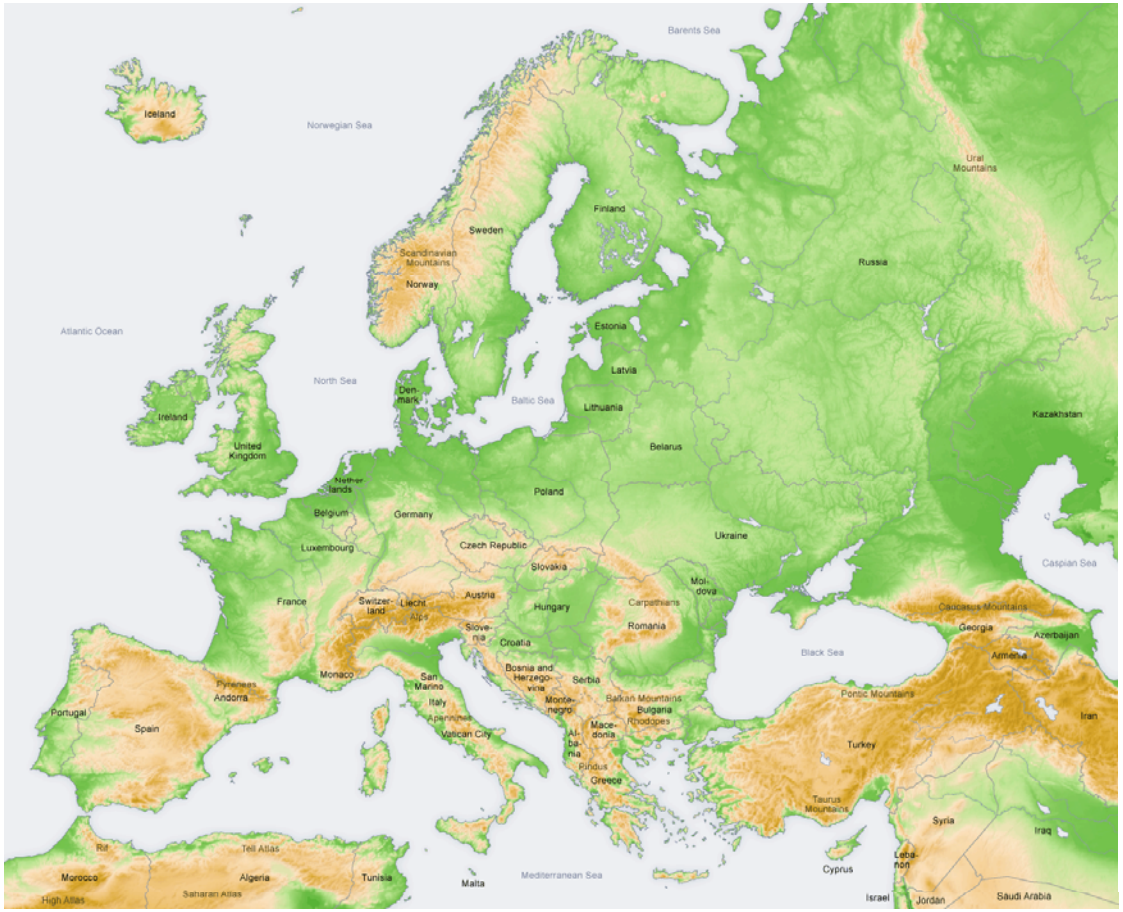
European Climate Data and Information Products for Monitoring and Assessment Needs

Albert Klein Tank, KNMI, Netherlands

Port of Rotterdam

Port of Rotterdam



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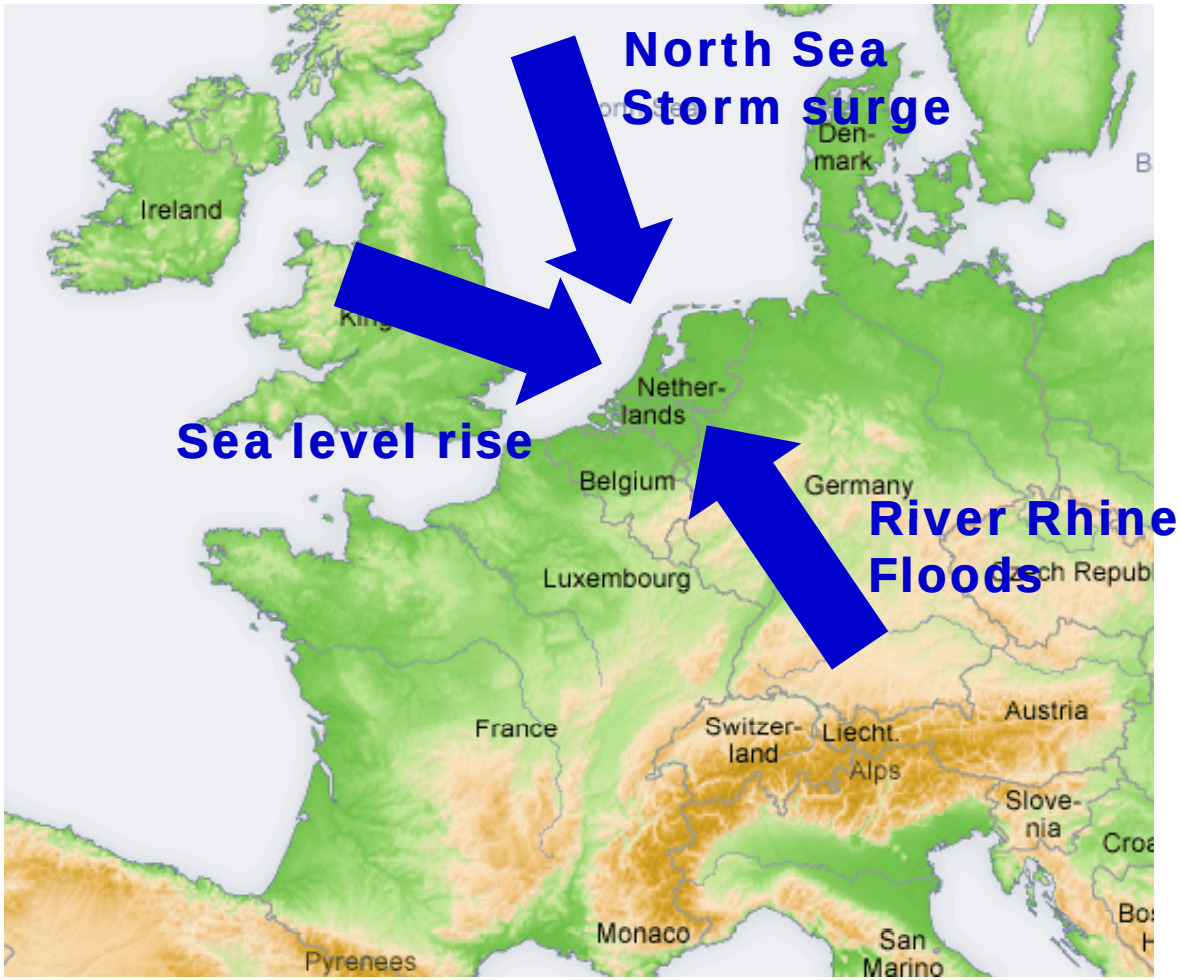



February 1953

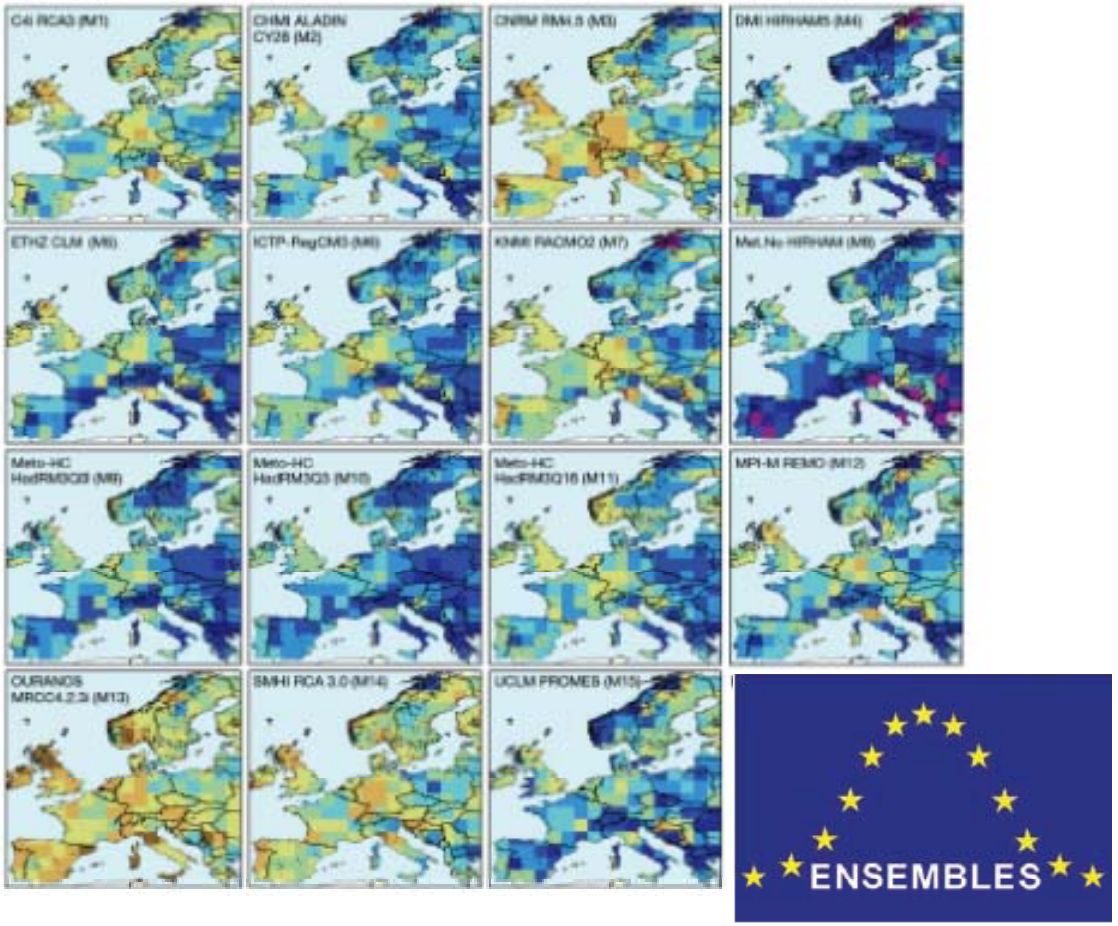
Port of Rotterdam

Storm surge barrier “Maeslant” (1997)

Nowadays, the design criteria of Dutch Delta works are based on:

- historical observations
  (return periods of extremes and trends)
- projections of future climate

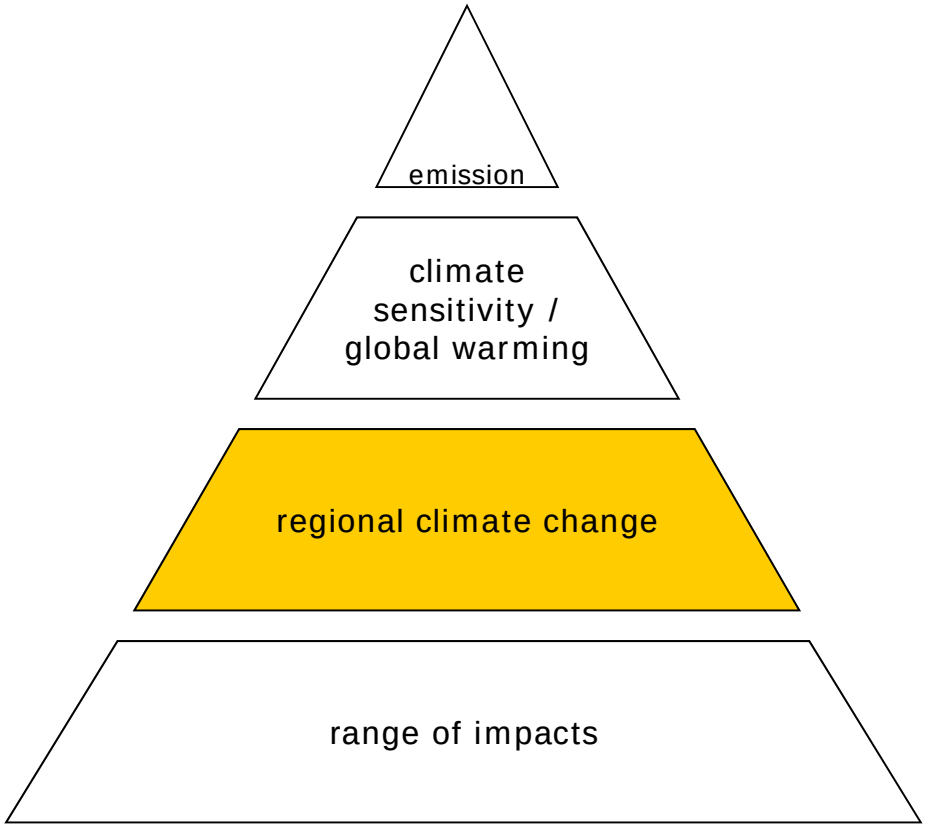
Projections of future climate at regional scale



Ensemble of model projections available (GCMs + RCMs)

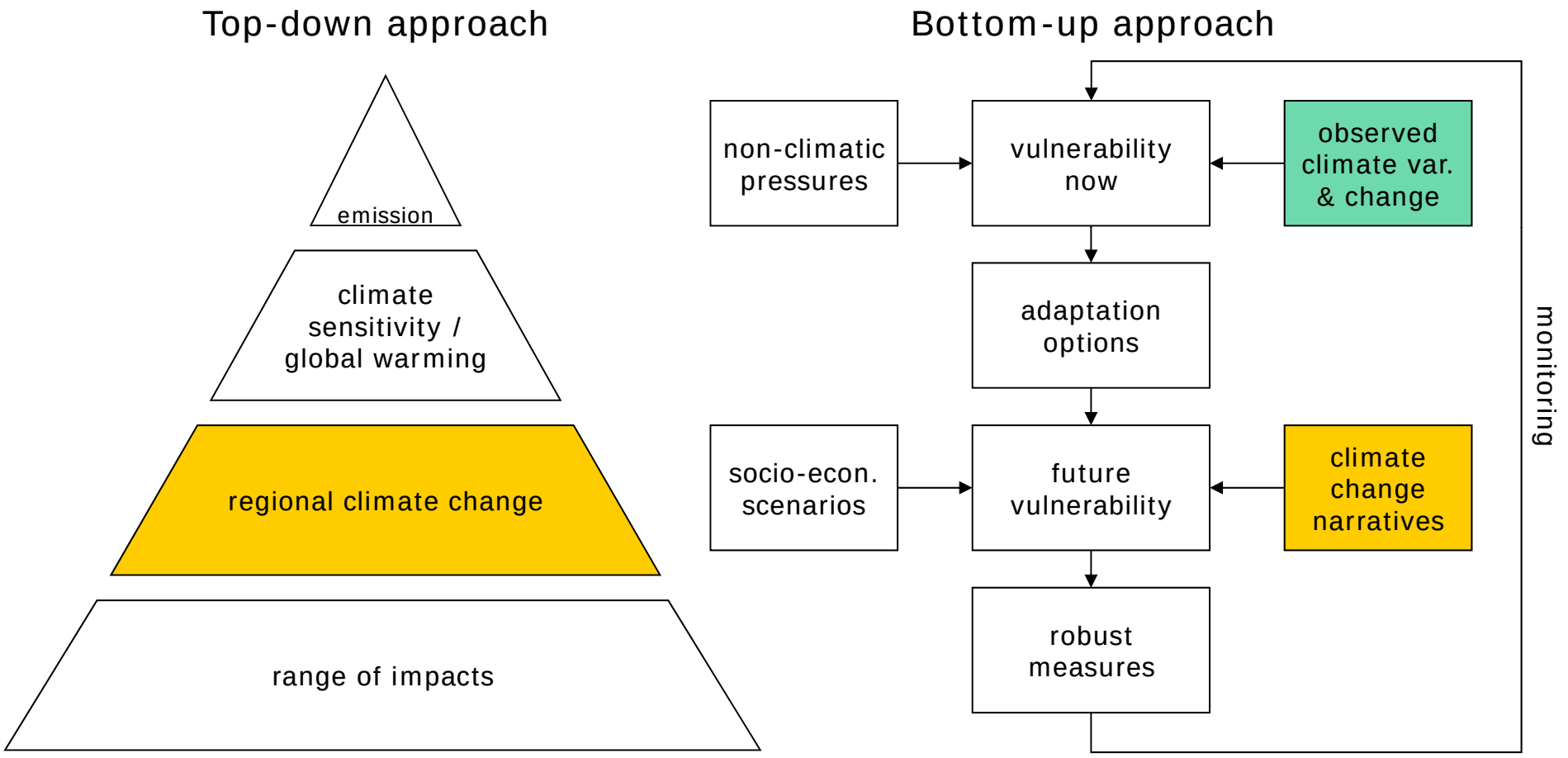
Projections of future climate at regional scale

Top-down approach



Schneider, 1983; Henderson-Sellers, 1993; Wilby and Dessai, 2010

Projections of future climate at regional scale



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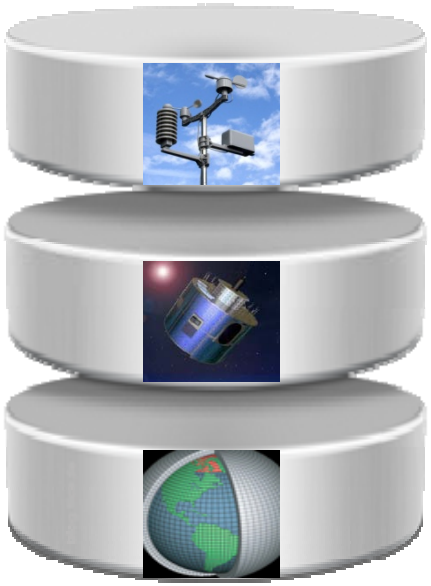

1) in-situ observations

2) satellite climate data records

3) (regional) reanalyses of past weather

Historical observations

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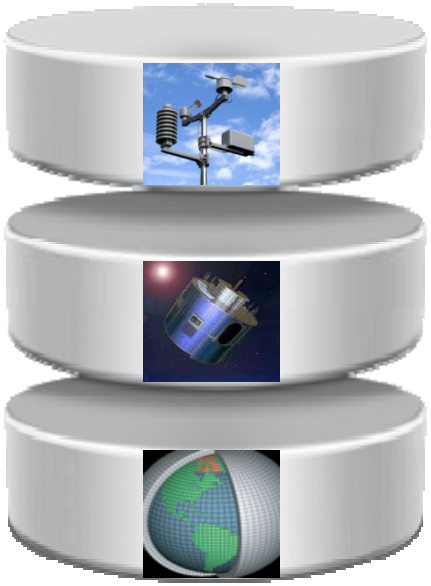
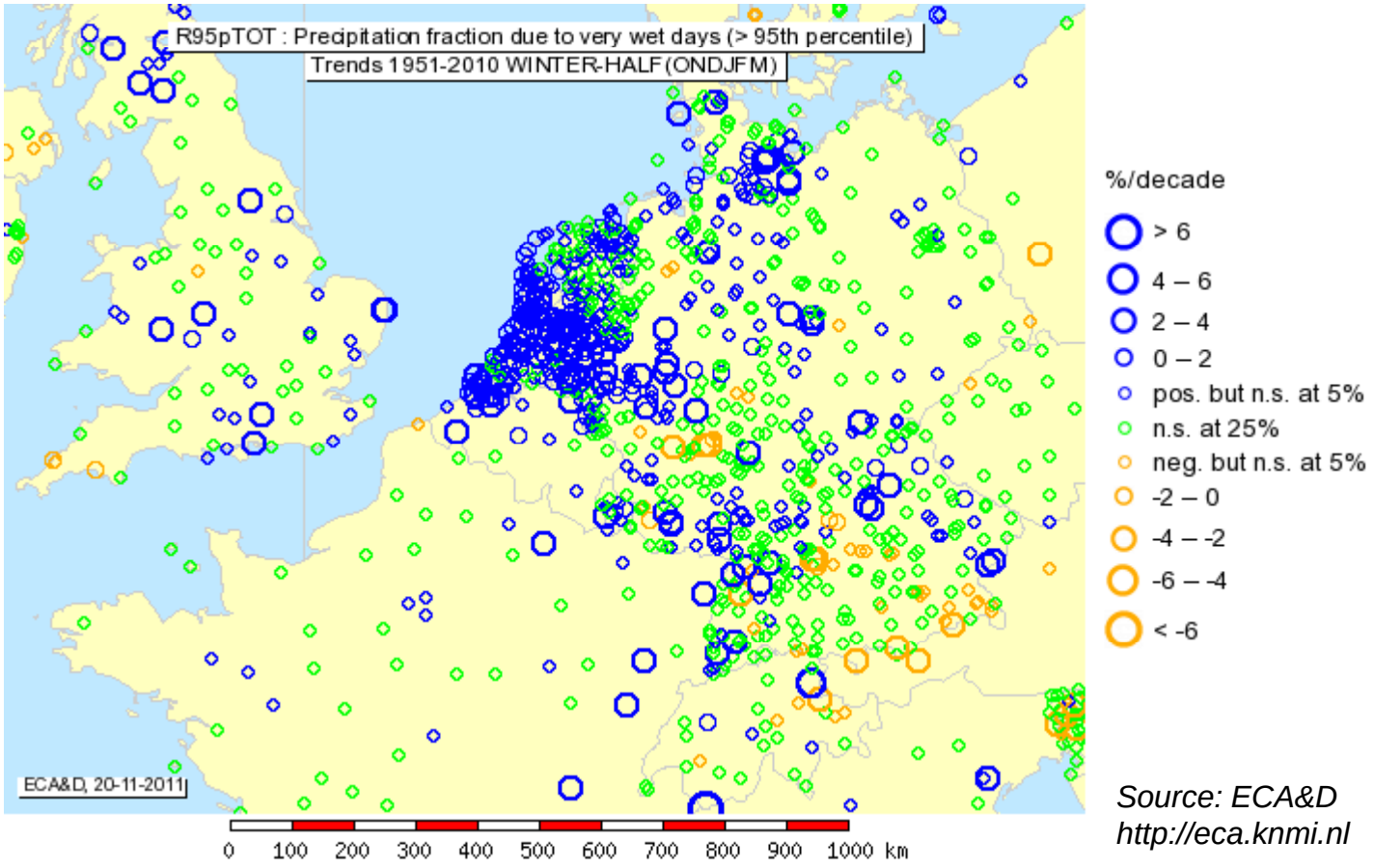


1) in-situ observations
   long-term records (50-100yr) but sparse

2) satellite climate data records
   spatially extensive but short (<30yr)

3) (regional) reanalyses of past weather
   complete but expensive and some bias

In-situ observations of precipitation extremes

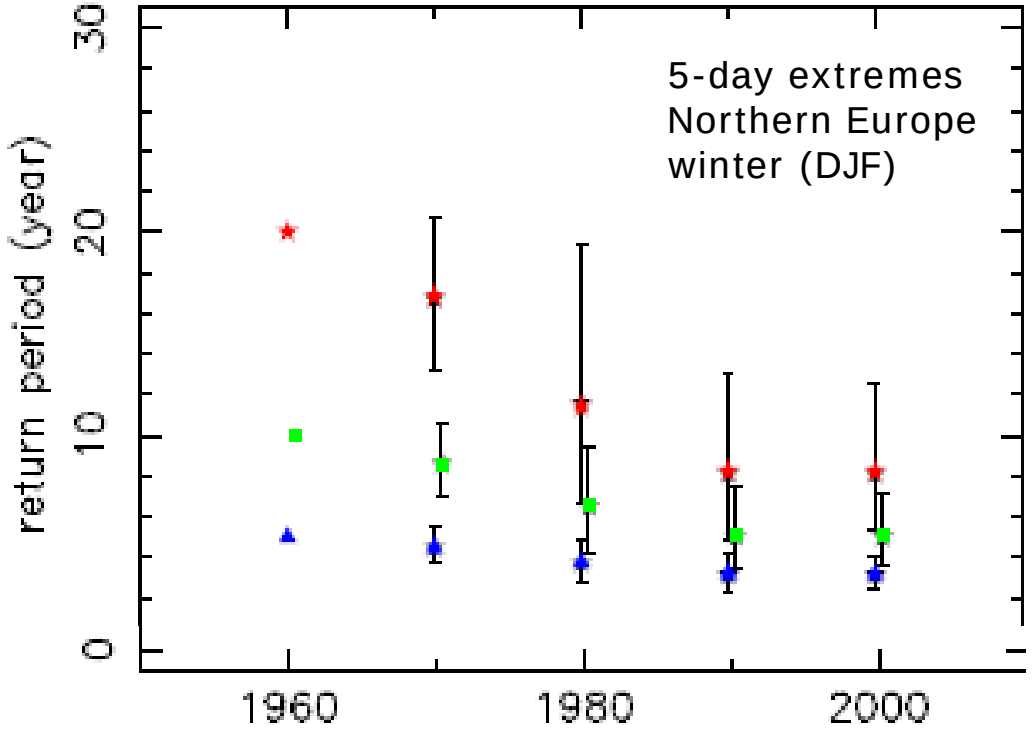


Increase in precipitation fraction due to heavy events is seen in other regions too (IPCC-AR4)

Source: ECA&D
http://eca.knmi.nl

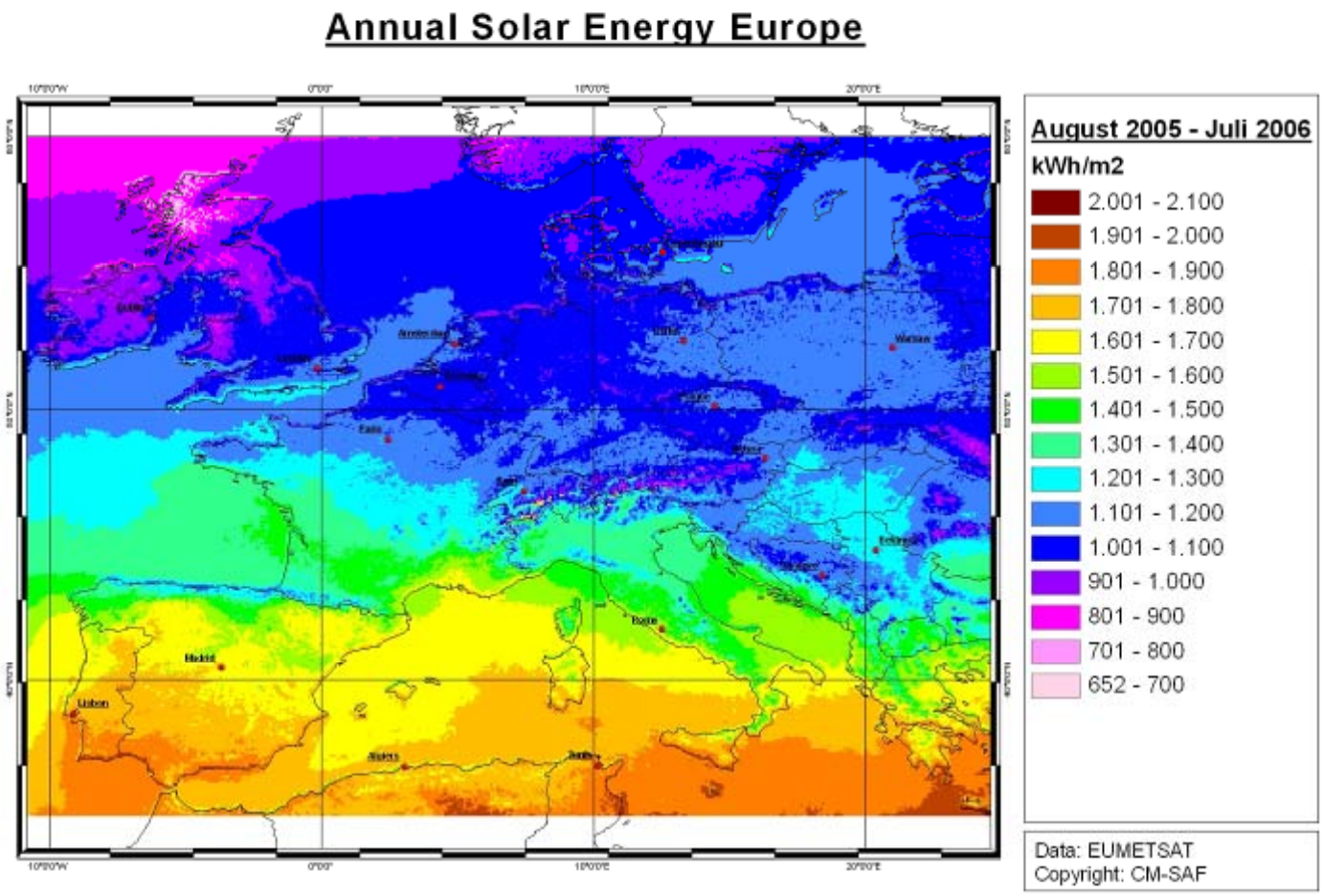
In-situ observations of precipitation extremes

Van den Besselaar et al., Int.J.Climatol., submitted

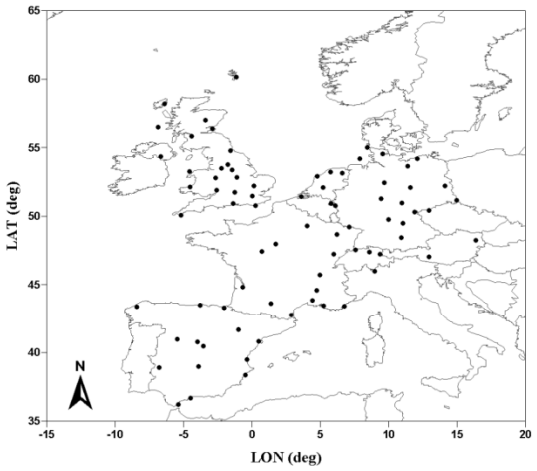


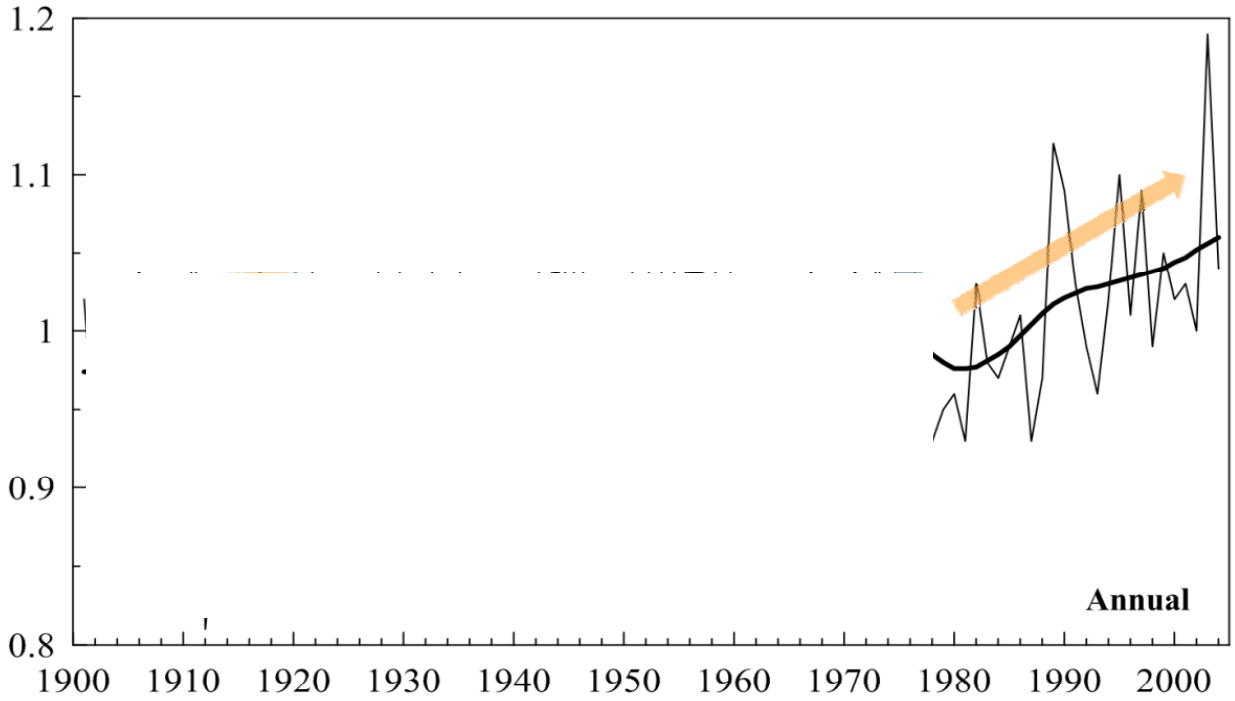
Reduction is in qualitative agreement with model projections for the 21st Century e.g. Kharin et al. J.Climate, 2007

Satellite climate data records



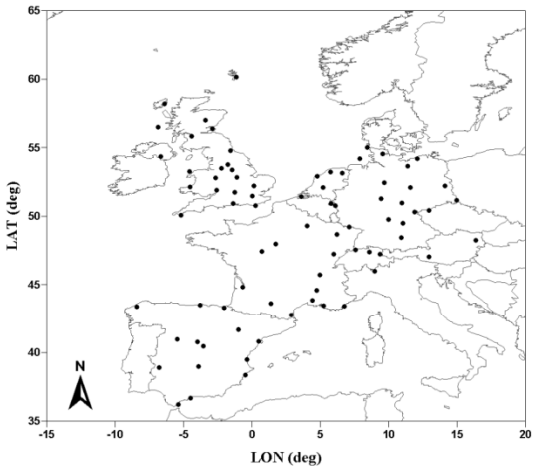
Decadal variability in solar energy potential

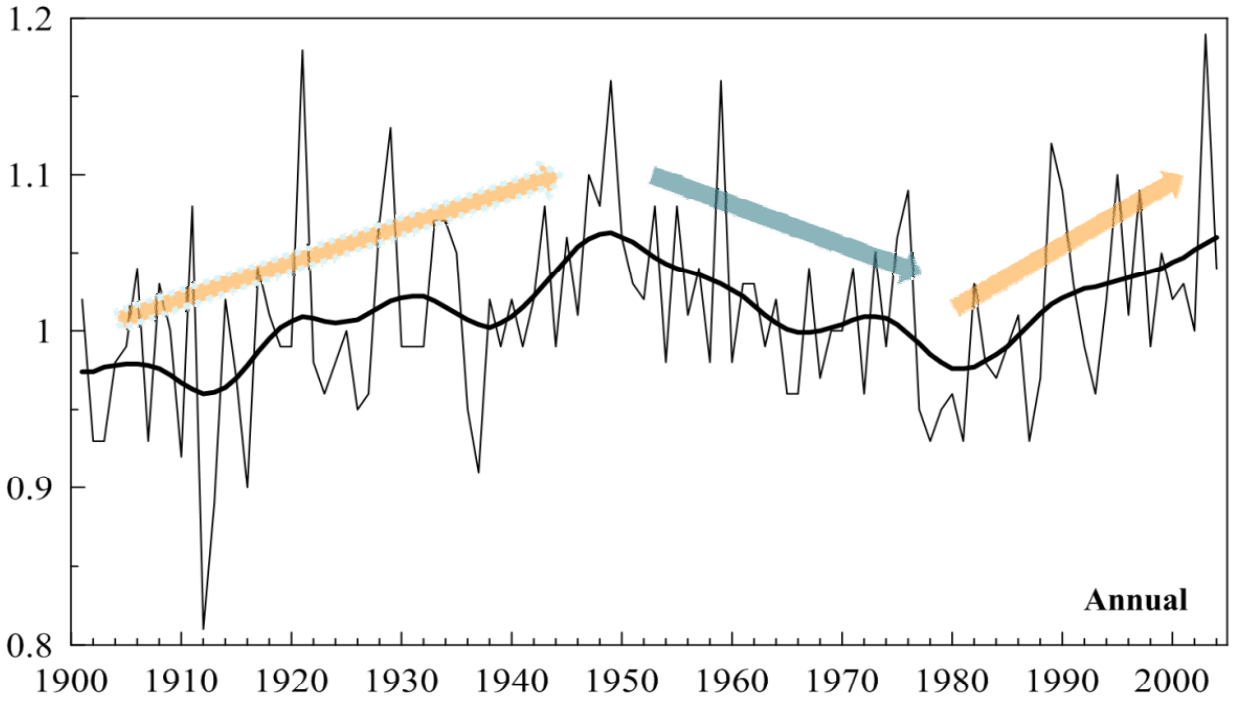




Subsequent periods of brightening, dimming, and brightening illustrated here with sunshine duration data from stations (Sanchez-Lorenzo, 2008)

Decadal variability in solar energy potential





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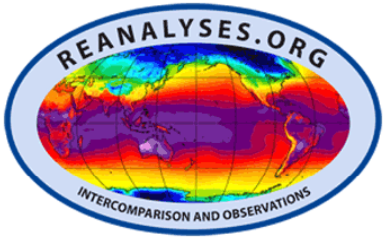
Reanalyses of past weather



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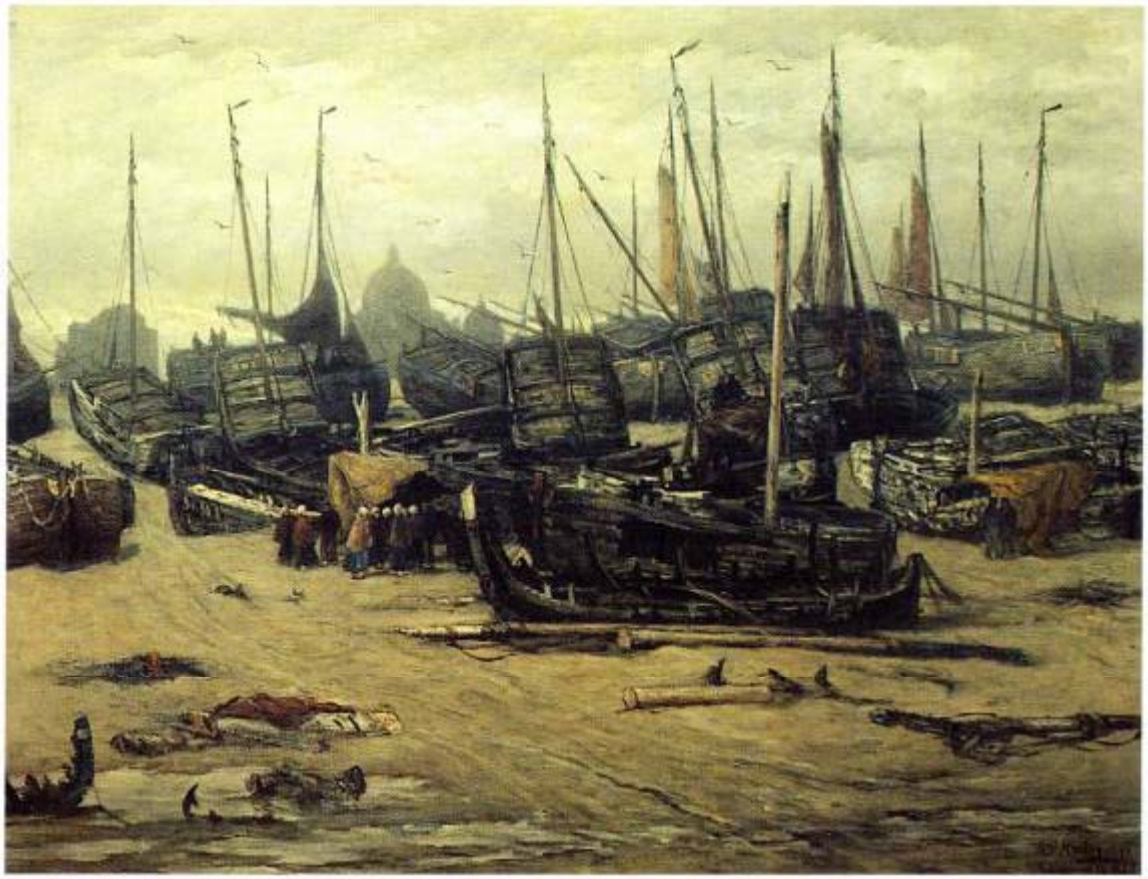
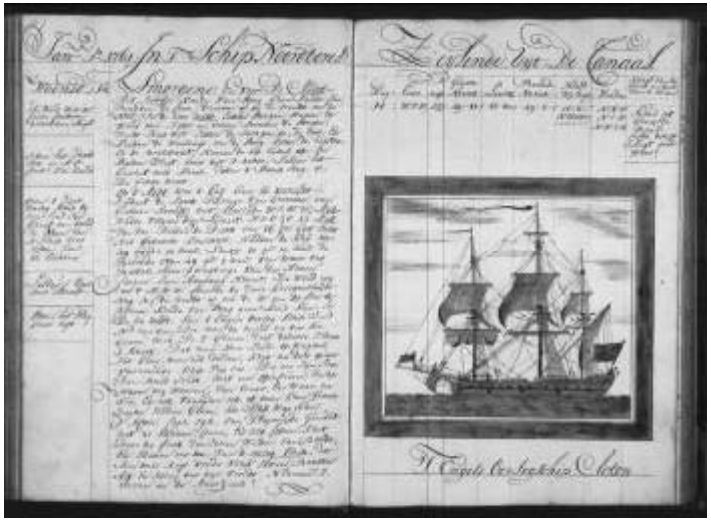
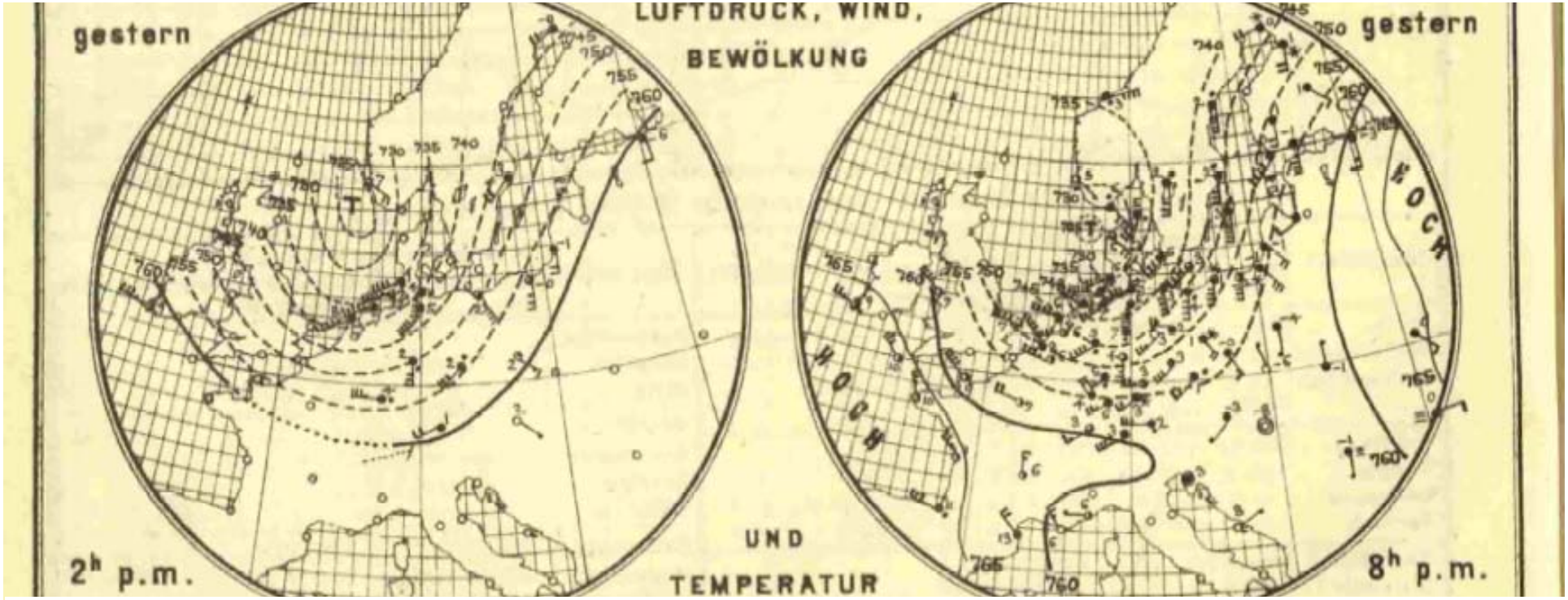
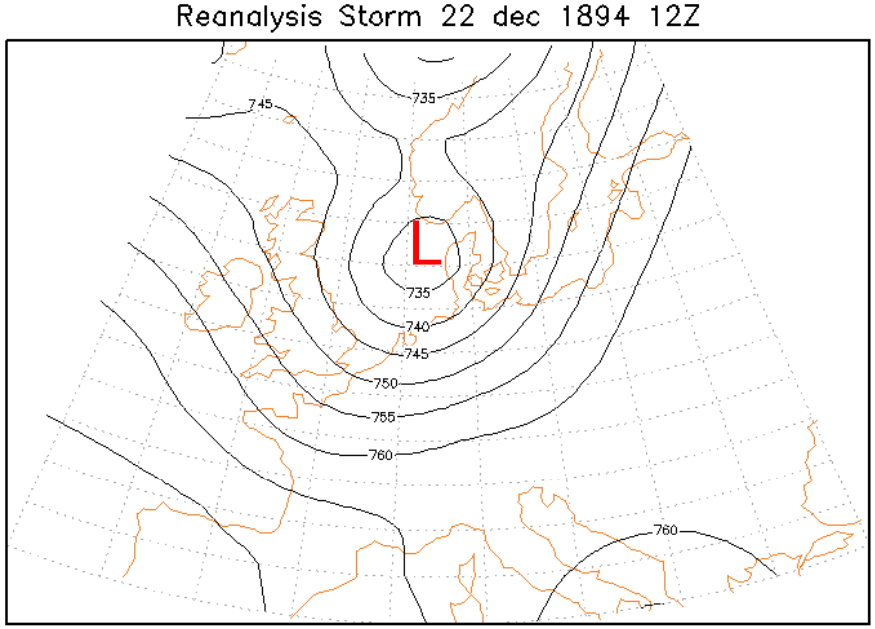


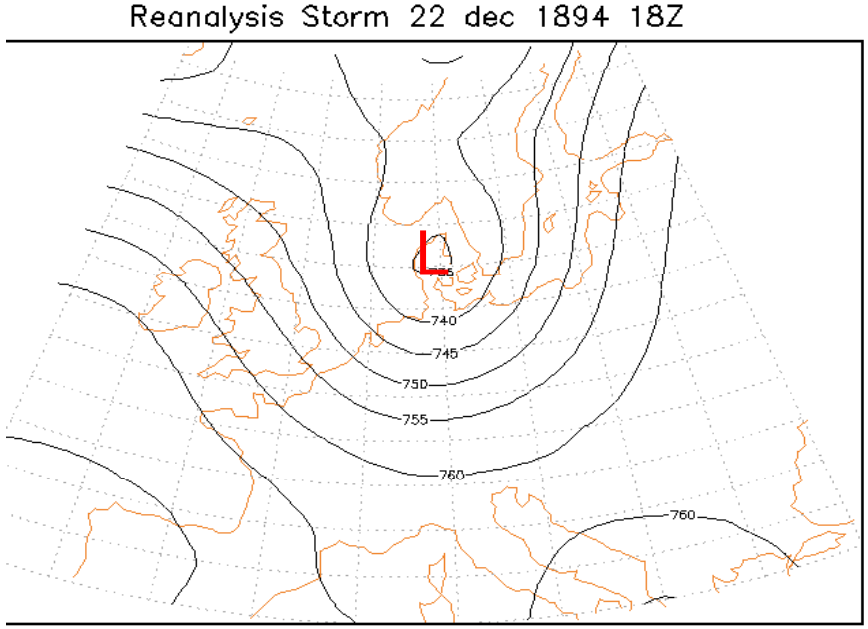
The 1894 storm
in NW Europe

included in the 20th Century Reanalysis by Compo et al., Quarterly Journal of the Royal Meteorological Society, 2011









Compo et al., Quarterly Journal of the Royal Meteorological Society, 2011

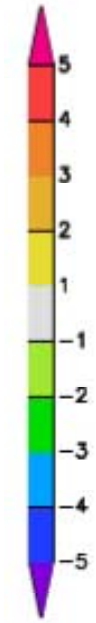
Towards more integrated products for Europe

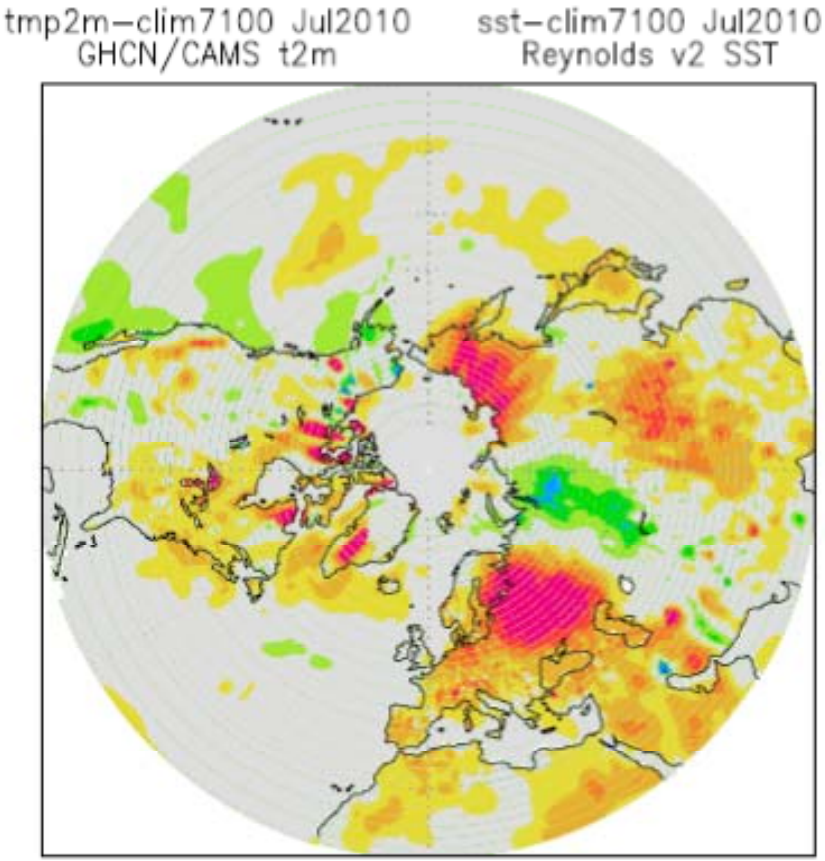
Climate Indicator Bulletins (CIBs)

- blend of data from stations, satellites and reanalyses
- user-oriented
- focus on trends and variability in impact relevant indicators of climate extremes

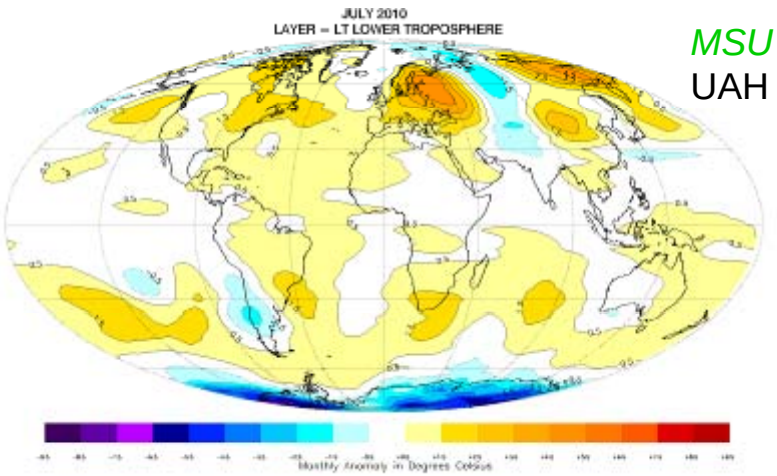
Moscow heat wave, July 2010

In-situ
NOAA

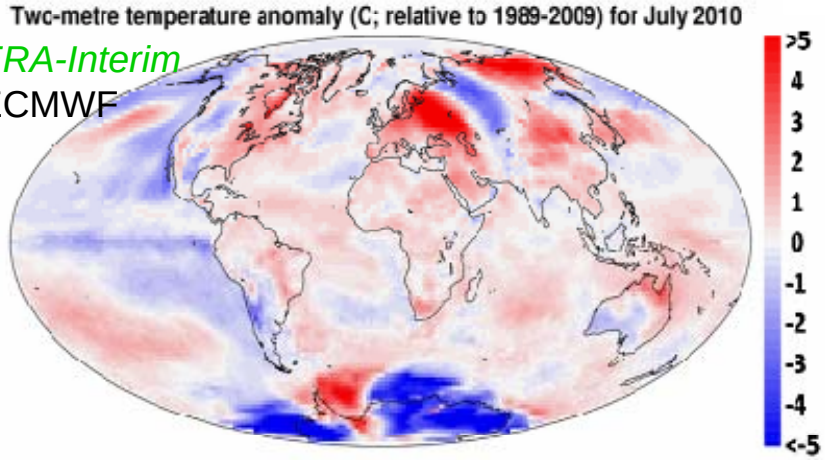




MSU
UAH



ERA-Interim
ECMWF



Courtesy: John Christy (top), Adrian Simmons (bottom)

Moscow heat wave, July 2010

31 days with T-max > 25°C against 9.5 days in a normal July

Source: ECA&D
http://eca.knmi.nl

16 nights with T-min > 20°C against 0.5 night in a normal July

Final remarks: user interaction

- Interaction between providers and stakeholders helps specify the needs in more detail
- Important to discuss and communicate the uncertainties (due to emissions, model limitations, internal variability, observational gaps/changes and errors)
- Lesson learned: guidance information is crucial

Thank you

http://climexp.knmi.nl

http://www.euro4m.eu

http://eca.knmi.nl