Evaluation of downscaled seasonal hindcasts of temperature over France

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Accurate temperature forecasts are crucial for the prediction of electricity demand, on all time scales from one day to several years. We focus here on the seasonal time range. As direct GCMs forecasts of local T2m are not very skilful, especially over mid-latitudes, downscaling large scale fields at upper levels to station points might be an efficient way to improve seasonal forecasts for application models.

In this study, we used the INM/UC web portal for statistical downscaling to downscale DEMETER System 2 T850 seasonal hindcasts (1959-2001) to get local min and max T2m at 26 points over France.

Deterministic and probabilistic scores were computed to evaluate the improvement due to the downscaling method as compared to climatological forecasts and direct T2m forecasts from the models.

From the deterministic point of view, using climatology is better to predict T2m over the north-eastern in-land stations, but the downscaled hindcasts do a better job over coastal regions. Compared to direct T2m model outputs, downscaled predictions are systematically better for all stations and for the 4 seasons, with a particular impact on the Mediterranean region. The results are variable dependent : the improvements are better in spring and summer for max T2m, but in autumn and winter for min T2m. The probabilistic approach reinforces these conclusions, showing that the downscaling process improves the forecasts of local T2m compared to both climatology and direct model outputs, except for winter.

The same tools and analysis are planned for the prediction of precipitations over

French river basins.