High-resolution regional observations and products

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This presentation

- some examples of regional observation products currently available and how these are used for climate services

- input data, tools and activities needed to support further development of these data products

- role of Copernicus

Added value of regional data products?

Observed change in surface temperature 1901–2012
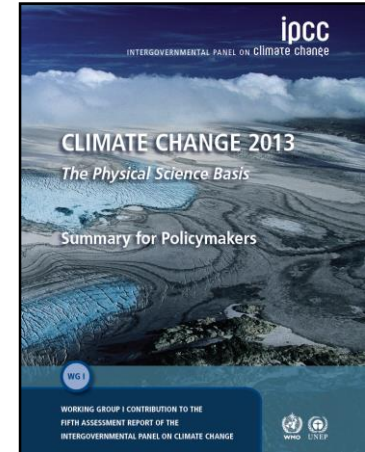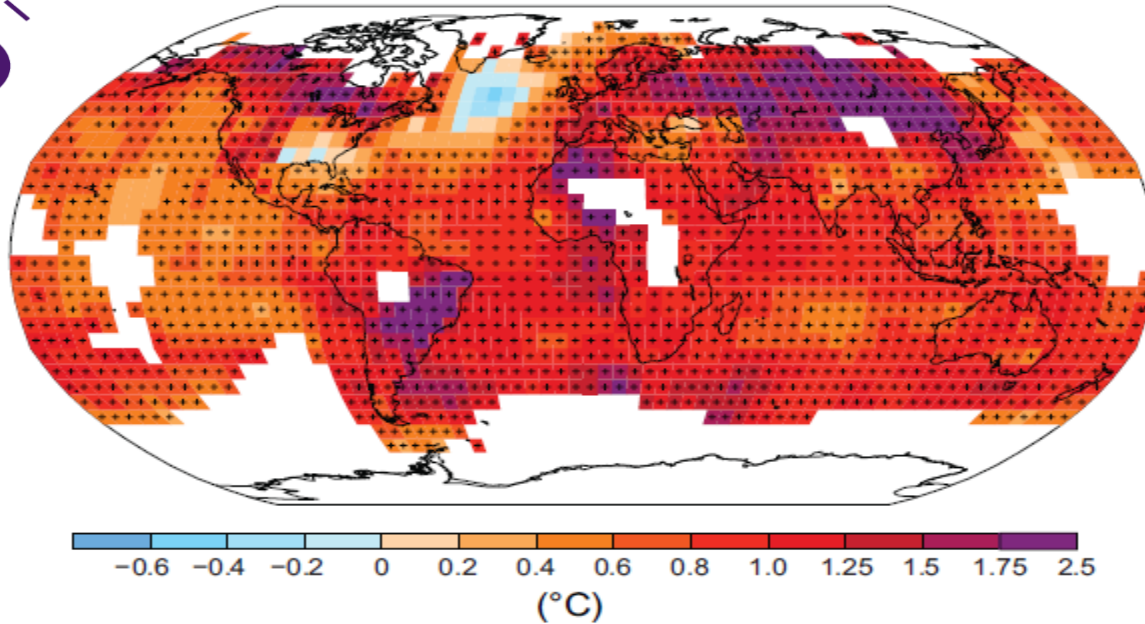
Regional data product I have been working on myself

- ECA&D data repository www.ecad.eu
  European web portal for daily station data and derived indices of extremes

- ICA&D www.ecad.eu/icad.php
  The ECA&D concept transferred to other regions of the world

DATA ACCESS

INTERNATIONAL CLIMATE ASSESSMENT & DATASET: CLIMATE SERVICES ACROSS BORDERS

BY ELSE J. M. VAN DEN BESSELAAR, ALBERT M. G. KLEIN TANK, GERARD VAN DER SCHRIER, MARIAMA S. ABASS, OMAR BADDOUR, ARYAN F.V. VAN ENGELEN, ANDREA FREIRE, PEER HECHLER, BAYU IMBANG LAKSONO, IQBAL, RUDMER JILDERDA, ANDRE KAMGA FOAMOUHOUE, ARIE KATTENBERG, ROBERT LEANDER, RODNEY MARTÍNEZ GÜINGLA, ALBERT S. MHANDA, JUAN JOSÉ NIETO, SUNARYO, ARIS SUWONDO, YUNUS S. SWARINOTO, AND GÉ VERVER
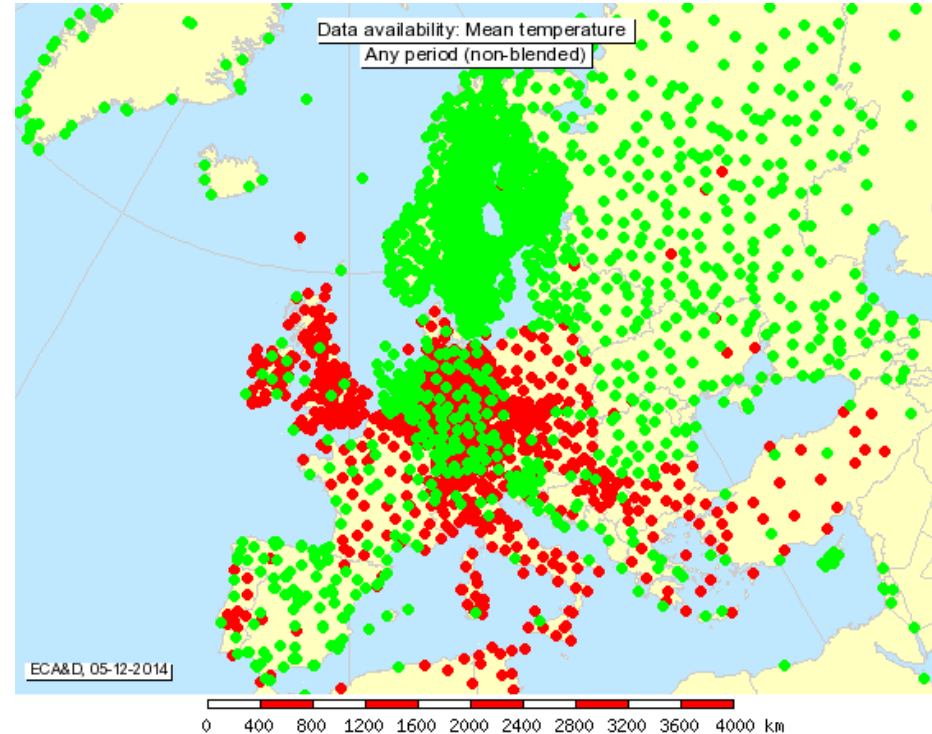
Besselaar et al., BAMS, 2014

ECA&D regional data

- in situ data collection based on national archives of NMHSs and others

- many data policy / IPR issues remain

- illustrated by this data availability map for temperature:

  downloadable data from ECA&D

  non-downloadable from ECA&D

Data availability: Mean temperature
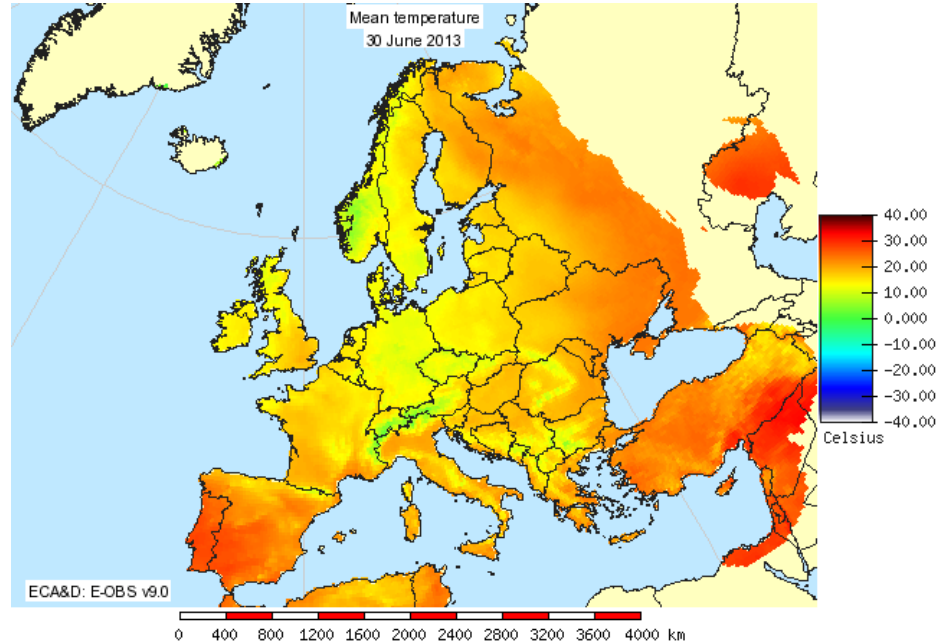Any period (non-blended)

ECA&D, 05-12-2014

From ECA&D station data to E-OBS daily gridded fields

- temperature, precipitation, pressure 1951-now (updated monthly)

- developed as part of:

- heavily used for bias correction of seasonal forecasts and regional climate projections, e.g. EUPORIAS


Mean temperature 30 June 2013

Celsius

ECA&D: E-OBS v9.0

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

Use of E-OBS in climate services

- Europe-average temperature, updated each month in one of a series of "Climate Indicator Bulletins" http://cib.knmi.nl

  EURO4M

- E-OBS is also used for the indicators of extremes published by EEA

European Environment Agency

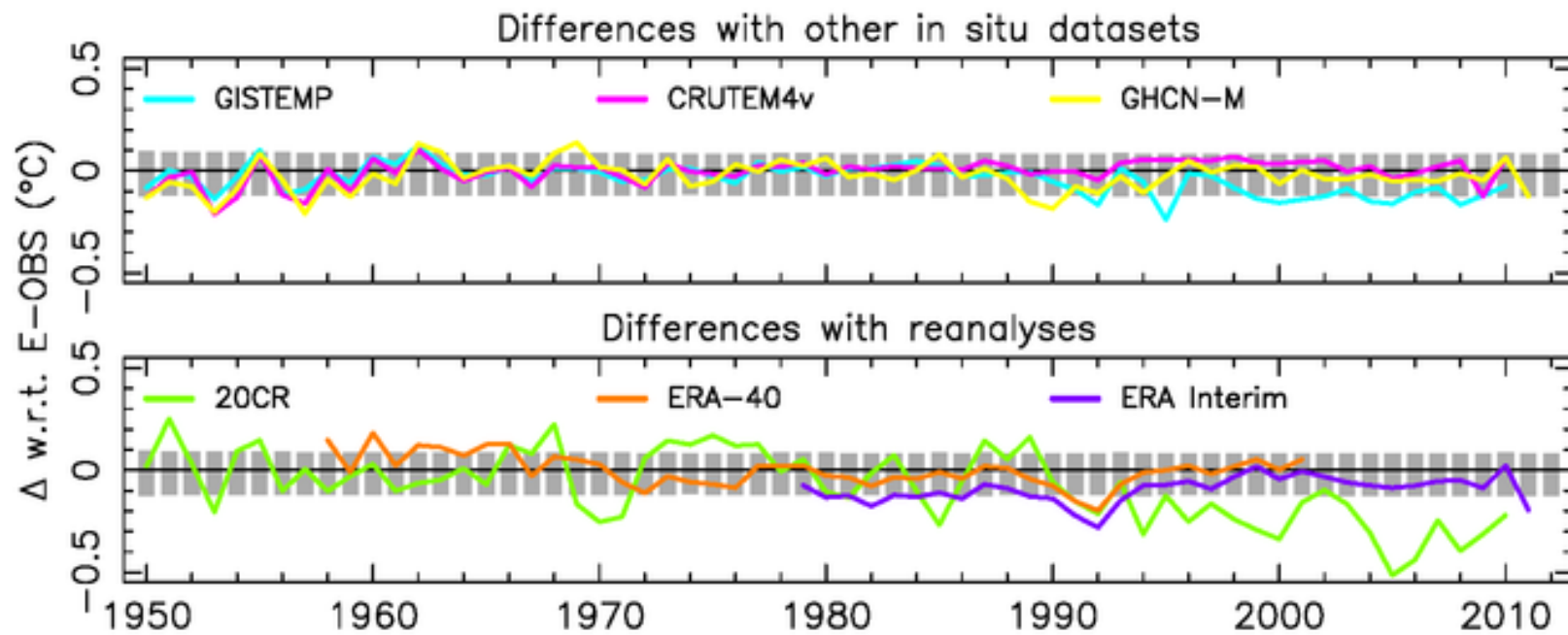E-OBS European temperature

ECA&D
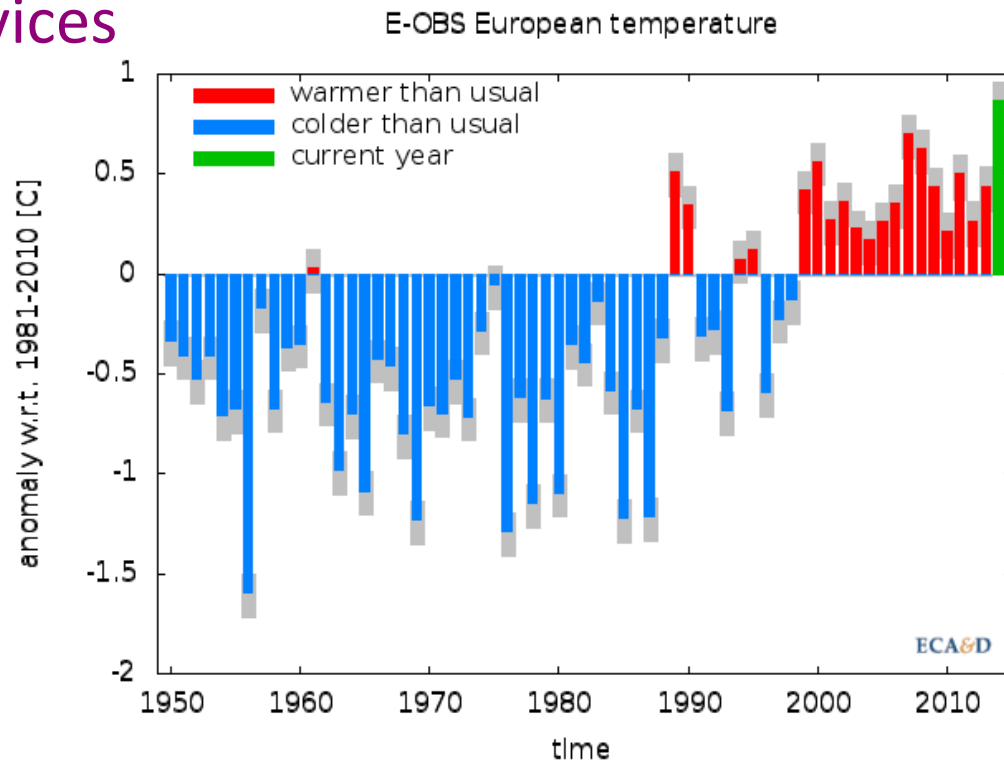
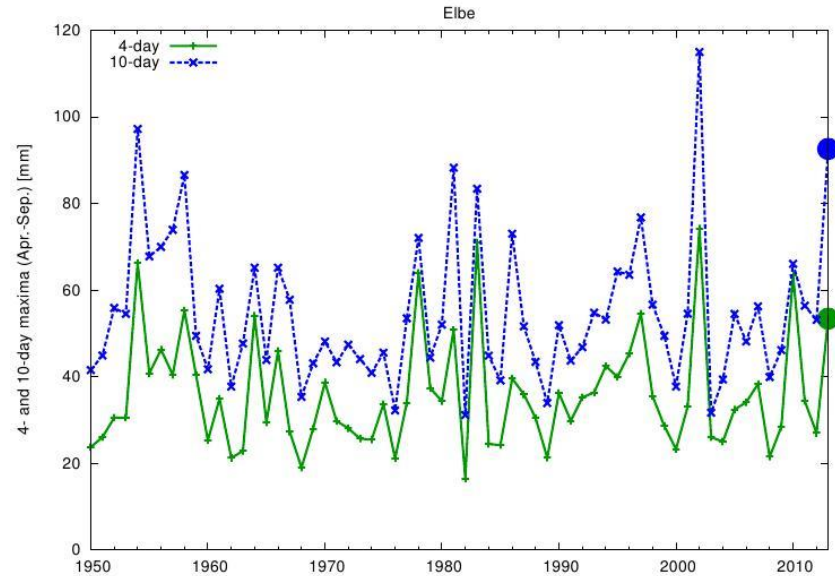# E-OBS confidence intervals and comparison with other data
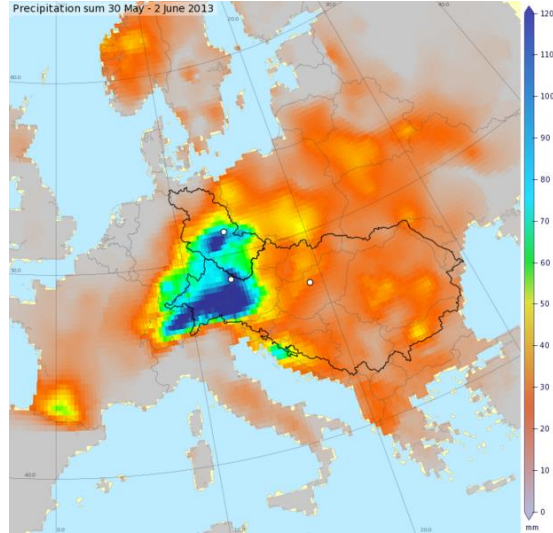
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Van der Schrier et al., JGR, 2013
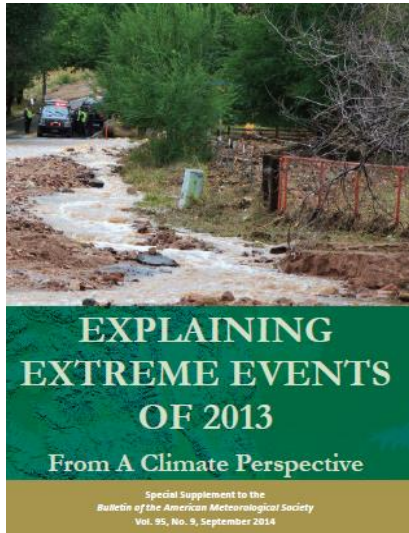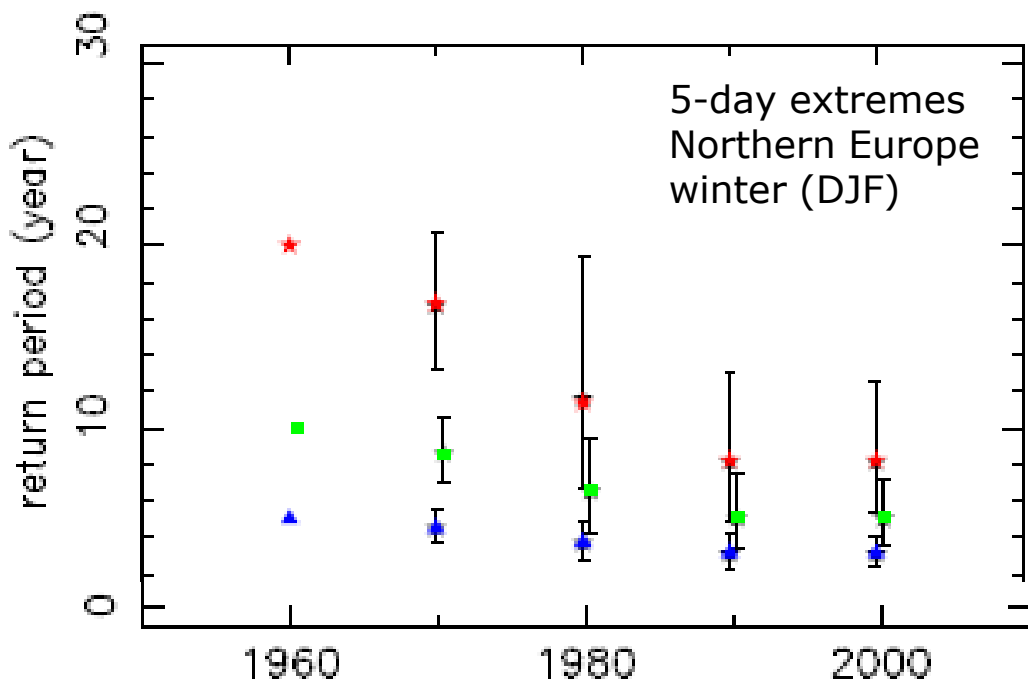
Use of E-OBS in climate services

- placing observed high-impact weather events in a historical context

Trends in extremes
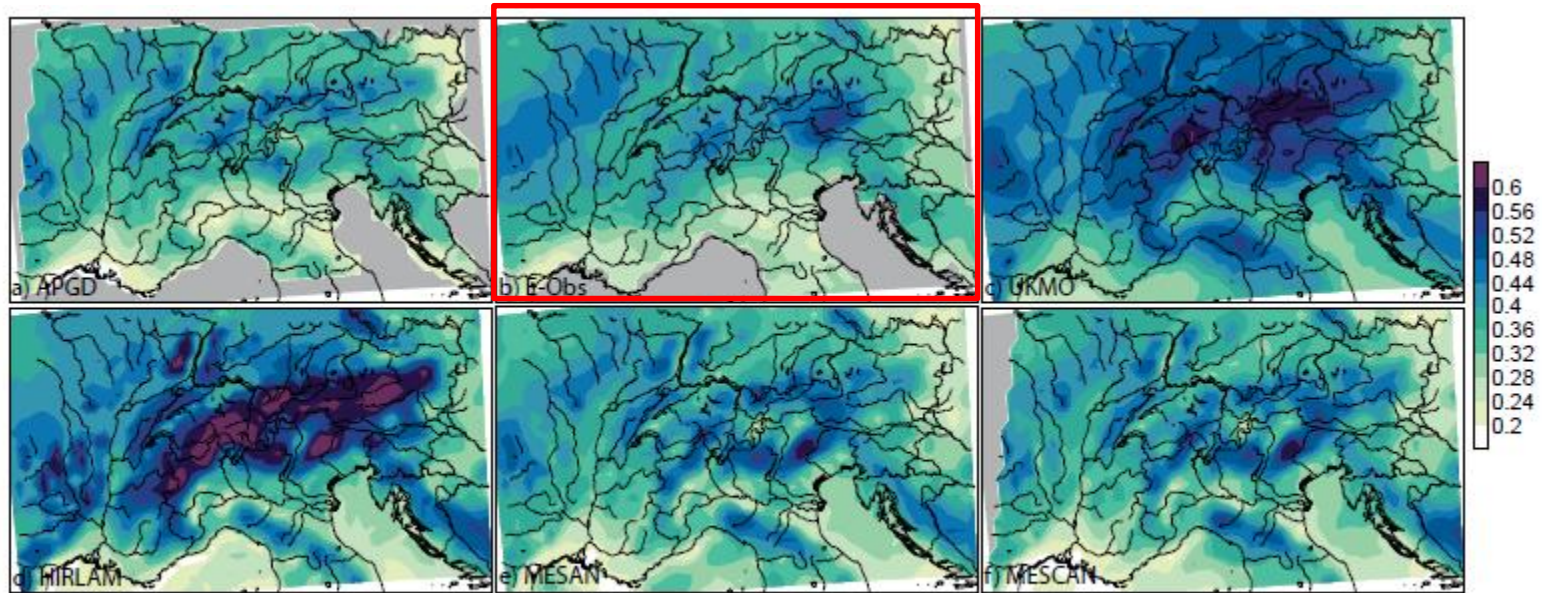

5-day extremes
Northern Europe
winter (DJF)

- precipitation extremes now more common in N. Europe than in the 60s

- trends are in agreement with model projections for the 21st Century

E-OBS precipitation against other (reanalysis) datasets

Alpine
dataset

Figure 4: Annual frequency of wet days (≥ 1 mm, fraction) in 2008 at 22-km resolution. a) APGD; b) E-Obs; c) UKMO; d) HIRLAM; e) MESAN; f) MESCAN.

Isotta, Vogel and Frei, Meteorol. Z., 2014

E-OBS precipitation against other (reanalysis) datasets
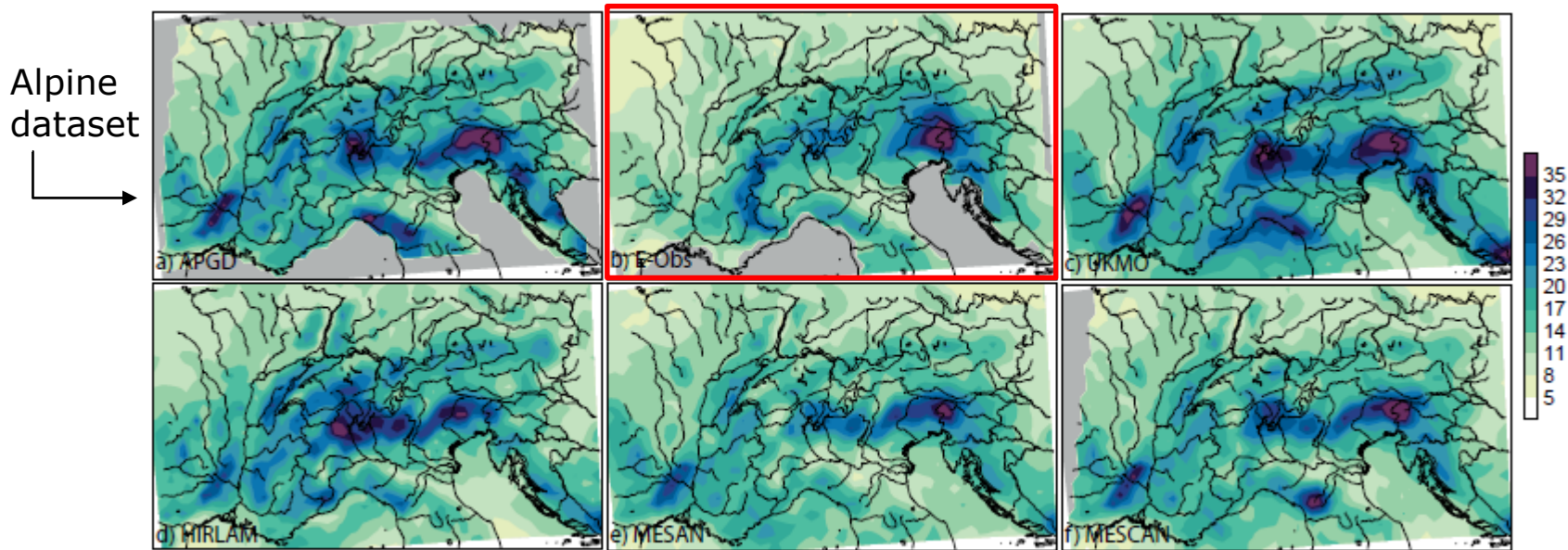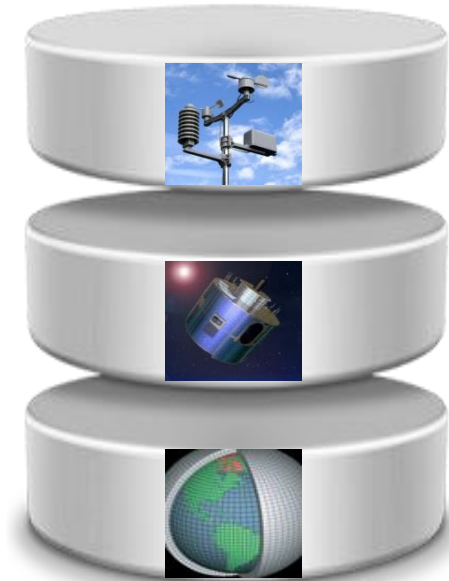
Alpine dataset →

Figure 5: 95 % quantile of daily precipitation (mm) for 2008 at 22-km resolution. a) APGD; b) E-Obs; c) UKMO; d) HIRLAM; e) MESAN; f) MESCAN.

Combination of different sources is required for applications

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

2) satellite CDRs
   spatially extensive but short (< 40yr)

3) regional reanalysis of past weather
   spatially and temporally complete but expensive and potential model bias
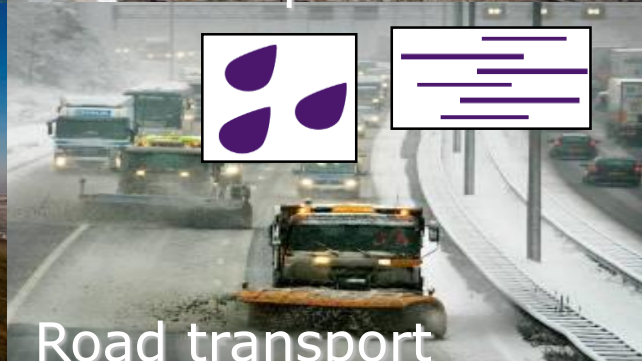
Agriculture

Health

Aviation

Fresh water

Energy

Rail transport

Water management

Industry

Road transport

Global > regional > local?

- no need to interfere with climate data stores and services at the national and local scale

- but reference data products for Europe are beneficial also for national/local services

Actions to improve the historical archive (DARE, etc.)

at best…

…but more common

36 million images at NOAA

climate archive in Mauritius

Role of Copernicus

- aim at multiple datasets for the European domain, each with described quality and metadata provided in different forms of merging and aggregation (fit-for-purpose)

- help resolve data policy issues which continue to hamper access to in situ data leading to restricted transparency and business opportunities

- link to the C3S infrastructure including the software requirements to visualize and extract spatio-temporal data (e.g. IS-ENES climate4impact)

- link to the C3S SIS because turning data products into application relevant indices is not straightforward

- support DARE activities and ensure that recovered and digitized data is actually added to the regional (and global) data products when available

Thank you; questions?