Improvement of seasonal forecast correction by using weather regimes

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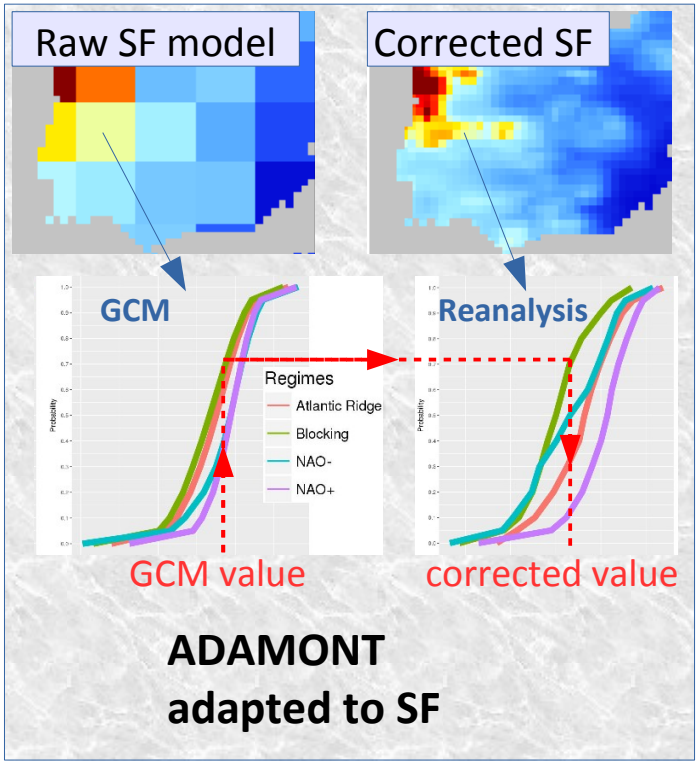
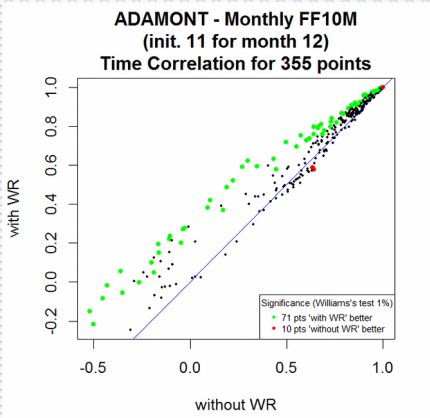
Objective : test a quantile mapping method to downscale and correct raw Seasonal Forecast data.
Originality : QM = f (Weather Regimes)

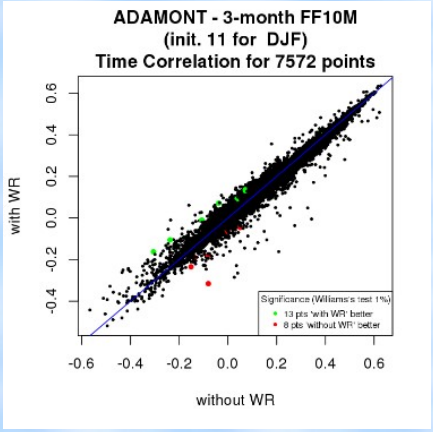


Ideal case (with a « perfect forecast » of WR)

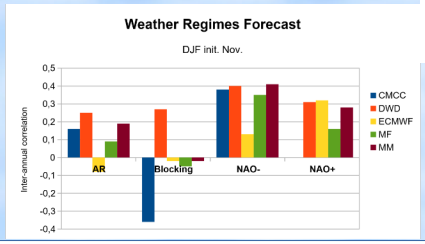


⇒ **Additional skill** (interannual correlation), specifically **over mountainous regions** (or regions with complex orography) **for wind speed and precipitation**

Real conditions (with Seasonal Forecast of WR)



⇒ loss of ADAMONT's benefit due to **poor forecast of Weather Regimes**



Verfaillie, D., M. Déqué, S. Morin, and M. Lafaysse, 2017. **The method ADAMONT** v1.0 for statistical adjustment of climate projections applicable to energy balance land surface models. *Geosci. Model Dev.*, **10**, 4257–4283, https://doi.org/10.5194/gmd-10-4257-2017

Strategies for operationnal use

1) **Use of an "external" forecast of WR**, to select a subset of members (as it is done in Wang, 2017 and Hall, 2017 for winter NAO, based on climate drivers can outperform current dynamical models).

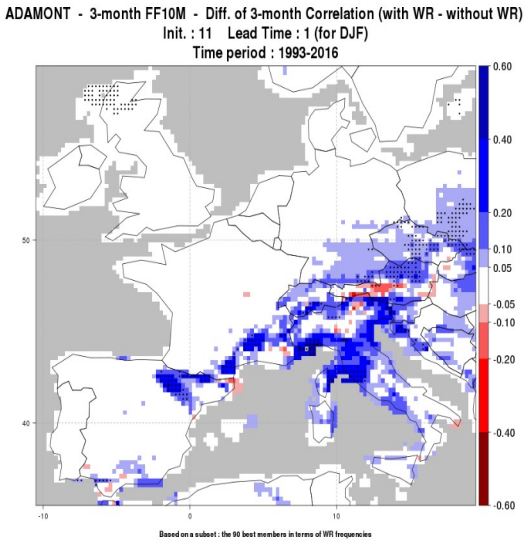


Illustration : **additional skill of ADAMONT** vs a simple QM correction, for **a subset of 90 members among 120** (here for 10m windspeed, interannual correlation) chosen for their good forecast of WR frequencies

2) **Identifying « windows of opportunity »** : the value added from using WR in ADAMONT is limited to situations of good predictability of the large-scale circulation. Users could choose to use a version "with WR" in the case of strong drivers, and a version "without WR" in all other situations

⇒ planned work in a coming C3S project

Full report available on **http://www.secli-firm.eu/project-reports/** :
D2.3: Report on the predictability of weather patterns and regimes of relevance for the case study applications

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