



Drought variability in six catchments in the UK

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Drought is fundamentally related to consistent low precipitation levels. Changes in global and regional drought patterns are suggested by numerous recent climate change studies. However, most of the climate change adaptation measures are at a catchment scale, and the development of a framework for studying persistence in precipitation is still at an early stage.

Two stochastic approaches for modelling drought severity index (DSI) are proposed to investigate possible changes in droughts in six catchments in the UK. They are the autoregressive integrated moving average (ARIMA) and the generalised linear model (GLM) approach. Results of ARIMA modelling show that mean sea level pressure and possibly the North Atlantic Oscillation (NAO) index are important climate variables for short term drought forecasts, whereas relative humidity is not a significant climate variable despite its high correlation with the DSI series.

By simulating rainfall series, the generalised linear model (GLM) approach can provide the probability density function of the DSI. GLM simulations indicate that the changes in the 10th and 50th quantiles of drought events are more noticeable than in the 90th extreme droughts. The possibility of extending the GLM approach to support risk-based water management is also discussed.