



## **Predictability in France : atmospheric forcing or land surface initial conditions?**

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A first study of a hydrological forecasting suite has already been done at seasonal time scales over France (Céron and al., 2010) in a context of adaptation for water resources management. The results showed the feasibility of hydrological seasonal forecasts by forcing the hydrometeorological model Safran-Isba-Modcou (SIM) with seasonal atmospheric forecasts from the DEMETER project. Scores were better for hydrological variables than for atmospheric variables for four river catchments for the spring season.

The purpose of the present study is to quantify the sources of predictability of the hydrometeorological system. Two experiences were conducted in order to address this issue. The first experience consisted in testing the impact of the land surface initial conditions. We used realistic land surface initial state produced by the operational SIM model for the specific year and 9 random years of Safran atmospheric analyses (temperature and precipitation) from 1971 to 2001, in a consistent way with the previous study (Céron et al, 2010). The other atmospheric parameters (wind, specific humidity, long wave and short wave radiation and cloudiness) come from the SAFRAN climatology over the same period. The second experience was designed to evaluate the impact of the atmospheric forcing with 9 random years, chosen for the land surface initial state. The atmospheric forcing (temperature and precipitation) comes from the Safran analysis system for the corresponding year.

Some results of this study will be presented on soil wetness index (SWI) forecasts and river flows forecasts for all stations in France. We will compare deterministic and probabilistic scores of the two experiences with those of the hydrological forecasting suite built with the seasonal forecasts from the DEMETER project. Perspectives for the downscaling of seasonal forecasts will be discussed in a last part.

Céron J-P, Tanguy G, Franchistéguy L, Martin E, Regimbeau F and Vidal J-P, 2010. Hydrological seasonal forecast over France : feasibility and prospects. Atmospheric Science Letters, DOI: 10.1002/asl