



The importance of realism in reservoir operation optimisation

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In previous work, we find that one of the most important barriers to uptake of reservoir operation optimisation methods in practice is the focus on sophisticated optimisation techniques at the expense of realism in problem formulation. Water resource management problems may be simplified to improve optimisation or even just to aid method explanation, however this does not foster faith about the applicability of its solution in real-world. We aim to make the first step towards developing a methodology to identify the trade-off between estimated performance within the optimisation model and actual performance when the 'optimal' solutions are implemented in practice. We start by robustly optimising reservoir operation policies over a wide range of inflow scenarios and confirming whether this optimal performance estimate is robust under a wider range of input forcing and model structure uncertainties. Model structure uncertainties are addressed, for example, through increased temporal resolution and inclusion of more sophisticated physical representations such as water head, losses and maintenance. Demand uncertainty will be considered in a similar manner to inflow uncertainty through use of an ensemble of synthetic demand time series. A longer-term goal and extension of this study is to investigate how to incorporate such wider uncertainties directly into the optimisation process itself.