



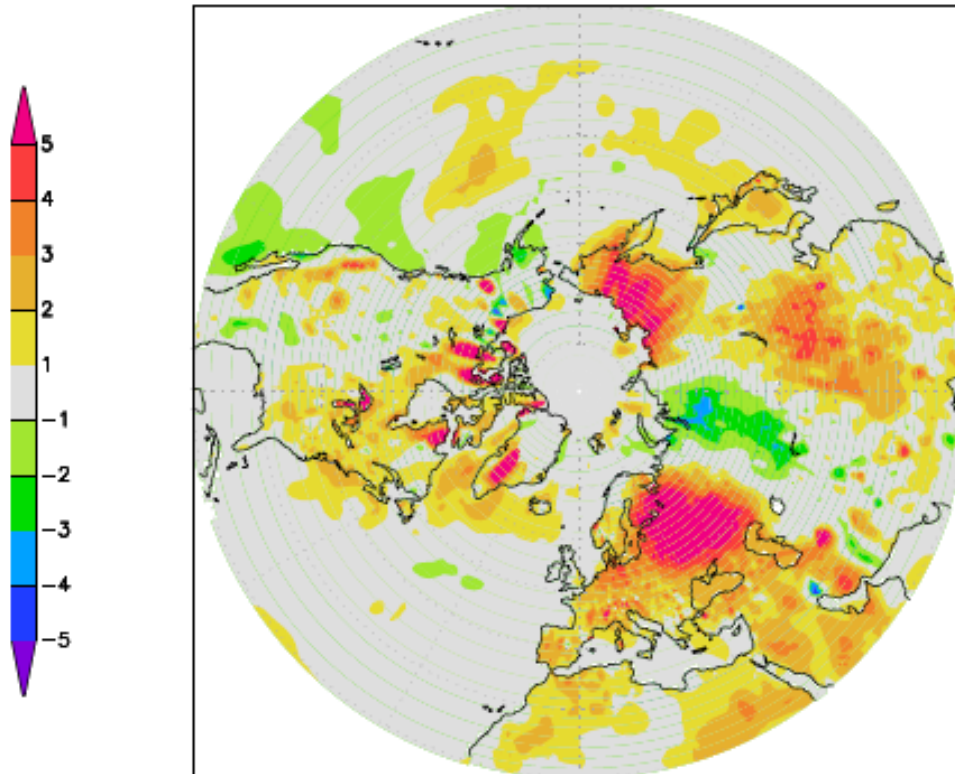
## Regional perspective and potential contributions

Albert Klein Tank  
KNMI, The Netherlands

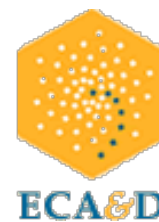
# Event: Moscow heat wave July 2010



tmp2m-clim7100 Jul2010      sst-clim7100 Jul2010  
GHCN/CAMS t2m                  Reynolds v2 SST

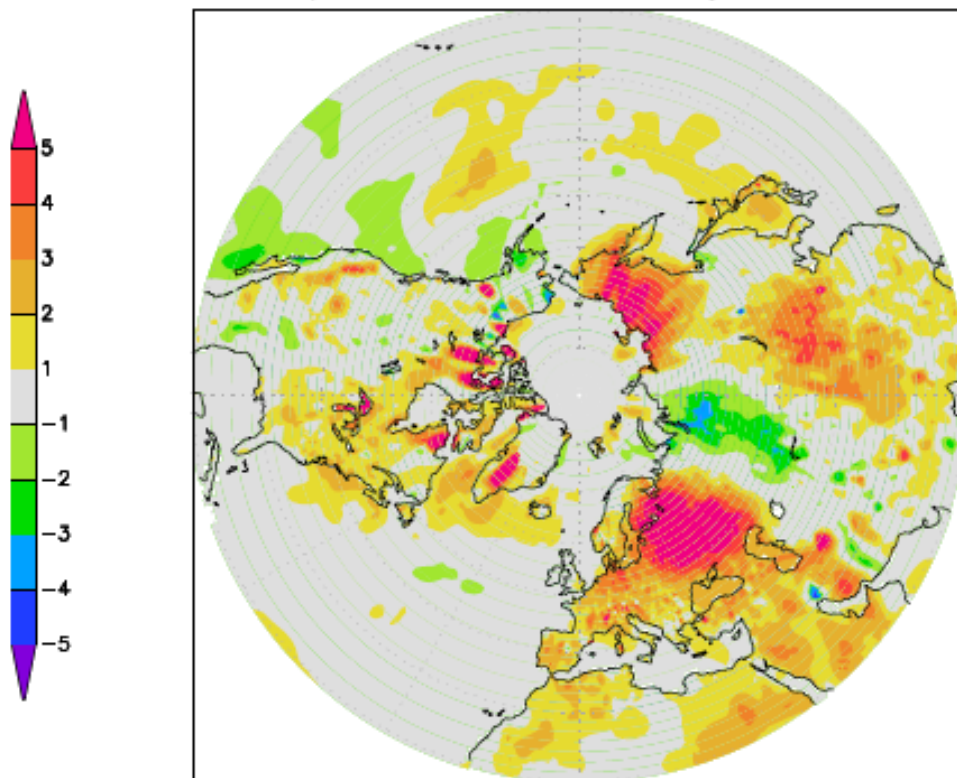


# Event: Moscow heat wave July 2010

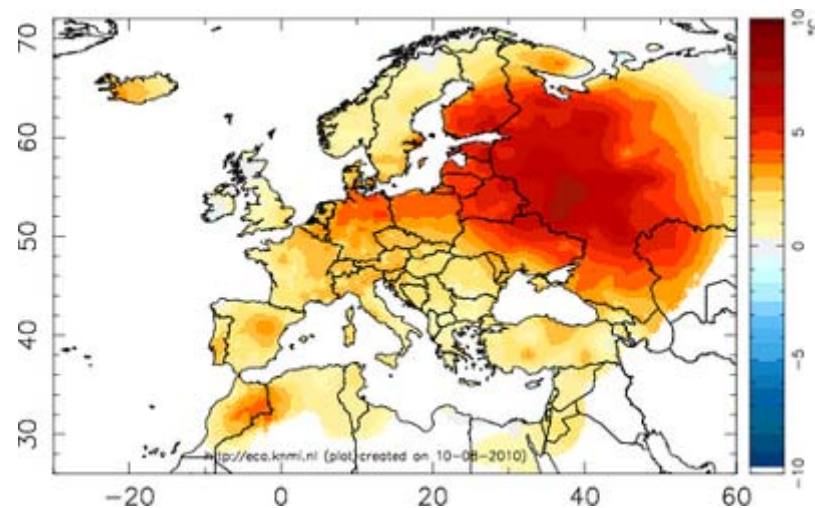


tmp2m-clim7100 Jul2010  
GHCN/CAMS t2m

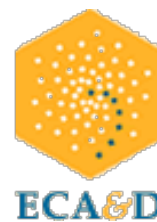
sst-clim7100 Jul2010  
Reynolds v2 SST



E-OBS, July 2010

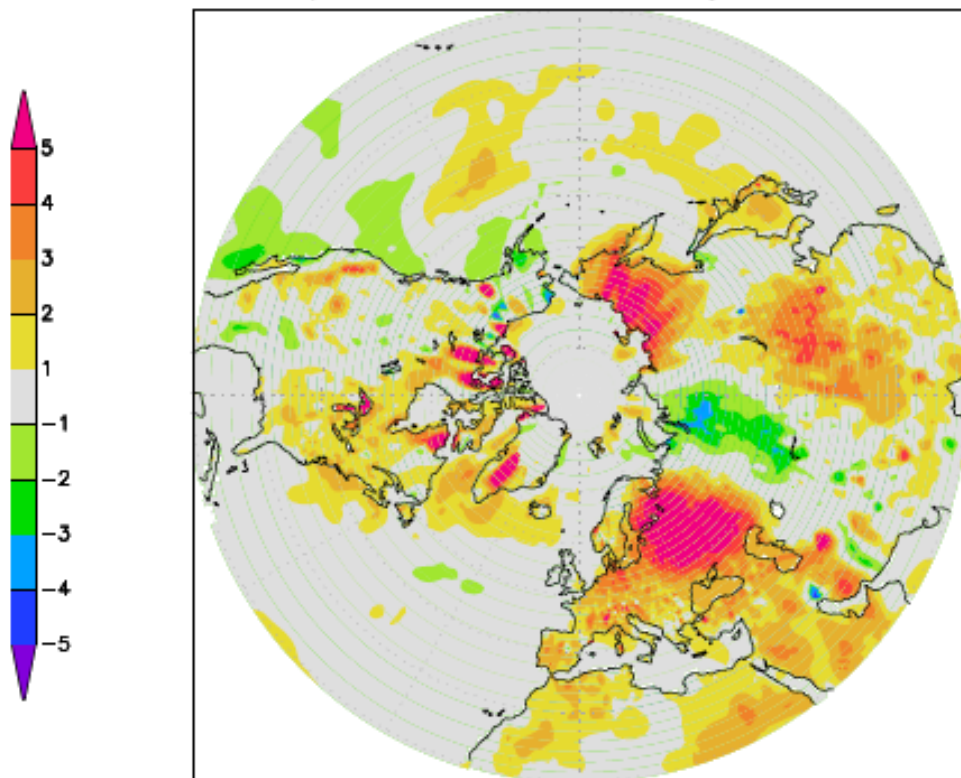


# Event: Moscow heat wave July 2010

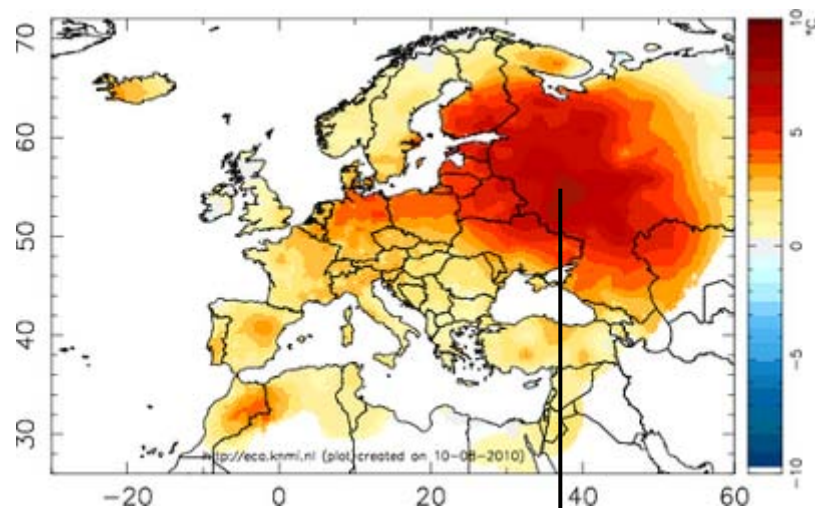


tmp2m-clim7100 Jul2010  
GHCN/CAMS t2m

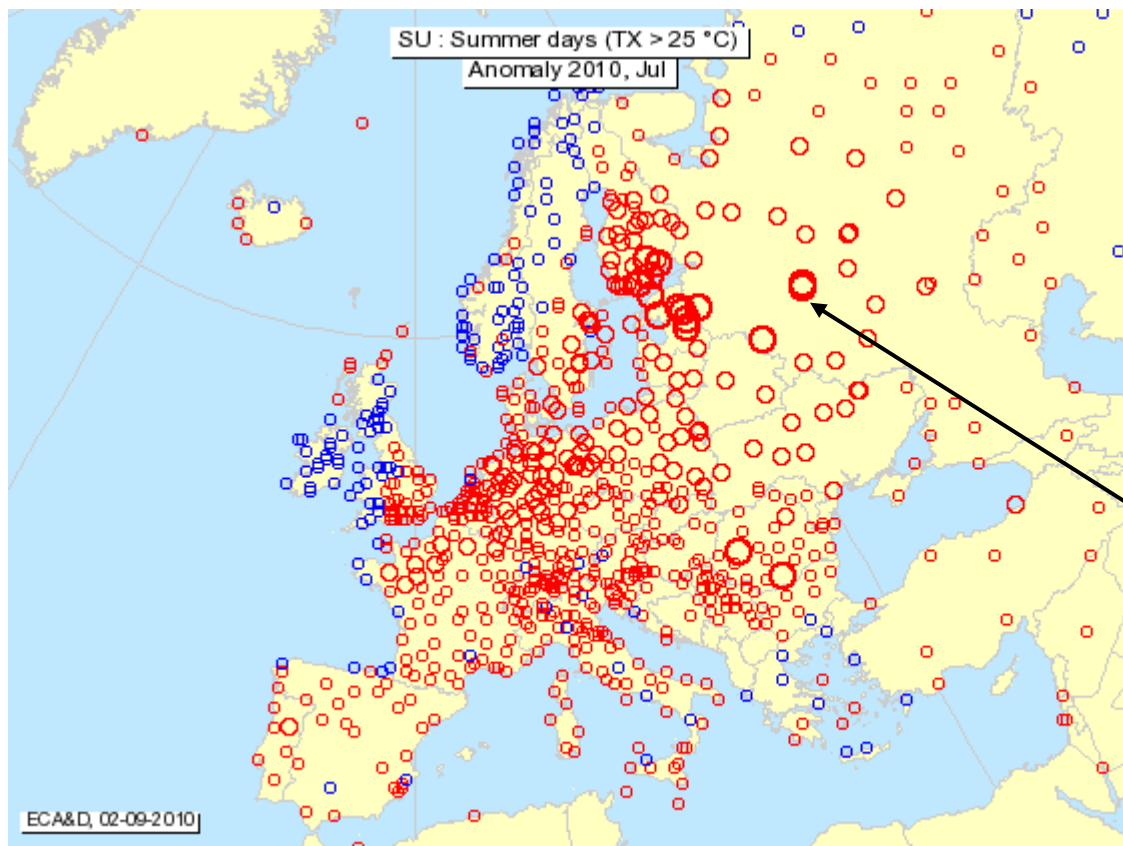
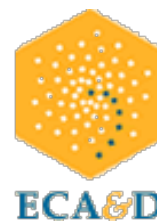
sst-clim7100 Jul2010  
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E-OBS, July 2010

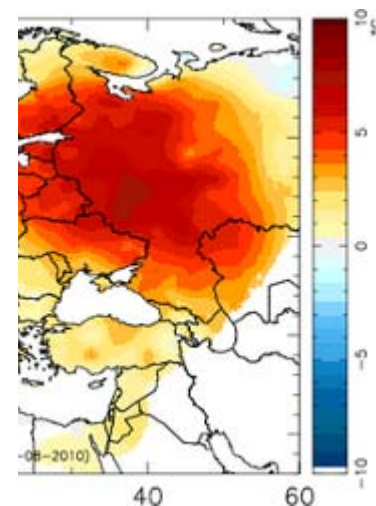


# Event: Moscow heat wave July 2010



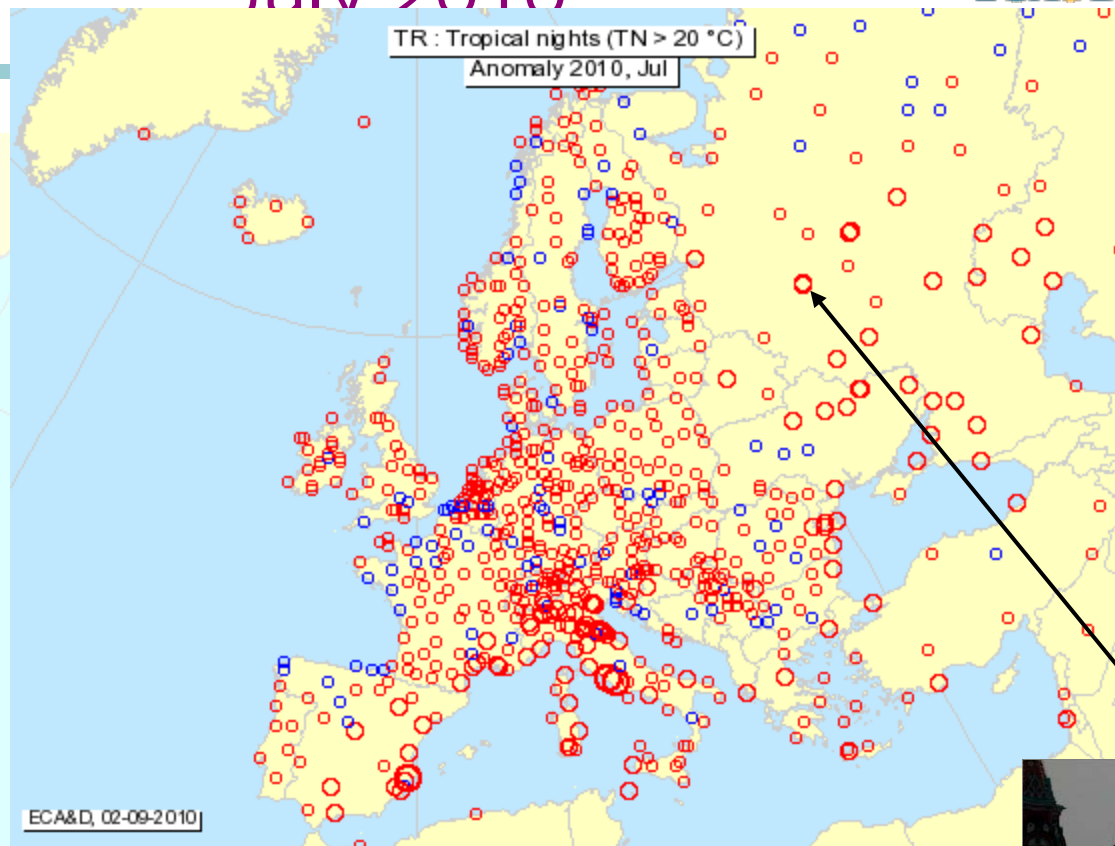
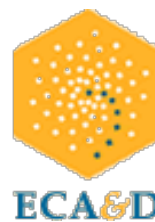
0 400 800 1200 1600 2000 2400 2800 3200 3600 4000 km

2010



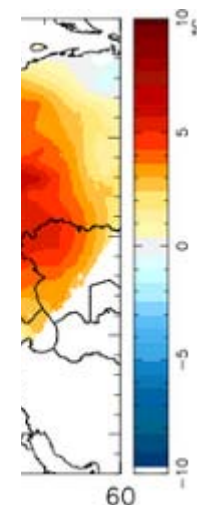
31 days with  
Tx > 25 °C;  
normal is  
9.5 days

# Event: Moscow heat wave July 2010



day  
deviation from  
1961-1990 average

-  > 30
-  20 – 30
-  10 – 20
-  0 – 10
-  -10 – 0
-  -20 – -10
-  -30 – -20
-  < -30



ECA&D, 02-09-2010

0 400 800 1200 1600 2000 2400 2800 3200 3600 4000 km

ECA&D, 02-09-2010

0 400 800 1200 1600 2000 2400 2800 3200 3600 4000 km



16 nights  
with  
 $T_n > 20\text{ }^\circ\text{C}$ ;  
normal is  
0.5 nights

# Outline of issues



- The data requirements for assessing extreme events (and for providing climate services) are more demanding than for measuring global warming
- Ongoing European projects illustrate the benefit of joining the databases of Met Services and Universities from different countries in a region
- Successful worldwide coordination of regional activities is provided by the international Expert Team on Climate Change Detection and Indices (ETCCDI)
- Lessons learned; what worked, what didn't, and which contributions can be expected from regional nodes

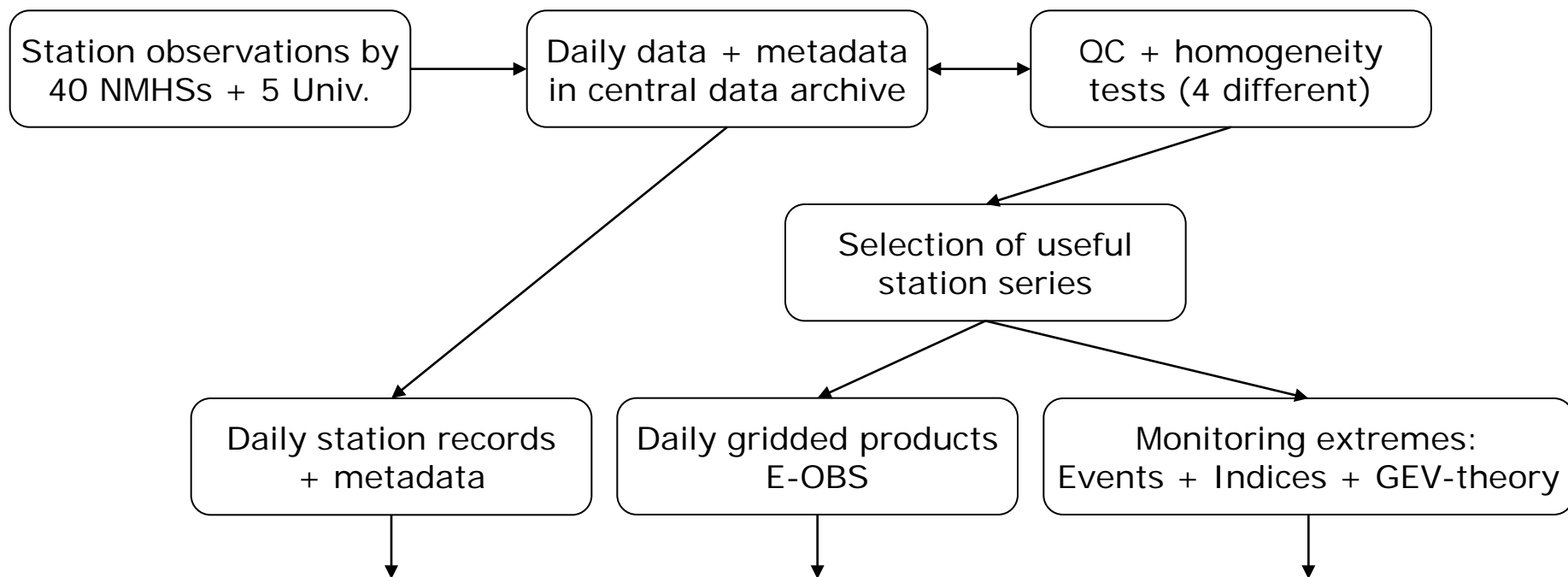
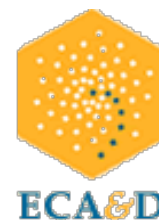
# Ongoing European projects



1. European Climate Assessment & Dataset (ECA&D, <http://eca.knmi.nl>)
  2. European Reanalysis and Observations for Monitoring (EURO4M, <http://www.euro4m.eu>)
- Both projects are joint activities of Met Services and Universities sponsored by the European Union
  - Goal is to describe the past evolution of weather & climate extremes and to provide near-real-time monitoring information plus access to the underlying daily data (and metadata)
  - Complementary approaches are used: regional observation datasets of Essential Climate Variables (stations & satellites) and regional reanalysis (based on advanced weather models)
  - Multiple project outcomes: mixture of science and services



# Data processing steps in ECA&D



European Climate Assessment & Dataset

Website <http://eca.knmi.nl>

Home

FAQ

Daily data

Indices of extremes

Return values

Extreme events

Project info

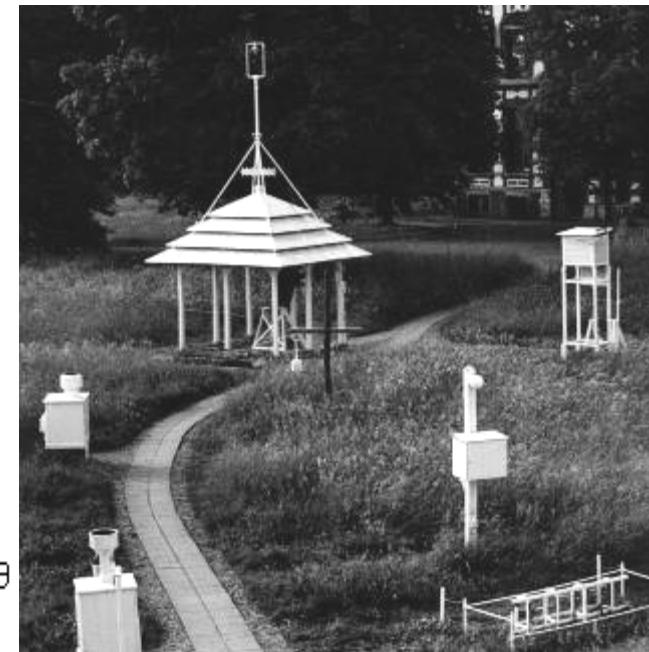
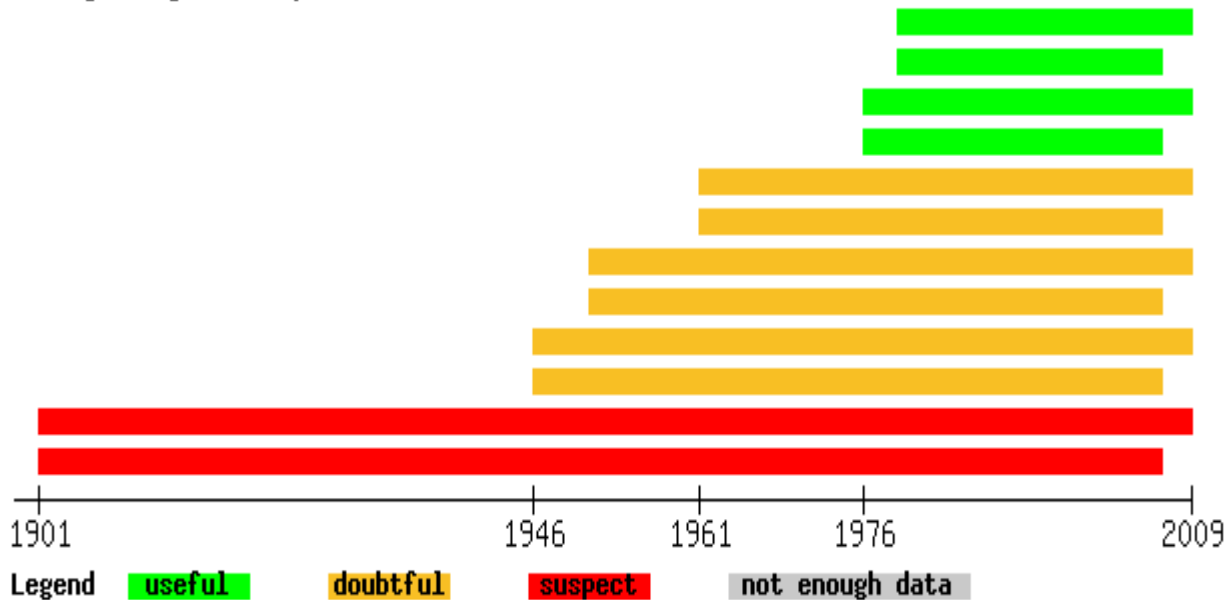
Home

# QC + homogeneity tests

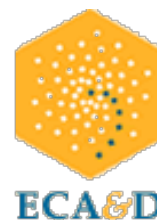


- Statistical homogeneity tests are complemented by metadata (incl. primary source, station/instrument history and site photos); the results guide the selection of data for monitoring products

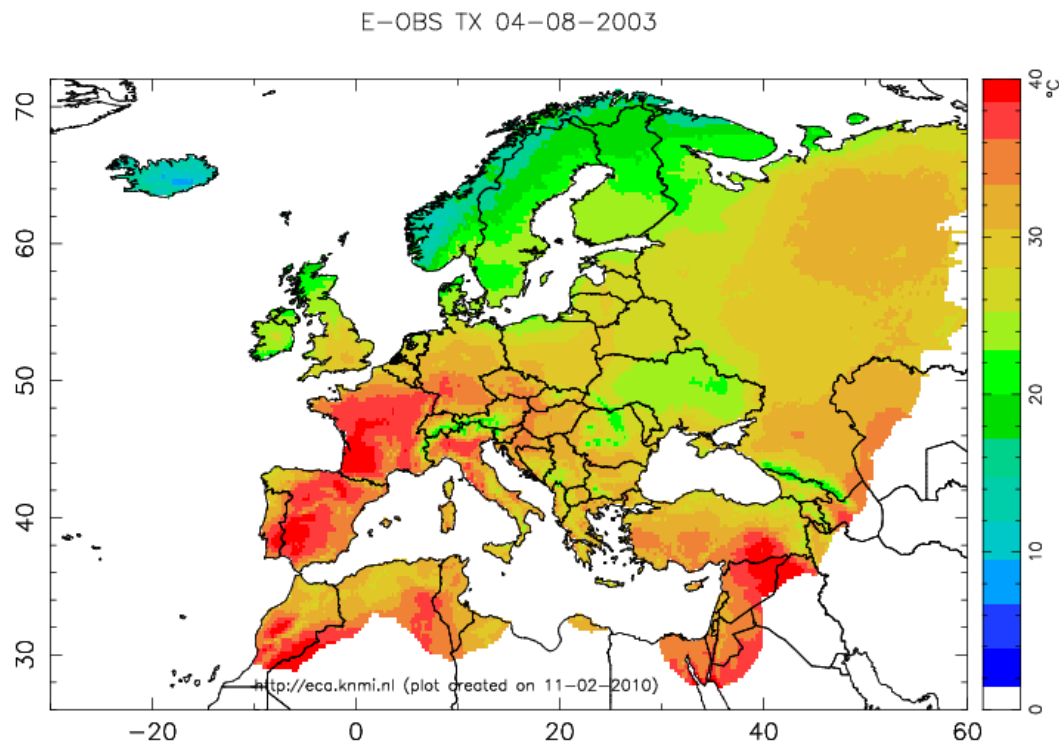
Homogeneity for temperature series DE BILT, NETHERLANDS



# Daily gridded products (E-OBS)



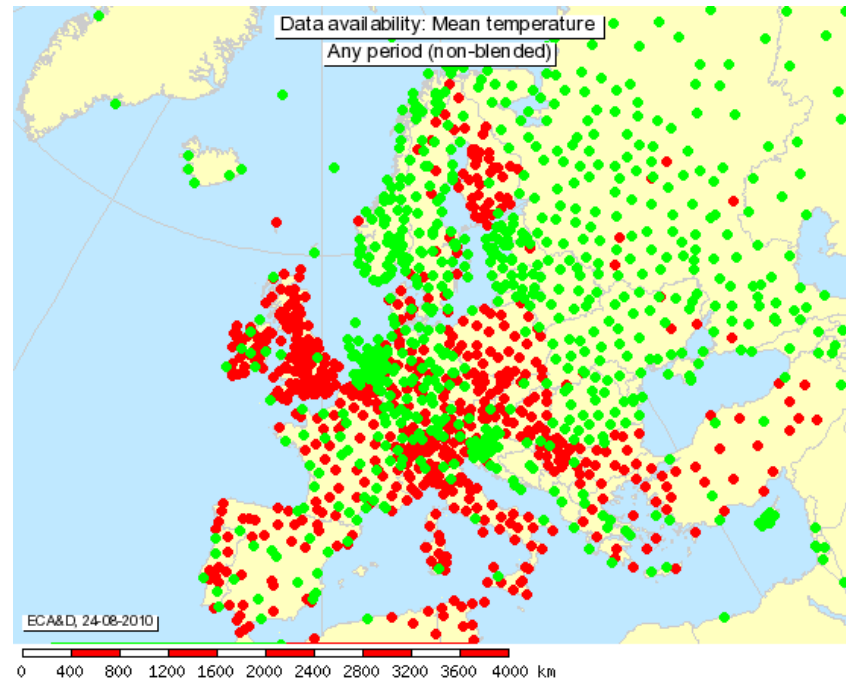
- Station records are the only source here
- Two-step interpolation method (Haylock et al., J. Geophys. Res., 2008)
- Daily fields
- 1950 – now
- 0.25 deg and 0.50 deg resolution
- Matching the common RCM grids in Europe
- Associated error fields exist, but these are rarely used!



# Daily station records and metadata

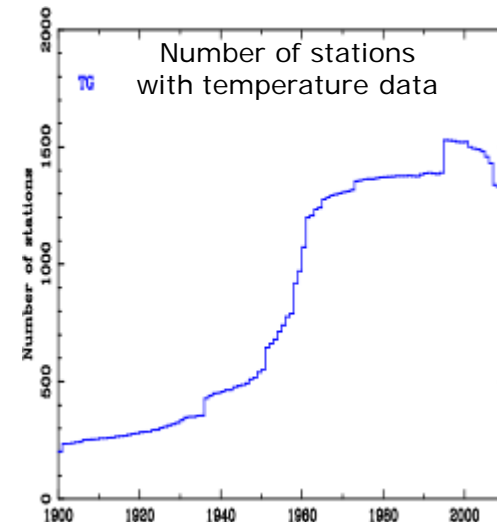


- About 60% is “public”, i.e. available from the ECA&D website
- For the other stations, only the metadata and derived products can be released from the central website <http://eca.knmi.nl>



Data availability maps  
(public = downloadable)

- Public data
- Non-public data



# Successful global coordination - the ETCCDI -



- European and similar activities elsewhere are coordinated worldwide by the Expert Team on Climate Change Detection and Indices (ETCCDI)
- ETCCDI is a group of scientists jointly sponsored by several international agencies (WMO-CCI/WCRP-CLIVAR/JCOMM)
- Defined a list of 27 standardized indices calculated from daily data to describe extremes (often counts of days exceeding fixed or percentile thresholds) used in IPCC TAR and AR4 for observations and models



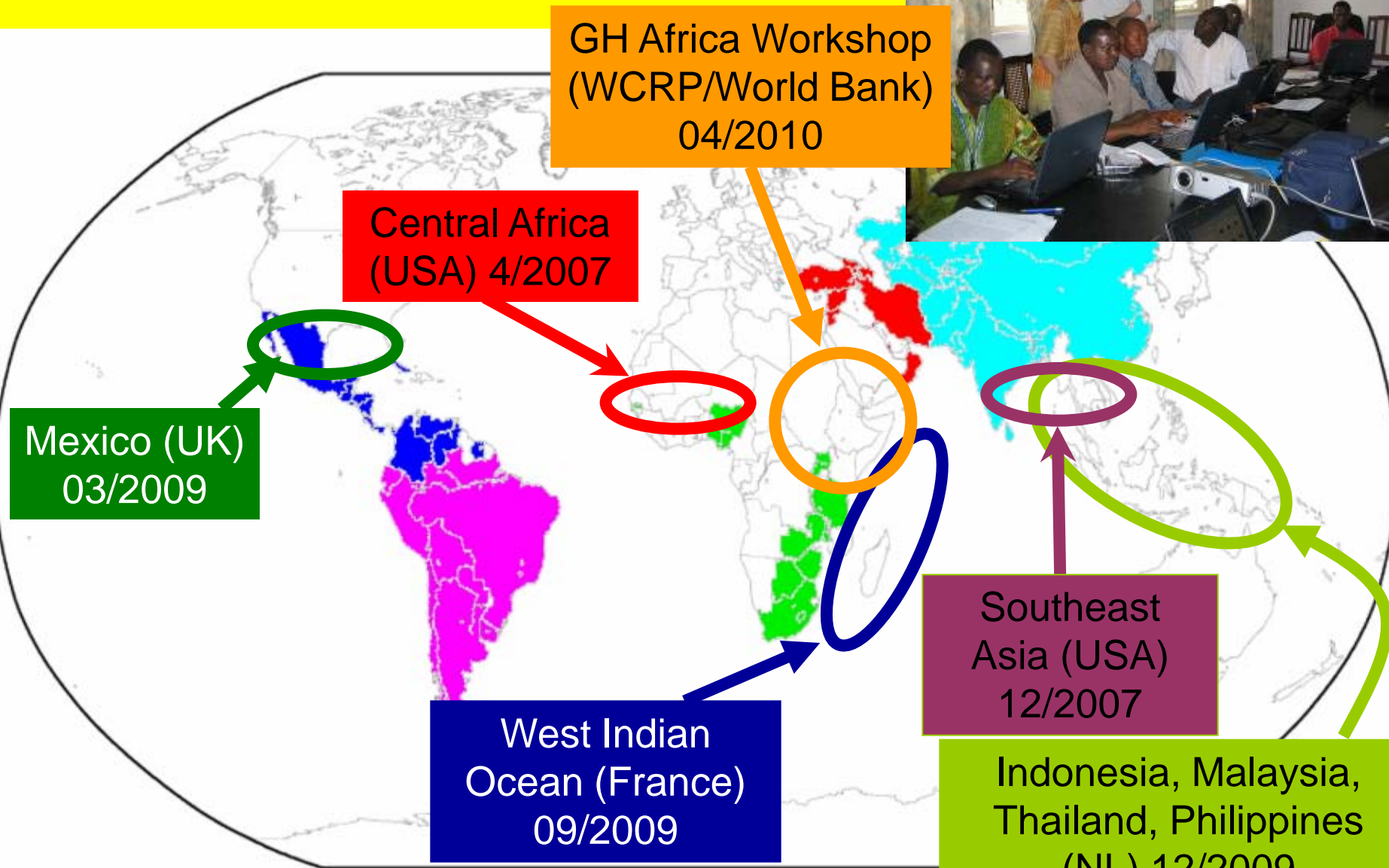
# Regional workshops



- Expert Team also organizes regional workshops with goal to:
  - build capacity to analyze observed changes in extremes
  - improve information services on extremes in the region
  - contribute to a worldwide indices database
  - publish a peer-reviewed paper from each workshop
- Environment Canada provides, maintains, and further develops the R-based workshop software (freely available from <http://cccma.seos.uvic.ca/ETCCDI>)
- The ETCCDI website keeps record of all past workshops (<http://www.clivar.org/organization/etccdi/etccdi.php>)

# ETCCDI Regional Workshops (complemented by APN)

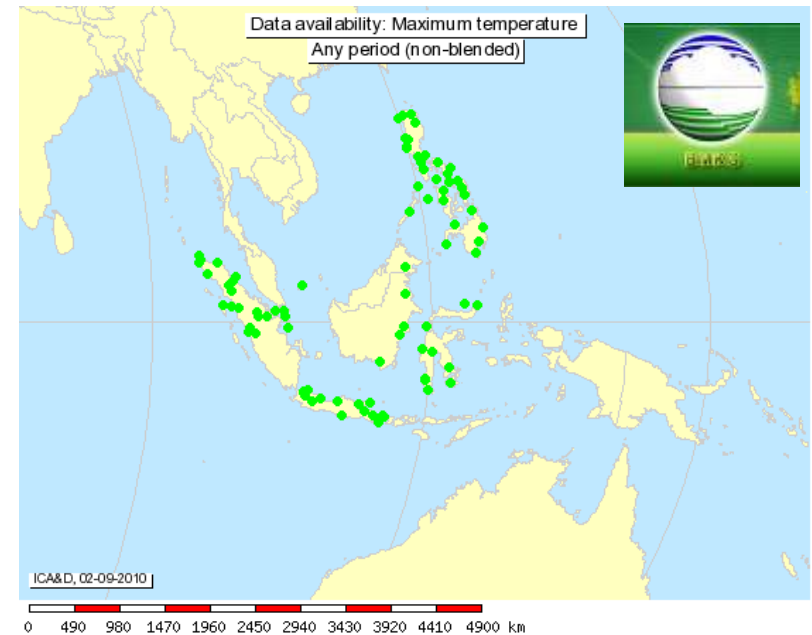
Working together



# Lessons learned (1 of 3)



- Integrated approach of ECA&D (data plus monitoring products) works, and could easily form a European contribution (or regional node), providing data and metadata with timely updates on a monthly basis
- ECA&D website, relational database, software code, and complete documentation is available for use in other regions
  - currently implemented for Indonesia, Philippines, others in a joint project with BMKG
  - E-OBS gridding technique is currently being used in Mexico and South America





## Lessons learned (2 of 3)



- Worldwide set of ETCCDI indices and regional workshops have enabled a consistent approach to the monitoring, analysis and detection of changes in extremes
- In many regions where workshops have been held, access to the underlying daily data is limited (which compromises transparency), and updating is problematic
- Met Services are not keen if their sole role is providing data and metadata; application relevant products are a necessary return of investment
- Local workshop organizers form potential contact points (regional nodes) for our global effort

## Lessons learned (3 of 3)



- Need to close the gap between rapid IT developments and actually implementing a modern distributed database management system for climate (the latter proves difficult, even in Europe)
- Work needs to comply with WMO ideas on systems/standards, data rescue, and plans for future global climate services; but in the end the actual *deliverables* count rather than *nice words*



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