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Drought management decisions and information requirements

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Droughts affect the entire water cycle producing a wide range of negative environmental, economic and social impacts to such an extent that they are considered to be the most damaging and costliest of natural hazards. The implementation of drought management plans can contribute to mitigate these negative effects by defining mitigation measures. These plans often include early detection and monitoring systems. However, drought is a complex phenomenon to monitor due to the prolonged duration of events, the difficulty to determine the onset and cessation, the spatial extent affected and the wide range of impacts. Generally drought plans rely on indicators or information systems that combine different kinds of data to produce the required information to support operational management decisions. Therefore, the availability and reliability of data sources to fulfil the information needs of the decision process is crucial for drought management.

This research explores the role of data and its uncertainty within operational drought management decision processes. Different decision processes at basin level will be examined to identify their key characteristics, and in particular, the information required to support the decisions and the impact of uncertainty in triggering the implementation of adequate measures. A general framework within which drought management decision processes can be evaluated will be proposed. This will be tested for the decision process followed by the Ebro river basin authority to trigger drought mitigation measures. This decision process relies on a drought indicator based on monthly precipitation, three-month flow data and reservoir level data from measurement stations to detect drought, quantify its intensity and trigger the corresponding mitigation measures according to threshold levels defined for the basin.