On the seasonality of subseasonal rainfall and temperature skill

Ángel G. Muñoz, Caio A. S. Coelho, Andrew W. Robertson, Simon J. Mason

International Research Institute for Climate and Society (IRI). The Earth Institute at Columbia University.
agmunoz@iri.columbia.edu

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This document summarizes the methods followed to conduct a global predictive skill assessment for uncalibrated rainfall and 2-m temperature forecasts, produced using the ECMWF's IFS model, available through the WWRP/WCRP S2S Prediction Project Database via the International Research Institute for Climate and Society (IRI) Data Library.

Average monthly predictive skill for these two variables was assessed by pooling all available initializations per month as described in the next paragraph, to increase the sample size and robustness of the estimations. The IFS model version used is Cycle 45r1, implemented on 5 June 2018. The reference rainfall and temperature datasets used to conduct the skill assessment were the CPC-Unified and the ERA-Interim 2-m temperature fields, respectively.

After subtracting lead-dependent climatological averages, the skill assessment was conducted for each one of the 6 weeks following each initialization date in the month. These lead-times are named Week-1, Week-2,...., Week-6 in the output available to the public; Week-1 corresponds to days 1-7, and the other weeks are defined similarly. Each target week was assessed independently, and the corresponding maps are representatives of the average skill obtained using the 8 initializations available for each month. For example, Week-1 for the (re)forecasts initialized in January corresponds to the representative predictive skill of the first week following each initialization in all the 20 Januaries available in the reforecast period (2017-1998). The month (January in this example) corresponds always to the initialization month, not the target. Hence, skill assessment for Week-5 and Week-6 will always target the following month, but have the same initialization month as all the other weeks (Week-1 to Week-4).

The skill maps show how good the forecast system is for forecasts initialised in each calendar month. Different skill metrics measure different forecast attributes, but in each case are averaged for all start dates within the calendar month. By examining these metrics over all 12 months of the year one can have an assessment of how subseasonal forecast skill varies seasonally.

The current output is available in the IRI Data Library. Two sets of metrics (see links below for a detailed list), for deterministic and probabilistic forecasts, respectively, have been computed for rainfall, and only deterministic metrics are available at the moment for 2-m temperature. Probabilistic forecasts are based on tercile probabilities computed by simple counting. For

additional details regarding the methodology, please see [here](). For additional information about the skill metrics used, see the [Descriptions of the IRI Climate Forecast Verification Scores]().

Interactive maps in the IRI Data Library can be found in the following links:

Rainfall

- [Deterministic metrics]()
- [Probabilistic metrics]()

2-m Temperature

- [Deterministic metrics]()