



**National Centre for
Atmospheric Science**
NATURAL ENVIRONMENT RESEARCH COUNCIL

Observed variability of the climate system

Talk: Laurent Terray

Chair: Jeff Knight

Rapporteur: Ed Hawkins



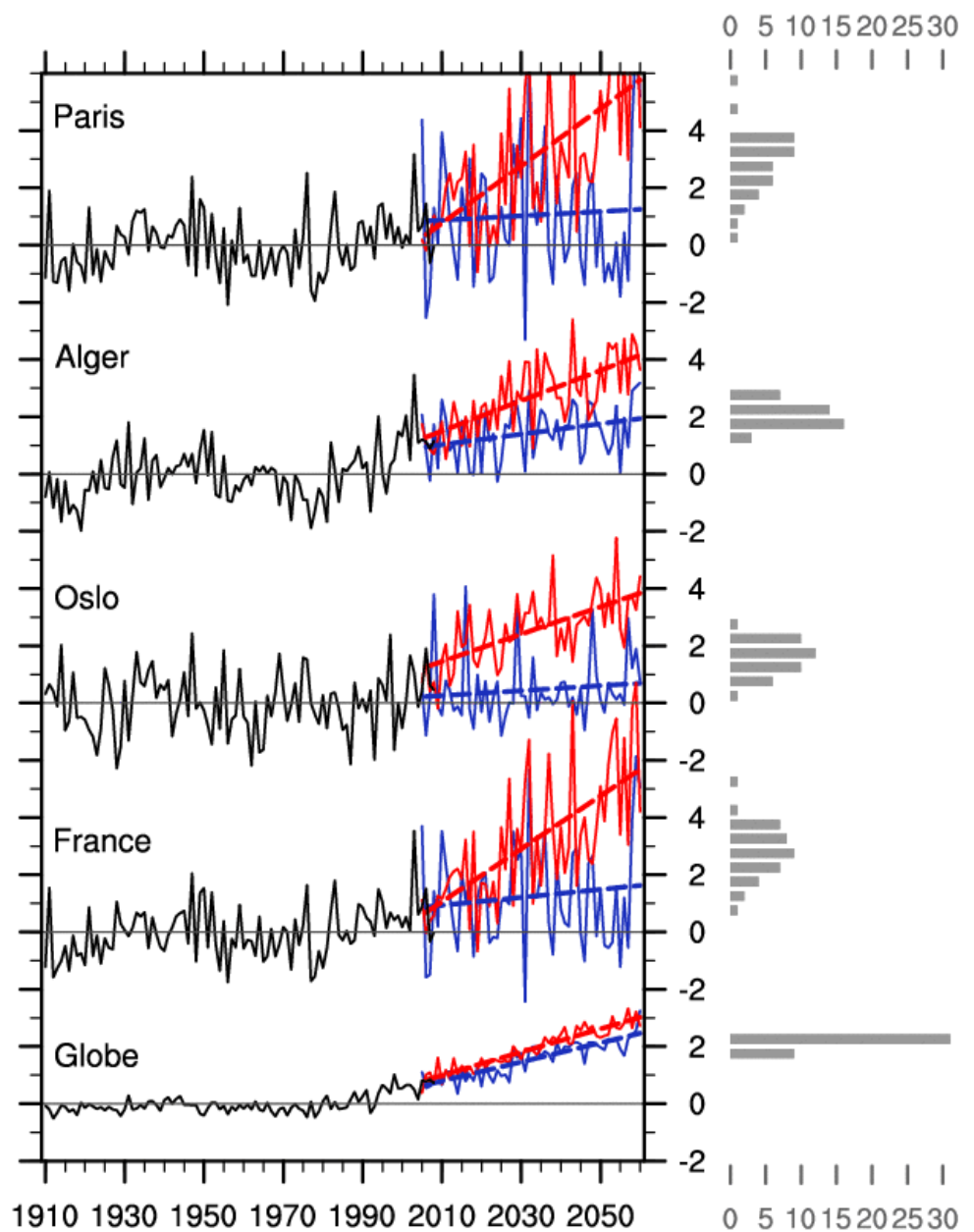
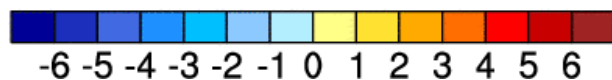
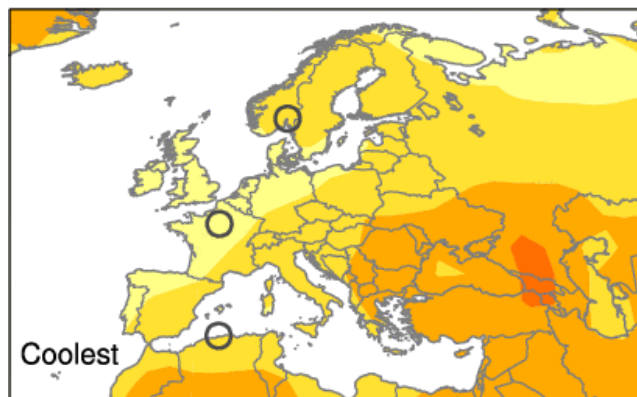
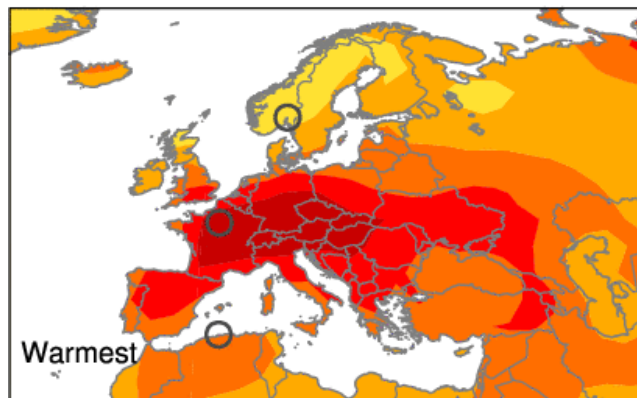
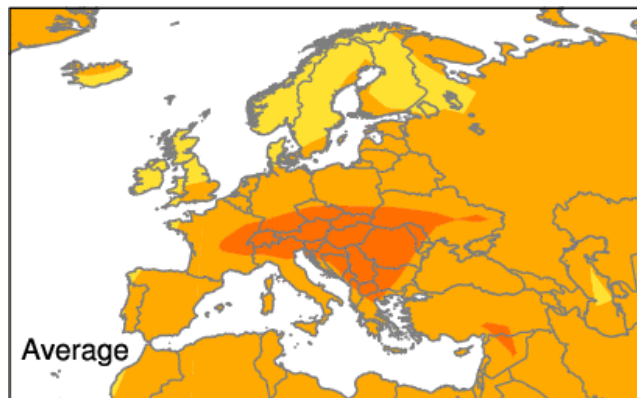
- **Observation reconstructions can disagree significantly (even when similar raw data is used)!**
 - e.g. sea level, ocean heat content, stratospheric temperatures...
- **Need to think more about ensembles of reconstructions**
 - to sample “structural” uncertainty in methods, e.g. upper tropospheric temperatures
- **Our homogeneous observational records are very short, even for global temperatures**
- **Variability of the climate system is high, and can affect predictions for 50 years potentially**
- **Models disagree on role of variability & forcing for recent Atlantic changes**
- **Signal-to-noise is key metric for assessing importance of future changes**



- **For ECOMS:**
 - **Variability will dominate uncertainty for predictions of the next decade on regional scales**
 - **Care required in interpreting observational reconstructions and short records (& also short simulations)**
 - **Palaeo data could help constrain estimates of variability**
 - **Model estimates of variability disagree widely - need to understand mechanisms, magnitude and causes of variability – what observations do we need?**
 - **Climate services components of the project need to recognise role of variability**
 - **How can we sample observational uncertainty when initialising predictions?**
 - **How large ensembles do we need?**

Summer temperature rate of change until 2050

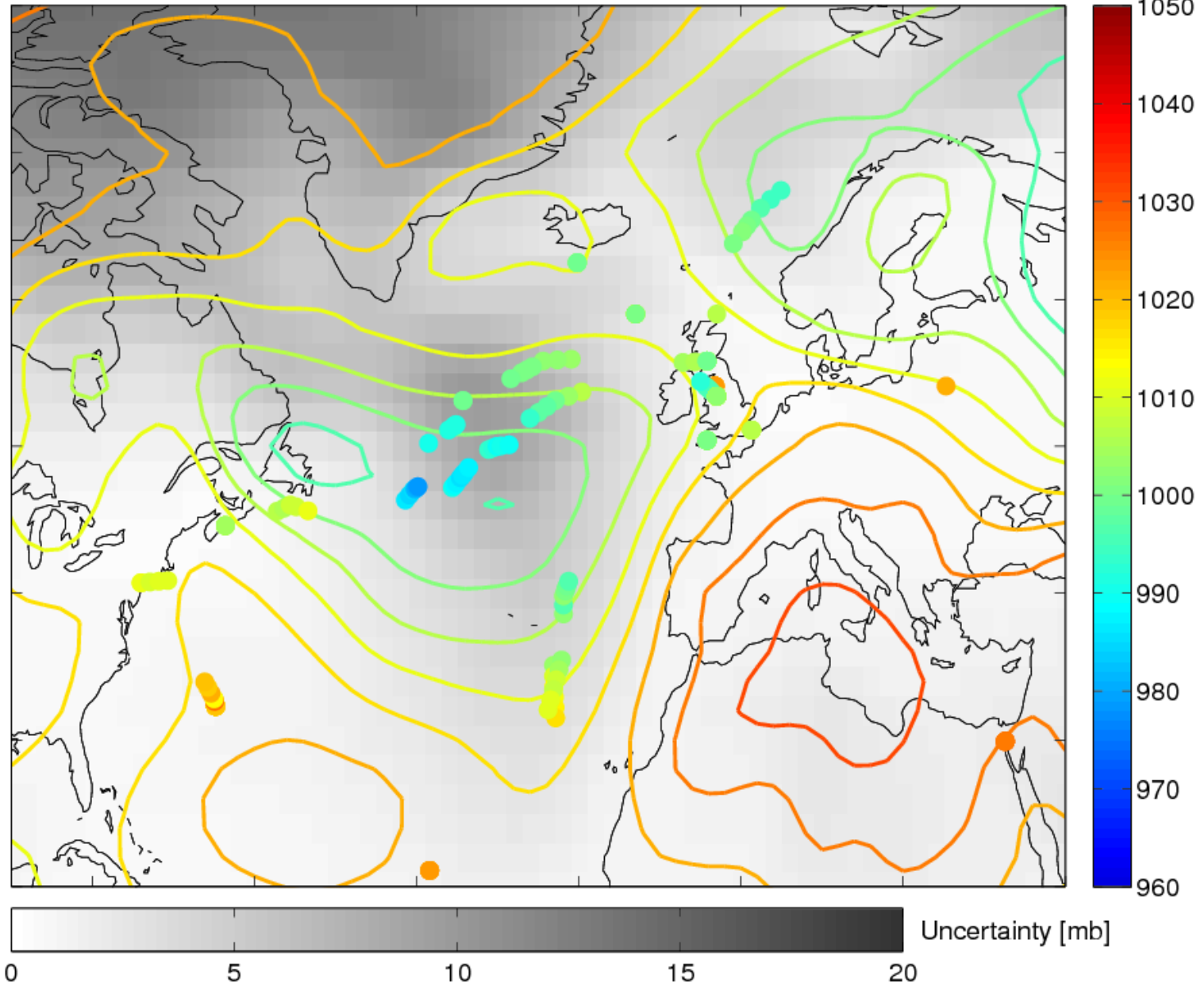
Deser et al. (2012)



Ens. members

Date: 17 Jan 1918

Pressure [mb]



oldWeather

Lines: MSLP from 20th C Reanalysis
Grey shading: uncertainty in reanalysis
Points: new data from logbooks!