

VERIFICATION BULLETIN

MAY - JUNE - JULY 2019

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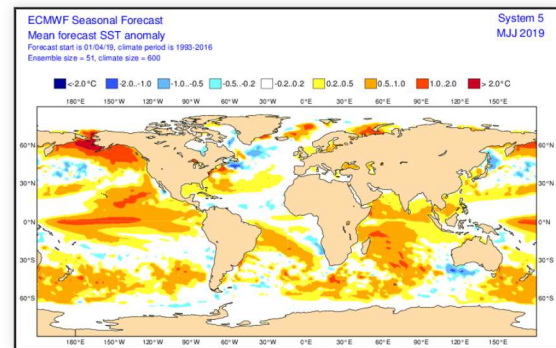
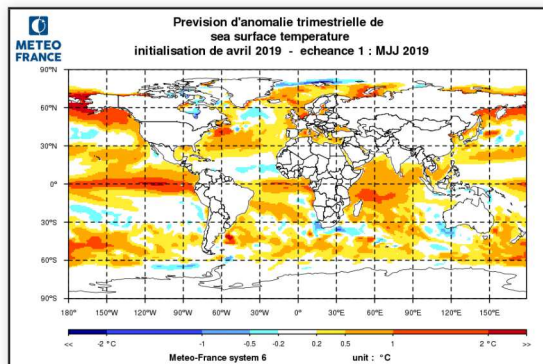
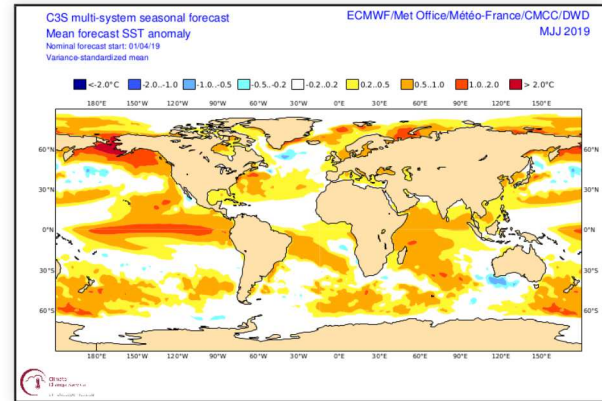
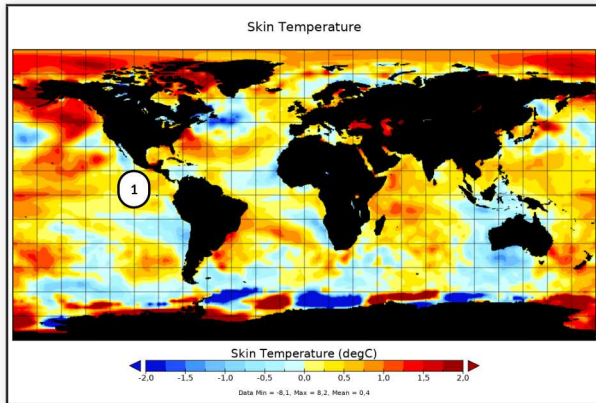
Introduction : Objective

- 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

The models have correctly predicted the SST in the northern hemisphere. In the southern hemisphere, SST have been a little overestimated.

The anomalies along the equator have also been overestimated in the eastern part of the basin, hence an overestimation of the El Nino phenomenon.



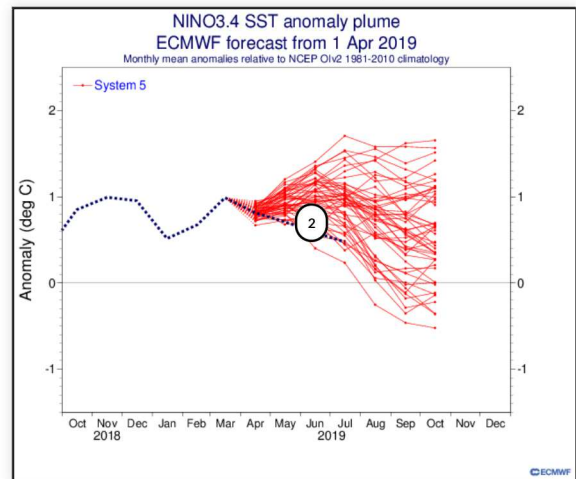
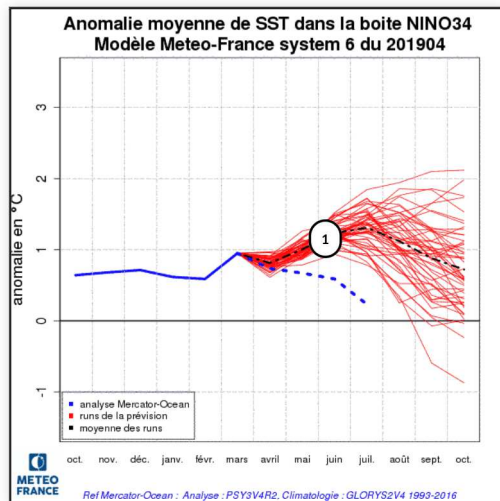
SST anomalies in the analysis from IRI (top left), C3S multi-models (top right), MF6 (bottom left) and SEAS5 (bottom right)

1 - Less strong anomaly than expected

Oceans : ENSO

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

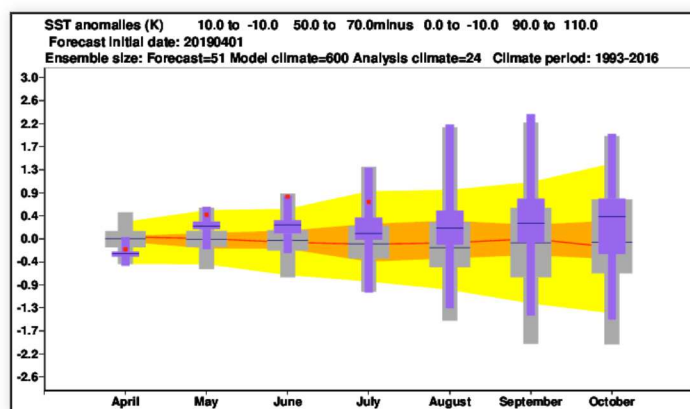
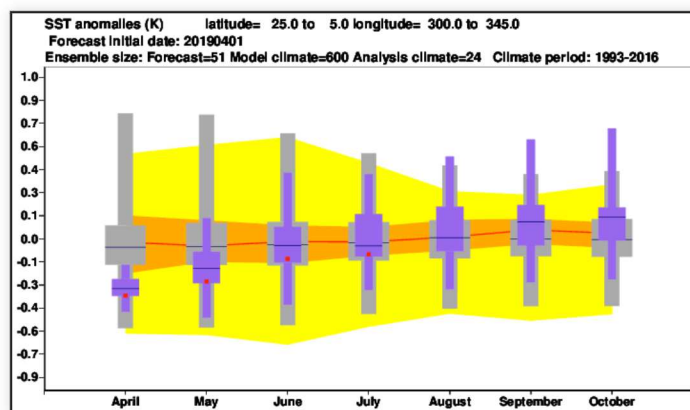
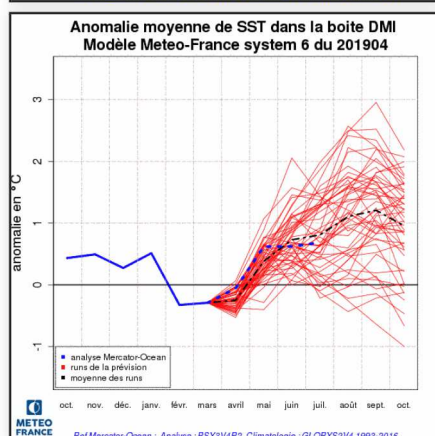
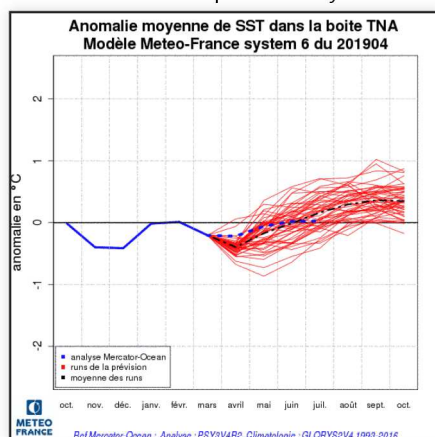
Intensity of the anomaly in the El Niño box Nino3.4 was overestimated by MF6 model and to a lesser extent by ECMWF model.



- 1 - plume entirely above observation
- 2 - observation at the low limit of the plume

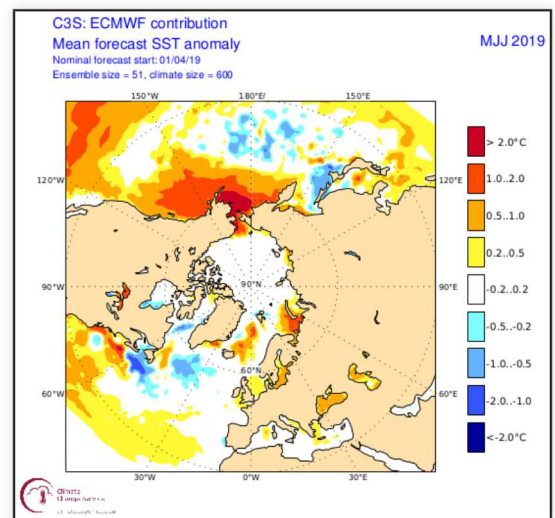
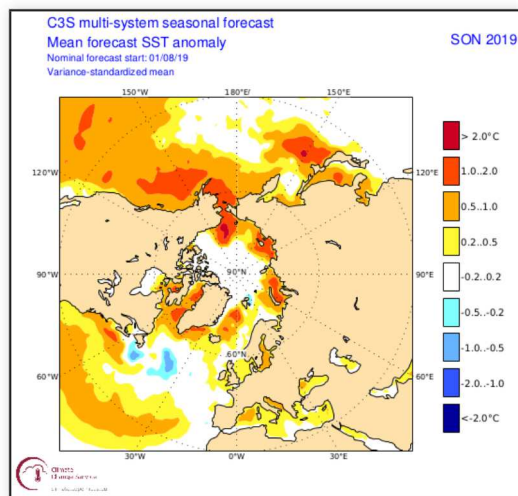
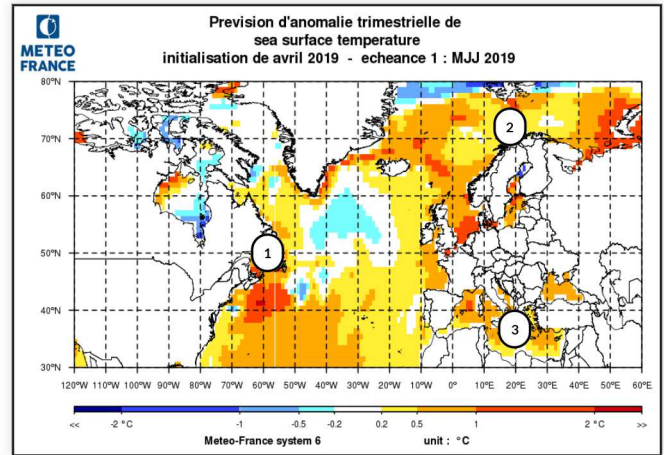
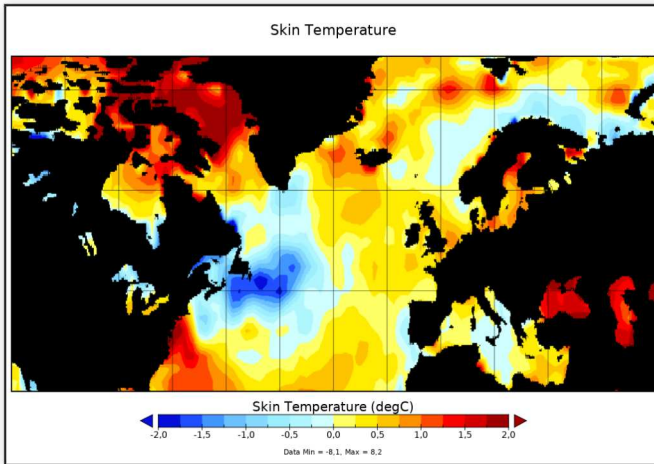
Oceans : tropical Atlantic and Indian Ocean index

TNA and DMI were well predicted by both models



Oceans : North Atlantic SST

the SEAS5 forecast seems better than MF6 in this area



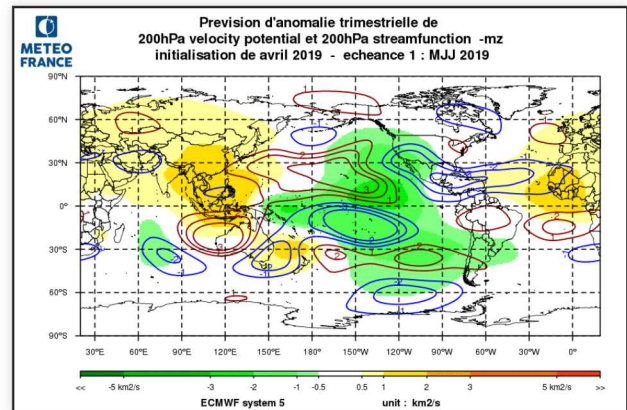
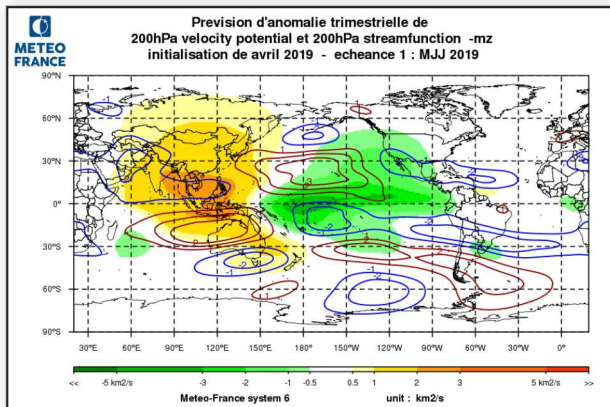
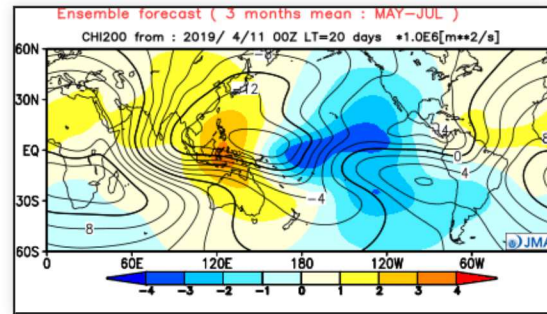
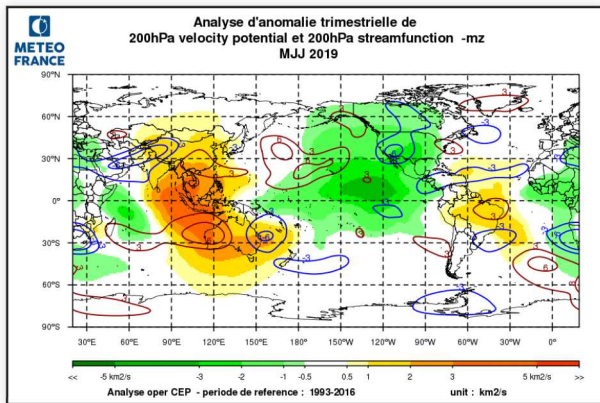
SST anomalies in the analysis from IRI (top left), MF6 (top right), C3S multi-models (bottom left) and SEAS5 (bottom right)

- 1 - the cold anomaly was predicted insufficiently cold and too far north
- 2 - Norwegian sea predicted too hot
- 3 - Mediterranean sea predicted too hot

Atmospheric circulation : Global teleconnection

VP 200hPa : The forecast is quite good on the Indian and Pacific zone, even though ECMWF is a little soft. The second wave on America, Atlantic and Africa is on the other hand rather badly anticipated.

FC 200 hPa : The field analyzed is, as usual, less structured than in the forecasts

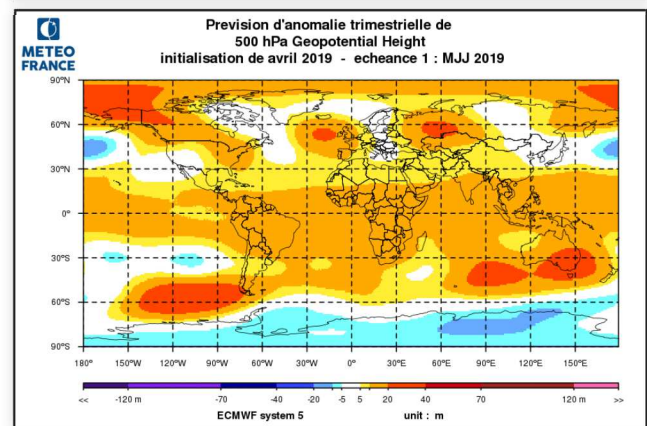
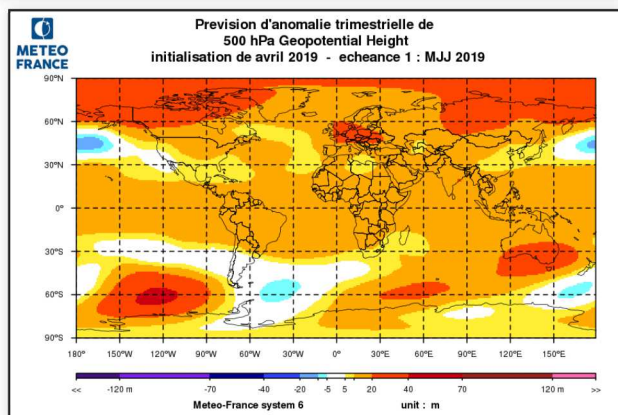
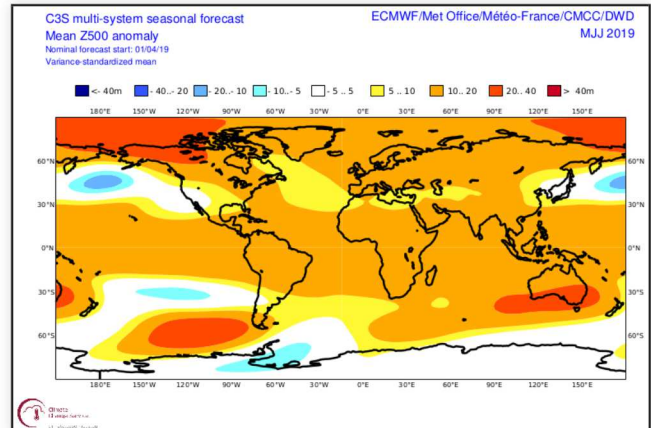
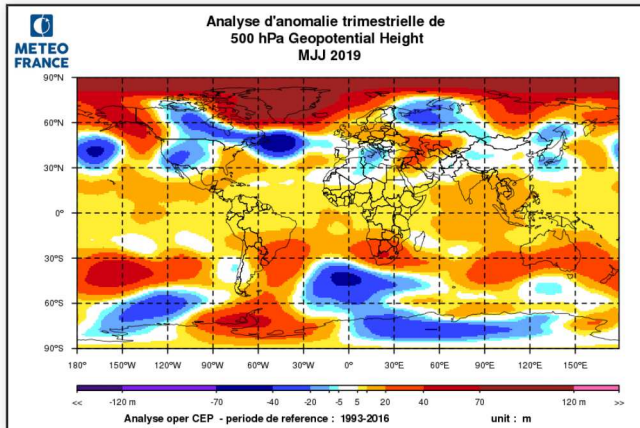


Atmospheric circulation : 500hPa Geopotential height

The fields provided are logically smoother than the analysis.

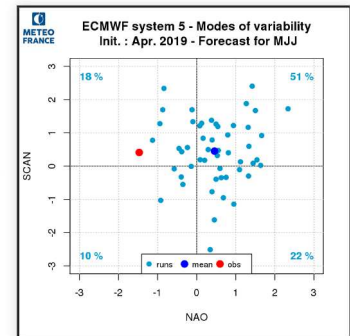
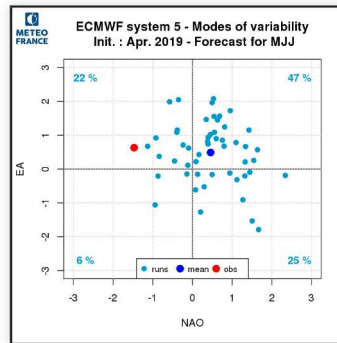
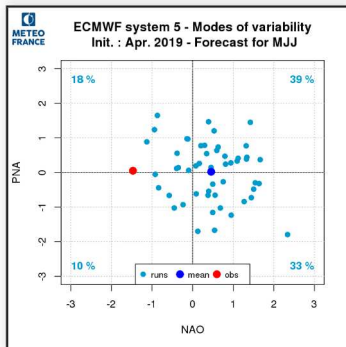
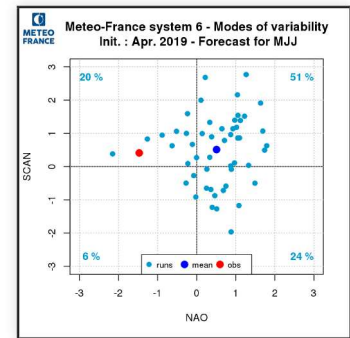
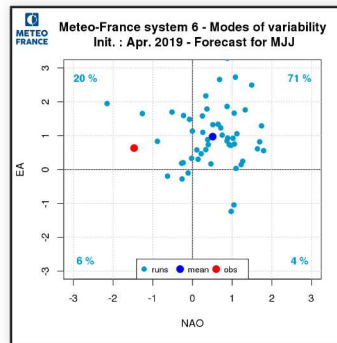
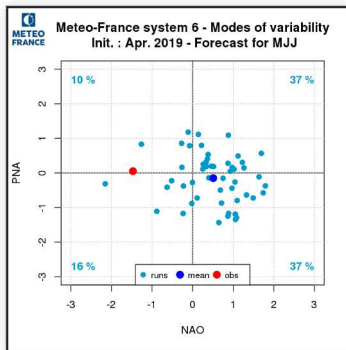
In the northern hemisphere, MF6 suggests a structure close to the analysis from Europe to Asia and the Pacific. It is less convincing about America and the Atlantic. the ECMWF model is worse.

In the southern hemisphere, neither model comes close to reality except near Australia.



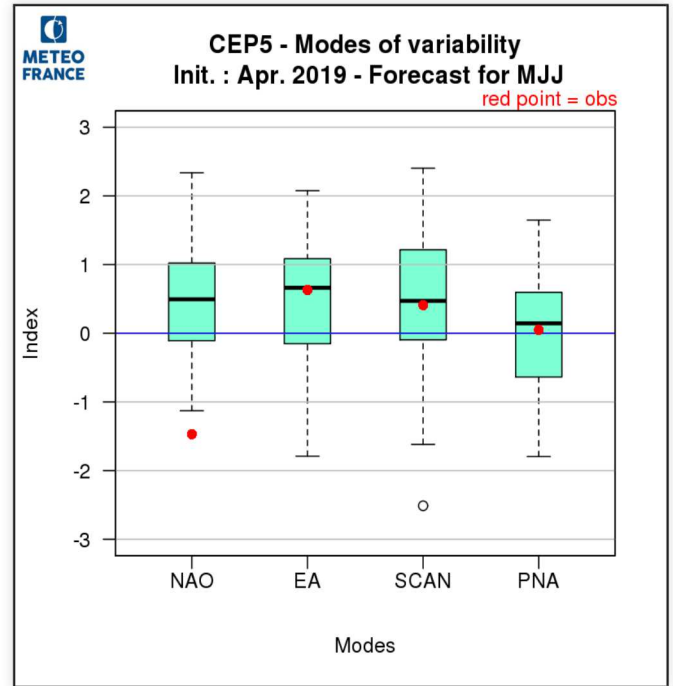
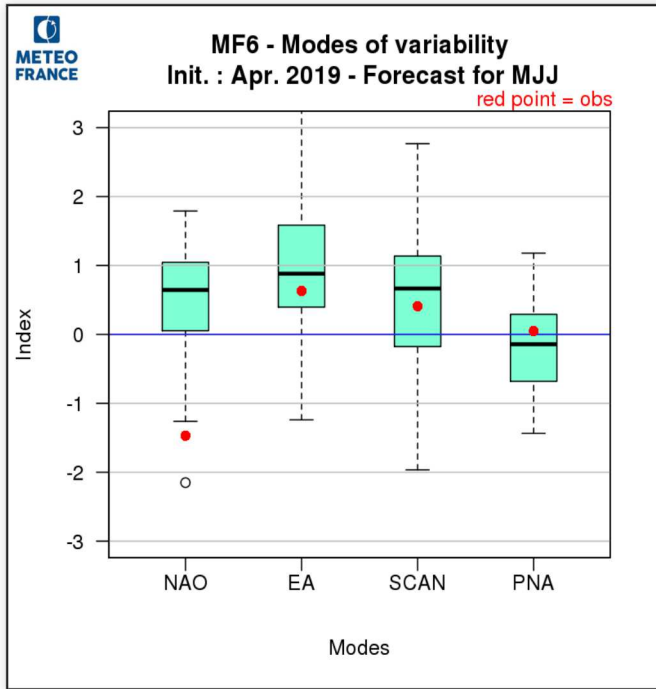
Atmospheric circulation : Modes of variability

The very marked negative phase of NAO mode was neither forecast by MF nor by SEAS5.
Good forecast for the other modes.



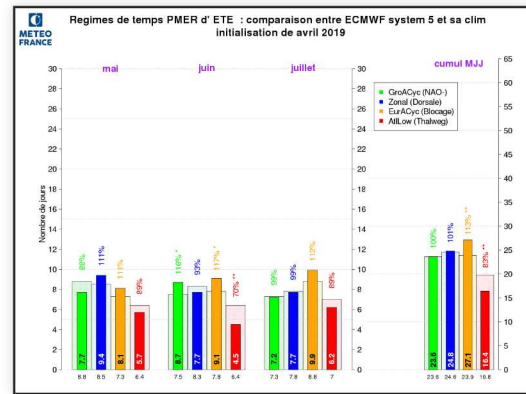
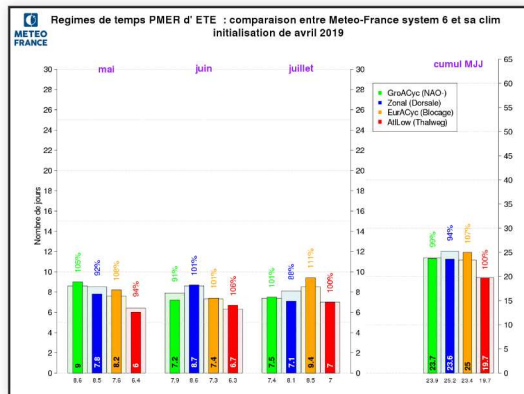
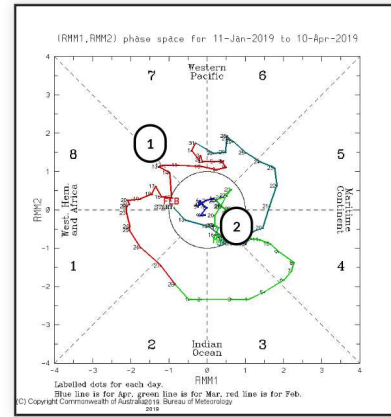
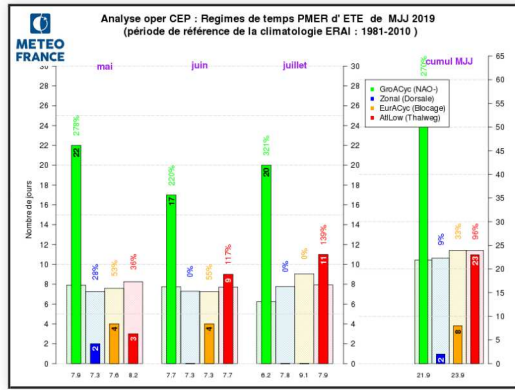
Atmospheric circulation : Modes verification

MF6 and SEAS5 were unable to predict the marked negative phase of NAO mode



Atmospheric circulation : Summer SLP weather regimes

MF6 and SEAS5 were unable to predict the pre-eminence of the NAO- summer weather regime

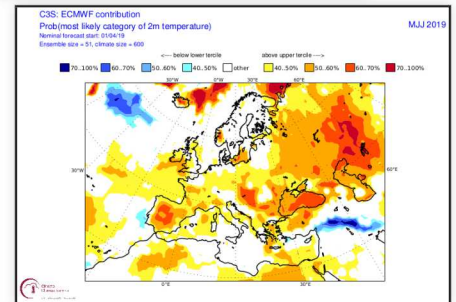
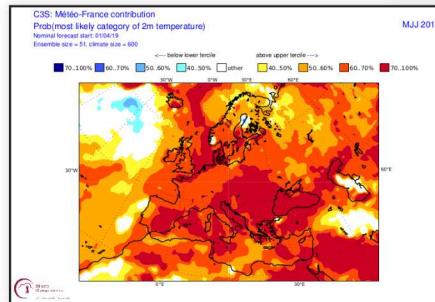
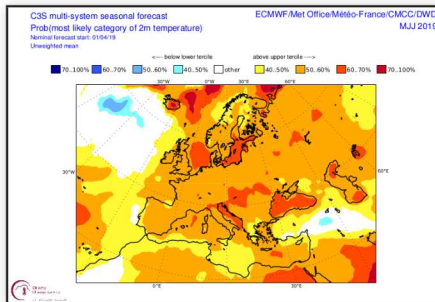
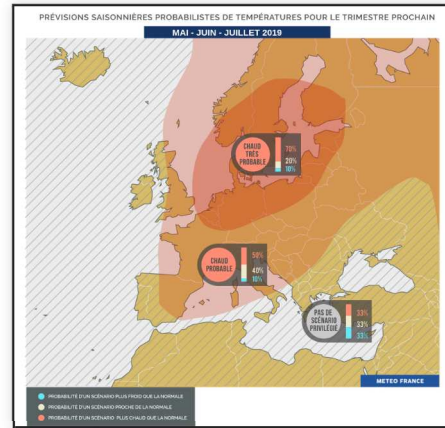
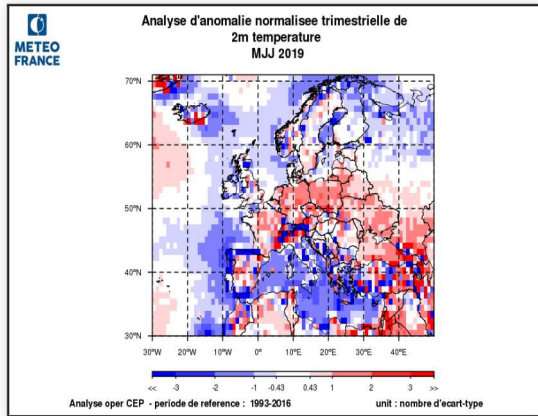


- 1 - The MJO in this sector favors NAO.
- 2 - no clear influence for the rest of the period

Climatic parameters over Europe : temperature

Colder than normal conditions in the Mediterranean and northern Scandinavia have not been anticipated by MF6. ECMWF model made a better forecast over Europe.

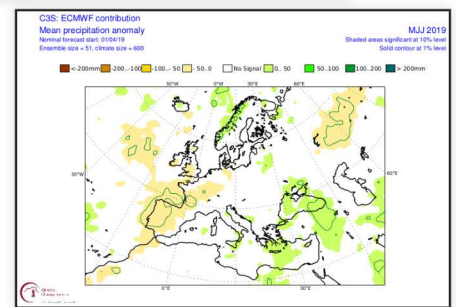
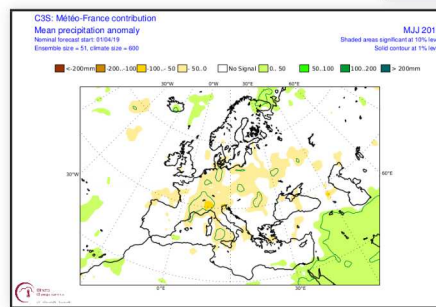
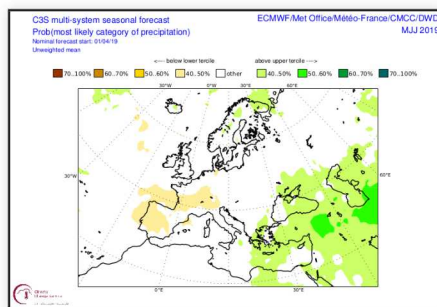
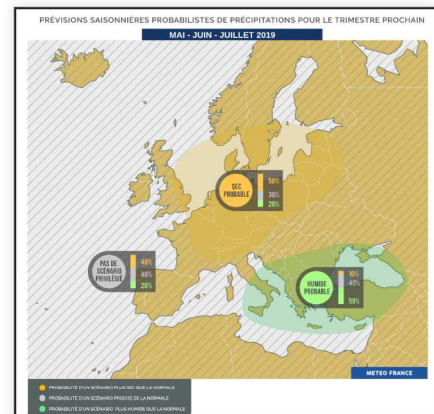
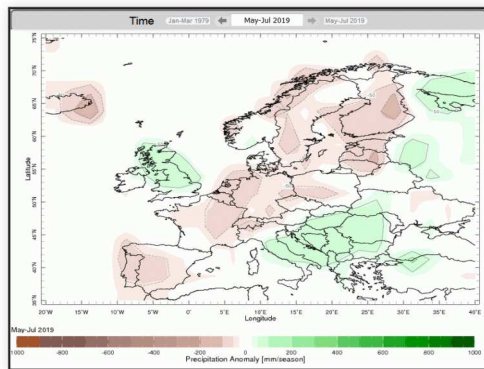
The summary map does not bring real added value.



Climatic parameters over Europe : Precipitations

The contrast between wetter than normal southeastern Europe and drier than normal Continental Europe was well predicted, although the extension of the zones does not fit perfectly with the analysis.

The excess of precipitation on the British Islands had not been forecasted.



General summary : for the period AMJ 2019

1) **Oceans :**

Rather good forecast globally. El Niño intensity overestimated.

2) **Large scale atmospheric circulation :**

VP 200hPa : The forecast is quite good on the Indian and Pacific zone. The second wave on America, Atlantic and Africa is badly anticipated.

FC 200 hPa : The field analyzed is less structured than forecasted.

Z500 : rather well predicted by MF6 from Europe to Asia and Pacific.

NAO- mode of variability predominance was not forecasted.

3) **Climatic parameters over Europe :**

Cool conditions over the Mediterranean were not forecasted especially by MF6.

The structure of precipitation anomalies was rather well anticipated.