



# CROP WATER BALANCE VARIABILITY

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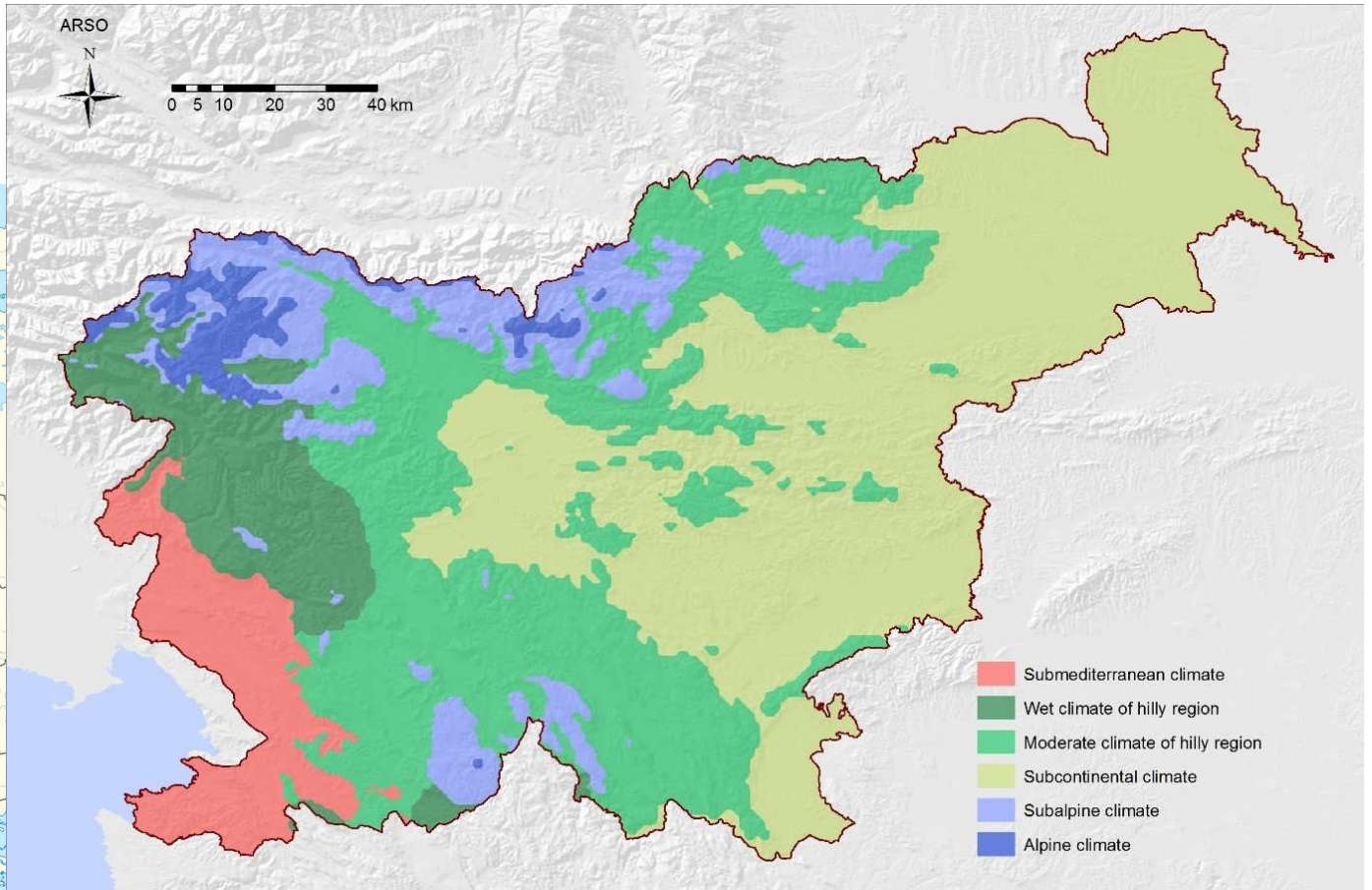
Ajda Valher, Lučka Kajfež-Bogataj

e-mail: [ajda.valher@gmail.com](mailto:ajda.valher@gmail.com)

16<sup>th</sup> EMS & 11<sup>th</sup> European Conference on Applied  
Climatology (ECAC)

Trieste, 12<sup>th</sup> September 2016

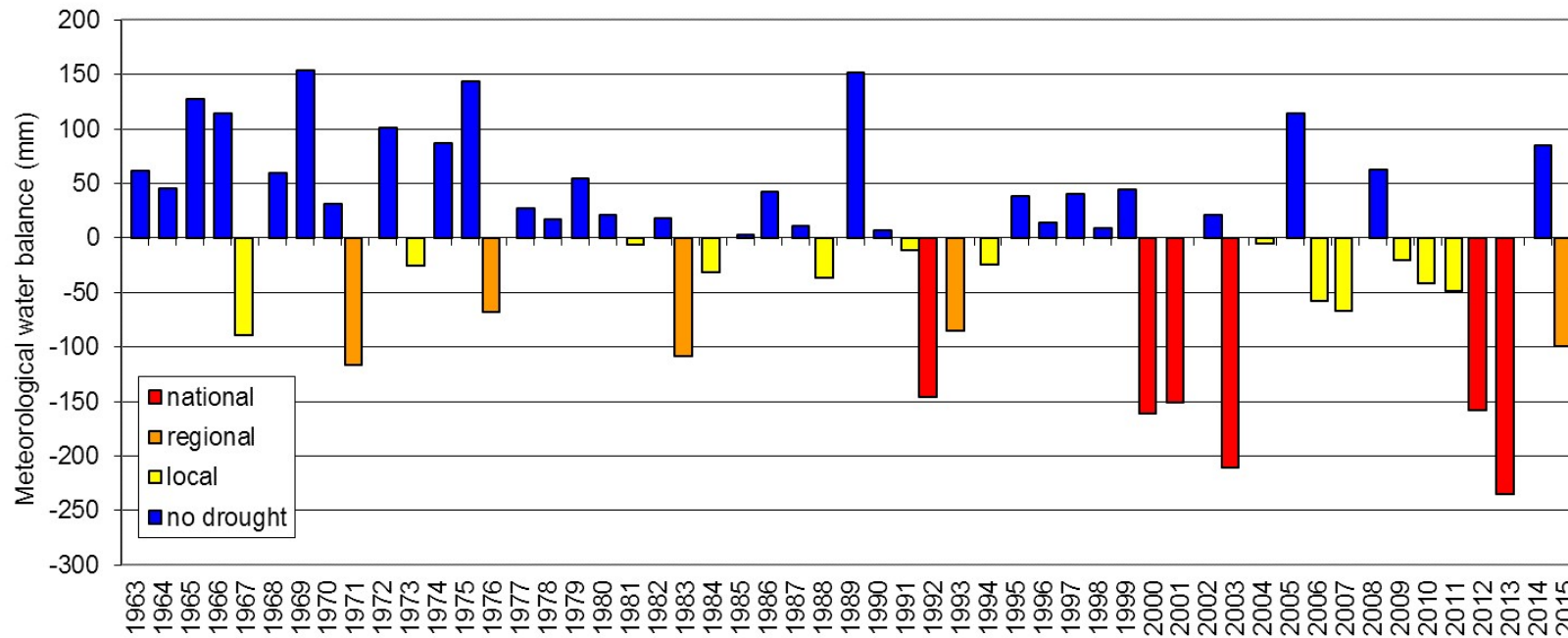
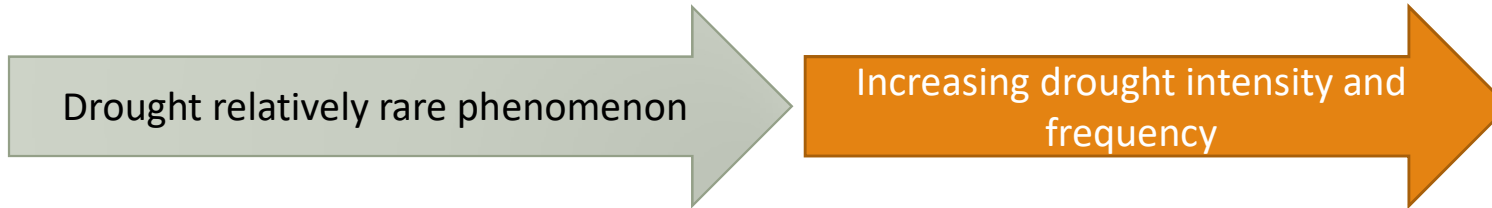
A solid orange horizontal bar at the bottom of the slide.



(Kozjek, 2015)

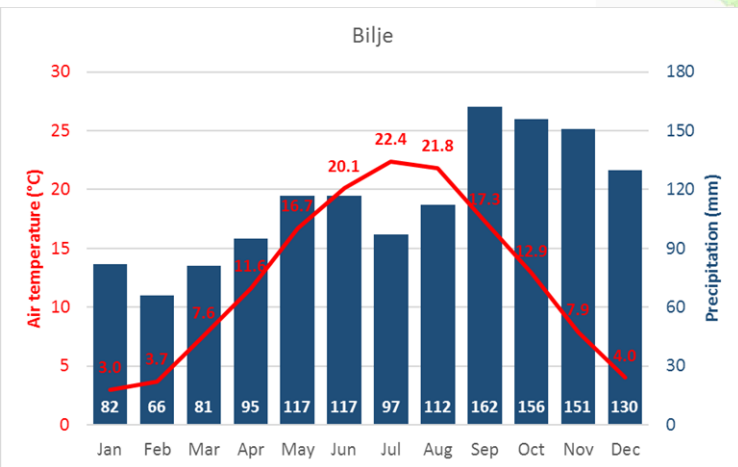
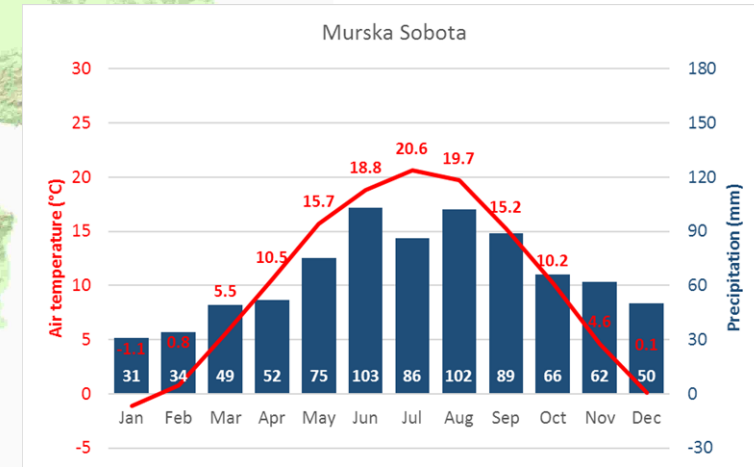
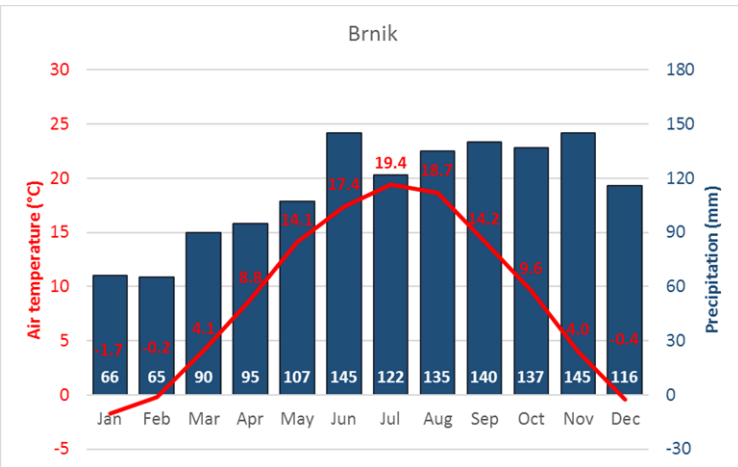
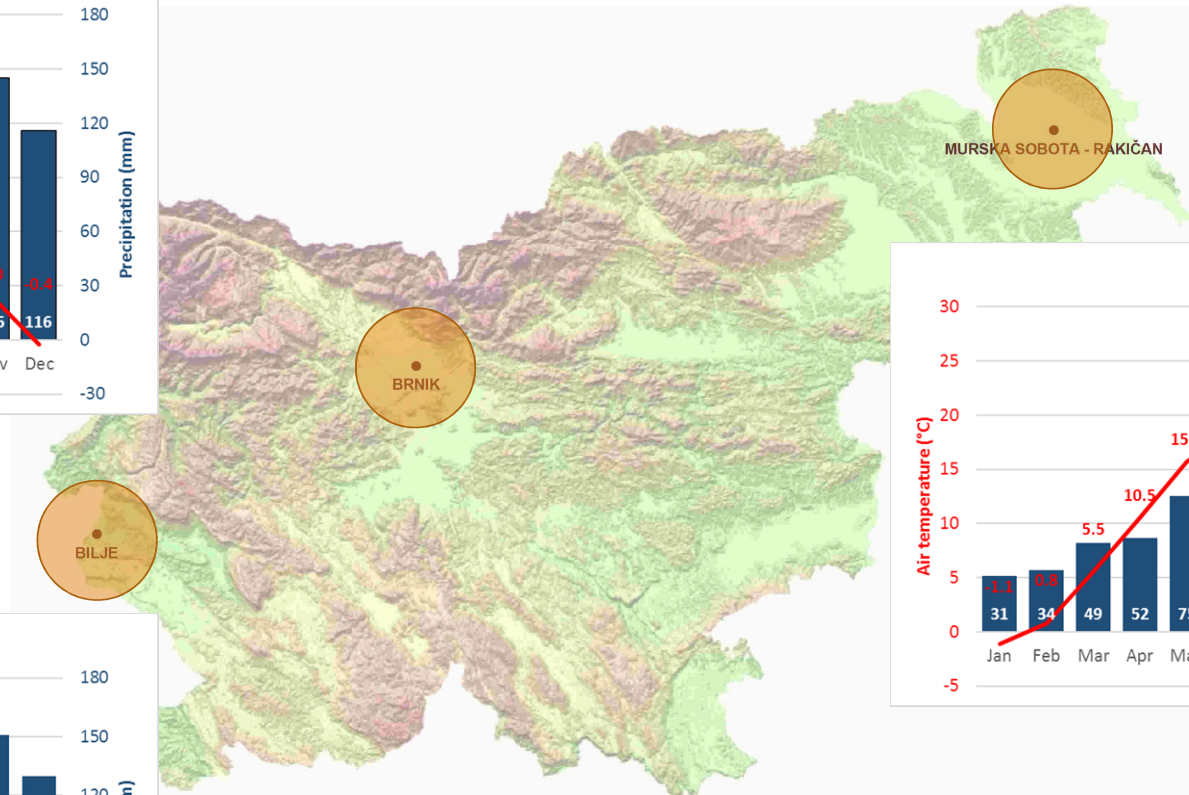
<http://www.lahistoriaconmapas.com>

## SUMMER METEOROLOGICAL WATER BALANCE (June, July, August)



(ARSO 2016, adapted by Sušnik 2016)

(ARSO 2016)

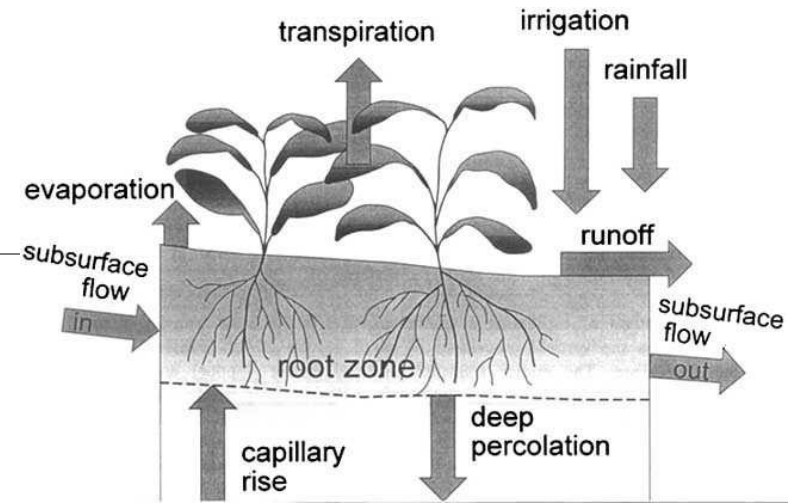


Long term-averages 1981–2010 in VEGETATION SEASON

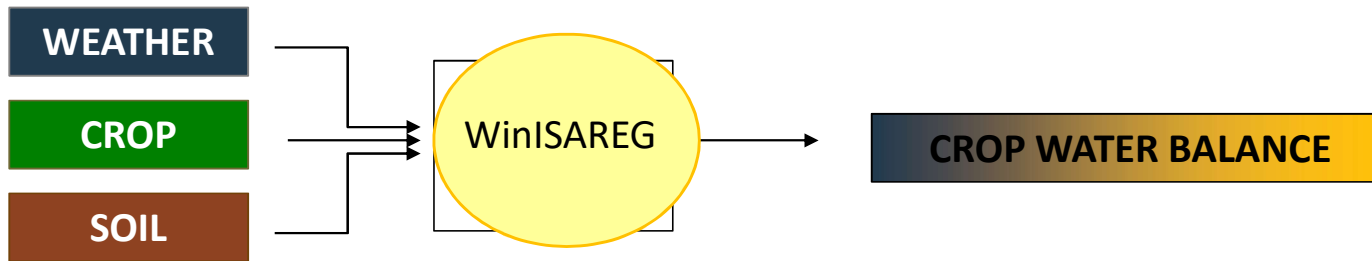
	Murska Sobota	Bilje	Brnik
Precipitation (mm)	507	700	744
Evapotranspiration (mm)	622	694	574



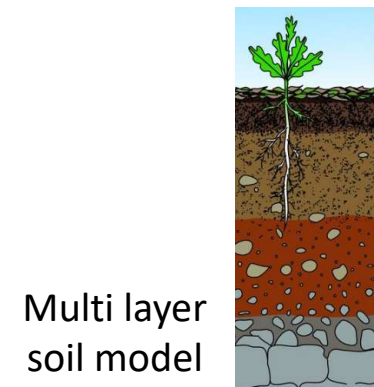
# Water balance model



(Allen et al., 1998)



*Agrometeorological models are not accurate description of environmental state but nevertheless model describes well environmental characteristics.*

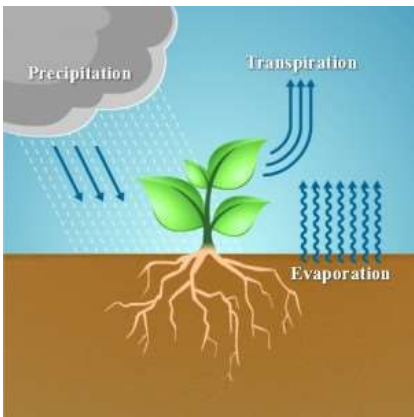


Multi layer soil model

(thunderboltkids.co.za)

## WEATHER

- Daily precipitation
- Daily evapotranspiration



(Victor Yee, 2011)

## CROP

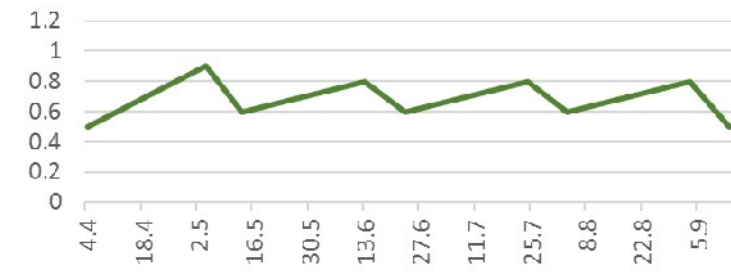
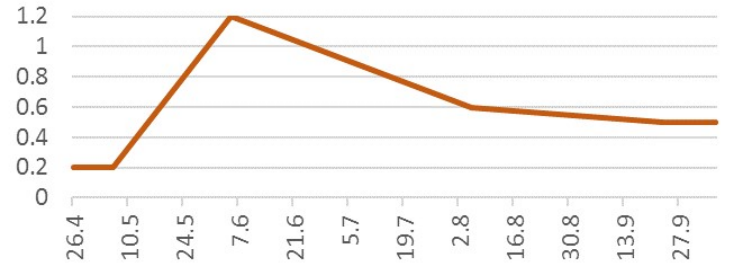
- Maize
- Four-cut grassland



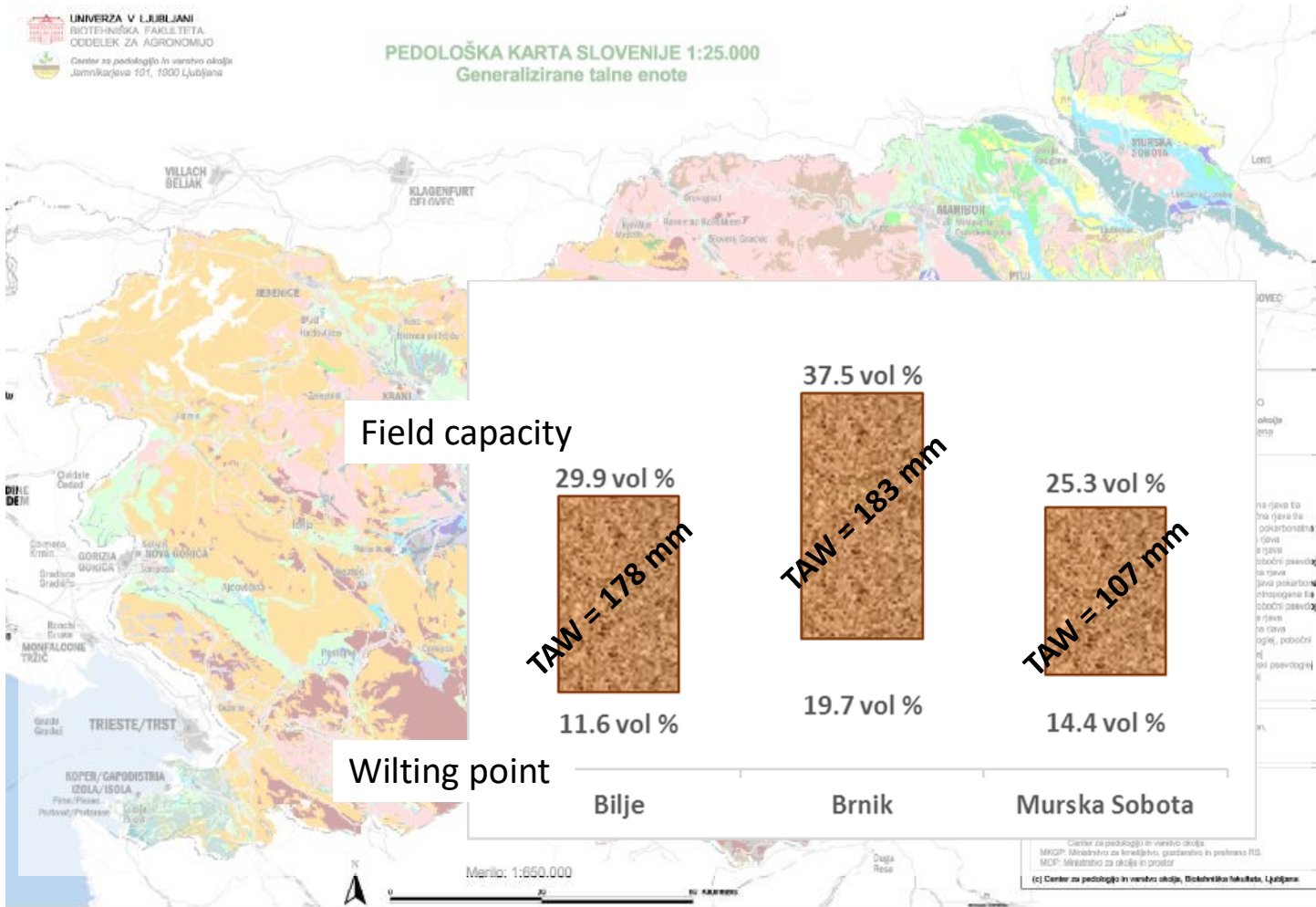
(<http://bufo.eu>)



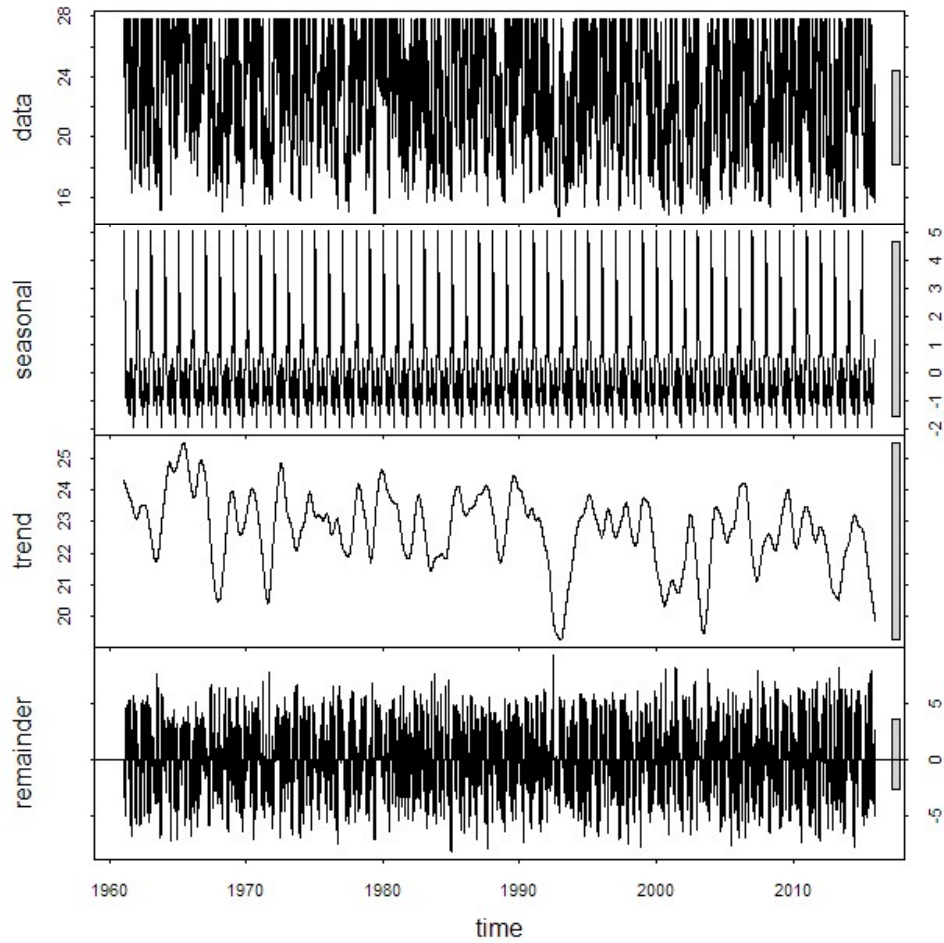
Crop coefficient



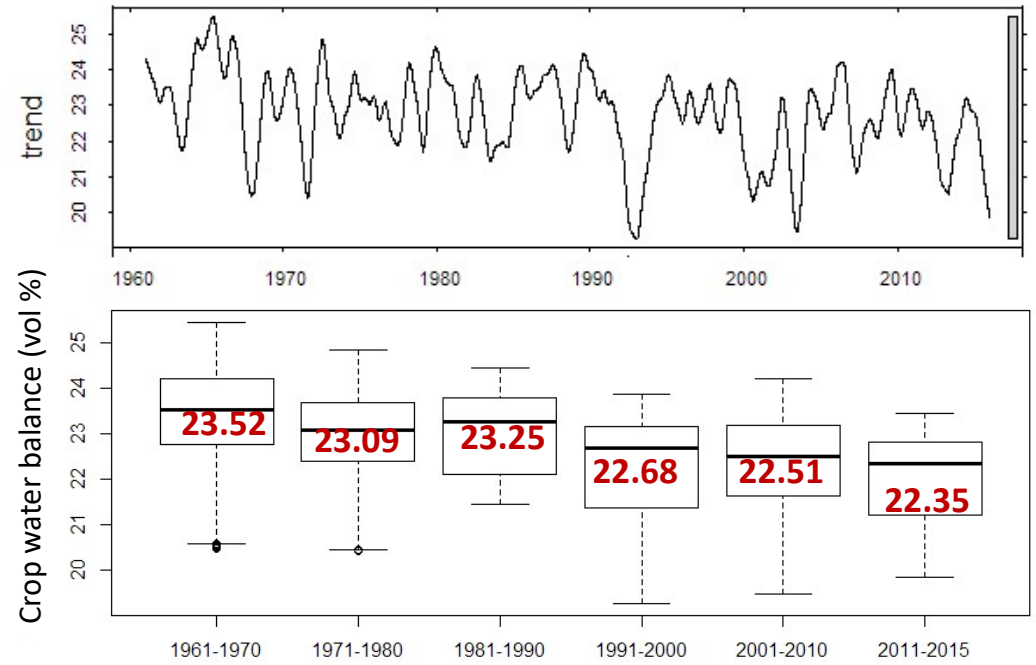
# SOIL



# MURSKA SOBOTA



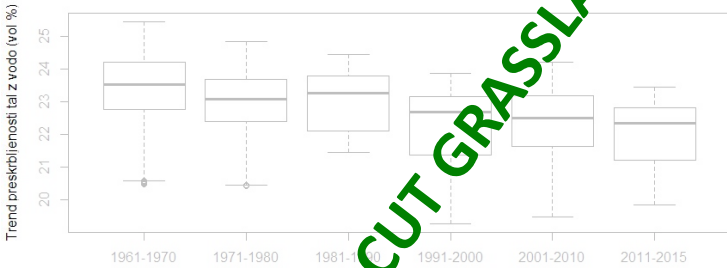
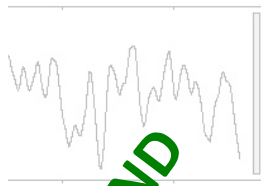
# FOUR-CUT GRASSLAND





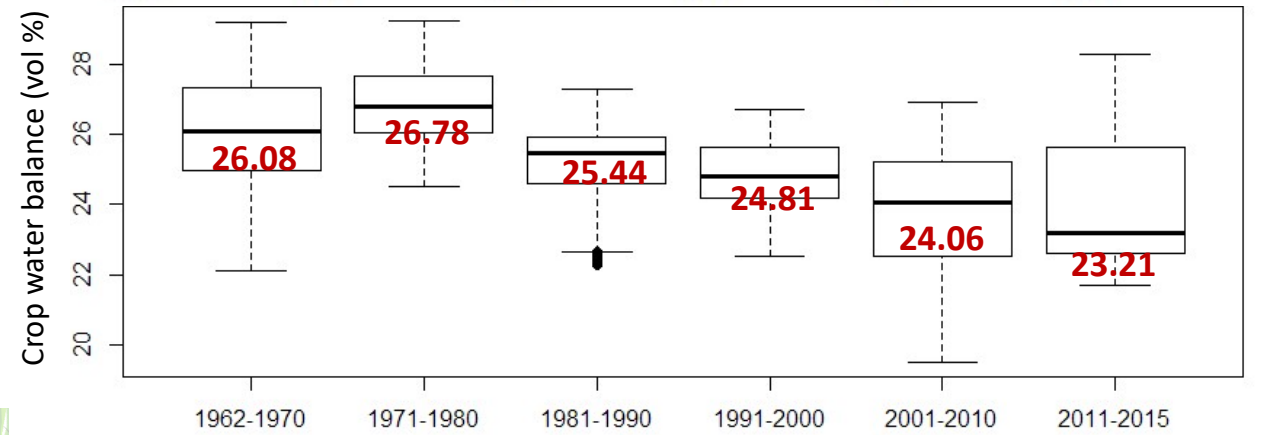
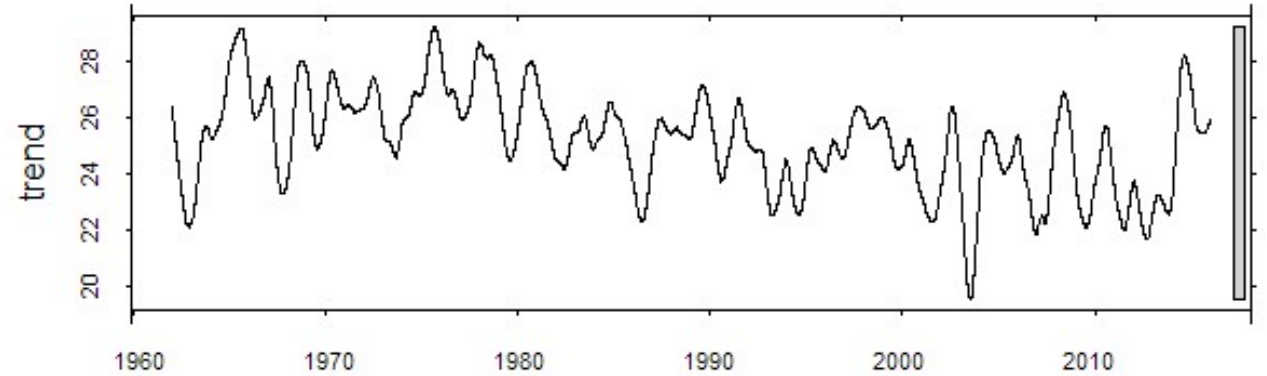


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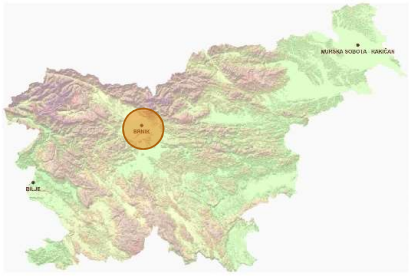


FOUR-CUT GRASSLAND

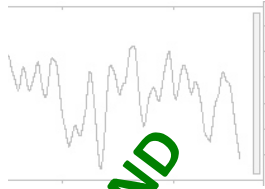
BILJE



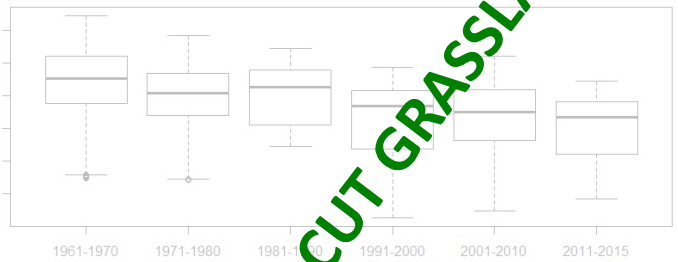




30TA



Trend preskibljenosti tal z vodo (vol %)



Trend preskibljenosti tal z vodo (vol %)

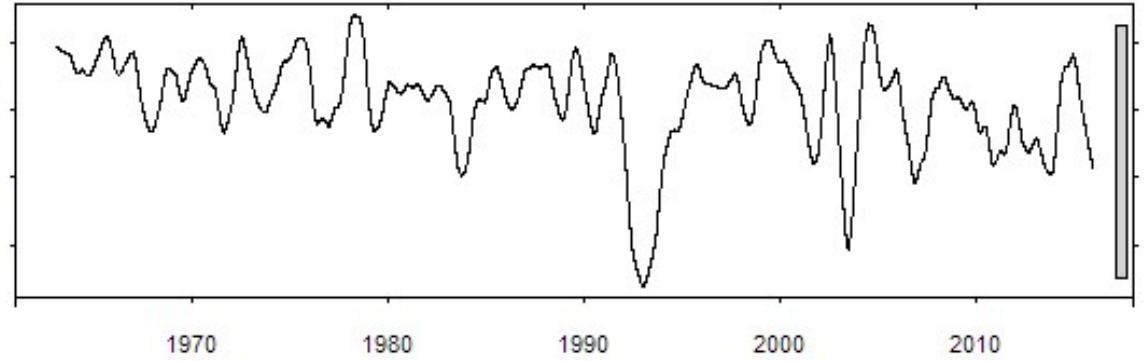


FOUR-CUT GRASSLAND

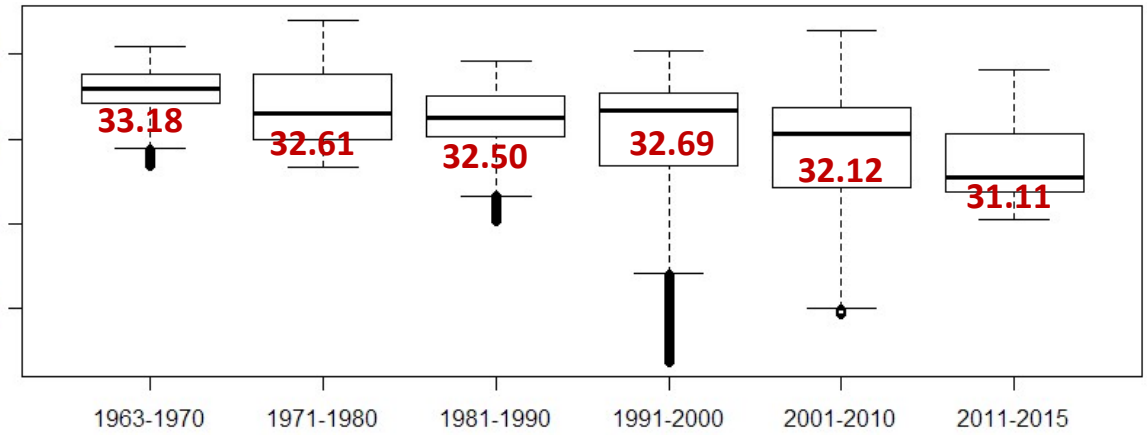
BILJE

BRNIK

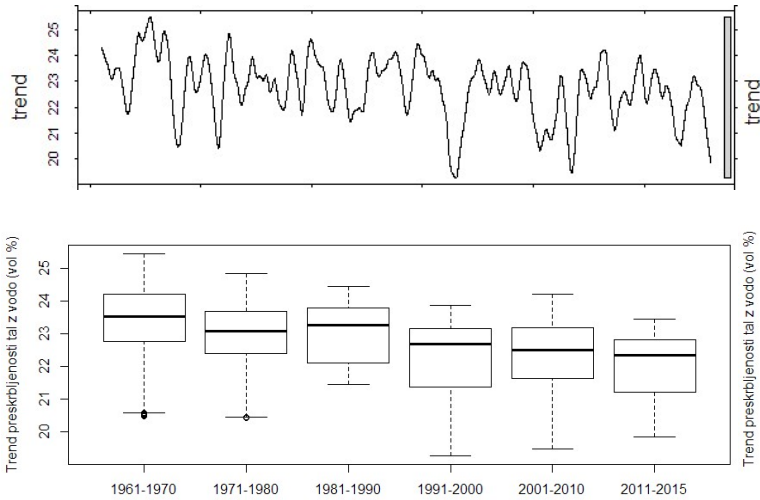
trend



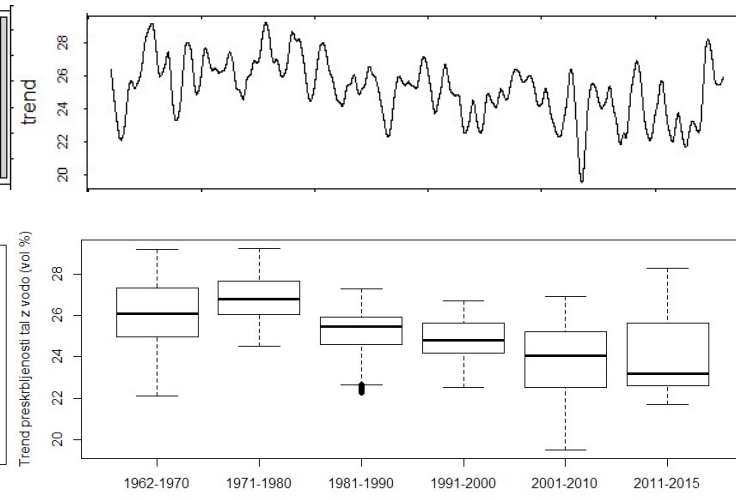
Crop water balance (vol %)



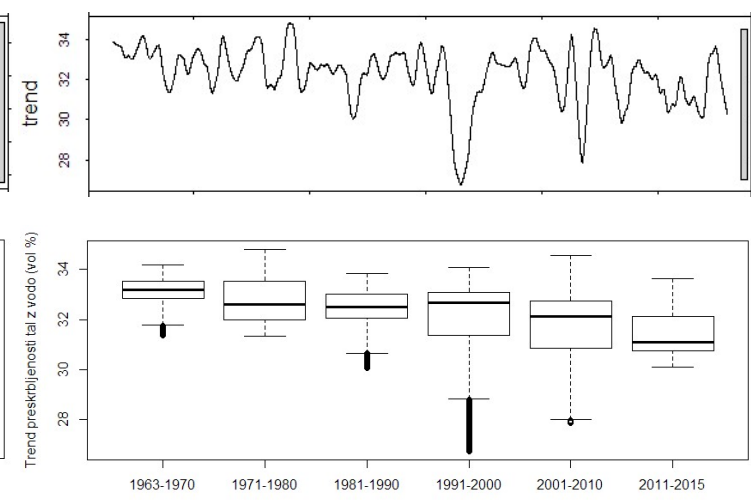
## MURSKA SOBOTA



## BILJE

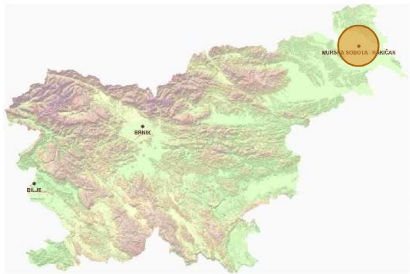


## BRNIK



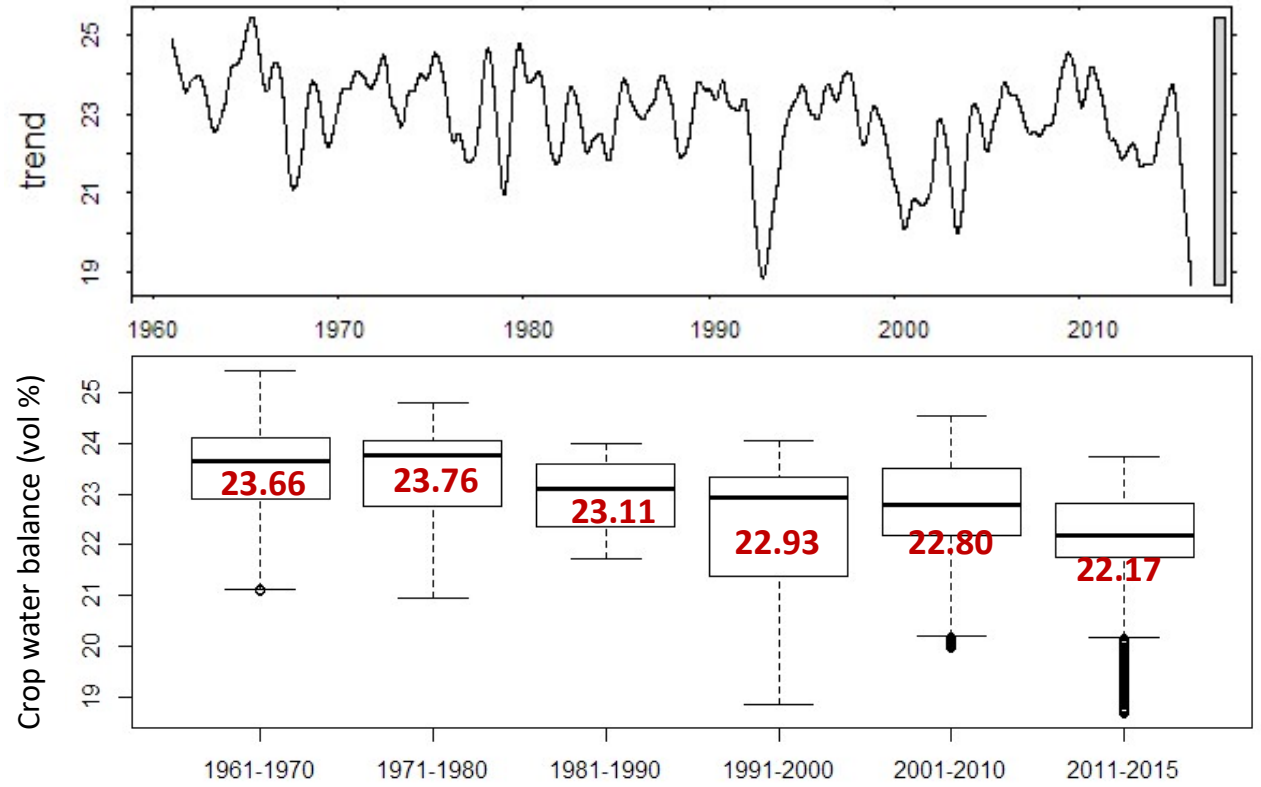
# FOUR-CUT GRASSLAND

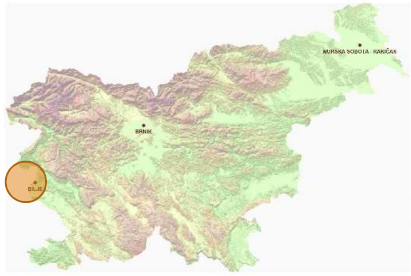




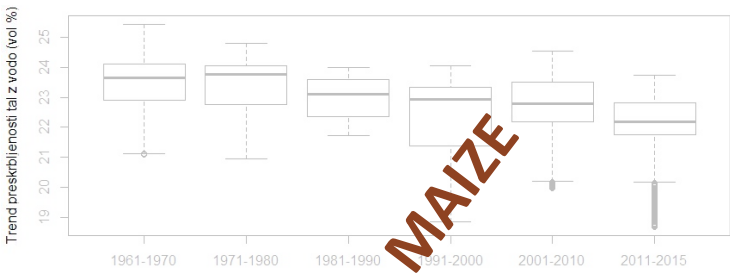
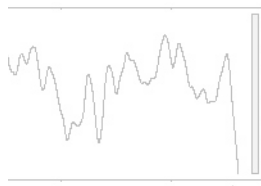
# MAIZE

## MURSKA SOBOTA

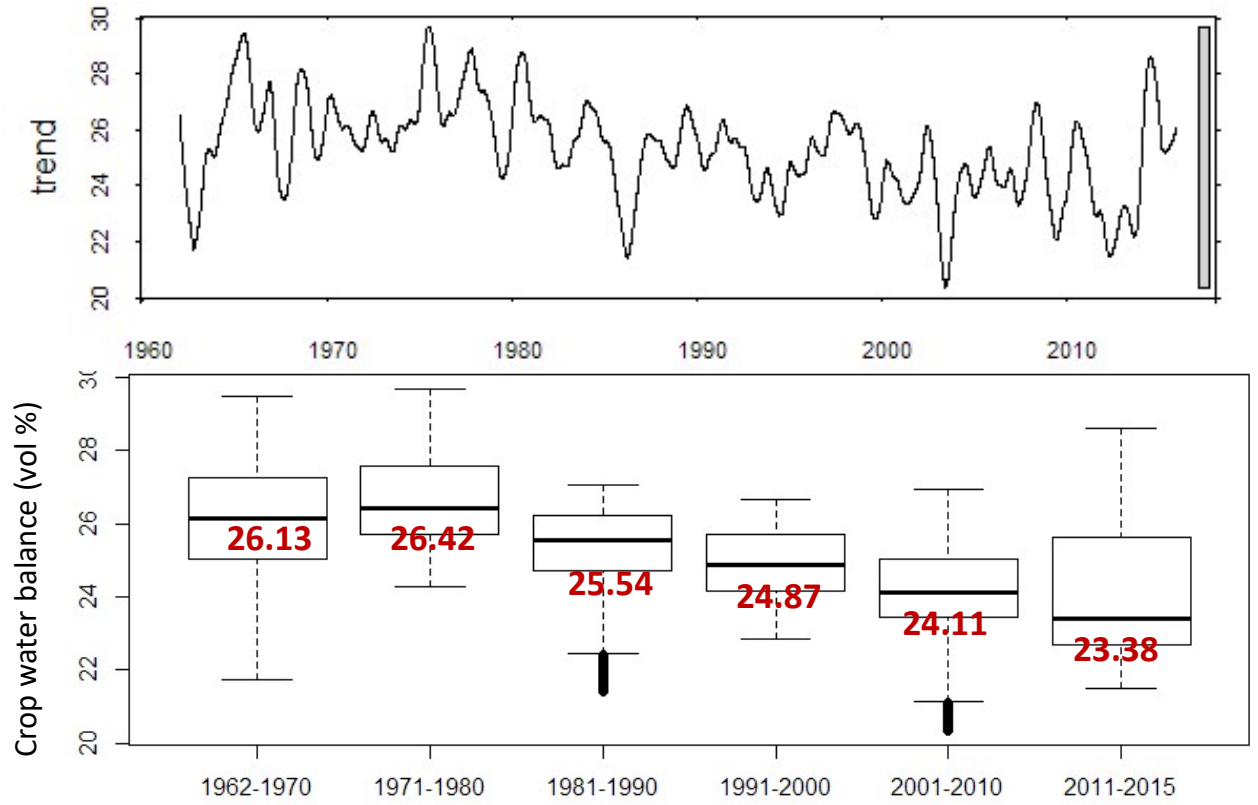




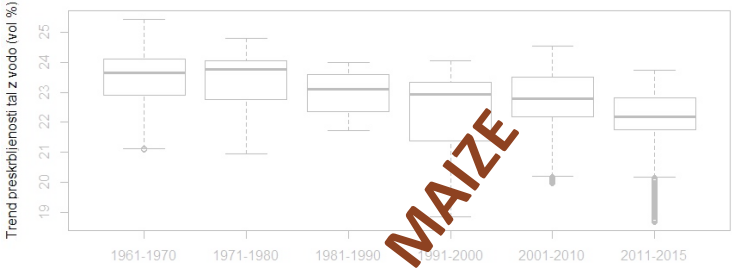
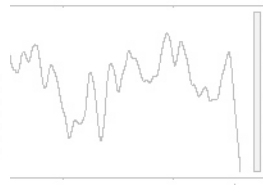
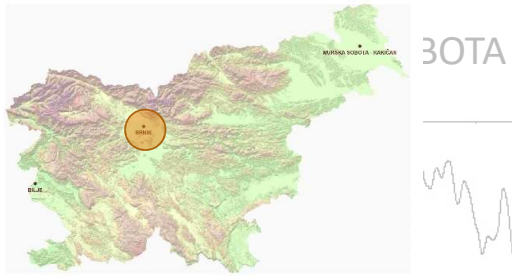
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# BILJE



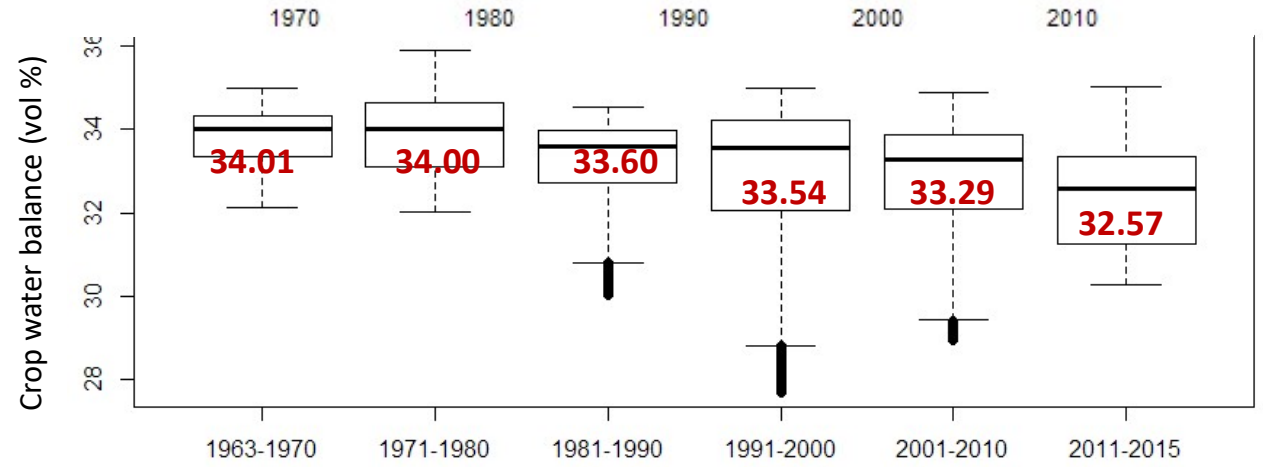
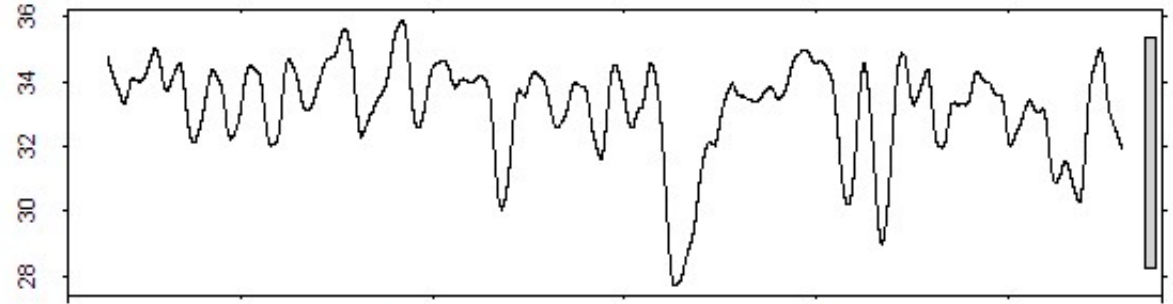




**MAIZE**

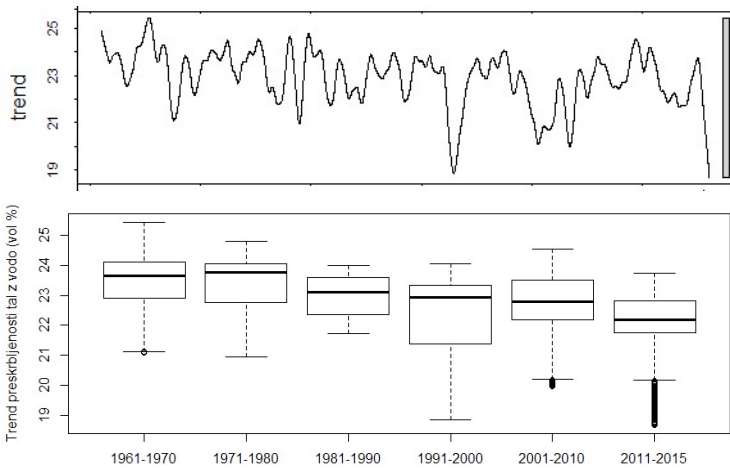
BILJE

BRNIK

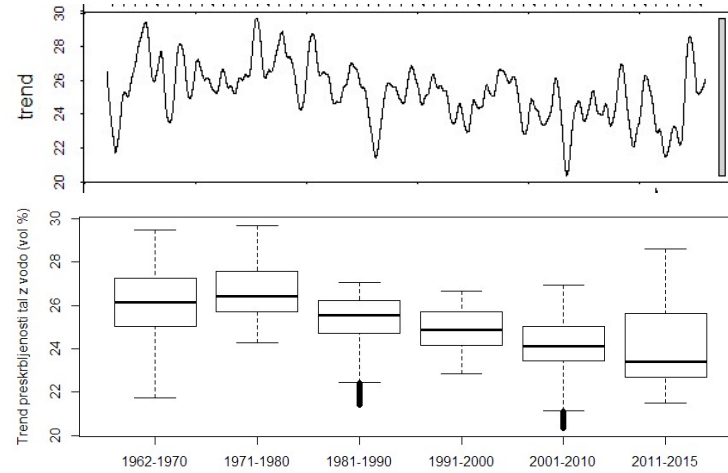




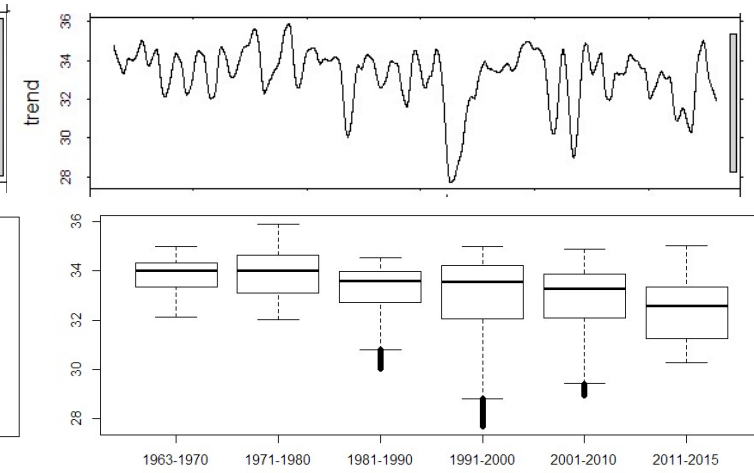
## MURSKA SOBOTA



## BILJE



## BRNIK



# MAIZE



# CONCLUSIONS

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*Changes in crop water balance are noticeable, more dry conditions are present in latest decades.*

- Changes of crop water balance for grassland and maize are present in time period 1961–2015
- Crop water balance decreases in time at all locations for grassland and maize
- Minimum values in 55-year period are detected:
  - after year 1991 in Brnik and Murska Sobota (mainly Continental climate)
  - after year 2001 in Bilje (Sub-Mediterranean climate)
- Noticeable is decrease of maximum crop water balance in Murska Sobota and larger dispersion on the dry side of the graphs from year 1991 further on
- Wider range (between extreme values) which indicates larger dispersion among dry and wet events are detected after year:
  - 2001 in Bilje
  - 1991 in Brnik

**There is no more doubt that agriculture policy has to be changed. Therefore, we have to decide how to change the policy and how fast.**



THANK YOU FOR ATTENTION.