EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-553-1, 2009
9th EMS / 9th ECAM

9th EMS Annual Meeting
9th European Conference on Applications of Meteorology
High resolution meteorology
- applications and services

Downscaling of seasonal forecasts and possible application to hydro-power production forecasts in France

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Managing the power generation system at the scale of a country is a very complex problem which involves in particular climatic variables at different space and time scales. Air temperature and precipitation are among the most important ones, as they explain respectively an important part of the demand variability and the hydro power production capacity. If direct GCMs forecasts of local variables are not very skilful, specially over mid-latitudes, large scale fields such as geopotential height or mean sea level pressure show some positive skill over the North Atlantic / european region, that can be used to make local predictions of surface variables, using downscaling technics.

In this study, we evaluated the 2m temperature and precipitation hindcasts of the DEMETER and ENSEMBLES systems on a number of hydrological basins in France. We used the University of Cantabria web portal for statistical downscaling, developed in the ENSEMBLES project, to downscale the most predictable large scale fields, and compared direct raw hindcasts with indirect downscaled hindcasts. Both direct and indirect hindcasts are then used in an hydrolocial model to evaluate their respective interest for hydro-power production forecasts.