

VERIFICATION BULLETIN

AUGUST - SEPTEMBER - OCTOBER 2019

Table of Content

1. Introduction	
1. Objective	3
2. Oceans	
1. surface temperature anomalies	4
2. ENSO	5
3. tropical Atlantic and Indian Ocean index	6
4. North Atlantic SST	7
3. Atmospheric circulation	
1. Global teleconnection	8
2. 500hPa Geopotential height	9
3. Modes of variability	10
4. Modes verification	11
5. Summer SLP weather regimes	12
4. Climatic parameters over Europe	
1. temperature	13
2. Precipitations	14
5. General summary	
1. for the period ASO 2019	15

Introduction : Objective

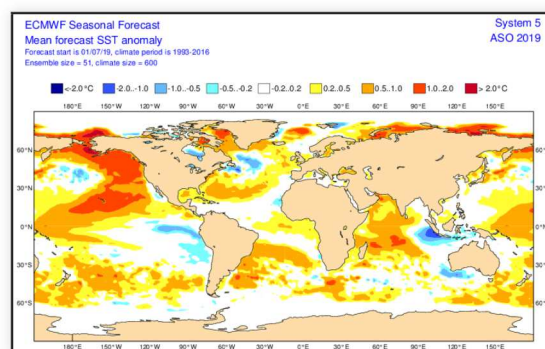
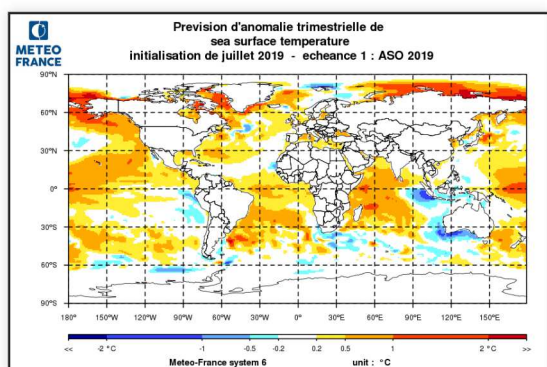
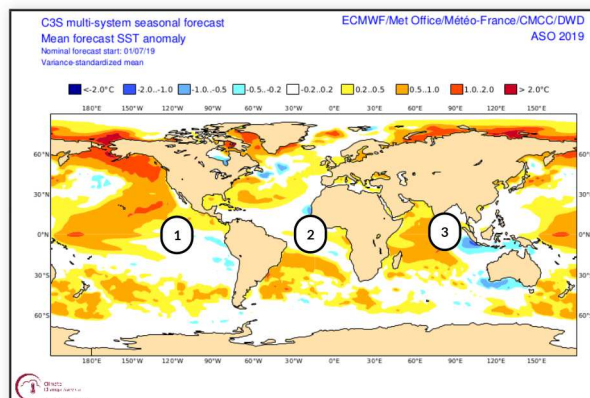
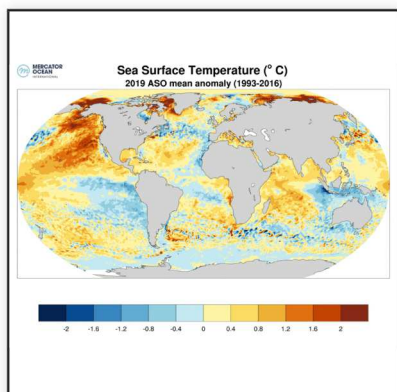
- The objective of the Seasonal Verification Bulletin is to present an evaluation of the main elements highlighted in the Seasonal Forecast Bulletin : oceanic forcings, large scale circulation patterns, and a focus on temperature and precipitation forecast over Northern Atlantic, Europe and the Mediterranean Basin.
- The aim is not to evaluate the mean skill of Seasonal Forecast models, for which scores are calculated over the whole hindcast period, but to enhance the knowledge of the behavior of models for advanced users (as National Meteorological Services), in parallel with an assessment of expertised forecast. This approach meets the need of many users, who want to know the recent real-time performances of forecasts, for specific events.
- Thanks to Mercator-Ocean and DWD (RCC-Climate Monitoring node for Europe) for providing products and analysis on the monitoring part.

Oceans : surface temperature anomalies

SST patterns rather were well captured by the models in the Northern Hemisphere, both Pacific and Atlantic oceans.

In the tropics, the positive IOD was well predicted, as well as the positive anomaly in the equatorial Atlantic.

In the Southern hemisphere cold anomalies were underestimated, especially over eastern equatorial and South Pacific and over Tropical Atlantic.

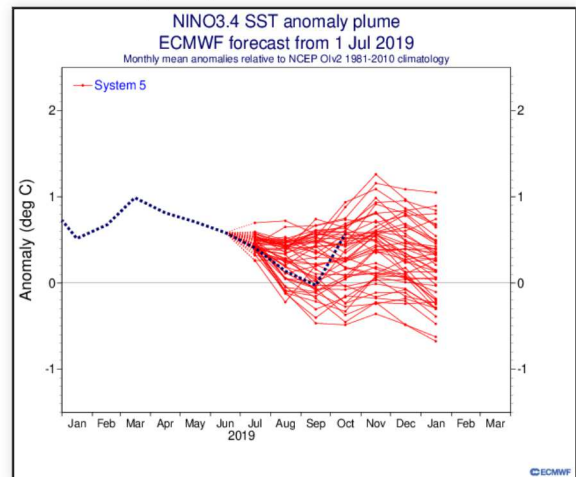
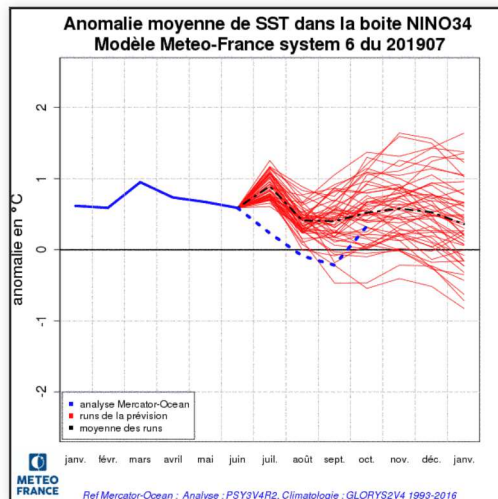


SST anomalies in the analysis from Mercator (top left), C3S multi-models (top right), MF6 (bottom left) and SEAS5 (bottom right)
 1 - Cold anomaly not predicted
 2 - Warm anomaly predicted
 3 - Positive IOD very well captured

Oceans : ENSO

CAUTION : reference analysis differ between MF-S6 (Mercator-Ocean 1993-2016) and SEAS5 (NCEP 1981-2010).

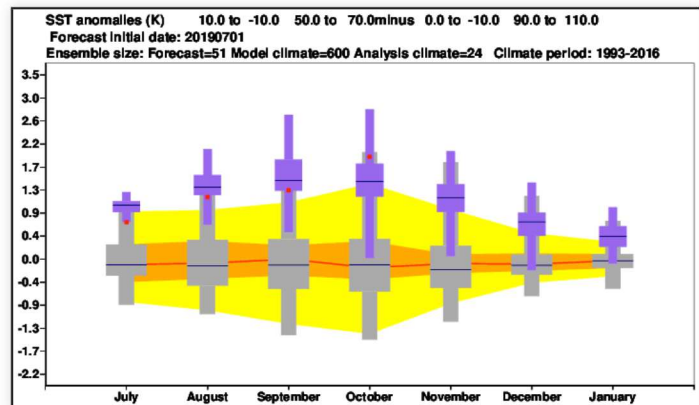
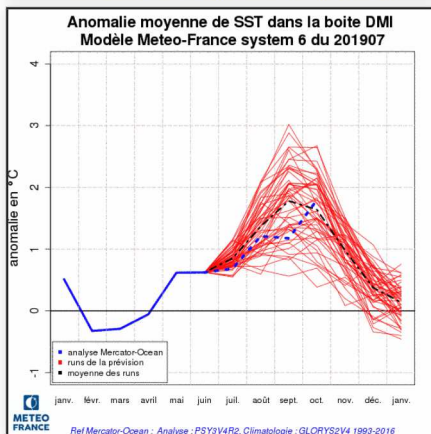
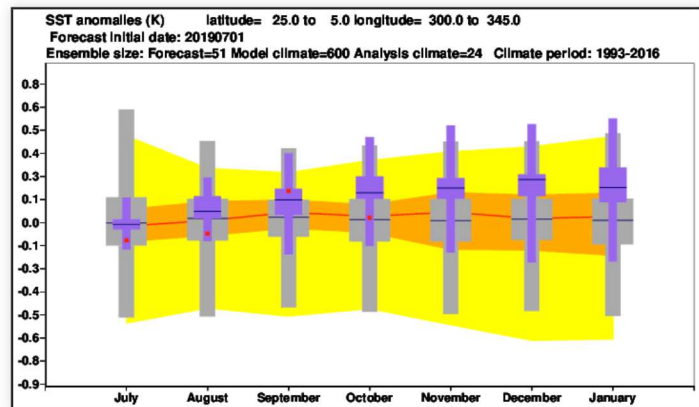
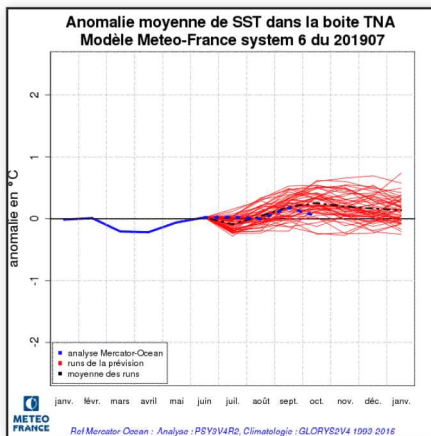
Decrease of temperature anomaly in the Niño 3.4 box was well anticipated by ECMWF, not by MF-S6



Oceans : tropical Atlantic and Indian Ocean index

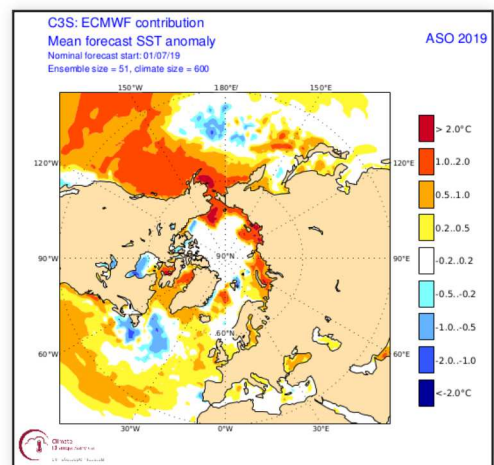
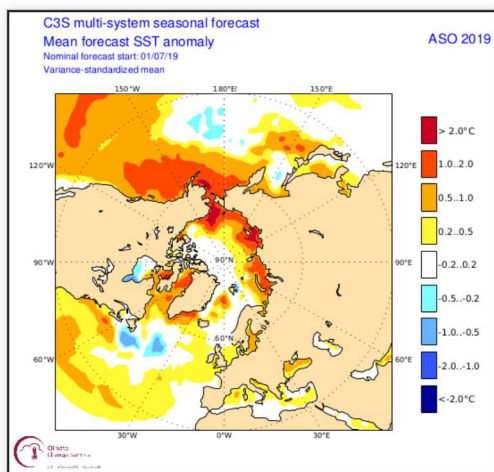
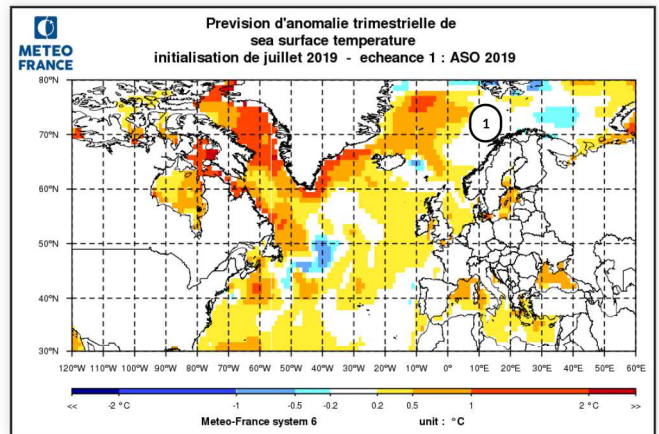
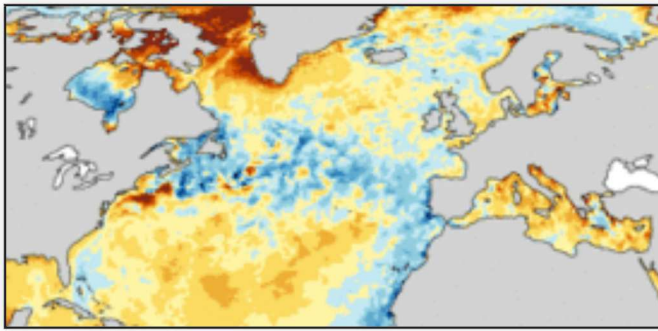
TNA : good prediction for MF-S6 and ECMWF-SEAS5

DMI : increasing trend well forecasted by both models



Oceans : North Atlantic SST

Underestimation of the cold anomaly from Canadian coast to the Iberian peninsula and along the african coast. The warm patterns (the one around Greenland, and the one from USA's coasts to Azores) were rather well predicted. In the Mediterranean, good prediction of the warm anomaly.

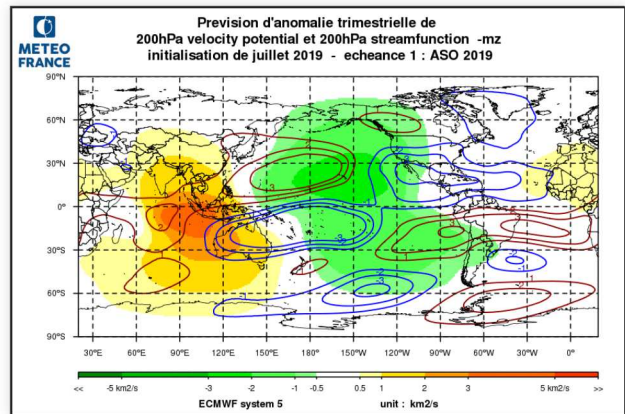
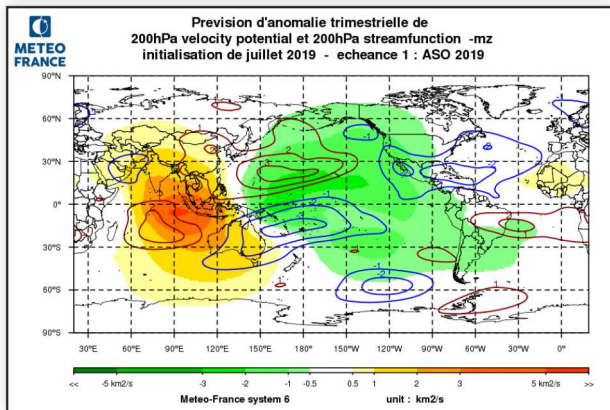
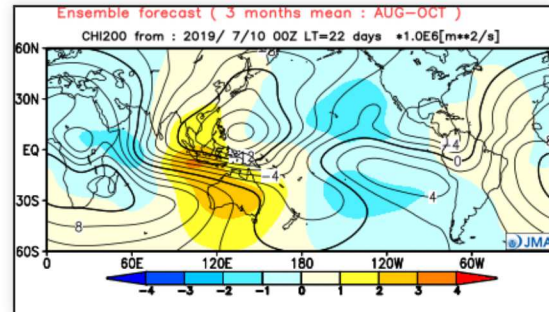
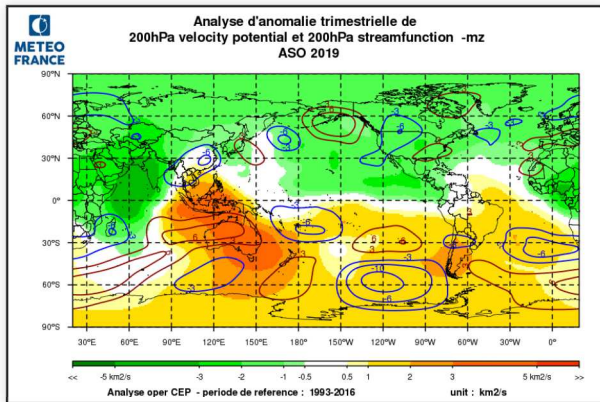


SST anomalies in the analysis from Mercator (top left), MF6 (top right), C3S multi-models (bottom left) and SEASS (bottom right)
1 - Norwegian sea predicted too hot

Atmospheric circulation : Global teleconnection

VP 200hPa : subsidence anomaly was well forecast over Maritime Continent and to a lesser extent over Australia. Ascent anomalies were also well predicted over northern Pacific Ocean. Poor forecasts elsewhere with MF-S6 and ECMWF : widespread subsidence accross the whole Southrn Hemisphere was not anticipated. Neither was the ascent anomaly over Indian Subcontinent and West-Central Africa. Note that JMA predicted the good signal over Eastern Indian Ocean and Africa.

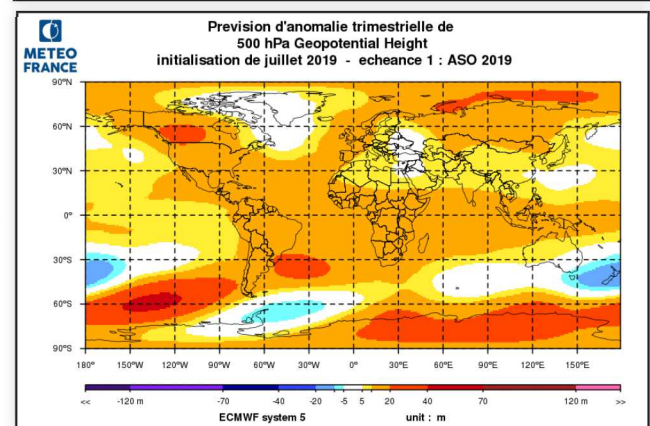
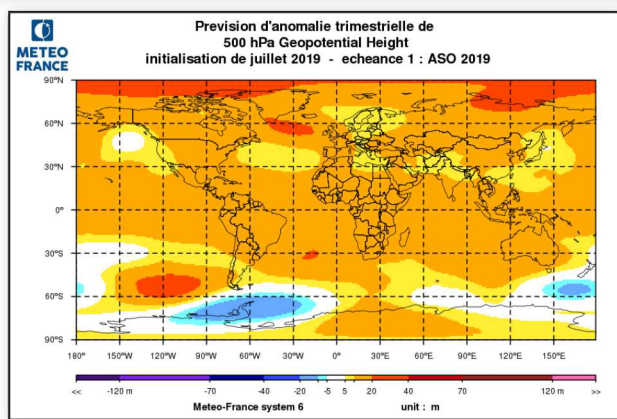
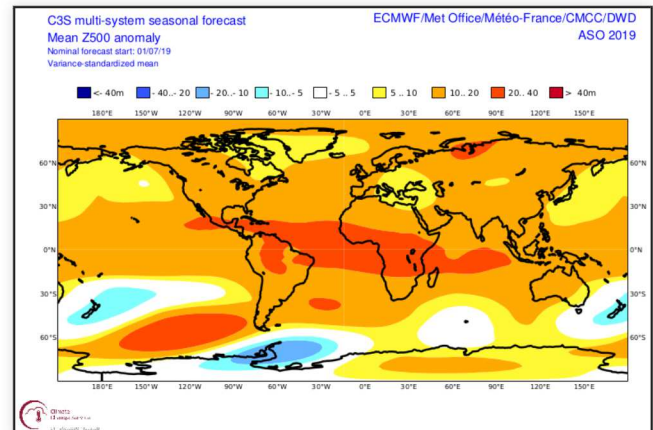
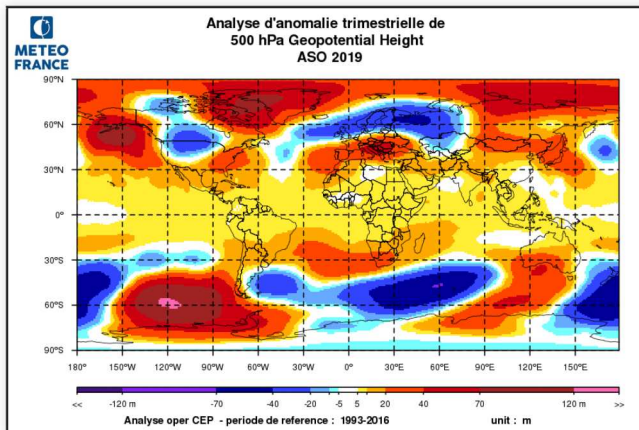
FC 200 hPa : Rather strong teleconnections were forecast over the Pacific (both hemispheres) but they dit not occur, even where the VP200 forecast was correct.



Atmospheric circulation : 500hPa Geopotential height

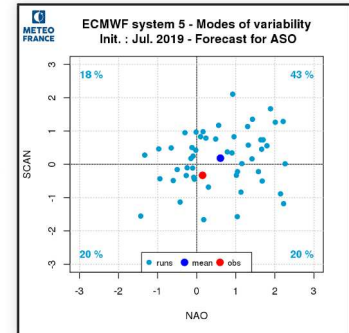
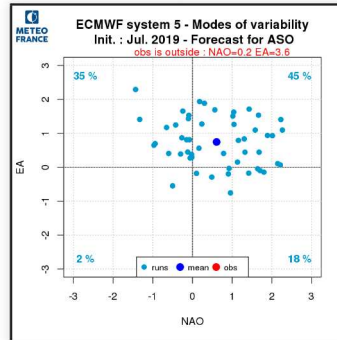
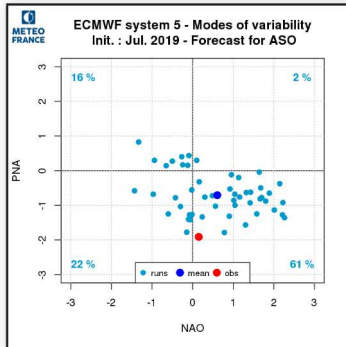
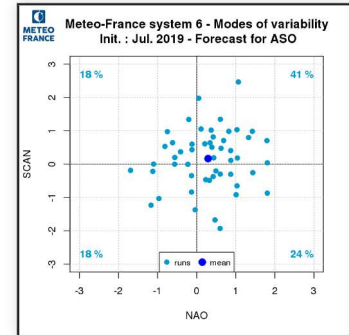
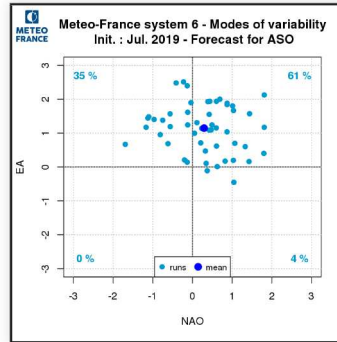
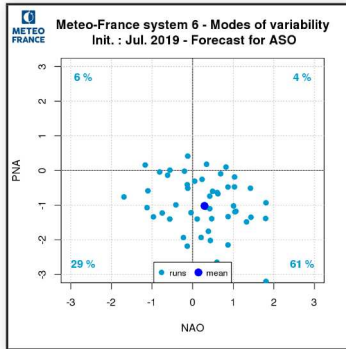
Very poor forecasts for the individual models and the C3S multi-model on the North hemisphere, much better on the South hemisphere.

Over Europe the dipole anomaly pattern was missed by models.



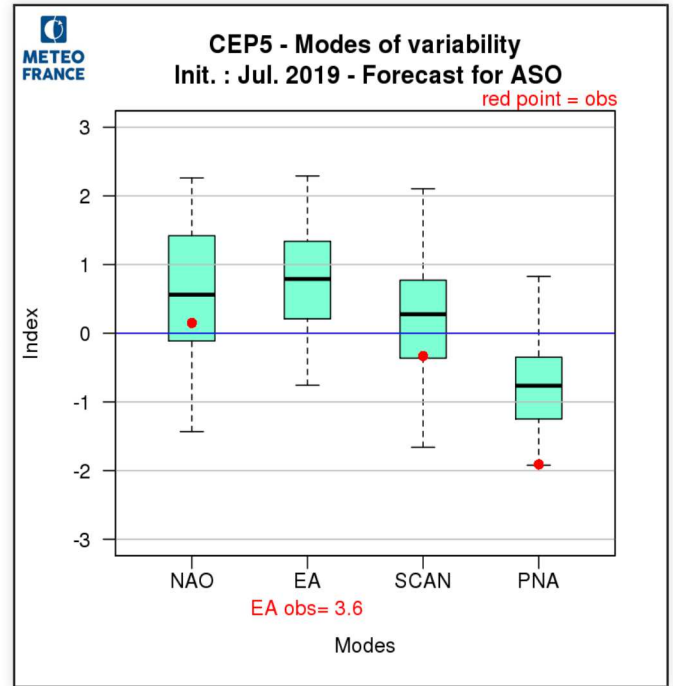
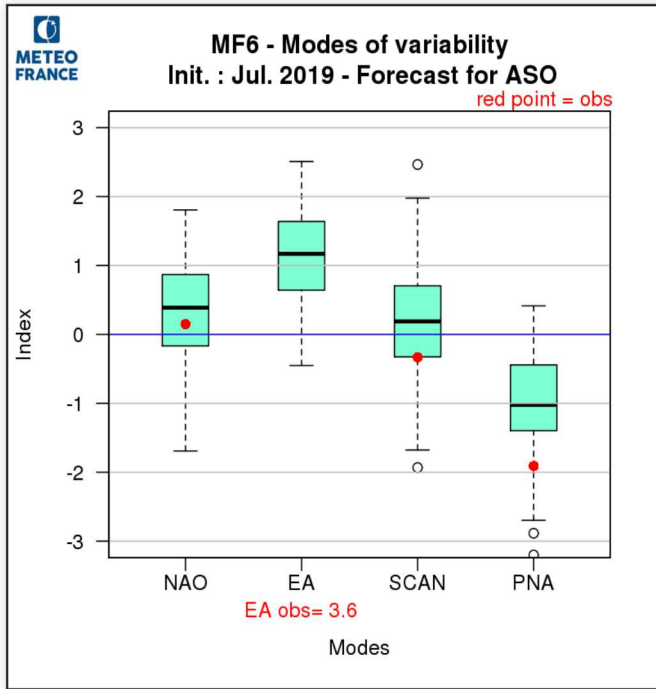
Atmospheric circulation : Modes of variability

Despite a bad Z500 forecast (visually), the main modes of variability predictions were pretty good : the strong negative PNA and the strong positive EA were foreseen.



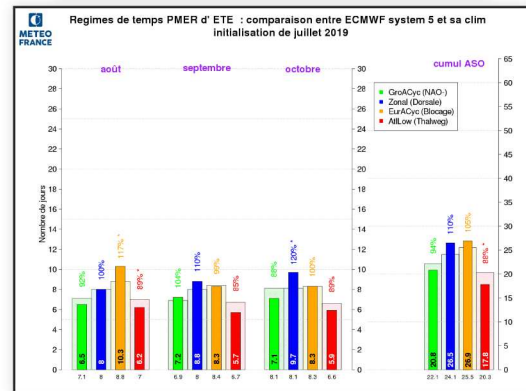
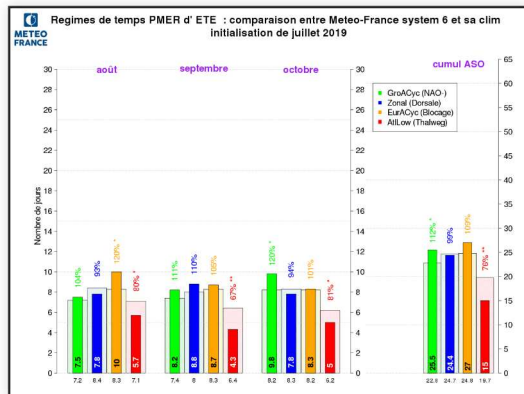
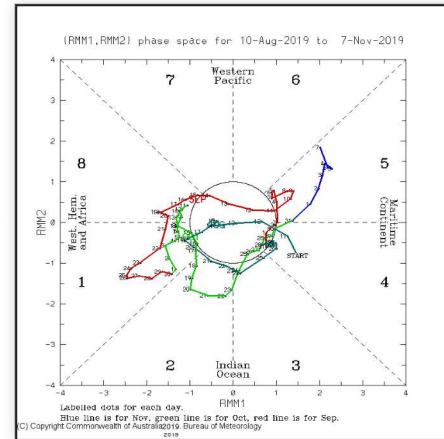
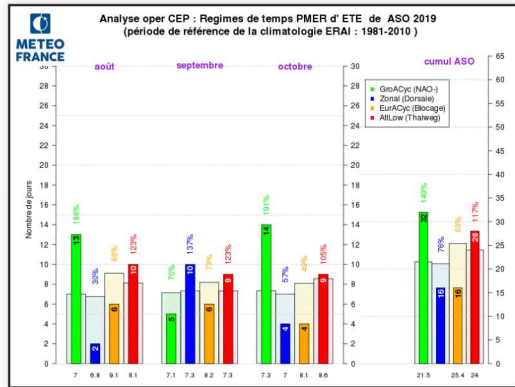
Atmospheric circulation : Modes verification

Same remarks as previous slide. Globally a good forecast for the main modes of variability with both models.



Atmospheric circulation : Summer SLP weather regimes

Poor performances of both models.

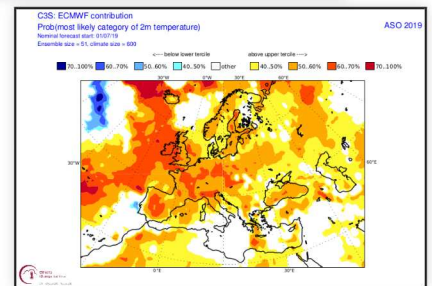
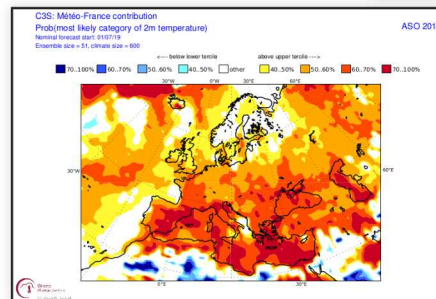
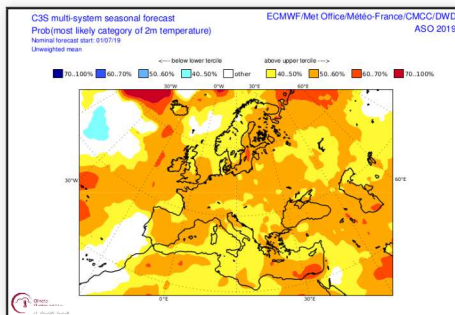
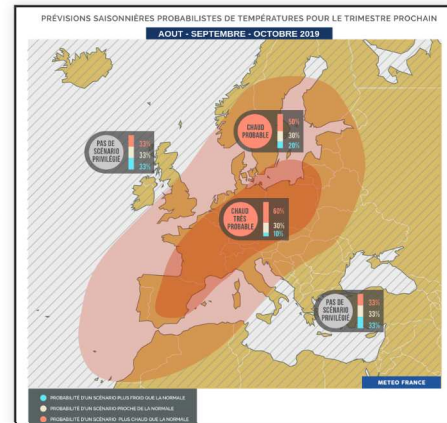
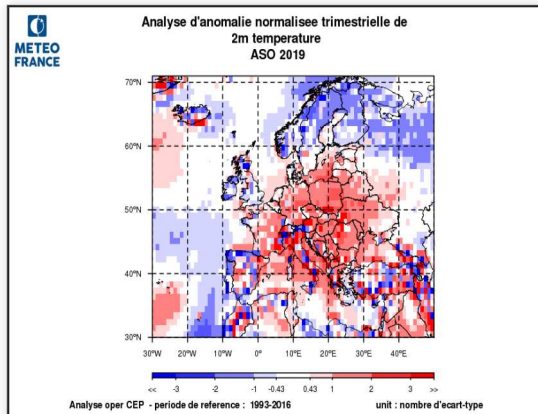


Climatic parameters over Europe : temperature

Rather good forecast for Europe, the warm pattern observed over most of the continent was well predicted by models and was present in the synthesis.

The cold anomaly in high latitudes was not foreseen.

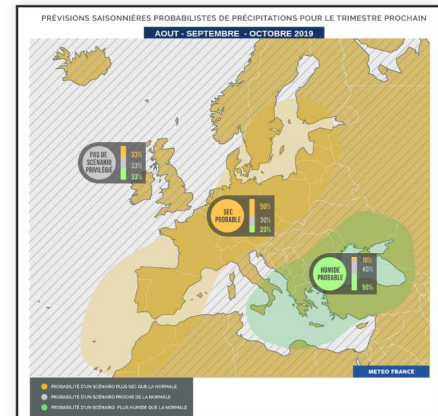
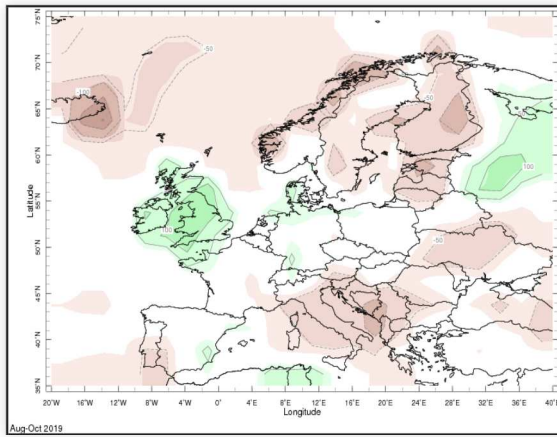
Elsewhere, quite patchy signal.



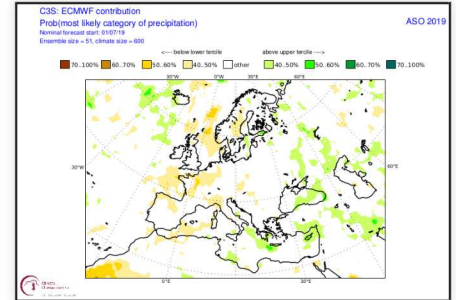
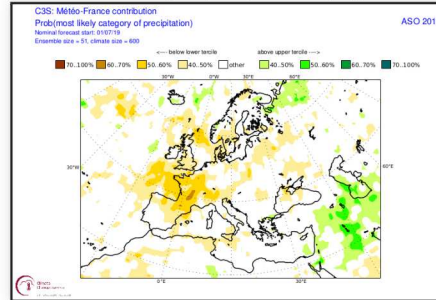
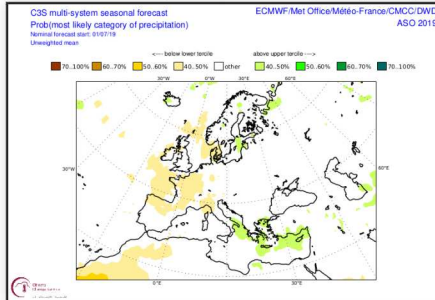
Climatic parameters over Europe : Precipitations

Bad forecast over the Balkans, Turkey and around the Black Sea.

Over western Europe, the dry signal privileged by models and the synthesis did not really occur, the situation was normal.



Standardized Precipitation Index analysed by IRI top left, Synthetic forecast map for precipitation top right and forecast for multi-model, MF6 and SEAS5 on the bottom line.



General summary : for the period ASO 2019

1) Oceans :

Good forecasts when looking at a global scale. The positive IOD was very well captured.

2) Large scale atmospheric circulation :

VP 200hPa : OK for Maritime Continent / Australia (subsidence) and northern Pacific basin (ascents). Poor forecasts for ascent anomalies over West-Central Africa (except for JMA), and widespread subsidence for the Southern Hemisphere.

FC 200 hPa : Teleconnections were much more weaker than forecasted.

Z500 : globally very poor forecasts, especially in mid-latitudes.

But the main modes (EA+ and PNA-) were very well captured by MF-S6 and ECMWF-SEAS5. The forecast was strong and was right. .

3) Climatic parameters over Europe :

Bad forecast for precipitation. Warm signal for Europe was well anticipated . Cool conditions not anticipated for Western Russia and Scandinavia.