



HAL
open science

Impact of streamflow data assimilation on the quality of ensemble short-term hydrological forecasts

Annie Randrianasolo, Guillaume Thirel, Maria-Helena Ramos, E. Martin,
Vazken Andréassian

► **To cite this version:**

Annie Randrianasolo, Guillaume Thirel, Maria-Helena Ramos, E. Martin, Vazken Andréassian. Impact of streamflow data assimilation on the quality of ensemble short-term hydrological forecasts. 7th EGU General Assembly, May 2010, Vienna, Austria. 1 p. hal-00583775

HAL Id: hal-00583775

<https://hal.science/hal-00583775>

Submitted on 6 Apr 2011

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Impact of streamflow data assimilation on the quality of ensemble short-term hydrological forecasts

Annie Randrianasolo (1), Guillaume Thirel (2,3), Maria-Helena Ramos (1), Eric Martin (2), and Vazken Andréassian (1)

(1) Cemagref, Hydrology Research Group, HBAN, Antony, France, (2) CNRM-GAME, Météo-France, CNRS, Toulouse, France, (3) JRC, DG Joint Research Centre, European Commission, IES, Ispra, Italy

In this study a comparative analysis is conducted to assess the impact of discharge data assimilation on the quality of streamflow forecasts issued by two different modelling conceptualizations of catchment response, both driven by the same weather ensemble prediction system. Weather forecasts come from the ensemble prediction system PEARP of Météo-France, which is based on the global spectral ARPEGE model zoomed over France. The model runs 11 perturbed members for a forecast range of 60 hours. The two hydrological modelling approaches used are: 1) the coupled physically-based hydro-meteorological model SAFRAN-ISBA-MODCOU developed at Météo-France and based on a fully distributed catchment model, with a data assimilation procedure that uses streamflow measurements to assess the best initial state of soil water content, and 2) the lumped soil-moisture-accounting type rainfall-runoff model GRP developed at Cemagref, with the assimilation of the last observed discharge to update the state of the routing store. The study is conducted on 86 catchments in France and over a 17-month period (March 2005-July 2006). Forecasts are compared to observed discharges and skill scores are computed for two lead times (24h and 48h). To investigate the impact of data assimilation, both models are run with and without their own data assimilation procedure. The results suggest good performance of both hydrological models forced by the PEARP ensemble predictions and demonstrate the benefit of streamflow data assimilation for ensemble short-term forecasting.