MEDCOF-21

RCC-LRF Météo-France report for DJF 2023-2024 – DRAFT

A) Oceanic forecast :

- **ENSO :** El Niño conditions moderate to strong (Index Nino3.4 close to 2)

- **IOD** : positive phase moderate to strong at the beginning with DMI index close to 1.5

- **Equatorial and tropical Atlantic** : strong positive anomaly

B) Drivers :

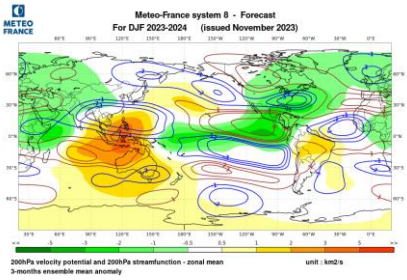
- El Niño : negative phase of NAO is favored at the end of winter with no significant effect on Europe based on composite maps.

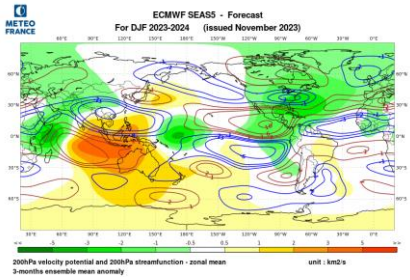
- IOD : Upward motion on the Indian Ocean can influence circulation over Eurasian mid-latitudes by teleconnection processes. In case of a strong positive phase of IOD, it is an NAO+ type circulation which is favored during winter.

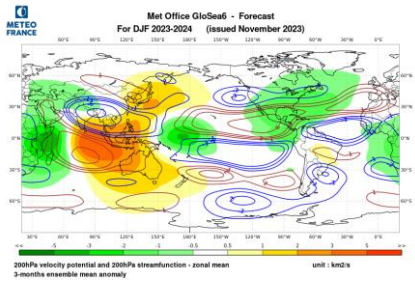
C) Atmospheric circulation :

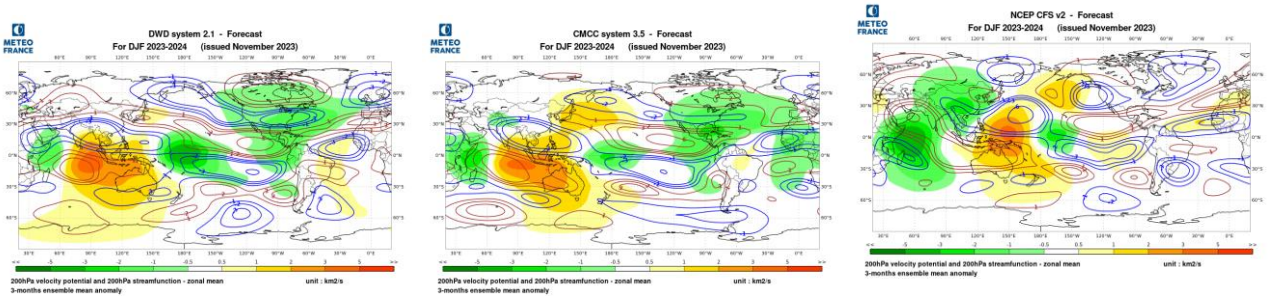
Velocity Potential 200 hPa : The models all agree on the strong anomaly of subsidences over the eastern Indian Ocean (linked to El Nino and IOD+). On the other hand, lift anomalies over the Pacific are more marked with MF8 and DWD than with Met Office and NCEP. Finally, most models predict subsidences over the Amazon and lifts over East Africa.

Streamfunction at 200 hPa : Dipoles over the Indian, Pacific and Atlantic oceans are clearly visible. In the northern hemisphere, teleconnections have been set up, particularly on the Pacific towards North America (less marked with Met Office and NCEP). All models also show teleconnections from the Indian and Atlantic basins (anticyclonic curvature over northern Africa). Over the North Atlantic and Europe most models suggest a cyclonic circulation over north or north-west of Europe (except Met Office and NCEP which favor an anticyclonic anomaly over western Europe).

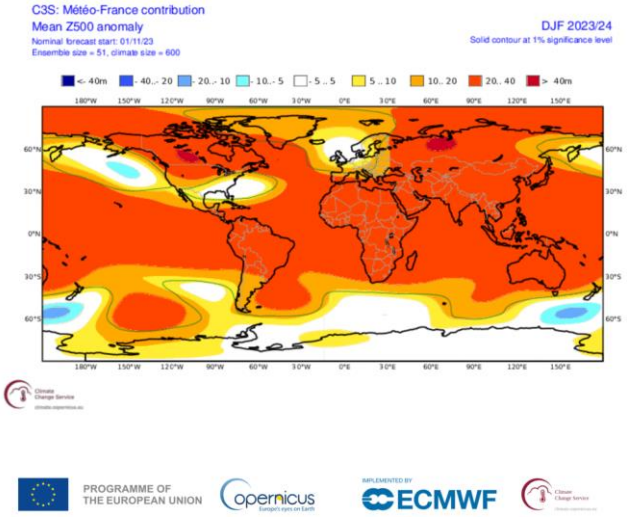




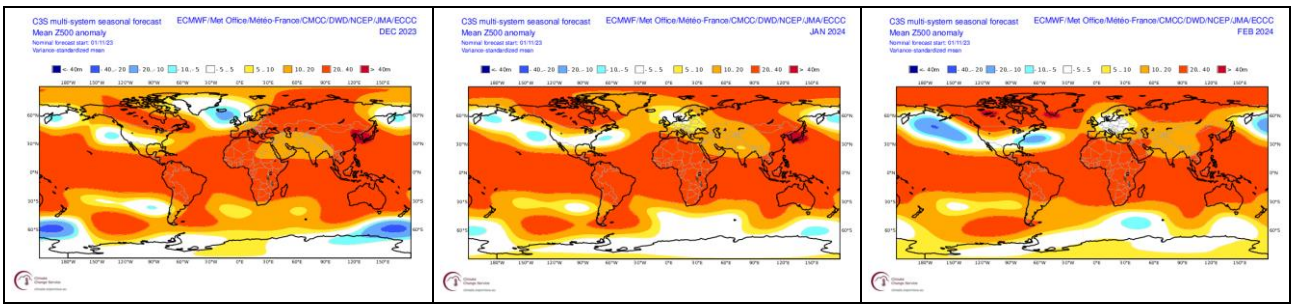




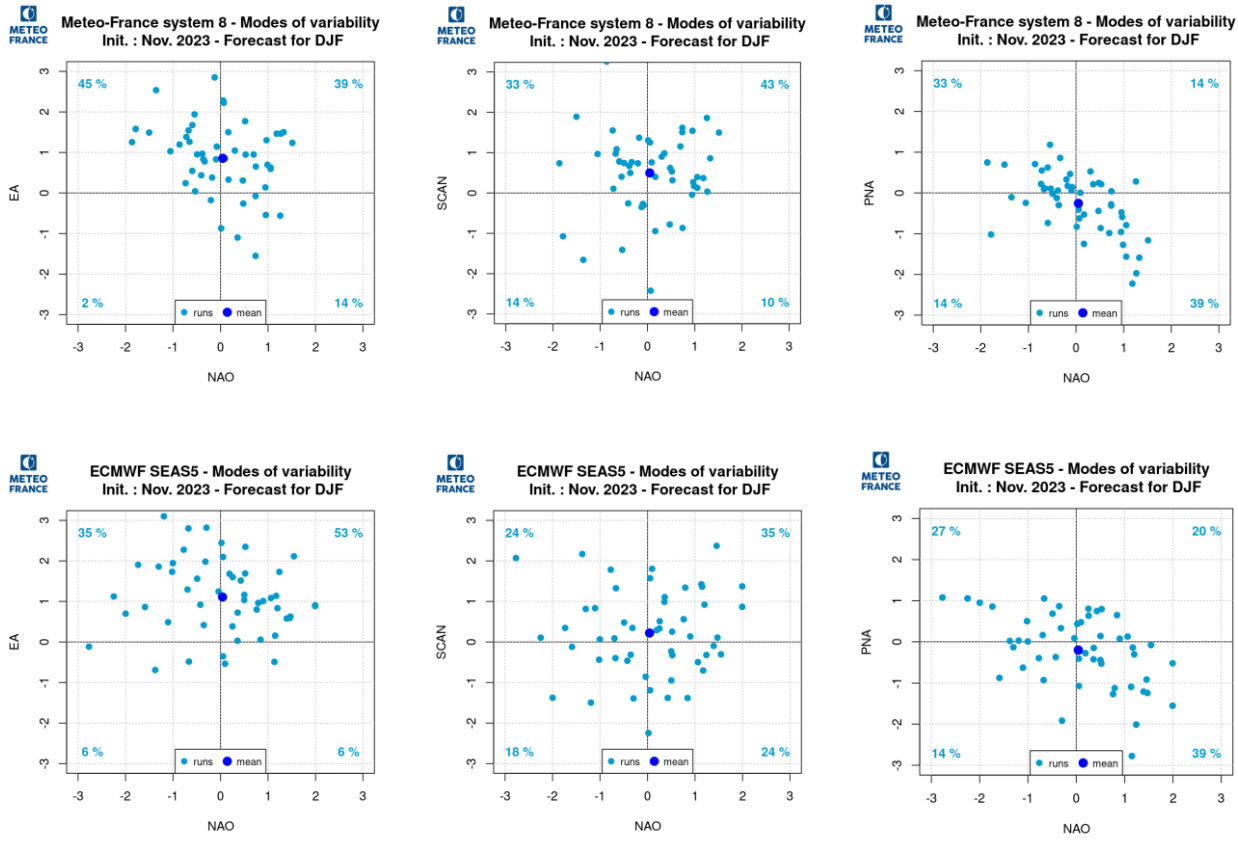
- Z500 : Most models (except NCEP) forecast a positive anomaly from Canada to Greenland and northern Russia, and relative weakness from the North Pacific to the South of the United States and on the north-west of Europe.



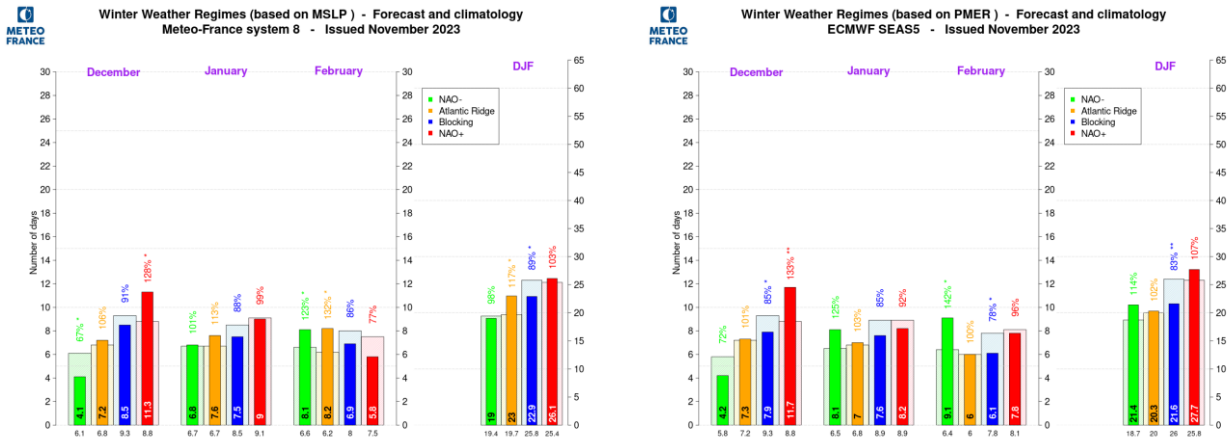
During this quarter, positive PNA pattern is strengthened, NAO becomes negative and a relative weakness of geopotential shifts from the North Sea to Central Europe.



- modes of variability : Negative PNA is most likely. Positive signal for EA. NAO index is close to 0. No clear signal for SCAN.



- weather regimes : The blocking regime is significantly lower than its climatology for both models. For MF8 the Atlantic Ridge regime is significantly above its climatology. We note that with both models the frequency of the NAO+ regime decreases during the quarter while the NAO- regime increases.



Frequency of SLP weather regimes, compared to the model's own climatology, for the next three months and aggregation over the entire quarter, for MF-S8 (left) and SEAS5 (right).

D) Most likely conditions :

A warmer-than-normal scenario is favoured over a large part of Europe and the Mediterranean basin.

A wetter-than-normal scenario is more likely in many countries from Western Europe to the Middle East; a drier-than-normal scenario is favored from the Canaries to Algeria. Elsewhere, no scenario for the trimester is favored.