< REPLY TO REVIEWER #1 >

- **Title: Evaluating robustness of dynamic reservoir management under diverse climatic uncertainties: Application to the Boryeong Reservoir in South Korea**
- **Authors: Kuk-Hyun Ahn and Young-Il Moon**

The authors sincerely appreciate the reviewer for his/her attentive and constructive comments. We have read the comments carefully and have tried to address them in the following text. An updated version of the manuscript incorporating the reviewer's suggestions will be promptly submitted if our paper makes it through to the next round.

The reviewer's main comment (point #1) is that the proposed reservoir operation is limited to multi-annual regulation. While we agree, the effects of initial- and ending-storages are to some extent alleviated by the design of the dynamic operation curve. To be specific, resampled two-year sequences of inflow, drawn from a set of yearly inflow sequences, are utilized to consider a multi-year drought event in this study. Moreover, the effects of initial- and ending-storages are also mitigated by issuing the climate information in September. The study basin generally receives two-thirds of annual precipitation (approximately 850 mm) in summer (June to August); accordingly one can reasonably expect that relatively sufficient reservoir inflow can be obtained as initial storage conditions.

Regarding the second question, we do agree that additional analysis is necessary to explicitly present the hydrological conditions of the source reservoir (i.e., Beakje Weir). Additional information will be provided in the revised manuscript.

For the third question, we acknowledge that the term "streamflow projections" is more acceptable than "streamflow forecasts" in many cases. Our manuscript will be modified to provide a clearer definition based on the reviewer's comment.

We also accept the fourth suggestion regarding the effectiveness of the hydrological model. While we described a brief evaluation to demonstrate the capabilities of the hydrological model relying on the calibration/validation framework (see Figure 5), an additional analysis will be conducted to present the effectiveness of the hydrological model by exploring changes in the hydrologic response resulting from synthetic climate forcing.

Lastly, we agree that there is a cascade of modelling uncertainties as the framework involves climate projections, weather generator, and hydrological modelling. Recently, the authors

proposed a statistical framework in which modelling uncertainties are accounted for and propagated (Ahn and Kim, 2019). We also believe that uncertainty quantifications will be a promising avenue in this research framework using the statistical uncertainty quantification method we previously proposed. However, this study focuses on a module framework to assess the robustness of reservoir system in the future. For the time being, we will reserve the research question raised by the reviewer for future work and address the necessity of uncertainty quantifications in the revised manuscript.

Two minor comments:

1) A flowchart will be presented to make the proposed framework more accessible in the revised manuscript.
2) The manuscript will be modified to provide a clearer definition between climate forecasts and climate projections.

((Reference))

Ahn, K.-H., Kim, Y.-O., 2019. Incorporating climate model similarities and hydrologic error models to quantify climate change impacts on future riverine flood risk. J. Hydrol. 570, 118–131.