

VERIFICATION BULLETIN

FEBRUARY - MARCH - APRIL 2019

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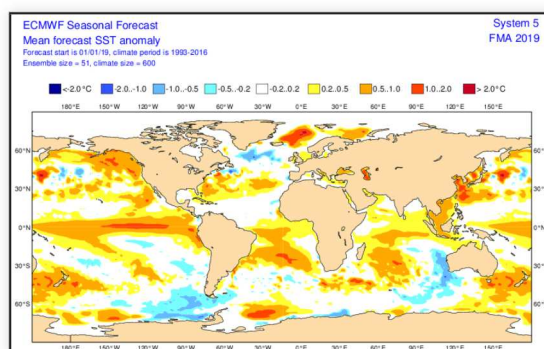
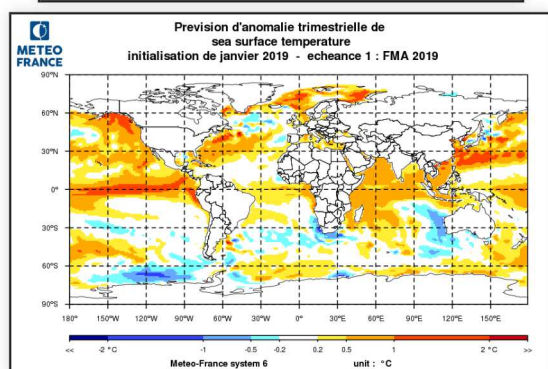
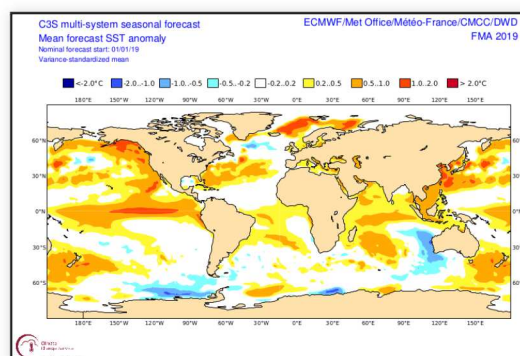
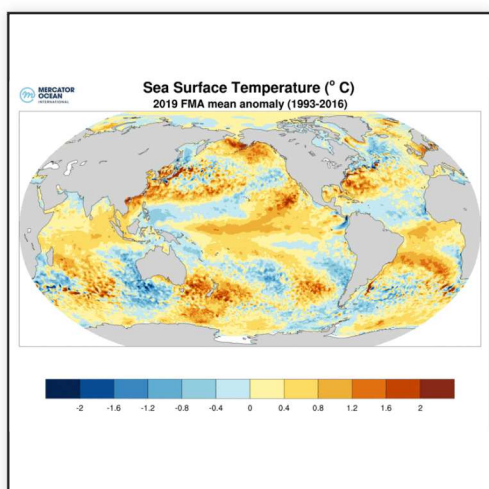
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Introduction : Objective

- 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 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.

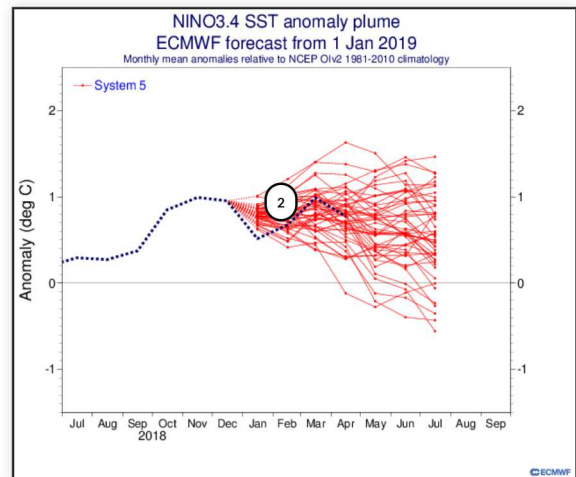
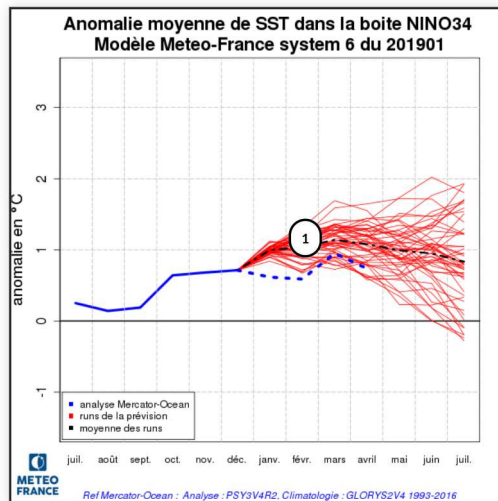
Oceans : surface temperature anomalies

Rather good forecasts globally, except cold anomalies off the western coasts of South America. In areas where models were different (Equatorial ou Southern Atlantic, Mediterrean Sea, northern hemisphere part of Indian Ocean), SEAS5 forecast are better than MF-S6 (and even C3S). Note that the area of maximum anomaly in equatorial Pacific is centered west of the dateline, whereas it was foreseen in the eastern part of the basin.



Oceans : ENSO

CAUTION : reference analysis differ between MF-S6 (Mercator-Ocean 1993-2016) and SEAS5 (NCEP 1981-2010).
 overestimation by MF-S6 (the observation is out of the spread at the beginning of the simulation), good SEAS5 forecast.

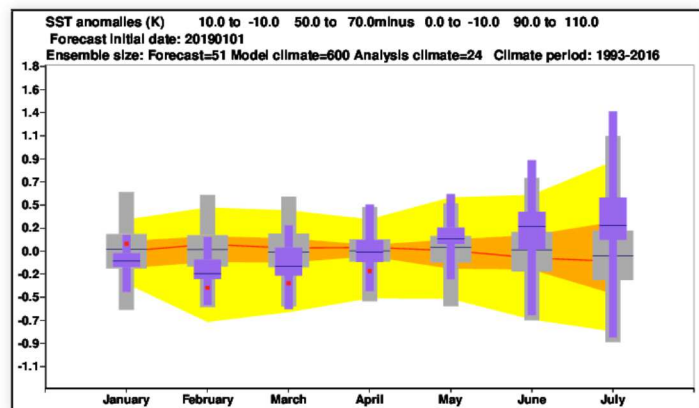
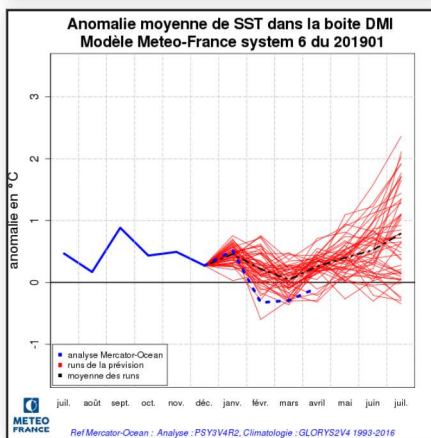
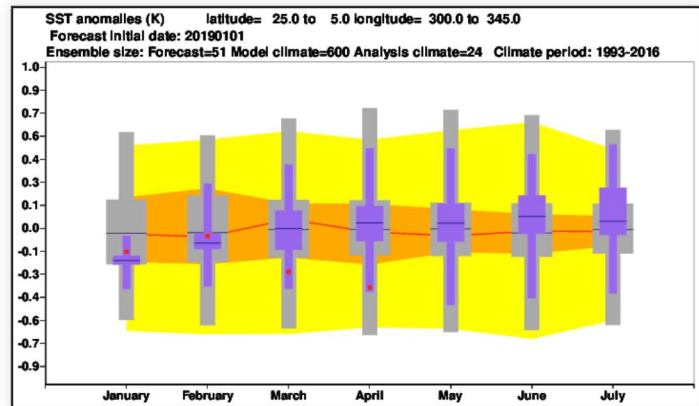
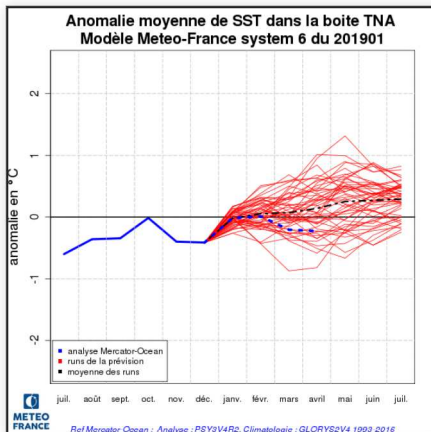


- 1 - overestimation by all runs at the beginning of the simulation, however the FMA forecast is in the spread
- 2 - The first month is very slightly out of the spread, but globally this plume very well captured the Nino3.4 evolution.

Oceans : tropical Atlantic and Indian Ocean index

TNA : overestimation by the 2 models, but in the spread

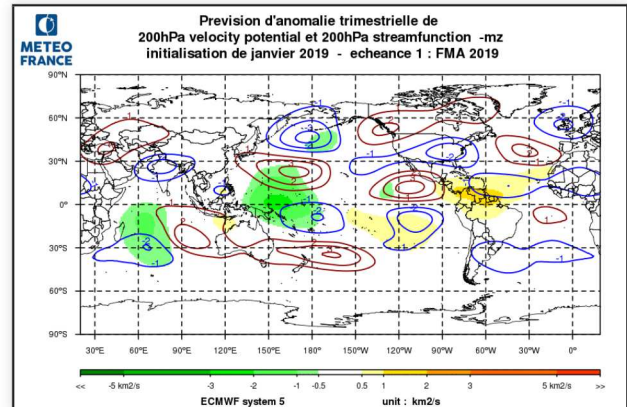
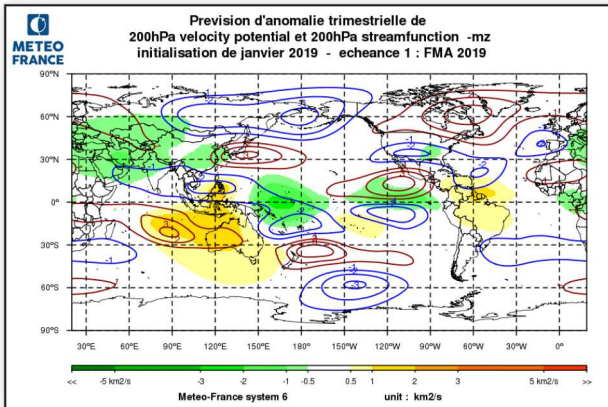
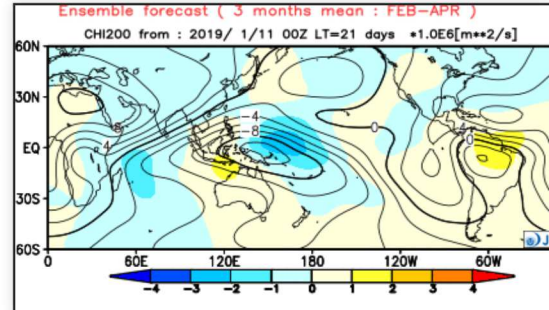
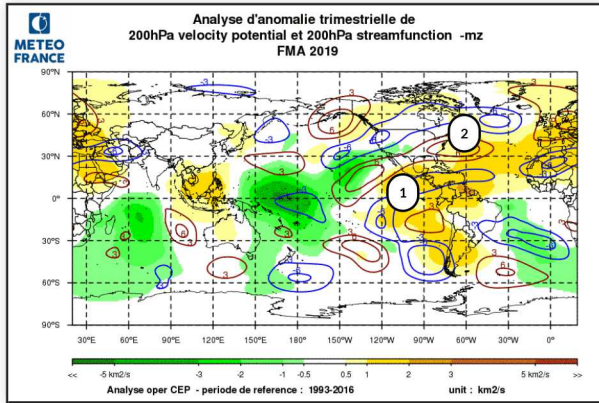
DMI : better mean forecast from SEAS5 than MF-S6, SEAS5 forecasted the good sign



Atmospheric circulation : Global teleconnection

VP 200hPa : rather good forecasts for western Pacific, Maritime Continent and north of South America. Over east Pacific, the downward motion anomaly was not forecasted. Globally, SEAS5 did a better forecast than MF-S6.

FC 200 hPa : very few patterns were correctly foreseen by models. The teleconnection over western Atlantic was not correctly located neither by MF-S6 nor SEAS5, despite a good positive VP200 anomaly (north of South America). All models were globally misleading over North America and Atlantic/Europe areas.



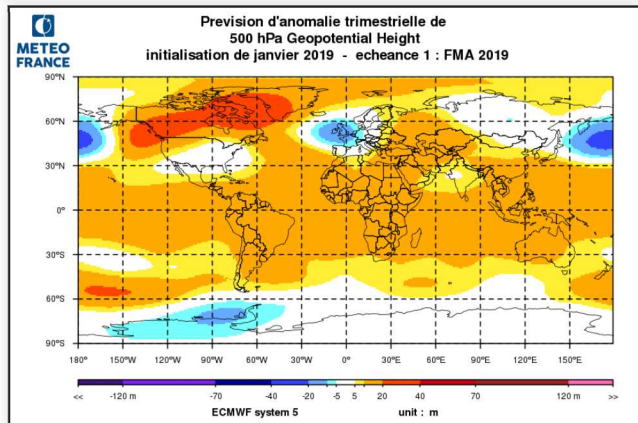
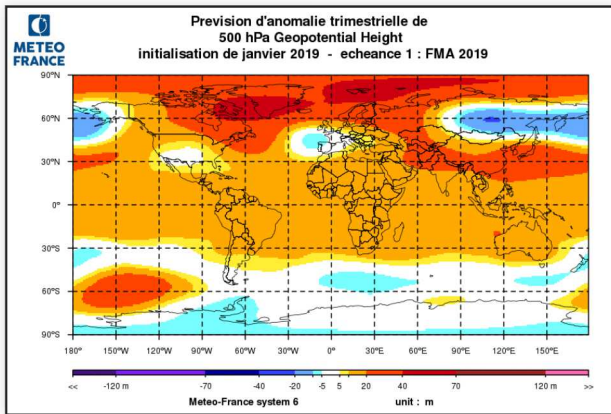
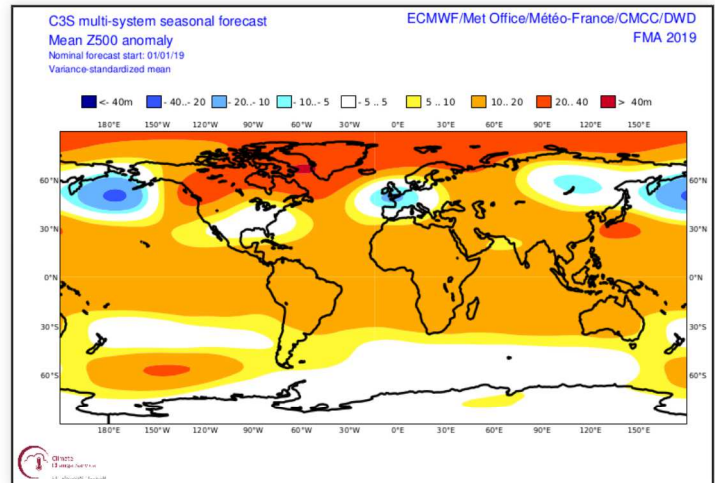
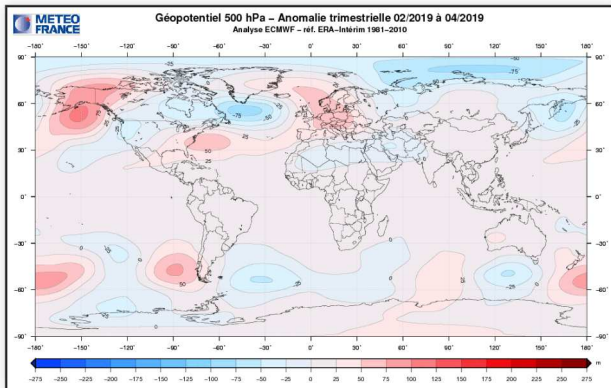
1 - Subsidence anomalies not forecasted

2 - teleconnection (cf FC) from north of South America up to North Atlantic. Unfortunately not really foreseen by models.

Atmospheric circulation : 500hPa Geopotential height

Despite good consistency between models, important mismatch of the main anomaly poles all over northern hemisphere.

Over Europe, almost anti-correlation between analysis and forecasts. A blocking situation was foreseen, but the positive Z500 anomaly was expected further to the east.

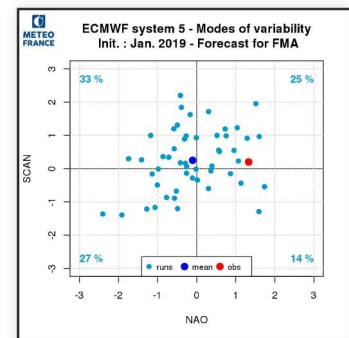
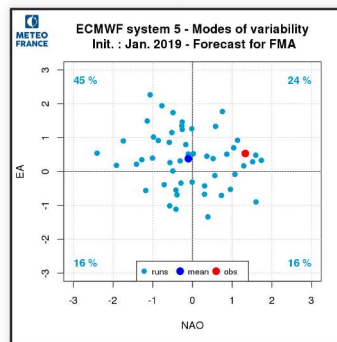
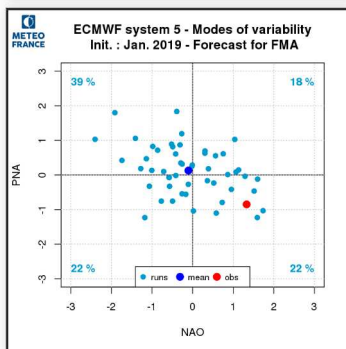
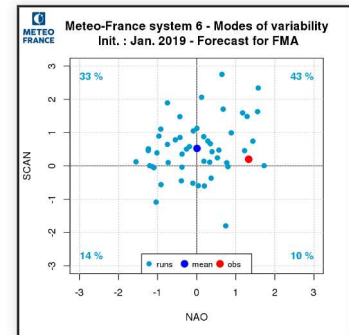
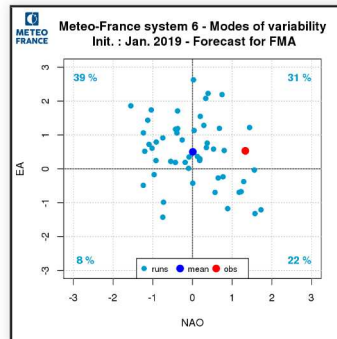
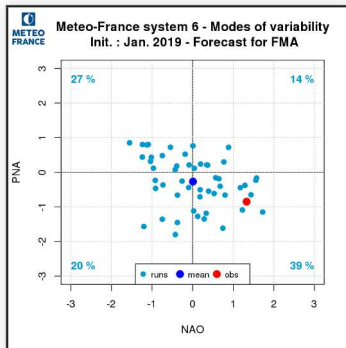


Atmospheric circulation : Modes of variability

PNA/NAO : MF-S6 privileged the good combination when looking at pourcentages in the quarters (39% for PNA-/NAO+), even if it is not visible when looking at Z500 chart (ensemble mean). SEAS5 privileged the opposite.

NAO/EA : the observed combination (+/+) was not the most probable. In MF-S6 and SEAS5, The NAO-/EA+ was privileged.

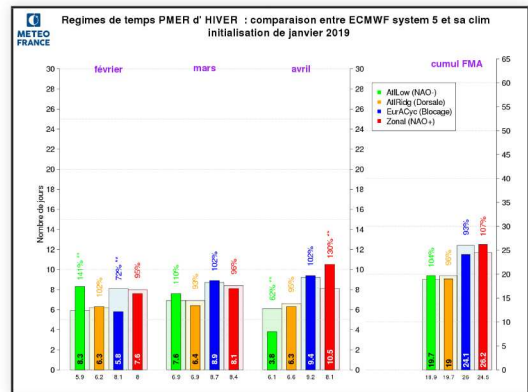
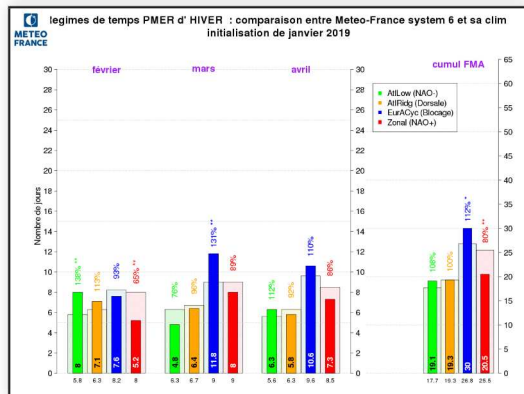
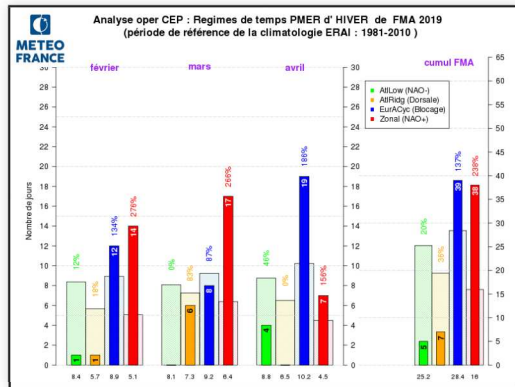
SCA : neutral scandinavian blocking, while models tended to privilege the positive phase of this mode.



Atmospheric circulation : Forecasted winter SLP weather regimes

MF-S6 : good forecast of Blocking, but poor forecast regarding the other regimes

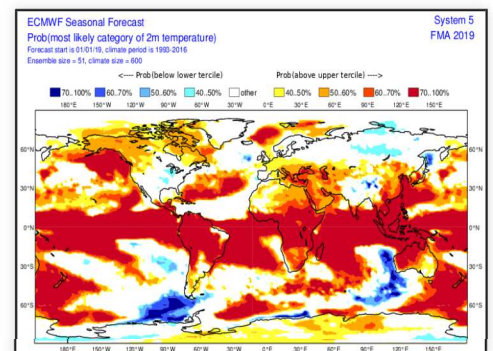
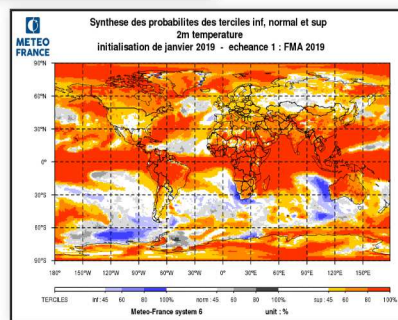
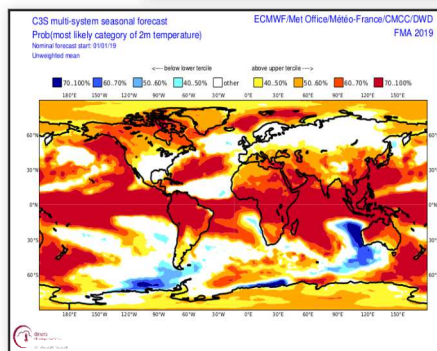
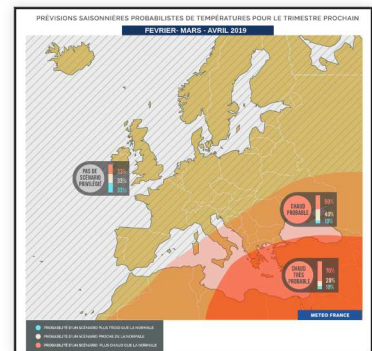
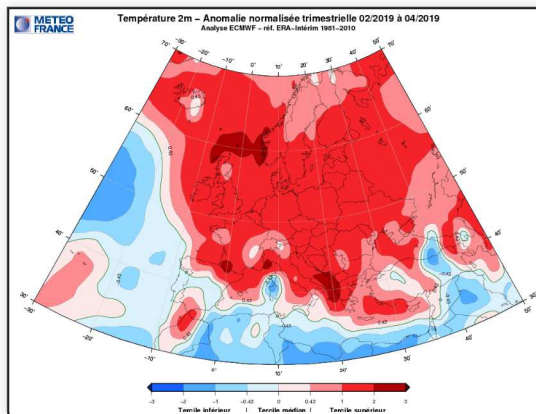
SEAS5 : no signal in the model



Climatic parameters on Europe : temperature

Analysis : North-South opposition between Europe (warm anomaly) and North Africa (cold anomaly).

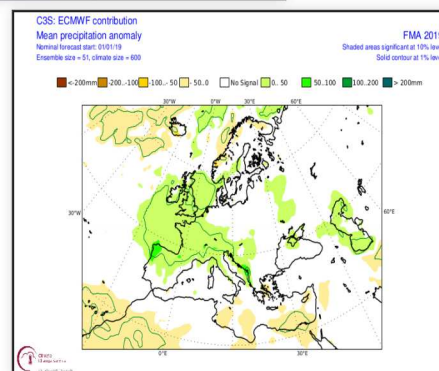
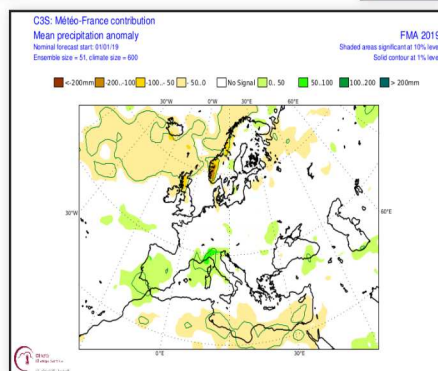
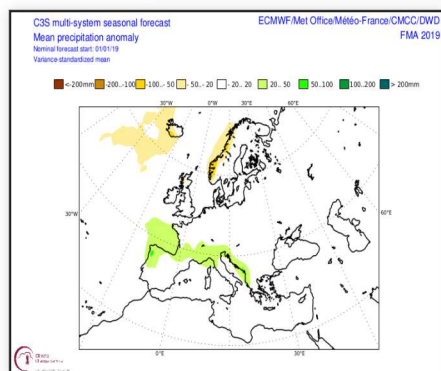
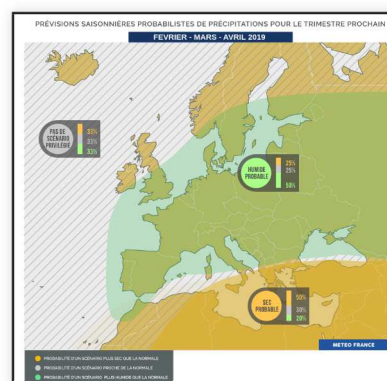
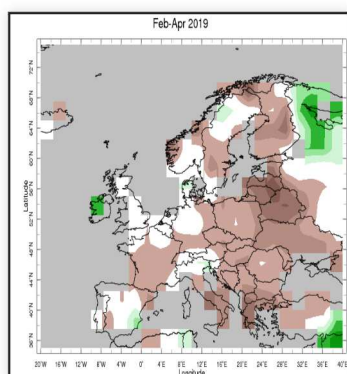
This large scale pattern was not foreseen by C3S models, in link with their poor large scale circulation forecast.



Climatic parameters on Europe : Precipitations

Analysis : widespread dry conditions accross Europe badly forecast, except for Ireland.

As for temperature, models were misleading and the synthesis map even worsened the wrong signal given by models.



General summary : for the period JFM 2019

1) Oceans :

Rather good forecast globally, but location of maximum anomaly associated with El Nino was foreseen far eastward from its real location.

2) Large scale atmospheric circulation :

Over tropics, some significant errors (see VP 200hPa) in eastern Pacific, maybe linked to the shift in SST anomalies discussed above.

Teleconnections toward north hemisphere were not correctly foreseen (see FC 200 hPa and Z500), and globally Z500 anomaly poles were poorly positioned all over north hemisphere.

Over North Atlantic and Europe, despite a rather good consistency between models, models failed to forecast large scale circulation.

3) Climatic parameters on Europe :

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

And good consistency between models maybe lead to over-confidence in the temperature and precipitation patterns of the models.