

Copernicus Climate Change Service



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MOTIVATION

Example: Météo-France seasonal forecast verification bulletin for 2mtemperature AMJ 2022 anomalies



Forecast synthesis map (issued March 2022)

Verification (ECMWF analysis AMJ 2022)

"The warmer-than-normal scenario adopted for the Mediterranean Basin and the western three-quarters of continental Europe is validated by an observed mean temperature well above normal.

Only the conditions in eastern Europe do not correspond to the scenario adopted because of the minimum in Z500 which was not forecast."

 \rightarrow The real-world scenario may diverge from the ensemble mean. Can we refine the analysis of the ensemble forecast?

APPLICATION TO MÉTÉO-FRANCE T2M SEASONAL FORECASTS



T2m AMJ 2022 anomaly maps for 51-member realtime forecast (MF system 8, issued March 2022)

Dissimilarity between the maps T_i and T_i based on spatial correlation: **1 – ACC(i,j)** = $1 - {}^{t}T_{i}T_{j}$ (e.g Nakaegawa and Kanamitsu, 2006)¹

¹Nakaegawa, T. & Kanamitsu, M. Cluster analysis of seasonal forecast skill of the NCEP SFM over the Pacific-North America sector. J. Clim. **19**, 123-138 (2006)

Hierarchical clustering Ward's method



Dendrogram of the 51-member clustering

→ 2 scenarios (= clusters) retained: 15 members and 36 members



1) The majority scenario (Cluster 2) forecasts a warm anomaly all over **Europe**, as in the synthesis map 2) The minority scenario (Cluster 1) exhibits normal to cold conditions over Eastern Europe related to a Z500 minimum

HOW GOOD AND HOW LIKELY IS THE "BEST" SCENARIO?



 \rightarrow In this case, the **minority scenario is closer to reality**. It might have helped adjust the synthesis map in the bulletin.

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 \succ 3 clustering options: T2M, PRECIP or T2M+PRECIP

Application to the C3S multimodel

 \succ Influence of ensemble size on the set of scenarios

Defining a real-time confidence index



PROGRAMME OF THE EUROPEAN UNION



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