali pomoć istovremene visinske situacije na karti apsolutne topografije 850 hPa.

Bez obzira na to što je pridruživanje tipa vremena razdiobi prizemnog polja tlaka sinoptičkih situacija određenog termina (u 00 UTC, 06 UTC ili 12 UTC) subjektivno, opisana klasifikacija vremenskih tipova omogućuje jednostavnu ocjenu najčešćih odnosno najvjerojatnijih tipova vremena kao i njihov hod tijekom godine koji je prikazan na grafikonima.

Greben visokog tlaka i anticiklonalno bezgradijentno polje najučestaliji su tipovi vremena u Hrvatskoj s time da je greben nešto češći u kontinentalnoj Hrvatskoj (14,7% za unutrašnjost, 11,5% sjeverni i 10,6% srednji Jadran), a anticiklonalno bezgradijetno polje na Jadranu (13,4%, 13,7% i 13,6%). S relativnom čestinom između 5% i 8% javljaju se prednja strana ciklone i doline te prednja, donja i stražnja strana anticiklone kao i ciklonalno bezgradijentno polje. Ostali tipovi vremena su vrlo rijetki, s godišnjom učestalošću manjom od 1%.

solation, cloudiness, air pressure, precipitation, air temperature, and not only wind) show a similar classification, weather types have been determined for continental Croatia and for each part of the Croatian coast (for Istria and the northern Croatian Littoral as the northern Adriatic and Dalmatia as the middle Adriatic) separately.

All weather types have been determined on the basis of the surface distribution of air pressure at one of the synoptic terms (00, 06 or 12 UTC), and, where necessary, time-approximated upper-level situations have been used, which are shown on the charts AT 850 hPa at 00 or 12 UTC.

In determining the weather types in continental Croatia and the northern Adriatic in the period 1971–2000, and also in the middle Adriatic in the period 1981–2000, advantage has been given to the surface distribution of air pressure shown on the synoptic charts of day terms (06 or 12 UTC) of the German weather service (*Europäischer Wetterbericht – Deutschen Wetterdienstes*), when they were available. The synoptic charts of the night term (00 UTC) of the same weather service were used when other were not available or in problem cases which demanded the help of a simultaneous upper-air situation on a chart of an absolute topography of 850 hPa.

Even though the association of a weather type to the surface distribution of air pressure in a synoptic situation at a certain term (in 00 UTC, 06 UTC or 12 UTC) is subjective, the typification described allows a simple estimation of the most common, i.e. the most probable weather types as well as their cycle during the year, which is shown in the following figures.

The high pressure ridge and the anticyclonic zero pressure gradient field are the most common weather types in Croatia, the ridge being a little more common in continental Croatia (14.7% inland, 11.5% on the northern and 10.6% on the middle Adriatic), and the anticyclone zero pressure gradient on the Adriatic

Jaka bura u Velebitskom kanalu 6. 2. 2005.
Strong bura in Velebit channel, 6 February 2005.
Fotografija Photo by: Stjepan Ivatek-Šahdan

(13.4%, 13.7% and 13.6%, respectively). A relative frequency from 5% to 8% applies also to the front side of the cyclone and the trough, and the front, bottom and rear side of the anticyclone, as well as the cyclonic zero pressure gradient. Other weather types are very rare with an annual frequency of less than 1%.

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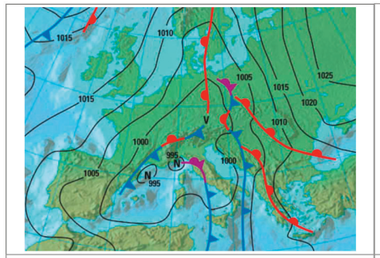
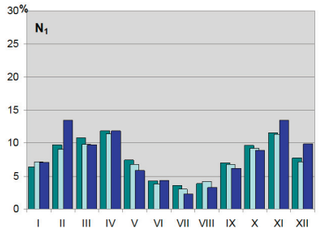


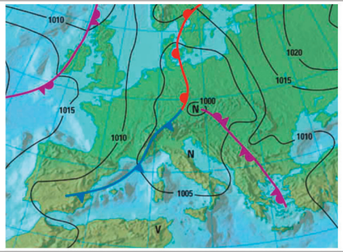


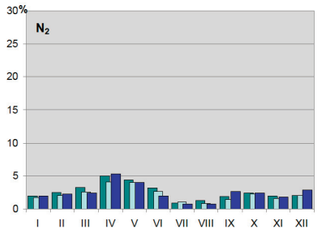
Istočni (prednji) sektor ciklone (N_1) – primjer 13.4.2002.

Ukoliko je središte sredozemne ili zapadnoeuropske ciklone zapadnije od naše zemlje, Hrvatska se nalazi u istočnom sektoru s dobro izraženom advekcijom toplog zraka. Tu spadaju i kratkotrajne sekundarne ciklone. Naime, u slučaju opće ciklonalne cirkulacije nad područjem velikog dijela Europe pri prodoru hladnog zraka u sredozemno-jadranski bazen stvaraju se plitke ciklone kratkog trajanja. Tip vremena N_1 daje obilježje vremena proljetnih i kasnojesenskih mjeseci.

Eastern (front) sector of cyclone (N_1) – example 13 April 2002

If the centre of a Mediterranean or western European cyclone is to the west of Croatia, then the country lies in the eastern sector with a prominent advection of warm air. Shortterm secondary cyclones also belong here. In the case of general cyclonic circulation over a large part of Europe, shallow cyclones of short duration form with the cold air outbreak into the MediterraneanAdriatic basin. The N1 weather type is characteristic of spring and the late autumn months.



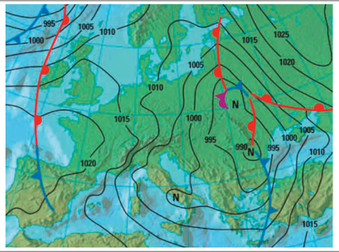


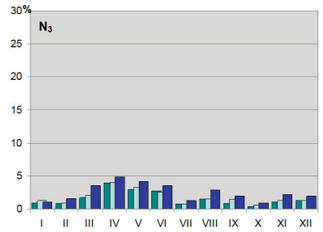
Južni (donji) sektor ciklone (N_2) – primjer 14.4.2002.

Taj sektor pripada prostranim i do velikih visina razvijenim ciklonama sa središtem u srednjoj ili sjevernoj Europi. Pri tom je južni sektor N_2 uključen u prijenos zraka iz najsjevernijih područja do srednjeg i istočnog Sredozemlja. Taj ciklonalni tip vremena javlja se u nas najčešće u proljeće.

Southern (lower) sector of cyclone (N_2) – example 14 April 2002

This sector belongs to large cyclones developed to great heights with their centre in central or northern Europe. The southern sector N_2 is included in the air transfer from the northernmost areas to the central and eastern Mediterranean. This cyclonic type of weather appears in Croatia mostly in springtime.



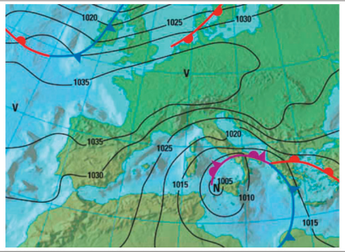


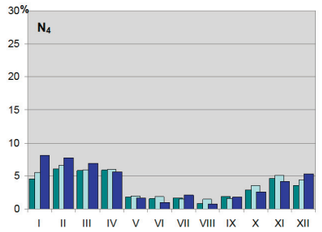
Zapadni (stražnji) sektor ciklone (N_3) – primjer 6.2.2002.

Odmicanjem ciklone na istok jednom od van Bebberovih putanja (staza) V_c ili V_{d1} naša zemlja dolazi pod utjecaj zapadnog sektora ciklone. Taj ciklonalni tip vremena javlja se rjeđe od ostalih, i to uglavnom u toplijem dijelu godine.

Western (back) sector of cyclone (N_3) – example 6 February 2002

As the cyclone moves eastward in one of van Bebber's paths V_c or V_{d1} Croatia falls under the influence of the western sector of cyclone. This cyclonic type of weather occurs less frequently than the others; mostly in the warm season.



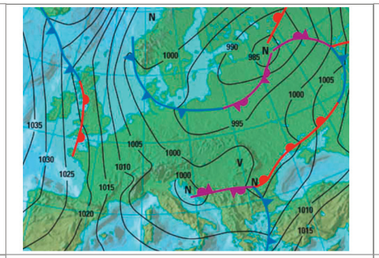


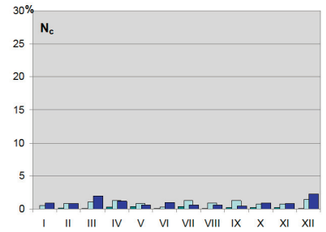
Sjeverni (gornji) sektor ciklone (N_4) – primjer 25.1.2003.

Zadržavanjem ciklone u srednjem Sredozemlju zbog blokirajuće pozicije anticiklone koja prevladava nad preostalim većim dijelom Europe, naša se zemlja nalazi u sjevernom sektoru sredozemne ciklone. Osim toga, pri premještanju ciklone duž Jadrana svi dijelovi naše obale, od sjevera prema jugu, postupno dolaze pod utjecaj tipa vremena N_4. Istovremeno to znači prijenos hladnog zraka iz unutrašnjosti, koji se na obalu prelijeva kao bura. To je tip hladnog dijela godine.

Northern (upper) sector of cyclone (N_4) – example 25 January 2003

When the cyclone stays in the central Mediterranean due to the blocking position of the anticyclone which dominates over the remaining larger part of Europe, Croatia lies in the northern sector of the Mediterranean cyclone. In addition, as the cyclone moves along the Adriatic, all the parts of the Croatian coast, from north to south, gradually come under the influence of the N_4 weather type. At the same time this means that cold air is transferred from the interior and flows to the coast as *bura* This is a type occurring in the cold season.



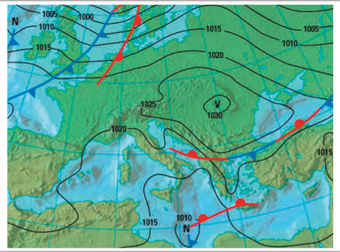


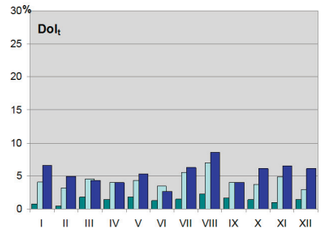
Središte ciklone (N_c) – primjer 30.1.2003.

Središte vrtloga (N_c) uključeno je u razvoj i kretanje ciklone. Zadržavanje središta ciklone nad našim područjem pretežno nad Jadranom obično je kraće od razmaka vremena između dviju uzastopnih sinoptičkih karata na osnovi kojih se određuju tipovi vremena. Zbog toga je učestalost tog tipa vremena vjerojatno podcijenjena. Taj tip vremena javlja se u svim godišnjim dobima sa sličnom učestalošću.

Centre of cyclone (N_c) – example 30 January 2003

The centre of the vortex (N_c) is included in the development and movement of the cyclone. The period during which the cyclone centre stays over Croatia, mostly over the Adriatic, is usually shorter than the timespan between two successive synoptic charts which serve as a basis for determining weather types. This is why the frequency of this weather type is probably underestimated. This weather type occurs in all seasons with similar frequency.





Dolina niskog tlaka Dol_t – primjer 9.3.2002.

Dol_t je specifična termička dolina niskog tlaka za područje jadranskog bazena jer se najčešće podudara s njegovim dimenzijama (oblikom i orijentacijom). Javlja se samo nad Jadranskim morem kroz cijelu godinu zbog utjecaja mora i pružanja planinskih lanaca paralelno s obalom.

Pressure through Dol_t – example 9 March 2002

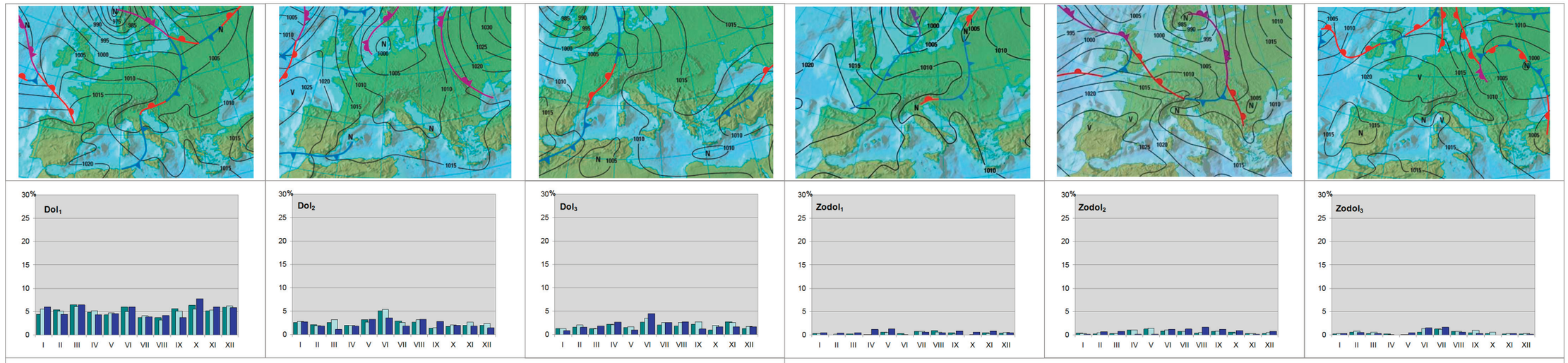
Dol_t is a specific thermal lowpressure trough for the area of the Adriatic basin because it most often corresponds to its dimensions (form and orientation). It appears only over the Adriatic throughout the year because of the influence of the sea and the mountain range that stretches along the coast.

- Kontinentalna Hrvatska / Continental part of Croatia
- Sjeverni Jadran / Northern Adriatic
- Srednji Jadran / Middle Adriatic

Prilagođeno prema Lončar i Vučetić (2003)
Adapted to Lončar and Vučetić (2003)

Godišnja razdioba tipova vremena (%) za kontinentalnu Hrvatsku i sjeverni Jadran u razdoblju 1971–2000. te srednji Jadran u razdoblju 1981–2000.

Annual distribution of weather types (%) for the continental part of Croatia and northern Adriatic for period 1971–2000 and midAdriatic for period 1981–2000.



Doline niskog tlaka (Dol_1, Dol_2, Dol_3) – primjeri 24.10.2002, 23.1.2003. i 23.5.2002.

Doline niskog tlaka, koje su povezane s dobro razvijenim ciklonalnim sustavom čija su središta (može ih biti više) nalaze daleko na sjeveru Europe, ukliještene su u svom južnom dijelu obično između azorske i istočnoeuropske anticiklone. Pri tom naša zemlja može biti na prednjoj strani doline (istočno od osi doline), tip vremena Dol_1 (primjer: 24.10.2002.), zatim na osi doline, tip vremena Dol_2 (primjer: 23.1.2003.) ili na njenoj stražnjoj strani (zapadno od osi doline), tip vremena Dol_3 (primjer: 23.5.2002.). Među tim tipovima vremena, koji se javljaju cijele godine, najčešći je tip vremena prednja strana doline (Dol_1).

Zonalne doline ($Zodol_1$, $Zodol_2$, $Zodol_3$) – primjeri 21.8.2004, 20.3.2002. i 14.8.2002.

To je dolina niskog tlaka sa zonalno položenom osi. Ti tipovi vremena razlikuju se od prethodnih dolina, ne samo zbog orijentacije svoje osi, nego i zbog svoje slabije izraženosti, kratkog trajanja i vrlo male učestalosti pa ne utječu znatno na vremenske značajke. Osim toga, Jadran može biti pod utjecajem nekog od Zodoltipova, a unutrašnjost Hrvatske u području sasvim drugog tipa vremena. Npr. vidi kartu gdje je $Zodol_3$ tipičan za Jadran, a istovremeno je unutrašnjost pod utjecajem visokog tlaka zraka.

Pressure throughs (Dol_1, Dol_2, Dol_3) – examples 24 October 2002, 23 January 2003 and 23 May 2002

Lowpressure troughs, which are connected to a welldeveloped cyclone system whose centres (there may be more than one), lie far in the north of Europe, are wedged in their southern part usually between the Azores and the eastern European anticyclone. Croatia can be on the front side of the trough (east of the trough axis), weather type Dol_1 (example: 24 October 2002), then on the axis of the trough, weather type Dol_2 (example: 23 January 2003) or at its back (west of the trough axis), weather type Dol_3 (example: 23 May 2002). Among those weather types, which occur throughout the year, the most frequent one is the front side of the trough (Dol_1).

Zonally oriented pressure throughs ($Zodol_1$, $Zodol_2$, $Zodol_3$) – examples 21 August 2004, 20 March 2002 and 14 August 2002

This is a lowpressure trough with a zonally positioned axis. Such weather types differ from the previously described troughs not only because of their axis orientation, but also because they are less prominent, last shorter and occur very infrequently, so they don't influence weather features in a significant way. In addition, the Adriatic can be under the influence of any of the Zodol types, whereas the interior of the country can lie in the area of a completely different weather type. E.g. see the chart with $Zodol_3$, which is typical for the Adriatic, while at the same time the interior is under the influence of high air pressure.

- Kontinentalna Hrvatska / Continental part of Croatia
- Sjeverni Jadran / Northern Adriatic
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Prilagođeno prema Lončar i Vučetić (2003)
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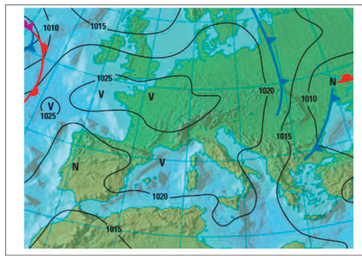
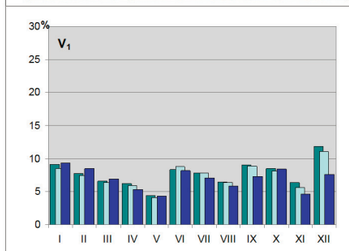
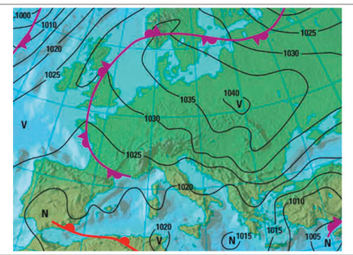
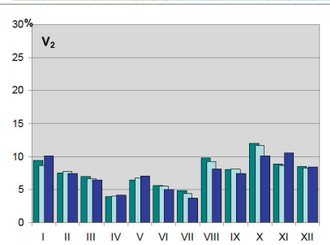



Istočni (prednji) sektor anticiklone (V_1) – primjer 31.5.2002.

Taj sektor pripada prostranim anticiklonama (zapadne, srednje i južne Europe), čiji je centar zapadno ili sjeverozapadno od naše zemlje. To je stabilan sustav dužeg trajanja, a javlja se tijekom cijele godine.

Eastern (front) sector of anticyclone (V_1) – example 31 May 2002

This sector belongs to large anticyclones (of western, central and southern Europe), whose centre lies to the west or northwest of Croatia. It is a stable system of longer duration and it appears throughout the year.

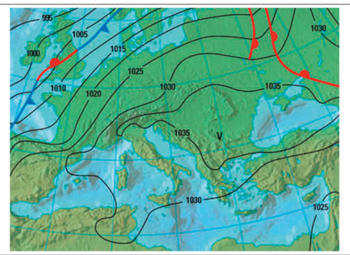
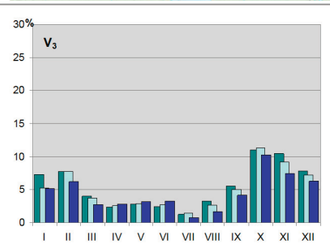



Južni (donji) sektor anticiklone (V_2) – primjer 13.2.2003.

Južni sektor anticiklone čiji je centar sjeverno od Hrvatske s prevladavajućim utjecajem ne samo nad većim dijelom Europskog kopna nego i nad zapadnim i srednjim Sredozemljem. Iako je čestina tog tipa vremena značajna kroz cijelu godinu, ipak je najčešći u jesen.

Southern (lower) sector of anticyclone (V_2) – example 13 February 2003

The southern sector of anticyclone whose centre is north of Croatia with a dominant influence not only over the larger part of the European mainland but also over the western and central Mediterranean. Although this weather type is frequent throughout the year, it is most frequent in autumn.

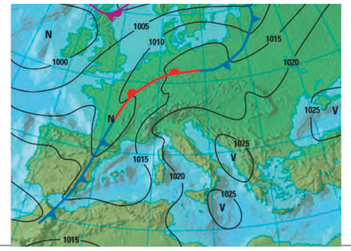
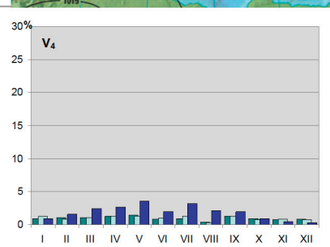



Zapadni (stražnji) sektor anticiklone (V_3) – primjer 3.2.2002.

Zapadna odnosno stražnja strana onog dijela europske anticiklone (središte istočno ili sjeveroistočno od naše zemlje) u kojem ona slabi i pokazuje tendenciju prelaska u neki drugi tip vremena. Taj tip vremena susreće se često, i to osobito u jesen i zimi.

Western (back) sector of anticyclone (V_3) – example 3 February 2002

This is the western, i.e. the back side of that part of the European anticyclone (the centre is east or northeast of Croatia) where it starts to weaken and shows a tendency to turn into another weather type. This is a frequent weather type, especially during autumn and winter.

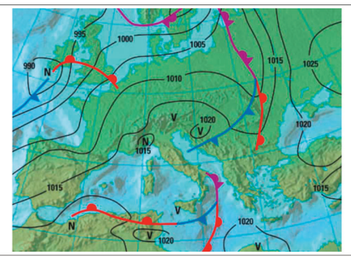
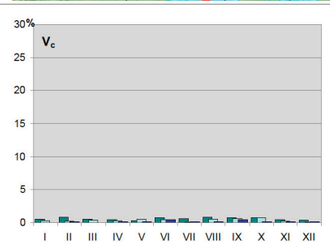



Sjeverni (gornji) sektor anticiklone (V_4) – primjer 30.4.2003.

Slabljenje i transformacija južnoeuropske anticiklone uz premještanje njezina središta u Sredozemlje dovodi područje Hrvatske i osobito Jadrana pod utjecaj sjevernog (gornjeg) sektora anticiklone. Taj se tip vremena javlja cijele godine s relativno malom čestinom.

Nothern (upper) sector of anticyclone (V_4) – example 30 April 2003

The weakening and transformation of the southern European anticyclone as its centre moves to the Mediterranean places Croatia, especially the Adriatic, under the influence of the northern (upper) sector of the anticyclone. This weather type occurs throughout the year, relatively infrequently.

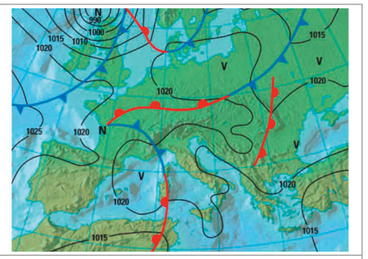
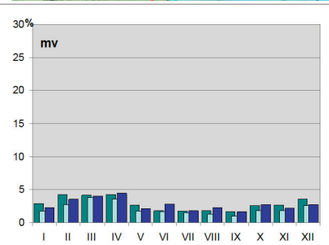



Središte anticiklone (V_c) – primjer 28.4.2003.

Naše područje nije pogodno za stvaranje velikih anticiklonalnih sustava pa zato niti za stvaranje i održavanje središta anticiklone. U vezi s tim čestina tog tipa vremena je mala.

Centre of anticyclone (V_c) – example 28 April 2003

Croatia is not an area suitable for the formation of large anticyclone systems, nor for the formation and susteinment of the anticyclone centre. Because of this, this weather type occurs infrequently.

Most visokog tlaka (mv) – primjer 8.5.2003.

Most visokog tlaka jest tip vremena koji razdvaja dva ciklonalna sustava obično smještena jedan drugomu nasuprot, a istovremeno preko naše zemlje povezuje azorsku i istočnoeuropsku anticiklonu.

Bridge of high pressure (mv) – example 8 May 2003

The bridge of high pressure is a weather type that divides two cyclonic systems, which usually face one another, and at the same time connects the Azorean and southern European anti-cyclones via Croatia.

- Kontinentalna Hrvatska / Continental part of Croatia
- Sjeverni Jadran / Northern Adriatic
- Srednji Jadran / Middle Adriatic

Prilagođeno prema Lončar i Vučetić (2003)
Adapted to Lončar and Vučetić (2003)

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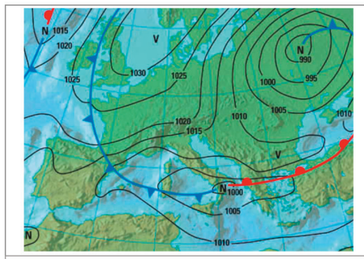
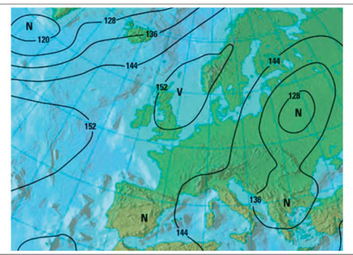
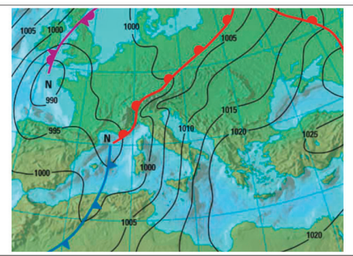
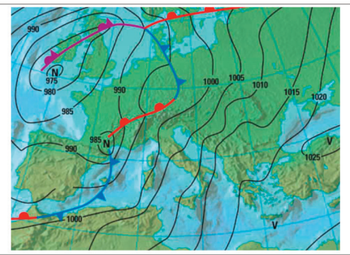
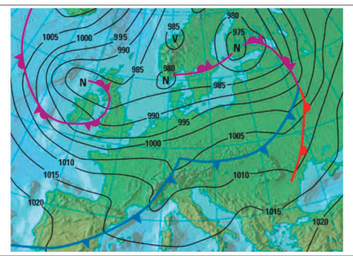
Annual distribution of weather types (%) for the continental part of Croatia and northern Adriatic for period 1971–2000 and midAdriatic for period 1981–2000.

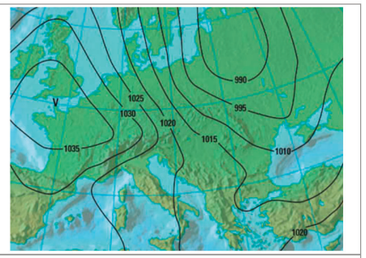


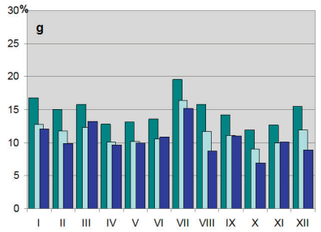






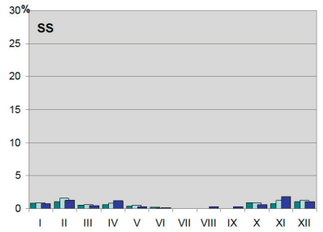


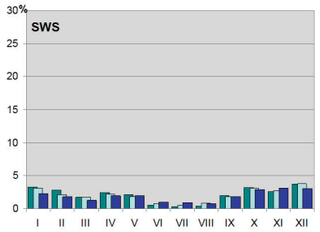


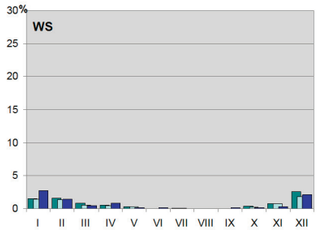


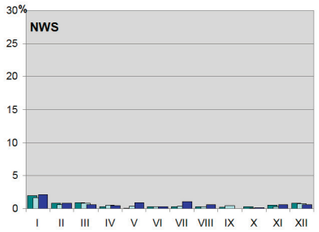
Sinoptička karta AT 850 hPa primijenjena za pravilniju ocjenu grebena visokog tlaka

Synoptic chart AT 850 hPa applied for a more accurate estimate of highpressure ridge









Greben visokog tlaka (g) – primjer 7.4.2003.

Tip vremena greben visokog tlaka odgovara području povišenog tlaka u odnosu na susjedna područja, a nastaje pri transformaciji baričkih sustava. Pravi predstavnik grebena jest onaj koji nastaje u fazama stvaranja ili raspadanja anticiklone. Zbog vertikalne supsidencije i horizontalne divergencije odlikuje se osobinama područja visokog tlaka, što znači i odgovarajućim vremenskim prilikama. Međutim greben koji nastaje iza hladne fronte samo zbog termički uvjetovanog porasta tlaka nema osobine vremena tipične za greben visokog tlaka, jer se u njemu zadržava oblačno vrijeme, pa čak i kiša. Ispitivanja prijelaza iz jednog tipa vremena u drugi pokazuju da se tip vremena greben visokog tlaka formira češće nakon tipa vremena koji pripada području niskog tlaka (Dol_3, Dol_2, N_3 i NES) negoli iza anticiklonalnih tipova vremena. Prema tome prizemna raspodjela tlaka zraka ne može jednoznačno definirati taj tip vremena, pa je nužno analiziranje visinske karte AT 850 hPa vremenski najbliže prizemnoj situaciji.

Ridge of high pressure (g) – example 7 April 2003

This weather type ridge of high pressure corresponds to the high pressure in relation to neighboring area and it is formed during the transformation of baric systems. The best representative of the ridge is the one forming in the phases of formation or decay of the anticyclone. Due to vertical subsidence and horizontal divergence it has features of the highpressure area, which also includes corresponding weather conditions. However, a ridge formed after the cold front only due to thermal caused pressure increase doesn't have features of weather typical of the high pressure ridge because of prevailing clouds and sometimes even rain. Research into transformation from one into another weather type indicate that the weather type of high pressure ridge forms more often after a weather type belonging to the lowpressure area (Dol_3, Dol_2, N_3 and NES) than after anticyclonic weather types. Because of this the surface air pressure distribution cannot unequivocally define this weather type and it is necessary to analyze the upperlevel chart AT 850 hPa, which is closest in time to the situation at the surface.

Južno stanje (SS) – primjer 16.11.2002.

Taj tip vremena odgovara stanju između sredozemne i zapadnoeuropske ciklone te istočnoeuropske anticiklone s južnim vjetrom velikih brzina, koji katkad postiže i olujnu jačinu. Taj je tip vremena najčešći zimi.

Southern type (SS) – example 16 November 2002

This weather type corresponds to a type between the Mediterranean and western European cyclone and the south European anticyclone with a south wind of high speed, which sometimes reaches severe intensity. This weather type occurs most frequently in winter.

Jugozapadno i zapadno stanje (SWS, WS) – primjeri 15.11.2002. i 28.2.2002.

Na području naše zemlje susreće se SWS (15.11.2002.) ili WS (28.2.2002.) kad nad Europom i susjednim morima uključujući i dio Atlantskog oceana (Azori) vlada isključivo ciklonalna cirkulacija s jakim zonalnim strujanjem preko većeg dijela južne Europe i Sredozemlja ovisno o orijentaciji izobara na prizemnoj, a osobito na karti AT 850 hPa. Oba tipa kao i njihov prethodnik najčešći su zimi.

Southwestern and western type (SWS, WS) – examples 15 November 2002 and 28 February 2002

SWS (15 November 2002) or WS (28 February 2002) occurs in Croatia when over Europe and the neighbouring seas, including a part of the Atlantic ocean (the Azores), dominates only cyclonic circulation with a strong zonal air stream over a larger part of southern Europe and the Mediterranean depending on the orientation of isobars on the surface chart, particularly on the chart AT 850hPa. Both types as well as their predecessor appear mostly frequently in winter.

Sjeverozapadno stanje (NWS) – primjer 9.2.2004.

Azorska anticiklona pomaknuta na sjeveroistok i udružena s anticiklonom u jugozapadnoj Europi i u zapadnom Sredozemlju s jedne strane, a ciklone nad sjevernom i sjeveroistočnom Europom s druge, uvjetuje jako strujanje NW smjera iznad sjeverozapadne, srednje i jugoistočne Europe. I taj tip vremena najčešći je u zimskim mjesecima.

Northwesterly type (NWS) – example 9 February 2004

The Azorean anticyclone moved to the northeast and combined with the anticyclone in southeastern Europe and the western Mediterranean from one side and the cyclone over northern and southwestern Europe from the other side causes a strong air stream of NW direction over northwestern, central and southeastern Europe. This weather type is also most frequent in the winter months.

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Adapted to Lončar and Vučetić (2003)

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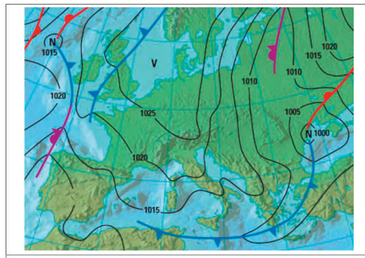
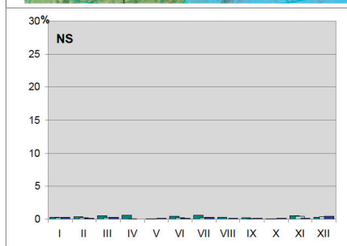
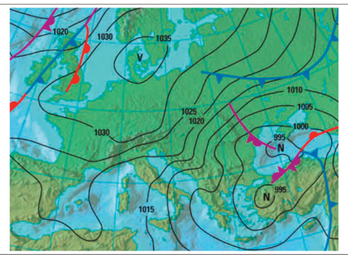
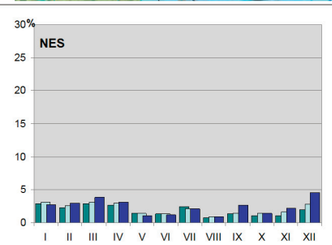



Sjeverno stanje (NS) –
primjer 8.4.2003.

Međusobni položaj anticiklona i ciklona gotovo je isti kao i kod prijelaznog stanja NWS, samo se izobare izrazitije poklapaju sa smjerom meridijana. Čestina tog tipa vremena neznatna je.

Northern type (NS) –
example 8 April 2003

The mutual position of anticyclones and cyclones is almost identical to the transitional type NWS, but the isobars correspond more prominently with meridian direction. The frequency of this weather type is negligible.

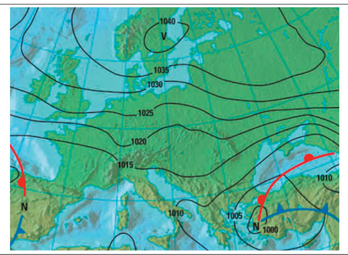
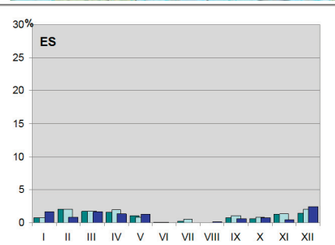



Sjeveroistočno stanje (NES) –
primjer 25.3.2002.

Naša se zemlja nalazi na granici između prostrane anticiklone koja prevladava u Europi i ciklone u istočnom Sredozemlju s pojačanim vjetrom NE smjera koji na Jadranu puše kao bura čak i olujne jačine. Taj je tip vremena najčešći zimi i u rano proljeće.

Northeastern type (NES) –
example 25 March 2002

Croatia lies between a large anticyclone prevailing over Europe and a cyclone over the eastern Mediterranean with intensified wind of NE direction that blows on the Adriatic as *bura* with stormy intensity at times. This weather type is most frequent during winter and in early spring.

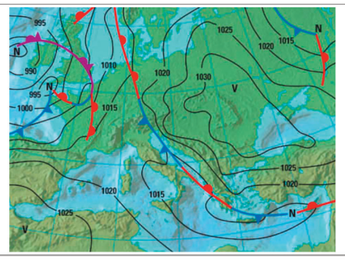
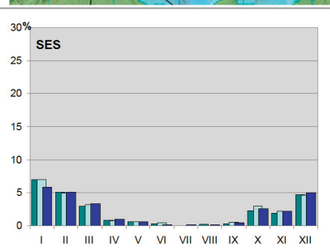



Istočno stanje (ES) –
primjer 19.4.2003.

ES vrlo je slično tipu vremena N_4, a predstavlja graničnu zonu pravocrtnih izobara između sredozemne ciklone i zapadnoeuropske odnosno sjeverno-europske anticiklone. Za vrijeme tog tipa vremena puše jak do olujan hladan istočni vjetar povezan s oblačnim vremenom, povremeno kišom, ali nerijetko i snijegom. Najčešće je zimi i u proljeće.

Eastern type (ES) –
example 19 April 2003

ES is very similar to the N_4 weather type and it presents a boundary zone of linear isobars between the Mediterranean and the western European, i.e. northern European anticyclone. During this weather type there is a strong, at times severe, cold east wind connected with cloudy weather and sometimes with rain or snow. It occurs mostly in winter and spring.

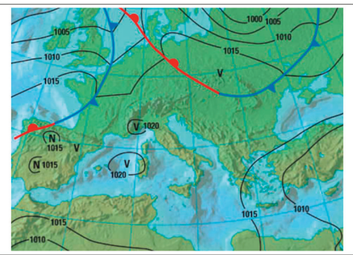
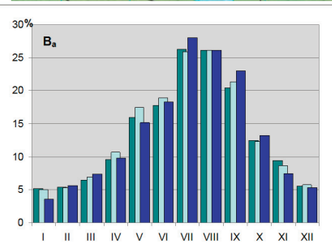



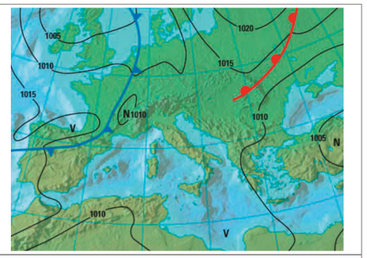
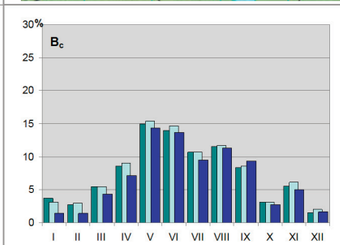
Jugoistočno stanje (SES) –
primjer 26.12.2002.

SES javlja se kada je međusobni položaj ciklone u zapadnom Sredozemlju ili zapadnoj Europi i anticiklone iznad većeg dijela Europe takav da su granične izobare (gotovo pravocrtne) usmjerene od SE prema NW. Taj perzistentan zimski tip vremena javlja se na području znatno većem od područja Hrvatske. To je tip vremena hladnog dijela godine i češći je od ostalih tipova iz grupe prijelaznih stanja.

Southeastern type (SES) –
example 26 December 2002

SES appears when the mutual position of the cyclone in the western Mediterranean or western Europe and the anticyclone over a larger part of Europe is such that the boundary isobars (almost linear) are directed from SE to NW. This persistent winter type of weather occurs in an area much larger than Croatia. It is a weather type of the cold period of the year and it is more common than other types from the group of transitional types.

Anticiklonalno i ciklonalno bezgradijentno polje (B_a, B_c) –
primjeri 15.6.2002. i 10.7.2002.

Bezgradijentna polja B_a i B_c jesu tipovi vremena toplog dijela godine, posebno ljeta, kada je intenzitet opće cirkulacije atmosfere smanjen. Gradijent tlaka kod oba je tipa vremena vrlo malen, a pripadnost anticikloni (indeks a) ili cikloni (indeks c) određuje se najpouzdanije pomoću karte AT 850 hPa. To su perzistentni tipovi vremena. U tipu vremena B_a karakter je vremena anticiklonalni, a u tipu vremena B_c moguć je razvoj lokalnih pojava nestabilnosti. Ti tipovi vremena dominiraju u toplom dijelu godine, prvenstveno ljeti.

Anticyclonic and cyclonic zero pressure gradient field (B_a, B_c) –
examples 15 June 2002 and 10 July 2002

Zero pressure gradient fields B_a and B_c are weather types of the warm period of the year, particularly summer, when general atmosphere circulation intensity is reduced. The pressure gradient in the case of both weather types is very low and the classification to anticyclone (index a) or cyclone (index c) is most reliably determined by means of the chart AT 850 hPa. These are persistent types of weather. The character of the B_a weather type is anticyclonic while during the B_c weather type locally unstable weather may occur. These weather types prevail in the warm period of the year, especially summer.

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Vjetar
Wind

Višnja Vučetić
Alica Bajić

Strujanje zraka nad nekim područjem odraz je primarne cirkulacije koja se uspostavlja globalnom raspodjelom tlaka zraka, značajnom za topli i hladni dio godine. Prema općoj atmosferskoj cirkulaciji nad kontinentalnu Hrvatsku prodire hladan zrak maritimnog podrijetla iz sjeverozapadnog kvadranta i kontinentalnog podrijetla iz sjeveroistočnog kvadranta. Strujanje toplog i vlažnog zraka najčešće je iz južnog kvadranta. Međutim, u kraćim razdobljima promjene tlaka zraka makro razmjera generiraju i sekundarnu cirkulaciju mezo i lokalnih razmjera. To su pokretni cirkulacijski sustavi koji uzrokuju lokalno strujanje zraka ovisno o reljefu tla, svojstvima podloge i zračnih masa. Dakle, prizemni vjetar karakterističan za neko područje rezultat je advekcije toplog ili hladnog zraka u makro razmjerima koji se u najnižim slojevima troposfere modificira na pojedinim lokacijama ovisno o planinskoj prepreci, ali i zbog izloženosti terena, konkavnosti i konveksnosti reljefa, nadmorske visine i sl.

U regionalnim razmjerima vjetrovni režim u Hrvatskoj je pod utjecajem nekoliko čimbenika kao što su blizina alpskog masiva na sjeverozapadu, Dinaridi duž jadranske obale i Panonska nizina u sjeveroistočnom dijelu zemlje. Područje Hrvatske obilježeno je raznolikošću vremenskih situacija uz česte i intenzivne promjene vremena iz dana u dan i tijekom godine. U hladnom dijelu godine prevladavaju anticiklonalni tipovi vremena sa slabim strujanje, malom turbulentnom razmjenom zraka i stabilnom stratifikacijom atmosfere. S druge strane, zimi nagli prodori hladnog zraka sa sjevera i sjeveroistoka uzrokuju jak, ali vrlo rijetko olujni NE vjetar u unutrašnjosti Hrvatske. Na Jadranu tada zapuše jaka ili olujna bura koja ponekad može postići i orkansku jačinu.

Bura je suh, hladan i mahovit sjeveroistočni vjetar (NNE–ENE smjerova). Za vrijeme bure pojačan je osjet hladnoće. Zbog svoje mahovitosti bura stvara kratke, ali visoke valove, koji stvaraju teškoće u plovidbi. Jaka bura na moru trga vrške valova i stvara morski dim. Obala izložena buri pokrivena je tankim slojem posolice

Air flow over an area is the reflection of primary circulation, established by global air pressure distribution, significant for the warm and the cold part of the year. According to the general circulation of the atmosphere, cold air of maritime origin penetrates Croatia from the north-western quadrant and cold air of continental origin from the north-eastern quadrant. The flow of warm and moist air comes most commonly from the southern quadrant. However, in shorter time periods, changes in air pressure of macro proportions also generate secondary circulation of meso and local proportions. These are moving circulation systems, causing local air flow depending on the relief and the properties of the ground and air masses. Consequently, the surface wind characteristic of an area is a result of the advection of warm or cold air of macro scale, and is modified in the lowest layers of the troposphere, at certain locations, depending on mountain barriers or the exposure of the terrain, the concavity and convexity of the relief, altitude and other similar features.

On a regional scale, the flow regime in Croatia is influenced by several factors like the closeness of the Alpine massif in the north-west, the Dinaric Alps along the Adriatic coast and the Pannonian Plain in the north-eastern part of the country. Croatia has many diverse weather situations, with frequent and intense weather changes from day to day and over the year. Anticyclone weather types with weak flow, small turbulent air exchange and stable stratification of the atmosphere are prevalent in the cold part of the year. In such weather situations, in autumn and winter, there is foggy weather or low cloudiness in the continental part, while it is sunny and clear on the coast and in the highlands. On the other side, in winter, sudden cold air outbreaks from the north and the north-east cause a strong and, although very rarely, severe NE wind inland. At the same time, strong or severe *bura* starts to blow on the Adriatic and it can sometimes reach even gale force.

Bura is a dry, cold and gusty north-east wind (NNE-ENE directions). During *bura,* there is an increased per-

iz isparenih kapljica morske vode što ju je bura nanijela u morskom dimu. Na tim mjestima biljke slabo uspijevaju i tlo je ogoljelo. Budući da se smjer vjetra lokalno modificira ovisno o obliku reljefa tla nekog područja, bura na nekim lokacijama ima više izraženu sjevernu komponentu (N–NNE), a na drugim istočnu komponentu (ENE–E). Buri često puta prethodi i hladan sjeverni (N) vjetar poznat pod nazivom tramontana.

Za razliku od bure, jugo je vlažan, topao i jednoličan jugoistočni vjetar (ESE–SSE smjerova). Jako jugo stvara velike valove, nastaje na prednjoj strani sredozemne ciklone, a zbog dizanja vlažnog zraka na fronti i uz brda često je praćeno velikom količinom oborine. Ponekad topli zrak pritječe iz sjeverne Afrike koji prelazeći Sredozemno more poprimi također maritimne značajke. Nakon prolaska fronte i pomaka središta ciklone na istok vjetar najčešće skreće na buru. Dakle, bura najčešće zamjenjuje jugo. Ni za vrijeme jakog i olujnog juga ni za vrijeme jake i olujne bure ne preporuča se izlazak na more. Bura i jugo češći su i jači u hladnom dijelu godine iako i ljetna bura svojom jačinom može stvoriti probleme u cestovnom i morskom prometu.

Na jadranskoj obali i otocima izdvajaju se neka područja po vrlo jakoj buri. Najjača je bura izmjerena na postaji Maslenički most, gdje je maksimalni udar bure od 69,0 ms^{-1} zabilježen 21. prosinca 1998. Vrlo poznato područje po učestaloj jakoj buri jest Senj čija godišnja ruža vjetra pokazuje 36% relativne čestine ENE smjera. Ni na jednom dijelu Jadrana nije zabilježena tako velika učestalost vjetra iz istog smjera kao što je na toj postaji. Uzrok tome je blizina planinskog prijevoja Vratnik koji pojačava i kanalizira zračnu struju prema Senju u situacijama s burom. Po jakoj i olujnoj buri još su poznata područja: krčki most (58,9 ms^{-1}), cijeli podvelebitski kanal s pripadnim otocima (paški most, 65,2 ms^{-1}), šibensko (41,0 ms^{-1}), splitsko (48,5 ms^{-1}), makarsko (59,0 ms^{-1}) i dubrovačko (44,3 ms^{-1}) područje. Općenito se relativna čestina jake bure smanjuje od sjevernog Jadrana prema južnom Jadranu kao

Anemometar na glavnoj meteorološkoj postaji Zavižan
Anemometer at the Zavižan main meteorological station.
Fotografija Photo by: Ante Vukušić

ception of coldness. Because of its gustiness, *bura* creates short but high waves, which then create difficulties to sea navigation. Strong *bura* at sea tears the wave crests and creates sea spray. A coast exposed to *bura* is covered in a thin layer of salt sediment from the evaporated seawater droplets drifted in with the sea spray. In such places there is poor plant life and the ground is bare. Since the wind direction is locally modified depending on the surface relief form of a certain area, *bura* has, in certain locations, a more expressed northern component (N–NNE) and in other locations an eastern component (ENE–E). *Bura* is often preceded by a cold north (N) wind known as *tramontana*.

Unlike *bura*, *jugo* is a moist, warm and uniform south-east wind (ESE–SSE directions). Strong *jugo* creates high waves; it is formed on the front side of the Mediterranean cyclone, and is often followed by large amounts of precipitation because of the moist air lifting

Slijevanje hladnog zraka preko prijevoja na Vratniku pri početku bure.
Cold air flowing through the Vratnik Mountain Pass at the start of bura.
Fotografija Photo by: Marko Vučetić

i od kopnenog zaleđa prema otvorenom moru. Obrnuto je s jugom gdje je jako jugo češće na južnom nego sjevernom Jadranu pa je na Palagruži izmjeren i najjači udar juga od 56,9 ms^{-1} zabilježen 4. ožujka 1974.

Nakon juga na srednjem i južnom Jadranu moguće je da vjetar skrene preko južnog i jugozapadnog smjera na zapadni smjer. U pomorstvu je južni (S) vjetar poznat kao oštro, jugozapadni (SW) kao lebić ili garbin, a zapadni (W) kao pulenat, a nevremena redom oštrijada, lebićada ili garbinada i pulentada. To skretanje vjetra povezano je s ciklonom čije središte sa sjevernog Jadrana prelazi na kopno, na Istru ili nešto južnije. U pravilu što je dublja ciklona na sjevernom Jadranu koja se premješta na kopno, to je jači južni vjetar na srednjem i južnom Jadranu koji stvara velike valove na moru. Kada se razvedri i vjetar stiša, dugi valovi putuju

at the atmospheric front and up the hills. Sometimes, warm air comes from North Africa, and acquires maritime characteristics crossing the Mediterranean. After the passing of the front and after the centre of the cyclone has shifted to the east, the wind most commonly turns into *bura*. Consequently, *bura* most commonly replaces *jugo*. Being out at sea is not recommended during strong and severe *jugo*, nor during strong and severe *bura*. *Bura* and *jugo* are more frequent and stronger in the cold season, although the intensity of the summer *bura* can create problems in road and maritime traffic.

There are some areas on the Adriatic coast and the islands which can be isolated because of the intensity of *bura* there. The strongest *bura* was recorded at the Maslenica Bridge station on 21 December 1998, when a gust of 69.0 ms^{-1} was measured. Senj is also famous for frequent and strong *bura*, and its annual wind rose shows a 36% relative frequency of ENE direction. Senj is the only station on the Adriatic where such a high frequency of wind from the same direction has been recorded. This is caused by the closeness of the Vratnik Mountain Pass, which intensifies and channels the air stream towards Senj in *bura* situations. Some other areas are also famous for strong and severe *bura*: the Krk Bridge (58.9 ms^{-1}), the whole sub-Velebit Channel with the corresponding islands (the Pag Bridge, 65.2 ms^{-1}), and the Šibenik (41.0 ms^{-1}), Split (48.5 ms^{-1}), Makarska (59.0 ms^{-1}) and Dubrovnik (44.3 ms^{-1}) areas. In general, the relative frequency of strong *bura* decreases from the northern Adriatic towards the southern Adriatic, and also from the hinterland to the open sea. It is a completely different case with *jugo*, which is more frequent on the southern than on the northern Adriatic. The strongest *jugo* gust of 56.9 ms^{-1} was measured in Palagruža on 4 March 1974.

On the middle and southern Adriatic, it is possible, after *jugo,* for the wind to turn via south and south-west to a west direction. In seafaring, south wind (S) is

od pučine prema obali te kad naiđu na plitku obalu visina valova naglo raste i lomi sve pred sobom. Za vrijeme pulentade stradavaju usidrene brodice.

U primorju pušu i drugi karakteristični tipovi vjetra kao što je istočni (E) vjetar levanat koji zimi ima odlike i juga i bure. Hladan je, jak, ali ne mahovit vjetar, koji donosi oblačno i kišno vrijeme, a ponekad i snijeg. Nastaje u situacijama kada se nad južnim Jadranom nalazi ciklona, a nad sjevernim Jadranom jača anticiklona. Područje srednje Dalmacije se tada najčešće nalazi u prijelaznom istočnom stanju gdje puše neugodan istočni vjetar koji može potrajati i nekoliko dana što se naziva levantara.

Ljeti pak dominiraju barička polja s malim gradijentom tlaka u kojima također prevladava slab vjetar, ali s uglavnom labilnom stratifikacijom atmosfere. U slučaju da je turbulentno miješanje zraka jako, razvijaju se grmljavinski oblaci kumulonimbusi (oblaci vertikalnog razvoja s jakim uzlaznim strujama) i u popodnevnim i večernjim satima moguće je nevrijeme. Na Jadranu je ono poznato pod nazivom nevera. U takvoj se ljetnoj oluji javlja jak odnosno olujan vjetar praćen pljuskom kiše i grmljavinom, a ponekad i tučom.

Na području Hrvatske javlja se i dnevna periodička cirkulacija koja se razvija na obali, na obroncima, u kotlinama i drugim složenim oblicima terena za vedra, neporemećena vremena u toplom dijelu godine. U takvim ljetnim situacijama dolazi do nejednaka zagrijavanja zraka uz obronke brda ili planina i onog u slobodnoj atmosferi te se javlja cirkulacija obronka. Danju ugrijani zrak struji uz obronak, a podalje od obronka se spušta i tako se kruženje zatvara. Zbog uzlaznog gibanja zraka uz obronak može se pojaviti oblak lijepog vremena kumulus pri vrhu brda ili planine. Noću je kruženje zraka obrnuto. Hladniji se zrak spušta niz obronak prema podnožju, a na njegovo mjesto u visini dolazi topliji zrak iz slobodne atmosfere. Ljeti u primorju temperaturnu opreku pojačava i djelovanje kopna i mora i dovodi do razvoja obalne cirkulacije. Danju se u obalnoj cirkulaciji, zbog bržeg grijanja kopna u odnosu na

known as *oštro*, south-west wind (SW) as *lebić or garbin*, west wind (W) as *pulenat*, and rough weather as *oštrijada, lebićada or garbinada* and *pulentada*. The turning of the wind is connected to cyclones, whose centres cross from the northern Adriatic to the mainland, Istria, or more to the south. As a rule, the deeper the cyclone on the northern Adriatic which moves to the mainland, the stronger the south wind on the middle and southern Adriatic, creating high waves at sea. When the weather clears and the wind calms down, long waves travel from the open sea to the shore, and when they hit the shallow shore their height rapidly grows and they break everything in sight. During *pulentada,* anchored boats are seriously damaged.

There are other characteristic winds on the coast like the east (E) wind *levanat*, which in winter has both *jugo* and *bura* traits. It is a cold, strong but not gusty wind, which brings cloudy and rainy weather, and sometimes even snow. It is formed in situations when there is a cyclone over the southern Adriatic and a growing anticyclone over the northern Adriatic. The area of central Dalmatia is then most commonly in a transitional eastern state with an unpleasant east wind which can last up to several days and is known as *levantara*.

In summer, on the other hand, baric fields with a small pressure gradient are dominant, with prevalent weak wind but mostly with unstable atmosphere stratification. If the turbulent air motion is strong, cumulonimbus thunder clouds are formed (vertically developed clouds with strong updrafts) and there is a possibility of rough weather in the afternoon and in the evening. Such weather is known on the Adriatic as *nevera*. In summer storms like these, there is strong or severe wind followed by rain showers and thunder, and sometimes even hail.

A daily periodical circulation also develops on the coast, on the hillsides, in the ravines and other complex forms of terrain during clear, undisturbed weather,

Valovito more za vrijeme zapadnog vjetra (pulentada). Pakleni kanal, Hvar 21.11. 2001.
Sea waves during western wind (pulentada), Pakleni kanal, Hvar, 21 November 2001.
Fotografija Photo by: Joško Vučetić

more, uspostavlja gradijent tlaka s mora prema kopnu i vjetar s mora (smorac). Noću je obrnuto zbog toga što se kopno hladi brže nego more. Noćni vjetar s kopna (kopnenjak) obično je slab i prestaje rano u jutro. Položaj gorskih prepreka, koje se pružaju na otocima i priobalju, čine sustav strujanja još složenijim. Uz obronak se tada razvija termička cirkulacija u kojoj vjetar ima isti smjer kao i u obalnoj cirkulaciji. Tako gorski prijevoji i usjeci mogu pojačati noćni vjetar, koji tada prelazi u burin. Zbog različita mehanizma nastanka burin se ne može zamijeniti s burom iako im se NE smjer vjetra poklapa. Uz to i stalna zračna struja, kao dio opće atmosferske cirkulacije, pojačava obalni vjetar, koji se s njom podudara u smjeru. Takav slučaj vlada ljeti gdje etezija (nastaje zbog razlike tlaka u južnoj Europi između azorske anticiklone i karačijske depresije) i po-

during the warm part of the year. In such summer situations, the air by the hillsides or mountains and the air in the free atmosphere are unevenly warmed, so a mountain-plains circulation system is formed. During the day, the warmed air flows up the hillside, and descends beyond the hillside, thus completing the cycle. Because of the hillside updraft, a fine-weather cumulus cloud can form at the top of the hill or the mountain. At night the air flow is reversed. Colder air descends down to the foot of the hills, and warmer air from the free atmosphere comes into its place. In summer, in the costal area, the temperature contrast is increased by the effect of the land and the sea, and costal circulation forms. In costal circulation, during the day, because the ground warms faster than the sea, there is a pressure gradient from sea to land and a wind blows from the sea (*smorac* – sea breeze). During the night, the situation is reversed because the land cools faster than the sea. The night wind from the land (land breeze) is usually gentle and ceases early in the morning. The position of mountain barriers, which stretch along the islands and the coast, makes the circulation system more complex. Up the slopes, thermal circulation is also developed, where the wind has the same direction as in the land and sea wind circulation. Thus, mountain passes and notches can intensify the night wind, which then turns into *burin*. Due to the different mechanism of its genesis, *burin* must not be mistaken for *bura* although the NE wind direction is the same. As part of the general circulation of the atmosphere, this constant air stream also strengthens the coastal wind in the corresponding direction. This occurrence can be seen in summer, when the *etesians* (formed because of the pressure difference in southern Europe between the Azorean anticyclone and the Karachi depression) and the afternoon *smorac* have approximately the same direction, forming together a moderate, in channels even strong wind, known as *maestral* (NW–W directions).

slijepodnevni smorac imaju približno isti smjer pa zajedno čine umjeren, a u kanalima i jak vjetar, poznat pod imenom maestral (NW–W smjerova).

Uz tu termički uvjetovanu obalnu cirkulaciju i cirkulaciju obronka, velik utjecaj na strujanje, osobito na njegovu promjenu s visinom, ima i blizina i položaj planinskog kopnenog zaleđa, koji u određenim vremenskim uvjetima može pogodovati pojavi pojačanog bočnog vjetra, velikog horizontalnog i vertikalnog smicanja vjetra, turbulencije, te jakih uzlaznih i silaznih gibanja zraka.

U Hrvatskoj, dakle, postoji dva osnovna režima strujanja. U kontinentalnom dijelu uglavnom prevladava slab do umjeren vjetar čiji je smjer promjenjiv. Stoga prevladavajući smjer vjetra u unutrašnjosti Hrvatske znatno ovisi o otvorenosti i obliku okolnog terena, što se uočava na godišnjim ružama vjetra na prikazanoj karti. Godišnja razdioba srednje satne brzine pokazuje da je jak vjetar na tom području vrlo rijedak, a povezan je s prodorom hladnog zraka iz polarnih ili sibirskih krajeva u hladnom dijelu godine ili se javlja za vrijeme ljetnih oluja. Suprotno tome na istočnoj jadranskoj obali jak vjetar je češći, a može postići olujnu pa čak i orkansku jačinu najčešće za vrijeme bure ili juga čiji su smjerovi ujedno i najučestaliji na tom području.

Besides this thermally conditioned coastal and mountain-plains circulation, the closeness and the position of the mountainous hinterland has also a strong influence on the airflow, especially on its change with height; in certain weather conditions, it can facilitate the occurrence of weather situations characterised by the appearance of increased side wind, great horizontal and vertical wind shear, turbulence, and strong ascending and descending air movements.

To conclude, there are two basic circulation regimes in Croatia. A mostly weak-to-moderate wind with changeable direction is mainly prevalent in the continental part. The prevalent wind direction inland depends significantly on the openness and the form of the surrounding terrain, as can be seen on the annual wind rose map. The annual distribution of mean hourly wind speed indicates that a strong wind is very rare in that area, and it occurs during cold air outbreaks from polar or Siberian areas in winter or during rough weather in summer. On the contrary, strong wind is more frequent on the eastern Adriatic coast, and it can reach severe or even gale force, most commonly during *bura* or *jugo*, the wind directions which are also the most frequent in this area.

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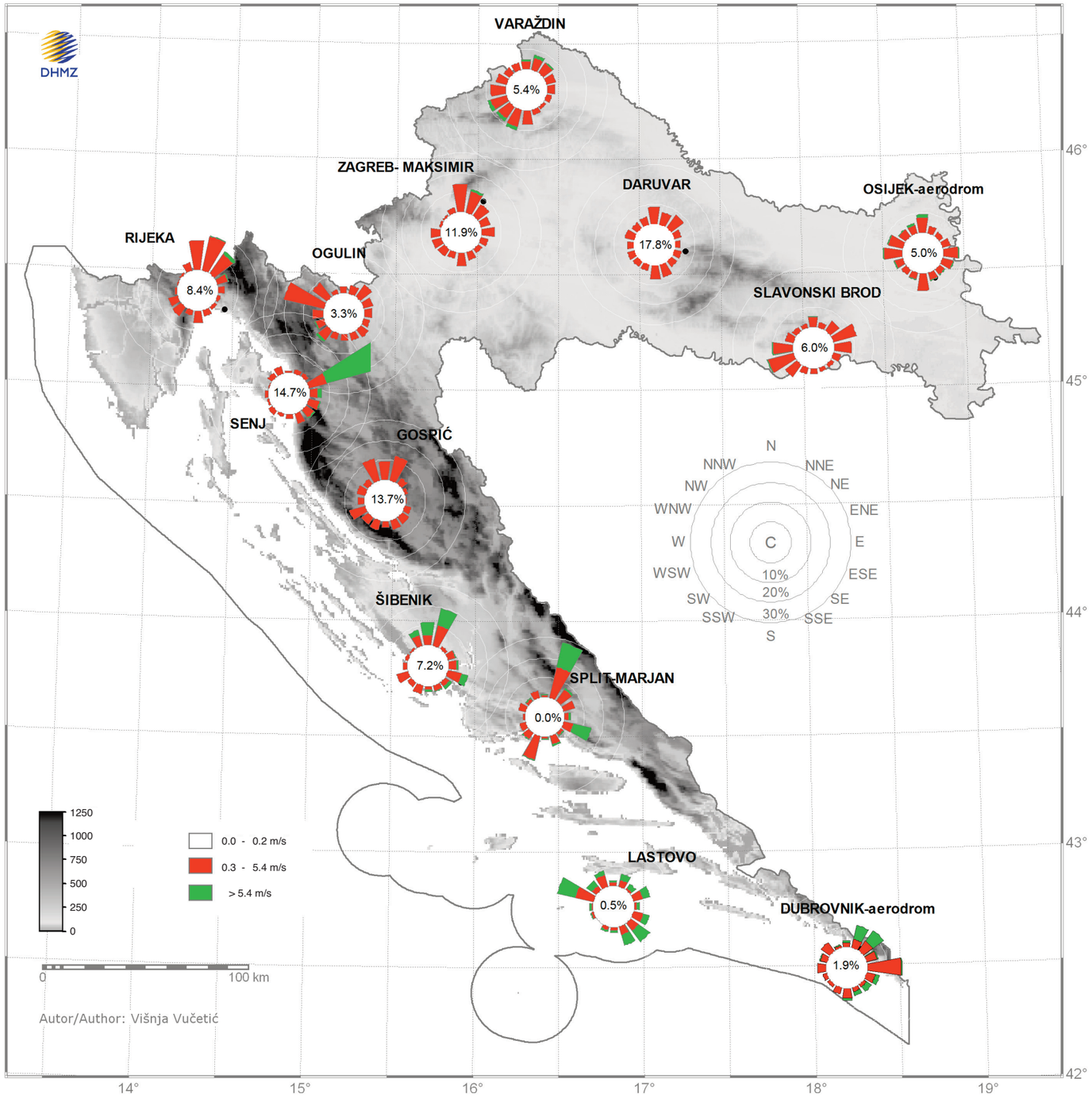
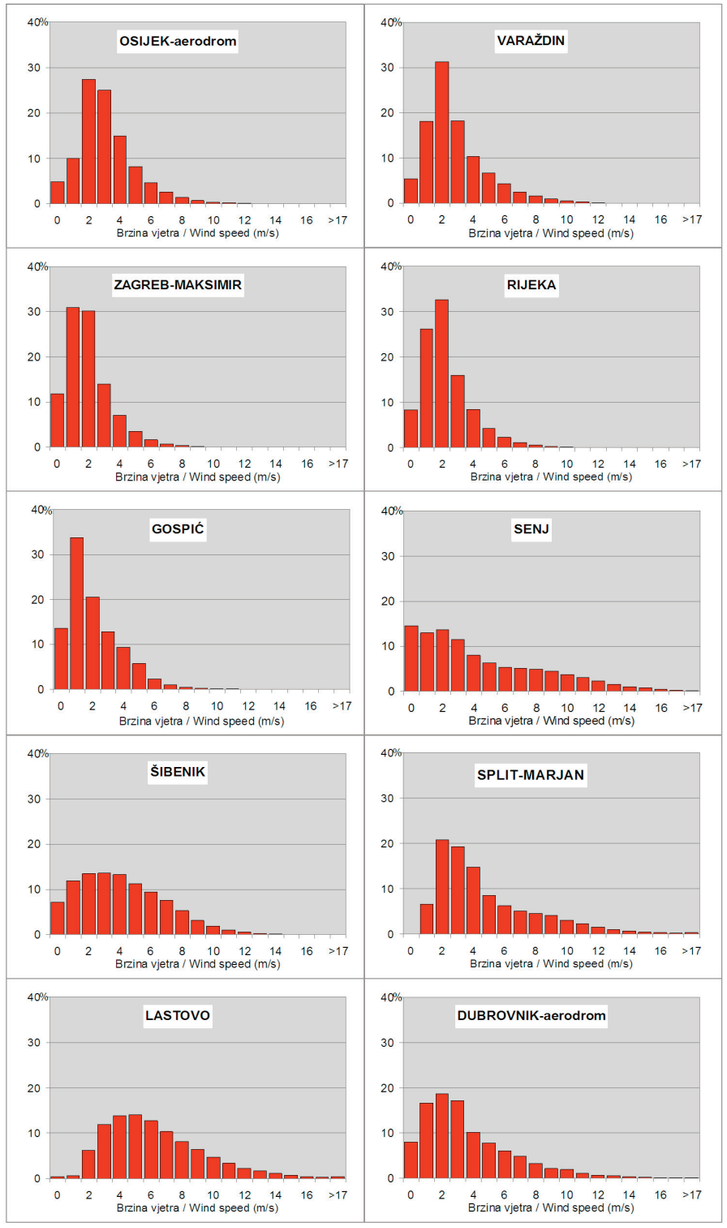
Godišnj ruža vjetra Annual wind rose





Godišnja razdioba srednje satne brzine vjetra (%) za razdoblje 1981-1990.
Annual distribution of mean hourly wind speed (%) for the period 1981-1990

Humana biometeorologija
Human biometeorology

Ksenija Zaninović

Na čovjekov osjet ugode utječe stupanj termičkog opterećenja, koji ovisi o više meteoroloških i nemeteoroloških faktora. U pravilu, čovjek se osjeća ugodno ako su proizvodnja i gubitak topline jednaki. Ako je proizvodnja energije veća od njezina gubitka čovjeku će biti pretoplo, a ako gubi više topline nego što je tijelo može proizvesti, bit će mu hladno. Čovjekov organizam ima sposobnost prilagodbe na dosta širok raspon vanjskih utjecaja, ali ako ni to nije dovoljno, štiti se odjećom koju prema potrebi dodaje ili odbacuje, povećanom aktivnošću za hladnoće i manjom za vrućine, prehranom koja je zimi obilnija a ljeti lakša. Stoga se i vrsta prehrane razlikuje u različitim klimatskim zonama. Poznata dalmatinska lagana hrana, pripremljena uglavnom kuhanjem s malo masnoće, prilagođena je toploj klimi, dok je u hladnijim klimama, kao na primjer u planinskim predjelima, prehrana teža i masnija. Na te parametre čovjek, dakle, može utjecati i mijenjati ih prema potrebi. Međutim, na meteorološke parametre ne može utjecati, već im se mora prilagođavati. Iz iskustva je poznato da na čovjekov osjet ugode, osim temperature, utječu strujanje i vlažnost zraka te zračenje. Zračenje Sunca i okolnih predmeta u znatnoj mjeri utječu na osjet topline, a znatno se mijenja i ako je čovjek izložen direktnom Sunčevu zračenju ili se skloni u sjenu. Strujanje zraka pospješuje odvođenje topline s površine tijela, pa kod niskih temperatura povećava osjet hladnoće, a kod visokih smanjuje osjećaj topline. Međutim, što je temperatura zraka viša i bliža tjelesnoj temperaturi, ohlađujući utjecaj vjetra se smanjuje, a kad temperatura zraka premaši temperaturu tijela, strujanje zraka čak povećava osjet topline. Utjecaj vlažnosti zraka veći je u toplom dijelu skale nego kod niskih temperatura. Isparavanje znoja s površine tijela troši energiju i smanjuje osjet topline. Kad zrak sadrži više vodene pare, isparavanje znoja s površine tijela otežano je, što doprinosi osjetu topline i sparine kod visokih temperatura.

Human thermal perception is affected by the degree of thermal strain, which depends on a number of meteorological and non-meteorological factors. As a rule, a person feels comfortable if the production and loss of heat are the same. If the production of energy is higher than its loss, the person will be too warm, and if a person loses more heat than the body can produce, he/she will be cold. The human organism has the ability to adapt to a wide range of outside influences, and, if that is not enough, it protects itself with clothes, which are put on or taken off, with increased activity during cold weather and decreased activity during warm weather, and a diet which is heavier in the winter and lighter in the summer. This is why diet types are different in various climatic zones. The famous Dalmatian light food, generally prepared with small amounts of fat, is adapted to a warmer climate, whereas in colder climates, as in the mountainous parts for example, the diet is heavier and contains more fat. Man can, of course, influence these parameters and change them according to his needs. However, he cannot influence meteorological parameters, but only adapt to them. It is known from experience that the human perception of comfort is influenced, besides temperature, by air flow, humidity and radiation. Radiation from the Sun and from surrounding objects significantly influences our sense of warmth, which changes considerably depending on whether a person is exposed to direct solar radiation or standing in the shade. Air circulation helps to channel heat away from the body surface, so at low temperatures it increases the sense of cold and at high temperatures it reduces the sense of warmth. However, as air temperature gets higher and closer to the temperature of the body, the cooling effect of wind is reduced, and when air temperature exceeds the temperature of the body, wind even increases the thermal sensation. The influence of humidity is greater in the warm part of the scale than at low temperatures. Evaporation of sweat from the body surface consumes

Za pravilnu procjenu termičkog utjecaja okoline potrebno je uvažiti sve parametre koji utječu na osjet topline, odnosno osjet ugode. Kvantitativno se osjet ugode može odrediti pomoću kombiniranih biometeoroloških veličina, kojih je u literaturi mnogo. Najbolji su oni koji se baziraju na jednadžbi energetske ravnoteže između čovjeka i okoline:

$$M + W + R + C + E_D + E_{Re} + E_{Sw} + S = 0$$

gdje je M – stupanj metabolizma (unutarnja proizvodnja energije oksidacijskim procesima u tijelu), W – energija stvorena fizičkim radom, R – ukupno zračenje tijela, C – konvektivni tok topline, E_D – gubitak topline difuzijom vodene pare kroz kožu, E_{Re} – ukupni tok topline zbog zagrijavanja i vlaženja zraka koji se udiše i izdiše, E_{Sw} – tok topline zbog isparavanja znoja, S – spremanje energije u organizmu (sve u W). Izrazi u jednadžbi pozitivni su u slučaju dobitka energije, a negativni u slučaju gubitka energije (M je uvijek pozitivan, W, E_D i E_{Sw} uvijek su negativni). Na pojedine parametre direktno utječu sljedeći meteorološki parametri:

- temperatura zraka – na C, E_{Re}
- vlažnost zraka – na E_D, E_{Re}, E_{Sw}
- brzina strujanja – na C, E_{Sw}
- srednja temperatura zračenja – na R

Na temelju navedene jednadžbe energetske ravnoteže između tijela i okoline i sistema jednadžbi za proračun pojedinih parametara u njoj izvedenih pomoću temperature tijela, kože, aktivnosti i indeksa odjevenosti (termički otpor odjeće) izveden je model MEMI (**M**unich **E**nergy-Balance **M**odel for **I**ndividuals) za ocjenu termičkog osjeta čija je izlazna veličina *fiziološka ekvivalentna temperatura* (PET, u ovoj publikaciji označena s PhET, radi razlikovanja od potencijalne evapotranspiracije) (Höppe, 1999, Matzarakis et. al, 1999). PhET se definira kao temperatura pri kojoj bi se u zatvore-

Toplina ljeta i ponašanje ljudi. Plaža u Baškoj Vodi.
Summer warmth and human behaviour, the Baška Voda beach.
Fotografija Photo by: Velibor Zaninović

energy and reduces the sense of warmth. When air contains more water vapour, evaporation of the sweat from the body surface is more difficult, which contributes to a sense of warmth and sultriness at high temperatures.

To make a correct estimate of the thermal influence of the environment it is necessary to consider all the parameters which influence thermal perception. Quantitatively, thermal perception can be determined using numerous combined biometeorological indices, which can be found in scientific literature. The best ones are those which are based on the energy balance equation between man and the environment (Fanger, 1970, Höppe, 1999):

$$M + W + R + C + E_D + E_{Re} + E_{Sw} + S = 0$$

where M is the metabolic rate (internal production of

Aktivni odmor na jedrenju.
Sailing as recreation.
Fotografija Photo by: Marko Vučetić

nom prostoru čovjek (odjeven u lagano odijelo – indeks odjevenosti I_{clo}=0,9 i sjedi – W=80W) osjećao jednako kao u stvarnim uvjetima. Pretpostavljeni su sljedeći referentni uvjeti u zatvorenom prostoru:

- srednja temperatura zračenja jednaka temperaturi zraka (T_{mrt}=T)
- brzina strujanja 0,1 m/s
- tlak vodene pare 12 hPa (relativna vlažnost 50% uz temperaturu zraka 20°C)

Korištenje fiziološke ekvivalentne temperature PhET omogućuje procjenu termičke komponente klime temeljem vlastitog iskustva. Naime, čovjeku je relativno lako predočiti kako bi se osjećao u prostoriji uz određenu temperaturu.

Za proračun fiziološke ekvivalentne temperature koriste se podaci temperature, relativne vlažnosti, brzine strujanja i zračenja, a ako nema zračenja ono se proračunava pomoću podataka naoblake.

energy by oxidation processes in the body), W is the work rate, R is total body radiation, C is convective heat transfer, E_D is the loss of heat through water vapour diffusion through the skin, E_{Re} is the total heat transfer due to the heating and moisturising of the air which is breathed in and out, E_{Sw} is the heat transfer due to sweat evaporation, S is the storing of energy in the body (everything in W). The values in the equation are positive when energy is gained, and negative when energy is lost (M is always positive, W, E_D and E_{Sw} are always negative). Some parameters are directly influenced by the following meteorological parameters:

- air temperature – C, E_{Re}
- air humidity – E_D, E_{Re}, E_{Sw}
- air speed – C, E_{Sw}
- mean radiant temperature – R.

Using the above mentioned energy balance equation between the body and the environment and a system of equations designed to calculate certain parameters in the equation, derived by using body and skin temperature, activity and clothing index (thermal resistance of clothing), the MEMI model (**M**unich **E**nergy-Balance **M**odel for **I**ndividuals) was developed. It is used to evaluate the thermal sensation, whose output value is the *physiological equivalent temperature* (PET, in this publication denoted PhET to distinguish it from potential evapotranspiration) (Höppe, 1999, Matzarakis et al, 1999). PhET is defined as the temperature at which a person (dressed lightly – clothing index I_{clo}=0.9 and seated – W=80W) indoors would feel the same as in real-life conditions. The following referential indoor conditions were assumed:

- mean radiant temperature equal to air temperature (T_{mrt} =T)
- air speed 0.1 m/s
- water vapour pressure of 12 hPa (a relative humidity of 50% with an air temperature of 20°C).

By using the PhET physiological equivalent temperature it is possible to evaluate the thermal component of the climate based on personal experience. In other words, it is relatively easy for a person to imagine what he/she would feel like in a room at a given temperature.

Temperature, relative humidity, air speed and radiation data are used to determine the physiological equivalent temperature and if there are no radiation data, radiation is calculated by means of cloud cover data.

Thermal perception based on the physiological equivalent temperature is determined using Table 1.

In **January,** in Croatia, the prevailing perception is *very cold*. In the lowland part of mainland Croatia, a larger part of Lika and Gorski kotar and a part of the Dalmatian hinterland, the values of the physiological equivalent temperature range from -5°C to 0°C. Despite the heating influence which might be expected in the Sava River valley, PhET values are not higher because of frequent winter fogs, which prevent further heating. PhET values lower than -5°C occur only on the

Osjet ugode prema fiziološkoj ekvivalentnoj temperaturi određuje se prema Tablici 1.

U **siječnju** je u čitavoj Hrvatskoj prevladavajući osjet *vrlo hladno*. U nizinskom dijelu kontinentalne Hrvatske, u većem dijelu Like i Gorskog kotara te u dijelu dalmatinskog zaleđa vrijednosti fiziološke ekvivalentne temperature kreću se u rasponu od -5°C do 0°C. Usprkos zagrijavajućem utjecaju koji bi se mogao očekivati u dolini rijeke Save, vrijednosti PhET nisu više zbog čestih zimskih magli koje sprečavaju jače zagrijavanje. Vrijednosti PhET niže od -5°C pojavljuju se samo na Dinaridima i na najvišim dijelovima gorja u Slavoniji i sjeverozapadnoj Hrvatskoj. Na obali, otocima i u Dalmatinskoj zagori vrijednosti PhET su između 0°C i 4°C. U **travnju** kao predstavniku proljeća u najvećem dijelu Hrvatske prevladava osjet *svježega*, odnosno vrijednosti PhET su u granicama između 8°C i 13°C. U dolini Save i Kupe, na obali i otocima te dijelu dalmatinskog zaleđa je *ugodno svježe* (PhET između 13°C i 18°C). Na većim nadmorskim visinama Like i Gorskog kotara te na najvišim dijelovima gorja u nizinskoj Hrvatskoj je *hladno* (PhET od 4°C do 8°C), dok je još samo na najvišim dijelovima Dinarida *vrlo hladno* (0–4°C). U većem dijelu Hrvatske u **srpnju** je *ugodno toplo* (srednje vrijednosti PhET u granicama između 23°C i 29°C). U primorju i u dijelovima dalmatinskog zaleđa je *toplo*, dok je u gorju *ugodno* (18–23°C), a na vrhovima *ugodno svježe* (13–18°C). Zbog zagrijavajućeg utjecaja mora i rijeka jesen je toplija od proljeća, pa je u **listopadu** područje s prosječnim osjetom *svježe* (8–13°C) ograničeno na dio nizinske Hrvatske te Liku i Gorski kotar. U središnjoj Hrvatskoj, dolinom Save i dijelom dolina Drave i Dunava, na obali, otocima i u Dalmatinskom zaleđu kao i u većem dijelu Istre je *ugodno svježe* (13–18°C), a *hladno* je samo na vršnim dijelovima Dinarskog gorja.

Tablica1. klasifikacija osjjeta ugode prema fiziološkoj ekvivalentnoj temperaturi (Matzarakis et al, 1999).
Table 1. Thermal sensation clasification according to physiological equialent temperature (Matzarakis et al, 1999).

PhET PhET (°C)	Osjet ugode Thermal perception
< 4	vrlo hladno very cold
4 – 8	hladno cold
8 – 13	svježe cool
13 – 18	ugodno svježe slightly cool
18 – 23	ugodno comfortable
23 – 29	ugodno toplo slightly warm
29 – 35	toplo warm
35 – 41	vruće hot
> 41	vrlo vruće very hot

Umirujuća rekreacijska šetnja gustom zelenom šumom.
A relaxing recreational walk through a dense green wood.
Fotografija Photo by: Zorislav Zaninović

Godišnji hod fiziološke ekvivalentne temperature prema podacima u terminima motrenja 7h, 14h i 21h pokazuje da u unutrašnjosti vrijednosti PhET niže od -5°C javljaju samo u jutarnjim i večernjim satima zimskih mjeseci (prosinac, siječanj i veljača) (grafikoni uz kartu PhET za siječanj). Istovremeno u primorskom dijelu Hrvatske PhET ne pada ispod 0°C. Tijekom dana zimi je u unutrašnjosti PhET u granicama od -5°C do 0°C, a na Jadranu 4°C do 8°C. U unutrašnjosti jutra postaju *svježa* sredinom ožujka, na sjevernom Jadranu početkom ožujka, a na srednjem Jadranu već sredinom veljače. Jutra u nizinskom dijelu ostaju *svježa* do sredine svibnja, u Gorskom kotaru i Lici još i u lipnju, a u primorju do polovice travnja. Večeri, kada više nema sunca, *svježe* su do kraja svibnja, dok su u Gorskom kotaru večeri *svježe* i ljeti. U svibnju je pretežno *ugodno* i u unutrašnjosti i u primorju. Ljeti su u unutrašnjosti jutra i večeri uglavnom *ugodni* dok su u primorju jutra *ugodno topla* a uvečer je *ugodno*. Danju je *ugodno toplo*, u najtoplijem dijelu dana *toplo*, a na Jadranu, osobito u Dalmaciji, *toplo* postaje već u ranim jutarnjim satima. Osjet *vruće* pojavljuje se samo u najtoplije doba dana i to u nizinskim kopnenim krajevima od sredine lipnja do sredine kolovoza, a na Jadranu do kraja kolovoza. U Lici i Gorskom kotaru taj se osjet ponegdje javlja samo krajem srpnja i početkom kolovoza. Rujan je u unutrašnjosti danju uglavnom *ugodno svjež* a ujutro i uvečer *svjež*, dok su u primorju jutra i večeri *ugodno svježi* a popodneva *ugodna*. Krajem listopada u unutrašnjosti popodneva postaju *hladna*, na sjevernom Jadranu tek u prosincu, dok se u Dalmaciji osjet *hladnoga* pojavljuje u prosjeku samo ujutro i uvečer, dok je danju *svježe*.

Detaljniju sliku o biometeorološkim prilikama daje **vjerojatnost pojavljivanja različitih osjeta ugode** u terminima motrenja po dekadama tijekom godine, čiji su grafikoni prikazani uz karte za travanj (7h), srpanj (14h) i listopad (21h). U **7h** u unutrašnjosti zimi od sredine prosinca do polovice ožujka prevladava osjet *vrlo hladnoga* s PhET<-5°C. Takve vrijednosti PhET pojavljuju se i u primorju, premda mnogo rjeđe i učestalost im se smanjuje idući od sjevernog Jadrana prema jugu, a prevladavaju vrijednosti PhET od -5°C do 4°C. Odmicanjem zime sve češće postaje *hladno*, zatim *svježe*.

Dinarides and the highest mountain parts in Slavonia and north-western Croatia. On the coast, the islands and the Dalmatian hinterland, PhET values range between 0°C and 4°C. In **April**, representative of spring, in most of Croatia, there is a perception of *cool*, PhET values are from 8°C to 13°C. In the Sava and Kupa valleys, on the coast, on the islands and in a part of the Dalmatian hinterland it is *slightly cool* (PhET is between 13°C and 18°C). At higher altitudes, in Lika and Gorski kotar, as well as in the highest parts of the mountains in lowland Croatia it is *cold* (PhET from 4°C to8°C), while it is *very cold* only in the highest parts of the Dinarides (0°C to 4°C). In most of the country, it is *slightly warm* in **July** (mean PhET values between 23°C and 29°C). On the coast and in some parts of the Dalmatian hinterland it is *warm*, while it is *comfortable* in the mountains (18°C to 23°C) and *slightly cool* on the mountain peaks (13°C to 18°C). Because of the heating influence of the sea and rivers, autumn is warmer than spring, so in **October** the area with an average perception of *cool* (8°C to 13°C) is limited to a part of the lowlands, Lika and Gorski kotar. In central Croatia, in the Sava Valley, in some parts of the Drava and the Danube River valleys, on the coast, the islands, in the Dalmatian hinterland as well as in a large part of Istria it is *slightly cool* (13°C to 18°C), while it is *cold* only on the peaks of the Dinarides.

According to data acquired at the 7 am, 2 pm and 9 pm observation terms, the **annual course** of the physiological equivalent temperature shows that inland PhET values lower than -5°C occur only in the mornings and evenings of the winter months (December, January and February) (graphs next to the PhET map for January). At the same time, PhET at the seaside does not drop below 0°C. During the day, in winter, PhET values inland range from -5°C to 0°C, and at the seaside from 4°C to 8°C. Inland, the mornings become *cool* in mid-March, on the northern Adriatic at the beginning of March, and on the southern Adriatic as early as mid-February. In the lowlands, the mornings stay *cool* up to mid-May, in Gorski kotar and Lika the mornings are still *cool* in June, while they are *cool* up to mid-April at the seaside. The evenings, when there is no more sun, are *cool* up to the end of May, while in Gorski kotar they are *cool* during summer as well. In May, it is predominantly *comfortable* both inland and at the seaside. During summer, inland mornings and evenings are mostly *comfortable*, while at the seaside mornings are *slightly warm* and evenings are *comfortable*. During the day it is *slightly warm*, in the warmest part of the day it is *warm*, and at the seaside, especially on the southern Adriatic, it already becomes *warm* in the early morning hours. The perception of *hot* occurs only in the warmest part of the day in the continental, lowland parts from mid-June to mid-August, and until the end of August on the Adriatic. In Lika and Gorski kotar, this perception occurs in some places only at the end of July and the beginning of August. September is generally *slightly cool* inland during the day and *cool* in the morning and evening, whereas at the seaside mornings and evenings are *slightly cool* and afternoons are *comfortable*. The inland afternoons become *cold* at the end of October. On the northern Adriatic this does not happen before December, while on the southern Adriatic the perception of *cold* is felt, on average, only in the morning and evening, while it is *cool* during the day.

The probability of different thermal perceptions at observation times, by decades during the year, gives a more detailed picture of biometeorological conditions. These graphs are shown next to the PhET maps for April (7 am), July (2 pm) and October (9 pm). At **7 am,** during winter, the perception of *cold* prevails inland, from mid-December to mid-March, with a PhET of <-5°C. Such PhET values also occur at the seaside, although more rarely, and their frequency decreases moving south from the northern Adriatic, while PhET values from -5°C to 4°C predominate. As winter comes to an end, it becomes *cold* more frequently and then

Ugodna jutra (od *ugodno svježe* do *ugodno toplo*) u nizinskoj unutrašnjosti prevladavaju od sredine svibnja do sredine kolovoza, na Jadranu od početka svibnja pa sve do polovice listopada, a u Lici i Gorskom kotaru od početka lipnja do kraja kolovoza. U unutrašnjosti su jutra rijetko *topla*, još rjeđe *vruća*, dok na Jadranu ljeti *topla* pa čak i *vruća* jutra nisu tako rijetka, osobito u Dalmaciji. Od sredine listopada u unutrašnjosti u jutarnjim satima počinje prevladavati *hladno* zatim i *vrlo hladno*, dok u primorju ujutro postaje *hladno* tek krajem studenoga.

U najtoplijem dijelu dana u **14h** u kontinentalnoj unutrašnjosti osjet *vrlo hladnoga* je prevladavajući osjet od kraja studenoga do sredine veljače, dok u primorju istovremeno prevladava *hladno* i rijetko *vrlo hladno*. Krajem ožujka u unutrašnjosti, a na Jadranu zbog ohlađujućeg utjecaja mora početkom travnja, počinje prevladavati *ugodno* (od *ugodno svježe* do *ugodno toplo*) i to ostaje prevladavajući osjet do početka lipnja. Tada postaju sve učestaliji osjeti *toplo*, *vruće*, a rjeđe i *vrlo vruće* koji je najčešći u istočnoj Hrvatskoj gdje je maritimni utjecaj najmanji. Od sredine lipnja do kraja kolovoza, a u primorju do sredine rujna to su prevladavajući osjeti. Nakon toga ponovo počinje prevladavati *ugodno* što u 14h ostaje najčešći osjet do sredine listopada u unutrašnjosti, a na Jadranu do sredine studenoga.

Večernji termin motrenja u **21h** je tijekom čitave godine najhladniji jer više nema Sunčeva zračenja. Osjet *vrlo hladnoga* u kontinentalnom dijelu Hrvatske traje od kraja listopada do kraja ožujka, a u primorju od kraja studenoga do kraja travnja. Pri tome se vrijednosti PhET manje od -5°C na Jadranu pojavljuju vrlo rijetko, dok se u kontinentalnim dijelovima Hrvatske pojavljuju u više od 50% slučajeva od sredine prosinca do sredine veljače, a u gorskim dijelovima od početka prosinca do sredine ožujka. Od sredine lipnja do kraja kolovoza u kontinentalnom dijelu Hrvatske prevladavaju *ugodne* večeri (najčešće *ugodno svježe*), dok razdoblje *ugodnih* večeri traje od sredine svibnja do sredine listopada u Dalmaciji, a od početka lipnja do sredine rujna na sjevernom Jadranu.

cool. Comfortable mornings (from *slightly cool* to *slightly warm*) prevail in the continental lowlands from mid-May to mid-August, on the Adriatic from the beginning of May up to mid-October, and in Lika and Gorski kotar from the beginning of June to the end of August. On the mainland, mornings are seldom *warm* and even less frequently *hot*, while at the seaside, during summer, *warm* or even *hot* mornings are not so infrequent, especially on the southern Adriatic. Inland, mornings become predominantly *cold* in mid-October and are then followed by *very cold*, while at the seaside it does not get *cold* until the end of November.

During the warmest part of the day, at **2 pm,** on the mainland, the perception of *very cold* predominates from the end of November until mid-February, while at the seaside a perception of *cold* and, infrequently, *very cold* prevails. The end of March in the interior and, because of the cooling influence of the sea, the beginning of April at the seaside, is when *comfortable* starts to predominate (from *slightly cool* to *slightly warm*). This is the prevailing perception until the beginning of June. After that, the most frequent perceptions are *warm*, *hot* and sometimes even *very hot*, which is most frequent in eastern Croatia, where maritime influence is the weakest. These are the predominant perceptions from mid-June until the end of August on the mainland, and up until mid-September at the seaside. Then, the perception of *comfortable* begins to predominate and does so until mid-October inland and until mid-November at the seaside.

During the whole year, evenings (**9 pm)** are the coldest because there is no more solar radiation. The perception of *very cold* in the continental part of Croatia lasts from the end of October until the end of March, and at the seaside from the end of November until the end of April. At the same time, PhET values lower than -5°C occur very rarely at the seaside, while in mainland Croatia they occur in more than 50% of cases from mid-December to mid-February, and in the mountainous parts from the beginning of December until mid-March. From mid-June until the end of August, in the continental part of Croatia, evenings are *comfortable* (most frequently *slightly cool*), while at the seaside the period of *comfortable* evenings lasts from mid-May until mid-October on the southern Adriatic, and from the beginning of June until mid-September on the northern Adriatic.

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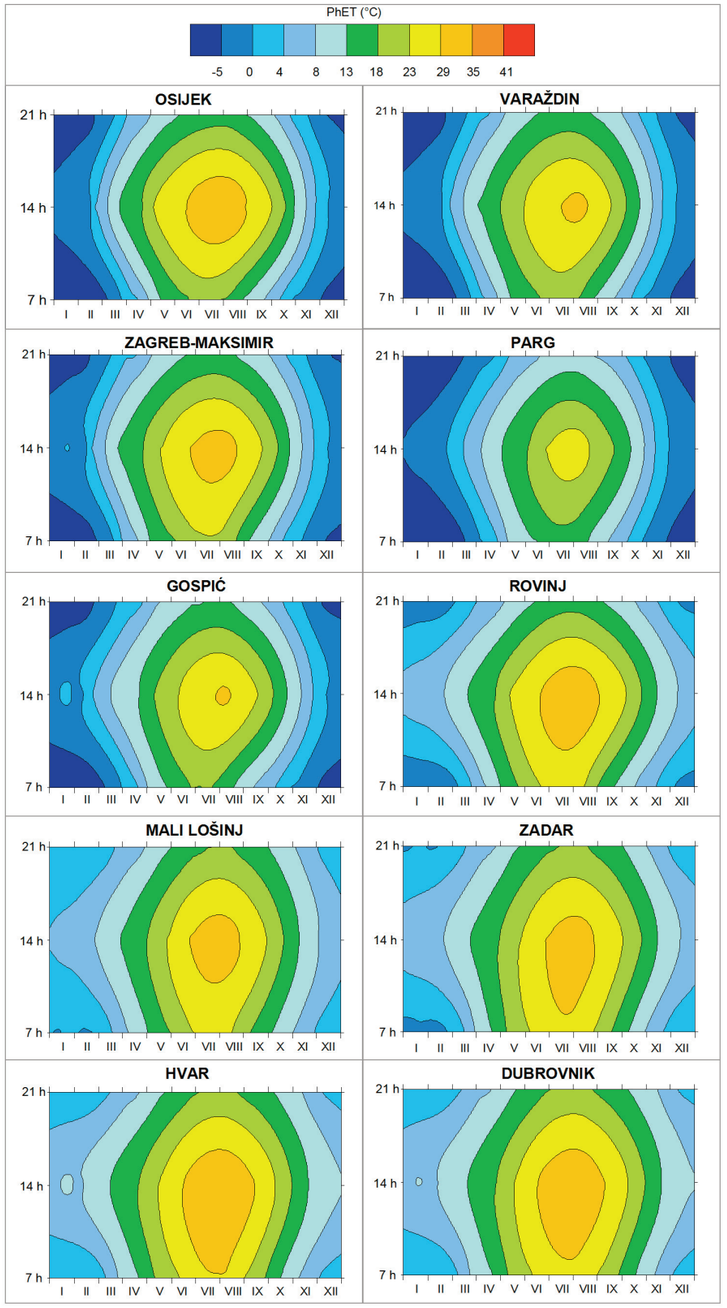
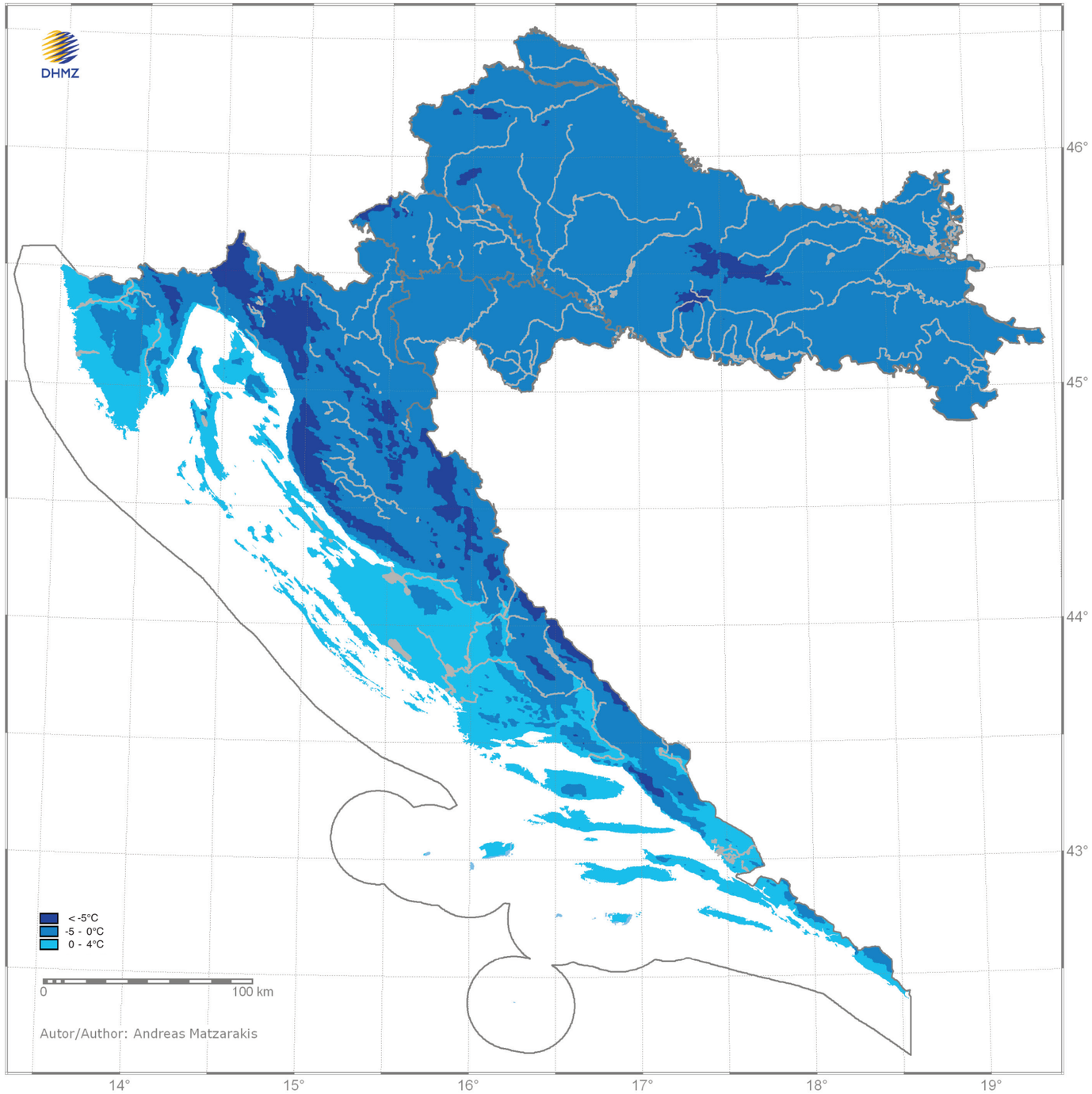
Srednja fiziološka ekvivalentna temperatura za siječanj Mean physiological equivalent temperature in January

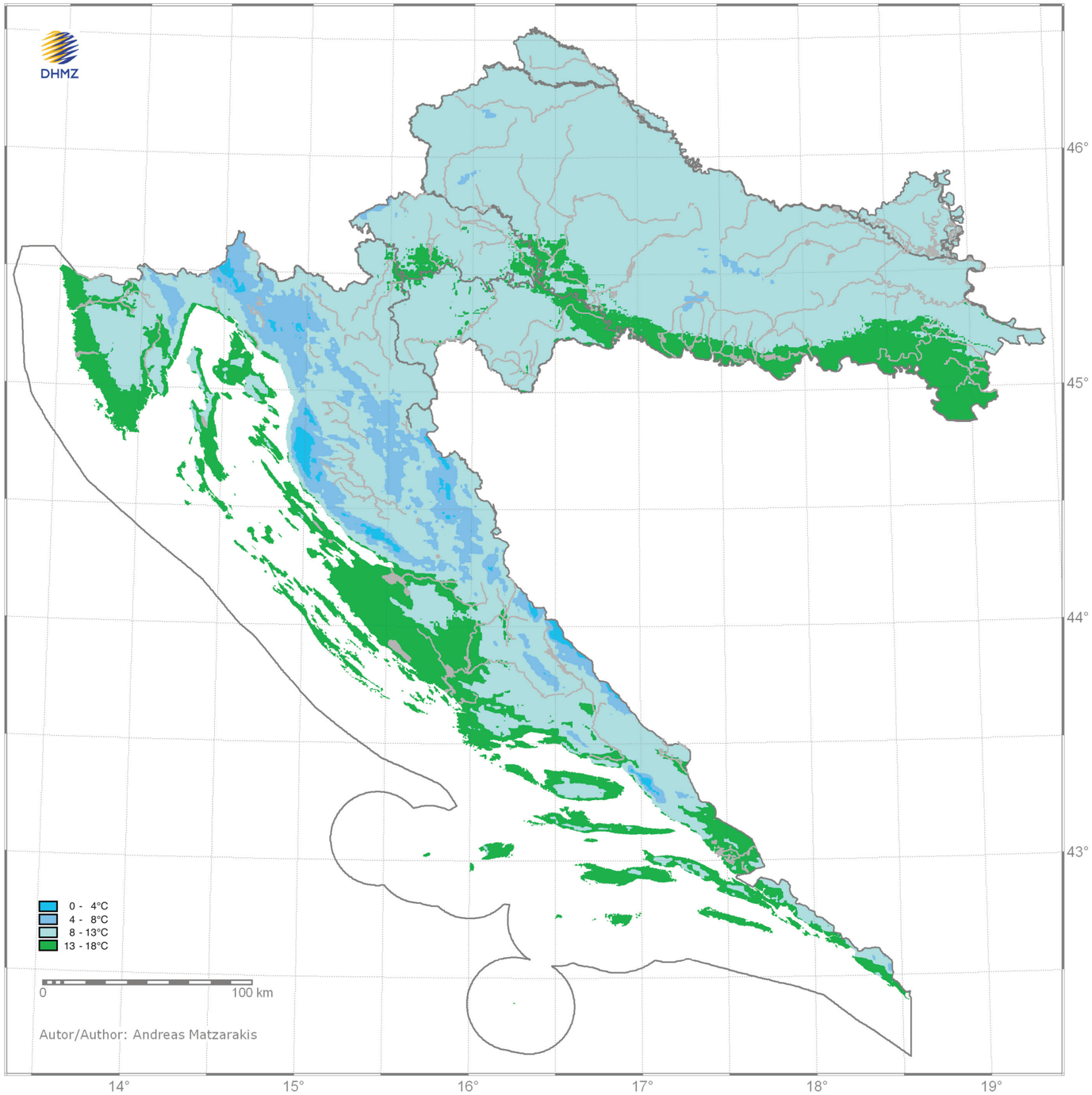


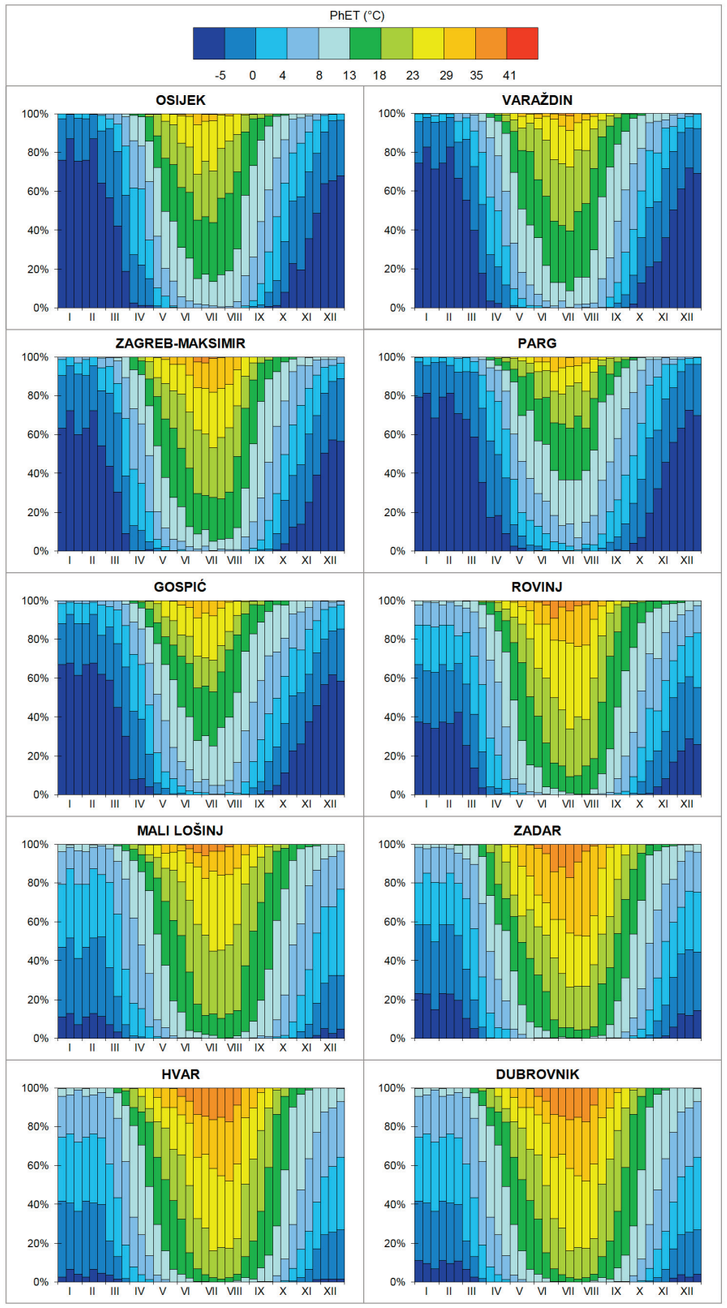
Godišnji hod srednje fiziološke ekvivalentne temperature zraka (°C) u terminima motrenja.

Annual course of mean phisiologically equivalent temperature (°C) in terms of observation.



Srednja fiziološka ekvivalentna temperatura za travanj Mean physiological equivalent temperature in April

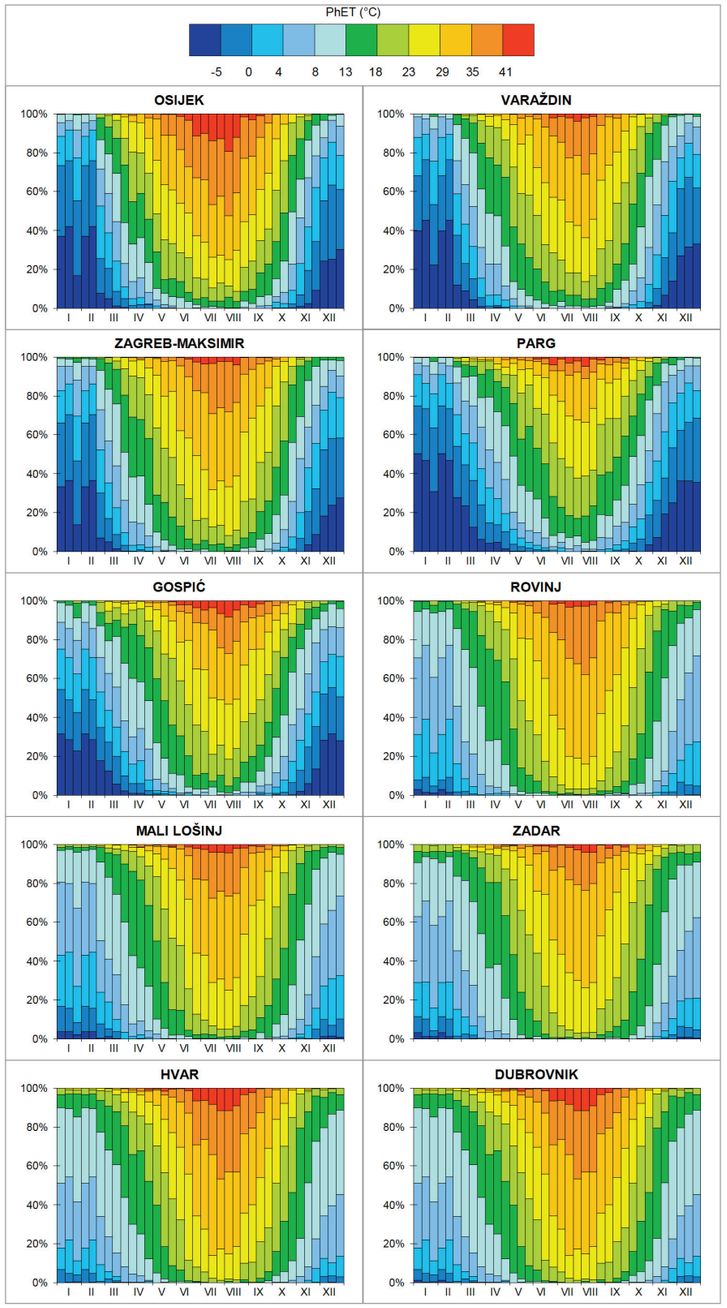




Vjerojatnost pojavljivanja srednje fiziološke ekvivalentne temperature zraka (PhET) u 7h po dekadama tijekom godine.

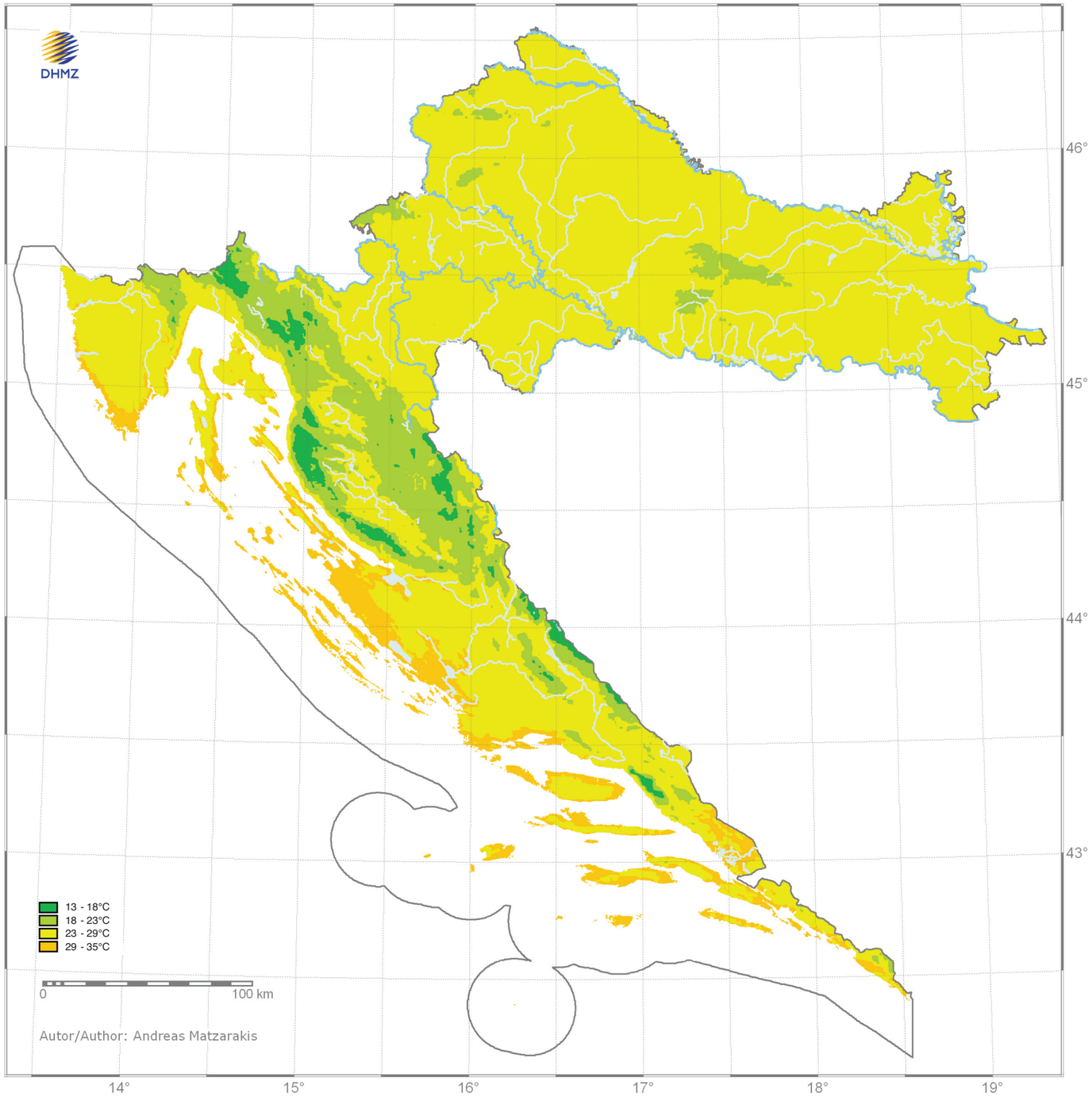
Probability of occurence mean phisiologically equivalent temperature (PhET) at 7 am by ten-day periods during the year.

Srednja fiziološka ekvivalentna temperatura za srpanj Mean physiological equivalent temperature in July

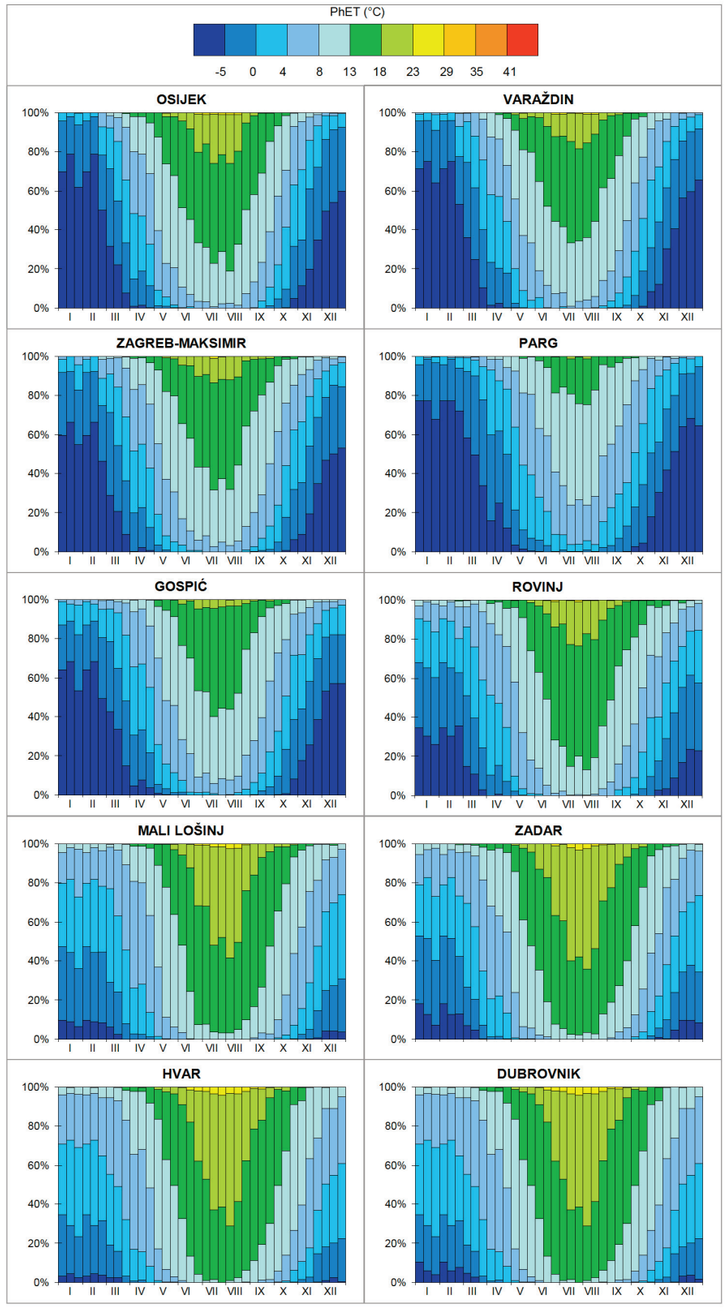


Vjerojatnost pojavljivanja srednje fiziološke ekvivalentne temperature zraka (PhET) u 14h po dekadama tijekom godine.

Probability of occurence mean phisiologically equivalent temperature (PhET) at 2 pm by ten-day periods during the year.



Srednja fiziološka ekvivalentna temperatura za listopad Mean physiological equivalent temperature in October



Vjerojatnost pojavljivanja srednje fiziološke ekvivalentne temperature zraka (PhET) u 21h po dekadama tijekom godine.

Probability of occurence mean phisiologically equivalent temperature (PhET) at 9 pm by ten-day periods during the year.

Agrometeorologija
Agrometeorology

Marko Vučetić
Dražen Kaučić
Željko Lončar

Godišnji hod srednjih mjesečnih temperaturnih suma

Marko Vučetić

Temperatura zraka jedan je od važnih meteoroloških elemenata o kojem ovisi cjelokupna aktivnost biljke. Postoje četiri temperaturna praga (apsolutni minimum, vegetacijska nultočka, najpovoljnija temperatura i apsolutni maksimum) koji su svojstveni pojedinoj biljnoj vrsti u različitoj razvojnoj fazi. Padom temperature ispod vegetacijske nultočke prestaje razvoj biljke, a kad opet zatopli ponovno započinje vegetacija. Međutim, ukoliko se temperatura zraka snizi ispod apsolutnog minimuma, biljka zbog hladnoće ugiba. U doba mirovanja zimi, biljka je otpornija na nisku temperaturu. Povećanjem temperature iznad vegetacijske nultočke počinje rast, i prirast biljke je veći što je temperatura viša. Aktivnost biljke je najpovoljnija pri optimalnoj temperaturi. Porast temperature iznad apsolutnog maksimuma uzrokuje uginuće biljke zbog vrućine.

Najniža temperatura zraka pri kojoj biljka ulazi u neku razvojnu (fenološku) fazu naziva se biološki minimum temperature. Temperaturu iznad biološkog minimuma za određenu fenofazu naziva se aktivna temperatura. Pod efektivnom temperaturom podrazumijeva se aktivna temperatura umanjena za veličinu biološkog minimuma. Za pojedine poljodjelske kulture (pšenicu, raž, ječam, zob) kao i za šumsko drveće biološki je minimum oko 5°C. Za neke druge kulture npr. suncokret ili voćke taj temperaturni prag iznosi 7–8°C, dok je za soju i kukuruz 10°C i više. Poznavanjem temperaturnih pragova moguće je za pojedine fenološke faze odrediti količinu akumulirane topline potrebne za tu fazu pomoću suma srednjih temperatura zraka iznad određenog praga. Takve sume nazivaju se biološke ili temperaturne sume za određeno razdoblje.

Temperaturne sume TS za pragove 5°C i 10°C izračunate su prema relaciji:

Annual variation of mean monthly temperature sums

Marko Vučetić

Air temperature is one of the important meteorological elements which influence the total activity of a plant. There are four temperature thresholds (absolute minimum, zero vegetation, optimal temperature and absolute maximum) which are characteristic of a particular type of vegetation at different stages of development. As temperature drops below vegetation zero, vegetation and the development of plants stops and later, when it gets warm, vegetation starts again. However, if air temperature drops below the absolute minimum, the plants die of cold. During the resting period, in winter, plants are more resilient to low temperatures. As temperature increases above vegetation zero, vegetation growth begins, and it increases with temperature. An increase in temperature above the absolute maximum causes the plants to die because of heat.

The lowest temperature at which a plant enters a developmental (phenological) phase is called biological temperature minimum. All temperatures above the biological minimum for a certain phenophase are called active temperatures. By effective temperatures we mean active temperatures reduced by the biological minimum. For certain agricultural crops (wheat, rye, barley, oats) as well as for forest trees, the biological minimum is 5°C. For some other crops like sunflowers or fruit trees, the temperature threshold is 7°C to 8°C, while it is 10°C and above for soybean and maize. By knowing the temperature thresholds, it is possible to determine the quantity of accumulated heat necessary for a certain phenological phase, using the mean air temperature sums above a certain threshold. Those sums are called biological or temperature sums for a certain period.

Uz dovoljno sunca i topline dozrijevaju plodovi bajama.
Sufficient sun and warmth help the ripening of almonds.
Fotografija Photo by: Marko Vučetić

$$TS = \sum_{i=1}^{n} (S_i - P) \quad \text{za} \quad S_i > P$$

$$S = \frac{t_{max} + t_{min}}{2}$$

gdje su:

- S = srednja temperatura zraka
- t_{max} = dnevna maksimalna temperatura zraka
- t_{min} = dnevna minimalna temperatura zraka
- P = temperaturni prag (5°C i 10°C)
- Σ = suma od prvog do posljednjeg dana u odabranom mjesecu

Godišnji hod srednjih temperaturnih suma je jednostruki val s maksimumom u ljetnom dijelu godine u pravilu u srpnju, a rjeđe u kolovozu (veći utjecaj mora) (grafikoni uz kartu srednjih datuma početka i svršetka

The TS temperature sums for the 5°C and 10°C thresholds are calculated according to the relation:

$$TS = \sum_{i=1}^{n} (S_i - P) \quad \text{for} \quad S_i > P$$

$$S = \frac{t_{max} + t_{min}}{2}$$

The values are:

- S = mean air temperature
- t_{max} = daily maximum air temperature
- t_{min} = daily minimum air temperature
- P = temperature threshold (5°C and 10°C)
- Σ = sum from the first to the last day in a given month

The **annual course** of the mean temperature sums is a one-fold wave with a maximum in the summer part of the year, normally in July, and less frequently in August (because of the greater influence of the sea) (graphs next to the map of mean dates of the beginning and the end of period with the air temperature above threeesholds). In the lowland part of Croatia, the mean annual sums above the 10°C threshold range from around 1250°C in the north-west to around 1570°C in the east of Croatia. For the 5°C threshold, those values are 2370°C in the north-west to 2740°C in the east. In the mountainous parts of Croatia the annual temperature sum amount varies considerably depending on the altitude of the meteorological station and its position (the concavity or the convexity of the terrain). Naturally, the lowest values are on the mountain peaks, for the 10°C threshold below 300°C, and for the 5°C threshold below 1000°C (Zavižan). In lower areas (500 to 900 m a.s.l.), the mean annual sum amount ranges from around 700°C to about 1220°C for the 10°C threshold, and from around 1640°C to around 2350°C for the 5°C threshold. Along the Adriatic, the

Pogodnost klime (klima masline) i dugovječnost masline stare oko 1500–2000 godina. Zastražišće, otok Hvar.
Favourable climate (olive climate) and the longevity of olive-trees: a 1500–2000 years old olive-tree, Zastražišće, the Island of Hvar.
Fotografija Photo by: Marko Vučetić

razdoblja s temperaturom zraka iznad pragova). U nizinskom dijelu Hrvatske srednje godišnje sume iznad praga 10°C kreću se od oko 1250°C na sjeverozapadu do oko 1570°C na istoku Hrvatske. Za prag 5°C te su vrijednosti 2370°C na sjeverozapadu do 2740°C na istoku Hrvatske. U gorskoj Hrvatskoj godišnji iznos temperaturnih suma uvelike varira u ovisnosti o nadmorskoj visini meteorološke postaje i njezinog položaja (konkavnost ili konveksnost terena). Dakako, najniže su vrijednosti na planinskim vrhovima, za prag 10°C ispod 300°C, a za prag 5°C ispod 1000°C (Zavižan). U nižim predjelima (500 do 900 m n/m) srednji godišnji iznos suma kreće se od oko 700 do oko 1220°C za prag 10°C, a od oko 1640 do oko 2350°C za prag 5°C. Uzduž Jadrana srednji godišnji iznos temperaturnih suma iznad praga 10°C kreće se od oko 1400°C u središnjoj Istri do oko 2540°C na srednjedalmatinskim otocima. Za prag 5°C te se vrijednosti kreću od oko 2630°C u središnjoj Istri do oko 4230°C na srednjedalmatinskim otocima. U kontinentalnom nizinskom dijelu Hrvatske razdoblje vegetacije je od travnja do rujna (srednja temperaturna suma od oko 1180 do oko 1450°C), a vegetacijsko se razdoblje prekida tijekom zime. Međutim uzduž Jadrana napose u Dalmaciji vegetacijsko se razdoblje prekida tijekom ljetnog razdoblje zbog nedovoljnih količina oborine ali i velike dozračene sunčane energije (topline) te biljke prisilno prekidaju vegetacijski ciklus. Samo u dva najtoplija mjeseca srpnju i kolovozu u tim krajevima maksimalne mjesečne vrijednosti temperaturne sume mogu iznositi i više od 500°C.

Srednji datumi početka i svršetka razdoblja iznad temperaturnih pragova

Marko Vučetić

Određivanjem datuma kada temperatura zraka naraste iznad određenog temperaturnog praga ili se spusti ispod njega, dobije se trajanje vegetacijskog razdoblja odnosno trajanje razdoblja mirovanja vegetacije. Datumi nastupa pojedinog praga određuju se iz srednjeg godišnjeg hoda temperature zraka za pojedinu meteorološku postaju. Za dio godine u kojem se mean annual temperature sum amount above the 10°C threshold ranges from around 1400°C in central Istria to around 2540°C on the central Dalmatian islands. For the 5°C threshold, the values range from around 2630°C in central Istria to around 4230°C on the mid-Dalmatian islands. In the continental, lowland part of Croatia the vegetation period lasts from April to September (the mean temperature sum is from around 1180°C to around 1450°C), and there is no vegetation period during winter. However, along the Adriatic, especially in Dalmatia, there is no vegetation period during summer, either, because of insufficient amounts of precipitation, as well as because of a large amount of irradiated solar energy (heat) so that the plants are forced to suspend the vegetation cycle. In these parts, the maximum temperature sum values can amount to over 500°C a month, only in the two warmest months of the year, July and August.

Mean start and end dates of periods above temperature thresholds

Marko Vučetić

By determining the date when air temperature rises above or drops below a certain temperature threshold we can calculate the duration of the vegetation period and the duration of the resting period. The starting dates of a particular threshold are determined from the mean annual air temperature variation for a particular meteorological station. For the part of the year when the mean monthly air temperature values increase, the following relation is applied:

$$d_{+} = D\frac{P - t_b}{t_a - t_b}$$

and for the part of the year when the mean monthly air temperature values decrease:

$$d_{-} = D\frac{t_a - P}{t_a - t_b}$$

where:
- P = temperature threshold (5°C and 10°C)
- t_a = mean monthly air temperature value greater than P
- t_b = mean monthly air temperature value smaller than P
- D = number of days in a month
- d_{+} = addition to the middle of the month (15+ d_{+})
- d_{-} = addition to the middle of the month (15+ d_{-})

When analysing data obtained in this way, it should be taken into account that these are statistical climatic terms of reference, while the actual crossing of the temperature threshold fluctuates a great deal in a particular year and it is not possible to determine it with complete precision.

According to the results obtained, it is possible to divide Croatia into three areas with shared characteristics. In lowland Croatia, inland Istria and the Dalmatian hinterland the dates of the beginning/end of the season for both thresholds can be obtained from the mean annual air temperature variation. The period with air temperature higher than 5°C lasts from the first half of March to mid-November, and the period with air temperature greater than 10°C is two months shorter and it lasts from the first half of April to mid-October. The second area with the shortest vegetation period is the mountainous part of Croatia where it lasts from the end of March or the beginning of May to the beginning of November (5°C), and from the end of April or the first half of May to the beginning of October (10°C). In the third area, the mean monthly air temperature does not drop below 5°C, except on the northern Adriatic and on the west coast of Istria. The period with temperature greater than 10°C stretches from north-west to south-east. On the northern Adriatic, it starts at the beginning

vrijednosti srednje mjesečne temperature zraka povećavaju primjenjuje se relacija

$$d_{+} = D\frac{P - t_b}{t_a - t_b}$$

a za dio godine u kojem se vrijednosti srednje mjesečne temperature zraka smanjuju relacija

$$d_{-} = D\frac{t_a - P}{t_a - t_b}$$

gdje su:

P = temperaturni prag (5°C i 10°C)

t_a = srednja mjesečna vrijednost temperature zraka viša od P

t_b = srednja mjesečna vrijednost temperature zraka niža od P

D = broj dana u mjesecu

d_+ = dodatak na sredinu mjeseca (15 + d_+)

d_- = dodatak na sredinu mjeseca (15 + d_-)

Kod analize tako dobivenih rezultata treba voditi računa da se radi o statističkim odrednicama, a da stvarno prelaženje temperaturnog praga u pojedinoj godini uvelike oscilira i nije moguće jednoznačno ga odrediti.

Prema dobivenim rezultatima moguće je Hrvatsku podijeliti u tri područja s različitim značajkama. U nizinskoj Hrvatskoj te u unutrašnjosti Istre i dalmatinskom zaleđu datumi početka/svršetka sezone za oba praga mogu se dobiti iz srednjeg godišnjeg hoda temperature zraka. Razdoblje s temperaturom zraka višom od 5°C traje od prve polovice ožujka do sredine studenoga, a ono s temperaturom zraka višom od 10°C dva mjeseca kraće, od prve polovice travnja do sredine listopada. Drugo područje koje ima najkraće vegetacijsko razdoblje, pripada gorskoj Hrvatskoj i traje od kraja ožujka ili početka svibnja do početka studenoga (5°C), odnosno od kraja travnja ili prve polovice svibnja do početka listopada (10°C). U trećem području srednja mjesečna temperatura zraka ne spušta se ispod 5°C s izuzetkom sjevernog Jadrana i zapadne obale Istre. Razdoblje s temperaturom zraka višom od 10°C produžuje se od sjeverozapada prema jugoistoku. Na sjevernom Jadranu počinje početkom travnja i traje do sredine studenoga. Na otocima sjevernog Jadrana i na srednjem Jadranu to razdoblje traje od druge polovice ožujka do kraja studenoga ili početka prosinca. Na srednjodalmatinskim otocima i na krajnjem jugu Dalmacije temperatura zraka prelazi prag od 10°C u drugoj polovici veljače i iznad toga praga ostaje do kraja prosinca.

Pod utjecajem vremenskih prilika u pojedinoj godini temperatura zraka može i prije naznačenih srednjih datuma prekoračiti prag na više ili na niže pa se tako čak zadržati dulje vrijeme i biljke potaknuti na listanje, cvjetanje, zriobu ili opadanje lišća kada u normalnim vremenskim okolnostima do toga ne bi došlo. U većini takvih slučajeva nastaju štete u poljoprivredi i šumarstvu, ali pojedine godine, ovisno o biljnoj vrsti i njezinoj razvojnoj fazi, mogu tako postati izuzetno poticajne i rodne.

of April and lasts until mid-November. On the islands of the northern Adriatic and on the mid-Adriatic, the period lasts from the second half of March to the end of November or the beginning of December. On the mid-Dalmatian islands and the southern Adriatic, the air temperature is greater than the 10°C threshold in the second half of February and remains above the threshold until the end of December.

Influenced by the weather conditions in a particular year, air temperature can rise above or drop below the threshold before the mean dates given. It can even last longer and cause the emergence of leaves or flowers, maturation or the falling of leaves, when the plant would not do that in normal weather conditions. In most such cases, damage is sustained in agriculture and forestry. Particular years, depending on the plant type and its developmental phase, can be extremely stimulating and fertile.

Soil temperature

Dražen Kaučić

Soil temperature measurements form an integral part of applied meteorology and agrometeorology, all in accordance with the requirements of the WMO Agrometeorolgy Commission. Soil temperature measurements in Croatia date back to 1898, the year when the Economics and Forestry College in Križevci purchased three thermometers for soil temperature measurements. The following year, another five geothermometers were purchased, which were sunk into the ground at depths of 25 cm, 50 cm, 100 cm, 150 cm and 200 cm.

Since 1951, soil temperature has been measured systematically at a number of meteorological stations. At first, soil temperature was only measured down to a depth of 20 cm during the vegetation period but, from 1955, measurements were carried out at depths of 20

Temperatura tla

Dražen Kaučić

Mjerenja temperature tla u Hrvatskoj datiraju od 1898. godine, kad je Gospodarsko i šumarsko učilište u Križevcima nabavilo tri termometra za tu svrhu. Sljedeće godine nabavljeno je još pet novih geotermometara, koji su ukopani na dubinama 25, 50, 100, 150 i 200 cm.

Od 1951. godine postoji sustavno mjerenje temperature tla na više meteoroloških postaja. Temperatura tla mjerila se je s početka samo do 20 cm dubine i to u vegetacijskom razdoblju, a od 1955. mjeri se cijele godine na dubinama 2, 5, 10, 20, 30, 50 i 100 cm na golom tlu, tj. na tlu na kojem nema vegetacije.

Površinski sloj tla zagrijava se apsorpcijom kratkovalnog Sunčevog zračenja te protuzračenja atmosfere,

Geotermometarsko polje glavne agromeorološke postaje Križevci.
The geothermometer field of the Križevci agrometeorological station.
Fotografija Photo by: Dražen Kaučić

cm, 30 cm, 50 cm and 100 cm throughout the year. Today, soil temperature is measured at depths of 2 cm, 5 cm, 10 cm, 20 cm, 30 cm, 50 cm and 100 cm on bare soil, i.e. soil without vegetation. Temperature measured at the main meteorological stations is forwarded to the central NMHS computer on a daily basis. Other meteorological stations submit the soil temperature recorded in Observation logs.

The surface soil layer is heated by absorbing shortwave solar radiation and counter-radiation from the atmosphere, whereas it cools by radiating in the long-wave area. During the warm weather period of the year, deeper soil layers are heated by conducting heat away from the surface and, in the colder period, they are cooled by conducting heat towards the surface. As depth increases, so do temperature differences between two adjacent soil layers.

Obnovljeni fenoloških vinograd u sastavu glavne agrometeorološke postaje Križevci.
The renewed phenological vineyard within the Križevci main agrometeorological station.
Fotografija Photo by: Zdravko Koščević

a hladi se ižaravanjem u dugovalnom području. U toplom dijelu godine dublji se slojevi tla zagrijavaju vođenjem topline s površine, dok se u hladnom dijelu godine hlade vođenjem topline prema površini. S porastom dubine temperaturne razlike između dvaju susjednih slojeva tla se smanjuju.

Toplinski režim pojedinih tipova tala ovisi o njihovim fizikalnim, kemijskim i biološkim svojstvima. Prekrivanjem ili zasjenjivanjem tla može se utjecati na njegov temperaturni režim. Temperaturni odnosi u tlu mijenjaju se i njegovom obradom, jer se obrađeno tlo zagrijava i ohlađuje brže od neobrađenoga. Gnojidbom organskim gnojivima potiče se aktivnost mikroorganizama, pa se struktura, a time i temperaturni režim tla vrlo brzo mijenjaju.

U **godišnjem hodu** temperature tla na dubinama 5 i 20 cm maksimum se javlja u srpnju, na 20 cm ponekad i u kolovozu, a minimum u siječnju (grafikoni uz kartu pragova temperature tla). Srednja godišnja temperatura tla na obje dubine kreće se između 11°C i 12°C u nizinskoj Hrvatskoj, u gorskom dijelu između 9°C i 10°C, a na jadranskom području od 12°C u unutrašnjosti Istre do gotovo 16°C na krajnjem jugu.

Tlo na dubini 5 cm na jadranskom je podučju za oko 4°C toplije nego u nizinskoj Hrvatskoj, a za oko 6°C toplije nego u gorskom dijelu Hrvatske. U vegetacijskom razdoblju, što je važno za poljoprivrednu proizvodnju, tlo u nizinskoj Hrvatskoj je oko 3°C toplije nego u njenom gorskom dijelu.

U razdoblju od ožujka do kolovoza gradijent temperature tla u sloju od 5 do 20 cm dubine je negativan, tj. temperatura povećanjem dubine opada. Nasuprot tome, od rujna do veljače temperatura tla s dubinom raste.

Poznavanje datuma početka razdoblja s temperaturama tla višima od pragova 5°C i 10°C na dubinama 5 i 20 cm važno je zbog određivanja agrotehničkih rokova sjetve poljoprivrednih kultura. Sjeme ranijih povrtlarskih kultura klije pri temperaturi tla od 5°C, a sjeme većine ratarskih kultura na 10°C. Kod višegodišnjih biljaka početak kolanja sokova iz korijena u vegetativne dijelove biljaka, o čemu ovisi i pojava različitih fenofaza, započinje razdobljem s temperaturom tla iznad tih pragova.

U nizinskom dijelu Hrvatske temperatura tla na obje dubine prelazi temperaturni prag 5°C u prvoj polovici ožujka, a to razdoblje završava krajem studenoga. Razdoblje s temperaturama tla višim od 10°C je dva mjeseca kraće, te nastupa u prvoj polovici travnja i traje do kraja listopada. Nešto raniji nastup temperaturnog praga 10°C u istočnim nego u zapadnim dijelovima uzrok je ranijoj sjetvi ratarskih kultura u istočnim dijelovima Hrvatske.

U gorskom dijelu Hrvatske nastup temperaturnih pragova kasni oko 15 dana u odnosu na nizinske dijelove, a završava 5 do 10 dana prije.

The heat regime of different soil types depends on their physical, chemical and biological properties. Covering the soil or creating shade can influence its temperature regime. Temperature relations in the soil are also changed through cultivation because cultivated soil heats faster than uncultivated. Fertilizing the soil with organic fertilizers stimulates the activity of microorganisms and, thus, the structure and temperature regime of the soil change rapidly.

Within the **annual course** of soil temperature, at depths of 5 cm and 20 cm, the maximum is reached in July, and sometimes August, at 20 cm, whereas the minimum occurs in January (graphs next to the soil temperature thresholds map). The mean annual soil temperature at both depths ranges from 11°C to 12°C in the lowlands, from 9°C to 10°C in the mountains, and from 12°C in the Istrian interior up to almost 16°C in the southernmost part of the Adriatic.

The soil at a depth of 5 cm is approximately 4°C warmer in the Adriatic area than in the lowlands and approximately 6°C warmer than in the mountains. During the vegetation period, which is important for agricultural production, the soil in the lowlands is around 3°C warmer than in the mountains.

In the warm period of the year, from March to August, the soil temperature gradient in the 5 cm to 20 cm deep layer is negative, i.e. temperature decreases with depth. However, during the cold period of the year, soil temperature increases with depth.

It is important to know the starting date of the period with soil temperatures above the 5°C and 10°C thresholds in order to determine the agrotechnical deadlines for sowing agricultural crops. Seeds of earlier vegetable crops germinate at a soil temperature of 5°C and of most field crops at 10°C. In the case of perennial plants, the flow of juices from the root to the vegetative part of the plant, which also influences the onset of various phenophases, starts with the period of soil temperature above these thresholds.

Prvi zreli plodovi pitomog kestena.
The first ripe fruits of sweet chestnut.
Fotografija Photo by: Dinko Žagi

In the Croatian lowlands, soil temperature at both depths rises above the 5°C temperature threshold in the first part of March and that period lasts until the end of November. The period with soil temperatures above 10°C is two months shorter: it starts in the first part of April and lasts until the end of October. The somewhat earlier onset of the 10°C temperature threshold in the eastern, but not in the western, part of the country is the reason why field crops are sowed at an earlier time in the eastern part of Croatia.

In the mountainous parts of Croatia, the onset of temperature thresholds is approximately 15 days later than in the lowlands and it ends 5 to 10 days earlier.

In the Istrian interior and the Dalmatian hinterland, the period with soil temperature above the 5°C threshold lasts from the end of February until the beginning of December and above the 10°C threshold from the first decade of April until the first decade of November.

Mreža fenoloških postaja (2007. godina).
Phenological station network (2007).

U unutrašnjosti Istre i u dalmatinskom zaleđu razdoblje temperature tla iznad praga 5°C traje od kraja veljače do početka prosinca, a praga 10°C od prve dekade travnja do prve dekade studenoga.

U Dalmaciji temperatura tla je u prosjeku tijekom čitave godine viša od 5°C na obje dubine, a razdoblje temperature tla iznad praga 10°C traje od polovice ožujka do kraja studenoga.

Biljna fenologija
Željko Lončar

Sustavno praćenje i istraživanje nastupa bioloških ciklusa biljaka – listanja, cvjetanja, zriobe plodova, promjene boje lišća i drugih godišnjih fenoloških promjena – i njihove povezanosti s vremenom i klimom, neupitno će doprinijeti boljem razumijevanju interakcija atmosfere i biosfere. Dobiveni rezultati dragocjena su dopuna meteorološkim podacima pri tumačenju vremenskih i klimatskih prilika i promjena na lokalnoj, regionalnoj i globalnoj razini. Istodobno su nezaobilazan i ključan čimbenik pri proučavanju utjecaja vremena i klime na razvoj biljaka. Stoga je fenološka aktivnost organizirana uglavnom na meteorološkim postajama ili u njihovoj blizini.

S prvim fenološkim opažanjima u Hrvatskoj započeo je 1870. godine na otoku Hvaru znameniti prirodoslovac Grgur Bučić. Početak sustavno organiziranih fenoloških opažanja pridjeljuje se Poljoprivrednom institutu 1946. godine, ali je prijelomnica za razvoj fenološke aktivnosti u Hrvatskoj godina 1950., kada se počinje organizirati mreža fenoloških postaja u okviru hidrometeorološke službe. Do tada nije bilo organiziranih sveobuhvatnih opažanja, već su postojala samo na lokalnoj razini. Od 1951. podaci se objavljuju u fenološkim godišnjacima kao redni brojevi dana od početka kalendarske godine. Do 1983. opažanja su obuhvaćala i neke važnije biljne bolesti i štetnike te ptice selice.

Broj fenoloških postaja tijekom godina stalno se mijenjao. Tako se u samim počecima opažanje obavljalo na 61 postaji, najviše fenoloških postaja, njih 129, bilo je 1957., a u 1992., zbog ratnih zbivanja i okupacije velikog područja Hrvatske, radila je samo 41 fenološka postaja. Danas ih ima 60.

Pored osnovne mreže fenoloških postaja u sastavu Glavne agrometeorološke postaje (GAP) Križevci osnovani su 1951. godine domaći fenološki vrt, 1958. međunarodni fenološki vrt te fenološki voćnjak i vinograd 1981. godine. Suradnjom Državnog hidrometeorološkog zavoda RH i Srednje gospodarske škole Križevci fenološki vinograd je posve obnovljen 2006. godine sa 27 sorti vinove loze različitih epoha dozrijevanja.

Soil temperature in Dalmatia on average exceeds 5°C at both depths throughout the year and the period with soil temperature above the 10°C threshold lasts from the middle of March until the end of November.

Plant phenology
Željko Lončar

Systematic observation of and research into the occurrence of biological plant cycles – the emergence of leaves and flowers, maturation, change of leaf colour and other phenological changes – and how these are related to weather and climate will definitely contribute to a better understanding of how the atmosphere and the biosphere interact. The results obtained are a valuable supplement to meteorological data for explaining weather and climate conditions and changes at local, regional and global level. At the same time, they are an indispensable and crucial factor for research in the effects of weather and climate on plant development. Phenology-related activity is, therefore, organised mostly at meteorological stations or in their vicinity.

In 1870, a well-known natural scientist, Grgur Bučić, started conducting the first phenological observations in Croatia on the island of Hvar. The Agricultural Institute was the first to start with systematically organised phenological observations in 1946, but the milestone in the development of phenology in Croatia was the year 1950, when a phenological station network was set up within the Meteorological and Hydrological Service. There had been no organised comprehensive observations until then, except at local level. Since 1951, data have been published in phenological almanacs as ordinal numbers of days from the beginning of a calendar year. Until 1983, observations also included information on relevant plant diseases, pests and migratory birds.

Međunarodni fenoloških vrt (br. 56) u sastavu glavne agrometeorološke postaje Križevci.
The international phenological garden (no. 56) within the Križevci main agrometeorological station.
Fotografija Photo by: Zdravko Koščević

The number of phenological stations has constantly varied over the years. Initially, there were 61 stations; in 1957, a record number of 129 stations was reached; in 1992, only 41 phenological stations were active due to the war and the fact that most of the Croatian territory was occupied, and today there are 60 stations.

In 1951, a national phenological garden was set up; in 1958, an international phenological garden and, in 1981, a phenological orchard and vineyard were started, all in addition to the basic phenological station network within the Križevci Main Agrometeorological Station (MAS). Through co-operation of the Meteorological and Hydrological Service of Croatia and the Križevci Secondary School of Economics, in 2006, the phenological vineyard was completely renewed with 27 grapevine sorts with different maturation periods.

Cvjetanje šafrana.
Crocus flowering.
Fotografija Photo by: Ante Vukušić

Međunarodni fenološki vrt Križevci (MFV–56) pripada mreži od 68 međunarodnih fenoloških vrtova u Europi kojima je osnovna namjena mogućnost uspoređivanja razvoja šumskog drveća i grmlja s jednakom genetskom osnovom. Sadnjom materijala istog genetskog podrijetla u sličnom okružju posebice se izdvajaju vremenski i klimatski čimbenici kao mjerilo rasta i razvoja. Izvorni vrt za vegetativno razmnožavanje i snabdijevanje svih vrtova kloniranim sadnim materijalom nalazi se u Ahrensburgu, u Njemačkoj, dok međunarodnu koordinaciju i administraciju vodi Humboldt sveučilište u Berlinu.

Od 1962. do uništenja zbog izgradnje stambenih objekata 1967. godine mreži međunarodnih fenoloških vrtova pripadao je i vrt u Dubrovniku. Stoga su od 1970. fenološka opažanja organizirana i nastavljena u Arboretumu Hrvatske akademije znanosti i umjetnosti u Trstenom, nedaleko od Dubrovnika, ali su prekinuta 1985. godine.

Program i kriteriji fenoloških opažanja usklađeni su s ostalim europskim zemljama, ali je, uz uvažavanje biološke i klimatske raznolikosti, naš program proširen još nekim autohtonim, kulturološko i ekološki značajnim biljnim vrstama.

Program fenoloških opažanja obuhvaća sljedeće grupe:

- samonikle zeljaste biljke
- šumsko drveće i grmlje
- djeteline i livadne trave
- ratarske kulture
- voćke
- vinovu lozu
- pčele
- opće poljske radove

Opažaju se različite fenološke faze ovisno o grupi i vrsti biljaka. Primjerice, na kultiviranom i nekultiviranom drveću i grmlju motri se početak listanja, početak, opća faza i završetak cvatnje, pojava prvih zrelih plodova, berba, opća promjena boje lišća i opće opadanje lišća. Fenološki podaci o aktivnostima pčelinjih zajednica odnose se na prvu pašu, odnosno prvo unošenje peluda u košnicu, te medenje na bagremu i različitim vrstama lipe. Kod općih poljskih radova bilježe se podaci o početku, općem (masovnom) obavljanju i završetku proljetnih radova, košenju livada i žetvi ozimih žitarica te završnim radovima pred zimu.

Programom fenoloških opažanja danas je u Hrvatskoj obuhvaćeno pedesetak vrsta drvenastih biljaka. Ovdje su prikazani rezultati opažanja nekog listopadnog i vazdazelenog drveća za koje postoje vremenski dovoljno dugi nizovi podataka, pri čemu se je pri odabiru lokacija vodilo računa o klimatskoj raznolikosti Hrvatske. Podaci se odnose na pet fenoloških faza, odnosno od jedne do četiri za pojedinu biljnu vrstu. Vegetacijskom sezonom označava se razdoblje od početka listanja do opće promjene boje (žućenja) lišća.

The Križevci International Phenological Garden (IPG-56) belongs to the network of 68 international phenological gardens in Europe, the primary purpose of which is the comparison of the development of forest trees and bushes with the same genetic base. When material of the same genetic base is planted in a similar environment, weather and climatic factors are of special importance as criteria for growth and development. The original garden, used for vegetative propagation, providing all gardens with cloned planting material, is in Ahrensburg, Germany, while the Humboldt University of Berlin is in charge of international co-ordination and administration.

From 1962, until its destruction in 1967 due to housing construction, the garden in Dubrovnik also belonged to the network of international phenological gardens. From 1970 onwards, phenological observations were organised and continued in the Arboretum of the Croatian Academy of Sciences and Arts in Trsteno near Dubrovnik, but they ceased in 1985.

The programme and criteria of phenological observations are in accordance with those of other European countries, but, taking into consideration biological and climatic diversity, the Croatian programme has been enlarged with some further indigenous, culturally and ecologically significant plant species.

The programme of phenological observations includes the following groups:

- self-grown herbaceous plants
- forest trees and bushes
- clovers and meadow grasses
- field crops
- fruit trees
- grapevines
- bees
- general field activities

Different phenological phases are observed, depending on the plant group and type. For example, the beginning of the emergence of leaves, the beginning, general phase and end of flowering, the appearance of the first mature fruits, harvesting, the general change of leaf colour, the general falling of leaves are all observed on cultivated and uncultivated trees and bushes.

Phenological data about the activities of bee communities refer to the ‘first grazing’, i.e. to the first time pollen is brought into the hive, as well as honey-sourcing from acacia and different lime species. As regards general field activities, data are recorded at the beginning, during general activities and at the end of spring activities, during the mowing of meadows, the harvest-

Prvi zreli plodovi nara (šipka).
The first ripe fruits of pomegranates.
Fotografija Photo by: Marko Vučetić

Početak cvjetanja naranče.
The beginning of the flowering of the sweet orange.
Fotografija Photo by: Marko Vučetić

Kod analize fenoloških podataka treba voditi računa da razvojne faze bilja ne ovise samo o vremenu i klimi, već su posljedica i orografske, geološke, pedološke, vegetacijske i genetske raznolikosti. Konačno, izvjesna je i određena subjektivnost fenoloških podataka, jer se zasnivaju na vizualnim procjenama motritelja izravno povezanim s njihovim iskustvom i točnošću.

Zamjetne su promjene u prosječnim datumima nastupa pojedinih fenoloških faza u prikazanim tridesetogodišnjim razdobljima, 1961–1990. i 1971–2000 (Tablica 2). U drugome mjernom razdoblju svi proljetni događaji, kao što su početak listanja i cvjetanja, nastupaju ranije, dok jesenski, kao promjena boje (žućenje) lišća, nastupaju kasnije nego u prvome. To znači da se prosječna vegetacijska sezona produljila. Na osnovu tendencija uočenih na izabranim lokacijama mogu se očekivati slične fenološke promjene i u drugim dijelovima Hrvatske.

ing of winter grains and the final activities before winter.

Today, the programme of phenological observations covers around fifty types of woody plants in Croatia. The observation results given here refer to some deciduous and evergreen trees, for which data sequences cover a sufficient time period, while the location was chosen on the basis of the climatic diversity of Croatia. The data refer to five phenological phases, i.e. from one to four for a particular plant type. The vegetational season is the period from the beginning of the emergence of leaves until the general change of leaf colour (yellowing).

When analysing phenological data, one has to take into account that the developmental phases of plants are not only dependent on weather and climate but are also a consequence of orographical, geological, pedological, vegetational and genetic diversity. Finally, there is a certain subjectivity in phenological data as they are based on the observer's visual estimates, which are directly related to his or her experience and accuracy.

There are significant changes in the average starting dates of particular phenological phases in the described thirty-year periods (1961–1990 and 1971–2000) (Table 2). In the second measurement period, all spring events, such as the emergence of leaves and flowers, begin earlier, while autumn events, such as colour change (yellowing) of leaves, begin later than in the first measurement period. It means that the average vegetation season has been prolonged. On the basis of the tendencies noted at chosen locations, similar phenological changes can be expected in other parts of Croatia as well.

Geografski položaj fenoloških postaja
Geographical position of phenological stations

Postaja Station	Nadmorska visina Altitude	Zemljopisna širina Geographical latitude		Zemljopisna dužina Geographical longitude	
	(m)	φ (° ´)		λ (° ´)	
Mandićevac	231	45	22	18	14
Daruvar	161	45	36	17	14
Križevci	138	46	02	16	33
Zagreb	121	45	49	16	02
Ogulin	325	45	16	15	17
Gospić	566	44	32	15	24
Rab	24	44	45	14	46
Hvar	20	43	10	16	27
Trsteno	60	42	45	17	59

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Tablica 2. Fenološke faze, srednji (MEAN), najraniji (MIN) i najkasniji (MAX) datum nastupa fenoloških faza uz pripadnu standardnu devijaciju (STD) u razdoblju 1961-1990.
Table 2. Mean (MEAN), the earliest (MIN) and the latest (MAX) date of commencement of phenological phases and standard deviation (STD) during the period 1961-1990.

Postaja / Station	1961-1990																															
	Aesculus hippocastanum																Corylus avellana								Syringa vulgaris				Robinia pseudoacacia			
	UL				BF				RF				CL				BF				RF				BF				BF			
	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Mandićevac	9.IV.	7.2	23.III.	22.IV.	28.IV.	5.6	15.IV.	7.V.	17.IX.	3.9	10.IX.	28.IX.	19.X.	5.5	4.X.	29.X.	27.II.	15.8	24.I.	25.III.	28.VIII.	8.1	15.VIII.	9.IX.	22.IV.	10.3	28.III.	9.V.	15.V.	8.5	25.IV.	5.VI.
Daruvar	10.IV.	7.1	22.III.	22.IV.	28.IV.	5.8	14.IV.	7.V.	16.IX.	4.6	6.IX.	24.IX.	19.X.	6.3	5.X.	31.X.	23.II.	14.8	25.I.	25.III.	29.VIII.	5.5	20.VIII.	10.IX.	24.IV.	9.8	31.III.	8.V.	17.V.	6.9	1.V.	31.V.
Križevci	12.IV.	7.8	28.III.	23.IV.	29.IV.	6.2	15.IV.	8.V.	16.IX.	5.0	4.IX.	25.IX.	17.X.	5.8	8.X.	30.X.	25.II.	16.5	27.I.	25.III.	29.VIII.	6.1	16.VIII.	9.IX.	27.IV.	9.4	5.IV.	11.V.	19.V.	7.1	4.V.	5.VI.
Zagreb	9.IV.	7.7	23.III.	20.IV.	27.IV.	4.7	16.IV.	5.V.	17.IX.	4.8	7.IX.	29.IX.	19.X.	5.5	12.X.	2.XI.	22.II.	15.4	26.I.	24.III.	26.VIII.	7.2	14.VIII.	10.IX.	21.IV.	8.6	2.IV.	3.V.	16.V.	7.7	27.IV.	31.V.
Ogulin	15.IV.	6.9	30.III.	26.IV.	3.V.	6.0	19.IV.	16.V.	22.IX.	5.3	8.IX.	2.X.	15.X.	5.2	6.X.	25.X.	1.III.	16.2	28.I.	31.III.	4.IX.	5.9	26.VIII.	16.IX.	29.IV.	9.9	2.IV.	14.V.	23.V.	7.3	10.V.	8.VI.
Gospić	23.IV.	7.7	3.IV.	5.V.	11.V.	6.7	1.V.	26.V.	27.IX.	4.9	17.IX.	7.X.	12.X.	4.9	4.X.	24.X.	13.III.	14.6	19.II.	19.IV.	10.IX.	7.8	28.VIII.	27.IX.	10.V.	7.8	19.IV.	21.V.	4.VI.	8.5	22.V.	22.VI.
Rab																									14.IV.	8.2	23.III.	29.IV.	5.V.	5.7	22.IV.	15.V.
Hvar																									9.IV.	7.9	20.III.	23.IV.	1.V.	6.8	14.IV.	11.V.
Trsteno	27.III.	7.5	6.III.	11.IV.	16.IV.	6.8	30.III.	27.IV.	13.IX.	5.8	2.IX.	22.IX.	2.XI.	7.1	19.X.	15.XI.	9.II.	9.5	16.I.	28.II.	20.VIII.	7.2	4.VIII.	31.VIII.	7.IV.	9.2	15.III.	23.IV.	29.IV.	6.2	10.IV.	10.V.

Postaja / Station	Tilia cordata												Betula pendula				Laurus nobilis				Olea europaea											
	UL				BF				CL				BF				BF				BF				RF				RP			
	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Mandićevac	17.IV.	7.3	28.III.	29.IV.	18.VI.	6.0	9.VI.	30.VI.	21.X.	5.4	12.X.	1.XI.																				
Daruvar	17.IV.	7.0	31.III.	28.IV.	18.VI.	6.0	8.VI.	28.VI.	22.X.	5.3	10.X.	5.XI.	7.IV.	7.0	25.III.	20.IV.																
Križevci	18.IV.	7.9	4.IV.	5.V.	20.VI.	4.8	8.VI.	29.VI.	23.X.	4.1	15.X.	31.X.	9.IV.	7.9	23.III.	23.IV.																
Zagreb	15.IV.	7.9	24.III.	26.IV.	17.VI.	5.4	8.VI.	27.VI.	25.X.	4.6	17.X.	2.XI.	6.IV.	7.5	19.III.	20.IV.																
Ogulin	24.IV.	6.4	10.IV.	6.V.	23.VI.	5.9	14.VI.	4.VII.	18.X.	5.0	7.X.	27.X.	14.IV.	7.3	1.IV.	30.IV.																
Gospić	29.IV.	8.2	11.IV.	13.V.	24.VI.	7.2	16.VI.	15.VII.	14.X.	6.9	5.X.	26.X.	24.IV.	7.5	10.IV.	6.V.																
Rab	10.IV.	7.2	26.III.	24.IV.	12.VI.	5.3	2.VI.	26.VI.	31.X.	7.5	20.X.	17.XI.					22.III.	13.0	25.II.	16.IV.	1.VI.	7.3	18.V.	15.VI.	16.X.	6.4	29.IX.	31.X.	11.XI.	6.7	29.X.	26.XI.
Hvar																	17.III.	10.6	20.II.	30.III.	26.V.	6.7	8.V.	6.VI.	20.X.	5.8	7.X.	4.XI.	13.XI.	6.3	1.XI.	26.XI.
Trsteno	5.IV.	7.2	22.III.	19.IV.	9.VI.	5.5	30.V.	19.VI.	3.XI.	6.8	25.X.	21.XI.					14.III.	10.4	15.II.	31.III.	23.V.	6.2	10.V.	6.VI.	24.X.	7.0	10.X.	8.XI.	17.XI.	6.0	4.XI.	30.XI.

Fenološki objekti / Phenological objects

Divlji kesten / Common horse chestnut / Aesculus hippocastanum L.
Obična lijeska / Common hazel / Corylus avellana L.
Malolisna lipa / Small-leaved lime / Tilia cordata Mill.
Obični jorgovan / Common lilac / Syringa vulgaris L.
Obična breza / Silver birch / Betula pendula Roth
Lovor / Sweet bay / Laurus nobilis L.
Obični bagrem / Locust tree / Robinia pseudoacacia L.
Maslina / Olive / Olea europaea L.

Fenološke faze / Phenological phases

UL: Početak listanja / Beginning of leaf unfolding
BF: Početak cvjetanja, prvo prašenje peluda / Beginning of flowering, first pollen spread
RF: Prvi zreli plodovi / First ripe fruits
RP: Plodovi zreli za berbu / Fruits ripe for picking
CL: Opće žućenje lišća / General colouring of leaves

Tablica 2. Fenološke faze, srednji (MEAN), najraniji (MIN) i najkasniji (MAX) datum nastupa fenoloških faza uz pripadnu standardnu devijaciju (STD) u razdoblju 1971-2000.
Table 2. Mean (MEAN), the earliest (MIN) and the latest (MAX) date of commencement of phenological phases and standard deviation (STD) during the period 1971-2000.

Postaja / Station	1971-2000																															
	Aesculus hippocastanum																Corylus avellana								Syringa vulgaris				Robinia pseudoacacia			
	UL				BF				RF				CL				BF				RF				BF				BF			
	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Mandićevac	7.IV.	7.3	23.III.	21.IV.	27.IV.	6.4	14.IV.	11.V.	17.IX.	3.8	10.IX.	28.IX.	20.X.	6.8	4.X.	30.X.	21.II.	17.5	14.I.	25.III.	27.VIII.	8.2	15.VIII.	10.IX.	20.IV.	9.2	28.III.	3.V.	14.V.	7.7	28.IV.	5.VI.
Daruvar	8.IV.	6.9	22.III.	21.IV.	26.IV.	5.5	11.IV.	5.V.	16.IX.	4.6	6.IX.	24.IX.	21.X.	7.3	5.X.	2.XI.	18.II.	17.8	15.I.	25.III.	29.VIII.	6.4	19.VIII.	12.IX.	22.IV.	8.9	31.III.	5.V.	16.V.	6.4	1.V.	31.V.
Križevci	11.IV.	8.3	27.III.	30.IV.	28.IV.	6.3	15.IV.	8.V.	17.IX.	4.8	4.IX.	25.IX.	18.X.	7.5	5.X.	1.XI.	20.II.	18.5	15.I.	24.III.	30.VIII.	6.6	16.VIII.	11.IX.	26.IV.	8.8	5.IV.	11.V.	18.V.	7.4	5.V.	5.VI.
Zagreb	7.IV.	7.4	23.III.	22.IV.	26.IV.	5.0	11.IV.	4.V.	18.IX.	4.9	8.IX.	29.IX.	22.X.	6.6	12.X.	3.XI.	17.II.	18.0	13.I.	24.III.	29.VIII.	8.0	14.VIII.	11.IX.	21.IV.	8.1	2.IV.	3.V.	15.V.	7.0	4.V.	31.V.
Ogulin	14.IV.	7.7	30.III.	28.IV.	2.V.	6.4	19.IV.	16.V.	22.IX.	5.1	8.IX.	2.X.	16.X.	6.0	6.X.	30.X.	24.II.	17.7	23.I.	31.III.	2.IX.	7.9	19.VIII.	16.IX.	27.IV.	9.9	2.IV.	14.V.	21.V.	8.1	3.V.	8.VI.
Gospić	22.IV.	8.0	3.IV.	5.V.	10.V.	5.9	1.V.	24.V.	27.IX.	4.2	21.IX.	7.X.	14.X.	6.4	6.X.	27.X.									9.V.	7.2	25.IV.	21.V.				
Rab																									12.IV.	8.1	23.III.	25.IV.	4.V.	5.9	22.IV.	16.V.
Hvar																									7.IV.	7.5	20.III.	20.IV.	30.IV.	7.1	14.IV.	10.V.
Trsteno	25.III.	6.3	6.III.	4.IV.	14.IV.	6.2	30.III.	23.IV.	13.IX.	5.0	5.IX.	22.IX.	3.XI.	7.5	19.X.	15.XI.									5.IV.	9.0	15.III.	20.IV.	28.IV.	6.9	10.IV.	8.V.

Postaja / Station	Tilia cordata												Betula pendula				Laurus nobilis				Olea europaea											
	UL				BF				CL				BF				BF				BF				RF				RP			
	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Mandićevac	15.IV.	7.7	28.III.	29.IV.	16.VI.	4.9	7.VI.	28.VI.	22.X.	6.6	12.X.	5.XI.	5.IV.	8.2	20.III.	18.IV.																
Daruvar	16.IV.	7.0	31.III.	28.IV.	16.VI.	5.9	3.VI.	28.VI.	23.X.	6.7	10.X.	5.XI.	6.IV.	8.1	23.III.	21.IV.																
Križevci	17.IV.	7.6	4.IV.	5.V.	18.VI.	5.3	9.VI.	29.VI.	23.X.	6.2	9.X.	4.XI.	8.IV.	9.1	23.III.	26.IV.																
Zagreb	14.IV.	7.6	24.III.	26.IV.	15.VI.	6.1	2.VI.	27.VI.	26.X.	5.1	17.X.	6.XI.	5.IV.	7.6	19.III.	21.IV.																
Ogulin	22.IV.	8.2	6.IV.	6.V.	21.VI.	6.6	12.VI.	4.VII.	19.X.	5.5	7.X.	27.X.	12.IV.	9.0	27.III.	30.IV.																
Gospić													23.IV.	7.9	7.IV.	5.V.																
Rab	9.IV.	7.2	26.III.	25.IV.	9.VI.	5.4	27.V.	16.VI.	2.XI.	8.1	21.X.	17.XI.					20.III.	12.6	27.II.	8.IV.	30.V.	7.2	18.V.	15.VI.	19.X.	7.0	10.X.	4.XI.	11.XI.	7.8	30.X.	26.XI.
Hvar																	14.III.	11.4	20.II.	30.III.	24.V.	7.2	8.V.	6.VI.	22.X.	6.8	11.X.	6.XI.	14.XI.	7.0	30.X.	26.XI.
Trsteno	3.IV.	6.4	22.III.	14.IV.	7.VI.	6.3	25.V.	19.VI.	5.XI.	7.8	25.X.	21.XI.					12.III.	11.3	15.II.	31.III.	22.V.	6.8	10.V.	6.VI.	26.X.	8.1	10.X.	14.XI.	17.XI.	7.4	4.XI.	30.XI.

Fenološki objekti / Phenological objects

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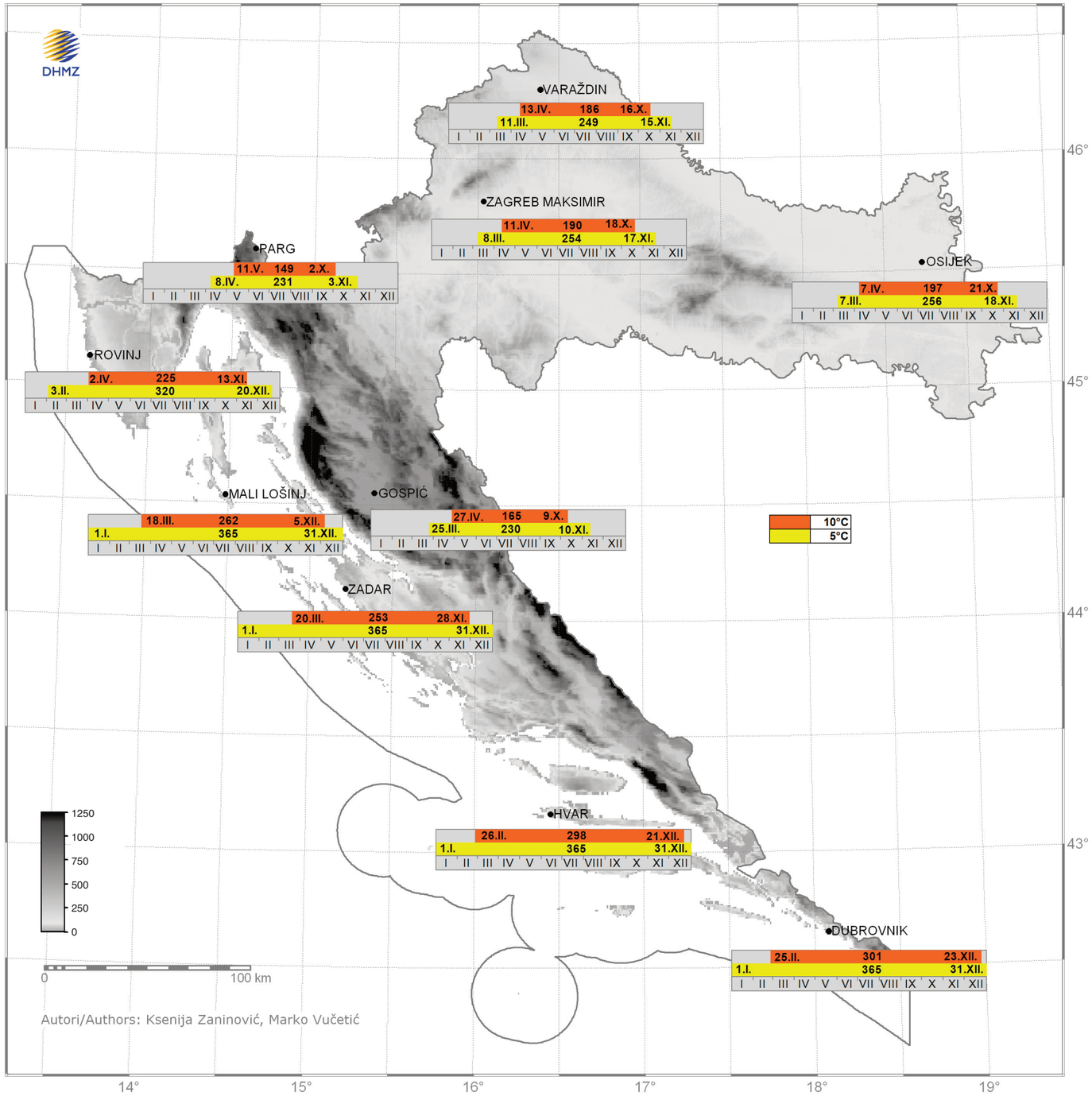
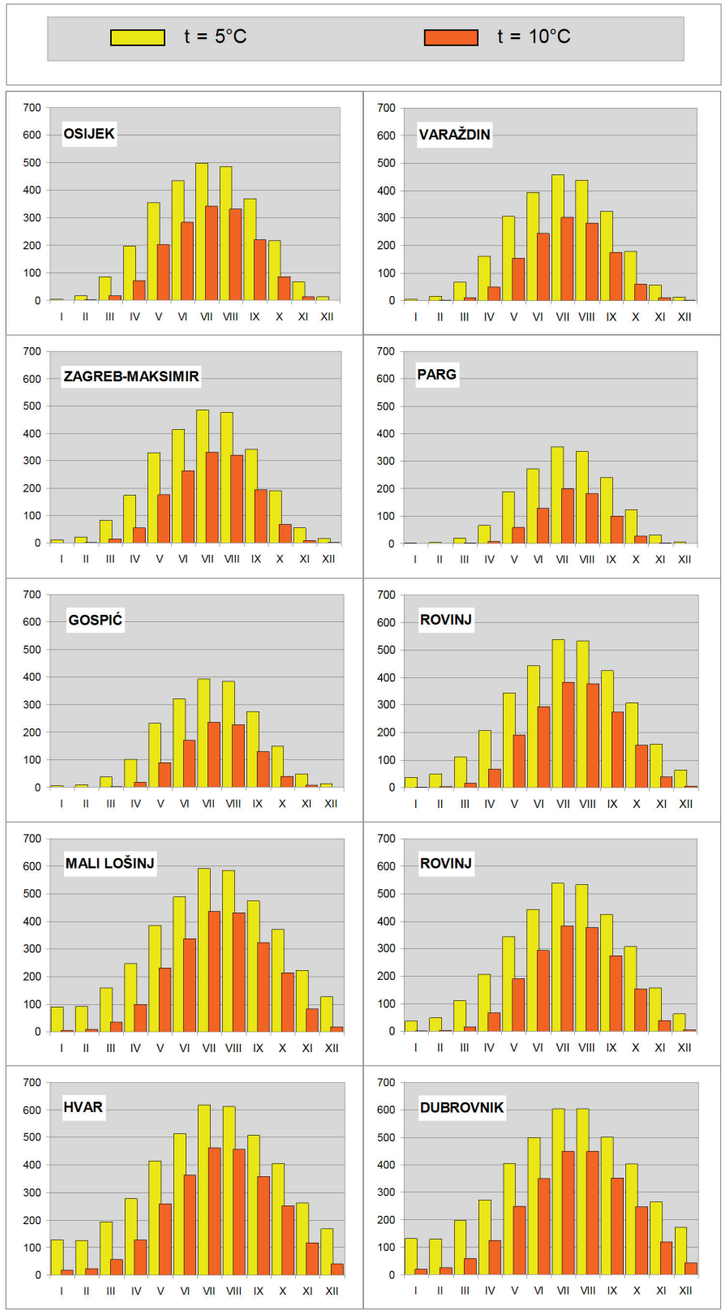
Srednji datumi početka i svršetka razdoblja s temperaturom zraka iznad različitih pragova

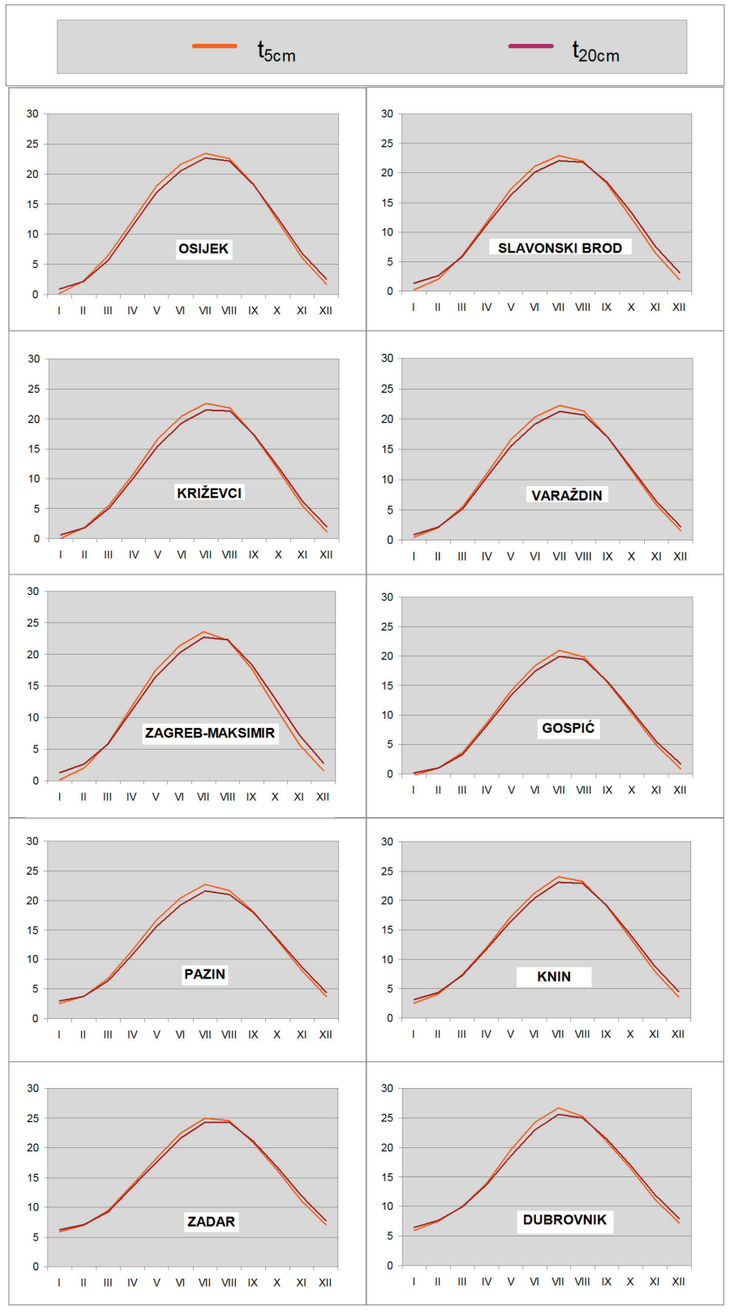
Mean dates of the beginning and the end of the period with the air temperature above different thresholds





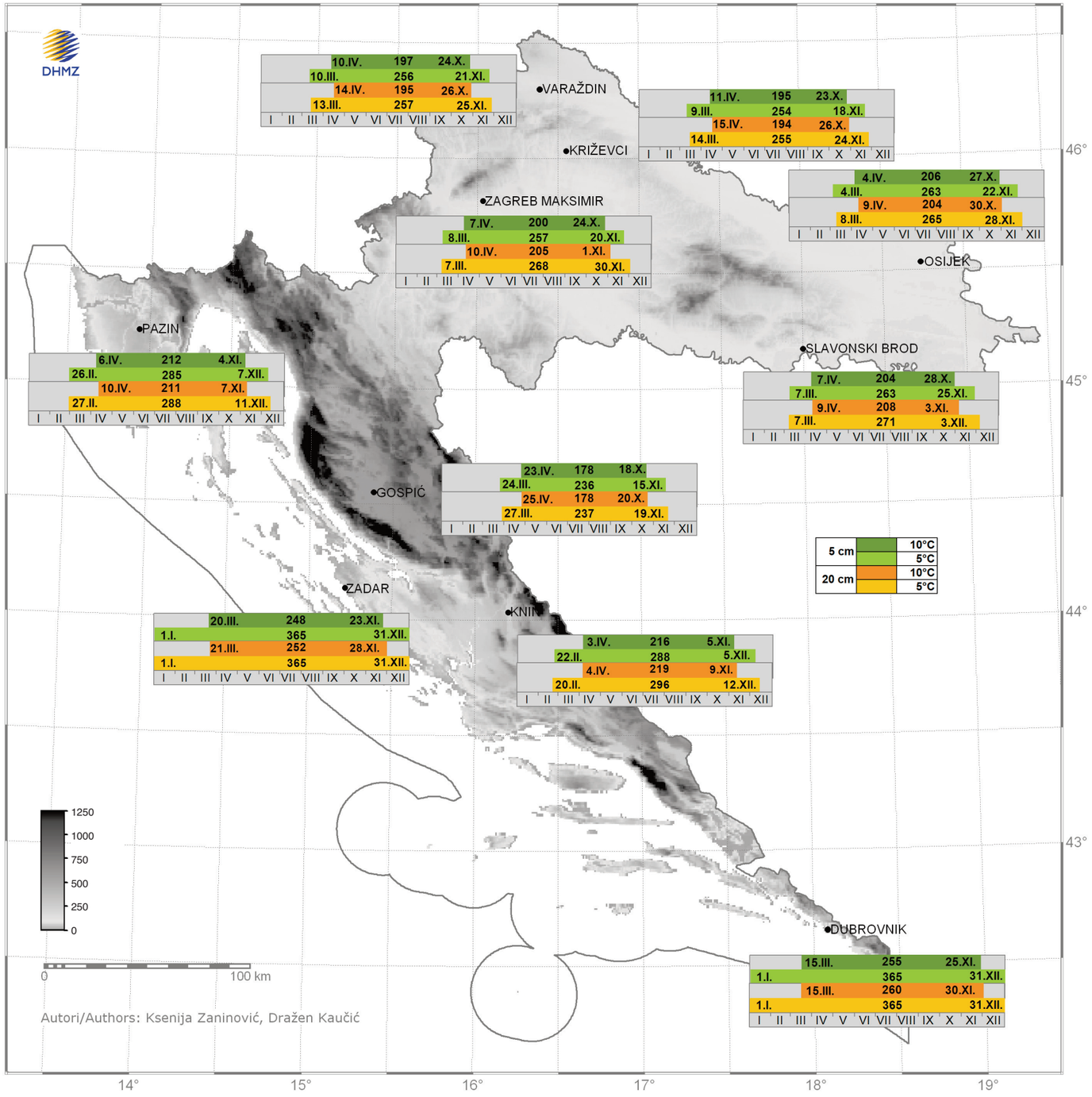
Godišnji hod srednjih mjesečnih temperaturnih suma iznad pragova 5°C i 10°C, °C.

Annual course of mean monthly temperature sum above the thresholds 5°C and 10°C, °C.

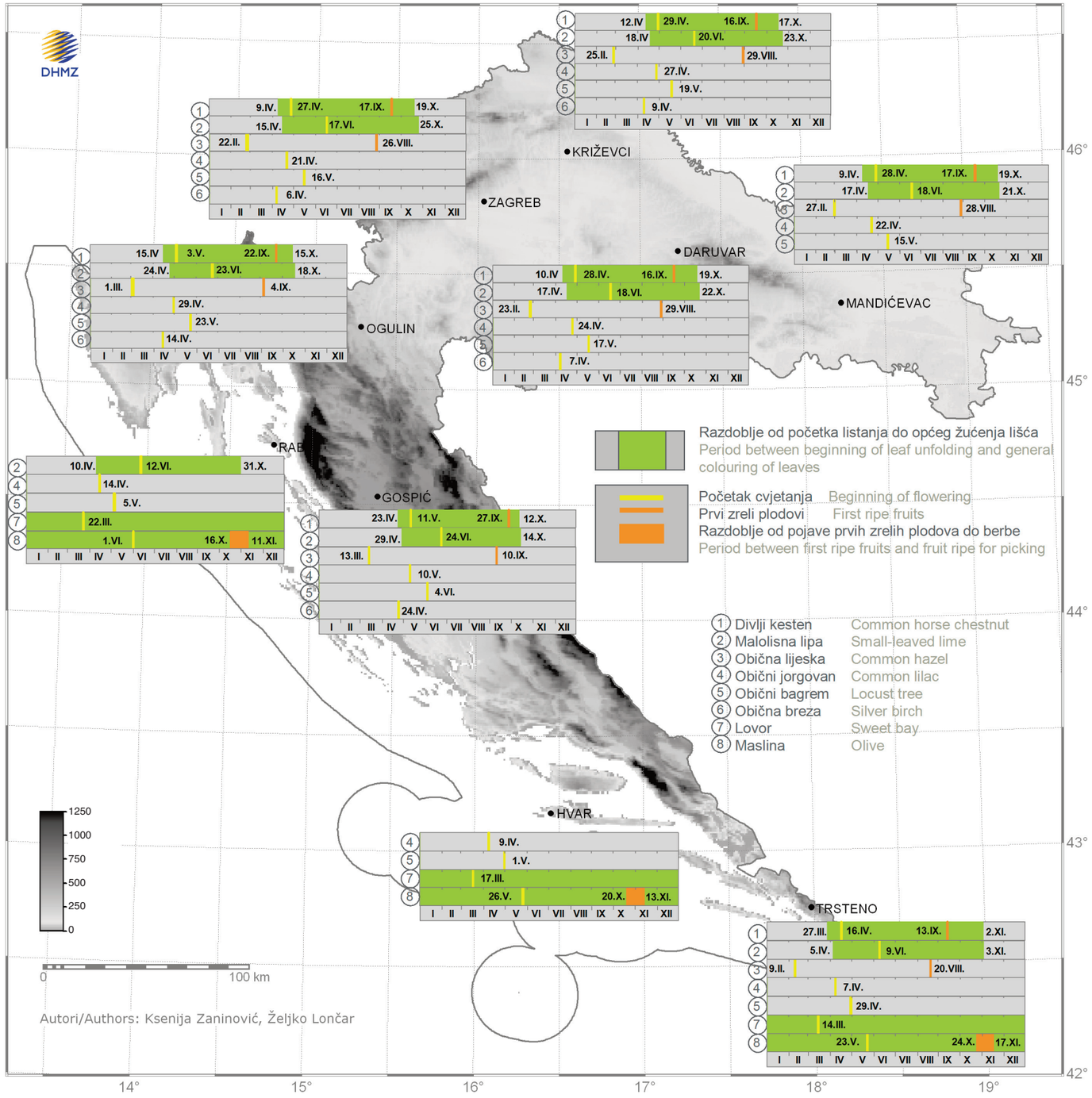


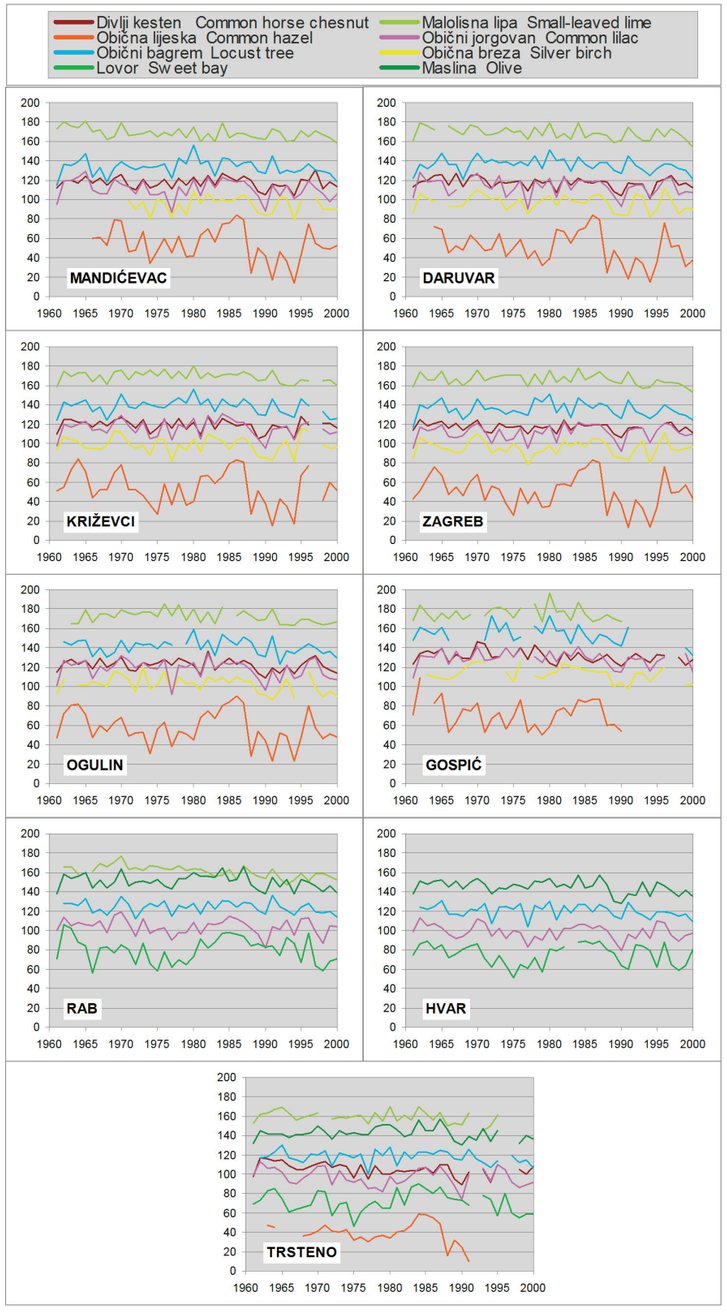
Godišnji hod srednjih mjesečnih temperatura tla na 5 cm i 20 cm dubine, °C.
Annual course of mean monthly soil temperature at 5 cm and 20 cm, °C.

Srednji datumi početka i svršetka razdoblja s temperaturom tla iznad različitih pragova
Mean dates of the beginning and the end of the period with the soil temperature above different thresholds



Autori/Authors: Ksenija Zaninović, Dražen Kaučić





Vremenski nizovi početka cvjetanja odabranog bilja u razdoblju 1961–2000., dan u godini.
Time series of the beginning of flowering of selected plants during the period 1961–2000, day of the year.

Metode
Methods

Melita Perčec Tadić
Krešo Pandžić
Tanja Likso
Marjana Gajić-Čapka

Geostatističko kartiranje klimatoloških varijabli

Melita Perčec Tadić

Geostatističko kartiranje može se definirati kao analitička izrada karata korištenjem prostornih opažanja, pomoćnih informacija i kompjuterskih programa za predikciju vrijednosti ciljane varijable na lokacijama od interesa (Hengl, 2007). U klimatologiji, jedna od najvažnijih informacija o klimi mjesta ili područja su klimatološke normale (CLImatological NOrmal - CLINO) – prosječne vrijednosti meteoroloških elemenata za 30-godišnje razdoblje. Ova vrsta informacija obično se nalazi u tablicama i za pojedina mjesta opažanja dostupna je u nacionalnim meteorološkim službama ili u publikacijama Svjetske meteorološke organizacije (WMO, 1996). Ključno pitanje tada postaje kako interpolirati ove vrijednosti za cijelo područje interesa, a u svrhu dobivanja pouzdanih i točnih procjena (karata) klimatskih elemenata.

U ovom Klimatskom atlasu Hrvatske predstavljene su karte koje daju uvid u srednje vrijednosti različitih klimatskih elemenata u razdoblju 1961–1990. U ovom su poglavlju predstavljene metode pripreme, obrade podataka i izrade karata, uključujući i mjere kvalitete završnih karata. Cilj projekta bio je izraditi karte temperaturnih i oborinskih parametara, relativne vlažnosti, dozračene sunčane energije, osunčavanja, naoblake i fiziološke ekvivalentne temperature (PhET). U tu svrhu korištena je tehnika geostatističkog kartiranja, tzv. "regresijski kriging" (Slika 4), opisan u Pebesma (2006) i Hengl (2007); karte PheT prethodno je pripremio Matzarakis, a metoda je ukratko predstavljena u Matzarakis et al. (1999). Regresijski kriging je napredna metoda geostatističkog kartiranja, te se koristi u raznim granama znanosti o okolišu (atmosferske znanosti, geo-znanosti itd.). Metoda kroz regresiju uključuje korelaciju s ekološkim prediktorima, a preko kriginga prostornu autokorelaciju samih ciljanih varijabli. Ova metoda je već korištena u klimatologiji, ali ne u punom potencijalu (Wackernagel, 2003; Lloyd, 2005). Karte i procedure za proračune koje su predstavljene u ovoj knjizi dostupne su i u digitalnom obliku pogodnom za integraciju u Geografske informacijske sustave različitih namjena (hidrološke, ekološke i dr.).

U usporedbi s drugim europskim zemljama, Hrvatska je razmjerno mala zemlja; ali usprkos tome, sastoji se od nekoliko različitih klimatskih područja. To je rezultat specifičnog položaja uz Jadransko more te prilično raznolike topografije koja uključuje nizine na istoku, središnje umjereno brdovite krajeve te planine koje odvajaju kontinentalni od primorskog dijela zemlje (Bognar, 1996). Vremenski sustavi koji imaju izvorište ili prolaze preko Hrvatske su pod snažnim utjecajem topografije tako da utjecaj koji oni imaju na vrijeme i klimu

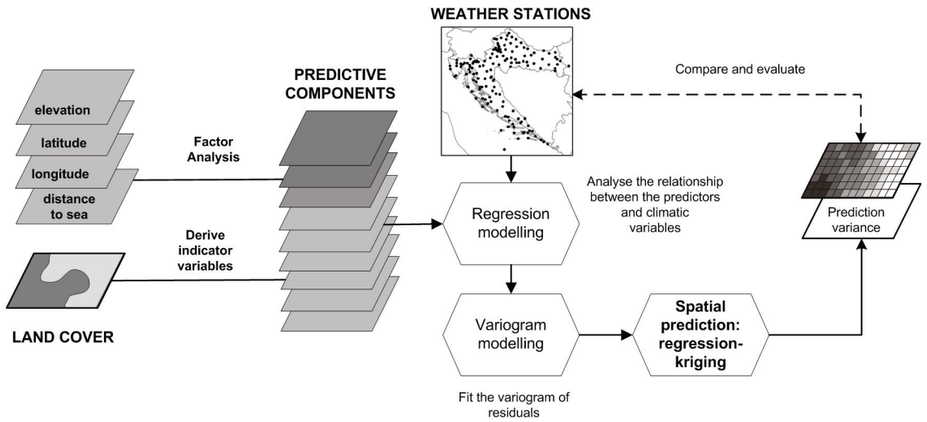
Geostatistical mapping of climatological variables

Melita Perčec Tadić

Geostatistical mapping can be defined as the analytical production of maps by using field observations, auxiliary information and a computer programme that calculates the values at locations of interest (Hengl, 2007). In climatology, one of the most important pieces of information about the climate of a place or a region is information about the CLImatological NOrmals (CLINO) – the average values of meteorological elements for a 30-year period. This kind of information usually comes in tables and is available for different observation sites from national meteorological services or from World Meteorological Organization publications (WMO, 1996). The key issue, then, becomes how to interpolate these values over the whole area of interest to get reliable and accurate estimates (maps) of climatic elements.

This Climate Atlas of Croatia presents maps that give an insight into the average values of different climatic elements in the 1961–1990 period. In this section, data preparation, processing and mapping methodology, including quality measures for the final maps, are described in detail. The objective was to produce maps of temperature- and precipitation-related parameters, air humidity, solar irradiation, bright sunshine duration, cloudiness and physiological equivalent temperature (PhET). To achieve this, geostatistical mapping techniques were used, i.e. the regression-kriging framework (Figure 4) as explained in Pebesma (2006) and Hengl (2007); the PhET maps were previously prepared by Matzarakis and the method is discussed in brief in Matzarakis et al. (1999). Regression kriging is the advanced mapping methodology now used in various environmental sciences (atmospheric sciences, geosciences, etc.). It uses correlation with multiple environmental predictors through regression, and spatial autocorrelation of the targeted values through kriging. This technique has already been used in climatology but not to its full potential (Wackernagel, 2003; Lloyd, 2005). The maps and computational procedures presented in this book are also available in digital format suitable for integration into different-purpose Geographic Information Systems (hydrological, ecological applications etc.).

Compared with other European countries, Croatia is a relatively small country; nevertheless, it comprises several different climatic regions. This is the result of its specific position on the Adriatic Sea and of its fairly diverse topography ranging from plains in the east, through a hilly central part, to the mountains separating the continental from the maritime part of the country (Bognar, 1996). Weather systems originating in or



Slika 4. Računalni okvir (na način kako je uključen u R programski paket) korišten pri interpolaciji klimatoloških varijabli.
Figure 4. Computational framework (as implemented in the R computing environment) used to interpolate climatological variables.

bitno ovise o regiji. Ova prirodna raznolikost zahtijeva vrlo gustu mrežu postaja za praćenje stanja vremena, posebno oborine, koja je prostorno znatno promjenjivija u usporedbi s drugim klimatološkim varijablama.

Prije ikakve daljnje analize treba razmotriti pitanje gustoće i rasporeda mreže opažanja. Na primjer, raspored meteoroloških postaja u Hrvatskoj trebao bi i uglavnom prati njenu topografsku promjenjivost (npr. razdiobu visina na temelju digitalnog modela reljefa – DMR). U stvarnosti, na mnogim brdima višim od 800 m nedostaje opažanja (Gajić-Čapka et al. 2003). Također, prostorna pokrivenost zemlje meteorološkim postaja nije najbolja s obzirom na njen oblik (tzv. zagađenost rubova ili "edge pollution" efekt). Ovaj negativan efekt se može umanjiti korištenjem podataka susjednih država. Na primjer, za potrebe kartiranja temperaturnih elemenata uključeno je 85 dodatnih postaja susjednih država. U slučaju kartiranja oborina, slab prostorni raspored meteoroloških postaja kompenziran je većim brojem postaja. Usprkos navedenim nadopunama, završna ocjena izrađenih karata pokazat će da su u nekim slabije naseljenim područjima kao što je Lika, pogreške predviđanja zbog rjeđe mreže opažanja neizbježno veće.

Drugi važan aspekt bitan za uspjeh geostatističkog kartiranja je izbor osnovne rezolucije karata, tj. izbor veličine piksela. Ukupna površina kopnenog dijela Hrvatske je 56,594 km^2 (DZS, 2007), a koristimo podatke sa 152 postaje, što znači da jedna postaja u prosjeku pokriva zemljišni blok veličine 19×19 km^2. To znači da ovakva mreža postaja može poslužiti samo za izradu karata male skale 1:1-5M (Hengl, 2006). Karte u ovom atlasu tiskane su u mjerilu 1:2.2M. Prema kartografskim načelima (Hengl, 2006), za karte mjerila 1:2M, prihvatljiva veličina piksela za karte je 1000 m, što je bila veličina piksela također odabrana za potrebe izrade ovog Atlasa. Naglasimo da prostorna gustoća kišomjernih postaja (567 postaja ili jedna postaja na 10×10 km^2 prostora), koje zajedno s klimatološkim postajama opažaju parametre vezane uz oborinu, omogućuje korištenje i finije rezolucije.

Za potrebe prostornog predviđanja, originalnim klimatološkim atributnim podacima pridružene su informacije o lokacijama postaja, kao što su koordinate i visine. Pri tome je najprije trebalo poboljšati preciznost koordinata geografske širine i dužine, koje su u meta podacima o postajama zapisane u stupnjevima (*arcdeg*) i minutama (*arcmin*), tj. s položajnom preciznošću od 1 *arcmin* (približno 1400 m u longitudinalnom i 1900 m u latitudinalnom smjeru). Ovo je očigledno nedovoljno za potrebe digitalnog kartiranja ovakvog stupnja preciznosti. Za približno 60 postaja je koordinate navedene u meta-bazi u *arcdeg* i *arcmin* trebalo ispraviti, uglavnom zbog dva razloga: prilikom prikaza postaja na SRTM DEM-u (SRTM_DEM_RH_100m.zip sa http://spatial-analyst.net) rezolucije 100 m, pojedine postaje bile su pogrešno pozicionirane u moru, a za ostale je razlika visine navedene u meta-bazi i DMR-u bila veća od 200 m. To je ukazivalo da je položaj postaje nešto drugačiji od navedenog u meta podacima. Kako bi se koordinate utvrdile preciznije, položaji postaja su označeni (prema oznakama položaja na papirnatim kartama u meta podacima) na prethodno skeniranim i georeferenciranim topografskim kartama 1:25K te su očitane koordinate s preciznošću od 1 arc sekunde.

Slično korekciji koordinata i veliki dio klimatoloških podataka s klimatoloških i kišomjernih postaja je prethodno dodatno obrađen. Temperaturni i podaci o meteorološkim pojavama (satni ili opaženi u 7 ,14, 21 lokalnog vremena (UTC+1)) dostupni su u digitalnoj bazi samo za razdoblje nakon 1981. godine. Kišomjerni podaci dostupni su u digitalnoj bazi za razdoblje nakon 1991. godine. Kako bi se pripremili podaci za razdoblje 1961–1990., bilo je potrebno veliku količinu (mjesečnih) podataka koji su sakupljeni prije ove dvije godine unijeti iz pisanih izvještaja u posebnu bazu podataka (samo za potrebe pripreme Atlasa).

Također, bilo je dosta postaja s nedostajućim podacima ili je period opažanja bio kraći od standardnog, ali

crossing over Croatian territory are strongly influenced by this topography and, thus, the influence they have on weather and climate is highly dependent on the region. This natural diversity requires a very dense monitoring weather station network, especially for precipitation, which has greater spatial variability than other climatological variables.

The first aspect that needs to be considered before any further analysis is the density and spread of the monitoring network. For example, the distribution of weather stations in Croatia should, and it mainly does, match its topographic variability (e.g. the distribution of altitudes based on the digital elevation model – DEM). In reality, there are many hills above 800 m with no stations (Gajić-Čapka et al. 2003). Likewise, the spatial coverage by weather stations is not ideal considering the shape of the country (the so called "*edge pollution*" effect). This negative effect can be reduced by taking into consideration data from neighbouring countries. For example, when mapping temperature variables, 85 additional stations from neighbouring countries have been included in the analysis. When mapping precipitation, the poor spatial distribution of weather stations was compensated by taking a larger number of stations. Still, the final evaluation of the maps produced will show that, in some less populated regions, such as Lika, prediction errors are larger because of the sparse measurement network.

Another important issue for the success of geostatistical mapping is the selection of the ground resolution for the output maps, i.e. the selection of the grid cell size. The total land area of Croatia is 56,594 km^2 (DZS, 2007) and data from 152 stations have been used, which means that, in average, one climatological station represents a 19×19 km^2 block of land. This means that such monitoring network can be used only to produce general-scale maps of scale 1:1-5M (Hengl, 2006). The maps in this atlas are printed at a scale of 1:2.2M. According to cartographic rules (Hengl 2006) for maps of a working scale of 1:2M, a suitable grid cell size for output maps would be 1000 m and, therefore, this cell size was also adopted for the Atlas. It should be noted that the spatial density of precipitation stations (567 stations or one station per 10×10 km^2 block of land) together with the climatological stations, which both observe precipitation-related parameters, might allow us to use even finer cell sizes.

For spatial prediction purposes, the original climatological point data were accompanied by information about station locations, like co-ordinates and elevations. Here, we first needed to improve the precision of the latitude and longitude co-ordinates, which were set out in the stations metadata in degrees (*arcdeg*) and minutes (*arcmin*), i.e. with a positional precision of 1 *arcmin* (around 1400 m longitudinally and 1900 m latitudinally). This would have obviously been insufficient for the purpose of digital mapping at this level of detail. For approximately 60 stations, the co-ordinates set out in the metadata in *arcdeg* and *arcmin* had to be corrected, mostly because of two reasons: when overlaid to a 100 m-resolution SRTM DEM (SRTM_DEM_RH_100m.zip obtained from http://spatial-analyst.net) some of the stations were misplaced in the sea, and some had a difference in height larger than 200 m. This indicated that the positions of the stations were slightly different from the ones indicated in the metadata. To estimate the co-ordinates more precisely, the position of the stations had to be marked (according to the position marked on the paper maps in metadata) on the previously scanned and georeferenced 1:25K topographic maps and then the co-ordinates were determined with a precision of 1 arc second.

Similarly, a large portion of climatological data from climatological and precipitation stations had also to be pre-processed. Temperature- and meteorological phenomena-related data (observed hourly or at 7, 14, 21 local time (UTC+1)) existed in the digital data-base for data collected after 1981, and precipitation-related data

unatoč tome to su vrlo vrijedna opažanja. S obzirom da je potrebno imati 30 mjesečnih vrijednosti da bi se izračunao 30-godišnji srednjak, takve nedostajuće vrijednosti su zamijenjene odgovarajućim vrijednostima. Korišten je sljedeći princip:

- ako nije nedostajalo više od 30% mjesečnih vrijednosti, nedostajuće vrijednosti su interpolirane pomoću podataka susjedne postaje;
- u slučaju da je nedostajalo 30–70% mjesečnih podataka, pripadajući srednjak kraćeg razdoblja je reduciran na 30-godišnji srednjak;
- ako je nedostajalo više od 70% mjesečnih vrijednosti, stanica je isključena iz analize.

Razdiobe srednjih mjesečnih i godišnje temperature, broja hladnih i toplih dana, osunčavanja, dozračene sunčane energije i naoblake su uglavnom bimodalne, s gotovo jasnom podjelom na kontinentalni i primorski dio zemlje (slika 5). U nekim slučajevima razdioba podaka je izrazito asimetrična s više manjih (količine oborine) ili većih (relativna vlažnost) vrijednosti ili podaci ne prate normalnu razdiobu (broj dana s toplim noćima). Za svaku klimatološku varijablu pripremljene su atributne karte koje su najprije vizualno analizirane kako bi se stekao uvid o prostornom trendu. Očekivano, jaki utjecaji nadmorske visine, udaljenosti od mora i u određenoj mjeri geografske širine i dužine bili su očiti te su ove varijable odabrane kao mogući prediktori u regresijskom modelu. Dodatno smo pretpostavili da bi zemljišni pokrov mogao objasniti promjene klimatoloških varijabli kao što je relativna vlažnost, ali ova korelacija se pokazala nesignifikantnom.

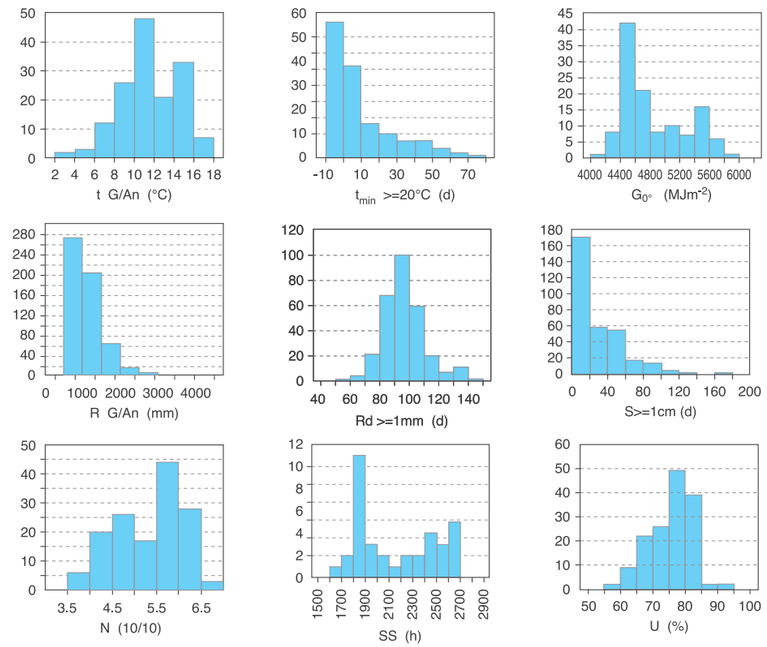
Nadmorska visina praktički objašnjava glavninu prostorne varijacije svih klimatoloških varijabli, iako njen utjecaj može zapravo biti prisutan kroz indirektne korelacije s drugim faktorima. Na primjer, dozračena sunčana energija veća je na višim visinama, ali to je neizraženo zbog izrazitije naoblake i orografskih oborina ljeti. Prostorna razdioba temperature ovisna je o

existed in the digital data-base for data collected after 1991. To prepare the data for the 1961–1990 period, a large amount of (monthly) data collected previously had to be determined from paper reports and entered into a separate data-base (only for the purpose of preparing this Atlas).

In addition, there were a lot of stations with missing data or shorter-than-standard observation periods, but nevertheless very valuable. Since it is necessary to have 30 monthly values to be able to calculate 30-years averages, the missing data were replaced by appropriate values according to the following principle:

- if not more than 30% of monthly values were missing, the missing data were interpolated according to data from neighbouring stations;
- if 30-70% of monthly data were missing, the corresponding shorter-period average was reduced to the 30-year average;
- if more than 70% of monthly values were missing, the station was excluded from the analysis.

The distribution of the average monthly and annual temperatures, the number of cold and warm days, sunshine duration, solar irradiation and cloudiness is in general bimodal, with an almost clear differentiation between the continental and maritime part of the country (figure 5). In some cases, the data distribution is also skewed toward smaller (precipitation) or larger values (relative humidity) or the data do not follow normal distribution (number of days with warm nights). For every climatological variable, point values were prepared and first examined visually to get an impression of spatial trends. As expected, the strong influence of elevation, distance to the coast and, to some extent, latitude and longitude was obvious, so these variables were selected as possible predictors in the regression model. In addition, we assumed that the variation in climatological variables such as humidity might be explained by land cover, but this correlation turned out to be insignificant.



Slika 5. Histogram glavnih klimatoloških varijabli (prvi red: t G/An (°C), t_{min} ≥20°C (d), $G_{0°}$ (MJm^{-2}); drugi red: R G/An (mm), Rd≥1mm (d), S≥1cm (d); treći red: N(10/10), SS(h), U(%)).

Figure 5. Histograms of the main target climatological variables (first row: t G/An (°C), t_{min} ≥20°C (d), $G_{0°}$ (MJm^{-2}); second row: R G/An (mm), Rd≥1mm (d), S≥1cm (d); third row: N(10/10), SS(h), U(%)).

visini direktno preko temperaturne stope (vertikalni temperaturni gradijent) dok naoblaku i količinu oborine orografija modificira na više načina. Relativna vlažnost bitno ovisi o temperaturi – temperatura je određena nadmorskom visinom.

Jadransko more bitno utječe na klimu priobalnog pojasa kao i dublje u unutrašnjosti, uglavnom djelujući

Elevation practically explains most of the spatial variation of all climatological variables. However, this influence can be inherent through indirect correlation with other modifying factors. For example, solar irradiation is generally stronger at higher altitudes, but this is usually hidden by pronounced cloudiness and orographic precipitation during summer. Spatial tempera-

kao izvor topline i vlage (Penzar et al. 2001). Na nekim dijelovima obale je taj utjecaj modificiran i smanjen prisustvom visokih i dugih planinskih lanaca koji se protežu duž obale. Zbog toga se za ovakav tip priobalnog pojasa marimni utjecaj ne može modelirati pomoću jednostavnih prediktora kao što su udaljenost od mora i slično. Razlog je taj što je na istoj udaljenosti od mora maritimni efekt slabiji uz prisustvo planina duž obale u usporedbi s područjima na kojima nema ovakvih planinskih lanaca. Stoga je otežana udaljenost od mora uvedena kao drugi potencijalno važan prediktor. Ovdje smo uglavnom pretpostavili da je udaljenost do obale efektivno veća u slučaju kada se planine pružaju uz obalu u usporedbi sa slučajem uglavnom ravnog prostora na obali. U skladu s navedenim, maritimni utjecaj je manji u prvom i veći u drugom slučaju. Otežana udaljenost od mora proračunata je prema algoritmu usvojenom u sklopu ILWIS GIS (Ilwis Open 3.4) open source programskog paketa. ILWIS je korišten i za pripremu karata prediktora i vizualizaciju finalnih karata. Zemljopisna širina je također uvažena zbog utjecaja na srednju dnevnu dozračenu sunčanu energiju (Perčec Tadić, 2004) zbog čega modificira i sve druge klimatološke varijable.

Nakon filtriranja podataka i pripreme pomoćnih karata nastavljeno je s interpolacijom vrijednosti uporabom regresijskog kriginga (RK). Metoda uobičajeno sadrži četiri koraka: (1) prvo se modelira deterministički dio varijacije korištenjem pomoćnih karata; (2) zatim se modelira prostorna autokorelacija reziduala (variogram); (3) nakon čega se računaju konačna predviđanja i pogreške predviđanja korištenjem modela RK-a; i (4) na kraju se računa pouzdanost predikcije pomoću metode poprečne validacije (CV). Ovdje su raziduali razlike opaženih i predviđenih vrijednosti na lokacijama opažanja. Na temelju raspoloživog skupa mjerenja pojedine klimatološke varijable, moguće je modelirati vezu s prediktorima koja omogućuje predviđanja na novim lokacijama, na kojima su poznate vrijednosti pre-

ture distribution is affected by elevation directly through the temperature lapse rate, while cloudiness and precipitation are subject to different kinds of orographic modifications. Relative humidity strongly depends on temperature and temperature is controlled by altitude.

The Adriatic Sea significantly affects the climate along the coast and at some distance inland, mainly acting as a source of heat and moisture (Penzar et al. 2001). In some parts of the coast, this influence is modified and suppressed by the presence of high and long mountain ridges stretching along the coast. Consequently, for this type of coastal areas, the maritime influence can not be modelled with simple predictors such as distance to the coast and similar. This is because at the same distance from the coast the maritime effect is weaker where mountains stretch along the coast than in areas where such mountain chains do not exist. Therefore, as a second potentially valuable predictor, weighted distance to the coast was introduced. Here, it was assumed that the distance to the coast is effectively larger where mountains are present along the coast than in the mainly flat-surface coastal areas. Hence, maritime influence is smaller in the former and larger in the latter case. Weighted distance to the coast was derived from the algorithm adopted in ILWIS GIS (Ilwis Open 3.4), an open-source software. ILWIS was also used for the preparation of predictor maps and for the visualisation of the final maps. Finally, latitude was included because it affects average daily solar irradiation (Perčec Tadić, 2004) and, consequently, modifies all other climatological variables.

After data filtering and the preparation of auxiliary maps, we proceeded with interpolation using the regression-kriging (RK) framework. This typically consists of four steps: (1) first; the deterministic part of the variation is modelled using the auxiliary maps; (2) then, the residuals are modelled for spatial autocorrelation (variogram); (3) then, predictions and prediction error are computed using the RK model; and (4) finally, the ac-

diktora. Višestrukom linearnom regresijom objašnjava se deterministički dio ovisnosti ciljane varijable o prediktorima što je poznato kao globalna ili prostorna varijacija na sitnim mjerilima – "*large-scale spatial variability*" (Cressie, 1993). Obični kriging reziduala opisuje lokalnu prostornu varijaciju ili varijaciju krupnih mjerila, te modelira prostornu autokorelaciju. Za klimatološke varijable autokorelacija je standardno jača za podatke koji su prostorno bliži. Ovakva geostatistička analiza se danas može uspješno implementirati u "R" open source programskom paketu za statističke izračune (www.r-project.org).

Kao pomoćni prediktori izabrani se digitalni model reljefa i globalna karta zemljišnog pokrova (GLC2000, Global Land Cover 2000 database, 2003). Četiri prediktorske varijable izvedene su iz DMR-a: (1) visina, (2) zemljopisna širina, (3) zemljopisna dužina i (4) otežana udaljenost do morske obale. Sedam indikatorskih varijabli izvedeno je iz karte zemljišnog pokrova na osnovu osam tipova zemljišnog pokrova prisutnog na prostoru Hrvatske. To su: (1) obradivo tlo, (2) listopadne šume, (3) zimzeleno nisko raslinje, (4) šume miješanog tipa, (5) zimzelene šume, (6) travnjaci, (7) listopadno nisko raslinje te (8) umjetne površine.

Na temelju prediktora izvedenih iz DMR-a izvedene su četiri faktorske komponente (FC1, FC2, FC3 and FC4) te su korištene kao nezavisni prediktori. Prema matrici korelacije koja je izlaz iz procedure Faktorske analize (ILWIS Open 3.4), glavna komponenta FC1 je primarno objašnjena varijacijom otežane udaljenosti od mora. Druga komponenta (FC2) protumačena je varijacijom geografske širine, a FC3 varijacijom visine. Četvrta kompornenta, FC4, koja objašnjava manje od 4% ukupne varijacije, također je pretežno objašnjena varijacijom visine. Dodatno su za varijable opažene s manjom prostornom gustoćom uzorkovanja kao prediktori korištene druge klimatološke varijable koje su gušće uzorkovane (kao dopuna orginalnim komponentama). Najbolja kombinacija prediktora za višestruku regresiju

curacy of the predictions is evaluated using cross-validation (CV). In this case, the residuals are the differences between the observed and predicted values at the observation locations. From the existing set of measurements of a certain climatological variable, a relationship with the predictors can be modelled which allows prediction at unvisited locations where the values of predictors are known. The multiple linear regression explains the deterministic part of the dependence of the target variable on the predictors, also known as global or large-scale spatial variability (Cressie, 1993). Simple kriging of the residuals then accounts for the local or small-scale part of spatial variability and models spatial autocorrelation. For climatological variables, spatial autocorrelation is typically stronger for data at nearby spatial locations. Such geostatistical analysis can be successfully implemented in the "R" open-source package for statistical computing (www.r-project.org).

The selected auxiliary predictors included the Digital Elevation Model and Global Land Cover map (GLC2000, Global Land Cover 2000 database, 2003). Four predictor variables were derived from the DEM: (1) elevation, (2) latitude, (3) longitude and (4) weighted distance to the sea coast. Seven indicator variables were derived from the GLC according to eight different types of land cover. These are: (1) cultivated areas, (2) deciduous broad-leaved tree cover, (3) evergreen shrub cover, (4) mixed leaf tree cover, (5) evergreen needle-leaved tree cover, (6) herbaceous cover, (7) deciduous shrub cover, and (8) artificial surfaces.

From the set of DEM-derived predictors four factor components (FC1, FC2, FC3 and FC4) were extracted and used as independent predictors. According to the output correlation matrix of the Factor Analysis operation (Ilwis Open 3.4), the main FC1 component was explained primarily by the variation in the weighted distance to the sea. The second component (FC2) accounted mainly for the variation in latitude and FC3 for

izabrana je tzv. "*stepwise*" metodom implementiranom u R-ovom base paketu. FC3, koja je uglavnom objašnjena varijacijom visine, bila je najznačajniji prediktor u 9 od 12 slučajeva kod kojih su samo faktorske komponente korištene kao prediktori u regresijskim modelima (travanjska, srpanjska i godišnja temperatura, sezonske i godišnja količina oborine). Za preostale tri varijable (siječanjska i listopadska temperatura, relativna vlažnost) najvažniji prediktor bila je prva komponenta (FC1). Za predikciju relativne vlažnosti ovo se može objasniti činjenicom da je more glavni izvor vlage u atmosferi, te ima veći utjecaj na primorskom nego u kontinentalnom dijelu zemlje. Slično, srednja listopadska temperatura je viša na obali, jer more djeluje kao spremnik topline koja modificira teoretski simetrični godišnji hod temperature u korist jeseni (koja je na obali toplija od proljeća). Naposljetku, utjecaj FC1 na siječanjsku temperaturu nije direktno povezan s morem, nego s izrazitijim hlađenjem kontinentalnog dijela zemlje za trajanja zimskih anticiklonalnih situacija. Zaključno, srednje siječanjske i listopadske temperature su klimatološke varijable s izrazitim bimodalnim razdiobama u usporedbi sa svim ostalima, što je posljedica velikih razlika između obale i unutrašnjosti.

Sveukupno je preciznost predviđanja regresijskog kriginga testirana metodom poprečne validacije izostavljanjem po jednog elementa (LOOCV). Srednja pogreška procjene (ME), korijen srednje kvadratne pogreške procjene (RMSE) i normalizirani korijen srednje kvadratne pogreške procjene (RMSEr) izračunati su za sve zavisne varijable. ME daje srednju vrijednost razlike opažene i predviđene vrijednosti i očekuje se da bude približno 0, dok je RMSE korijen srednjeg kvadrata razlika opažene i predviđene vrijednosti. RMSE bi trebala biti bliska standardnoj devijaciji opažanja na malim udaljenostima. Posljednja mjera (RMSEr), što je RMSE podijeljeno sa standardnom devijacijom podataka, daje normaliziranu preciznost predikcije i smatra se zadovoljavajućom ako je manja od 40% – model tada objašnjava više od 85% (1-RMSEr^2) varijabilnosti na validacijskim lokacijama (Hengl et al. 2004).

U dijelu tablice 3 "ocjena modela", prikazane su sažeto ove mjere kvalitete karata. Srednja pogreška je blizu 0 za srednje mjesečne i godišnju temperaturu i naoblaku. Za druge varijable ME je nešto veća, jer su i vrijednosti varijabli veće. Općenito, ME na validacijskim lokacijama potvrđuje da je procjena nepristrana. U slučaju predviđanja srednjeg godišnjeg broja dana s toplim noćima (t_{min}≥20°C), naoblake i relativne vlažnosti RMSE nije bitno manji od standardne devijacije (StD), što ukazuje na to da je ukupna uspješnost modela (RMSEr) relativno slaba. Svi ostali modeli imaju točnost predikcije iznad 86% što ukazuje na to da su karte zadovoljavajuće preciznosti. Za kartiranje srednje mjesečne temperature zraka, model koji koristi samo hrvatske podatke uspoređen je s onim koji koristi i podatke susjednih zemalja. Poboljšanja su bila vidljiva uz granice, ali se nisu pokazala signifikantnim prema mjerama za ocjenu modela. Konačne proizvedene karte su dodatno pregledane i uspoređene s postojećim kartama (Gajić-Čapka et al. 1985), a razlike diskutirane s iskusnim klimatolozima.

Na kraju korisnicima karata ukazujemo na nekoliko kritičnih točaka. Točnost predviđanja vrijednosti klimatoloških varijabli na novim lokacijama ovisi o reprezentativnosti uzorka, a nakon toga o moći predviđanja primijenjenih modela. Kao što je spomenuto, nedovoljan je broj opažanja na većim visinama i na područjima s manjom gustoćom stanovništva. Stoga se može očekivati manja preciznost na većim visinama i u brdovitim krajevima. Ovo se pokazalo točnim posebice za područje Like, koja je i slabo naseljena i na većoj nadmorskoj visini. Također nisu uspješno modelirani neki dobro poznati lokalni efekti, npr. zagrebački gradski toplinski otok, koji je prema mjerenjima 0,5°C do 1,5°C topliji od okolice. Nadalje, neka očekivana jezera hladnog zraka u situacijama s temperaturnim inverzijama

the variation in elevation. The fourth component, FC4, explaining less then 4% of the total variation, was also mainly explained by the variation in elevation. Additionally, for less densely sampled variables, other climatological variables sampled at higher density were added as predictors (in addition to the original components). The best combination of predictors for multiple regression was further selected using the stepwise procedure as implemented in the R base package. FC3, mainly explained by variation in elevation, was the most relevant predictor in 9 out of 12 cases where only factor components were used as predictors in regression models (April, July and annual temperature, seasonal and annual precipitation amounts, relative humidity). For the remaining three variables (January and October temperature and relative humidity), the most relevant predictor was the first component (FC1). For the prediction of relative humidity, this can be explained by the fact that the sea is the main source of moisture in the atmosphere and this affects the maritime part of the country more than the continental part. Similarly, the average October temperature is higher on the coast, since the sea acts as a heat container that modifies the theoretical symmetric annual course of temperature in favour of autumn (which is warmer than spring on the coast). Finally, the effect of FC1 on the January temperature is not directly connected with the sea, but with a more pronounced cooling in the continental part of the country during winter anticyclonic situations. To conclude, the average January and October temperatures are climatological variables with pronounced bimodal distribution when compared with all the others, which reflects the large difference between the coast and the hinterland.

The overall accuracy of the predictions of regression-kriging was evaluated by the *leave-one-out* cross-validation method (LOOCV). The mean prediction error (ME), the root mean square prediction error (RMSE) and the normalised root mean square prediction error (RMSEr) were calculated for all dependent variables. The ME gives the average difference between observed and predicted values and should be close to 0, while the RMSE is the square root of the average squared difference between observed and predicted values. The RMSE should be close to the standard deviation of the data observed at short distances. The last measure (RMSEr), that is RMSE divided by the standard deviation of the data, gives a normalised accuracy of prediction and it can be considered satisfactory if it is less then 40% – the model in this case accounts for more than 85% (1-RMSEr^2) variability at the validation points (Hengl, 2007).

The summary of these map quality measures is presented in the "model validation" part of Table 3. This shows that the mean error is close to 0 for the mean monthly and annual temperatures and cloudiness. For the other variables, the ME is slightly larger, because the scale of the variables is also larger. In general, the ME at validation points proves that the estimation is generally unbiased. When predicting the mean annual number of warm nights (t_{min}≥20°C), cloudiness and relative humidity, the RMSE is not considerably smaller than the standard deviation (StD), which means that the overall accuracy (RMSEr) in mapping these variables is relatively poor. All other models have an accuracy of prediction above 86%, which indicates that the maps are fairly accurate. For mapping the average monthly temperature, the model using only Croatian data was compared with a model using also data from neighbouring countries. Improvements were visible near the borders, but the validation tests showed that they were not significant. The final output maps were, additionally, visually compared with the existing maps (Gajić-Čapka et al. 1985) and discussed with experienced climatologists.

Finally, we would like to mention some critical points which map users should be aware of. The accuracy of prediction of climatological variable values at unvisited

Tablica 3: Zbirna tablica s osnovnom statistikom klimatoloških varijabli te mjerama za ocjenu geostatističkih modela. Statistika klimatoloških varijabli korištenih za prostorno modeliranje i izradu karata: broj postaja N, srednjak Sred, minimum Min, maksimum Max, varijanca Var, standardna devijacija StD, koeficijent asimetrije K.A. i koeficijent spljoštenosti K.S. Prilagođeni koeficijent determinacije R_a^2 regresijskog modela i statistika poprečne validacije primijenjenih modela regresijskog kriginga: srednja pogreška procjene ME, korijen srednje kvadratne pogreške RMSE, normalizirana RMSE RMSEr.

Table 3: Summary table with descriptive statistics of climatological variables and x-validation model statistics. Statistics of the climate variables used for spatial modelling and mapping: number of stations N, average Avg, minimum Min, maximum Max, variance Var, standard deviation StD, skewness Skew, kurtosis Kurt. Adjusted coefficient of determination R_a^2 of the regression model and cross-validation statistics of the applied regression-kriging models: mean prediction error ME, root mean square prediction error RMSE, normalized RMSE RMSEr.

	Osnovna statistika Descriptive statistics								Ocjena modela Model validation			
	N	Sred Mean	Min	Max	Var	StD	K.A. Skew	K.A. Kurt	R_a^2	ME	RMSE	RMSEr
	Temperatura zraka Air temperature											
t (°C) I	152	1.8	-4.7	9.7	15.1	3.9	0.5	-1.3	0.89	-0.01	0.74	0.21
t (°C) IV	152	10.8	1.4	14.2	6.7	2.6	-1.4	2.4	0.94	-0.01	0.58	0.24
t (°C) VII	152	21.0	12.2	25.4	8.2	2.9	-0.7	0.3	0.93	-0.02	0.64	0.24
t (°C) X	152	12.2	4.8	17.7	9.4	3.1	0.1	-0.9	0.90	-0.03	0.70	0.25
t (°C) G/An	152	11.5	3.5	16.3	8.7	2.9	-0.2	-0.5	0.92	-0.02	0.62	0.23
t_{min} <0°C (d)	139	67.9	1.0	159.0	1799.8	42.4	-0.1	-1.1	0.90	-0.34	11.08	0.26
t_{max} ≥25°C (d)	139	76.4	0.2	119.9	766.5	27.7	-1.1	0.9	0.88	0.25	7.71	0.31
t_{min} ≥20°C (d)	139	11.0	0.0	72.0	286.9	16.9	1.6	1.9	0.76	-0.71	11.51	0.62
	Oborina Precipitation											
R (mm) Z/W	567	286.3	101.8	1094.7	18866.3	137.4	1.6	3.4	0.81	2.97	51.13	0.37
R (mm) P/Sp	567	267.5	79.7	869.6	9889.6	99.4	1.7	3.9	0.76	1.48	34.98	0.35
R (mm) LJ/Su	567	246.9	46.0	571.2	6675.4	81.7	0.4	0.4	0.85	0.92	19.64	0.24
R (mm) J/A	567	329.6	83.3	1188.0	19615.6	140.1	1.4	3.2	0.83	1.83	38.78	0.28
R (mm) Veg	567	518.0	114.3	1401.2	28653.2	169.3	1.2	2.3	0.80	1.72	44.50	0.26
R (mm) G/An	567	1130.3	310.8	3723.5	171817.6	414.5	1.7	4.4	0.77	6.37	136.82	0.33
Rd≥1mm (d)	292	96.4	57.4	140.5	200.1	14.1	0.7	0.9	0.88	0.17	4.29	0.31
S≥1cm (d)	328	25.0	0.0	174.3	852.4	29.2	1.3	2.0	0.89	0.52	8.02	0.31
	Naoblaka Cloudiness											
N (10/10)	144	5.4	3.8	6.7	0.6	0.8	-0.4	-1.0	0.83	0.001	0.30	0.40
	Trajanje sijanja Sunca Insolation duration											
SS (h)	36	2150.4	1660.0	2696.8	105995.0	325.6	0.3	-1.5	0.94	2.21	56.26	0.17
	Globalno zračenje Global radiation (1961-1980)											
$G_{0°}$ (MJm^{-2})	120	4844.4	4175.2	5890.9	195035.8	441.6	0.7	-0.9	0.94	-1.19	100.61	0.23
	Vlažnost zraka Air humidity											
U (%)	151	75.6	58.0	94.0	46.5	6.8	-0.4	-0.2	0.65	0.21	4.04	0.59

nisu razlučena u modelu, jer njihov lokalni karakter ne utječe na ukupnu temperaturnu stopu. Godišnji broj dana s toplim noćima je bilo teško modelirati jer izuzetno ovisi o lokalnim uvjetima i cirkulaciji (vidi također Perry i Hollis, 2005).

Rezultati validacije pokazali su da je kvaliteta dviju karata (srednje godišnje naoblake i srednje godišnje relativne vlažnosti) općenito manja, uglavnom zbog značajno manje preciznosti s njima povezanim mjerenjima. Srednja godišnja naoblaka se ne mjeri nego vizualno opaža u desetinama neba prekrivenim oblacima i iskazuje se s preciznošću od 1 desetine, ali neprecizznost opažanja je tipično veća. Također neprikladno, ali zbog malog raspona vrijednosti (3–7 desetina) i povijesnih razloga, ova karta je crtana s klasama od 0,5 desetina što je iznad preciznosti opažanja. U sljedećem izdanju Atlasa očekujemo da će klimatologija oblaka biti izvedena iz satelitskih opažanja.

Vrijednosti srednje godišnje relativne vlažnosti su također manje pouzdane zbog kompliciranije i na pogreške osjetljivije metode mjerenja. Relativna vlažnost se određuje psihrometrom koji se sastoji od dva termometra. Iz termodinamičke mokre i suhe temperature zraka proračunava se relativna vlažnost. Procedura pripreme termometara i očitavanje ovih temperatura zahtijeva točnost koju neprofesionalni motritelji u velikom broju slučajeva nemaju. Kako male pogreške u očitavanju, osobito pri hladnom vremenu, rezultiraju velikim pogreškama relativne vlažnosti, i to je pridonijelo manjoj preciznosti ove karte.

Karte klimatskih elemenata moguće je dalje poboljšavati korištenjem sofisticiranijih topo-klimatskih prediktora izvedenih iz DMR-a, kao što su otvorenost neba, raspored struja hladnog zraka i dubina udolina (Böhner i Antonić, 2008), ali i daljinskim metodama snimljenim slikama kao što su noćni snimci svijetla / urbane aktivnosti i sl. Na ovaj način moglo bi se preciznije prikazati temperaturne inverzije uzrokovane lokalnom topografijom i lokalna područja toplijeg zraka zbog utjecaja grada. Budući prostorno-vremenski predikcijski modeli bazirani na nizovima meteoroloških satelitskih snimaka omogućit će još preciznije (vremenski i prostorno) predviđanje klimatskih elemenata.

locations depends on the representativeness of the samples and also on the predictive power of the applied models. As mentioned earlier, the data were under-sampled at higher elevations and in areas with a lower population density. Hence, one might expect mapping accuracy to be lower at higher elevations and in the highlands. This has proven correct, especially for the Lika region, which is both under-populated and at high elevations. In addition, some well-known smaller scale effects were not modelled successfully, e.g. the Zagreb urban heat island, which is, according to measurements, by 0.5–1.5°C warmer then its surroundings. Furthermore, some expected wintertime cold air pools during temperature inversion situations were not captured in the model because of their local character which does not affect the general temperature lapse rate. The annual number of warm nights was especially difficult to model because it is strongly influenced by local characteristics and circulation (see also Perry and Hollis, 2005).

The results of cross-validation showed that two maps (average annual cloudiness and average annual relative humidity) were generally of lower quality, mainly because of the considerably lower accuracy of the related measurement. Average annual cloudiness is not a measured but a visually observed parameter in tenths of sky cover with a stated precision of 1 tenth, but the inaccuracy of observation is typically larger. Also inappropriately, but because of the small range (3-7 tenths) of values and because of historical reasons, this map has been drawn with classes of 0.5 tenth, which is above observation precision. The next Atlas edition will probably use satellite-derived cloud climatology.

The values of average annual humidity are also less reliable as a consequence of more complex and error-sensitive measurement methods. In this case, relative humidity was estimated by using a psychrometer consisting of two thermometers. The final value was calculated from the thermodynamic wet- and dry-bulb temperatures of the atmosphere, but the procedure for preparing the thermometers and the reading of these temperatures seeks for a precision that non-professional observers in many cases do not have. Since small errors in readings (especially during cold weather) result in large errors in relative humidity, this also resulted in lower accuracy.

The maps of climatic elements could be further improved by using more sophisticated topo-climatic predictors derived from DEM, such as sky-view factor, cold airflow distribution and the depth of sinks (Böhner and Antonić, 2008), but also remote-sensing based images such as night-light images / urban activities and similar. Thus, temperatures inversions due to fine scale topography and warmer local fields due to urban activities could also be depicted with higher accuracy. Future developments will include the use of spatio-temporal interpolation frameworks which also include time series of meteorological images so that an even more precise (temporal and local) prediction of climatic elements will become feasible.

Homogenizacija vremenskih nizova srednje godišnje temperature zraka

Krešo Pandžić, Tanja Likso

Smatra se da su vremenski nizovi meteoroloških elemenata (temperature, vlažnosti i tlaka zraka, brzine i smjera vjetra i drugih) homogeni ako su njihova kolebanja uzrokovana kolebanjima vremena i klime. Međutim, mjerenje tih parametara izloženo je različitim najčešće umjetno izazvanim promjenama na meteorološkim postajama: njihovom premještaju, promjeni motritelja, instrumenta, okoliša pa i pravila motrenja. Na primjer, tijekom devetnaestog stoljeća temperatura zraka se mjerila u meteorološkim kućicama postavljenim na sjevernim stranama zgrada na različitim visinama da bi se početkom dvadesetog stoljeća meteorološke kućice premještale u motrilište na visini 2 m iznad tla. Mjerno mjesto je pod stalnim utjecajem promjene neposrednog okoliša: sadnje ili uklanjanja raslinja, izgradnje ili rušenja različitih stambenih ili infastrukturnih objekata: obiteljskih kuća, zgrada, tornjeva, prometnica, igrališta i drugih objekata. Taj je utjecaj najizraženiji u gradovima pa su često meteorološke postaje u "bijegu" od urbanizacije sele na periferiju grada. Uzroci preseljenja meteoroloških postaja mogu biti i druge naravi osim širenja naselja. Postupna promjena neposrednog okoliša mjerne postaje izaziva postupni trend temperature zraka dok premještaj postaje obično izaziva signifikantnu naglu promjenu prosječne temperature zraka u usporedbi s prosječnom temperaturom za određeno (dovoljno dugo) razdoblje prije te promjene.

Za otkrivanje umjetno izazvanih promjena statistič-

Homogenisation of mean annual air temperature time series

Krešo Pandžić, Tanja Likso

It is assumed that the time series of meteorological elements (temperature, air humidity and pressure, wind speed and direction etc.) are homogeneous if their fluctuations are caused by the fluctuations of weather and climate. However, the measurements of these parameters are most often influenced by artificially generated changes at meteorological stations: their relocation, the replacement of observers or instruments, changes in the environment and even in observation standards. For example, in the nineteenth century, air temperature was measured in instrument shelters located on the northern side of buildings at dif-

kih svojstava meteoroloških vremenskih nizova kao što su srednjak, trend ili standardna devijacija, to jest nehomogenosti, koriste se različiti statistički testovi. Oni se mogu svrstati u dvije skupine: apsolutne i relativne. Apsolutna homogenost se promatra unutar samog niza koji se testira, a nedostatak joj je što ne razlikuje uzroke nehomogenosti koji mogu biti posljedica kolebanja vremena i klime na regionalnoj ljestvici od promjene uvjeta i načina mjerenja te lokacije. Kod relativnog pristupa testiranje homogenosti vremenskog niza obavlja se u odnosu na referentni niz koji je izložen istim prirodnim kolebanjima (na primjer kolebanjima regionalne klime), a istovremeno izvan dosega najčešće umjetno izazvanih efekata (na primjer, promjene okoliša ili premještaja postaje) na testirani niz. Nakon saznanja da su klimatske promjene evidentne sve češće se primjenjuju relativni statistički testovi.

Za ispitivanje homogenosti temperature zraka na 20 postaja korištenih u Klimatskom atlasu Hrvatske za standardno razdoblje 1961–1990. godina primijenjena je općenitija varijanta SNHT testa (engl. Standard Normal Homogeneity Test - SNHT) koja uključuje i testiranje relativne nehomogenosti s obzirom na pojavu umjetno izazvanog linearnog trenda u vremenskim nizovima temperature pored naglih prekida. Nizovi na kojima su utvrđeni prekidi homogenosti su homogenizirani kako bi se izbjegle pogreške osobito u promatranju prirodnog trenda temperature zraka.

Uobičajena je praksa da se nehomogeni vremenski nizovi homogeniziraju tako da se statistički parametri (na primjer srednja vrijednost) dijela niza prije prekida homogenosti prilagođava statističkim parametrima (srednjoj vrijednosti) niza nakon prekida homogenosti, dakle novijem stanju. Pojednostavljeno, članovi niza prije prekida homogenosti korigiraju se za razliku srednjaka niza nakon prekida i odgovarajućeg srednjaka prije prekida.

Za potrebe klimatskog atlasa za razdoblje 1961–1990. razmatra se homogenost vremenskih nizova sre-

ferent altitudes, whereas in the twentieth century the instrument shelters were relocated within the meteorological station enclosure at 2 m above ground. Measurement sites are constantly exposed to the influence of a changing environment: the planting or removal of plants, the building or demolishing of different housing or infrastructural units – family houses, buildings, towers, roads, playgrounds and other facilities. Such influence is particularly pronounced in towns and, therefore, meteorological stations often move to suburban areas, “fleeing“ urbanisation. There may also be other reasons for changing the site of a particular meteorological station. A gradual change in the measuring station immediate surroundings results in a gradual air temperature trend, whereas the relocation of the station usually brings about a significant, abrupt change in mean air temperature compared to the mean air temperature of the (sufficiently long) period preceding the relocation.

Different statistical tests are used to determine artificially generated changes in the statistical characteristics of meteorological weather series like means, trends or standard deviations, i.e. inhomogeneities. They can be divided into two groups: absolute and relative. Absolute homogeneity is observed within the very series being tested and its disadvantage is that it does not distinguish the causes of inhomogeneity which can be the result of weather and climate fluctuation on a regional scale from changes in conditions and measurement procedures at the location considered. In the relative approach, the weather series homogeneity is tested in relation to a referent series exposed to the same natural fluctuations (e.g. regional climate fluctuations) but, at the same time, unreached by the artificially generated effects (e.g. changes in the environment or station relocation) influencing the series tested. Awareness of evident climate changes has led to the prevailing use of relative statistical tests.

The homogeneity testing of air temperature from the 20 stations chosen for the Climate Atlas of Croatia, for

dnje godišnje temperature zraka za sljedećih 20 postaja: Osijek, Slavonski Brod, Đurđevac, Križevci, Varaždin, Zagreb-Maksimir, Sisak, Parg, Ogulin, Gospić, Zavižan, Rovinj, Pazin, Rijeka, Mali Lošinj, Zadar, Split-Marjan, Knin, Hvar i Dubrovnik.

Obzirom da je gustoća raspoloživih postaja veća u nizinskom nego u planinskom i primorskom pojasu, referentni nizovi za nizinski dio su konstruirani na temelju pet okolnih postaja geografski najbližih postaji koja se testira, dok su u planinskom i primorskom području korištene tri najbliže postaje. Testiranje je pokazalo da su rezultati s tri postaje stabilni kao i s pet postaja.

U Tablici 4. navedene su nehomogenosti temperaturnih nizova na 95% nivou pouzdanosti. Slovom *a* označena je godina koja prethodi prekidu homogenosti, a slovom *b* početna godina nakon prekida homogenosti, odnosno posljednja godina razdoblja linearnog trenda. U slučaju naglog prekida homogenosti to jest kada je $b=a+1$ oznaka *b* je izostavljena. U sljedećem stupcu prikazane su razlike srednjih vrijednosti nizova prije i nakon prekida homogenosti te “trend” po godini u slučaju višegodišnjeg linearnog trenda. Konačno, u zadnjem stupcu opisani su mogući uzroci prekida homogenosti kao što su: promjena položaja postaje, bližeg okoliša te urbanizacija u slučaju većih naselja. Ostali mogući uzroci nisu razmatrani kao što su promjena instrumenata ili motritelja kao i eventualno lokalni efekti na prirodna kolebanja regionalne klime kao što je također već navedeno.

Iz Tablice 4. je vidljivo da postoji određen broj naglih prekida homogenosti koji se poklapaju s vremenom premještaja postaje. Primjeri su takvih prekida evidentirani za postaje: Varaždin (1971. godine), Slavonski Brod (1969. godine), Osijek, Rijeku i Zadar (1994. godine). U Rovinju, Zadru i Dubrovniku preseljenje postaje nije uzrokovalo prekid homogenosti.

S druge strane na postajama: Zagreb-Maksimir, Đurđevac, Varaždin (1982. godine), Slavonski Brod (1969. i 1996. godine), Parg, Knin, Rovinj, Split-Marjan

the period 1961–1990, has been performed by applying the more common variant of the Standard Normal Homogeneity Test (SNHT), which includes the testing of relative inhomogeneity in view of the appearance, besides abrupt disruptions, of an artificially generated linear trend in the temperature time series. Homogenisation was also performed. The series showing homogeneity breaks were homogenised to avoid errors, particularly in the monitoring of the natural air temperature trend.

It is usual practice to homogenise inhomogeneous time series in such a way that the statistical parameters (e.g. mean values) of the part of the series preceding a homogeneity break are reduced to the statistical parameters (mean values) of the series following the homogeneity break, i.e. to the recent situation. To make it simpler, the members of the series preceding the homogeneity break are corrected for the difference between the series mean after the break and the relevant mean preceding the break.

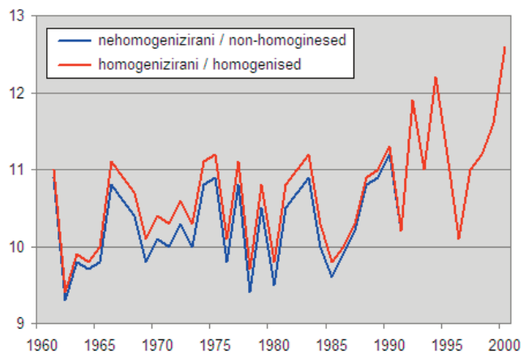
For the purpose of the Climate Atlas for the period 1961–1990, the homogeneity of 20 mean annual temperature time series has been considered. Air temperature data have been taken from the following stations: Osijek, Slavonski Brod, Đurđevac, Križevci, Varaždin, Zagreb-Maksimir, Sisak, Parg, Ogulin, Gospić, Zavižan, Rovinj, Pazin, Rijeka, Mali Lošinj, Zadar, Split-Marjan, Knin, Hvar and Dubrovnik.

As the density of available stations is greater in the lowland than in the mountainous or Adriatic area, the referent series for the lowland area have been constructed using five surrounding stations nearest to the station tested, while three stations were used in the mountainous and Adriatic area. Testing has shown that the results received with three stations were as stable as those with five.

Table 4 presents the temperature series inhomogeneities at a reliability level of 95%. The letter “a” marks the year preceding the homogeneity break and

Tablica 4. Rezultati testiranja homogenosti vremenskih nizova srednje godišnje temperature zraka za 20 meteoroloških postaja u Hrvatskoj za razdoblje 1961–2000. godina.
Table 4. Results of the testing of the homogeneity of the mean annual air temperature time series from 20 meteorological stations in Croatia, for the period 1961–2000.

Postaja Station	Prekid homogenosti Homogeneity break		Promjena srednjaka nizova Change in series means		Komentar Commentary
	a	b	°C °C	°C/god °C/year	
Osijek	1968		-0.18		17. 10. 1991. premještaj postaje 17 Oct. 1991 - station relocation
	1990	1992	-0.18	-0.09	
Slavonski Brod	1969		-0.45		Od 1. 1. 1970. godine podaci u nizu s novog položaja postaje (paralelan rad postaja); urbanizacija From 1 Jan. 1970, the data in the series are from the new station site (parallel station operation); urbanisation
	1986	1992	0.39	0.07	
	1996		-0.36		
	1969		-0.12		
Đurđevac	1966	1971	-0.24	-0.05	Promjena neposrednog okoliša Change in immediate environment
	1977		0.20		
	1987		0.15		
Križevci	1968	1970	-0.06	-0.03	Zasađen voćnjak od 1980. godine u fenološkom vrtu From 1980, a new orchard planted in the phenological garden
	1981	1983	-0.21	-0.11	
Varaždin	1971		-0.25		Preseljenje postaje 1. 1. 1972. godine Station relocation on 1 Jan. 1972
	1982		0.11		
	1994	1997	-0.21	-0.07	
Zagreb-Maksimir	1964	1966	-0.20	-0.10	Urbanizacija te osobit utjecaj bliže okolice tj. dogradnje tvorrnice Kraš 1980-tih i izgradnja teniskog centra 1990-tih Urbanisation and strong influence of immediate surrounding (enlargement of the Kraš factory in the 1980s and the building of a tennis centre in the 1990s
	1979	1993	0.24	0.02	
	1977	1993	0.11	0.01	
	1991		0.11		
	1995	1998	-0.13	-0.04	
Sisak	1968	1970	0.28	0.14	Urbanizacija i promjena neposrednog okoliša Urbanisation and change in the immediate environment
	1975	1986	-0.13	-0.01	
Parg	1968		0.41		Uređenje meteorološkog kruga? Modification of the weather station compound?
	1974	1985	-0.48	-0.04	
Ogulin	1968				Vjerojatno nema prekida homogenosti Probably no homogeneity disruption
Gospić	1976	1979			Vjerojatno nema prekida homogenosti Probably no homogeneity disruption
Zavižan	1984				Vjerojatno nema prekida homogenosti Probably no homogeneity disruption
Rovinj	1979	1981	-0.41	-0.21	Premještaj postaje 17. 12. 1979. godine; promjena neposrednog okoliša Station relocation on 17 Dec. 1979; change in immediate environment
	1986	1989	0.37	0.12	
	1987		0.16		
Pazin	1969	1982	0.38	0.03	Promjena neposrednog okoliša Change in immediate environment
	1987	1989	-0.30	-0.15	
Rijeka	1976		-0.18		Premještaj postaje 1.12. 1977. godine Station relocation on 1 Dec. 1977
Mali Lošinj	1970	1972			Vjerojatno nema prekida homogenosti Probably no homogeneity disruption
Zadar	1963	1965	0.29	0.15	Premještaj postaje dva puta: 1. 1. 1965. i 27. 7. 1995. god. Station relocated twice: 1 Jan. 1965 and 27 Jul. 1995
	1994		0.29		
Split-Marjan	1963	1969	-0.22	-0.04	Promjena neposrednog okoliša Change in immediate environment
	1979		0.14		
Knin	1964	1967	0.28	0.09	Premještaj postaje dva puta: 16. 5. 1971. i 22. 12. 1988. godine; ratni uvjeti 1995. g. Station relocated twice: 16 May 1971 and 22 Dec. 1988; war conditions in 1995
	1995		-0.25		
Hvar	1964				Vjerojatno nema prekida homogenosti Probably no homogeneity disruption
Dubrovnik	1970		-0.24		Postaja preseljena 12. 5. 1979. godine Station relocation on 12 May 1979



Slika 6. Homogenizirani i nehomogenizirani vremenski nizovi srednje godišnje temperature zraka za Zagreb Maksimir za razdoblje 1961–2000.
Figure 6. Homogenised and non-homogenised time series of the mean annual air temperature at Zagreb-Maksimir, for the period 1961–2000.

i Dubrovnik, zabilježeni su nagli prekidi homogenosti, a nije evidentirano preseljenje postaje. Mogući razlozi su nagla promjena okoliša kao što je na primjer izgradnja teniskog igrališta u blizini postaje Zagreb-Maksimir početkom 1990-tih. Na nekim postajama pojava linearnog trenda može se objasniti kao posljedica urbanizacije (Zagreb-Maksimir) te ponegdje sadnja i rast drveća u blizini postaje (na primjer u Križevcima sadnja fenološkog vrta). Na nekolicini postaja, većinom lociranih u gorskoj Hrvatskoj (Ogulin, Gospić, Zavižan) i na Jadranu (Mali Lošinj, Hvar) nije ustanovljena nehomogenost.

Ispravljanje nehomogenih podataka može utjecati na statističke parametre: srednjak, varijancu, ekstreme, autokorelacije, razdiobe čestina itd. U Tablici 5. su dane homogenizirane i nehomogeizirane vrijednosti srednje godišnje temperature zraka, a na slici 6. vremenski niz

the letter "b" marks the first year following the homogeneity break, i.e. the last year of the linear trend period. In cases of abrupt homogeneity breaks, i.e. when *b=a+*1, the "b" mark has been omitted. The next column in Table 4 shows the differences in the series mean values before and after the homogeneity break and the yearly "trends", in the case of multiannual linear trends. Finally, the last column describes the possible causes of homogeneity breaks such as: relocation of the station, change in the immediate environment or urbanisation (in larger settlements). Other possible causes have not been taken into consideration (replacement of instruments or observers or possible local effects on the natural fluctuation of regional climate).

In Table 4. a certain number of abrupt homogeneity breaks are visible, coinciding with the time of station relocation. Such breaks have been recorded at the following stations: Varaždin (1971), Slavonski Brod (1969), Osijek, Rijeka and Zadar (1994). In Rovinj, Zadar and Dubrovnik, station relocation did not result in homogeneity break.

On the other hand, at the Zagreb-Maksimir, Đurđevac, Varaždin (1982), Slavonski Brod (1969 and 1996), Parg, Knin, Rovinj, Split-Marjan and Dubrovnik stations' abrupt homogeneity breaks were recorded although there was no evidence of station relocation. Possible causes might include a sudden change in environment like the construction of tennis courts near the Zagreb-Maksimir station in the early '90s. At some stations, the appearance of a linear trend may be explained by urbanisation (Zagreb-Maksimir) or by the planting and growth of trees in the vicinity of the station (e.g. the planting of a phenological garden in Križevci). At a small number of stations, manly located in the highlands (Ogulin, Gospić, Zavižan) and on the coast (Mali Lošinj, Hvar), no inhomogeneity has been recorded.

The correction of inhomogeneous data can affect statistical parameters: mean, variance, extremes, autocorrelations, frequency distribution etc. Table 4. pre-

Tablica 5. Nehomogenizirane (NH) i homogenizirane (H) vrijednosti srednje godišnje temperature zraka i njihove razlike (dif) za razdoblja 1961–1990. i 1971–2000.
Table 5. Non-homogenised (NH) and homogenised (H) values of the mean annual air temperature and their differences (dif) for the periods 1961–1990 and 1971–2000.

	1961–1990			1971–2000		
	NH	H	dif	NH	H	dif
Osijek	10.8	10.5	0.3	11.0	10.8	0.1
Slavonski Brod	10.5	10.3	0.2	10.7	10.6	0.1
Đurđevac	9.7	9.7	0.0	10.1	10.1	0.0
Križevci	9.7	9.6	0.2	10.0	9.9	0.1
Varaždin	9.9	9.7	0.2	10.2	10.0	0.1
Zagreb-Maksimir	10.3	10.5	-0.2	10.7	10.8	-0.2
Sisak	10.6	10.6	0.0	11.0	10.9	0.0
Parg	7.0	6.8	0.2	7.2	7.0	0.1
Ogulin	9.7	9.7	0.0	10.0	10.0	0.0
Gospić	8.4	8.4	0.0	8.7	8.7	0.0
Zavižan	3.5	3.5	0.1	3.8	3.8	0.0
Rovinj	13.2	13.4	-0.3	13.4	13.6	-0.2
Pazin	11.0	11.0	0.1	11.3	11.2	0.1
Rijeka	13.6	13.5	0.1	13.8	13.8	0.0
Mali Lošinj	15.1	15.1	0.0	15.3	15.3	0.0
Zadar	14.7	15.0	-0.3	14.9	15.2	-0.2
Split-Marjan	15.9	16.0	0.0	16.1	16.1	0.0
Knin	12.9	12.7	0.2	13.0	12.8	0.2
Hvar	16.3	16.3	0.0	16.4	16.4	0.0
Dubrovnik	16.3	16.2	0.1	16.3	16.3	0.0

homogeniziranih i nehomogeniziranih srednjih godišnjih temperatura zraka za meteorološku postaju Zagreb-Maksimir u razdoblju 1961–2000.

Primjena SNHT za ispitivanje trenda u vremenskim nizovima godišnjih srednjih vrijednosti temperature zraka za 20 postaje za razdoblje 1961–2000. godina rezultirala je pokazateljima koji ukazuju na tip prekida homogenosti (nagli prekid ili trend), njegov intenzitet i vrijeme nastanka odnosno trajanja. Na tri postaje u gorskoj Hrvatskoj i dvije na Jadranu nije utvrđen ni jedan

sents the homogenised and non-homogenised mean annual air temperature values and Figure 6. shows the time series of the homogenised and non-homogenised mean annual air temperatures at the Zagreb-Maksimir station in the period 1961–2000.

The application of the SNHT for testing trends in the time series of mean annual air temperature values at 20 stations in the period 1961–2000 resulted in indicators of the type of homogeneity break (abrupt break or trend), its intensity, time of occurrence and duration. At

prekid homogenosti. Riječ je o glavnim meteorološkim postajama prvog reda koje nisu bile znatno izložene promjeni okoliša i nisu bile premještane. Za pet postaja utvrđen je nagli prekid homogenosti koji odgovara premještaju postaja. Za nekoliko postaja koje su premještene nije utvrđen prekid homogenosti. Linearni trend je otkriven za desetak postaja i to za neke postaje višestruk. U nekim slučajevima objašnjenje za trend je očigledno, na primjer za Zagreb-Maksimir (urbanizacija) ili Križevce (sadnja fenološkog vrta) dok je u nekim slučajevima teško naći objašnjenje za navedene trendove, na primjer za postaje: Križevci, Đurđevac, Parg, Pazin i Rovinj. Očito je riječ uglavnom o skupini postaja nižeg ranga što se odrazilo na kvalitetu rezultata mjerenja na njima iako se možda daljnjim istraživanjima dođe do odgovarajućih pojašnjenja.

Analiza ekstremnih vrijednosti

Marjana Gajić-Čapka

Analiza godišnjih ekstrema minimalnih i maksimalnih temperatura zraka i maksimalnih dnevnih količina oborine provedena je pomoću opće razdiobe ekstremnih vrijednosti (Generalized Extreme Value Distribution – GEV distribution) u skladu s postupkom Jenkinsona (Jenkinson, 1955, 1969; Makjanić, 1977; Sevruk i Geiger, 1981). Opći oblik troparametarske razdiobe vjerojatnosti ekstrema glasi:

$$P(x) = \exp\left[-e^{-y(x)}\right] \qquad (1)$$

gdje je *P(x)* vjerojatnost da je godišnji ekstrem najviše jednak *x*, a *y(x)* je reducirana varijata:

$$y = -\ln\ln\frac{1}{P(x)}. \qquad (2)$$

Opće rješenje ima oblik:

$$x = x_o + \alpha\frac{1-e^{-ky}}{k}. \qquad (3)$$

Maksimalne vrijednosti *x* povezane su s povratnim periodom *T* pomoću reducirane varijate *y*, x_0 je vrijednost koja se može u prosjeku očekivati jednom godišnje uz *y=0*, α je nagib x,y krivulje u točki $x=x_O$, *y=0* i *k* je parametar zakrivljenosti.

Opće rješenje uključuje sva tri tipa graničnih slučajeva koje su utvrdili Fisher i Tippet (Fisher i Tippet, 1928), a koji su određeni pomoću vrijednosti parametra *k*.

U slučaju *k*=0 GEV razdioba daje Gumbelovu (Gumbel, 1958) ili Fisher-Tippett tip I razdiobu i rješenje (3) ima oblik pravca .

U slučaju *k*<0 GEV razdioba se zove Frechet-ova ili Fisher-Tippet tip II razdioba, omeđena dolje, ali ne gore, i krivulja (3) nema gornje granice, pa se procjena ekstrema povećava bez ograničenja kad povratni period raste, a donja asimptota iznosi

$$x_{min} = x_o - \frac{\alpha}{k}.$$

U slučaju *k*>0 GEV razdioba poprima oblik Weibullove ili Fisher-Tippet tip III razdiobe omeđene s gornje strane, gdje krivulja (3) teži konačnoj vrijednosti

$$x_{max} = x_o + \frac{\alpha}{k}.$$

Povratni period *T(x)* definiran je kao srednji vremenski razmak koji proteče između dva premašaja vrijednosti *x*, ovisan je o funkciji kumulativne razdiobe u točki *x* i može se pisati kao:

$$\frac{1}{T} = 1 - P(x). \qquad (4)$$

three highland and two coastal stations there was no record of homogeneity disruption. These are main meteorological stations, which were not significantly exposed to environmental change and which were not relocated. At five stations, abrupt homogeneity breaks were identified, linked to station relocation. At some relocated stations no homogeneity break was recorded. A linear trend was detected at about ten stations; at some of these stations the trend was multiple. In some cases the trend can be easily explained, e.g. at Zagreb-Maksimir (urbanisation) or Križevci (the planting of a phenological garden), while in some cases it is difficult to find an explanation, as for the Đurđevac, Parg, Pazin and Rovinj stations but these are mostly lower-class stations and this might have affected measurement quality. Further research might result in a suitable explanation.

Extreme-value analysis

Marjana Gajić Čapka

The annual extremes of minimal and maximal air temperatures and daily precipitation amounts have been analized by means of the Generalized Extreme Value (GEV) Distribution. They have been determined in accordance with Jenkinson's procedure (Jenkinson, 1955, 1969; Makjanić, 1977; Sevruk and Geiger, 1981). The generalized form of the extremal three-parameter distribution function is:

$$P(x) = \exp\left[-e^{-y(x)}\right] \qquad (1)$$

where *P(x)* denotes the probability that the annual extreme is at most *x*, and *y(x)* is the reduced variate:

$$y = -\ln\ln\frac{1}{P(x)}. \qquad (2)$$

The general solution is given in the form:

$$x = x_o + \alpha\frac{1-e^{-ky}}{k}. \qquad (3)$$

The maximal values *x* are related to the return period *T* by means of the reduced variate *y*; x_0 is the value expected on average once a year, where *y* is 0, α is the slope of the *x,y* curve at $x=x_0$, *y=0*, and *k* is the shape parameter.

Three special GEV cases have already been recognized by Fisher and Tippett (Fisher and Tippet, 1928), depending on the value of the shape parameter *k*.

If *k* approaches zero, the GEV disribution yields the Gumbel (Gumbel, 1958) or Fisher-Tippet Type I distribution and (3) is in the form of a straight line .

For *k*<0, the GEV distribution is referred to as the Fréchet or Fisher-Tippet Type II distribution, bounded below, but not above. Therefore the extreme value estimates increase to infinity by increase of return period *T*. The lower limit (asimptote) is

$$x_{min} = x_o - \frac{\alpha}{k}.$$

For k>0, the GEV distribution takes the form of the Fisher-Tippet Type III distribution, known as the Weibull upper-bound distribution, with the upper limit (asimptote)

$$x_{max} = x_o + \frac{\alpha}{k}.$$

The return period *T(x)* associated with a quantile *x* is typically interpreted to be the average time interval between successive overpassings of *x*. It is a function of the cumulative distribution function evaluated at *x*:

$$\frac{1}{T} = 1 - P(x). \qquad (4)$$

iz čega proizlazi relacija:

$$y = -\ln\ln\frac{T}{T-1} \quad . \qquad (5)$$

Veza između procijenjenoga ekstrema *x* i pripadnoga povratnog perioda *T* dana je izrazom:

$$x = x_0 + \alpha\frac{1-\left\{\ln\left[T/(T-1)\right]\right\}^k}{k} \quad . \qquad (6)$$

Za potrebe ovog klimatskog atlasa korišten je program za izračunavanje parametara troparametarske GEV razdiobe, te očekivane maksimalne odnosno minimalne vrijednosti za različite povratne periode, koji je sastavni dio izvješća Faragó-a i Katz-a (Faragó i Katz, 1990) u seriji publikacija koje izdaje Svjetska meteorološka organizacija (World Meteorological Organization – WMO) u okviru "Svjetskog klimatskog programa - primjena" (World Climate Programme – Applications).

Procjene parametara izračunate su metodom maksimalne vjerojatnosti iz uzoraka koji su u slučajevima ekstremnih temperatura zraka (apsolutnih minimuma i maksimuma temperature zraka) nizovi izmjerenih godišnjih maksimalnih i minimalnih vrijednosti u razdoblju 1961–1990. Za procjenu očekivanih maksimalnih dnevnih količina oborine korištene su maksimalne godišnje vrijednosti u razdoblju 1951–2000. budući da je za stabilizaciju kratkotrajnih oborina i prikaz prosječnih prilika ekstremnih oborina potrebno dulje razdoblje (Gajić-Čapka, 1999, 2000).

From this, the following relation is obtained:

$$y = -\ln\ln\frac{T}{T-1} \quad . \qquad (5)$$

The relation between the estimated extreme *x* and its return period *T* is given by:

$$x = x_0 + \alpha\frac{1-\left\{\ln\left[T/(T-1)\right]\right\}^k}{k} \quad . \qquad (6)$$

The computation of the GEV distribution parameters and the estimation of the maximal and minimal values with various return periods have been performed by means of a computer programme which is part of the report by Faragó and Katz (Faragó and Katz, 1990), published in the World Climate Applications Programme series by the World Meteorological Organization.

The estimates of the extremal distribution parameters have been obtained by the method of maximum likelihood from samples which, in the case of extreme air temperatures, are series of measured annual absolute minimal and maximal air temperatures for the period 1961–1990. A sample size of n=50 (annual data for 1951–2000) was used for the estimation of maximal daily precipitation amounts, because a longer period is required for the climate to stabilise in terms of short-term precipitation (Gajić-Čapka, 1999, 2000).

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Tablice
Tables

Popis meteoroloških postaja u tablicama
List of meteorological stations in tables

Postaja Station	Nadmorska visina Altitude	Zemljopisna širina Geographical latitude		Zemljopisna dužina Geographical longitude	
	(m)	(° ´)		(° ´)	
Osijek	89	45	32	18	44
Slavonski Brod	88	45	10	18	00
Đurđevac	121	46	03	17	04
Križevci	155	46	02	16	33
Varaždin	167	46	18	16	23
Zagreb-Maksimir	123	45	49	16	02
Sisak	98	45	30	16	22
Parg	863	45	36	14	38
Ogulin	328	45	16	15	14
Gospić	564	44	33	15	23
Zavižan	1594	44	49	14	59
Rovinj	20	45	05	13	38
Pazin	291	45	14	13	56
Rijeka	120	45	20	14	27
Mali Lošinj	53	44	32	14	29
Zadar	5	44	08	15	13
Split-Marjan	122	43	31	16	26
Knin	234	44	02	16	12
Hvar	20	43	10	16	27
Dubrovnik	52	42	39	18	05

Osijek

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-1.2	1.6	6.1	11.3	16.5	19.5	21.1	20.3	16.6	11.2	5.4	0.9	0.4	11.3	20.3	11.1	17.5	10.8
T_{max}	(°C)	17.5	21.8	26.9	30.9	36.0	36.7	38.6	38.1	34.0	29.0	25.8	20.0	21.8	36.0	38.6	34.0	38.6	38.6
T_{min}	(°C)	-27.1	-24.8	-21.0	-3.0	-0.8	1.0	7.3	5.1	-0.7	-5.4	-15.7	-23.2	-27.1	-21.0	1.0	-15.7	-3.0	-27.1
t_{max}	(°C)	2.3	5.9	11.9	17.5	22.5	25.4	27.4	27.1	23.7	17.9	10.0	4.2	4.3	17.3	26.6	17.2	23.9	16.3
t_{min}	(°C)	-4.6	-2.1	1.0	5.6	10.3	13.5	14.7	14.2	10.9	5.9	1.8	-2.0	-2.9	5.6	14.1	6.2	11.5	5.8
$t_{min\ 5cm}$	(°C)	-5.7	-3.5	-0.7	3.5	8.2	11.7	12.9	12.3	8.9	3.9	0.4	-3.2	-4.2	3.6	12.3	4.4	9.6	4.0
$t_{min\ 5cm}$ min	(°C)	-29.1	-27.1	-24.4	-6.0	-2.7	-0.8	5.5	2.4	-3.4	-7.6	-18.6	-24.2	-29.1	-24.4	-0.8	-18.6	-6.0	-29.1
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	4.8	1.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6	8.2	0.7	0.0	0.3	0.0	9.2
t_{max}<0°C	(d)	8.9	3.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.7	17.8	0.7	0.0	0.5	0.0	19.0
t_{min}<0°C	(d)	24.8	18.5	11.1	1.3	0.1	0.0	0.0	0.0	0.0	2.4	9.3	20.2	63.1	12.5	0.0	11.7	1.4	87.8
t_{max}≥25°C	(d)	0.0	0.0	0.3	2.5	10.3	16.9	22.9	22.2	12.5	2.7	0.1	0.0	0.0	13.0	61.9	15.3	87.1	90.2
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	1.2	4.8	8.9	8.3	2.4	0.0	0.0	0.0	0.0	1.2	22.0	2.4	25.7	25.7
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.8
$t_{min\ 5cm}$ <0°C	(d)	27.4	21.8	16.4	4.9	0.4	0.0	0.0	0.0	0.2	6.0	13.4	23.4	71.7	21.7	0.0	19.6	5.5	113.9
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	4.5	17.1	85.1	197.2	354.3	434.0	497.6	485.5	368.7	216.8	66.9	12.1	33.7	636.6	1417.0	652.4	2337.2	2739.8
$t_{5°C}$ max	(°C)	23.6	89.8	158.8	289.4	430.7	507.8	574.3	550.0	470.3	360.6	178.8	51.3	100.8	786.5	1547.9	802.2	2540.7	2974.2
$t_{5°C}$ min	(°C)	0.0	0.0	19.5	92.7	253.0	362.6	417.0	370.8	257.0	85.5	3.2	0.0	3.1	411.1	1209.4	468.8	1966.2	2251.7
$t_{10°C}$	(°C)	0.0	1.6	17.0	71.7	201.4	284.0	342.6	330.5	219.2	85.1	12.2	0.6	2.2	290.1	957.1	316.5	1449.3	1565.8
$t_{10°C}$ max	(°C)	0.8	15.3	50.8	139.5	275.7	357.8	419.2	395.0	320.3	213.1	63.8	9.4	20.5	415.7	1087.9	461.6	1649.9	1774.7
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	21.3	117.2	218.9	290.7	249.5	137.8	7.3	0.0	0.0	0.0	155.7	838.1	176.1	1225.7	1320.2
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.2	2.2	6.5	12.2	18.0	21.6	23.4	22.6	18.4	12.3	6.0	1.8	1.4	12.3	22.5	12.2	19.4	12.1
t_{5cm} max	(°C)	3.5	5.9	9.8	15.0	21.3	24.6	27.1	24.7	22.1	16.3	9.0	4.2	5.9	21.3	27.1	22.1	27.1	27.1
t_{5cm} min	(°C)	-6.2	-3.2	2.7	9.2	15.0	19.0	20.6	20.1	15.8	9.0	2.5	-3.1	-6.2	2.7	19.0	2.5	9.2	-6.2
t_{20cm}	(°C)	0.9	2.2	5.7	11.3	16.9	20.5	22.7	22.1	18.3	12.7	6.8	2.6	1.9	11.3	21.8	12.6	18.6	11.9
t_{20cm} max	(°C)	3.6	5.6	9.0	14.0	19.9	23.2	25.5	24.0	21.2	16.7	9.3	4.6	5.6	19.9	25.5	21.2	25.5	25.5
t_{20cm} min	(°C)	-5.1	-1.0	2.7	8.5	14.1	18.7	20.0	20.0	16.4	10.0	3.5	-1.4	-5.1	2.7	18.7	3.5	8.5	-5.1
Oborina Precipitation																			
R	(mm)	46.9	40.2	44.8	53.8	58.5	88.0	64.8	58.5	44.8	41.3	57.3	51.6	138.5	157.1	211.2	143.4	368.3	650.4
Rmax	(mm)	105.5	120.5	118.3	122.8	170.6	180.2	273.5	136.6	138.1	157.2	120.6	150.4	318.5	284.8	458.5	246.4	612.7	884.7
Rmin	(mm)	2.8	4.9	7.5	19.4	11.4	38.0	26.0	2.4	3.8	0.0	10.0	2.1	45.6	78.4	138.4	63.3	246.4	466.9
Rd_{max}	(mm)	35.6	24.9	30.6	45.4	50.6	101.2	85.7	50.7	45.5	31.4	35.0	35.0	35.6	50.6	101.2	45.5	101.2	101.2
Rd≥0.1mm	(d)	11.8	11.6	11.7	13.1	13.5	13.9	10.6	10.2	8.7	9.2	11.9	13.5	37.0	38.2	34.6	29.8	69.8	139.6
Rd≥1mm	(d)	7.6	7.4	7.9	8.9	8.8	9.8	7.5	7.1	6.2	5.8	8.7	8.9	23.9	25.6	24.4	20.7	48.4	94.7
Rd≥5mm	(d)	3.4	2.8	3.0	3.6	3.9	5.2	4.0	3.7	2.8	2.6	4.3	3.7	9.8	10.5	12.9	9.7	23.2	42.9
Rd≥10mm	(d)	1.3	1.1	1.2	1.4	1.8	2.8	2.1	1.9	1.2	1.4	1.6	1.3	3.7	4.4	6.8	4.2	11.1	19.1
Rd≥20mm	(d)	0.2	0.1	0.1	0.2	0.4	0.9	0.6	0.7	0.4	0.3	0.2	0.2	0.5	0.8	2.2	1.0	3.3	4.5
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.2
S≥1cm	(d)	13.5	9.3	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	7.3	29.9	3.4	0.0	1.7	0.0	35.2
S≥10cm	(d)	7.8	4.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.8	14.5	1.0	0.0	0.4	0.0	16.0
S≥30cm	(d)	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.5	0.0	0.0	0.0	0.0	2.5
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
S_{max}	(cm)	44	45	28	0	0	0	0	0	0	0	18	57	57	28	0	18	0	57
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	10	16	30	54	86	108	126	114	78	46	21	12	38	170	348	145	566	701
ET	(mm)	10	16	30	52	81	103	106	88	60	37	20	12	38	163	297	117	490	615

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.2	1.8	6.4	11.2	16.7	19.7	21.3	20.8	16.5	11.0	5.1	1.2	0.9	11.5	20.6	10.9	17.7	11.0
T_{max}	(°C)	17.5	20.6	26.9	28.6	35.0	35.7	38.5	38.6	34.0	29.2	23.7	20.0	20.6	35.0	38.6	34.0	38.6	38.6
T_{min}	(°C)	-27.1	-24.8	-21.0	-5.9	-0.6	2.8	5.6	5.1	0.7	-5.5	-15.7	-21.1	-27.1	-21.0	2.8	-15.7	-5.9	-27.1
t_{max}	(°C)	3.3	6.5	12.3	17.2	22.6	25.6	27.6	27.5	23.4	17.4	9.4	4.7	4.8	17.4	26.9	16.7	24.0	16.5
t_{min}	(°C)	-3.3	-2.1	1.3	5.5	10.5	13.6	14.8	14.5	10.8	6.1	1.6	-1.7	-2.4	5.7	14.3	6.2	11.6	6.0
$t_{min\ 5cm}$	(°C)	-4.7	-3.9	-0.7	3.3	8.1	11.6	12.9	12.5	8.7	4.0	0.1	-3.1	-3.9	3.6	12.3	4.3	9.5	4.1
$t_{min\ 5cm}$ min	(°C)	-29.0	-27.1	-24.4	-8.4	-2.4	0.7	3.6	2.4	-3.4	-9.1	-17.0	-22.2	-29.0	-24.4	0.7	-17.0	-8.4	-29.0
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	2.7	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.7	6.3	0.5	0.0	0.2	0.0	6.8
t_{max}<0°C	(d)	7.9	3.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.7	16.1	0.5	0.0	0.9	0.0	17.4
t_{min}<0°C	(d)	23.7	18.1	11.0	1.7	0.0	0.0	0.0	0.0	0.0	2.7	9.9	19.4	61.5	12.7	0.0	12.6	1.7	86.6
t_{max}≥25°C	(d)	0.0	0.0	0.3	2.2	10.5	16.8	23.4	23.1	12.2	2.2	0.0	0.0	0.0	13.0	63.3	14.3	88.1	90.6
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	1.1	4.8	9.1	9.3	1.9	0.0	0.0	0.0	0.0	1.1	23.3	1.9	26.2	26.2
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	1.2	1.2
$t_{min\ 5cm}$<0°C	(d)	26.9	22.1	16.7	5.6	0.2	0.0	0.0	0.0	0.1	6.0	14.1	23.0	72.0	22.5	0.0	20.0	5.9	114.4
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	6.8	19.3	88.8	191.5	359.4	437.1	503.0	497.1	363.5	212.4	62.2	13.5	39.6	639.6	1437.2	638.1	2351.5	2754.6
$t_{5°C}$ max	(°C)	23.6	72.6	158.8	289.2	430.7	507.6	574.3	599.1	470.3	302.5	178.9	51.3	100.8	786.5	1559.2	839.6	2593.7	3223.1
$t_{5°C}$ min	(°C)	0.0	0.0	17.2	103.0	248.6	368.9	442.9	404.5	251.2	101.1	1.8	0.0	4.3	446.9	1298.1	508.1	2072.6	2415.1
$t_{10°C}$	(°C)	0.0	1.3	18.4	68.4	205.9	287.1	348.0	342.1	213.9	85.1	11.7	0.7	2.0	292.8	977.2	310.7	1465.5	1582.7
$t_{10°C}$ max	(°C)	0.8	11.1	50.8	154.3	275.7	357.5	419.2	444.1	320.3	154.0	55.9	9.4	20.5	415.7	1099.4	439.1	1693.8	1922.7
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	21.3	97.5	218.9	287.9	249.5	101.2	7.3	0.0	0.0	0.0	155.7	838.1	176.1	1225.7	1320.2
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.9	2.7	6.8	12.1	18.5	22.0	23.8	23.3	18.3	12.2	5.9	2.1	1.9	12.5	23.0	12.1	19.7	12.4
t_{5cm} max	(°C)	3.5	5.9	10.6	14.9	22.0	25.2	27.1	27.0	22.1	14.6	9.4	4.2	5.9	22.0	27.1	22.1	27.1	27.1
t_{5cm} min	(°C)	-0.5	-0.7	3.3	8.4	14.6	19.0	21.7	20.1	14.5	9.0	2.5	0.0	-0.7	3.3	19.0	2.5	8.4	-0.7
t_{20cm}	(°C)	1.5	2.5	6.0	11.3	17.2	20.7	22.9	22.7	18.3	12.6	6.9	3.0	2.3	11.5	22.1	12.6	18.9	12.1
t_{20cm} max	(°C)	4.0	5.6	9.6	14.0	19.9	23.2	25.5	25.4	21.2	15.1	10.5	5.1	5.6	19.9	25.5	21.2	25.5	25.5
t_{20cm} min	(°C)	-0.5	-1.0	3.0	8.0	14.1	18.7	20.9	20.0	15.9	10.0	3.5	0.6	-1.0	3.0	18.7	3.5	8.0	-1.0
Oborina Precipitation																			
R	(mm)	41.4	35.1	40.5	51.0	59.2	82.0	65.4	61.9	51.0	56.6	61.7	49.1	125.9	150.8	209.2	169.3	370.4	654.9
Rmax	(mm)	99.9	80.9	116.4	99.9	170.6	180.2	273.5	136.6	157.1	164.0	123.7	117.7	190.8	284.8	458.5	317.5	612.7	884.7
Rmin	(mm)	6.4	0.7	7.5	19.6	11.4	9.6	19.0	5.3	6.9	5.8	10.0	2.1	45.6	78.4	77.7	67.8	154.5	317.0
Rd_{max}	(mm)	39.3	20.2	30.6	33.4	50.6	85.7	85.7	51.7	66.3	36.6	35.0	32.2	39.3	50.6	85.7	66.3	85.7	85.7
Rd≥0.1mm	(d)	11.3	10.6	11.2	13.0	13.3	13.4	10.6	9.9	9.4	10.5	11.7	12.3	34.2	37.5	33.9	31.6	69.5	137.2
Rd≥1mm	(d)	6.7	6.7	7.2	8.7	8.8	9.3	7.6	7.0	6.7	7.1	8.6	8.1	21.6	24.7	23.8	22.3	48.0	92.4
Rd≥5mm	(d)	2.9	2.3	2.6	3.4	3.9	4.8	3.9	3.9	3.1	3.3	4.3	3.6	8.8	10.0	12.6	10.7	23.0	42.0
Rd≥10mm	(d)	1.1	1.1	1.1	1.4	1.8	2.8	2.0	2.1	1.4	2.0	1.9	1.4	3.5	4.3	6.9	5.2	11.5	20.0
Rd≥20mm	(d)	0.2	0.0	0.1	0.2	0.4	1.0	0.7	0.8	0.6	0.5	0.4	0.2	0.4	0.7	2.5	1.5	3.7	5.2
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.3	0.3
S≥1cm	(d)	10.3	7.8	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	6.5	24.9	2.2	0.0	2.2	0.0	28.9
S≥10cm	(d)	4.3	2.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	8.5	0.5	0.0	0.3	0.0	9.1
S≥30cm	(d)	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.7
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	44	36	28	6	0	0	0	0	0	0	18	28	44	28	0	18	6	44
Isparavanje Evaporation																			
EV	(mm)				58.6	87.5	99.2	111.2	100.3	63.5	36.2							556.4	
EVmax	(mm)				97.0	134.1	169.5	151.7	165.3	101.6	57.1							169.5	
EVmin	(mm)				34.2	59.6	72.4	86.4	69.6	40.8	19.7							19.7	
PET	(mm)	12	19	35	58	97	123	142	132	86	49	22	14	45	190	397	157	638	789
ET	(mm)	12	19	35	57	90	109	106	88	59	39	22	13	44	182	303	120	509	649

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	88.8	84.8	77.5	73.3	72.8	73.7	71.8	74.3	77.8	80.0	87.6	89.8	87.8	74.5	73.3	81.8	74.0	79.4
Umin (%)	41.0	27.0	21.0	13.0	15.0	25.0	23.0	21.0	20.0	24.0	25.0	38.0	27.0	13.0	21.0	20.0	13.0	13.0
U>80% (d)	18.0	11.2	6.7	4.6	3.7	3.1	2.3	2.4	3.2	5.3	14.0	19.4	48.5	15.1	7.9	22.6	19.4	94.0
U≤30% (d)	0.0	0.0	1.3	2.1	1.2	0.3	1.0	1.7	1.2	0.5	0.0	0.0	0.0	4.6	3.1	1.8	7.6	9.5
e (hPa)	5.3	6.1	7.3	9.8	13.6	16.8	17.8	17.6	14.6	10.8	8.2	6.2	5.9	10.2	17.4	11.2	15.0	11.2
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	131	195	362	482	602	617	662	577	401	288	135	95	420	1445	1855	824	3339	4544
$G_{45°S}$ (MJm^{-2})	210	281	442	491	543	530	581	562	461	414	204	145	636	1477	1674	1079	3170	4866
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.8	2.9	4.5	5.8	6.8	7.6	8.4	8.0	6.5	4.8	2.3	1.6	2.1	5.7	8.0	4.5	7.2	5.1
SS_{rel} (%)	24	32	42	47	50	54	61	62	57	51	29	21	26	47	59	48	55	47
SS_{max} (h)	3.5	6.2	6.3	7.4	9.3	9.6	10.4	10.1	9.3	7.2	4.0	3.4	3.4	7.2	9.7	5.6	8.8	6.2
SS_{min} (h)	1.0	0.8	2.5	3.8	4.8	5.4	6.3	6.5	4.9	2.6	0.3	0.1	1.0	4.2	6.5	3.6	6.0	4.3
Naoblaka Cloudiness																		
N (10/10)	7.2	6.8	6.1	5.9	5.4	5.1	4.0	3.8	4.3	4.9	6.8	7.3	7.1	5.8	4.3	5.3	4.7	5.6
N_{max} (10/10)	8.6	9.2	8.0	7.2	6.7	6.4	6.2	5.4	6.4	7.0	9.7	9.5	8.3	6.8	5.6	6.7	5.7	6.5
N_{min} (10/10)	4.9	3.4	4.3	4.5	4.1	4.0	2.5	2.1	2.1	2.3	5.2	5.1	5.1	4.7	3.3	4.4	4.1	4.8
N<2/10	2.5	3.5	4.6	4.9	5.6	5.8	9.9	11.8	9.1	8.4	3.3	2.6	8.5	15.1	27.4	20.8	47.0	71.8
N<2/10 max	8	15	10	10	12	13	18	21	20	16	11	8	26	30	46	33	70	113
N<2/10 min	0	0	0	1	0	1	2	5	1	1	0	0	1	6	18	6	29	41
N>8/10	15.5	12.9	10.9	9.7	7.4	6.1	4.4	4.3	5.5	7.8	14.1	16.5	44.9	28.1	14.7	27.3	37.4	115.1
N>8/10 max	24	23	21	15	12	12	11	8	11	16	28	28	58	40	25	43	56	148
N>8/10 min	7	2	5	5	3	2	0	1	0	1	6	7	29	17	8	18	24	80
Meteorološke pojave Weather phenomena																		
magla/fog	5.6	3.5	1.7	0.7	0.5	0.3	0.4	0.6	1.6	4.3	6.4	6.4	15.6	2.9	1.3	12.3	4.1	32.1
magla/fog max	13	11	12	4	3	2	3	4	4	13	12	13	30	14	5	22	9	48
magla/fog min	1	0	0	0	0	0	0	0	0	0	0	1	4	0	0	2	0	10
tuča/hail	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.4	0.1	0.8	0.9
tuča/hail max	0	0	1	1	2	1	2	1	1	0	0	0	0	2	3	1	3	3
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.0	0.1	0.4	1.8	4.0	6.3	5.0	4.7	1.3	0.2	0.1	0.1	0.2	6.3	15.9	1.7	23.1	24.1
grm/thun max	0	2	2	6	10	11	15	13	6	1	1	1	2	15	28	6	40	43
grm/thun min	0	0	0	0	1	1	0	1	0	0	0	0	0	2	5	0	12	13
rosa/dew	0.0	0.3	5.5	12.7	15.8	15.3	18.4	19.7	19.5	14.1	3.9	0.9	1.2	34.0	53.4	37.5	101.4	126.1
rosa/dew max	1	3	17	23	22	21	27	25	26	22	15	11	11	52	64	53	126	167
rosa/dew min	0	0	0	6	8	10	10	12	10	3	0	0	0	20	39	23	76	96
mraz/frost	7.0	7.6	7.4	2.1	0.1	0.0	0.0	0.0	0.2	4.7	7.5	9.0	23.6	9.6	0.0	12.4	2.4	45.6
mraz/frost max	21	20	16	12	2	0	0	0	2	14	15	16	52	20	0	22	14	71
mraz/frost min	0	0	2	0	0	0	0	0	0	0	0	0	6	4	0	4	0	14
inje/rime	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.9	0.0	0.0	0.2	0.0	2.1
inje/rime max	9	3	0	0	0	0	0	0	0	0	3	5	12	0	0	3	0	12
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1009.0	1006.7	1005.6	1002.7	1004.0	1004.3	1005.1	1005.1	1007.5	1009.0	1007.6	1008.0	1007.9	1004.1	1004.8	1008.0	1004.8	1006.2
p max (hPa)	1033.0	1030.8	1029.4	1022.7	1018.4	1017.8	1017.1	1015.7	1024.1	1025.7	1029.4	1036.8	1036.8	1029.4	1017.8	1029.4	1024.1	1036.8
p min (hPa)	975.2	963.6	979.6	976.5	980.8	988.6	988.5	986.7	985.0	975.7	977.1	959.4	959.4	976.5	986.7	975.7	976.5	959.4
Vjetar Wind																		
v_h (ms^{-1})	2.7	3.0	3.2	3.3	2.8	2.5	2.3	2.2	2.2	2.4	2.6	2.8	2.8	3.1	2.3	2.4	2.6	2.7
v_h max (ms^{-1})	13.1	14.7	11.3	14.7	15.8	12.4	13.1	11.2	10.6	21.3	11.2	12.2	14.7	15.8	13.1	21.3	15.8	
v_{max} (ms^{-1})	21.2	34.0	18.3	28.1	24.9	23.1	33.6	21.8	33.1	20.1	18.3	20.1	34.0	28.1	33.6	33.1	33.6	
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-9.5	-9.2	-3.6	4.2	12.7	17.7	18.7	15.2	8.7	2.0	-2.7	-6.9	-8.5	4.4	17.2	2.6	12.9	3.9
$PhET_{14h}$ (°C)	-2.4	-0.9	9.9	17.2	24.8	29.2	32.5	31.9	26.2	17.1	6.0	-1.0	-1.4	17.3	31.2	16.4	27.0	15.9
$PhET_{21h}$ (°C)	-8.1	-7.4	-0.7	4.9	10.3	13.6	15.2	14.6	10.6	4.9	-0.9	-5.6	-7.0	4.8	14.5	4.9	11.5	4.3

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	87.5	81.9	74.1	71.3	70.1	70.9	69.6	71.8	76.2	79.2	86.1	88.5	86.0	71.8	70.8	80.5	71.6	77.3
Umin (%)	38.0	27.0	21.0	19.0	21.0	25.0	23.0	21.0	25.0	24.0	25.0	34.0	27.0	19.0	21.0	24.0	19.0	19.0
U>80% (d)	16.5	9.0	5.5	4.1	3.1	2.7	1.9	2.4	3.0	6.0	13.4	17.9	43.4	12.7	6.9	22.4	17.1	85.5
U≤30% (d)	0.0	0.2	1.6	1.7	1.5	0.7	1.3	2.9	0.9	0.4	0.0	0.0	0.2	4.8	4.9	1.3	8.9	11.2
e (hPa)	5.6	6.0	7.2	9.4	13.3	16.2	17.5	17.4	14.3	10.6	7.9	6.2	5.9	10.0	17.1	10.9	14.7	11.0
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.9	3.4	4.7	5.7	7.0	7.7	8.4	8.1	6.3	4.6	2.3	1.8	2.3	5.8	8.1	4.4	7.2	5.2
SS_{rel} (%)	20	34	42	45	52	55	60	61	53	44	25	21	25	47	58	42	54	45
SS_{max} (h)	3.5	6.2	7.1	7.5	9.8	11.4	10.1	10.8	9.0	6.5	4.0	3.4	3.7	7.4	10.5	5.3	9.1	6.5
SS_{min} (h)	0.5	0.8	2.7	3.8	4.8	5.6	6.3	6.5	3.5	2.6	0.3	0.6	1.0	4.2	6.5	3.4	6.0	4.3
Naoblaka Cloudiness																		
N (10/10)	7.1	6.2	5.7	5.8	5.1	4.9	4.0	3.7	4.4	5.1	6.7	7.0	6.8	5.5	4.2	5.4	4.6	5.5
N_{max} (10/10)	9.1	9.2	7.7	7.1	6.7	6.4	6.2	5.4	6.6	7.0	9.7	9.0	8.3	6.8	5.6	6.7	5.7	6.5
N_{min} (10/10)	4.5	3.4	4.1	4.5	3.2	2.4	2.5	1.7	2.2	3.0	5.2	5.1	4.9	4.3	2.7	4.5	3.5	4.5
N<2/10	2.4	4.7	5.0	4.8	6.2	6.1	8.9	11.9	8.4	7.4	3.4	3.2	10.3	16.0	26.9	19.1	46.3	72.4
N<2/10 max	9	15	10	12	13	16	14	19	17	13	11	10	26	30	44	31	70	106
N<2/10 min	0	0	1	2	0	1	2	6	1	1	0	0	2	7	11	6	29	41
N>8/10	15.1	11.4	9.3	8.8	6.6	5.5	3.7	3.9	5.0	7.6	13.9	14.9	41.5	24.7	13.0	26.4	33.4	105.6
N>8/10 max	24	23	18	15	12	12	11	8	11	14	28	24	58	40	25	43	56	148
N>8/10 min	7	2	3	3	1	0	0	0	0	0	5	7	23	12	3	13	16	64
Meteorološke pojave Weather phenomena																		
magla/fog	6.5	3.5	1.6	1.3	0.5	0.4	0.6	0.7	2.2	4.8	6.3	7.6	17.6	3.5	1.8	13.4	5.9	36.2
magla/fog max	18	12	12	4	2	2	4	4	7	13	12	16	30	14	6	24	17	57
magla/fog min	1	0	0	0	0	0	0	0	0	0	2	1	4	0	0	4	1	10
tuča/hail	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.0	0.9	0.9
tuča/hail max	0	0	1	1	2	1	2	1	1	0	0	0	0	2	3	1	4	4
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.0	0.1	0.4	1.8	4.5	6.3	5.5	4.8	1.8	0.8	0.2	0.1	0.3	6.7	16.6	2.8	24.7	26.4
grm/thun max	1	2	2	6	10	12	15	13	5	5	2	1	2	12	28	9	38	40
grm/thun min	0	0	0	0	1	1	0	1	0	0	0	0	0	2	5	0	12	13
rosa/dew	0.7	1.5	7.4	14.8	18.3	17.2	19.9	21.4	20.8	16.5	6.8	2.3	4.6	40.6	58.5	44.1	112.5	147.8
rosa/dew max	15	13	19	24	29	27	29	29	29	28	23	18	28	68	82	67	154	233
rosa/dew min	0	0	0	6	12	10	10	12	11	3	0	0	0	26	40	23	76	97
mraz/frost	9.5	10.0	9.7	2.4	0.1	0.0	0.0	0.0	0.1	5.1	7.9	10.9	30.4	12.2	0.0	13.0	2.6	55.6
mraz/frost max	21	23	21	12	2	0	0	0	2	11	15	24	54	29	0	22	14	78
mraz/frost min	0	2	2	0	0	0	0	0	0	1	0	2	11	3	0	5	0	28
inje/rime	1.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	3.1	0.0	0.0	0.2	0.0	3.4
inje/rime max	9	3	0	0	0	0	0	0	0	0	3	6	12	0	0	3	0	12
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1010.1	1008.2	1006.1	1002.4	1004.0	1004.2	1004.6	1005.2	1006.8	1008.5	1008.2	1009.0	1009.1	1004.2	1004.7	1007.8	1004.5	1006.4
p max (hPa)	1034.1	1030.8	1029.4	1024.1	1020.0	1018.9	1017.1	1015.7	1023.2	1026.6	1029.4	1031.7	1034.1	1029.4	1018.9	1029.4	1024.1	1034.1
p min (hPa)	975.2	963.6	975.7	978.1	980.8	988.6	987.5	986.7	981.8	975.7	977.1	959.4	959.4	975.7	986.7	975.7	978.1	959.4
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.6	-8.5	-3.5	4.3	13.0	17.8	19.1	16.5	9.1	2.4	-3.1	-6.8	-7.9	4.6	17.8	2.8	13.3	4.3
$PhET_{14h}$ (°C)	-1.7	0.0	9.4	15.9	23.9	28.3	31.5	31.8	24.8	15.9	5.3	-0.6	-0.8	16.4	30.5	15.4	26.0	15.4
$PhET_{21h}$ (°C)	-7.2	-6.6	-0.7	4.4	10.2	13.6	15.4	15.0	10.5	4.8	-1.3	-5.4	-6.4	4.6	14.7	4.7	11.5	4.4

Slavonski Brod

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-1.1	1.7	6.1	11.1	15.8	19.0	20.6	19.9	16.1	10.7	5.4	0.7	0.5	11.0	19.8	10.7	17.1	10.5
T_{max}	(°C)	18.7	21.9	27.4	31.4	35.2	37.0	39.2	38.8	34.5	30.2	25.2	23.0	23.0	35.2	39.2	34.5	39.2	39.2
T_{min}	(°C)	-27.8	-23.0	-14.0	-4.5	-1.7	1.7	6.1	4.7	-3.1	-5.8	-13.7	-22.0	-27.8	-14.0	1.7	-13.7	-4.5	-27.8
t_{max}	(°C)	2.5	6.2	11.9	17.2	22.0	25.0	27.1	26.7	23.3	17.3	10.0	4.2	4.3	17.0	26.3	16.9	23.6	16.1
t_{min}	(°C)	-4.8	-2.4	0.8	5.0	9.3	12.5	13.6	13.2	9.9	5.3	1.3	-2.6	-3.2	5.0	13.1	5.5	10.6	5.1
$t_{min\ 5cm}$	(°C)	-5.6	-3.9	-1.3	2.7	7.0	10.6	11.7	10.8	8.0	3.5	-0.1	-3.7	-4.4	2.8	11.1	3.8	8.5	3.3
$t_{min\ 5cm}$ min	(°C)	-28.6	-26.0	-19.0	-8.5	-5.0	-1.7	0.6	3.0	-7.0	-9.8	-18.5	-23.3	-28.6	-19.0	-1.7	-18.5	-8.5	-28.6
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	4.6	1.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.1	8.5	0.6	0.0	0.3	0.0	9.4
t_{max}<0°C	(d)	9.8	3.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	6.0	19.1	0.8	0.0	0.4	0.0	20.4
t_{min}<0°C	(d)	26.1	19.3	12.0	2.2	0.2	0.0	0.0	0.0	0.2	3.3	10.8	22.5	67.1	14.4	0.0	14.2	2.6	96.5
t_{max}≥25°C	(d)	0.0	0.0	0.3	2.0	8.9	16.1	21.8	20.9	11.2	2.5	0.1	0.0	0.0	11.2	58.9	13.8	81.0	83.8
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.1	0.8	3.5	8.2	7.5	2.1	0.0	0.0	0.0	0.0	0.9	19.2	2.2	22.2	22.3
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4	0.4
$t_{min\ 5cm}$<0°C	(d)	26.5	21.3	17.6	8.0	1.2	0.1	0.0	0.0	0.7	7.4	13.6	23.5	70.5	26.7	0.1	21.7	10.0	119.9
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	4.1	17.5	80.0	184.1	328.6	411.2	474.9	461.9	346.3	198.1	63.0	12.0	33.6	592.7	1348.0	607.4	2207.0	2581.7
$t_{5°C}$ max	(°C)	22.7	91.4	147.4	258.6	411.4	491.7	544.3	535.1	451.5	347.3	186.8	65.3	116.0	743.0	1554.2	778.0	2523.1	2979.9
$t_{5°C}$ min	(°C)	0.0	0.0	19.5	92.7	253.0	362.6	417.0	370.8	257.0	85.5	3.2	0.0	3.1	411.1	1209.4	468.8	1966.2	2251.7
$t_{10°C}$	(°C)	0.1	1.7	13.7	62.8	176.2	261.2	319.9	306.9	197.3	72.5	10.8	1.2	3.0	252.7	888.0	280.6	1324.3	1424.3
$t_{10°C}$ max	(°C)	2.5	14.2	38.9	125.5	258.2	341.7	389.3	380.1	301.6	199.8	71.1	22.1	33.2	378.2	1094.2	429.8	1630.7	1762.0
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	17.4	101.4	212.6	261.9	215.8	109.7	5.3	0.0	0.0	0.0	127.0	749.4	157.5	1085.8	1157.4
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.3	2.0	6.0	11.7	17.2	21.2	22.9	22.0	18.1	12.4	6.4	2.0	1.4	11.7	22.0	12.3	18.8	11.8
t_{5cm} max	(°C)	3.5	6.0	9.3	17.8	21.2	24.0	26.2	23.7	21.3	16.4	9.4	4.2	6.0	21.2	26.2	21.3	26.2	26.2
t_{5cm} min	(°C)	-6.1	-3.4	2.2	8.7	14.1	19.1	20.1	19.3	15.6	9.2	2.6	-2.9	-6.1	2.2	19.1	2.6	8.7	-6.1
t_{20cm}	(°C)	1.4	2.6	5.8	11.3	16.2	20.1	22.0	21.8	18.5	13.3	7.6	3.2	2.4	11.1	21.3	13.1	18.3	12.0
t_{20cm} max	(°C)	3.7	5.7	9.0	14.2	19.0	22.7	24.5	23.3	21.0	16.9	11.0	5.4	5.7	19.0	24.5	21.0	24.5	24.5
t_{20cm} min	(°C)	-4.4	-0.8	1.6	8.7	13.8	18.4	19.8	19.4	16.3	10.8	4.5	-0.9	-4.4	1.6	18.4	4.5	8.7	-4.4
Oborina Precipitation																			
R	(mm)	48.9	42.7	50.8	59.4	73.3	84.6	82.5	69.1	59.1	52.0	63.6	57.5	148.7	183.5	236.2	174.8	428.1	743.6
Rmax	(mm)	120.7	119.4	118.0	114.9	179.5	142.6	262.2	168.7	171.6	155.0	127.7	123.3	308.5	292.1	462.2	271.5	621.4	928.2
Rmin	(mm)	4.8	6.4	4.8	21.0	9.7	25.8	25.5	4.6	9.5	0.1	10.5	3.9	43.6	94.0	107.9	79.0	299.1	540.7
Rd_{max}	(mm)	28.4	25.5	29.8	42.5	65.5	52.4	76.8	51.0	64.0	58.6	38.3	35.8	35.8	65.5	76.8	64.0	76.8	76.8
Rd≥0.1mm	(d)	13.3	12.1	13.0	13.4	13.3	14.1	10.2	10.4	9.4	9.6	12.7	14.8	40.0	39.6	34.7	31.7	70.7	146.1
Rd≥1mm	(d)	7.8	7.8	8.6	9.2	9.7	10.3	7.8	7.1	6.7	6.5	9.3	9.9	25.4	27.5	25.1	22.5	50.7	100.6
Rd≥5mm	(d)	3.5	3.1	3.3	3.9	4.7	5.2	4.5	4.1	3.7	3.3	4.3	3.9	10.6	11.9	13.9	11.3	26.2	47.5
Rd≥10mm	(d)	1.3	1.3	1.5	1.9	2.3	2.7	2.7	2.6	2.1	1.7	1.9	1.4	4.0	5.6	7.9	5.6	14.1	23.2
Rd≥20mm	(d)	0.2	0.1	0.3	0.4	0.6	1.2	1.2	0.9	0.6	0.4	0.5	0.3	0.6	1.4	3.3	1.5	4.9	6.8
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.3
S≥1cm	(d)	14.2	8.5	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.2	8.5	31.1	2.8	0.0	2.2	0.1	36.3
S≥10cm	(d)	7.1	4.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.8	15.3	0.6	0.0	0.5	0.0	16.4
S≥30cm	(d)	2.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.7	0.0	0.0	0.0	0.0	3.7
S≥50cm	(d)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.3
S_{max}	(cm)	47	55	24	4	0	0	0	0	0	0	15	68	68	24	0	15	4	68
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	10	17	31	52	77	99	115	104	70	40	21	12	39	160	318	131	517	648
ET	(mm)	10	17	31	52	77	96	109	94	64	39	21	12	39	160	299	124	492	622

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.2	1.9	6.5	11.0	16.1	19.3	21.0	20.4	16.1	10.6	5.0	1.1	0.9	11.2	20.2	10.6	17.3	10.7
T_{max}	(°C)	18.7	21.9	27.4	29.0	34.6	35.1	38.6	39.6	34.5	30.2	25.6	23.0	23.0	34.6	39.6	34.5	39.6	39.6
T_{min}	(°C)	-26.1	-23.0	-12.9	-5.5	-0.8	1.7	6.0	4.7	-3.0	-7.4	-13.7	-20.5	-26.1	-12.9	1.7	-13.7	-5.5	-26.1
t_{max}	(°C)	3.5	6.9	12.5	17.1	22.2	25.2	27.4	27.2	23.1	17.0	9.5	4.8	5.0	17.3	26.6	16.5	23.7	16.4
t_{min}	(°C)	-3.8	-2.6	0.9	4.9	9.4	12.7	14.0	13.7	9.9	5.4	1.0	-2.4	-3.0	5.0	13.4	5.5	10.8	5.2
$t_{min\ 5cm}$	(°C)	-4.8	-4.4	-1.4	2.3	6.9	10.6	11.8	11.1	7.9	3.7	-0.4	-3.5	-4.2	2.6	11.2	3.7	8.4	3.3
$t_{min\ 5cm}$ min	(°C)	-27.5	-26.0	-16.5	-8.5	-5.0	-1.7	0.6	3.0	-7.0	-9.8	-18.5	-21.5	-27.5	-16.5	-1.7	-18.5	-8.5	-27.5
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	2.9	1.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2	7.0	0.5	0.0	0.2	0.0	7.7
t_{max}<0°C	(d)	7.9	3.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	4.8	15.9	0.6	0.0	0.8	0.0	17.2
t_{min}<0°C	(d)	25.4	19.8	12.1	2.6	0.1	0.0	0.0	0.0	0.1	3.6	11.5	21.8	67.4	14.8	0.0	15.2	2.8	97.0
t_{max}≥25°C	(d)	0.0	0.0	0.4	2.1	9.6	16.5	22.6	22.1	11.1	2.2	0.0	0.0	0.0	12.1	61.2	13.4	84.0	86.6
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.8	4.0	8.8	8.7	1.7	0.0	0.0	0.0	0.0	0.8	21.5	1.8	24.0	24.1
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.9	0.9
$t_{min\ 5cm}$<0°C	(d)	26.4	21.8	18.0	9.0	1.1	0.1	0.0	0.0	0.6	7.2	14.3	22.9	71.4	28.0	0.1	21.9	10.7	121.1
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	5.8	19.4	85.2	181.3	332.8	418.4	485.7	478.7	345.0	197.1	58.9	13.4	38.7	599.2	1382.8	601.0	2241.9	2621.8
$t_{5°C}$ max	(°C)	22.7	69.0	160.0	275.6	424.8	484.3	566.4	640.1	451.5	284.3	169.3	65.3	116.0	734.8	1670.7	799.3	2553.4	3060.4
$t_{5°C}$ min	(°C)	0.0	0.0	19.5	92.7	225.3	362.6	417.0	370.8	257.0	85.5	3.2	0.0	3.5	411.1	1209.4	468.8	1966.2	2251.7
$t_{10°C}$	(°C)	0.1	1.4	15.8	61.5	181.4	268.4	330.7	323.7	195.8	74.9	9.7	1.5	3.0	258.7	922.8	280.4	1361.5	1464.8
$t_{10°C}$ max	(°C)	2.5	11.1	38.9	139.9	269.9	334.2	411.4	485.1	301.6	141.1	44.5	22.1	33.2	387.4	1210.6	407.8	1688.1	1794.7
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	17.4	81.1	212.6	261.9	215.8	108.7	5.3	0.0	0.0	0.0	127.0	749.4	157.5	1085.8	1157.4
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.9	2.4	6.6	11.7	17.8	21.5	23.3	22.7	18.2	12.4	6.3	2.2	1.8	12.0	22.5	12.3	19.2	12.2
t_{5cm} max	(°C)	3.5	6.0	10.1	14.5	21.2	24.0	26.2	27.5	21.3	14.8	10.0	4.2	6.0	21.2	27.5	21.3	27.5	27.5
t_{5cm} min	(°C)	-1.2	-0.7	2.2	8.6	13.9	19.5	21.5	19.3	15.6	9.2	2.6	-0.8	-1.2	2.2	19.3	2.6	8.6	-1.2
t_{20cm}	(°C)	1.7	2.5	6.2	11.1	16.8	20.5	22.6	22.5	18.5	13.3	7.6	3.4	2.5	11.4	21.8	13.2	18.7	12.2
t_{20cm} max	(°C)	4.2	5.7	9.8	13.9	19.7	23.8	25.4	26.4	21.0	16.2	10.8	5.6	5.7	19.7	26.4	21.0	26.4	26.4
t_{20cm} min	(°C)	-1.7	-0.5	2.5	8.3	13.2	18.6	20.8	19.4	16.2	10.3	4.5	1.2	-1.7	2.5	18.6	4.5	8.3	-1.7
Oborina Precipitation																			
R	(mm)	47.3	38.5	45.8	55.9	69.4	82.4	87.8	67.9	62.9	68.3	68.4	53.4	137.9	171.1	238.1	199.6	426.3	748.1
Rmax	(mm)	111.7	83.6	98.8	101.8	179.5	164.5	262.2	141.2	173.8	183.4	127.7	113.3	223.5	292.1	462.2	358.2	621.4	992.2
Rmin	(mm)	12.4	3.3	10.5	23.8	9.7	25.3	6.4	10.9	9.5	4.1	10.5	3.9	43.6	94.0	123.8	79.0	250.9	511.3
Rd_{max}	(mm)	36.8	29.6	30.4	28.1	45.0	64.2	76.8	48.4	42.4	58.6	36.0	34.3	36.8	45.0	76.8	58.6	76.8	76.8
Rd≥0.1mm	(d)	12.0	11.1	12.1	13.4	12.5	13.8	10.4	10.1	9.7	11.0	12.4	13.7	36.8	37.9	34.4	33.1	70.0	142.2
Rd≥1mm	(d)	7.3	7.2	7.8	9.2	9.2	10.4	7.9	7.2	7.4	7.6	8.8	9.0	23.6	26.2	25.4	23.7	51.2	98.8
Rd≥5mm	(d)	3.5	2.7	3.0	3.9	4.2	5.3	4.6	4.1	4.2	4.1	4.8	3.6	9.7	11.2	14.0	13.0	26.4	48.0
Rd≥10mm	(d)	1.5	1.2	1.4	1.9	2.1	2.5	3.1	2.5	2.2	2.2	2.3	1.3	3.9	5.4	8.1	6.7	14.3	24.2
Rd≥20mm	(d)	0.1	0.1	0.2	0.2	0.6	0.9	1.3	0.9	0.6	0.7	0.5	0.3	0.5	1.1	3.2	1.8	4.7	6.6
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
S≥1cm	(d)	11.2	7.3	1.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.7	7.4	26.3	2.0	0.0	2.7	0.2	30.6
S≥10cm	(d)	4.1	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.7	9.1	0.3	0.0	0.4	0.0	9.5
S≥30cm	(d)	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.0	0.0	0.0	0.0	0.9
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	34	51	24	4	0	0	0	0	0	0	15	36	51	24	0	15	4	51
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	11	18	33	51	79	101	117	109	69	39	20	12	41	163	327	128	526	659
ET	(mm)	11	18	33	51	79	98	111	95	63	38	20	12	41	163	304	121	497	629

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	87.0	81.7	74.5	71.5	73.7	74.7	73.4	75.7	79.1	81.7	86.1	88.2	85.6	73.2	74.6	82.3	74.7	78.9
Umin (%)	31.0	13.0	5.0	6.0	18.0	23.0	24.0	21.0	16.0	15.0	28.0	31.0	13.0	5.0	21.0	15.0	6.0	5.0
U>80% (d)	16.5	8.9	5.1	4.4	3.5	3.0	2.3	2.5	3.1	6.0	13.4	17.8	43.2	13.0	7.8	22.5	18.8	86.5
U≤30% (d)	0.0	0.3	3.0	3.8	1.4	0.7	0.7	1.0	1.3	0.8	0.1	0.0	0.3	8.2	2.4	2.2	8.9	13.1
e (hPa)	5.2	5.9	7.0	9.3	13.1	16.4	17.6	17.3	14.4	10.7	8.0	6.0	5.7	9.8	17.1	11.0	14.7	10.9
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	128	192	346	474	609	633	653	571	427	278	134	90	410	1429	1857	838	3367	4535
$G_{45°S}$ (MJm^{-2})	200	271	414	482	550	542	573	555	496	389	199	132	603	1446	1669	1084	3197	4802
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.6	2.7	4.3	5.7	7.0	7.6	8.6	8.1	6.4	4.4	2.2	1.4	1.9	5.6	8.1	4.3	7.2	5.0
SS_{rel} (%)																		
SS_{max} (h)	3.2	6.0	6.5	8.0	8.7	9.1	10.6	10.2	9.0	6.7	3.7	2.9	3.1	6.8	9.1	5.3	8.0	5.7
SS_{min} (h)	0.5	0.6	2.2	3.8	4.5	5.9	6.1	6.2	4.5	2.7	0.1	0.5	0.9	4.1	6.8	3.1	6.2	4.4
Naoblaka Cloudiness																		
N (10/10)	7.8	7.3	6.8	6.5	6.2	6.0	4.8	4.6	5.2	6.1	7.6	8.1	7.7	6.5	5.1	6.3	5.5	6.4
N_{max} (10/10)	9.4	9.3	8.5	7.8	7.7	7.2	7.5	6.5	6.8	8.0	9.6	9.7	8.8	7.6	6.2	7.4	6.6	7.0
N_{min} (10/10)	5.9	4.3	4.7	4.9	4.8	5.0	3.3	2.6	2.3	3.8	5.9	6.1	6.1	5.4	4.2	5.3	4.8	5.7
N<2/10	1.6	1.9	3.1	3.4	3.3	3.1	7.0	8.7	6.5	3.8	1.7	1.2	4.7	9.7	18.8	12.0	32.0	45.2
N<2/10 max	5	8	9	11	10	7	13	18	19	10	5	4	16	22	32	24	51	71
N<2/10 min	0	0	0	0	0	0	1	0	0	0	0	0	0	2	11	3	16	23
N>8/10	18.0	14.9	13.3	11.0	9.7	8.4	5.7	5.8	7.6	10.3	16.7	19.6	52.5	34.1	19.8	34.6	48.2	141.1
N>8/10 max	29	24	24	18	18	15	15	11	13	19	27	28	68	50	31	49	66	178
N>8/10 min	9	3	3	4	3	2	2	0	1	2	9	10	37	21	11	24	31	107
Meteorološke pojave Weather phenomena																		
magla/fog	15.6	10.6	6.1	3.6	5.4	7.0	8.0	10.4	15.3	17.5	15.1	15.4	41.7	15.1	25.4	47.9	49.6	130.1
magla/fog max	26	21	20	11	13	18	20	23	27	27	24	26	65	43	53	77	103	232
magla/fog min	7	3	0	0	0	0	0	0	2	5	0	5	16	0	3	15	10	47
tuča/hail	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.5	0.1	1.0	1.0
tuča/hail max	0	0	1	1	1	1	1	1	1	0	0	1	1	2	2	1	2	3
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.1	0.1	0.4	2.3	5.8	7.6	6.9	6.7	2.0	0.7	0.4	0.2	0.4	8.5	21.3	3.1	31.3	33.3
grm/thun max	1	1	2	8	12	14	14	13	6	4	2	2	2	15	30	7	45	48
grm/thun min	0	0	0	0	1	3	2	2	0	0	0	0	0	1	14	0	18	20
rosa/dew	1.4	3.0	11.3	18.9	22.2	22.2	25.1	25.9	24.5	22.8	11.6	3.4	7.9	52.4	73.2	58.9	138.7	192.3
rosa/dew max	21	19	25	26	30	28	31	31	30	31	25	20	34	71	87	81	164	247
rosa/dew min	0	0	0	10	13	13	8	19	16	11	2	0	0	26	50	33	98	126
mraz/frost	11.1	10.2	10.0	3.6	0.3	0.0	0.0	0.0	0.3	4.9	9.3	11.5	32.8	13.9	0.0	14.6	4.2	61.2
mraz/frost max	26	22	17	11	3	0	0	0	2	17	22	23	63	24	0	30	14	108
mraz/frost min	0	0	3	0	0	0	0	0	0	0	1	0	8	3	0	2	0	14
inje/rime	5.6	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	3.5	10.8	0.3	0.0	1.4	0.0	12.5
inje/rime max	20	7	3	0	0	0	0	0	0	3	7	10	28	3	0	8	0	31
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1009.1	1006.8	1005.6	1002.7	1004.0	1004.4	1005.2	1005.2	1007.5	1009.0	1007.7	1008.2	1008.0	1004.1	1004.9	1008.1	1004.8	1006.3
p max (hPa)	1033.2	1030.7	1030.3	1023.4	1018.6	1018.2	1018.0	1016.1	1023.8	1026.0	1029.4	1035.8	1035.8	1030.3	1018.2	1029.4	1023.8	1035.8
p min (hPa)	975.7	964.7	977.0	976.1	981.2	989.2	965.2	987.0	984.6	976.8	977.7	960.5	960.5	976.1	965.2	976.8	965.2	960.5
Vjetar Wind																		
v_h (ms^{-1})	1.8	2.0	2.4	2.4	2.0	1.9	1.7	1.7	1.5	1.6	1.7	1.9	1.9	2.3	1.7	1.6	1.9	1.9
v_h max (ms^{-1})	15.4	13.1	12.5	13.5	12.0	12.0	16.8	12.0	12.0	12.0	13.0	13.1	15.4	13.5	16.8	13.0	16.8	16.8
v_{max} (ms^{-1})	30.0	25.4	23.3	29.7	25.1	23.1	31.1	29.6	28.0	23.0	25.6	27.7	30.0	29.7	31.1	28.0	31.1	31.1
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.7	-8.4	-2.5	4.9	12.5	17.1	18.3	15.4	9.3	3.0	-2.1	-6.2	-7.8	5.0	16.9	3.4	12.9	4.4
$PhET_{14h}$ (°C)	-1.8	-0.6	9.3	15.8	23.2	27.7	31.1	30.2	25.0	16.1	6.3	-0.2	-0.9	16.1	29.7	15.8	25.5	15.2
$PhET_{21h}$ (°C)	-7.4	-6.8	0.0	4.9	10.2	13.7	15.3	14.5	10.7	5.0	-0.6	-5.1	-6.4	5.1	14.5	5.1	11.6	4.5

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	87.1	80.9	73.1	72.0	73.6	74.7	73.7	75.6	79.6	82.4	86.3	88.6	85.5	72.9	74.7	82.8	74.9	79.0
Umin (%)	31.0	13.0	5.0	6.0	18.0	23.0	25.0	21.0	18.0	15.0	28.0	31.0	13.0	5.0	21.0	15.0	6.0	5.0
U>80% (d)	16.5	7.9	4.9	4.5	3.8	3.4	2.6	2.8	3.2	7.4	13.3	17.3	41.7	13.1	8.8	23.9	20.3	87.5
U≤30% (d)	0.0	0.4	2.9	3.3	1.7	0.6	0.7	1.3	0.7	0.8	0.1	0.0	0.4	7.9	2.7	1.6	8.4	12.5
e (hPa)	5.5	5.9	7.0	9.2	13.3	16.6	18.1	17.8	14.5	10.8	7.8	6.1	5.9	9.9	17.5	11.0	14.9	11.1
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
G45°S (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.8	3.2	4.6	5.8	7.2	7.9	8.7	8.2	6.3	4.2	2.2	1.6	2.2	5.9	8.3	4.3	7.4	5.2
SS_{rel} (%)																		
SS_{max} (h)	3.8	6.0	6.3	7.3	9.3	11.4	10.6	11.0	9.0	6.1	3.9	2.9	3.7	7.3	10.6	5.3	8.9	6.3
SS_{min} (h)	0.5	0.6	2.6	3.8	4.5	5.9	6.1	6.2	4.5	2.7	0.1	0.6	0.9	4.1	6.8	3.1	6.2	4.4
Naoblaka Cloudiness																		
N (10/10)	7.6	6.7	6.3	6.3	5.8	5.6	4.7	4.4	5.1	6.1	7.4	7.6	7.3	6.1	4.9	6.2	5.3	6.1
N_{max} (10/10)	9.4	9.3	8.2	7.8	7.7	7.2	7.5	6.5	7.2	8.0	9.6	9.5	8.5	7.3	6.2	7.4	6.6	7.0
N_{min} (10/10)	4.5	4.1	4.7	4.9	4.1	2.6	3.3	1.8	2.3	4.3	5.9	5.8	5.3	4.9	3.0	5.2	4.0	5.1
N<2/10	2.0	3.3	3.6	3.3	3.8	3.6	7.1	8.8	5.8	3.5	1.9	1.9	7.2	10.6	19.5	11.2	32.4	48.5
N<2/10 max	10	12	9	11	10	13	13	21	17	10	5	7	22	22	38	22	56	82
N<2/10 min	0	0	0	0	0	0	1	0	0	0	0	0	0	3	9	3	16	23
N>8/10	17.6	13.1	11.0	10.2	8.3	7.0	5.2	4.9	6.9	10.7	15.9	17.6	48.3	29.6	17.1	33.5	42.6	128.5
N>8/10 max	29	24	21	18	18	15	15	10	14	19	27	28	68	47	31	49	66	178
N>8/10 min	6	3	3	4	2	0	2	0	0	4	7	10	26	12	2	21	17	72
Meteorološke pojave Weather phenomena																		
magla/fog	15.4	10.6	6.2	4.7	6.1	7.7	9.1	11.2	16.2	17.4	15.2	15.8	41.8	16.9	28.1	48.7	55.0	135.5
magla/fog max	26	21	20	11	13	18	20	23	27	27	24	26	65	43	53	77	103	232
magla/fog min	5	2	0	0	1	1	0	0	0	8	7	3	17	4	3	18	7	44
tuča/hail	0.0	0.0	0.1	0.0	0.2	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.3	0.7	0.2	1.0	1.2
tuča/hail max	1	0	1	1	1	1	1	2	1	1	0	1	1	2	2	1	3	3
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.1	0.1	0.5	1.9	5.1	6.8	6.3	6.1	2.1	1.0	0.3	0.2	0.5	7.5	19.2	3.5	28.3	30.7
grm/thun max	1	1	2	6	10	16	14	12	6	5	2	2	2	15	30	8	43	47
grm/thun min	0	0	0	0	1	2	2	1	0	0	0	0	0	1	9	0	18	20
rosa/dew	2.9	4.8	12.8	18.8	23.0	22.1	25.8	25.9	24.5	23.4	12.9	4.8	12.5	54.5	73.8	60.9	140.1	201.8
rosa/dew max	21	19	25	26	30	28	31	31	30	30	25	20	34	71	87	81	164	247
rosa/dew min	0	0	0	7	6	2	8	3	13	7	3	0	0	14	13	25	39	54
mraz/frost	14.8	13.7	11.2	3.9	0.2	0.0	0.0	0.0	0.3	5.1	10.0	13.8	42.3	15.3	0.0	15.4	4.4	73.0
mraz/frost max	26	24	17	11	1	0	0	0	2	12	22	28	71	26	0	30	14	108
mraz/frost min	3	3	3	0	0	0	0	0	0	0	0	0	19	5	0	2	0	51
inje/rime	4.8	1.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	3.3	9.9	0.3	0.0	1.5	0.0	11.7
inje/rime max	18	7	3	0	0	0	0	0	0	3	7	10	28	3	0	8	0	31
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1010.4	1008.4	1006.3	1002.7	1004.2	1004.5	1004.9	1005.4	1007.0	1008.7	1008.4	1009.3	1009.3	1004.4	1004.9	1008.0	1004.8	1006.7
p max (hPa)	1034.0	1031.1	1030.3	1023.5	1018.8	1019.0	1018.0	1016.1	1023.6	1026.3	1029.4	1032.1	1034.0	1030.3	1019.0	1029.4	1023.6	1034.0
p min (hPa)	975.7	964.7	977.0	978.3	981.2	988.8	965.2	987.6	982.5	977.8	977.7	960.5	960.5	977.0	965.2	977.7	965.2	960.5
Vjetar Wind																		
v_h (ms^{-1})	2.0	2.2	2.6	2.6	2.2	2.1	1.9	1.8	1.7	1.8	1.9	2.0	2.1	2.5	1.9	1.8	2.1	2.1
v_h max (ms^{-1})	15.4	16.9	18.4	20.3	14.3	14.2	16.8	14.2	15.9	16.9	18.5	13.6	16.9	20.3	16.8	18.5	20.3	20.3
v_{max} (ms^{-1})	30.0	26.0	25.7	29.7	25.6	26.1	38.3	29.6	28.0	27.0	27.2	27.7	30.0	29.7	38.3	28.0	38.3	38.3
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-7.6	-7.4	-2.5	4.4	12.5	16.9	18.2	15.7	9.2	3.4	-2.1	-6.0	-7.0	4.8	16.9	3.5	12.8	4.6
$PhET_{14h}$ (°C)	-0.9	0.9	9.6	15.9	23.2	28.0	31.2	31.2	24.8	15.9	6.1	0.3	0.1	16.3	30.1	15.6	25.7	15.5
$PhET_{21h}$ (°C)	-6.3	-5.6	0.1	4.9	10.4	14.1	15.8	15.3	10.9	5.4	-0.6	-4.8	-5.5	5.2	15.0	5.2	11.9	5.0

Đurđevac

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-1.5	1.1	5.2	10.0	14.9	18.2	19.6	18.7	15.1	9.8	4.8	0.5	0.1	10.0	18.8	9.9	16.1	9.7
T_{max}	(°C)	18.0	19.4	26.1	28.3	31.5	33.4	37.3	35.3	31.9	26.7	24.3	21.4	21.4	31.5	37.3	31.9	37.3	37.3
T_{min}	(°C)	-28.3	-25.5	-23.5	-4.4	-2.9	1.1	5.9	2.6	-3.5	-8.4	-18.6	-28.0	-28.3	-23.5	1.1	-18.6	-4.4	-28.3
t_{max}	(°C)	2.1	5.5	10.9	16.3	21.3	24.4	26.4	25.9	22.3	16.4	9.2	3.8	3.8	16.2	25.6	16.0	22.8	15.4
t_{min}	(°C)	-5.1	-2.7	0.5	4.4	8.7	12.3	13.3	12.5	9.4	4.8	1.1	-2.6	-3.4	4.5	12.7	5.1	10.1	4.7
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
$t_{min} \leq -10°C$	(d)	5.8	2.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.4	10.7	0.8	0.0	0.4	0.0	11.9
$t_{max}<0°C$	(d)	9.8	3.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	6.8	20.3	0.9	0.0	0.7	0.0	21.9
$t_{min}<0°C$	(d)	25.5	19.1	12.4	2.8	0.2	0.0	0.0	0.0	0.2	4.2	11.7	22.3	66.7	15.4	0.0	16.1	3.2	98.5
$t_{max} \geq 25°C$	(d)	0.0	0.0	0.1	0.6	6.6	14.2	20.4	19.0	8.7	0.7	0.0	0.0	0.0	7.2	53.6	9.4	69.4	70.2
$t_{max} \geq 30°C$	(d)	0.0	0.0	0.0	0.0	0.3	2.3	5.4	5.4	0.5	0.0	0.0	0.0	0.0	0.3	13.1	0.5	14.0	14.0
$t_{min} \geq 20°C$	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.2
$t_{min\ 5cm}<0°C$	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	5.3	15.2	68.8	162.2	311.4	400.4	460.6	440.7	324.2	177.4	55.5	13.5	34.0	542.4	1301.7	557.2	2099.5	2435.3
$t_{5°C}$ max	(°C)	33.9	82.0	135.7	259.7	382.5	473.9	561.0	496.0	408.1	310.1	174.9	73.2	101.2	665.4	1418.3	692.8	2324.7	2641.6
$t_{5°C}$ min	(°C)	0.0	0.0	24.1	98.8	236.8	337.5	415.1	361.4	248.1	77.1	1.6	0.0	0.0	380.9	1191.8	434.5	1897.0	2176.2
$t_{10°C}$	(°C)	0.2	1.4	10.6	47.5	160.1	250.5	305.6	285.7	175.5	58.4	9.8	1.7	3.3	218.2	841.8	243.7	1224.9	1307.1
$t_{10°C}$ max	(°C)	3.7	13.6	33.5	109.7	227.5	323.9	406.0	340.9	258.2	167.7	63.7	28.6	30.6	317.0	958.3	359.5	1433.1	1493.9
$t_{10°C}$ min	(°C)	0.0	0.0	0.3	16.9	91.4	191.0	260.1	206.4	100.9	3.9	0.0	0.0	0.0	121.2	731.8	128.1	1045.7	1090.2
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	51.1	48.6	55.9	64.3	76.2	88.5	80.9	77.5	62.6	58.5	86.1	64.0	163.8	196.3	246.9	207.2	449.9	814.0
Rmax	(mm)	166.9	126.0	97.8	156.1	165.4	186.7	313.8	186.8	122.8	188.0	212.2	141.4	288.5	306.4	556.1	331.5	810.2	1108.9
Rmin	(mm)	3.3	12.9	8.1	14.7	12.8	21.1	23.7	13.3	7.6	0.0	13.4	8.2	63.6	95.3	146.6	104.5	310.4	566.5
Rd_{max}	(mm)	42.2	39.8	39.1	42.2	73.1	56.2	59.6	70.3	63.1	49.3	66.2	40.0	42.2	73.1	70.3	66.2	73.1	73.1
Rd≥0.1mm	(d)	10.0	9.7	11.2	11.6	11.8	12.3	9.8	9.7	9.0	8.6	10.4	10.5	30.1	34.6	31.8	28.0	64.2	124.6
Rd≥1mm	(d)	7.1	7.2	7.8	9.2	9.1	9.8	7.5	7.6	7.3	6.4	8.3	7.8	22.0	26.0	24.9	22.0	50.4	95.0
Rd≥5mm	(d)	3.7	3.3	3.7	4.5	4.6	5.2	4.4	4.2	3.9	3.5	5.2	4.3	11.3	12.7	13.8	12.6	26.8	50.4
Rd≥10mm	(d)	1.7	1.4	1.8	2.1	2.3	3.0	2.7	2.7	2.1	2.0	3.0	2.3	5.5	6.2	8.4	7.1	14.9	27.2
Rd≥20mm	(d)	0.3	0.3	0.5	0.4	0.8	1.2	1.1	1.1	1.0	0.6	1.3	0.5	1.2	1.7	3.4	3.0	5.6	9.3
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.4	0.4
S≥1cm	(d)	15.6	9.6	3.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.4	8.4	33.5	3.8	0.0	2.4	0.2	39.7
S≥10cm	(d)	9.5	6.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.5	19.0	1.6	0.0	1.1	0.0	21.7
S≥30cm	(d)	2.4	2.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	5.4	0.5	0.0	0.2	0.0	6.1
S≥50cm	(d)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
S_{max}	(cm)	50	62	50	10	0	0	0	0	0	0	45	50	62	50	0	45	10	62
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	13	19	32	53	83	108	121	104	70	41	23	15	47	168	333	134	539	682
ET	(mm)	13	19	32	53	83	105	113	93	66	40	23	15	47	168	311	129	513	655

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.2	1.5	5.6	10.1	15.3	18.5	20.0	19.4	15.2	9.8	4.5	1.1	0.7	10.4	19.3	9.9	16.4	10.1
T_{max}	(°C)	18.0	20.0	26.1	28.2	31.9	34.3	36.1	37.3	31.9	26.9	23.4	21.4	21.4	31.9	37.3	31.9	37.3	37.3
T_{min}	(°C)	-26.5	-25.5	-22.9	-6.1	-1.4	1.1	5.9	2.6	-3.5	-8.4	-18.6	-25.8	-26.5	-22.9	1.1	-18.6	-6.1	-26.5
t_{max}	(°C)	3.3	6.3	11.6	16.3	21.7	24.6	26.7	26.5	22.2	16.2	8.8	4.5	4.7	16.5	25.9	15.7	23.0	15.7
t_{min}	(°C)	-3.8	-2.8	0.6	4.3	9.0	12.5	13.8	13.0	9.5	4.9	0.8	-2.2	-3.0	4.7	13.1	5.0	10.3	5.0
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
$t_{min} \leq -10°C$	(d)	3.3	2.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.4	8.6	0.6	0.0	0.5	0.0	9.6
$t_{max}<0°C$	(d)	7.6	3.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.2	16.2	0.7	0.0	1.0	0.0	17.7
$t_{min}<0°C$	(d)	24.7	19.6	12.9	3.1	0.1	0.0	0.0	0.0	0.1	4.7	12.8	21.2	66.0	16.1	0.0	17.6	3.3	99.2
$t_{max} \geq 25°C$	(d)	0.0	0.0	0.1	0.6	7.9	14.3	21.2	20.7	8.9	0.9	0.0	0.0	0.0	8.6	56.2	9.8	73.6	74.6
$t_{max} \geq 30°C$	(d)	0.0	0.0	0.0	0.0	0.2	2.8	6.1	6.8	0.4	0.0	0.0	0.0	0.0	0.2	15.7	0.4	16.4	16.4
$t_{min} \geq 20°C$	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.3
$t_{min\ 5cm}<0°C$	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	8.7	18.4	72.9	162.8	320.8	406.5	471.5	457.6	325.3	177.2	50.1	15.0	42.2	556.5	1335.6	552.6	2144.5	2486.9
$t_{5°C}$ max	(°C)	33.9	67.1	149.6	255.5	382.5	473.9	561.0	566.5	408.1	254.8	125.5	73.2	101.2	707.4	1486.6	712.0	2384.5	2896.9
$t_{5°C}$ min	(°C)	0.0	0.0	8.2	86.6	219.4	349.3	414.2	361.4	240.8	77.1	1.6	0.0	5.8	380.9	1191.8	434.5	1897.0	2176.2
$t_{10°C}$	(°C)	0.3	1.3	12.2	48.7	168.9	256.5	316.5	302.6	176.3	61.4	8.2	1.9	3.5	229.9	875.6	245.9	1269.6	1354.8
$t_{10°C}$ max	(°C)	3.1	9.9	33.5	126.1	227.5	323.9	406.0	411.5	258.2	117.2	41.5	28.6	30.6	342.7	1026.6	342.2	1499.1	1632.7
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	16.9	78.4	199.3	259.2	206.4	91.3	3.9	0.0	0.0	0.0	121.2	731.8	128.1	1045.7	1090.2
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	44.4	47.6	48.1	62.9	71.7	92.3	83.2	76.9	73.3	70.7	83.7	67.9	159.3	182.7	252.4	227.7	460.3	822.8
Rmax	(mm)	166.9	135.5	85.9	156.1	165.4	186.7	313.8	186.8	225.7	193.2	183.9	171.1	288.5	306.4	556.1	389.0	810.2	1088.1
Rmin	(mm)	4.5	2.9	8.1	14.7	12.8	22.5	23.7	5.8	18.6	4.1	13.4	8.2	63.6	97.0	138.2	104.5	310.4	566.5
Rd_{max}	(mm)	42.2	40.5	39.1	42.2	51.7	60.0	62.0	70.3	73.0	48.2	66.2	49.2	49.2	51.7	70.3	73.0	73.0	73.0
Rd≥0.1mm	(d)	9.1	8.6	10.3	11.9	11.4	12.3	10.3	9.5	9.7	9.7	10.1	10.2	28.0	33.6	32.1	29.5	65.1	123.2
Rd≥1mm	(d)	6.4	6.8	7.0	9.1	8.9	9.6	8.1	7.5	7.6	7.5	8.2	8.0	21.2	25.0	25.2	23.3	50.9	94.8
Rd≥5mm	(d)	3.3	2.9	3.1	4.3	4.2	5.4	4.5	4.1	4.2	3.9	4.6	4.2	10.4	11.5	14.1	12.7	26.7	48.7
Rd≥10mm	(d)	1.3	1.4	1.5	2.1	2.3	3.2	2.8	2.7	2.4	2.6	2.9	2.3	5.0	5.9	8.7	8.0	15.5	27.6
Rd≥20mm	(d)	0.3	0.5	0.4	0.4	0.7	1.3	1.1	1.1	1.1	0.9	1.3	0.8	1.6	1.5	3.5	3.3	5.7	10.0
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4	0.4
S≥1cm	(d)	11.5	9.3	2.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.8	7.1	28.2	2.8	0.0	2.8	0.2	33.5
S≥10cm	(d)	5.1	5.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.4	13.0	1.0	0.0	1.5	0.0	15.2
S≥30cm	(d)	1.2	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	2.5	0.3	0.0	0.3	0.0	2.9
S≥50cm	(d)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3
S_{max}	(cm)	50	50	50	10	0	0	0	0	0	0	55	50	50	50	0	55	10	55
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	15	20	33	53	86	111	124	111	70	40	22	16	51	172	346	132	555	701
ET	(mm)	14	20	33	53	85	108	115	98	66	39	22	15	49	171	321	127	525	668

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	85.4	83.0	78.8	76.2	76.1	76.9	77.1	80.5	83.5	85.4	87.3	87.3	85.2	77.1	78.2	85.4	78.4	81.5
Umin (%)	25.0	24.0	22.0	26.0	20.0	23.0	25.0	21.0	35.0	20.0	28.0	34.0	24.0	20.0	21.0	20.0	20.0	20.0
U>80% (d)	17.9	11.1	7.1	4.6	3.5	3.4	2.5	2.8	4.2	7.6	14.9	19.3	48.2	15.3	8.7	26.7	21.0	98.8
U≤30% (d)	0.0	0.1	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.2	0.1	0.7	1.1
e (hPa)	5.1	5.9	7.3	9.6	13.3	16.5	18.1	17.8	14.8	10.9	8.0	5.9	5.6	10.1	17.5	11.2	15.0	11.1
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	129	192	352	485	612	626	660	578	431	271	138	94	415	1448	1864	840	3391	4567
$G_{45°S}$ (MJm^{-2})	213	280	430	498	555	540	581	567	509	386	217	147	641	1482	1688	1112	3250	4923
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.2	3.5	4.8	6.2	7.3	8.1	9.5	8.8	6.9	5.0	2.6	1.8	2.4	6.1	8.8	4.8	7.8	5.6
SS_{rel} (%)																		
SS_{max} (h)	4.2	6.8	6.8	7.9	9.7	9.5	11.4	11.0	8.9	7.1	4.6	3.6	4.0	7.3	9.6	6.1	8.7	6.5
SS_{min} (h)	0.6	2.0	1.9	4.8	4.8	6.8	7.2	7.3	5.4	3.0	0.6	0.6	1.5	4.7	7.6	3.7	6.6	4.8
Naoblaka Cloudiness																		
N (10/10)	7.1	6.6	5.8	5.5	5.1	5.1	4.0	4.0	4.4	5.2	6.9	7.2	7.0	5.5	4.3	5.5	4.7	5.6
N_{max} (10/10)	9.2	8.1	8.7	6.9	7.0	6.5	6.0	5.4	6.2	7.2	9.4	9.1	8.1	6.7	5.4	6.8	5.8	6.4
N_{min} (10/10)	4.3	3.2	3.8	3.9	3.2	3.6	2.4	1.8	2.0	3.0	4.5	4.5	5.1	4.5	3.6	4.1	3.9	4.6
N<2/10	3.9	4.0	5.6	5.5	6.9	6.1	10.5	11.8	9.0	6.7	3.3	3.2	11.0	18.1	28.4	18.9	49.8	76.4
N<2/10 max	12	14	13	10	17	13	18	22	23	16	10	9	31	31	41	34	73	109
N<2/10 min	0	0	0	2	0	1	2	4	4	0	0	0	1	6	13	7	29	46
N>8/10	16.0	12.4	10.7	8.9	7.3	7.1	4.3	4.6	5.5	8.8	14.3	16.1	44.6	26.8	16.0	28.6	37.7	116.1
N>8/10 max	27	20	22	17	14	12	11	9	11	16	27	26	64	43	24	41	58	153
N>8/10 min	4	5	3	3	3	2	0	0	1	2	7	5	26	13	5	15	23	78
Meteorološke pojave Weather phenomena																		
magla/fog	6.9	5.1	2.3	1.4	1.2	0.9	0.6	2.7	7.9	10.2	8.3	7.0	18.9	4.9	4.2	26.4	14.7	54.5
magla/fog max	17	15	9	6	6	3	5	8	16	21	20	13	29	12	11	42	27	78
magla/fog min	2	0	0	0	0	0	0	0	1	3	0	2	8	0	0	13	1	30
tuča/hail	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.1	0.4	0.5
tuča/hail max	0	0	0	1	1	0	1	1	1	1	0	0	0	2	1	1	3	4
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.2	0.3	0.4	2.1	4.7	6.9	6.1	5.1	1.9	0.8	0.7	0.2	0.7	7.1	18.0	3.4	26.7	29.3
grm/thun max	1	2	3	6	9	13	13	12	6	4	3	1	3	14	25	9	41	43
grm/thun min	0	0	0	0	0	3	1	0	0	0	0	0	0	2	8	0	17	20
rosa/dew	0.1	0.8	9.0	19.7	25.0	24.5	27.2	26.7	24.3	16.6	4.8	0.3	1.3	53.7	78.4	45.7	147.4	179.1
rosa/dew max	4	8	21	26	31	29	31	31	29	27	13	3	8	69	87	60	163	219
rosa/dew min	0	0	0	13	18	21	18	22	20	2	0	0	0	40	70	27	134	156
mraz/frost	5.1	6.4	7.3	2.8	0.4	0.0	0.0	0.0	0.3	4.9	7.8	7.1	18.6	10.5	0.0	13.0	3.5	42.1
mraz/frost max	19	17	16	6	3	0	0	0	3	15	18	16	44	22	0	28	10	73
mraz/frost min	0	0	2	0	0	0	0	0	0	0	2	0	2	3	0	4	0	14
inje/rime	1.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	3.6	0.0	0.0	0.1	0.0	3.7
inje/rime max	6	2	1	0	0	0	0	0	0	0	1	7	12	1	0	1	0	12
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)																		
p max (hPa)																		
p min (hPa)																		
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-10.0	-9.7	-3.8	3.5	10.7	15.5	16.9	13.5	7.6	1.7	-3.2	-7.3	-9.0	3.5	15.3	2.1	11.3	2.9
$PhET_{14h}$ (°C)	-3.9	-2.8	7.0	13.4	20.2	24.2	27.4	27.1	21.3	13.2	3.8	-2.5	-3.1	13.5	26.3	12.8	22.3	12.4
$PhET_{21h}$ (°C)	-8.8	-8.5	-2.5	2.3	7.3	11.1	12.6	12.0	8.4	3.1	-2.0	-6.5	-8.0	2.4	11.9	3.2	8.9	2.4

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	85.4	81.7	77.9	75.7	75.4	76.2	77.0	79.5	83.2	85.1	87.2	87.2	84.8	76.3	77.6	85.2	77.8	81.0
Umin (%)	33.0	33.0	20.0	26.0	19.0	23.0	26.0	21.0	25.0	31.0	35.0	34.0	33.0	19.0	21.0	25.0	19.0	19.0
U>80% (d)	17.4	9.9	6.5	4.8	3.9	3.6	2.7	2.6	4.4	8.1	14.9	18.7	45.9	15.2	8.9	27.4	22.0	97.4
U≤30% (d)	0.0	0.0	0.3	0.5	0.2	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	1.1	0.4	0.1	1.2	1.5
e (hPa)	5.5	6.0	7.4	9.6	13.5	16.6	18.4	18.3	14.8	10.9	7.8	6.2	5.9	10.2	17.8	11.2	15.2	11.3
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.2	4.0	5.0	6.2	7.5	8.1	9.3	9.0	6.8	4.8	2.6	1.9	2.7	6.2	8.8	4.7	7.8	5.6
SS_{rel} (%)																		
SS_{max} (h)	4.2	6.8	6.8	7.9	9.7	10.2	11.4	11.5	8.8	7.1	4.6	3.6	4.0	7.3	10.0	6.1	8.9	6.5
SS_{min} (h)	0.3	2.1	2.8	4.8	4.8	6.8	7.2	7.3	4.3	3.0	0.6	0.3	1.5	4.7	7.6	3.5	6.6	4.8
Naoblaka Cloudiness																		
N (10/10)	7.0	6.0	5.6	5.6	5.0	5.1	4.1	3.8	4.5	5.4	6.9	7.0	6.7	5.4	4.3	5.6	4.7	5.5
N_{max} (10/10)	9.5	8.0	7.8	6.9	7.0	6.5	6.0	5.4	7.5	7.2	9.4	9.5	8.1	6.7	5.4	6.9	5.8	6.4
N_{min} (10/10)	4.3	3.2	3.8	3.9	3.2	2.8	2.4	1.4	2.2	3.0	4.5	4.5	5.1	4.5	3.1	4.1	3.6	4.6
N<2/10	3.7	5.1	5.7	5.0	7.5	6.0	9.5	12.2	8.6	6.4	3.0	3.6	12.4	18.2	27.8	18.0	48.9	76.4
N<2/10 max	12	14	12	10	17	14	18	22	19	17	10	9	31	31	41	34	73	109
N<2/10 min	0	1	2	0	0	1	2	5	1	0	0	0	4	7	13	6	29	46
N>8/10	15.9	10.8	9.8	8.5	6.9	6.9	4.3	4.5	5.8	9.1	14.3	15.7	42.4	25.2	15.7	29.2	36.9	112.4
N>8/10 max	28	19	20	17	14	12	11	9	14	16	27	29	63	43	24	39	58	153
N>8/10 min	4	2	5	3	2	1	0	0	0	2	7	5	25	13	5	19	16	76
Meteorološke pojave Weather phenomena																		
magla/fog	6.7	4.5	2.1	0.9	0.8	0.5	0.5	2.2	6.0	8.9	7.7	6.9	18.0	3.8	3.2	22.6	10.9	47.6
magla/fog max	17	15	9	4	6	3	5	8	16	19	20	14	29	12	10	42	27	78
magla/fog min	1	0	0	0	0	0	0	0	1	3	1	2	6	0	0	7	1	23
tuča/hail	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3
tuča/hail max	0	0	0	0	1	1	1	0	1	1	0	0	0	1	1	1	2	2
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.3	0.3	0.4	1.6	3.7	5.6	5.8	4.5	2.0	1.1	0.6	0.1	0.7	5.7	15.9	3.6	23.3	26.0
grm/thun max	1	2	2	4	9	11	13	12	6	4	2	1	3	12	25	9	35	36
grm/thun min	0	0	0	0	0	1	1	1	0	0	0	0	0	2	7	0	13	15
rosa/dew	0.6	1.9	9.6	20.5	25.4	24.7	28.0	27.3	24.7	18.7	6.6	1.2	3.7	55.5	80.0	50.0	150.6	189.2
rosa/dew max	13	14	24	26	31	29	31	31	29	30	18	10	27	70	89	72	170	245
rosa/dew min	0	0	0	13	17	19	22	20	19	2	0	0	0	38	64	27	126	153
mraz/frost	7.3	8.3	8.1	2.4	0.1	0.0	0.0	0.0	0.2	4.9	8.2	8.1	23.7	10.7	0.0	13.3	2.8	47.7
mraz/frost max	19	18	16	6	1	0	0	0	2	13	18	21	44	22	0	28	8	73
mraz/frost min	0	0	2	0	0	0	0	0	0	0	0	0	6	3	0	4	0	26
inje/rime	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.3	0.0	0.0	0.2	0.0	2.5
inje/rime max	6	1	1	0	0	0	0	0	0	0	4	5	9	1	0	4	0	10
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1010.8																	
p max (hPa)																		
p min (hPa)																		
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.6	-8.5	-3.4	3.4	11.0	15.9	17.1	13.9	7.8	2.1	-3.2	-6.7	-7.9	3.7	15.6	2.2	11.5	3.4
$PhET_{14h}$ (°C)	-2.5	-1.0	7.7	13.6	20.8	25.0	28.3	28.9	21.9	13.3	3.9	-1.4	-1.7	14.0	27.4	13.0	23.1	13.2
$PhET_{21h}$ (°C)	-7.2	-6.9	-1.8	2.8	8.1	11.8	13.6	13.2	9.0	3.6	-1.8	-5.7	-6.6	3.0	12.9	3.6	9.8	3.2

Križevci

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-1.3	1.3	5.5	10.2	14.8	18.0	19.6	18.7	15.1	9.9	4.8	0.3	0.1	10.2	18.8	10.0	16.1	9.7
T_{max}	(°C)	16.8	18.4	25.2	27.5	30.2	32.5	37.6	34.5	30.5	27.9	23.7	21.6	21.6	30.2	37.6	30.5	37.6	37.6
T_{min}	(°C)	-25.5	-22.6	-18.7	-3.5	-3.0	0.5	4.0	2.4	-2.0	-7.0	-17.2	-19.8	-25.5	-18.7	0.5	-17.2	-3.5	-25.5
t_{max}	(°C)	1.9	5.2	10.5	15.7	20.5	23.5	25.6	25.0	21.5	15.7	8.7	3.3	3.5	15.6	24.7	15.3	22.0	14.8
t_{min}	(°C)	-4.6	-2.3	0.8	4.7	8.8	12.2	13.5	13.1	9.9	5.3	1.2	-2.6	-3.2	4.8	12.9	5.5	10.4	5.0
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	4.5	1.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0	8.3	0.6	0.0	0.3	0.0	9.2
t_{max}<0°C	(d)	10.1	3.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	7.7	21.2	0.9	0.0	1.0	0.0	23.2
t_{min}<0°C	(d)	25.5	19.5	12.0	2.2	0.2	0.0	0.0	0.0	0.1	3.1	11.7	22.5	66.6	14.4	0.0	14.9	2.5	96.7
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.6	4.6	12.1	18.8	16.3	6.8	0.3	0.0	0.0	0.0	5.2	47.2	7.1	59.2	59.6
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.2	3.4	3.4	0.3	0.0	0.0	0.0	0.0	0.0	8.0	0.3	8.3	8.3
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.2
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	4.1	13.3	65.5	157.8	299.2	386.9	451.2	435.6	321.5	173.0	51.3	10.7	28.1	522.6	1273.7	545.8	2052.3	2370.2
$t_{5°C}$ max	(°C)	29.3	79.4	140.1	252.6	385.1	460.3	523.9	486.9	408.6	299.8	161.5	70.6	95.0	633.9	1389.0	670.3	2255.0	2601.7
$t_{5°C}$ min	(°C)	0.0	0.0	24.0	94.0	228.0	326.4	402.3	360.3	243.2	58.6	2.6	0.0	0.0	361.2	1156.5	419.9	1814.9	2080.9
$t_{10°C}$	(°C)	0.3	1.0	9.4	44.5	148.4	237.0	296.2	280.5	172.7	54.1	8.1	1.3	2.6	202.3	813.8	234.8	1179.4	1253.5
$t_{10°C}$ max	(°C)	3.6	10.6	37.4	102.6	230.1	310.3	368.9	331.9	260.8	157.4	53.0	25.8	26.1	307.2	929.0	343.0	1364.4	1444.8
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	15.4	81.4	179.5	247.4	205.3	95.9	0.9	0.0	0.0	0.0	106.3	696.5	122.4	969.9	1006.7
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.1	1.9	5.6	10.9	16.6	20.5	22.6	21.8	17.3	11.3	5.5	1.2	1.1	11.0	21.6	11.3	18.3	11.3
t_{5cm} max	(°C)	3.0	5.5	8.9	13.9	19.4	23.8	25.3	24.0	20.5	15.1	9.1	4.0	5.5	19.4	25.3	20.5	25.3	25.3
t_{5cm} min	(°C)	-5.7	-0.9	2.0	8.7	13.9	18.5	20.0	19.0	15.0	7.8	2.3	-2.7	-5.7	2.0	18.5	2.3	8.7	-5.7
t_{20cm}	(°C)	0.7	1.9	5.1	10.2	15.4	19.3	21.5	21.3	17.3	11.9	6.2	2.0	1.5	10.2	20.7	11.8	17.5	11.1
t_{20cm} max	(°C)	3.1	5.3	8.4	13.1	17.6	22.3	24.0	23.3	20.1	15.5	9.6	3.9	5.3	17.6	24.0	20.1	24.0	24.0
t_{20cm} min	(°C)	-5.1	-1.3	1.6	7.5	13.0	17.6	19.3	18.6	15.5	8.8	3.0	-2.1	-5.1	1.6	17.6	3.0	7.5	-5.1
Oborina Precipitation																			
R	(mm)	42.6	40.8	51.1	61.7	82.7	91.1	77.8	72.7	69.9	60.5	80.5	56.3	139.9	195.5	241.5	211.0	455.9	787.7
Rmax	(mm)	139.6	93.7	110.2	148.4	193.0	206.9	180.8	191.4	192.8	185.0	199.9	141.4	250.8	351.4	368.3	341.5	695.0	1037.1
Rmin	(mm)	0.1	5.5	9.4	8.0	20.2	46.8	23.4	12.1	17.0	0.2	11.4	11.1	54.3	71.7	96.3	110.1	321.9	573.3
Rd_{max}	(mm)	29.7	34.0	35.1	55.5	69.8	58.0	57.8	44.0	49.0	48.8	64.0	38.8	38.8	69.8	58.0	64.0	69.8	69.8
Rd≥0.1mm	(d)	10.7	9.9	11.4	12.2	12.9	13.3	10.3	10.2	10.3	11.0	12.2	11.5	32.2	36.5	33.8	33.4	69.2	135.8
Rd≥1mm	(d)	6.6	6.6	7.7	8.8	9.5	10.3	8.1	7.7	7.2	6.6	8.2	7.9	21.0	26.0	26.1	22.0	51.6	95.2
Rd≥5mm	(d)	2.9	2.9	3.2	4.0	5.2	5.8	4.9	4.2	4.1	3.8	4.9	3.6	9.5	12.4	14.9	12.8	28.3	49.6
Rd≥10mm	(d)	1.3	1.1	1.6	1.9	2.6	3.0	2.8	2.6	2.6	2.2	3.0	1.8	4.2	6.0	8.5	7.8	15.5	26.4
Rd≥20mm	(d)	0.3	0.1	0.4	0.6	0.9	1.2	1.0	0.9	0.9	0.7	1.1	0.5	0.9	1.8	3.1	2.7	5.5	8.5
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.2
S≥1cm	(d)	14.5	9.9	3.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.5	8.0	32.4	3.6	0.0	2.5	0.1	38.6
S≥10cm	(d)	7.2	4.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.0	14.8	1.2	0.0	0.8	0.0	16.8
S≥30cm	(d)	1.2	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4	0.2	0.0	0.0	0.0	2.6
S≥50cm	(d)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S_{max}	(cm)	41	53	35	5	0	0	0	0	0	0	32	40	53	35	0	32	5	53
Isparavanje Evaporation																			
EV	(mm)				60.2	86.4	91.9	105.2	85.5	54.0	29.1								512.4
EVmax	(mm)				88.9	115.0	121.5	141.8	112.6	68.1	41.9								141.8
EVmin	(mm)				46.2	61.5	67.2	78.2	69.1	39.5	17.9								17.9
PET	(mm)	14	22	39	63	93	119	137	117	79	46	26	16	52	195	373	151	608	771
ET	(mm)	14	22	39	62	91	114	121	100	72	44	26	16	52	192	335	142	560	721

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.3	1.7	6.0	10.2	15.0	18.1	19.9	19.2	15.1	9.8	4.4	0.8	0.7	10.4	19.1	9.8	16.3	10.0
T_{max}	(°C)	16.8	20.2	25.2	27.3	31.6	34.3	35.3	37.5	30.5	27.9	23.0	21.6	21.6	31.6	37.5	30.5	37.5	37.5
T_{min}	(°C)	-23.9	-22.6	-17.0	-5.0	-2.2	2.3	5.7	2.4	-2.0	-7.0	-17.2	-21.0	-23.9	-17.0	2.3	-17.2	-5.0	-23.9
t_{max}	(°C)	2.9	6.0	11.2	15.7	20.8	23.8	25.9	25.7	21.5	15.4	8.3	3.9	4.2	15.9	25.1	15.1	22.2	15.1
t_{min}	(°C)	-3.6	-2.5	0.9	4.5	9.0	12.3	13.8	13.4	9.8	5.2	0.8	-2.3	-2.9	4.8	13.2	5.3	10.5	5.1
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	2.7	2.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9	6.9	0.5	0.0	0.3	0.0	7.6
t_{max}<0°C	(d)	8.3	3.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	6.0	18.0	0.7	0.0	1.6	0.0	20.1
t_{min}<0°C	(d)	24.8	19.8	12.1	2.6	0.1	0.0	0.0	0.0	0.1	3.7	12.8	22.2	67.1	14.8	0.0	16.6	2.8	98.1
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.4	5.8	12.0	19.5	18.4	6.7	0.5	0.0	0.0	0.0	6.3	50.0	7.2	62.9	63.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	1.6	3.6	4.6	0.2	0.0	0.0	0.0	0.0	0.1	9.8	0.2	10.1	10.1
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.3
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	6.8	15.2	70.4	156.7	307.6	391.3	460.6	451.3	319.5	169.7	46.2	12.0	34.1	534.7	1303.2	535.4	2087.0	2407.4
$t_{5°C}$ max	(°C)	29.3	58.8	141.3	253.4	385.1	460.3	524.7	563.2	408.6	245.7	124.6	70.6	95.0	681.7	1450.5	705.4	2347.1	2845.0
$t_{5°C}$ min	(°C)	0.0	0.0	14.1	94.0	208.8	341.6	406.3	360.3	229.2	58.6	2.6	0.0	3.7	361.2	1156.5	419.9	1814.9	2080.9
$t_{10°C}$	(°C)	0.2	0.8	10.7	44.4	156.1	241.3	305.6	296.2	170.6	55.2	6.1	1.6	2.6	211.1	843.2	231.9	1214.3	1288.8
$t_{10°C}$ max	(°C)	3.6	6.9	37.4	120.8	230.1	310.3	369.8	408.2	260.8	109.5	25.9	25.8	26.1	318.5	990.6	331.0	1449.8	1588.1
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	17.8	68.3	191.7	251.3	205.3	81.1	0.9	0.0	0.0	0.0	106.3	696.5	122.4	969.9	1006.7
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.6	2.0	6.1	11.0	17.1	20.8	22.9	22.5	17.5	11.4	5.4	1.6	1.4	11.4	22.1	11.4	18.6	11.6
t_{5cm} max	(°C)	3.0	5.5	9.6	14.4	20.4	23.9	24.9	27.2	20.5	13.5	9.0	4.0	5.5	20.4	27.2	20.5	27.2	27.2
t_{5cm} min	(°C)	-1.7	-1.7	2.7	8.7	13.0	18.5	20.5	19.0	14.9	7.8	2.3	-0.2	-1.7	2.7	18.5	2.3	8.7	-1.7
t_{20cm}	(°C)	1.2	2.1	5.5	10.2	15.9	19.6	21.8	21.8	17.4	11.9	6.1	2.3	1.9	10.5	21.1	11.8	17.8	11.3
t_{20cm} max	(°C)	3.2	5.3	8.9	13.2	19.0	22.9	23.6	25.6	20.1	14.0	9.6	4.8	5.3	19.0	25.6	20.1	25.6	25.6
t_{20cm} min	(°C)	-1.4	-1.3	1.6	7.5	12.7	17.7	19.8	18.6	15.3	8.8	0.4	-0.8	-1.4	1.6	17.7	0.4	7.5	-1.4
Oborina Precipitation																			
R	(mm)	39.1	40.1	46.3	57.5	75.2	90.4	76.0	70.5	75.5	75.5	79.0	60.9	138.9	178.9	236.9	230.0	445.0	785.9
Rmax	(mm)	139.6	93.7	80.5	148.4	193.0	206.9	175.1	191.4	205.4	201.0	189.2	141.4	250.8	351.4	357.0	429.2	698.0	1057.2
Rmin	(mm)	5.1	1.3	5.1	8.0	16.8	32.2	26.0	1.0	24.2	3.0	11.4	11.1	54.3	87.8	117.7	110.1	273.4	564.6
Rd_{max}	(mm)	29.7	34.0	35.1	55.5	69.8	58.0	57.8	55.3	58.2	56.5	64.0	45.8	45.8	69.8	58.0	64.0	69.8	69.8
Rd≥0.1mm	(d)	9.0	8.6	9.9	12.2	12.2	13.3	10.6	9.8	10.4	11.0	11.2	10.6	28.4	34.3	33.7	32.6	68.5	128.9
Rd≥1mm	(d)	5.8	5.9	6.7	8.6	9.1	10.2	8.0	7.4	7.7	7.2	7.6	7.7	19.5	24.3	25.6	22.5	50.9	91.8
Rd≥5mm	(d)	2.7	2.9	2.9	3.9	4.8	5.8	5.0	3.8	4.4	4.2	4.6	3.7	9.3	11.5	14.7	13.2	27.7	48.7
Rd≥10mm	(d)	1.3	1.2	1.5	1.8	2.4	3.0	2.8	2.5	2.7	2.6	2.9	1.9	4.2	5.6	8.4	8.2	15.2	26.5
Rd≥20mm	(d)	0.3	0.2	0.4	0.4	0.8	1.1	0.9	0.9	1.0	1.0	1.0	0.6	1.1	1.7	2.9	3.1	5.1	8.7
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.3
S≥1cm	(d)	11.2	8.9	2.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.0	7.1	27.5	2.8	0.0	3.0	0.1	33.0
S≥10cm	(d)	3.7	3.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	3.0	10.9	0.8	0.0	1.6	0.0	13.0
S≥30cm	(d)	0.3	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.3	0.2	0.0	0.1	0.0	1.6
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.3
S_{max}	(cm)	35	41	35	5	0	0	0	0	0	0	75	75	75	35	0	75	5	75
Isparavanje Evaporation																			
EV	(mm)				57.8	84.0	91.4	103.1	88.0	52.9	27.6								504.9
EVmax	(mm)				75.7	115.0	125.1	127.8	122.9	68.1	41.3								127.8
EVmin	(mm)				43.5	59.5	67.2	78.2	69.1	34.9	17.9								17.9
PET	(mm)	16	23	40	63	94	120	137	123	77	44	24	16	55	197	380	145	614	777
ET	(mm)	15	23	40	62	92	113	122	100	70	42	24	16	54	194	335	136	559	719

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	85.2	80.4	74.0	70.8	73.0	74.5	74.2	78.0	81.5	83.8	85.6	87.0	84.2	72.6	75.6	83.6	75.3	79.0
Umin (%)	30.0	24.0	23.0	23.0	25.0	22.0	28.0	22.0	31.0	25.0	30.0	35.0	24.0	23.0	22.0	25.0	22.0	22.0
U>80% (d)	15.8	8.9	5.5	3.7	3.4	3.1	2.5	2.7	3.6	7.0	13.5	17.7	42.4	12.6	8.3	24.0	19.0	87.4
U≤30% (d)	0.0	0.1	0.5	0.9	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	1.6	0.3	0.1	1.4	2.2
e (hPa)	5.0	5.7	6.8	8.8	12.4	15.5	17.0	17.0	14.2	10.6	7.7	5.7	5.5	9.3	16.5	10.8	14.2	10.5
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	116	181	334	472	570	584	599	498	369	256	126	69	367	1376	1681	751	3093	4175
$G_{45°S}$ (MJm^{-2})	179	258	401	483	517	504	529	480	419	355	189	92	528	1400	1513	963	2932	4404
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.7	3.0	4.4	5.8	7.1	7.7	9.0	8.1	6.3	4.4	2.3	1.4	2.0	5.8	8.3	4.3	7.4	5.1
SS_{rel} (%)	21	32	45	46	52	53	63	61	55	46	30	21	25	48	59	45	55	47
SS_{max} (h)	3.8	6.5	6.7	7.8	9.4	9.6	10.7	10.4	8.7	6.5	4.2	3.0	3.2	6.9	9.3	5.4	8.3	5.8
SS_{min} (h)	0.4	1.1	1.5	4.3	4.3	5.7	6.7	6.2	4.5	2.5	0.5	0.3	1.0	4.4	7.1	3.2	6.4	4.5
Naoblaka Cloudiness																		
N (10/10)	7.6	7.1	6.3	6.0	5.6	5.5	4.5	4.5	5.0	5.8	7.3	7.7	7.5	6.0	4.8	6.0	5.2	6.1
N_{max} (10/10)	9.5	8.8	8.8	7.4	6.9	6.8	6.3	5.9	7.4	7.6	9.4	9.2	8.6	6.9	5.8	7.2	6.2	6.8
N_{min} (10/10)	5.9	4.6	4.1	4.4	3.2	4.2	3.1	2.6	2.4	4.0	4.8	6.0	6.2	4.6	4.0	5.0	4.1	5.3
N<2/10	2.1	2.4	4.1	4.3	4.6	4.3	7.9	8.2	6.1	5.0	2.0	1.8	6.3	12.9	20.4	13.2	35.4	52.8
N<2/10 max	7	8	10	10	15	9	12	15	19	10	9	6	18	31	30	28	64	86
N<2/10 min	0	0	0	0	0	1	1	2	0	0	0	0	0	6	4	1	12	16
N>8/10	17.7	13.9	11.4	9.7	7.8	7.2	4.9	5.2	6.6	9.9	15.5	17.9	49.6	28.9	17.3	32.0	41.4	127.8
N>8/10 max	29	23	23	16	13	14	9	12	12	20	28	27	69	40	30	46	63	172
N>8/10 min	4	3	4	5	3	1	0	1	1	3	5	9	32	19	7	18	28	93
Meteorološke pojave Weather phenomena																		
magla/fog	9.9	7.6	5.1	2.1	1.5	1.3	1.5	3.2	8.4	12.2	11.0	11.1	28.6	8.7	5.9	31.6	17.9	74.9
magla/fog max	23	21	22	7	4	5	6	9	15	21	20	20	51	27	15	53	35	129
magla/fog min	3	1	0	0	0	0	0	0	2	4	3	3	11	1	0	15	6	45
tuča/hail	0.0	0.1	0.1	0.1	0.5	0.3	0.3	0.2	0.0	0.1	0.0	0.0	0.1	0.7	0.8	0.1	1.4	1.7
tuča/hail max	0	1	1	1	3	2	2	1	0	1	1	1	1	3	2	1	5	5
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.2	0.3	0.5	1.6	4.3	6.2	5.7	5.7	1.9	0.8	0.7	0.3	0.8	6.3	17.6	3.4	25.4	28.1
grm/thun max	1	1	2	5	9	12	12	13	7	3	3	1	3	14	31	9	46	48
grm/thun min	0	0	0	0	0	1	1	0	0	0	0	0	0	1	4	0	10	11
rosa/dew	1.5	3.2	10.8	20.8	25.4	25.5	27.8	28.0	27.3	24.4	14.0	4.0	8.8	57.0	81.3	65.8	154.9	212.9
rosa/dew max	13	13	26	28	31	30	31	31	30	31	24	16	25	76	91	82	172	259
rosa/dew min	0	0	0	11	18	18	25	22	23	16	1	0	0	33	69	50	136	178
mraz/frost	14.0	12.9	11.7	3.6	0.4	0.0	0.0	0.0	0.5	5.2	9.5	12.9	39.8	15.8	0.0	15.1	4.6	70.7
mraz/frost max	23	19	24	10	3	1	0	0	4	16	19	23	60	27	1	29	13	99
mraz/frost min	4	3	6	0	0	0	0	0	0	0	3	3	16	7	0	8	0	41
inje/rime	4.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.5	8.3	0.1	0.0	1.0	0.0	9.4
inje/rime max	15	2	1	0	0	0	0	0	0	0	6	12	19	1	0	6	0	23
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tlak zraka Air pressure																		
p (hPa)	1002.0	999.9	998.8	996.2	997.5	998.1	998.9	998.9	1001.1	1002.3	1000.7	1001.2	999.6	997.5	998.6	1001.4	998.4	999.6
p max (hPa)	1026.3	1024.4	1023.4	1016.4	1013.7	1012.3	1011.4	1010.0	1017.1	1019.6	1021.9	1029.6	1029.6	1023.4	1012.3	1021.9	1017.1	1029.6
p min (hPa)	967.9	955.6	969.3	970.6	974.5	985.1	983.1	979.4	979.0	969.0	971.5	953.2	953.2	969.3	979.4	969.0	970.6	953.2
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-10.2	-9.9	-4.2	2.7	9.8	14.5	16.0	12.8	7.0	0.9	-3.9	-8.0	-9.4	2.8	14.4	1.3	10.5	2.3
$PhET_{14h}$ (°C)	-4.4	-3.2	6.6	12.9	19.6	24.1	27.1	26.4	20.7	12.5	3.3	-3.2	-3.6	13.0	25.9	12.2	21.8	11.9
$PhET_{21h}$ (°C)	-8.7	-8.1	-1.7	3.2	7.8	11.4	13.0	12.0	8.2	2.9	-2.2	-7.0	-7.9	3.1	12.1	3.0	9.3	2.6

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	84.7	78.4	72.0	69.6	71.9	73.5	73.8	76.7	81.3	83.9	85.8	87.0	83.4	71.2	74.7	83.7	74.5	78.2
Umin (%)	30.0	22.0	22.0	22.0	24.0	28.0	21.0	22.0	29.0	25.0	30.0	37.0	22.0	22.0	21.0	25.0	21.0	21.0
U>80% (d)	14.9	7.2	4.4	3.4	3.3	3.1	2.3	2.3	4.0	7.6	13.6	17.7	39.8	11.1	7.7	25.2	18.4	83.8
U≤30% (d)	0.0	0.2	0.7	1.1	0.4	0.0	0.1	0.5	0.0	0.1	0.0	0.0	0.3	2.2	0.6	0.1	2.2	3.2
e (hPa)	5.3	5.6	6.8	8.6	12.4	15.5	17.2	17.2	14.1	10.5	7.5	5.9	5.6	9.3	16.6	10.7	14.2	10.6
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.9	3.6	4.6	5.7	7.5	7.9	9.1	8.4	6.4	4.1	2.2	1.6	2.3	5.9	8.5	4.2	7.5	5.2
SS_{rel} (%)	24	39	43	46	54	55	64	64	56	44	30	25	30	48	61	45	57	48
SS_{max} (h)	3.8	6.5	6.6	7.3	9.8	11.1	11.0	11.3	9.2	6.5	4.2	3.0	3.6	7.3	10.3	5.4	9.0	6.4
SS_{min} (h)	0.4	1.1	2.5	4.3	4.3	5.7	6.7	6.2	4.0	2.5	0.5	0.3	1.2	4.4	7.1	3.2	6.4	4.5
Naoblaka Cloudiness																		
N (10/10)	7.5	6.5	6.0	6.0	5.3	5.3	4.3	4.3	5.0	6.0	7.3	7.5	7.2	5.7	4.6	6.1	5.0	5.9
N_{max} (10/10)	9.5	8.8	8.1	7.4	6.9	6.5	6.3	5.9	7.4	7.6	9.4	9.6	8.5	6.5	5.8	7.2	6.2	6.8
N_{min} (10/10)	5.9	3.6	4.1	4.8	3.1	2.3	3.1	1.7	2.0	4.0	4.8	5.8	5.7	4.4	2.9	5.0	3.4	4.5
N<2/10	2.1	3.5	4.3	3.7	5.4	5.2	8.5	9.3	6.2	4.3	2.1	2.1	7.2	12.7	22.3	12.5	37.0	54.7
N<2/10 max	6	10	9	10	15	16	16	20	21	10	9	6	20	31	36	27	64	86
N<2/10 min	0	0	0	0	0	1	1	2	0	0	0	0	0	5	4	1	12	16
N>8/10	16.9	11.4	9.8	9.0	7.0	6.5	4.5	4.4	6.3	10.3	15.0	17.0	45.3	25.8	15.4	31.6	37.6	118.1
N>8/10 max	29	23	21	16	13	13	9	10	12	20	28	29	69	40	26	45	63	172
N>8/10 min	4	1	3	3	1	1	0	0	1	3	5	9	28	10	5	16	11	59
Meteorološke pojave Weather phenomena																		
magla/fog	10.4	7.4	5.2	2.1	1.5	1.2	1.7	3.4	8.9	12.2	11.5	12.2	30.0	8.8	6.3	32.5	18.9	77.7
magla/fog max	25	21	22	7	3	5	6	9	15	21	20	26	51	27	15	53	35	129
magla/fog min	3	1	0	0	0	0	0	0	3	4	4	3	11	3	1	19	9	51
tuča/hail	0.0	0.0	0.1	0.1	0.4	0.4	0.4	0.2	0.0	0.1	0.0	0.0	0.1	0.7	1.1	0.1	1.6	1.9
tuča/hail max	0	1	1	1	3	2	2	1	0	1	0	1	1	3	3	1	5	5
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.2	0.2	0.4	1.2	3.6	4.9	5.3	4.8	1.8	0.9	0.5	0.2	0.7	5.1	15.0	3.2	21.6	24.0
grm/thun max	1	1	2	5	9	12	12	13	7	3	3	1	3	14	31	9	46	48
grm/thun min	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	10	11
rosa/dew	3.2	3.6	11.9	21.1	25.7	24.7	27.4	27.7	27.3	24.6	15.0	6.1	12.9	58.8	79.8	67.0	154.0	218.4
rosa/dew max	15	13	26	28	31	30	31	31	30	31	30	22	31	76	91	91	172	259
rosa/dew min	0	0	0	11	18	18	19	21	23	16	1	0	0	33	59	50	136	178
mraz/frost	15.1	14.0	11.0	3.2	0.2	0.0	0.0	0.0	0.4	5.2	10.1	14.9	44.0	14.4	0.0	15.7	3.7	74.0
mraz/frost max	27	24	24	10	2	0	0	0	2	14	19	27	68	27	0	29	12	99
mraz/frost min	6	6	4	0	0	0	0	0	0	0	3	3	26	7	0	6	0	51
inje/rime	4.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.2	7.7	0.1	0.0	1.0	0.0	8.8
inje/rime max	15	4	1	0	1	0	0	0	0	0	6	15	19	1	0	6	1	23
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tlak zraka Air pressure																		
p (hPa)	1003.3	1001.5	999.5	996.1	997.7	998.1	998.6	999.2	1000.5	1001.9	1001.5	1002.3	1000.0	997.8	998.6	1001.3	998.4	1000.0
p max (hPa)	1027.2	1024.4	1023.4	1017.7	1013.7	1013.5	1011.4	1010.0	1017.1	1020.3	1021.9	1024.9	1027.2	1023.4	1013.5	1021.9	1017.7	1027.2
p min (hPa)	967.9	955.6	969.4	974.5	974.5	982.8	982.7	979.4	976.9	971.8	971.9	953.2	953.2	969.4	979.4	971.8	974.5	953.2
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.8	-8.5	-3.8	2.8	9.9	14.7	15.9	14.0	7.2	1.9	-3.4	-7.4	-8.2	3.0	14.8	1.9	10.7	2.9
$PhET_{14h}$ (°C)	-2.4	-0.1	8.0	14.5	21.0	26.0	29.2	29.9	22.1	13.6	3.7	-2.3	-1.6	14.5	28.3	13.2	23.8	13.6
$PhET_{21h}$ (°C)	-7.3	-6.3	-0.7	4.4	9.3	13.1	14.9	14.3	9.7	4.1	-1.7	-6.1	-6.6	4.3	14.1	4.0	10.9	4.0

Varaždin

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-1.3	1.3	5.4	10.3	15.1	18.3	19.8	18.9	15.4	10.1	4.9	0.5	0.2	10.3	19.0	10.1	16.3	9.9
T_{max}	(°C)	17.3	19.9	25.3	30.2	30.4	33.2	37.2	36.1	30.8	27.5	24.3	21.4	21.4	30.4	37.2	30.8	37.2	37.2
T_{min}	(°C)	-26.8	-26.4	-23.4	-5.5	-2.3	2.2	4.7	3.2	-3.1	-7.0	-19.6	-22.7	-26.8	-23.4	2.2	-19.6	-5.5	-26.8
t_{max}	(°C)	2.4	5.4	10.6	15.8	20.7	23.8	25.8	25.2	21.7	15.9	9.0	3.8	3.9	15.7	24.9	15.6	22.2	15.0
t_{min}	(°C)	-4.9	-2.5	0.8	4.8	9.1	12.5	13.7	13.1	9.9	5.4	1.3	-2.7	-3.3	4.9	13.1	5.5	10.5	5.0
$t_{min\ 5cm}$	(°C)	-18.6	-14.2	-9.8	-4.3	-0.6	3.7	5.7	4.7	0.8	-4.4	-9.4	-14.9	-21.9	-10.0	3.0	-9.6	-4.5	-21.3
$t_{min\ 5cm}$ min	(°C)	-30.6	-27.5	-24.6	-10.0	-4.7	-1.8	2.0	1.8	-5.2	-9.9	-23.6	-24.6	-30.6	-24.6	-1.8	-23.6	-10.0	-30.6
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	5.7	2.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.4	10.3	0.6	0.0	0.4	0.0	11.4
t_{max}<0°C	(d)	9.5	4.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	6.6	20.1	1.0	0.0	0.7	0.0	21.8
t_{min}<0°C	(d)	24.9	18.8	12.1	2.5	0.3	0.0	0.0	0.0	0.1	3.7	11.5	22.3	65.8	14.8	0.0	15.4	2.8	96.2
t_{max}≥25°C	(d)	0.0	0.0	0.1	0.8	5.1	12.4	18.7	16.0	6.7	0.5	0.0	0.0	0.0	5.9	47.1	7.2	59.7	60.2
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	1.6	4.1	3.7	0.4	0.0	0.0	0.0	0.0	0.2	9.3	0.4	9.9	9.9
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.4
$t_{min\ 5cm}$<0°C	(d)	27.1	22.2	18.5	7.6	1.2	0.1	0.0	0.0	0.7	7.4	14.7	23.6	72.0	27.3	0.1	22.8	9.6	123.1
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	6.3	16.9	68.2	162.1	306.0	394.3	457.0	437.9	324.4	179.5	56.1	12.9	36.1	536.2	1289.1	560.0	2081.5	2421.4
$t_{5°C}$ max	(°C)	33.1	91.5	129.5	271.0	393.1	461.9	539.5	493.6	400.1	321.3	184.3	74.0	106.3	666.6	1403.8	701.5	2324.0	2665.6
$t_{5°C}$ min	(°C)	0.0	0.0	26.3	97.5	227.6	334.1	402.3	355.2	231.4	62.5	2.1	0.0	0.0	366.3	1150.1	407.3	1813.6	2099.4
$t_{10°C}$	(°C)	0.3	1.5	10.9	49.1	155.2	244.4	302.0	282.9	175.7	60.3	10.9	1.7	3.5	215.2	829.3	246.8	1209.2	1294.7
$t_{10°C}$ max	(°C)	4.8	14.8	31.4	121.0	238.1	311.9	384.5	338.6	250.1	180.3	71.9	27.7	31.0	321.0	943.8	374.5	1431.7	1511.4
$t_{10°C}$ min	(°C)	0.0	0.0	0.6	17.2	82.0	187.4	247.3	200.2	88.0	0.9	0.0	0.0	0.0	107.8	690.1	113.8	971.7	1012.6
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.5	2.1	5.5	11.0	16.6	20.4	22.2	21.3	17.0	11.4	5.8	1.6	1.4	11.0	21.3	11.4	18.1	11.3
t_{5cm} max	(°C)	3.5	5.8	8.9	14.7	20.0	23.2	25.6	24.9	19.2	15.1	9.8	4.1	5.8	20.0	25.6	19.2	25.6	25.6
t_{5cm} min	(°C)	-5.5	-1.1	2.4	8.9	13.5	17.8	19.9	18.4	14.6	7.9	2.7	-3.1	-5.5	2.4	17.8	2.7	8.9	-5.5
t_{20cm}	(°C)	0.9	2.2	5.2	10.4	15.5	19.2	21.2	20.7	16.9	11.7	6.4	2.2	1.8	10.4	20.4	11.7	17.3	11.0
t_{20cm} max	(°C)	3.7	5.1	8.2	13.1	18.1	21.2	23.5	23.5	19.1	15.4	10.0	4.2	5.1	18.1	23.5	19.1	23.5	23.5
$t_{20cm\ min}$	(°C)	-5.3	-0.6	0.2	8.4	12.9	17.3	19.2	18.0	14.6	8.3	3.3	-2.3	-5.3	0.2	17.3	3.3	8.4	-5.3
Oborina Precipitation																			
R	(mm)	45.0	45.4	54.7	70.2	84.0	98.1	91.8	98.3	81.4	69.4	82.9	57.9	149.0	208.9	288.2	233.7	523.9	879.2
Rmax	(mm)	145.4	124.6	105.9	152.4	164.2	199.9	230.9	258.1	167.7	208.4	254.2	169.9	272.1	332.4	483.5	372.8	767.1	1249.1
Rmin	(mm)	1.4	7.7	7.6	9.4	12.2	37.1	15.3	15.0	9.9	0.7	19.6	16.6	52.1	82.3	146.2	139.9	309.3	566.6
Rd_{max}	(mm)	28.3	41.8	29.2	70.3	64.4	70.0	72.5	131.3	63.8	51.8	56.5	39.5	41.8	70.3	131.3	63.8	131.3	131.3
Rd≥0.1mm	(d)	10.2	10.6	11.4	12.8	13.2	14.0	11.8	11.9	9.6	9.6	11.5	11.6	32.5	37.3	37.7	30.7	73.3	138.1
Rd≥1mm	(d)	6.8	6.6	7.7	8.8	9.3	10.4	8.9	8.5	7.4	6.5	7.9	8.0	21.5	25.7	27.8	21.8	53.3	96.8
Rd≥5mm	(d)	3.2	3.3	3.6	4.2	4.9	6.0	5.1	5.1	4.6	4.2	4.9	3.9	10.5	12.7	16.3	13.8	30.0	53.2
Rd≥10mm	(d)	1.4	1.2	2.0	2.5	2.8	3.3	3.1	3.2	2.8	2.2	3.0	1.9	4.5	7.3	9.6	8.0	17.6	29.4
Rd≥20mm	(d)	0.3	0.4	0.4	0.8	1.0	1.2	1.5	1.3	1.2	1.0	1.1	0.5	1.1	2.3	4.0	3.3	7.0	10.7
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.4	0.2	0.6	0.7
S≥1cm	(d)	17.6	10.8	4.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	3.5	11.6	39.6	5.2	0.0	3.5	0.3	48.6
S≥10cm	(d)	8.1	5.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	4.1	17.6	1.5	0.0	1.3	0.0	20.4
S≥30cm	(d)	1.7	1.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	4.3	0.4	0.0	0.2	0.0	4.9
S≥50cm	(d)	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
S_{max}	(cm)	52	57	37	10	0	0	0	0	0	1	43	48	57	37	0	43	10	57
Isparavanje Evaporation																			
EV	(mm)				62.2	90.5	97.7	109.6	88.1	54.5	30.3							532.9	
EVmax	(mm)				85.0	127.3	133.4	140.0	134.2	73.9	45.5							140.0	
EVmin	(mm)				41.7	66.8	77.9	75.6	66.9	42.3	19.0							19.0	
PET	(mm)	13	19	32	55	84	108	122	105	71	42	24	15	47	171	335	137	545	690
ET	(mm)	13	19	32	55	84	106	115	97	70	41	24	15	47	171	318	135	527	671

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.2	1.6	5.8	10.3	15.4	18.5	20.2	19.5	15.4	10.0	4.6	1.0	0.7	10.5	19.4	10.0	16.5	10.2
T_{max}	(°C)	17.3	21.6	25.3	28.1	31.4	34.9	35.4	37.9	30.8	27.5	22.9	21.4	21.6	31.4	37.9	30.8	37.9	37.9
T_{min}	(°C)	-25.4	-26.4	-18.9	-4.9	-2.3	2.6	6.3	3.2	-3.1	-7.5	-19.6	-22.5	-26.4	-18.9	2.6	-19.6	-4.9	-26.4
t_{max}	(°C)	3.4	6.1	11.1	15.7	20.9	23.9	26.0	25.8	21.5	15.5	8.6	4.4	4.6	15.9	25.2	15.2	22.3	15.2
t_{min}	(°C)	-3.7	-2.5	1.0	4.7	9.2	12.6	14.1	13.5	10.0	5.5	1.0	-2.2	-2.8	5.0	13.4	5.5	10.7	5.3
$t_{min\ 5cm}$	(°C)	-5.2	-4.6	-1.1	2.1	6.6	10.2	11.8	11.2	7.7	3.5	-0.5	-3.6	-4.5	2.5	11.1	3.5	8.3	3.2
$t_{min\ 5cm}$ min	(°C)	-28.3	-27.5	-23.2	-9.0	-4.7	-1.8	2.4	1.4	-5.2	-10.8	-23.6	-26.4	-28.3	-23.2	-1.8	-23.6	-9.0	-28.3
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	3.4	2.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.1	8.0	0.5	0.0	0.5	0.0	8.9
t_{max}<0°C	(d)	8.4	3.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	5.7	17.7	0.9	0.0	1.1	0.0	19.7
t_{min}<0°C	(d)	23.8	18.7	11.9	2.8	0.2	0.0	0.0	0.0	0.0	4.2	12.2	21.0	63.9	14.9	0.0	16.4	3.0	94.8
t_{max}≥25°C	(d)	0.0	0.0	0.1	0.6	6.0	12.2	19.5	17.8	6.4	0.5	0.0	0.0	0.0	6.7	49.5	6.9	62.5	63.0
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	1.9	4.0	4.8	0.3	0.0	0.0	0.0	0.0	0.1	10.7	0.3	11.1	11.1
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.3
$t_{min\ 5cm}$<0°C	(d)	26.8	22.6	17.6	8.0	1.0	0.1	0.0	0.0	0.8	7.5	15.3	23.0	72.8	26.7	0.1	23.6	9.9	122.8
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	10.1	19.6	71.8	159.1	311.9	397.9	465.5	453.0	322.9	176.2	51.2	14.5	44.2	542.8	1316.3	550.3	2110.1	2453.6
$t_{5°C}$ max	(°C)	33.1	79.7	151.6	265.5	393.1	459.6	539.5	582.6	400.1	258.7	137.6	74.0	106.3	718.8	1478.6	739.7	2410.7	2960.7
$t_{5°C}$ min	(°C)	0.0	0.0	15.1	94.1	214.9	347.5	402.3	355.2	231.4	62.5	2.1	0.0	6.3	366.3	1150.1	407.3	1813.6	2099.4
$t_{10°C}$	(°C)	0.4	1.5	12.1	46.9	160.4	247.9	310.5	298.0	174.1	61.2	8.8	1.9	3.9	219.4	856.4	244.1	1237.8	1323.7
$t_{10°C}$ max	(°C)	4.8	9.9	33.4	130.6	238.1	309.7	384.5	427.6	250.1	117.3	37.6	27.7	31.0	349.5	1018.6	342.9	1511.5	1676.3
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	15.6	71.6	197.5	247.3	200.2	85.2	0.9	0.0	0.0	0.0	107.8	690.1	113.8	971.7	1012.6
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.8	2.1	5.9	10.8	16.6	20.2	22.2	21.7	16.7	11.0	5.4	1.8	1.6	11.1	21.4	11.0	18.0	11.3
t_{5cm} max	(°C)	3.5	5.3	9.0	13.6	20.0	23.6	25.1	27.0	19.2	12.7	8.5	4.1	5.3	20.0	27.0	19.2	27.0	27.0
t_{5cm} min	(°C)	-1.2	-1.4	2.4	8.2	13.2	17.8	19.9	18.4	13.8	7.9	2.7	-0.2	-1.4	2.4	17.8	2.7	8.2	-1.4
t_{20cm}	(°C)	1.4	2.3	5.7	10.4	15.9	19.5	21.6	21.3	16.9	11.6	6.1	2.6	2.1	10.6	20.8	11.5	17.6	11.3
t_{20cm} max	(°C)	3.7	4.8	9.0	13.2	19.2	22.5	23.6	26.3	19.1	13.5	9.4	4.9	4.9	19.2	26.3	19.1	26.3	26.3
t_{20cm} min	(°C)	-0.3	-1.2	2.7	8.4	12.7	17.3	19.2	18.0	14.6	8.3	3.3	0.9	-1.2	2.7	17.3	3.3	8.4	-1.2
Oborina Precipitation																			
R	(mm)	38.9	42.0	50.9	63.1	71.8	96.5	91.2	88.0	84.7	80.6	77.0	58.3	138.0	185.8	275.8	242.2	495.4	843.1
Rmax	(mm)	145.4	124.6	96.6	152.4	144.2	199.9	230.9	258.1	169.7	208.4	181.5	169.9	261.8	314.7	441.8	414.2	767.1	1126.4
Rmin	(mm)	3.3	1.2	8.8	15.0	12.2	37.1	15.3	4.8	34.1	2.4	19.6	16.6	52.1	93.8	98.1	139.9	199.0	566.6
Rd_{max}	(mm)	28.3	45.7	51.9	70.3	45.2	61.7	72.5	131.3	63.8	51.8	52.2	39.5	45.7	70.3	131.3	63.8	131.3	131.3
Rd≥0.1mm	(d)	9.2	9.3	10.9	12.9	13.2	14.0	12.1	10.9	10.3	10.4	11.1	11.2	29.7	37.0	36.9	31.8	73.3	135.4
Rd≥1mm	(d)	5.8	5.8	7.0	8.2	9.3	10.7	8.9	7.7	8.0	7.1	7.7	7.7	19.4	24.6	27.2	22.8	52.8	93.9
Rd≥5mm	(d)	2.8	3.0	3.3	3.7	4.5	6.0	5.0	4.6	4.8	4.5	4.7	3.7	9.5	11.4	15.6	14.0	28.5	50.6
Rd≥10mm	(d)	1.2	1.3	1.7	2.2	2.5	3.3	3.1	2.9	2.9	2.7	2.5	1.9	4.3	6.4	9.3	8.1	16.8	28.2
Rd≥20mm	(d)	0.3	0.4	0.4	0.7	0.7	1.1	1.3	1.3	1.2	1.2	1.1	0.5	1.1	1.8	3.7	3.4	6.2	10.0
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.4	0.3	0.6	0.7
S≥1cm	(d)	13.5	9.9	3.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	3.7	9.4	33.1	3.9	0.0	3.7	0.5	40.4
S≥10cm	(d)	5.4	4.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.3	13.4	0.8	0.0	1.7	0.0	15.6
S≥30cm	(d)	0.7	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	1.8	0.2	0.0	0.2	0.0	2.1
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
S_{max}	(cm)	48	49	36	10	0	0	0	0	0	0	60	52	52	36	0	60	10	60
Isparavanje Evaporation																			
EV	(mm)				65.8	94.4	104.8	115.9	98.7	59.0	32.4							571.1	
EVmax	(mm)				92.0	127.3	154.5	140.0	160.5	85.9	45.5							160.5	
EVmin	(mm)				45.5	66.6	79.1	89.1	69.9	42.1	23.2							23.2	
PET	(mm)	15	21	36	59	93	119	135	121	77	44	24	16	52	188	375	145	604	760
ET	(mm)	15	21	36	58	91	114	124	103	73	43	24	16	52	185	341	140	563	718

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	83.9	79.6	73.8	69.2	70.1	71.7	72.3	76.2	79.4	81.3	83.4	84.8	82.8	71.0	73.4	81.4	73.2	77.1
Umin (%)	27.0	21.0	23.0	22.0	21.0	28.0	27.0	24.0	26.0	26.0	32.0	30.0	21.0	21.0	24.0	26.0	21.0	21.0
U>80% (d)	14.8	8.5	5.8	3.5	2.8	2.7	2.2	2.4	3.4	6.0	12.1	15.1	38.4	12.1	7.4	21.5	17.1	79.4
U≤30% (d)	0.1	0.2	0.8	1.8	0.4	0.1	0.2	0.4	0.1	0.1	0.0	0.0	0.3	3.0	0.6	0.2	2.9	4.1
e (hPa)	5.0	5.6	6.8	8.7	12.1	15.3	16.8	16.8	14.1	10.4	7.5	5.7	5.4	9.2	16.3	10.7	14.0	10.4
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	123	187	341	464	578	613	637	551	419	266	134	95	405	1384	1802	819	3264	4410
$G_{45°S}$ (MJm^{-2})	199	273	415	475	525	530	564	538	494	378	210	152	624	1415	1632	1081	3125	4752
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.2	3.3	4.6	5.9	7.3	7.9	8.9	8.0	6.4	4.7	2.7	1.9	2.5	5.9	8.3	4.6	7.4	5.3
SS_{rel} (%)	26	35	46	48	54	56	64	61	55	48	33	26	29	50	60	46	57	49
SS_{max} (h)	4.0	6.7	6.8	7.4	10.0	9.5	10.7	10.3	8.6	6.6	4.6	4.0	3.8	7.1	9.5	5.7	8.2	6.0
SS_{min} (h)	0.7	1.4	1.8	4.1	5.4	6.1	6.3	6.2	4.5	2.8	0.8	0.6	1.2	4.6	7.2	3.3	6.3	4.6
Naoblaka Cloudiness																		
N (10/10)	7.1	6.8	6.5	6.3	6.0	5.9	4.7	4.6	4.8	5.5	7.0	7.3	7.1	6.3	5.1	5.7	5.4	6.0
N_{max} (10/10)	9.0	8.0	8.9	7.8	7.3	7.1	6.8	5.9	6.3	7.5	8.9	9.0	8.3	7.1	6.0	7.1	6.4	6.8
N_{min} (10/10)	5.2	3.7	4.5	5.1	4.3	4.3	3.1	3.0	2.4	3.4	4.5	5.3	5.7	5.1	4.1	4.3	4.5	5.1
N<2/10	3.1	3.4	4.0	4.0	3.6	3.5	7.1	8.5	7.3	6.0	2.5	2.1	8.7	11.6	19.2	15.8	34.1	55.3
N<2/10 max	8	11	9	8	11	8	14	16	18	13	11	5	17	25	33	26	50	82
N<2/10 min	0	0	0	0	0	0	2	1	2	2	0	0	1	3	9	6	16	37
N>8/10	15.2	13.1	12.5	11.2	8.9	8.0	5.4	5.8	5.9	9.5	13.4	15.7	44.0	32.7	19.2	28.7	45.2	124.5
N>8/10 max	25	19	23	17	15	14	12	12	10	18	24	26	67	43	31	44	64	160
N>8/10 min	6	4	6	6	2	4	1	2	1	4	4	6	25	22	9	15	25	81
Meteorološke pojave Weather phenomena																		
magla/fog	10.1	6.6	3.4	1.3	1.4	1.5	1.6	3.0	7.7	9.5	8.3	8.6	25.3	6.1	6.1	25.5	16.5	62.9
magla/fog max	22	14	15	3	4	5	6	12	16	19	14	16	43	16	19	36	30	81
magla/fog min	2	0	0	0	0	0	0	0	1	2	1	2	11	1	1	13	7	40
tuča/hail	0.0	0.0	0.0	0.1	0.3	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.1	0.9	1.0
tuča/hail max	0	0	1	1	2	1	2	1	0	1	1	0	0	2	3	1	3	3
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.2	0.2	0.5	1.9	5.4	7.1	7.2	5.7	2.5	0.8	0.6	0.3	0.7	7.7	20.0	3.9	29.7	32.4
grm/thun max	1	1	3	5	11	13	14	12	5	4	4	2	3	15	33	9	45	50
grm/thun min	0	0	0	0	0	3	1	1	0	0	0	0	0	2	9	1	14	16
rosa/dew	2.5	4.9	15.3	23.0	24.7	24.3	26.3	28.3	27.7	26.3	15.4	5.4	12.7	63.1	78.8	69.4	154.3	224.1
rosa/dew max	15	22	29	28	30	29	31	31	30	31	25	17	46	83	88	81	171	275
rosa/dew min	0	0	0	18	16	18	18	25	25	16	2	0	0	41	65	55	140	189
mraz/frost	7.7	9.0	9.2	3.3	0.4	0.0	0.0	0.0	0.3	5.8	9.9	11.4	28.1	12.9	0.0	15.9	4.0	57.0
mraz/frost max	25	19	16	8	3	0	0	0	2	18	20	21	57	23	0	29	11	91
mraz/frost min	0	0	2	0	0	0	0	0	0	0	5	0	6	5	0	6	0	29
inje/rime	3.7	1.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	3.1	8.3	0.2	0.0	0.9	0.0	9.4
inje/rime max	15	6	2	0	0	0	0	0	0	1	5	10	18	2	0	6	0	20
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tlak zraka Air pressure																		
p (hPa)	999.1	997.1	996.0	993.6	995.0	995.5	996.4	996.4	998.4	999.5	997.8	998.3	998.1	994.8	996.1	998.6	995.9	996.9
p max (hPa)	1023.1	1021.2	1020.2	1013.7	1011.2	1009.8	1008.9	1008.3	1014.8	1018.3	1019.2	1027.9	1027.9	1020.2	1009.8	1019.2	1014.8	1027.9
p min (hPa)	966.4	953.5	967.8	967.7	973.5	981.8	980.5	976.7	976.5	966.2	965.8	951.0	951.0	967.7	976.7	965.8	967.7	951.0
Vjetar Wind																		
v_h (ms^{-1})	2.4	2.6	2.9	3.2	2.7	2.4	2.0	1.9	1.9	2.1	2.3	2.6	2.5	2.9	2.1	2.1	2.4	2.4
v_h max (ms^{-1})	13.8	16.8	13.2	13.8	13.2	10.7	9.5	10.0	9.9	11.1	14.2	14.4	16.8	13.8	10.7	14.2	13.8	16.8
v_{max} (ms^{-1})	25.3	30.1	22.4	24.0	24.4	21.0	21.9	21.7	21.1	21.7	24.8	23.3	30.1	24.4	21.9	24.8	24.4	30.1
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-9.6	-9.2	-3.1	4.8	12.8	17.3	19.4	15.6	8.8	2.3	-2.9	-7.3	-8.7	4.8	17.4	2.7	13.1	4.1
$PhET_{14h}$ (°C)	-2.4	-1.5	7.9	14.2	20.9	25.8	28.8	28.8	22.8	14.1	4.6	-1.4	-1.8	14.3	27.8	13.8	23.5	13.5
$PhET_{21h}$ (°C)	-8.2	-7.6	-1.4	3.8	9.0	12.6	14.2	13.3	9.8	4.2	-1.5	-6.2	-7.3	3.8	13.4	4.2	10.5	3.5

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	84.1	78.6	73.2	69.1	69.6	70.9	71.7	74.8	79.3	81.7	84.7	85.7	82.8	70.6	72.5	81.9	72.6	76.9
Umin (%)	27.0	21.0	26.0	22.0	23.0	28.0	28.0	22.0	27.0	26.0	32.0	37.0	21.0	22.0	22.0	26.0	22.0	21.0
U>80% (d)	14.1	7.3	5.1	3.2	2.7	2.9	2.3	2.0	3.8	6.6	12.2	15.4	36.7	11.1	7.2	22.6	17.0	77.6
U≤30% (d)	0.1	0.3	0.8	1.6	0.7	0.2	0.1	1.0	0.1	0.2	0.0	0.0	0.4	3.1	1.3	0.3	3.7	5.1
e (hPa)	5.3	5.6	6.8	8.7	12.2	15.2	17.0	17.0	14.0	10.4	7.5	5.9	5.6	9.2	16.4	10.6	14.0	10.5
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.5	4.0	4.8	6.0	7.7	8.2	9.0	8.4	6.5	4.5	2.8	2.1	2.8	6.2	8.5	4.6	7.6	5.5
SS_{rel} (%)	30	43	45	49	57	59	65	65	57	47	34	29	34	51	63	47	59	51
SS_{max} (h)	4.0	6.8	6.5	7.5	10.0	11.6	10.7	11.5	9.1	6.6	4.6	4.0	3.9	7.6	10.3	5.7	9.2	6.8
SS_{min} (h)	0.5	1.4	2.7	4.1	5.4	6.1	6.3	6.6	4.1	3.1	0.8	0.5	1.2	4.6	7.2	3.3	6.3	4.6
Naoblaka Cloudiness																		
N (10/10)	6.9	6.2	6.2	6.3	5.8	5.7	4.7	4.4	5.0	5.7	6.9	7.1	6.8	6.1	4.9	5.9	5.3	5.9
N_{max} (10/10)	9.1	8.0	8.1	7.8	7.3	7.1	6.8	5.7	7.5	7.3	8.9	9.4	8.1	6.9	6.0	7.1	6.4	6.8
N_{min} (10/10)	5.2	3.7	4.5	5.1	3.8	3.5	3.1	2.1	2.9	3.4	4.5	5.3	5.3	5.1	3.9	4.3	4.4	5.1
N<2/10	3.3	4.4	4.4	3.4	4.1	3.7	6.8	9.1	6.5	5.0	2.9	2.5	10.1	11.9	19.6	14.3	33.6	56.0
N<2/10 max	8	11	9	8	11	11	14	17	14	13	11	7	19	25	33	26	52	82
N<2/10 min	0	0	1	0	0	1	1	3	0	2	0	0	1	4	10	6	16	37
N>8/10	14.4	11.1	11.4	10.7	8.1	7.4	5.0	5.0	6.0	9.7	13.4	15.2	40.7	30.2	17.3	29.1	42.1	117.3
N>8/10 max	27	18	21	17	14	14	12	8	15	16	24	28	64	41	27	44	64	160
N>8/10 min	6	2	7	6	2	2	1	0	1	4	4	6	24	16	9	15	21	81
Meteorološke pojave Weather phenomena																		
magla/fog	9.3	5.6	3.3	1.5	1.7	1.4	1.7	3.1	7.1	9.5	8.0	8.2	23.1	6.4	6.1	24.6	16.4	60.3
magla/fog max	22	13	15	4	5	5	6	12	16	20	14	14	37	16	19	36	30	81
magla/fog min	2	0	0	0	0	0	0	0	1	3	2	1	11	2	0	11	6	28
tuča/hail	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.7	0.7
tuča/hail max	0	0	0	1	2	1	2	1	1	0	0	0	0	2	3	1	3	3
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.3	0.3	0.6	1.5	5.0	6.7	7.2	5.5	2.6	1.4	0.4	0.3	0.9	7.0	19.4	4.4	28.5	31.7
grm/thun max	1	2	2	4	11	12	14	12	5	5	2	2	3	15	33	9	45	50
grm/thun min	0	0	0	0	0	3	1	1	0	0	0	0	0	2	10	1	14	16
rosa/dew	3.6	6.3	16.8	22.9	24.0	22.2	25.0	27.0	26.8	25.1	15.1	5.5	15.3	63.7	74.2	66.9	147.8	220.2
rosa/dew max	15	22	29	28	30	29	31	31	30	31	26	17	46	83	88	81	171	275
rosa/dew min	0	0	0	15	16	8	16	10	21	16	1	0	1	41	42	41	103	146
mraz/frost	10.2	10.6	9.5	3.3	0.2	0.0	0.0	0.0	0.3	5.7	9.7	12.2	33.0	13.0	0.0	15.7	3.8	61.7
mraz/frost max	25	20	16	8	2	0	0	0	2	12	20	21	57	23	0	29	11	91
mraz/frost min	0	0	2	0	0	0	0	0	0	1	1	0	13	5	0	6	0	35
inje/rime	2.4	1.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	2.6	6.5	0.2	0.0	0.9	0.0	7.6
inje/rime max	11	7	2	0	0	0	0	0	0	1	5	10	18	2	0	6	0	18
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1000.4	998.7	996.9	993.6	995.3	995.6	996.2	996.8	998.0	999.3	998.7	999.4	999.5	995.2	996.2	998.6	995.9	997.4
p max (hPa)	1024.1	1021.2	1020.2	1013.8	1011.2	1011.0	1008.9	1008.3	1014.8	1018.3	1019.2	1022.1	1024.1	1020.2	1011.0	1019.2	1014.8	1024.1
p min (hPa)	966.4	953.5	967.6	972.5	970.5	979.6	980.5	976.7	972.9	969.0	969.8	951.0	951.0	967.6	976.7	969.0	970.5	951.0
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.5	-8.5	-3.3	4.4	12.8	17.3	19.3	16.2	8.8	2.4	-3.2	-6.9	-7.9	4.6	17.6	2.7	13.1	4.2
$PhET_{14h}$ (°C)	-1.6	-0.3	7.9	13.6	20.7	25.4	28.5	29.1	21.9	13.5	4.2	-0.9	-1.0	14.1	27.7	13.2	23.2	13.5
$PhET_{21h}$ (°C)	-7.2	-6.6	-1.3	3.5	8.9	12.4	14.3	13.8	9.6	4.0	-1.9	-5.9	-6.6	3.7	13.5	3.9	10.4	3.6

Zagreb-Maksimir

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.8	1.9	5.9	10.6	15.3	18.5	20.1	19.3	15.8	10.5	5.3	0.9	0.7	10.6	19.3	10.5	16.6	10.3
T_{max}	(°C)	18.5	20.8	26.0	29.4	30.8	34.3	37.5	35.1	32.1	28.3	25.4	22.5	22.5	30.8	37.5	32.1	37.5	37.5
T_{min}	(°C)	-24.0	-20.2	-18.3	-4.4	-1.5	2.5	5.4	3.7	-0.6	-5.6	-13.5	-19.8	-24.0	-18.3	2.5	-13.5	-4.4	-24.0
t_{max}	(°C)	2.6	6.0	11.3	16.3	21.1	24.2	26.3	25.6	22.1	16.1	9.2	3.9	4.2	16.2	25.3	15.8	22.6	15.4
t_{min}	(°C)	-4.2	-1.9	1.2	5.1	9.2	12.6	14.1	13.7	10.6	5.9	1.6	-2.2	-2.7	5.1	13.5	6.0	10.9	5.5
$t_{min\ 5cm}$	(°C)	-15.9	-12.9	-9.1	-3.9	-0.1	4.4	6.3	5.6	1.8	-3.7	-8.5	-13.4	-19.0	-9.1	3.6	-8.5	-3.9	-18.6
$t_{min\ 5cm}$ min	(°C)	-26.4	-25.6	-19.6	-6.5	-4.6	-0.5	2.4	1.0	-3.3	-9.0	-18.0	-24.0	-26.4	-19.6	-0.5	-18.0	-6.5	-26.4
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	4.5	1.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8	8.0	0.4	0.0	0.2	0.0	8.6
t_{max}<0°C	(d)	9.0	3.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	6.5	18.7	0.8	0.0	0.7	0.0	20.3
t_{min}<0°C	(d)	24.6	18.7	11.7	2.1	0.2	0.0	0.0	0.0	0.1	2.5	10.8	21.6	64.6	14.0	0.0	13.3	2.4	92.2
t_{max}≥25°C	(d)	0.0	0.0	0.1	0.9	5.8	13.4	20.0	17.3	7.9	0.6	0.0	0.0	0.0	6.7	50.7	8.5	65.2	65.9
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	1.9	4.9	4.2	0.6	0.0	0.0	0.0	0.0	0.1	11.1	0.6	11.8	11.8
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.3
$t_{min\ 5cm}$<0°C	(d)	26.9	21.0	16.5	6.2	0.7	0.1	0.0	0.0	0.2	5.8	13.3	22.9	69.9	23.4	0.1	19.4	7.2	113.6
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	6.2	17.9	75.4	171.4	314.1	402.4	470.3	453.6	339.7	188.5	58.5	13.7	37.8	560.9	1326.3	586.7	2151.5	2511.7
$t_{5°C}$ max	(°C)	35.5	91.5	149.8	272.5	398.7	473.5	543.1	502.1	438.9	311.0	174.1	73.6	104.5	685.3	1434.9	720.5	2378.4	2728.6
$t_{5°C}$ min	(°C)	0.0	0.0	28.7	106.5	247.6	334.6	418.4	367.3	255.6	68.4	6.4	0.0	0.0	411.3	1204.5	445.9	1893.4	2194.5
$t_{10°C}$	(°C)	0.3	1.4	12.4	52.3	162.4	252.5	315.4	298.6	190.3	63.6	10.0	1.6	3.3	227.0	866.4	263.8	1271.3	1360.6
$t_{10°C}$ max	(°C)	3.9	11.4	42.0	122.4	243.7	323.5	388.2	347.1	290.3	167.3	59.3	29.1	29.3	323.3	975.0	377.0	1480.4	1556.7
$t_{10°C}$ min	(°C)	0.0	0.0	0.1	14.6	95.0	187.6	263.4	212.3	105.8	1.9	0.0	0.0	0.0	122.6	744.5	141.4	1042.6	1087.5
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.2	2.0	5.9	11.7	17.5	21.3	23.5	22.2	17.7	11.6	5.7	1.6	1.2	11.7	22.4	11.7	19.0	11.7
t_{5cm} max	(°C)	3.2	5.8	10.0	15.4	20.8	24.7	26.6	24.8	21.2	15.1	9.4	4.3	5.8	20.8	26.6	21.2	26.6	26.6
t_{5cm} min	(°C)	-5.8	-1.1	2.4	9.3	14.2	19.0	21.3	19.2	15.2	7.7	3.2	-1.3	-5.8	2.4	19.0	3.2	9.3	-5.8
t_{20cm}	(°C)	1.3	2.6	5.8	11.0	16.4	20.2	22.7	22.3	18.3	12.9	7.2	2.8	2.2	11.1	21.7	12.8	18.5	12.0
t_{20cm} max	(°C)	3.7	5.6	9.3	14.0	18.9	23.3	24.8	24.6	21.1	16.1	10.2	5.6	5.6	18.9	24.8	21.1	24.8	24.8
t_{20cm} min	(°C)	-4.8	-0.3	2.7	9.0	13.5	18.6	20.6	19.3	16.4	9.5	4.6	-1.8	-4.8	2.7	18.6	4.6	9.0	-4.8
Oborina Precipitation																			
R	(mm)	46.4	42.0	55.8	63.6	78.7	100.1	83.4	94.6	79.3	69.2	81.2	58.0	147.2	198.1	278.1	229.6	499.7	852.2
Rmax	(mm)	159.9	77.0	101.3	140.6	204.8	184.2	186.4	262.6	141.1	219.1	258.8	136.4	251.4	310.9	511.4	407.0	743.6	1092.2
Rmin	(mm)	0.5	5.5	4.8	14.9	16.9	42.6	25.7	8.0	20.3	0.2	8.7	16.0	52.6	75.8	136.4	105.9	309.3	558.2
Rd_{max}	(mm)	29.9	32.6	41.3	32.8	50.4	66.5	83.7	85.0	86.1	53.5	68.1	40.7	40.7	50.4	85.0	86.1	86.1	86.1
Rd≥0.1mm	(d)	11.1	10.3	11.9	12.9	13.5	13.6	10.8	10.5	9.6	9.7	11.4	11.3	32.6	38.2	35.0	30.7	70.9	136.5
Rd≥1mm	(d)	7.3	6.9	8.3	8.6	9.8	10.5	7.9	8.4	7.0	6.5	8.3	8.0	22.1	26.7	26.8	21.8	52.1	97.3
Rd≥5mm	(d)	3.0	3.0	3.7	4.3	5.0	5.8	5.2	5.1	4.5	4.0	4.7	3.8	10.0	13.0	16.1	13.3	29.9	52.2
Rd≥10mm	(d)	1.4	1.2	1.9	2.1	2.6	3.1	3.1	3.4	3.2	2.4	2.9	1.9	4.7	6.6	9.7	8.4	17.6	29.3
Rd≥20mm	(d)	0.2	0.2	0.3	0.5	0.8	1.2	1.0	1.4	1.1	1.0	1.0	0.4	0.9	1.5	3.6	3.1	6.0	9.2
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.4	0.2	0.5	0.6
S≥1cm	(d)	13.4	8.1	2.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.6	8.2	29.7	2.9	0.0	2.6	0.1	35.2
S≥10cm	(d)	6.3	3.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.1	12.4	0.7	0.0	0.6	0.0	13.6
S≥30cm	(d)	0.7	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8	0.1	0.0	0.0	0.0	2.0
S≥50cm	(d)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
S_{max}	(cm)	40	51	37	8	0	0	0	0	0	0	35	56	56	37	0	35	8	56
Isparavanje Evaporation																			
EV	(mm)				61.9	88.5	97.0	114.9	93.1	60.0	31.3							546.7	
EVmax	(mm)				94.7	116.9	117.0	149.2	127.5	82.7	55.5							149.2	
EVmin	(mm)				41.7	55.5	72.7	94.3	65.9	48.1	17.2							17.2	
PET	(mm)	12	18	31	52	79	101	117	103	69	39	22	14	44	162	321	130	521	657
ET	(mm)	12	18	31	52	78	100	112	97	68	38	22	14	44	161	309	128	507	642

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	0.3	2.3	6.4	10.7	15.8	18.8	20.6	20.1	15.9	10.5	5.0	1.4	1.3	11.0	19.8	10.5	17.0	10.7
T_{max}	(°C)	18.5	22.0	26.0	28.3	31.0	36.0	36.1	38.5	31.7	28.3	23.4	22.5	22.5	31.0	38.5	31.7	38.5	38.5
T_{min}	(°C)	-22.6	-20.2	-15.1	-3.0	-1.5	3.2	6.2	3.7	-0.5	-5.6	-13.5	-18.0	-22.6	-15.1	3.2	-13.5	-3.0	-22.6
t_{max}	(°C)	3.7	6.8	11.9	16.3	21.5	24.5	26.7	26.3	22.1	15.8	8.9	4.6	5.0	16.6	25.8	15.6	22.9	15.8
t_{min}	(°C)	-3.0	-1.8	1.6	5.2	9.8	13.0	14.7	14.4	10.8	6.2	1.4	-1.7	-2.2	5.5	14.0	6.1	11.3	5.9
$t_{min\ 5cm}$	(°C)	-4.4	-3.9	-0.7	2.9	7.2	10.9	12.6	12.1	8.5	4.2	0.1	-3.1	-3.8	3.1	11.9	4.2	9.0	3.9
$t_{min\ 5cm}$ min	(°C)	-26.4	-25.6	-19.1	-7.6	-4.6	0.4	3.5	1.0	-3.3	-9.0	-18.0	-21.9	-26.4	-19.1	0.4	-18.0	-7.6	-26.4
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	2.5	1.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5	5.8	0.2	0.0	0.2	0.0	6.2
t_{max}<0°C	(d)	7.1	2.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	5.2	15.4	0.6	0.0	1.1	0.0	16.9
t_{min}<0°C	(d)	23.2	18.8	10.3	2.1	0.1	0.0	0.0	0.0	0.0	2.5	11.3	20.5	62.9	12.5	0.0	13.8	2.2	88.8
t_{max}≥25°C	(d)	0.0	0.0	0.1	0.7	7.1	14.1	21.3	20.0	8.0	0.8	0.0	0.0	0.0	7.9	55.4	8.8	71.2	72.1
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.3	2.5	5.6	5.7	0.5	0.0	0.0	0.0	0.0	0.3	13.8	0.5	14.6	14.6
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.0	0.9	0.9
$t_{min\ 5cm}$<0°C	(d)	26.1	21.6	16.3	7.1	0.7	0.0	0.0	0.0	0.3	6.3	14.2	22.3	70.4	24.0	0.0	20.7	8.0	114.8
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	10.5	21.6	83.3	174.5	329.2	413.8	485.8	476.3	343.0	189.9	55.8	16.7	48.9	586.9	1375.8	588.7	2222.4	2600.4
$t_{5°C}$ max	(°C)	35.5	75.6	172.9	281	407.6	493.2	555.7	601.9	438.9	273.1	140.1	73.6	104.5	779.2	1549.5	786.2	2590.4	3198.4
$t_{5°C}$ min	(°C)	0.0	0.0	23.5	106.5	221.6	351.6	421.4	367.3	255.6	68.4	6.4	0.0	9.2	411.3	1204.5	445.9	1893.4	2194.5
$t_{10°C}$	(°C)	0.3	1.5	15.1	55.3	176.6	263.8	330.8	321.2	193.5	68.1	9.0	2.1	3.9	247.0	915.8	270.7	1341.3	1437.5
$t_{10°C}$ max	(°C)	3.9	10.9	47.0	141.4	252.6	343.2	400.7	446.8	290.3	128.3	41.0	29.1	29.3	391.5	1089.5	387.0	1685.7	1863.1
$t_{10°C}$ min	(°C)	0.0	0.0	0.6	19.9	76.6	201.6	266.4	212.3	105.8	1.9	0.0	0.0	0.0	122.6	744.5	141.4	1042.6	1087.5
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.8	2.3	6.5	11.7	18.1	21.8	23.9	23.1	18.0	11.7	5.6	1.9	1.6	12.1	22.9	11.8	19.4	12.1
t_{5cm} max	(°C)	3.2	5.8	10.0	15.0	22.3	26.1	26.6	28.5	21.2	13.7	9.1	4.5	5.8	22.3	28.5	21.2	28.5	28.5
t_{5cm} min	(°C)	-1.4	-1.1	2.4	9.1	13.7	19.3	21.1	19.2	14.8	7.7	3.2	-0.6	-1.4	2.4	19.2	3.2	9.1	-1.4
t_{20cm}	(°C)	1.9	2.8	6.3	11.1	16.9	20.6	22.9	22.9	18.5	13.1	7.2	3.3	2.6	11.4	22.1	12.9	18.8	12.3
t_{20cm} max	(°C)	3.8	5.6	9.3	13.9	20.4	24.2	24.9	28.0	21.4	14.7	10.4	5.9	5.9	20.4	28.0	21.4	28.0	28.0
t_{20cm} min	(°C)	0.1	-0.4	2.7	9.0	13.5	18.7	20.6	19.3	16.0	9.5	4.6	0.9	-0.4	2.7	18.7	4.6	9.0	-0.4
Oborina Precipitation																			
R	(mm)	43.2	38.9	52.6	59.3	72.6	95.3	77.4	92.3	85.8	82.9	80.1	59.6	139.3	184.5	265.0	248.8	482.8	840.1
Rmax	(mm)	159.9	77.0	105.0	140.6	204.8	184.2	186.4	262.6	202.2	219.1	163.3	136.4	251.4	310.9	511.4	448.8	743.6	1090.5
Rmin	(mm)	3.3	1.5	8.8	15.2	16.9	42.6	25.7	10.0	21.9	3.5	8.7	10.9	52.6	104.0	135.9	105.9	242.6	558.2
Rd_{max}	(mm)	29.9	31.1	42.9	32.8	44.7	66.5	83.7	85.0	86.1	77.3	55.7	40.7	40.7	44.7	85.0	86.1	86.1	86.1
Rd≥0.1mm	(d)	9.8	9.4	11.0	13.0	13.5	13.7	11.2	10.4	10.4	10.9	11.3	11.0	30.3	37.5	35.3	32.6	72.2	135.6
Rd≥1mm	(d)	6.3	6.4	7.5	8.5	9.3	10.3	8.0	7.8	7.9	7.6	8.2	7.7	20.5	25.3	26.1	23.6	51.8	95.4
Rd≥5mm	(d)	2.9	2.9	3.4	4.1	4.5	5.5	4.9	4.5	4.9	4.4	4.8	3.9	9.5	12.0	15.0	14.0	28.4	50.7
Rd≥10mm	(d)	1.5	1.2	1.8	2.0	2.4	3.1	3.0	3.1	3.3	2.9	2.8	2.1	4.6	6.2	9.2	9.0	16.8	29.1
Rd≥20mm	(d)	0.3	0.2	0.3	0.4	0.7	1.2	0.9	1.4	1.2	1.4	1.2	0.6	0.9	1.3	3.5	3.7	5.7	9.5
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.2	0.4	0.5
S≥1cm	(d)	10.3	7.1	1.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.9	6.7	24.5	2.0	0.0	2.9	0.2	29.0
S≥10cm	(d)	3.8	3.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.8	8.7	0.7	0.0	1.1	0.0	10.5
S≥30cm	(d)	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.1	0.0	0.0	0.0	0.8
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	36	41	37	16	0	0	0	0	0	0	50	45	45	37	0	50	16	50
Isparavanje Evaporation																			
EV	(mm)				58.1	84.9	96.5	112.4	97.0	60.3	30.7							539.8	
EVmax	(mm)				78.6	116.9	121.0	144.8	147.4	89.0	55.5							147.4	
EVmin	(mm)				37.8	55.5	64.6	91.0	65.9	36.5	17.2							17.2	
PET	(mm)	14	20	34	54	84	107	124	113	72	40	22	15	49	172	344	134	554	699
ET	(mm)	14	20	34	54	83	104	116	102	68	39	22	15	49	171	322	129	527	671

1961–1990	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	83.9	78.8	72.7	68.8	69.7	71.2	70.4	74.3	78.7	81.5	83.9	85.1	82.6	70.4	72.0	81.4	72.2	76.6
Umin (%)	25.0	20.0	19.0	22.0	23.0	25.0	26.0	23.0	27.0	18.0	28.0	27.0	20.0	19.0	23.0	18.0	22.0	18.0
U>80% (d)	14.3	7.9	4.5	3.0	2.3	2.2	1.8	2.2	2.7	6.3	12.0	15.9	38.0	9.9	6.2	21.0	14.2	75.0
U≤30% (d)	0.0	0.3	1.2	1.9	0.6	0.1	0.1	0.3	0.0	0.1	0.1	0.1	0.4	3.8	0.5	0.2	3.1	4.9
e (hPa)	5.2	5.8	6.9	8.8	12.2	15.4	16.7	16.8	14.3	10.7	7.8	5.8	5.6	9.3	16.3	10.9	14.0	10.5
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	117	183	336	470	607	639	670	570	415	269	131	87	388	1413	1879	814	3371	4494
$G_{45°S}$ (MJm^{-2})	180	260	403	480	550	550	589	557	484	379	197	128	568	1433	1696	1060	3209	4756
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.7	3.0	4.3	5.7	7.1	7.6	8.8	8.0	6.2	4.3	2.1	1.4	2.0	5.7	8.2	4.2	7.3	5.0
SS_{rel} (%)	21	32	40	45	51	53	62	61	53	43	26	20	25	46	59	43	55	45
SS_{max} (h)	3.9	6.3	6.8	7.8	9.8	9.7	10.7	10.1	8.8	6.6	4.3	2.9	3.2	7.0	9.4	5.2	8.5	5.8
SS_{min} (h)	0.4	1.3	1.4	4.0	4.4	5.5	6.0	6.1	4.2	2.3	0.5	0.3	1.0	4.2	6.9	3.0	6.0	4.2
Naoblaka Cloudiness																		
N (10/10)	7.5	6.9	6.5	6.2	5.9	5.8	4.6	4.6	5.0	5.9	7.4	7.7	7.4	6.2	5.0	6.1	5.3	6.2
N_{max} (10/10)	9.6	8.6	8.9	7.4	7.7	7.0	6.5	6.0	6.4	7.9	9.4	9.4	8.6	7.2	5.8	7.1	6.1	6.8
N_{min} (10/10)	5.1	3.9	4.3	4.4	4.3	4.9	2.9	2.7	2.3	3.4	5.4	5.6	5.9	5.0	4.3	5.0	4.6	5.3
N<2/10	2.1	2.9	3.8	3.6	3.4	3.5	6.6	8.4	6.4	5.0	1.8	1.8	6.7	10.8	18.5	13.2	31.9	49.2
N<2/10 max	8	10	11	8	11	7	11	17	18	11	7	6	18	27	28	26	52	79
N<2/10 min	0	0	0	0	0	0	1	2	1	0	0	0	1	4	11	3	18	28
N>8/10	17.2	13.0	12.6	10.1	8.2	7.8	4.6	5.5	6.6	10.4	15.8	17.9	48.1	31.0	17.9	32.8	42.9	129.8
N>8/10 max	29	21	23	15	17	14	12	11	11	21	27	27	70	46	27	47	61	169
N>8/10 min	7	3	5	3	4	5	1	1	2	3	5	9	30	19	11	21	30	88
Meteorološke pojave Weather phenomena																		
magla/fog	12.0	5.9	2.2	0.8	0.8	0.8	0.6	1.4	4.7	8.6	9.1	11.3	29.2	3.9	2.8	22.5	9.2	58.4
magla/fog max	21	13	10	4	3	4	4	4	9	19	14	23	41	10	7	34	16	78
magla/fog min	1	1	0	0	0	0	0	0	0	1	3	3	12	0	0	9	3	39
tuča/hail	0.0	0.1	0.0	0.0	0.3	0.3	0.2	0.2	0.1	0.0	0.1	0.0	0.1	0.3	0.8	0.2	1.2	1.4
tuča/hail max	0	1	1	0	2	2	2	2	1	1	2	0	1	2	4	2	6	6
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.5	0.6	0.6	2.2	5.8	8.4	7.5	7.1	3.4	1.3	1.2	0.5	1.6	8.5	22.9	5.9	34.3	38.9
grm/thun max	2	3	2	6	10	13	14	11	10	4	3	2	5	17	35	12	48	52
grm/thun min	0	0	0	0	2	3	2	1	0	0	0	0	0	3	15	1	26	30
rosa/dew	1.9	3.4	11.7	19.1	23.3	22.9	25.5	26.5	26.3	25.1	12.0	3.6	8.9	54.1	75.0	63.5	143.7	201.5
rosa/dew max	14	21	26	26	29	27	31	31	30	29	23	11	27	79	85	75	160	239
rosa/dew min	0	0	1	8	17	16	17	19	18	17	2	0	0	35	59	49	115	147
mraz/frost	9.5	9.8	10.5	3.5	0.4	0.0	0.0	0.0	0.2	5.2	9.5	11.9	31.2	14.4	0.0	14.9	4.1	60.5
mraz/frost max	24	19	22	11	4	0	0	0	1	16	20	21	56	29	0	25	11	107
mraz/frost min	0	0	2	0	0	0	0	0	0	0	3	1	6	6	0	5	0	22
inje/rime	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.0	5.1	0.0	0.0	0.3	0.0	5.4
inje/rime max	15	7	1	0	0	0	0	0	0	0	3	7	18	1	0	3	0	18
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1004.4	1002.1	1001.0	998.4	999.7	1000.2	1001.1	1001.0	1003.2	1004.5	1003.0	1003.5	1003.3	999.7	1000.8	1003.6	1000.6	1001.8
p max (hPa)	1028.4	1026.2	1025.3	1018.7	1015.4	1014.5	1013.8	1011.9	1019.3	1022.0	1024.6	1032.0	1032.0	1025.3	1014.5	1024.6	1019.3	1032.0
p min (hPa)	971.3	957.9	971.8	973.2	976.9	987.4	984.7	981.6	980.4	970.6	972.4	955.0	955.0	971.8	981.6	970.6	973.2	955.0
Vjetar Wind																		
v_h (ms^{-1})	1.4	1.8	2.1	2.2	1.8	1.6	1.5	1.4	1.3	1.3	1.3	1.6	1.6	2.0	1.5	1.3	1.6	1.6
v_h max (ms^{-1})	10.9	17.9	12.3	9.8	8.2	8.6	16.9	8.5	9.2	8.3	9.0	12.5	17.9	12.3	16.9	9.2	16.9	17.9
v_{max} (ms^{-1})	20.8	29.2	19.8	19.4	16.2	21.0	20.2	23.2	23.3	16.7	20.0	26.6	29.2	19.8	23.2	23.3	23.3	29.2
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-7.7	-7.5	-1.7	6.9	15.0	19.8	22.1	18.7	10.5	3.9	-1.3	-5.5	-6.9	6.8	20.2	4.4	15.5	6.1
$PhET_{14h}$ (°C)	-1.3	-0.3	9.3	15.7	22.3	27.4	30.4	29.6	24.1	15.8	6.0	-0.3	-0.6	15.8	29.2	15.3	24.9	14.9
$PhET_{21h}$ (°C)	-6.7	-6.3	-0.7	4.1	8.9	12.6	14.0	13.2	9.8	4.7	-0.4	-4.9	-6.0	4.1	13.3	4.7	10.4	4.0

1971–2000	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	82.5	76.4	70.3	67.5	68.3	69.7	69.1	72.1	77.7	81.3	83.6	84.8	81.3	68.7	70.3	80.9	70.7	75.3
Umin (%)	25.0	20.0	19.0	20.0	24.0	23.0	25.0	23.0	24.0	18.0	28.0	30.0	20.0	19.0	23.0	18.0	20.0	18.0
U>80% (d)	12.8	5.8	3.7	2.8	2.4	2.2	1.8	1.7	2.9	6.9	11.8	15.5	34.1	8.9	5.7	21.6	13.8	70.3
U≤30% (d)	0.1	0.6	1.6	2.0	0.7	0.4	0.2	1.0	0.1	0.1	0.1	0.0	0.7	4.3	1.7	0.3	4.4	6.9
e (hPa)	5.4	5.7	6.8	8.7	12.3	15.3	16.9	17.0	14.2	10.7	7.6	6.0	5.7	9.3	16.4	10.8	14.1	10.6
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.8	3.5	4.6	5.6	7.4	7.8	8.9	8.3	6.3	4.0	2.1	1.6	2.3	5.9	8.4	4.1	7.4	5.2
SS_{rel} (%)	23	39	43	45	54	55	63	63	54	41	26	23	29	48	60	42	56	47
SS_{max} (h)	3.9	6.3	6.6	6.9	9.8	11.6	10.8	11.2	9.2	6.6	4.3	2.9	3.3	7.4	10.4	5.2	9.0	6.4
SS_{min} (h)	0.3	1.3	2.7	4.0	4.4	5.5	6.0	6.4	4.1	2.4	0.5	0.3	1.0	4.2	6.9	3.0	6.0	4.2
Naoblaka Cloudiness																		
N (10/10)	7.3	6.4	6.2	6.3	5.7	5.7	4.7	4.4	5.2	6.2	7.4	7.5	7.1	6.1	4.9	6.3	5.3	6.1
N_{max} (10/10)	9.6	8.6	8.0	7.4	7.7	7.0	6.5	5.8	7.4	7.6	9.4	9.5	8.6	7.2	5.8	7.4	6.1	6.8
N_{min} (10/10)	5.1	3.5	4.5	5.2	4.2	3.7	2.9	2.1	2.9	3.4	5.4	5.0	5.4	5.0	3.9	5.0	4.3	5.3
N<2/10	2.4	3.8	4.0	2.8	4.0	3.1	6.5	8.2	5.8	4.3	1.6	2.2	8.5	11.0	17.9	11.6	30.6	49.0
N<2/10 max	8	11	10	7	11	9	11	16	14	11	7	10	20	27	27	26	49	72
N<2/10 min	0	0	0	0	0	0	1	0	0	0	0	0	1	3	6	2	14	24
N>8/10	16.2	11.4	11.2	9.9	7.7	7.2	4.3	5.0	7.0	11.1	15.6	17.0	44.6	28.7	16.5	33.7	41.0	123.5
N>8/10 max	29	21	20	15	17	14	9	10	15	17	27	29	70	46	27	45	61	169
N>8/10 min	7	3	5	3	0	1	1	0	1	3	5	8	25	17	3	21	18	81
Meteorološke pojave Weather phenomena																		
magla/fog	9.6	3.9	2.0	0.8	0.7	0.7	0.6	1.0	4.0	7.9	8.7	10.7	24.2	3.5	2.3	20.6	7.8	50.6
magla/fog max	21	11	10	4	3	4	4	3	8	14	14	23	41	10	7	32	15	78
magla/fog min	1	0	0	0	0	0	0	0	0	1	3	3	9	0	0	9	1	31
tuča/hail	0.0	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.1	0.0	0.1	0.0	0.1	0.4	0.6	0.2	1.0	1.3
tuča/hail max	0	1	1	1	1	2	2	1	1	1	2	0	1	2	3	2	4	4
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.5	0.8	0.7	2.0	5.4	8.0	7.5	6.9	3.4	2.0	1.2	0.6	1.9	8.1	22.3	6.6	33.2	38.9
grm/thun max	2	3	2	5	10	13	14	13	8	8	4	2	5	14	35	11	47	50
grm/thun min	0	0	0	0	2	3	2	3	0	0	0	0	0	3	14	1	19	29
rosa/dew	3.3	4.8	13.3	19.6	23.4	22.7	25.4	25.8	25.9	24.7	12.8	4.2	12.3	56.3	74.0	63.4	142.9	206.0
rosa/dew max	15	21	27	26	29	27	31	30	30	29	25	14	32	79	85	75	160	248
rosa/dew min	0	0	1	8	17	16	20	16	17	19	3	0	0	35	53	49	115	147
mraz/frost	11.8	12.0	10.5	3.5	0.3	0.0	0.0	0.0	0.2	5.0	10.0	13.5	37.3	14.3	0.0	15.2	4.0	66.8
mraz/frost max	24	23	22	12	2	0	0	0	1	12	20	26	56	29	0	25	12	107
mraz/frost min	0	2	2	0	0	0	0	0	0	1	2	0	17	5	0	4	0	40
inje/rime	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.2	4.7	0.0	0.0	0.5	0.0	5.3
inje/rime max	8	7	1	0	0	0	0	0	0	0	4	8	18	1	0	4	0	18
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1005.6	1003.6	1001.7	998.3	999.9	1000.2	1000.7	1001.3	1002.6	1004.1	1003.7	1004.5	1004.6	999.9	1000.7	1003.5	1000.5	1002.2
p max (hPa)	1029.3	1026.2	1025.3	1018.8	1015.4	1015.5	1013.8	1011.9	1019.3	1022.4	1024.6	1027.5	1029.3	1025.3	1015.5	1024.6	1019.3	1029.3
p min (hPa)	971.3	957.9	970.9	974.9	976.9	984.5	984.5	981.6	977.7	973.8	972.4	955.0	955.0	970.9	981.6	972.4	974.9	955.0
Vjetar Wind																		
v_h (ms^{-1})	1.5	1.8	2.1	2.2	1.9	1.7	1.6	1.5	1.4	1.4	1.5	1.5	1.6	2.1	1.6	1.4	1.7	1.7
v_h max (ms^{-1})	10.9	17.9	12.3	11.6	9.3	8.6	16.9	10.2	9.2	9.4	10.3	12.5	17.9	12.3	16.9	10.3	16.9	17.9
v_{max} (ms^{-1})	23.2	29.2	24.0	21.4	22.4	24.4	20.6	23.2	23.3	17.3	20.0	26.6	29.2	24.0	24.4	23.3	24.4	29.2
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-6.8	-6.8	-1.4	7.0	15.3	19.7	22.4	19.8	11.0	4.2	-1.5	-5.1	-6.2	7.0	20.6	4.6	15.9	6.5
$PhET_{14h}$ (°C)	-0.3	1.2	9.9	15.5	22.7	27.7	30.6	30.6	24.0	15.4	5.9	0.4	0.4	16.0	29.6	15.1	25.2	15.3
$PhET_{21h}$ (°C)	-5.8	-5.3	-0.3	4.2	9.4	13.0	14.6	14.1	10.2	4.9	-0.6	-4.4	-5.2	4.4	13.9	4.8	10.9	4.5

Sisak

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.7	1.9	6.3	11.1	15.8	19.1	20.8	19.8	16.0	10.8	5.6	1.0	0.8	11.1	19.9	10.8	17.1	10.6
T_{max}	(°C)	18.8	21.8	27.4	30.4	32.3	34.4	38.4	36.6	33.2	29.6	25.0	23.7	23.7	32.3	38.4	33.2	38.4	38.4
T_{min}	(°C)	-25.2	-20.7	-18.4	-5.0	-2.3	1.9	5.4	3.9	-1.8	-7.2	-15.6	-18.2	-25.2	-18.4	1.9	-15.6	-5.0	-25.2
t_{max}	(°C)	2.6	5.9	11.5	16.7	21.5	24.6	26.7	26.0	22.4	16.4	9.6	4.0	4.2	16.6	25.8	16.1	23.0	15.7
t_{min}	(°C)	-4.4	-2.1	1.2	5.3	9.4	12.8	14.1	13.6	10.3	5.8	1.7	-2.2	-2.9	5.3	13.5	6.0	10.9	5.5
$t_{min\ 5cm}$	(°C)	-5.4	-3.6	-0.5	3.3	7.1	10.9	12.1	11.9	8.6	4.4	0.7	-3.2	-4.1	3.3	11.6	4.6	9.0	3.9
$t_{min\ 5cm}$ min	(°C)	-29.1	-27.1	-20.6	-7.4	-4.8	-1.3	3.2	3.8	-4.4	-10.2	-21.1	-20.2	-29.1	-20.6	-1.3	-21.1	-7.4	-29.1
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	4.3	1.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.1	8.4	0.4	0.0	0.5	0.0	9.2
t_{max}<0°C	(d)	9.9	3.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	6.9	20.3	0.9	0.0	0.7	0.0	22.0
t_{min}<0°C	(d)	24.7	18.5	11.0	1.6	0.1	0.0	0.0	0.0	0.1	2.9	9.8	21.1	64.0	12.6	0.0	12.8	1.7	89.8
t_{max}≥25°C	(d)	0.0	0.0	0.1	1.1	7.2	14.6	20.9	18.8	9.2	1.2	0.0	0.0	0.0	8.4	54.3	10.4	71.7	73.0
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.1	0.5	2.8	6.5	5.2	1.1	0.0	0.0	0.0	0.0	0.6	14.5	1.1	16.2	16.2
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
$t_{min\ 5cm}$<0°C	(d)	26.5	21.1	15.8	4.4	0.4	0.0	0.0	0.0	0.4	5.6	12.4	22.4	69.1	20.6	0.0	18.3	5.2	108.9
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	8.7	19.5	81.6	181.7	324.2	410.8	477.6	458.7	341.9	192.8	66.0	17.6	45.8	587.5	1347.1	600.6	2194.9	2581.0
$t_{5°C}$ max	(°C)	49.4	87.4	171.8	274.0	407.3	484.9	565.5	516.2	439.7	314.0	196.8	85.8	120.4	770.2	1493.0	740.5	2522.3	2914.3
$t_{5°C}$ min	(°C)	0.0	0.0	27.3	112.0	250.8	344.1	425.4	370.6	255.9	99.6	7.6	0.0	0.2	431.0	1254.9	456.1	2023.6	2348.7
$t_{10°C}$	(°C)	0.8	1.7	15.4	59.4	172.1	260.9	322.6	303.7	192.7	67.7	14.1	3.0	5.5	246.9	887.2	274.5	1311.4	1414.1
$t_{10°C}$ max	(°C)	8.1	16.8	49.7	130.8	252.3	334.9	410.5	361.2	289.6	170.8	77.3	39.9	40.8	392.2	1033.1	380.5	1614.3	1712.9
$t_{10°C}$ min	(°C)	0.0	0.0	0.6	20.5	100.6	197.3	270.4	215.6	108.8	6.5	0.0	0.0	0.0	138.5	794.9	150.5	1163.9	1221.9
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	50.5	49.5	58.2	73.3	81.7	90.9	77.2	85.2	76.1	64.4	90.4	68.0	167.3	213.2	253.3	230.9	484.4	865.4
Rmax	(mm)	169.9	114.1	91.6	146.3	176.5	190.4	151.6	205.5	156.7	206.3	224.3	151.8	344.0	310.6	386.1	400.1	701.7	1048.6
Rmin	(mm)	3.4	7.1	5.6	14.9	3.8	33.7	24.6	13.2	2.5	0.1	25.8	10.7	73.6	87.1	120.0	119.4	272.4	588.4
Rd_{max}	(mm)	28.2	26.5	38.8	40.1	85.3	66.5	49.5	73.9	48.1	58.9	82.8	43.4	43.4	85.3	73.9	82.8	85.3	85.3
Rd≥0.1mm	(d)	12.7	12.1	13.1	13.9	13.5	14.2	10.6	11.1	11.4	11.7	12.5	13.2	37.8	40.5	35.9	35.7	74.7	150.1
Rd≥1mm	(d)	7.7	7.5	8.8	9.7	10.0	10.0	7.7	7.4	7.6	7.0	8.5	8.8	23.9	28.5	25.1	23.1	52.4	100.8
Rd≥5mm	(d)	3.7	3.5	3.7	4.6	5.2	5.4	4.8	4.5	4.7	3.7	5.2	4.7	11.9	13.5	14.7	13.7	29.2	53.8
Rd≥10mm	(d)	1.5	1.6	1.8	2.3	2.7	3.3	2.7	2.9	2.8	2.1	3.0	2.5	5.6	6.7	8.9	7.9	16.6	29.2
Rd≥20mm	(d)	0.2	0.4	0.3	0.7	0.8	1.1	1.0	1.4	1.0	0.7	1.2	0.5	1.1	1.8	3.6	2.9	6.1	9.4
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.3	0.4
S≥1cm	(d)	15.8	10.1	3.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.7	10.0	35.9	3.9	0.0	2.7	0.2	42.5
S≥10cm	(d)	8.1	5.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.3	16.8	1.3	0.0	1.0	0.0	19.0
S≥30cm	(d)	1.5	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3.8	0.2	0.0	0.0	0.0	4.0
S≥50cm	(d)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.4
S_{max}	(cm)	78	52	41	10	0	0	0	0	0	0	32	56	78	41	0	32	10	78
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	11	17	32	53	80	102	117	100	66	39	22	13	41	165	319	127	518	652
ET	(mm)	11	17	32	53	79	101	112	92	64	37	22	13	41	164	305	123	501	633

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	0.5	2.4	6.8	11.2	16.2	19.4	21.2	20.4	16.1	10.8	5.3	1.5	1.4	11.4	20.3	10.7	17.4	11.0
T_{max}	(°C)	18.8	22.6	27.4	28.8	31.7	35.6	36.9	38.1	33.2	29.6	24.3	23.7	23.7	31.7	38.1	33.2	38.1	38.1
T_{min}	(°C)	-25.2	-20.7	-16.2	-3.4	-2.3	3.0	6.4	3.9	-1.8	-7.2	-15.6	-19.2	-25.2	-16.2	3.0	-15.6	-3.4	-25.2
t_{max}	(°C)	3.7	6.8	12.2	16.7	21.9	24.8	27.0	26.6	22.4	16.2	9.1	4.7	5.0	16.9	26.1	15.9	23.2	16.0
t_{min}	(°C)	-3.1	-2.0	1.5	5.4	9.9	13.1	14.7	14.3	10.5	6.1	1.6	-1.7	-2.3	5.6	14.0	6.1	11.3	5.9
$t_{min\ 5cm}$	(°C)	-4.3	-3.8	-0.7	3.0	7.1	10.7	12.2	11.9	8.2	4.2	0.2	-3.0	-3.7	3.1	11.6	4.2	8.8	3.8
$t_{min\ 5cm}$ min	(°C)	-27.7	-27.1	-17.4	-9.4	-4.4	0.0	3.2	2.1	-4.4	-11.1	-21.1	-22.5	-27.7	-17.4	0.3	-21.1	-9.4	-27.7
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	2.4	1.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	6.0	0.3	0.0	0.5	0.0	6.7
t_{max}<0°C	(d)	8.0	3.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	5.6	17.1	0.7	0.0	1.2	0.0	18.8
t_{min}<0°C	(d)	23.7	18.3	10.7	1.7	0.1	0.0	0.0	0.0	0.0	2.8	10.4	20.1	62.4	12.5	0.0	13.2	1.8	87.8
t_{max}≥25°C	(d)	0.0	0.0	0.1	1.1	8.6	14.8	22.2	20.5	9.3	1.4	0.0	0.0	0.0	9.8	57.5	10.7	76.6	78.1
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.5	3.4	7.0	6.4	0.9	0.0	0.0	0.0	0.0	0.5	16.9	0.9	18.3	18.3
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.3
$t_{min\ 5cm}$<0°C	(d)	26.4	21.6	16.0	5.4	0.4	0.0	0.0	0.0	0.4	5.9	13.4	22.3	70.6	21.7	0.0	19.8	6.2	111.8
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	13.7	23.4	89.3	183.2	336.9	418.9	491.1	477.9	344.2	194.2	62.5	21.3	58.4	609.4	1388.0	600.9	2252.2	2656.7
$t_{5°C}$ max	(°C)	49.4	81.9	182.8	278.5	407.3	484.9	565.5	589.5	439.7	272.3	157.0	85.8	120.4	770.2	1528.4	785.6	2523.9	3159.5
$t_{5°C}$ min	(°C)	0.0	0.0	17.5	105.2	234.2	369.1	440.3	370.6	254.2	99.6	7.6	0.0	12.2	431.0	1254.9	456.1	2023.6	2348.7
$t_{10°C}$	(°C)	0.9	2.0	18.5	61.6	184.2	268.9	336.1	322.9	194.9	71.7	12.9	3.8	6.7	264.2	928.0	279.5	1368.6	1478.4
$t_{10°C}$ max	(°C)	8.1	16.8	54.5	137.4	252.3	334.9	410.5	434.5	289.6	125.2	45.1	39.9	40.8	392.2	1068.4	380.5	1617.7	1808.5
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	20.5	90.7	219.2	285.3	215.6	105.1	6.5	0.0	0.0	0.0	138.5	794.9	150.5	1163.9	1221.9
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	49.0	48.2	55.0	69.4	79.4	94.7	80.2	77.8	84.5	78.7	91.1	68.3	162.3	203.8	252.6	254.2	485.9	876.1
Rmax	(mm)	169.9	114.1	90.7	146.3	198.6	190.4	151.6	205.5	228.3	206.3	196.5	133.8	274.0	310.6	409.7	411.4	701.7	1086.9
Rmin	(mm)	9.4	4.5	5.6	21.4	3.8	33.7	24.6	10.5	25.4	10.2	17.2	10.7	73.6	121.1	120.0	119.4	272.4	588.4
Rd_{max}	(mm)	30.4	29.0	38.8	38.6	85.3	66.5	114.6	73.9	79.0	58.9	82.8	43.4	43.4	85.3	114.6	82.8	114.6	114.6
Rd≥0.1mm	(d)	11.7	10.9	11.6	13.8	13.0	13.8	10.9	10.1	11.5	12.3	12.0	12.4	35.1	38.4	34.8	35.8	73.1	143.9
Rd≥1mm	(d)	7.0	7.1	7.9	9.7	9.9	9.9	8.3	7.0	8.2	8.2	8.4	8.5	22.6	27.5	25.1	24.8	52.9	100.0
Rd≥5mm	(d)	3.3	3.3	3.4	4.5	5.0	5.5	4.9	4.2	5.0	4.5	5.1	4.7	11.3	12.9	14.6	14.6	29.1	53.4
Rd≥10mm	(d)	1.5	1.6	1.8	2.3	2.6	3.2	2.6	2.9	3.1	2.9	3.1	2.5	5.4	6.7	8.7	9.1	16.7	30.0
Rd≥20mm	(d)	0.4	0.3	0.4	0.6	0.8	1.3	1.0	1.2	1.2	0.9	1.3	0.7	1.3	1.8	3.5	3.4	6.0	10.0
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.2	0.4	0.5
S≥1cm	(d)	11.8	8.4	2.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	3.5	8.3	28.8	2.9	0.0	3.5	0.4	34.8
S≥10cm	(d)	5.1	4.2	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.7	2.2	11.8	0.9	0.0	1.7	0.1	14.1
S≥30cm	(d)	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.6	0.2	0.0	0.1	0.0	1.9
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2
S_{max}	(cm)	49	46	41	12	0	0	0	0	0	0	67	62	62	41	0	67	12	67
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	12	18	33	51	79	101	116	102	64	36	20	13	43	163	319	120	513	645
ET	(mm)	12	18	33	51	79	100	111	93	62	35	20	13	43	163	304	117	496	627

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	86.8	81.7	74.5	70.4	71.7	73.2	73.0	77.1	81.1	83.1	85.6	87.7	85.4	72.2	74.4	83.3	74.4	78.8
Umin (%)	26.0	26.0	20.0	16.0	22.0	28.0	25.0	23.0	26.0	17.0	29.0	23.0	23.0	16.0	23.0	17.0	16.0	16.0
U>80% (d)	17.6	9.7	6.4	4.2	3.1	3.0	2.6	2.5	3.6	7.5	14.1	18.9	46.3	13.8	8.1	25.3	19.1	93.4
U≤30% (d)	0.1	0.2	1.6	1.9	0.6	0.1	0.4	0.5	0.1	0.3	0.0	0.0	0.3	4.1	1.0	0.4	3.6	5.8
e (hPa)	5.3	6.0	7.2	9.3	12.9	16.2	17.8	17.8	14.9	11.0	8.1	6.0	5.8	9.8	17.3	11.3	14.8	11.0
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	116	173	345	460	619	652	667	574	421	260	125	86	375	1424	1893	807	3394	4499
$G_{45°S}$ (MJm^{-2})	174	237	415	467	560	559	587	559	490	358	181	124	535	1442	1706	1030	3223	4712
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.6	2.8	4.4	5.9	7.3	7.9	9.2	8.1	6.3	4.0	2.0	1.3	1.9	5.8	8.4	4.1	7.5	5.1
SS_{rel} (%)																		
SS_{max} (h)	3.9	5.4	7.1	7.6	9.8	9.7	11.0	10.2	9.0	6.3	3.9	2.4	3.3	6.8	9.9	5.2	8.5	5.8
SS_{min} (h)	0.4	1.0	1.9	4.3	4.7	6.1	7.2	6.2	4.6	2.3	0.2	0.3	0.9	4.5	7.0	3.2	6.1	4.5
Naoblaka Cloudiness																		
N (10/10)	7.8	7.2	6.6	6.2	5.9	5.8	4.5	4.5	5.1	6.2	7.6	8.0	7.6	6.2	4.9	6.3	5.3	6.3
N_{max} (10/10)	9.7	9.3	8.5	7.3	7.3	7.1	7.2	5.9	6.7	7.8	9.6	9.6	8.9	7.1	6.1	7.4	6.3	7.1
N_{min} (10/10)	5.6	4.3	4.2	4.6	4.6	4.7	2.4	2.7	2.3	4.3	5.0	5.8	5.9	5.0	3.8	5.2	4.2	5.4
N<2/10	1.6	2.2	3.7	3.7	3.7	3.9	8.6	8.7	6.3	3.4	1.2	1.3	5.1	11.1	21.2	10.9	34.9	48.3
N<2/10 max	5	11	12	10	9	9	15	18	18	8	5	5	16	23	38	25	67	93
N<2/10 min	0	0	0	0	0	1	0	3	0	0	0	0	0	3	9	3	15	28
N>8/10	18.3	14.2	12.9	10.7	8.7	8.6	5.0	5.9	6.9	11.0	16.7	19.5	52.0	32.3	19.5	34.6	45.9	138.4
N>8/10 max	30	25	22	15	17	13	10	10	11	21	26	29	75	45	29	48	60	178
N>8/10 min	7	3	5	5	4	2	0	1	0	2	7	10	34	19	7	21	20	101
Meteorološke pojave Weather phenomena																		
magla/fog	9.9	7.5	3.6	1.8	2.3	1.8	2.8	6.8	11.9	12.9	10.0	9.7	27.1	7.7	11.4	34.8	27.3	81.0
magla/fog max	19	25	13	5	11	6	10	15	21	26	15	20	48	21	26	49	51	129
magla/fog min	1	1	0	0	0	0	0	0	3	4	5	1	7	0	0	17	4	29
tuča/hail	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.9	0.9
tuča/hail max	0	1	1	1	1	1	1	1	1	0	0	0	1	1	2	1	2	2
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.3	0.4	0.6	2.0	5.1	7.3	6.2	6.1	2.6	1.0	0.6	0.4	1.1	7.7	19.6	4.2	29.3	32.6
grm/thun max	2	3	2	5	11	14	16	12	8	4	3	1	3	17	31	9	50	57
grm/thun min	0	0	0	0	0	1	2	1	0	0	0	0	0	1	7	0	17	20
rosa/dew	1.8	3.0	10.7	17.5	21.8	21.3	24.6	25.8	25.4	21.7	10.5	2.6	7.4	50.0	71.7	57.6	136.4	186.7
rosa/dew max	12	13	23	26	28	27	29	29	29	29	21	8	23	72	81	69	156	225
rosa/dew min	0	0	0	11	13	12	18	20	16	11	2	0	0	35	59	44	117	163
mraz/frost	14.5	12.8	11.2	3.3	0.4	0.0	0.0	0.0	0.6	5.0	9.3	14.8	42.1	14.8	0.0	14.8	4.3	71.8
mraz/frost max	29	23	22	11	2	1	0	0	4	19	23	22	67	29	1	32	14	120
mraz/frost min	0	0	3	0	0	0	0	0	0	0	1	0	15	4	0	4	0	39
inje/rime	4.3	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.1	7.6	0.2	0.0	0.5	0.0	8.3
inje/rime max	17	4	3	0	0	0	0	0	0	0	3	9	28	3	0	3	0	28
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1006.7	1004.5	1003.4	1000.7	1002.0	1002.6	1003.4	1003.3	1005.5	1006.8	1005.4	1005.9	1005.7	1002.0	1003.1	1005.9	1002.9	1004.2
p max (hPa)	1030.6	1028.9	1028.6	1021.6	1017.9	1016.4	1016.2	1014.7	1021.7	1024.5	1027.0	1033.3	1033.3	1028.6	1016.4	1027.0	1021.7	1033.3
p min (hPa)	973.6	960.7	974.0	974.9	978.6	988.4	985.2	985.4	982.0	973.0	973.9	958.5	958.5	974.0	985.2	973.0	974.9	958.5
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-7.2	-7.0	-1.4	6.2	12.7	17.7	19.3	15.7	9.7	4.3	-0.6	-4.8	-6.3	5.9	17.6	4.4	13.6	5.4
$PhET_{14h}$ (°C)	-0.9	0.1	10.1	16.3	22.0	26.7	30.2	29.7	24.3	15.6	6.2	-0.1	-0.3	16.1	28.9	15.4	24.9	15.0
$PhET_{21h}$ (°C)	-5.7	-5.2	0.9	5.9	10.7	14.4	16.1	15.3	11.4	6.3	1.0	-3.9	-4.9	5.9	15.3	6.2	12.3	5.6

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	85.0	78.7	71.3	68.5	69.8	71.1	71.1	74.9	79.9	82.8	85.8	87.3	83.7	69.9	72.4	82.8	72.6	77.2
Umin (%)	26.0	25.0	16.0	16.0	24.0	23.0	21.0	21.0	24.0	17.0	31.0	35.0	25.0	16.0	21.0	17.0	16.0	16.0
U>80% (d)	15.3	7.7	5.0	3.9	3.1	3.1	2.1	2.2	3.8	8.3	14.4	18.3	41.3	12.1	7.5	26.5	18.3	87.4
U≤30% (d)	0.1	0.5	2.1	2.2	0.9	0.3	0.5	1.1	0.2	0.3	0.0	0.0	0.6	5.2	1.9	0.5	5.2	8.2
e (hPa)	5.6	5.9	7.0	9.0	12.8	16.0	17.7	17.8	14.7	11.0	7.9	6.2	5.9	9.6	17.2	11.2	14.6	11.0
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	1.7	3.3	4.6	5.8	7.6	8.2	9.2	8.3	6.2	3.7	1.8	1.4	2.1	6.0	8.6	3.9	7.6	5.2
SS_{rel} (%)																		
SS_{max} (h)	3.9	5.7	6.5	7.3	9.8	11.8	11.0	11.5	8.5	6.3	3.6	3.6	3.3	7.1	11.0	5.2	9.4	6.5
SS_{min} (h)	0.3	1.0	2.6	4.3	4.7	6.1	7.2	6.2	3.4	2.5	0.2	0.1	0.9	4.5	7.0	2.9	6.1	4.5
Naoblaka Cloudiness																		
N (10/10)	7.6	6.6	6.2	6.1	5.6	5.6	4.5	4.3	5.1	6.4	7.6	7.7	7.3	6.0	4.8	6.4	5.2	6.1
N_{max} (10/10)	9.7	9.3	8.1	7.3	7.3	6.9	7.2	5.7	7.6	7.7	9.6	9.4	8.9	7.1	6.1	7.5	6.3	7.1
N_{min} (10/10)	5.6	3.9	4.5	4.9	3.9	4.0	2.4	1.4	2.7	4.3	5.0	3.9	5.4	4.8	3.8	5.2	4.0	5.1
N<2/10	2.1	3.3	3.9	3.2	4.0	3.4	7.7	9.0	5.5	2.7	1.2	1.9	7.3	11.1	20.1	9.4	32.8	47.8
N<2/10 max	9	14	8	8	9	8	15	24	14	8	5	16	25	21	36	22	61	97
N<2/10 min	0	0	0	0	0	1	0	2	0	0	0	0	1	3	7	0	15	28
N>8/10	17.4	12.0	11.2	9.9	7.4	7.2	4.5	5.3	6.7	10.9	16.3	18.2	47.7	28.5	17.0	33.9	41.0	127.1
N>8/10 max	30	25	21	15	17	13	10	9	16	17	26	28	75	45	26	48	59	178
N>8/10 min	7	3	5	5	1	2	0	1	0	2	7	9	29	16	7	21	20	87
Meteorološke pojave Weather phenomena																		
magla/fog	7.5	4.8	2.5	1.4	1.3	1.1	1.7	4.7	9.1	10.7	8.8	8.8	21.1	5.3	7.5	28.7	19.4	62.5
magla/fog max	19	14	13	5	4	4	5	14	21	19	15	17	42	18	18	47	43	114
magla/fog min	1	1	0	0	0	0	0	0	1	3	4	1	7	0	0	12	4	29
tuča/hail	0.0	0.1	0.0	0.1	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.1	0.7	0.8
tuča/hail max	1	1	1	1	1	1	1	1	1	0	0	0	1	1	2	1	2	2
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.3	0.5	0.6	1.5	4.0	5.6	5.4	4.8	2.3	1.0	0.5	0.2	1.0	6.1	15.9	3.8	23.7	26.8
grm/thun max	2	3	2	4	11	11	16	11	8	3	3	1	3	12	29	8	42	43
grm/thun min	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	0	8	9
rosa/dew	2.0	2.3	10.4	16.6	21.6	19.9	24.0	24.9	23.7	19.6	8.5	2.5	6.8	48.6	68.7	51.9	130.7	176.0
rosa/dew max	12	11	23	26	28	27	29	29	29	29	21	8	23	72	79	69	150	225
rosa/dew min	0	0	0	7	14	2	16	20	11	4	0	0	0	26	40	26	87	92
mraz/frost	13.5	12.3	9.3	2.8	0.3	0.0	0.0	0.0	0.4	4.4	8.4	13.0	38.8	12.4	0.0	13.3	3.5	64.5
mraz/frost max	27	24	22	11	2	1	0	0	4	19	23	22	65	29	1	32	14	120
mraz/frost min	2	0	1	0	0	0	0	0	0	0	0	0	13	2	0	0	0	28
inje/rime	2.2	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.7	4.7	0.2	0.0	0.6	0.0	5.5
inje/rime max	17	5	3	0	0	0	0	0	0	0	6	9	22	3	0	6	0	25
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1008.2	1006.3	1004.3	1000.8	1002.4	1002.7	1003.2	1003.7	1005.2	1006.6	1006.3	1007.2	1007.3	1002.5	1003.2	1006.0	1003.0	1004.8
p max (hPa)	1028.8	1028.9	1028.6	1021.8	1017.9	1018.4	1016.2	1014.7	1021.7	1025.3	1027.0	1032.0	1032.0	1028.6	1018.4	1027.0	1021.8	1032.0
p min (hPa)	973.6	960.7	974.2	975.3	978.6	986.9	985.2	985.4	979.1	976.5	973.9	958.5	958.5	974.2	985.2	973.9	975.3	958.5
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-5.9	-5.9	-1.0	6.3	13.3	18.3	19.9	16.6	9.9	4.6	-0.6	-4.1	-5.3	6.2	18.2	4.6	14.0	5.9
$PhET_{14h}$ (°C)	0.4	2.0	10.7	16.2	22.6	27.1	30.6	30.7	24.1	15.3	5.9	0.7	1.0	16.5	29.5	15.1	25.2	15.5
$PhET_{21h}$ (°C)	-4.4	-3.9	1.3	6.1	11.3	14.9	16.8	16.2	11.7	6.4	0.9	-3.2	-3.8	6.2	16.0	6.4	12.8	6.2

Parg

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-2.0	-1.1	1.8	5.9	10.7	13.9	16.2	15.4	12.4	8.1	3.1	-0.6	-1.1	6.1	15.1	7.8	12.4	7.0
T_{max}	(°C)	15.4	17.4	22.1	26.0	28.2	30.2	33.5	32.4	29.1	25.9	21.7	17.1	17.4	28.2	33.5	29.1	33.5	33.5
T_{min}	(°C)	-21.7	-20.1	-18.9	-10.2	-4.4	-1.6	2.2	0.9	-1.8	-5.8	-13.4	-16.2	-21.7	-18.9	-1.6	-13.4	-10.2	-21.7
t_{max}	(°C)	1.5	2.9	6.4	11.0	16.1	19.3	22.0	21.4	18.0	12.8	6.7	2.9	2.5	11.2	20.9	12.5	18.0	11.7
t_{min}	(°C)	-5.4	-4.4	-2.0	1.6	5.8	8.8	10.7	10.3	8.0	4.3	-0.2	-3.8	-4.5	1.8	9.9	4.0	7.5	2.8
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	5.8	3.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.5	13.0	1.4	0.0	0.4	0.0	14.8
t_{max}<0°C	(d)	11.4	8.4	3.6	0.2	0.0	0.0	0.0	0.0	0.0	0.1	2.8	8.9	28.3	3.8	0.0	2.9	0.2	35.4
t_{min}<0°C	(d)	26.3	22.7	20.6	9.6	1.3	0.0	0.0	0.0	0.1	4.0	16.3	24.7	73.3	31.5	0.0	20.4	11.1	125.6
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.0	0.2	2.6	7.5	6.4	1.3	0.0	0.0	0.0	0.0	0.2	16.5	1.3	18.0	18.0
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7	0.7
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	2.0	3.1	20.0	65.6	187.0	271.9	352.1	336.3	240.1	122.2	31.2	6.2	11.3	272.6	960.3	393.6	1453.0	1637.7
$t_{5°C}$ max	(°C)	12.6	36.6	75.8	142.5	283.5	339.8	446.1	409.8	334.5	208.8	97.5	37.4	48.0	373.8	1081.7	569.0	1642.0	1857.2
$t_{5°C}$ min	(°C)	0.0	0.0	0.0	19.9	115.9	221.3	308.1	239.2	144.4	7.8	0.7	0.0	0.0	141.9	864.1	247.7	1232.2	1352.5
$t_{10°C}$	(°C)	0.0	0.0	1.4	7.8	57.8	127.1	197.9	182.1	100.6	28.1	2.1	0.1	0.1	67.1	507.1	130.8	673.4	705.0
$t_{10°C}$ max	(°C)	0.0	1.3	11.4	33.3	133.3	189.8	291.2	254.8	184.5	73.7	14.4	1.4	1.4	147.6	623.8	205.5	856.6	871.7
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	0.0	10.5	79.6	156.1	86.5	38.3	0.0	0.0	0.0	0.0	10.5	409.8	42.0	495.5	503.7
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	131.9	126.7	135.8	148.2	141.1	160.7	121.3	141.9	169.5	196.3	220.2	155.8	418.0	425.0	423.9	586.0	882.6	1849.3
Rmax	(mm)	270.2	292.2	308.9	298.7	341.8	286.5	220.4	263.4	386.2	487.6	475.3	351.0	826.2	688.4	585.8	902.8	1156.6	2188.5
Rmin	(mm)	0.0	16.4	25.4	74.8	43.7	67.8	28.6	10.7	21.7	0.0	33.4	35.3	158.4	225.0	244.7	310.1	685.1	1438.2
Rd_{max}	(mm)	87.2	76.1	62.6	61.9	122.9	111.7	108.7	137.6	173.5	170.3	125.5	80.4	87.2	122.9	137.6	173.5	173.5	173.5
Rd≥0.1mm	(d)	14.3	14.0	15.1	16.0	15.9	16.3	11.9	12.3	11.3	12.3	14.1	14.5	42.7	47.0	40.5	37.7	83.7	168.0
Rd≥1mm	(d)	11.4	11.0	11.8	13.2	12.9	13.3	9.2	9.9	9.4	9.7	11.9	11.9	34.3	38.0	32.5	30.9	68.0	135.6
Rd≥5mm	(d)	7.2	6.1	7.1	8.0	7.8	8.3	5.9	6.0	6.3	6.8	8.7	7.7	21.1	23.0	20.1	21.9	42.3	86.0
Rd≥10mm	(d)	4.6	4.4	4.7	5.4	4.7	5.3	3.7	4.1	4.9	5.6	6.9	4.8	13.9	14.9	13.2	17.4	28.2	59.2
Rd≥20mm	(d)	2.1	1.9	2.3	2.5	2.0	2.5	1.8	2.4	2.7	3.4	4.1	2.4	6.5	6.8	6.7	10.2	13.9	30.1
Rd≥50mm	(d)	0.1	0.2	0.2	0.0	0.1	0.3	0.4	0.5	0.7	0.9	0.8	0.4	0.6	0.4	1.1	2.4	2.0	4.5
S≥1cm	(d)	24.0	21.5	19.2	7.0	0.6	0.0	0.0	0.0	0.1	0.6	9.2	21.5	66.5	26.7	0.0	9.9	7.6	103.6
S≥10cm	(d)	17.1	15.9	13.3	2.9	0.0	0.0	0.0	0.0	0.0	0.2	4.7	10.7	43.0	16.2	0.0	4.9	2.9	64.8
S≥30cm	(d)	8.6	9.4	7.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.9	3.5	21.4	8.5	0.0	1.9	0.6	31.9
S≥50cm	(d)	3.2	4.8	3.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	8.8	4.0	0.0	0.4	0.1	13.2
S_{max}	(cm)	112	141	156	68	17	0	0	0	16	23	80	74	141	156	0	80	68	156
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	12	14	20	31	51	65	84	72	50	32	19	13	39	102	221	101	353	463
ET	(mm)	12	14	20	31	51	65	84	71	50	32	19	13	39	102	220	101	352	462

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-1.3	-0.7	2.3	5.8	11.0	14.0	16.5	16.0	12.3	7.8	2.8	-0.1	-0.7	6.4	15.5	7.6	12.6	7.2
T_{max}	(°C)	15.4	18.4	22.1	25.5	27.9	31.1	33.5	32.4	29.1	25.9	21.7	17.1	18.4	27.9	33.5	29.1	33.5	33.5
T_{min}	(°C)	-21.7	-20.1	-17.8	-10.2	-3.9	-2.2	2.2	0.9	-2.1	-6.8	-13.4	-17.4	-21.7	-17.8	-2.2	-13.4	-10.2	-21.7
t_{max}	(°C)	2.2	3.5	7.2	11.0	16.4	19.5	22.3	22.1	17.8	12.3	6.4	3.4	3.0	11.5	21.3	12.2	18.2	12.0
t_{min}	(°C)	-4.7	-4.3	-1.9	1.4	6.0	8.7	10.8	10.7	7.8	4.1	-0.5	-3.3	-4.2	1.8	10.1	3.8	7.6	2.9
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	4.1	3.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.9	10.6	1.2	0.0	0.5	0.0	12.2
t_{max}<0°C	(d)	10.2	7.3	2.9	0.3	0.0	0.0	0.0	0.0	0.0	0.3	3.6	7.9	25.6	3.1	0.0	3.9	0.3	32.4
t_{min}<0°C	(d)	25.5	23.1	20.6	10.3	1.1	0.1	0.0	0.0	0.2	5.0	17.1	23.5	72.6	32.0	0.1	22.3	11.6	126.4
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.0	0.3	2.7	7.6	8.4	0.8	0.0	0.0	0.0	0.0	0.3	18.7	0.9	19.8	19.8
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.9	0.9
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	2.5	4.5	23.7	63.4	193.4	273.1	357.6	353.6	234.0	116.5	28.9	7.7	14.6	280.5	984.2	379.4	1475.1	1658.8
$t_{5°C}$ max	(°C)	10.4	45.4	84.2	149.6	283.5	342.8	446.1	451.0	334.5	185.5	73.9	37.4	48.0	414.9	1145.5	491.9	1729.8	2014.6
$t_{5°C}$ min	(°C)	0.0	0.0	0.5	19.9	77.8	218.1	306.0	239.2	137.9	7.8	0.7	0.0	0.0	141.9	864.1	247.7	1232.2	1352.5
$t_{10°C}$	(°C)	0.0	0.0	1.4	7.8	57.8	127.1	197.9	182.1	100.6	28.1	2.1	0.1	0.1	67.1	507.1	130.8	673.4	705.0
$t_{10°C}$ max	(°C)	0.0	1.3	11.4	33.3	133.3	189.8	291.2	254.8	184.5	73.7	14.4	1.4	1.4	147.6	623.8	205.5	856.6	871.7
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	0.0	10.5	79.6	156.1	86.5	38.3	0.0	0.0	0.0	0.0	10.5	409.8	42.0	495.5	503.7
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	119.5	113.5	129.1	141.1	138.5	158.3	118.9	134.2	180.8	230.9	213.5	162.7	392.6	408.7	411.3	625.3	871.7	1840.9
Rmax	(mm)	270.2	236.3	308.9	251.6	341.8	286.5	259.9	255.8	511.9	579.6	569.8	351.0	826.2	688.4	585.8	1143.8	1224.4	2106.4
Rmin	(mm)	0.1	5.3	25.4	36.3	43.1	57.0	28.6	28.1	50.7	25.5	33.4	27.8	107.7	225.0	244.7	310.1	579.5	1438.2
Rd_{max}	(mm)	87.2	79.9	66.2	82.9	87.1	111.7	108.7	137.6	226.7	151.5	125.5	81.6	87.2	87.1	137.6	226.7	226.7	226.7
Rd≥0.1mm	(d)	13.8	12.9	14.4	15.9	16.3	16.7	12.8	11.9	12.4	14.6	14.2	14.7	41.5	46.6	41.3	41.3	85.9	170.5
Rd≥1mm	(d)	10.6	9.8	10.9	12.5	12.7	13.1	9.5	9.2	10.1	11.6	11.8	11.6	32.2	36.1	31.9	33.5	67.2	133.5
Rd≥5mm	(d)	6.5	5.3	6.4	8.0	7.9	8.2	5.5	5.4	6.5	7.9	8.1	7.7	19.6	22.3	19.1	22.6	41.5	83.4
Rd≥10mm	(d)	4.2	3.7	4.3	5.4	4.7	5.3	3.5	3.7	4.8	6.4	6.3	5.1	13.0	14.4	12.5	17.4	27.4	57.4
Rd≥20mm	(d)	1.8	1.7	2.2	2.2	1.8	2.5	1.8	2.2	2.8	4.1	4.0	2.5	5.9	6.3	6.4	10.8	13.3	29.6
Rd≥50mm	(d)	0.1	0.3	0.3	0.1	0.1	0.3	0.4	0.5	0.8	1.1	1.0	0.4	0.7	0.5	1.1	2.9	2.1	5.3
S≥1cm	(d)	22.9	20.4	17.9	6.8	0.4	0.0	0.0	0.0	0.1	0.8	9.7	20.7	64.3	25.1	0.0	10.6	7.2	99.7
S≥10cm	(d)	15.7	14.8	12.8	2.6	0.0	0.0	0.0	0.0	0.0	0.2	5.0	12.7	43.3	15.4	0.0	5.2	2.7	63.8
S≥30cm	(d)	7.0	8.9	7.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	2.4	5.1	21.2	7.8	0.0	2.4	0.4	31.2
S≥50cm	(d)	2.7	4.3	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.7	8.6	3.3	0.0	0.7	0.0	12.7
S_{max}	(cm)	112	141	151	52	17	0	0	0	16	23	99	81	141	151	0	99	52	151
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	15	17	25	35	59	75	97	89	57	35	21	15	47	119	261	113	412	540
ET	(mm)	14	17	25	35	59	75	96	88	57	35	21	15	46	119	259	113	410	537

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	84.1	82.6	78.3	76.3	76.0	77.6	75.4	79.4	82.3	83.4	85.0	84.9	83.9	76.8	77.5	83.6	77.8	80.4
Umin (%)	17.0	12.0	13.0	14.0	22.0	24.0	17.0	22.0	24.0	13.0	20.0	20.0	12.0	13.0	17.0	13.0	14.0	12.0
U>80% (d)	17.8	13.5	11.9	9.5	7.6	7.2	5.3	6.9	7.9	10.9	15.7	17.8	49.1	29.0	19.4	34.6	44.4	132.1
U≤30% (d)	0.8	0.4	0.9	1.1	0.3	0.1	0.2	0.1	0.1	0.3	0.4	0.4	1.5	2.3	0.4	0.9	1.9	5.1
e (hPa)	4.8	5.0	5.6	7.2	10.0	12.6	14.2	14.1	12.2	9.3	6.8	5.3	5.0	7.6	13.6	9.4	11.7	8.9
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	127	195	334	441	536	592	663	585	442	267	138	109	431	1310	1840	847	3258	4427
$G_{45°S}$ (MJm^{-2})	202	282	398	444	483	510	583	571	522	373	213	183	667	1326	1664	1107	3112	4764
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.4	3.0	3.8	4.4	5.6	5.9	7.7	7.1	5.6	4.1	2.7	2.1	2.5	4.6	6.9	4.1	6.1	4.5
SS_{rel} (%)	29	33	35	36	42	42	55	55	48	40	30	27	30	38	51	40	47	41
SS_{max} (h)	4.7	6.0	6.9	6.7	8.1	8.1	9.5	9.3	8.5	6.7	4.8	4.4	3.8	5.9	8.0	5.2	7.1	5.2
SS_{min} (h)	0.3	1.0	1.4	2.9	2.8	4.1	5.0	5.1	3.7	1.5	0.8	0.8	0.8	3.3	5.6	3.2	5.1	3.7
Naoblaka Cloudiness																		
N (10/10)	6.8	6.8	6.8	6.8	6.4	6.1	4.9	4.9	5.3	5.9	6.9	6.9	6.8	6.7	5.3	6.0	5.7	6.2
N_{max} (10/10)	9.4	9.3	8.8	8.4	8.2	7.6	7.2	6.7	6.9	8.5	8.7	8.5	8.8	7.8	6.6	7.0	6.9	7.2
N_{min} (10/10)	3.9	3.9	3.8	5.1	5.0	5.0	3.4	2.3	2.0	3.2	4.3	4.2	5.5	5.6	4.2	4.8	4.6	5.3
N<2/10	4.3	3.5	3.4	3.0	2.6	2.6	6.5	7.0	6.3	6.0	3.8	4.3	12.1	9.0	16.1	16.1	28.0	53.3
N<2/10 max	10	11	13	7	7	8	14	18	20	14	12	13	22	19	32	30	50	86
N<2/10 min	0	0	0	0	0	0	0	0	1	0	1	0	3	3	1	7	5	27
N>8/10	15.5	13.9	14.9	13.7	10.2	9.1	5.9	6.4	8.4	11.6	14.9	15.4	44.8	38.8	21.4	34.9	53.7	139.9
N>8/10 max	27	25	24	20	22	16	12	12	14	20	23	22	70	57	34	47	73	180
N>8/10 min	4	3	5	7	4	3	0	1	1	3	4	4	27	28	12	21	31	107
Meteorološke pojave Weather phenomena																		
magla/fog	7.9	7.3	6.6	5.1	3.5	2.6	1.8	2.2	3.7	6.6	8.0	8.1	23.2	15.1	6.6	18.3	18.9	63.3
magla/fog max	15	18	17	9	8	7	6	7	8	12	17	17	41	27	15	29	34	92
magla/fog min	0	1	0	1	0	0	0	0	0	1	1	1	12	6	1	9	9	42
tuča/hail	0.1	0.1	0.1	0.2	0.4	0.3	0.4	0.1	0.1	0.2	0.1	0.0	0.2	0.7	0.8	0.4	1.4	2.1
tuča/hail max	1	1	2	1	2	2	3	1	1	1	1	1	1	3	3	2	4	5
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.7	0.8	1.4	2.3	6.2	10.1	9.3	8.2	4.7	2.8	2.4	1.2	2.7	9.9	27.6	9.9	40.8	50.1
grm/thun max	4	3	5	5	13	22	18	13	11	9	7	5	7	18	40	19	58	68
grm/thun min	0	0	0	0	1	6	3	2	1	0	0	0	0	4	16	4	24	27
rosa/dew	0.0	0.1	0.3	3.4	11.1	11.9	17.5	17.4	15.4	7.5	1.1	0.0	0.1	14.8	46.8	23.9	76.6	85.6
rosa/dew max	0	2	5	11	20	21	26	27	27	17	7	1	2	26	65	43	114	123
rosa/dew min	0	0	0	0	0	3	7	7	6	0	0	0	0	0	24	9	41	50
mraz/frost	4.8	3.3	3.2	2.4	0.3	0.0	0.0	0.0	0.3	5.0	6.1	4.7	12.7	5.9	0.0	11.5	3.1	30.2
mraz/frost max	31	19	12	7	3	1	0	0	3	12	12	15	58	15	1	23	7	84
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	13
inje/rime	2.6	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8	5.3	0.3	0.0	0.5	0.0	6.1
inje/rime max	11	7	4	1	0	0	0	0	0	0	6	15	31	4	0	6	1	31
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	916.7	915.3	915.4	914.3	916.9	918.3	919.6	919.4	920.6	920.2	917.1	916.3	916.1	915.5	919.1	919.3	918.2	917.5
p max (hPa)	937.8	937.7	937.5	932.1	930.2	930.0	929.6	929.7	934.4	933.2	934.8	937.8	937.8	937.5	930.0	934.8	934.4	937.8
p min (hPa)	884.7	874.4	888.8	891.2	893.8	905.7	904.0	900.0	895.4	889.3	889.8	871.6	871.6	888.8	900.0	889.3	891.2	871.6
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-9.6	-9.8	-5.7	0.9	8.6	13.6	15.9	13.0	7.1	1.5	-4.0	-7.9	-9.1	1.3	14.1	1.5	9.8	2.0
$PhET_{14h}$ (°C)	-3.6	-3.1	4.0	9.2	15.3	20.3	24.5	23.5	18.4	10.9	2.0	-2.6	-3.1	9.5	22.8	10.4	18.5	9.9
$PhET_{21h}$ (°C)	-9.0	-9.2	-5.1	-0.8	4.1	7.6	10.1	9.4	6.2	1.6	-3.4	-7.5	-8.6	-0.6	9.0	1.5	6.1	0.3

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	82.8	79.9	76.8	76.0	76.0	77.1	75.3	77.7	81.9	84.0	84.9	84.3	82.4	76.3	76.7	83.6	77.3	79.7
Umin (%)	18.0	12.0	17.0	18.0	22.0	24.0	24.0	30.0	24.0	22.0	20.0	20.0	12.0	17.0	24.0	20.0	18.0	12.0
U>80% (d)	17.4	12.5	10.6	9.2	7.5	7.0	5.3	6.3	7.8	12.2	15.8	17.1	47.0	27.4	18.6	35.7	43.1	128.6
U≤30% (d)	0.6	0.7	0.5	0.7	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.5	1.8	1.4	0.2	0.5	1.1	3.9
e (hPa)	4.9	4.9	5.7	7.1	10.2	12.6	14.3	14.3	12.0	9.2	6.7	5.4	5.1	7.7	13.7	9.3	11.8	8.9
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.5	3.4	4.1	4.4	5.9	6.0	7.6	7.4	5.6	3.7	2.6	2.3	2.7	4.8	7.0	4.0	6.2	4.6
SS_{rel} (%)	31	37	38	36	44	43	55	58	48	37	30	29	32	40	52	39	48	42
SS_{max} (h)	4.7	6.0	6.6	6.2	8.1	9.5	9.0	9.8	8.6	6.7	4.8	4.4	3.8	6.7	9.0	5.2	7.7	5.6
SS_{min} (h)	0.3	1.0	1.9	2.9	2.8	4.1	5.0	5.1	3.3	1.7	0.5	0.3	0.8	3.3	5.6	1.9	5.1	3.7
Naoblaka Cloudiness																		
N (10/10)	6.7	6.5	6.8	7.1	6.6	6.4	5.3	5.1	5.7	6.4	7.0	6.8	6.7	6.8	5.6	6.4	6.0	6.4
N_{max} (10/10)	9.4	9.3	8.8	8.4	8.2	7.6	7.2	6.8	7.8	8.5	9.1	9.5	8.8	7.8	6.7	8.2	7.0	7.2
N_{min} (10/10)	3.9	3.9	5.1	5.9	5.0	5.1	3.5	3.3	2.8	3.2	4.3	4.2	5.2	5.7	4.6	4.8	5.0	5.6
N<2/10	4.3	4.1	2.8	1.8	2.2	1.6	4.5	5.6	4.6	4.4	3.3	4.2	12.6	6.7	11.7	12.2	20.2	43.3
N<2/10 max	10	11	8	5	7	5	11	14	13	14	12	13	28	19	24	28	45	79
N<2/10 min	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	5	11
N>8/10	15.4	12.9	13.9	14.0	10.5	9.0	5.7	6.3	8.4	13.3	15.3	14.8	43.2	38.4	21.0	37.0	53.9	139.5
N>8/10 max	27	25	24	20	22	16	12	12	16	20	24	27	70	57	34	55	73	180
N>8/10 min	4	3	5	6	5	4	0	0	1	3	4	4	28	21	12	25	30	112
Meteorološke pojave Weather phenomena																		
magla/fog	7.5	6.1	5.6	4.4	3.0	2.6	1.5	1.6	3.6	7.0	7.7	7.9	21.4	13.0	5.6	18.2	16.6	58.3
magla/fog max	21	18	17	9	8	7	5	5	8	12	17	18	41	27	15	28	34	92
magla/fog min	0	0	0	0	0	0	0	0	0	2	1	1	8	0	1	9	1	25
tuča/hail	0.0	0.1	0.2	0.2	0.4	0.3	0.2	0.3	0.0	0.2	0.1	0.0	0.1	0.9	0.8	0.3	1.4	2.1
tuča/hail max	1	1	2	1	2	2	3	1	1	1	1	1	1	3	3	2	4	5
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.8	0.9	1.4	2.5	6.7	9.9	9.5	8.9	5.3	3.6	2.3	1.2	2.9	10.6	28.2	11.3	42.7	53.0
grm/thun max	4	3	5	7	13	22	18	19	11	11	13	5	7	18	40	24	58	68
grm/thun min	0	0	0	0	3	5	3	4	2	0	0	0	0	4	16	4	28	34
rosa/dew	0.0	0.2	1.5	4.7	13.0	13.9	19.7	20.3	16.8	8.1	1.6	0.4	0.6	19.2	54.0	26.6	88.5	100.4
rosa/dew max	1	4	16	14	23	24	27	29	27	21	10	7	8	43	72	43	126	155
rosa/dew min	0	0	0	0	0	3	7	7	8	0	0	0	0	0	24	9	41	50
mraz/frost	3.9	3.9	4.1	3.0	0.3	0.0	0.0	0.0	0.3	5.4	6.1	4.0	11.9	7.4	0.0	11.8	3.6	31.1
mraz/frost max	31	19	18	11	1	1	0	0	3	12	12	14	58	24	1	22	12	84
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	13
inje/rime	2.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5	4.8	0.1	0.0	0.3	0.0	5.2
inje/rime max	11	7	1	1	0	0	0	0	0	0	6	15	31	1	0	6	1	31
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	918.1	916.9	916.2	914.4	917.1	918.3	919.4	919.7	920.0	919.7	917.7	917.6	917.5	915.9	919.1	919.1	918.1	917.9
p max (hPa)	937.8	937.7	937.5	932.1	931.3	930.4	928.6	929.7	934.4	933.2	933.5	937.4	937.8	937.5	930.4	934.4	934.4	937.8
p min (hPa)	884.7	874.4	887.2	893.7	892.4	901.7	903.5	900.0	895.4	890.0	890.2	871.6	871.6	887.2	900.0	890.0	892.4	871.6
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-9.7	-9.9	-6.4	-0.7	6.9	11.4	13.9	11.9	6.0	0.6	-5.0	-8.2	-9.3	-0.1	12.4	0.5	8.2	0.9
$PhET_{14h}$ (°C)	-4.1	-2.8	3.2	7.6	14.2	18.9	23.1	23.2	17.0	9.1	1.0	-2.8	-3.2	8.3	21.7	9.0	17.3	9.0
$PhET_{21h}$ (°C)	-9.2	-9.0	-5.5	-1.7	3.7	7.0	9.7	9.4	5.5	0.9	-4.4	-7.6	-8.6	-1.2	8.7	0.6	5.6	-0.1

Ogulin

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.5	1.4	5.1	9.6	14.2	17.4	19.2	18.2	15.0	10.3	5.3	1.0	0.7	9.6	18.3	10.2	15.6	9.7
T_{max}	(°C)	18.9	19.7	25.4	27.6	30.6	34.1	38.0	34.1	32.8	28.7	24.7	20.9	20.9	30.6	38.0	32.8	38.0	38.0
T_{min}	(°C)	-26.1	-24.3	-19.9	-8.1	-2.7	2.1	4.3	2.4	-2.2	-5.1	-19.1	-22.3	-26.1	-19.9	2.1	-19.1	-8.1	-26.1
t_{max}	(°C)	3.5	5.5	9.8	14.7	19.5	22.7	25.2	24.5	21.1	15.6	9.4	4.7	4.6	14.7	24.1	15.4	21.3	14.7
t_{min}	(°C)	-4.2	-2.3	0.8	4.9	8.8	11.9	13.1	12.8	10.1	6.0	1.8	-2.5	-2.9	4.8	12.6	6.0	10.3	5.1
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	5.3	2.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.2	11.3	0.8	0.0	0.5	0.0	12.6
t_{max}<0°C	(d)	9.5	4.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	7.0	20.7	1.4	0.0	1.2	0.0	23.5
t_{min}<0°C	(d)	23.7	19.0	12.1	2.4	0.3	0.0	0.0	0.0	0.1	2.4	10.4	21.1	63.4	14.7	0.0	12.9	2.7	91.4
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.4	3.2	9.9	17.1	14.4	5.9	0.9	0.0	0.0	0.0	3.7	41.4	6.8	50.9	51.8
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	0.9	2.8	2.6	0.4	0.0	0.0	0.0	0.0	0.1	6.3	0.4	6.7	6.7
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.7	0.7
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	14.3	20.7	65.7	137.0	283.9	369.3	438.5	423.8	317.0	184.2	69.9	23.9	59.0	486.6	1231.7	571.1	1969.6	2348.3
$t_{5°C}$ max	(°C)	54.5	103.6	148.0	240.3	372.9	432.8	514.5	489.4	412.8	321.5	206.4	86.4	126.8	615.3	1348.2	708.3	2146.6	2574.1
$t_{5°C}$ min	(°C)	0.0	0.0	18.8	65.3	202.1	316.7	387.7	333.8	217.7	59.3	2.5	0.0	5.1	313.9	1112.4	428.1	1725.5	2012.2
$t_{10°C}$	(°C)	0.8	1.6	10.3	42.7	135.2	219.8	283.5	268.8	169.1	64.6	16.8	3.1	5.6	188.2	772.1	250.6	1119.1	1216.5
$t_{10°C}$ max	(°C)	5.5	11.8	36.7	102.2	218.3	282.8	359.5	334.4	267.5	177.8	89.5	35.7	39.2	288.2	888.1	362.4	1284.9	1392.6
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	10.0	62.2	172.4	232.7	178.7	80.3	3.8	0.0	0.0	0.0	80.7	652.2	119.4	905.0	938.4
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	105.8	109.8	122.3	137.6	124.7	129.3	118.8	135.5	138.6	139.0	174.5	141.3	356.2	384.6	383.6	452.1	784.5	1577.2
Rmax	(mm)	214.2	245.6	207.6	328.1	261.2	288.8	246.3	269.9	290.4	458.1	364.9	339.8	578.9	660.4	585.5	846.2	1259.3	2022.7
Rmin	(mm)	1.0	13.2	30.8	30.8	10.6	56.8	17.5	0.8	16.4	0.1	14.6	42.5	126.1	219.0	204.5	190.9	462.7	1103.2
Rd_{max}	(mm)	44.4	60.0	57.9	58.2	110.8	67.9	91.7	97.0	86.6	98.1	93.5	59.6	60.0	110.8	97.0	98.1	110.8	110.8
Rd≥0.1mm	(d)	16.1	14.6	15.3	15.4	15.0	15.1	10.9	11.2	11.1	12.3	15.0	16.3	47.0	45.6	37.2	38.5	78.6	168.3
Rd≥1mm	(d)	11.2	11.1	11.7	11.9	11.1	11.5	8.4	8.6	9.0	9.5	11.9	12.5	34.7	34.7	28.5	30.4	60.5	128.4
Rd≥5mm	(d)	6.4	6.4	7.0	7.6	6.7	7.1	5.4	5.7	6.0	6.4	8.3	7.7	20.6	21.2	18.2	20.8	38.5	80.8
Rd≥10mm	(d)	4.0	3.9	4.6	4.7	4.2	4.3	3.9	4.2	4.6	4.5	5.6	5.3	13.1	13.5	12.3	14.7	25.9	53.7
Rd≥20mm	(d)	1.5	1.5	1.8	2.1	1.9	1.8	2.0	2.4	2.5	2.2	3.3	2.4	5.3	5.7	6.2	8.0	12.7	25.4
Rd≥50mm	(d)	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.3	0.1	0.1	0.5	0.9	1.2	1.7	2.7
S≥1cm	(d)	19.8	16.2	10.2	1.6	0.1	0.0	0.0	0.0	0.0	0.2	6.1	16.7	51.9	11.8	0.0	6.3	1.6	70.7
S≥10cm	(d)	12.1	9.8	6.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	3.3	9.3	30.6	7.2	0.0	3.3	0.4	41.8
S≥30cm	(d)	4.9	4.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.0	12.4	2.4	0.0	0.9	0.1	15.8
S≥50cm	(d)	2.0	2.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	5.1	0.7	0.0	0.1	0.0	5.9
S_{max}	(cm)	110	95	72	40	8	0	0	0	0	9	65	79	110	72	0	65	40	110
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	15	20	32	53	78	100	119	101	71	44	27	17	52	163	320	142	522	677
ET	(mm)	15	20	32	53	78	99	115	97	70	44	27	17	52	163	311	141	512	667

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	0.5	1.7	5.5	9.5	14.4	17.6	19.5	18.8	15.0	10.1	5.0	1.7	1.2	9.8	18.6	10.0	15.8	9.9
T_{max}	(°C)	18.9	21.2	25.4	27.2	30.8	32.7	38.0	36.7	32.8	28.7	24.7	20.9	21.2	30.8	38.0	32.8	38.0	38.0
T_{min}	(°C)	-24.5	-24.3	-18.5	-8.1	-2.7	2.1	4.5	2.4	-1.5	-5.1	-16.2	-20.5	-24.5	-18.5	2.1	-16.2	-8.1	-24.5
t_{max}	(°C)	4.3	6.2	10.5	14.6	19.8	23.0	25.4	25.2	21.0	15.2	9.2	5.5	5.3	15.0	24.5	15.1	21.5	15.0
t_{min}	(°C)	-3.1	-2.2	1.0	4.7	9.0	12.0	13.5	13.3	10.1	6.1	1.4	-1.8	-2.4	4.9	12.9	5.8	10.4	5.3
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	3.4	2.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.8	8.9	0.5	0.0	0.4	0.0	9.8
t_{max}<0°C	(d)	8.5	3.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	5.2	17.6	1.0	0.0	1.6	0.0	20.0
t_{min}<0°C	(d)	22.9	18.8	11.9	2.9	0.1	0.0	0.0	0.0	0.0	2.8	11.4	19.7	62.0	14.9	0.0	14.2	3.0	90.6
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.3	3.6	10.4	17.9	16.9	5.7	0.7	0.0	0.0	0.0	3.9	45.1	6.4	54.7	55.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	1.1	2.9	4.1	0.2	0.0	0.0	0.0	0.0	0.1	8.1	0.2	8.4	8.4
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.8	0.8
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	19.6	22.8	71.2	132.7	290.6	374.3	448.2	441.7	316.0	179.9	65.0	29.3	71.6	494.6	1264.3	560.9	2003.6	2391.4
$t_{5°C}$ max	(°C)	54.5	77.9	171.9	221.5	372.9	437.3	514.5	560.0	412.8	255.8	161.2	86.7	130.9	654.4	1412.2	755.4	2298.4	2935.1
$t_{5°C}$ min	(°C)	0.0	0.0	12.0	64.0	180.8	324.3	387.7	333.8	217.7	59.3	2.5	0.0	16.6	313.9	1112.4	428.1	1725.5	2012.2
$t_{10°C}$	(°C)	1.1	1.6	12.1	40.8	141.0	224.5	293.2	286.7	168.1	64.2	14.3	4.1	6.8	193.9	804.5	246.6	1154.4	1251.8
$t_{10°C}$ max	(°C)	5.5	11.8	45.6	110.4	218.3	287.3	359.5	405.0	267.5	114.3	46.6	35.7	39.2	310.1	952.2	362.4	1423.0	1605.4
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	10.0	49.3	174.3	232.7	178.7	80.3	3.8	0.0	0.0	0.0	80.7	652.2	119.4	905.0	938.4
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	95.5	101.0	109.1	126.9	117.3	133.7	111.7	115.4	143.1	159.6	168.7	142.8	338.0	353.3	360.7	471.5	748.1	1524.8
Rmax	(mm)	214.2	198.0	207.6	328.1	294.0	288.8	268.8	269.9	290.4	458.1	360.3	339.8	578.9	660.4	560.3	846.2	1259.3	2022.7
Rmin	(mm)	1.0	8.6	48.9	35.3	10.6	56.8	17.5	4.5	41.3	18.0	14.6	42.5	126.1	219.0	204.5	232.4	413.4	1103.2
Rd_{max}	(mm)	52.9	60.9	57.9	56.9	110.8	80.0	91.7	106.3	97.8	98.1	93.5	75.0	75.0	110.8	106.3	98.1	110.8	110.8
Rd≥0.1mm	(d)	15.0	13.0	13.4	15.0	14.2	14.6	11.1	10.5	11.5	14.5	15.0	15.1	43.3	42.6	36.2	41.0	76.9	162.9
Rd≥1mm	(d)	10.3	9.9	10.4	11.4	10.3	11.1	8.5	7.8	9.6	10.9	11.5	11.6	32.0	32.1	27.4	32.1	58.7	123.3
Rd≥5mm	(d)	5.8	5.9	6.2	7.2	6.2	7.1	5.4	5.1	6.4	7.2	7.9	7.3	19.1	19.6	17.6	21.5	37.4	77.7
Rd≥10mm	(d)	3.7	3.4	3.8	4.4	4.0	4.5	3.7	3.6	4.7	5.2	5.4	5.2	12.2	12.2	11.8	15.3	24.9	51.5
Rd≥20mm	(d)	1.3	1.3	1.7	1.7	1.7	2.0	1.9	2.0	2.6	2.7	3.1	2.7	5.2	5.2	5.9	8.4	12.0	24.8
Rd≥50mm	(d)	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.4	0.5	0.5	0.2	0.1	0.2	0.4	0.7	1.2	1.5	2.5
S≥1cm	(d)	16.9	14.6	8.1	1.9	0.1	0.0	0.0	0.0	0.0	0.2	5.9	15.3	47.1	10.1	0.0	6.1	2.0	63.0
S≥10cm	(d)	10.4	8.8	4.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	3.7	8.8	28.3	5.4	0.0	3.7	0.8	37.1
S≥30cm	(d)	3.8	3.2	1.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.5	3.1	10.4	1.7	0.0	1.5	0.2	13.3
S≥50cm	(d)	1.2	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	3.1	0.6	0.0	0.4	0.0	4.1
S_{max}	(cm)	87	83	72	47	8	0	0	0	0	9	76	79	87	72	0	76	47	87
Isparavanje Evaporation																			
EV	(mm)				56.9	84.2	96.4	108.7	95.3	56.1	30.3							528.0	
EVmax	(mm)				80.5	121.2	142.0	142.2	143.0	74.8	47.8							143.0	
EVmin	(mm)				35.0	54.1	71.3	50.7	61.5	28.0	17.6							17.6	
PET	(mm)	17	21	35	53	82	105	122	109	71	43	25	18	56	170	336	139	542	701
ET	(mm)	17	21	35	53	80	103	118	101	69	43	25	18	56	168	322	137	524	683

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	82.6	80.0	74.2	70.1	71.4	73.3	72.6	76.6	80.0	81.5	83.0	83.9	82.1	71.9	74.2	81.5	74.0	77.4
Umin (%)	24.0	22.0	11.0	19.0	19.0	25.0	17.0	21.0	25.0	16.0	12.0	22.0	22.0	11.0	17.0	12.0	17.0	11.0
U>80% (d)	13.3	9.3	7.3	5.5	4.4	4.0	3.0	3.8	4.6	7.7	12.2	14.8	37.4	17.2	10.8	24.5	25.3	89.9
U≤30% (d)	0.2	0.2	1.1	1.7	0.6	0.1	0.3	0.4	0.2	0.4	0.2	0.2	0.7	3.5	0.7	0.7	3.3	5.6
e (hPa)	5.2	5.7	6.6	8.3	11.5	14.6	16.1	16.0	13.8	10.5	7.7	5.8	5.6	8.8	15.6	10.6	13.4	10.1
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	122	179	358	458	604	631	687	593	433	263	146	102	403	1420	1911	842	3406	4576
$G_{45°S}$ (MJm^{-2})	185	247	434	462	545	541	604	578	507	363	227	160	592	1441	1723	1096	3236	4852
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.2	3.1	4.4	5.5	7.0	7.7	9.0	8.0	6.2	4.2	2.5	2.0	2.4	5.6	8.2	4.3	7.2	5.1
SS_{rel} (%)																		
SS_{max} (h)	3.9	6.0	6.9	8.1	9.2	9.2	10.8	10.5	9.4	6.7	4.4	4.3	3.5	6.8	9.6	5.2	8.4	6.0
SS_{min} (h)	0.2	0.8	2.3	3.3	4.2	5.4	5.8	6.1	4.3	2.1	1.0	0.6	1.0	4.1	6.9	3.1	6.1	4.3
Naoblaka Cloudiness																		
N (10/10)	7.3	7.1	6.7	6.5	6.1	5.8	4.6	4.6	5.1	6.1	7.3	7.5	7.3	6.4	5.0	6.2	5.4	6.2
N_{max} (10/10)	9.6	9.2	8.6	7.9	7.9	6.9	7.1	6.0	6.9	8.4	9.0	9.1	9.0	7.5	6.2	7.2	6.6	7.1
N_{min} (10/10)	5.1	4.1	4.3	4.3	4.7	4.7	3.4	2.4	2.0	3.5	5.2	4.8	5.9	5.3	3.9	4.9	4.4	5.5
N<2/10	3.1	3.2	3.9	3.6	3.6	4.6	8.4	9.0	7.5	6.0	2.9	2.5	8.8	11.0	22.0	16.3	36.7	58.1
N<2/10 max	10	12	10	10	9	9	15	20	21	16	10	9	24	22	36	29	66	92
N<2/10 min	0	0	1	0	0	0	1	2	1	0	0	0	1	3	6	5	12	36
N>8/10	17.2	14.7	14.4	11.9	10.2	8.4	6.0	6.3	7.9	12.3	16.5	17.9	49.8	36.5	20.7	36.7	50.6	143.7
N>8/10 max	30	23	25	19	20	14	13	10	14	21	23	26	76	50	29	49	73	185
N>8/10 min	6	5	6	5	4	4	0	1	1	4	9	5	34	25	10	20	30	104
Meteorološke pojave Weather phenomena																		
magla/fog	7.3	5.1	3.0	0.8	0.6	1.1	0.7	1.4	3.0	4.6	7.1	8.6	20.9	4.5	3.2	14.6	7.7	43.3
magla/fog max	14	13	12	3	3	4	3	5	7	12	17	16	33	17	7	24	14	59
magla/fog min	1	1	0	0	0	0	0	0	0	1	1	2	10	0	0	6	2	21
tuča/hail	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.3	0.6	0.1	1.0	1.1
tuča/hail max	1	0	0	1	1	1	2	1	1	1	1	0	1	2	2	1	3	3
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.1	1.0	1.2	2.6	5.7	8.3	7.0	7.2	3.9	2.2	2.5	1.3	3.3	9.5	22.5	8.7	34.7	44.0
grm/thun max	5	5	3	7	12	18	15	13	8	9	7	4	10	19	32	16	47	60
grm/thun min	0	0	0	0	1	4	2	1	0	0	0	0	0	3	10	2	21	29
rosa/dew	1.0	1.2	4.9	11.3	16.5	16.6	22.5	23.5	22.3	19.0	7.0	1.7	3.9	32.7	62.6	48.3	112.7	147.4
rosa/dew max	7	14	17	20	26	24	29	29	30	30	18	7	14	52	72	63	131	176
rosa/dew min	0	0	0	3	8	9	15	16	12	6	2	0	0	16	50	31	87	118
mraz/frost	4.6	3.7	5.1	2.2	0.4	0.0	0.0	0.0	0.1	3.7	6.2	4.0	12.3	7.7	0.0	10.0	2.8	30.1
mraz/frost max	21	14	14	6	3	0	0	0	2	10	15	17	36	20	0	19	7	57
mraz/frost min	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	9
inje/rime	2.9	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	2.5	6.4	0.4	0.0	1.1	0.0	8.0
inje/rime max	10	4	2	1	0	0	0	0	0	1	10	8	15	3	0	10	1	17
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tlak zraka Air pressure																		
p (hPa)	979.8	977.8	977.2	975.0	976.7	977.5	978.5	978.4	980.2	981.0	979.0	979.2	978.9	976.3	978.1	980.1	977.7	978.4
p max (hPa)	1003.6	1001.6	1001.3	994.8	991.6	991.0	990.3	989.4	995.6	996.9	999.8	1003.6	1003.6	1001.3	991.0	999.8	995.6	1003.6
p min (hPa)	947.7	934.6	949.7	948.5	955.0	964.3	962.5	959.2	957.6	946.5	948.7	931.3	931.3	948.5	959.2	946.5	948.5	931.3
Vjetar Wind																		
v_h (ms^{-1})	1.6	1.5	1.8	2.1	2.0	1.8	1.6	1.5	1.6	1.5	1.4	1.7	1.6	2.0	1.7	1.5	1.8	1.7
v_h max (ms^{-1})	18.0	14.1	13.3	10.4	11.6	9.6	9.0	7.9	9.0	10.8	11.8	15.0	18.0	13.3	9.6	11.8	11.6	18.0
v_{max} (ms^{-1})	36.9	30.6	27.7	24.2	24.1	21.3	20.0	19.4	20.5	22.6	29.6	35.4	36.9	27.7	21.3	29.6	24.2	36.9
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.4	-8.4	-3.3	3.6	10.6	15.3	16.4	12.9	7.6	2.5	-2.1	-6.6	-7.8	3.6	14.9	2.6	11.1	3.3
$PhET_{14h}$ (°C)	-1.3	-0.7	6.9	12.5	19.0	23.8	27.3	26.7	21.3	13.3	4.8	-0.4	-0.8	12.8	26.0	13.1	21.8	12.8
$PhET_{21h}$ (°C)	-7.1	-6.9	-1.4	3.3	8.0	11.5	13.3	12.2	9.0	4.1	-0.9	-5.5	-6.5	3.3	12.3	4.1	9.5	3.3

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	82.3	78.1	72.5	70.1	70.8	72.1	72.3	75.5	79.7	82.0	83.6	83.8	81.4	71.1	73.3	81.8	73.4	76.9
Umin (%)	24.0	16.0	11.0	21.0	25.0	21.0	17.0	20.0	28.0	16.0	12.0	22.0	16.0	11.0	17.0	12.0	17.0	11.0
U>80% (d)	13.4	8.2	6.6	5.5	4.2	3.9	2.9	3.3	5.0	8.8	12.4	14.2	35.8	16.3	10.2	26.1	24.8	88.5
U≤30% (d)	0.4	0.8	1.8	1.8	0.8	0.4	0.4	1.1	0.3	0.3	0.3	0.2	1.4	4.4	1.8	0.9	4.7	8.5
e (hPa)	5.5	5.6	6.6	8.2	11.5	14.5	16.2	16.2	13.6	10.4	7.6	6.1	5.7	8.8	15.6	10.5	13.4	10.2
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.2	3.6	4.6	5.5	7.2	7.8	9.0	8.1	6.2	3.9	2.4	2.1	2.6	5.8	8.3	4.2	7.3	5.2
SS_{rel} (%)																		
SS_{max} (h)	3.9	6.0	7.2	7.0	9.8	11.4	10.8	10.6	8.9	6.7	4.4	4.3	3.8	7.5	10.7	5.2	9.1	6.5
SS_{min} (h)	0.2	0.8	2.6	3.3	4.2	5.4	5.8	6.1	3.5	2.4	0.7	0.3	1.0	4.1	6.9	2.7	6.1	4.3
Naoblaka Cloudiness																		
N (10/10)	7.2	6.6	6.4	6.5	6.0	5.7	4.6	4.5	5.3	6.5	7.3	7.2	7.0	6.3	5.0	6.4	5.5	6.2
N_{max} (10/10)	9.6	9.2	8.3	7.9	7.9	6.9	7.1	5.9	8.0	7.9	9.0	9.6	9.0	7.5	6.2	7.7	6.6	7.1
N_{min} (10/10)	5.1	4.1	4.4	5.4	4.5	3.7	3.4	2.3	2.6	3.5	5.2	4.8	5.8	5.3	3.6	4.9	4.5	5.5
N<2/10	3.3	4.2	4.1	3.1	3.5	4.3	8.0	9.3	6.4	4.8	2.7	3.2	10.6	10.7	21.6	13.9	34.6	56.8
N<2/10 max	10	12	9	8	9	14	16	20	16	16	10	9	24	22	39	29	55	83
N<2/10 min	0	0	1	0	0	0	1	2	0	0	0	0	3	3	6	2	12	36
N>8/10	17.2	12.9	13.3	11.7	10.0	7.9	5.7	6.2	8.0	13.4	16.4	16.8	46.9	35.0	19.8	37.8	49.5	139.5
N>8/10 max	30	23	22	19	20	14	13	10	18	21	23	29	76	50	29	51	73	185
N>8/10 min	6	5	3	6	3	4	0	1	2	4	9	5	31	17	10	20	30	104
Meteorološke pojave Weather phenomena																		
magla/fog	7.3	3.9	2.5	0.8	0.7	1.1	0.8	1.1	2.7	5.0	6.2	7.9	19.1	4.0	2.9	13.8	7.1	39.9
magla/fog max	16	13	12	3	3	4	3	5	6	12	17	16	33	17	7	24	14	59
magla/fog min	1	0	0	0	0	0	0	0	0	2	0	1	10	0	0	5	0	21
tuča/hail	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.2	0.6	0.2	0.8	1.1
tuča/hail max	1	0	0	1	1	1	1	3	1	2	1	0	1	2	3	2	3	4
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.1	1.2	1.2	2.4	5.1	8.1	7.4	6.9	4.2	2.9	2.5	1.5	3.8	8.7	22.4	9.6	34.1	44.5
grm/thun max	5	5	4	5	12	18	15	14	8	10	8	4	10	14	33	18	45	60
grm/thun min	0	0	0	0	1	4	2	1	0	0	0	0	0	3	10	2	22	33
rosa/dew	1.5	2.0	6.6	13.0	18.1	18.3	23.3	24.3	22.8	18.1	7.7	2.1	5.5	37.7	65.8	48.7	119.8	157.7
rosa/dew max	7	14	20	21	29	26	29	29	30	27	18	7	17	59	76	63	139	200
rosa/dew min	0	0	0	5	9	9	15	18	12	8	3	0	0	19	54	36	94	120
mraz/frost	5.6	5.5	6.3	2.2	0.3	0.0	0.0	0.0	0.1	3.8	6.4	4.2	15.3	8.8	0.0	10.3	2.6	34.5
mraz/frost max	21	17	14	6	3	0	0	0	1	8	15	17	36	20	0	19	7	57
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	16
inje/rime	2.5	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.9	5.2	0.3	0.0	1.3	0.0	6.8
inje/rime max	10	4	2	1	0	0	0	0	0	1	10	11	13	3	0	10	1	17
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tlak zraka Air pressure																		
p (hPa)	981.1	979.4	977.9	975.0	976.9	977.5	978.2	978.7	979.7	980.5	979.7	980.2	980.3	976.6	978.1	980.0	977.7	978.7
p max (hPa)	1003.8	1001.6	1001.3	994.8	991.6	992.4	990.3	989.4	995.6	996.9	999.8	1002.5	1003.8	1001.3	992.4	999.8	995.6	1003.8
p min (hPa)	947.7	934.6	948.5	951.6	953.5	961.5	962.0	959.2	954.7	951.4	948.7	931.3	931.3	948.5	959.2	948.7	951.6	931.3
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-7.3	-7.5	-3.3	3.0	10.6	15.1	16.4	13.1	7.4	2.8	-2.3	-5.9	-6.9	3.5	14.9	2.6	10.9	3.5
$PhET_{14h}$ (°C)	-0.5	0.6	7.4	12.5	19.1	24.0	27.7	27.9	21.0	13.0	4.8	0.5	0.2	13.0	26.5	13.0	22.0	13.2
$PhET_{21h}$ (°C)	-6.1	-5.8	-1.2	3.2	8.2	11.7	13.6	12.9	8.9	4.2	-1.1	-4.7	-5.5	3.4	12.7	4.0	9.8	3.7

Gospić

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-1.7	0.2	3.6	8.1	12.8	16.0	18.1	17.3	13.6	9.0	4.2	-0.5	-0.6	8.2	17.1	8.9	14.3	8.4
T_{max}	(°C)	15.0	18.5	23.4	26.2	28.8	31.8	37.0	34.9	33.2	26.8	20.5	16.9	18.5	28.8	37.0	33.2	37.0	37.0
T_{min}	(°C)	-28.9	-26.1	-21.0	-7.0	-3.9	0.3	2.4	0.2	-5.6	-7.6	-23.2	-26.6	-28.9	-21.0	0.2	-23.2	-7.0	-28.9
t_{max}	(°C)	2.5	4.7	8.9	13.5	18.6	22.1	24.8	24.6	20.9	15.4	8.9	3.5	3.6	13.7	23.8	15.1	20.7	14.0
t_{min}	(°C)	-6.0	-4.1	-1.3	2.6	6.3	9.2	10.5	10.1	7.4	3.8	-0.1	-4.3	-4.8	2.6	10.0	3.7	7.7	2.9
$t_{min\ 5cm}$	(°C)	-6.7	-5.2	-2.7	0.7	4.4	7.6	8.6	8.4	6.0	2.3	-1.1	-4.9	-5.6	0.8	8.2	2.4	6.0	1.5
$t_{min\ 5cm}$ min	(°C)	-29.5	-30.2	-24.4	-10.5	-6.9	-2.0	0.3	-1.2	-6.6	-11.3	-25.0	-28.4	-30.2	-24.4	-2.0	-25.0	-10.5	-30.2
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	8.0	4.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	5.0	17.3	1.6	0.0	1.2	0.0	20.1
t_{max}<0°C	(d)	9.7	5.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	8.5	23.2	1.7	0.0	1.3	0.0	26.3
t_{min}<0°C	(d)	25.8	21.2	18.7	7.5	1.1	0.0	0.0	0.0	0.7	6.7	15.0	23.6	70.3	27.3	0.0	22.5	9.3	120.4
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	1.7	7.6	16.6	14.9	5.3	0.5	0.0	0.0	0.0	1.7	39.2	5.9	46.2	46.8
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	0.4	2.1	3.5	0.4	0.0	0.0	0.0	0.0	0.0	6.0	0.4	6.4	6.4
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
$t_{min\ 5cm}$<0°C	(d)	25.5	22.0	20.7	13.1	3.9	0.3	0.0	0.1	2.2	10.0	16.3	23.2	70.8	37.7	0.4	28.4	19.5	137.1
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	5.7	9.7	37.7	102.5	232.8	319.6	392.0	383.0	274.8	148.4	49.3	13.3	28.7	373.0	1094.6	472.5	1704.8	1968.8
$t_{5°C}$ max	(°C)	29.5	46.3	87.3	176.7	325.3	382.2	470.4	461.6	373.4	256.3	160.6	60.2	80.1	497.9	1204.0	595.7	1878.1	2160.9
$t_{5°C}$ min	(°C)	0.0	0.0	1.8	30.0	145.6	275.8	350.8	285.3	191.4	27.2	1.1	0.0	5.7	197.6	984.8	340.6	1479.1	1689.9
$t_{10°C}$	(°C)	0.2	0.3	2.4	17.4	89.3	170.9	237.1	228.0	129.8	40.8	8.1	0.8	1.3	109.1	636.0	178.7	872.5	925.1
$t_{10°C}$ max	(°C)	2.7	2.8	15.9	47.7	170.5	232.2	315.4	306.6	231.0	114.8	56.6	18.0	18.7	204.6	744.0	298.5	1071.0	1123.6
$t_{10°C\ min}$	(°C)	0.0	0.0	0.0	0.0	21.3	134.0	195.8	130.3	65.9	1.1	0.0	0.0	0.0	21.7	526.1	82.4	685.0	706.1
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	-0.3	1.0	3.7	8.6	14.2	18.4	21.0	19.8	15.5	10.3	4.8	0.9	0.5	8.8	19.7	10.2	16.2	9.8
t_{5cm} max	(°C)	3.0	4.0	7.2	12.0	17.6	21.7	24.1	22.6	18.4	13.2	8.8	3.4	4.0	17.6	24.1	18.4	24.1	24.1
t_{5cm} min	(°C)	-6.1	-1.7	-0.3	6.3	10.9	16.7	18.8	16.7	13.3	6.1	1.5	-3.1	-6.1	-0.3	16.7	1.5	6.3	-6.1
t_{20cm}	(°C)	0.2	1.1	3.3	8.2	13.4	17.4	20.0	19.5	15.6	10.7	5.5	1.7	1.0	8.3	19.0	10.6	15.7	9.7
t_{20cm} max	(°C)	2.9	4.0	6.4	11.3	16.5	20.4	22.7	21.5	18.4	13.4	9.3	3.9	4.0	16.5	22.7	18.4	22.7	22.7
t_{20cm} min	(°C)	-5.7	-1.5	-0.5	6.1	10.4	16.0	18.2	16.2	13.7	7.0	2.5	-2.6	-5.7	-0.5	16.0	2.5	6.1	-5.7
Oborina Precipitation																			
R	(mm)	107.0	107.8	104.4	107.6	107.4	91.6	66.3	101.1	118.1	136.4	179.1	142.1	360.2	319.3	259.0	433.6	592.1	1368.8
Rmax	(mm)	199.2	241.6	223.0	161.2	239.6	202.0	152.1	220.5	376.3	461.7	413.7	390.7	649.7	464.5	394.1	771.1	963.5	1768.0
Rmin	(mm)	1.4	12.6	21.8	17.9	14.4	35.5	4.6	0.0	12.7	0.0	18.2	24.1	86.5	174.0	108.1	171.9	360.1	910.0
Rd_{max}	(mm)	39.7	62.5	41.5	55.5	77.8	57.4	92.2	120.9	88.8	103.4	79.6	109.3	109.3	77.8	120.9	103.4	120.9	120.9
Rd≥0.1mm	(d)	12.9	12.6	13.0	13.7	13.3	12.4	7.9	8.7	10.1	11.0	13.4	13.7	39.1	39.9	29.0	34.4	66.0	142.6
Rd≥1mm	(d)	10.3	9.3	10.3	10.6	10.2	9.6	5.8	7.0	8.0	8.5	10.7	10.8	30.5	31.1	22.4	27.2	51.2	111.2
Rd≥5mm	(d)	6.8	5.8	6.1	6.5	6.2	5.1	3.1	4.6	5.1	6.1	7.7	7.2	20.0	18.8	12.8	19.0	30.6	70.5
Rd≥10mm	(d)	4.3	3.8	3.9	3.9	3.7	2.9	2.1	3.4	3.8	3.8	5.9	4.5	12.8	11.5	8.4	13.6	19.8	46.1
Rd≥20mm	(d)	1.3	1.7	1.6	1.5	1.5	1.4	1.0	1.5	2.1	2.3	3.4	2.2	5.2	4.6	3.9	7.8	8.9	21.4
Rd≥50mm	(d)	0.0	0.2	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.3	0.5	0.2	0.5	1.2	1.0	2.4
S≥1cm	(d)	18.4	14.9	11.0	2.0	0.1	0.0	0.0	0.0	0.0	0.3	6.2	16.0	49.0	13.1	0.0	6.4	2.1	68.8
S≥10cm	(d)	11.5	9.9	6.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	3.4	9.4	30.7	7.6	0.0	3.4	0.9	41.8
S≥30cm	(d)	6.3	4.8	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.5	3.9	15.1	1.8	0.0	1.5	0.2	18.4
S≥50cm	(d)	2.0	1.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	4.8	0.4	0.0	0.3	0.1	5.6
S_{max}	(cm)	82	117	58	62	4	0	0	0	0	9	95	91	117	62	0	95	62	117
Isparavanje Evaporation																			
EV	(mm)				53.9	78.5	90.2	110.8	95.6	55.7	30.3							514.9	
EVmax	(mm)				80.6	102.2	116.5	149.7	127.3	75.6	43.3							149.7	
EVmin	(mm)				39.2	46.6	68.8	87.3	63.1	37.0	12.0							12.0	
PET	(mm)	10	13	21	36	55	72	90	79	52	32	18	10	33	112	241	102	384	488
ET	(mm)	10	13	21	36	54	71	87	76	50	31	18	10	33	111	234	99	374	477

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-0.8	0.3	4.1	8.0	13.0	16.3	18.5	17.9	13.6	9.1	3.8	0.0	-0.2	8.4	17.6	8.8	14.6	8.7
T_{max}	(°C)	15.0	18.5	23.4	26.0	29.0	31.8	37.0	36.8	33.2	26.8	20.2	16.9	18.5	29.0	37.0	33.2	37.0	37.0
T_{min}	(°C)	-27.3	-26.1	-21.0	-7.1	-3.3	0.3	2.5	0.2	-4.9	-7.6	-18.3	-20.4	-27.3	-21.0	0.2	-18.3	-7.1	-27.3
t_{max}	(°C)	3.3	5.4	9.7	13.5	19.0	22.5	25.2	25.4	20.8	15.3	8.5	3.9	4.2	14.1	24.4	14.9	21.1	14.4
t_{min}	(°C)	-5.0	-4.2	-1.1	2.5	6.5	9.4	10.9	10.5	7.5	4.1	-0.4	-3.7	-4.4	2.7	10.3	3.7	7.9	3.1
$t_{min\ 5cm}$	(°C)	-5.7	-5.6	-2.9	0.4	4.1	7.4	8.7	8.5	5.8	2.5	-1.4	-4.4	-5.3	0.5	8.2	2.3	5.8	1.4
$t_{min\ 5cm}$ min	(°C)	-29.0	-30.2	-24.4	-11.2	-6.9	-2.7	0.4	-1.3	-6.2	-11.3	-22.2	-23.6	-30.2	-24.4	-2.7	-22.2	-11.2	-30.2
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	3.4	2.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.8	8.9	0.5	0.0	0.4	0.0	9.8
t_{max}<0°C	(d)	8.5	3.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	5.2	17.6	1.0	0.0	1.6	0.0	20.0
t_{min}<0°C	(d)	22.9	18.8	11.9	2.9	0.1	0.0	0.0	0.0	0.0	2.8	11.4	19.7	62.0	14.9	0.0	14.2	3.0	90.6
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.3	3.6	10.4	17.9	16.9	5.7	0.7	0.0	0.0	0.0	3.9	45.1	6.4	54.7	55.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	1.1	2.9	4.1	0.2	0.0	0.0	0.0	0.0	0.1	8.1	0.2	8.4	8.4
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.8	0.8
$t_{min\ 5cm}$<0°C	(d)	24.8	22.8	21.4	13.7	3.9	0.4	0.0	0.1	2.7	9.7	17.1	22.6	70.5	39.0	0.5	29.5	20.7	139.2
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	6.8	9.2	43.1	100.9	241.1	328.5	405.2	401.6	274.3	153.9	47.0	15.3	31.3	385.2	1135.4	475.2	1751.7	2027.0
$t_{5°C}$ max	(°C)	29.5	46.3	108.4	194.5	325.3	382.2	475.1	479.5	373.4	238.7	141.2	60.2	80.1	538.1	1307.7	673.1	2041.6	2511.5
$t_{5°C}$ min	(°C)	0.0	0.0	1.8	29.1	133.4	283.2	350.8	285.3	184.7	27.2	1.1	0.0	8.1	197.6	984.8	340.6	1479.1	1689.9
$t_{10°C}$	(°C)	0.2	0.2	3.2	17.0	95.5	179.1	250.2	246.6	129.3	46.0	6.9	0.9	1.2	115.8	676.0	182.2	917.9	975.3
$t_{10°C}$ max	(°C)	2.6	2.6	16.9	74.8	170.5	232.2	320.1	324.5	231.0	98.1	36.6	18.0	18.7	222.0	847.7	298.5	1158.8	1292.6
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	0.0	18.4	134.0	195.8	130.3	45.6	1.1	0.0	0.0	0.0	21.7	526.1	82.4	685.0	706.1
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	0.2	1.0	4.1	8.4	14.2	18.3	21.4	20.6	15.7	10.4	4.8	1.2	0.8	8.9	20.1	10.3	16.4	10.0
t_{5cm} max	(°C)	3.0	4.0	8.2	11.7	18.1	22.5	24.1	23.2	18.4	12.8	8.9	4.1	4.1	18.1	24.1	18.4	24.1	24.1
t_{5cm} min	(°C)	-2.1	-1.7	-0.9	4.4	4.3	3.6	19.6	16.7	13.3	6.1	1.5	-1.2	-2.1	-0.9	3.6	1.5	3.6	-2.1
t_{20cm}	(°C)	0.5	1.1	3.8	8.1	13.6	18.0	20.5	20.2	15.8	10.9	5.4	2.0	1.2	8.5	19.6	10.7	16.0	10.0
t_{20cm} max	(°C)	2.9	4.0	7.6	11.1	17.2	21.2	22.7	22.6	18.4	13.3	9.5	4.8	4.8	17.2	22.7	18.4	22.7	22.7
t_{20cm} min	(°C)	-1.0	-1.5	-0.5	5.5	9.8	16.3	18.4	16.2	13.7	7.0	2.5	-0.4	-1.5	-0.5	16.2	2.5	5.5	-1.5
Oborina Precipitation																			
R	(mm)	101.8	98.8	95.2	108.9	108.4	95.4	60.4	83.1	140.4	156.5	175.4	141.9	340.0	312.4	238.9	472.3	596.5	1365.9
Rmax	(mm)	199.2	241.6	184.9	181.8	239.6	289.5	140.6	160.2	376.3	505.9	382.2	390.7	649.7	464.5	457.2	817.6	963.5	1754.9
Rmin	(mm)	1.5	11.0	19.9	58.3	14.4	33.1	4.6	3.9	12.7	16.4	18.2	24.1	86.5	176.2	107.6	171.9	360.1	910.0
Rd_{max}	(mm)	45.1	62.5	64.2	75.5	77.8	92.8	92.2	84.1	100.5	103.4	90.8	87.1	87.1	77.8	92.8	103.4	100.5	103.4
Rd≥0.1mm	(d)	12.7	11.6	12.4	13.8	13.2	11.9	8.3	8.2	11.2	12.4	13.8	13.5	37.9	39.4	28.4	37.4	66.6	143.0
Rd≥1mm	(d)	9.9	8.4	9.5	10.3	10.3	9.2	6.1	6.4	8.8	9.7	11.0	10.5	28.9	30.0	21.6	29.5	50.9	109.9
Rd≥5mm	(d)	6.1	5.2	5.6	6.4	6.2	4.8	3.3	3.9	5.7	7.1	7.5	6.9	18.4	18.2	12.0	20.3	30.3	68.7
Rd≥10mm	(d)	4.1	3.5	3.5	3.8	3.7	2.9	2.1	2.8	4.4	4.5	5.4	4.6	12.1	11.0	7.8	14.3	19.7	45.3
Rd≥20mm	(d)	1.3	1.6	1.4	1.5	1.5	1.5	0.8	1.3	2.6	2.8	3.2	2.3	5.1	4.5	3.6	8.6	9.3	22.0
Rd≥50mm	(d)	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.4	0.5	0.4	0.4	0.5	0.2	0.4	1.3	1.0	2.5
S≥1cm	(d)	16.0	14.5	9.1	2.6	0.2	0.0	0.0	0.0	0.0	0.3	6.5	16.0	46.7	11.8	0.0	6.9	2.7	65.2
S≥10cm	(d)	8.9	9.0	5.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	3.5	8.6	26.7	7.0	0.0	3.5	1.3	36.9
S≥30cm	(d)	4.8	4.0	1.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.7	12.7	1.9	0.0	1.7	0.4	16.1
S≥50cm	(d)	1.9	1.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	4.2	0.5	0.0	0.3	0.2	5.1
S_{max}	(cm)	82	117	58	62	10	0	0	0	0	9	95	91	117	62	0	95	62	117
Isparavanje Evaporation																			
EV	(mm)				52.1	78.2	93.1	111.7	98.4	55.7	29.4							518.6	
EVmax	(mm)				77.0	108.2	125.7	131.6	141.5	75.6	43.8							141.5	
EVmin	(mm)				36.5	46.6	68.8	87.3	63.1	34.1	12.0							12.0	
PET	(mm)	13	17	26	39	62	83	106	97	61	39	22	14	44	127	286	122	448	579
ET	(mm)	13	17	26	39	61	81	98	84	59	39	22	14	44	126	263	120	422	553

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	84.8	81.9	76.7	73.1	73.4	73.9	71.4	74.9	79.4	82.0	84.3	86.7	84.5	74.4	73.4	81.9	74.3	78.5
Umin (%)	25.0	18.0	13.0	11.0	19.0	21.0	13.0	14.0	14.0	15.0	21.0	24.0	18.0	11.0	13.0	14.0	11.0	11.0
U>80% (d)	14.3	9.7	6.4	5.1	4.3	2.9	1.9	2.2	3.8	6.8	12.1	16.9	40.9	15.8	7.1	22.7	20.2	86.4
U≤30% (d)	0.1	0.4	2.4	2.3	1.5	0.6	2.0	3.0	2.2	1.1	0.4	0.1	0.6	6.1	5.5	3.7	11.5	15.9
e (hPa)	5.0	5.4	6.2	7.8	10.8	13.4	14.5	14.4	12.3	9.6	7.3	5.6	5.3	8.2	14.1	9.8	12.2	9.4
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	123	176	345	453	609	640	687	629	421	271	137	96	395	1407	1957	830	3440	4589
$G_{45°S}$ (MJm^{-2})	181	236	408	454	548	546	600	615	484	371	200	140	556	1410	1762	1054	3247	4782
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.1	3.0	4.2	5.5	7.0	7.9	9.5	8.5	6.4	4.3	2.3	1.6	2.2	5.6	8.7	4.3	7.5	5.2
SS_{rel} (%)	24	31	38	43	51	56	68	65	54	43	27	19	25	45	63	42	56	46
SS_{max} (h)	4.1	6.0	6.9	7.5	9.4	9.7	12.0	11.9	9.4	6.9	4.8	3.4	3.6	6.6	9.9	5.6	8.5	6.0
SS_{min} (h)	0.6	1.3	1.6	3.3	4.0	6.3	6.6	6.3	4.5	1.7	0.7	0.3	0.9	4.1	7.3	3.0	6.4	4.4
Naoblaka Cloudiness																		
N (10/10)	6.9	6.9	6.5	6.4	5.8	5.6	4.1	4.1	4.9	5.8	7.1	7.3	7.0	6.2	4.6	5.9	5.1	5.9
N_{max} (10/10)	9.3	8.7	8.5	8.2	7.6	6.9	6.4	5.8	6.7	8.5	9.2	9.1	9.0	7.3	5.8	6.9	6.1	6.9
N_{min} (10/10)	4.4	4.0	4.1	4.6	4.5	4.5	2.5	1.8	1.8	3.0	4.6	5.3	5.6	5.4	3.8	4.7	4.2	5.1
N<2/10	3.7	3.2	3.7	3.5	3.6	4.2	8.8	9.5	7.0	5.7	2.9	2.7	9.5	10.8	22.4	15.6	36.5	58.4
N<2/10 max	11	9	10	7	9	9	16	19	19	16	11	8	21	22	34	29	60	86
N<2/10 min	0	0	0	0	0	0	2	0	0	0	0	0	3	1	4	6	11	34
N>8/10	15.4	13.5	13.2	11.4	8.0	6.5	3.8	4.0	6.4	10.5	15.3	16.6	45.6	32.6	14.3	32.2	40.2	124.7
N>8/10 max	28	23	23	20	15	13	8	8	13	21	25	25	75	46	23	45	56	172
N>8/10 min	6	4	5	4	4	2	0	0	0	3	7	6	31	21	9	20	21	86
Meteorološke pojave Weather phenomena																		
magla/fog	7.4	5.8	3.1	1.5	3.2	4.6	3.5	5.9	11.2	9.9	7.9	9.8	23.0	7.8	14.0	29.0	29.9	73.8
magla/fog max	19	12	8	4	9	14	10	15	19	18	15	23	46	17	33	42	58	106
magla/fog min	2	0	0	0	0	1	0	1	3	2	2	2	10	3	5	17	10	51
tuča/hail	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.2	0.1	0.6	0.3	0.7	0.4	0.9	2.0
tuča/hail max	2	2	1	1	1	1	2	2	1	1	2	2	3	3	3	2	3	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.7	1.8	2.2	3.0	5.3	7.4	5.8	5.8	4.5	3.1	4.1	2.2	5.7	10.5	19.1	11.7	31.9	47.0
grm/thun max	6	6	8	7	13	14	13	10	12	10	13	9	11	21	28	20	47	65
grm/thun min	0	0	0	0	1	2	1	0	0	0	1	0	1	4	9	4	18	33
rosa/dew	0.6	1.4	5.9	15.9	23.7	24.7	27.3	27.5	25.7	20.6	8.0	1.5	3.5	45.5	79.5	54.2	144.7	182.8
rosa/dew max	7	9	21	24	28	29	31	30	30	29	19	6	10	59	85	66	163	211
rosa/dew min	0	0	0	7	7	15	22	22	20	7	1	0	0	33	64	41	108	150
mraz/frost	7.9	7.6	10.1	8.0	2.1	0.3	0.0	0.0	2.1	8.7	11.0	8.1	23.6	20.2	0.3	21.8	12.5	65.9
mraz/frost max	27	22	21	14	7	2	0	1	7	20	23	24	64	32	2	38	23	127
mraz/frost min	0	0	2	0	0	0	0	0	0	0	2	0	0	8	0	6	4	30
inje/rime	3.1	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	4.5	9.3	0.4	0.0	1.2	0.0	10.8
inje/rime max	16	6	2	1	0	0	0	0	0	2	5	11	28	2	0	7	1	28
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Tlak zraka Air pressure																		
p (hPa)	950.8	949.0	948.7	947.1	949.2	950.3	951.3	951.1	952.8	953.0	950.8	950.4	950.1	948.4	950.9	952.2	950.3	950.4
p max (hPa)	971.9	971.7	971.8	965.6	961.9	961.8	960.9	961.1	966.2	967.0	969.2	972.0	972.0	971.8	961.8	969.2	966.2	972.0
p min (hPa)	919.6	909.5	921.8	922.8	925.7	936.2	937.5	934.1	929.6	923.7	923.4	907.3	907.3	921.8	934.1	923.4	922.8	907.3
Vjetar Wind																		
v_h (ms^{-1})	1.6	1.7	2.0	2.3	1.9	1.6	1.5	1.5	1.3	1.6	1.5	1.9	1.7	2.0	1.5	1.5	1.7	1.7
v_h max (ms^{-1})	13.7	17.9	14.0	11.2	13.6	8.2	9.5	11.1	13.0	10.6	10.8	12.9	17.9	14.0	11.1	13.0	13.6	17.9
v_{max} (ms^{-1})	26.5	30.6	23.2	21.7	25.0	17.8	26.0	21.7	25.4	26.4	24.1	28.4	30.6	25.0	26.0	26.4	26.0	30.6
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.8	-8.7	-4.2	3.0	10.9	16.2	17.8	13.1	6.9	2.1	-2.5	-7.0	-8.2	3.2	15.7	2.2	11.3	3.2
$PhET_{14h}$ (°C)	0.1	0.8	7.6	12.0	18.7	24.1	28.0	28.1	22.8	14.7	5.8	-0.2	0.2	12.8	26.8	14.4	22.3	13.5
$PhET_{21h}$ (°C)	-7.4	-7.2	-2.2	2.5	7.5	11.3	13.0	12.3	8.6	3.7	-1.3	-5.9	-6.8	2.6	12.2	3.7	9.2	2.9

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	84.3	79.9	74.8	72.5	72.5	72.3	70.3	73.0	78.9	81.2	84.1	86.2	83.4	73.3	71.9	81.4	73.3	77.5
Umin (%)	25.0	24.0	17.0	18.0	19.0	21.0	13.0	14.0	17.0	15.0	23.0	29.0	24.0	17.0	13.0	15.0	13.0	13.0
U>80% (d)	13.9	8.3	5.9	4.9	4.1	2.9	1.9	2.3	4.2	7.2	12.6	16.6	38.7	14.9	7.1	23.9	20.3	84.6
U≤30% (d)	0.2	0.8	2.5	2.4	2.0	1.2	2.6	4.5	1.9	1.3	0.4	0.0	1.0	6.8	8.3	3.6	14.5	19.7
e (hPa)	5.2	5.3	6.2	7.7	10.7	13.3	14.6	14.5	12.2	9.7	7.2	5.7	5.4	8.2	14.1	9.7	12.1	9.3
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.2	3.6	4.7	5.5	7.3	8.3	9.8	8.8	6.4	4.2	2.3	1.8	2.5	5.9	9.0	4.3	7.7	5.4
SS_{rel} (%)	25	38	43	44	54	59	70	67	55	42	27	21	28	47	65	43	59	48
SS_{max} (h)	4.1	6.2	7.9	7.0	9.9	12.0	11.4	11.5	9.4	6.5	4.8	3.4	3.7	8.2	11.2	5.6	9.4	6.7
SS_{min} (h)	0.6	1.3	2.8	3.3	4.0	6.3	6.6	6.3	4.0	1.7	0.9	0.3	0.9	4.1	7.5	3.0	6.4	4.4
Naoblaka Cloudiness																		
N (10/10)	6.9	6.4	6.2	6.4	5.7	5.4	4.0	4.0	5.0	6.0	7.1	7.1	6.8	6.1	4.5	6.0	5.1	5.8
N_{max} (10/10)	9.3	8.7	8.1	8.2	7.2	6.9	6.4	5.8	6.6	7.8	8.5	9.5	9.0	7.3	5.8	7.1	6.1	6.9
N_{min} (10/10)	4.4	3.8	4.0	5.0	4.5	3.1	2.5	2.1	1.9	3.7	4.6	5.1	5.5	4.7	3.0	4.7	4.1	5.1
N<2/10	4.0	4.4	4.1	3.3	3.8	4.2	9.0	9.6	5.9	4.8	2.8	2.9	11.2	11.3	22.7	13.5	35.8	58.8
N<2/10 max	11	11	10	7	9	10	16	20	19	11	11	8	21	22	34	29	60	86
N<2/10 min	1	0	1	0	0	0	3	0	0	0	0	0	3	1	4	3	11	34
N>8/10	15.1	12.1	11.8	11.0	7.4	5.6	3.5	3.6	6.3	11.0	15.0	15.9	43.2	30.3	12.8	32.3	37.5	118.5
N>8/10 max	28	23	21	20	12	11	8	8	13	17	21	28	75	46	21	43	56	172
N>8/10 min	6	4	0	4	2	1	0	0	0	3	7	6	26	12	4	20	19	84
Meteorološke pojave Weather phenomena																		
magla/fog	7.7	4.8	3.0	2.0	3.5	4.4	3.7	6.1	10.3	8.8	7.8	10.3	22.8	8.5	14.2	26.9	30.0	72.4
magla/fog max	19	12	8	6	9	14	10	15	19	17	15	23	46	17	33	42	58	106
magla/fog min	3	0	0	0	0	1	0	1	2	4	2	2	13	2	3	11	12	44
tuča/hail	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.2	0.1	0.6	0.2	0.5	0.3	0.7	1.6
tuča/hail max	2	2	1	1	1	1	1	2	1	1	2	2	3	3	3	2	3	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.5	1.8	2.2	3.0	5.2	6.4	5.7	5.8	5.1	3.9	3.6	2.4	5.7	10.4	17.9	12.6	31.2	46.7
grm/thun max	5	6	8	7	13	14	13	10	12	16	8	9	11	21	28	26	45	59
grm/thun min	0	0	0	0	1	0	2	2	0	0	0	0	2	4	8	4	18	35
rosa/dew	1.0	1.2	6.1	14.7	24.6	24.8	27.2	26.9	25.8	20.1	8.4	2.1	4.4	45.4	78.9	54.3	144.0	183.0
rosa/dew max	7	9	21	24	28	28	31	30	30	28	20	15	15	59	85	66	163	211
rosa/dew min	0	0	0	1	20	17	22	20	20	10	1	0	0	26	65	37	124	155
mraz/frost	11.5	10.5	11.6	9.1	1.9	0.2	0.0	0.1	2.2	9.0	11.6	9.6	31.6	22.6	0.3	22.8	13.4	77.2
mraz/frost max	27	22	21	17	6	2	0	2	7	20	23	24	64	36	2	38	23	127
mraz/frost min	0	0	3	3	0	0	0	0	0	1	2	0	0	8	0	8	3	43
inje/rime	2.7	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	4.1	8.1	0.3	0.0	1.6	0.0	10.0
inje/rime max	8	5	2	0	0	0	0	0	0	2	5	11	16	2	0	7	0	20
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Tlak zraka Air pressure																		
p (hPa)	952.2	950.6	949.5	947.1	949.5	950.4	951.0	951.4	952.2	952.6	951.3	951.7	951.5	948.7	950.9	952.0	950.3	950.8
p max (hPa)	971.9	971.7	971.8	965.6	963.6	963.9	960.7	961.1	966.2	967.0	969.2	971.5	971.9	971.8	963.9	969.2	966.2	971.9
p min (hPa)	920.6	909.5	920.2	925.3	925.7	933.2	936.4	934.1	928.7	924.5	925.0	907.3	907.3	920.2	933.2	924.5	925.3	907.3
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-8.2	-8.4	-4.3	2.3	10.5	15.4	17.2	13.4	6.8	2.2	-2.9	-6.8	-7.8	2.8	15.3	2.1	10.9	3.1
$PhET_{14h}$ (°C)	0.4	1.4	7.8	11.9	19.2	24.2	28.1	28.9	22.4	14.1	5.4	0.1	0.6	13.0	27.0	14.0	22.4	13.7
$PhET_{21h}$ (°C)	-6.7	-6.5	-2.2	2.1	7.4	11.1	13.1	12.7	8.4	3.7	-1.7	-5.6	-6.3	2.4	12.3	3.4	9.1	3.0

Zavižan

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-4.2	-4.3	-2.1	1.4	6.2	9.6	12.2	12.0	9.2	5.1	0.4	-2.9	-3.8	1.8	11.3	4.9	8.4	3.5
T_{max}	(°C)	11.2	13.7	16.5	16.6	20.6	22.6	27.6	25.7	27.2	20.3	16.4	14.4	14.4	20.6	27.6	27.2	27.6	27.6
T_{min}	(°C)	-24.5	-21.7	-22.6	-10.8	-9.8	-3.1	0.2	-0.4	-3.8	-10.1	-16.8	-23.2	-24.5	-22.6	-3.1	-16.8	-10.8	-24.5
t_{max}	(°C)	-1.4	-1.4	0.9	4.5	9.8	13.3	16.3	16.1	12.8	8.4	3.4	0.0	-0.9	5.1	15.2	8.2	12.1	6.9
t_{min}	(°C)	-6.9	-6.7	-4.6	-1.1	3.5	6.8	9.1	9.1	6.5	2.6	-2.1	-5.6	-6.4	-0.7	8.3	2.3	5.6	0.9
$t_{min\ 5cm}$	(°C)	-7.3	-7.2	-5.4	-1.9	2.3	5.1	7.3	7.5	5.0	1.7	-2.5	-6.0	-6.8	-1.7	6.6	1.4	4.2	-0.1
$t_{min\ 5cm}$ min	(°C)	-26.8	-23.8	-24.8	-11.7	-12.4	-4.6	-2.6	-2.6	-4.0	-10.6	-17.0	-25.7	-26.8	-24.8	-4.6	-17.0	-12.4	-26.8
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	7.9	7.8	4.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.9	6.8	22.2	4.4	0.0	2.0	0.1	28.9
t_{max}<0°C	(d)	17.9	15.8	12.3	4.5	0.3	0.0	0.0	0.0	0.1	1.7	6.8	13.7	46.9	17.1	0.0	8.6	4.9	72.9
t_{min}<0°C	(d)	29.2	26.2	25.6	17.2	4.6	0.9	0.0	0.0	1.7	8.4	18.6	26.6	81.8	47.4	1.0	28.7	24.4	159.1
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$t_{min\ 5cm}$<0°C	(d)	29.4	26.4	27.2	19.7	6.6	1.8	0.4	0.1	2.2	9.7	19.4	27.1	81.9	53.5	2.3	31.5	31.5	170.9
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	0.3	0.4	4.1	14.2	76.7	155.7	238.6	236.3	146.2	63.0	10.2	1.3	2.0	95.0	630.6	219.4	867.7	947.0
$t_{5°C}$ max	(°C)	3.2	10.6	31.5	54.0	159.3	213.9	340.5	321.9	268.6	129.4	33.4	12.1	12.1	191.6	729.9	343.0	1036.8	1111.9
$t_{5°C}$ min	(°C)	0.0	0.0	0.0	0.0	6.1	101.7	189.5	126.4	59.0	0.0	0.0	0.0	0.0	6.1	519.7	98.4	666.6	738.1
$t_{10°C}$	(°C)	0.0	0.0	0.1	0.5	11.1	44.0	96.5	95.3	39.9	9.3	0.3	0.0	0.0	11.8	235.8	49.5	287.3	297.0
$t_{10°C}$ max	(°C)	0.0	0.0	2.1	5.0	40.9	87.5	186.5	166.9	134.7	30.2	3.4	0.0	0.0	45.9	316.0	137.1	408.8	413.4
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	0.0	0.0	10.3	47.4	11.4	4.6	0.0	0.0	0.0	0.0	0.0	143.5	5.8	165.6	167.7
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	143.1	149.8	154.7	177.5	157.4	144.2	95.5	139.9	153.9	179.8	221.8	181.1	472.2	489.7	379.7	555.5	868.6	1898.8
Rmax	(mm)	277.1	297.1	284.8	335.0	325.7	295.3	178.7	340.3	390.4	565.5	543.9	414.3	677.1	763.9	601.2	1009.0	1258.9	2457.4
Rmin	(mm)	0.0	23.7	50.8	59.8	5.5	64.2	5.3	0.0	13.2	0.4	20.3	32.0	97.2	311.6	156.9	279.5	524.7	1302.1
Rd_{max}	(mm)	54.1	98.3	64.4	78.3	123.1	99.0	81.6	125.0	110.3	129.6	133.8	70.6	98.3	123.1	125.0	133.8	125.0	133.8
Rd≥0.1mm	(d)	15.7	15.2	15.4	15.4	14.4	13.9	9.5	10.2	11.5	12.2	15.2	16.3	47.3	45.1	33.7	38.9	75.0	165.0
Rd≥1mm	(d)	13.1	13.0	13.6	13.5	11.9	11.2	6.8	7.7	9.1	10.0	13.0	14.1	40.1	39.0	25.7	32.0	60.2	136.9
Rd≥5mm	(d)	8.1	8.5	8.3	8.5	7.9	7.3	4.1	5.3	6.3	6.8	8.7	9.3	25.8	24.7	16.7	21.8	39.4	89.1
Rd≥10mm	(d)	5.3	5.2	5.4	6.0	5.5	4.9	2.7	4.2	4.8	5.0	6.8	5.9	16.3	16.9	11.8	16.6	28.1	61.6
Rd≥20mm	(d)	2.2	2.2	2.6	3.2	2.7	2.5	1.7	2.3	3.0	3.3	4.1	3.2	7.6	8.4	6.5	10.4	15.4	33.0
Rd≥50mm	(d)	0.1	0.1	0.1	0.3	0.3	0.3	0.4	0.6	0.3	0.8	0.8	0.2	0.4	0.6	1.3	1.8	2.1	4.2
S≥1cm	(d)	29.1	27.2	29.9	27.8	11.6	1.1	0.0	0.0	0.4	4.2	14.9	28.0	84.0	69.4	1.1	19.5	40.9	174.3
S≥10cm	(d)	27.8	26.7	29.7	26.9	9.9	0.6	0.0	0.0	0.1	1.8	10.3	23.3	77.6	66.5	0.6	12.2	37.4	157.2
S≥30cm	(d)	25.0	26.4	29.4	25.1	7.5	0.4	0.0	0.0	0.0	1.0	5.6	17.4	68.3	62.0	0.4	6.6	33.0	137.9
S≥50cm	(d)	21.5	24.5	28.2	22.4	5.4	0.3	0.0	0.0	0.0	0.4	3.4	12.7	58.2	56.0	0.3	3.8	28.1	118.8
S_{max}	(cm)	230	287	320	298	272	106	3	0	18	87	142	167	287	320	106	142	298	320
Isparavanje Evaporation																			
EV	(mm)						77.0	98.7	85.5	56.4								317.6	
EVmax	(mm)						98.0	130.4	114.0	83.0								130.4	
EVmin	(mm)						56.6	74.5	53.6	33.4								33.4	
PET	(mm)	15	14	18	25	45	62	87	83	61	38	21	17	46	88	232	120	363	486
ET	(mm)	15	14	18	25	44	62	85	80	59	38	21	17	46	87	227	118	355	478

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	-3.5	-4.0	-1.7	1.2	6.5	9.9	12.5	12.4	8.9	5.0	0.2	-2.4	-3.3	2.0	11.6	4.7	8.6	3.8
T_{max}	(°C)	12.5	13.7	16.5	16.4	21.5	22.4	27.6	27.2	27.2	19.7	15.7	14.6	14.6	21.5	27.6	27.2	27.6	27.6
T_{min}	(°C)	-24.5	-22.4	-22.5	-11.6	-9.8	-2.4	0.2	-2.0	-3.8	-11.5	-16.8	-24.2	-24.5	-22.5	-2.4	-16.8	-11.6	-24.5
t_{max}	(°C)	-0.7	-0.9	1.4	4.4	10.1	13.6	16.6	16.9	12.6	8.4	3.2	0.5	-0.4	5.3	15.7	8.1	12.4	7.2
t_{min}	(°C)	-6.1	-6.5	-4.3	-1.2	3.8	7.0	9.4	9.5	6.2	2.4	-2.3	-5.0	-5.9	-0.6	8.6	2.1	5.8	1.1
$t_{min\ 5cm}$	(°C)	-6.5	-7.1	-5.2	-2.2	2.4	5.4	7.8	8.0	5.0	1.8	-2.6	-5.4	-6.4	-1.6	7.1	1.4	4.4	0.1
$t_{min\ 5cm}$ min	(°C)	-26.8	-23.8	-24.8	-12.8	-12.4	-4.6	-1.5	-2.6	-4.2	-12.8	-17.1	-25.7	-26.8	-24.8	-4.6	-17.1	-12.8	-26.8
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	7.2	7.4	3.8	0.2	0.0	0.0	0.0	0.0	0.0	0.2	2.5	5.9	20.5	4.0	0.0	2.7	0.2	27.1
t_{max}<0°C	(d)	15.8	15.2	11.1	4.5	0.3	0.0	0.0	0.0	0.1	1.8	7.1	11.9	43.0	16.0	0.0	9.0	4.9	67.9
t_{min}<0°C	(d)	28.3	25.7	24.5	17.7	4.4	0.6	0.0	0.1	1.7	8.8	18.7	25.8	80.1	46.6	0.8	29.1	24.5	156.3
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.4	0.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$t_{min\ 5cm}$<0°C	(d)	28.7	26.7	26.9	20.4	5.9	1.2	0.3	0.1	2.0	9.2	18.7	26.6	82.3	53.2	1.6	29.9	29.8	166.6
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	0.6	0.7	4.8	12.7	83.4	161.9	248.3	254.4	140.9	62.6	10.5	1.7	3.0	101.0	664.7	214.0	901.7	982.7
$t_{5°C}$ max	(°C)	4.3	10.6	31.5	60.8	159.3	236.7	340.5	372.6	268.6	134.8	33.4	12.1	13.1	196.4	837.1	343.0	1137.7	1229.8
$t_{5°C}$ min	(°C)	0.0	0.0	0.0	0.0	6.1	101.7	189.7	126.4	32.8	0.0	0.0	0.0	0.0	6.1	519.7	70.4	666.6	738.1
$t_{10°C}$	(°C)	0.0	0.0	0.1	0.4	13.0	47.6	103.9	111.3	37.6	9.2	0.3	0.0	0.0	13.5	262.8	47.1	313.8	323.4
$t_{10°C}$ max	(°C)	0.0	0.0	2.1	5.2	38.3	99.9	186.5	217.6	134.7	30.2	3.4	1.4	1.4	38.3	430.0	137.1	508.0	513.4
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	0.0	0.0	10.3	58.1	11.4	0.8	0.0	0.0	0.0	0.0	0.0	143.5	0.8	165.6	167.7
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	144.7	147.2	147.0	179.3	154.7	156.4	86.5	121.8	180.4	215.9	245.6	204.0	488.1	481.0	364.7	642.0	879.1	1983.4
Rmax	(mm)	277.1	300.2	284.8	335.0	325.7	295.3	178.7	333.6	415.9	672.8	543.9	414.3	690.4	763.9	601.2	1221.7	1258.9	2457.4
Rmin	(mm)	0.0	23.7	48.1	58.8	5.5	27.7	5.3	7.0	13.2	22.8	20.3	32.0	97.2	291.7	145.0	279.5	524.7	1302.1
Rd_{max}	(mm)	69.6	85.4	86.8	71.2	123.1	99.0	74.4	123.3	116.4	106.9	133.8	155.4	85.4	123.1	123.3	133.8	123.3	155.4
Rd≥0.1mm	(d)	14.7	14.1	14.4	16.1	13.6	13.6	9.6	9.4	11.7	13.7	15.0	15.4	44.2	44.2	32.6	40.4	74.1	161.3
Rd≥1mm	(d)	12.1	12.2	12.2	13.9	11.3	11.0	7.0	6.9	9.6	11.6	13.0	13.7	38.0	37.4	24.9	34.2	59.7	134.5
Rd≥5mm	(d)	7.7	8.2	7.7	8.7	7.6	7.2	4.1	4.6	7.0	7.9	9.5	9.2	25.1	24.0	15.9	24.4	39.3	89.4
Rd≥10mm	(d)	5.4	4.7	4.9	6.0	5.1	4.8	2.7	3.6	5.4	6.2	7.4	6.1	16.3	16.0	11.1	19.0	27.7	62.5
Rd≥20mm	(d)	2.4	2.3	2.4	3.1	2.6	2.6	1.5	2.0	3.4	3.9	4.8	3.7	8.2	8.1	6.0	12.1	15.1	34.6
Rd≥50mm	(d)	0.1	0.2	0.1	0.3	0.3	0.5	0.2	0.6	0.6	1.0	0.8	0.5	0.7	0.8	1.3	2.4	2.6	5.3
S≥1cm	(d)	29.1	27.2	29.8	27.9	9.9	1.0	0.0	0.0	0.5	4.7	16.1	27.6	84.2	67.6	1.0	21.4	39.3	173.9
S≥10cm	(d)	27.7	26.8	29.5	26.8	8.3	0.6	0.0	0.0	0.1	2.2	12.0	24.1	78.4	64.6	0.6	14.3	35.8	158.1
S≥30cm	(d)	23.6	25.5	27.9	24.1	5.8	0.4	0.0	0.0	0.0	1.0	6.3	18.2	67.3	57.8	0.4	7.3	30.3	132.8
S≥50cm	(d)	20.7	23.9	25.2	20.2	4.1	0.3	0.0	0.0	0.0	0.4	3.7	13.2	57.7	49.4	0.3	4.1	24.5	111.6
S_{max}	(cm)	230	287	320	298	272	106	3	5	18	87	122	167	287	320	106	122	298	320
Isparavanje Evaporation																			
EV	(mm)						82.0	100.9	93.6	57.0								333.5	
EVmax	(mm)						115.7	125.7	129.4	83.0								129.4	
EVmin	(mm)						56.6	74.5	53.6	33.4								33.4	
PET	(mm)	16	16	20	25	47	67	94	93	61	38	22	17	49	92	254	121	387	516
ET	(mm)	16	16	20	25	47	67	91	89	59	38	22	17	49	92	247	119	378	507

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	82.6	84.2	82.2	81.7	79.7	79.5	74.8	76.7	78.9	80.7	83.3	82.3	83.0	81.2	77.0	81.0	78.6	80.6
Umin (%)	12.0	12.0	9.0	11.0	12.0	13.0	11.0	11.0	13.0	7.0	5.0	10.0	10.0	9.0	11.0	5.0	11.0	5.0
U>80% (d)	21.0	19.7	18.8	15.4	12.6	12.1	7.3	9.5	13.4	16.7	20.2	21.2	61.9	46.8	28.9	50.4	70.3	188.2
U≤30% (d)	2.1	1.5	1.6	0.9	0.6	0.4	0.5	0.7	1.3	2.5	2.7	2.7	6.4	3.0	1.6	6.6	4.4	17.7
e (hPa)	3.9	4.0	4.5	5.6	7.7	9.7	10.7	10.9	9.3	7.2	5.4	4.3	4.1	5.9	10.4	7.3	9.0	6.9
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	147	200	328	442	576	598	676	603	443	290	161	127	474	1346	1877	894	3338	4591
$G_{45°S}$ (MJm^{-2})	244	285	384	442	518	513	591	587	517	411	259	223	753	1343	1691	1187	3168	4975
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.0	3.4	4.1	5.1	6.6	7.3	9.3	8.6	6.6	4.7	3.1	2.7	3.0	5.3	8.4	4.8	7.3	5.4
SS_{rel} (%)	32	33	36	40	48	51	65	63	54	43	33	31	32	42	60	44	54	46
SS_{max} (h)	6.9	6.3	7.1	7.5	9.6	8.8	11.3	11.1	10.0	7.4	6.5	5.3	5.2	6.5	9.8	6.6	8.5	6.3
SS_{min} (h)	0.8	1.4	1.9	2.5	3.6	5.7	6.3	5.8	4.4	1.3	1.1	1.1	1.6	3.5	7.1	3.2	6.2	4.7
Naoblaka Cloudiness																		
N (10/10)	6.7	6.9	6.7	6.7	6.3	5.9	4.5	4.7	5.3	6.1	7.0	6.9	6.8	6.6	5.1	6.1	5.6	6.2
N_{max} (10/10)	8.7	8.8	8.6	8.5	8.3	7.2	6.9	6.6	7.2	8.8	8.7	9.0	8.3	7.9	6.4	7.3	6.6	6.6
N_{min} (10/10)	3.1	4.4	4.2	5.0	4.6	4.5	2.5	2.6	1.9	3.7	3.2	4.7	4.8	5.5	3.9	4.3	4.3	5.3
N<2/10	4.5	4.0	4.0	3.1	3.1	3.2	7.7	8.0	6.7	6.5	3.7	4.4	12.8	10.1	18.8	17.0	31.7	58.7
N<2/10 max	18	10	12	7	7	8	17	16	19	15	16	10	35	23	33	35	58	87
N<2/10 min	0	0	0	0	0	0	1	1	0	0	0	0	2	3	6	7	14	30
N>8/10	14.7	14.2	14.3	13.0	10.8	8.4	4.8	6.1	8.4	12.8	15.6	15.6	44.5	38.1	19.4	36.8	51.6	138.7
N>8/10 max	23	23	23	20	19	13	11	13	15	25	24	24	59	57	30	53	73	161
N>8/10 min	5	6	4	7	5	4	1	1	1	5	6	8	29	25	10	18	33	112
Meteorološke pojave Weather phenomena																		
magla/fog	20.4	19.0	18.6	16.4	14.0	12.1	8.4	10.2	13.1	17.9	20.4	20.5	59.9	48.9	30.6	51.5	74.1	190.9
magla/fog max	27	27	26	26	25	20	14	17	19	28	28	30	79	71	48	72	93	232
magla/fog min	10	9	8	8	6	3	2	3	5	8	9	11	44	35	22	34	56	149
tuča/hail	0.1	0.1	0.2	0.2	1.1	0.7	0.3	0.4	0.6	0.7	0.7	0.3	0.5	1.4	1.4	1.9	3.3	5.3
tuča/hail max	1	2	1	2	4	3	2	2	3	5	4	2	2	4	4	6	8	11
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
grm/thun	0.9	1.4	1.4	2.8	3.5	5.4	5.0	5.6	4.7	3.1	3.3	1.5	3.8	7.8	16.0	11.1	27.0	38.7
grm/thun max	3	4	7	6	9	10	12	11	12	11	7	6	12	16	27	24	43	61
grm/thun min	0	0	0	0	0	1	1	0	0	0	0	0	0	2	7	2	14	22
rosa/dew	0.0	0.0	0.0	0.2	2.2	4.0	4.8	4.5	4.2	1.3	0.1	0.0	0.0	2.3	13.3	5.6	19.8	21.3
rosa/dew max	0	0	0	3	6	11	15	13	8	5	3	0	0	9	33	11	40	40
rosa/dew min	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	0	6	6
mraz/frost	0.5	0.1	0.2	0.7	0.8	0.1	0.0	0.1	0.8	1.8	0.9	0.1	0.7	1.6	0.2	3.5	2.4	6.0
mraz/frost max	8	3	3	5	3	1	1	1	6	6	5	2	8	7	1	9	8	20
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	17.2	16.1	14.1	9.1	1.4	0.4	0.0	0.0	0.3	4.0	9.0	15.1	48.4	24.6	0.4	13.3	11.3	86.7
inje/rime max	30	28	28	20	6	4	0	0	3	15	19	26	71	51	4	27	24	139
inje/rime min	2	1	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	14
Tlak zraka Air pressure																		
p (hPa)	835.0	833.6	834.5	834.6	838.4	840.8	842.5	842.4	842.7	841.0	837.1	835.2	834.6	835.8	841.9	840.3	840.2	838.2
p max (hPa)	854.9	854.6	855.3	849.2	850.1	850.9	851.8	854.3	855.8	852.8	853.5	853.8	854.9	855.3	854.3	855.8	855.8	855.8
p min (hPa)	808.3	802.0	809.8	814.1	816.9	825.4	827.8	826.1	819.6	811.5	812.6	797.7	797.7	809.8	825.4	811.5	814.1	797.7
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-12.9	-13.3	-10.7	-5.6	1.4	6.1	8.8	7.6	3.1	-2.5	-7.9	-11.4	-12.6	-5.0	7.5	-2.4	3.6	-3.1
$PhET_{14h}$ (°C)	-9.3	-9.0	-4.9	0.0	7.0	11.8	15.7	15.3	10.1	3.0	-4.4	-8.4	-8.9	0.7	14.3	2.9	10.0	2.2
$PhET_{21h}$ (°C)	-12.7	-13.0	-10.5	-6.6	-1.3	2.5	4.9	4.9	1.7	-2.8	-7.7	-11.3	-12.4	-6.1	4.1	-3.0	1.0	-4.3

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	80.6	79.8	80.4	81.1	78.6	77.1	72.6	73.5	77.9	80.8	82.6	81.4	80.6	80.1	74.4	80.4	76.8	78.9
Umin (%)	9.0	10.0	5.0	11.0	12.0	9.0	10.0	11.0	13.0	10.0	9.0	3.0	3.0	5.0	9.0	9.0	9.0	3.0
U>80% (d)	20.5	17.7	16.9	15.0	12.5	10.6	6.6	7.7	12.3	17.0	19.7	20.7	58.9	44.4	24.9	49.0	64.8	177.3
U≤30% (d)	3.6	3.1	2.1	1.3	1.2	0.8	1.2	1.4	1.6	2.6	3.2	3.5	10.1	4.5	3.3	7.4	7.4	25.4
e (hPa)	4.0	3.8	4.5	5.5	7.7	9.5	10.6	10.7	9.0	7.2	5.3	4.4	4.1	5.9	10.2	7.2	8.8	6.9
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.2	4.1	4.7	5.2	7.0	7.9	9.6	9.1	6.8	4.6	3.2	2.9	3.4	5.6	8.9	4.8	7.6	5.7
SS_{rel} (%)	35	40	40	41	51	55	67	68	55	42	34	34	36	44	63	45	56	49
SS_{max} (h)	6.9	6.9	7.9	6.8	9.6	11.8	11.3	11.9	10.0	7.4	6.5	5.3	5.2	8.0	11.4	6.6	9.4	6.8
SS_{min} (h)	1.2	1.4	2.5	2.5	3.6	5.7	6.3	6.3	4.1	1.3	1.2	1.0	1.6	3.5	7.2	3.2	6.2	4.7
Naoblaka Cloudiness																		
N (10/10)	6.6	6.5	6.6	6.8	6.2	5.9	4.6	4.6	5.5	6.4	7.0	6.8	6.6	6.6	5.0	6.3	5.6	6.1
N_{max} (10/10)	8.6	8.8	8.2	8.5	8.3	7.6	6.9	6.5	7.6	8.5	9.1	9.1	8.3	7.9	6.4	7.8	6.6	6.8
N_{min} (10/10)	3.1	4.3	4.3	5.7	4.6	3.4	2.5	2.6	1.9	4.1	3.2	4.7	4.8	5.5	3.5	4.3	4.3	5.3
N<2/10	4.9	5.0	3.9	2.6	3.1	3.3	7.2	7.9	6.0	5.8	3.8	4.6	14.6	9.5	18.4	15.6	30.0	58.0
N<2/10 max	18	11	12	7	9	12	17	18	18	14	16	10	35	23	34	35	58	84
N<2/10 min	0	0	0	0	0	0	1	1	0	0	0	0	4	3	6	4	14	30
N>8/10	14.6	12.9	13.2	13.4	10.9	8.0	5.1	5.4	8.7	13.4	15.7	15.4	42.9	37.5	18.4	37.7	51.3	136.6
N>8/10 max	23	23	21	20	19	13	11	13	16	23	24	25	56	57	30	53	73	165
N>8/10 min	5	5	4	8	5	1	1	0	1	5	6	8	29	21	6	18	31	112
Meteorološke pojave Weather phenomena																		
magla/fog	20.8	17.9	18.0	17.1	14.6	12.1	8.9	9.8	14.1	19.2	20.7	20.8	59.6	49.6	30.8	54.0	76.6	194.0
magla/fog max	27	27	26	26	25	20	16	17	19	28	28	30	79	71	48	72	93	232
magla/fog min	10	8	8	10	6	4	2	1	5	9	9	11	44	32	15	34	56	158
tuča/hail	0.1	0.1	0.1	0.3	0.8	0.7	0.2	0.3	0.6	0.6	0.9	0.4	0.6	1.2	1.3	2.2	3.0	5.3
tuča/hail max	1	2	1	2	4	3	2	2	3	3	4	4	4	4	4	6	8	12
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
grm/thun	0.9	1.4	1.2	2.5	2.9	5.2	4.6	4.9	5.1	3.4	2.9	1.7	4.0	6.6	14.7	11.4	25.2	36.7
grm/thun max	3	4	7	7	8	10	12	9	12	13	8	6	12	12	23	22	42	60
grm/thun min	0	0	0	0	0	0	1	2	0	0	0	0	0	2	7	2	14	22
rosa/dew	0.0	0.0	0.0	0.0	1.6	3.8	4.6	3.8	3.6	1.1	0.2	0.0	0.0	1.6	12.2	4.9	17.4	18.7
rosa/dew max	0	0	0	0	5	13	15	13	9	4	3	0	0	5	33	12	40	40
rosa/dew min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	4	5
mraz/frost	0.2	0.1	0.2	0.4	0.7	0.1	0.0	0.0	0.6	1.2	0.7	0.2	0.5	1.3	0.1	2.6	1.9	4.5
mraz/frost max	4	3	3	3	3	1	1	1	6	4	3	3	4	5	1	8	8	12
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	19.8	18.1	15.7	10.7	2.0	0.2	0.0	0.0	0.5	4.5	11.6	16.8	54.7	28.4	0.2	16.6	13.4	99.9
inje/rime max	30	28	28	20	10	3	0	1	3	15	19	26	71	51	3	27	26	139
inje/rime min	6	6	4	1	0	0	0	0	0	0	2	6	37	15	0	3	3	69
Tlak zraka Air pressure																		
p (hPa)	836.6	835.1	835.3	834.5	838.7	840.7	842.3	842.8	842.1	840.6	837.5	836.6	836.1	836.2	841.9	840.1	840.2	838.6
p max (hPa)	854.9	854.6	855.3	849.5	851.1	850.2	851.1	854.3	855.8	852.8	853.5	853.8	854.9	855.3	854.3	855.8	855.8	855.8
p min (hPa)	809.5	802.0	810.8	815.4	816.9	825.0	828.3	826.1	819.6	811.5	812.3	797.7	797.7	810.8	825.0	811.5	815.4	797.7
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-12.1	-12.4	-10.3	-5.9	1.5	6.1	9.2	8.4	2.9	-2.4	-8.0	-10.8	-11.8	-4.9	7.9	-2.5	3.7	-2.8
$PhET_{14h}$ (°C)	-8.5	-8.0	-4.3	-0.2	7.1	12.2	16.1	16.5	10.1	2.8	-4.2	-7.8	-8.1	0.9	14.9	2.9	10.3	2.6
$PhET_{21h}$ (°C)	-12.0	-12.2	-10.3	-6.7	-1.3	2.6	5.2	5.2	1.4	-2.8	-7.9	-10.8	-11.7	-6.1	4.3	-3.1	1.1	-4.1

Rovinj

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	4.8	5.3	7.8	11.5	16.1	19.9	22.4	21.8	18.4	14.2	9.7	6.1	5.5	11.8	21.4	14.1	18.3	13.2
T_{max}	(°C)	16.9	21.3	22.2	28.8	29.5	33.5	34.8	34.8	32.0	27.6	21.6	16.7	21.3	29.5	34.8	32.0	34.8	34.8
T_{min}	(°C)	-14.8	-8.8	-10.0	-1.0	0.6	5.4	7.3	8.2	4.0	-1.5	-6.4	-7.4	-14.8	-10.0	5.4	-6.4	-1.0	-14.8
t_{max}	(°C)	9.2	10.4	13.1	16.8	21.3	25.0	28.0	28.0	24.6	20.1	14.6	10.5	10.1	17.1	27.0	19.8	24.0	18.5
t_{min}	(°C)	1.1	1.4	3.5	7.0	11.0	14.5	16.7	16.4	13.7	9.8	5.8	2.4	1.6	7.2	15.9	9.8	13.2	8.6
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	10.0	9.3	9.9	12.3	16.7	21.0	23.7	24.2	22.0	18.6	15.3	12.1	10.4	13.0	23.0	18.6	20.0	16.2
t_{min} ≤-10°C	(d)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3
t_{max}<0°C	(d)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
t_{min}<0°C	(d)	11.7	10.1	5.8	0.3	0.0	0.0	0.0	0.0	0.0	0.1	2.0	8.7	30.3	6.1	0.0	3.2	2.5	4.3
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	3.5	16.2	28.1	27.3	14.6	1.1	0.0	0.0	0.0	3.6	71.5	7.6	8.3	8.3
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.8	7.5	8.2	0.8	0.1	0.0	0.0	0.0	0.0	17.6	1.5	1.7	1.7
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.4	3.2	2.3	0.4	0.0	0.0	0.0	0.0	0.0	5.9	0.5	0.6	0.6
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	38.6	48.6	110.9	206.9	345.2	443.0	537.5	532.9	425.3	307.8	158.4	63.5	150.7	663.0	1513.4	891.5	2490.8	3218.6
$t_{5°C}$ max	(°C)	107.4	121.3	189.1	299.9	404.2	520.5	606.8	598.7	508.5	397.2	256.5	110.9	240.9	818.0	1628.3	1032.1	2638.5	3523.5
$t_{5°C}$ min	(°C)	5.2	5.9	53.7	127.7	274.6	396.2	485.6	441.5	342.5	189.6	91.0	9.7	80.1	508.6	1383.2	718.9	2230.8	2823.0
$t_{10°C}$	(°C)	1.5	3.1	16.6	66.8	190.6	293.0	382.5	377.9	275.3	155.0	39.8	5.5	10.1	274.0	1053.4	470.1	1586.1	1807.6
$t_{10°C}$ max	(°C)	10.6	15.0	51.5	149.9	249.2	370.5	451.8	443.7	358.5	245.2	112.2	21.4	26.7	369.3	1168.4	595.2	1729.7	2005.2
$t_{10°C\ min}$	(°C)	0.0	0.0	0.8	15.4	119.6	246.1	330.7	286.5	192.5	47.9	4.5	0.0	0.0	139.6	923.3	309.2	1353.4	1510.4
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	70.5	61.1	61.4	67.0	60.1	62.1	47.6	76.8	85.9	90.0	100.3	74.0	208.0	188.5	186.4	276.2	399.4	856.8
Rmax	(mm)	176.1	137.7	142.7	122.2	102.2	130.4	105.4	173.3	246.8	296.8	253.6	192.0	384.7	273.2	314.0	523.1	567.3	1143.8
Rmin	(mm)	0.0	6.0	1.2	1.5	2.2	12.9	3.6	4.2	13.3	0.0	8.1	18.0	33.9	95.8	68.3	60.1	203.1	510.4
Rd_{max}	(mm)	58.4	40.4	43.2	54.5	56.3	70.5	67.0	89.8	105.1	97.2	78.5	54.4	58.4	56.3	89.8	105.1	105.1	105.1
Rd≥0.1mm	(d)	9.8	9.0	9.0	11.1	10.2	9.1	6.0	7.8	7.2	8.8	10.4	8.9	28.0	30.3	22.8	26.4	51.3	107.2
Rd≥1mm	(d)	7.9	7.0	7.1	7.9	8.1	6.7	4.4	6.1	6.1	7.0	8.5	7.3	22.4	23.1	17.2	21.6	39.3	84.0
Rd≥5mm	(d)	4.7	4.2	4.0	4.0	4.2	3.3	2.5	3.7	3.9	4.5	5.1	4.3	13.4	12.2	9.6	13.5	21.7	48.5
Rd≥10mm	(d)	2.5	2.1	2.3	2.2	2.0	2.0	1.7	2.6	2.7	2.8	3.3	2.5	7.2	6.5	6.2	8.8	13.1	28.6
Rd≥20mm	(d)	0.8	0.7	0.6	0.6	0.6	0.9	0.7	1.2	1.4	1.4	1.5	1.1	2.6	1.8	2.7	4.4	5.4	11.5
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.6	0.5	1.1
S≥1cm	(d)	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.0	0.0	0.0	0.0	0.9
S≥10cm	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	12	7	2	0	0	0	0	0	0	0	0	3	12	2	0	0	0	12
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	24	27	37	53	79	117	149	136	93	63	40	28	79	169	402	196	627	846
ET	(mm)	23	26	36	52	75	101	98	80	69	55	39	28	77	163	279	163	475	682

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	5.3	5.5	8.1	11.5	16.4	20.1	22.8	22.4	18.4	14.2	9.6	6.5	5.7	12.0	21.8	14.1	18.6	13.4
T_{max}	(°C)	16.9	21.3	22.2	26.1	30.0	36.0	35.1	37.1	32.0	27.2	21.3	16.7	21.3	30.0	37.1	32.0	37.1	37.1
T_{min}	(°C)	-14.8	-8.8	-10.0	-1.0	0.6	5.5	7.3	8.2	4.0	-1.5	-6.4	-9.4	-14.8	-10.0	5.5	-6.4	-1.0	-14.8
t_{max}	(°C)	9.6	10.6	13.4	16.7	21.7	25.4	28.5	28.7	24.6	19.9	14.4	10.8	10.3	17.3	27.5	19.6	24.3	18.7
t_{min}	(°C)	1.8	1.6	4.0	7.2	11.6	14.9	17.2	17.2	14.0	10.2	6.0	3.2	2.2	7.6	16.4	10.0	13.7	9.1
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0
t_{min}<0°C	(d)	9.6	9.1	4.6	0.3	0.0	0.0	0.0	0.0	0.0	0.1	2.2	6.3	25.1	4.8	0.0	2.0	1.3	3.4
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	4.6	17.6	28.8	28.2	15.0	1.2	0.0	0.0	0.0	4.7	74.6	8.7	9.5	9.5
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	2.2	9.7	11.5	1.0	0.1	0.0	0.0	0.0	0.0	23.4	2.2	2.5	2.5
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.7	4.8	4.8	0.4	0.0	0.0	0.0	0.0	0.0	10.4	1.0	1.1	1.1
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	46.6	51.7	120.5	209.5	359.8	453.9	553.1	555.2	428.8	310.3	158.0	75.7	174.0	689.8	1562.3	897.1	2560.4	3323.2
$t_{5°C}$ max	(°C)	107.4	107.0	201.7	273.0	434.0	520.5	637.4	641.6	509.3	363.3	229.9	138.5	257.0	823.6	1762.5	1032.1	2873.9	3800.8
$t_{5°C}$ min	(°C)	5.2	9.4	53.7	127.7	274.6	396.2	485.6	441.5	342.5	189.6	91.0	25.8	80.1	508.6	1383.2	718.9	2230.8	2823.0
$t_{10°C}$	(°C)	1.9	3.1	20.5	68.5	205.1	303.9	398.1	400.2	278.8	158.1	40.9	7.1	12.1	294.1	1102.3	477.9	1654.7	1886.4
$t_{10°C}$ max	(°C)	11.6	12.7	58.6	123.3	279.0	370.5	482.4	486.6	359.2	208.3	88.5	28.0	28.0	393.4	1302.5	595.2	1960.0	2226.6
$t_{10°C}$ min	(°C)	0.0	0.0	0.8	15.4	119.6	246.1	330.7	286.5	192.5	47.9	4.5	0.0	0.0	139.6	923.3	309.2	1353.4	1510.4
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	59.5	50.3	55.0	63.3	56.4	72.1	40.7	64.5	83.1	97.0	98.3	71.2	178.8	174.7	177.3	278.4	380.1	811.5
Rmax	(mm)	176.1	131.5	138.0	124.3	121.1	141.7	89.8	151.9	174.3	288.8	267.6	155.3	384.7	234.8	314.0	483.7	567.3	1050.5
Rmin	(mm)	0.0	0.6	0.6	1.5	2.2	0.9	3.6	4.2	13.3	2.2	8.1	18.0	33.9	95.8	44.4	60.1	199.6	510.4
Rd_{max}	(mm)	58.4	40.4	43.2	54.5	41.6	70.5	67.0	89.8	105.1	96.6	99.3	54.2	58.4	54.5	89.8	105.1	105.1	105.1
Rd≥0.1mm	(d)	8.8	7.4	8.1	10.5	9.7	9.0	5.8	6.6	7.9	9.8	10.0	8.5	24.7	28.3	21.3	27.6	49.3	102.0
Rd≥1mm	(d)	6.6	5.7	6.1	7.3	7.5	6.9	4.1	5.0	6.5	7.7	8.1	7.1	19.4	21.0	16.0	22.3	37.3	78.7
Rd≥5mm	(d)	3.9	3.5	3.4	4.1	3.9	3.8	2.3	2.8	4.0	5.1	4.6	4.3	11.6	11.4	8.9	13.7	20.9	45.7
Rd≥10mm	(d)	1.9	1.8	2.0	2.1	1.8	2.5	1.4	1.9	2.7	3.1	2.9	2.4	6.0	5.9	5.8	8.8	12.4	26.6
Rd≥20mm	(d)	0.8	0.6	0.6	0.6	0.5	1.1	0.5	1.1	1.2	1.4	1.4	1.0	2.4	1.8	2.7	4.0	5.0	10.8
Rd≥50mm	(d)	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.3	0.3	0.1	0.1	0.0	0.3	0.8	0.6	1.2
S≥1cm	(d)	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.1	0.0	0.1	0.0	0.5
S≥10cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	5	7	5	0	0	0	0	0	0	0	3	0	7	5	0	3	0	7
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	28	32	44	62	97	143	180	168	111	72	45	33	93	203	491	228	761	1015
ET	(mm)	27	31	42	60	86	110	83	67	74	61	44	32	90	188	260	179	480	717

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	81.1	78.9	76.4	75.4	75.4	72.5	68.7	72.0	77.0	78.7	79.8	79.7	79.9	75.7	71.1	78.5	73.5	76.3
Umin (%)	23.0	9.0	14.0	21.0	25.0	25.0	23.0	26.0	19.0	24.0	20.0	20.0	9.0	14.0	23.0	19.0	19.0	9.0
U>80% (d)	12.2	8.3	5.0	4.2	3.4	1.9	0.7	1.5	2.0	4.0	8.0	10.2	30.6	12.6	4.1	14.0	13.7	61.3
U≤30% (d)	0.4	0.9	0.5	0.5	0.1	0.1	0.2	0.1	0.2	0.3	0.4	0.5	1.7	1.1	0.4	1.0	1.2	4.2
e (hPa)	7.1	7.2	8.2	10.0	13.3	16.4	18.2	18.3	16.0	12.7	9.8	7.6	7.3	10.5	17.6	12.9	15.4	12.1
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	143	244	403	550	682	715	740	627	471	319	162	123	510	1634	2082	952	3785	5178
$G_{45°S}$ (MJm^{-2})	237	390	507	571	617	610	648	615	561	473	267	214	841	1695	1874	1300	3623	5710
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.2	4.6	5.5	6.8	8.6	9.6	10.7	9.7	7.9	6.0	3.6	3.1	3.6	6.9	10.0	5.8	8.9	6.6
SS_{rel} (%)																		
SS_{max} (h)	5.8	6.6	8.6	8.9	10.9	11.2	12.4	11.5	10.1	8.3	6.2	4.3	4.6	8.3	11.1	7.2	9.7	7.3
SS_{min} (h)	1.4	2.1	2.8	5.5	5.8	7.9	8.4	7.8	6.2	4.2	1.9	1.6	2.6	5.8	8.8	4.7	8.0	6.0
Naoblaka Cloudiness																		
N (10/10)	6.1	5.6	5.4	5.2	4.5	4.0	2.9	3.0	3.5	4.5	5.9	6.1	6.0	5.0	3.3	4.6	3.8	4.7
N_{max} (10/10)	8.0	8.2	7.9	6.7	6.7	5.4	4.4	4.6	5.9	7.0	7.6	7.9	7.3	6.1	4.4	6.0	4.8	5.5
N_{min} (10/10)	2.7	3.5	2.3	3.7	2.2	2.6	1.5	0.8	1.0	2.2	2.5	4.4	4.8	3.9	2.4	2.8	3.1	3.9
N<2/10	7.0	7.0	7.6	7.6	9.2	9.9	15.0	15.1	12.7	9.7	6.1	6.3	20.4	24.4	40.1	28.5	69.5	113.4
N<2/10 max	17	15	17	13	20	18	23	28	23	22	18	11	33	41	52	45	90	163
N<2/10 min	1	0	0	2	1	0	7	6	2	1	1	2	8	13	25	13	43	83
N>8/10	13.4	10.4	10.0	8.1	5.8	3.3	1.9	2.6	3.8	6.7	11.2	12.8	36.6	23.9	7.8	21.7	25.6	90.0
N>8/10 max	22	19	19	12	14	6	4	7	9	16	17	19	51	34	14	39	36	124
N>8/10 min	3	5	0	5	0	0	0	0	0	0	3	6	24	12	2	8	16	68
Meteorološke pojave Weather phenomena																		
magla/fog	1.4	1.4	1.2	0.3	0.1	0.0	0.0	0.0	0.3	1.1	0.7	1.2	4.0	1.6	0.0	2.1	0.7	7.7
magla/fog max	13	9	6	2	1	0	0	0	4	8	4	8	26	6	0	9	5	36
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.8
tuča/hail max	1	1	1	1	1	1	1	1	1	3	1	1	1	1	2	3	3	5
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.2	0.4	0.7	1.2	2.7	4.3	4.3	4.4	3.0	1.9	1.1	0.4	1.1	4.6	13.1	6.0	20.0	24.8
grm/thun max	2	2	3	4	7	11	10	9	8	9	5	3	5	11	25	15	37	41
grm/thun min	0	0	0	0	1	0	1	0	0	0	0	0	0	1	4	2	8	10
rosa/dew	2.6	2.8	7.0	12.7	13.6	10.0	8.0	11.4	16.6	15.6	8.6	5.0	10.4	33.3	29.4	40.8	72.3	113.9
rosa/dew max	12	20	19	21	21	20	20	22	25	29	18	22	34	46	62	64	113	178
rosa/dew min	0	0	0	2	4	1	1	0	1	5	0	0	0	9	5	11	24	35
mraz/frost	10.7	9.0	5.8	0.3	0.0	0.0	0.0	0.0	0.0	0.7	3.7	9.0	28.7	6.2	0.0	4.4	0.3	39.3
mraz/frost max	20	18	16	3	0	0	0	0	0	5	12	17	45	16	0	13	3	56
mraz/frost min	2	0	2	0	0	0	0	0	0	0	0	0	12	2	0	0	0	22
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)																		
p max (hPa)																		
p min (hPa)																		
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-2.5	-2.7	1.1	8.4	16.4	22.1	24.8	22.0	13.8	7.5	2.7	-1.0	-2.1	8.6	23.0	8.0	17.9	9.4
$PhET_{14h}$ (°C)	6.0	6.6	11.8	16.4	23.0	28.0	32.1	31.8	26.9	19.8	12.0	7.0	6.5	17.1	30.7	19.6	26.4	18.5
$PhET_{21h}$ (°C)	-2.0	-2.1	1.1	4.7	9.3	13.3	15.5	15.1	11.7	7.5	3.2	-0.7	-1.6	5.0	14.6	7.5	11.6	6.4

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	82.1	78.9	75.7	74.6	74.5	70.7	67.7	70.3	76.3	79.6	80.4	81.1	80.7	74.9	69.5	78.8	72.3	76.0
Umin (%)	21.0	9.0	14.0	21.0	25.0	25.0	23.0	26.0	19.0	24.0	23.0	20.0	9.0	14.0	23.0	19.0	19.0	9.0
U>80% (d)	12.7	7.5	4.6	3.9	3.1	1.7	0.7	1.3	2.0	5.2	8.6	12.0	32.2	11.6	3.7	15.8	12.7	63.3
U≤30% (d)	0.4	0.9	0.8	0.6	0.2	0.1	0.2	0.1	0.2	0.4	0.5	0.7	2.0	1.5	0.4	1.1	1.4	5.1
e (hPa)	7.4	7.3	8.2	9.9	13.4	16.2	18.3	18.5	16.0	13.0	9.8	8.0	7.6	10.5	17.7	12.9	15.4	12.2
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.3	4.9	5.7	6.7	8.7	9.6	10.6	9.8	7.7	5.7	3.6	3.0	3.7	7.0	10.0	5.7	8.9	6.6
SS_{rel} (%)																		
SS_{max} (h)	5.8	7.4	8.3	8.2	10.9	11.8	12.3	11.2	10.1	8.2	6.2	4.5	4.6	8.9	11.3	7.2	9.7	7.2
SS_{min} (h)	1.4	3.0	3.8	5.5	5.8	7.9	8.4	8.3	5.6	4.0	1.9	1.6	2.6	5.8	8.8	4.6	8.0	6.0
Naoblaka Cloudiness																		
N (10/10)	6.3	5.5	5.5	5.6	4.8	4.4	3.3	3.2	4.1	5.2	6.2	6.4	6.0	5.3	3.7	5.2	4.2	5.0
N_{max} (10/10)	8.0	7.8	7.6	6.9	7.3	6.2	5.2	5.3	6.7	7.7	8.4	7.9	7.3	6.4	5.4	7.2	5.2	5.9
N_{min} (10/10)	2.7	3.1	3.6	4.1	2.2	2.6	1.5	1.5	1.0	2.5	2.5	3.8	4.7	4.0	2.6	2.8	3.1	3.9
N<2/10	6.6	7.3	6.8	6.0	7.9	7.9	11.8	13.6	9.7	7.4	5.7	5.4	19.3	20.7	33.3	22.8	57.0	96.1
N<2/10 max	17	15	14	11	20	18	23	22	23	16	18	11	33	41	52	45	90	163
N<2/10 min	0	2	0	1	0	0	1	2	1	1	0	1	7	5	4	2	17	36
N>8/10	13.7	9.9	9.3	9.0	6.3	4.1	2.2	2.6	4.6	8.7	12.3	13.7	37.3	24.6	8.8	25.6	28.8	96.4
N>8/10 max	22	19	19	15	17	8	4	7	10	17	21	20	51	37	17	41	40	126
N>8/10 min	3	1	3	5	0	0	0	0	0	2	3	4	23	16	2	8	17	71
Meteorološke pojave Weather phenomena																		
magla/fog	2.8	2.2	1.7	0.6	0.1	0.0	0.0	0.0	0.3	1.2	0.9	1.5	6.5	2.4	0.0	2.3	1.0	11.3
magla/fog max	13	9	7	5	1	1	0	0	4	8	4	8	26	10	1	9	5	36
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
tuča/hail	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.8	1.2
tuča/hail max	0	1	0	1	1	2	1	2	1	3	1	2	2	2	2	3	3	5
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.3	0.5	0.9	1.7	3.5	5.2	4.7	5.4	3.9	2.8	1.5	0.5	1.3	6.0	15.4	8.3	24.5	31.0
grm/thun max	2	2	5	7	8	11	10	10	10	9	10	3	5	16	25	25	38	60
grm/thun min	0	0	0	0	1	0	1	2	1	0	0	0	0	1	7	2	11	12
rosa/dew	5.1	5.6	9.8	13.4	13.3	9.5	7.0	9.9	15.6	15.4	10.8	9.2	19.8	36.5	26.3	41.7	68.6	124.4
rosa/dew max	16	20	25	21	21	20	18	24	25	26	24	22	42	52	52	66	113	178
rosa/dew min	0	0	1	5	2	1	0	0	4	5	0	0	3	13	2	19	36	74
mraz/frost	10.2	9.1	4.8	0.3	0.0	0.0	0.0	0.0	0.0	0.4	4.0	8.3	27.6	5.0	0.0	4.4	0.3	37.0
mraz/frost max	20	20	16	2	0	0	0	0	0	4	12	20	45	16	0	13	2	56
mraz/frost min	2	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	22
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1010.8																	
p max (hPa)																		
p min (hPa)																		
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-2.8	-3.1	0.2	6.6	14.5	20.0	23.0	20.9	12.9	7.0	2.0	-1.1	-2.4	7.1	21.3	7.3	16.3	8.3
$PhET_{14h}$ (°C)	5.2	5.7	10.6	14.6	21.4	26.5	31.2	31.6	25.1	18.0	10.7	6.1	5.7	15.5	29.8	17.9	25.1	17.2
$PhET_{21h}$ (°C)	-2.3	-2.4	0.5	3.9	8.9	12.8	15.3	15.3	11.2	7.2	2.4	-0.8	-1.8	4.4	14.5	6.9	11.2	6.0

Pazin

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	2.5	3.5	6.1	9.9	14.5	18.1	20.4	19.5	16.0	11.6	7.0	3.5	3.2	10.2	19.3	11.6	16.4	11.0
T_{max}	(°C)	21.4	21.4	26.5	27.7	30.7	33.0	38.2	37.0	34.8	31.3	23.0	21.6	21.6	30.7	38.2	34.8	38.2	38.2
T_{min}	(°C)	-18.7	-15.6	-13.3	-5.0	-2.5	1.7	5.2	4.0	-2.0	-5.2	-10.5	-13.6	-18.7	-13.3	1.7	-10.5	-5.0	-18.7
t_{max}	(°C)	8.1	9.4	12.5	16.3	21.3	25.0	28.1	27.7	24.0	19.1	13.1	9.2	8.9	16.7	26.9	18.7	23.7	17.8
t_{min}	(°C)	-2.3	-1.6	0.6	4.2	8.0	11.4	13.1	12.6	9.8	6.0	2.1	-1.2	-1.7	4.3	12.4	5.9	9.9	5.2
$t_{min\ 5cm}$	(°C)	-3.4	-3.1	-1.1	2.4	6.4	9.8	11.4	11.1	8.2	4.3	0.8	-2.4	-3.0	2.6	10.8	4.4	8.2	3.7
$t_{min\ 5cm}$ min	(°C)	-22.0	-19.4	-16.3	-6.7	-4.9	0.1	3.1	0.8	-3.0	-7.4	-13.6	-17.0	-22.0	-16.3	0.1	-13.6	-6.7	-22.0
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	2.0	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.8	0.4	0.0	0.0	0.0	4.2
t_{max}<0°C	(d)	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.1	0.0	0.0	0.0	1.1
t_{min}<0°C	(d)	20.7	17.5	14.0	4.2	0.4	0.0	0.0	0.0	0.0	3.0	11.2	19.8	57.3	18.6	0.0	14.3	4.6	90.8
t_{max}≥25°C	(d)	0.0	0.0	0.1	0.4	5.4	15.5	26.0	23.9	12.4	2.0	0.0	0.0	0.0	5.8	65.4	14.3	83.5	85.5
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.2	2.6	9.8	9.3	1.6	0.0	0.0	0.0	0.0	0.2	21.6	1.6	23.4	23.4
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.5
$t_{min\ 5cm}$<0°C	(d)	21.4	19.4	17.7	8.7	1.2	0.0	0.0	0.0	0.3	6.6	13.8	21.0	61.1	27.5	0.0	20.6	10.2	110.0
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	16.4	25.6	72.0	158.4	298.9	395.3	483.7	469.9	357.3	232.8	91.8	29.0	71.0	529.2	1348.9	681.9	2163.4	2631.0
$t_{5°C}$ max	(°C)	53.8	82.3	134.4	248.4	387.2	454.7	569.1	538.4	451.9	319.8	183.3	63.5	122.6	626.5	1463.0	816.5	2338.2	2809.1
$t_{5°C}$ min	(°C)	0.0	1.3	26.8	97.3	239.5	348.3	437.0	381.6	260.4	97.8	17.8	0.0	27.7	408.6	1249.2	513.2	1958.3	2388.7
$t_{10°C}$	(°C)	0.3	0.6	7.1	38.0	145.8	245.3	328.7	314.9	207.5	90.6	15.7	1.8	2.7	190.9	888.9	313.8	1280.2	1396.3
$t_{10°C}$ max	(°C)	4.6	4.0	25.2	98.4	232.3	304.8	414.1	383.4	303.2	172.5	66.3	12.4	12.4	298.2	1002.9	430.8	1452.8	1564.2
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	6.5	84.8	198.3	282.0	226.5	111.4	7.3	0.0	0.0	0.0	104.0	789.2	157.7	1074.4	1167.2
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	2.5	3.7	6.8	11.5	16.7	20.4	22.7	21.7	18.1	13.2	8.1	3.8	3.3	11.7	21.6	13.1	18.5	12.4
t_{5cm} max	(°C)	6.3	7.4	9.2	13.9	18.7	22.5	24.2	23.7	20.8	16.1	10.9	6.8	7.4	18.7	24.2	20.8	24.2	24.2
t_{5cm} min	(°C)	-1.1	0.1	3.9	9.4	13.9	19.0	21.0	19.3	15.6	9.7	5.3	0.8	-1.1	3.9	19.0	5.3	9.4	-1.1
t_{20cm}	(°C)	3.0	3.8	6.3	10.8	15.5	19.2	21.6	21.0	17.9	13.4	8.7	4.4	3.7	10.9	20.6	13.3	17.7	12.1
t_{20cm} max	(°C)	6.3	6.9	9.8	13.0	17.3	21.1	22.8	23.1	20.3	16.3	11.3	6.8	6.9	17.3	23.1	20.3	23.1	23.1
t_{20cm} min	(°C)	0.0	0.5	3.8	9.2	13.4	17.9	20.2	19.1	16.1	10.8	6.3	2.2	0.0	3.8	17.9	6.3	9.2	0.0
Oborina Precipitation																			
R	(mm)	91.1	79.6	86.6	93.0	89.5	99.0	72.4	109.2	110.2	112.5	134.0	90.4	264.7	269.0	280.5	356.7	573.1	1167.4
Rmax	(mm)	221.2	177.3	173.0	148.5	191.6	199.0	209.6	211.8	329.7	462.5	325.5	284.9	485.6	416.0	406.0	609.6	853.6	1551.5
Rmin	(mm)	0.0	8.3	6.3	11.4	8.1	31.2	1.2	6.2	4.4	0.1	10.6	17.2	63.9	132.7	112.1	90.1	349.8	803.9
Rd_{max}	(mm)	59.7	82.4	160.4	57.2	65.8	72.3	127.8	94.2	95.0	137.5	115.9	80.1	82.4	160.4	127.8	137.5	127.8	160.4
Rd≥0.1mm	(d)	11.0	9.8	10.5	12.7	13.2	12.1	8.5	10.0	9.3	10.1	11.8	10.7	31.8	36.5	30.6	31.2	65.9	129.8
Rd≥1mm	(d)	8.4	7.4	8.4	9.7	10.0	9.1	6.3	8.0	7.3	8.1	9.1	8.0	24.1	28.0	23.4	24.5	50.3	99.7
Rd≥5mm	(d)	4.9	4.7	4.8	5.8	5.6	5.7	3.8	5.3	5.0	5.4	6.5	5.0	14.8	16.3	14.8	16.8	31.2	62.5
Rd≥10mm	(d)	3.2	2.8	2.9	3.0	2.7	3.3	2.4	3.7	3.1	3.9	4.7	3.4	9.6	8.7	9.4	11.7	18.3	39.2
Rd≥20mm	(d)	1.4	1.1	1.2	1.1	1.0	1.3	1.1	1.8	1.8	1.7	2.1	1.3	3.9	3.3	4.2	5.6	8.1	16.8
Rd≥50mm	(d)	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.2	0.4	0.2	0.3	0.1	0.2	0.3	0.3	0.9	0.9	1.8
S≥1cm	(d)	2.9	1.5	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	5.8	0.7	0.0	0.2	0.1	6.6
S≥10cm	(d)	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	0.2	0.0	0.0	0.0	1.4
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	25	29	30	12	0	0	0	0	0	0	3	12	29	30	0	3	12	30
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	21	25	35	51	75	102	132	117	80	51	32	23	69	161	351	163	557	744
ET	(mm)	20	25	35	51	75	100	119	100	70	49	31	23	68	161	319	150	515	698

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	3.0	3.5	6.4	9.9	14.8	18.3	20.8	20.2	16.0	11.7	6.9	3.9	3.4	10.4	19.8	11.5	16.7	11.3
T_{max}	(°C)	21.4	21.5	26.5	26.9	30.7	33.5	38.2	37.0	34.8	31.3	23.0	21.6	21.6	30.7	38.2	34.8	38.2	38.2
T_{min}	(°C)	-18.7	-15.9	-13.3	-5.5	-2.2	1.7	5.7	3.5	-2.0	-5.6	-10.5	-15.1	-18.7	-13.3	1.7	-10.5	-5.5	-18.7
t_{max}	(°C)	8.7	10.0	13.0	16.2	21.6	25.1	28.4	28.5	23.9	18.7	12.9	9.5	9.4	16.9	27.4	18.5	23.9	18.0
t_{min}	(°C)	-1.9	-2.1	0.5	3.9	8.1	11.4	13.3	12.9	9.6	6.1	1.9	-0.9	-1.7	4.2	12.5	5.8	9.9	5.2
$t_{min\ 5cm}$	(°C)	-3.1	-3.6	-1.3	2.2	6.3	9.7	11.4	11.2	7.9	4.5	0.4	-2.2	-3.0	2.4	10.7	4.3	8.1	3.6
$t_{min\ 5cm}$ min	(°C)	-18.9	-19.1	-16.3	-7.4	-4.0	0.3	3.1	1.4	-3.0	-7.7	-13.6	-17.9	-19.1	-16.3	0.3	-13.6	-7.4	-19.1
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	1.4	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.2	0.5	0.0	0.0	0.0	3.7
t_{max}<0°C	(d)	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.6
t_{min}<0°C	(d)	19.9	19.1	14.6	4.8	0.2	0.0	0.0	0.0	0.0	3.0	12.2	18.4	57.8	19.6	0.0	15.3	5.1	92.3
t_{max}≥25°C	(d)	0.0	0.0	0.1	0.2	6.3	16.0	26.6	25.6	12.1	1.7	0.0	0.0	0.0	6.6	68.2	13.7	86.8	88.6
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.2	2.7	10.7	11.8	1.4	0.0	0.0	0.0	0.0	0.2	25.2	1.4	26.8	26.8
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7	0.7
$t_{min\ 5cm}$<0°C	(d)	20.4	20.7	18.3	9.4	0.9	0.0	0.0	0.0	0.3	6.5	15.0	19.8	61.4	28.6	0.0	21.8	10.6	111.3
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	19.5	24.7	75.9	153.1	304.9	397.0	491.3	486.9	352.0	230.1	89.4	33.9	78.0	533.9	1375.2	671.4	2185.2	2658.5
$t_{5°C}$ max	(°C)	53.8	61.5	148.5	224.8	387.2	454.3	569.1	554.7	451.9	295.0	153.1	84.1	122.6	653.7	1524.3	817.9	2415.0	3037.3
$t_{5°C}$ min	(°C)	0.5	1.3	26.8	92.6	204.2	348.3	439.8	381.6	260.4	97.8	17.8	0.5	27.7	408.6	1249.2	513.2	1958.3	2401.8
$t_{10°C}$	(°C)	0.3	0.4	8.0	34.1	151.1	247.0	336.3	331.9	202.3	89.6	16.0	2.1	2.7	193.3	915.2	307.9	1302.7	1419.1
$t_{10°C}$ max	(°C)	2.7	2.6	25.3	94.0	232.3	304.3	414.1	399.7	303.2	140.1	41.1	12.4	12.4	301.5	1064.3	430.8	1519.0	1708.2
$t_{10°C}$ min	(°C)	0.0	0.0	0.0	6.5	58.0	198.3	284.8	226.5	111.4	7.3	0.0	0.0	0.0	90.9	789.2	157.7	1074.4	1167.2
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	3.0	3.7	7.0	11.4	16.7	20.4	22.7	22.2	18.0	13.3	8.1	4.2	3.6	11.7	21.8	13.1	18.6	12.6
t_{5cm} max	(°C)	6.3	6.5	9.9	13.1	19.5	25.0	24.2	24.7	20.8	15.2	10.7	6.8	6.8	19.5	25.0	20.8	25.0	25.0
t_{5cm} min	(°C)	-0.4	0.6	3.9	9.4	13.8	18.7	21.0	19.3	15.6	9.7	5.3	0.6	-0.4	3.9	18.7	5.3	9.4	-0.4
t_{20cm}	(°C)	3.3	3.7	6.5	10.6	15.7	19.4	21.7	21.5	18.0	13.5	8.5	4.7	3.9	10.9	20.8	13.3	17.8	12.2
t_{20cm} max	(°C)	6.3	6.5	9.7	12.0	18.0	22.7	23.2	23.4	20.3	15.2	11.2	7.3	7.3	18.0	23.4	20.3	23.4	23.4
t_{20cm} min	(°C)	0.0	0.3	3.8	9.2	12.5	17.9	20.2	19.1	16.1	10.8	6.3	1.7	0.0	3.8	17.9	6.3	9.2	0.0
Oborina Precipitation																			
R	(mm)	74.7	66.9	78.8	91.7	79.1	92.7	65.0	94.9	102.8	123.5	123.7	92.6	233.1	249.7	252.6	350.0	526.3	1086.4
Rmax	(mm)	221.2	177.3	170.6	187.7	191.6	162.8	141.4	211.8	223.0	313.4	358.7	284.9	485.6	416.0	398.7	618.3	690.9	1551.5
Rmin	(mm)	0.0	1.3	6.3	11.4	8.1	16.2	1.2	6.2	4.4	9.0	10.6	17.2	63.9	105.2	123.9	90.1	283.9	803.9
Rd_{max}	(mm)	59.7	82.4	160.4	57.2	64.0	60.4	63.1	94.2	95.0	103.6	115.9	81.5	82.4	160.4	94.2	115.9	95.0	160.4
Rd≥0.1mm	(d)	10.0	8.1	9.4	13.1	11.9	12.1	8.5	9.1	9.6	10.9	11.2	10.4	28.4	34.4	29.7	31.6	64.3	124.2
Rd≥1mm	(d)	7.4	6.2	7.2	9.1	9.2	9.0	6.2	7.0	7.7	8.9	8.7	7.8	21.3	25.5	22.2	25.3	48.2	94.3
Rd≥5mm	(d)	4.1	4.0	4.0	5.7	5.2	5.8	3.5	4.6	5.2	6.1	6.0	5.0	13.0	14.8	14.0	17.3	30.0	59.1
Rd≥10mm	(d)	2.7	2.4	2.4	3.1	2.4	3.1	2.2	3.0	3.3	4.2	4.1	3.3	8.3	7.9	8.3	11.7	17.1	36.2
Rd≥20mm	(d)	1.1	0.9	1.2	1.1	0.8	1.1	1.0	1.4	1.7	2.1	2.1	1.4	3.4	3.1	3.5	5.9	7.1	15.9
Rd≥50mm	(d)	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.8	0.7	1.6
S≥1cm	(d)	1.5	0.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	2.9	0.5	0.0	0.1	0.0	3.6
S≥10cm	(d)	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.5
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	25	21	30	7	0	0	0	0	0	0	3	12	25	30	0	3	7	30
Isparavanje Evaporation																			
EV	(mm)				51.3	74.4	86.7	103.0	93.3	55.5	28.6							492.7	
EVmax	(mm)				64.0	96.7	121.5	131.5	123.7	74.9	45.2							131.5	
EVmin	(mm)				34.5	42.6	66.5	83.2	59.7	40.5	19.0							19.0	
PET	(mm)	21	25	35	48	75	102	132	122	77	49	30	22	68	158	356	156	556	738
ET	(mm)	21	25	35	48	74	98	116	98	66	48	30	22	68	157	312	144	500	681

1961–1990	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	79.1	74.8	71.9	71.5	73.5	74.0	70.1	73.0	77.4	79.0	80.6	79.3	77.7	72.3	72.4	79.0	73.2	75.3
Umin (%)	9.0	10.0	13.0	16.0	21.0	23.0	18.0	15.0	14.0	6.0	13.0	14.0	9.0	13.0	15.0	6.0	14.0	6.0
U>80% (d)	10.0	6.3	4.6	3.7	3.2	3.1	1.5	2.2	2.4	4.6	8.1	10.3	26.6	11.5	6.8	15.1	16.1	60.0
U≤30% (d)	3.6	4.8	5.6	3.5	1.9	0.9	2.7	4.4	3.0	3.0	3.1	2.7	11.1	11.0	8.0	9.0	16.4	39.2
e (hPa)	6.1	6.1	6.9	8.7	12.0	15.2	16.4	16.2	14.1	11.1	8.5	6.6	6.3	9.2	15.9	11.2	13.8	10.7
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	134	235	387	518	639	678	712	590	446	299	150	116	485	1545	1981	895	3585	4906
$G_{45°S}$ (MJm^{-2})	214	370	481	534	578	580	625	576	525	433	238	196	781	1593	1781	1195	3417	5349
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.8	3.9	4.6	5.6	6.8	7.5	9.0	8.6	7.2	5.3	3.0	2.5	3.0	5.7	8.4	5.2	7.5	5.6
SS_{rel} (%)																		
SS_{max} (h)	4.7	5.6	6.8	6.8	8.9	8.6	10.1	10.4	9.5	7.5	4.7	3.4	4.1	6.6	9.1	6.1	8.1	6.2
SS_{min} (h)	1.5	1.8	2.6	4.3	4.6	6.1	7.4	7.3	5.5	3.1	2.0	0.9	2.1	4.6	7.4	4.0	6.6	5.1
Naoblaka Cloudiness																		
N (10/10)	6.1	5.7	6.0	6.1	5.7	5.4	4.2	4.1	4.5	5.2	6.3	6.1	6.0	5.9	4.6	5.3	5.0	5.4
N_{max} (10/10)	8.1	8.5	8.1	7.9	7.8	6.6	6.3	5.7	6.4	7.8	8.0	8.9	7.4	7.1	5.6	6.6	6.0	6.1
N_{min} (10/10)	3.1	3.5	3.4	4.5	3.8	4.4	2.9	1.8	1.9	2.5	3.8	4.5	4.4	4.9	3.6	4.1	4.2	4.7
N<2/10	6.9	6.5	5.3	3.8	3.8	3.6	7.8	8.7	8.2	7.6	4.9	6.4	19.8	13.0	20.1	20.7	35.9	73.6
N<2/10 max	19	14	14	10	10	8	18	19	19	19	11	12	36	23	33	35	55	101
N<2/10 min	1	0	1	0	0	0	0	2	2	0	1	0	6	4	10	9	20	49
N>8/10	13.2	10.4	10.8	10.0	8.2	5.3	3.4	3.4	4.9	8.5	12.6	12.8	36.5	29.0	12.1	26.0	35.1	103.5
N>8/10 max	22	20	20	17	18	10	8	8	13	18	20	24	54	45	21	40	56	138
N>8/10 min	3	4	2	6	2	0	0	0	0	3	3	6	21	18	5	16	21	82
Meteorološke pojave Weather phenomena																		
magla/fog	7.8	5.0	2.7	1.6	1.2	1.4	0.6	1.6	5.6	7.5	7.3	7.9	20.7	5.5	3.6	20.4	12.0	50.2
magla/fog max	16	13	8	6	5	6	4	6	14	17	17	18	37	10	9	33	26	68
magla/fog min	3	1	0	0	0	0	0	0	0	3	2	2	11	2	0	8	2	25
tuča/hail	0.1	0.0	0.0	0.2	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.0	0.1	0.6	0.8	0.5	1.6	2.0
tuča/hail max	2	1	1	2	3	2	3	2	1	1	2	1	3	3	4	4	5	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.5	0.5	1.2	3.1	6.0	9.8	8.2	8.1	5.4	2.8	2.1	0.8	1.7	10.3	26.1	10.3	40.6	48.4
grm/thun max	3	3	5	9	15	19	17	13	12	10	5	3	5	25	39	20	70	73
grm/thun min	0	0	0	0	1	4	3	2	0	0	0	0	0	2	14	1	21	26
rosa/dew	5.2	7.9	14.2	21.0	25.4	26.7	28.3	28.2	27.3	25.2	16.4	7.4	20.5	60.7	83.3	68.9	157.1	233.3
rosa/dew max	17	17	26	27	30	30	31	31	30	31	23	17	43	80	90	83	169	261
rosa/dew min	0	0	2	14	21	22	24	23	21	16	3	0	4	41	74	45	136	196
mraz/frost	18.8	16.3	14.9	6.7	0.7	0.0	0.0	0.0	0.4	6.3	13.0	18.0	53.1	22.3	0.0	19.7	7.8	95.0
mraz/frost max	28	24	23	13	4	0	0	0	2	15	24	27	68	35	0	34	17	123
mraz/frost min	5	2	6	0	0	0	0	0	0	0	6	10	27	10	0	6	1	60
inje/rime	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.3	0.0	0.0	0.2	0.0	1.6
inje/rime max	4	3	1	0	0	0	0	0	0	0	2	5	8	1	0	2	0	10
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	981.7	980.0	979.7	978.0	979.8	980.5	981.1	980.9	982.8	983.2	981.3	981.1	980.9	979.1	980.8	982.4	980.5	980.8
p max (hPa)	1003.9	1003.1	1004.7	996.2	993.3	992.1	991.1	990.8	995.7	998.6	1000.3	1003.0	1003.9	1004.7	992.1	1000.3	996.2	1004.7
p min (hPa)	947.5	938.3	953.7	952.6	957.1	965.2	965.4	962.5	960.2	950.5	950.1	935.0	935.0	952.6	962.5	950.1	952.6	935.0
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-4.3	-4.7	-1.9	3.8	9.5	14.7	16.5	14.1	8.9	4.3	0.3	-3.2	-4.1	3.8	15.1	4.5	11.3	4.8
$PhET_{14h}$ (°C)	4.5	4.9	9.9	14.5	20.7	25.8	30.5	30.2	25.0	17.7	9.6	5.2	4.9	15.0	28.9	17.4	24.5	16.6
$PhET_{21h}$ (°C)	-2.7	-2.8	0.5	4.4	9.5	13.5	15.5	15.0	11.2	6.6	2.0	-1.9	-2.5	4.8	14.7	6.6	11.5	5.9

1971–2000	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	78.6	73.0	70.8	71.4	72.1	71.9	68.4	70.6	76.6	78.6	79.4	79.3	77.0	71.4	70.3	78.2	71.8	74.2
Umin (%)	9.0	10.0	13.0	16.0	19.0	22.0	18.0	15.0	14.0	15.0	13.0	16.0	9.0	13.0	15.0	13.0	14.0	9.0
U>80% (d)	9.7	5.1	3.8	3.8	3.2	2.9	1.3	2.1	2.5	5.2	7.2	10.4	25.2	10.8	6.3	14.9	15.7	57.2
U≤30% (d)	4.6	6.5	6.8	4.8	3.2	1.9	4.5	7.2	4.0	3.5	3.2	3.3	14.4	14.8	13.7	10.8	25.6	53.6
e (hPa)	6.3	5.9	6.9	8.6	12.0	14.9	16.3	16.0	13.8	11.1	8.3	6.8	6.3	9.1	15.7	11.1	13.6	10.6
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	2.8	4.2	4.6	5.5	6.8	7.4	8.9	8.6	6.9	4.9	3.0	2.4	3.1	5.6	8.3	4.9	7.4	5.5
SS_{rel} (%)																		
SS_{max} (h)	4.6	6.3	6.0	6.5	8.9	9.7	10.1	10.2	9.5	7.3	4.7	4.3	4.2	6.6	9.2	6.1	8.1	6.2
SS_{min} (h)	1.5	2.6	3.0	4.3	4.6	6.1	7.4	7.4	5.5	3.1	1.6	0.9	2.1	4.6	7.3	4.0	6.6	5.1
Naoblaka Cloudiness																		
N (10/10)	6.0	5.4	5.9	6.3	5.7	5.4	4.3	4.1	4.8	5.6	6.4	6.2	5.9	6.0	4.6	5.6	5.1	5.5
N_{max} (10/10)	8.1	7.5	7.7	7.9	7.8	6.6	6.3	5.6	6.4	7.8	8.5	8.9	7.4	7.1	5.7	6.8	6.0	6.1
N_{min} (10/10)	3.2	2.5	4.4	4.9	3.8	3.4	2.9	2.1	1.9	2.8	3.8	3.0	4.1	4.9	3.6	4.1	4.2	4.7
N<2/10	7.0	7.7	5.0	3.3	4.0	3.5	7.5	8.5	7.1	6.3	4.6	6.4	21.1	12.3	19.5	18.0	33.9	70.9
N<2/10 max	17	17	11	9	10	13	18	16	19	17	11	17	43	23	33	35	53	101
N<2/10 min	1	0	1	0	0	0	0	2	1	0	0	0	6	3	7	7	18	46
N>8/10	13.4	9.3	10.1	10.6	8.9	5.7	3.3	3.6	5.6	9.9	12.8	13.9	36.5	29.5	12.6	28.3	37.6	106.9
N>8/10 max	22	17	20	18	18	10	8	8	13	18	21	24	54	45	21	42	56	138
N>8/10 min	3	1	3	6	2	1	0	0	0	3	3	5	21	15	5	16	23	82
Meteorološke pojave Weather phenomena																		
magla/fog	8.0	4.4	2.7	1.8	1.6	1.5	0.7	1.4	5.4	7.7	7.7	7.9	20.3	6.0	3.6	20.8	12.4	50.7
magla/fog max	16	10	8	7	7	6	4	6	14	12	17	18	37	18	9	31	26	71
magla/fog min	2	0	0	0	0	0	0	0	0	4	2	2	10	0	0	9	1	25
tuča/hail	0.1	0.0	0.1	0.2	0.3	0.1	0.2	0.2	0.2	0.1	0.2	0.0	0.1	0.6	0.5	0.4	1.2	1.6
tuča/hail max	2	1	1	2	3	1	2	2	1	1	2	0	3	3	3	4	5	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.4	0.4	1.1	2.8	4.9	8.3	7.0	6.9	4.6	2.6	1.5	0.7	1.5	8.8	22.2	8.8	34.6	41.3
grm/thun max	3	2	5	7	11	19	17	12	12	8	7	3	5	16	39	20	54	60
grm/thun min	0	0	0	0	1	2	3	0	0	0	0	0	0	2	11	1	19	20
rosa/dew	6.7	8.1	13.9	20.3	25.8	26.2	28.1	27.7	26.7	24.1	16.0	8.9	23.7	60.0	81.9	66.8	154.7	232.5
rosa/dew max	17	17	26	27	30	30	31	31	30	30	26	19	43	80	90	80	169	267
rosa/dew min	0	0	2	12	21	21	20	19	21	16	3	0	8	40	65	45	133	188
mraz/frost	17.6	18.1	14.6	7.0	0.5	0.0	0.0	0.0	0.3	5.8	13.4	17.4	53.1	22.2	0.0	19.6	7.9	94.9
mraz/frost max	28	26	24	16	4	0	0	0	2	14	24	30	73	36	0	34	18	126
mraz/frost min	8	10	6	1	0	0	0	0	0	0	3	10	38	10	0	4	1	62
inje/rime	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.5
inje/rime max	2	2	0	0	0	0	0	0	0	0	1	2	4	0	0	1	0	5
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	983.1	981.6	980.5	977.9	979.9	980.4	980.8	981.1	982.3	982.7	981.8	982.3	982.3	979.4	980.8	982.2	980.4	981.2
p max (hPa)	1003.9	1003.1	1004.7	996.2	993.4	994.2	989.9	990.8	995.7	998.6	1000.3	1003.0	1003.9	1004.7	994.2	1000.3	996.2	1004.7
p min (hPa)	947.5	938.3	949.9	954.9	957.1	963.6	965.3	962.5	957.8	953.4	954.0	935.0	935.0	949.9	962.5	953.4	954.9	935.0
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-4.6	-5.1	-2.5	2.8	9.5	14.5	16.8	14.4	8.4	4.2	-0.3	-3.4	-4.4	3.2	15.2	4.1	11.1	4.5
$PhET_{14h}$ (°C)	4.4	5.1	9.9	13.7	20.7	25.7	31.0	31.2	24.4	16.9	9.2	4.9	4.8	14.8	29.3	16.8	24.5	16.4
$PhET_{21h}$ (°C)	-2.9	-2.9	0.2	3.9	9.5	13.2	15.8	15.4	10.9	6.3	1.3	-2.0	-2.6	4.5	14.8	6.2	11.4	5.7

Rijeka

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	5.3	6.1	8.5	12.2	16.6	20.1	22.8	22.3	18.9	14.4	9.8	6.5	6.0	12.4	21.8	14.4	18.8	13.6
T_{max}	(°C)	20.0	21.4	24.0	27.3	29.2	35.0	34.7	35.8	32.6	27.5	22.1	20.4	21.4	29.2	35.8	32.6	35.8	35.8
T_{min}	(°C)	-11.4	-8.2	-7.7	-0.2	2.1	7.4	10.4	10.2	4.8	1.7	-4.5	-7.2	-11.4	-7.7	7.4	-4.5	-0.2	-11.4
t_{max}	(°C)	8.5	9.5	12.2	16.0	20.7	24.4	27.5	27.2	23.6	18.8	13.4	9.8	9.3	16.3	26.4	18.6	23.2	17.6
t_{min}	(°C)	2.4	3.2	5.3	8.7	12.6	15.9	18.2	18.1	15.1	11.1	6.8	3.6	3.1	8.9	17.4	11.0	14.8	10.1
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
t_{max}<0°C	(d)	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.1	0.0	0.0	0.0	1.1
t_{min}<0°C	(d)	7.1	5.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.8	17.3	2.1	0.0	0.9	0.0	20.3
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.2	3.7	13.8	24.4	22.8	10.5	1.1	0.0	0.0	0.0	3.9	60.9	11.7	75.4	76.5
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.7	7.4	7.3	0.7	0.0	0.0	0.0	0.0	0.0	16.4	0.7	17.1	17.1
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.1	1.7	8.5	7.9	0.6	0.0	0.0	0.0	0.0	0.1	18.2	0.6	18.9	18.9
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	49.3	61.4	125.5	221.3	362.0	455.1	554.2	547.2	429.0	307.0	156.0	73.2	183.9	708.7	1556.4	892.0	2568.7	3341.1
$t_{5°C}$ max	(°C)	109.2	131.4	216.9	307.9	450.3	545.8	623.4	630.2	512.9	375.8	253.3	127.6	303.7	850.4	1645.2	1017.3	2725.2	3620.2
$t_{5°C}$ min	(°C)	9.5	6.3	47.0	147.2	279.5	404.9	499.6	459.9	348.9	172.6	73.4	13.6	100.8	551.4	1435.8	735.7	2319.1	2973.4
$t_{10°C}$	(°C)	1.4	4.1	24.3	80.6	207.3	305.1	399.2	392.2	279.0	154.5	40.4	5.9	11.4	312.2	1096.4	474.0	1663.3	1894.0
$t_{10°C}$ max	(°C)	5.0	20.0	77.3	157.9	295.3	395.7	468.5	475.2	362.9	226.7	109.1	22.0	29.0	409.6	1185.1	585.6	1818.8	2091.9
$t_{10°C}$ min	(°C)	0.0	0.0	2.8	18.7	125.1	254.8	344.6	304.9	198.9	32.8	4.4	0.0	2.5	163.4	975.8	325.6	1414.1	1596.8
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	136.5	118.7	123.6	117.6	106.7	116.2	80.9	113.4	166.2	167.3	174.9	139.6	399.1	347.8	310.5	508.4	701.0	1561.4
Rmax	(mm)	447.8	326.3	267.8	248.3	217.9	230.1	180.8	351.2	401.6	460.9	329.1	455.5	993.4	547.1	562.2	809.2	1054.4	1973.4
Rmin	(mm)	0.5	3.6	0.4	10.5	13.1	22.5	25.2	12.4	10.9	0.0	13.4	32.7	78.3	98.3	133.7	210.2	443.0	1075.8
Rd_{max}	(mm)	99.4	83.4	95.5	74.6	87.9	94.2	55.2	204.5	210.3	125.0	152.7	101.5	101.5	95.5	204.5	210.3	210.3	210.3
Rd≥0.1mm	(d)	11.5	9.9	11.1	12.3	13.3	11.9	8.8	9.6	9.7	10.1	12.1	10.8	32.3	36.7	30.3	31.9	65.6	131.1
Rd≥1mm	(d)	9.1	8.2	8.7	9.8	9.9	9.1	6.3	7.5	7.8	8.5	9.7	8.4	25.9	28.4	22.9	26.0	50.3	103.0
Rd≥5mm	(d)	6.3	5.8	5.6	6.1	5.5	5.4	3.8	4.9	5.5	6.2	7.1	6.0	18.2	17.2	14.2	18.8	31.4	68.3
Rd≥10mm	(d)	4.1	4.1	4.0	3.8	3.6	3.6	2.6	3.4	4.3	4.5	5.3	4.3	12.6	11.5	9.6	14.1	21.4	47.7
Rd≥20mm	(d)	2.3	2.2	2.3	1.9	1.5	1.7	1.3	1.9	2.7	3.0	3.0	2.7	7.3	5.6	4.9	8.7	11.0	26.5
Rd≥50mm	(d)	0.5	0.2	0.3	0.1	0.2	0.3	0.1	0.3	0.7	0.6	0.6	0.4	1.2	0.6	0.7	1.9	1.7	4.4
S≥1cm	(d)	1.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0	0.2	0.0	0.0	0.0	2.3
S≥10cm	(d)	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.5
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	28	10	52	0	0	0	0	0	0	0	8	5	28	52	0	8	0	52
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	35	39	51	70	102	139	180	172	124	82	52	39	113	223	491	258	787	1085
ET	(mm)	35	38	50	70	99	129	142	118	104	74	52	39	112	219	389	230	662	950

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	5.8	6.3	8.8	12.0	16.8	20.3	23.1	23.1	18.8	14.2	9.6	6.8	6.3	12.6	22.2	14.2	19.0	13.8
T_{max}	(°C)	20.0	21.4	24.0	27.1	30.2	35.1	35.9	38.1	32.6	28.3	22.2	20.4	21.4	30.2	38.1	32.6	38.1	38.1
T_{min}	(°C)	-11.4	-9.1	-7.7	-0.2	2.1	7.5	10.5	9.1	4.8	0.6	-4.5	-8.9	-11.4	-7.7	7.5	-4.5	-0.2	-11.4
t_{max}	(°C)	9.1	9.9	12.6	15.9	21.1	24.6	27.9	28.1	23.5	18.5	13.2	10.1	9.7	16.5	26.8	18.4	23.5	17.9
t_{min}	(°C)	2.9	3.2	5.5	8.4	12.8	16.0	18.6	18.6	14.9	10.9	6.6	4.0	3.3	8.9	17.7	10.8	14.9	10.2
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
t_{max}<0°C	(d)	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	0.1	0.0	0.0	0.0	0.8
t_{min}<0°C	(d)	6.0	5.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	4.1	15.4	1.7	0.0	1.2	0.0	18.2
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	4.4	14.2	25.2	24.4	10.4	0.9	0.0	0.0	0.0	4.5	63.9	11.3	78.9	79.7
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.8	8.4	9.7	0.5	0.0	0.0	0.0	0.0	0.0	19.9	0.5	20.4	20.4
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.1	2.0	9.7	10.2	0.7	0.0	0.0	0.0	0.0	0.1	21.9	0.7	22.7	22.7
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	56.8	65.6	133.6	215.7	370.4	459.1	565.1	568.6	425.8	300.9	151.7	81.3	203.6	719.7	1592.8	878.3	2604.7	3394.5
$t_{5°C}$ max	(°C)	109.2	141.7	216.9	296.0	450.3	540.4	661.7	663.6	512.9	368.1	235.3	144.1	303.7	868.2	1779.9	1055.2	2925.4	3909.8
$t_{5°C}$ min	(°C)	13.8	12.5	55.2	144.3	259.6	404.9	499.6	459.9	332.7	172.6	73.4	33.1	116.5	551.4	1435.8	735.7	2319.1	2973.4
$t_{10°C}$	(°C)	1.9	5.0	27.1	75.4	215.7	309.1	410.1	413.6	275.8	150.0	38.8	7.3	14.2	318.2	1132.8	464.6	1699.7	1929.7
$t_{10°C}$ max	(°C)	10.8	40.0	77.3	148.9	295.3	390.4	506.7	508.6	362.9	213.1	87.4	28.5	42.9	452.5	1319.9	602.3	2013.3	2357.1
$t_{10°C}$ min	(°C)	0.0	0.0	2.8	18.7	106.7	254.8	344.6	304.9	182.7	32.8	4.4	0.0	3.1	163.4	975.8	325.6	1414.1	1596.8
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	128.7	104.1	113.0	113.8	103.3	119.9	70.1	101.5	156.5	203.9	181.9	155.6	384.9	330.1	291.6	542.3	665.2	1552.4
Rmax	(mm)	447.8	231.7	267.8	232.1	259.9	230.1	139.9	351.2	401.6	526.7	482.6	455.5	993.4	517.7	562.2	912.7	1054.4	1973.4
Rmin	(mm)	0.5	2.7	0.4	10.5	1.8	22.1	11.4	8.4	27.4	35.1	13.4	27.8	78.3	98.3	149.3	210.2	421.7	1075.8
Rd_{max}	(mm)	99.4	83.4	95.5	73.7	100.8	82.3	68.6	204.5	210.3	200.0	152.7	101.5	101.5	100.8	204.5	210.3	210.3	210.3
Rd≥0.1mm	(d)	10.7	8.5	10.3	12.6	12.5	12.3	8.8	9.0	10.6	12.1	11.7	11.2	30.3	35.4	30.0	34.3	65.7	130.1
Rd≥1mm	(d)	8.6	7.0	7.7	9.6	9.2	9.4	5.9	7.0	8.6	9.7	9.6	8.8	24.3	26.5	22.3	27.8	49.7	101.0
Rd≥5mm	(d)	5.9	5.0	4.9	5.9	5.4	5.8	3.5	4.3	5.7	6.8	6.9	6.4	17.2	16.2	13.5	19.4	30.5	66.4
Rd≥10mm	(d)	3.9	3.7	3.4	3.3	3.6	3.8	2.3	2.9	4.2	5.1	5.2	4.6	12.0	10.4	9.0	14.5	20.2	46.0
Rd≥20mm	(d)	2.2	2.0	2.0	1.8	1.6	1.8	1.0	1.8	2.8	3.5	3.0	2.8	6.9	5.4	4.6	9.3	10.8	26.2
Rd≥50mm	(d)	0.5	0.1	0.4	0.2	0.1	0.3	0.1	0.3	0.6	0.9	0.7	0.6	1.3	0.7	0.7	2.3	1.6	5.0
S≥1cm	(d)	0.8	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.2	0.0	0.0	0.0	1.4
S≥10cm	(d)	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.4
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	28	5	52	0	0	0	0	0	0	0	8	5	28	52	0	8	0	52
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	36	41	53	68	105	142	185	185	124	78	51	39	116	226	512	253	809	1107
ET	(mm)	36	40	52	68	100	131	139	108	99	76	51	39	115	220	378	226	645	939

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																			
U	(%)	64.2	62.9	61.4	62.2	64.0	63.1	56.9	58.3	63.6	65.6	67.4	65.1	64.0	62.5	59.4	65.6	61.3	62.9
Umin	(%)	12.0	14.0	12.0	10.0	18.0	17.0	22.0	20.0	17.0	14.0	12.0	16.0	12.0	10.0	17.0	12.0	10.0	10.0
U>80%	(d)	7.6	6.4	5.1	4.3	3.1	2.4	0.8	1.6	2.5	4.8	6.7	7.4	21.5	12.5	4.8	14.0	14.7	52.7
U≤30%	(d)	2.8	2.8	4.0	2.2	1.2	0.5	1.4	1.7	1.4	1.6	1.8	2.5	8.1	7.4	3.6	4.7	8.4	23.8
e	(hPa)	6.2	6.3	7.1	8.9	12.2	15.1	16.0	15.9	14.1	11.2	8.7	6.7	6.4	9.4	15.6	11.3	13.7	10.7
Sunčevo zračenje Solar radiation (1961-1980)																			
$G_{0°}$	(MJm^{-2})	144	225	360	491	626	661	705	584	432	302	154	122	490	1478	1950	889	3499	4807
$G_{45°S}$	(MJm^{-2})	242	347	439	502	566	566	619	569	505	441	249	214	803	1507	1754	1196	3328	5260
Trajanje sijanja Sunca Insolation duration																			
SS	(h)	3.4	4.3	4.7	5.7	7.2	8.2	9.5	8.7	6.8	5.3	3.5	3.1	3.6	5.8	8.8	5.2	7.7	5.9
SS_{rel}	(%)	40	45	43	47	55	60	71	68	59	53	40	39	41	49	66	52	60	53
SS_{max}	(h)	5.9	6.5	7.3	7.8	9.9	10.0	11.1	10.8	9.6	7.7	6.4	5.2	4.9	7.1	10.0	6.8	8.3	6.5
SS_{min}	(h)	1.7	2.3	2.3	3.8	3.6	6.2	7.5	6.7	5.0	3.2	2.0	1.6	2.5	4.2	7.6	4.1	6.8	5.1
Naoblaka Cloudiness																			
N (10/10)		6.1	6.0	6.3	6.5	5.9	5.5	4.1	4.1	4.7	5.2	6.4	6.1	6.1	6.2	4.6	5.4	5.1	5.6
N_{max} (10/10)		8.0	8.1	8.2	8.4	8.1	6.4	6.2	6.4	6.8	7.5	7.9	8.4	7.4	7.5	5.5	6.7	5.9	6.2
N_{min} (10/10)		2.6	3.6	3.9	4.7	3.9	4.5	3.0	1.7	2.1	2.8	2.7	4.5	4.5	5.1	3.4	3.9	4.3	5.0
N<2/10		6.4	6.4	4.9	4.1	4.3	4.3	9.7	10.4	9.0	8.8	5.5	6.4	19.2	13.2	24.3	23.3	41.7	80.1
N<2/10 max		18	12	13	10	10	9	18	21	19	19	15	13	40	26	37	34	65	109
N<2/10 min		1	0	0	0	0	0	3	4	3	1	2	0	9	4	15	11	23	58
N>8/10		13.2	11.8	12.6	12.8	9.4	6.7	3.9	5.1	6.8	9.7	13.5	12.6	37.5	34.8	15.7	30.0	44.7	118.1
N>8/10 max		22	18	23	20	18	13	11	14	14	17	21	22	54	52	29	44	59	145
N>8/10 min		2	4	6	7	3	1	0	0	1	3	3	7	24	24	7	19	27	92
Meteorološke pojave Weather phenomena																			
magla/fog		0.7	0.9	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.8	2.4	1.0	0.0	0.3	0.3	3.7
magla/fog max		4	5	3	2	1	0	0	0	1	3	1	3	9	3	0	3	2	12
magla/fog min		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
tuča/hail		0.0	0.3	0.1	0.2	0.1	0.2	0.4	0.0	0.1	0.1	0.2	0.0	0.3	0.5	0.6	0.5	1.1	1.9
tuča/hail max		0	2	1	2	1	2	2	0	1	1	2	1	2	3	3	2	4	7
tuča/hail min		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun		0.6	1.3	2.0	3.2	5.5	8.1	7.7	7.9	5.3	3.2	3.0	1.3	3.2	10.6	23.7	11.5	37.6	49.0
grm/thun max		3	4	6	8	12	13	18	17	14	13	8	5	8	18	34	25	57	72
grm/thun min		0	0	0	0	2	4	2	2	0	0	0	0	0	4	15	3	23	34
rosa/dew		2.1	2.2	5.0	9.5	12.7	8.7	4.1	6.6	14.9	13.3	8.4	3.4	7.7	27.3	19.4	36.6	56.5	91.0
rosa/dew max		16	14	13	20	23	23	15	19	24	28	18	14	26	51	41	57	87	142
rosa/dew min		0	0	0	0	2	0	0	0	0	4	2	0	0	7	3	9	27	40
mraz/frost		6.3	4.5	2.4	0.2	0.0	0.0	0.0	0.0	0.0	0.2	3.8	7.3	18.1	2.7	0.0	3.9	0.2	24.7
mraz/frost max		20	12	8	2	1	0	0	0	0	2	14	14	35	10	0	14	2	49
mraz/frost min		0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	8
inje/rime		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																			
p	(hPa)	1003.8	1002.1	1001.7	999.6	1001.0	1001.4	1001.9	1001.6	1003.8	1004.6	1003.0	1003.0	1003.0	1000.8	1001.6	1003.8	1001.6	1002.3
p max	(hPa)	1027.8	1024.1	1025.5	1017.2	1014.4	1014.8	1013.8	1012.1	1018.0	1021.2	1021.7	1025.4	1027.8	1025.5	1014.8	1021.7	1018.0	1027.8
p min	(hPa)	968.3	957.3	975.2	975.3	977.9	985.6	986.9	984.4	981.0	972.5	972.6	957.2	957.2	975.2	984.4	972.5	975.3	957.2
Vjetar Wind																			
v_h	(ms^{-1})	1.9	1.9	2.0	1.9	1.6	1.7	1.8	1.9	1.7	1.8	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8
v_h max	(ms^{-1})	12.1	11.2	14.1	11.6	7.4	10.1	8.6	8.9	10.3	10.5	16.0	13.3	13.3	14.1	10.1	16.0	11.6	16.0
v_{max}	(ms^{-1})	39.1	26.9	41.5	40.0	24.0	25.0	26.5	28.5	24.8	40.8	42.0	30.2	39.1	41.5	28.5	42.0	40.0	42.0
Osjet ugode Thermal sensation																			
$PhET_{7h}$	(°C)	-1.9	-2.1	2.5	10.4	18.6	23.6	26.0	23.2	16.4	8.7	3.1	-0.6	-1.5	10.5	24.3	9.4	19.7	10.7
$PhET_{14h}$	(°C)	6.0	6.5	12.3	17.0	23.9	29.3	32.7	32.2	26.8	19.4	11.4	6.9	6.5	17.7	31.4	19.2	27.0	18.7
$PhET_{21h}$	(°C)	-1.2	-1.3	2.4	6.4	10.9	14.6	16.9	16.6	13.1	8.4	3.7	0.1	-0.8	6.6	16.1	8.4	13.1	7.6

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																			
U	(%)	65.1	60.3	60.4	62.6	63.7	62.4	56.4	56.0	63.7	67.4	67.3	66.4	64.0	62.2	58.3	66.1	60.8	62.7
Umin	(%)	11.0	10.0	16.0	18.0	18.0	23.0	22.0	19.0	19.0	16.0	16.0	14.0	10.0	16.0	19.0	16.0	18.0	10.0
U>80%	(d)	8.4	5.4	5.1	4.4	3.4	2.4	0.7	1.6	3.2	5.7	6.7	8.4	22.2	12.9	4.8	15.6	15.8	55.5
U≤30%	(d)	3.4	3.6	4.4	2.5	1.9	1.0	2.0	2.8	1.9	1.7	1.8	2.4	9.4	8.7	5.8	5.4	12.0	29.3
e	(hPa)	6.4	6.1	7.1	8.9	12.3	15.0	16.2	15.9	14.0	11.4	8.6	7.0	6.5	9.4	15.7	11.3	13.7	10.7
Sunčevo zračenje Solar radiation																			
$G_{0°}$	(MJm^{-2})																		
$G_{45°S}$	(MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																			
SS	(h)	3.6	4.8	5.0	5.7	7.5	8.3	9.6	9.0	6.7	5.2	3.7	3.2	3.8	6.1	9.0	5.2	7.8	6.0
SS_{rel}	(%)	41	50	47	47	57	61	71	71	58	51	42	40	44	51	68	51	61	55
SS_{max}	(h)	5.9	6.8	7.5	7.6	9.9	11.3	11.4	10.8	9.7	7.5	6.4	5.6	5.2	7.8	10.3	6.8	8.9	6.6
SS_{min}	(h)	1.7	2.5	3.0	3.8	3.6	6.2	7.5	7.1	4.3	3.3	2.0	1.6	2.5	4.2	7.9	3.8	6.8	5.1
Naoblaka Cloudiness																			
N (10/10)		6.0	5.6	6.1	6.5	5.7	5.4	4.1	4.0	4.9	5.5	6.3	6.1	5.9	6.1	4.5	5.5	5.1	5.5
N_{max} (10/10)		8.0	7.8	8.2	8.4	8.1	6.4	6.2	5.9	6.8	7.4	8.0	8.4	7.4	7.5	5.4	6.9	5.9	6.2
N_{min} (10/10)		3.3	3.3	4.0	5.0	3.9	3.4	2.9	2.1	2.1	2.9	2.7	2.9	4.2	4.8	3.7	3.9	4.3	5.0
N<2/10		6.6	6.8	4.7	3.4	4.4	4.3	9.0	10.0	7.7	7.6	5.3	6.2	19.7	12.5	23.3	20.5	38.7	76.0
N<2/10 max		18	12	13	8	10	9	18	18	19	15	15	16	40	26	34	34	65	109
N<2/10 min		2	1	0	0	0	1	3	2	0	1	0	0	9	2	11	6	18	44
N>8/10		12.8	10.3	11.5	12.4	9.0	6.5	3.2	4.2	7.2	10.5	12.8	12.9	36.0	32.9	13.9	30.4	42.5	113.3
N>8/10 max		22	18	23	20	18	13	8	11	15	17	21	22	54	52	25	44	59	145
N>8/10 min		4	3	3	7	1	1	0	0	1	3	3	2	22	14	6	19	26	92
Meteorološke pojave Weather phenomena																			
magla/fog		0.7	0.8	0.6	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.6	2.2	0.9	0.0	0.6	0.4	3.7
magla/fog max		4	5	3	2	1	1	0	0	1	3	2	3	9	3	1	3	2	12
magla/fog min		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
tuča/hail		0.0	0.2	0.1	0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.6	0.2	1.0	1.5
tuča/hail max		0	2	2	2	1	2	2	1	1	1	1	1	2	3	2	1	3	4
tuča/hail min		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun		0.6	1.3	1.8	3.1	5.0	7.7	7.0	7.4	5.5	3.5	2.6	1.2	3.1	9.9	22.1	11.6	35.7	46.8
grm/thun max		3	4	6	8	10	13	18	12	11	11	11	5	8	15	33	22	50	62
grm/thun min		0	0	0	0	2	3	3	3	0	0	0	0	0	4	15	3	23	34
rosa/dew		5.6	5.0	8.4	11.4	13.3	9.1	5.4	6.5	15.5	13.9	9.4	7.0	17.6	33.1	21.0	38.7	61.2	110.4
rosa/dew max		18	18	19	26	26	23	18	19	25	23	21	18	43	63	47	58	111	198
rosa/dew min		0	0	0	0	2	0	0	0	0	4	2	0	0	7	3	9	27	40
mraz/frost		8.1	7.0	3.5	0.5	0.0	0.0	0.0	0.0	0.0	0.3	4.3	8.1	23.2	4.1	0.0	4.7	0.5	31.9
mraz/frost max		20	16	9	9	1	0	0	0	0	4	14	18	41	12	0	14	9	53
mraz/frost min		0	1	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	10
inje/rime		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																			
p	(hPa)	1004.5	1002.9	1001.7	998.8	1000.4	1000.7	1000.8	1001.1	1002.6	1003.4	1002.8	1003.5	1003.6	1000.3	1000.9	1002.9	1000.7	1001.9
p max	(hPa)	1024.2	1024.1	1025.5	1018.0	1013.4	1015.0	1010.6	1010.9	1018.0	1021.2	1021.7	1024.0	1024.2	1025.5	1015.0	1021.7	1018.0	1025.5
p min	(hPa)	968.3	957.3	969.7	977.3	977.4	982.6	985.1	984.4	977.7	975.6	973.3	957.2	957.2	969.7	982.6	973.3	977.3	957.2
Vjetar Wind																			
v_h	(ms^{-1})																		
v_h max	(ms^{-1})																		
v_{max}	(ms^{-1})																		
Osjet ugode Thermal sensation																			
$PhET_{7h}$	(°C)	-1.3	-1.5	2.6	10.1	18.6	23.5	26.3	24.2	16.4	8.6	2.8	-0.2	-1.0	10.5	24.7	9.3	19.9	10.9
$PhET_{14h}$	(°C)	6.6	7.1	12.2	16.3	23.6	28.9	32.7	32.8	26.2	18.7	11.2	7.3	7.0	17.4	31.5	18.7	26.8	18.6
$PhET_{21h}$	(°C)	-0.7	-0.6	2.5	6.0	10.9	14.6	17.0	17.2	12.9	8.3	3.4	0.6	-0.2	6.5	16.3	8.2	13.1	7.7

Mali Lošinj

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	7.5	7.8	9.7	12.9	17.2	21.0	23.8	23.5	20.3	16.5	12.2	8.9	8.1	13.2	22.7	16.4	19.8	15.1
T_{max}	(°C)	16.7	20.4	23.3	26.1	28.8	32.2	34.0	35.2	31.7	26.9	21.1	17.7	20.4	28.8	35.2	31.7	35.2	35.2
T_{min}	(°C)	-6.7	-3.0	-3.8	3.3	6.3	9.7	12.7	13.2	9.7	5.3	1.3	-5.2	-6.7	-3.8	9.7	1.3	3.3	-6.7
t_{max}	(°C)	9.7	10.4	12.8	16.3	20.8	24.9	27.9	27.6	24.0	19.6	14.7	11.0	10.4	16.6	26.8	19.4	23.6	18.3
t_{min}	(°C)	5.5	5.7	7.3	10.2	14.1	17.7	20.3	20.2	17.6	14.3	10.2	7.0	6.1	10.5	19.4	14.0	16.7	12.5
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	12.3	11.8	12.1	14.0	16.6	20.5	23.2	23.6	21.6	19.2	16.3	13.9	12.7	14.2	22.4	19.0	19.9	17.1
t_{max}<0°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{min}<0°C	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2
t_{max}≥25°C	(d)	1.7	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.9	0.7	0.0	0.0	0.0	3.5
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	2.5	14.6	26.9	25.4	11.5	0.5	0.0	0.0	0.0	2.6	66.9	12.1	81.0	81.5
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	1.2	7.3	6.6	0.2	0.0	0.0	0.0	0.0	0.0	15.2	0.2	15.4	15.4
$t_{min\ 5cm}$<0°C	(d)	0.0	0.0	0.0	0.0	0.1	6.0	18.2	18.1	4.7	0.1	0.0	0.0	0.0	0.1	42.3	4.8	47.0	47.1
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	91.5	93.4	159.2	246.8	385.9	488.8	591.2	585.3	474.5	370.2	223.0	127.9	312.8	791.9	1665.3	1067.7	2772.5	3837.8
$t_{5°C}$ max	(°C)	164.1	155.9	240.4	328.7	468.0	558.5	655.6	651.0	565.2	432.0	319.7	184.2	439.8	924.9	1755.2	1200.8	2919.0	4098.1
$t_{5°C}$ min	(°C)	45.5	24.4	78.7	180.8	313.0	444.1	551.0	495.1	401.6	252.8	159.8	64.0	178.3	645.2	1586.6	904.5	2572.1	3609.1
$t_{10°C}$	(°C)	5.7	9.6	35.6	99.6	230.9	338.8	436.2	430.3	324.5	215.3	82.8	18.4	33.8	366.1	1205.4	622.6	1860.3	2227.8
$t_{10°C}$ max	(°C)	24.6	35.2	86.8	178.7	313.0	408.5	500.6	496.1	415.3	277.0	169.7	42.1	66.7	466.4	1295.2	746.8	2006.5	2418.3
$t_{10°C}$ min	(°C)	0.0	0.0	9.0	45.1	157.9	294.1	396.0	340.2	251.6	99.9	34.2	0.0	6.6	244.1	1126.6	459.3	1658.3	1999.0
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	87.4	76.7	70.8	64.4	61.6	58.2	39.4	67.6	98.1	90.9	127.8	92.9	259.8	196.8	165.1	316.8	389.2	935.8
Rmax	(mm)	195.6	181.6	148.0	121.8	127.4	117.6	131.8	164.9	244.9	311.6	309.4	241.9	513.9	295.5	283.8	657.7	601.5	1367.5
Rmin	(mm)	0.5	9.2	9.2	13.4	0.8	12.7	0.0	0.0	7.5	0.2	13.3	14.7	66.9	54.7	57.2	72.9	191.7	579.2
Rd_{max}	(mm)	57.6	46.5	46.2	66.0	53.1	62.3	63.6	83.4	88.8	156.9	81.6	58.4	58.4	66.0	83.4	156.9	88.8	156.9
Rd≥0.1mm	(d)	11.2	9.5	10.6	10.3	10.5	8.6	5.3	6.5	8.2	8.8	11.4	11.2	32.1	31.4	20.4	28.5	49.4	112.2
Rd≥1mm	(d)	9.2	7.4	8.0	8.0	7.4	6.1	4.2	5.1	6.6	6.6	9.7	8.6	25.3	23.4	15.4	22.9	37.4	86.9
Rd≥5mm	(d)	5.3	4.8	4.7	4.1	3.8	3.5	2.2	3.1	4.6	4.4	6.6	5.5	15.7	12.7	8.8	15.6	21.3	52.7
Rd≥10mm	(d)	2.9	2.8	2.8	2.3	1.9	2.1	1.2	2.1	3.4	3.0	4.4	3.5	9.3	7.1	5.4	10.8	13.0	32.5
Rd≥20mm	(d)	1.1	1.1	0.7	0.7	0.6	0.7	0.5	0.9	1.6	1.4	2.0	1.4	3.6	2.0	2.1	5.0	5.0	12.7
Rd≥50mm	(d)	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.3	0.2	0.3	0.1	0.2	0.1	0.4	0.8	0.8	1.5
S≥1cm	(d)	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.8
S≥10cm	(d)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	13	21	4	0	0	0	0	0	0	0	0	0	21	4	0	0	0	21
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	47	50	60	82	120	170	217	207	154	110	74	54	151	262	594	338	950	1345
ET	(mm)	43	47	58	76	97	105	58	68	85	70	67	49	139	231	231	222	489	823

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	7.9	7.9	9.9	12.8	17.4	21.2	24.1	24.0	20.3	16.4	12.0	9.2	8.3	13.4	23.1	16.2	20.0	15.3
T_{max}	(°C)	16.7	20.4	23.3	25.9	29.1	35.6	36.3	37.4	31.7	26.9	21.4	17.4	20.4	29.1	37.4	31.7	37.4	37.4
T_{min}	(°C)	-3.7	-4.4	-3.7	3.6	8.2	9.7	13.2	10.0	9.7	5.0	1.1	-4.4	-4.4	-3.7	9.7	1.1	3.6	-4.4
t_{max}	(°C)	10.2	10.7	13.2	16.3	21.3	25.2	28.4	28.4	24.2	19.6	14.6	11.4	10.8	16.9	27.3	19.4	24.0	18.6
t_{min}	(°C)	5.9	5.8	7.5	10.0	14.2	17.8	20.6	20.7	17.5	14.1	10.0	7.3	6.3	10.6	19.7	13.9	16.8	12.6
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
t_{min}<0°C	(d)	0.9	0.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.2	0.5	0.0	0.0	0.0	2.7
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	4.7	16.3	28.2	26.8	12.5	0.6	0.0	0.0	0.0	4.8	71.3	13.2	88.6	89.2
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.7	9.1	9.6	0.2	0.0	0.0	0.0	0.0	0.0	20.4	0.2	20.7	20.7
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.1	6.0	19.2	20.2	4.4	0.1	0.0	0.0	0.0	0.1	45.4	4.4	49.9	49.9
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	100.7	97.6	168.1	245.2	395.5	495.5	603.4	605.1	474.9	366.5	218.6	137.3	335.6	808.7	1704.0	1060.0	2819.5	3908.3
$t_{5°C}$ max	(°C)	164.1	155.2	249.1	304.1	474.1	571.7	679.4	681.3	565.2	423.5	289.1	195.5	439.8	946.4	1860.9	1200.8	3106.5	4347.2
$t_{5°C}$ min	(°C)	55.2	30.4	80.9	176.3	300.2	444.1	551.0	495.1	387.6	252.8	159.8	81.7	230.2	645.2	1588.6	904.5	2572.1	3609.1
$t_{10°C}$	(°C)	7.0	9.8	40.4	97.9	240.4	345.5	448.4	450.1	324.9	211.8	80.2	22.3	39.0	378.7	1244.0	616.9	1907.2	2278.6
$t_{10°C}$ max	(°C)	24.6	35.2	94.3	154.1	319.1	421.6	524.4	526.3	415.3	268.5	139.1	59.5	66.7	502.8	1401.0	746.8	2191.5	2684.9
$t_{10°C}$ min	(°C)	0.4	0.0	6.6	39.1	145.4	294.1	396.0	340.2	237.6	99.9	34.2	1.7	15.0	244.1	1128.8	459.3	1658.3	1999.0
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	75.0	69.4	66.1	69.2	59.5	67.9	30.9	57.0	105.7	109.1	125.1	95.8	237.6	194.7	155.8	339.9	390.2	930.5
Rmax	(mm)	175.0	181.6	132.1	121.8	127.4	158.9	103.7	132.6	244.9	379.5	309.4	241.9	513.9	295.5	273.0	675.3	601.5	1367.5
Rmin	(mm)	0.5	10.8	8.3	16.3	0.8	9.8	0.0	6.8	7.5	23.9	13.3	14.7	66.9	54.7	64.7	72.9	191.7	579.2
Rd_{max}	(mm)	57.6	45.3	45.9	66.0	53.1	62.3	58.2	82.0	106.0	126.8	78.0	84.3	84.3	66.0	82.0	126.8	106.0	126.8
Rd≥0.1mm	(d)	10.1	8.4	9.3	10.3	10.0	8.3	5.4	6.0	8.6	10.0	11.3	10.4	29.1	29.7	19.7	29.9	48.7	108.3
Rd≥1mm	(d)	8.4	6.7	7.1	7.9	7.2	6.2	3.9	4.9	7.1	7.8	9.5	7.9	23.0	22.1	15.1	24.4	37.3	84.6
Rd≥5mm	(d)	4.8	4.5	4.2	4.1	3.7	3.9	1.7	3.0	4.9	5.1	6.3	5.4	14.6	12.0	8.5	16.3	21.2	51.5
Rd≥10mm	(d)	2.5	2.6	2.5	2.5	1.8	2.3	0.8	1.8	3.4	3.5	4.5	3.5	8.5	6.8	4.9	11.3	12.6	31.6
Rd≥20mm	(d)	0.9	1.0	0.9	0.8	0.8	1.1	0.3	0.7	1.7	1.7	2.0	1.4	3.3	2.5	2.1	5.4	5.3	13.3
Rd≥50mm	(d)	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.4	0.3	0.3	0.2	0.2	0.1	0.3	1.0	0.8	1.6
S≥1cm	(d)	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5
S≥10cm	(d)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	9	21	4	0	0	0	0	0	0	0	0	3	21	4	0	0	0	21
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	47	51	61	80	121	173	219	213	152	107	72	54	152	262	605	331	958	1350
ET	(mm)	44	48	58	75	96	110	52	58	90	82	65	50	142	229	220	237	481	828

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	73.0	70.9	70.2	70.0	69.9	67.8	62.9	65.4	70.8	71.6	72.2	72.4	72.1	70.0	65.3	71.5	67.8	69.8
Umin (%)	24.0	24.0	23.0	21.0	20.0	21.0	25.0	24.0	26.0	25.0	17.0	23.0	23.0	20.0	21.0	17.0	20.0	17.0
U>80% (d)	8.4	7.3	5.9	4.2	3.3	1.7	1.0	1.1	2.6	4.4	7.7	8.2	23.9	13.5	3.8	14.7	14.0	55.9
U≤30% (d)	0.3	0.5	0.7	0.7	0.4	0.3	0.4	0.3	0.2	0.3	0.2	0.3	1.1	1.8	1.0	0.7	2.4	4.7
e (hPa)	7.9	7.9	8.7	10.6	13.8	17.1	18.7	19.1	17.2	13.8	10.7	8.6	8.1	11.0	18.3	13.9	16.1	12.8
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	156	251	411	570	693	744	760	657	484	329	178	126	533	1674	2161	991	3909	5360
$G_{45°S}$ (MJm^{-2})	264	398	513	592	624	631	663	645	575	487	301	215	878	1729	1939	1362	3729	5908
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.4	4.8	5.6	7.3	8.9	10.4	11.4	10.3	8.2	6.1	3.8	3.1	3.7	7.3	10.7	6.0	9.4	6.9
SS_{rel} (%)	39	49	50	56	63	70	78	75	68	59	42	37	42	57	75	57	69	60
SS_{max} (h)	5.4	7.3	8.7	8.8	11.4	12.0	12.5	12.5	10.1	8.8	6.5	5.0	4.6	8.6	12.1	7.6	10.4	7.6
SS_{min} (h)	1.8	3.0	2.9	5.1	5.9	9.0	9.5	8.5	6.3	3.8	2.1	1.7	2.8	5.6	9.7	5.0	8.4	6.2
Naoblaka Cloudiness																		
N (10/10)	5.9	5.4	5.4	5.2	4.7	4.1	2.7	2.9	3.7	4.4	5.8	6.0	5.8	5.1	3.2	4.6	3.9	4.7
N_{max} (10/10)	7.8	7.4	7.9	7.0	6.8	5.1	4.6	4.5	5.6	6.9	7.6	7.5	6.9	6.4	4.1	6.0	4.8	5.6
N_{min} (10/10)	3.0	3.1	2.2	3.8	2.9	3.0	1.4	0.8	1.3	1.9	2.2	4.0	4.5	3.9	2.2	3.0	3.1	4.0
N<2/10	6.2	7.1	7.3	6.1	8.1	9.3	15.0	15.5	12.0	9.9	5.6	6.1	19.5	21.5	39.8	27.5	66.1	108.3
N<2/10 max	14	16	19	12	18	13	22	25	21	21	21	11	33	38	49	48	81	136
N<2/10 min	1	1	2	0	0	4	7	7	3	1	0	1	9	11	28	13	44	73
N>8/10	11.8	9.2	9.2	7.7	5.9	3.4	1.4	2.3	3.9	5.9	10.3	11.8	32.8	22.8	7.2	20.1	24.6	82.8
N>8/10 max	20	18	20	14	16	7	4	8	8	12	18	19	47	34	17	34	38	117
N>8/10 min	3	3	2	3	0	0	0	0	0	0	4	5	21	13	2	9	12	62
Meteorološke pojave Weather phenomena																		
magla/fog	0.3	0.7	0.9	0.4	0.3	0.0	0.1	0.0	0.4	0.6	0.1	0.3	1.3	1.6	0.1	1.1	1.2	4.1
magla/fog max	5	5	4	2	2	1	1	1	3	6	1	4	5	4	1	6	3	14
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
tuča/hail	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.0	0.1	0.2	0.1	0.3	0.2	0.3	0.3	0.4	1.1
tuča/hail max	3	1	2	2	0	1	0	1	0	1	2	1	3	2	2	3	2	4
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.9	1.2	1.1	2.2	2.5	3.6	3.4	4.2	4.3	2.6	3.1	1.5	3.6	5.7	11.2	10.0	20.2	30.6
grm/thun max	4	5	4	5	7	8	9	11	9	10	9	6	11	13	23	26	36	58
grm/thun min	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	9
rosa/dew	5.6	5.4	8.0	7.8	8.1	5.4	3.0	3.5	12.2	10.2	6.1	6.9	17.8	23.9	11.9	28.5	40.0	82.1
rosa/dew max	25	15	21	20	20	14	17	11	22	22	17	17	39	52	35	47	83	156
rosa/dew min	0	0	1	0	0	0	0	0	3	2	1	0	3	6	0	8	8	31
mraz/frost	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	0.2	0.0	0.1	0.0	1.1
mraz/frost max	10	2	1	0	0	0	0	0	0	0	2	1	11	1	0	2	0	11
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1010.8	1009.0	1008.6	1006.6	1008.1	1008.4	1008.7	1008.5	1010.7	1011.4	1009.9	1009.9	1009.9	1007.7	1008.5	1010.7	1008.5	1009.2
p max (hPa)	1033.4	1032.7	1034.2	1025.8	1021.7	1020.2	1019.1	1018.7	1023.6	1027.2	1028.8	1031.8	1033.4	1034.2	1020.2	1028.8	1025.8	1034.2
p min (hPa)	977.1	966.7	982.3	980.9	984.6	993.4	992.9	991.0	987.0	978.5	979.0	962.9	962.9	980.9	991.0	978.5	980.9	962.9
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	0.2	0.0	3.0	8.9	15.6	20.7	23.9	22.2	16.3	10.5	5.3	1.9	0.7	9.2	22.2	10.7	17.9	10.7
$PhET_{14h}$ (°C)	5.0	5.5	10.4	15.0	20.9	26.7	31.1	30.7	25.1	18.1	10.8	6.2	5.5	15.4	29.5	18.0	24.9	17.1
$PhET_{21h}$ (°C)	0.7	0.6	2.8	6.2	10.9	15.0	17.6	17.5	14.4	10.3	5.8	2.2	1.2	6.6	16.7	10.2	13.6	8.7

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	74.1	70.6	70.9	70.8	70.7	67.9	63.5	65.6	71.2	72.7	72.8	73.5	72.7	70.8	65.7	72.2	68.3	70.4
Umin (%)	24.0	21.0	23.0	24.0	21.0	21.0	25.0	24.0	27.0	25.0	17.0	23.0	21.0	21.0	21.0	17.0	21.0	17.0
U>80% (d)	9.7	6.6	5.8	4.3	3.4	2.1	0.8	1.3	3.2	5.4	8.2	9.4	25.7	13.5	4.1	16.8	15.0	60.1
U≤30% (d)	0.4	0.5	0.6	0.4	0.6	0.3	0.3	0.4	0.2	0.2	0.2	0.3	1.1	1.6	0.9	0.6	2.1	4.3
e (hPa)	8.2	7.9	8.9	10.6	14.2	17.4	19.2	19.8	17.3	14.0	10.7	8.9	8.3	11.3	18.8	14.0	16.4	13.1
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.5	5.1	5.9	7.2	9.1	10.5	11.5	10.5	8.2	5.9	3.8	3.2	3.9	7.4	10.8	6.0	9.5	7.0
SS_{rel} (%)	40	53	53	56	64	71	79	77	67	56	43	39	44	58	76	57	69	61
SS_{max} (h)	5.4	7.3	8.9	8.7	11.4	13.3	12.7	11.8	10.5	8.3	6.5	5.1	4.9	9.4	12.3	7.6	10.6	7.8
SS_{min} (h)	1.8	3.1	3.9	5.1	5.9	9.0	9.5	8.5	6.1	3.8	2.1	1.6	2.9	5.6	9.7	4.9	8.4	6.2
Naoblaka Cloudiness																		
N (10/10)	5.8	5.1	5.3	5.4	4.8	4.2	2.9	3.0	4.0	4.9	5.9	5.9	5.6	5.1	3.4	4.9	4.0	4.8
N_{max} (10/10)	7.8	7.3	7.1	7.0	6.8	5.4	4.6	4.7	6.4	7.3	7.6	8.2	6.9	6.4	4.7	6.5	4.8	5.6
N_{min} (10/10)	3.4	2.7	3.7	3.8	2.7	2.8	1.4	1.7	1.3	2.4	2.2	2.7	4.0	4.0	2.6	3.0	3.1	4.0
N<2/10	6.4	7.3	6.2	5.8	7.0	8.5	13.8	14.3	9.9	7.9	5.6	5.7	19.4	19.1	36.5	23.4	59.3	98.4
N<2/10 max	17	16	13	12	17	16	22	20	20	17	21	17	41	38	49	48	81	130
N<2/10 min	1	1	2	0	0	1	6	3	1	1	1	0	8	8	14	6	31	54
N>8/10	10.9	8.1	8.1	7.4	5.5	3.3	1.4	2.1	4.0	6.7	10.4	11.7	30.7	21.0	6.7	21.1	23.7	79.6
N>8/10 max	20	17	16	14	16	7	4	8	9	15	18	20	47	34	17	34	38	117
N>8/10 min	2	1	1	3	0	0	0	0	0	0	4	1	16	8	2	9	12	53
Meteorološke pojave Weather phenomena																		
magla/fog	0.1	0.9	0.9	0.4	0.3	0.0	0.1	0.0	0.4	0.7	0.2	0.3	1.3	1.6	0.1	1.4	1.2	4.3
magla/fog max	2	5	4	3	2	1	1	1	3	7	3	4	5	4	1	9	4	14
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
tuča/hail	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.4	0.7
tuča/hail max	1	1	0	2	0	1	1	1	0	1	1	1	1	2	2	1	2	3
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.6	0.9	0.7	1.4	1.3	2.8	2.4	2.9	3.7	2.5	2.2	0.9	2.4	3.4	8.1	8.3	14.4	22.2
grm/thun max	4	5	4	3	7	8	9	8	9	10	9	6	11	9	21	22	36	53
grm/thun min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3	9
rosa/dew	8.5	7.5	9.8	9.2	8.4	6.0	4.1	4.7	11.7	10.6	7.9	8.9	24.9	27.4	14.9	30.2	44.2	97.4
rosa/dew max	25	16	21	20	20	14	17	12	22	19	19	17	44	52	35	51	83	156
rosa/dew min	0	0	1	4	1	1	0	1	2	3	1	1	6	12	3	12	18	59
mraz/frost	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.2	0.2	0.0	0.1	0.0	1.4
mraz/frost max	10	3	2	0	0	0	0	0	0	0	2	1	11	2	0	2	0	11
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1012.2	1010.6	1009.4	1006.6	1008.2	1008.4	1008.4	1008.7	1010.2	1010.9	1010.4	1011.3	1011.4	1008.1	1008.5	1010.5	1008.4	1009.6
p max (hPa)	1033.4	1032.7	1034.2	1026.8	1022.4	1023.0	1017.7	1018.7	1023.6	1027.2	1028.8	1031.8	1033.4	1034.2	1023.0	1028.8	1026.8	1034.2
p min (hPa)	978.2	966.7	979.3	983.7	984.6	990.6	993.4	991.0	985.9	979.9	981.8	962.9	962.9	979.3	990.6	979.9	983.7	962.9
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	0.6	0.3	3.0	8.4	15.6	20.7	23.9	22.6	16.1	10.4	5.2	2.2	1.1	9.0	22.4	10.6	17.9	10.8
$PhET_{14h}$ (°C)	5.5	6.1	10.5	14.7	21.1	26.8	31.3	31.5	25.1	18.0	10.7	6.6	6.1	15.4	29.9	17.9	25.1	17.3
$PhET_{21h}$ (°C)	1.0	1.0	2.9	6.0	10.9	15.0	17.8	18.1	14.3	10.2	5.6	2.5	1.5	6.6	17.0	10.0	13.7	8.8

Zadar

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	6.7	7.4	9.4	12.9	17.2	21.0	23.6	23.1	19.8	15.8	11.5	8.1	7.4	13.2	22.5	15.7	19.6	14.7
T_{max}	(°C)	17.0	21.2	22.0	25.8	29.6	32.6	34.9	35.7	30.6	27.0	21.3	17.6	21.2	29.6	35.7	30.6	35.7	35.7
T_{min}	(°C)	-9.1	-6.3	-6.8	2.0	3.4	8.2	11.7	12.4	8.0	3.7	-1.4	-6.0	-9.1	-6.8	8.2	-1.4	2.0	-9.1
t_{max}	(°C)	10.2	11.1	13.3	16.7	21.0	24.9	27.8	27.5	24.2	20.0	15.3	11.6	11.0	17.0	26.7	19.9	23.7	18.6
t_{min}	(°C)	3.7	4.2	6.0	9.3	13.2	16.7	18.9	18.8	16.0	12.3	8.3	5.0	4.3	9.5	18.1	12.2	15.5	11.0
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	10.8	10.1	10.9	13.3	16.8	20.3	22.6	22.8	21.1	18.7	15.8	12.7	11.2	13.7	21.9	18.6	19.5	16.3
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
t_{min}<0°C	(d)	4.4	3.9	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.4	10.6	1.5	0.0	0.1	0.0	12.3
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.0	1.9	14.4	27.9	26.4	12.0	0.7	0.0	0.0	0.0	1.9	68.7	12.7	82.7	83.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.0	5.3	5.1	0.2	0.0	0.0	0.0	0.0	0.0	11.4	0.2	11.6	11.6
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	2.3	10.7	10.7	1.2	0.0	0.0	0.0	0.0	0.0	23.7	1.2	24.9	24.9
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	78.2	85.2	148.1	239.9	374.4	472.9	569.3	563.1	452.3	346.4	204.6	109.5	272.9	762.4	1605.3	1003.2	2672.0	3643.9
$t_{5°C}$ max	(°C)	150.8	150.3	217.0	318.3	450.7	535.8	625.9	623.6	528.8	414.9	299.5	169.6	397.0	873.7	1695.2	1147.3	2820.7	3819.6
$t_{5°C}$ min	(°C)	26.6	14.7	75.2	181.5	308.3	439.2	528.0	477.5	391.2	233.2	116.9	22.5	163.3	638.0	1516.8	862.9	2459.1	3405.4
$t_{10°C}$	(°C)	5.2	9.1	29.2	92.9	219.5	323.0	414.3	408.1	302.3	191.8	71.0	15.8	30.1	341.7	1145.4	565.1	1760.1	2082.2
$t_{10°C}$ max	(°C)	22.9	33.8	68.4	168.3	295.6	385.8	470.9	468.6	378.7	260.3	150.3	36.3	61.5	430.0	1235.2	696.5	1908.9	2269.6
$t_{10°C}$ min	(°C)	0.0	0.0	6.5	39.8	153.3	289.3	373.0	322.5	241.2	84.0	11.1	0.0	5.8	216.1	1056.9	426.8	1545.9	1812.9
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	5.9	7.0	9.5	13.8	18.3	22.4	25.0	24.5	20.8	16.2	11.0	7.0	6.7	13.8	24.0	16.0	20.8	15.1
t_{5cm} max	(°C)	9.0	10.4	12.2	16.8	21.0	24.3	27.7	27.5	24.3	20.0	14.7	9.0	10.4	21.0	27.7	24.3	27.7	27.7
t_{5cm} min	(°C)	0.1	4.6	5.9	11.6	15.8	20.5	22.4	21.3	18.1	12.5	8.5	3.1	0.1	5.9	20.5	8.5	11.6	0.1
t_{20cm}	(°C)	6.3	7.1	9.3	13.5	17.5	21.6	24.3	24.3	21.1	16.7	11.8	7.7	7.0	13.4	23.4	16.5	20.4	15.1
t_{20cm} max	(°C)	9.0	9.5	11.7	16.4	19.8	23.5	26.8	26.8	23.9	20.4	15.2	9.5	9.5	19.8	26.8	23.9	26.8	26.8
t_{20cm} min	(°C)	0.5	4.7	6.4	11.7	15.3	19.9	22.1	21.5	18.7	13.7	9.5	3.6	0.5	6.4	19.9	9.5	11.7	0.5
Oborina Precipitation																			
R	(mm)	76.9	71.6	74.2	59.6	60.8	51.9	34.9	63.1	97.8	111.9	118.5	94.2	244.5	194.6	149.9	328.2	368.1	915.5
Rmax	(mm)	139.5	177.6	202.4	116.2	130.2	108.7	102.4	172.8	374.5	375.9	364.1	278.2	384.1	321.5	248.1	674.4	624.3	1433.9
Rmin	(mm)	1.3	18.2	13.2	15.5	5.3	5.8	0.2	0.0	1.2	0.0	11.7	14.7	50.9	68.0	24.6	66.1	143.2	610.5
Rd_{max}	(mm)	38.4	48.7	67.1	101.0	47.0	41.5	66.5	114.4	352.2	170.4	95.5	78.2	72.7	101.0	114.4	352.2	352.2	352.2
Rd≥0.1mm	(d)	10.6	9.8	10.1	10.2	10.1	8.3	5.1	6.5	7.9	9.2	11.1	11.4	31.6	30.3	19.9	28.2	48.0	110.2
Rd≥1mm	(d)	8.8	8.1	8.2	7.6	7.3	6.0	3.6	5.1	6.1	7.1	9.4	9.0	25.6	23.1	14.7	22.7	35.7	86.4
Rd≥5mm	(d)	5.3	4.7	4.4	3.4	3.4	3.1	1.8	3.0	3.7	4.6	6.3	5.5	15.2	11.3	7.9	14.6	18.5	49.2
Rd≥10mm	(d)	2.9	2.4	2.5	2.2	2.2	1.7	1.0	2.1	2.8	3.1	4.1	3.1	8.4	6.8	4.7	10.0	11.9	30.0
Rd≥20mm	(d)	0.7	0.7	0.9	0.7	0.7	0.8	0.5	1.1	1.4	1.7	1.7	1.1	2.4	2.3	2.4	4.9	5.2	12.0
Rd≥50mm	(d)	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.5	0.3	0.1	0.1	0.1	0.2	1.1	0.5	1.5
S≥1cm	(d)	0.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	0.1	0.0	0.0	0.0	1.6
S≥10cm	(d)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	19	8	5	0	0	0	0	0	0	0	1	8	19	5	0	1	0	19
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	44	48	57	78	113	160	202	191	141	100	68	50	142	248	553	309	885	1252
ET	(mm)	41	45	54	75	94	100	57	64	78	74	64	47	133	223	221	216	468	793

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	7.3	7.5	9.7	12.9	17.5	21.3	23.9	23.7	19.9	15.9	11.4	8.5	7.7	13.4	22.9	15.7	19.8	14.9
T_{max}	(°C)	17.1	21.2	22.0	24.3	29.4	33.3	35.4	36.1	31.5	27.0	21.9	17.8	21.2	29.4	36.1	31.5	36.1	36.1
T_{min}	(°C)	-7.9	-5.5	-5.7	1.4	4.9	9.4	12.7	11.5	8.0	2.3	-1.8	-6.5	-7.9	-5.7	9.4	-1.8	1.4	-7.9
t_{max}	(°C)	10.8	11.3	13.6	16.6	21.3	25.2	28.2	28.2	24.3	20.0	15.1	11.9	11.3	17.1	27.2	19.8	24.0	18.9
t_{min}	(°C)	4.3	4.3	6.3	9.3	13.5	17.0	19.3	19.3	16.0	12.5	8.3	5.5	4.6	9.7	18.6	12.3	15.7	11.3
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.2
t_{min}<0°C	(d)	3.0	3.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.9	8.1	1.2	0.0	0.2	0.0	9.5
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.0	3.4	15.9	28.8	27.7	12.0	0.8	0.0	0.0	0.0	3.4	72.4	12.8	87.8	88.6
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.3	7.0	8.1	0.2	0.0	0.0	0.0	0.0	0.0	16.3	0.2	16.6	16.6
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	3.5	12.8	13.9	1.4	0.1	0.0	0.0	0.0	0.0	30.1	1.5	31.6	31.7
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	88.6	87.7	156.5	237.4	384.3	482.9	581.9	582.4	453.6	348.3	200.9	121.1	297.5	778.1	1647.2	1002.8	2722.4	3725.6
$t_{5°C}$ max	(°C)	150.8	144.6	218.7	285.7	470.5	568.4	656.7	658.0	528.8	414.6	295.8	192.2	397.0	909.0	1839.1	1184.4	3014.3	4218.7
$t_{5°C}$ min	(°C)	33.4	37.5	75.2	164.7	289.8	439.2	528.0	477.5	383.8	233.2	116.9	56.3	178.5	638.0	1516.8	862.9	2459.1	3405.4
$t_{10°C}$	(°C)	6.7	8.5	33.1	90.6	229.3	332.9	426.9	427.4	303.6	194.1	69.0	19.2	34.4	353.0	1187.2	566.7	1810.7	2141.3
$t_{10°C}$ max	(°C)	22.9	33.8	68.4	135.7	315.5	418.4	501.7	502.9	378.7	259.7	145.7	63.4	65.2	473.0	1379.0	729.3	2099.2	2591.6
$t_{10°C}$ min	(°C)	0.0	0.0	6.5	32.8	134.8	289.3	373.0	322.5	233.8	84.0	11.1	0.4	11.7	216.1	1056.9	426.8	1545.9	1812.9
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	6.4	7.2	10.2	13.9	19.1	23.2	25.8	25.7	21.1	16.2	11.0	7.5	7.0	14.4	24.9	16.1	21.5	15.6
t_{5cm} max	(°C)	9.0	9.7	13.2	16.9	24.5	30.0	30.6	30.0	24.3	18.5	13.9	10.0	10.0	24.5	30.6	24.3	30.6	30.6
t_{5cm} min	(°C)	3.5	4.9	6.6	11.6	15.7	20.9	23.6	21.3	18.1	12.5	8.5	4.8	3.5	6.6	20.9	8.5	11.6	3.5
t_{20cm}	(°C)	6.6	7.1	9.7	13.6	18.3	22.3	25.0	25.3	21.3	16.8	11.7	8.1	7.3	13.9	24.2	16.6	21.0	15.5
t_{20cm} max	(°C)	9.0	9.3	12.4	15.9	23.0	27.7	28.8	29.0	24.1	18.8	14.8	10.6	10.6	23.0	29.0	24.1	29.0	29.0
t_{20cm} min	(°C)	3.8	4.7	6.7	11.7	15.3	20.2	22.7	21.5	18.7	13.7	9.5	5.6	3.8	6.7	20.2	9.5	11.7	3.8
Oborina Precipitation																			
R	(mm)	72.6	62.5	63.5	70.0	64.7	54.4	30.4	49.6	104.0	106.7	105.6	95.2	226.9	198.2	134.4	316.3	373.1	879.2
Rmax	(mm)	143.5	164.0	202.4	121.8	175.3	159.6	94.4	172.8	374.5	349.8	256.3	278.2	384.1	321.5	238.8	549.7	624.3	1186.1
Rmin	(mm)	1.6	17.7	10.1	17.4	3.7	0.0	0.2	0.0	1.2	18.1	11.7	14.7	50.9	92.2	38.9	66.1	143.2	610.5
Rd_{max}	(mm)	48.8	47.6	67.1	56.0	59.9	53.2	66.5	114.4	352.2	106.3	64.2	78.2	78.2	67.1	114.4	352.2	352.2	352.2
Rd≥0.1mm	(d)	10.0	8.5	8.9	10.4	9.5	8.2	5.3	5.9	8.7	9.8	11.2	10.4	28.8	28.9	19.5	29.7	48.1	106.8
Rd≥1mm	(d)	8.3	7.0	7.1	7.9	6.8	6.2	3.6	4.5	6.7	7.4	9.4	8.3	23.6	21.8	14.3	23.5	35.6	83.2
Rd≥5mm	(d)	4.9	4.1	4.1	4.0	3.2	3.4	1.8	2.4	4.0	4.6	6.1	5.3	14.1	11.2	7.6	14.7	18.7	47.7
Rd≥10mm	(d)	2.5	2.2	2.2	2.4	2.1	1.8	0.8	1.5	2.9	3.1	4.0	3.4	8.0	6.8	4.1	10.0	11.5	29.0
Rd≥20mm	(d)	0.8	0.6	0.6	0.9	0.9	0.7	0.3	0.8	1.5	1.7	1.3	1.2	2.5	2.3	1.8	4.6	5.1	11.4
Rd≥50mm	(d)	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.5	0.1	0.1	0.1	0.2	0.1	0.9	0.6	1.3
S≥1cm	(d)	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.1	0.0	0.0	0.0	1.1
S≥10cm	(d)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.3
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	15	13	5	0	0	0	0	0	0	0	1	19	19	5	0	1	0	19
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	43	45	55	72	108	152	190	182	131	92	61	47	135	235	524	284	835	1178
ET	(mm)	40	43	52	70	93	104	64	51	81	75	58	45	128	215	219	214	463	776

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	72.0	70.8	71.9	72.8	73.7	71.4	66.8	68.9	73.3	73.0	73.2	72.2	71.7	72.8	69.0	73.2	71.2	71.7
Umin (%)	18.0	18.0	22.0	23.0	24.0	23.0	24.0	22.0	21.0	22.0	19.0	20.0	18.0	22.0	22.0	19.0	21.0	18.0
U>80% (d)	8.2	6.1	5.6	4.0	4.0	1.9	1.0	1.4	2.4	5.0	6.7	8.4	22.7	13.5	4.3	14.1	14.6	54.5
U≤30% (d)	0.5	0.8	0.8	0.3	0.2	0.3	0.5	0.6	0.3	0.5	0.6	0.5	1.8	1.3	1.4	1.3	2.2	5.8
e (hPa)	7.5	7.7	8.9	11.1	14.8	18.1	19.8	19.8	17.3	13.6	10.5	8.3	7.8	11.6	19.2	13.8	16.8	13.1
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	169	249	413	535	682	741	763	655	485	348	190	133	550	1629	2159	1023	3861	5362
$G_{45°S}$ (MJm^{-2})	292	387	513	548	613	626	664	639	573	520	326	229	908	1674	1930	1420	3664	5931
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.5	4.7	5.7	6.9	8.7	9.9	11.2	10.2	8.1	6.2	4.0	3.3	3.8	7.1	10.4	6.1	9.2	6.9
SS_{rel} (%)																		
SS_{max} (h)	6.0	7.6	8.2	8.2	10.7	11.6	12.6	12.5	10.1	8.5	6.8	5.1	4.8	8.1	12.0	7.2	10.3	7.4
SS_{min} (h)	1.7	2.9	3.3	4.6	5.7	7.8	9.2	8.3	6.6	3.8	2.2	2.0	2.9	5.4	9.3	5.2	8.2	6.4
Naoblaka Cloudiness																		
N (10/10)	5.6	5.3	5.1	5.2	4.5	3.9	2.7	2.6	3.3	4.1	5.5	5.6	5.5	4.9	3.1	4.3	3.7	4.4
N_{max} (10/10)	7.5	7.5	7.6	7.3	6.4	5.3	4.8	4.2	5.1	6.7	7.9	7.4	6.8	6.4	4.1	5.5	4.8	5.4
N_{min} (10/10)	2.1	2.8	2.4	3.6	3.1	2.5	1.3	0.6	1.2	1.4	2.4	3.3	3.9	3.9	1.7	3.2	2.7	3.8
N<2/10	7.8	7.6	7.9	6.8	9.0	10.0	15.6	16.6	13.1	11.5	6.2	7.0	22.4	23.7	42.1	30.8	71.0	119.0
N<2/10 max	22	18	18	14	16	18	23	28	23	24	17	14	41	36	63	43	95	152
N<2/10 min	3	1	2	1	1	4	5	6	5	3	1	1	13	11	26	17	48	84
N>8/10	10.2	8.4	8.2	7.7	5.1	3.1	1.3	1.7	2.9	5.3	9.1	10.4	29.1	21.0	6.2	17.3	21.9	73.6
N>8/10 max	17	15	19	16	11	8	5	5	6	15	17	18	41	34	11	28	39	103
N>8/10 min	1	1	3	4	0	0	0	0	0	0	3	5	12	13	1	11	11	54
Meteorološke pojave Weather phenomena																		
magla/fog	0.4	0.6	1.0	0.2	0.2	0.1	0.1	0.2	0.9	1.4	0.2	0.4	1.4	1.4	0.3	2.5	1.6	5.6
magla/fog max	2	4	6	2	2	1	1	2	10	6	3	4	6	6	2	12	12	18
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.2	0.3	0.3	0.3	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.4	1.0	0.7	0.3	0.4	0.7	2.3
tuča/hail max	2	3	2	2	1	1	1	1	1	2	2	4	4	3	2	2	3	6
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.3	1.8	1.6	2.5	3.1	4.2	3.2	4.8	3.7	3.7	3.9	1.6	4.6	7.2	12.2	11.3	21.5	35.3
grm/thun max	4	6	6	6	7	9	10	11	8	11	9	8	12	16	20	24	35	53
grm/thun min	0	0	0	0	0	1	0	0	0	0	0	0	0	3	4	4	8	19
rosa/dew	4.3	4.5	9.0	10.8	13.6	9.1	6.9	10.1	16.0	13.8	7.4	5.6	14.4	33.4	26.2	37.2	66.5	111.2
rosa/dew max	20	18	20	22	21	20	21	20	26	24	20	15	32	54	54	60	104	171
rosa/dew min	0	0	0	4	2	1	0	0	4	1	0	0	2	12	7	13	26	41
mraz/frost	5.2	4.6	2.9	0.3	0.0	0.0	0.0	0.0	0.0	0.1	2.5	4.9	14.7	3.2	0.0	2.6	0.3	20.6
mraz/frost max	17	17	9	3	0	0	0	0	0	1	11	15	38	11	0	11	3	50
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1016.4	1014.7	1014.3	1012.2	1013.6	1013.8	1013.9	1013.7	1016.0	1016.8	1015.6	1015.5	1015.5	1013.3	1013.8	1016.1	1013.8	1014.7
p max (hPa)	1039.5	1038.4	1039.2	1030.1	1027.4	1025.8	1024.2	1023.3	1028.7	1032.0	1033.8	1038.0	1039.5	1039.2	1025.8	1033.8	1030.1	1039.5
p min (hPa)	983.7	972.5	988.2	987.3	987.9	999.8	999.3	997.4	992.2	985.9	987.9	968.3	968.3	987.3	997.4	985.9	987.3	968.3
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-0.8	-0.8	3.5	11.6	19.2	24.3	27.5	25.2	17.9	10.5	4.3	0.7	-0.3	11.5	25.7	10.9	21.0	11.9
$PhET_{14h}$ (°C)	6.8	7.1	11.3	15.7	21.1	26.6	30.7	30.6	25.7	19.2	11.9	7.6	7.2	16.0	29.3	18.9	25.1	17.9
$PhET_{21h}$ (°C)	0.2	0.1	3.4	7.1	11.8	15.6	18.0	17.8	14.6	10.2	5.2	1.5	0.6	7.4	17.1	10.0	14.1	8.8

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	72.4	70.0	71.2	72.7	73.8	71.2	67.2	69.3	73.4	73.8	73.5	72.8	71.7	72.6	69.2	73.6	71.3	71.8
Umin (%)	20.0	19.0	22.0	18.0	23.0	23.0	19.0	24.0	24.0	18.0	19.0	20.0	19.0	18.0	19.0	18.0	18.0	18.0
U>80% (d)	9.4	6.0	5.9	4.5	4.0	1.9	1.0	1.5	3.5	6.6	8.4	9.7	25.0	14.4	4.4	18.4	16.4	62.3
U≤30% (d)	1.2	1.1	1.6	0.5	0.3	0.4	0.6	0.5	0.4	0.7	0.6	0.7	3.0	2.4	1.5	1.8	2.7	8.7
e (hPa)	7.9	7.7	8.9	11.0	15.1	18.3	20.3	20.6	17.4	13.9	10.5	8.6	8.0	11.7	19.8	13.9	17.1	13.4
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.7	5.2	6.0	6.9	8.9	10.1	11.3	10.4	8.2	5.9	4.1	3.5	4.1	7.3	10.6	6.1	9.3	7.0
SS_{rel} (%)																		
SS_{max} (h)	5.4	7.6	8.7	8.1	10.8	12.7	12.7	11.8	10.3	8.3	6.8	5.6	5.3	9.0	11.9	7.2	10.4	7.8
SS_{min} (h)	1.7	3.3	4.1	4.6	5.7	7.8	9.2	8.3	6.3	3.6	2.2	2.0	2.9	5.4	9.3	5.0	8.2	6.4
Naoblaka Cloudiness																		
N (10/10)	5.3	4.8	4.7	5.1	4.3	3.9	2.7	2.4	3.4	4.3	5.4	5.4	5.2	4.7	3.0	4.3	3.6	4.3
N_{max} (10/10)	7.5	7.4	6.9	7.3	6.4	5.3	4.8	3.8	5.1	6.5	7.9	7.4	6.8	6.4	4.1	5.5	4.8	5.4
N_{min} (10/10)	2.6	2.6	2.6	4.0	2.8	1.8	1.3	0.9	1.4	1.6	2.4	2.6	3.4	3.3	1.8	3.2	2.9	3.8
N<2/10	8.1	8.8	8.3	6.9	9.8	9.4	15.3	17.4	12.4	10.3	6.5	7.5	24.5	25.0	42.1	29.2	71.3	120.9
N<2/10 max	20	18	15	12	16	19	23	26	23	22	17	15	43	39	63	43	95	149
N<2/10 min	3	1	3	1	1	3	5	6	5	2	1	1	13	11	26	17	48	84
N>8/10	9.6	7.2	6.6	7.3	4.5	2.9	1.2	1.3	2.8	5.3	8.5	9.6	26.4	18.4	5.4	16.5	20.0	66.7
N>8/10 max	17	15	16	16	11	6	5	5	7	11	17	19	41	34	11	27	39	103
N>8/10 min	4	1	1	4	0	0	0	0	0	1	2	0	12	7	0	6	9	40
Meteorološke pojave Weather phenomena																		
magla/fog	0.5	0.9	1.2	0.2	0.4	0.1	0.2	0.2	0.7	1.0	0.3	0.5	2.0	1.8	0.4	2.1	1.8	6.3
magla/fog max	4	5	6	2	3	1	2	2	10	6	3	4	8	6	2	12	12	18
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.3	0.2	0.3	0.3	0.1	0.0	0.1	0.1	0.0	0.2	0.2	0.4	1.0	0.7	0.2	0.4	0.7	2.3
tuča/hail max	2	3	3	2	2	1	1	1	1	2	2	4	4	4	1	2	2	8
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.3	1.8	1.8	3.1	3.5	5.2	3.8	5.2	4.7	4.3	3.9	2.5	5.6	8.4	14.2	12.9	25.5	41.1
grm/thun max	4	6	6	6	7	11	10	11	10	11	8	9	12	16	23	21	37	64
grm/thun min	0	0	0	1	0	2	0	1	0	0	0	0	1	3	8	4	15	26
rosa/dew	7.7	6.9	11.4	13.1	16.7	11.7	10.1	13.1	16.5	14.3	9.8	8.2	22.8	41.2	34.9	40.6	81.1	139.4
rosa/dew max	20	19	28	22	23	22	27	29	26	24	21	15	49	64	71	60	129	217
rosa/dew min	0	0	0	5	11	2	0	2	6	4	3	0	5	20	10	19	42	76
mraz/frost	7.5	6.4	3.3	0.3	0.0	0.0	0.0	0.0	0.0	0.3	2.7	5.6	19.5	3.6	0.0	3.0	0.3	26.1
mraz/frost max	17	17	9	3	0	0	0	0	0	3	11	15	38	11	0	11	3	50
mraz/frost min	0	1	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	8
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1017.6	1016.0	1014.8	1011.9	1013.4	1013.5	1013.3	1013.6	1015.3	1016.2	1015.8	1016.7	1016.7	1013.4	1013.5	1015.8	1013.5	1014.8
p max (hPa)	1038.6	1038.4	1039.2	1032.0	1027.3	1028.1	1022.4	1023.3	1028.7	1032.0	1033.8	1038.0	1038.6	1039.2	1028.1	1033.8	1032.0	1039.2
p min (hPa)	984.9	972.5	985.2	989.7	987.9	995.8	998.6	997.4	991.6	985.9	989.0	968.3	968.3	985.2	995.8	985.9	987.9	968.3
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-0.7	-0.9	2.8	9.8	17.4	22.6	26.2	24.3	16.5	9.9	4.0	0.8	-0.3	10.0	24.4	10.1	19.5	11.1
$PhET_{14h}$ (°C)	6.6	7.0	10.7	14.8	20.8	26.4	30.8	31.1	24.9	18.4	11.2	7.4	7.0	15.4	29.4	18.2	24.8	17.5
$PhET_{21h}$ (°C)	0.3	0.3	3.0	6.4	11.4	15.2	17.9	17.9	14.2	9.9	4.8	1.7	0.8	7.0	17.0	9.6	13.8	8.6

Split - Marjan

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	7.6	8.2	10.5	13.9	18.7	22.5	25.4	24.9	21.4	16.9	12.3	8.9	8.3	14.3	24.3	16.9	21.1	15.9
T_{max}	(°C)	17.4	22.3	23.2	25.8	30.3	35.2	38.1	38.1	32.5	27.4	21.7	18.1	22.3	30.3	38.1	32.5	38.1	38.1
T_{min}	(°C)	-9.0	-6.2	-6.6	3.4	5.5	10.0	13.0	11.8	8.8	3.8	-0.4	-6.3	-9.0	-6.6	10.0	-0.4	3.4	-9.0
t_{max}	(°C)	10.0	11.0	13.6	17.4	22.4	26.5	29.8	29.2	25.1	20.0	14.9	11.2	10.8	17.8	28.5	20.0	25.1	19.3
t_{min}	(°C)	5.1	5.5	7.6	10.8	15.1	18.6	21.4	21.1	18.0	14.1	9.7	6.4	5.7	11.1	20.4	14.0	17.5	12.8
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	12.2	11.5	11.9	13.9	17.3	21.0	23.1	23.4	21.7	19.3	16.6	14.0	12.6	14.4	22.5	19.2	20.1	17.2
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3
t_{min}<0°C	(d)	3.0	2.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	6.2	1.1	0.0	0.1	0.0	7.4
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	7.4	20.9	29.3	28.3	16.0	1.4	0.0	0.0	0.0	7.4	78.5	17.5	101.9	103.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	4.7	15.7	13.9	1.6	0.0	0.0	0.0	0.0	0.1	34.4	1.6	36.0	36.0
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	1.3	10.1	22.5	20.6	8.5	0.4	0.0	0.0	0.0	1.4	53.2	9.0	63.1	63.5
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	93.8	101.7	177.7	272.2	426.5	526.5	638.0	625.5	496.8	373.7	220.0	125.0	320.5	876.4	1790.0	1090.5	2985.5	4077.3
$t_{5°C}$ max	(°C)	169.6	178.9	265.6	348.8	515.3	598.0	726.0	719.4	591.9	429.2	309.3	186.4	415.8	998.4	1897.6	1244.2	3168.9	4311.0
$t_{5°C}$ min	(°C)	36.4	18.1	87.1	197.7	341.0	474.6	595.3	511.4	416.6	241.5	124.9	45.8	215.6	702.7	1657.6	906.6	2721.7	3779.6
$t_{10°C}$	(°C)	8.6	14.6	49.6	124.6	271.5	376.5	483.0	470.5	346.8	219.2	84.2	21.4	44.6	445.8	1330.0	650.2	2072.9	2470.5
$t_{10°C}$ max	(°C)	33.2	50.7	110.9	198.8	360.3	448.1	571.0	564.4	442.0	274.2	160.1	46.3	87.8	581.2	1437.6	791.4	2254.0	2662.0
$t_{10°C}$ min	(°C)	0.0	1.1	16.5	55.8	186.0	324.6	440.4	356.4	266.6	91.9	13.0	0.0	12.5	270.8	1197.6	476.2	1808.7	2155.0
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	82.8	68.5	75.3	65.5	56.6	50.9	28.3	50.2	60.6	78.7	108.4	99.6	252.8	197.4	129.3	247.7	312.0	825.3
Rmax	(mm)	184.7	182.0	192.6	127.0	182.4	126.6	97.7	205.7	141.1	241.1	296.3	230.9	447.0	360.2	285.7	428.6	499.8	1101.5
Rmin	(mm)	0.7	9.3	11.9	17.4	1.5	10.9	0.8	0.1	0.2	0.0	33.2	6.8	54.6	82.6	17.7	121.3	107.7	486.6
Rd_{max}	(mm)	70.2	42.5	60.0	38.2	54.5	79.2	61.1	131.6	68.7	90.7	100.0	49.4	70.2	60.0	131.6	100.0	131.6	131.6
Rd≥0.1mm	(d)	11.2	10.7	10.9	11.2	9.4	9.1	5.7	5.9	7.2	8.9	11.9	12.1	33.6	31.5	20.7	28.0	48.4	114.2
Rd≥1mm	(d)	8.9	8.2	8.5	7.8	6.4	6.2	3.4	4.2	5.2	7.2	9.6	9.5	26.2	22.8	13.8	22.0	33.3	85.1
Rd≥5mm	(d)	5.4	4.3	4.6	4.2	3.3	3.1	1.4	2.4	3.2	4.5	6.0	5.8	15.2	12.2	6.9	13.7	17.6	48.1
Rd≥10mm	(d)	3.2	2.4	2.6	2.5	2.1	1.8	0.9	1.6	1.9	2.5	4.0	3.5	8.9	7.2	4.3	8.4	10.8	28.9
Rd≥20mm	(d)	0.9	0.7	0.9	0.7	0.7	0.5	0.3	0.8	1.0	1.1	1.5	1.6	3.1	2.3	1.5	3.6	3.9	10.5
Rd≥50mm	(d)	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.4	0.4	0.8
S≥1cm	(d)	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.2	0.0	0.0	0.0	0.8
S≥10cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	21	6	7	0	0	0	0	0	0	0	0	14	21	7	0	0	0	21
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	63	68	84	116	176	241	310	294	219	147	94	70	201	376	845	460	1356	1882
ET	(mm)	57	60	73	93	97	66	31	50	61	72	78	60	177	263	147	211	398	798

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	8.0	8.4	10.6	13.7	18.9	22.8	25.7	25.4	21.2	16.8	12.0	9.1	8.5	14.4	24.6	16.7	21.3	16.1
T_{max}	(°C)	17.4	22.3	23.2	24.8	30.3	34.9	38.1	38.1	32.5	27.2	21.7	18.1	22.3	30.3	38.1	32.5	38.1	38.1
T_{min}	(°C)	-5.8	-5.7	-5.4	1.4	5.5	11.5	13.0	11.8	8.8	3.8	-0.4	-5.1	-5.8	-5.4	11.5	-0.4	1.4	-5.8
t_{max}	(°C)	10.4	11.2	13.8	17.2	22.7	26.8	30.0	29.7	24.9	19.9	14.7	11.4	11.0	17.9	28.8	19.8	25.2	19.4
t_{min}	(°C)	5.6	5.7	7.8	10.6	15.4	18.9	21.7	21.7	18.0	14.1	9.6	6.7	6.0	11.3	20.8	13.9	17.7	13.0
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	12.0	11.5	11.9	13.8	17.3	21.1	23.2	23.6	21.7	19.3	16.4	13.7	12.4	14.3	22.6	19.1	20.1	17.1
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
t_{min}<0°C	(d)	1.8	2.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	4.8	0.9	0.0	0.1	0.0	5.9
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	9.1	22.0	29.5	29.0	15.4	1.3	0.0	0.0	0.0	9.2	80.4	16.7	105.0	106.3
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.1	5.0	16.5	15.7	1.1	0.0	0.0	0.0	0.0	0.1	37.2	1.1	38.3	38.3
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	1.6	11.3	23.7	22.5	7.9	0.8	0.0	0.0	0.0	1.6	57.4	8.8	67.0	67.8
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	102.3	105.1	183.6	267.0	435.0	536.1	645.7	641.0	492.5	372.1	214.8	132.0	339.4	885.6	1822.7	1079.4	3017.2	4127.2
$t_{5°C}$ max	(°C)	169.6	175.8	265.6	344.7	529.0	601.5	726.0	724.9	591.9	423.8	305.8	192.1	415.8	1045.5	1986.3	1244.2	3330.6	4586.8
$t_{5°C}$ min	(°C)	36.4	47.0	87.1	169.4	333.4	478.3	595.3	511.4	385.7	241.5	124.9	62.9	215.6	702.7	1657.6	906.6	2721.7	3779.6
$t_{10°C}$	(°C)	10.4	15.6	53.4	120.0	280.0	386.1	490.7	486.0	342.5	218.1	81.2	24.2	50.2	453.5	1362.7	641.7	2105.2	2508.1
$t_{10°C}$ max	(°C)	33.2	54.8	110.9	194.7	374.0	451.5	571.0	569.9	442.0	268.8	155.9	64.3	87.8	612.9	1526.3	791.4	2415.6	2956.5
$t_{10°C}$ min	(°C)	0.5	1.1	16.5	41.3	178.4	328.3	440.4	356.4	235.7	91.9	13.0	0.1	21.0	270.8	1197.6	476.2	1808.7	2155.0
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	73.7	61.2	63.4	61.9	61.6	47.3	25.5	44.8	68.9	82.1	101.7	90.8	226.8	186.8	117.6	252.7	310.0	782.8
Rmax	(mm)	184.7	182.0	192.6	121.3	182.4	161.5	97.7	205.7	214.9	241.1	235.7	203.0	397.0	360.2	285.7	448.1	499.8	1101.5
Rmin	(mm)	0.7	3.8	2.4	17.0	1.5	6.6	0.3	0.1	0.2	3.3	33.2	6.8	53.1	82.6	25.6	121.3	135.8	486.6
Rd_{max}	(mm)	70.2	42.5	50.6	57.0	68.0	116.7	61.1	131.6	70.4	90.7	91.0	56.1	70.2	68.0	131.6	91.0	131.6	131.6
Rd≥0.1mm	(d)	10.6	9.5	9.6	10.9	9.4	8.7	5.3	5.4	7.9	9.6	11.5	11.5	31.7	29.9	19.3	29.0	47.5	109.8
Rd≥1mm	(d)	7.9	7.2	7.5	7.7	6.6	5.7	3.3	3.8	5.8	7.6	9.1	8.6	23.8	21.8	12.8	22.5	32.9	80.9
Rd≥5mm	(d)	4.6	3.7	4.0	4.0	3.4	2.6	1.4	2.0	3.6	4.5	5.8	5.3	13.7	11.4	6.0	14.0	17.0	45.0
Rd≥10mm	(d)	2.5	2.2	2.2	2.2	2.2	1.5	0.8	1.4	2.3	2.6	3.5	3.2	7.9	6.7	3.7	8.4	10.5	26.8
Rd≥20mm	(d)	0.8	0.7	0.6	0.6	0.7	0.3	0.2	0.7	1.0	1.2	1.5	1.4	2.9	1.9	1.3	3.7	3.5	9.8
Rd≥50mm	(d)	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.2	0.4	0.5	0.9
S≥1cm	(d)	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.4
S≥10cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	21	1	7	0	0	0	0	0	0	0	0	14	21	7	0	0	0	21
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	65	70	86	114	181	249	315	303	214	144	93	71	206	381	867	451	1376	1905
ET	(mm)	56	57	70	85	85	60	28	45	67	77	75	59	172	240	133	219	370	764

1961–1990	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	60.4	59.5	59.8	59.4	59.3	56.3	49.4	51.7	58.3	61.2	63.9	61.5	60.5	59.5	52.5	61.2	55.7	58.4
Umin (%)	12.0	16.0	15.0	11.0	21.0	16.0	17.0	20.0	22.0	15.0	15.0	15.0	12.0	11.0	16.0	15.0	11.0	11.0
U>80% (d)	5.5	4.1	3.6	2.5	1.9	0.9	0.4	0.4	1.2	2.9	4.9	6.1	15.6	8.0	1.7	9.0	7.2	34.3
U≤30% (d)	2.7	3.8	2.9	2.1	1.3	1.3	3.1	3.4	1.6	1.8	2.0	2.3	8.8	6.2	7.9	5.4	12.9	28.4
e (hPa)	6.8	6.9	7.9	9.6	12.8	15.5	16.2	16.4	15.1	12.2	9.7	7.5	7.1	10.1	16.0	12.3	14.3	11.4
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	191	267	424	532	677	750	777	665	501	369	207	161	619	1634	2191	1078	3902	5522
$G_{45°S}$ (MJm^{-2})	345	421	526	541	605	631	672	647	592	556	364	301	1068	1672	1950	1512	3688	6200
Trajanje sijanja Sunca Insolation duration																		
SS (h)	4.1	5.1	5.7	7.1	8.7	10.0	11.1	10.2	8.3	6.5	4.4	3.9	4.3	7.1	10.4	6.4	9.2	7.1
SS_{rel} (%)	45	52	51	56	64	71	80	77	69	62	48	45	47	58	76	61	70	62
SS_{max} (h)	7.0	7.7	8.3	8.8	10.9	11.2	12.6	12.1	10.5	8.8	6.6	5.7	6.1	8.0	11.8	7.3	10.3	7.7
SS_{min} (h)	2.2	2.5	3.9	5.1	6.1	8.3	9.3	8.2	6.9	3.5	2.7	2.5	2.9	5.7	8.8	5.1	8.3	6.4
Naoblaka Cloudiness																		
N (10/10)	5.6	5.5	5.6	5.6	5.0	4.2	2.9	2.9	3.5	4.3	5.7	5.7	5.6	5.4	3.3	4.5	4.0	4.7
N_{max} (10/10)	7.6	7.5	7.7	7.2	6.9	5.6	4.4	5.3	5.1	7.4	7.6	7.2	6.7	6.7	4.4	5.8	4.8	5.2
N_{min} (10/10)	2.0	3.2	2.8	3.9	3.9	3.3	1.5	1.0	0.9	1.5	2.5	3.8	3.3	4.4	2.3	3.3	3.2	4.0
N<2/10	6.8	7.0	6.2	5.2	7.1	7.9	15.0	15.9	13.3	11.0	6.2	6.3	20.1	18.6	38.7	30.5	64.4	107.9
N<2/10 max	21	14	16	12	13	14	24	26	26	21	15	13	44	30	53	45	93	152
N<2/10 min	0	1	1	0	1	3	7	3	6	3	1	1	10	5	26	16	48	80
N>8/10	10.5	9.3	9.7	8.7	6.8	3.5	1.8	2.2	3.5	6.3	10.3	10.6	30.4	25.2	7.5	20.2	26.6	83.4
N>8/10 max	20	17	19	14	11	9	8	6	8	18	16	19	42	35	15	36	38	100
N>8/10 min	2	1	2	3	3	0	0	0	0	0	3	4	14	17	1	11	17	62
Meteorološke pojave Weather phenomena																		
magla/fog	0.2	0.3	0.6	0.1	0.2	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.6	0.9	0.1	0.4	0.5	2.0
magla/fog max	2	2	3	2	2	1	0	0	1	5	3	1	4	3	1	5	3	7
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.1	0.2	0.2	0.4	0.1	0.1	0.0	0.1	0.2	0.1	0.5	0.5	0.8	0.7	0.2	0.8	1.0	2.5
tuča/hail max	1	2	1	2	1	2	0	1	3	1	5	3	4	2	2	5	3	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.9	2.1	2.2	3.6	4.7	6.3	5.2	5.3	4.2	3.6	4.3	3.3	7.3	10.5	16.8	12.1	29.4	46.7
grm/thun max	6	5	5	8	10	15	14	10	9	11	13	9	14	19	27	26	44	64
grm/thun min	0	0	0	0	0	1	0	2	0	0	0	0	1	3	7	2	17	35
rosa/dew	1.5	2.2	3.8	4.6	4.0	2.9	0.6	1.4	4.3	5.4	3.5	2.0	5.7	12.4	4.9	13.3	17.8	36.3
rosa/dew max	7	12	13	14	16	17	5	10	20	20	12	7	16	32	23	42	54	106
rosa/dew min	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	6
mraz/frost	1.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	3.0	0.2	0.0	0.2	0.0	3.4
mraz/frost max	14	5	4	0	0	0	0	0	0	0	2	5	21	4	0	2	0	25
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1001.3	999.6	999.3	997.5	999.1	999.4	999.5	999.4	1001.7	1002.4	1001.0	1000.6	1000.5	998.6	999.5	1001.7	999.4	1000.1
p max (hPa)	1023.6	1022.6	1022.3	1013.9	1011.2	1010.0	1009.6	1008.5	1013.7	1017.0	1018.7	1021.3	1023.6	1022.3	1010.0	1018.7	1013.9	1023.6
p min (hPa)	968.4	961.8	972.5	972.8	975.4	985.8	985.6	980.8	976.5	970.0	974.9	959.3	959.3	972.5	980.8	970.0	972.8	959.3
Vjetar Wind																		
v_h (ms^{-1})	4.8	5.0	4.9	4.7	4.0	3.4	3.4	3.5	3.6	4.2	5.0	5.3	5.0	4.5	3.4	4.2	3.8	4.3
v_h max (ms^{-1})	23.8	25.9	20.9	23.0	22.2	15.6	17.4	18.0	16.9	18.9	24.7	24.3	25.9	23.0	18.0	24.7	23.0	25.9
v_{max} (ms^{-1})	45.0	41.4	39.2	36.9	41.0	28.5	30.5	33.3	30.4	33.3	43.2	43.9	45.0	41.0	33.3	43.2	41.0	45.0
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-1.0	-1.1	2.9	9.3	17.0	22.4	25.2	23.0	16.5	10.0	4.3	0.6	-0.5	9.7	23.5	10.3	18.9	10.8
$PhET_{14h}$ (°C)	5.8	6.3	11.0	15.9	22.5	28.9	33.3	32.8	26.4	18.8	10.9	6.6	6.2	16.5	31.7	18.7	26.6	18.3
$PhET_{21h}$ (°C)	0.3	0.2	3.2	7.1	12.2	16.2	19.3	18.9	15.3	10.5	5.4	1.6	0.7	7.5	18.1	10.4	14.8	9.2

1971–2000	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	-	57.9	59.2	59.2	58.8	54.9	49.3	51.7	59.1	62.2	63.0	61.5	60.1	59.1	52.0	61.4	55.5	58.1
Umin (%)	12.0	13.0	15.0	11.0	21.0	21.0	22.0	20.0	23.0	15.0	15.0	15.0	12.0	11.0	20.0	15.0	11.0	11.0
U>80% (d)	5.8	3.5	2.9	2.7	2.1	0.9	0.3	0.5	1.6	3.5	5.4	5.7	15.0	7.7	1.7	10.4	8.1	34.9
U≤30% (d)	2.9	4.4	3.5	2.6	1.5	1.4	2.9	3.2	1.1	1.7	2.1	2.9	10.2	7.6	7.5	4.9	12.7	30.3
e (hPa)	7.0	6.8	7.9	9.4	12.9	15.4	16.4	16.9	15.1	12.4	9.4	7.6	7.1	10.1	16.2	12.3	14.4	11.4
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	4.3	5.4	6.0	7.0	8.8	10.2	11.2	10.3	8.2	6.2	4.5	4.2	4.6	7.3	10.5	6.3	9.3	7.2
SS_{rel} (%)	47	55	54	56	65	72	81	79	70	61	50	48	50	59	77	61	71	63
SS_{max} (h)	7.0	7.5	8.6	8.3	10.9	12.0	12.6	12.0	10.0	9.0	6.6	5.7	6.1	9.0	11.6	7.3	10.1	7.8
SS_{min} (h)	2.2	2.5	3.9	5.1	6.1	8.3	9.3	8.2	6.1	3.9	2.7	2.3	2.9	5.7	8.8	4.9	8.3	6.4
Naoblaka Cloudiness																		
N (10/10)	5.4	5.1	5.4	5.7	4.9	4.2	2.9	2.7	3.6	4.6	5.5	5.4	5.3	5.3	3.3	4.6	4.0	4.6
N_{max} (10/10)	7.6	7.5	7.7	7.2	6.9	5.8	4.4	4.4	5.6	7.2	7.6	7.8	6.7	6.7	4.3	6.1	4.7	5.2
N_{min} (10/10)	2.0	2.4	3.3	4.5	3.6	2.6	1.5	1.1	1.6	1.8	2.5	3.5	3.3	4.0	2.3	3.3	3.4	4.1
N<2/10	7.7	7.8	6.9	5.3	6.9	8.0	14.7	16.0	12.3	9.2	6.6	7.0	22.5	19.0	38.8	28.1	63.2	108.4
N<2/10 max	21	15	14	10	13	14	24	24	21	21	15	14	44	30	53	44	89	136
N<2/10 min	0	1	1	0	1	1	7	8	5	1	1	1	10	5	27	14	48	79
N>8/10	10.0	8.4	8.8	8.7	6.2	3.4	1.6	1.9	3.7	6.7	9.4	9.7	28.1	23.7	6.9	19.8	25.5	78.5
N>8/10 max	20	17	19	14	11	7	8	7	11	13	16	21	41	35	15	33	38	102
N>8/10 min	2	2	1	3	0	0	0	0	0	1	3	3	14	11	1	11	14	58
Meteorološke pojave Weather phenomena																		
magla/fog	0.1	0.3	0.5	0.1	0.3	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.4	0.9	0.2	0.4	0.7	2.0
magla/fog max	1	2	3	2	2	1	1	1	1	5	3	0	2	3	2	5	3	7
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.1	0.2	0.2	0.3	0.5	0.0	0.6	0.6	1.5
tuča/hail max	1	1	1	1	1	0	0	1	3	2	2	3	3	3	1	3	3	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	1.9	2.2	2.1	4.0	4.8	5.4	5.3	5.2	4.5	4.0	4.1	2.7	6.7	10.9	15.9	12.5	29.2	46.1
grm/thun max	6	8	5	9	10	10	14	9	9	12	14	9	15	19	27	23	44	72
grm/thun min	0	0	0	0	0	1	0	1	0	0	0	0	1	3	7	2	17	35
rosa/dew	1.8	1.3	2.6	2.1	1.7	0.7	0.1	0.6	1.3	2.6	2.0	1.5	4.6	6.5	1.4	5.9	6.5	18.3
rosa/dew max	7	9	13	11	9	3	1	3	6	13	10	7	16	21	5	25	23	52
rosa/dew min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
mraz/frost	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.2	0.0	0.0	0.1	0.0	1.3
mraz/frost max	4	4	1	0	0	0	0	0	0	0	2	4	7	1	0	2	0	7
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1002.7	1001.1	1000.0	997.4	999.1	999.4	999.2	999.5	1001.2	1002.0	1001.4	1002.0	1001.9	998.9	999.4	1001.5	999.3	1000.4
p max (hPa)	1023.6	1022.6	1022.3	1016.7	1013.0	1012.4	1008.6	1008.5	1013.7	1017.0	1018.7	1021.3	1023.6	1022.3	1012.4	1018.7	1016.7	1023.6
p min (hPa)	970.4	963.0	969.8	976.2	975.4	983.0	984.0	980.8	976.5	970.0	974.9	959.3	959.3	969.8	980.8	970.0	975.4	959.3
Vjetar Wind																		
v_h (ms^{-1})	4.8	5.0	4.9	4.7	3.9	3.5	3.5	3.3	3.8	4.5	5.0	5.0	4.9	4.5	3.4	4.4	3.8	4.3
v_h max (ms^{-1})	30.1	25.9	27.1	23.5	22.2	17.8	21.2	18.0	19.2	21.4	24.7	24.9	30.1	27.1	21.2	24.7	23.5	30.1
v_{max} (ms^{-1})	48.5	45.4	45.1	36.9	41.0	31.8	33.0	35.8	34.1	36.0	43.2	43.9	48.5	45.1	35.8	43.2	41.0	48.5
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-0.6	-0.7	2.9	8.7	16.8	22.2	25.3	23.6	16.3	10.0	4.1	0.8	-0.2	9.5	23.7	10.1	18.8	10.8
$PhET_{14h}$ (°C)	6.4	6.9	11.3	15.6	22.8	29.0	33.5	33.5	25.9	18.4	10.8	6.9	6.7	16.6	32.0	18.4	26.7	18.4
$PhET_{21h}$ (°C)	0.7	0.7	3.3	6.7	12.2	16.5	19.5	19.5	15.0	10.4	5.2	1.8	1.1	7.4	18.5	10.2	14.9	9.3

Knin

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	3.5	5.0	7.9	11.9	16.5	19.9	22.7	22.0	18.2	13.5	8.5	4.7	4.5	12.1	21.5	13.4	18.5	12.9
T_{max}	(°C)	17.9	22.3	27.6	29.0	32.6	36.4	39.4	39.6	36.7	31.6	24.2	21.6	22.3	32.6	39.6	36.7	39.6	39.6
T_{min}	(°C)	-18.3	-11.4	-14.0	-2.1	1.7	4.6	8.5	7.1	1.0	-3.3	-8.4	-15.4	-18.3	-14.0	4.6	-8.4	-2.1	-15.6
t_{max}	(°C)	8.1	9.9	13.5	17.6	22.7	26.3	29.7	29.6	25.6	20.2	13.9	9.3	9.1	17.9	28.5	19.9	25.3	18.9
t_{min}	(°C)	-0.6	0.9	3.2	6.7	10.6	13.8	15.9	15.6	12.3	8.2	4.1	0.7	0.4	6.8	15.1	8.2	12.5	7.6
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.1	0.0	0.0	0.0	0.7
t_{max}<0°C	(d)	1.5	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.5	0.3	0.0	0.0	0.0	2.7
t_{min}<0°C	(d)	16.6	12.5	6.2	0.4	0.0	0.0	0.0	0.0	0.0	0.3	6.3	13.9	42.8	6.6	0.0	6.7	0.4	56.2
t_{max}≥25°C	(d)	0.0	0.0	0.3	1.4	9.9	19.1	27.8	26.8	17.7	4.4	0.0	0.0	0.0	11.6	73.8	22.1	102.8	107.5
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.8	5.8	16.0	15.2	4.4	0.1	0.0	0.0	0.0	0.8	37.0	4.5	42.2	42.3
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.4	1.8	1.6	0.2	0.0	0.0	0.0	0.0	0.0	3.9	0.2	4.1	4.1
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	30.4	48.9	118.1	215.8	361.3	451.3	552.3	544.4	418.3	286.2	128.6	47.8	127.1	695.2	1548.1	833.1	2543.5	3203.5
$t_{5°C}$ max	(°C)	86.8	119.5	213.3	305.7	443.8	517.0	641.5	647.0	512.7	355.2	237.6	89.4	201.3	803.6	1664.6	967.4	2712.7	3482.5
$t_{5°C}$ min	(°C)	0.0	6.8	54.1	126.5	280.9	396.5	507.4	442.3	344.6	140.1	38.2	0.6	71.5	505.5	1446.7	686.5	2317.3	2918.9
$t_{10°C}$	(°C)	1.9	5.0	25.2	80.4	206.8	301.3	397.3	389.4	268.4	136.1	31.2	5.0	11.9	312.3	1088.1	435.6	1643.6	1848.0
$t_{10°C}$ max	(°C)	7.1	20.8	76.0	155.7	288.8	367.0	486.6	492.0	362.7	205.2	104.4	27.6	39.1	412.0	1204.6	551.9	1818.0	2031.1
$t_{10°C}$ min	(°C)	0.0	0.0	1.3	14.1	126.8	246.5	352.5	287.2	194.6	20.8	0.0	0.0	1.8	150.2	986.6	300.7	1426.3	1588.3
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	2.5	4.1	7.4	11.9	17.1	21.2	24.0	23.2	19.1	13.5	8.0	3.6	3.4	12.1	22.8	13.5	19.4	13.0
t_{5cm} max	(°C)	5.7	7.3	10.3	13.8	20.4	23.4	26.6	26.2	22.8	15.5	11.4	6.0	7.3	20.4	26.6	22.8	26.6	26.6
t_{5cm} min	(°C)	-0.4	0.9	3.9	9.8	14.5	18.7	21.8	20.4	16.9	9.6	5.0	-0.2	-0.4	3.9	18.7	5.0	9.8	-0.4
t_{20cm}	(°C)	3.2	4.4	7.2	11.7	16.4	20.4	23.1	22.9	19.1	14.1	8.9	4.5	4.0	11.7	22.1	14.1	18.9	13.0
t_{20cm} max	(°C)	6.0	7.0	10.9	13.7	18.3	22.8	25.8	26.4	22.6	16.1	11.8	7.0	7.0	18.3	26.4	22.6	26.4	26.4
t_{20cm} min	(°C)	0.8	1.0	4.2	9.7	14.0	18.4	20.6	20.0	17.2	10.7	6.4	0.5	0.5	4.2	18.4	6.4	9.7	0.5
Oborina Precipitation																			
R	(mm)	87.3	81.2	84.6	87.1	89.3	88.3	45.7	73.6	98.5	108.2	122.2	107.8	277.2	261.0	207.6	328.9	482.5	1073.8
Rmax	(mm)	238.2	273.2	227.2	131.7	194.0	171.2	128.5	169.0	263.6	362.9	345.3	253.6	492.2	417.8	362.7	811.5	679.8	1630.8
Rmin	(mm)	1.4	12.1	16.3	31.6	6.9	28.2	4.3	1.1	0.5	0.0	22.8	6.3	51.4	132.3	55.0	135.7	214.9	728.1
Rd_{max}	(mm)	55.2	100.0	58.5	57.0	92.2	51.7	67.1	65.6	89.0	136.7	87.3	75.8	100.0	92.2	67.1	136.7	92.2	136.7
Rd≥0.1mm	(d)	10.8	10.2	10.2	11.6	11.9	11.4	6.4	7.3	8.5	9.1	11.2	11.2	32.3	33.8	25.0	28.8	57.0	119.8
Rd≥1mm	(d)	8.5	8.1	8.4	9.4	8.9	8.8	4.8	5.7	6.7	7.1	9.5	9.5	26.2	26.6	19.3	23.3	44.2	95.3
Rd≥5mm	(d)	5.4	5.0	5.2	5.5	5.0	5.3	2.6	3.8	4.7	5.1	6.5	5.9	16.4	15.7	11.7	16.4	26.9	60.1
Rd≥10mm	(d)	3.4	3.1	3.5	3.1	3.2	2.9	1.5	2.5	2.9	3.4	4.1	3.7	10.3	9.7	6.9	10.4	16.0	37.2
Rd≥20mm	(d)	0.9	0.9	1.1	1.0	1.1	1.2	0.6	1.2	1.5	1.8	2.0	1.6	3.4	3.2	3.0	5.3	6.6	14.8
Rd≥50mm	(d)	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.8	0.9	1.7
S≥1cm	(d)	2.2	1.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	4.9	0.4	0.0	0.2	0.0	5.5
S≥10cm	(d)	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.6	0.0	0.0	0.0	0.0	1.6
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	21	24	7	0	0	0	0	0	0	0	5	30	30	7	0	5	0	30
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	28	35	48	70	104	139	181	168	116	73	45	31	94	222	488	234	778	1038
ET	(mm)	27	34	46	69	99	123	108	79	79	60	44	30	91	214	310	183	557	798

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	4.0	5.1	8.2	11.5	16.6	20.1	23.0	22.5	18.0	13.3	8.2	5.0	4.7	12.1	21.9	13.2	18.6	13.0
T_{max}	(°C)	18.3	22.3	27.6	28.8	32.6	36.4	39.4	41.4	36.7	31.6	24.8	21.6	22.3	32.6	41.4	36.7	41.4	41.4
T_{min}	(°C)	-15.6	-11.6	-14.0	-3.1	1.7	4.6	8.1	7.0	1.4	-3.3	-8.5	-10.6	-15.6	-14.0	4.6	-8.5	-3.1	-15.6
t_{max}	(°C)	8.9	10.4	14.1	17.4	23.0	26.6	30.1	30.3	25.4	19.9	13.7	9.9	9.7	18.2	29.0	19.7	25.5	19.1
t_{min}	(°C)	-0.2	0.7	3.3	6.5	10.6	13.8	16.2	16.0	12.2	8.3	3.8	0.9	0.4	6.8	15.3	8.1	12.5	7.7
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)																		
t_{min} ≤-10°C	(d)	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.1	0.0	0.0	0.0	0.7
t_{max}<0°C	(d)	0.9	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.6	0.2	0.0	0.0	0.0	1.8
t_{min}<0°C	(d)	15.9	12.7	5.7	0.8	0.0	0.0	0.0	0.0	0.0	0.6	6.8	13.6	42.4	6.5	0.0	7.4	0.8	56.1
t_{max}≥25°C	(d)	0.0	0.0	0.3	1.0	10.8	20.1	27.8	27.7	17.2	3.8	0.0	0.0	0.0	12.1	75.6	21.1	104.6	108.8
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.9	6.4	17.0	17.5	4.2	0.1	0.0	0.0	0.0	0.9	41.0	4.3	46.1	46.2
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.0	0.4	2.6	2.1	0.2	0.0	0.0	0.0	0.0	0.0	5.1	0.2	5.3	5.3
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	34.1	51.7	125.9	208.6	365.1	456.3	561.5	562.4	414.0	281.9	123.1	53.1	138.9	699.6	1580.2	819.0	2567.8	3237.6
$t_{5°C}$ max	(°C)	86.8	116.4	213.3	298.7	443.8	517.0	645.5	639.6	512.7	340.4	222.3	104.5	202.9	834.0	1738.0	980.7	2836.3	3679.8
$t_{5°C}$ min	(°C)	5.5	12.7	54.1	98.7	251.5	396.5	507.4	442.3	304.5	140.1	38.2	5.4	73.2	505.5	1446.7	686.5	2317.3	2918.9
$t_{10°C}$	(°C)	2.0	5.5	28.3	74.7	210.6	306.3	406.5	407.4	264.0	134.6	30.0	5.9	13.4	313.6	1120.2	428.5	1669.5	1875.7
$t_{10°C}$ max	(°C)	7.1	24.0	76.0	151.2	288.8	367.0	490.5	484.6	362.7	186.0	80.7	27.6	39.1	434.8	1278.0	551.9	1923.8	2224.9
$t_{10°C}$ min	(°C)	0.0	0.0	4.1	9.9	102.2	246.5	352.5	287.2	154.5	20.8	0.0	0.0	2.2	150.2	986.6	300.7	1426.3	1588.3
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	2.9	4.2	7.7	11.8	17.3	21.5	24.5	24.0	19.1	13.6	8.0	4.1	3.7	12.3	23.3	13.5	19.7	13.2
t_{5cm} max	(°C)	5.7	6.8	11.1	13.6	20.6	26.5	26.8	28.6	22.8	15.5	11.1	6.4	6.8	20.6	28.6	22.8	28.6	28.6
t_{5cm} min	(°C)	0.4	0.2	3.9	8.9	12.5	18.7	22.4	20.7	15.5	9.6	5.0	1.6	0.2	3.9	18.7	5.0	8.9	0.2
t_{20cm}	(°C)	3.4	4.4	7.5	11.3	16.1	20.9	23.7	23.8	19.4	14.3	8.8	4.8	4.2	11.6	22.8	14.1	19.2	13.2
t_{20cm} max	(°C)	6.0	7.0	10.9	13.7	20.2	24.8	25.8	26.9	22.6	16.1	11.7	7.0	7.0	20.2	26.9	22.6	26.9	26.9
t_{20cm} min	(°C)	1.3	2.0	2.0	1.4	0.5	18.8	21.7	20.5	16.3	10.7	6.4	1.5	1.3	0.5	18.8	6.4	0.5	0.5
Oborina Precipitation																			
R	(mm)	75.9	69.8	74.7	92.0	90.5	81.1	43.7	61.7	108.1	114.3	112.3	101.7	247.0	257.2	186.5	334.7	477.2	1025.8
Rmax	(mm)	160.3	191.6	152.3	166.5	194.0	171.2	128.5	122.9	278.6	318.2	249.2	253.6	492.2	417.8	362.7	654.1	679.8	1361.6
Rmin	(mm)	1.4	0.5	16.3	32.7	6.9	5.7	4.3	0.0	0.5	11.7	22.8	6.3	51.4	132.3	36.4	135.7	214.9	728.1
Rd_{max}	(mm)	44.0	100.0	69.6	63.0	92.2	62.5	61.0	73.1	89.0	136.7	67.9	75.8	100.0	92.2	73.1	136.7	92.2	136.7
Rd≥0.1mm	(d)	10.7	9.2	9.6	11.8	11.4	10.8	6.4	7.1	8.8	10.5	11.0	11.0	30.7	32.8	24.4	30.3	56.4	118.4
Rd≥1mm	(d)	8.1	7.1	7.5	9.3	8.6	8.3	4.6	5.3	7.1	8.1	9.3	8.8	24.0	25.4	18.3	24.6	43.3	92.2
Rd≥5mm	(d)	5.1	4.4	4.4	5.7	4.9	4.7	2.6	3.5	4.8	5.6	6.5	5.6	15.2	15.0	10.8	16.9	26.2	57.8
Rd≥10mm	(d)	2.8	2.4	2.9	3.3	3.0	2.7	1.5	1.9	3.1	3.7	4.0	3.4	8.7	9.3	6.0	10.8	15.5	34.8
Rd≥20mm	(d)	0.9	0.6	1.0	1.0	1.2	0.9	0.5	0.9	1.8	1.8	1.7	1.4	2.8	3.1	2.4	5.2	6.3	13.6
Rd≥50mm	(d)	0.0	0.1	0.0	0.1	0.2	0.1	0.0	0.1	0.5	0.2	0.2	0.2	0.3	0.4	0.3	0.8	1.1	1.7
S≥1cm	(d)	1.3	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	3.2	0.2	0.0	0.3	0.0	3.5
S≥10cm	(d)	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.0	0.0	0.0	0.0	1.0
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	32	24	7	0	0	0	0	0	0	0	5	40	40	7	0	5	0	40
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	31	38	52	70	110	150	196	187	121	75	46	33	102	232	533	242	834	1109
ET	(mm)	29	36	49	70	103	126	98	67	82	66	45	32	97	222	291	193	546	803

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	69.5	66.5	64.2	63.4	64.4	64.4	58.5	61.1	66.9	69.6	71.6	70.8	68.9	64.0	61.3	69.4	63.1	65.9
Umin (%)	14.0	8.0	7.0	7.0	19.0	20.0	19.0	14.0	6.0	17.0	10.0	12.0	8.0	7.0	14.0	6.0	6.0	6.0
U>80% (d)	5.8	3.1	3.4	2.9	2.8	2.0	1.0	1.4	1.5	2.6	4.4	5.9	14.8	9.1	4.5	8.5	11.6	36.8
U≤30% (d)	2.3	2.6	6.0	5.7	3.6	2.2	5.9	8.2	5.4	3.6	2.3	1.4	6.4	15.2	16.3	11.3	30.9	49.2
e (hPa)	5.8	6.1	6.9	8.7	11.9	14.8	15.8	15.7	13.7	10.9	8.3	6.4	6.1	9.2	15.4	11.0	13.4	10.4
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	164	248	407	519	655	710	714	644	467	341	181	138	550	1582	2068	989	3709	5190
$G_{45°S}$ (MJm^{-2})	278	384	503	529	587	600	622	627	545	504	302	243	905	1620	1849	1352	3511	5726
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.7	4.8	5.6	6.4	7.6	8.8	10.4	9.4	7.8	6.1	4.1	3.4	3.9	6.5	9.5	6.0	8.4	6.5
SS_{rel} (%)																		
SS_{max} (h)	6.6	7.6	8.2	8.3	9.7	10.1	12.2	10.9	9.8	8.6	6.9	5.2	5.6	7.7	10.4	7.2	9.2	7.2
SS_{min} (h)	2.1	2.7	3.1	4.5	4.6	7.2	8.5	7.7	6.1	3.8	2.4	2.3	2.6	5.0	8.5	5.0	7.5	6.0
Naoblaka Cloudiness																		
N (10/10)	5.7	5.6	5.8	5.9	5.4	4.9	3.5	3.4	3.8	4.4	5.8	5.7	5.7	5.7	3.9	4.7	4.5	5.0
N_{max} (10/10)	7.7	7.4	8.1	8.1	7.5	6.4	5.6	5.6	5.5	7.1	7.9	7.2	6.9	7.2	5.1	5.9	5.4	5.6
N_{min} (10/10)	2.3	3.1	3.4	4.6	3.9	3.9	1.6	1.7	1.5	1.7	2.6	3.5	3.6	4.9	2.8	3.5	3.8	4.2
N<2/10	6.8	6.4	5.7	4.3	4.8	5.8	11.7	12.5	11.5	10.3	6.4	6.7	19.9	14.8	30.0	28.2	50.7	92.9
N<2/10 max	22	15	14	10	10	12	22	22	22	21	16	15	47	25	44	40	71	126
N<2/10 min	1	1	2	0	0	2	2	3	4	2	1	1	10	5	17	15	33	68
N>8/10	11.4	9.6	10.5	9.7	7.7	5.4	2.3	2.8	4.5	6.6	10.4	11.4	32.4	28.0	10.5	21.5	32.4	92.3
N>8/10 max	20	15	19	19	16	10	6	6	9	14	19	19	43	41	16	33	51	118
N>8/10 min	4	2	1	5	1	1	0	0	0	0	3	5	16	19	5	12	21	63
Meteorološke pojave Weather phenomena																		
magla/fog	1.7	0.9	0.7	0.4	0.4	0.2	0.2	0.2	1.1	2.3	2.2	2.0	4.5	1.4	0.6	5.6	2.5	12.2
magla/fog max	5	4	4	3	2	3	2	2	7	8	8	12	13	5	3	17	14	25
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
tuča/hail	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.6	1.0	0.5	0.3	1.3	2.5
tuča/hail max	1	3	2	2	2	2	2	1	1	1	1	2	3	4	3	2	4	6
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.9	1.5	1.6	3.5	5.1	6.6	5.2	5.7	3.6	2.4	2.6	1.5	3.9	10.3	17.5	8.7	29.8	40.4
grm/thun max	3	5	9	8	11	17	15	12	7	8	9	5	9	20	30	18	52	62
grm/thun min	0	0	0	0	0	1	0	1	0	0	0	0	1	1	5	3	12	18
rosa/dew	1.3	0.8	4.0	8.9	14.4	13.7	11.0	12.7	16.0	14.7	6.9	2.0	4.0	27.2	37.3	37.6	76.6	106.2
rosa/dew max	9	8	21	16	22	22	22	25	24	24	15	10	18	53	58	56	107	168
rosa/dew min	0	0	0	0	4	2	0	0	4	6	1	0	0	5	2	15	27	46
mraz/frost	7.6	5.8	4.0	1.0	0.0	0.0	0.0	0.0	0.1	1.9	5.7	7.6	21.0	5.0	0.0	7.7	1.1	33.6
mraz/frost max	21	14	9	5	1	0	0	0	1	8	17	20	38	14	0	17	5	48
mraz/frost min	0	0	0	0	0	0	0	0	0	0	1	1	7	0	0	1	0	17
inje/rime	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2
inje/rime max	2	0	0	0	0	0	0	0	0	0	1	2	2	0	0	1	0	2
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	988.0	986.2	985.8	984.0	985.7	986.3	986.6	986.5	988.7	989.3	987.8	987.3	987.2	985.2	986.5	988.6	986.3	986.9
p max (hPa)	1008.6	1007.5	1007.8	1001.5	998.2	997.0	996.5	995.6	1001.2	1004.0	1005.3	1008.0	1008.6	1007.8	997.0	1005.3	1001.5	1008.6
p min (hPa)	956.2	947.4	960.6	960.2	962.9	973.4	973.0	971.0	963.7	958.8	962.6	945.7	945.7	960.2	971.0	958.8	960.2	945.7
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-4.4	-4.4	0.5	8.2	16.8	21.7	23.6	20.4	12.8	6.2	0.9	-2.8	-3.9	8.5	21.9	6.6	17.2	8.3
$PhET_{14h}$ (°C)	4.4	5.0	11.4	16.8	24.2	30.0	34.6	34.3	28.7	20.2	10.8	5.4	5.0	17.4	33.0	19.9	28.1	18.8
$PhET_{21h}$ (°C)	-2.8	-2.8	1.7	6.1	11.2	14.8	17.0	16.4	12.8	7.7	2.7	-1.4	-2.3	6.3	16.1	7.7	13.1	7.0

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	69.0	63.5	62.2	63.1	63.6	62.1	56.1	58.3	65.8	69.2	70.1	70.3	67.6	62.9	58.8	68.3	61.5	64.4
Umin (%)	14.0	8.0	13.0	7.0	18.0	20.0	19.0	14.0	14.0	17.0	10.0	18.0	8.0	7.0	14.0	10.0	7.0	7.0
U>80% (d)	6.0	3.0	2.9	3.4	2.7	1.9	0.9	1.2	1.8	3.0	4.3	5.6	14.5	9.0	4.0	9.1	12.0	36.7
U≤30% (d)	2.8	4.7	7.3	5.9	4.4	3.6	8.6	10.9	5.6	3.6	2.6	2.1	9.7	17.6	23.0	11.8	38.9	62.0
e (hPa)	5.9	5.8	6.8	8.5	11.8	14.4	15.3	15.3	13.3	10.8	8.0	6.5	6.1	9.0	15.0	10.7	13.1	10.2
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	3.9	5.2	5.9	6.3	7.9	9.0	10.5	9.6	7.8	5.9	4.1	3.5	4.2	6.7	9.7	5.9	8.5	6.6
SS_{rel} (%)																		
SS_{max} (h)	6.6	7.6	8.3	8.3	9.7	11.0	12.2	11.3	10.0	8.5	6.9	5.5	5.6	8.3	10.8	7.2	9.3	7.2
SS_{min} (h)	2.1	2.7	3.8	4.5	4.6	6.8	8.5	7.9	5.5	3.1	2.4	2.0	2.6	5.0	8.5	4.6	7.6	6.0
Naoblaka Cloudiness																		
N (10/10)	5.5	5.3	5.6	5.9	5.3	4.8	3.4	3.3	3.9	4.8	5.7	5.6	5.4	5.6	3.8	4.8	4.4	4.9
N_{max} (10/10)	7.7	7.4	7.4	8.1	7.5	6.1	5.6	5.1	6.0	7.0	7.9	7.6	6.9	7.2	4.8	6.4	5.3	5.6
N_{min} (10/10)	2.3	2.8	4.0	4.6	3.8	3.0	1.6	1.2	1.7	2.0	2.6	3.3	3.6	4.8	2.8	3.5	3.7	4.2
N<2/10	7.5	7.0	5.8	4.1	4.8	5.7	11.8	12.6	10.8	9.0	6.5	7.1	21.7	14.6	30.1	26.3	49.8	92.7
N<2/10 max	22	15	13	9	12	14	22	24	19	20	16	15	47	28	44	38	74	131
N<2/10 min	1	1	2	0	0	0	2	5	1	2	1	1	10	5	11	8	27	58
N>8/10	10.9	8.7	9.4	9.1	6.6	4.7	2.1	2.6	4.5	7.3	10.0	10.9	30.4	25.1	9.3	21.8	29.5	86.7
N>8/10 max	20	14	17	19	16	10	6	5	9	14	19	20	43	41	16	35	51	118
N>8/10 min	4	1	1	5	1	0	0	0	0	1	3	4	16	13	1	12	16	63
Meteorološke pojave Weather phenomena																		
magla/fog	1.5	0.4	0.6	0.3	0.4	0.1	0.0	0.2	0.8	1.3	1.7	1.9	3.8	1.3	0.4	3.7	1.9	9.2
magla/fog max	6	2	4	3	2	1	1	3	7	5	8	12	13	5	3	17	14	25
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
tuča/hail	0.1	0.2	0.2	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.5	0.7	0.5	0.3	1.1	2.0
tuča/hail max	1	1	2	2	2	2	2	1	1	1	1	2	2	3	3	2	4	5
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	0.9	1.3	1.6	3.0	4.5	5.4	4.6	5.6	3.5	2.8	2.3	1.6	3.8	9.1	15.6	8.6	26.6	37.1
grm/thun max	3	5	9	8	10	10	14	12	7	6	7	5	9	16	25	16	43	59
grm/thun min	0	0	0	0	0	1	0	2	0	0	0	0	0	0	5	3	9	18
rosa/dew	1.7	0.7	4.7	8.3	13.0	10.8	8.2	9.3	13.7	12.3	6.0	2.2	4.6	26.1	28.3	32.1	63.4	91.1
rosa/dew max	9	8	21	16	22	23	22	22	24	26	15	10	18	53	58	56	103	168
rosa/dew min	0	0	0	0	3	2	0	0	3	0	0	0	0	4	2	15	21	36
mraz/frost	7.5	5.9	3.5	1.0	0.0	0.0	0.0	0.0	0.1	1.7	5.3	7.7	21.1	4.5	0.0	7.1	1.1	32.7
mraz/frost max	21	14	9	6	0	0	0	0	1	8	17	20	38	14	0	17	6	48
mraz/frost min	1	0	0	0	0	0	0	0	0	0	1	3	9	0	0	1	0	19
inje/rime	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.3
inje/rime max	2	1	0	0	0	0	0	0	0	0	1	2	3	0	0	1	0	3
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	988.7	987.0	985.9	983.3	985.2	985.6	985.6	986.0	987.5	988.2	987.5	988.0	987.9	984.8	985.8	987.8	985.6	986.6
p max (hPa)	1008.5	1007.5	1007.8	1001.5	998.2	997.8	995.3	995.6	1001.2	1004.0	1005.3	1008.0	1008.5	1007.8	997.8	1005.3	1001.5	1008.5
p min (hPa)	959.1	947.4	955.4	960.3	962.1	968.1	970.5	971.0	963.1	958.8	962.3	945.7	945.7	955.4	968.1	958.8	960.3	945.7
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	-4.3	-4.4	0.1	7.1	15.5	20.9	23.2	20.7	12.6	6.0	0.3	-3.0	-3.9	7.6	21.6	6.3	16.7	7.9
$PhET_{14h}$ (°C)	4.8	5.9	11.6	16.2	24.2	30.0	34.8	34.9	28.1	19.2	10.4	5.8	5.5	17.3	33.2	19.2	28.0	18.8
$PhET_{21h}$ (°C)	-2.6	-2.4	1.6	5.4	11.0	14.8	17.1	16.9	12.4	7.4	2.0	-1.3	-2.1	6.0	16.3	7.3	12.9	6.9

Hvar

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	8.8	9.2	11.0	14.1	18.3	22.0	24.8	24.5	21.6	17.7	13.6	10.3	9.5	14.5	23.7	17.6	20.9	16.3
T_{max}	(°C)	19.2	23.4	23.7	25.7	29.0	33.6	36.2	35.0	32.2	28.4	22.7	20.6	23.4	29.0	36.2	32.2	36.2	36.2
T_{min}	(°C)	-6.6	-4.7	-4.4	3.8	7.0	10.0	12.8	13.0	10.0	4.9	-0.2	-4.4	-6.6	-4.4	10.0	-0.2	3.8	-6.6
t_{max}	(°C)	12.2	12.8	14.7	17.9	22.1	26.2	29.2	29.0	26.1	21.9	17.0	13.6	12.9	18.3	28.1	21.7	25.1	20.2
t_{min}	(°C)	5.6	5.9	7.6	10.6	14.6	18.1	20.6	20.4	17.8	14.3	10.4	7.1	6.2	11.0	19.7	14.1	17.0	12.7
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	13.4	12.5	12.6	14.4	17.1	20.7	22.8	23.2	22.3	20.5	18.0	15.4	13.8	14.7	22.2	20.3	20.1	17.7
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
t_{min}<0°C	(d)	2.1	1.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	4.1	0.9	0.0	0.1	0.0	5.0
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	5.3	20.3	30.0	29.5	20.9	4.3	0.0	0.0	0.0	5.4	79.8	25.2	106.1	110.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	2.9	12.4	12.2	1.8	0.0	0.0	0.0	0.0	0.0	27.5	1.8	29.3	29.3
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.6	7.5	20.2	18.6	5.9	0.5	0.0	0.0	0.0	0.6	46.3	6.5	52.8	53.4
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	127.3	126.4	193.9	277.8	414.3	513.5	617.8	611.4	508.6	406.2	261.3	167.3	421.0	886.0	1742.7	1176.1	2943.4	4225.8
$t_{5°C}$ max	(°C)	195.6	186.5	264.0	337.1	485.9	576.1	681.0	679.4	580.0	464.3	340.3	220.7	541.9	1010.0	1831.5	1295.8	3102.6	4406.8
$t_{5°C}$ min	(°C)	67.5	32.1	101.3	207.7	337.8	467.6	570.8	519.9	438.7	305.5	167.6	101.4	302.6	725.9	1646.1	1001.9	2709.3	3939.8
$t_{10°C}$	(°C)	18.3	23.3	56.3	128.8	259.3	363.6	462.8	456.4	358.6	251.3	117.2	40.8	82.4	444.4	1282.8	727.1	2029.4	2536.6
$t_{10°C}$ max	(°C)	49.3	51.8	113.6	187.2	330.9	426.2	526.0	524.4	429.9	309.3	190.3	73.3	140.0	579.0	1371.5	840.9	2187.6	2719.5
$t_{10°C}$ min	(°C)	1.4	2.2	21.2	60.6	182.8	317.6	415.9	364.9	288.7	151.8	35.2	3.2	32.8	284.1	1186.1	558.1	1794.6	2248.8
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	79.5	64.4	71.3	52.9	41.3	38.7	24.8	42.3	59.4	81.1	83.9	90.8	233.8	165.5	105.8	224.4	259.4	730.4
Rmax	(mm)	203.4	174.9	224.6	116.4	162.0	141.7	143.6	142.0	143.1	213.5	202.9	246.5	454.2	333.3	227.9	393.3	477.7	1114.2
Rmin	(mm)	2.9	9.0	7.3	7.5	1.0	5.0	0.0	0.0	0.8	0.3	30.1	3.5	27.2	46.2	22.6	101.7	84.8	383.7
Rd_{max}	(mm)	71.8	51.3	79.0	66.6	86.2	40.8	67.3	122.5	108.3	82.8	65.1	112.8	112.8	86.2	122.5	108.3	122.5	122.5
Rd≥0.1mm	(d)	10.8	10.0	10.4	10.2	7.5	6.7	4.2	5.0	6.3	9.1	11.4	11.7	32.8	28.1	15.9	26.8	39.9	103.3
Rd≥1mm	(d)	8.5	7.8	8.1	7.1	5.2	4.4	2.6	3.8	4.8	7.2	8.6	8.9	25.3	20.4	10.9	20.6	28.0	77.0
Rd≥5mm	(d)	5.1	4.1	3.9	3.6	2.7	2.3	1.3	2.0	2.8	4.0	5.4	5.6	14.9	10.1	5.7	12.1	14.7	42.8
Rd≥10mm	(d)	2.9	1.9	2.0	1.7	1.4	1.4	0.7	1.2	1.9	2.6	3.1	3.0	7.7	5.0	3.3	7.7	8.3	23.8
Rd≥20mm	(d)	0.7	0.8	0.9	0.3	0.4	0.4	0.3	0.7	0.8	1.2	1.0	1.0	2.4	1.6	1.4	3.0	2.9	8.4
Rd≥50mm	(d)	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.3	0.1	0.1	0.4	0.3	1.0
S≥1cm	(d)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥10cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	1	5	3	0	0	0	0	0	0	0	0	0	5	3	0	0	0	5
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	57	60	71	95	136	185	235	225	178	127	87	64	181	302	645	392	1054	1520
ET	(mm)	50	53	61	72	79	58	30	42	59	72	68	54	157	212	130	199	340	698

		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	9.1	9.2	11.1	14.0	18.5	22.3	25.0	24.8	21.5	17.7	13.3	10.3	9.5	14.5	24.0	17.5	21.0	16.4
T_{max}	(°C)	19.2	23.4	23.7	26.5	29.5	34.0	36.2	37.5	32.2	28.4	23.5	20.0	23.4	29.5	37.5	32.2	37.5	37.5
T_{min}	(°C)	-4.6	-4.7	-4.4	2.7	6.6	10.6	14.1	12.1	10.0	4.9	-0.2	-3.1	-4.7	-4.4	10.6	-0.2	2.7	-4.7
t_{max}	(°C)	12.6	13.0	14.9	17.7	22.3	26.4	29.5	29.5	26.0	21.8	16.8	13.7	13.1	18.3	28.4	21.5	25.2	20.3
t_{min}	(°C)	5.9	5.9	7.7	10.5	14.7	18.3	20.9	20.8	17.7	14.3	10.1	7.2	6.3	11.0	20.0	14.0	17.1	12.8
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	13.5	12.6	12.8	14.2	17.2	20.8	22.9	23.5	22.4	20.6	18.0	15.3	13.8	14.7	22.4	20.3	20.1	17.7
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{min}<0°C	(d)	1.3	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	3.0	0.8	0.0	0.1	0.0	3.9
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	6.5	21.5	30.2	29.9	20.7	3.6	0.0	0.0	0.0	6.6	81.5	24.3	108.8	112.4
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	2.6	14.0	14.5	1.4	0.0	0.0	0.0	0.0	0.0	31.1	1.4	32.4	32.4
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.8	8.0	21.0	20.5	6.1	1.1	0.0	0.0	0.0	0.8	49.5	7.2	56.4	57.5
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	135.1	127.6	196.4	269.2	414.6	518.3	625.3	623.3	506.7	401.8	252.9	170.1	432.8	880.2	1766.9	1161.4	2957.4	4257.6
$t_{5°C}$ max	(°C)	195.6	186.5	295.4	333.3	509.6	586.4	695	686.8	580	466.8	342.8	231.7	541.9	1031.5	1900.4	1299.0	3213.7	4644.2
$t_{5°C}$ min	(°C)	67.5	74.8	101.3	178.2	332	467.6	570.8	519.9	405.4	305.5	167.6	87.7	302.6	725.9	1650.5	1001.9	2709.3	3939.8
$t_{10°C}$	(°C)	20.3	24.0	57.5	119.9	259.7	365.6	468.2	466.1	355.9	247.4	112.0	40.5	84.7	437.1	1299.9	715.3	2035.4	2537.8
$t_{10°C}$ max	(°C)	49.3	51.8	113.6	183.3	354.6	436.4	540.0	531.8	429.9	293.7	192.8	93.3	140.0	588.2	1440.4	844.0	2298.6	2948.2
$t_{10°C}$ min	(°C)	3.6	4.6	21.2	40.5	177.0	317.6	415.9	364.9	255.5	151.8	35.2	3.4	42.3	284.1	1190.7	558.1	1794.6	2248.8
Temperatura tla Soil temperature																			
t_{5cm}	(°C)																		
t_{5cm} max	(°C)																		
t_{5cm} min	(°C)																		
t_{20cm}	(°C)																		
t_{20cm} max	(°C)																		
t_{20cm} min	(°C)																		
Oborina Precipitation																			
R	(mm)	68.4	55.7	62.7	54.1	46.7	34.4	26.4	45.2	63.7	79.3	94.0	83.2	208.6	163.4	106.0	237.0	270.4	713.7
Rmax	(mm)	203.4	174.9	224.6	116.4	162.0	116.2	143.6	150.5	197.3	213.5	210.9	219.0	409.6	333.3	227.9	374.9	477.7	1114.2
Rmin	(mm)	2.9	3.2	4.2	7.5	1.0	5.0	0.0	0.0	3.3	9.6	30.1	3.5	27.2	69.6	22.6	102.4	84.8	383.7
Rd_{max}	(mm)	71.8	51.3	79.0	66.6	86.2	39.8	77.8	122.5	103.6	82.8	73.4	112.8	112.8	86.2	122.5	103.6	122.5	122.5
Rd≥0.1mm	(d)	9.8	9.0	9.4	10.2	7.8	6.8	4.0	4.7	7.0	9.3	11.3	10.4	29.3	27.4	15.5	27.6	40.5	99.8
Rd≥1mm	(d)	7.4	6.8	7.4	7.0	5.2	4.4	2.3	3.4	5.2	7.2	8.5	8.0	22.2	19.6	10.2	20.9	27.5	72.8
Rd≥5mm	(d)	4.4	3.5	3.6	3.3	2.9	2.1	1.2	1.8	3.2	4.0	5.2	4.9	12.8	9.8	5.0	12.4	14.4	40.0
Rd≥10mm	(d)	2.4	1.7	1.7	1.6	1.5	1.1	0.7	1.2	2.1	2.7	3.4	2.9	7.0	4.8	3.0	8.3	8.2	23.1
Rd≥20mm	(d)	0.6	0.6	0.8	0.5	0.5	0.4	0.3	0.7	0.9	1.1	1.2	1.0	2.2	1.8	1.4	3.2	3.3	8.6
Rd≥50mm	(d)	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.5	0.5	1.1
S≥1cm	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥10cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	5	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	57	61	71	94	138	191	240	231	177	126	84	64	182	303	662	387	1071	1534
ET	(mm)	49	48	58	71	74	53	30	45	62	73	69	52	149	203	128	204	335	684

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	67.3	65.4	66.5	65.8	66.6	64.5	59.2	61.4	65.2	67.2	68.3	68.1	67.0	66.3	61.7	66.9	63.8	65.5
Umin (%)	18.0	18.0	17.0	18.0	20.0	20.0	17.0	24.0	20.0	20.0	20.0	16.0	16.0	17.0	17.0	20.0	17.0	16.0
U>80% (d)	5.1	4.2	3.4	2.5	1.7	0.8	0.3	0.7	1.0	2.6	4.3	5.4	14.7	7.5	1.8	7.9	6.9	31.9
U≤30% (d)	1.4	2.5	2.0	1.1	0.7	0.7	1.0	0.7	1.1	1.2	1.1	1.1	5.0	3.9	2.4	3.5	5.4	14.7
e (hPa)	8.1	8.1	9.1	10.9	14.3	17.4	18.9	19.2	17.2	14.1	11.1	9.0	8.4	11.4	18.5	14.1	16.3	13.1
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	192	270	439	562	700	782	807	691	511	382	210	162	624	1700	2280	1102	4052	5705
$G_{45°S}$ (MJm^{-2})	341	423	546	573	624	654	695	672	603	576	364	298	1063	1743	2022	1542	3822	6370
Trajanje sijanja Sunca Insolation duration																		
SS (h)	4.1	5.2	6.0	7.5	9.2	10.6	11.7	10.7	8.6	6.7	4.4	3.7	4.3	7.6	11.0	6.6	9.7	7.4
SS_{rel} (%)	45	52	54	60	67	75	83	81	72	64	48	43	47	61	80	62	73	64
SS_{max} (h)	6.6	7.9	8.5	9.3	11.0	11.8	13.1	12.4	10.5	8.9	6.8	5.7	5.9	8.4	12.3	7.5	10.8	8.0
SS_{min} (h)	2.4	2.5	4.1	5.6	6.7	9.3	9.9	9.4	7.3	4.2	2.4	2.3	2.9	6.5	9.8	5.4	9.0	6.8
Naoblaka Cloudiness																		
N (10/10)	5.4	5.3	5.3	5.2	4.4	3.6	2.3	2.3	3.1	4.1	5.5	5.6	5.5	5.0	2.7	4.2	3.5	4.3
N_{max} (10/10)	7.5	7.2	7.3	6.8	6.1	4.9	3.8	3.9	5.0	7.0	7.3	7.5	6.8	6.1	3.6	5.7	4.2	4.9
N_{min} (10/10)	2.9	2.6	2.6	3.3	3.1	2.7	0.7	0.9	0.9	1.7	2.7	3.2	3.8	3.9	1.7	3.0	2.9	3.7
N<2/10	7.1	6.9	7.3	6.7	9.5	11.2	18.0	18.6	14.5	11.5	6.6	6.5	20.5	23.5	47.8	32.6	78.5	124.5
N<2/10 max	19	16	18	15	15	17	27	28	25	21	15	14	40	39	64	48	100	156
N<2/10 min	1	1	2	1	3	4	10	8	7	2	1	1	12	12	33	20	59	103
N>8/10	9.2	8.2	8.8	7.2	5.8	3.0	1.2	1.4	3.1	5.7	8.3	10.3	27.7	21.8	5.6	17.0	21.7	72.1
N>8/10 max	16	17	16	15	11	7	4	6	7	15	15	19	41	31	13	32	32	90
N>8/10 min	3	1	1	3	2	1	0	0	0	0	1	3	15	11	1	9	13	41
Meteorološke pojave Weather phenomena																		
magla/fog	0.0	0.1	0.2	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.6	0.4	0.3	1.0	1.4
magla/fog max	0	1	2	3	3	1	1	1	2	2	0	0	1	3	2	2	4	5
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.5	0.4	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.4	1.2	0.8	0.6	0.6	1.3	3.2
tuča/hail max	3	4	2	2	1	2	2	1	1	1	1	2	5	2	3	3	4	10
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	2.3	2.5	2.1	3.2	3.4	4.0	3.4	4.5	4.1	4.3	4.6	3.4	8.3	8.7	11.8	13.0	22.6	41.8
grm/thun max	10	9	6	7	8	6	10	9	11	12	13	6	18	15	20	29	34	62
grm/thun min	0	0	0	0	0	1	0	0	0	0	0	0	2	4	6	4	12	26
rosa/dew	10.3	7.9	11.1	11.0	11.7	9.7	7.2	9.7	13.6	12.2	10.3	10.4	28.6	33.9	26.5	36.1	62.9	125.2
rosa/dew max	24	21	21	17	20	17	12	18	28	20	19	21	51	57	40	51	87	167
rosa/dew min	0	0	0	4	3	0	0	2	3	4	1	1	12	15	10	12	28	71
mraz/frost	1.7	1.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	4.1	0.7	0.0	0.2	0.0	5.0
mraz/frost max	11	8	5	0	0	0	0	0	0	0	2	4	11	5	0	2	0	11
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1013.5	1011.7	1011.5	1009.6	1011.1	1011.3	1011.3	1011.1	1013.5	1014.3	1013.1	1012.7	1012.6	1010.7	1011.3	1013.6	1011.3	1012.1
p max (hPa)	1036.4	1035.4	1035.9	1026.7	1023.6	1022.1	1021.3	1020.4	1025.8	1029.3	1030.9	1034.1	1036.4	1035.9	1022.1	1030.9	1026.7	1036.4
p min (hPa)	980.2	974.8	983.3	984.4	987.0	997.4	997.6	992.8	988.1	982.4	985.8	972.5	972.5	983.3	992.8	982.4	984.4	972.5
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	1.0	0.8	4.9	11.8	18.7	24.1	27.9	26.5	19.7	12.1	6.2	2.8	1.5	11.8	26.2	12.7	21.4	13.0
$PhET_{14h}$ (°C)	8.1	8.5	12.8	17.3	22.8	28.9	33.3	33.1	28.3	20.7	13.1	9.1	8.6	17.6	31.8	20.7	27.3	19.7
$PhET_{21h}$ (°C)	1.7	1.6	4.0	7.4	11.9	15.9	18.5	18.3	15.3	11.2	6.8	3.3	2.2	7.8	17.6	11.1	14.6	9.7

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	68.7	65.0	66.4	65.5	66.6	63.7	58.8	61.0	65.4	67.8	68.5	69.0	67.6	66.2	61.2	67.2	63.5	65.5
Umin (%)	19.0	18.0	17.0	18.0	20.0	20.0	17.0	24.0	22.0	20.0	20.0	23.0	18.0	17.0	17.0	20.0	17.0	17.0
U>80% (d)	5.0	3.4	2.6	2.4	1.7	0.8	0.2	0.7	1.1	2.9	4.5	5.4	13.7	6.7	1.7	8.5	6.9	30.7
U≤30% (d)	1.3	2.5	2.0	1.2	0.7	0.8	1.0	0.5	1.0	1.4	1.1	1.0	4.7	3.8	2.3	3.6	5.2	14.4
e (hPa)	8.3	8.0	9.1	10.7	14.4	17.5	19.1	19.6	17.1	14.2	10.9	9.1	8.5	11.4	18.7	14.1	16.4	13.2
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	4.3	5.5	6.3	7.4	9.3	10.8	11.8	10.8	8.6	6.4	4.5	4.0	4.6	7.7	11.1	6.5	9.8	7.5
SS_{rel} (%)	47	55	56	59	68	76	84	81	71	61	49	46	50	61	80	61	74	65
SS_{max} (h)	6.6	7.9	8.8	8.7	11.5	12.4	13.1	12.4	10.5	9.1	6.8	5.9	6.0	9.4	12.2	7.5	10.6	8.0
SS_{min} (h)	2.4	2.5	4.3	5.6	6.7	9.0	9.9	9.4	6.1	3.7	2.4	2.5	2.9	6.5	9.8	5.1	9.0	6.8
Naoblaka Cloudiness																		
N (10/10)	5.2	4.9	5.0	5.2	4.4	3.6	2.3	2.2	3.2	4.4	5.3	5.3	5.1	4.9	2.7	4.3	3.5	4.3
N_{max} (10/10)	7.5	7.0	7.0	6.8	6.1	5.4	3.8	3.8	5.0	6.8	7.3	7.3	6.8	6.1	3.6	5.6	4.2	4.9
N_{min} (10/10)	2.9	2.2	2.9	4.1	3.1	2.3	0.7	0.9	1.1	1.9	2.7	2.7	3.6	3.9	1.7	3.0	2.9	3.7
N<2/10	7.8	8.0	7.5	6.6	9.0	10.9	17.8	18.8	13.3	9.6	7.0	7.2	23.0	23.1	47.5	29.9	76.4	123.5
N<2/10 max	19	16	14	12	15	17	27	28	23	19	15	17	40	33	64	48	100	154
N<2/10 min	1	2	2	1	3	1	10	11	5	1	1	1	12	12	33	16	59	103
N>8/10	8.6	7.2	8.0	7.5	5.6	2.8	1.2	1.2	3.0	5.9	7.7	8.8	24.6	21.1	5.1	16.6	21.3	67.4
N>8/10 max	16	14	16	15	11	7	4	6	7	14	14	19	41	31	13	26	32	92
N>8/10 min	3	2	1	4	1	1	0	0	0	0	1	2	12	11	1	9	9	41
Meteorološke pojave Weather phenomena																		
magla/fog	0.0	0.2	0.2	0.0	0.4	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.2	0.6	0.4	0.1	0.9	1.3
magla/fog max	0	2	2	0	3	1	1	2	2	0	0	0	2	3	3	2	4	5
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.4	0.5	0.3	0.3	0.1	0.2	0.1	0.1	0.2	0.2	0.4	0.2	1.1	0.8	0.5	0.8	1.1	3.1
tuča/hail max	3	4	2	2	1	2	1	1	1	1	2	2	5	2	2	3	3	10
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	2.3	2.6	2.0	3.3	3.1	3.6	3.1	4.2	4.2	4.0	4.3	2.8	7.7	8.4	10.9	12.5	21.5	39.4
grm/thun max	10	9	6	6	8	7	10	9	11	12	8	6	18	15	20	23	34	62
grm/thun min	0	0	0	1	0	0	0	0	0	1	0	0	2	3	5	4	12	26
rosa/dew	12.4	9.3	12.3	10.8	12.6	10.2	8.0	10.9	13.5	12.4	10.7	11.6	33.3	35.7	29.2	36.5	66.1	134.7
rosa/dew max	24	21	24	17	20	16	15	18	28	24	19	21	51	57	43	51	87	167
rosa/dew min	0	2	4	4	4	2	2	3	4	5	1	1	17	19	10	12	38	85
mraz/frost	1.9	1.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2	4.9	0.7	0.0	0.2	0.0	5.8
mraz/frost max	11	8	5	0	0	0	0	0	0	0	2	4	15	5	0	2	0	15
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1015.0	1013.4	1012.3	1009.6	1011.2	1011.3	1011.0	1011.3	1013.1	1014.0	1013.5	1014.2	1014.2	1011.0	1011.2	1013.5	1011.3	1012.5
p max (hPa)	1036.4	1035.4	1035.9	1029.4	1025.1	1024.3	1020.4	1020.4	1025.8	1029.3	1030.9	1034.1	1036.4	1035.9	1024.3	1030.9	1029.4	1036.4
p min (hPa)	982.4	975.7	983.3	988.0	987.0	995.2	995.4	992.8	988.1	982.4	985.8	972.5	972.5	983.3	992.8	982.4	987.0	972.5
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	1.1	0.9	4.6	11.0	18.2	23.8	28.0	26.9	19.2	11.9	5.9	2.7	1.6	11.3	26.2	12.4	21.2	12.9
$PhET_{14h}$ (°C)	8.6	9.1	13.0	16.7	22.8	28.7	33.5	33.7	28.0	20.6	13.2	9.3	9.0	17.5	32.0	20.6	27.2	19.8
$PhET_{21h}$ (°C)	1.9	1.8	3.9	7.0	11.9	15.9	18.7	18.7	15.2	11.2	6.4	3.2	2.3	7.6	17.8	10.9	14.6	9.7

Dubrovnik

		1961–1990																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	8.8	9.3	11.1	14.1	18.1	21.8	24.5	24.4	21.5	17.7	13.7	10.4	9.5	14.4	23.6	17.6	20.7	16.3
T_{max}	(°C)	18.0	24.1	23.0	25.6	28.9	33.2	34.7	36.6	33.5	28.0	24.5	20.2	24.1	28.9	36.6	33.5	36.6	36.6
T_{min}	(°C)	-7.0	-4.6	-4.2	4.8	5.2	11.2	14.1	14.1	8.5	4.5	-1.0	-6.0	-7.0	-4.2	11.2	-1.0	0.0	-7.0
t_{max}	(°C)	11.8	12.3	14.2	17.0	21.1	24.9	27.9	27.9	25.0	21.2	16.8	13.4	12.5	17.5	26.9	21.0	24.0	19.5
t_{min}	(°C)	6.1	6.5	8.3	11.1	15.0	18.5	21.1	21.1	18.4	14.8	10.9	7.7	6.8	11.5	20.2	14.7	17.5	13.3
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	13.0	12.7	13.2	14.8	17.8	21.4	22.9	23.3	22.1	19.8	17.1	14.7	13.5	15.3	22.6	19.7	20.4	17.7
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
t_{min}<0°C	(d)	1.9	1.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.4	0.6	0.0	0.0	0.0	4.1
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.0	3.0	15.0	28.8	28.0	15.9	1.6	0.0	0.0	0.0	3.1	71.8	17.5	90.7	92.3
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.1	5.8	6.1	0.6	0.0	0.0	0.0	0.0	0.0	13.0	0.6	13.6	13.6
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	0.8	9.8	22.3	21.0	8.7	0.6	0.0	0.0	0.0	0.8	53.1	9.3	62.6	63.2
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	131.9	128.6	196.3	272.3	405.4	500.3	603.3	603.9	501.9	402.9	265.2	173.1	433.6	874.0	1707.5	1169.9	2887.1	4185.0
$t_{5°C}$ max	(°C)	204.5	191.3	272.0	330.7	481.4	552.0	673.6	656.5	593.1	471.3	336.5	218.4	519.4	1002.0	1815.8	1307.2	3033.5	4379.6
$t_{5°C}$ min	(°C)	63.8	31.5	104.1	204.6	329.6	458.8	557.0	508.3	432.3	299.9	166.6	117.5	324.1	707.9	1608.6	972.0	2660.2	3892.9
$t_{10°C}$	(°C)	20.3	24.7	58.1	123.3	250.4	350.3	448.4	448.9	351.9	248.1	121.2	43.6	88.5	431.8	1247.5	721.2	1973.2	2489.0
$t_{10°C}$ max	(°C)	53.2	55.5	117.3	180.7	326.4	402.0	518.6	501.5	443.1	316.3	186.8	69.8	138.9	573.2	1355.9	853.1	2119.5	2682.2
$t_{10°C}$ min	(°C)	3.1	4.0	24.2	58.3	174.6	308.8	403.1	353.3	282.3	149.7	37.5	8.0	40.2	281.1	1148.6	532.7	1746.5	2211.6
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	6.0	7.5	10.0	13.9	19.5	24.2	26.7	25.3	21.0	16.4	11.3	7.2	6.9	14.5	25.4	16.2	21.8	15.7
t_{5cm} max	(°C)	8.8	10.8	13.1	15.7	22.2	26.2	28.4	27.8	23.8	18.7	14.3	9.5	10.8	22.2	28.4	23.8	28.4	28.4
t_{5cm} min	(°C)	3.0	3.6	6.8	11.9	16.2	22.3	25.2	22.4	18.4	13.8	7.1	4.7	3.0	6.8	22.3	7.1	11.9	3.0
t_{20cm}	(°C)	6.5	7.6	10.0	13.7	18.5	22.9	25.6	25.0	21.5	16.9	12.0	8.0	7.4	14.1	24.5	16.8	21.2	15.7
t_{20cm} max	(°C)	9.1	11.0	13.4	15.5	20.6	25.0	27.3	27.4	23.9	18.8	14.7	10.2	11.0	20.6	27.4	23.9	27.4	27.4
t_{20cm} min	(°C)	3.8	4.4	7.0	12.0	15.7	21.0	24.2	22.1	19.3	14.5	8.5	5.8	3.8	7.0	21.0	8.5	12.0	3.8
Oborina Precipitation																			
R	(mm)	129.9	117.3	108.1	91.8	65.9	61.1	35.7	78.7	92.7	131.8	151.3	135.5	385.5	265.7	175.5	375.8	425.9	1199.8
Rmax	(mm)	304.4	331.6	284.0	186.0	261.3	169.4	130.7	221.1	240.6	373.4	322.5	396.2	659.7	455.5	435.2	662.7	791.1	1752.4
Rmin	(mm)	5.1	23.0	36.4	18.4	7.8	5.1	0.5	0.0	0.0	0.0	36.9	10.6	64.2	125.0	28.3	150.6	120.1	767.3
Rd_{max}	(mm)	154.1	58.8	101.5	100.0	54.5	103.5	77.4	128.8	111.9	136.6	130.3	73.6	154.1	101.5	128.8	136.6	128.8	154.1
Rd≥0.1mm	(d)	12.7	12.5	12.6	11.9	9.6	7.4	5.0	5.6	7.2	9.9	13.1	13.5	38.8	34.1	18.0	30.2	46.7	120.9
Rd≥1mm	(d)	10.2	9.9	9.3	9.2	6.5	4.9	3.4	4.3	5.6	7.6	10.8	10.7	31.0	25.0	12.6	23.9	33.9	92.3
Rd≥5mm	(d)	7.1	6.4	6.3	5.3	3.4	2.7	1.6	2.7	4.1	5.1	7.4	7.0	20.6	15.0	7.1	16.6	19.9	59.1
Rd≥10mm	(d)	4.5	4.1	3.3	3.1	2.3	1.7	1.1	1.7	2.6	3.7	4.5	4.4	13.2	8.7	4.5	10.9	12.5	37.0
Rd≥20mm	(d)	1.9	1.7	1.7	1.3	0.9	0.9	0.5	1.2	1.6	2.1	2.2	2.2	5.9	3.9	2.5	6.0	6.3	18.1
Rd≥50mm	(d)	0.1	0.2	0.2	0.1	0.0	0.2	0.1	0.5	0.3	0.6	0.5	0.2	0.6	0.3	0.8	1.4	1.3	3.1
S≥1cm	(d)	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.5
S≥10cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	6	8	2	0	0	0	0	0	0	0	0	7	8	2	0	0	0	8
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	62	64	75	95	131	180	230	224	181	135	92	71	197	301	634	408	1041	1540
ET	(mm)	59	60	71	90	109	104	55	78	86	97	85	69	188	270	237	268	522	963

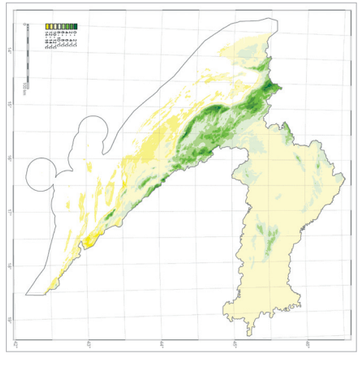
		1971–2000																	
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Temperatura zraka Air temperature																			
t	(°C)	9.2	9.4	11.1	13.8	18.3	22.0	24.6	24.8	21.4	17.6	13.3	10.3	9.7	14.4	23.8	17.5	20.8	16.3
T_{max}	(°C)	18.4	24.1	23.0	26.3	29.5	35.3	35.3	36.7	33.5	28.0	24.6	20.2	24.1	29.5	36.7	33.5	36.7	36.7
T_{min}	(°C)	-3.6	-5.2	-4.0	3.8	5.2	11.2	14.1	14.1	8.5	4.5	-1.0	-3.2	-5.2	-4.0	11.2	-1.0	0.0	-5.2
t_{max}	(°C)	12.3	12.6	14.4	16.9	21.5	25.3	28.2	28.5	25.1	21.1	16.6	13.4	12.7	17.6	27.4	20.9	24.3	19.7
t_{min}	(°C)	6.6	6.8	8.4	11.0	15.3	18.9	21.4	21.6	18.4	14.9	10.7	7.8	7.0	11.6	20.6	14.7	17.8	13.5
$t_{min\ 5cm}$	(°C)																		
$t_{min\ 5cm}$ min	(°C)																		
t_{more} / t_{sea}	(°C)	13.2	12.8	13.1	14.5	17.2	21.1	22.9	23.3	21.8	19.5	16.6	14.7	13.6	15.0	22.4	19.2	20.1	17.5
t_{min} ≤-10°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{max}<0°C	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_{min}<0°C	(d)	0.9	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.0	0.6	0.0	0.0	0.0	2.6
t_{max}≥25°C	(d)	0.0	0.0	0.0	0.1	4.2	17.3	29.2	28.6	16.7	1.9	0.0	0.0	0.0	4.3	75.1	18.6	96.1	98.1
t_{max}≥30°C	(d)	0.0	0.0	0.0	0.0	0.0	1.4	7.7	9.8	0.7	0.0	0.0	0.0	0.0	0.0	18.9	0.7	19.7	19.7
t_{min}≥20°C	(d)	0.0	0.0	0.0	0.0	1.3	11.1	23.4	23.1	9.0	1.1	0.1	0.0	0.0	1.3	57.6	10.2	67.8	69.0
$t_{min\ 5cm}$<0°C	(d)																		
Temperaturni zbroj iznad pragova 5°C i 10°C Temperature sum above the thresholds 5°C and 10°C																			
$t_{5°C}$	(°C)	142.5	134.8	200.8	268.6	414.9	512.6	612.9	622.2	503.9	402.4	259.4	175.1	452.4	884.3	1747.6	1165.7	2935.0	4250.0
$t_{5°C}$ max	(°C)	204.5	203.4	273.5	333.5	509.3	577.8	716.0	711.6	593.1	457.0	345.1	221.8	532.6	1023.6	1958.8	1353.6	3293.8	4857.5
$t_{5°C}$ min	(°C)	63.8	73.6	104.1	189.8	326.6	458.8	557.0	508.3	422.9	299.9	166.6	92.0	324.1	707.9	1608.6	972.0	2660.2	3892.9
$t_{10°C}$	(°C)	23.6	27.1	62.4	119.9	259.9	362.6	457.9	467.2	353.9	247.7	116.4	44.9	95.6	442.2	1287.7	717.9	2021.4	2543.4
$t_{10°C}$ max	(°C)	53.2	68.1	118.8	183.5	354.3	427.8	561.0	556.6	443.1	302.0	195.1	83.2	138.9	582.4	1498.8	898.7	2380.6	3094.9
$t_{10°C}$ min	(°C)	3.9	5.1	24.2	48.8	171.7	308.8	403.1	353.3	272.9	149.7	37.5	7.5	41.5	281.1	1148.6	532.7	1746.5	2211.6
Temperatura tla Soil temperature																			
t_{5cm}	(°C)	6.1	7.6	10.2	14.0	20.2	25.0	27.5	26.5	21.4	16.4	11.1	7.0	6.9	14.8	26.3	16.3	22.4	16.1
t_{5cm} max	(°C)	9.3	11.3	14.0	18.1	26.9	31.7	31.7	32.0	24.7	18.7	14.6	9.7	11.3	26.9	32.0	24.7	32.0	32.0
t_{5cm} min	(°C)	0.8	0.5	5.1	11.7	16.2	22.3	22.8	22.7	17.0	12.7	4.3	1.8	0.5	5.1	22.3	4.3	11.7	0.5
t_{20cm}	(°C)	6.5	7.8	10.2	13.7	18.9	23.6	26.3	25.9	21.6	17.0	11.9	8.1	7.5	14.3	25.3	16.8	21.7	16.0
t_{20cm} max	(°C)	9.4	11.0	13.7	16.8	24.0	28.8	30.1	30.3	24.0	18.5	15.3	10.3	11.0	24.0	30.3	24.0	30.3	30.3
t_{20cm} min	(°C)	0.9	3.0	6.4	8.1	15.7	20.3	21.5	22.0	18.8	11.3	6.2	5.8	0.9	6.4	20.3	6.2	8.1	0.9
Oborina Precipitation																			
R	(mm)	98.3	97.9	93.1	91.4	70.1	44.0	28.3	72.5	86.1	120.1	142.3	119.8	315.7	254.6	144.9	348.5	392.6	1064.0
Rmax	(mm)	299.2	290.7	244.7	178.9	261.3	142.9	130.7	221.1	201.8	283.5	322.5	227.6	568.4	455.5	435.2	534.9	663.2	1480.5
Rmin	(mm)	5.1	2.1	6.8	18.4	2.6	5.1	0.5	0.0	3.6	24.3	36.9	10.6	64.2	87.0	28.2	150.6	120.1	726.1
Rd_{max}	(mm)	121.0	58.5	101.5	80.6	54.8	84.6	63.1	128.8	111.9	127.0	117.0	65.5	121.0	101.5	128.8	127.0	128.8	128.8
Rd≥0.1mm	(d)	11.2	11.2	11.2	12.0	9.4	6.4	4.7	5.1	7.2	10.8	12.4	12.0	34.4	32.5	16.3	30.4	44.9	113.6
Rd≥1mm	(d)	8.9	9.1	8.1	9.2	6.6	4.4	3.1	3.8	5.4	8.2	10.1	9.7	27.6	23.9	11.2	23.7	32.4	86.5
Rd≥5mm	(d)	5.6	5.4	5.4	5.2	3.7	2.1	1.3	2.5	3.8	5.5	6.9	6.2	17.1	14.3	6.0	16.1	18.7	53.6
Rd≥10mm	(d)	3.3	3.4	3.0	2.9	2.3	1.1	0.9	1.7	2.4	3.6	4.7	4.0	10.7	8.3	3.7	10.7	11.3	33.4
Rd≥20mm	(d)	1.4	1.3	1.4	1.4	1.0	0.6	0.4	1.1	1.4	2.0	2.5	2.1	4.7	3.8	2.1	5.9	5.8	16.6
Rd≥50mm	(d)	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.5	0.3	0.4	0.4	0.1	0.4	0.3	0.7	1.1	1.2	2.5
S≥1cm	(d)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
S≥10cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥30cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S≥50cm	(d)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S_{max}	(cm)	3	3	0	0	0	0	0	0	0	0	0	7	7	0	0	0	0	7
Isparavanje Evaporation																			
EV	(mm)																		
EVmax	(mm)																		
EVmin	(mm)																		
PET	(mm)	65	68	77	95	136	188	236	236	185	136	93	72	205	308	660	414	1076	1587
ET	(mm)	60	60	70	89	106	90	40	73	81	97	83	70	190	265	203	261	479	919

	1961–1990																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	60.8	61.2	63.4	65.9	68.2	65.7	59.7	61.2	63.6	63.1	65.0	62.1	61.4	65.8	62.2	63.9	64.1	63.3
Umin (%)	9.0	13.0	13.0	17.0	19.0	12.0	18.0	21.0	15.0	8.0	15.0	14.0	9.0	13.0	12.0	8.0	12.0	8.0
U>80% (d)	5.8	5.1	5.5	5.1	4.2	2.9	0.8	2.1	2.1	3.8	6.0	5.8	16.7	14.7	5.8	12.0	17.1	49.2
U≤30% (d)	4.3	4.2	3.7	1.8	0.6	0.6	1.2	1.3	1.6	2.1	2.4	2.7	11.2	6.1	3.1	6.1	7.2	26.4
e (hPa)	7.4	7.6	8.8	10.8	14.5	17.5	18.7	19.1	16.7	13.3	10.7	8.3	7.8	11.3	18.4	13.6	16.2	12.8
Sunčevo zračenje Solar radiation (1961-1980)																		
$G_{0°}$ (MJm^{-2})	189	257	417	528	680	758	783	692	517	365	205	165	611	1625	2234	1087	3959	5557
$G_{45°S}$ (MJm^{-2})	324	386	507	531	604	633	673	670	607	532	343	299	1009	1642	1975	1483	3718	6109
Trajanje sijanja Sunca Insolation duration																		
SS (h)	4.0	4.7	5.5	6.9	8.5	10.2	11.2	10.4	10.1	6.5	4.4	3.8	4.1	7.0	10.6	7.0	9.6	7.2
SS_{rel} (%)																		
SS_{max} (h)	7.2	7.8	7.9	8.7	10.2	11.3	12.7	11.9	16.6	9.4	7.0	5.7	6.1	7.9	11.4	9.8	10.5	7.7
SS_{min} (h)	1.9	1.2	3.5	5.5	5.0	8.7	9.4	9.0	6.1	3.4	2.5	2.0	3.2	5.8	9.7	5.3	8.6	6.4
Naoblaka Cloudiness																		
N (10/10)	5.7	5.7	5.6	5.4	4.7	3.7	2.3	2.4	3.1	4.0	5.6	5.8	5.7	5.2	2.8	4.3	3.6	4.5
N_{max} (10/10)	8.0	8.9	8.1	6.8	7.2	4.6	4.3	4.1	5.1	7.2	8.0	7.6	6.8	6.1	3.5	5.9	4.3	5.1
N_{min} (10/10)	1.9	2.8	3.2	3.6	3.5	2.6	1.0	1.1	1.0	1.3	2.7	3.5	3.3	4.4	1.8	3.2	3.0	3.7
N<2/10	7.1	6.6	6.1	5.5	7.2	10.0	17.6	17.9	14.2	12.2	6.9	6.5	20.2	18.8	45.5	33.4	72.4	118.0
N<2/10 max	21	16	16	14	12	16	27	26	25	25	18	16	45	31	66	48	94	151
N<2/10 min	1	0	1	1	0	6	6	9	5	1	1	2	9	9	30	17	54	89
N>8/10	10.7	9.7	10.0	7.8	5.1	2.9	0.8	1.5	2.7	5.7	9.4	10.7	31.1	22.9	5.2	17.8	20.8	77.1
N>8/10 max	19	22	20	12	13	6	3	5	6	16	19	16	41	32	11	34	31	98
N>8/10 min	2	1	2	3	2	0	0	0	0	0	3	5	12	13	1	9	14	50
Meteorološke pojave Weather phenomena																		
magla/fog	0.0	0.0	0.2	0.3	0.4	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.9	0.2	0.2	1.0	1.4
magla/fog max	0	1	3	1	4	1	2	1	1	2	1	1	1	4	2	2	5	5
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.4	0.4	0.4	0.6	0.1	0.2	0.1	0.3	0.2	0.3	0.3	0.4	1.2	1.1	0.7	0.8	1.5	3.8
tuča/hail max	2	3	2	3	1	2	2	2	1	2	2	3	4	4	2	3	5	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	3.1	3.6	3.6	4.9	4.1	5.3	5.1	5.4	5.3	5.4	5.8	4.0	10.7	12.5	15.9	16.6	30.2	55.7
grm/thun max	8	9	9	10	10	15	16	11	12	14	12	10	20	26	32	32	55	94
grm/thun min	0	0	0	0	0	0	0	1	0	0	0	0	1	2	2	0	3	5
rosa/dew	7.4	6.1	10.9	13.7	17.2	12.3	8.0	11.0	15.2	13.6	8.8	7.5	21.1	41.7	31.3	37.6	77.4	131.7
rosa/dew max	20	18	22	24	25	27	17	24	25	22	22	19	43	62	53	52	116	189
rosa/dew min	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	14
mraz/frost	1.6	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	3.4	0.3	0.0	0.2	0.0	3.9
mraz/frost max	11	5	3	0	0	0	0	0	0	0	3	6	16	3	0	3	0	19
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1010.1	1008.3	1008.3	1006.5	1008.0	1008.0	1007.7	1007.7	1010.0	1011.2	1010.0	1009.4	1009.3	1007.6	1007.8	1010.4	1008.2	1008.8
p max (hPa)	1032.1	1031.7	1029.9	1022.4	1019.6	1018.6	1016.5	1015.9	1020.1	1022.5	1026.0	1029.5	1032.1	1029.9	1018.6	1026.0	1022.4	1032.1
p min (hPa)	977.7	972.5	981.1	983.6	990.9	993.7	998.8	994.1	994.9	989.8	985.0	977.5	972.5	981.1	993.7	985.0	983.6	972.5
Vjetar Wind																		
v_h (ms^{-1})	4.7	4.8	4.4	4.0	3.5	3.5	3.6	3.6	3.4	3.7	4.6	4.8	4.8	4.0	3.6	3.9	3.6	4.0
v_h max (ms^{-1})	20.9	19.6	21.4	18.7	17.5	17.0	15.6	14.4	15.2	17.7	18.0	21.8	21.8	21.4	17.0	18.0	18.7	21.8
v_{max} (ms^{-1})	39.1	41.2	43.2	39.6	43.2	29.3	28.3	29.9	29.9	37.1	37.1	44.3	44.3	43.2	29.9	37.1	43.2	44.3
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	1.0	1.0	5.4	12.0	18.9	24.3	27.1	25.8	19.9	12.6	6.5	2.7	1.6	12.1	25.7	13.0	21.3	13.1
$PhET_{14h}$ (°C)	7.7	8.2	12.0	16.5	22.1	28.5	32.5	32.4	27.6	20.6	13.2	8.8	8.2	16.9	31.1	20.4	26.6	19.2
$PhET_{21h}$ (°C)	1.8	1.8	4.4	7.8	12.2	16.1	18.6	18.6	15.5	11.5	7.2	3.5	2.4	8.1	17.8	11.4	14.8	9.9

	1971–2000																	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Z/W	P/Sp	LJ/Su	J/A	Veg	G/An
Vlažnost zraka Air humidity																		
U (%)	59.9	58.4	61.2	64.2	66.7	63.8	58.2	59.2	61.9	62.2	62.4	60.3	59.5	64.0	60.4	62.2	62.3	61.5
Umin (%)	9.0	13.0	13.0	17.0	17.0	12.0	18.0	19.0	17.0	8.0	15.0	9.0	9.0	13.0	12.0	8.0	12.0	8.0
U>80% (d)	5.1	4.5	3.8	4.6	4.1	2.6	0.8	2.0	1.9	3.9	5.6	5.4	14.9	12.5	5.3	11.5	16.0	44.2
U≤30% (d)	5.3	5.9	5.4	2.5	1.6	1.1	2.3	2.2	1.4	3.1	3.3	4.0	15.2	9.5	5.6	7.8	11.0	38.0
e (hPa)	7.4	7.3	8.5	10.4	14.3	17.2	18.4	18.9	16.2	13.1	10.1	8.1	7.6	11.0	18.2	13.1	15.9	12.5
Sunčevo zračenje Solar radiation																		
$G_{0°}$ (MJm^{-2})																		
$G_{45°S}$ (MJm^{-2})																		
Trajanje sijanja Sunca Insolation duration																		
SS (h)	4.2	5.1	5.8	6.9	8.6	10.4	11.2	10.5	10.3	6.1	4.5	4.0	4.4	7.1	10.7	7.0	9.6	7.3
SS_{rel} (%)																		
SS_{max} (h)	7.2	7.9	8.2	8.3	10.8	11.8	12.2	11.8	16.6	9.0	7.0	5.7	6.1	8.9	11.4	9.8	10.8	8.3
SS_{min} (h)	1.9	1.2	3.7	5.5	5.0	8.3	9.4	8.7	6.1	3.5	2.7	1.3	3.2	5.8	9.7	4.9	8.6	6.4
Naoblaka Cloudiness																		
N (10/10)	5.2	5.1	5.2	5.4	4.5	3.4	2.2	2.3	3.2	4.3	5.4	5.3	5.2	5.0	2.6	4.3	3.5	4.3
N_{max} (10/10)	8.0	8.9	7.3	6.8	7.2	4.5	4.3	4.2	5.3	6.7	7.1	8.4	6.7	6.1	3.5	5.6	4.3	5.1
N_{min} (10/10)	1.9	2.5	2.9	4.0	2.8	2.0	1.0	0.9	1.0	1.3	2.7	2.4	3.3	3.5	1.5	3.2	2.6	3.6
N<2/10	8.7	8.4	7.4	5.8	7.5	11.7	18.5	18.4	13.8	10.7	7.3	8.3	25.4	20.8	48.6	31.7	75.7	126.5
N<2/10 max	21	18	15	11	16	21	27	26	25	25	18	18	45	41	67	48	95	154
N<2/10 min	2	0	2	3	0	6	6	9	5	3	2	0	9	9	31	17	54	89
N>8/10	9.3	8.6	8.8	7.5	4.9	2.3	0.9	1.2	2.7	5.9	8.8	9.2	27.0	21.2	4.4	17.4	19.5	70.0
N>8/10 max	19	22	18	12	13	6	3	5	10	13	15	20	41	32	9	32	31	100
N>8/10 min	2	1	2	3	0	0	0	0	0	1	3	1	12	9	1	7	6	42
Meteorološke pojave Weather phenomena																		
magla/fog	0.0	0.0	0.3	0.2	0.4	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.8	0.4	0.2	1.0	1.4
magla/fog max	0	1	3	1	4	1	2	2	1	2	1	0	1	4	2	2	5	5
magla/fog min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tuča/hail	0.3	0.5	0.3	0.6	0.1	0.1	0.1	0.3	0.1	0.3	0.4	0.3	1.0	1.0	0.5	0.8	1.3	3.2
tuča/hail max	2	3	2	3	1	1	2	2	1	2	3	3	4	3	2	3	4	7
tuča/hail min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
grm/thun	2.5	3.5	3.5	4.5	3.6	4.5	4.5	5.1	5.2	5.3	5.1	3.7	9.7	11.6	14.0	15.5	27.3	50.8
grm/thun max	8	9	9	10	10	10	16	11	12	14	11	10	20	26	32	32	55	94
grm/thun min	0	0	0	0	0	0	0	0	1	0	1	0	2	2	2	5	5	17
rosa/dew	8.2	6.1	10.7	11.3	15.2	10.1	8.0	8.6	13.3	11.0	7.6	7.6	22.0	37.3	26.6	31.9	66.4	117.7
rosa/dew max	20	18	22	20	25	22	16	24	25	22	22	19	43	62	53	51	108	185
rosa/dew min	0	0	2	3	3	0	0	0	0	0	0	0	4	11	0	0	9	28
mraz/frost	1.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.2	0.3	0.0	0.2	0.0	2.7
mraz/frost max	11	3	3	0	0	0	0	0	0	0	3	6	16	3	0	3	0	19
mraz/frost min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
inje/rime max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
inje/rime min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tlak zraka Air pressure																		
p (hPa)	1011.1	1009.4	1008.6	1006.1	1007.7	1007.7	1007.1	1007.5	1009.4	1010.6	1010.0	1010.6	1010.4	1007.5	1007.4	1010.0	1007.7	1008.8
p max (hPa)	1032.1	1031.7	1029.9	1024.5	1020.6	1018.6	1016.5	1015.4	1020.1	1023.0	1026.0	1029.5	1032.1	1029.9	1018.6	1026.0	1024.5	1032.1
p min (hPa)	977.7	975.2	982.3	983.6	986.9	992.8	992.5	994.1	988.5	986.8	985.0	977.5	975.2	982.3	992.5	985.0	983.6	975.2
Vjetar Wind																		
v_h (ms^{-1})																		
v_h max (ms^{-1})																		
v_{max} (ms^{-1})																		
Osjet ugode Thermal sensation																		
$PhET_{7h}$ (°C)	1.3	1.2	5.0	11.2	18.5	24.1	27.0	26.0	19.3	12.3	6.1	2.4	1.6	11.6	25.7	12.6	21.0	12.9
$PhET_{14h}$ (°C)	8.3	8.7	12.1	15.9	22.2	28.3	32.5	33.1	27.2	20.0	13.0	8.9	8.6	16.8	31.3	20.1	26.5	19.2
$PhET_{21h}$ (°C)	2.0	2.0	4.2	7.3	12.1	15.9	18.7	19.0	15.3	11.3	6.7	3.3	2.4	7.8	17.9	11.1	14.7	9.8

Kratice Acronyms and abbraviations

t	– srednja temperatura zraka mean air temperature
T_{max}	– apsolutna maksimalna temperatura zraka absolute maximal air temperature
T_{min}	– apsolutna minimalna temperatura zraka absolute minimal air temperature
t_{max}	– srednja maksimalna temperatura zraka mean maximal air temperature
t_{min}	– srednja minimalna temperatura zraka mean minimal air temperature
$t_{min\ 5cm}$	– minimalna temperatura zraka na 5 cm minimal air temperature at 5 cm
t_{more} t_{sea}	– temperatura mora sea temperature
t_{min}≤-10°C	– ledeni dani days with minimal temperature ≤-10°C
t_{max}<0°C	– studeni dani icy days
t_{min}<0°C	– hladni dani frosty days
t_{max}≥25°C	– topli dani warm days
t_{max}≥30°C	– vrući dani hot days
t_{min}≥20°C	– tople noći tropical nights
$t_{5°C}$	– temperaturna suma za prag 5°C temperature sum for the 5°C threshold
$t_{10°C}$	– temperaturna suma za prag 10°C temperature sum for the 10°C threshold
t_{5cm}	– temperatura tla na dubini 5 cm soil temperature at depth of 5 cm
t_{20cm}	– temperatura tla na dubini 20 cm soil temperature at depth of 20 cm
R	– količina oborine precipitation amount
Rd_{max}	– maksimalna dnevna količina oborine maximal daily precipitation
Rd≥x mm	– dani s količinom oborine ≥x mm days with precipitation ≥x mm
S≥x cm	– dani sa snježnim pokrivačem ≥x cm days with snow cover ≥x mm
EV	– isparavanje (mjereno) evaporation (measured)
PET	– potencijalna evapotranspiracija (proračunato) potential evapotranspiration (calculated)
ET	– evapotranspiracija (proračunato) evapotranspiration (calculated)
U	– relativna vlažnost zraka relative air humidity
U>80%	– dani s relativnom vlažnošću većom od 80% u 14 h days with relative humidity >80% at 2 pm
U≤30%	– dani s relativnom vlažnošću zraka ≤30% u bilo kojem terminu days with relative air humidity ≤30% in one of climatological terms
e	– parcijalni tlak vodene pare partial water vapour pressure
$G_{0°}$	– dozračena sunčana energija na horizontalnu plohu solar irradiation on a horizontal surface
$G_{45°S}$	– dozračena sunčana energija na plohu nagnutu 45° prema jugu solar irradiation on a southward oriented surface inclined at 45°
SS	– trajanje sijanja Sunca Insolation duration
N	– naoblaka u desetinama cloudiness in tenths
N<2/10	– vedri dani clear days
N>8/10	– oblačni dani cloudy days
magla/fog	– dani s maglom days with fog
tuča/hail	– dani s tučom days with hail
grm/thun	– dani s grmljavinom days with lightning with thunder
rosa/dew	– dani s rosom days with dew
mraz/frost	– dani s mrazom days with frost
inje/rime	– dani s injem days with rime
p	– tlak zraka air pressure
v_h	– srednja satna brzina vjetra mean hourly wind speed
v_{max}	– maksimalni udar vjetra maximal wind gust
PhET	– ekvivalentna fiziološka temperatura equivalent physiological temperature
max	– maksimalna vrijednost maximal value
min	– minimalna vrijednost minimal value
d	– broj dana number of days
h	– sati hours


ELEVATION
Elevation (m)
Projection: Transverse Mercator
Datum: WGS84
Source: DHMZ
Author: Ivan Ivanec
Date: 2025-05-15
Version: 1.0
Notes: Elevation data derived from DHMZ digital terrain model.
Coastline and administrative boundaries for reference only.
Slope classes based on standard thresholds for hydrological analysis.
Slope (°)
Flat (0–2)
Gentle (2–5)
Moderate (5–10)
Steep (10–20)
Very steep (20–40)
Extreme (40–60)
Aspect
North
Northeast
East
Southeast
South
Southwest
West
Northwest
Flat
Hydrological Zone
Coastal
Karst
Alluvial
Mountain
Urban
Water
Land Use
Forest
Agriculture
Urban
Water
Bare land
Wetland
Shrub
Grassland
Soil Type
Rendzina
Luvisol
Cambisol
Gley
Fluvisol
Peat
Lithosol
Water
Slope (°)
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