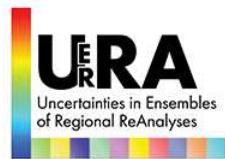


Indices in ECA&D/E-OBS

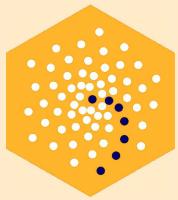
metadata standards for a rapidly developing field



EUPORIAS

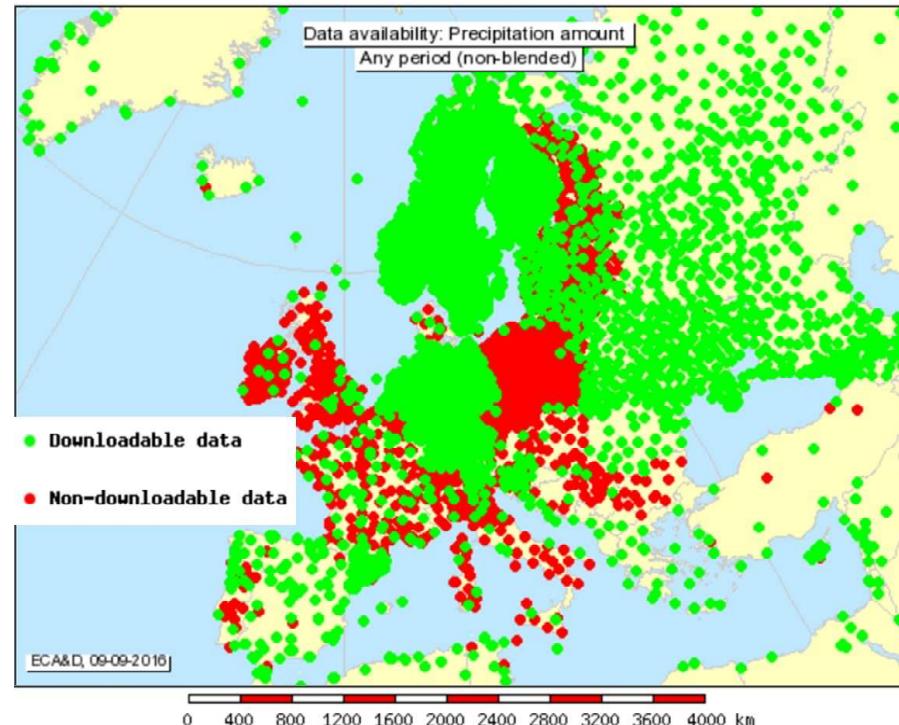


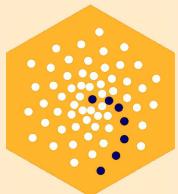
March 15, 2017



European Climate Assessment & Dataset

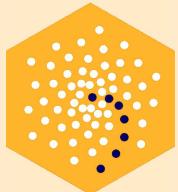
- ECA&D, ICA&D (LACA&D, SACA&D)
- Funded by EUMETNET (-2008), maintained by KNMI
- Regional Climate Center on Data for WMO Region VI
- analyse the climate of WMO region VI, focus on climatic extremes



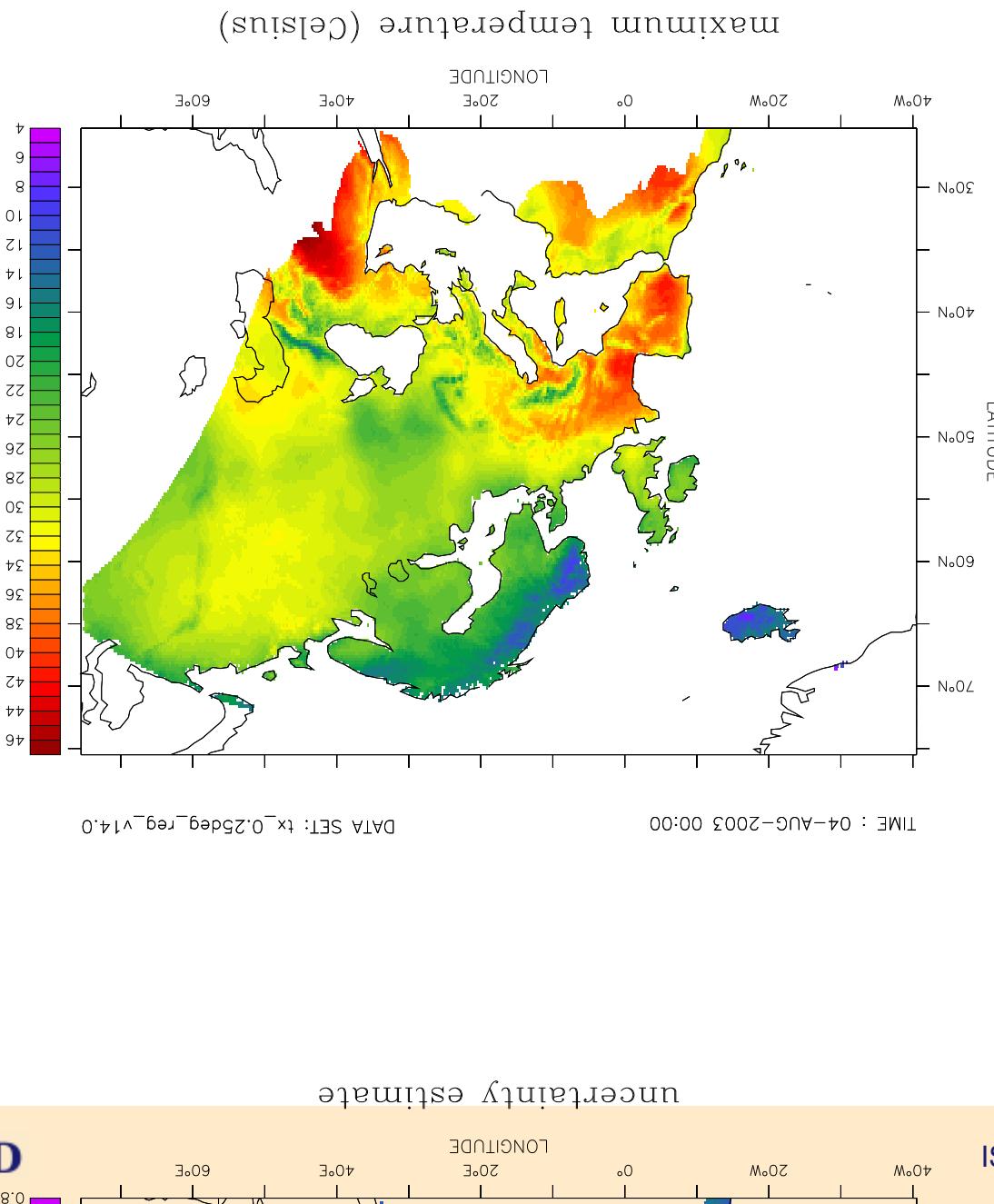


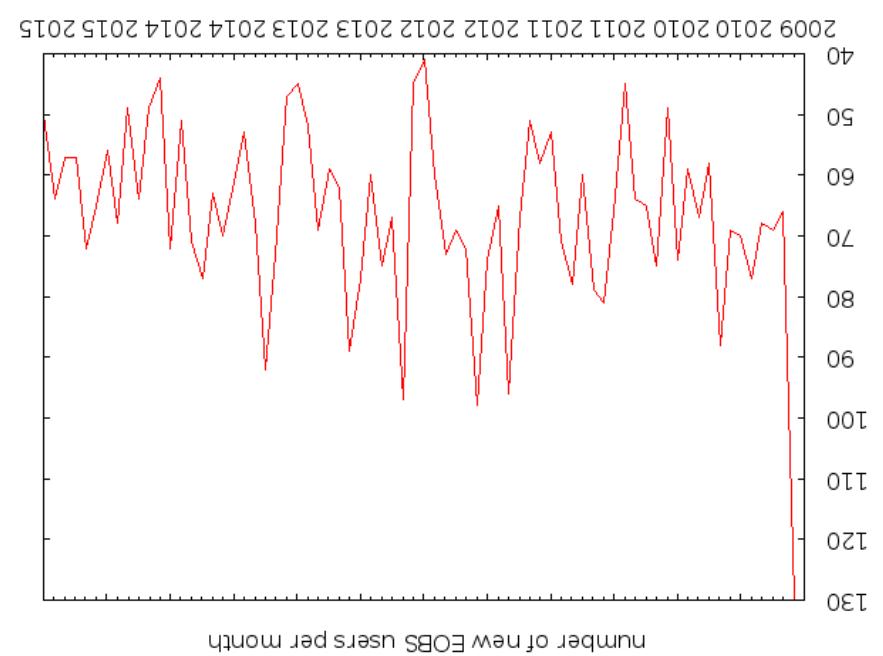
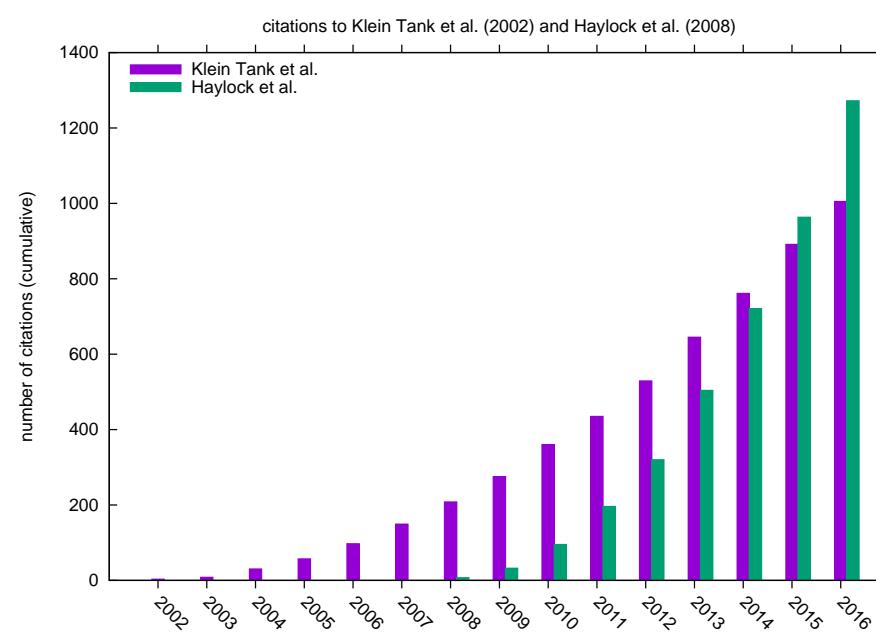
ECA&D Introduction

- Today, ECA&D is receiving data:
 - 66 participants for 62 countries
 - ECA dataset contains 10388 meteorological stations (RR, TN, TG, TX, PP, HU, SS, SD, FG, FX, DD, CC)
 - 77% of these daily series can be downloaded and used for non-commercial research and education.

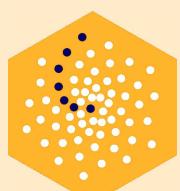


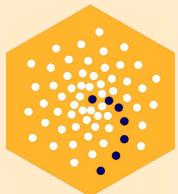
E-OBS Introduction





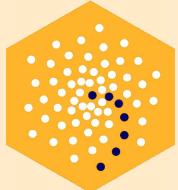
ECA&D introduction citations



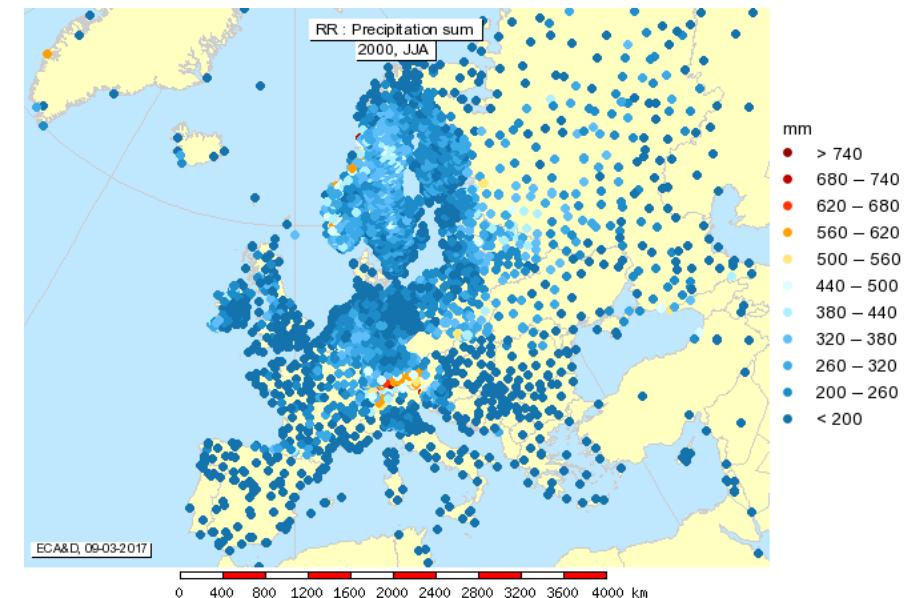
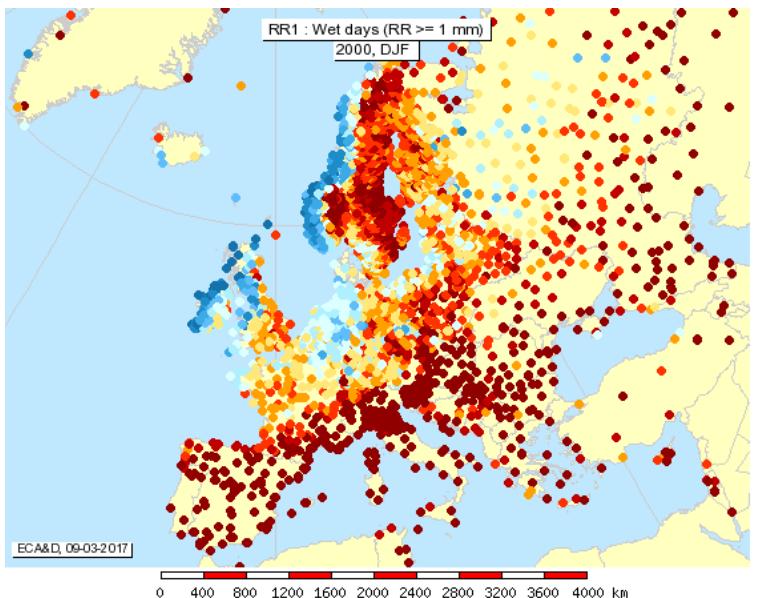


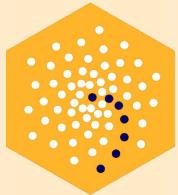
Climate extreme indices

- climate index: A climate index is here defined as a calculated value that can be used to describe the state and the changes in the climate system.
- particularly attractive to users due to their compact information.
- They help describe changes in historical and future climate, while being more illustrative to users than simple climate means and closer related to possible impacts.

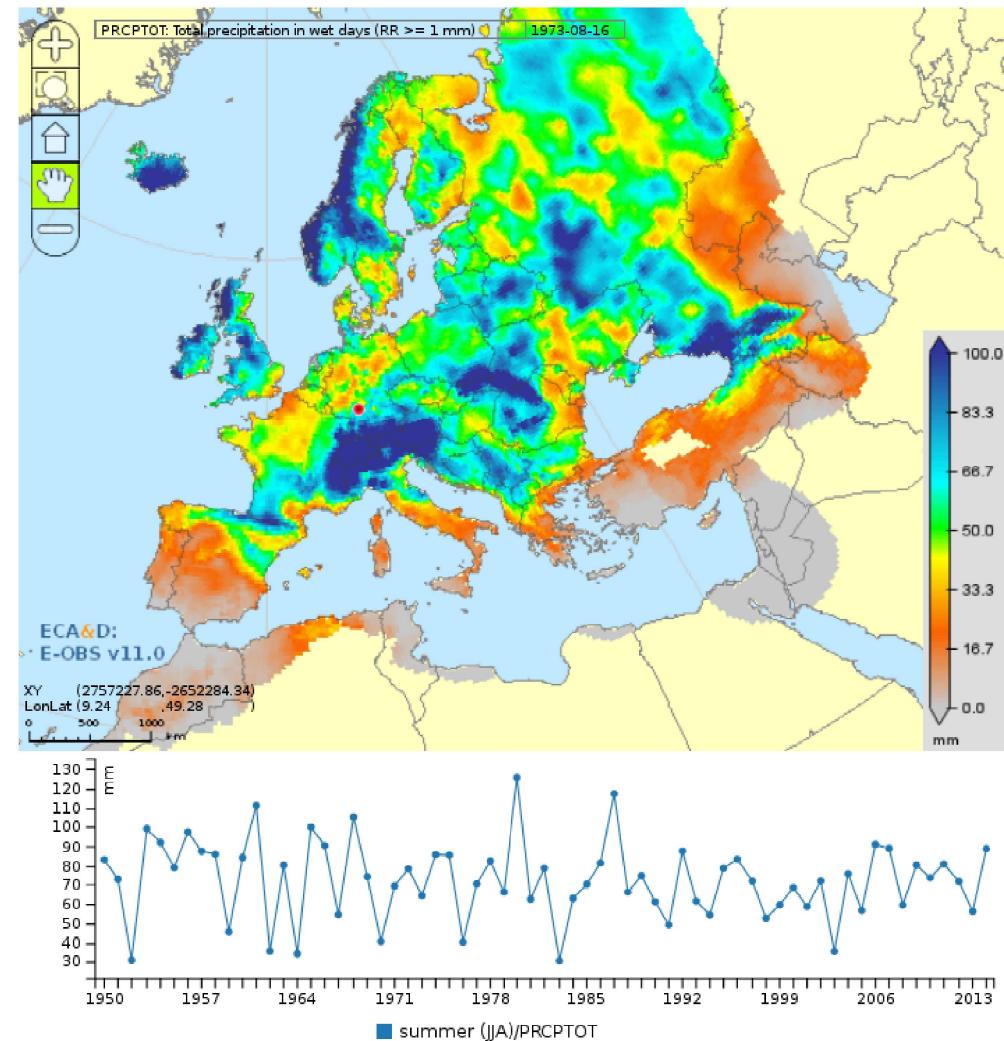
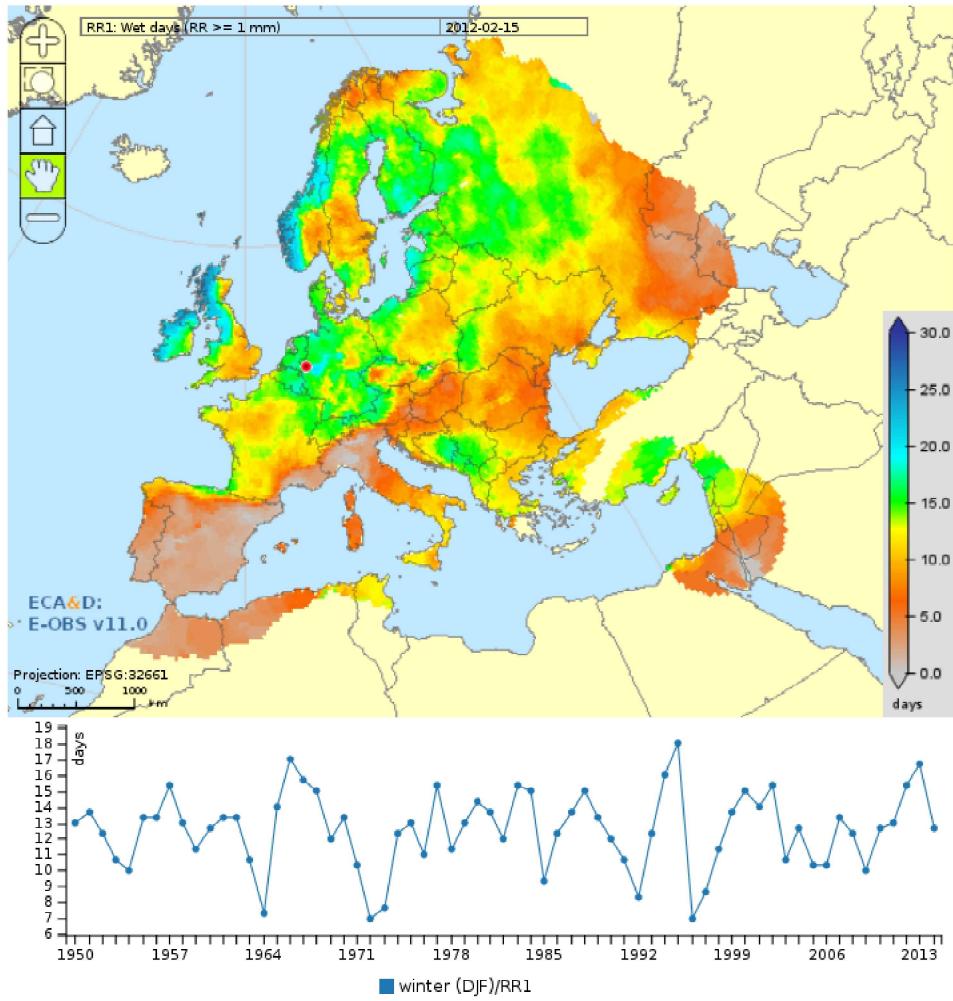


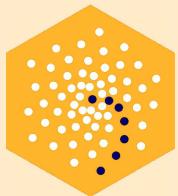
ECA&D climate indices





E-OBS climate indices

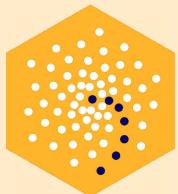




Indices - non-ETCCDI

'Simple' indices

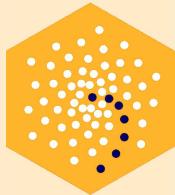
- snow depth
 - mean of snow depth
 - number of days with $\geq 5\text{cm}$
- cloud cover (MeteoSwiss works on this as well)
 - mean of cloud cover
 - mostly sunny days: $\text{cc} \leq 2 \text{ okta}$



Indices - non-ETCCDI

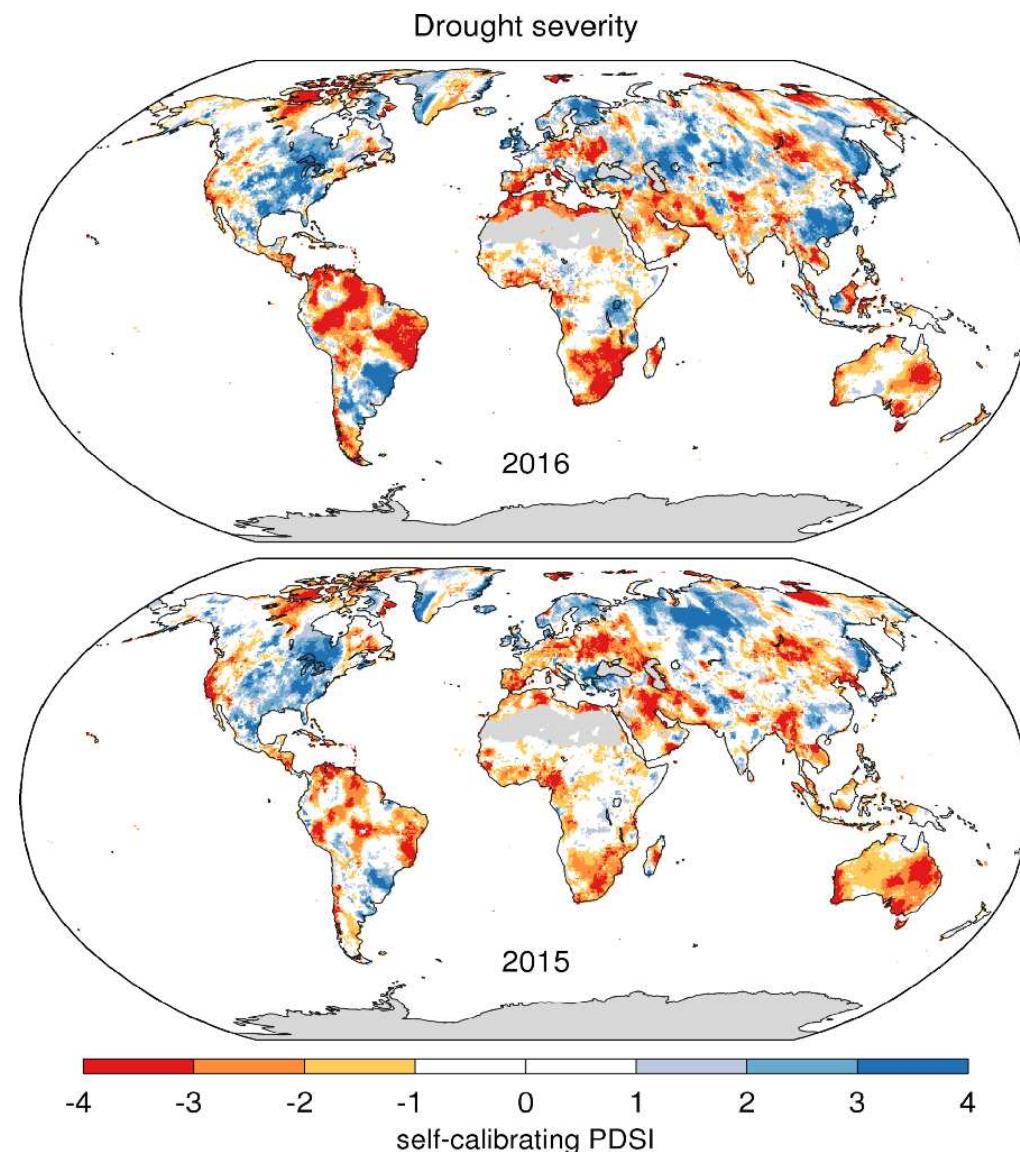
Multivariate indices

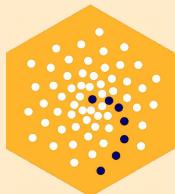
- Cold & Wet days (CW)
TG < 25thpercentile & RR > 75thpercentile
- Universal Thermal Climate Index (UTCI)
(combined heat & cold stress index)
requires: qq, fg, tx, hu
- Tourism Climatic Index (TCI)
(measure for the well-being of a city tourist)
requires: fg, tx, ss, rr, hu
 - mean of UTCI
 - number of days with $UTCI \geq 80$ ('excellent conditions')
- Hughlin-index & Biologically Effective Degree Days (BEDD)



NEW Indices - non-ETCCDI

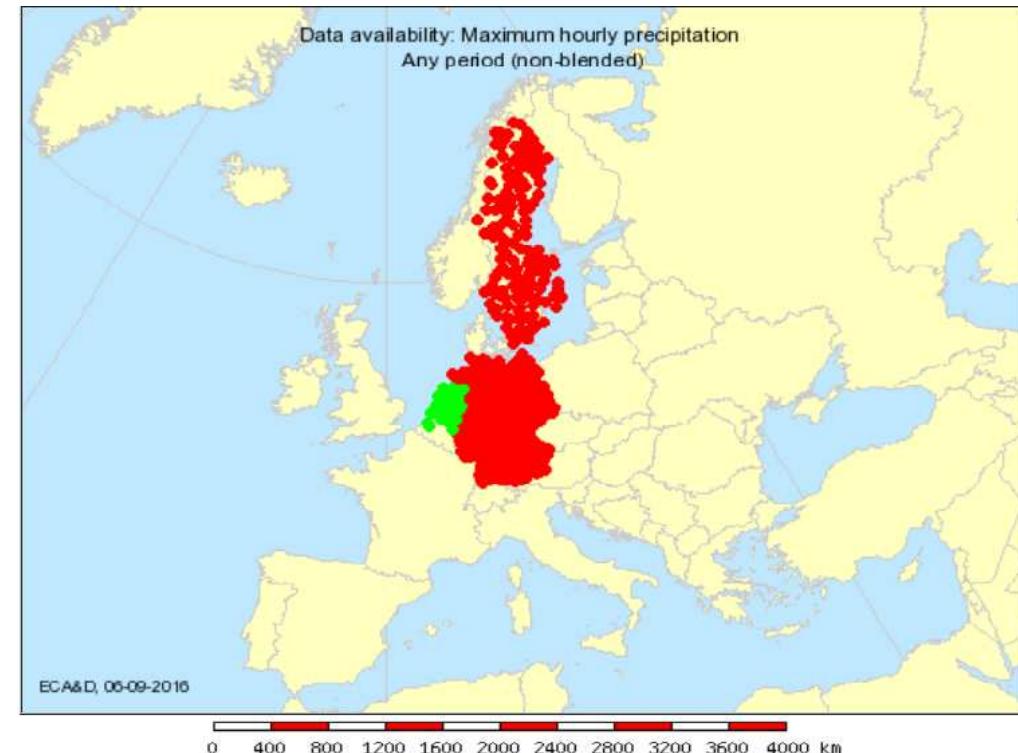
- Potential EvapoTranspiration (PET)
 - based on radiation alone (~Penman)
 - based on radiation and much more (~Penman-Monteith)
- Drought Indices
 - based on precipitation only (SPI)
 - based on precipitation and PET (PDSI)



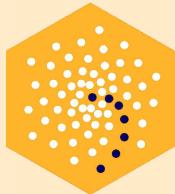


The shape of things to come

- Indices based on new parameters
 - maximum hourly precipitation
- Indices based on sub-daily data
 - 6-hourly precipitation
 - hourly temperature



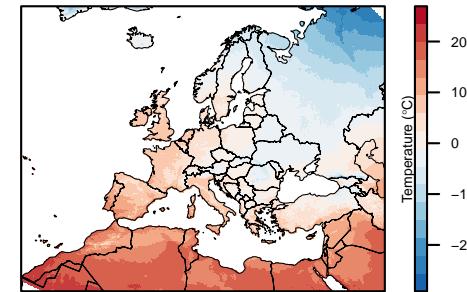
Motivation: model community is requesting for higher temporal resolution validation data



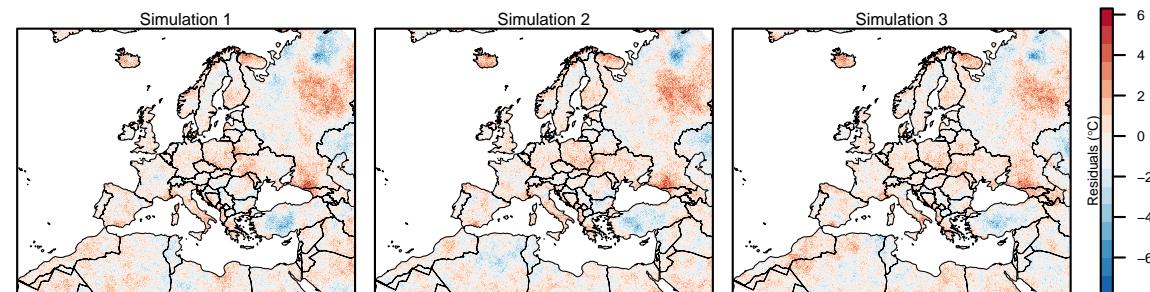
The shape of things to come

- monthly means: Generalized Additive Model
- conditional simulation kriging of daily anomalies
- ensemble equally likely members

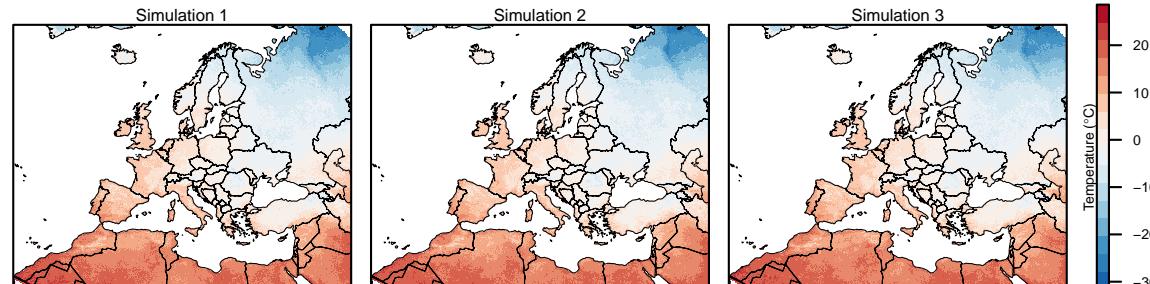
A model

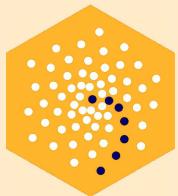


The first Three residual Simulations



The first Three Simulations





The shape of things to come

- mix of observational and forecast data as input to the climate indices

