Geophysical Research Abstracts, Vol. 8, 01962, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01962

Ensemble streamflow forecast over the entire France

F. Rousset Regimbeau, F. Habets, E. Martin
Meteo-France, Toulouse, France (fabienne.rousset@meteo.fr)

Since the year 2003, the French National Weather Service (Meteo-France) uses an operationnal real-time system that provides a daily monitoring of the water budget, streamflows and aquifer levels over the entire France : the SAFRAN-ISBA-MODCOU (SIM) system. This coupled model is composed of the ISBA surface scheme and of the distributed hydrological model MODCOU. It was first used in a forced mode, with the atmospheric forcing derived from observations through the use of the SAFRAN analysis system. It has been validated over 3 large french basins : the Rhone, the Adour-Garonne and the Seine basins. It was shown that the system satisfactorily reproduces the water and energy budgets, as well as the observed streamflows, aquifer levels and snow-packs. In particular, the main long-duration floods of the Seine are well simulated.

The SIM system is now also used for streamflow forecasting. As a first step, experiments of determinist forecasts have been performed over the Rhone basin, using 2- and 3-day quantitive precipitation forecast. The encouraging results showed the potential of SIM for flood forecasting. As a next step, an ensemble streamflow prediction system over the entire France has been built. The meteorological 10-day forecasts from the Ensemble Prediction System of the ECMWF are used to force the system. The initial conditions of soil moisture, aquifer levels, etc. are given by the operationnal run of SIM. Since early 2005 this system produces ensemble forecasts every day in a real-time mode and gives 10-day forecasts of the streamflow of the main french rivers with a measure of the associated confidence. This kind of information is greatly valuable for flood warning and water management.

Moreover, we chose the september 2004-july 2005 period in order to assess the ability of the system to forecast streamflows. First, statistics have been computed with the meteorological ensemble precipitation forecast from ECMWF. In particular, this led to an improvement in the downscaling method from ECMWF 1.5 degres data to the

ISBA 8 km grid. Then, the ensemble streamflow forecasts for this period have been calculated and analysed using statistical methods usually used in ensemble forecasting.