

VERIFICATION BULLETIN

DECEMBER - JANUARY - FEBRUARY 2018-2019

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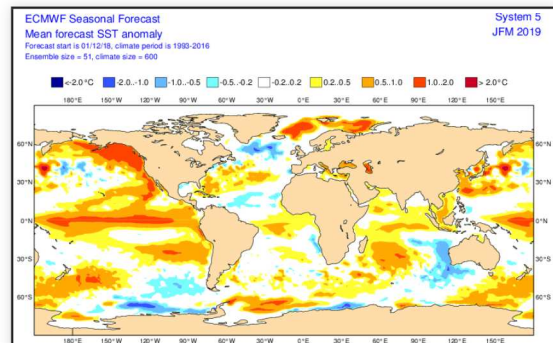
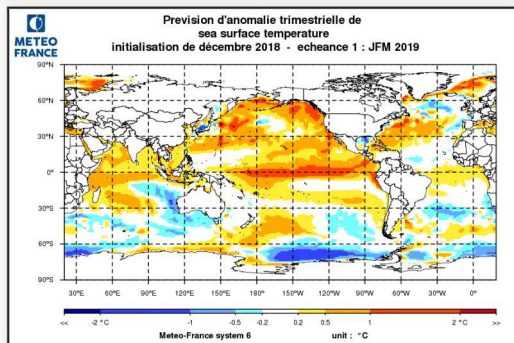
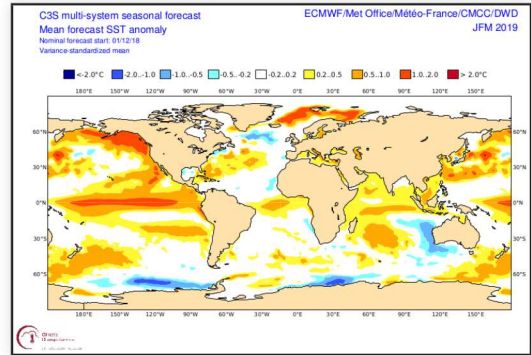
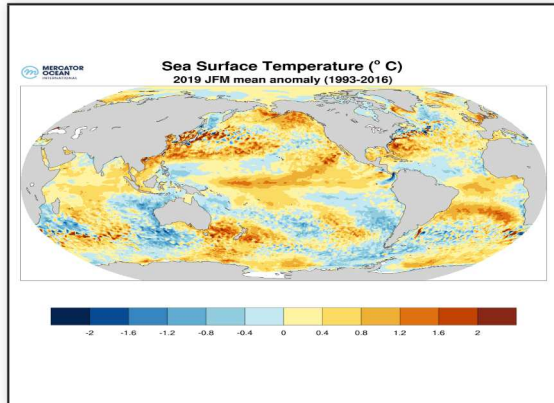
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Introduction : Objective

- 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 on 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, over 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

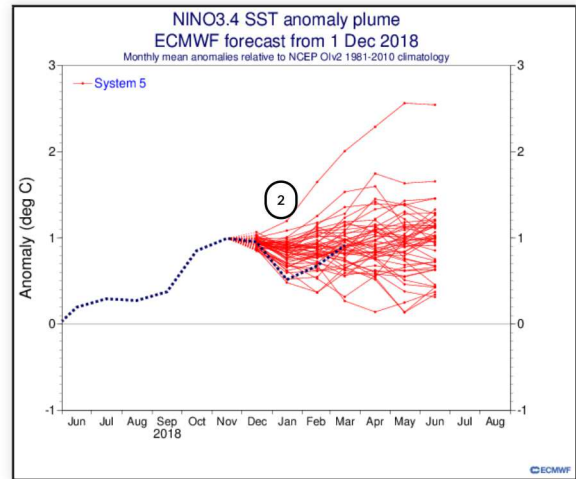
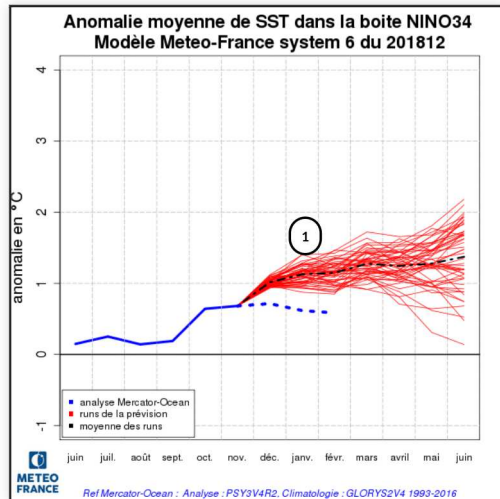
Good forecast in general except for the South Pacific (cold anomalies underestimated) and South Atlantic (misplaced anomalies)
The hot anomaly in equatorial Pacific related to El Nino is slightly overestimated by models.



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.



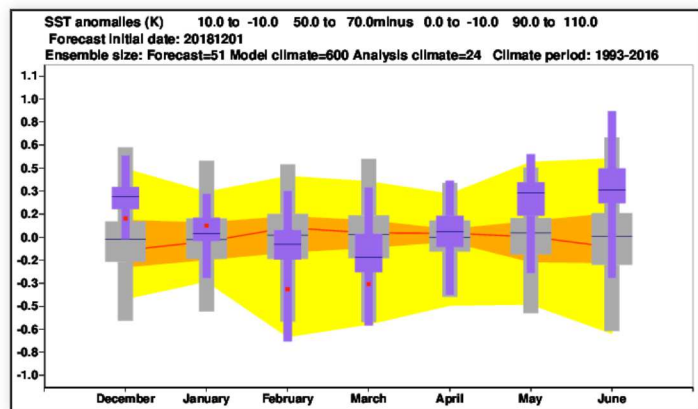
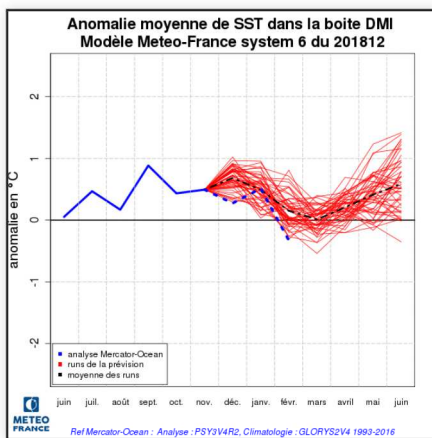
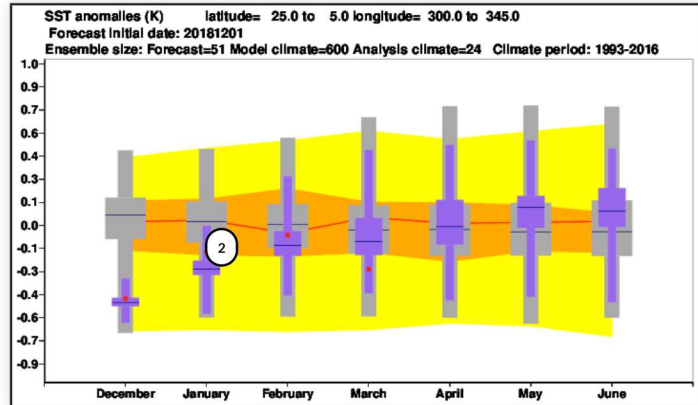
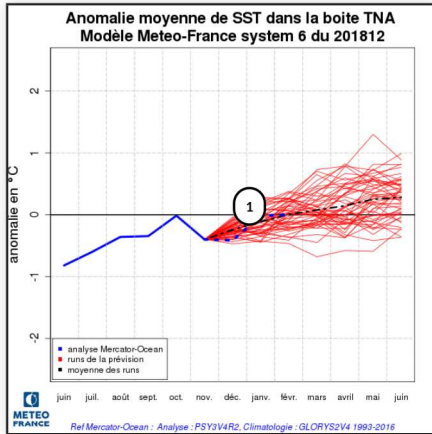
1 - hot anomaly significantly overestimated by all runs

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

The temperature in the tropical north Atlantic was overestimated at the beginning of the period.

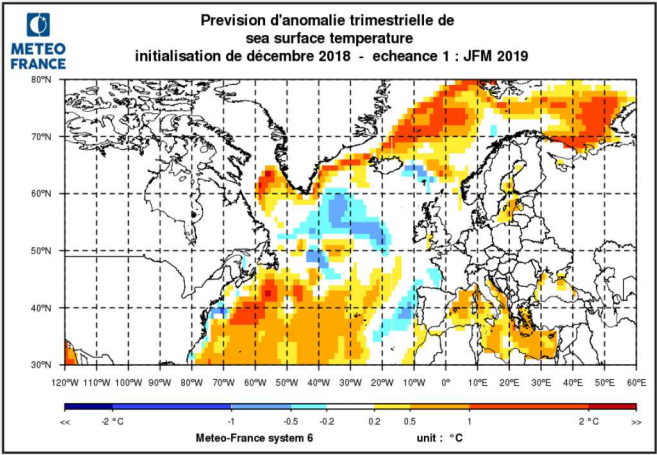
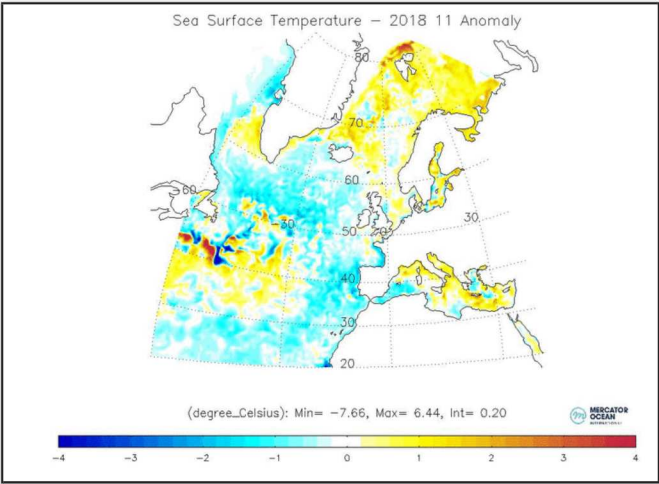
Very good forecast of the DMI index in the Indian Ocean



1 - The temperature was clearly overestimated in MF6

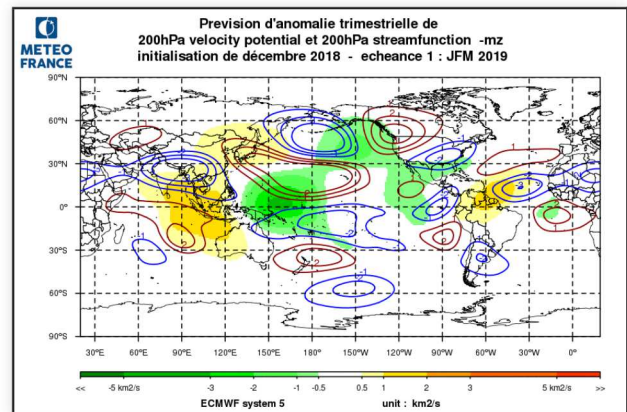
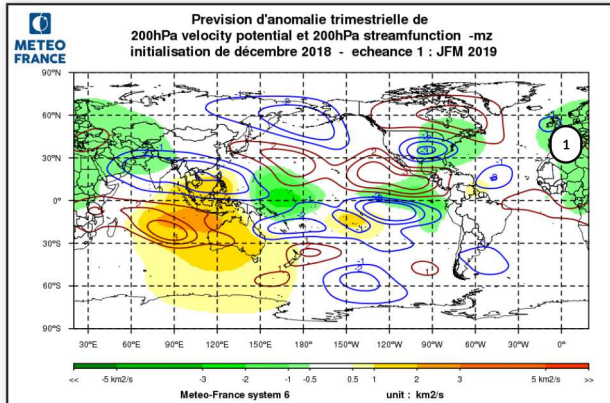
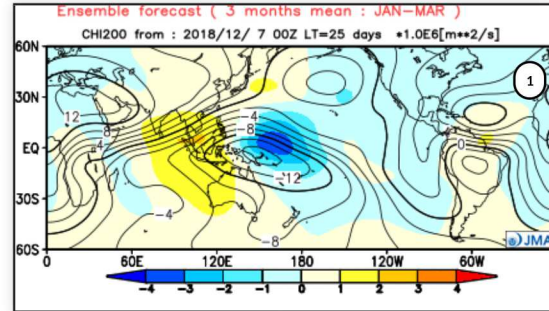
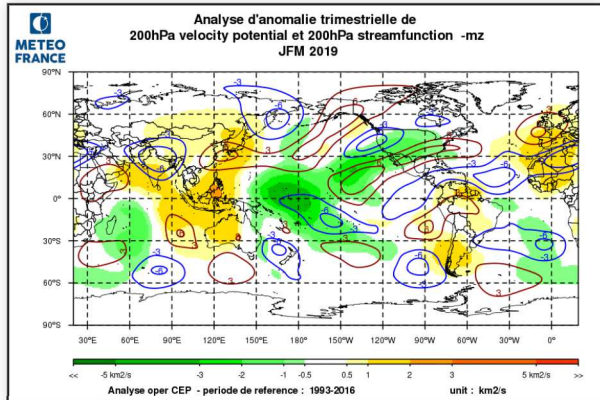
2 - The sign of the anomaly was well predicted but its value was underestimated

Oceans : North Atlantic SST



Atmospheric circulation : Global teleconnection

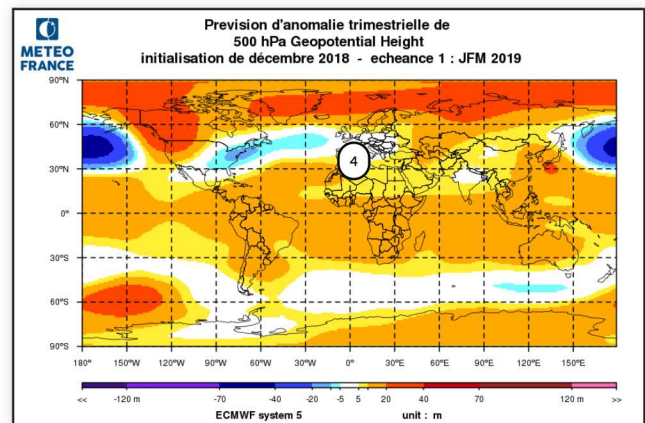
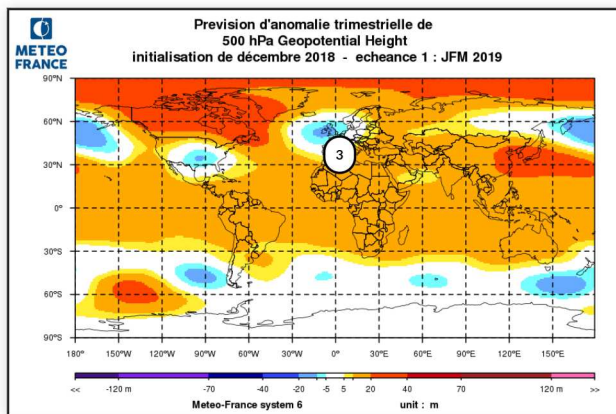
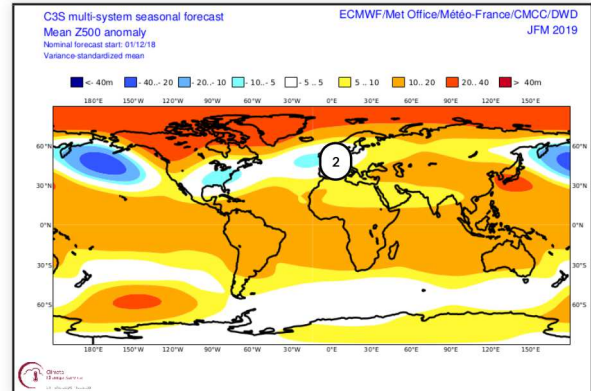
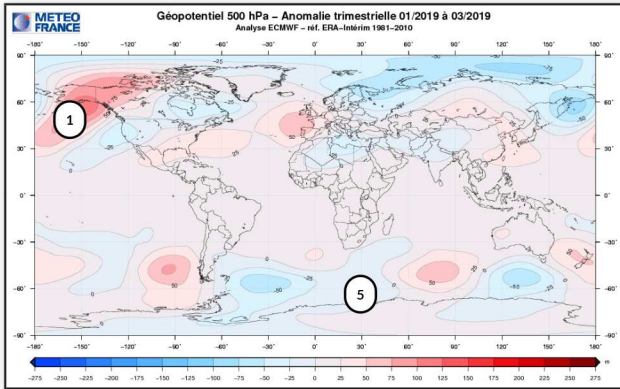
In the Pacific and Indian Ocean, the analyzed velocity potential field is close to the average of the runs of the models. The positive anomaly over Africa and South America was a little underestimated by ECMWF and not forecasted by MF6 and JMA



1 - A negative anomaly was forecasted a positive anomaly occurred
 1 - A negative anomaly was forecasted a positive anomaly occurred

Atmospheric circulation : 500hPa Geopotential height

The analyzed geopotential field is close to none of the average of the runs of the considered models. Neither in the northern hemisphere nor in the southern hemisphere.



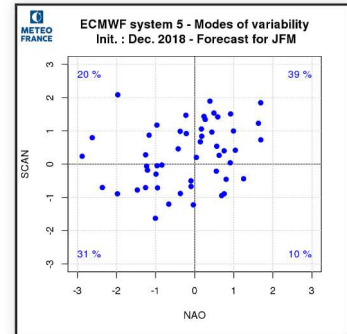
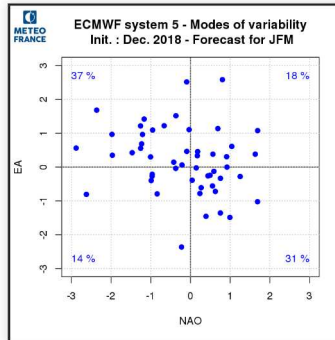
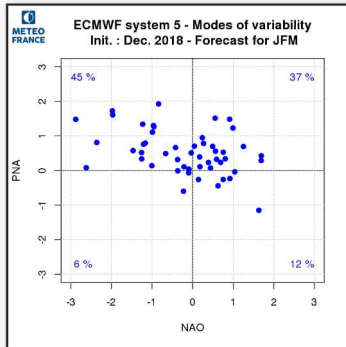
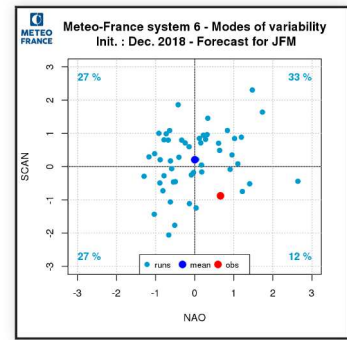
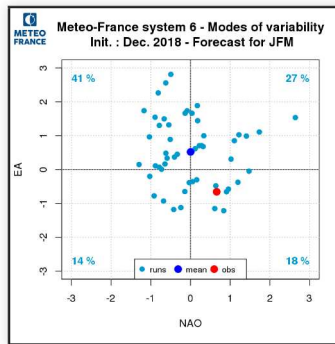
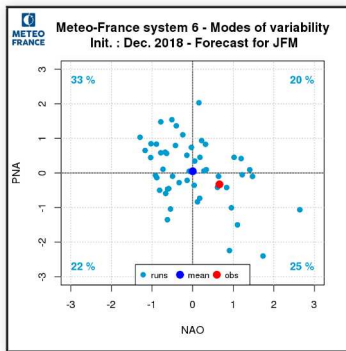
- 1 - None of the models forecasted this maximum
- 2 - the multi-model synthesis is not good over Europe
- 3 - The average of the runs of MF6 is in contradiction with the analysis.
- 4 - ECMWF has the best forecast on Western Europe. The maximum is however underestimated.
- 5 - None of the models has a good prediction of the field structure for the southern hemisphere.

Atmospheric circulation : Modes of variability

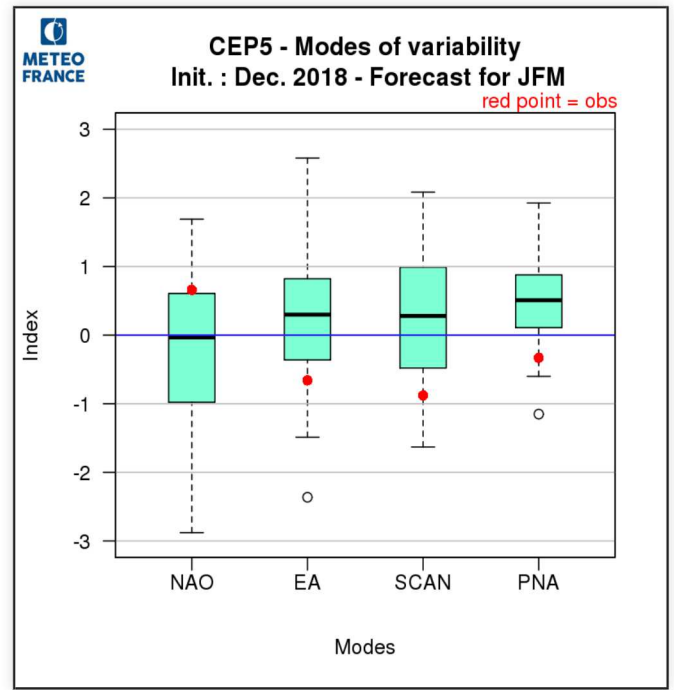
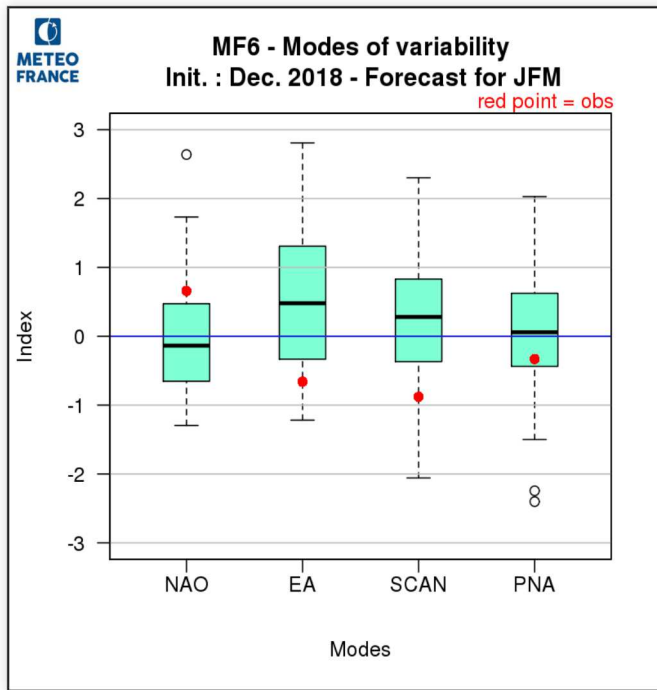
Positive PNA rather well forecasted.

In analysis, the blocking mode is quite strongly negative whereas a majority of the runs in the forecast gave a positive value.

The NAO remained neutral, contrary to the negative option we had chosen due to the presence of the phenomenon El Nino.



Atmospheric circulation : Modes verification



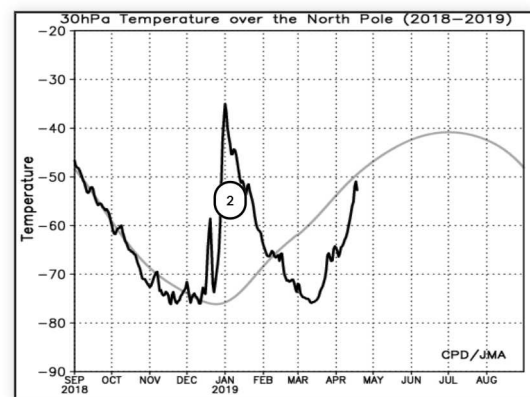
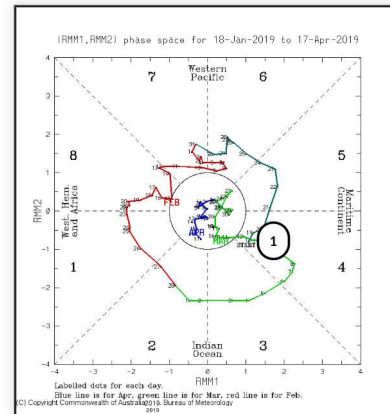
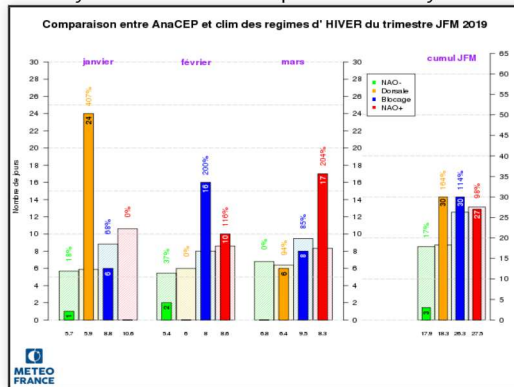
Atmospheric circulation : Analysis of winter SLP weather regimes

MJO is a rather good weather regime driver for december : phase 3/4 promotes Zonal and inhibits Atlantic-Low.

MJO remained active in January and February without having the expected effects.

The powerful SSW at the end of december could explain the strong dominance of the Atlantic Ridge regime in January

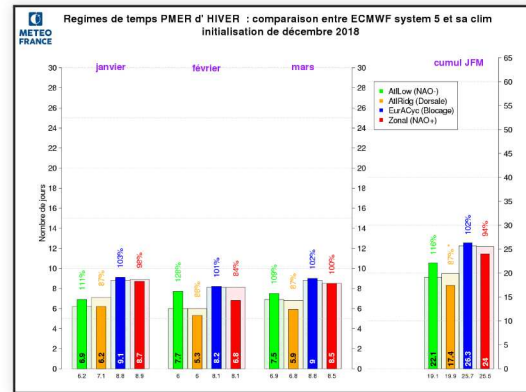
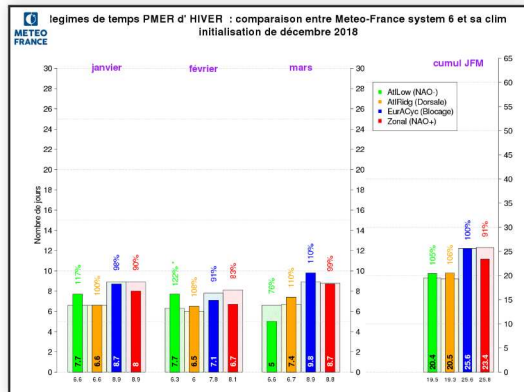
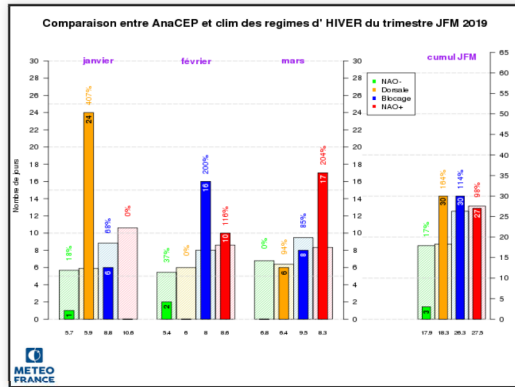
NAO- was very uncommon in the quarter contrary to the forecasts and the expected effect of El Niño



- 1 - MJO in the 3/4/5 sector in december
- 2 - Powerful SSW at the end of December

Atmospheric circulation : Forecasted winter SLP weather regimes

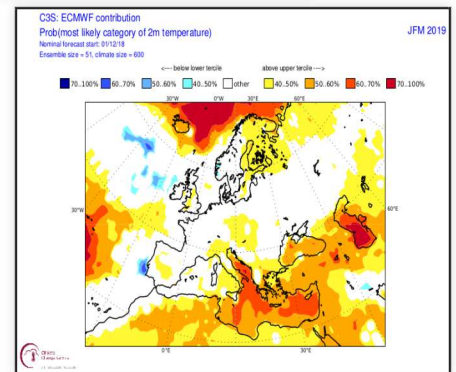
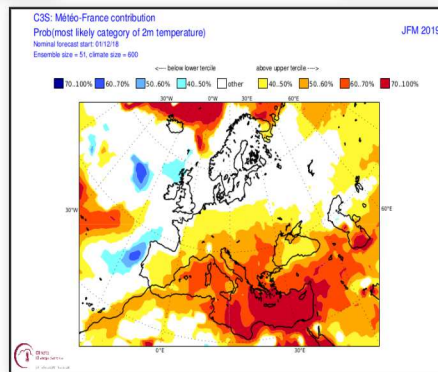
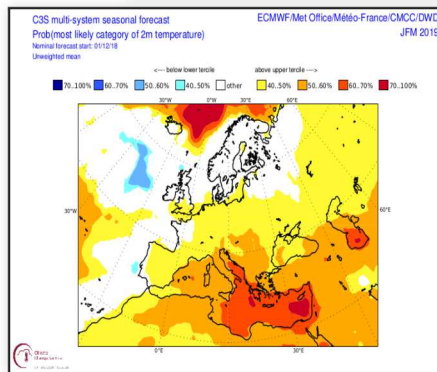
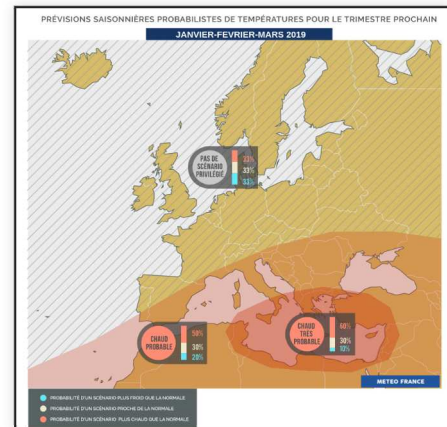
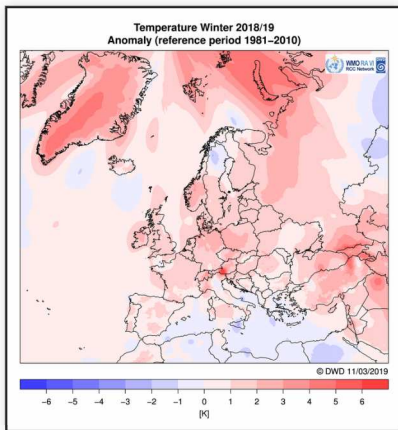
Models were unable to predict prevailing weather regimes despite strong discrimination in the quarter



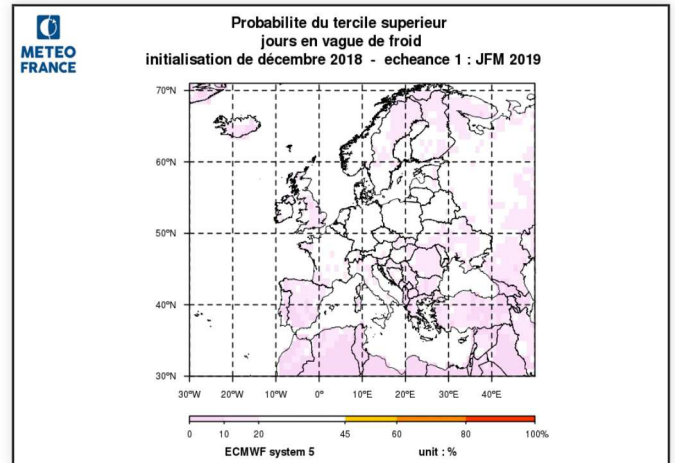
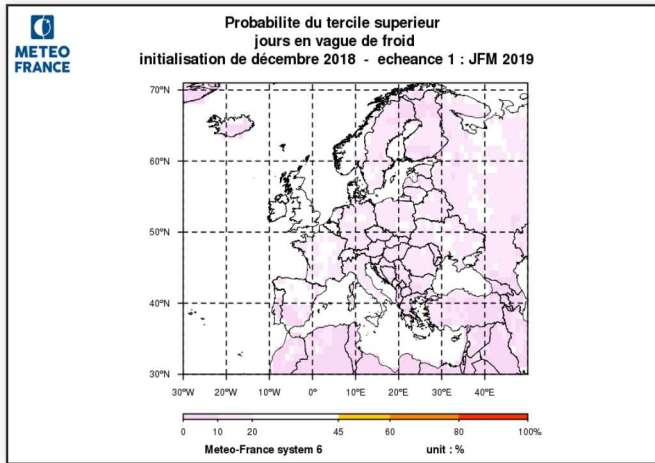
Climatic parameters on Europe : temperature

Models have made a very poor temperature forecast this quarter.

In the synthesis map, we had little confidence in the forecasts (large area without scenario). The zone that seemed more robust on the Mediterranean, finally revealed mainly poorly forecasted

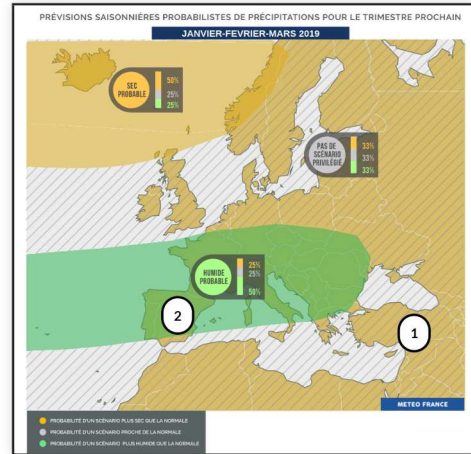
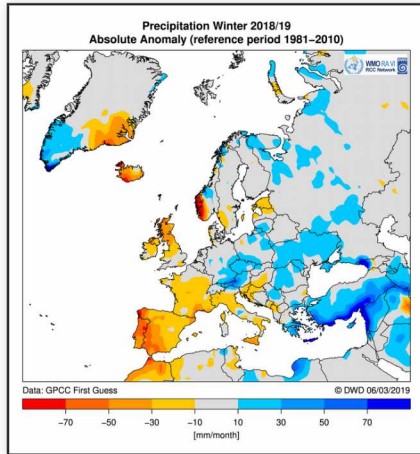


Climatic parameters on Europe : Temperatures - Cold spell



Climatic parameters on Europe : Precipitations

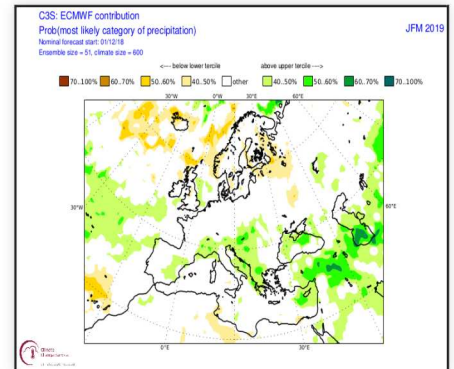
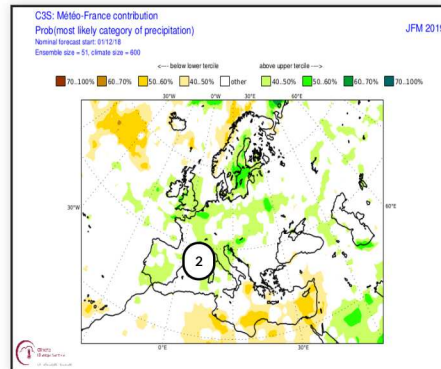
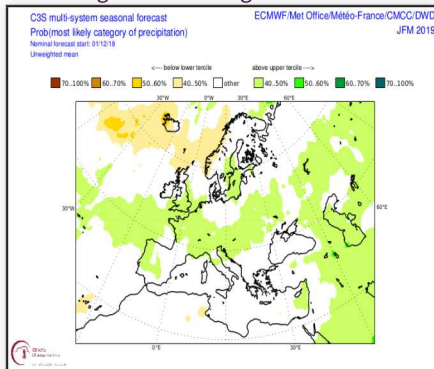
The wet anomaly on Eastern Europe and the Middle East was well forecasted (tendency to increased probability).
None of the models suggested a dry scenario on Western Europe



1 - Good option in the East.

2 - In line with the choice to strengthen the NAO- regime, a wet scenario had been favored over southwestern Europe but it did not occur.

2 - wrong forecasted signal



1 - Good option in the East

General summary : for the period DJF 2018-2019

1) Oceans :

Good forecast in general. El Nino is slightly overestimated by models.

2) Large scale atmospheric circulation :

On the tropics, good forecast of the velocity potentiel. On the contrary, at mid-lattitudes the geopotential at 500hPa is rather poorly forecast, especially in Europe. the expected NAO- circulation linked with El Nino/PNA did not occur.

3) Climatic parameters on Europe :

a) *Temperature* : poorly forecasted

b) *Precipitation* : The wet anomaly was forecasted for Eastern Europe and the Middle East. None of the models predicted the dry anomaly for Western Europe.