





# Recent work at CNRM on windows of opportunity at subseasonal time scales

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Two recent studies in the climate prediction team at CNRM focused on windows of opportunity at the sub-seasonal time scale.

- Flow-dependent predictability over Western Europe
- Model windows of opportunity for enhanced tropical rainfall

### **2m temperature correlation over Europe**





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#### Do the best forecasts coincide?





Scatter plot and PDF of ECMWF week 3 vs CNRM week 3 ACC with ERA5 (320 cases for DJFM 1997/98 – 2016/17).

Red dots mark the subset of significant ACCs (95% confidence level) for both systems (68 cases).



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Initial weather regime frequency in these 68 cases vs 252 other cases





## Week 3 correlation for strongest [NAO] ICs



0.9 0.25 (left) Gridpoint a) C) correlation of week 3 -0.8 0.2 *2m temperature with* ERA5 for the upper -0.15 -0.7 quartile (NAO+) and **CNRM** lower quartile (NAO-) -0.1 0.6 of initial NAO index values among -0.05 -0.5 forecasts initialized in -0.05 these two regimes. -0.4 b) d) (right) Difference in -0.3 -0.1 correlation with the -0.15 entire sample of -0.2 startdates **ECMWF** -0.1 -0.20.25

Ardilouze et al. (2021), WCD





- Performances (assessed by spatial correlation over Europe) of week 3 temperature forecasts are quite concurrent for ECMWF and CNRM S2S systems → common source(s) of subseasonal predictability
- Forecasts initialized in positive NAO phases tend to perform better than for 3 other "classic" weather regimes over the North Atlantic
- For the strongest NAO- and NAO+ initial conditions, skill is significantly improved in most of North West Europe

 $\rightarrow$  Study published in Weather and Climate Dynamics:

Ardilouze C., Specq D., Batté L. and Cassou C. (2021) Flow-dependence of wintertime subseasonal prediction skill over Europe, Weather Clim. Dynam., 2, 1033–1049, https://doi.org/10.5194/wcd-2-1033-2021



# Focus: weekly precipitation > 80<sup>th</sup> percentile MJO phases influence the base rate (observed frequency of the event)



Specq and Batté, in revision for ASL





#### Implementation with ECMWF S2S re-forecasts for NDJFMA



Specq and Batté, in revision for ASL





Simple contingency table approach to identify windows of opportunity related to teleconnections or large-scale variability modes acting as precursors

Increase in hit rate often undermined by larger false alarm rate  $\rightarrow$  Pierce Skill Score to quantify discrimination

 $\rightarrow$  Study in revision for Atm. Sci. Lett.