

VERIFICATION BULLETIN

JULY - AUGUST - SEPTEMBER 2019

Table of Content

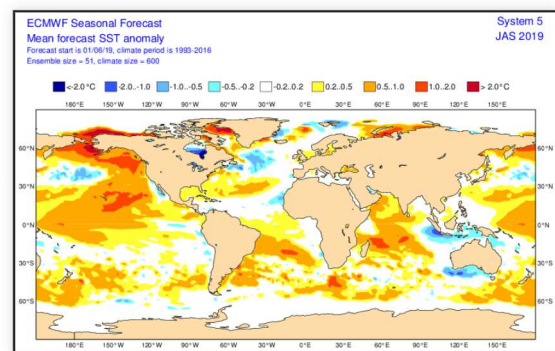
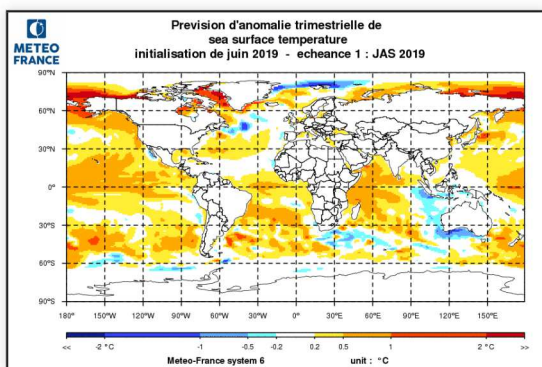
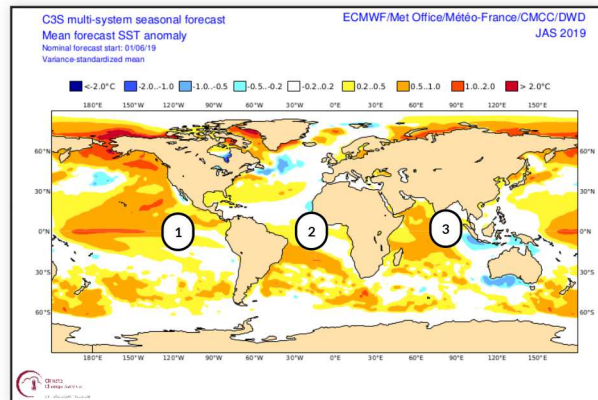
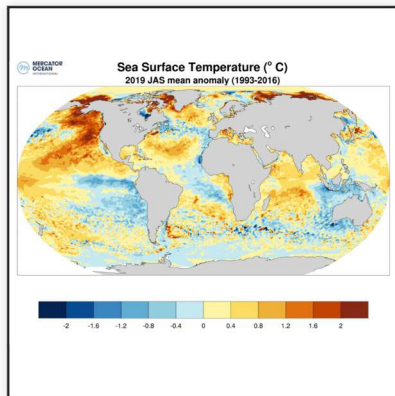
1. Introduction	
1. Objective	3
2. Oceans	
1. surface temperature anomalies	4
2. ENSO	5
3. tropical Atlantic and Indian Ocean index	6
4. North Atlantic SST	7
3. Atmospheric circulation	
1. Global teleconnection	8
2. 500hPa Geopotential height	9
3. Modes of variability	10
4. Modes verification	11
5. Summer SLP weather regimes	12
4. Climatic parameters over Europe	
1. temperature	13
2. Precipitations	14
5. General summary	
1. for the period JAS 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 were well captured by the models in the Northern Hemisphere. In the Southern hemisphere cold anomalies were underestimated, especially over eastern equatorial and South Pacific and over Tropical Atlantic. Positive IOD was rather well predicted.



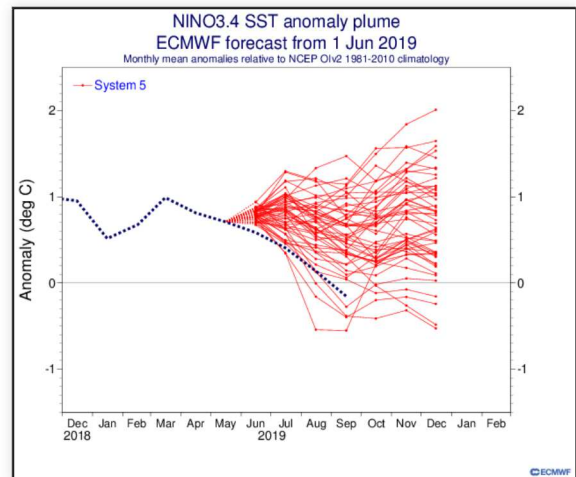
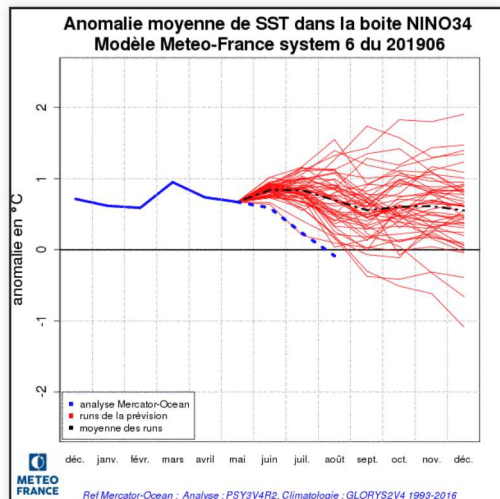
SST anomalies in the analysis from Mercator (top left), C3S multi-models (top right), MF6 (bottom left) and SEASS (bottom right)

- 1 - Cold anomaly not predicted
- 2 - Cold anomaly not predicted
- 3 - Positive IOD rather well captured

Oceans : ENSO

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

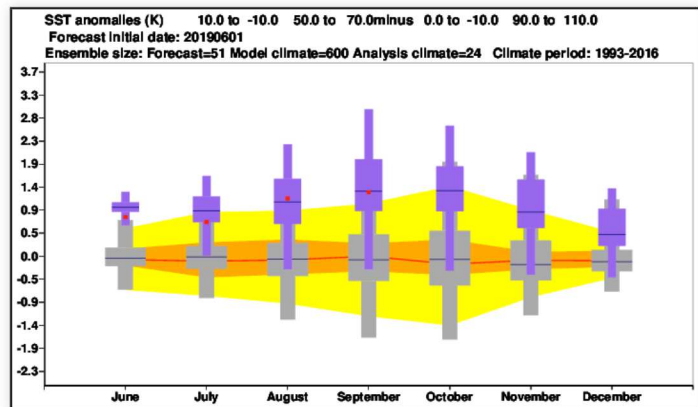
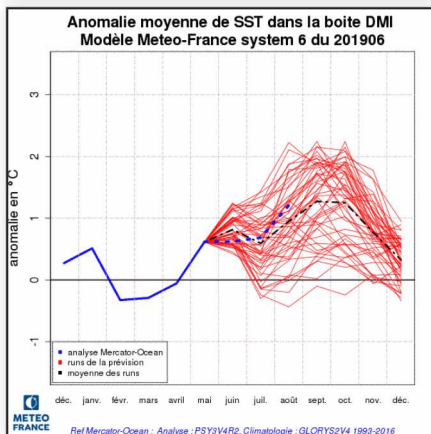
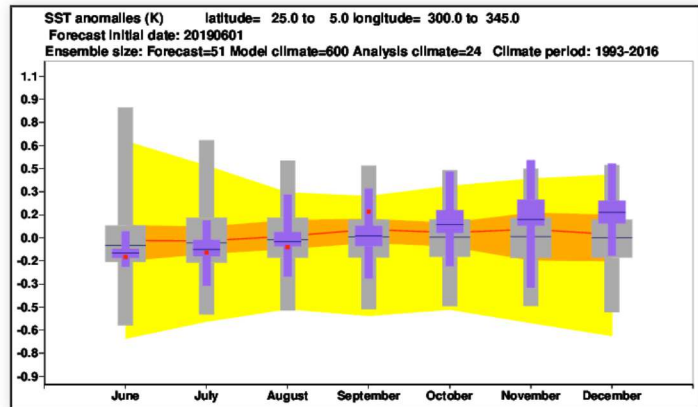
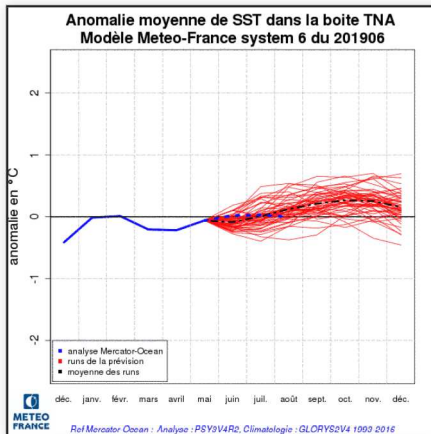
Decrease of temperature anomaly in the Niño 3.4 box was not anticipated by both models.



Oceans : tropical Atlantic and Indian Ocean index

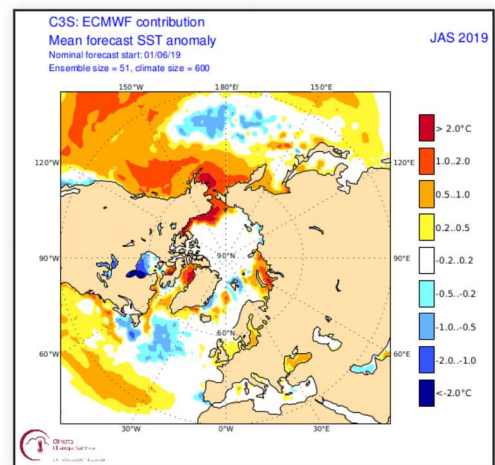
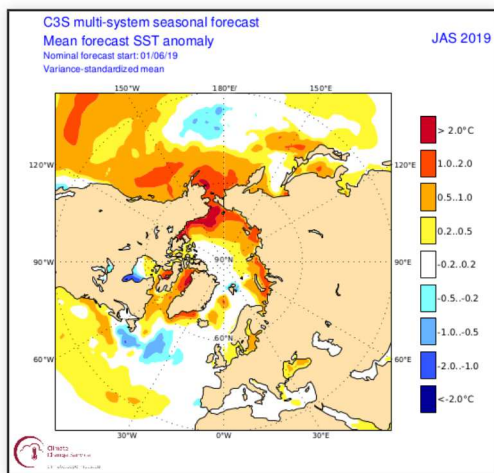
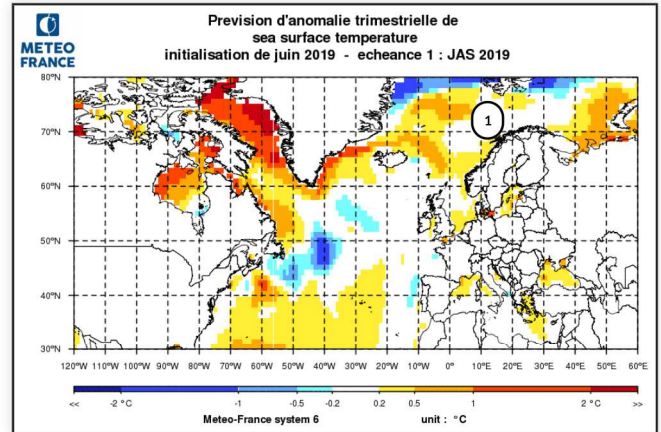
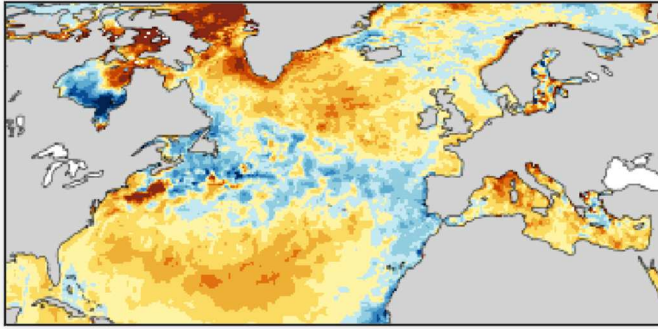
TNA : better prediction for MF7 (slow increase)

DMI : increasing trend rather well forecast by both models



Oceans : North Atlantic SST

Patterns rather well captured except for cold anomaly around Iceland and off the Labrador coasts. Magnitude of anomalies underestimated, especially in the Mediterranean.

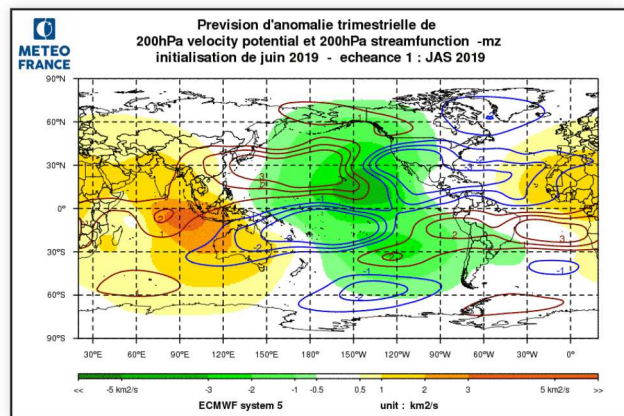
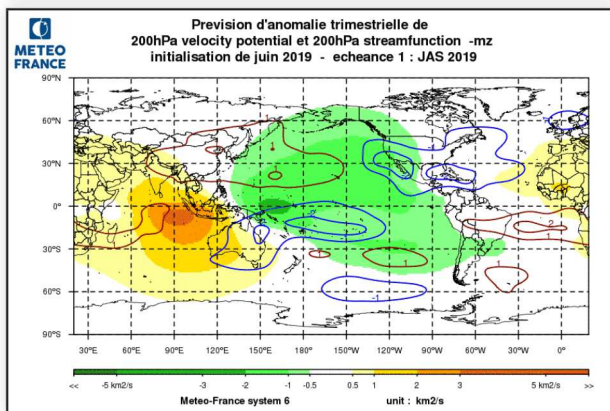
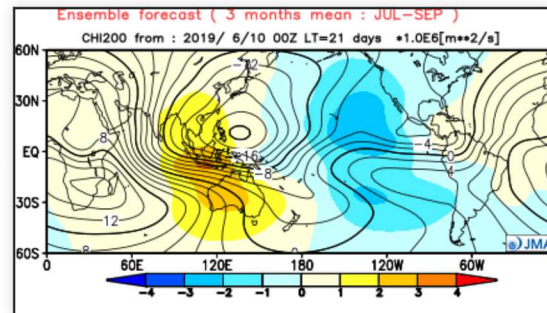
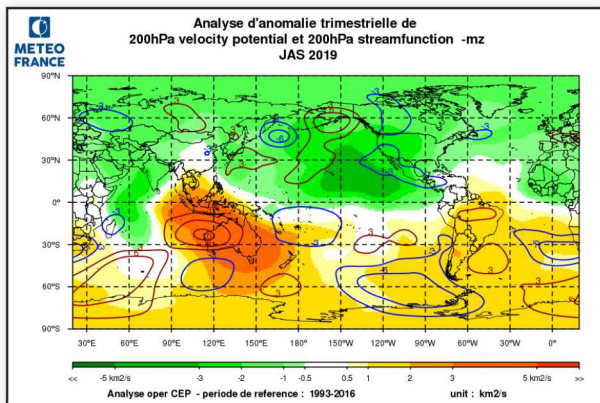


SST anomalies in the analysis from Mercator (top left), MF6 (top right), C3S multi-models (bottom left) and SEASS (bottom right)
1 - Norwegian sea predicted too hot

Atmospheric circulation : Global teleconnection

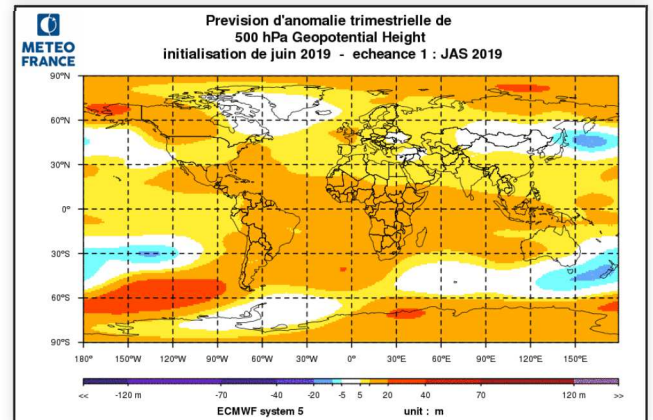
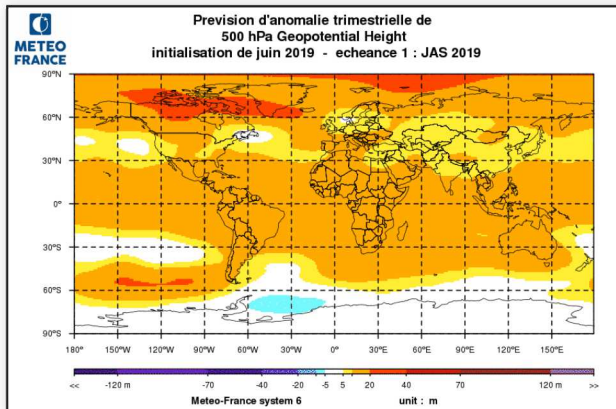
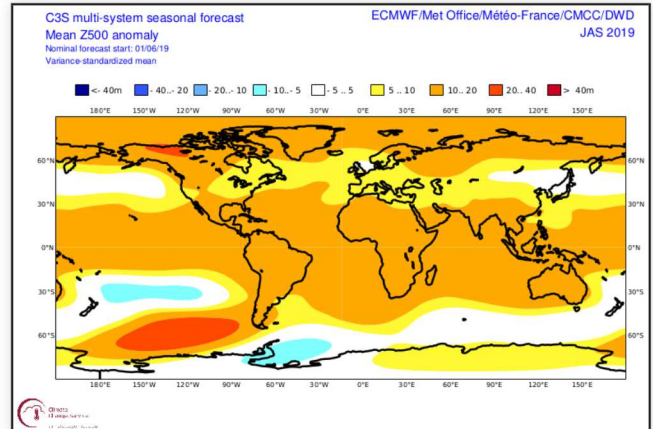
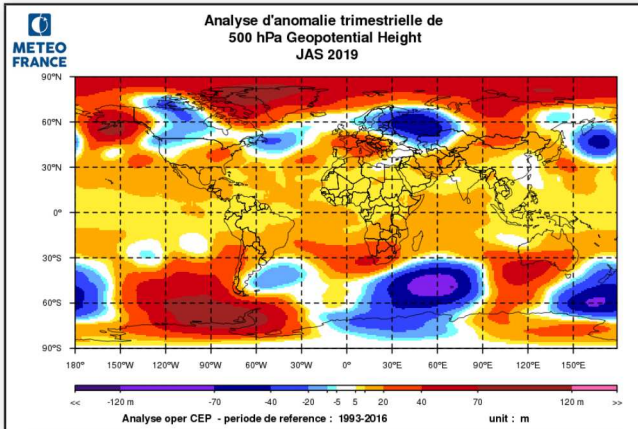
VP 200hPa : subsidence anomaly was well forecast over Maritime Continent and to a lesser extent over Australia. Ascent anomalies were also well predicted over northern Pacific Ocean. Poor forecasts elsewhere : widespread subsidence across the whole Southern Hemisphere was not anticipated. Neither was the ascent anomaly over Indian Subcontinent and West-Central Africa.

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



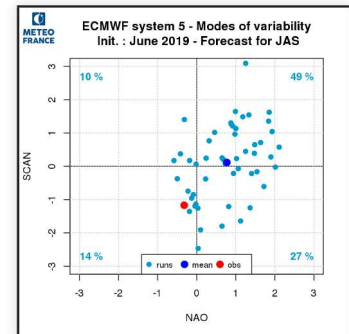
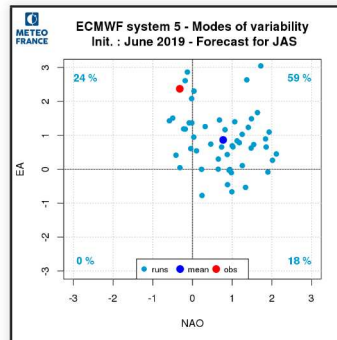
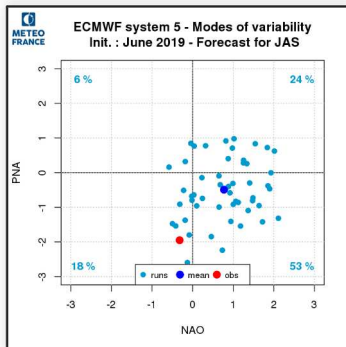
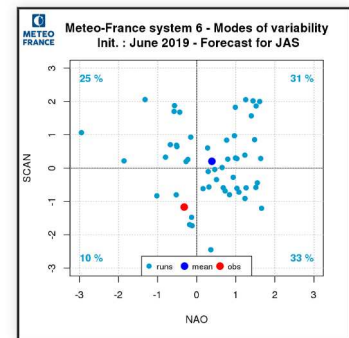
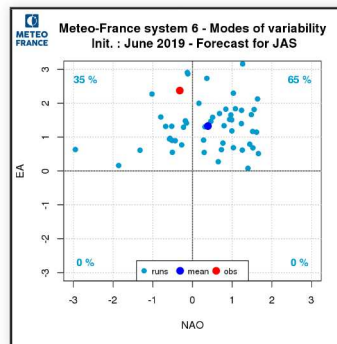
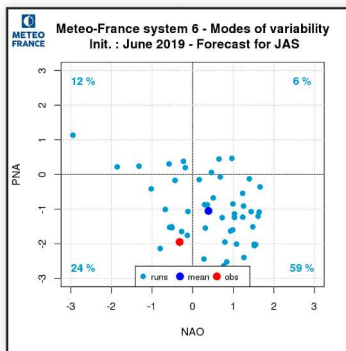
Atmospheric circulation : 500hPa Geopotential height

Very poor forecasts for the C3S consensus, particularly over the USA. A little better for Europe (esp. MF6), but the SW-NE dipole was largely underestimated and/or incorrectly positioned.



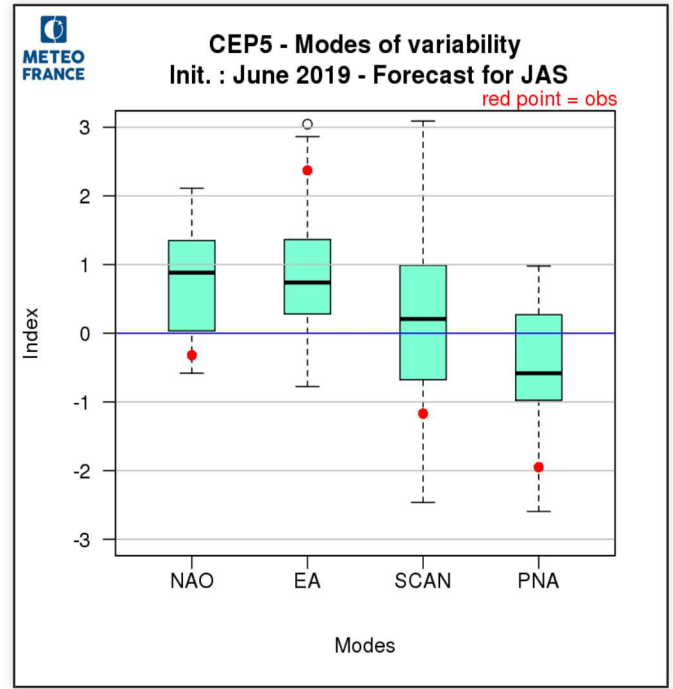
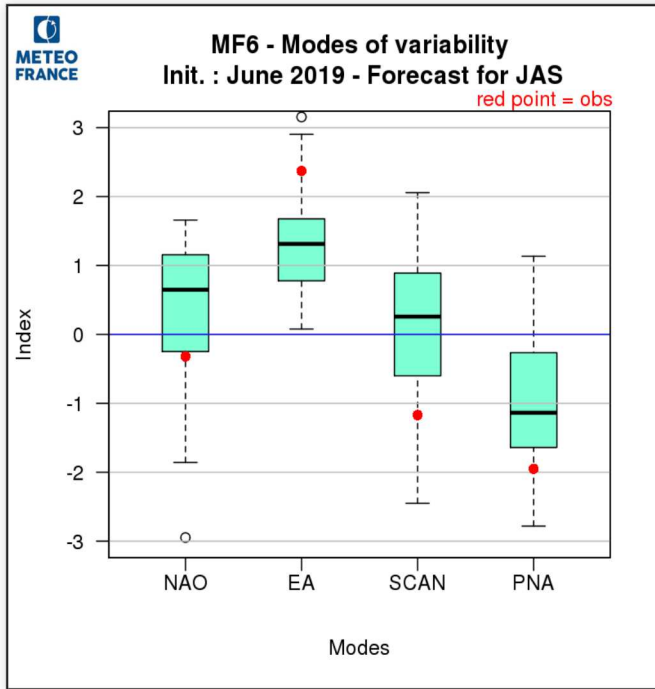
Atmospheric circulation : Modes of variability

Both modes were better predicted by MF6, especially the highly positive EA mode (100 % probability !).



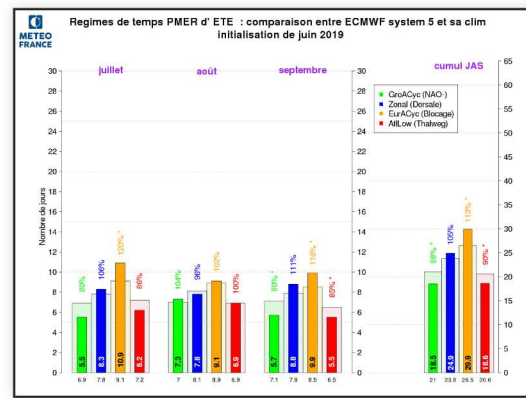
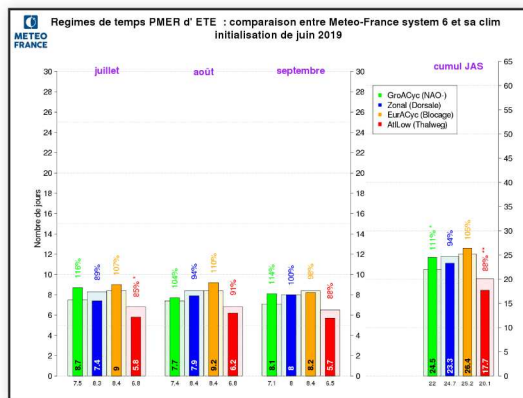
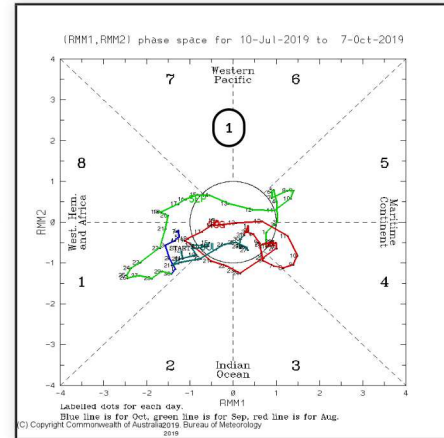
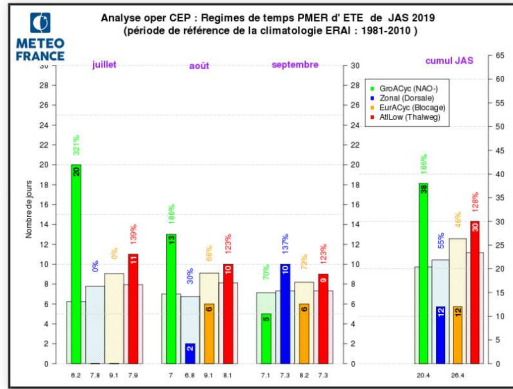
Atmospheric circulation : Modes verification

Same remarks as previous slide. Very poor SCAN forecasts.



Atmospheric circulation : Summer SLP weather regimes

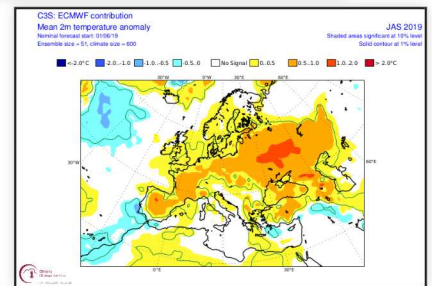
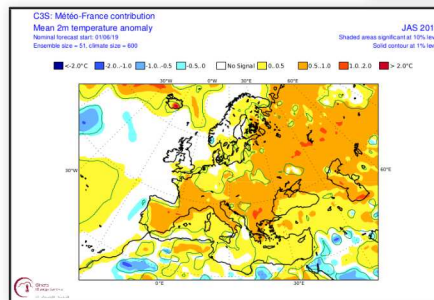
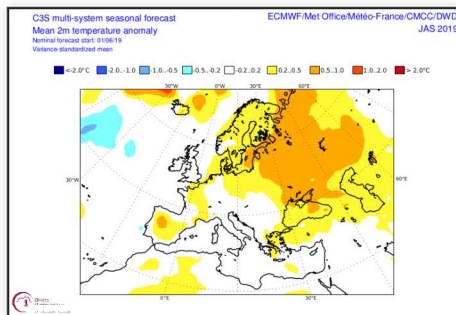
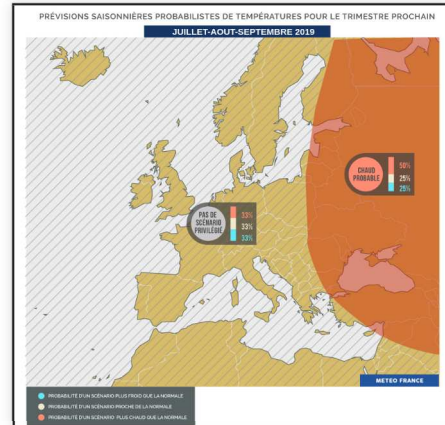
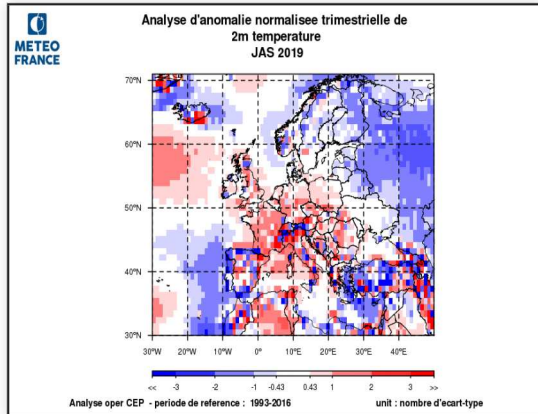
Poor performances of both models. MF6 a little better for NAO. Surprisingly, MF6 did not succeed in its "atlantic low" forecast whereas it was rather good at predicting the EA+ mode.



1 - MJO remained inactive most of the time and can't explain the predominance of the NAO - regime

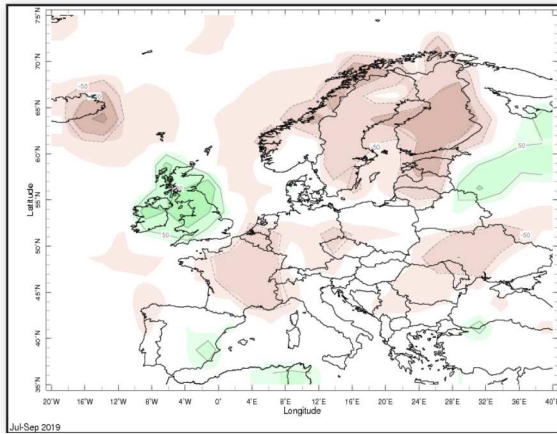
Climatic parameters over Europe : temperature

Poor forecasts for Scandinavia and western Russia, where cool conditions were not anticipated. Warm conditions for Western Europe were better captured by ECMWF and MF6 but the C3S consensus made the signal less clear.

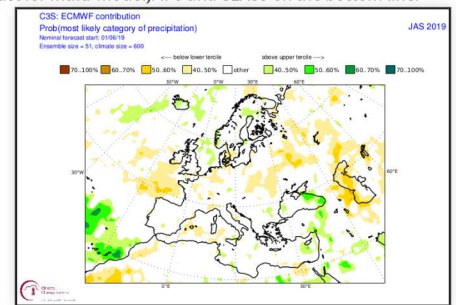
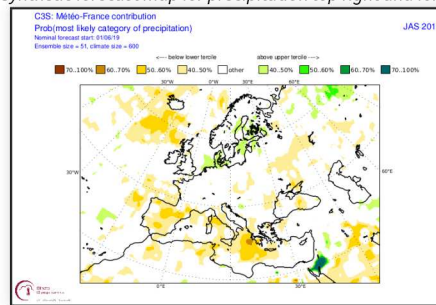
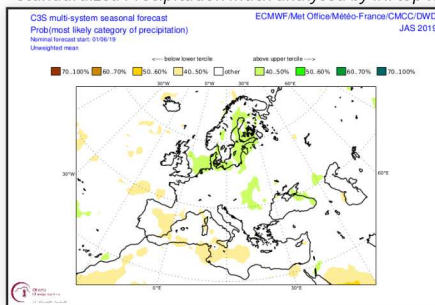


Climatic parameters over Europe : Precipitations

Poor 500 hPa height forecast means bad precipitation forecast : almost reverse to what has been observed, with dry conditions for continental Europe and wet conditions for the British Isles. It should be noted that the wet "spots" of Eastern Spain and Northern Africa are largely due to a single heavy precipitation event that lasted from 10 to 15 september !



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 JAS 2019

1) Oceans :

Rather good forecasts when looking at a global scale. When looking in more details, cooling along Equatorial Pacific was not anticipated. Neither was the cold anomaly of Tropical Atlantic. In the Indian Ocean, positive IOD was 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, and widespread subsidence for the Southern Hemisphere.

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

Z500 : globally very poor forecasts, especially in mid-latitudes. MF6 slightly better for Europe.

EA+ mode well captured by MF6. Negative NAO in July and switch to positive NAO in September was not anticipated.

3) Climatic parameters over Europe :

Poor forecasts, especially for precipitation. Warm signal for Western Europe was anticipated by MF6 and ECMWF5 but the C3S consensus somehow weakened the signal. Cool conditions not anticipated for Western Russia and Scandinavia.