

VERIFICATION BULLETIN

MAY - JUNE - JULY 2025

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Introduction : Objective

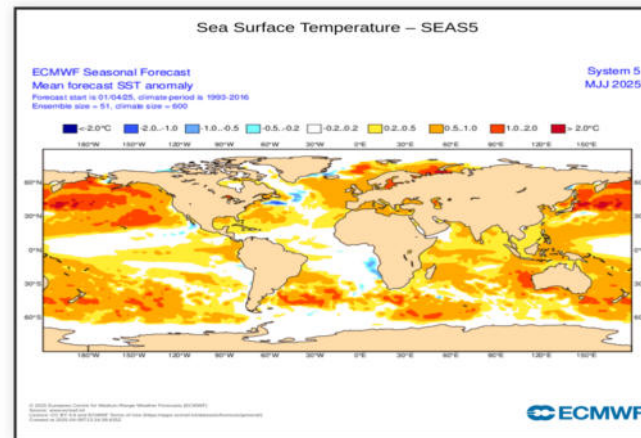
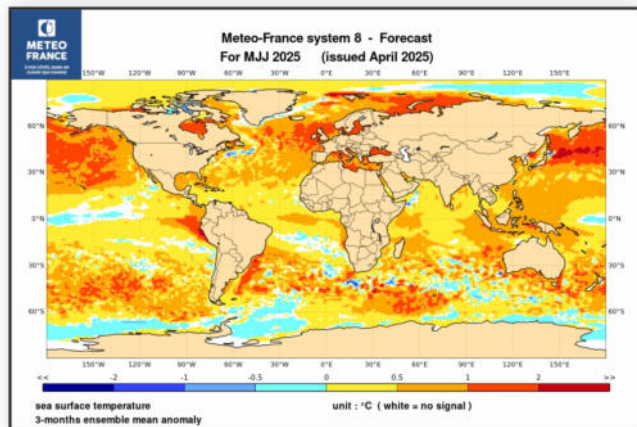
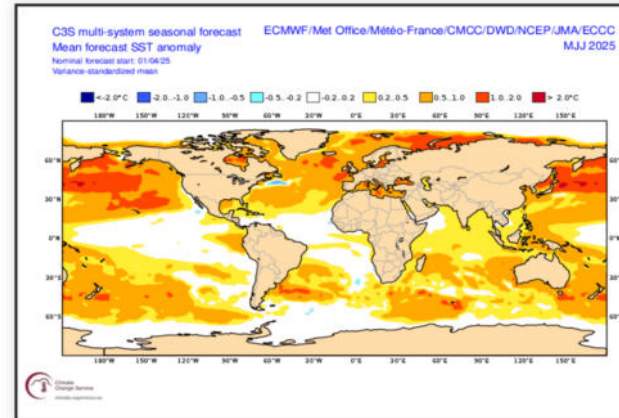
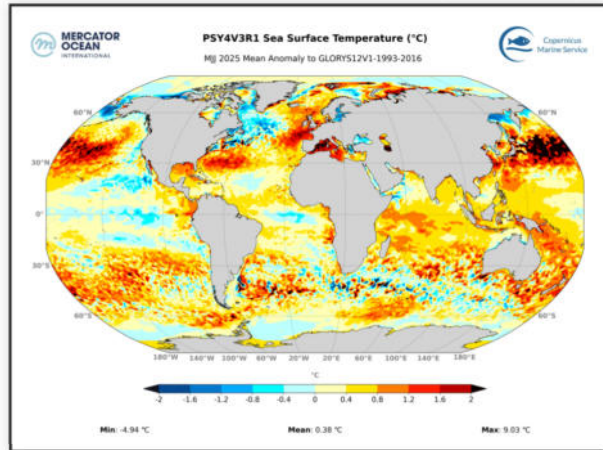
- The objective of the Seasonal Verification Bulletin is to present an evaluation of the main elements highlighted in the Seasonal Forecast Bulletin : oceanic forcings, large scale circulation patterns, and a focus on temperature and precipitation forecast over Northern Atlantic, Europe and the Mediterranean 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

In the Pacific Ocean, the PDO- pattern was correctly predicted by the models.

In the Indian Ocean the weak positive anomaly was well anticipated.

In the Atlantic Ocean, the weak cold anomaly around equator wasn't forecasted

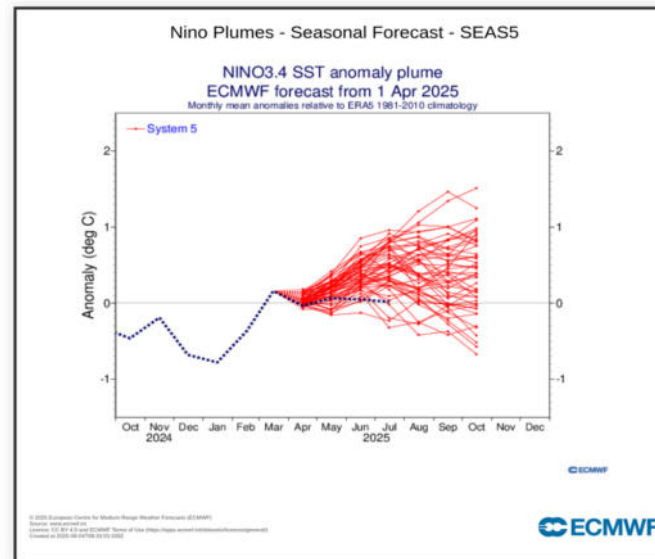
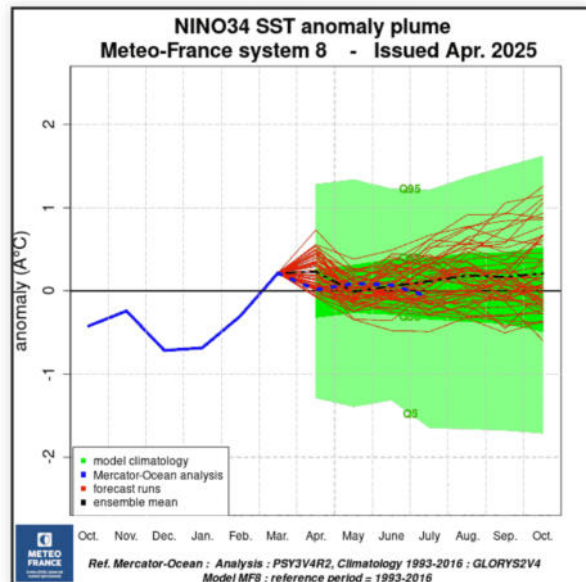


SST anomalies in the analysis from Mercator (top left), C3S multi-models (top right), MF-S8 (bottom left) and SEAS5 (bottom right)

Oceans : ENSO

CAUTION : reference analyses differ between MF-S8 (Mercator-Ocean 1993-2016) and ECMWF-SEAS5 (NCEP 1981-2010).

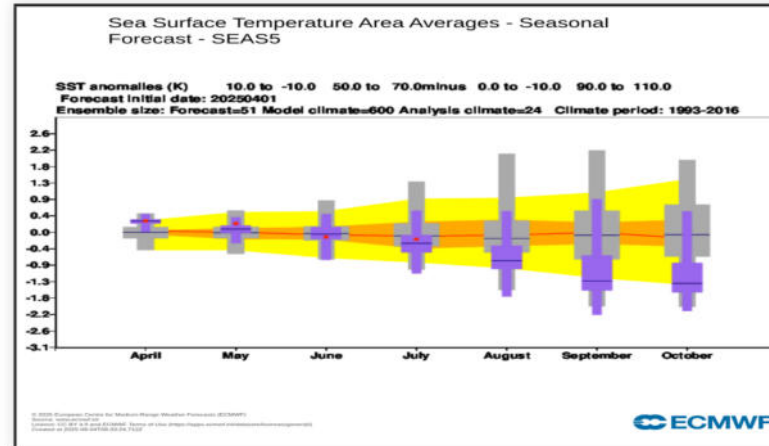
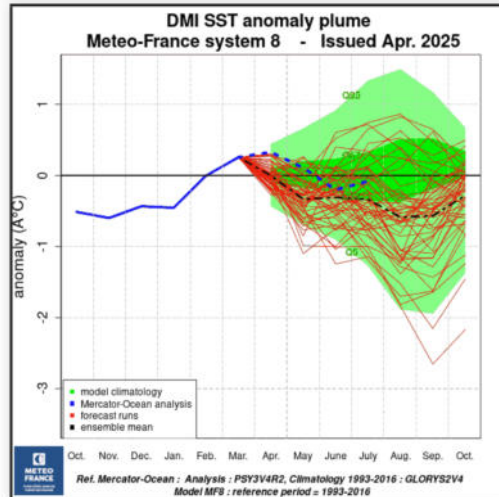
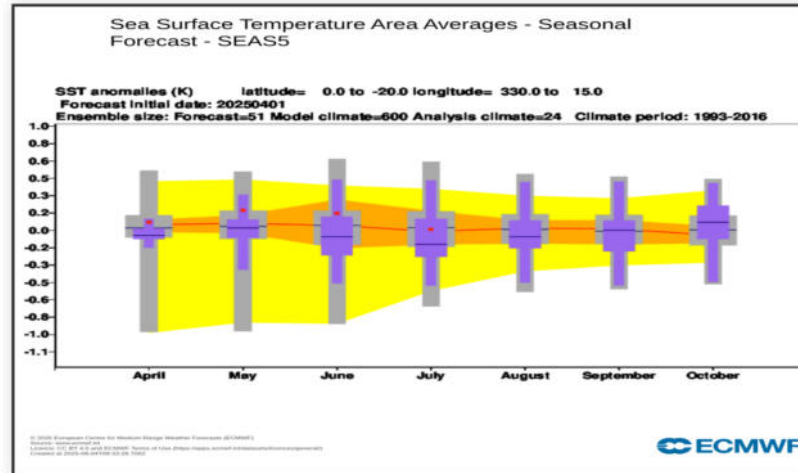
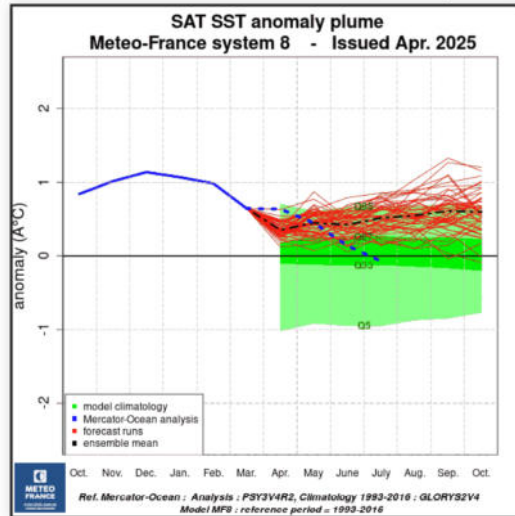
Neutral phase of ENSO well forecasted by models.



Oceans : tropical Atlantic and Indian Ocean index

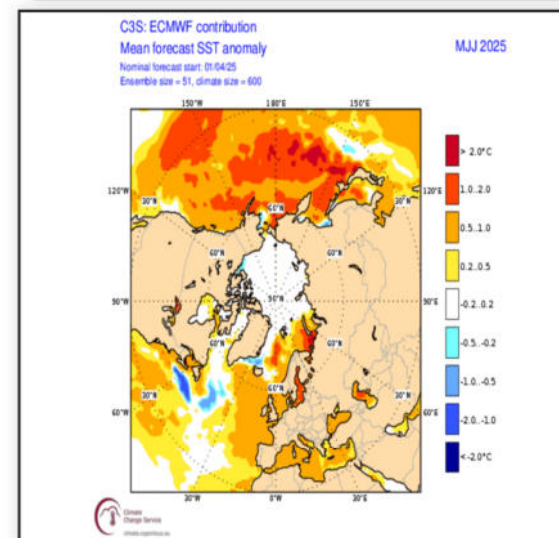
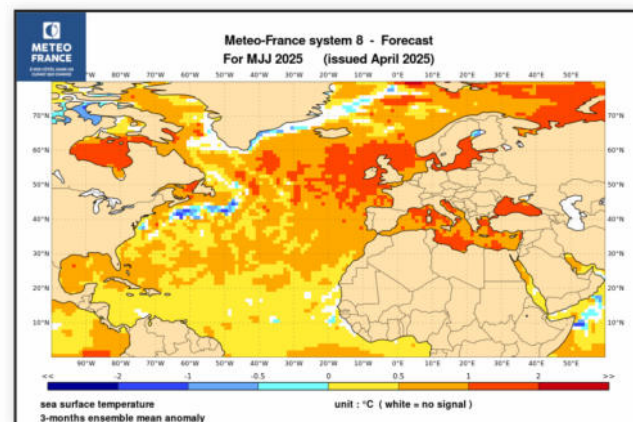
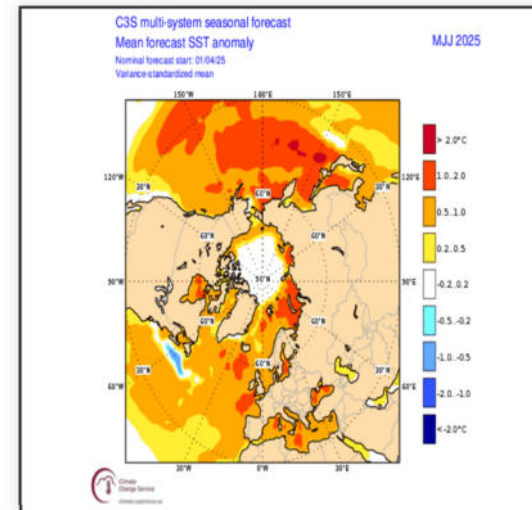
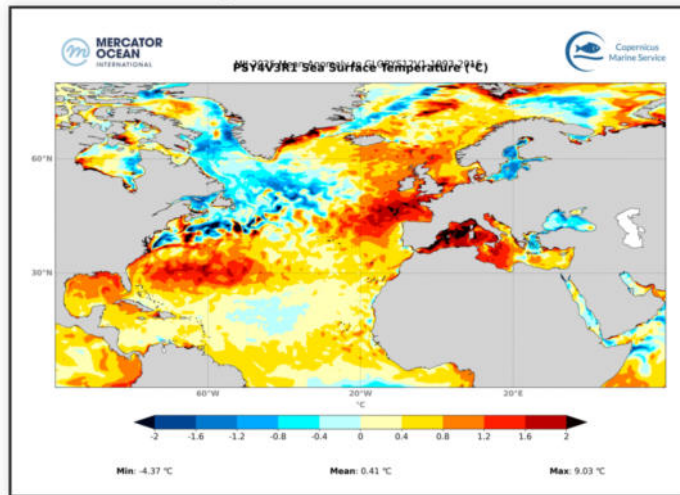
SAT : Neutral conditions, while MF8 predicted a slightly positive anomaly and SES5 the opposite.

DMI : DMI remains close to neutral, as expected .



Oceans : North Atlantic SST

The strong warm anomalies in the vicinity of Europe were well predicted by the models, particularly MF8, but the cold anomaly over the Black Sea and the Baltic Sea was not predicted. Moreover, they underestimated the warm anomaly around 30°N, and they didn't forecast the cold anomaly south of Greenland.

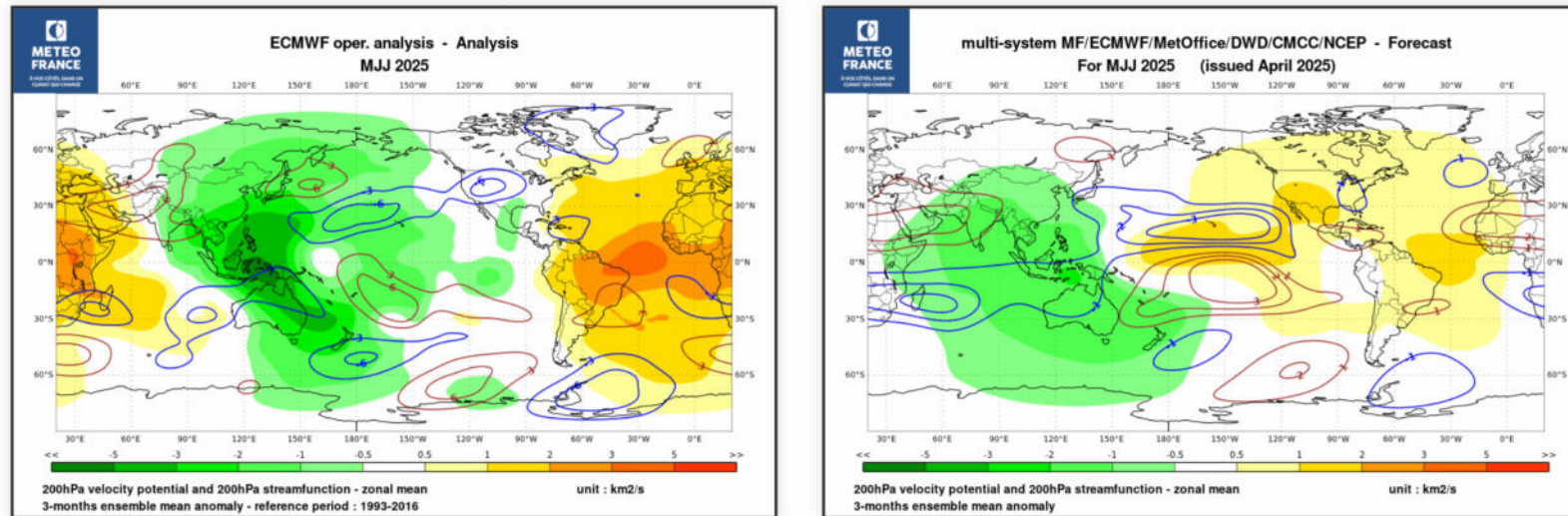


SST anomalies in the analysis from Mercator (top left), C3S multi-models (top right), MF-S8 (bottom left) and ECMWF SEASS (bottom right)

Atmospheric circulation : Global teleconnection

VP : Differences between analysis and forecast for the Central Pacific (subsidence predicted instead of ascending) and for Africa (subsidence not predicted).

SF : The Pacific Ocean dipole and Africa dipole are lightly visible on reanalysis, but without teleconnections.

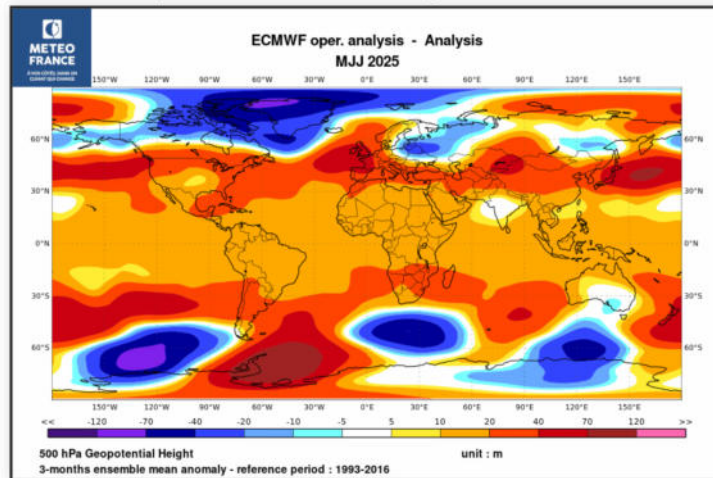


ECMWF analysis (left) and multi-model (right) for 200hPa velocity potential anomalies (color green : ascending, orange: subsidence) and stream function anomalies (isolines, red: anticyclonic in the northern hemisphere, blue: cyclonic in the northern hemisphere).

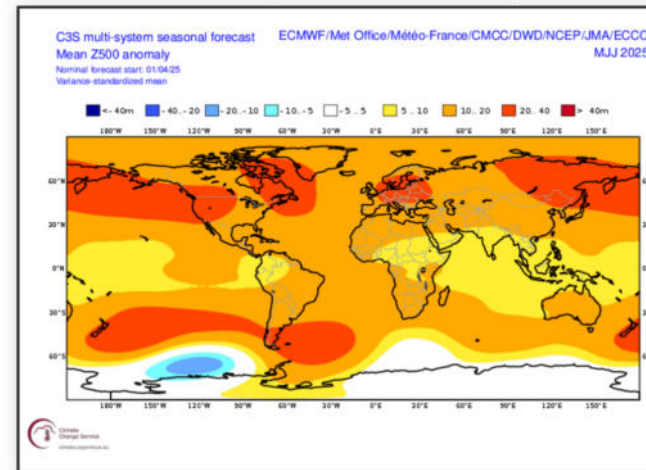
Atmospheric circulation : Atmospheric circulation

Southern Hemisphere : Anomalies positions were well forecasted but they are stronger in the analysis..

Northern Hemisphere : The low anomaly from Alaska to Greenland as well as that for Eastern Europe hasn't been anticipated.

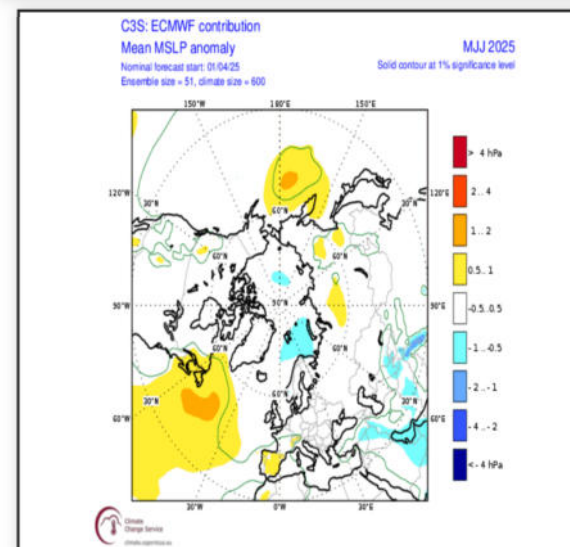
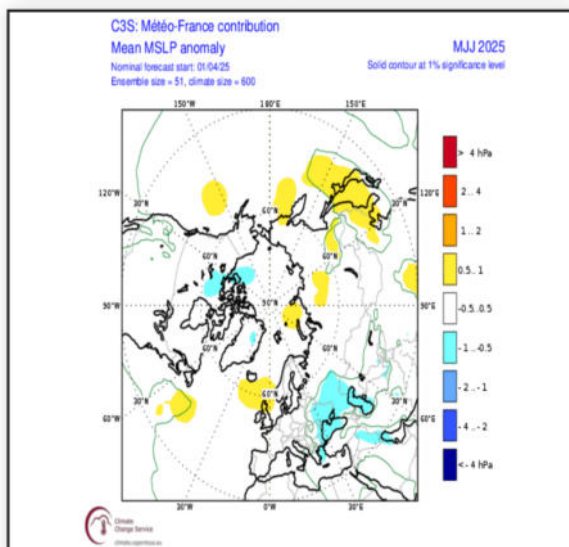
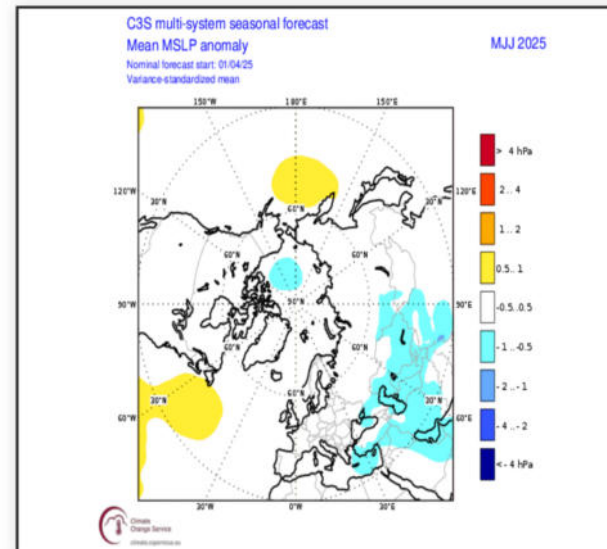
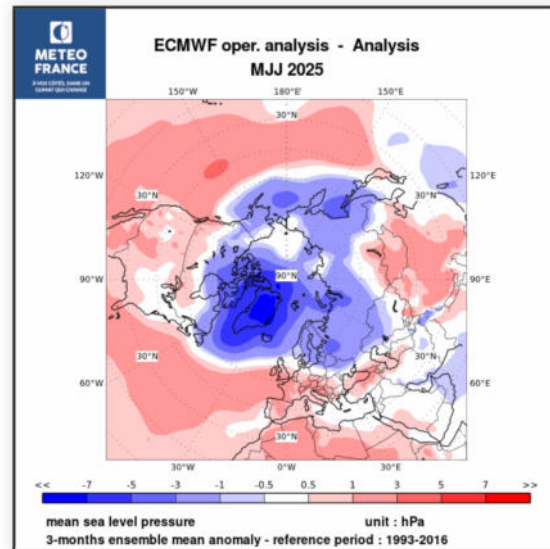


ECMWF analysis and C3S multi-system for 500hPa geopotential height anomalies.



Atmospheric circulation : MSLP

The negative anomaly around polar regions was not foreseen. Over Europe, the observed pattern is poorly anticipated by most models.

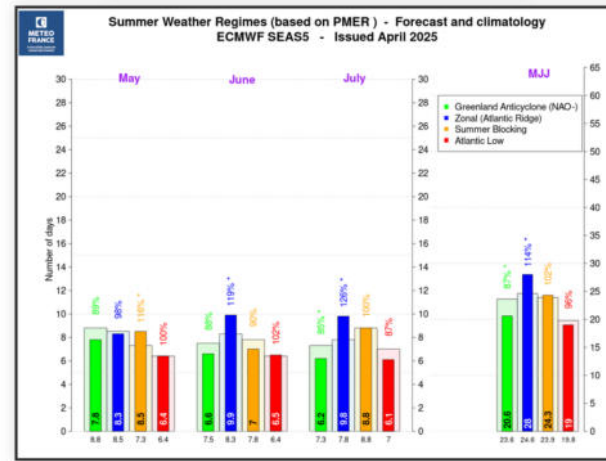
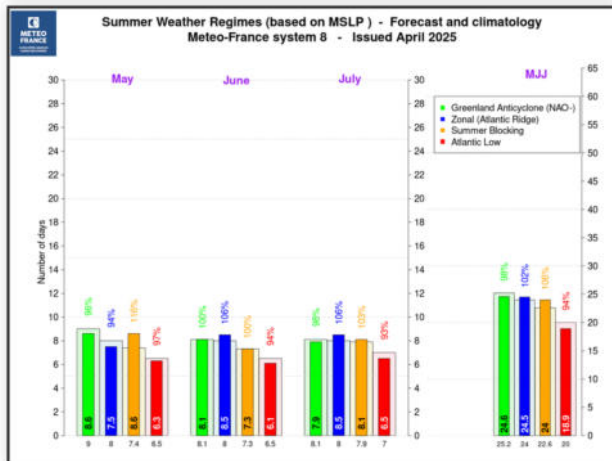
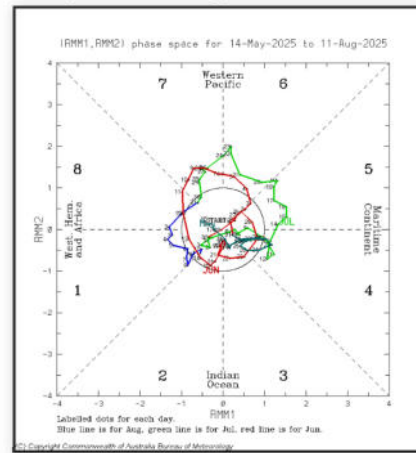
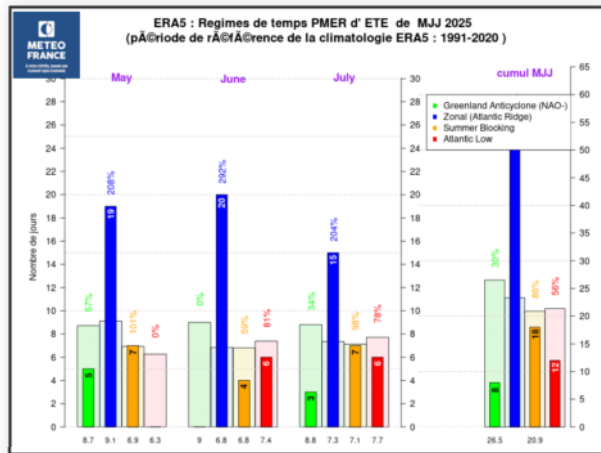


Analysis and multi-system C3S forecast MSLP anomalies (top), MF-S8 and ECMWF-SEAS5 MSLP anomalies (bottom)

Atmospheric circulation : Summer SLP weather regimes

In the analysis, zonal is over-represented while Atlantic low and Greenland anticyclone is under-represented.

This signal wasn't forecasted by MF8, close to his climatology, while SEAS5 was well anticipated this signal.

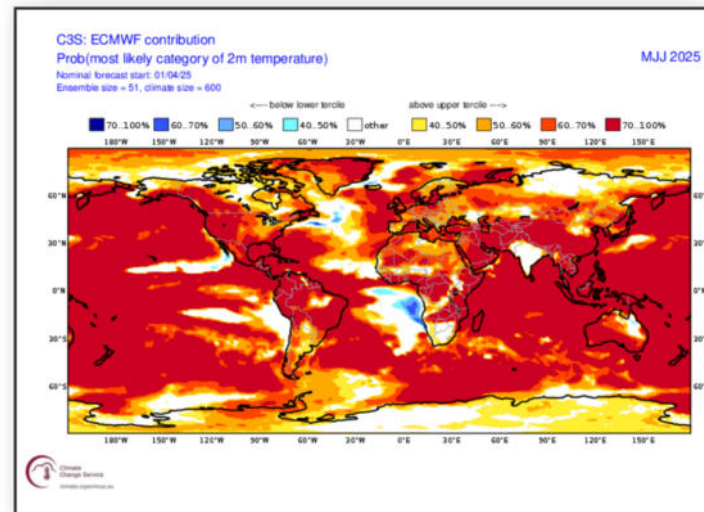
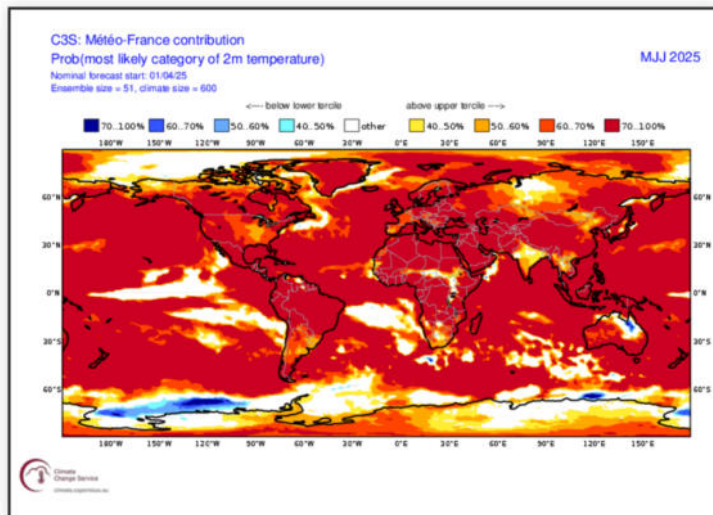
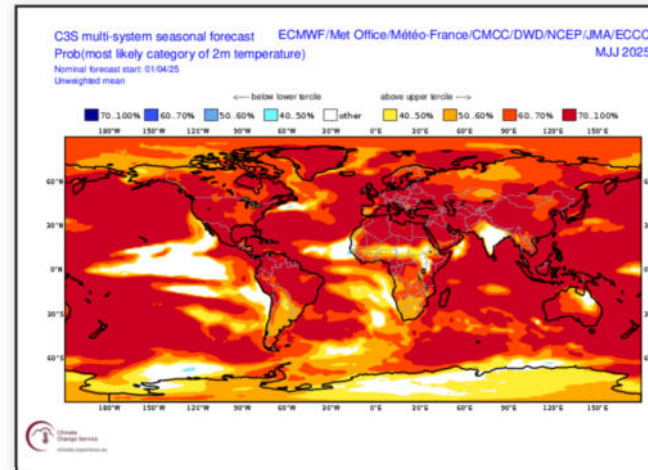
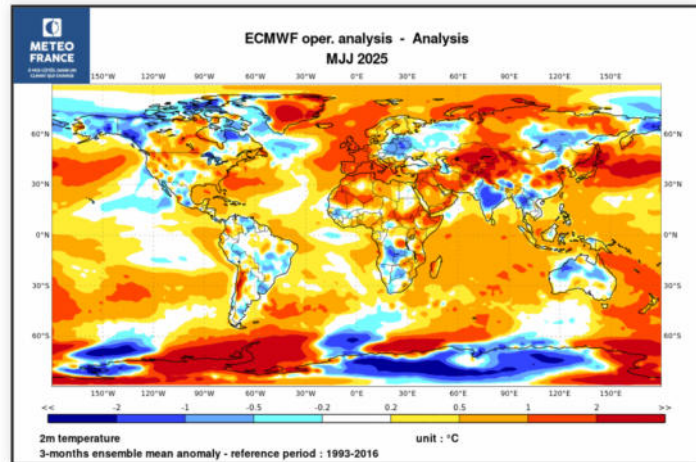


weather regime : ECMWF analysis top left, MF8 and ECMWF forecasts at the bottom. MJO phase top right

Climatic parameters : temperature on the globe

Warm anomalies dominate.

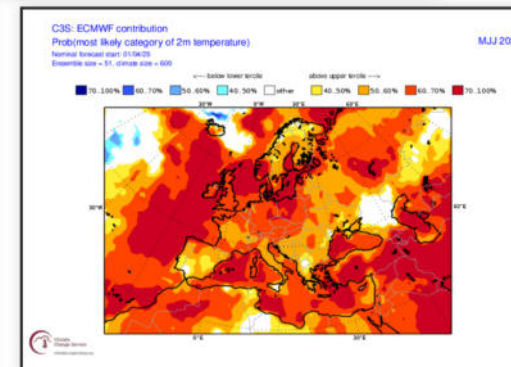
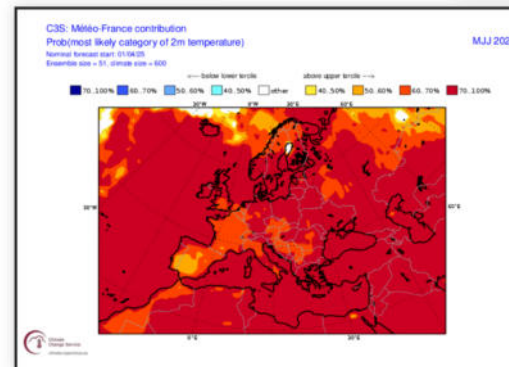
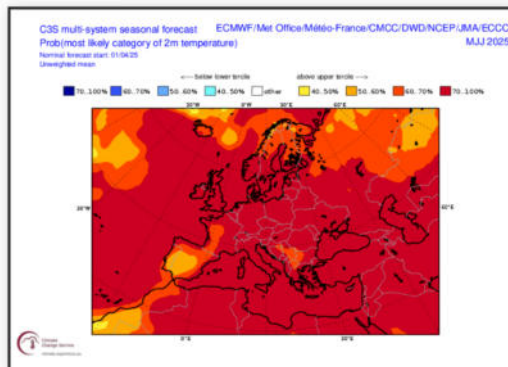
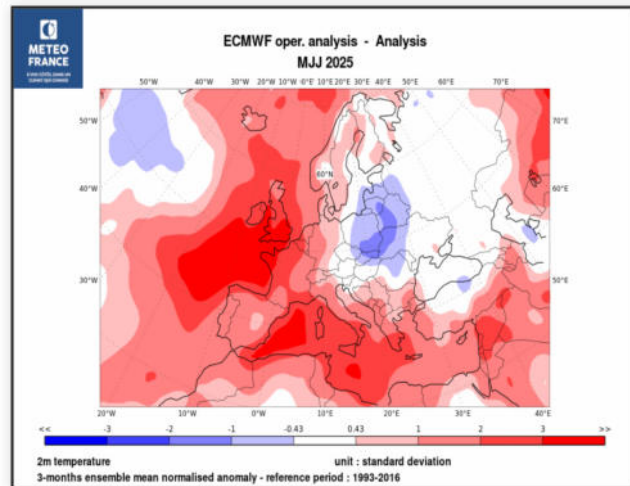
In the tropics, the forecast temperatures are a bit too warm. On the other hand, they are logically poor for Eastern Europe and North America.



legende

Climatic parameters : temperature over Europe

Warm anomalies over maritime areas were well forecast. Over continental Europe, warm anomalies dominate overall and have been anticipated. However, near-normal or colder conditions over the eastern part of Europe and west Russia were not seen by no model.

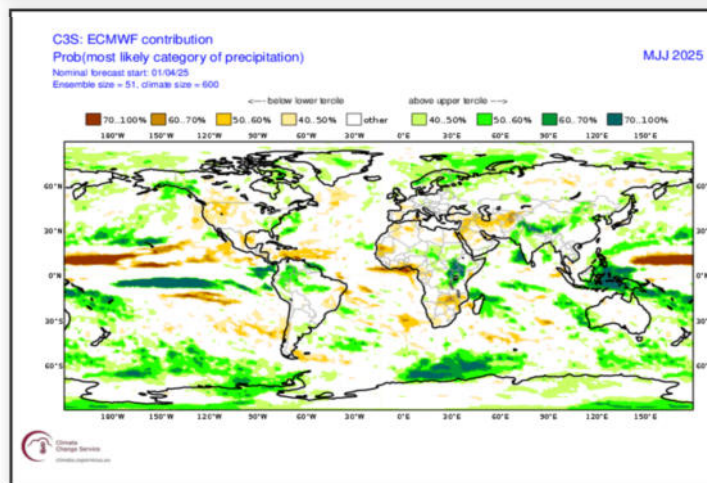
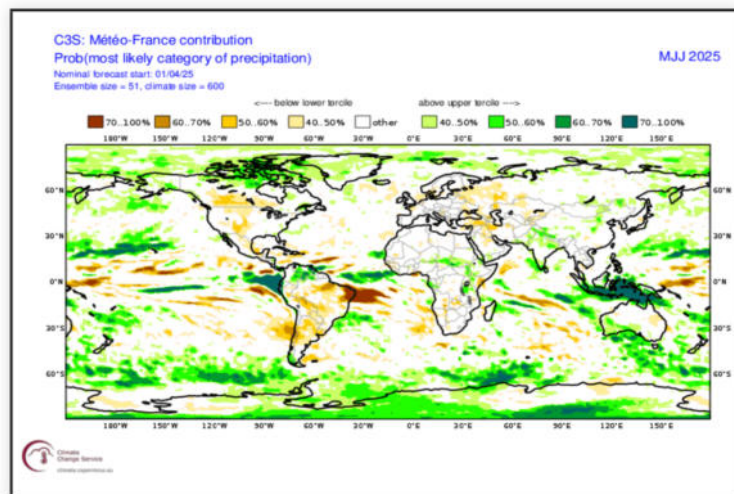
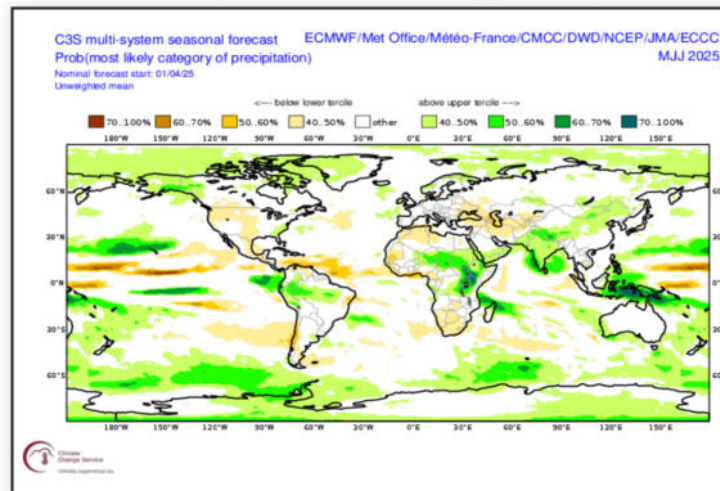
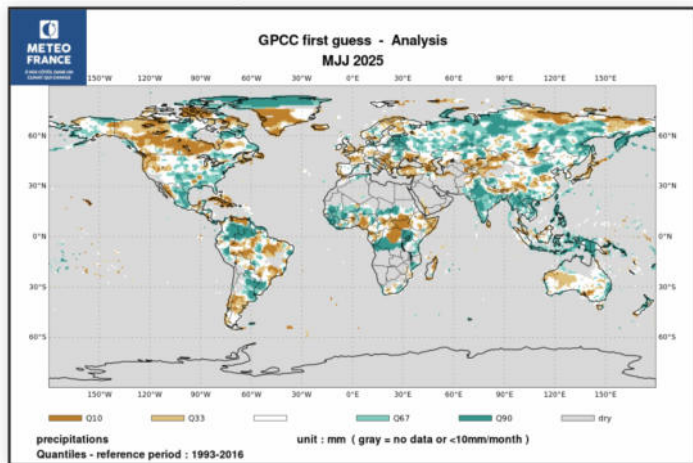


ECMWF analysis top left, synthetic forecast map top right. Forecast for multi-system, MF-S8 and SEAS5 on the bottom line.

Climatic parameters : Precipitations over the globe

In the inter-tropical zones, the wet signal forecast by the models over the Maritime Continent and India is confirmed by analysis.

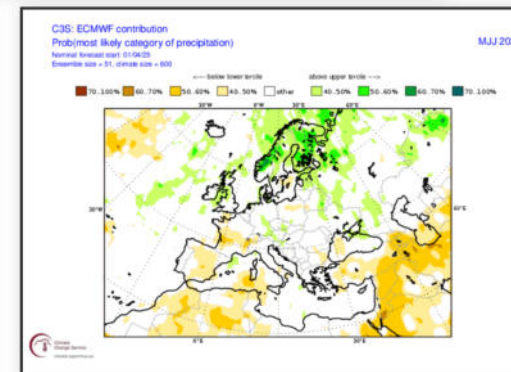
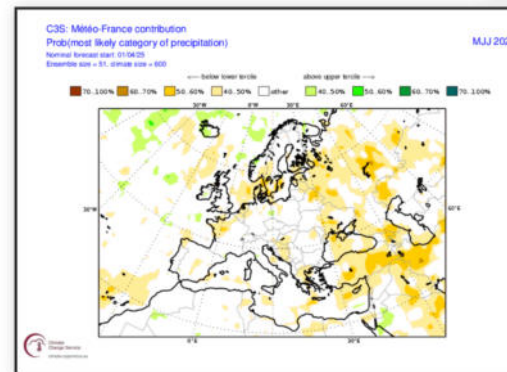
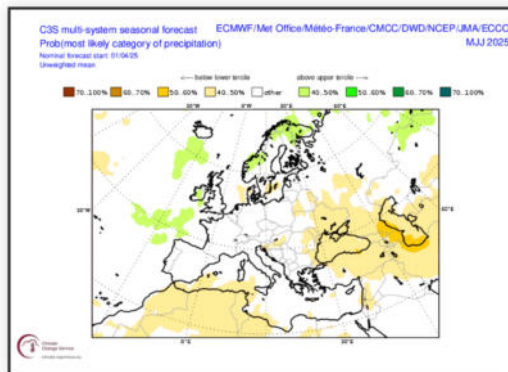
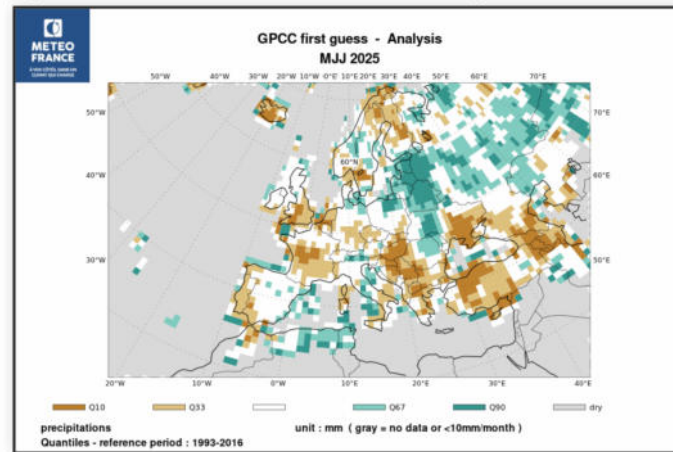
In the Northern Hemisphere, forecasts for North America are not correct. The wet anomaly over Russia is not suggested by the models.



Standardized Precipitation Index analysed by IRI top left, forecast for multi-model top right and MF-S8 and SEAS5 on the bottom line.

Climatic parameters : Precipitations over Europe

The dry signal from the Balkans towards the Caspian Sea and the wet conditions from the Baltic countries to Russia weren't forecast.



Precipitation anomalies analysed by IRI (top left). Synthetic forecast map for precipitation (top right) and forecast for multi-model, MF-S8 and SEAS5 (on the bottom line).

General summary : for the period MJJ 2025

1) Oceans :

The main SST anomalies predicted by the models are validated by analysis.

2) Large scale atmospheric circulation :

VP 200 hPa : Updrafts over the Maritime Continent were well forecast. On the other hand, downdrafts over central Pacific and Africa were not predicted.

SF 200 hPa : The models correctly anticipated the dipole over Pacific Ocean and Africa. However, there is not teleconnections in Northern Hemisphere

Over Europe, the positive circulation anomaly over Great Britain was not forecast.

Z500 :In the Southern Hemisphere, anomalies are correctly forecast.

In the Northern Hemisphere, the negative anomaly from Canada to Greenland was not forecasted. The negative anomaly over eastern Europe was not anticipated either.

3) Climatic parameters over Europe :

Temperatures : The warmer-than-normal conditions forecast are confirmed by analysis over a very large part of Europe, except over the eastern part.

Precipitations : The observed precipitation anomalies weren't forecasted.