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Comment on gmd-2022-108

Anonymous Referee #1

Referee comment on "Implementation and sensitivity analysis of the Dam-Reservoir OPeration model (DROP v1.0) over Spain" by Malak Sadki et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-108-RC1>, 2022

This manuscript is overall well written and easy to follow. The topic fits GMD very well. The authors nevertheless are challenged to better bring out its novelty or significance beyond applying an existing reservoir scheme over Spain. The objective of this study was two folds. First, it "proposes" a global and parameterized reservoir model. Secondly, it performs sensitivity analysis on the model parameters. Specific comments on the two aims are the following.

- The first aim of the study

Their statement is factual as the model simply converts deterministic values presented in Hanasaki et al. (2006) to parameters. However, even that is not the first attempt as it has been attempted by Shin et al. (2019). For example, in Equation (5), at $M = 0.5$, this Equation becomes Hanasaki. Similar case for Equation (6). Therefore, in general, this is an existing scheme. The naming of a scheme developed by others as new is also wrong from my point of view.

- The second aim of the study

Concerning the sensitivity, the identified most sensitive parameters are ones anyone could generalize through educated guesses. $C_{\text{threshold}}$ is the parameter for the lower bound of the Hanasaki schemes, the storage capacity to mean total annual inflow ratio. Equation (6) represents the final release where 'c' is the determinant factor. Below the threshold, the Equation is a one-parameter function, and the threshold has no influence. Above the threshold, it is a three-parameter and uses the threshold value directly. This is also the case for the M parameter (Equation 5). Further, the sensitivity analysis is performed on

the flow; both M and $C_{\text{threshold}}$ play a major role in release estimation. So, one can easily reach the same conclusion without performing the sensitivity analysis.

Since the novelty on the modeling or parameterization side is somehow limited, perhaps the authors can provide more analysis and discussions on the similarity and difference between the reservoir/river dynamics in Spain and other regions, hence producing improved scientific understanding.