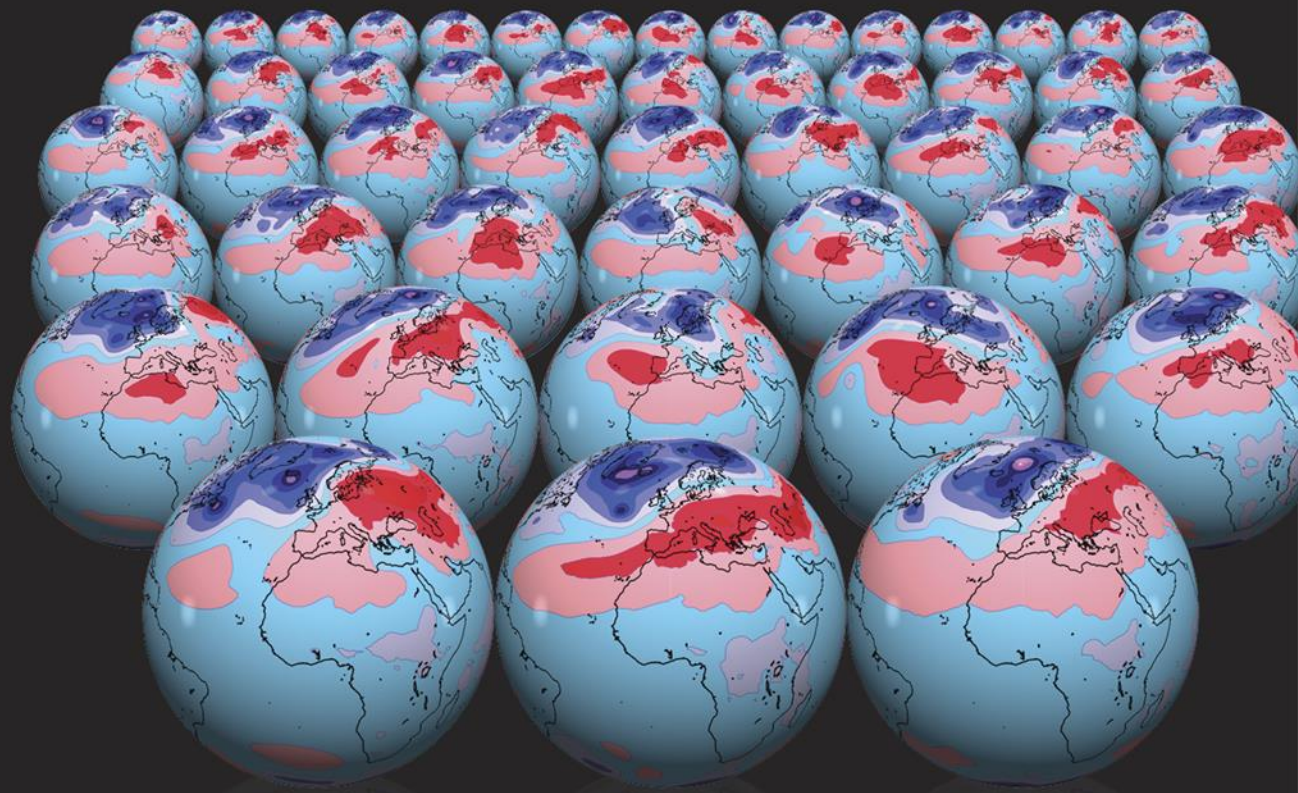
Annual Seminar 2017

Ensemble prediction: past, present and future

11 – 14 September

Welcome



ECMWF

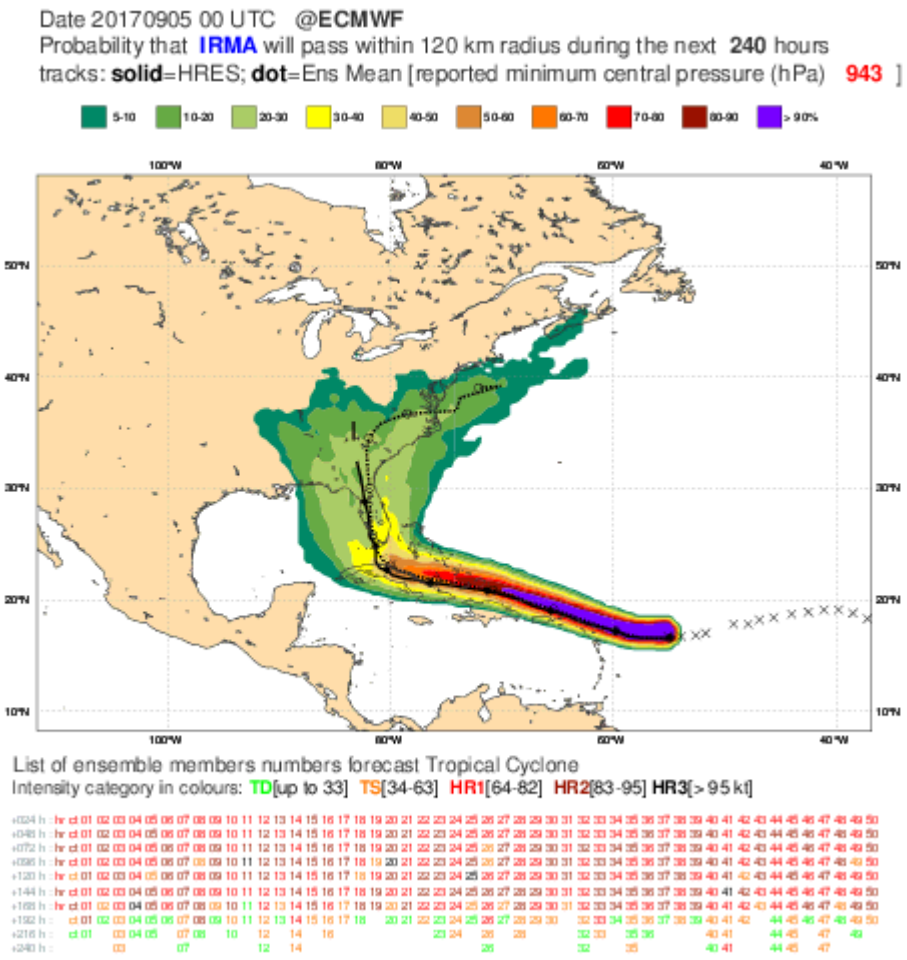
#AS2017

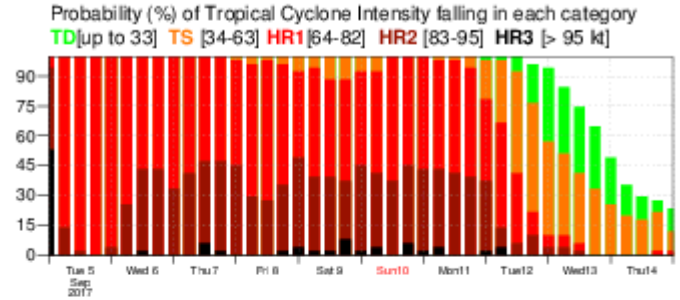
THE STRENGTH OF A COMMON GOAL

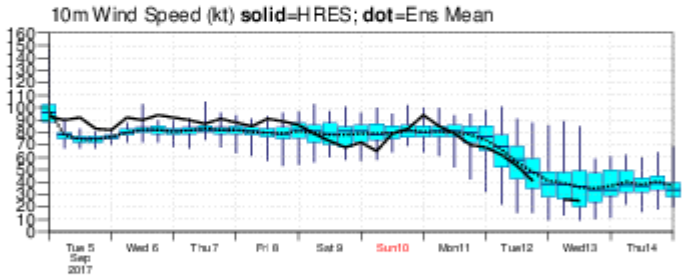
ECMWF's purpose is to develop a capability for medium-range weather forecasting and to provide such weather forecasts to the Member and Co-operating States

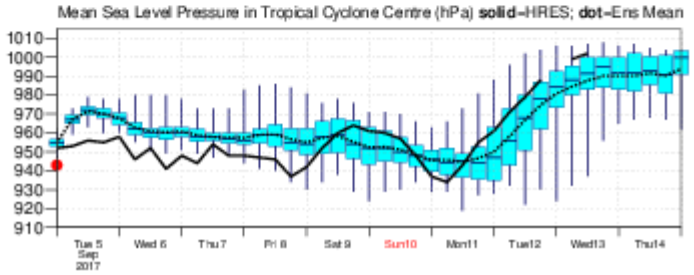
ECMWF is complementary to the National Meteorological Services and works with them in research, numerical weather predictions, supercomputing and training.

Ensembles are increasingly used to provide weather services



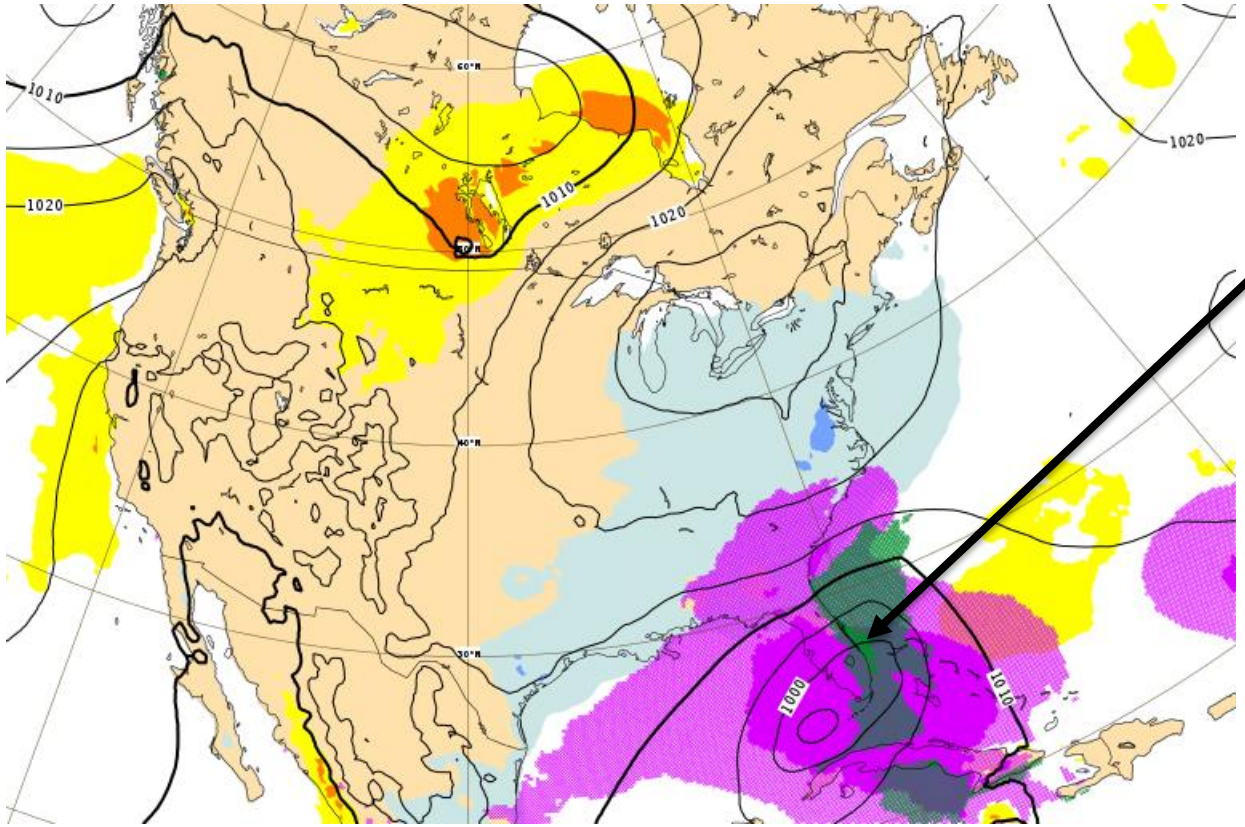




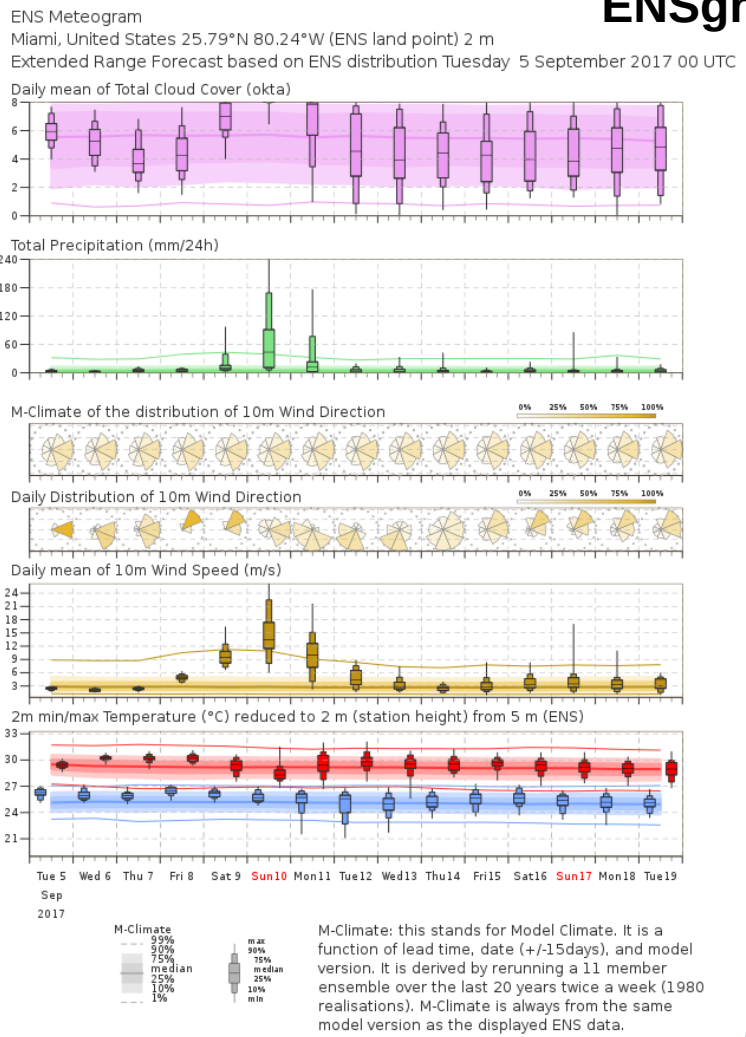


Ensembles are increasingly used to provide weather services

ENS: EFI 2017-09-05 00 +144h



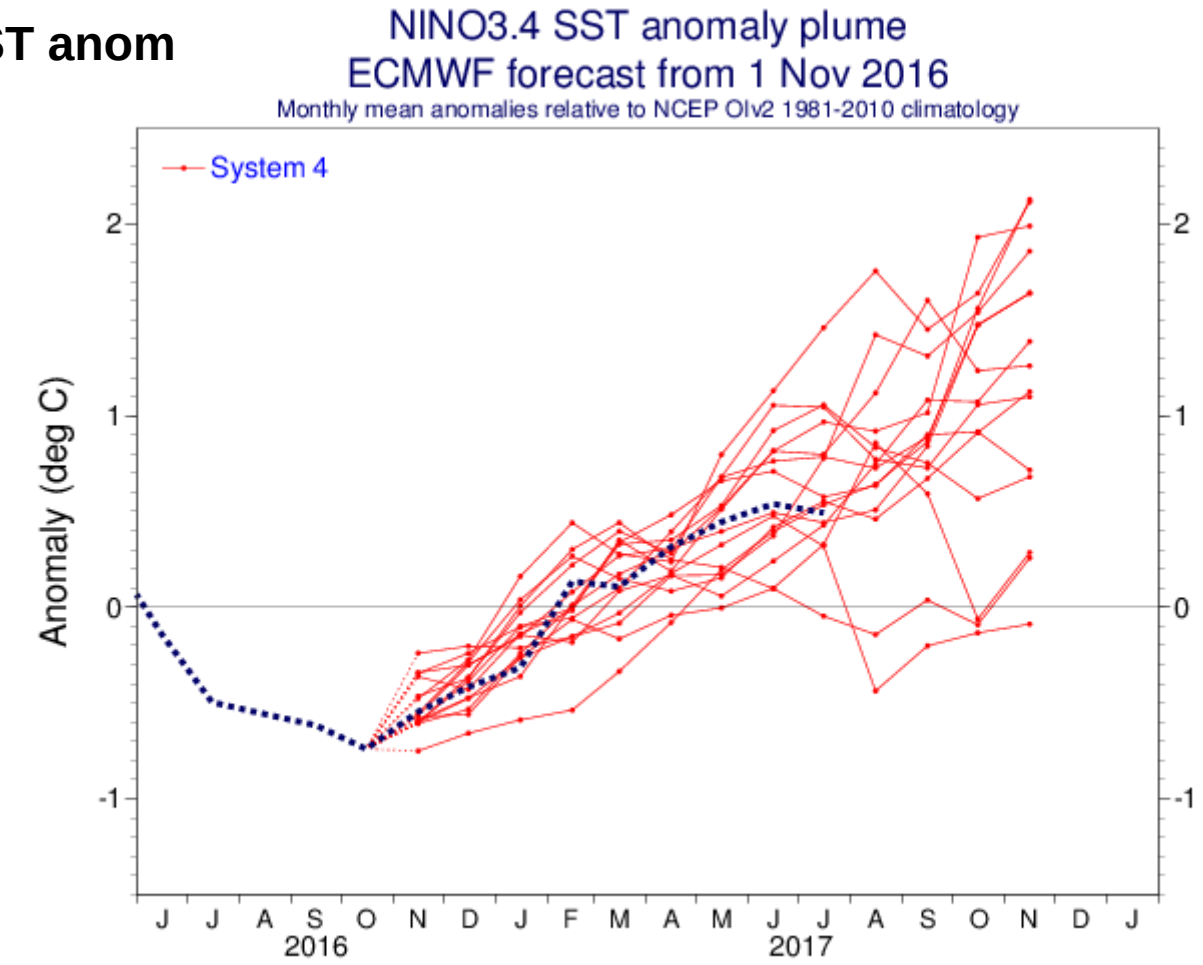
ENSgram Miami



M-Climate: this stands for Model Climate. It is a function of lead time, date (+/-15days), and model version. It is derived by rerunning a 11 member ensemble over the last 20 years twice a week (1980 realisations). M-Climate is always from the same model version as the displayed ENS data.

Ensembles are increasingly used to provide weather services

SEAS4: El Nino SST anom



ECMWF 2016-2025 strategy: goals for 2025

Forecast targets by 2025:

- Ensemble predictions of **high impact weather** up to two weeks ahead
- Seamless approach, aiming towards predictions of **large scale patterns and regime transitions** up to four weeks ahead and **global-scale anomalies** up to a year ahead

Research goals by 2025:

- Research at frontiers of knowledge in Earth-system modelling, data assimilation and predictability
- Ensemble-based analyses and predictions reaching a 5 km horizontal resolution

Together - More collaboration:

- Partnering with universities and research institutes – OpenIFS
- Pooling expertise to improve scalability of data assimilation

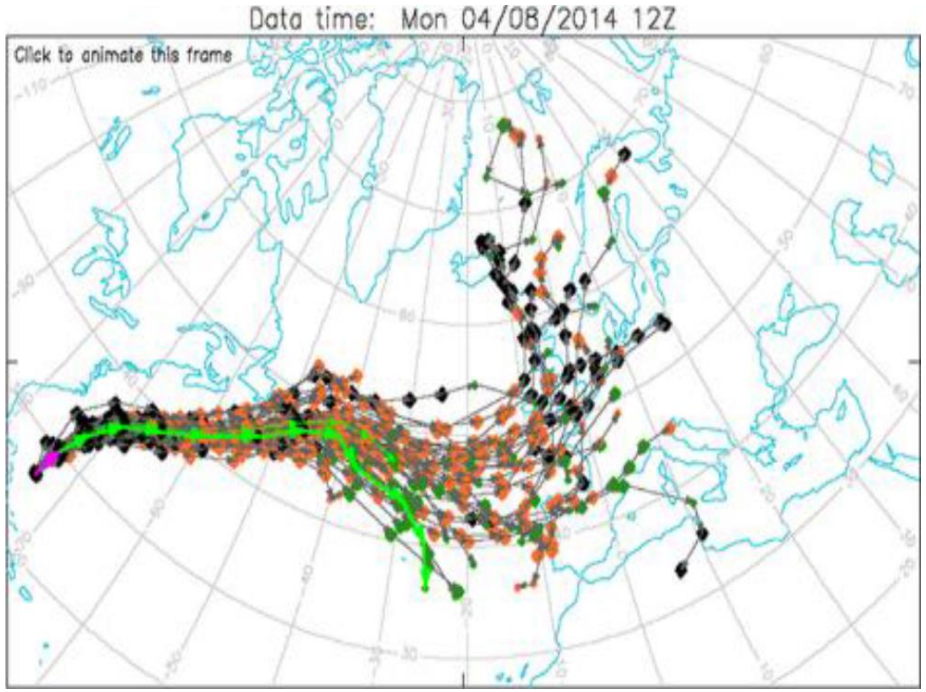
Continued support:

- Dedicated HPC, software, and data resources for Member States
- Advanced training

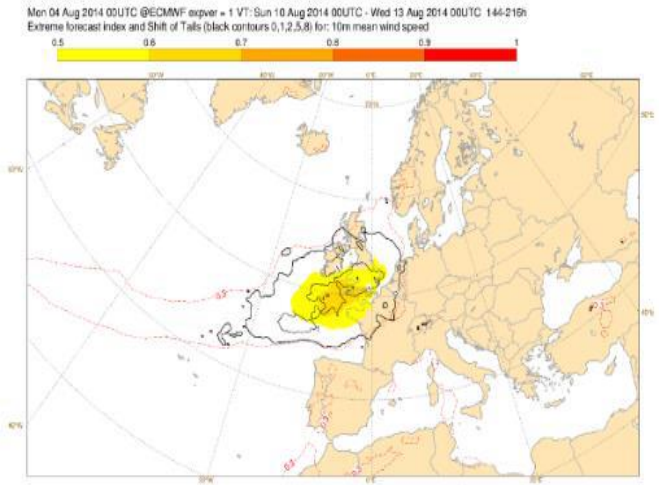
ECMWF 2016-2025 strategy: the challenge for the medium-range

(1) Prediction of high-impact weather 2 weeks ahead.

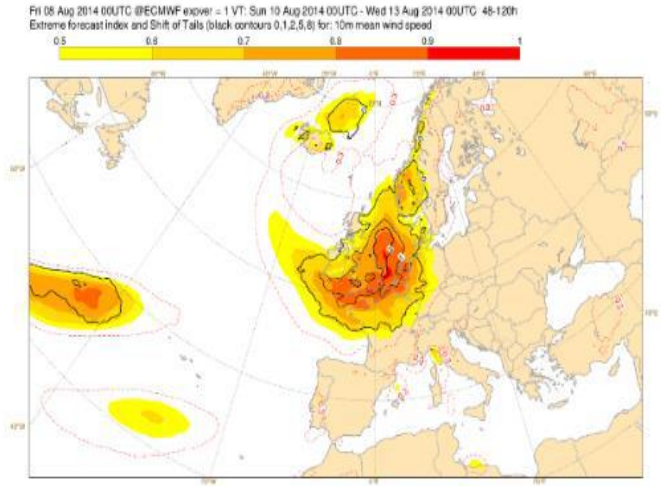
High-impact weather: Hurricane Bertha



The difficulty: sharp ensembles 2 weeks ahead



6-9 days



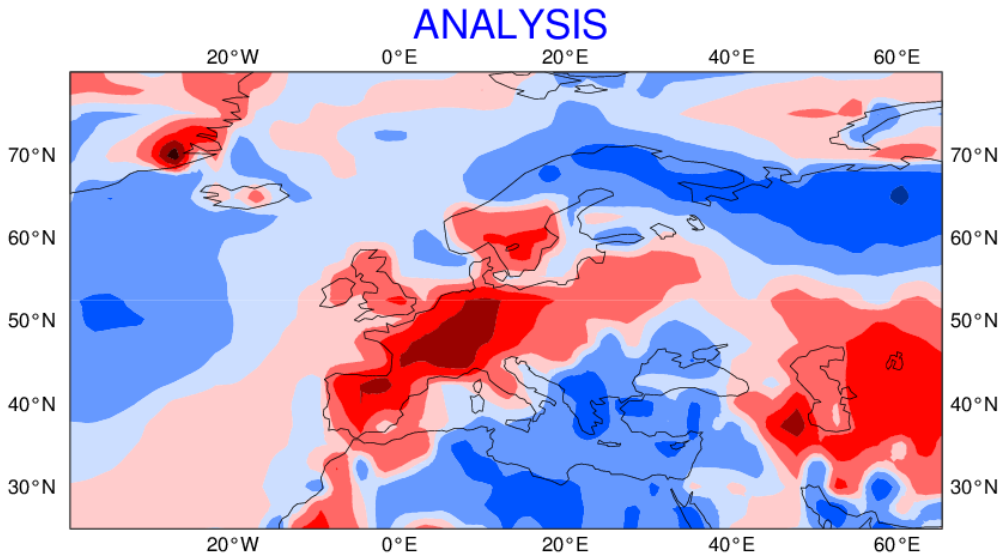
2-5 days

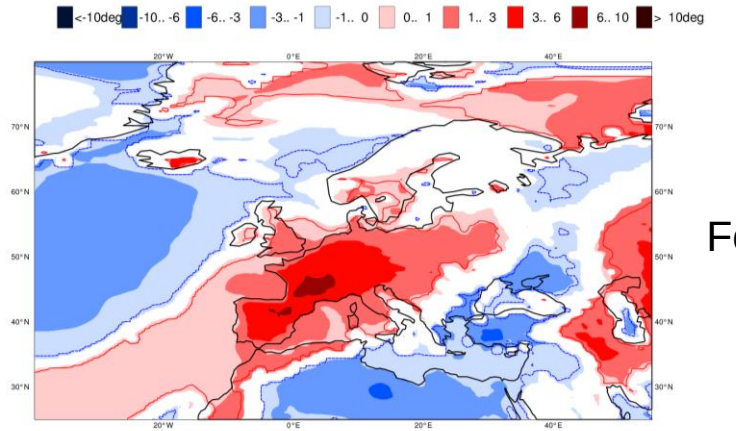
ECMWF 2016-2025 strategy: the challenge for the long range

(2) The prediction of regional anomalies and regime transitions 4 weeks ahead.

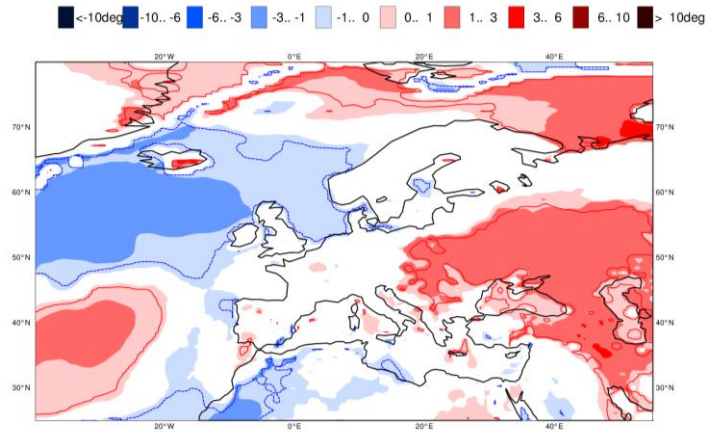
The difficulty: extracting a signal 3-4 weeks ahead

European heat wave - 29 June – 5 July 2015





Forecast week 1.5



Forecast week 2.5

ECMWF 2017 Annual Seminar

During the Seminar we will be discussing:

1. The root of ensemble prediction: what were the challenges 25 years ago?
2. Ensemble initial conditions
3. Representation of model uncertainties
4. Error growth, signal propagation and scales interactions
5. End-to-end ensembles: a look into applications
6. Ensemble verification and diagnostics
7. Expanding the ensemble horizon

Enjoy the meeting!!