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Komunikacija o vremenu i klimi



Dr.sc. Amela Jeričević
Hrvatsko meteorološko društvo

Svjetski meteorološki dan 2011
'Klima za Vas'



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Načini komuniciranja znanstvenih rezultata

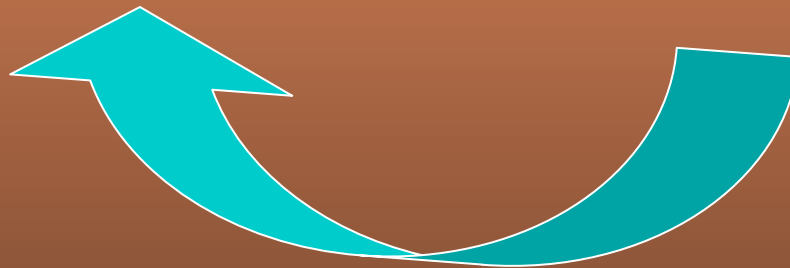
- ❑ Znanstveni nivo (CC radovi, izvještaji, studije, konferencije, seminari)
- ❑ Edukacijski- vrtići, škole, fakulteti, radionice
- ❑ Javni –mediji (TV, radio, novine, internet)



Dvosmjerna komunikacija

- Važno je prenositi i 'čuti' informacije u oba smijera

Što govorimo  Kako nas čuju



Povratna informacija

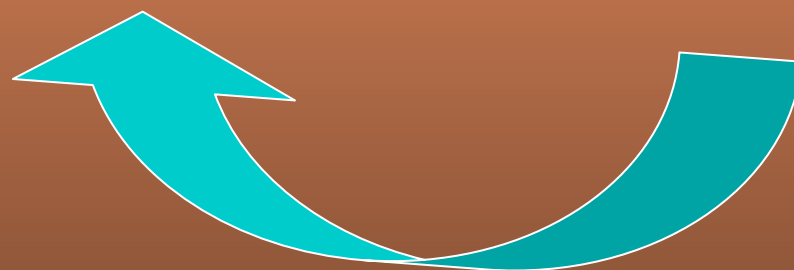


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Percepcija javnosti o klimatskim promjenama

Što govorimo:
Velika većina znanstvenika je u suglasju oko glavnih pitanja, vezanih uz klimatske promjene

Kako nas čuju:
Javnost je i dalje zbunjena i podvojenih stavova



Potrebna je jača i bolja prezentacija znanstvenih rezultata



SAD-iskustva i prakse

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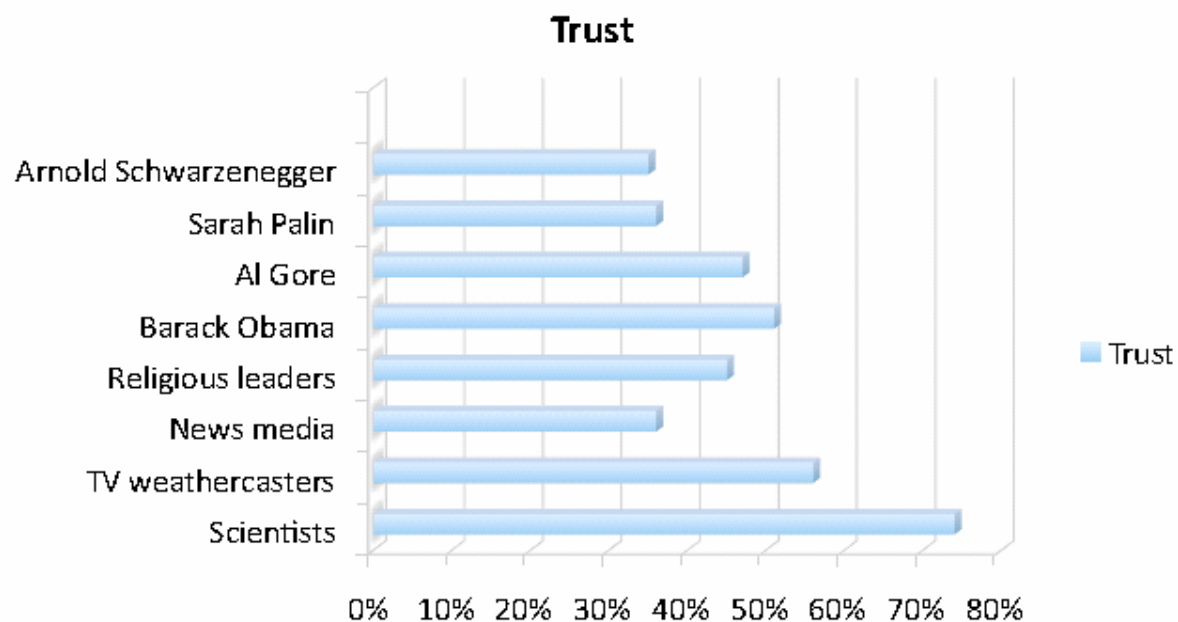
31. godišnja konferencija Američkog meteorološkog društva-23.-27.siječnja. 2011.
<http://www.ametsoc.org/meet/annual/>

SAD - pokazano da još uvijek značajan broj građana nema siguran stav prema klimatskim promjenama



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Trust in Sources of Information about Climate Change: *General Public*



Source: Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2010) *Climate change in the American Mind: Americans' global warming beliefs and attitudes in January 2010*. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change.



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Prijedlozi poboljšanje komunikacije

- ❑ National wildlife federation-uspješan projekt sa prezentacijom znanstvenih rezultata u medijski prilagođenom formatu.
- ❑ Predstavljaju najnovije znanstvene rezultate.
- ❑ Popraćeni agresivnim medijskim nastupom: relevantni eksperti informiranje novinara telefonom, gostovanje na radiu i televiziji, blogovi i druge internetske aktivnosti.

Extreme

Resigned Professor, American Academy of Allergy, Asthma and Immunology



More Global



Flickr: B. Duran

More Variable Global Warm Southeaster



Shutterstock

More Extreme Weather: Implications for Public Health and Social Justice

NATIONAL WILDLIFE FEDERATION 200



FEMA/istockphoto.com

Global warming is making hot days hotter, rainfall and flooding heavier, storms stronger, and droughts more severe. These will be the most visible impacts of global warming in our everyday lives and will have grave implications for public health and social justice. Indeed, our urban infrastructure, flood protection measures, emergency management strategies, and agricultural systems were all developed based on past experience with extreme weather. But, with global warming pushing these extremes beyond their historical limits, we can no longer plan for the future based on past climate conditions.

We are already seeing these impacts across the nation. The long-term warming trend is undeniable: according to NASA, the ten warmest years on record globally all occurred within the 12-year period 1997-2008.¹ Weather and climate disasters are becoming more common and more expensive in the United States. In the 1980s a billion-dollar weather disaster was relatively rare. The last decade has seen multiple billion-dollar disasters each year.²

Some people are more vulnerable than others to intensifying weather and climate extremes. Underserved communities and people who are old, young, or already sick are at greatest risk. Hurricane Katrina is a prime example: the poor and elderly lost the most because of where they lived and their limited ability to get out of harm's way. About 310,000 African Americans living in New Orleans were displaced by flooding or damage, a significantly larger proportion than any other group.³

More and more Americans will be living in vulnerable locations as population continues to grow rapidly in cities, along the coasts, and in the South. People of color will be disproportionately impacted because their populations are concentrated in these areas. For example, 56 percent of African Americans live in the southern United States or in urban areas.⁴

We must take action to reduce global warming pollution now, while there is still time to avert the worst impacts. Investing in a clean energy future is the essential path forward that will help communities nationwide, especially the most vulnerable. It can also create new economic opportunities for underserved communities. One analysis estimates that transitioning to clean energy could create more than 430,000 jobs for African Americans by 2030.⁵

Report



Ragweed Pollen Hay Fever

Hay fever symptoms are familiar to many: eye irritation, runny nose, sore nose, puffy eyes, sneezing, and inflamed, itchy nose and throat. The offending allergen for about 75 percent of people suffering from hay fever is ragweed. An herbaceous relative of the sunflower, ragweed produces highly allergenic pollen that is readily dispersed by the wind.¹² Native ragweed plants are found across the country, surviving under a range of habitat conditions, and are renowned for colonizing disturbed areas. Ragweed provides important wildlife habitat, even though it can be a nuisance for people. The plants bloom in late summer and fall. With each plant able to produce about a billion grains of pollen each season—pollen that can be carried up to 400 miles by the wind—it is no surprise that ragweed allergies already affect so many Americans.¹³

As atmospheric carbon dioxide levels and temperatures continue to rise, ragweed pollen loads will increase and possibly become more potent



Current Tree Habitat



2100 Tree Habitat



2100 Tree Habitat



pollen grains to burst, releasing much smaller allergen particles, granules that are less than 2.5 micrograms, which can reach the small airways of the lung.²⁷ Indeed, emergency department visits for asthma in Atlanta, Georgia are significantly correlated with intense thunderstorms.²⁸ Changing storm tracks could also affect the dispersion of pollen.

It is important to note that most native tree species, even those that

cause human allergies, have significant value as sources of food and shelter for wildlife, and generally are desirable to retain. In fact, global warming will make these trees even more valuable as places to store carbon, for providing shade that can help reduce cooling costs, and for helping naturally manage our water supply. A major challenge for future urban design will be to weigh the pros and cons of planting strategies to address these multiple different utilities.

NON-NATIVE SPECIES AND ALLERGIES: HOW POLLEN IN TUCSON, ARIZONA INCREASED 10-FOLD

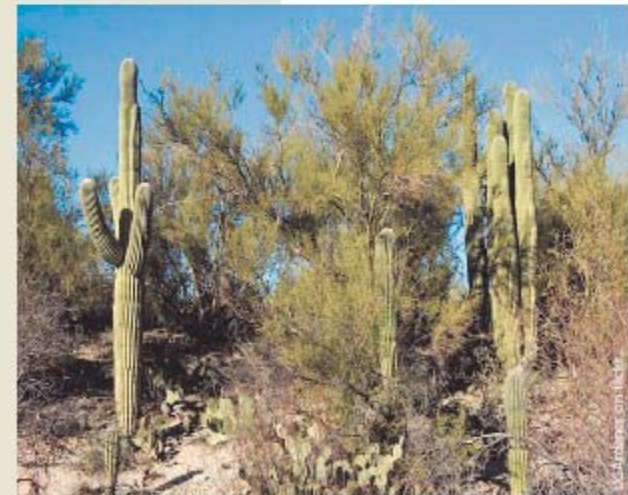
After World War II, thousands of allergy and asthma sufferers flocked to Tucson, Arizona, where they found relief from their symptoms. Relatively few allergenic species were native to the region, so pollen levels were extremely low. As Gregg Mitman, a medical historian, recounts in his book *Breathing Space*, Tucson aggressively marketed itself as a place where those with asthma and allergies could find relief and healthy air. Roughly 30 percent of people who moved to Tucson in the two decades following World War II did so for health reasons.²⁹

Yet, by the 1970s, pollen levels in Tucson had increased by a factor of 10. Why? Many of the people who moved to the city planted non-native trees and grasses that reminded them of their former homes. Some of these were the same tree and grass species that caused their allergy and asthma symptoms in the first place. The worst offenders were mulberry trees, Russian olive trees, and Bermuda grasses. At the same time, the rapid urbanization of the area created an urban heat island effect that further exacerbated pollen production, not to mention led to unhealthy levels of air pollution.³⁰

Tucson was not the only Western city where allergenic pollen levels increased significantly since the mid 20th century. Similar stories can be told for Phoenix, Arizona; Albuquerque, New Mexico; El Paso, Texas; and Las Vegas, Nevada. These cities now prohibit the sale or require labeling of certain species known to produce significant windborne and allergenic pollen.³¹



McCann Wildlife Photos



Corbridge on iStock

Increasing

Until the last decade, the Southeast United States enjoyed a climate of relatively abundant rainfall without major widespread droughts. Yet, these conditions are changing. The regular occurrence of droughts evident in historical patterns. Now, global climate change further uncertainty to water in the Southeast under more dry conditions, less frequent rainfall events, and an increased threat of saltwater intrusion into freshwater systems as



MORE DRY CONDITIONS

The second half of the 21st century was unusually wet in the Southeastern United States. From 19



amounts that could overwhelm water management systems. The number of days with very heavy rainfall, not including hurricanes, the Southeast coast increased by 10 percent over the 20th century. If this trend continues, by the end of the century, those heavy rain events that now occur in the Southeast only once every 20 years will occur every eight years.²¹ While individual precipitation events may be more intense on average, there will be a lower frequency of precipitation events, leaving areas with longer periods of time without rain.

With precipitation being a less reliable source of freshwater in the Southeast, at least some of the surface and groundwater supplies may not be replenished during storm events. However, a general trend toward heavier rainfall events will likely to reduce the regional need for recharging groundwater.

SEA-LEVEL RISE AND SALTWATER INTRUSION

Sea-level rise from the melting of ice around the world and thermal expansion of oceans will significantly impact coastal habitats, and freshwater availability in the Southeast. Global warming is expected to cause 2.6 to 6.6 feet of sea-level rise by 2100 if the melting of polar ice caps continues.

Freshwater, Forests, and Fire

Forested lands covering more than 50 percent of the Southeast United States help clean and naturally regulate freshwater supply. However, as the human population continues to expand in the region, as many as 12 million acres of forested land could be lost to urban development by 2020.²² With smaller and more fragmented forests, these valuable ecosystem services will be diminished just when the region needs them most. As global warming brings more heavy rainfall events separated by longer dry periods, forests will be critical for slowing stormwater runoff and helping to recharge groundwater.

Unfortunately, the increased temperatures, droughts, floods, and storms expected because of global warming could also take a toll on forests.²³ When stressed by water scarcity, trees and other plants are more susceptible to diseases and infestations. For example, pines are most vulnerable to attack by southern pine beetles, the most destructive insect pest of pines in the Southeast, when stressed by drought, flooding or storm damage.²⁴

Drought conditions also make southeastern forests more susceptible to wildfires. Most southeastern

terrestrial ecosystems evolved in and are highly adapted to frequent small fires. But, severe drought could cause catastrophic fires that are much larger and more intense. Such catastrophic fires put communities at risk, can decimate even fire-adapted species such as longleaf pines, and can deplete soil nutrients if topsoil layers are actually burned. In 2007, drought-fueled fires burnt about 600,000 acres in Georgia and Florida, the largest fires in the history of either state.²⁵



LESSONS FROM THE WEST

The Southeast has the opportunity to transform water use by putting in place management strategies that accommodate the projected regional growth and increasing climate variability. In developing such a system, the experiences in Western states, where water rights and shortages have been a major issue for decades, can help the Southeast avoid pitfalls. Some key lessons from the West include:

Accommodate all water uses. The Colorado River is the lifeblood of the West, now providing water to seven U.S. states and Mexico, 25 million people, and 3.5 million acres of farmland. Yet a few important things were missed when access to its water was first divided up: Mexico originally was not granted rights to water; insufficient water was allocated to reach the Sea of Cortez, where the Colorado River Delta once supported a significant fishery; and water quality was not considered.

Plan for drought. The water allocations for the Colorado River were based on best-case flow scenarios, yet drought is common in the West. After a series of droughts, Boulder, Colorado adopted a drought management plan that uses risk assessment. Just as flood management uses recurrence intervals, Boulder, and cities using similar approaches, plan for droughts of different severity – the 20, 100 or 1000 year drought – with increasingly stringent responses.

Integrate surface and groundwater planning. The law in many Western states treats groundwater and surface water as independent, even though the two systems are physically connected. During drought, when groundwater is most valuable, it may not be there when you need it.

Plan for change. Western states long ago allowed the region's water to be claimed, mostly for irrigated agriculture, and created legal systems that made changing water uses very difficult. Now that growing cities are demanding more water and that we recognize the water requirements for fish and wildlife, the legal system makes accommodating changes difficult.





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Izvještaji-priopćenja javnosti

- Oblikovani za medije
- Kratke, sažete informacije
- Naglasak na glavnu poruku
- Vizualna forma
- Nestandardna znanstvena forma



HMD-informacije o klimatskim promjenama

- Podrška znanstvenim istraživanjima:
 - objava znanstvenih publikacija, informiranje članova i javnosti putem interneta i medija, objavljivanje reagiranja i pisama javnosti vezano uz klimatske promjene, edukacija
- HMD-platforna za razmjenu informacija u svrhu poboljšanja komunikacije između znanstvenika i javnosti
- Pripoćenje za javnost o točnom informiranju javnosti, navođenje izvora iznesenih podataka.
- Organiziranje skupa: 'Meteorološki izazovi današnjice' – glavni cilj poboljšanje komunikacije



HMD-informacije o klimatskim promjenama-nastavak

- ❑ - Priopćenje za javnost povodom Festivala znanosti u Splitu
- ❑ - WMO povjerenstvo za klimatologiju, CC1 XV
- ❑ - IPCC Novosti
- ❑ - IPCC Working group
- ❑ - Emisija "Otvoreno" - komentar
- ❑ - Peto nacionalno izvješće o klimatskim promjenama
- ❑ - Potpuna izvješća svih zemalja o klimatskim promjenama
- ❑ - Globalna promjena klime i ocjena klime u 2009. god



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Komunikacija znanstvenih rezultata

- Javnost je zainteresirana za znanstvene rezultate



- Važno prilagoditi informaciju javnosti kako bi postigli potpuni učinak
- Dva jezika: znanstveni i za javnost
- A kritičari.....



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