

WP 3 – Meteo-Ro

Drought variability and change in the Danube basin

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Data

Temperature, precipitation, potential evapotranspiration from:

- CRU gridded global data(0.5 deg. resolution):
- WFDEI meteorological forcing data set based on ERA INTERIM (0.5 deg. resolution)
- SMHI regional simulations (EURO-CORDEX resolution of ~0.125 deg)
- Availabale Water Capacities (AWCs) from Joint Research Center Ispra

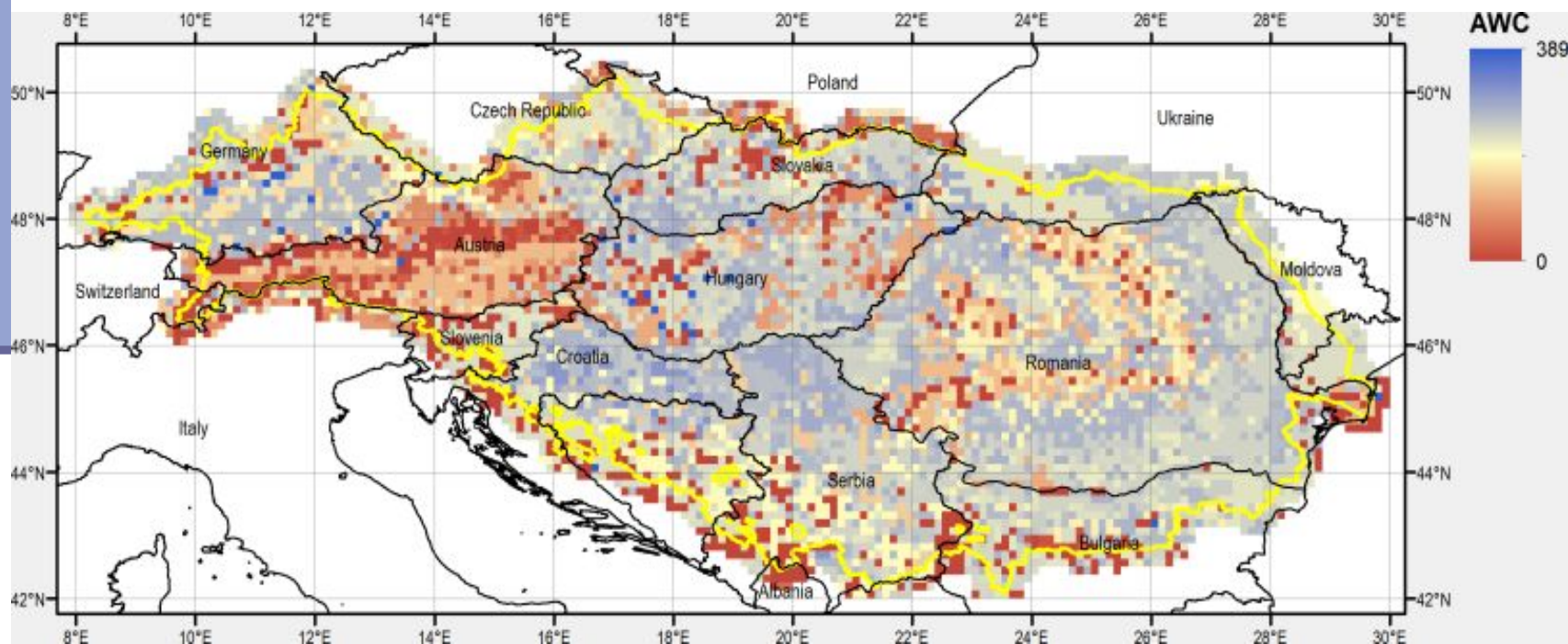
Potential evaporation follow Penman-Monteith approach.

PDSI is selfcalibrated (Wells, 2004)

Data

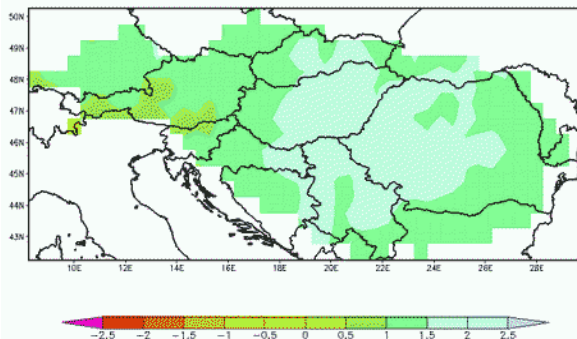
AWCs:

1. Summs of topsoil and subsoil values of AWC from JRC data sets - the European Soil Database (ESDB) (Panagos et al. 2012; Hiederer 2013).
2. Mean AWCs around EURO-CORDEX and CRU/ERA grids

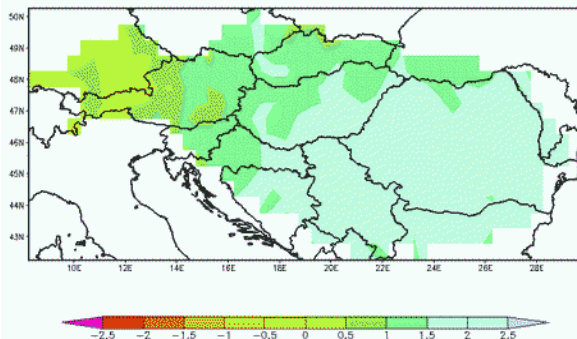


1st EOF mode of observed, reanalysis-derived and simulated PDSI for Danube basin

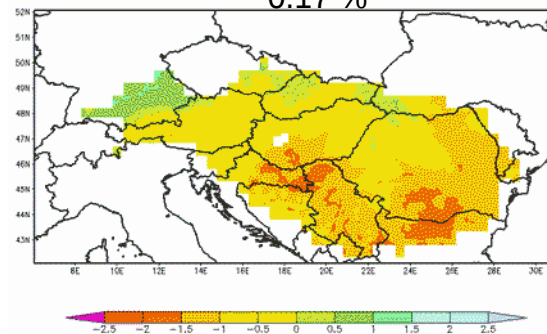
EOF 1 CRU 1901-2015 0.43 %



EOF 1 ERA-INTERIM derived 1979-2012
0.44 %

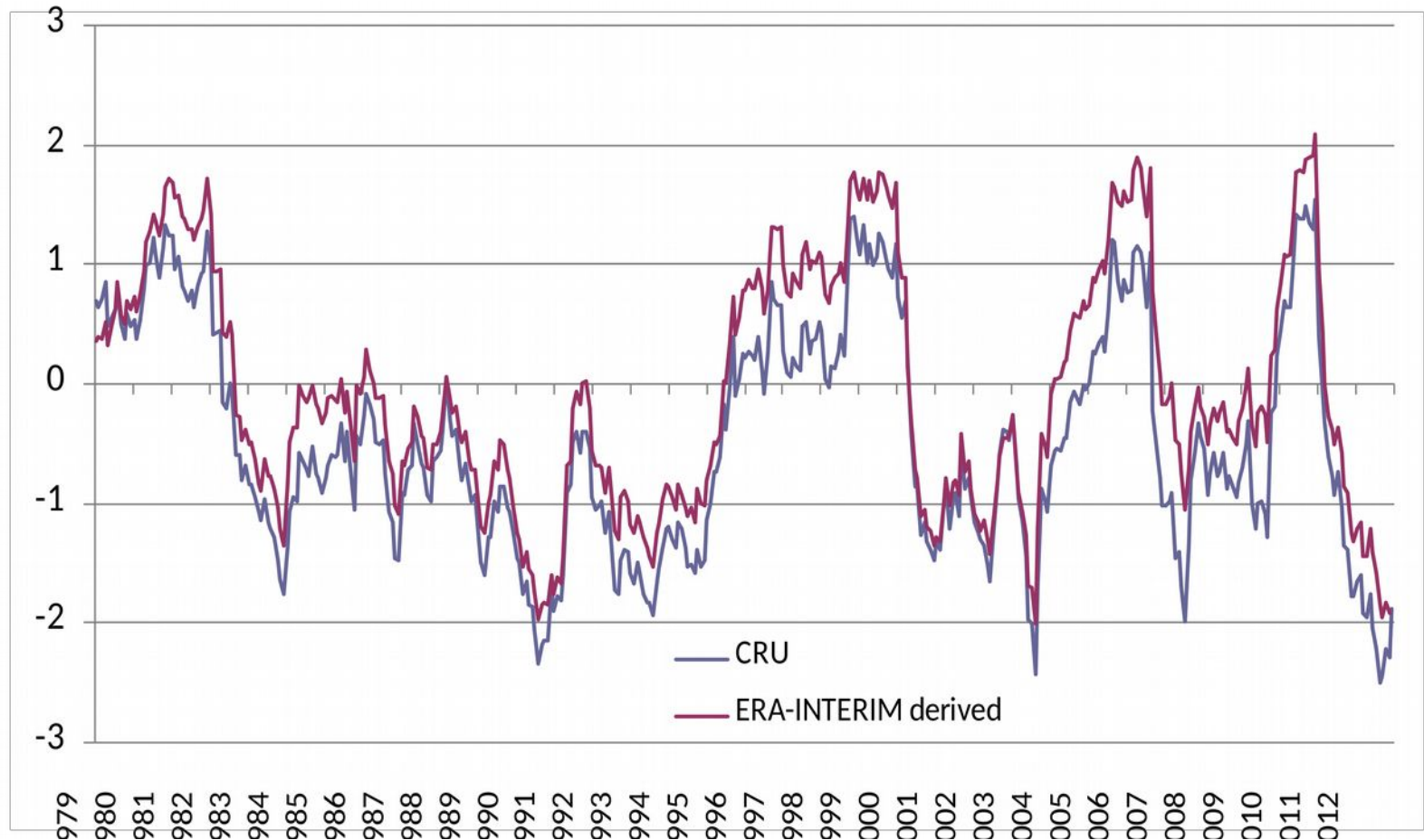


EOF 2 1971-2005 HIST SMHI
0.17 %



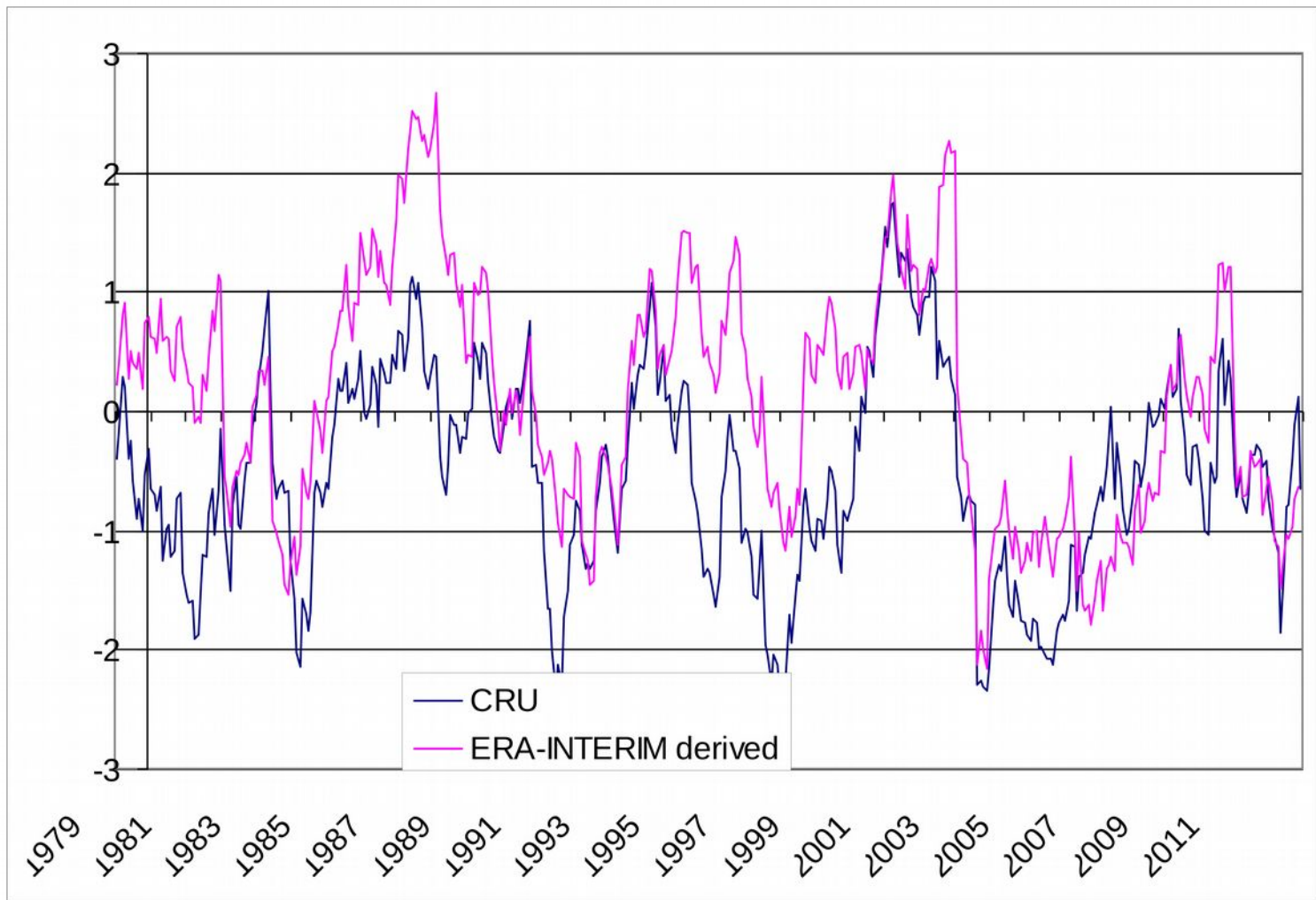
EOF 1 mode – CRU and ERA-derived time series

$R=0.96$



EOF 2 mode – CRU and ERA-derived time series

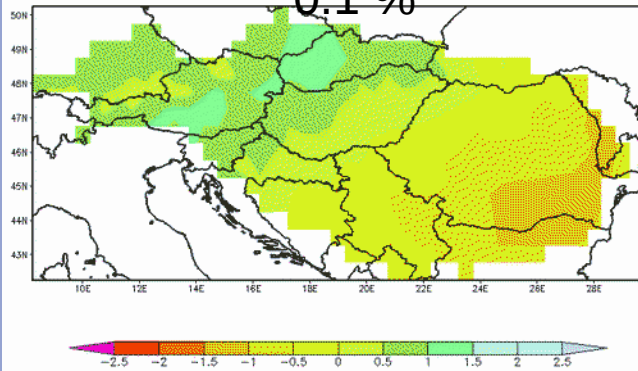
$R=0.71$



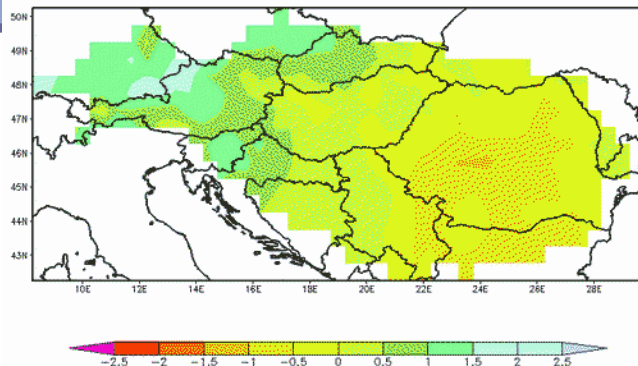
1st EOF mode of observed, reanalysis-derived and simulated PDSI for Danube basin

EOF 1 CRU 2 1901-2015

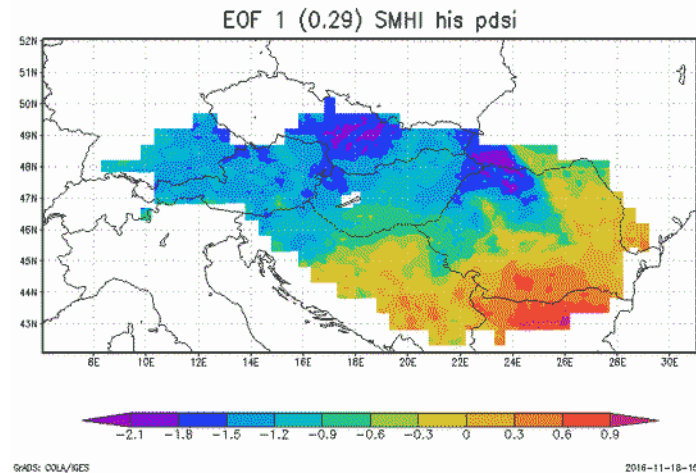
0.1 %



EOF 2 ERA INTERIM
derived 1979-2012 0.1 %



EOF 1 1971-2005 HIST SMHI
0.37%



Preliminary conclusions

- European reanalysis data will, hopefully, improve the high resolution spatial patterns for Palmer Drought Severity Index;
- We have prepared the draft of the methodology to compute and compare the PDSI derived from the new reanalysis data to in-situ and global reanalysis data.