EGUsphere, author comment AC2
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Reply on RC3

R. Scott Winton et al.

Author comment on "Patterns and drivers of water quality changes associated with dams in the Tropical Andes" by R. Scott Winton et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-403-AC2, 2022

We are pleased that the reviewer found this work to be of scientific significance and high quality and they recognize its relevance and potential for impact. We are also grateful for the many thoughtful suggestions for ways in which our message could be strengthened through a minor revision. All of these recommendations are highly constructive, and we plan to utilize them all to communicate this research more effectively. We summarize/categorize the recommendations briefly and provide the following responses:

-The reviewer gave several suggestions for adding important connections to key existing literature with specific articles identified that support specific paragraphs of our text. We will look for ways to cite each of these recommended articles.

-The reviewer provides some important advice for how the work might be perceived by regulators and suggests a few changes that could help communicate regulatory implications a bit more clearly. This includes suggestion the addition of some text to the end that explains how these lessons might apply to regions beyond the tropical Andes. Since we also hope that this work will be influential for the regulatory community, we will seek to address these points carefully and provide more explicit and clear messaging.

-The reviewer suggests some modifications to the figures, which we think are all worth implementing. The labels of the dams in Fig. 1, we had already added, but by mistake uploaded an unlabeled version, a regrettable oversight that we will correct.

-The question about potential for satellite-based monitoring is an interesting one. Although remote sensing of water quality is not a specialty of our author team, we can comment on why the Tropical Andes might be a challenging region to pursue this option. The region is extremely humid and finding cloud-free optical imagery is difficult in many regions for the wet season (when sediment mobilization is at its peak) and in some regions, such as the Choco, almost no cloud-free imagery exists. We note a recent review on this topic in S. America (Sheffield, J., Wood, E.F., Pan, M., Beck, H., Coccia, G., Serrat-Capdevila, A., Verbist, K., 2018. Satellite Remote Sensing for Water Resources Management: Potential for Supporting Sustainable Development in Data-Poor Regions. Water Resour. Res. 54, 9724–9758. https://doi.org/10.1029/2017WR022437), which is focused on hydrology, but does not mention water quality. Remote sensing could help with temperature, turbidity and chlorophyll -a, but cannot directly detect dissolved oxygen.

-The reviewer asks a specific question about data availability, which we should answer: Our goal was to look across the diversity of hydropower projects and so we requested from ANLA (the regulatory authority) the most recent year of vetted and approved monitoring data for each dam. There is historic data that ANLA is working to integrate it its modern data set, which should eventually allow the public to access real and historical monitoring information. Since we were not interested in assessing evolution of behavior over the years since construction we focused on a recent year where we could be sure to get contemporaneous data spanning as many projects as possible. ANLA is working to make all of its data publicly accessible, but while the data portal remains in development, provision of data is provided in response to goal-oriented requests, so we were provided the data that we requested based on our research goal.

-The reviewer makes a variety of recommendations to improve clarity or slightly modify phrasing to better reflect reality. All these recommendations seem very sensible and worth addressing.

-The reviewer also took the time to correct some objective errors in grammar and typos. We thank the reviewer for kindly pointing out these mistakes!