



An observation-modelling framework to distinguish between water scarcity and drought

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Drought and water scarcity are keywords for river basin managers in water-stressed regions like Africa, Asia and the Mediterranean Basin. Unfortunately, these terms are often misused. They refer to quite different phenomena. 'Drought' is a natural hazard, which is caused by climatic processes and their intrinsic variability, and cannot be prevented by short-term, local water management. 'Water scarcity' refers to the long-term unsustainable use of water resources and is a process that water managers can influence.

The interrelationships between drought and water scarcity, however, are complex. In regions with low water availability and high human activity, water scarcity situations are common and can be exacerbated by drought events. The worst situation is a multi-year drought in a (semi) arid region with high demand for water. In monitoring the hydrological system for water management purposes, it is difficult (but essential) to determine which part of the signal is caused by water scarcity (human induced) and which part by drought (natural). So the urgent question for many water managers is: how to distinguish between water scarcity and drought?

In this paper, we use a case study in the Upper-Guadiana catchment in Spain to demonstrate the use of an observation-modelling framework for distinguishing between water scarcity and drought. We will discuss the more generic aspects of such a framework, which is in principle applicable worldwide. Observation-modelling frameworks should help water managers in water-stressed regions like the Mediterranean to combat water scarcity, and to better adapt to drought by decreasing their vulnerability.