

Interactive comment on “Inferred inflow forecast horizons guiding reservoir release decisions across the United States” by Sean W. D. Turner et al.

Sean W. D. Turner et al.

sean.turner@pnnl.gov

Received and published: 7 November 2019

Thank you for your review and for your constructive suggestions for improving the article. We agree with all of the suggestions and will respond fully in due course. We wish to make an immediate short comment on the very last point raised, so that the issue can be clarified for remaining reviewers.

The comment was: “A final, general comment is that in the absence of pointers on what the forecast information is, the forecast information might well be the expected average inflows conditions – involving no actual forecast at all. This should be clarified.”

C1

Please be assured that we have constructed the method so that expected average inflow conditions will not be detected as forecast information. From Line 108:

“Importantly, because the algorithm is computed for individual weeks, it removes the effects of operational decisions driven by typical water availability conditions throughout the year. For example, simple knowledge that springtime typically brings high flows would not register as foresight in this procedure. Foresight detected must result from some knowledge as to how incoming flows differ from usual for that time of year.”

This was perhaps an uninformative way of making the point. Instead consider typical release rules for a reservoir. Those rules specify how much water to release as a function of storage for different times of year. There’s no look ahead horizon (release is only a function of current water availability), and yet the policy is still one that releases water to deal with seasonality in inflow conditions (since the relationship between release and water availability varies throughout the year). If it’s ahead of flood season, releases will be high to draw down the reservoir to make a flood pool, and so forth. Thus, when examining the decisions of a given week of the year, we would find a close relationship between release and current water availability (as per the policy) and would expect the policy fit to deteriorate by extending the candidate horizon (since the time of year, rather than an explicit forecast of water, is informing the decision). In this way, releases designed for average seasonality of inflow would not register as foresight in our procedure (we do it one week at a time). We have reflected that this can be difficult for a reader to digest, so we’ll provide an improved explanation, diagram, mathematical proof, or demonstrative simulation in our revision if given the opportunity.

Thanks again for your very helpful review.

Sean Turner (lead author) PNNL

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-486>, 2019.

C2