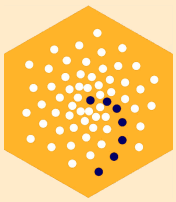


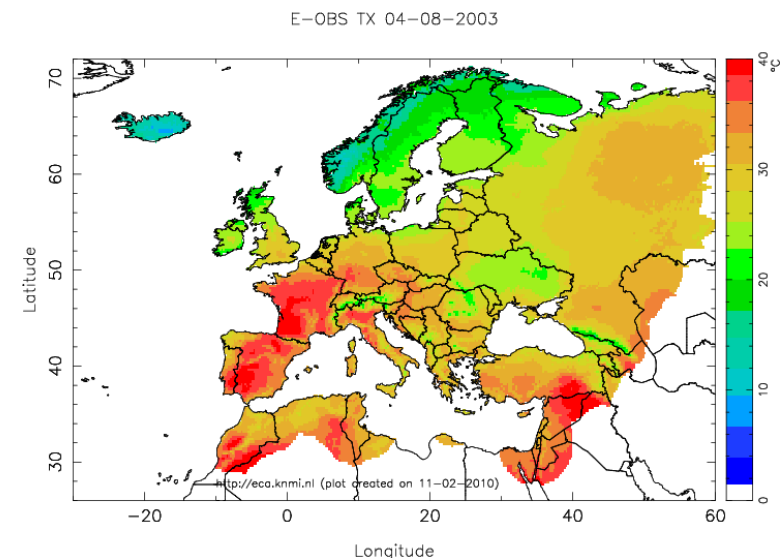
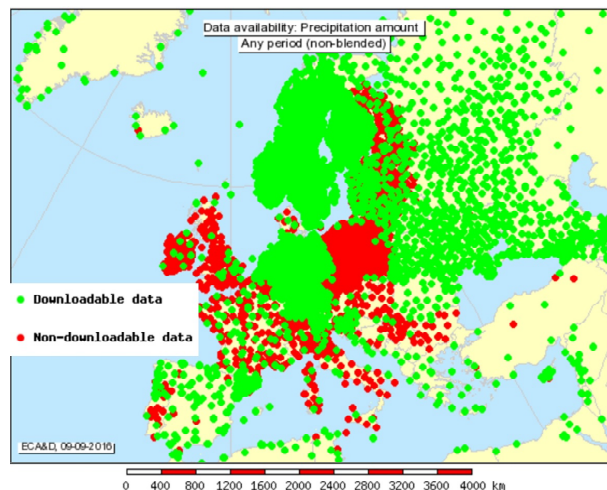
The E-OBS Climate Dataset

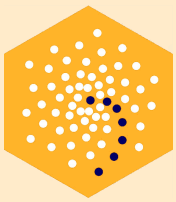
Phil Jones and the ECA&D Group



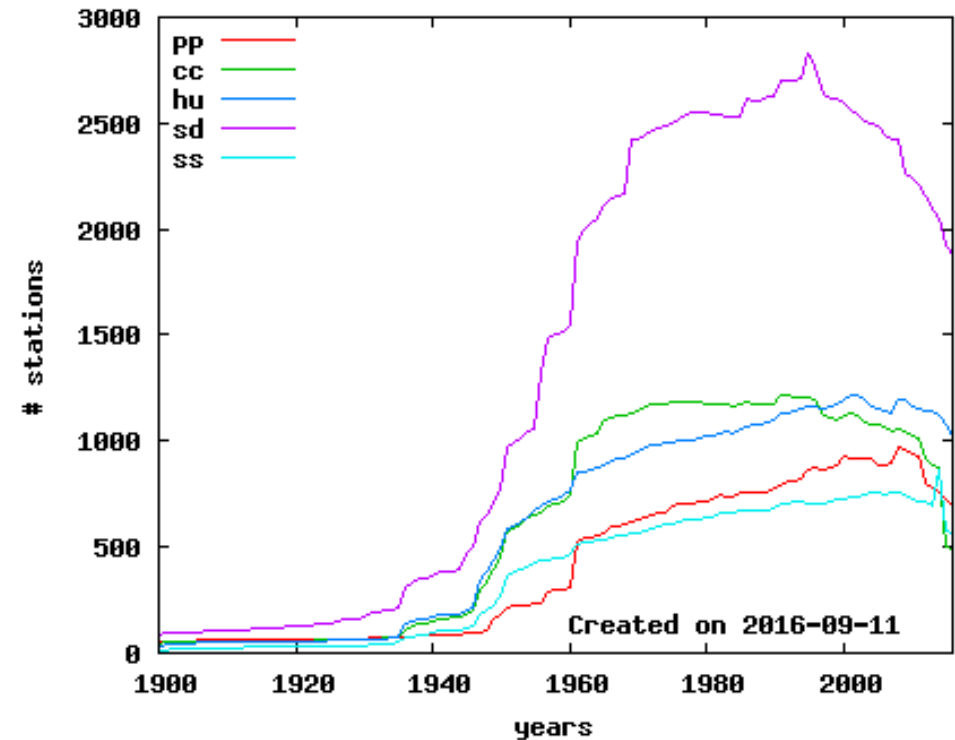
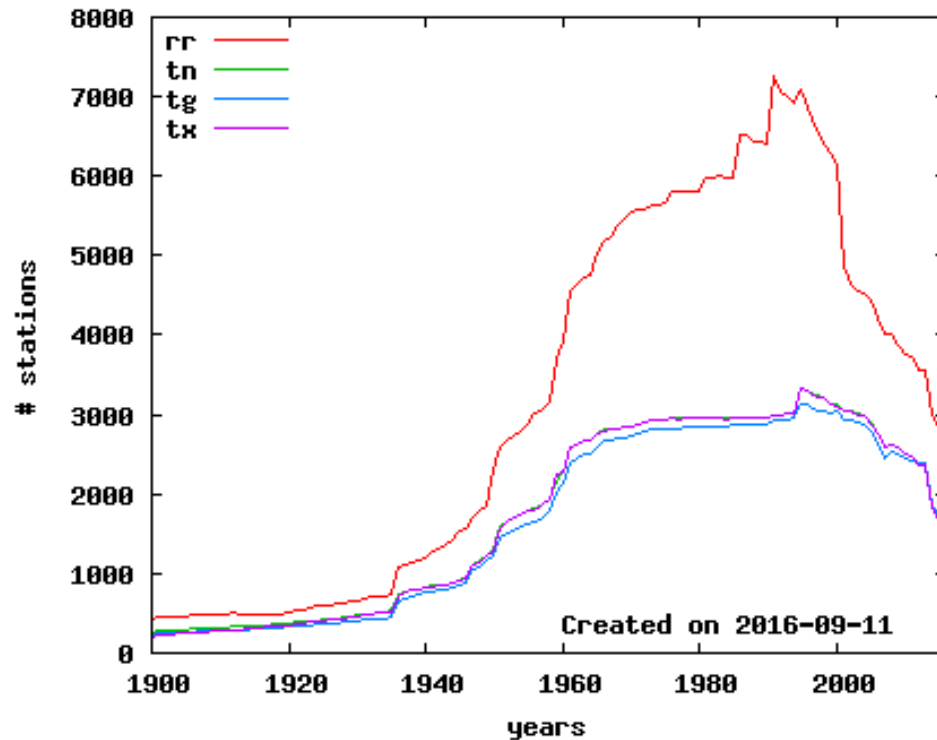
European Climate Assessment & Dataset

- Initiated by ECSN/EUMETNET in 1998
- Receives funds from EUMETNET and EU, maintained by KNMI
- Back bone of Regional Climate Centre on Climate Data for WMO RA VI
- Provides station database for Europe and an interpolated dataset (E-OBS)

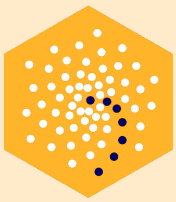




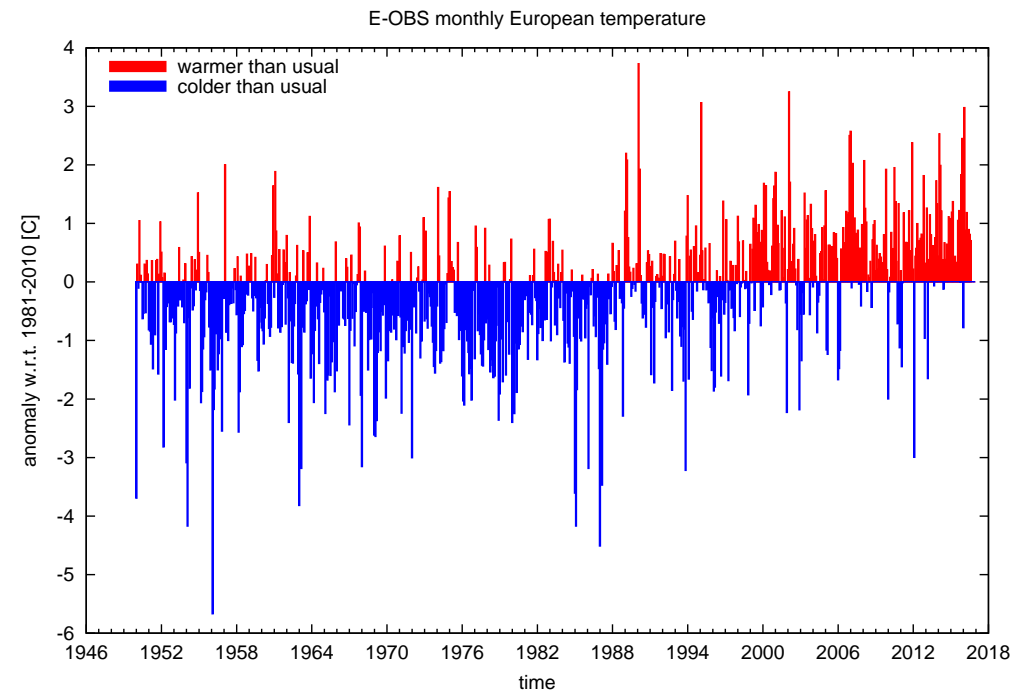
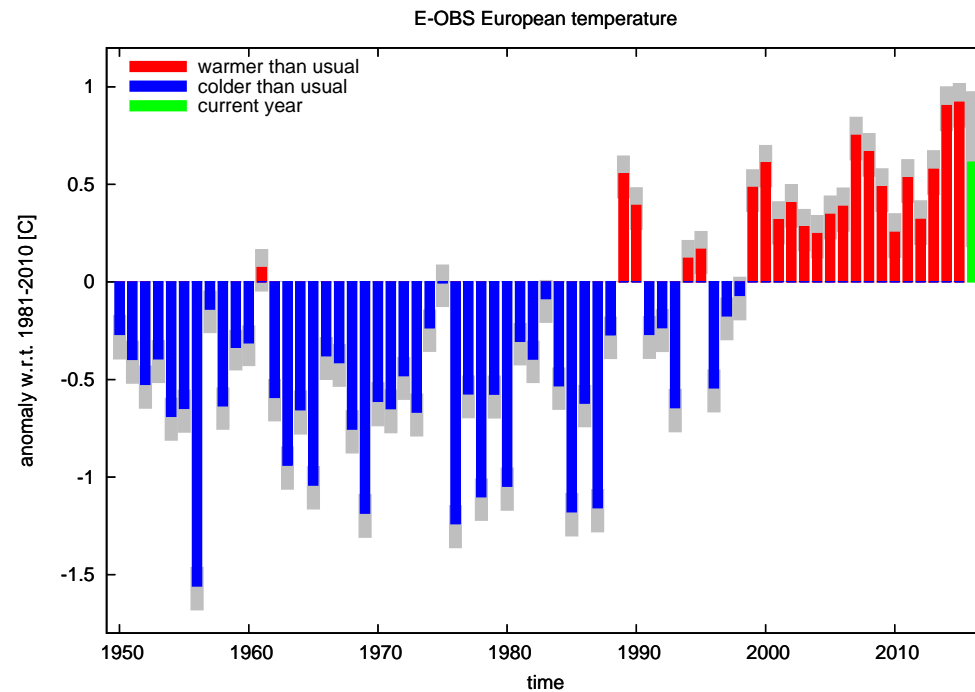
ECA&D Introduction



- Regular variables plus MSLP (pp), cloud cover (cc), relative humidity (hu), snow depth (sd) & sunshine duration (ss)
- Station density varies over time
- Higher density for precipitation compared to temperature
- New data series are regularly added

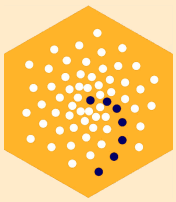


ECA&D products

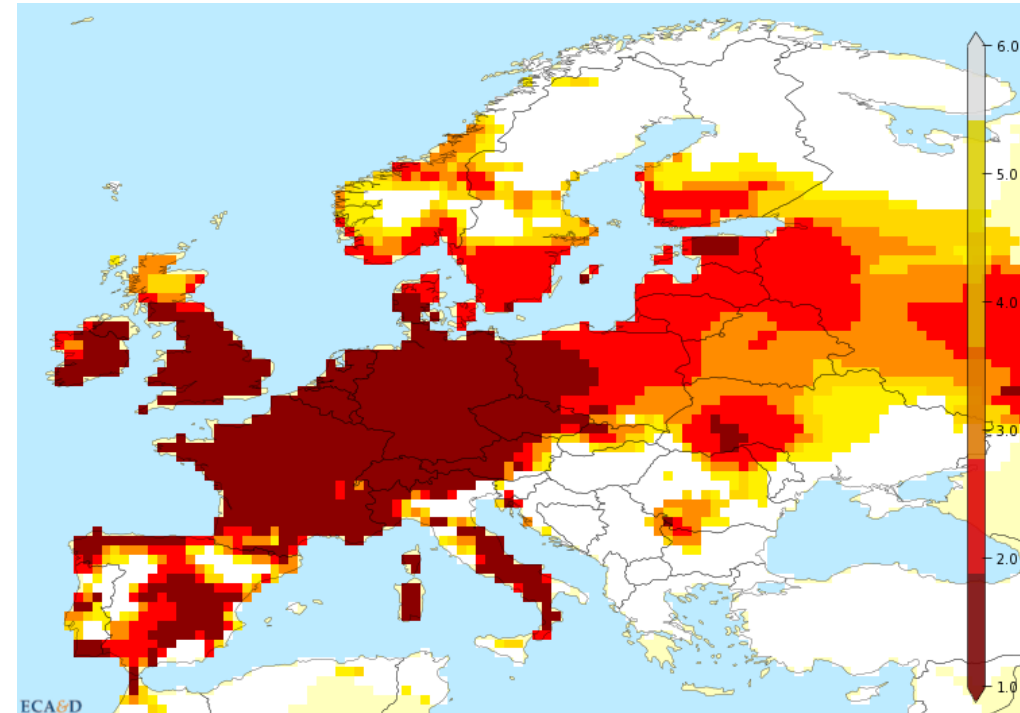
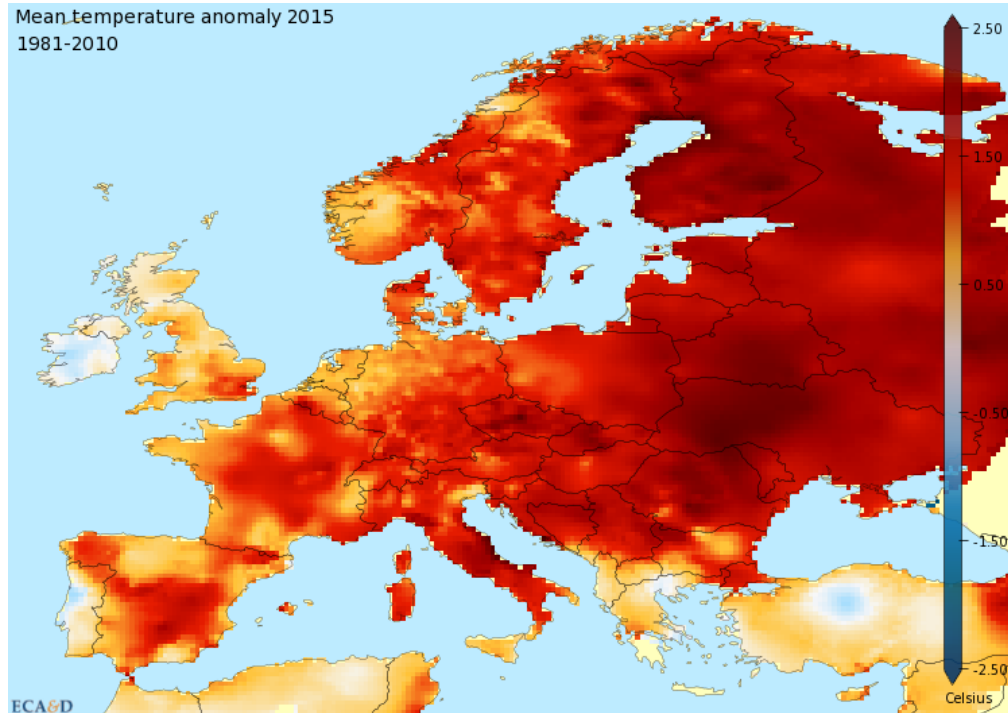


- European average temperature (over the domain 25N-75N x 40W-75E)

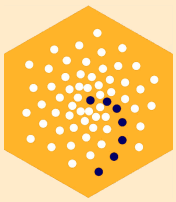
<http://cib.knmi.nl>, van der Schrier et al. (2013), Chrysanthou et al. (2014)



ECA&D products

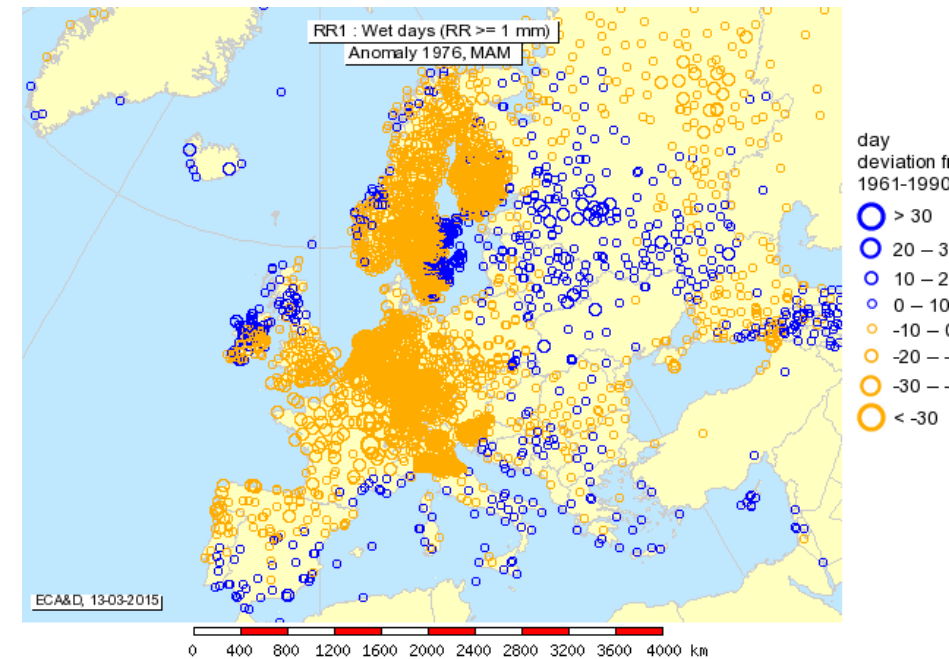
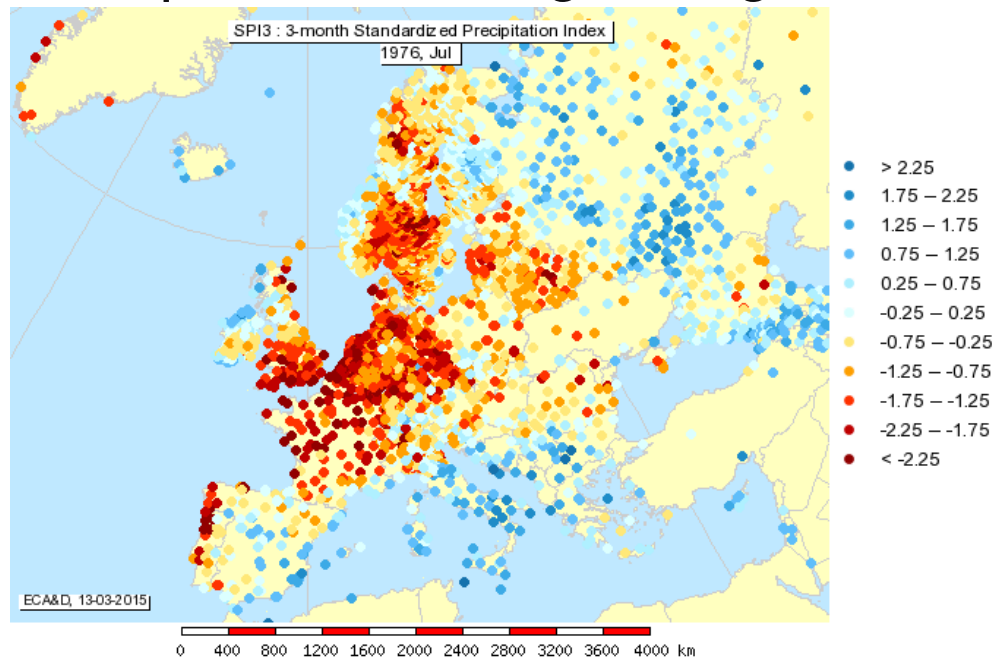


- European average temperature, maps, ranking and interpretation
- The left-hand plot above shows the mean temperature for 2015 relative to the 1981–2010 average
- The right-hand plot shows the top five ranking of each grid cell in 2015 relative to 1981–2010

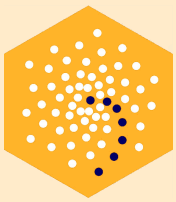


ECA&D products

Descriptions of droughts, eg. 1976

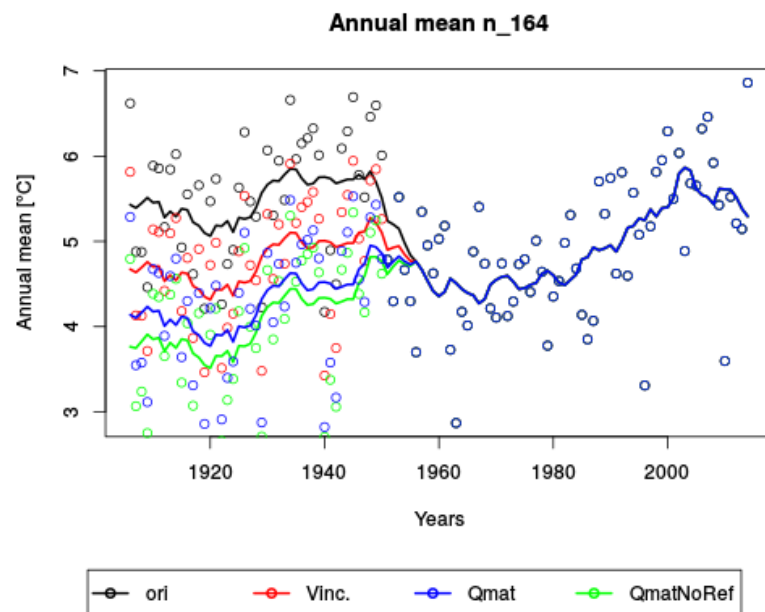


- 75 indices – 26 from ETCCDI
- See: <http://www.ecad.eu/utis/mapserver/indices.php>

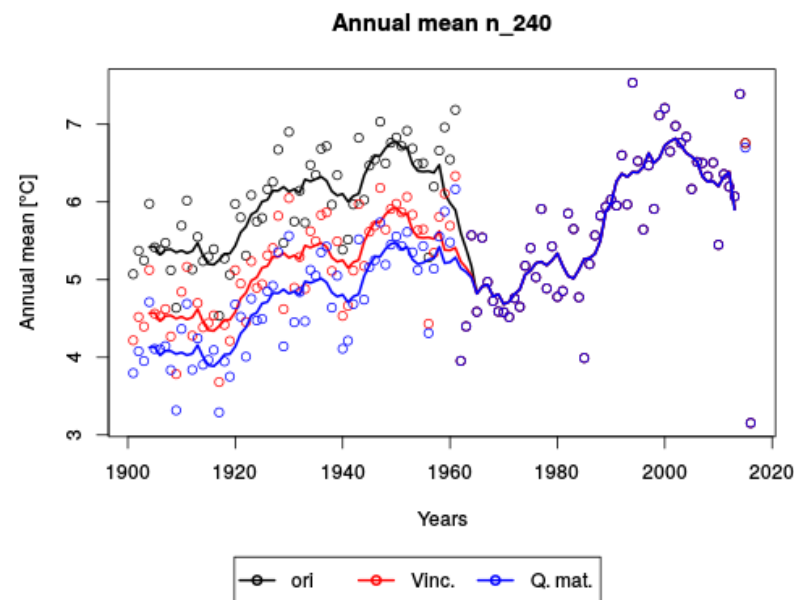


New developments: homogenization

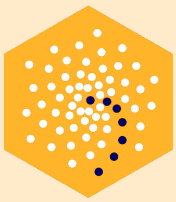
- Homogenization of *daily* data in ECA&D (EU-FP7 EUSTACE project)
- The plots below show two time series (ori) corrected using different methods: Vincent et al. (2002) [Vinc.], Qmat [Quantile matching], and Quantile matching without a reference series [QmatNoRef]



Groningen (NL)



Geneva (CH)

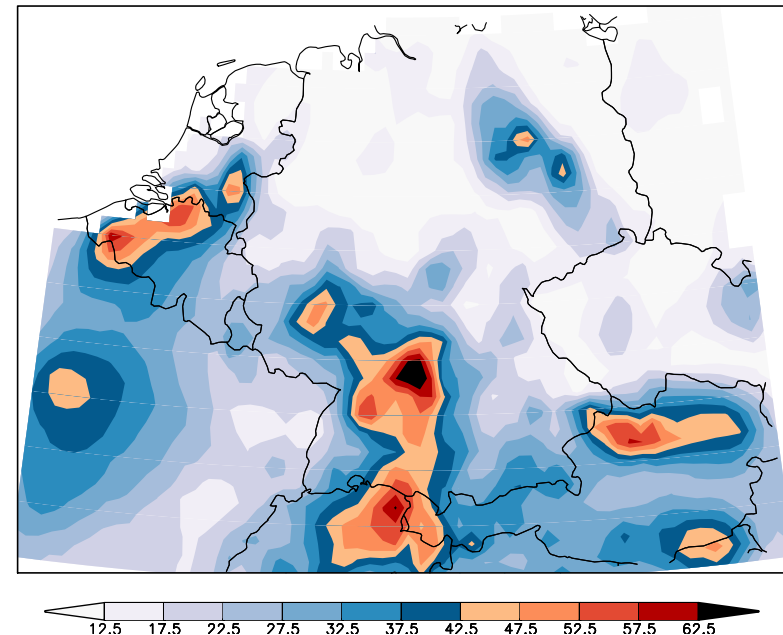


New developments: daily updates

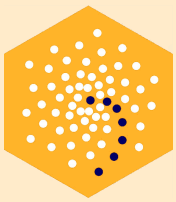
- Daily updates of E-OBS on the basis of data from GTS
- Provides input for near real-time attribution of extreme events (EU-EUCLEIA - EUropean CLimate Extremes Interpretation and Attribution)

Rapid attribution of the May/June 2016 flood-inducing precipitation in France and Germany to climate change

van Oldenborgh, G. J., et al., Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-308, in review, 2016.



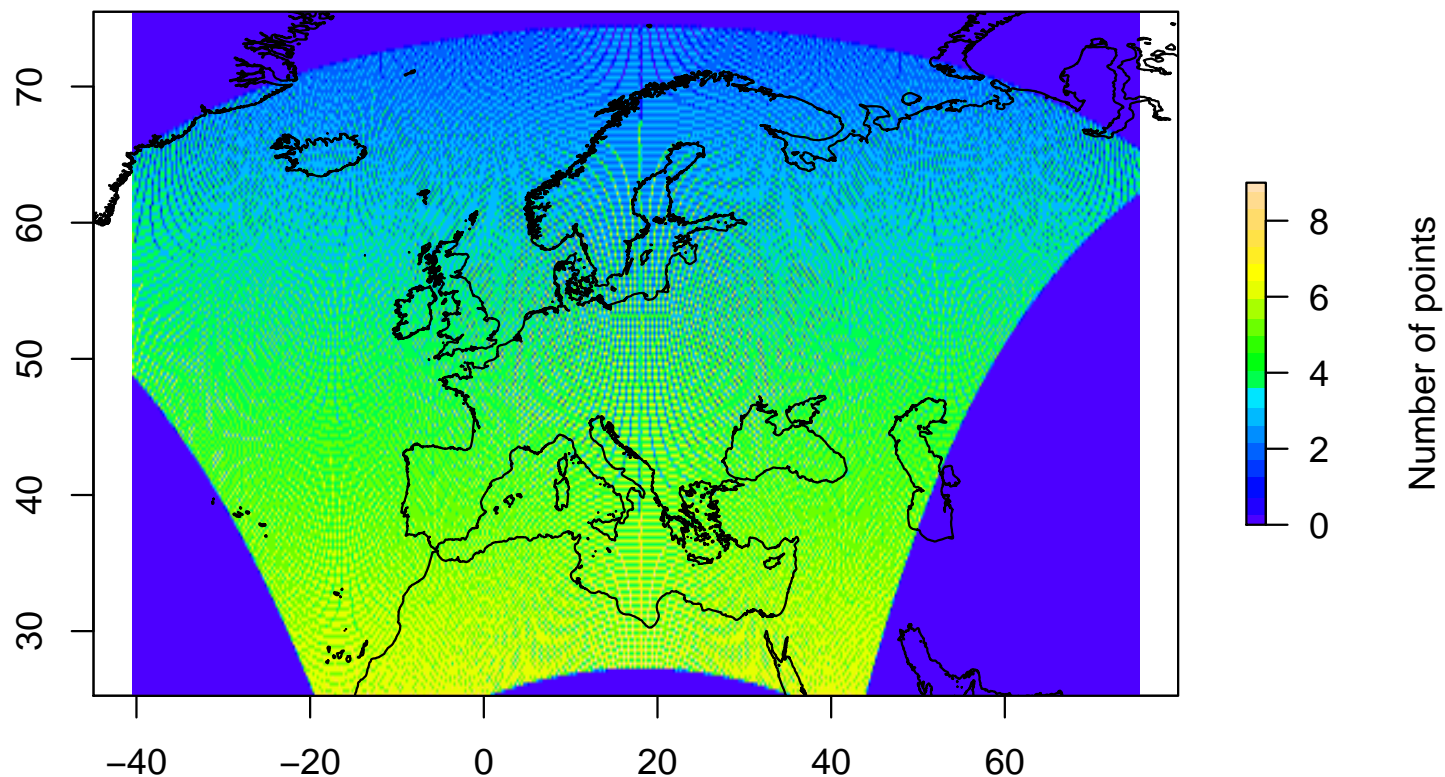
Highest 1-day precipitation in May 2016

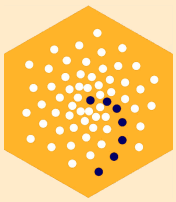


New developments: E-OBS Improvements

- Removal of an artifact that causes uneven variance across the domain

Count of high-resolution grid points per 0.25 coarse cell

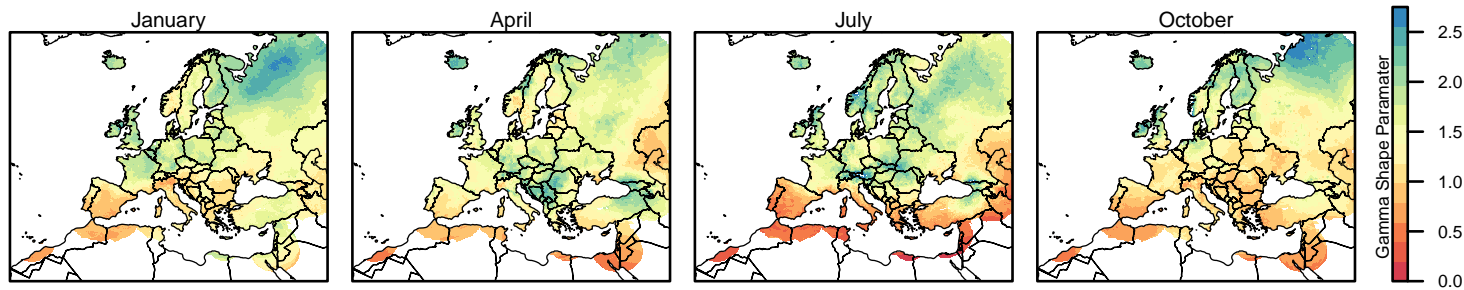




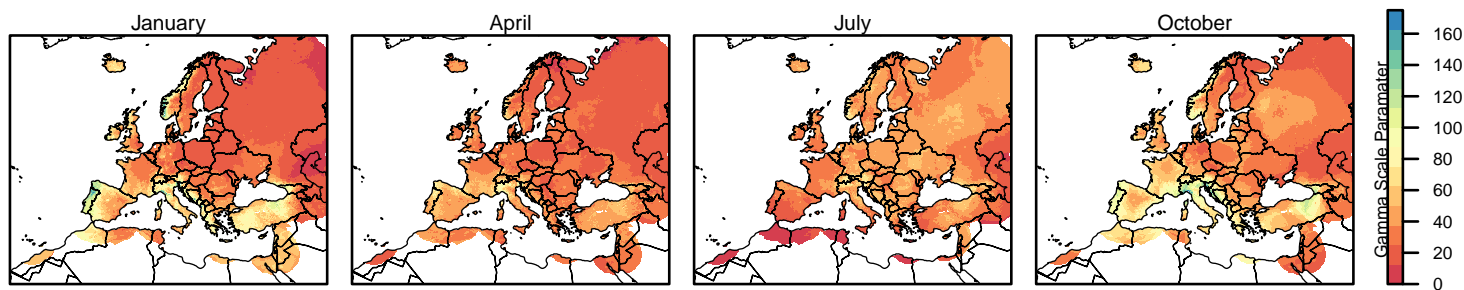
New developments: E-OBS Improvements

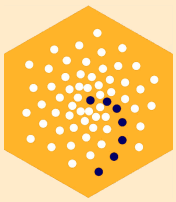
- Use of a Gamma distribution for gridding rainfall

Gamma Shape Parameter



Gamma Scale Parameter





New developments: E-OBS Improvements

- Ensemble of 100 equally probable grid realizations
- Provides improved uncertainty estimates
- Particularly useful for derived indices

