



Projected impacts of future climate scenarios on reservoir operability in a mountainous catchment in South Spain

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Reservoirs play a key role in Mediterranean catchments to provide both regulation and storage services for water resource management. The recent decades exhibit in these regions a highly variable hydrological regimen. Spain is suffering a strong drought period in which, however, extreme precipitation events have caused flooding in several catchments, especially in the South.

This work presents the projected impacts of future climate scenarios from AR5-IPCC on the fluvial regime in a mountain catchment in southern Spain, and the consequences for the operability of reservoirs in terms of satisfying the current water demands and environmental restrictions. For this, a global hydrological model E-HYPE has been used to project climate scenarios into river inflow to the reservoir, and the results have been downscaled by means of a local hydrological model, WiMMed. The annual water balance performed on the reservoir taking into account the current water demands (urban supply, irrigation, hydropower, and environmental flows) shows the occurrence of increasing deficit states in several years in the 2100 horizon, and a trend towards multi-year deficit. This highlights the potential need for adaptation in the water planning on an annual level, being the irrigation demand, generally, the most impacted, and for the optimization of the operational rules in the reservoir.