



Hydrological Outlook UK: seasonal river flow forecasts using rainfall forecasts

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Hydrological predictions in the UK are strongly influenced by both rainfall and antecedent soil conditions. The Flood Forecasting Centre (FFC) and Scottish Flood Forecasting Service (SFFS) operationally issue flood alerts and warnings, however these typically apply only days to weeks ahead. The Hydrological Outlook UK (HOUK) is the first operational seasonal forecasting system for the UK that brings together information on current and future weather conditions, soil moisture, river flows and groundwater levels, and uses a number of modelling approaches to explore hydrological conditions over the next 1 to 3 months. Here we focus on the method that provides a national hydrological forecast using an ensemble of rainfall forecasts from the UK Met Office's seasonal prediction system (GloSea5).

The seasonal rainfall forecasts from GloSea5 currently used in the operational HOUK system are UK resolution. A desire to use something more spatially variable has led to the trial of an analogue method that uses historic rainfall and potential evaporation data as input to the hydrological model to generate an ensemble of winter river flow forecasts. The method relies on the fact that the forecasts of winter UK precipitation are strongly influenced by large-scale circulation patterns, which are predictable. An ensemble of historical daily rainfall analogues are selected based on the GloSea5 North Atlantic Oscillation (NAO) predictions for winter, and these can be used as input to the national scale hydrological model. The method has been trialled for two 3-month periods in winter 2018/19 (DJF and JFM).

Here, an example of the HOUK products which are currently available on the Hydrological Outlook UK website (www.hydoutuk.net) will be presented together with a comparison of forecasts from the existing UK scale GloSea5 rainfall forecasts and the new NAO analogue time series method.