Hydrological ensemble predictions for reservoir inflow management

Ioanna Zalachori (1), Maria-Helena Ramos (1), Rémy Garçon (2), and Joel Gailhard (2)

(1) IRSTEA/Cemagref, Hydrology Group, UR HBAN, Antony, France, (2) EDF-DTG, Electricité de France, Division Technique Générale, Grenoble, France

Hydrologic forecasting is a topic of special importance for a variety of users with different purposes. It concerns operational hydrologists interested in forecasting hazardous events (eg., floods and droughts) for early warning and prevention, as well as planners and managers searching to optimize the management of water resources systems at different space-time scales. The general aim of this study is to investigate the benefits of using hydrological ensemble predictions for reservoir inflow management. Ensemble weather forecasts are used as input to a hydrologic forecasting model and daily ensemble streamflow forecasts are generated up to a lead time of 7 days. Forecasts are then integrated into a heuristic decision model for reservoir management procedures. Performance is evaluated in terms of potential gain in energy production. The sensitivity of the results to various reservoir characteristics and future streamflow scenarios is assessed. A set of 11 catchments in France is used to illustrate the added value of ensemble streamflow forecasts for reservoir management.