

VERIFICATION BULLETIN

MAY - JUNE - JULY 2020

Table of Content

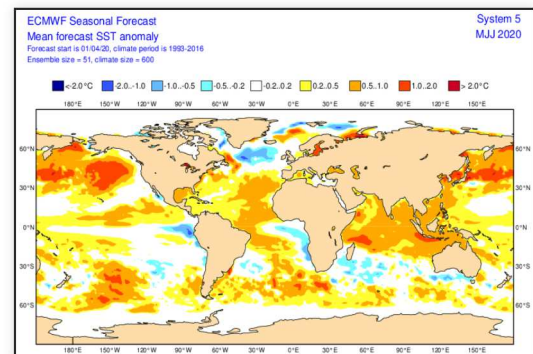
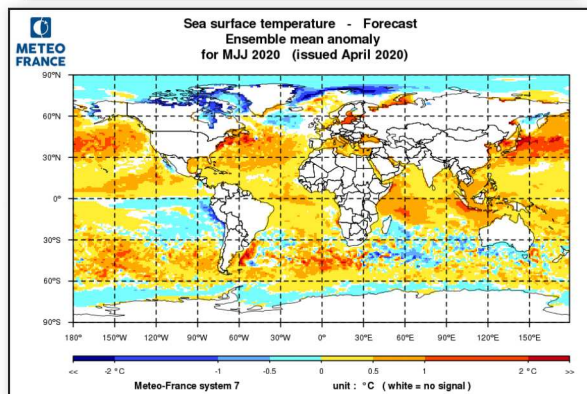
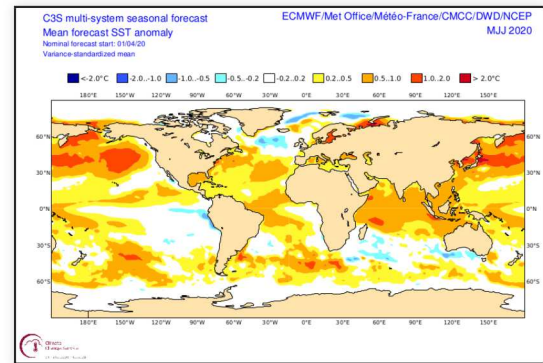
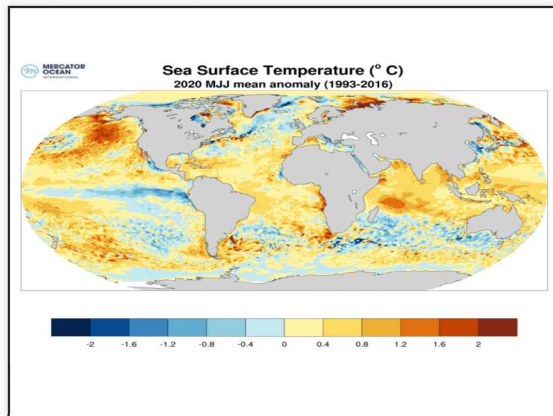
1. Introduction	
1. Objective	3
2. Oceans	
1. surface temperature anomalies	4
2. ENSO	5
3. tropical Atlantic and Indian Ocean index	6
3. Atmospheric circulation	
1. Global teleconnection	7
2. 500hPa Geopotential height	8
3. Modes of variability	9
4. Modes verification	10
5. Summer SLP weather regimes	11
4. Climatic parameters	
1. temperature on the globe	12
2. temperature over Europe	13
3. Precipitations over the globe	14
4. Precipitations over Europe	15
5. General summary	
1. for the period AMJ 2020	16

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 very well captured, especially the cold trend in Eastern equatorial Pacific. In details one can notice cold anomalies in Eastern Medit. that were not well foreseen by MF-S7 and other C3S models. Inversely, good forecast of MF-S7 in the Gulf of Guinea, whereas many C3S models were too cold.

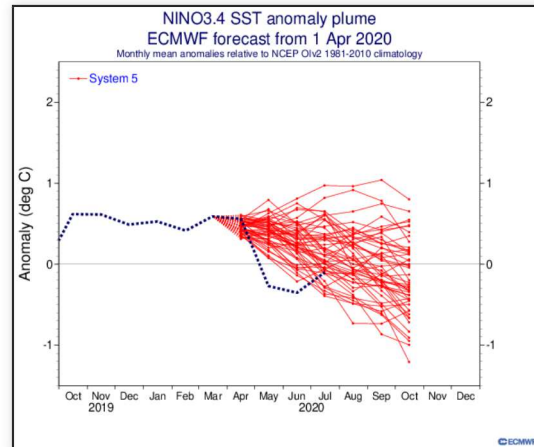
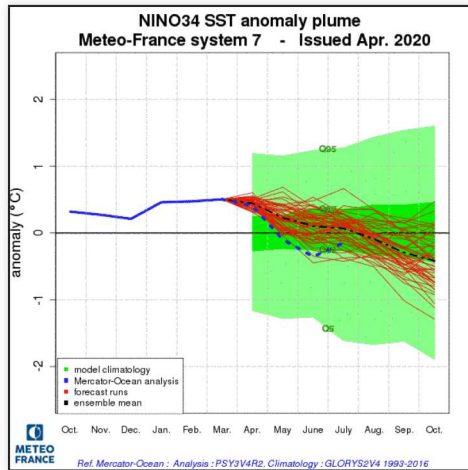


SST anomalies in the analysis from Mercator (top left), C3S multi-models (top right), MF-S7 (bottom left) and SEAS5 (bottom right)

Oceans : ENSO

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

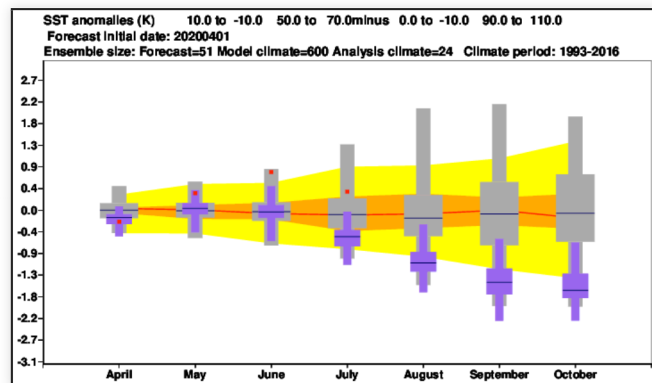
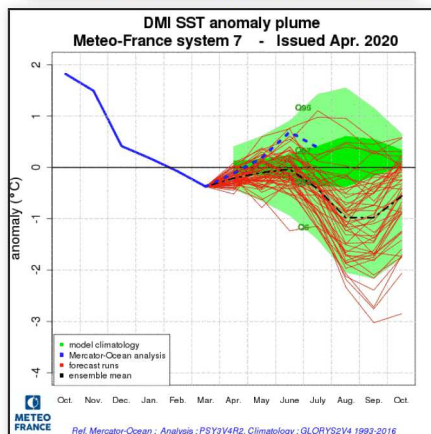
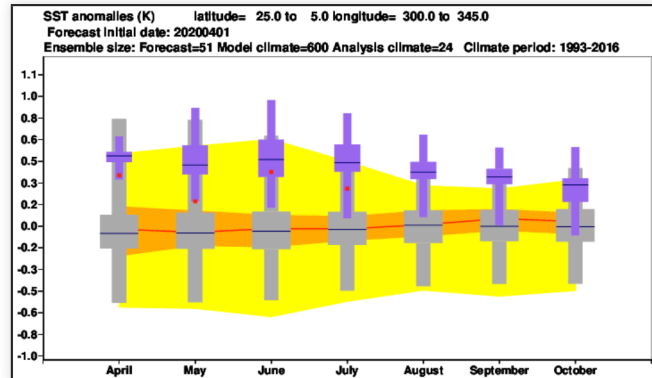
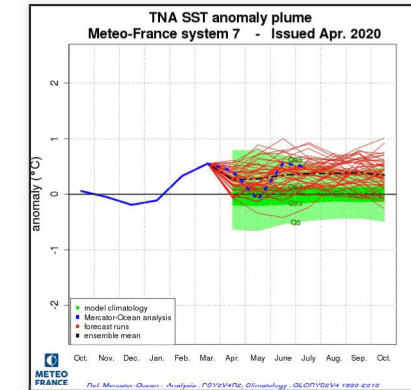
The sudden decrease in May and June was not anticipated by the models. Anyway, the negative trend was correct.



Oceans : tropical Atlantic and Indian Ocean index

Both models had very similar forecasts :

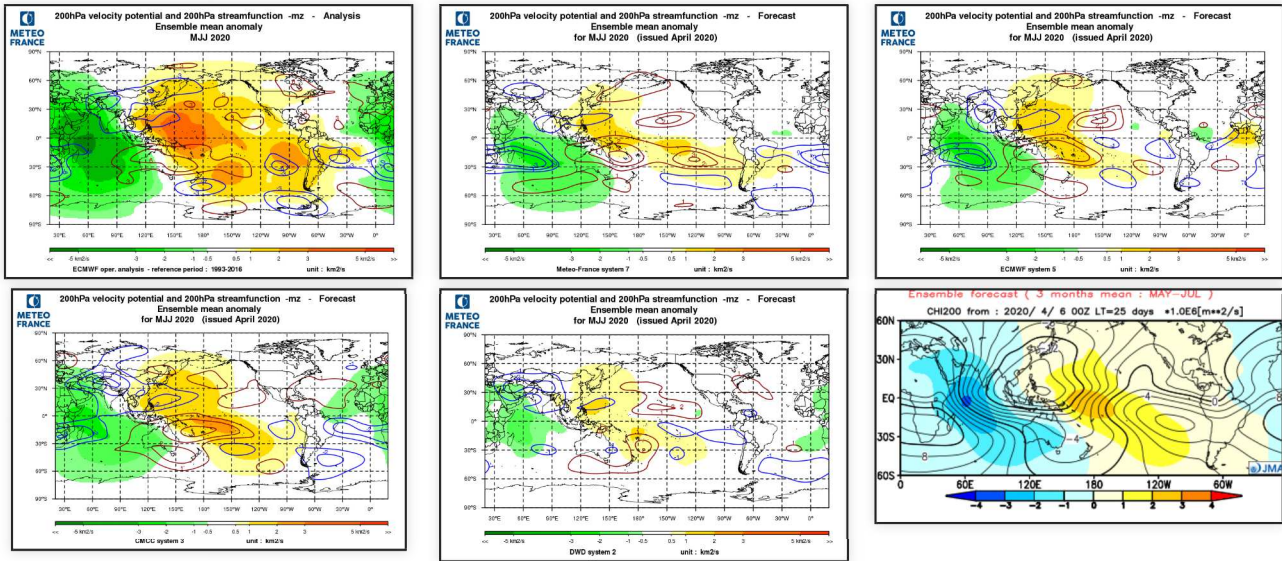
- TNA : Monthly fluctuations had not been anticipated by the models, but the 3-month mean forecasts were correct.
- DMI : the trend was well predicted, but the sign of the 2 last months was incorrect



Atmospheric circulation : Global teleconnection

VP 200hPa : The upward motion area over the Indian Ocean and downward motion over the Pacific were correctly foreseen. MF-S7 and CMCC were particularly good.

SF 200 hPa : Few large scale patters, except over the Indian Ocean (rather well foreseen by models, see MF-S7 or CMCC). No clear teleconnection observed toward mid-latitudes.

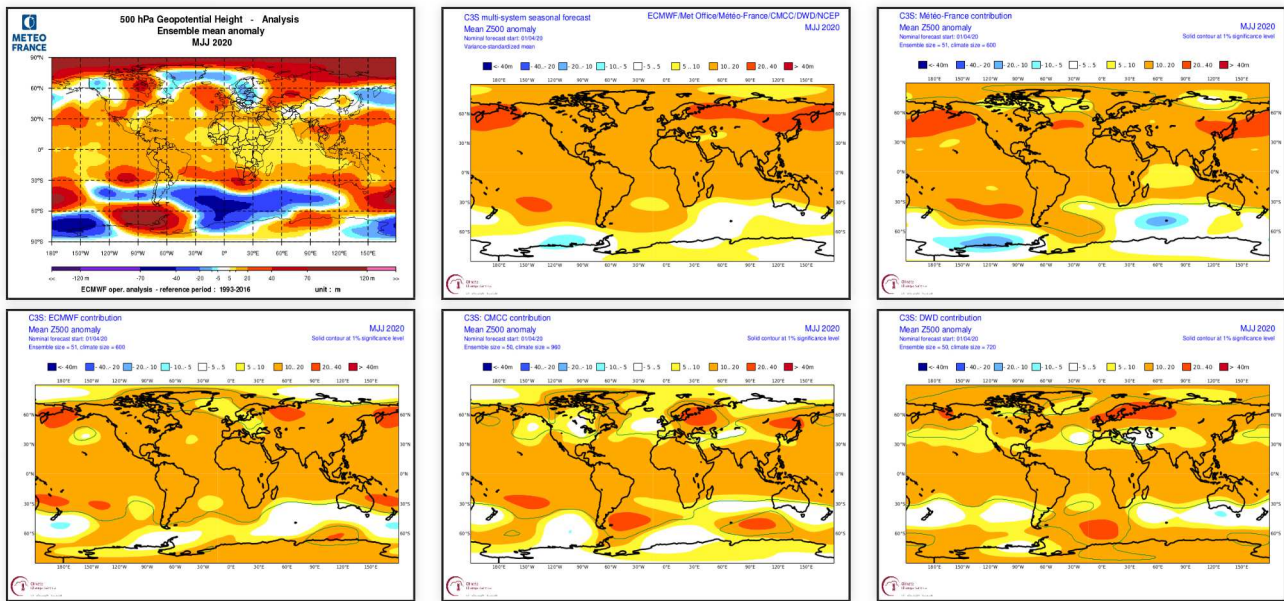


ECMWF analysis, MF-S7, ECMWF-SEAS5, CMCC, DWD and JMA 200hPa velocity potential anomalies (color range, green : ascending, orange: subsidence) and stream function anomalies (isolines, red: anticyclonic in the northern hemisphere, blue: cyclonic in the northern hemisphere).

Atmospheric circulation : 500hPa Geopotential height

In both hemispheres, complex patterns in the analysis. This kinds of forecast are difficult to forecast.

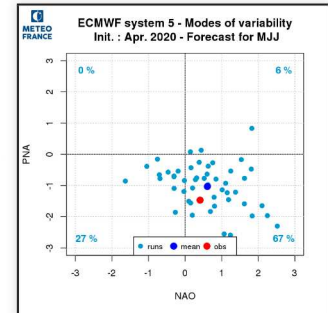
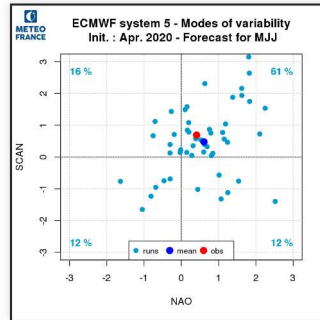
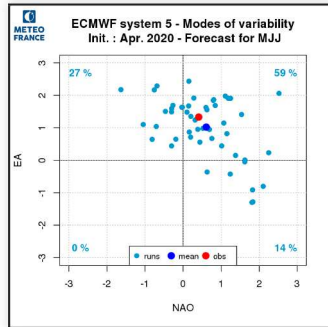
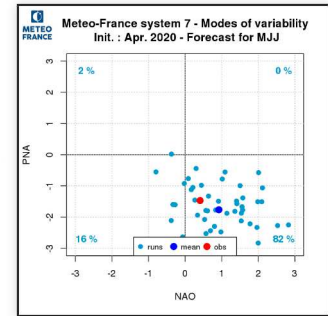
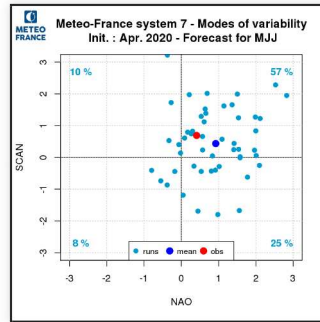
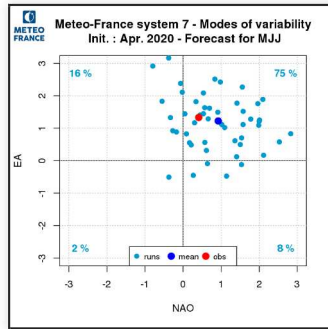
For North Atlantic and Europe, maybe MF-S7 and ECMWF-SEAS5 partly suggested the main circulation with a relative high over the Atlantic.



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

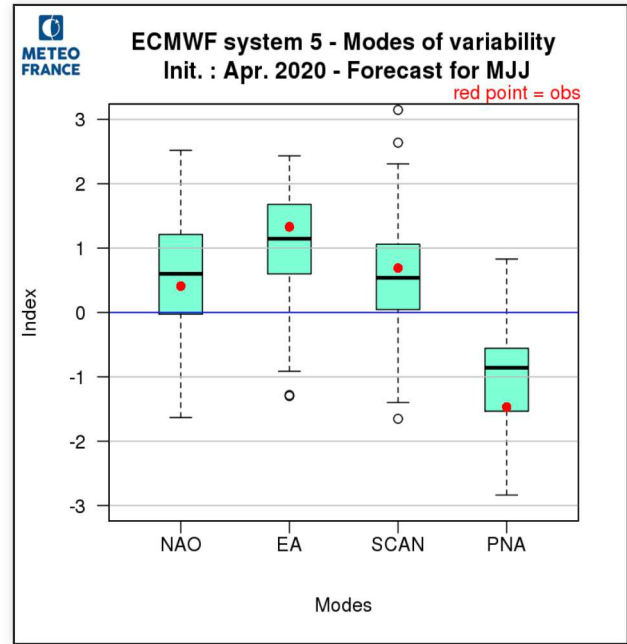
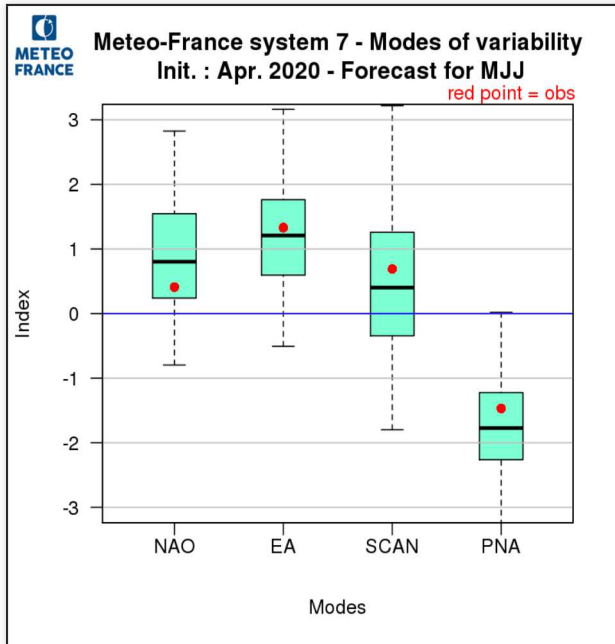
Atmospheric circulation : Modes of variability

Good forecast of both models



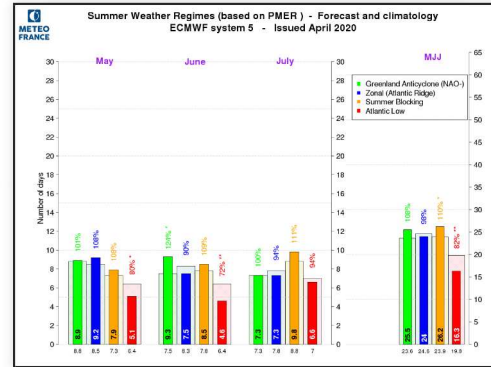
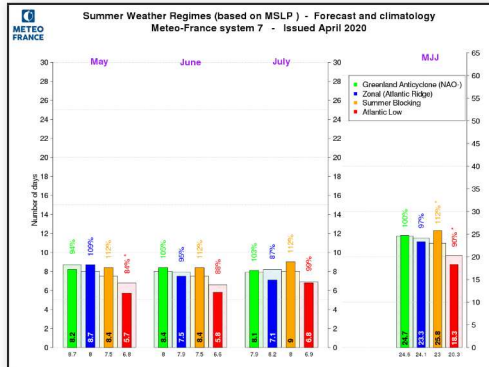
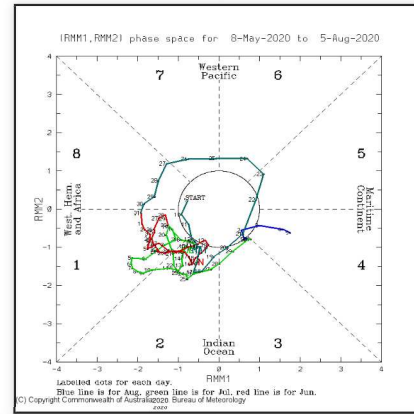
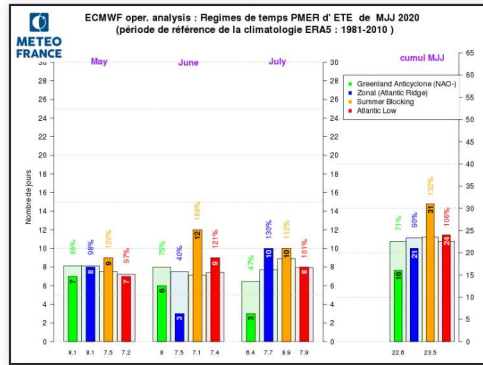
Atmospheric circulation : Modes verification

Good forecasts



Atmospheric circulation : Summer SLP weather regimes

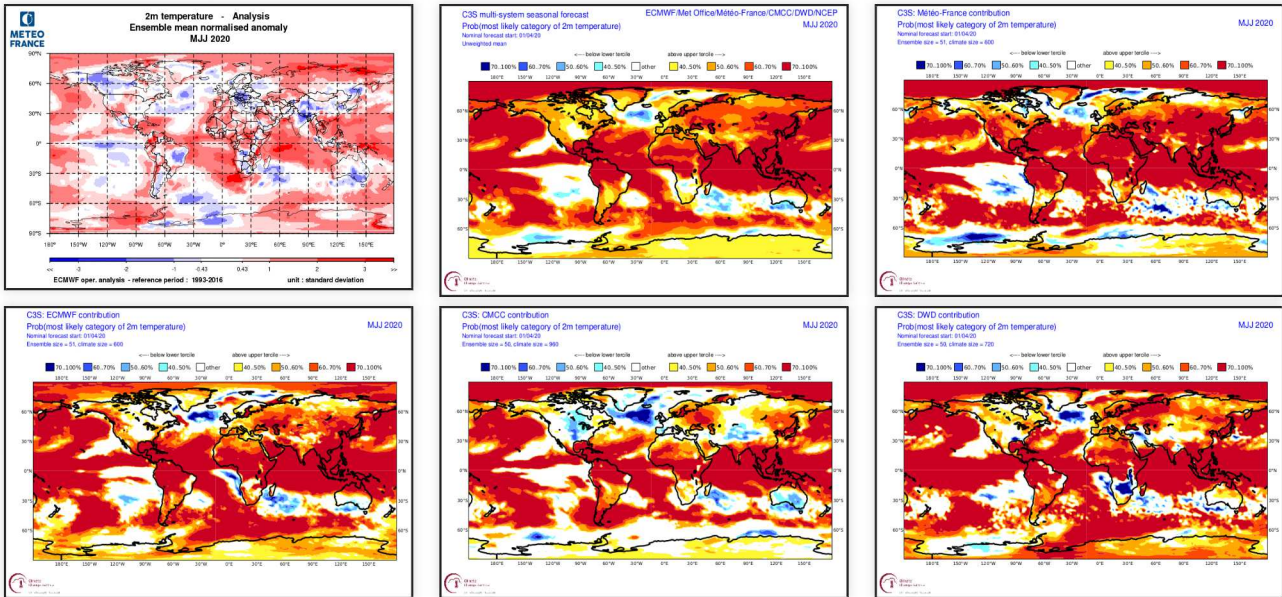
Good forecast of an excess of summer blocking, bad forecast of a deficit of Atlantic Low



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

Climatic parameters : temperature on the globe

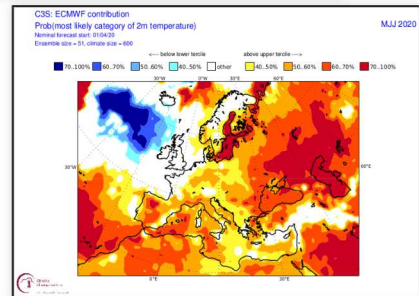
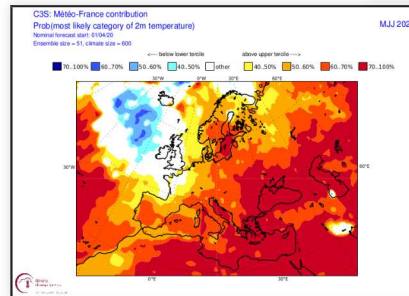
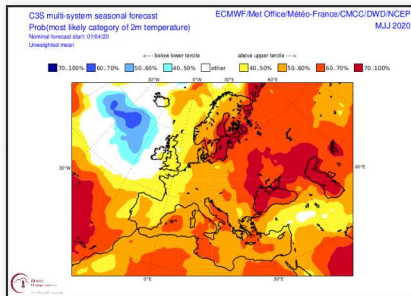
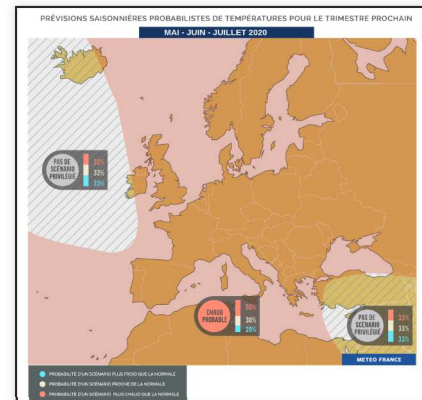
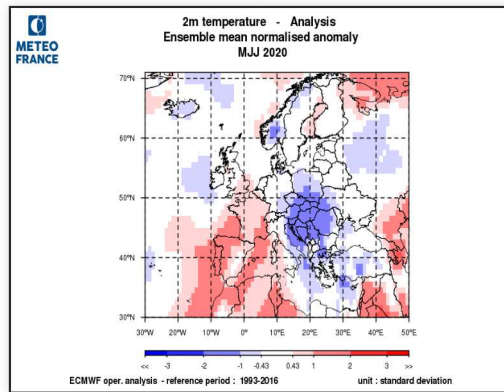
Complex anomaly patterns over the continents. Most of the cold anomalies (North and South America, Australia, Asia) were foreseen by some models, but none of them was correct everywhere. Over Europe, the cold anomaly was not detected.



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.

Climatic parameters : temperature over Europe

The strong cold anomaly observed over Central Europe was not anticipated.

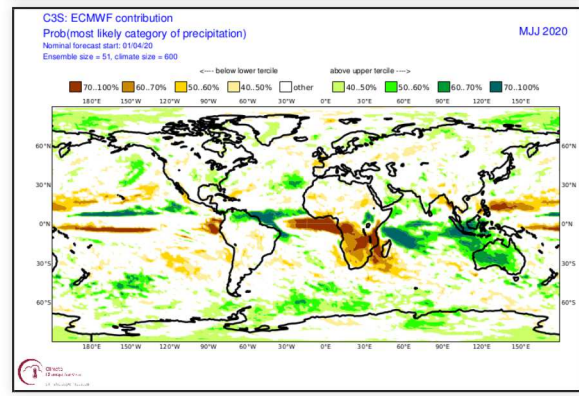
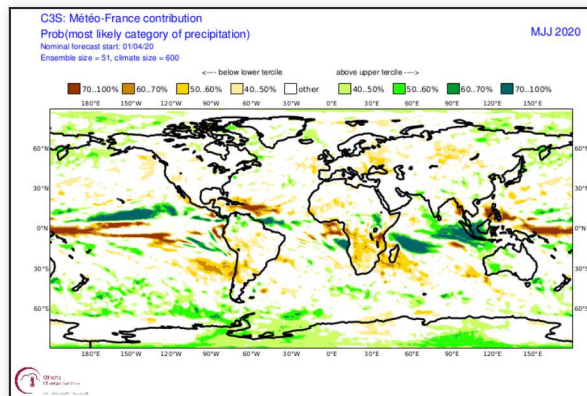
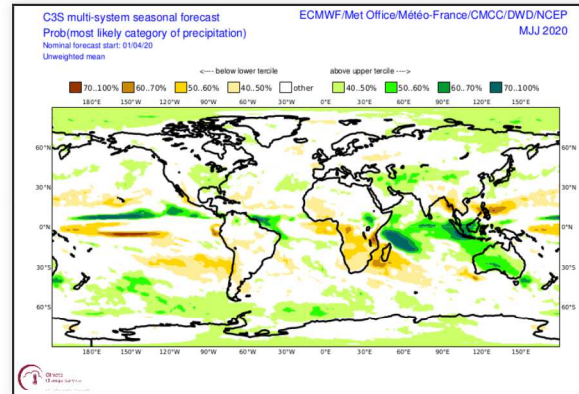
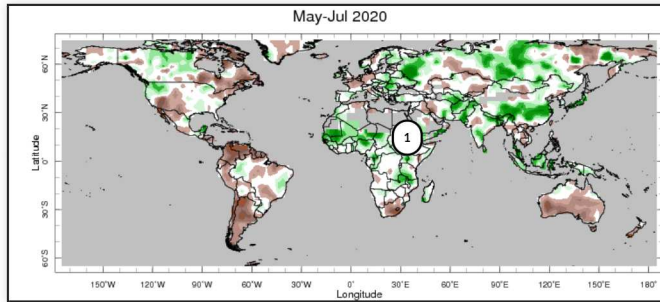


ECMWF analysis top left, synthetic forecast map top right. Forecast for multi-system, MF-S7 and SEAS5 on the bottom line.

Climatic parameters : Precipitations over the globe

Poor forecast, even in the tropics (see Australia, South America, West African monsoon).

In Northern hemisphere, the main anomalies were not detected.



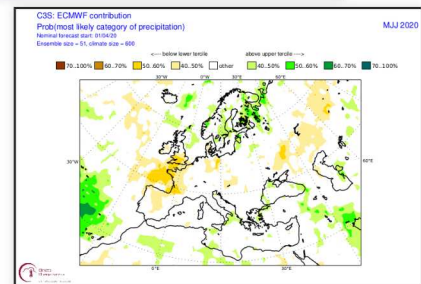
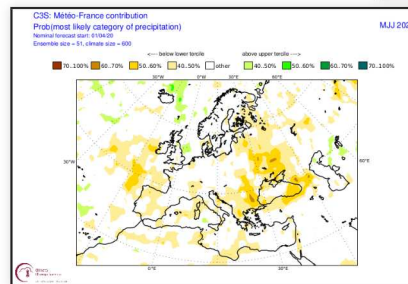
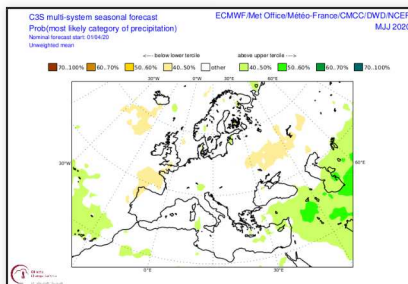
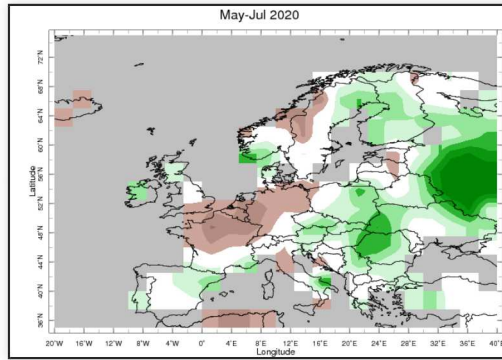
Standardized Precipitation Index analysed by IRI top left, forecast for multi-model top right and MF-S7 and SEAS5 on the bottom line.

1 - This rain anomaly was not expected

Climatic parameters : Precipitations over Europe

Weak signal in the models, sometimes contradictory.

On the synthesis chart, the only area highlighted (dry signal) was partly correct (coorrect over Northern France)



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).

General summary : for the period AMJ 2020

1) Oceans :

SST patterns were generally very well captured by the models.

2) Large scale atmospheric circulation :

VP 200hPa : The kernel on the Indian Ocean and the one on the maritime continent/East Pacific were generally well foreseen.

SF 200 hPa : No teleconnection, neither in the analysis nor in the forecast.

Z500, MSLP, Modes, Regimes : partly correct, models were not able to catch the complexity of the situation

3) Climatic parameters over Europe :

The significant cold anomaly over Central Europe was not foreseen. However over Western Europe, the privileged scenario (warm and dry) was pretty correct.