



Observational data for analyzing extremes

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Event: Moscow heat wave July 2010



Event: Floods Central-Europe May 2010



Motivation

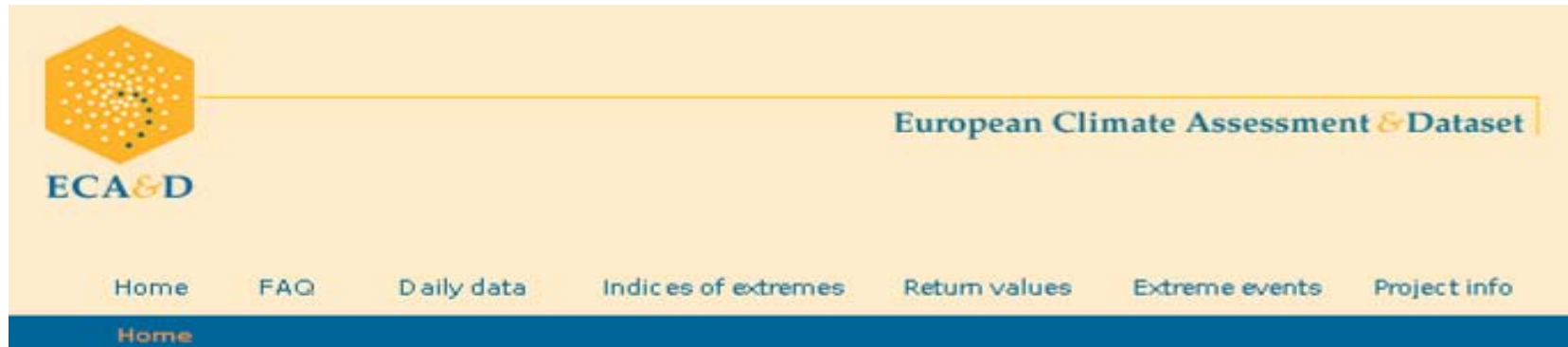


- The data requirements for assessing such extreme events are much more demanding than for measuring global warming
- Questions:
 - How can the event be characterized?
 - What is the probability of exceedance?
 - Has this probability changed over time?
 - Does the event fit in a long term trend?
 - Is this trend consistent with projected climate change?
 - Have the odds changed because of anthropogenic influence?
- Observational data to place individual significant weather events in a historical context (or in the context of anthropogenic climate change) is hard to obtain, in particular in near-real time and if the extreme event crosses national borders

European projects

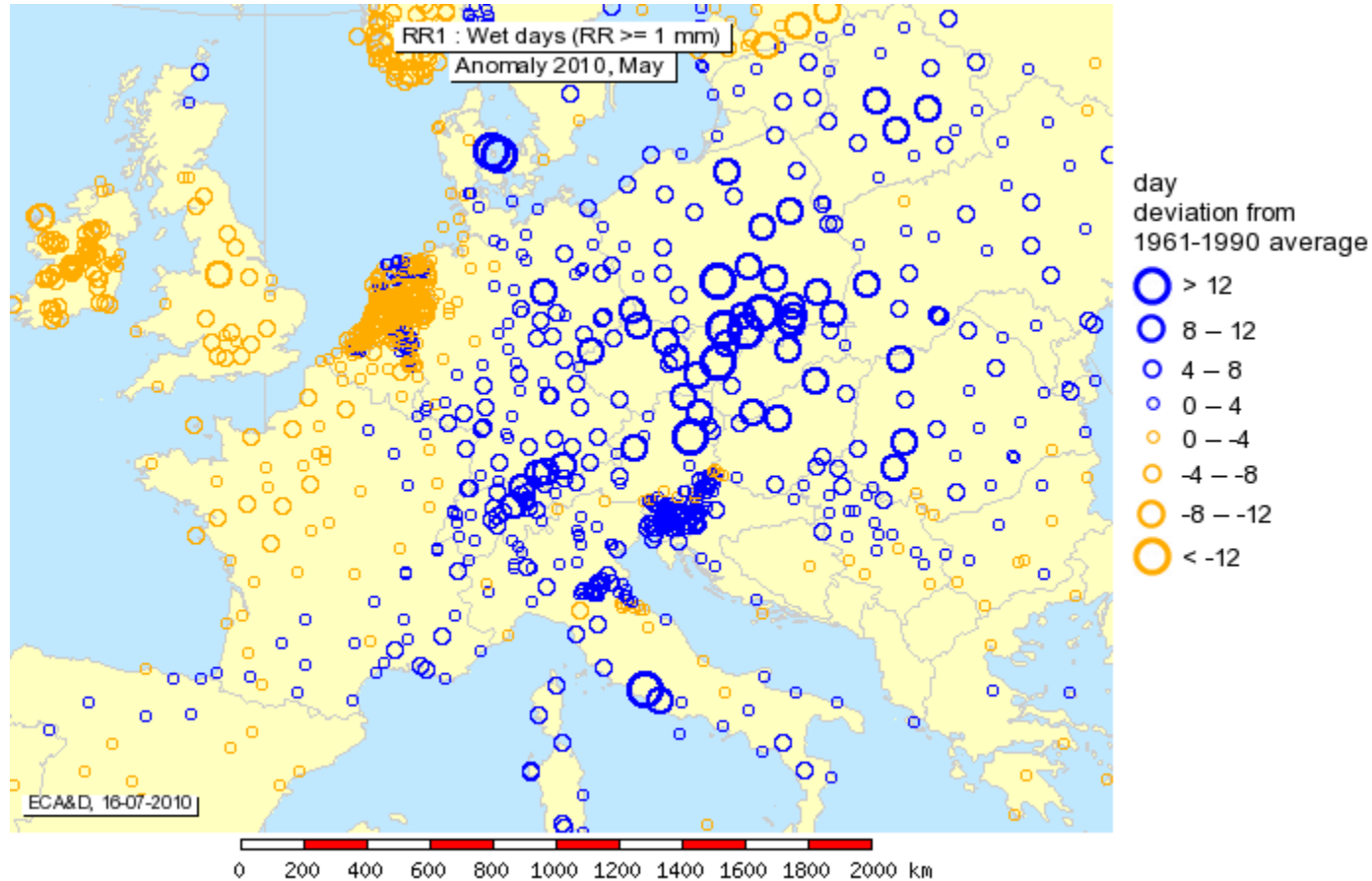


1. European Climate Assessment & Dataset
(ECA&D, <http://eca.knmi.nl>)

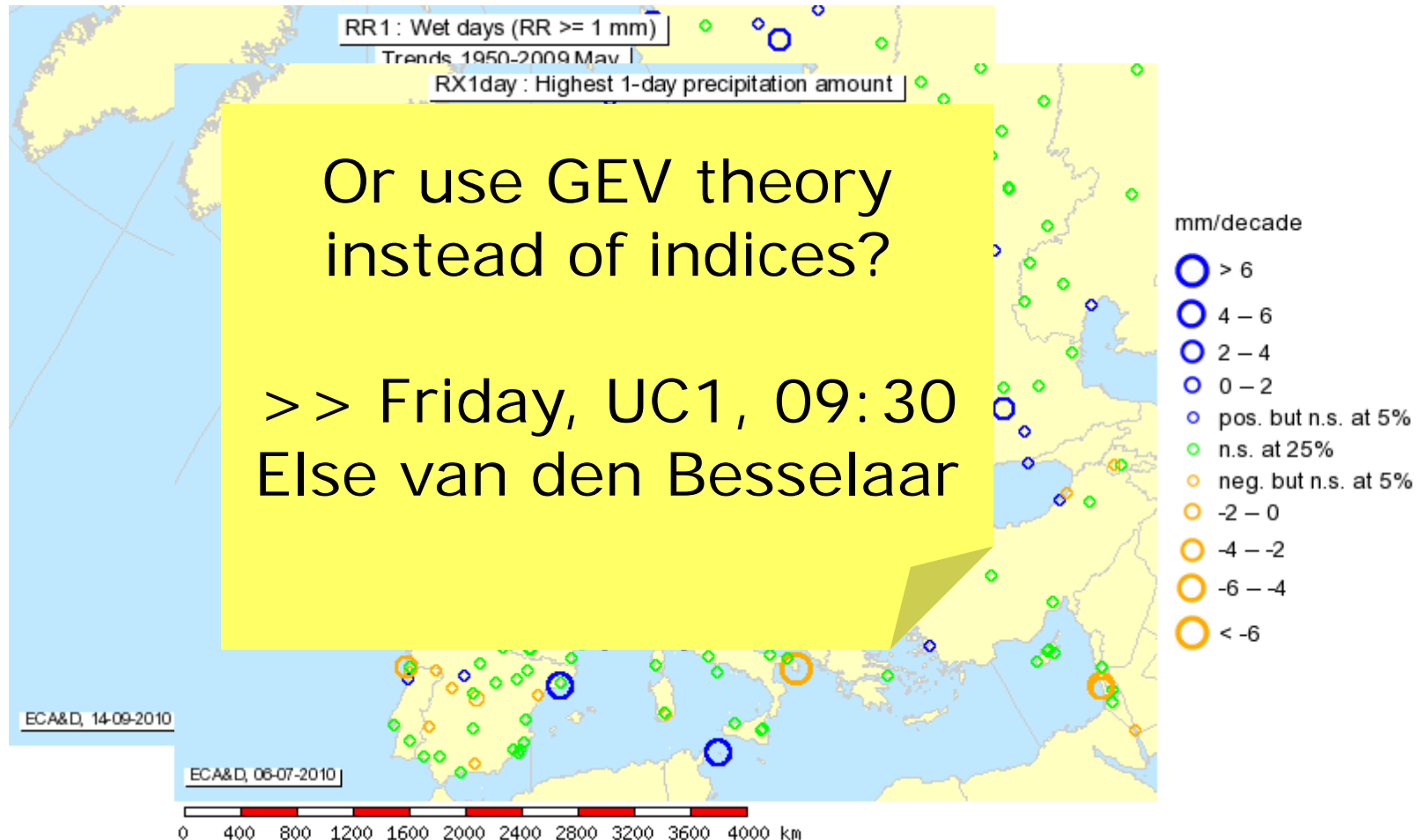


2. ENSEMBLES
(<http://ensembles-eu.metoffice.com>)
3. European Reanalysis and Observations for Monitoring
(EURO4M, <http://www.euro4m.eu>)
4. EUMETGRID
(<http://www.eumetgrid.eu>)

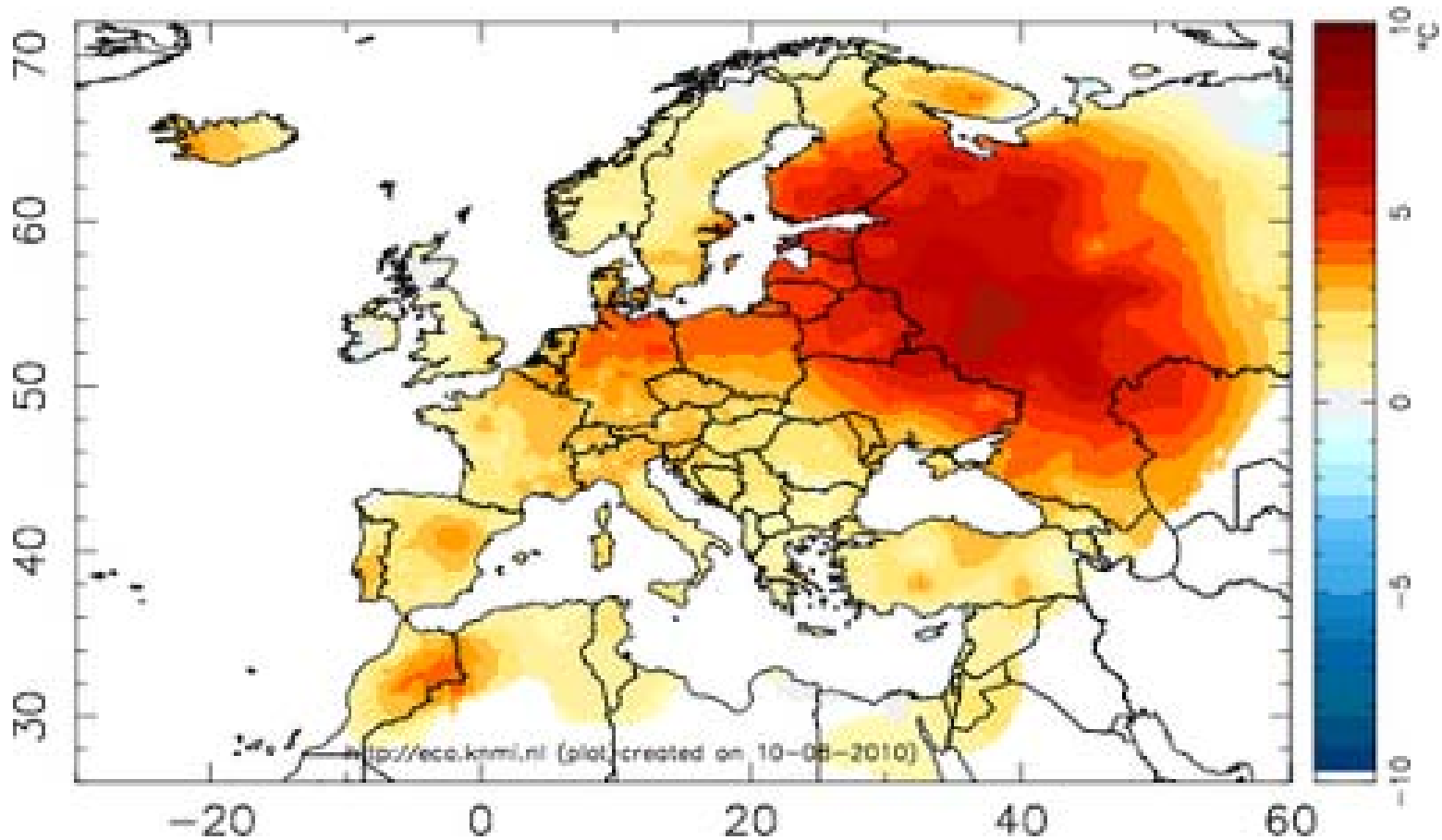
Anomaly in number of wet days May 2010



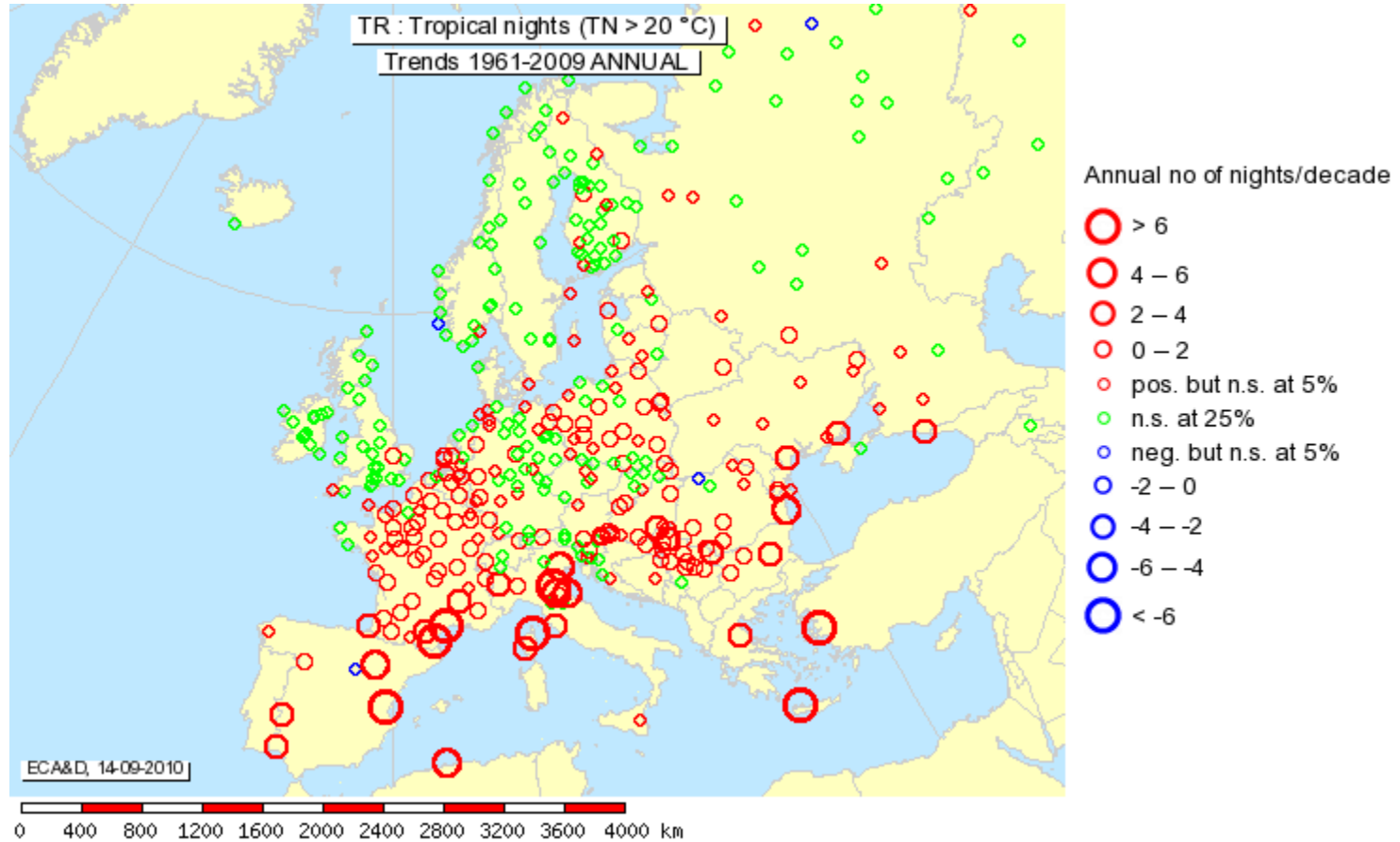
Long-term trend?



Temperature anomaly July 2010



Long-term trend?



E-OBS



- Source: ECA&D station records

- Two-step interpolation method (Haylock, J. Geophys. Res., 2008)

- Output: daily

- 1950 – now

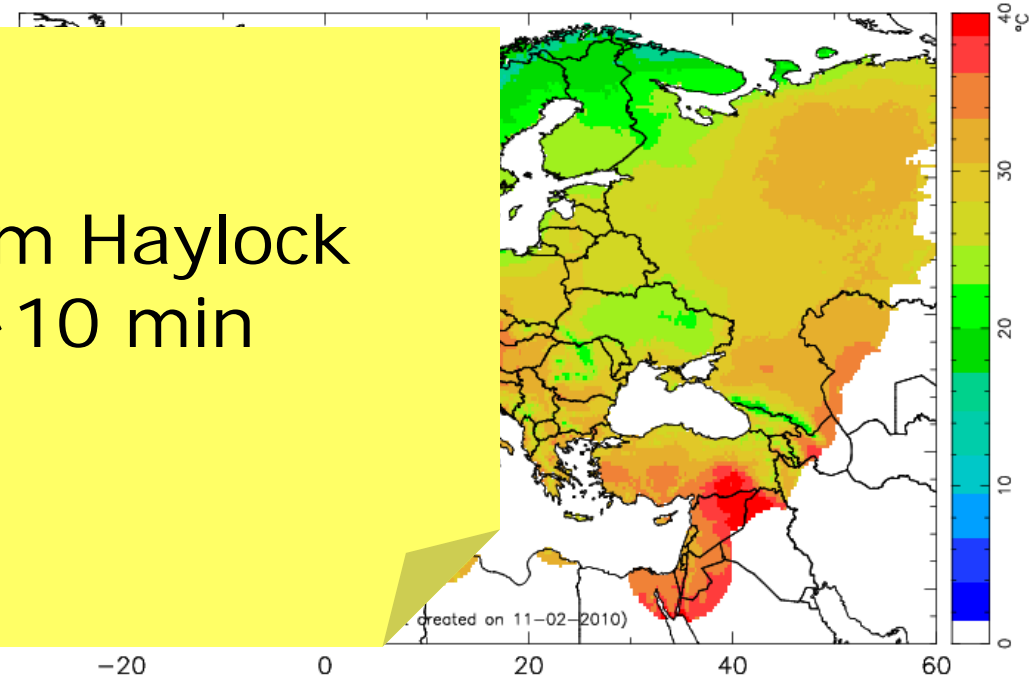
- 0.25 deg and 1 km resolution

- Matching the common RCM grids in Europe

- Associated error fields exist, but these are rarely used!

E-OBS TX 04-08-2003

Malcolm Haylock
in ~10 min





CLIMATE CHANGE
* air temperature
* precipitation
* evaporation
* extremes



WATERWAYS
* Quality / availability



INLAND WATERWAYS TRANSPORT (IWT)
* ship types
* draught, capacities
* cost efficiency



COMPANIES OF SHIPPING INDUSTRY
* production
* cargo volumes
* transport alternatives
* site selection

Infrastructure Adaptation
* hydroengineering measures
* impact on inflow discharge

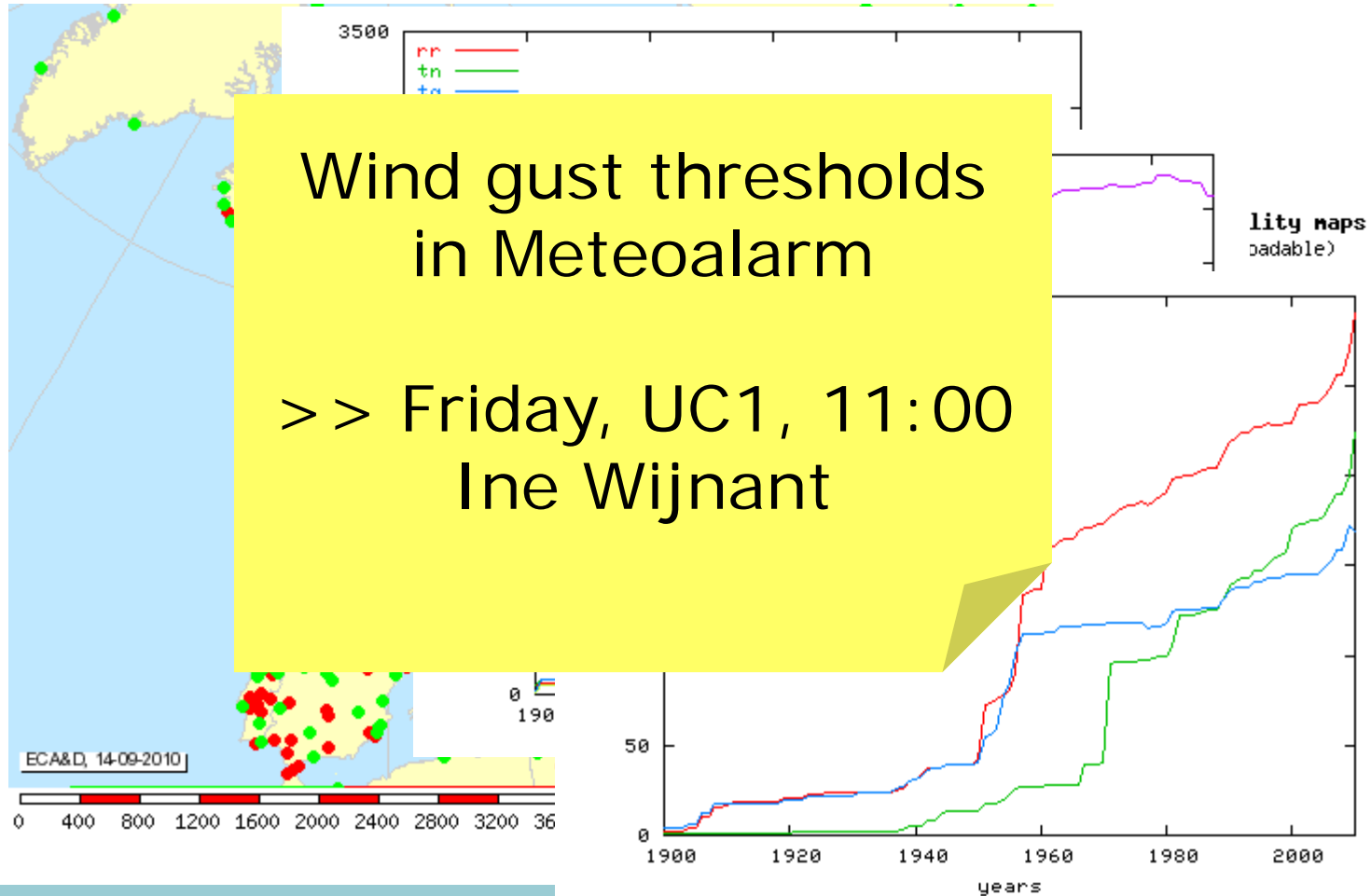
Improved Prediction of water levels

Fleet and Transport related Adaptation
* adjustments of fleet and operating modes

• Coordinator:

Christophe Heyndrickx

Transport & Mobility
Leuven





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