VERIFICATION BULLETIN

JUNE - JULY - AUGUST 2020

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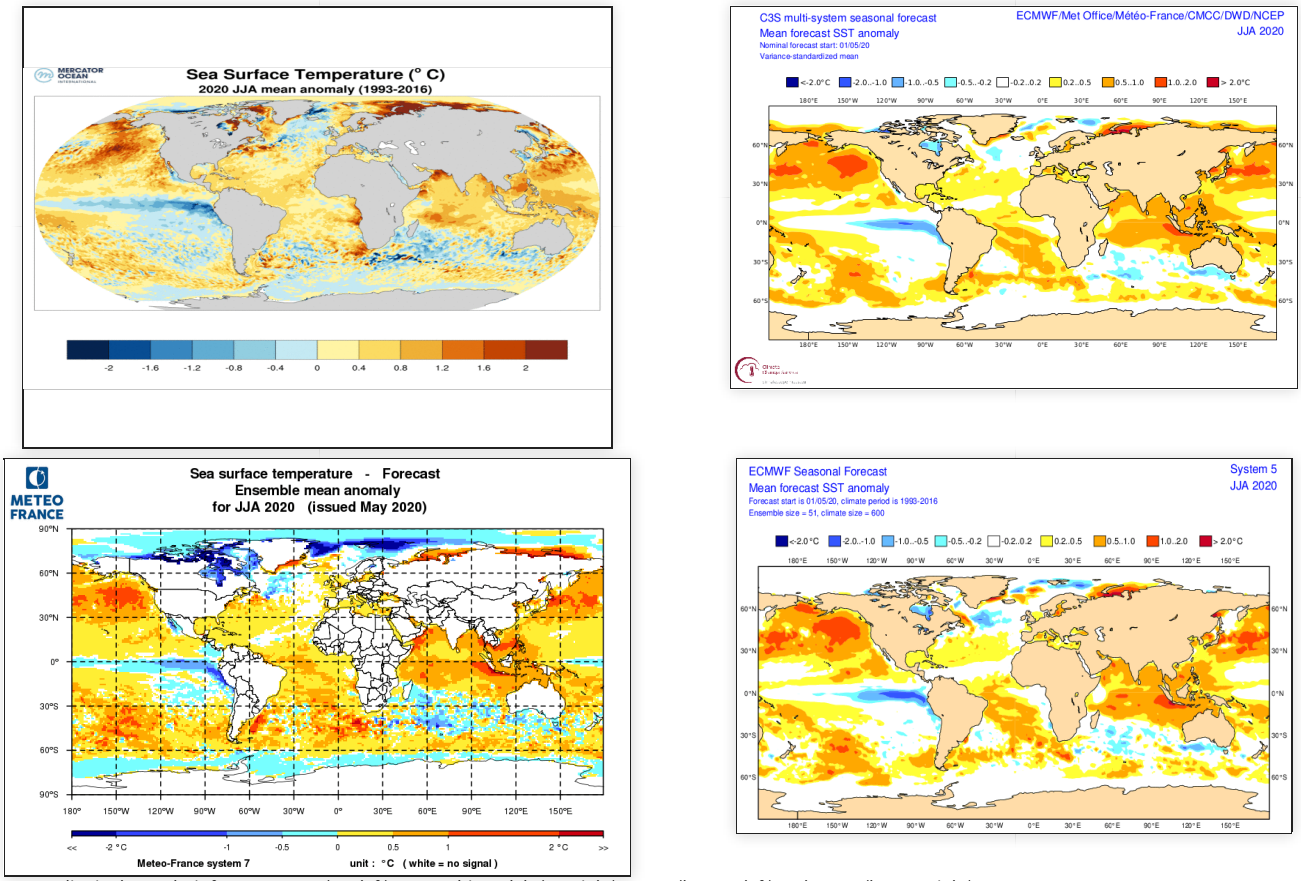
Introduction : Objective

- **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 main SST patterns were generally well captured. The cold anomaly over the eastern Pacific was well predicted. In the Indian Ocean the hot anomaly was overestimated in the vicinity of the Maritime Continent. Fairly good forecast for the Atlantic (MF7 is rather better than ECMWF near the African coast).

On the other hand, the forecast was far too cold at high northern latitudes and in particular between Greenland and Canada or in the Barents Sea where very hot anomalies occurred (in connection with the extension of the sea ice).

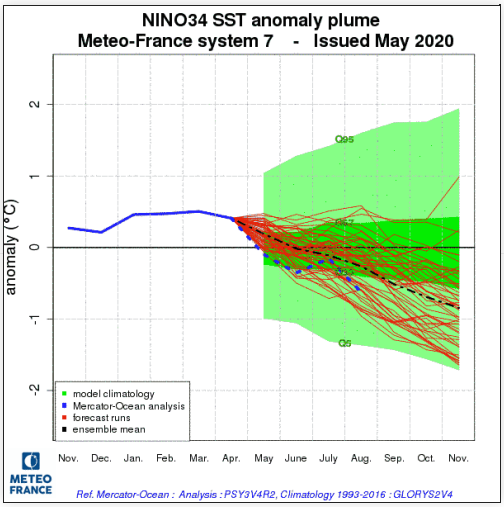


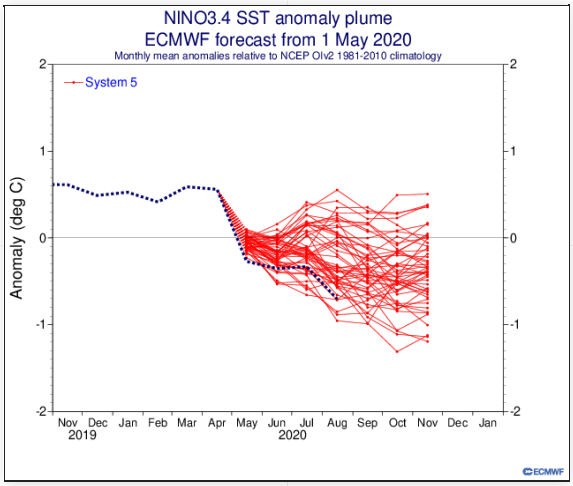
SST anomalies in the analysis from Mercator (top left), C3S multi-models (top right), MF-S7 (bottom left) and SEAS5 (bottom right)

Oceans : ENSO

CAUTION : reference analyses differ between MF-S7 (Mercator-Ocean 1993-2016) and SEAS5 (NCEP 1981-2010).

Correct negative trend even if the decrease was a little underestimated.



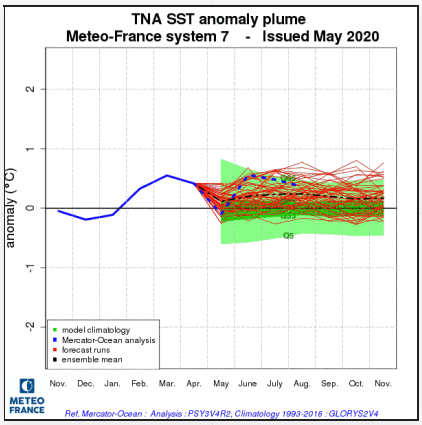


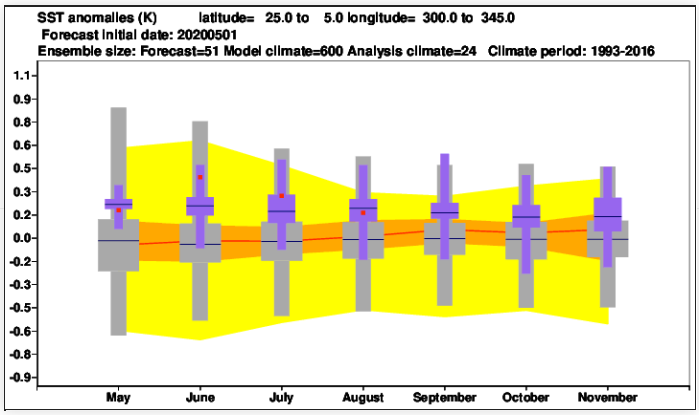
Oceans : tropical Atlantic and Indian Ocean index

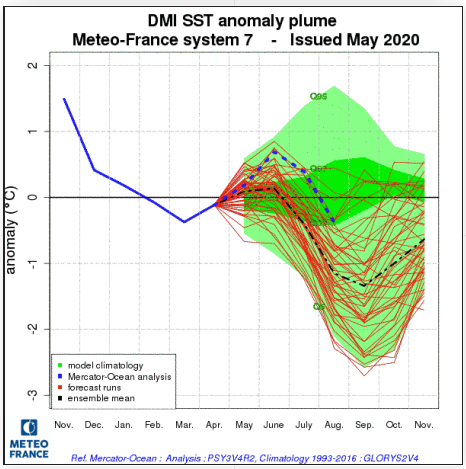
Both models had very similar forecasts :

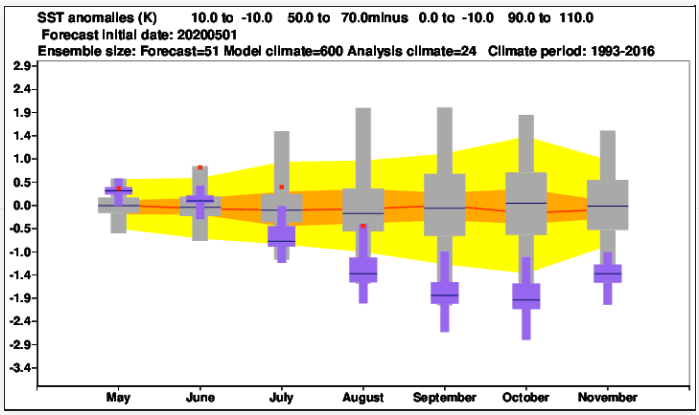
- TNA : Monthly fluctuations are significant but remain in the plume

- DMI : As guessed by the sight of the SST charts, the IOD reversal occurred later than expected



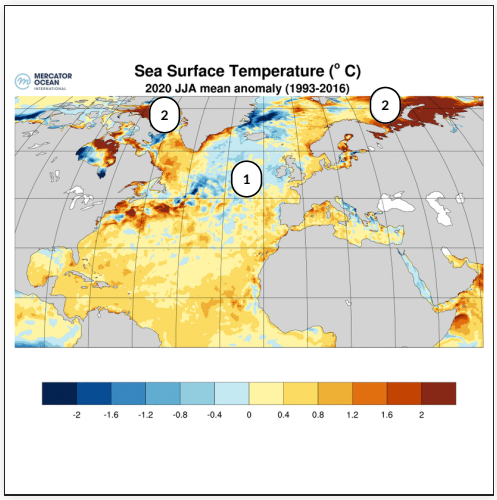


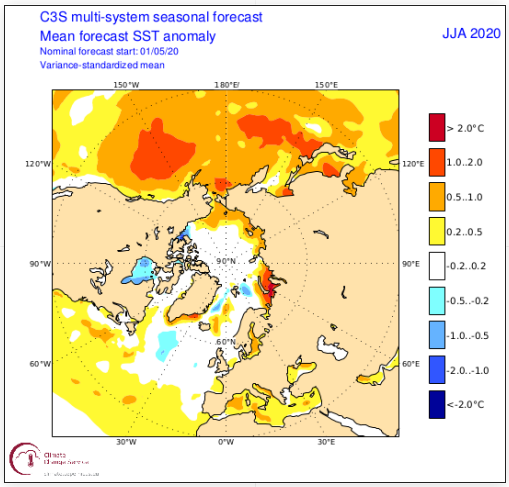


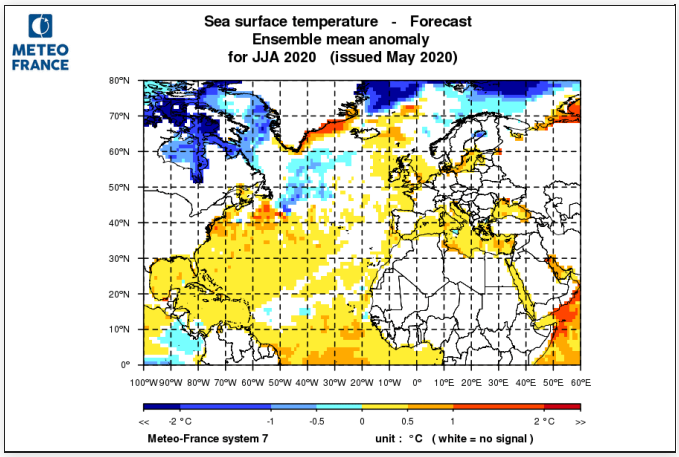


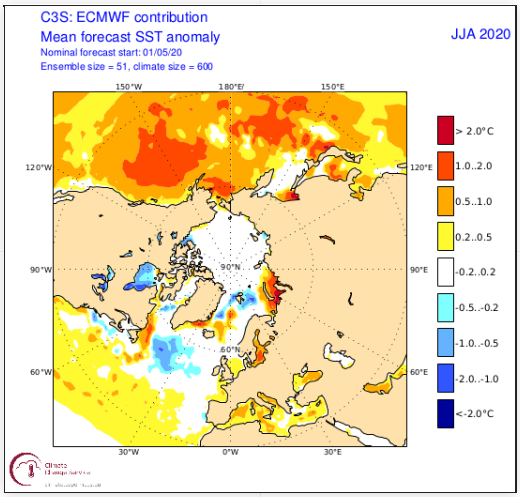
Oceans : North Atlantic SST

The warm anomalies between Greenland and Canada, and in the Barents Sea were not forecasted by the models.









SST anomalies in the analysis from Mercator (top left), C3S multi-models (top right), MF-S7 (bottom left) and ECMWF SEAS5 (bottom right)

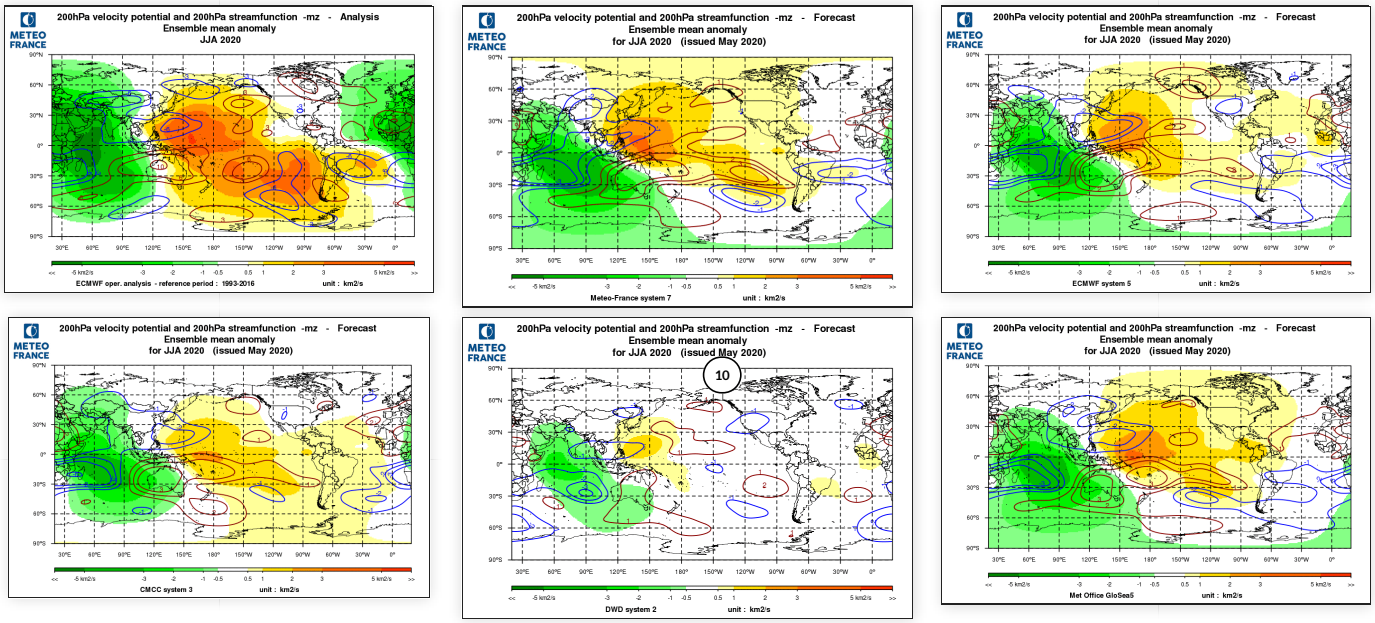
1 - Larger than expected extension
2 - This warm anomaly was not excpeted
2 - This warm anomaly was not excpeted

Atmospheric circulation : Global teleconnection

The dipole on each side of the Maritime Continent was very well forecaasted, both for PV and FC.

The intensity of the PV anomaly over the South Pacific was greatly underestimated.

The forecast was bad for Europe and Africa.

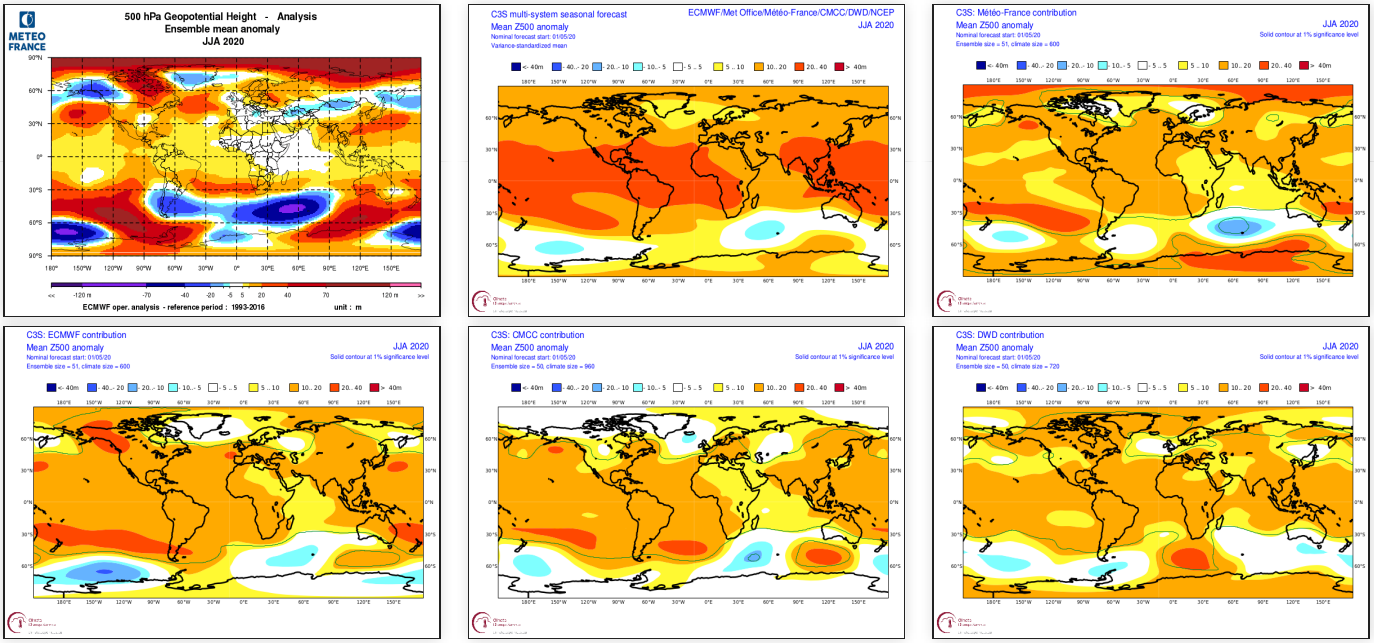


ECMWF analysis, MF-S7, ECMWF-SEAS5, CMCC, DWD and JMA 200hPa velocity potential anomalies (color range, green : ascending, orange: subsidence) and stream function anomalies (isolines, red: anticyclonic in the northern hemisphere, blue: cyclonic in the northern hemisphere).

10 - Very little signal in the DWD model

Atmospheric circulation : 500hPa Geopotential height

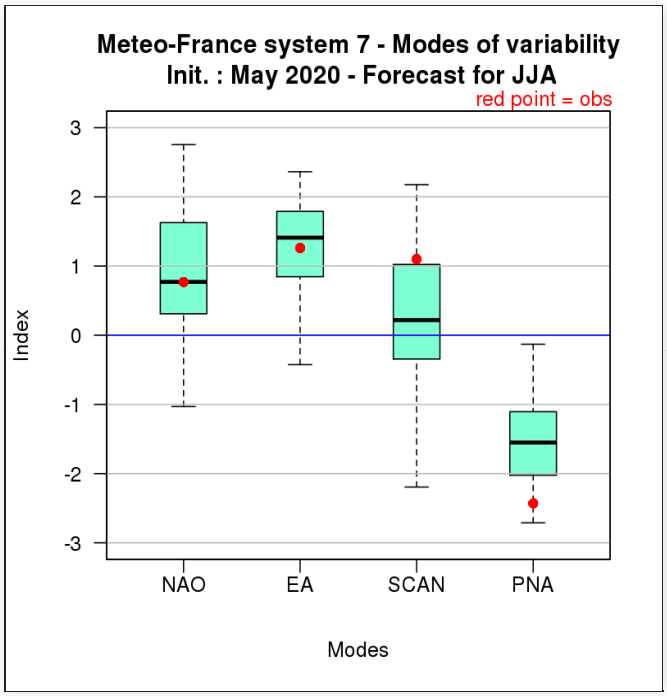
the relative weakness of the field over the Indian Ocean was sensed by most models, but none of them were able to approach the other patterns that occurred, both for the globe and for Europe.

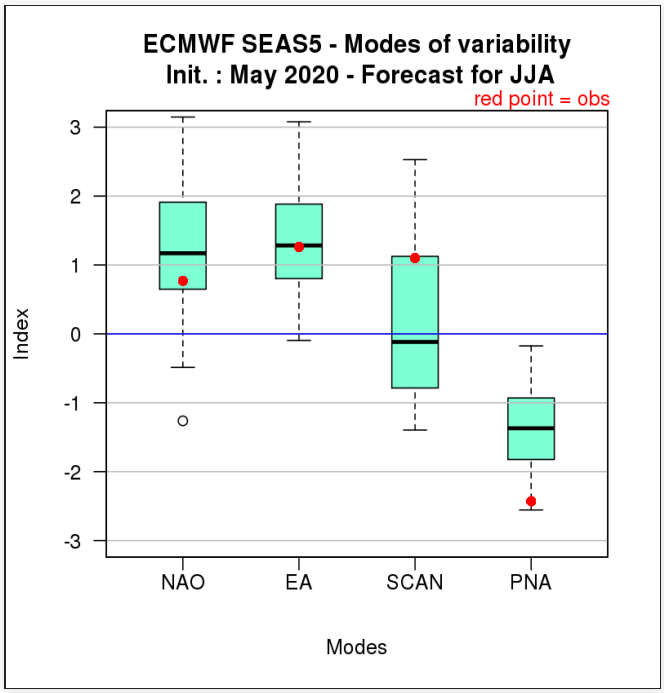


ECMWF analysis, C3S multi-system, MF-S7, ECMWF-SEAS5, CMCC and DWD 500hPa geopotential height anomalies.

Atmospheric circulation : Modes verification

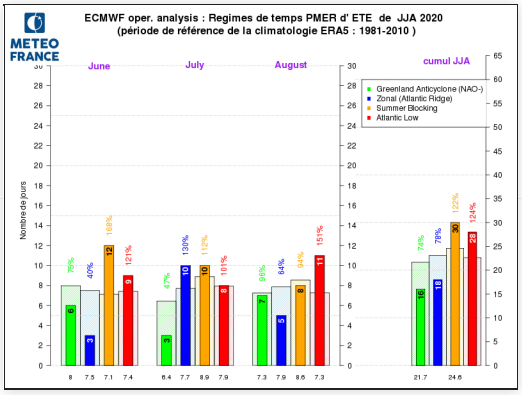
Good forecast for the NAO and EA indices. Much worse for SCAN and PNA

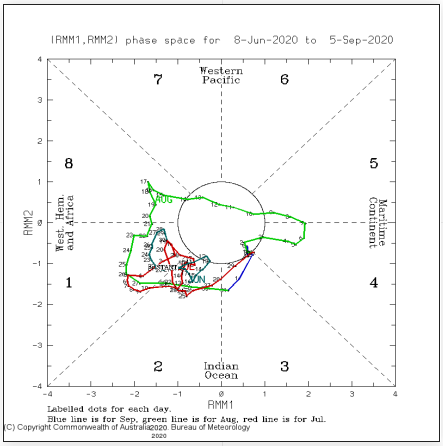


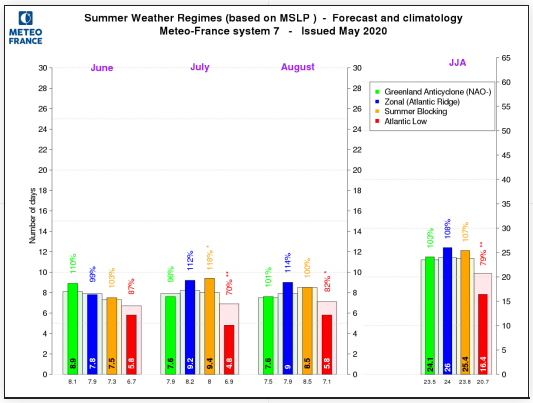


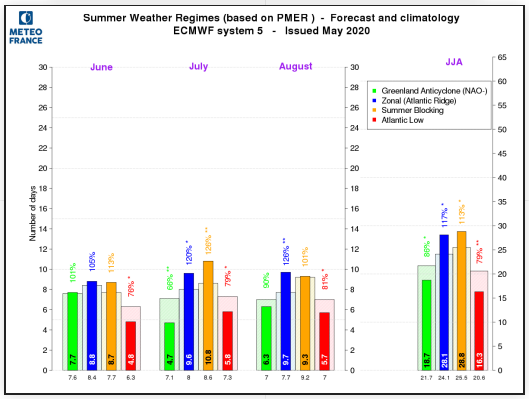
Atmospheric circulation : Summer SLP weather regimes

Contrary to what was expected, the oceanic regimes were strongly in deficit and the meridian regimes (Summer Blocking and Atlantic low) dominated.





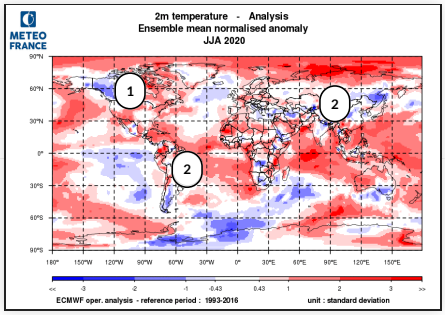


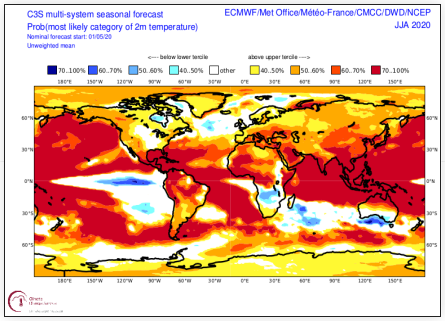


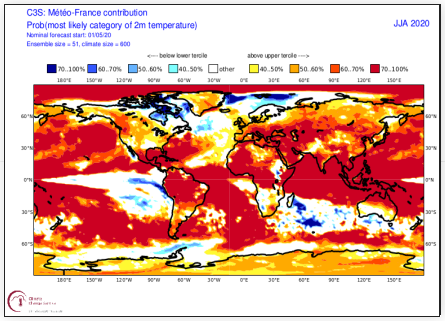
weather regime : ECMWF analysis top left, MF7 and ECMWF forecasts at the bottom. MJO phase top right

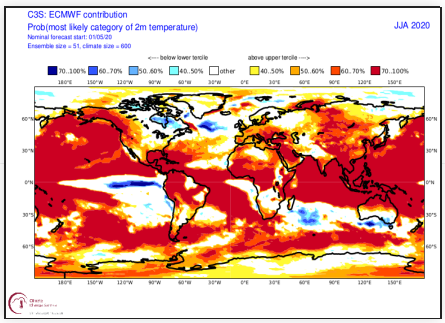
Climatic parameters : temperature on the globe

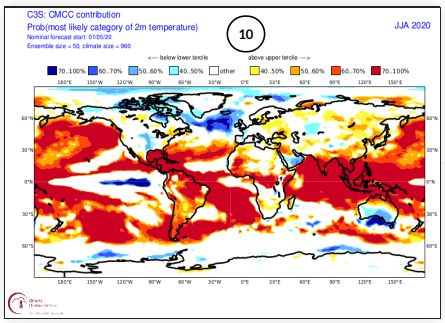
Cold anomalies over the continents were more numerous than expected, especially over Asia, western Canada and South America. The hot anomaly in the Labrador area was not expected since most models predicted cold in this area.

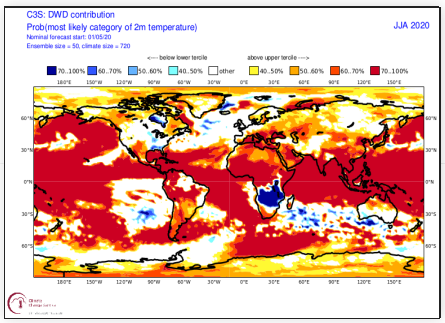










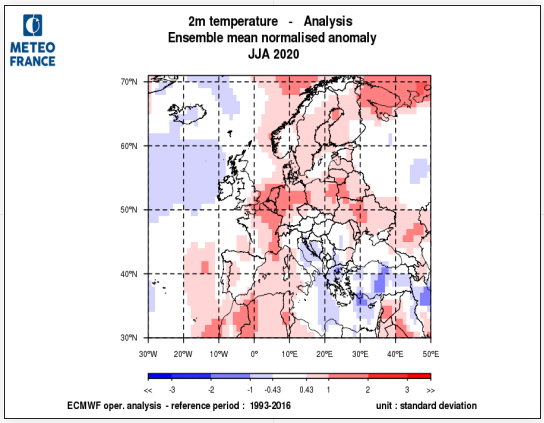


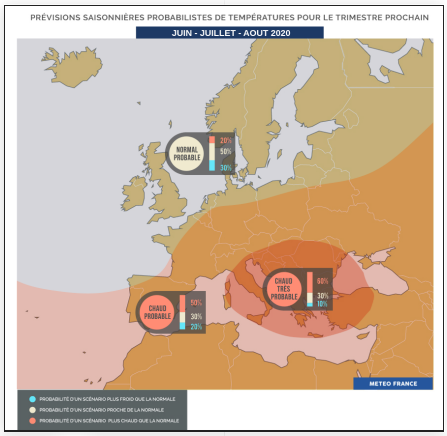
ECMWF analysis top left, forecast for multi-model top center and forecast for MF-S7 top right, ECMWF-SEAS5, CMCC, DWD on the bottom line.

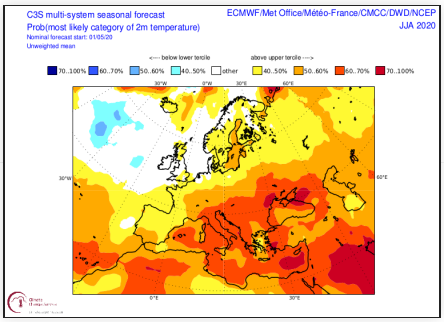
1 - the reverse of the expected dipole occurred
2 - none of the models predicted these cold anomalies.
2 - none of the models predicted these cold anomalies.
10 - The Italian model is generally colder than the others, but the distribution of anomalies is not better.

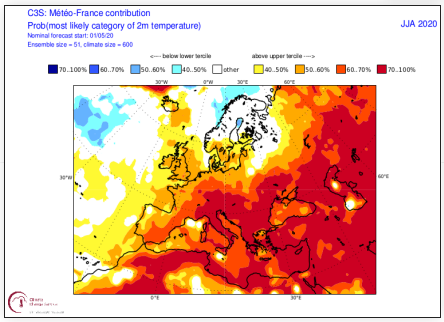
Climatic parameters : temperature over Europe

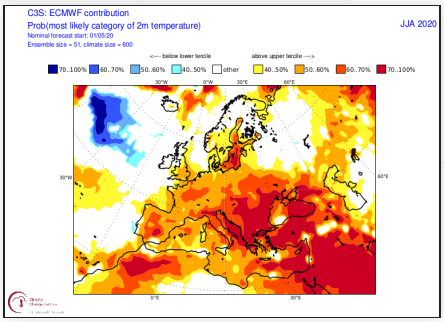
Very bad forecast for south-eastern Europe.







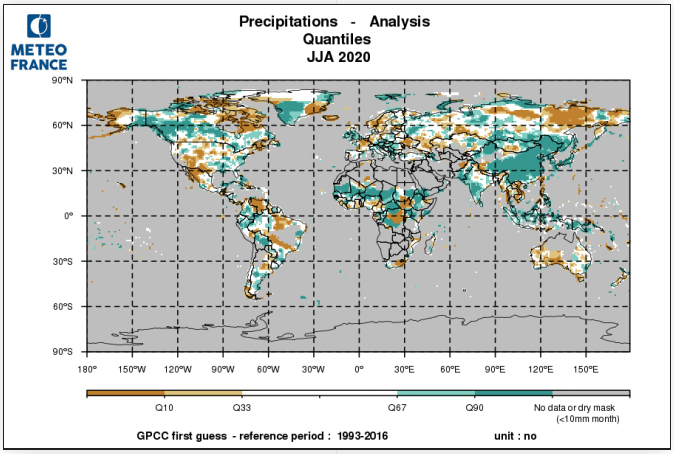


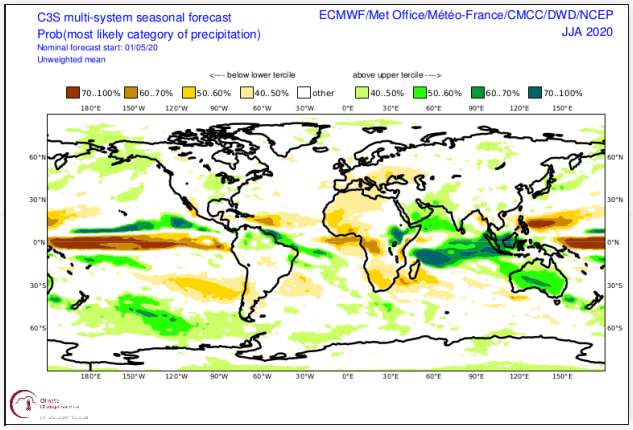


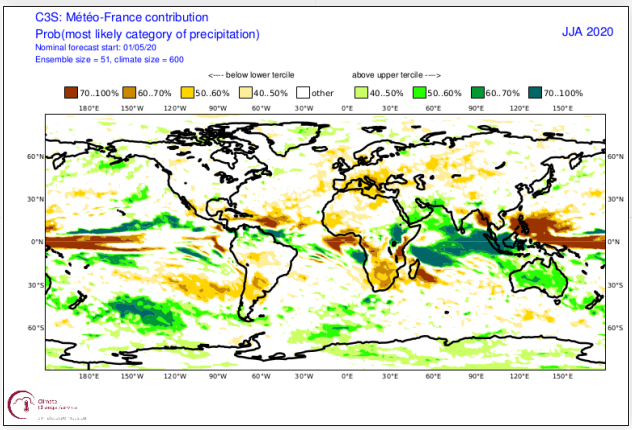
ECMWF analysis top left, synthetic forecast map top right. Forecast for multi-system , MF-S7 and SEAS5 on the bottom line.

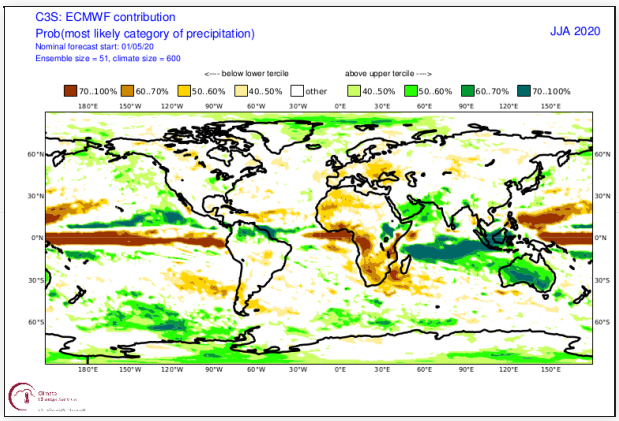
Climatic parameters : Precipitations over the globe

Forecasts were extremely poor across the globe, with the exception of the Maritime Continent where the expected excess precipitation did occur.





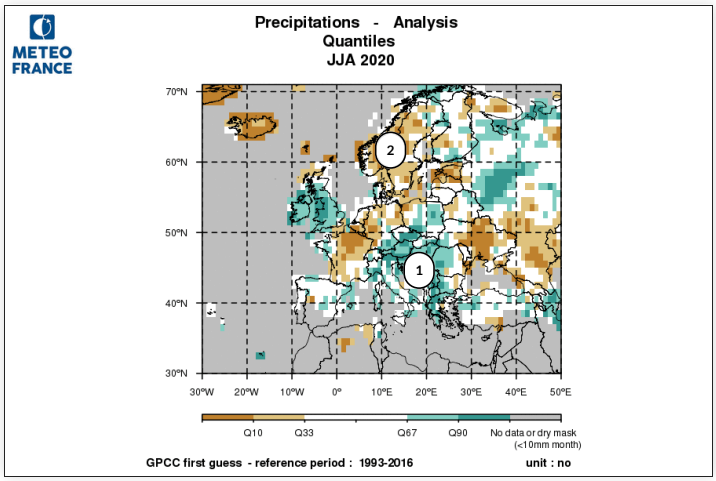


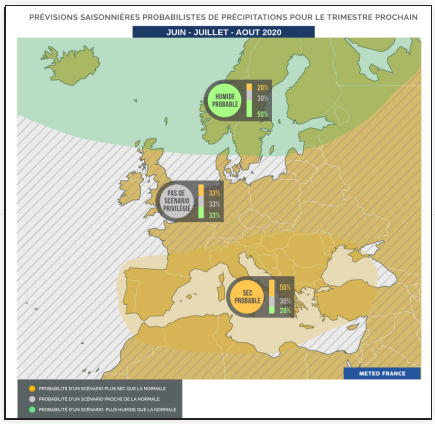


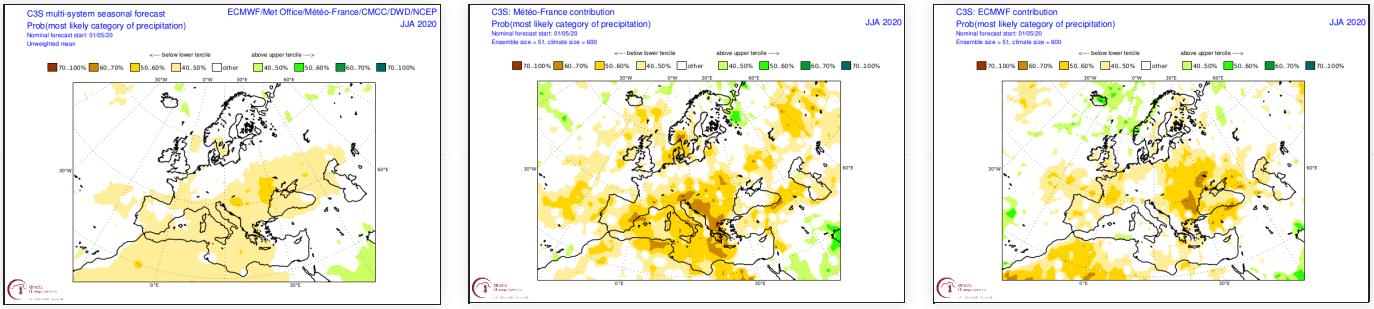
Standardized Precipitation Index analysed by IRI top left, forecast for multi-model top right and MF-S7 and SEAS5 on the bottom line.

Climatic parameters : Precipitations over Europe

Poor forecast over most of the continent







Precipitation anomalies analysed by IRI (top left). Synthetic forecast map for precipitation (top right) and forecast for multi-model,MF-S7 and SEAS5 (on the bottom line).

1 - Excess precipitation over the area with the strongest dry signal in the models
2 - Unexpected dry anomaly

General summary : for the period JJA 2020

1) **Oceans :**

SST patterns were generaly very well captured by the models except at high northern latitudes where unexpected very hot anomalies occurred

2) **Large scale atmospheric circulation :**

VP and FC at 200hPa : kernels on the Indian Ocean and West Pacific were generally well foreseen. The intensity of the anomaly on South Pacific was underestimated. Poor forecast on Europe and Africa.

Z500 : none of the models were able to approach the pattern that happened.
Surprisingly in this context, the prediction of the modes of variability is quite good for the NOA and the EA

3) **Climatic parameters over Europe :**

Poor forecast this month.