Geophysical Research Abstracts
Vol. 20, EGU2018-14705, 2018
EGU General Assembly 2018

Towards better integration of seasonal hydrological forecasts into operational decisions in the UK water industry

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Improved skill of seasonal predictions for the North Atlantic circulation and Northern Europe are motivating an increasing effort towards developing seasonal hydrological forecasting systems, such as the Hydrological Outlook UK (HOUK). Water managers are expected to be among the main beneficiaries of such forecasting systems, however the extent and process in which hydrological forecast products are used is still an open question.
From a recent survey of UK water companies and the analysis of their water management and drought plans, it appears that decision-making frameworks heavily rely on past observations and experiences of drought events more than hydrological and/or meteorological forecasts. When water resource simulation models are used, it is primarily to assess the effects of different operational strategies and support decision-making for medium term planning (months ahead). This is typically achieved via what-if exercises where the water system is simulated against a set of scenarios, often based on the worst hydrological events on historical records, instead of real-time forecasts. The benefits of current seasonal forecasting capabilities to improve decision-making in water management has yet to be fully assessed.
In this study, we investigate the potential for changing current decision-frameworks by integrating seasonal hydrological forecasts into model-based operational decisions, using a pumped-storage reservoir system in the South-West of England as a pilot application.