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# Influence of the management strategy model on estimating water system performance under climate change

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The performance of water systems used worldwide for the management of water resources is expected to be influenced by future changes in regional climates and water uses. Anticipating possible performance changes of a given system requires a modeling chain simulating its management. Operational management is usually not trivial especially when several conflicting objectives have to be accounted for. Management models are therefore often a crude representation of the real system and they only approximate its performance. Estimated performance changes are expected to depend on the management model used, but this is often not assessed.
This communication analyzes the influence of the management strategy representation on the performance of an Alpine reservoir (Serre-Ponçon, South-East of France) for which irrigation supply, hydropower generation and recreational activities are the main objectives. We consider three ways to construct the strategy named as clear-, short- and far-sighted management. They are based on different forecastability degrees of seasonal inflows into the reservoir. The strategies are optimized using a Dynamic Programming algorithm (deterministic for clear-sighted and implicit stochastic for short- and far-sighted). System performance is estimated for an ensemble of future hydro-meteorological projections obtained in the RIWER2030 research project (http://www.lthe.fr/RIWER2030/) from a suite of climate experiments from the EU – ENSEMBLES research project.
Our results show that changes in system performance is much more influenced by changes in hydro-meteorological variables than by the choice of strategy modeling. They also show that a simple strategy representation (i.e. clear-sighted management) leads to similar estimates of performance modifications than those obtained with a representation supposedly closer to real world (i.e. the far-sighted management). The Short-Sighted management approach lead to significantly different results, especially when inter-annual inflow variability is high.
Key words: Climate change, water resource, impact, management strategy modelling