

VERIFICATION BULLETIN

JANUARY - FEBRUARY - MARCH 2019

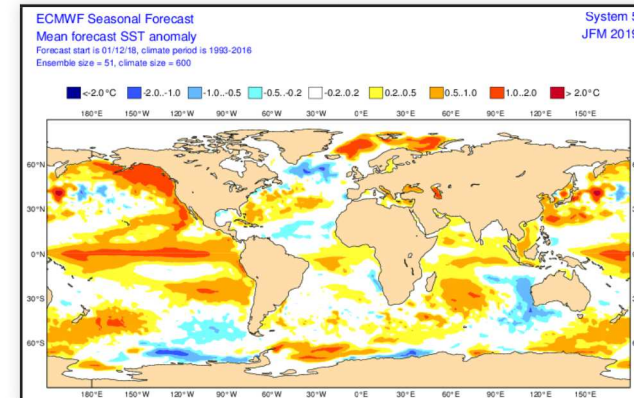
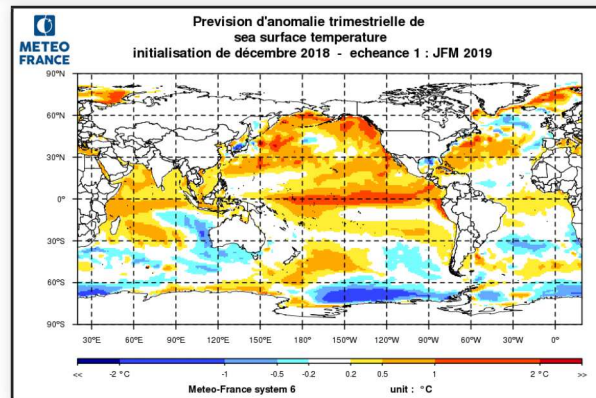
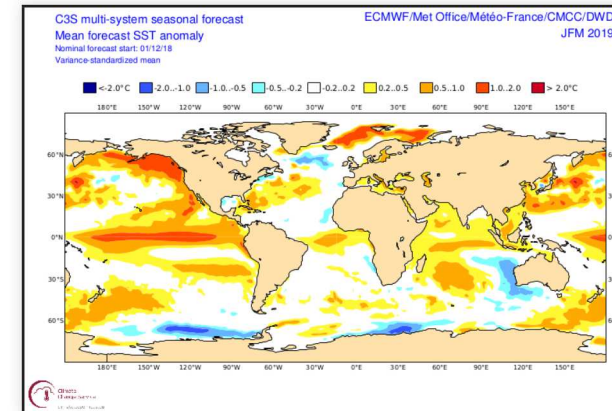
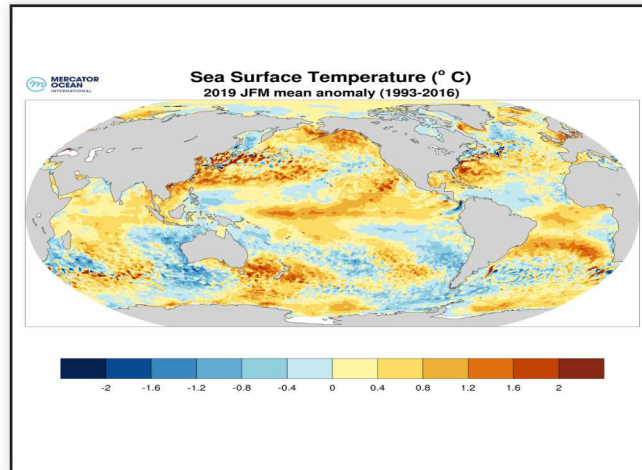
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Introduction : Objective

- 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.

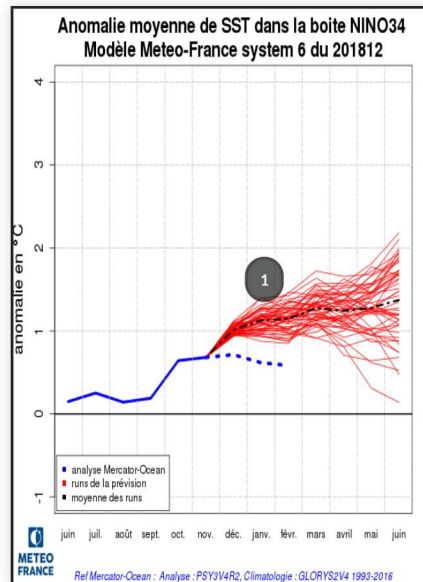
Oceans : surface temperature anomalies

Rather good forecasts globally, with the exceptions of cold anomalies off the western coasts of South America and warm anomalies in the Southern Atlantic.

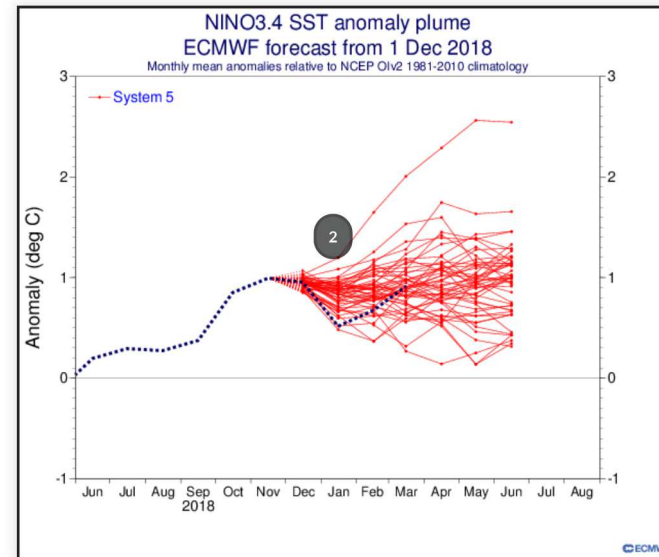


Oceans : ENSO

CAUTION : reference analysis differ between MF (Mercator-Ocean 1993-2016) and ECMWF (NCEP 1981-2010).
The models have generally overestimated the SST anomaly.



1- hot anomaly significantly overestimated by all runs

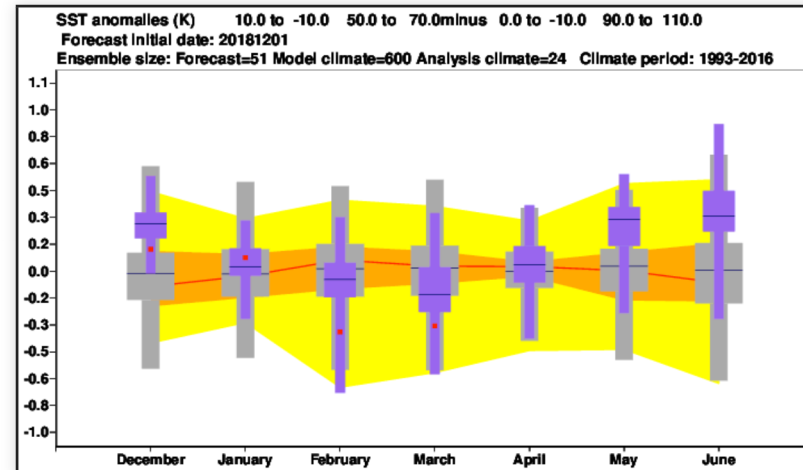
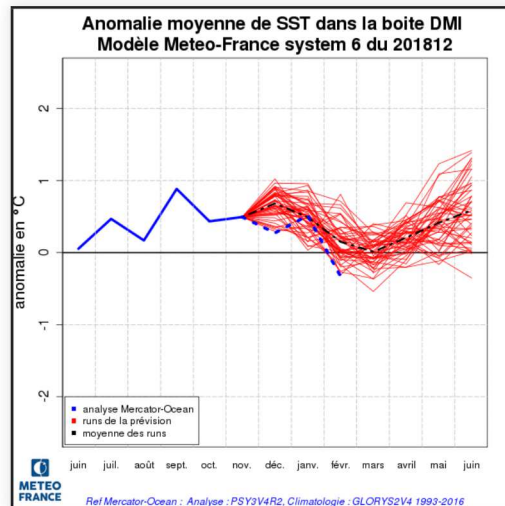
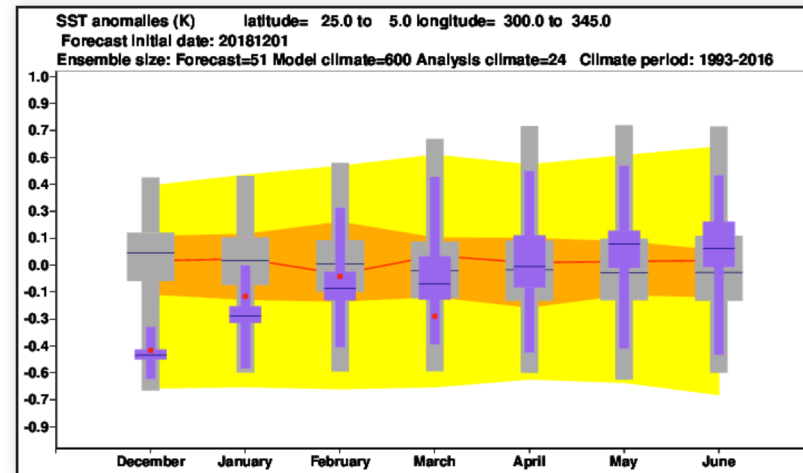
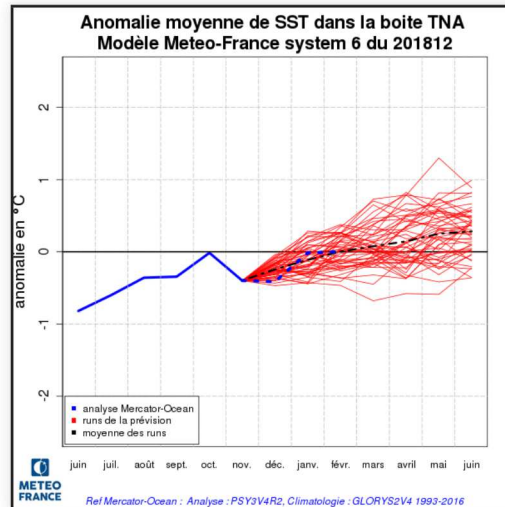


2- The analysis is in the plume, but the climatological reference (1981-2010) is not synchronized with the model (the observed anomaly is overestimated)

Oceans : tropical Atlantic and Indian Ocean index

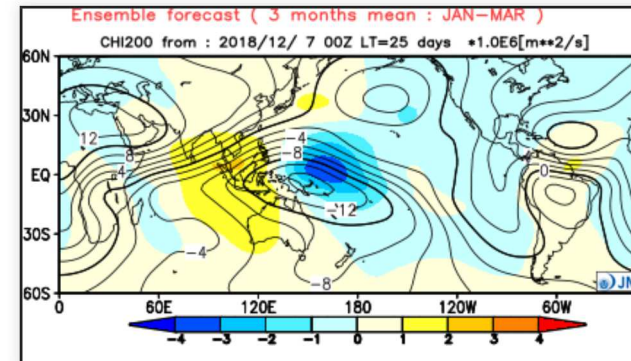
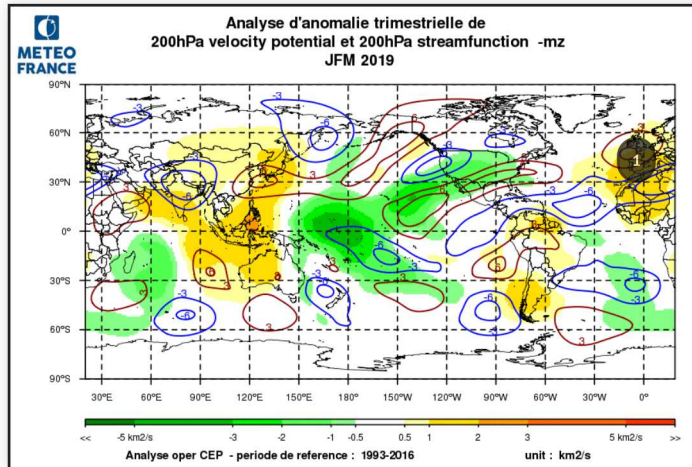
Rather good forecast of SST in the tropical north Atlantic, a bit overestimated in March though.

DMI close to neutral but a little overestimated by both models (forecast slightly positive, observed slightly negative).

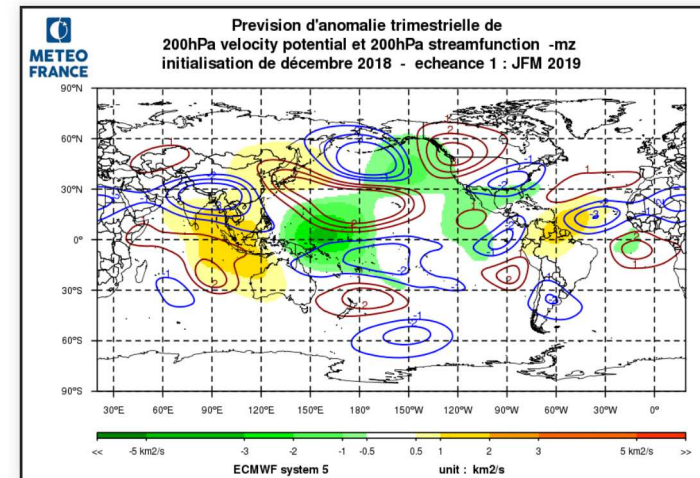
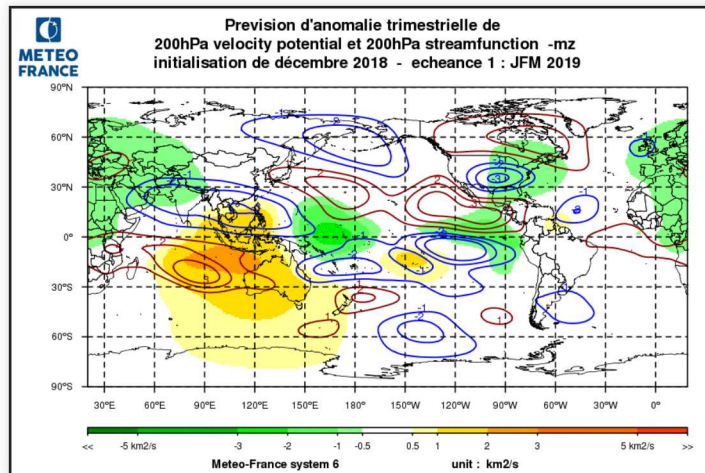


Atmospheric circulation : Global teleconnection

For 200 hPa Velocity Potential : rather good forecasts for Pacific and Maritime Continent (especially with ECMWF S5). Poor forecasts for Europe, Middle East, and Africa. For stream function teleconnections : poor forecast, especially for north America and Atlantic/Europe areas.

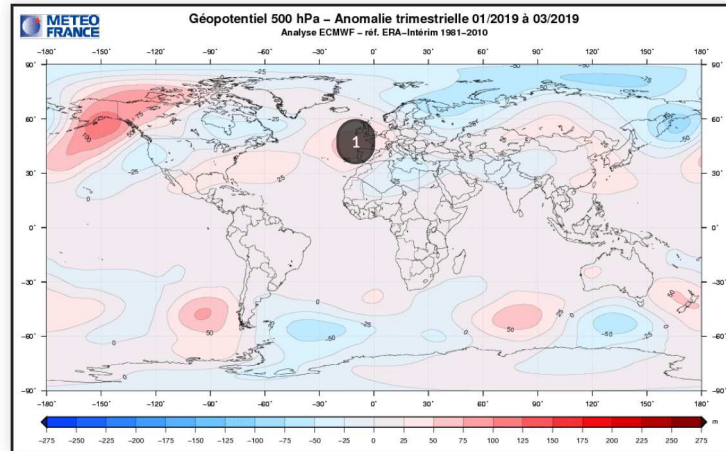


1- Subsidence anomalies not forecast over western Europe and western Africa.

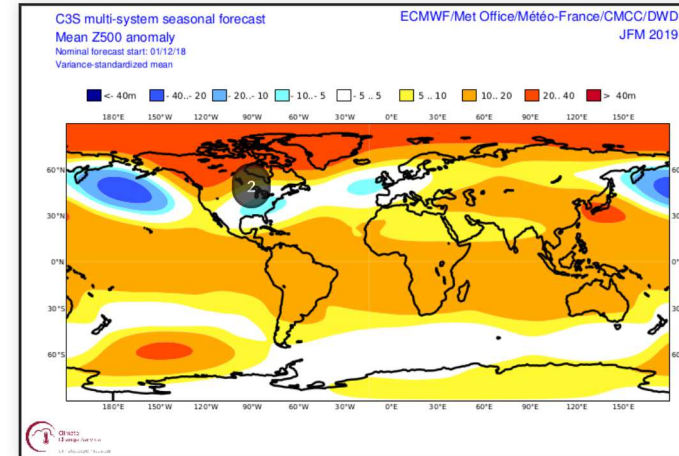


Atmospheric circulation : 500hPa Geopotential height

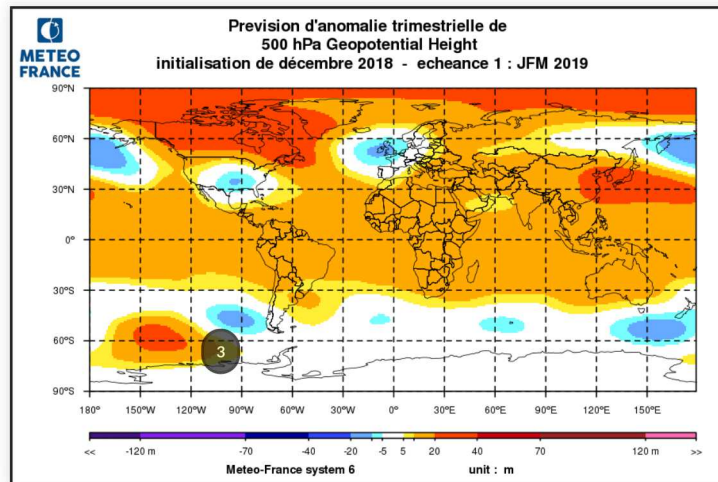
Very poor forecasts in both hemispheres despite good consistency between the models. Analyzed field is almost reverse to what was forecast : for example, positive anomaly was observed over western Europe and eastern Atlantic ocean when a negative anomaly was forecast. Same thing for south-eastern US.



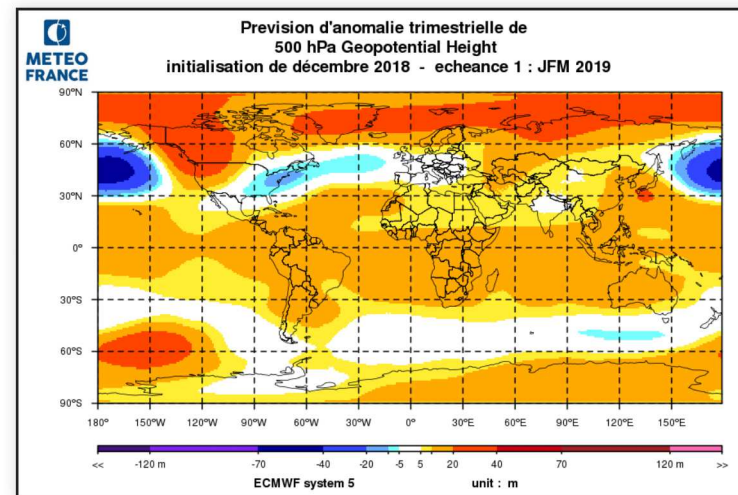
1- Positive anomaly not forecast



2- Dipole badly located (shifted to the west)



3- Dipole shifted to the east.

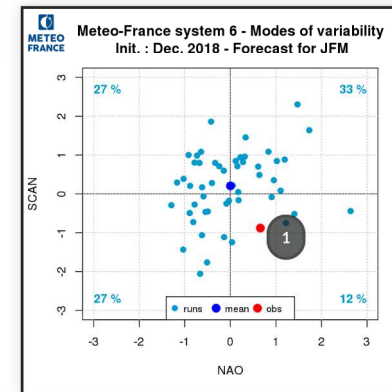
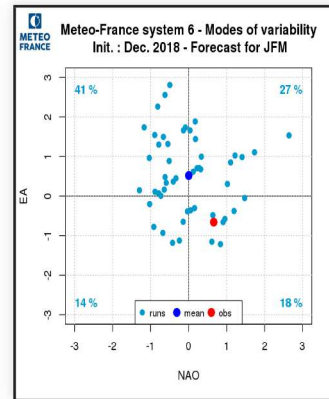
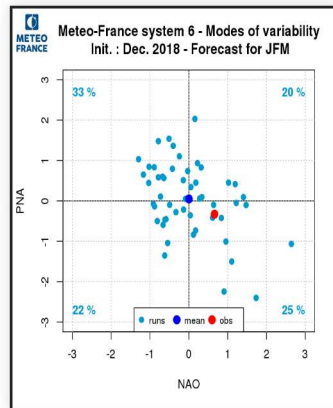


Atmospheric circulation : Modes of variability

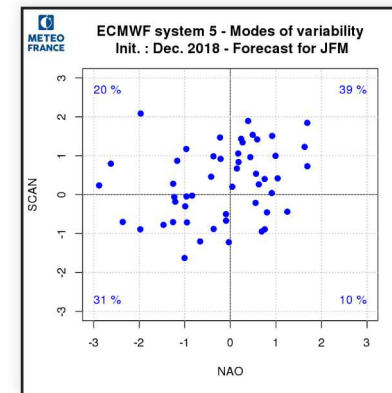
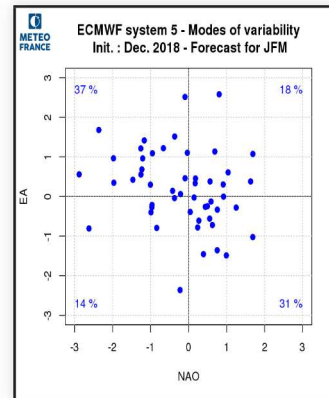
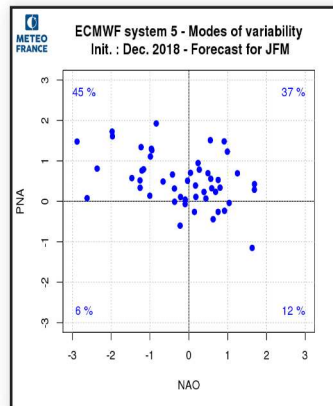
PNA close to neutral as forecast by MF S6 (positive for ECMWF).

As mentioned for 500 hPa heights, poor forecasts over Europe and the Atlantic, especially for EA and SCAN modes.

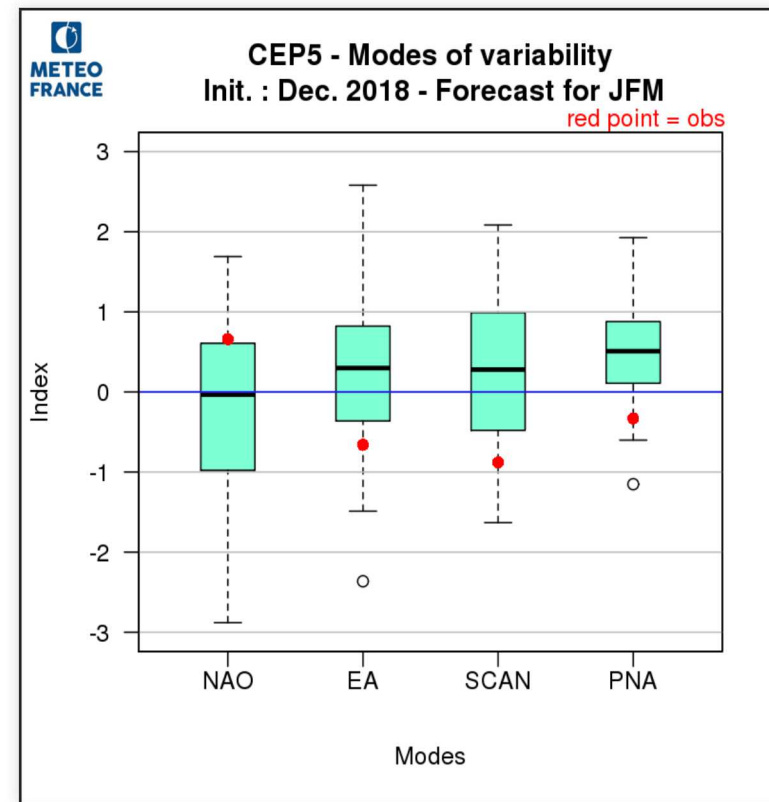
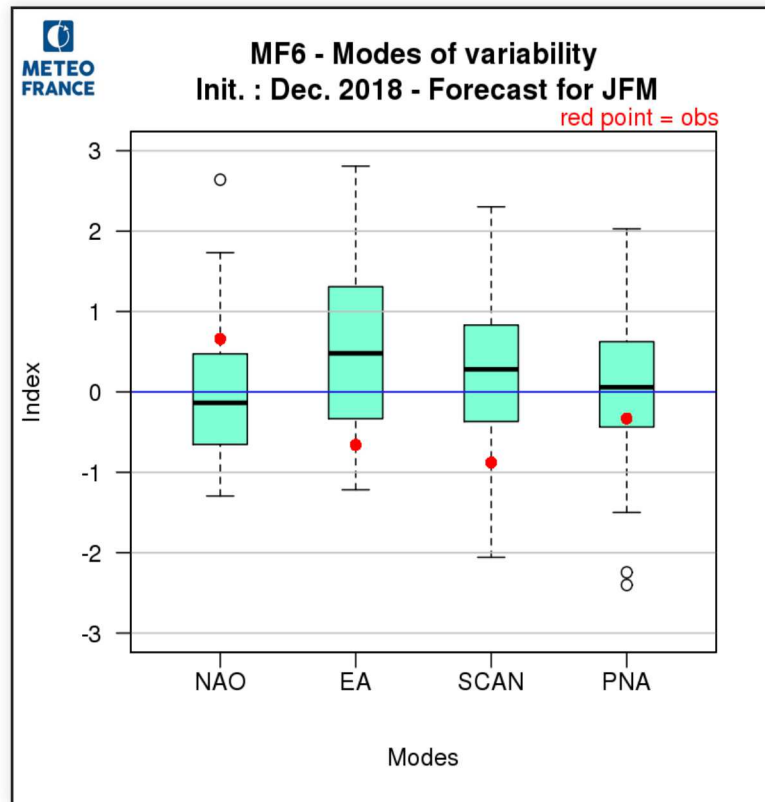
Besides, the observed mix of negative SCAN and positive NAO was the less likely according to MF S6 (12%) and ECMWF S5 (10%) among the 4 combinations.



1- Observed mix of SCAN- and NAO+ was the less likely according to MF (and ECMWF, see below).

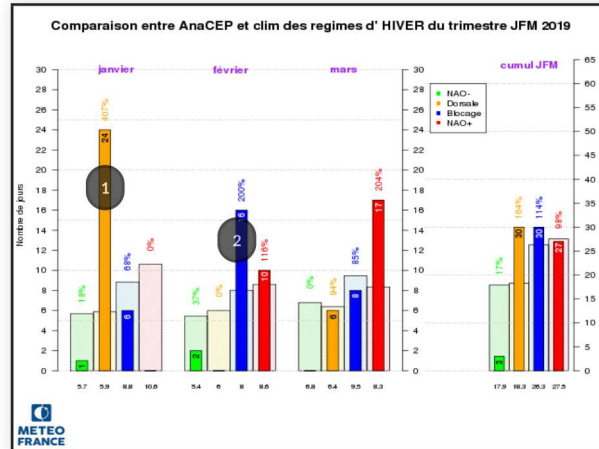


Atmospheric circulation : Modes verification



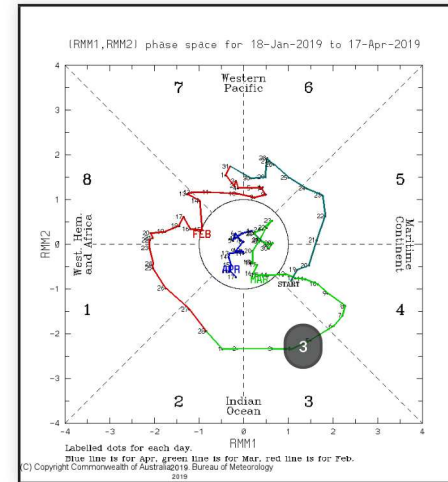
Atmospheric circulation : Analysis of winter SLP weather regimes

The occurrence of El Niño combined with the multi-models forecasts was supposed to favour a NAO- circulation over the period. Instead, this regime has proved to be very rare during these three months. Maybe the strong SSW observed in late December and early January is somehow responsible for that. Note that the MJO has been a good "fan" for the March NAO+ circulation, but not for January and February.

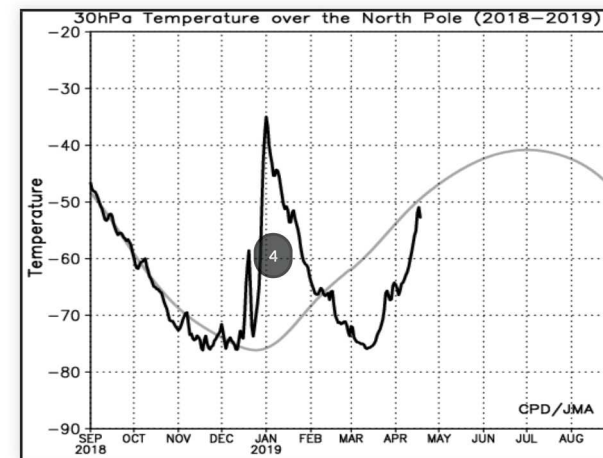


1- Atlantic Ridge in January (linked to SSW ??)

2- Blocking in February : not well explained by MJO.



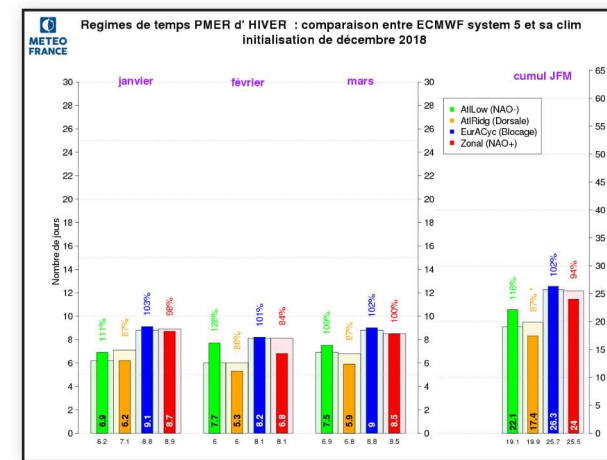
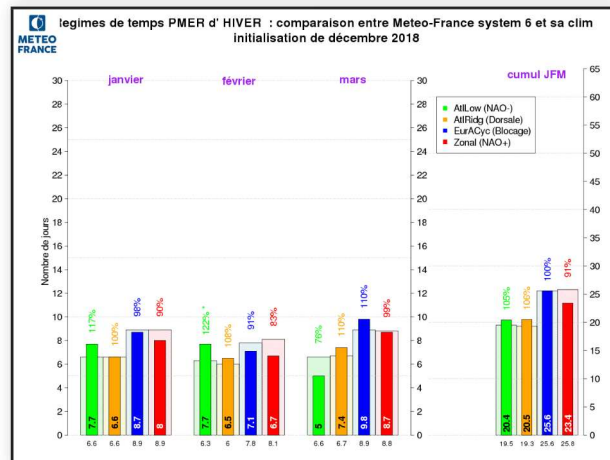
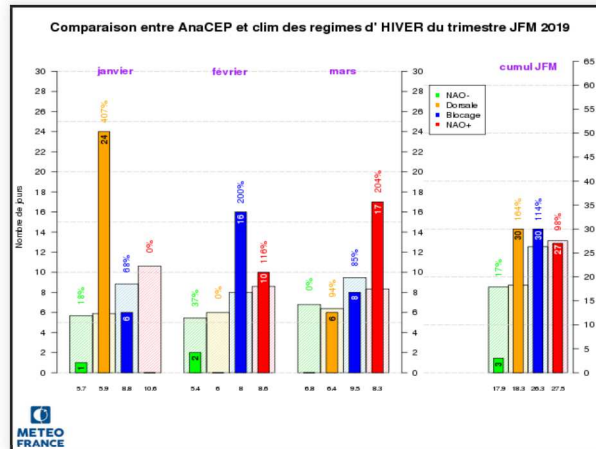
3- MJO phase 3 and 4 in early March accounting for dominating NAO+ regime



4- Powerful SSW in late December / early January

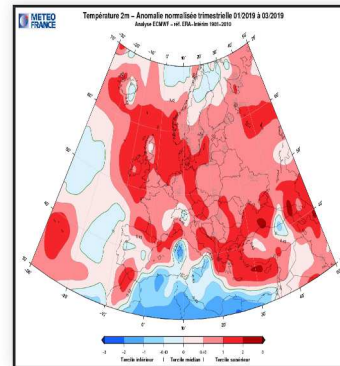
Atmospheric circulation : Forecasted winter SLP weather regimes

Very poor forecasts, as mentioned before, especially regarding the NAO which was forecast to be mainly negative (for January and February at least). The overwhelming Atlantic Ridge of January was not forecast neither.

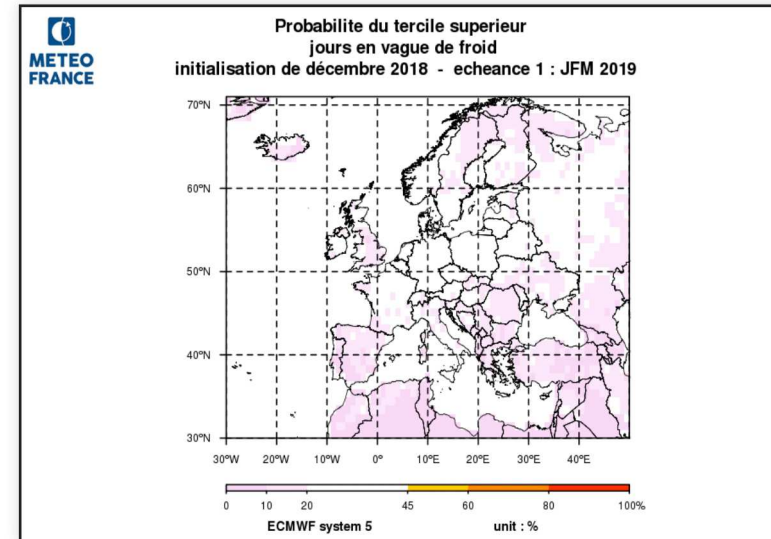
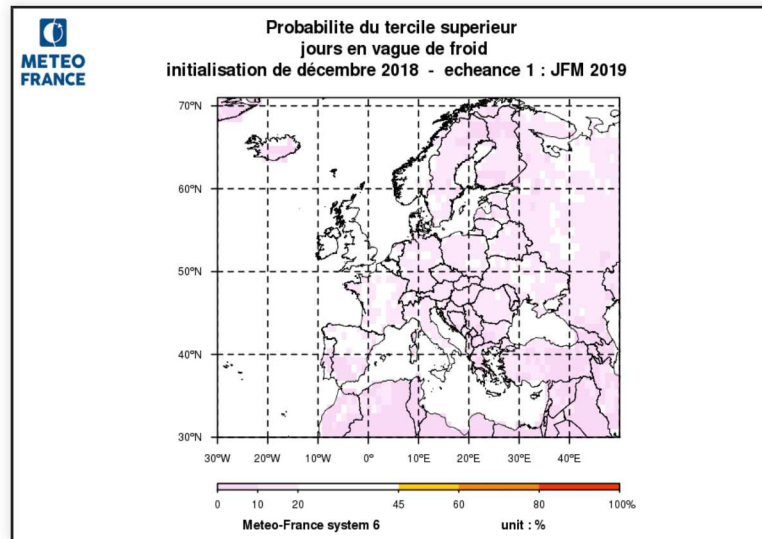


Climatic parameters on Europe : temperature

Bad temperature forecast (almost reverse pattern !), linked to the poor forecast of circulation types (dominant NAO- expected, almost never observed during the three-months period).

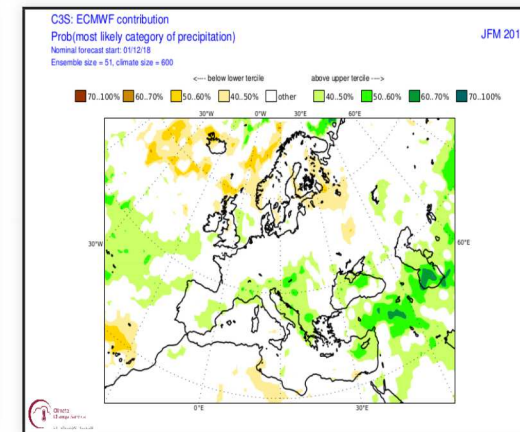
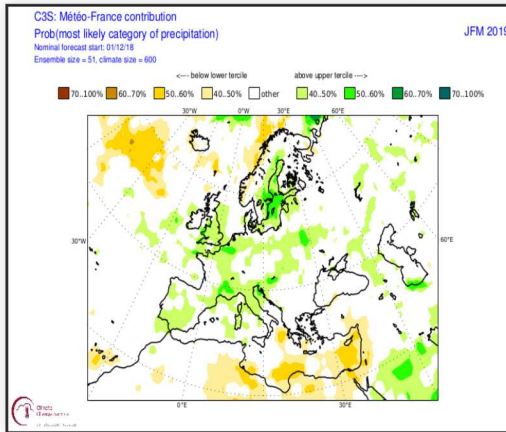
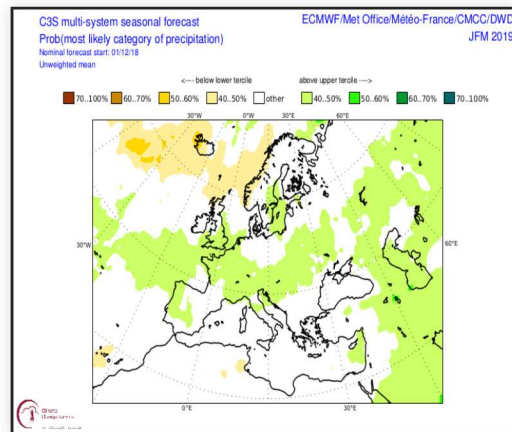
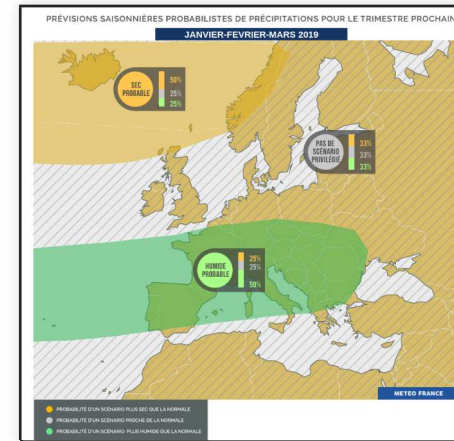
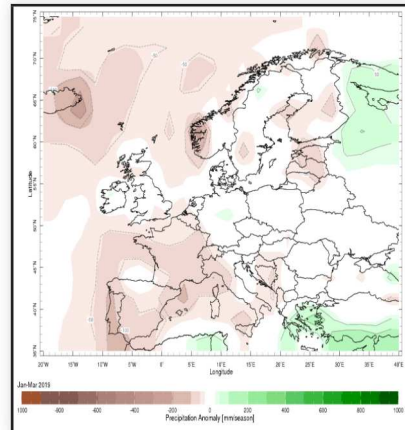


Climatic parameters on Europe : Temperatures - Cold spell



Climatic parameters on Europe : Precipitations

Widespread dry conditions accross Western and Northern Europe badly forecast, except for Iceland. Wet conditions forecast from Portugal to France and south-Central Europe were not observed in the absence of negative NAO (see previous slides).



General summary : for the period JFM 2019

1) Oceans :

Rather good forecast globally. El Nino was a little overestimated by the models.

2) Large scale atmospheric circulation :

Over the tropics, good forecast of the velocity potential. But poor forecast of stream function teleconnections, which partly explains the very poor forecasts of mid-latitudes circulation, especially for the Atlantic and for Europe.

3) Climatic parameters on Europe :

Bad large scale circulation forecast => poor forecasts of temperature and precipitation

a) *Temperature* : poorly forecasted

b) *Precipitation* : Poor forecast except for the dry anomaly over Iceland.

