ISTRAŽIVANJA KLIME U GEOFIZIČKOM ZAVODU

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«**Klima za Vas**», Svjetski meteorološki dan i Svjetski dan voda, Zagreb, 23. ožujka 2011.

- KLIMATSKO MODELIRANJE (ATMOSFERA)
- OPAŽANJA U JADRANU
- MIKROKLIMATOLOGIJA BURE
- KLIMATSKI ELEMENTI I ONEČIŠĆENJE ZRAKA

KLIMATSKO MODELIRANJE

GFZ & DHM & ICTP

(I. Herceg Bulić & Č. Branković & F. Kucharski, *Clim. Din.*, 2011)

atmosferski model opće cirkulacije (ICTP AGCM)

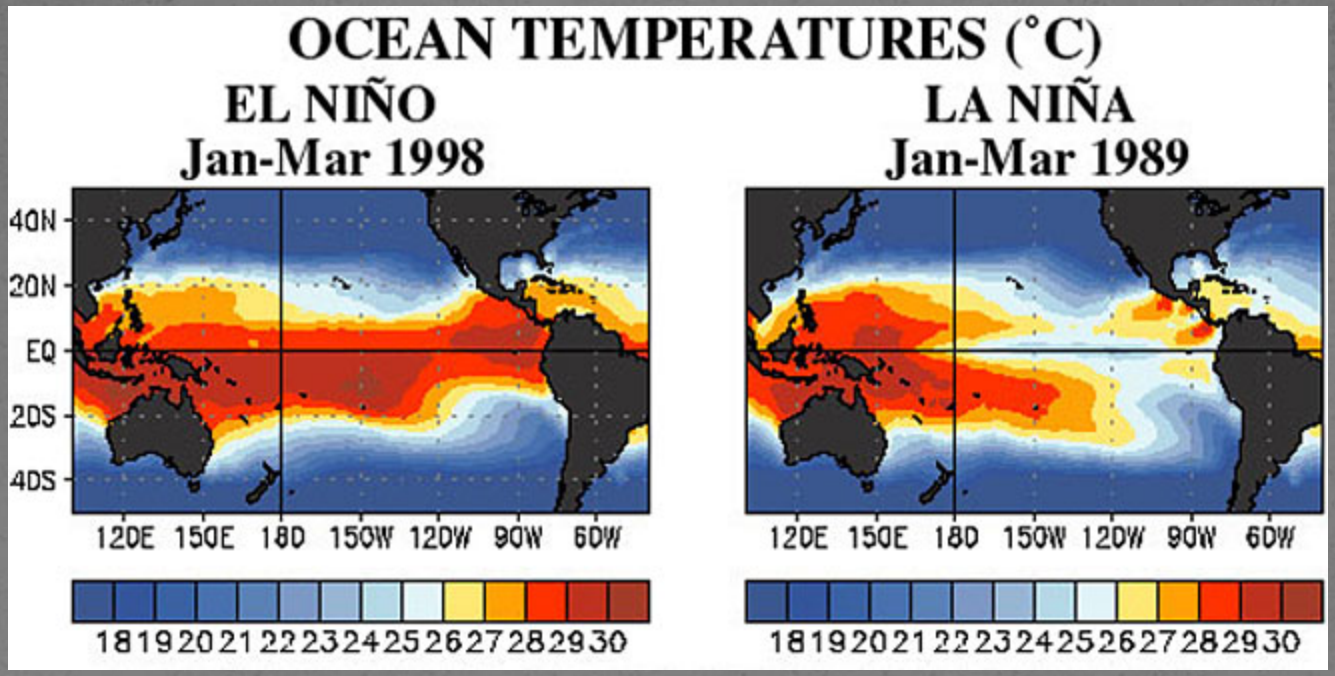
&

topla klima: 2 x [CO_2]

odziv atmosfere na prinudno djelovanje ENSO pojave tijekom zime od 1854. do 2002.

«**Klima za Vas**», Svjetski meteorološki dan i Svjetski dan voda, Zagreb, 23. ožujka 2011.

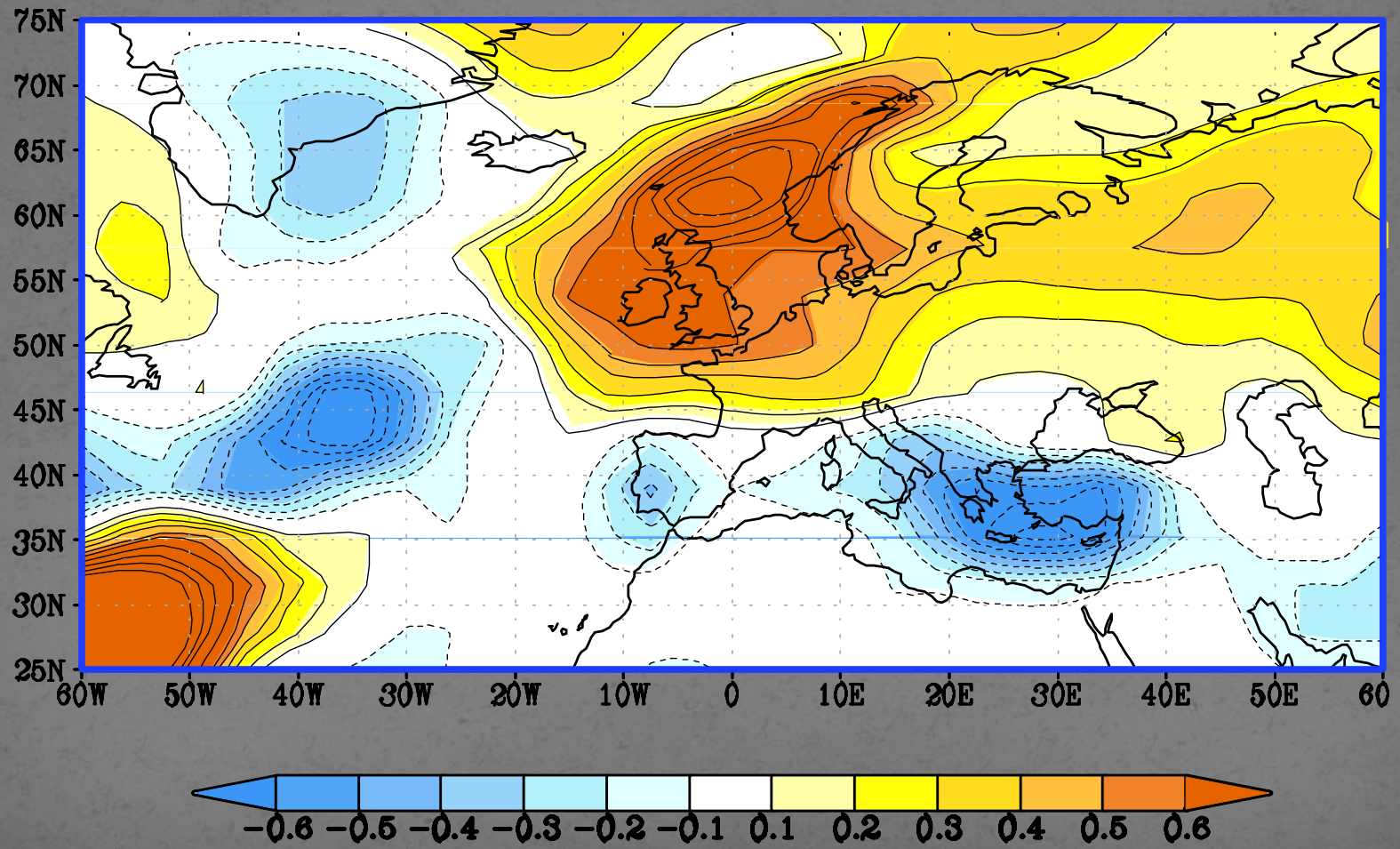
KLIMATSKO MODELIRANJE



«**Klima za Vas**», Svjetski meteorološki dan i Svjetski dan voda, Zagreb, 23. ožujka 2011.

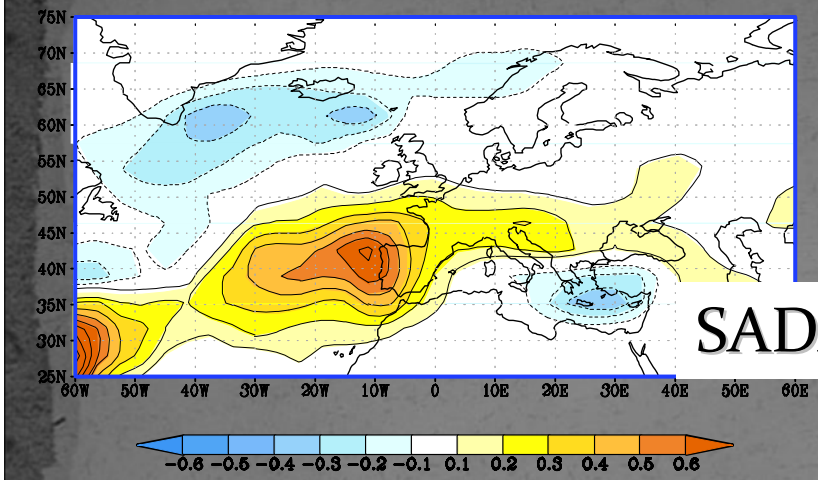
Razlika ukupne zimske oborine (148 god)
toplija klima – sadašnja klima

1

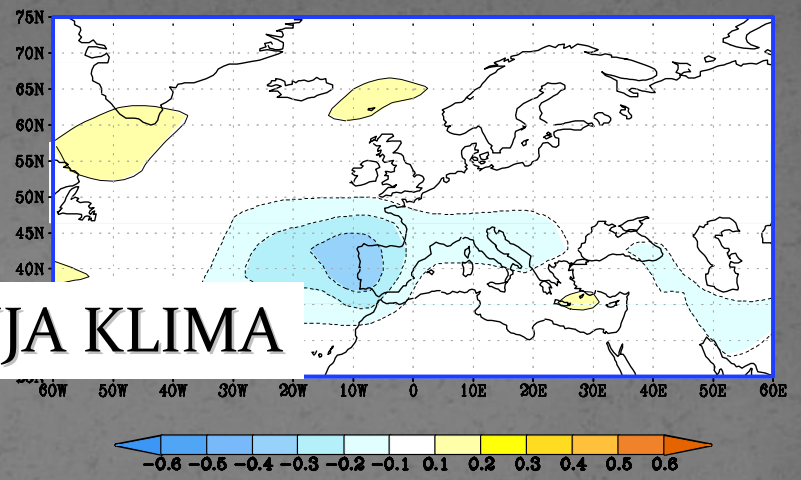


Anomalije zimske oborine (148 god)

2



SADAŠNJA KLIMA

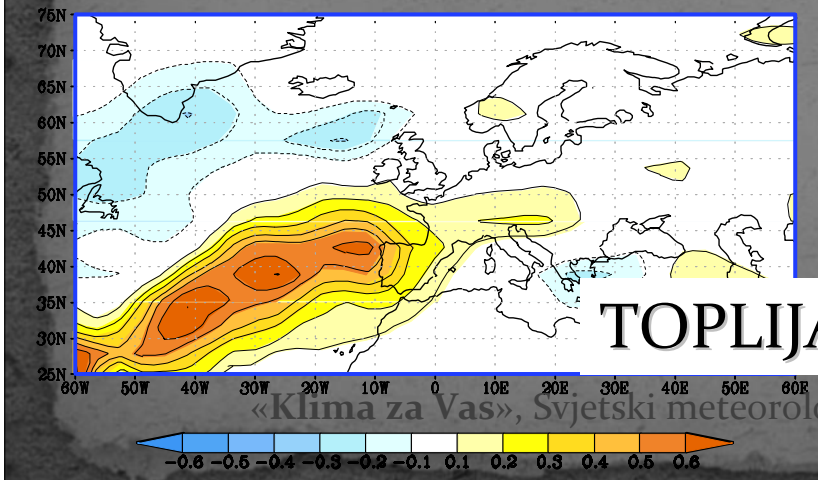


EL NIÑO

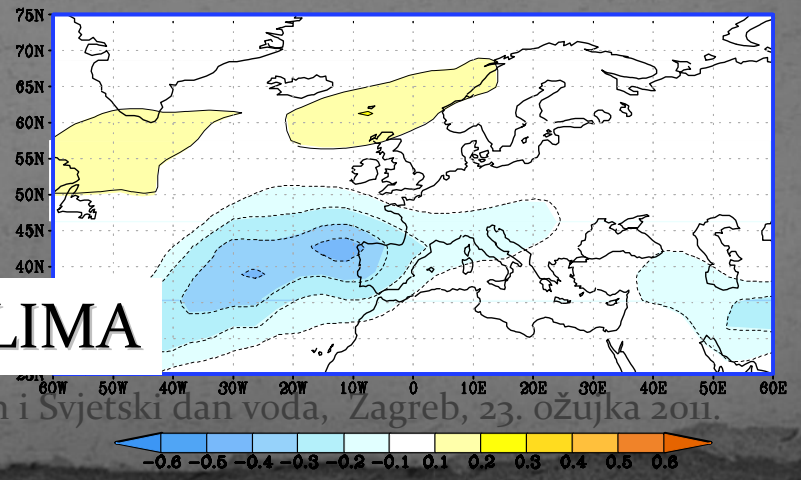
LA NIÑA

(c) Total precip; JFM; 2xCO2 warm composite
cont=0.1 mm/day

(d) Total precip; JFM; 2xCO2 cold composite
cont=0.1 mm/day



TOPLIJA KLIMA



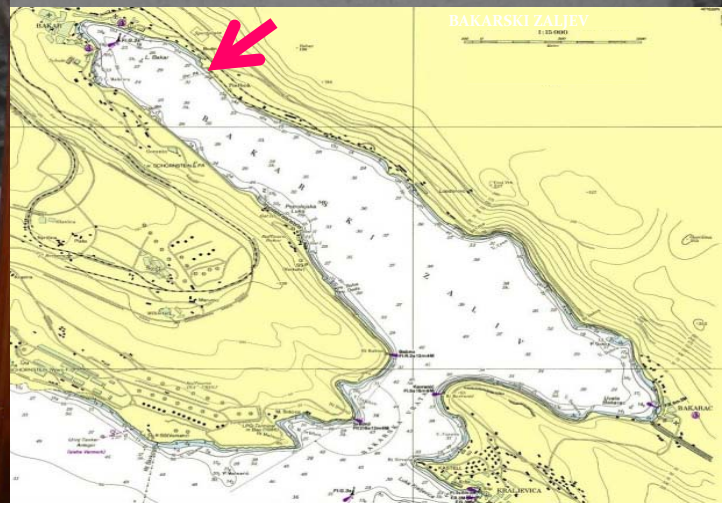
OPAŽANJA U JADRANU

MAREOGRAF - BAKAR

→ seši
→ plimne oscilacije
→ olujni uspori
→ **klimatska promjenjivost**
→ ....

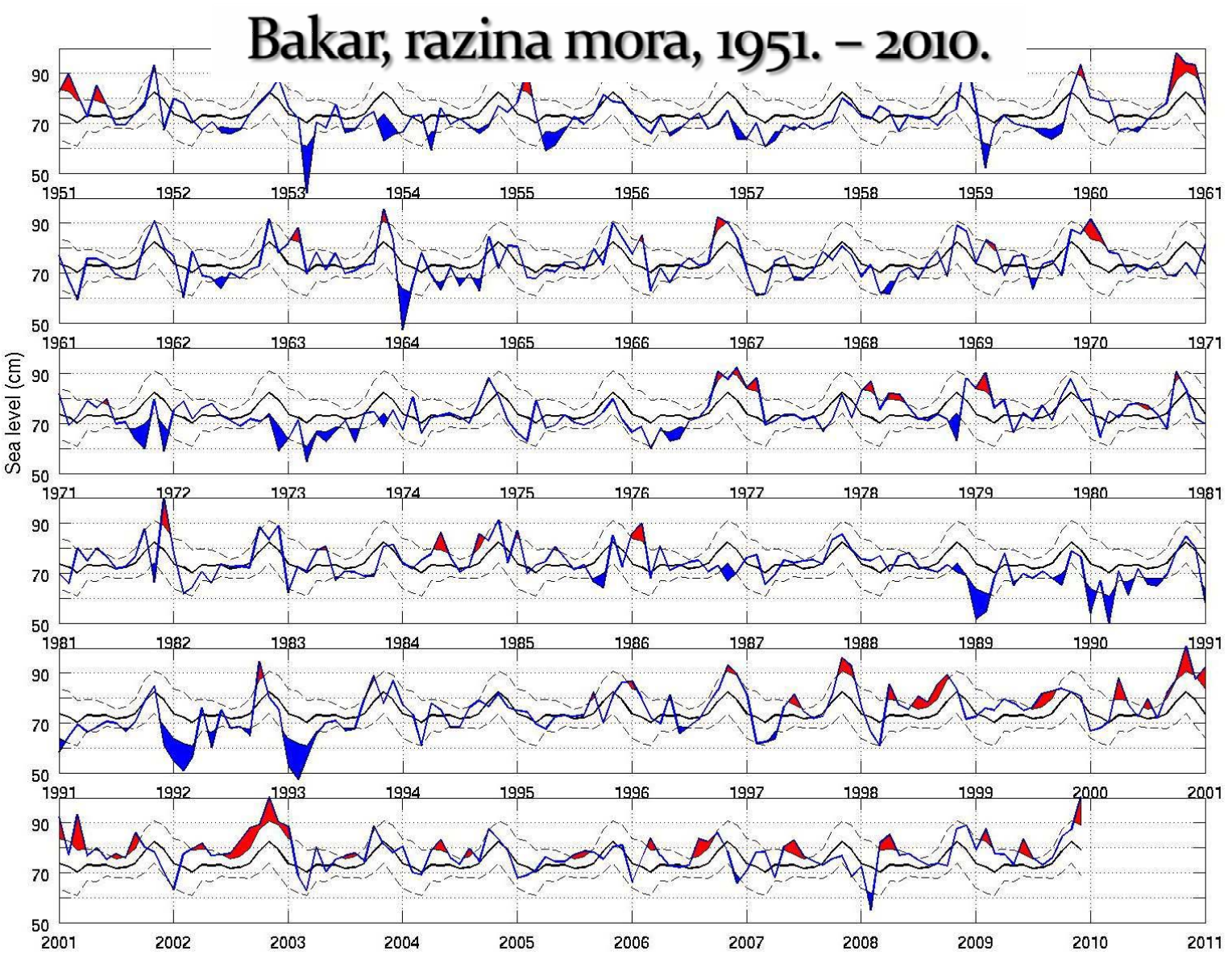
- neprekdno od 09/1949
- 1. u Hrvatskoj;
  2. na Jadranu

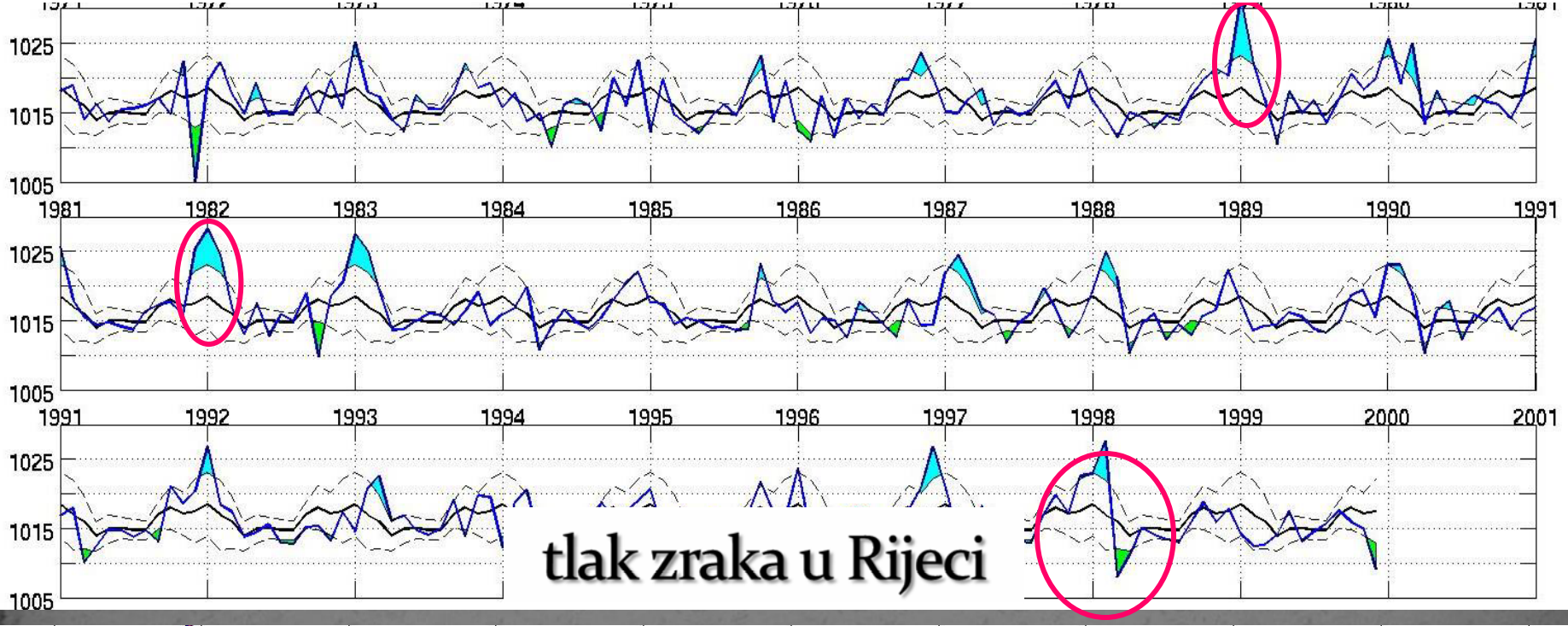
(M. Orlić & M. Pasarić)



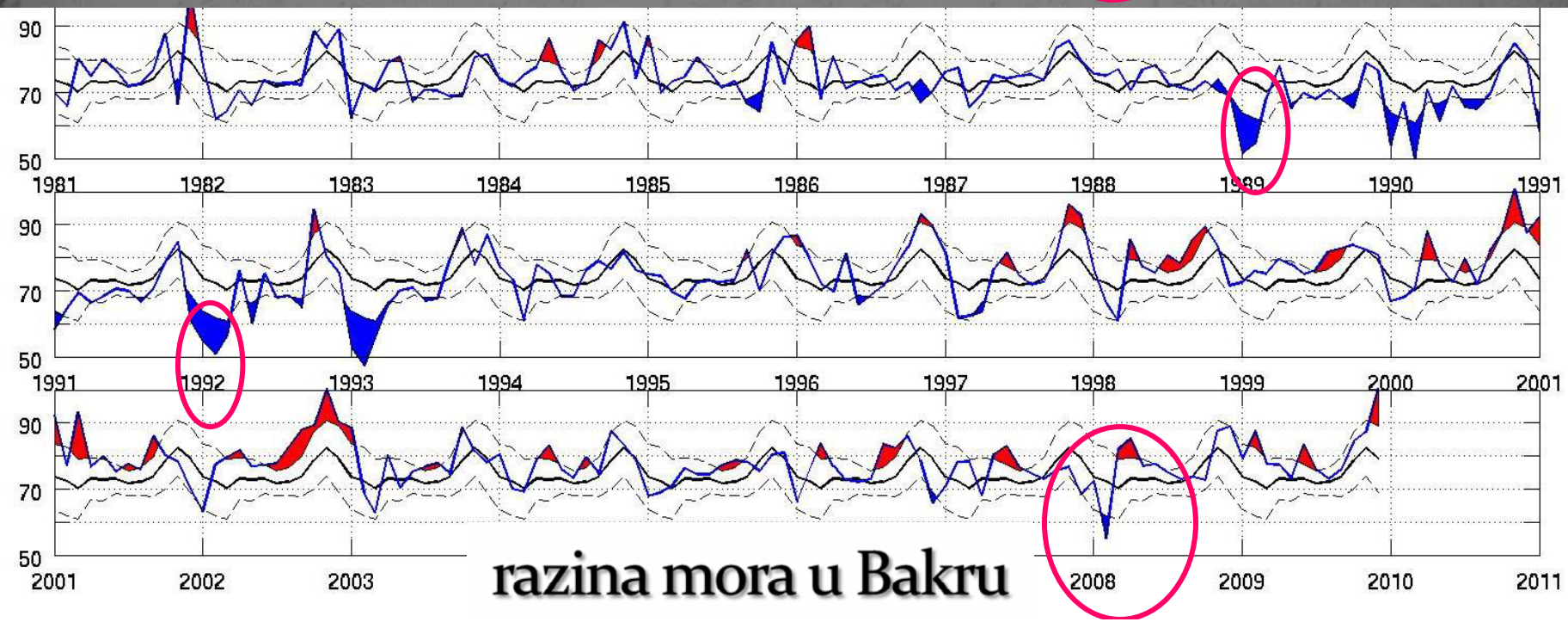
Međugodišnja varijabilnost

1

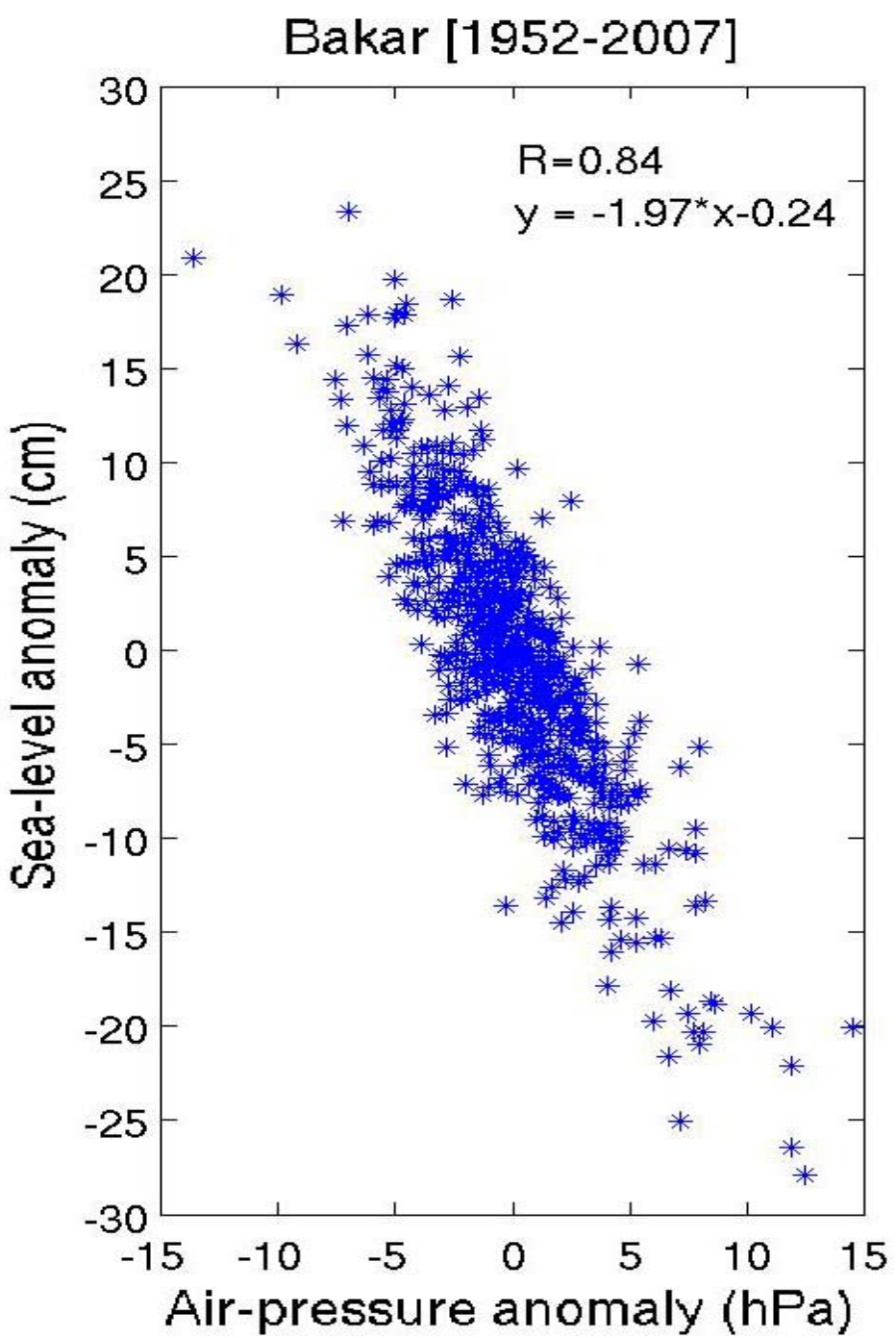




tlak zraka u Rijeci

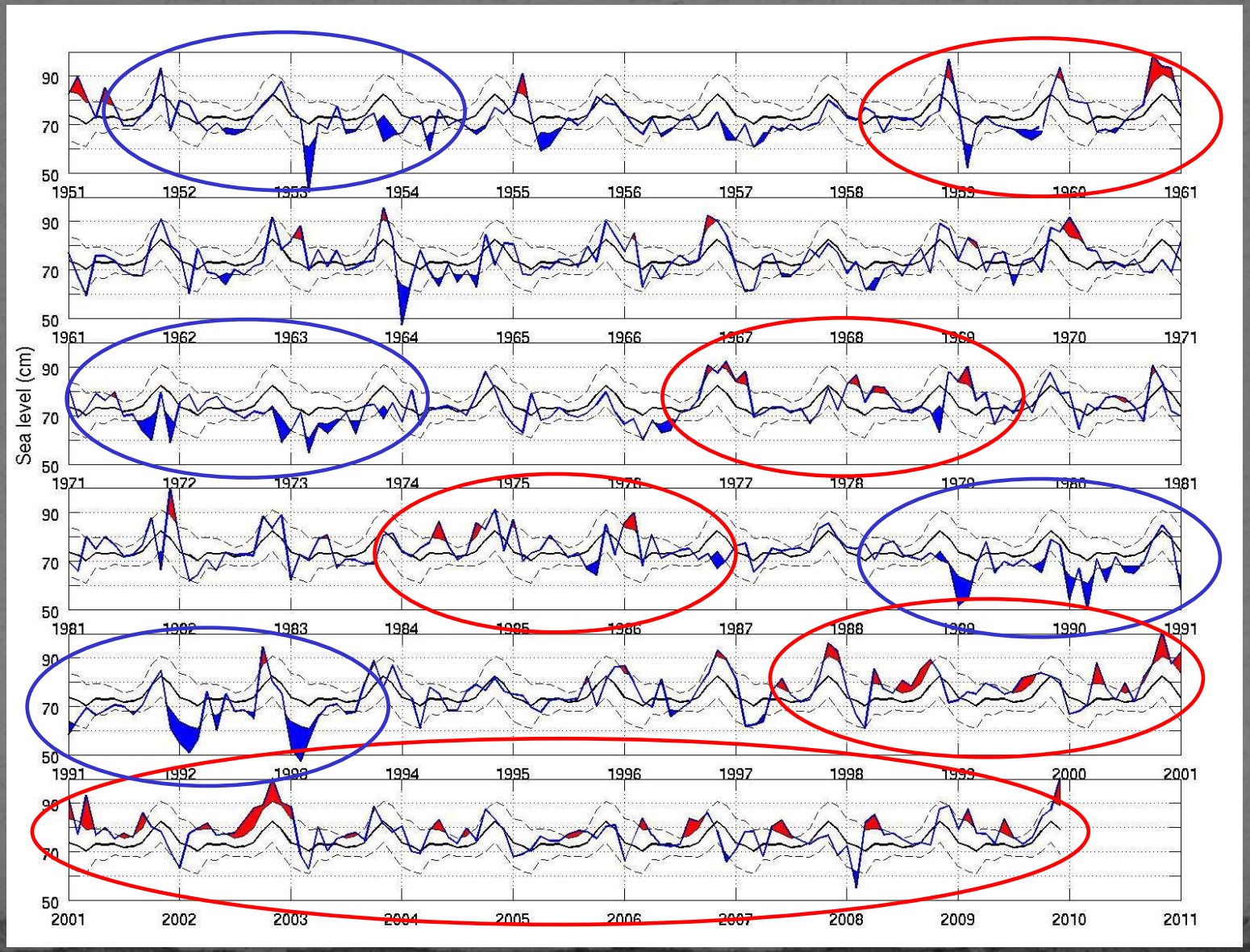


razina mora u Bakru



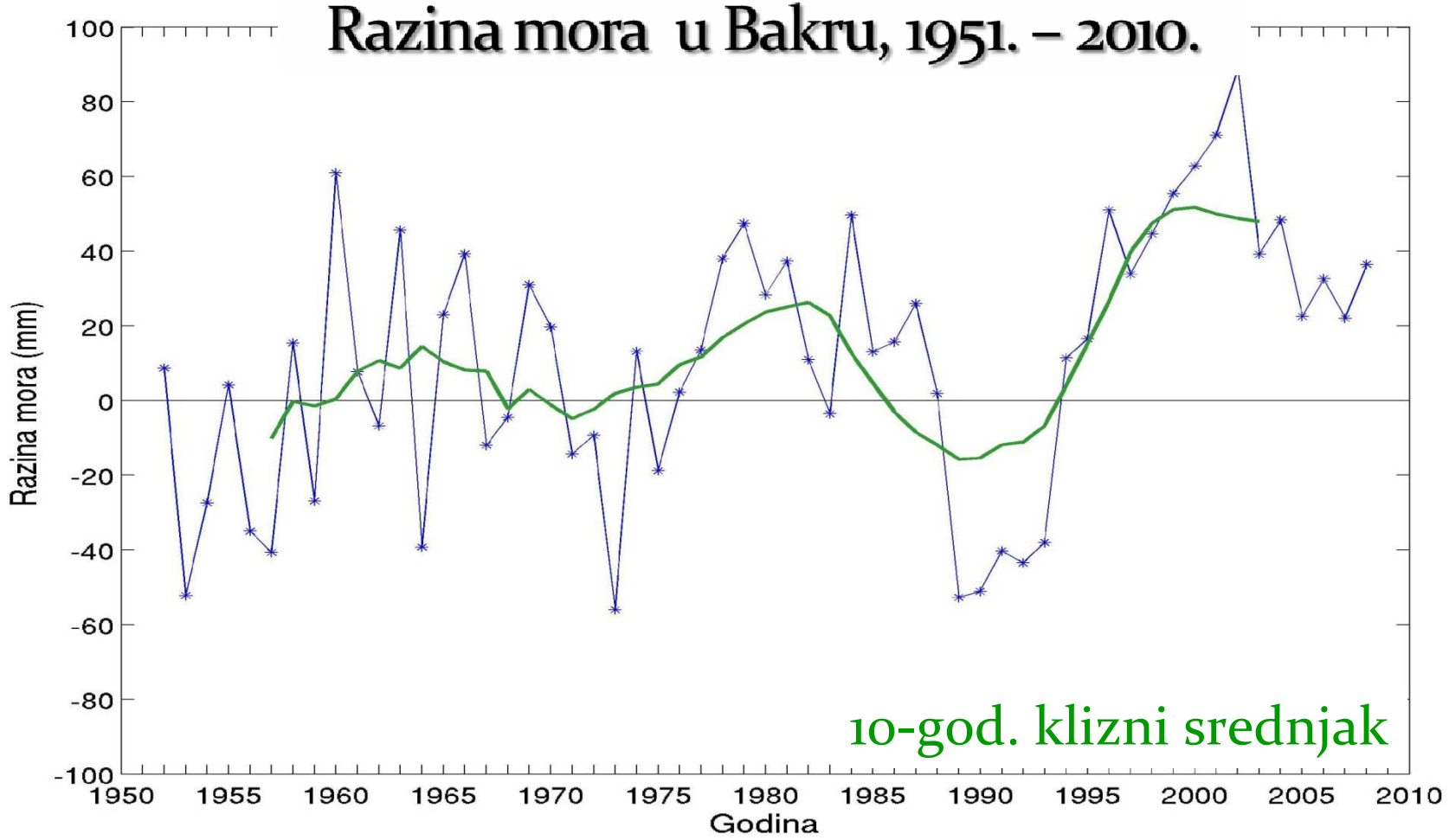
Anomalija tlaka i razine mora

Razina mora u Bakru, 1951. – 2010.



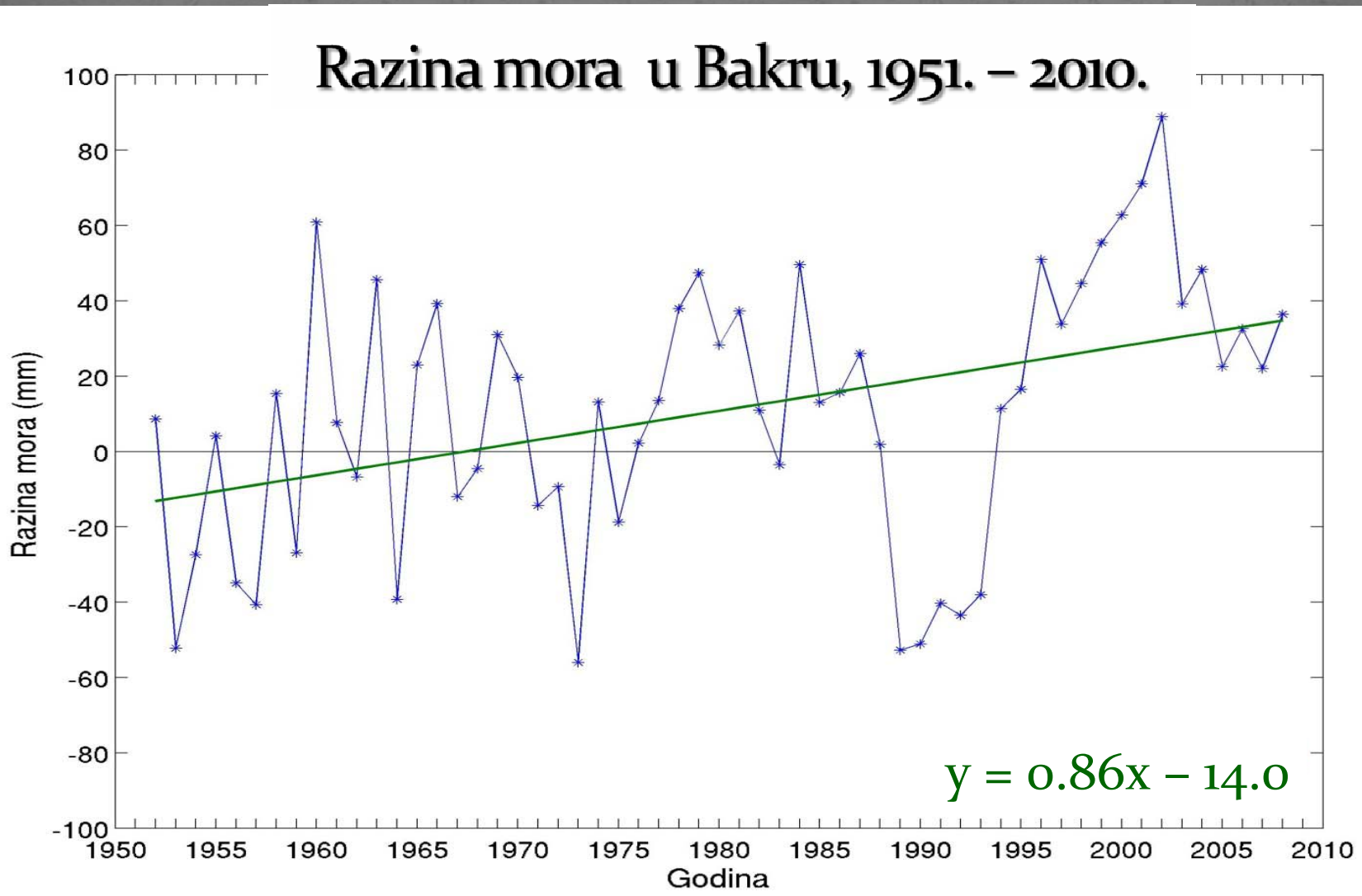
Dekadna varijabilnost

2

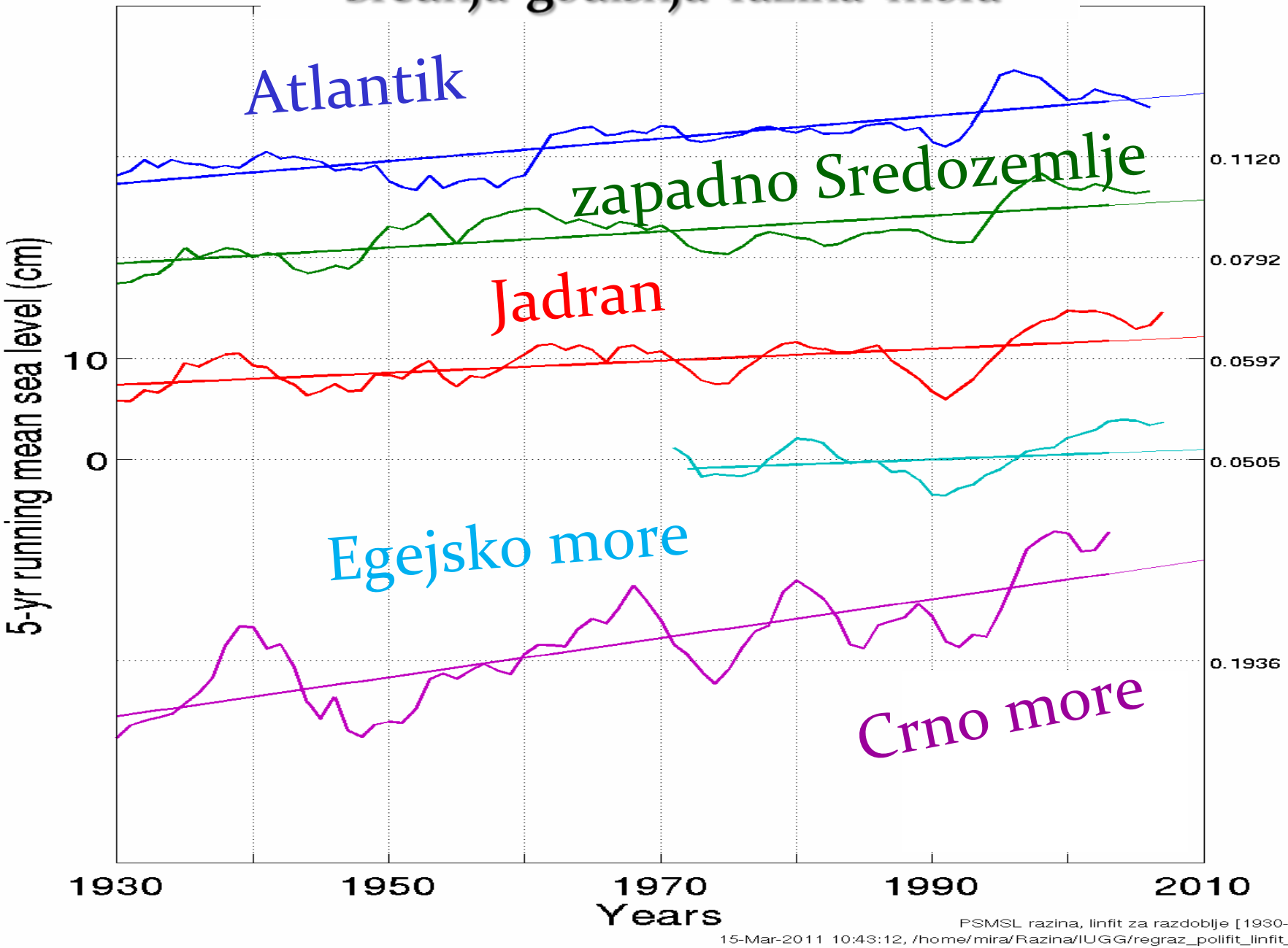


Trend

3


Razina mora u Bakru, 1951. – 2010.
Razina mora (mm)
Godina
100
80
60
40
20
0
-20
-40
-60
-80
-100
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
y = 0.86x – 14.0

Srednja godišnja razina mora



MIKROKLIMATOLOGIJA BURE

GFZ & DHMZ

(Ž. Večenaj & D. Belušić & K. Horvath & B. Grisogono)

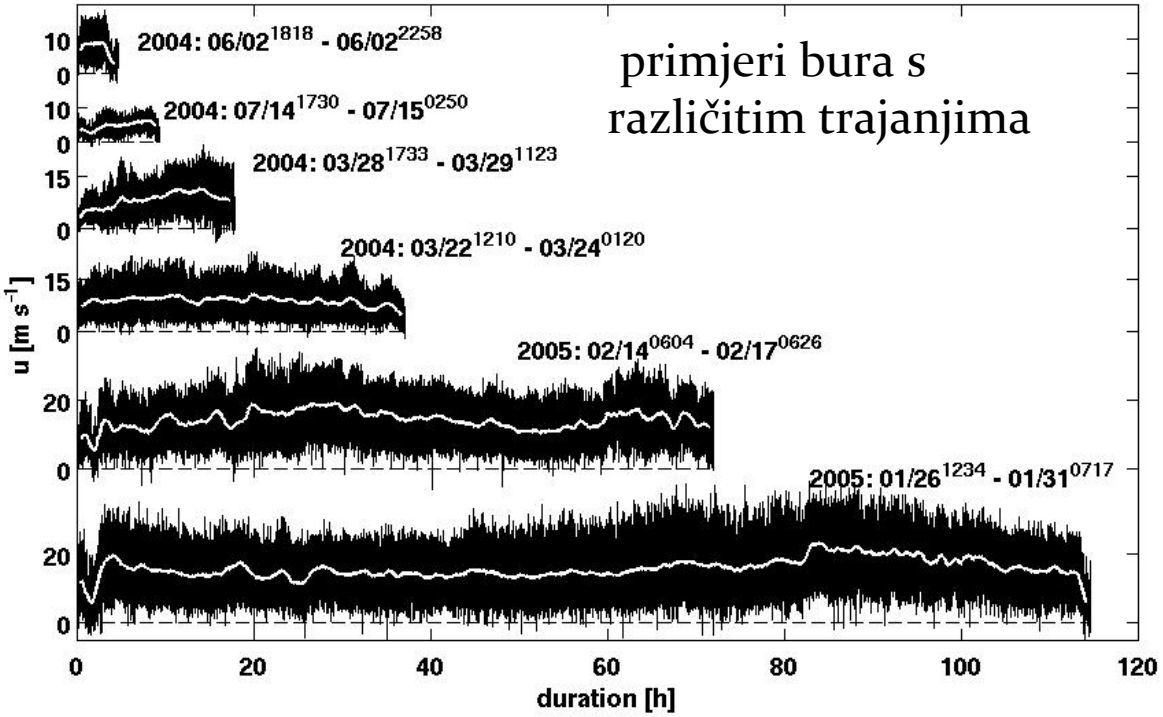
- višegodišnja mjerenja 3D vjetra ultrasoničnim anemometrima (~ 5 Hz)
- epizode bure u trajanju ≥ 3 h

? •
- skala turbulencije bure
- turbulentne veličine (TKE, ε…)
- ovisnost turbulentnih karakteristika bure o srednjoj brzini vjetra

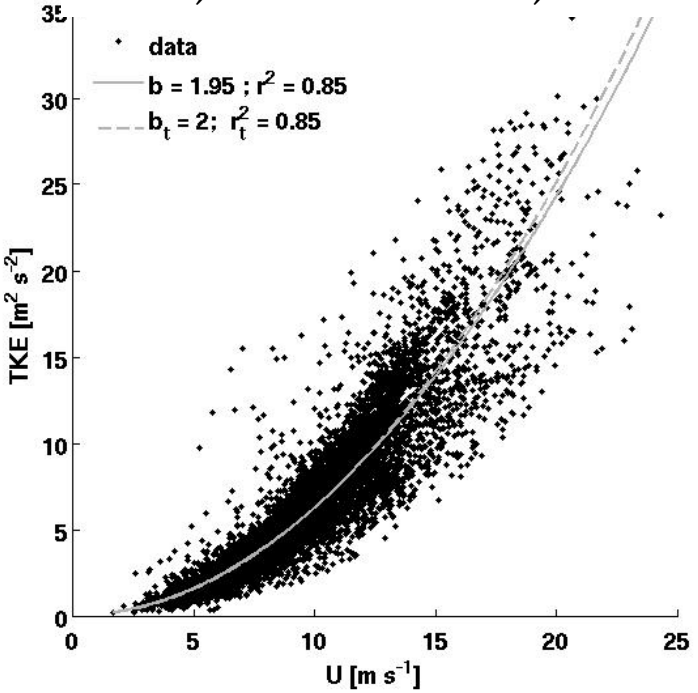
Senj: 03/2004. – 06/2006.

- 341 epizoda bure
- ukupnio trajanje ≈ 6200 h

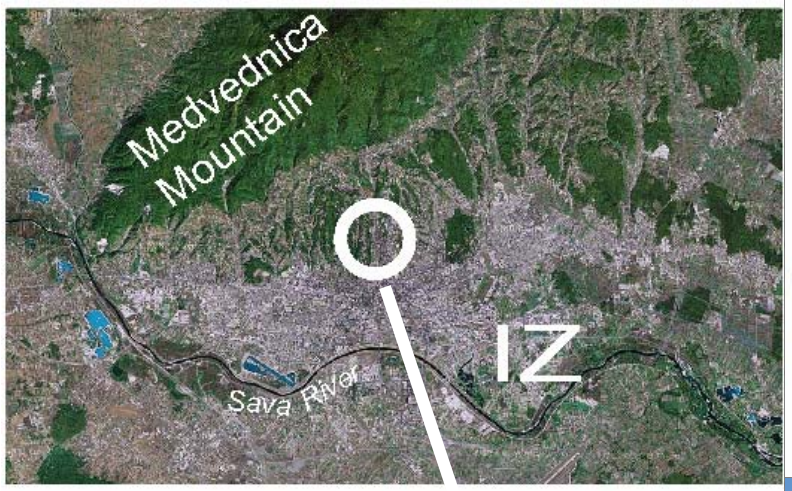
primjeri bura s različitim trajanjima

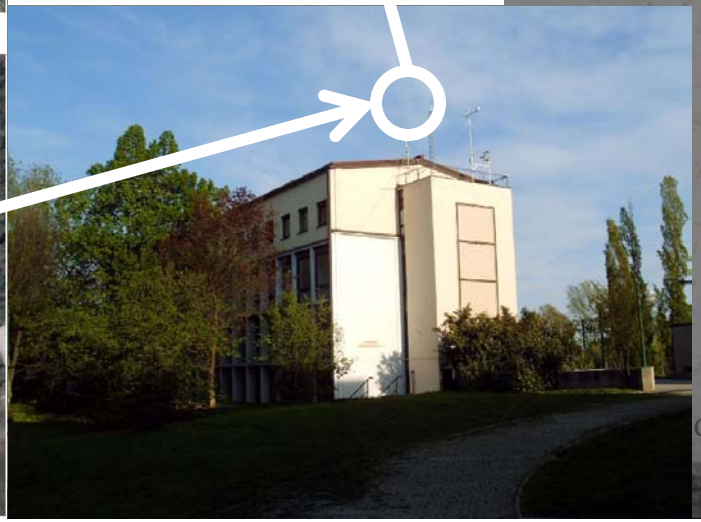


Satne vrijednosti TKE bure vs. srednja satna brzina vjetra



KLIMATSKI ELEMENTI I ONEČIŠĆENJE ZRAKA



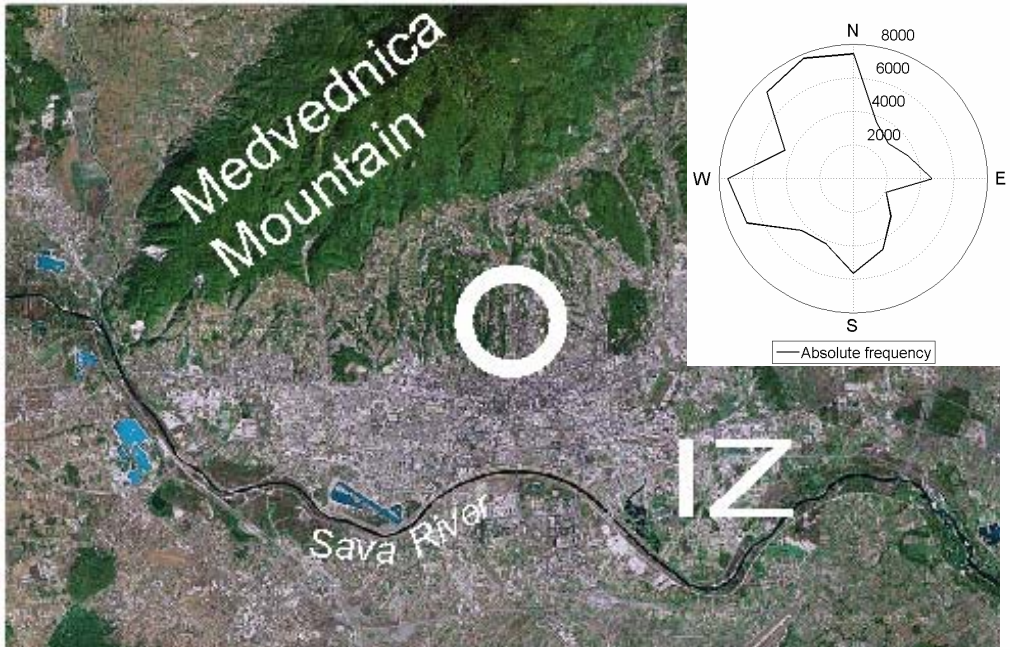


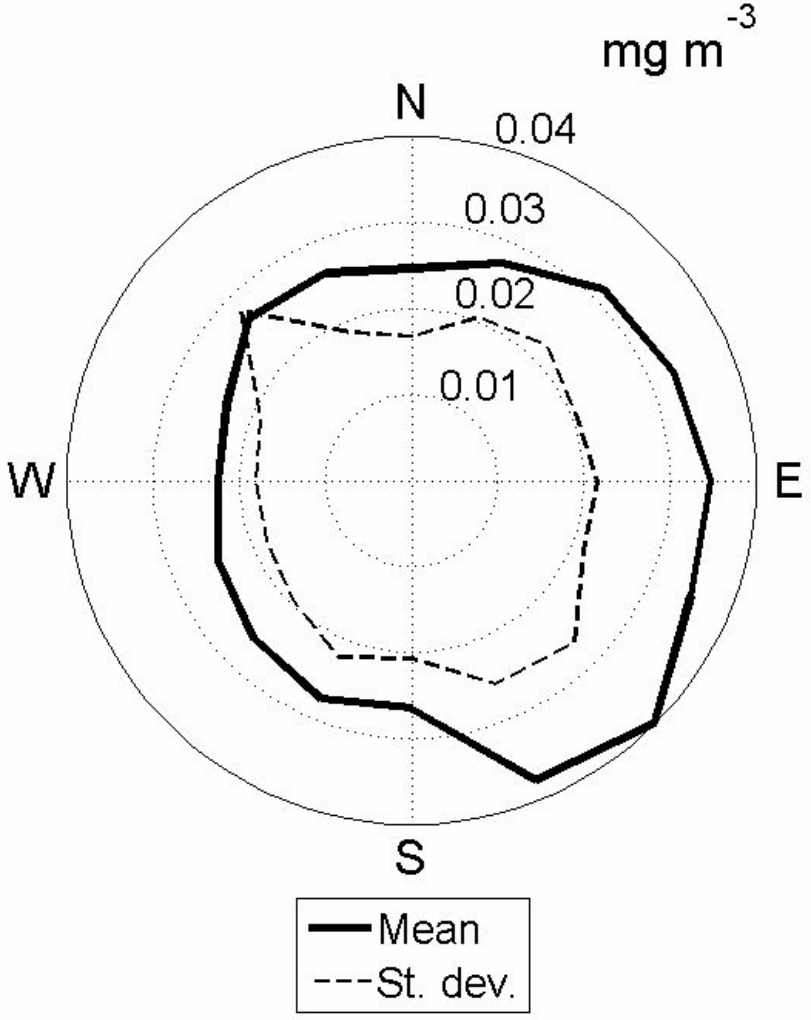
- lebdeće čestice PM1.0 (1 µm)
- meteorološki elementi (AMES)
- 1-min. sirednjaci

(Z. Pasarić & Z. B. K.)

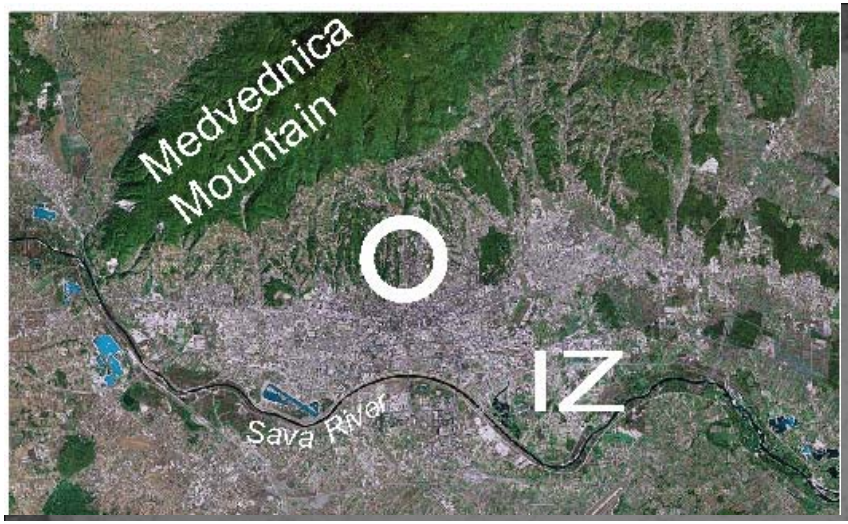
ožujka 2011.

17.03.2010.-12.05.2010. 18 → ukupno 80054 zapisa

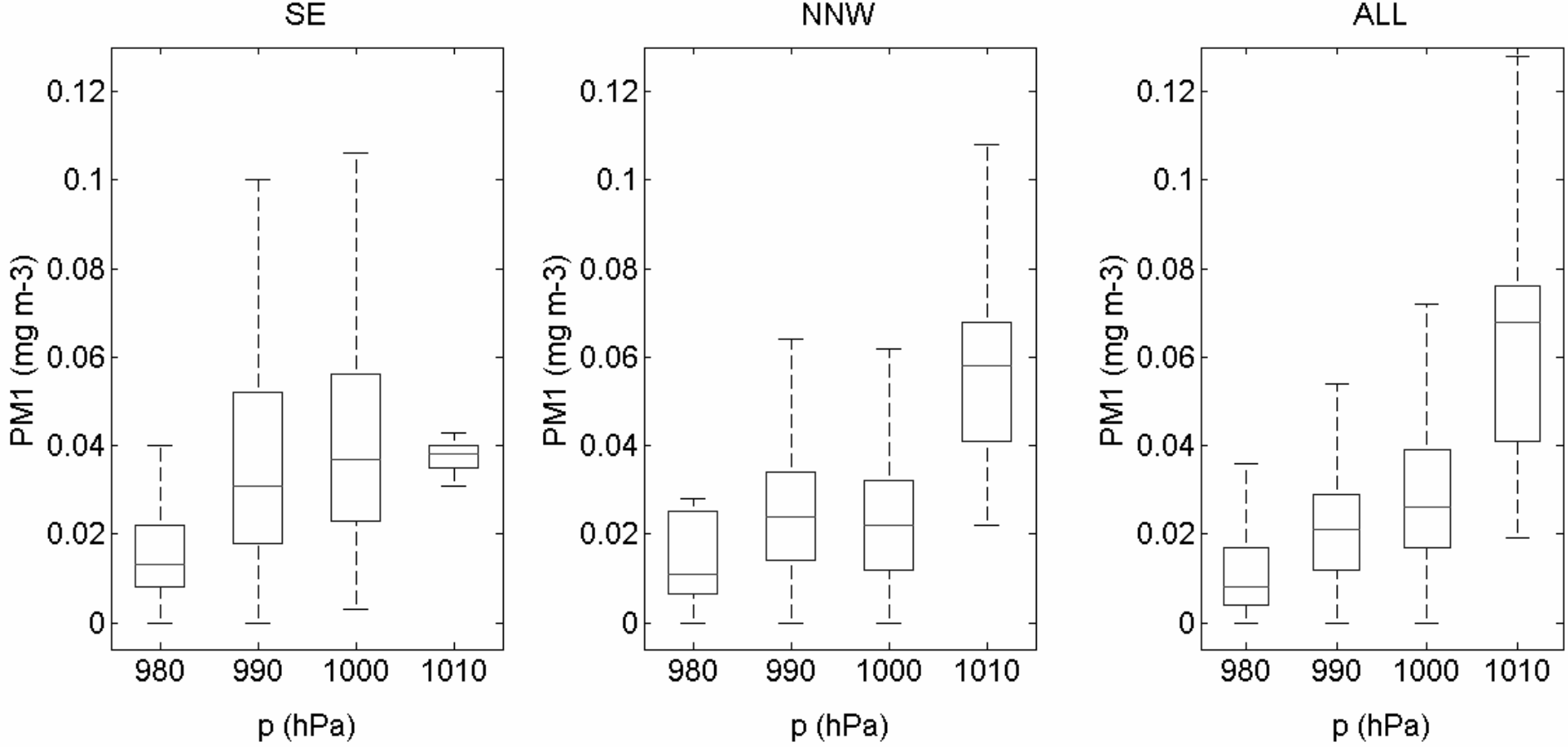




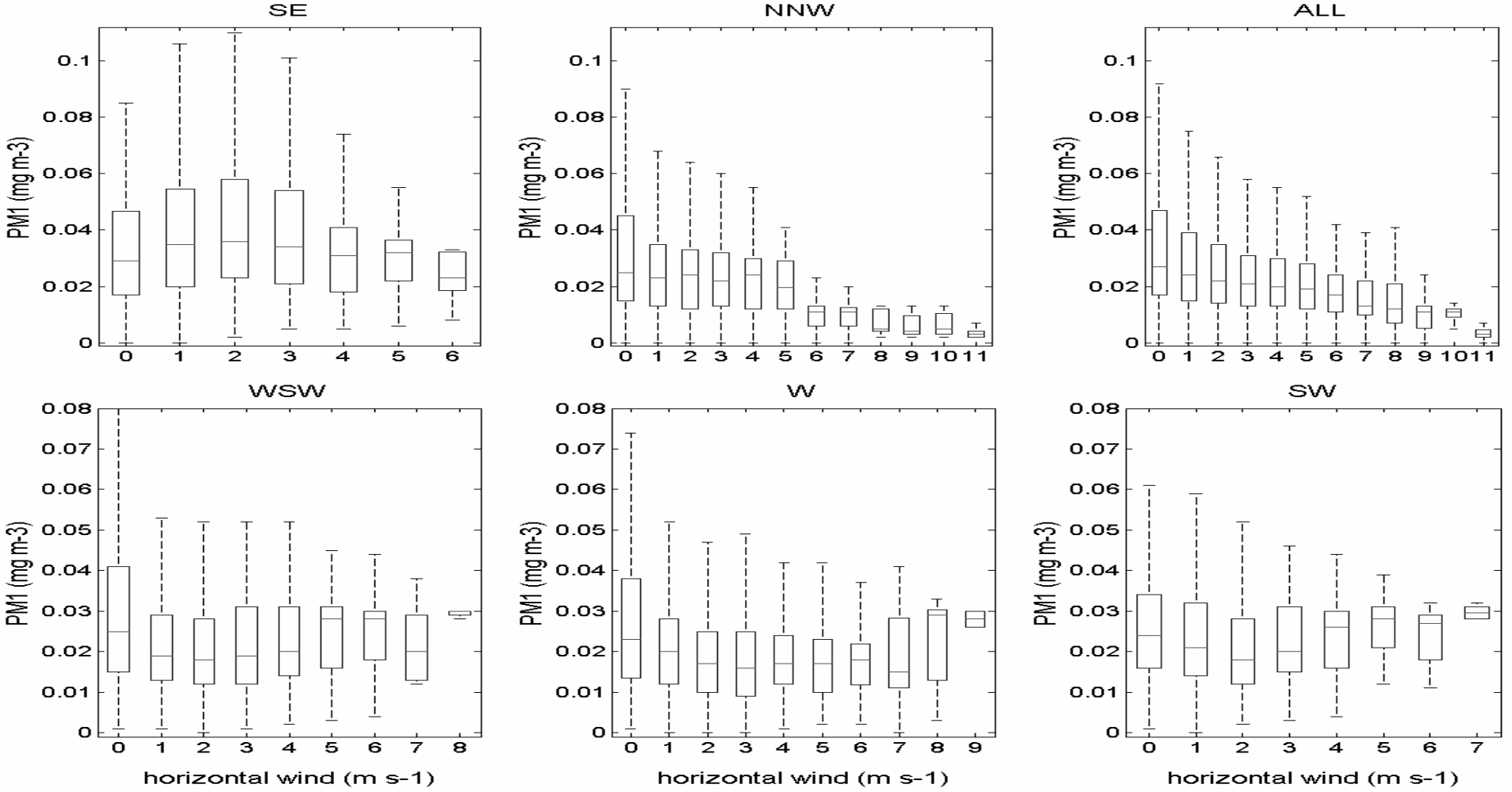
Srednja minutna koncentracija PM1.0 u ovisnosti o smjeru vjetra


Medvednica
Mountain
O
IZ
Sava River


tlak zraka


SE
NNW
ALL
PM1 (mg m-3)
0.12
0.1
0.08
0.06
0.04
0.02
0
980
990
1000
1010
p (hPa)

horizontalna brzina vjetra



HVALA NA PAŽNJI!