High resolution climatology
- towards climate change services

Improvement of ECMWF monthly forecasts of precipitation over France with an analog method

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Optimal operation of hydro-power plants requires accurate forecasts of precipitation which are then integrated into hydrological models to forecast river flows and water volumes in reservoirs. Precipitation is a difficult parameter to forecast, especially at long lead times (monthly and over) one of the reasons being the too coarse resolution of numerical weather prediction systems. In this study, we evaluate ECMWF's monthly forecasts of precipitation over 9 important basins in France. The deterministic approach shows that forecasts are useless over week 1. Using the probabilistic approach allows to get useful information for some events (lower and upper terciles for instance), up to week 3, but the overall scores are quite low, and hardly better than climatological scores.

In a second step, EDF's analog method, currently used in operations for D+7 forecasts, has been adapted to ECWMF's monthly forecasts. It uses Z700 and Z1000 fields over North Atlantic and Europe to get local precipitations. For the nine catchments studied here and for the four weeks, results show an overall improvement of analog precipitation forecasts compared to raw forecasts. Improvement is also identified with respect to climatology in more than half of the catchments. The prediction skill is mostly pronounced for extreme events (low and heavy precipitations).

The analog method thus presents significant performance, suited for operational use. Improvements can also be expected with some optimization of the method (mix of predictors, new similarity criterion. . .)