



How do I know if my forecasts are better? Using benchmarks in Hydrological Ensemble Predictions

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Hydrological Ensemble Prediction Systems (HEPS) are a new and exciting method with which to forecast floods, droughts and other hydrological related phenomena in the short, medium and long range future. They are currently transforming the hydrological forecasting environment. As new Hydrological Ensemble Prediction Systems come online in ever increasing numbers, it is now urgent to provide adequate guidance to researchers and operational forecasters on how to employ benchmarks in the assessment of their forecast system performance. In this study, several methods to derive benchmarks are tested using the operational set-up of the European Flood Awareness System (EFAS). The benchmarks evaluated span a range of meteorological-dominated and traditional hydrological approaches. The use of different benchmarks for different hydrological regimes (rising limb, falling limb, 20th and 80th flow percentile) and for different forecast lead times (short range: less than 3 days, medium range :between 3 and 30 days) is recommended. For the European Flood Awareness System the optimal benchmark is found to be meteorological persistency which uses the latest meteorological observation to drive the hydrological model. This study provides much-needed guidance on benchmark selection in hydrological ensemble modelling.