

# Distinguishing drought and water scarcity

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Water resources can become strained by both natural factors such as drought and by human factors such as unsustainable use. Water resource managers can develop practices to reduce overuse of water resources, but they cannot prevent droughts, so distinguishing the causes of water stress can be useful. However, since the two factors often occur at the same time, separating them can be difficult.

Van Loon and Van Lanen propose an observation-modeling framework for distinguishing natural and human effects on the hydrological system. They define "drought" as a temporary period of lower than normal water levels or streamflow caused by natural weather variability, and "water scarcity" as the unsustainable overexploitation of water resources by humans, in which water demand is higher than availability.

Using models, they simulated the natural system without [human influence](#), and then compared the results with observations to separate out the human-induced effects on water resources. They identify anomalies (deviations below some threshold) in both the simulated natural system with no human influence and the observational data, in which both drought and [water scarcity](#) manifest themselves. They demonstrate the framework in a test case in the Upper-Guadiana catchment in Spain, and show that in this region for the period from 1980 to 2000, the effects of human intervention on [groundwater supplies](#) were four times larger than the effects of natural drought. The framework could be applied to other regions to help water resource managers make better decisions for sustainable water use.

**More information:** Making the distinction between water scarcity and drought using an observation-modeling framework, *Water Resources Research*, [doi:10.1002/wrcr.20147](https://doi.org/10.1002/wrcr.20147), 2013 [onlinelibrary.wiley.com/doi/10.1002/wrcr.20147/abstract](https://onlinelibrary.wiley.com/doi/10.1002/wrcr.20147/abstract)

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