

Interactive comment on “Illustrating a new approach to estimating potential reduction in fish species richness due to flow alteration on a global scale” by S. Yoshikawa et al.

Anonymous Referee #1

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This manuscript addresses the very important issue of freshwater ecosystems responses to flow alterations globally.

The term "on a global scale" in the title of the paper is somewhat misleading, because the analysis is only done for 26 individual river basins (which for example do not cover Africa). More important than the "global scale" in environmental flow assessments is a globally consistently applicable method.

As stated by the authors, the focus of this paper is not on a realistic assessment of ecosystem responses, but on a comparison of two different methods for describing

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flow alterations. Responses of freshwater ecosystem to such flow alterations are only represented in the paper in terms of potential reductions in fish species richness (FSR). This FSR reduction is based on a statistical linear relationship between flows and FSR (by Xenopoulos et al.) I've heard comments that this relationship is too simplistic and not very helpful for future scenarios, but I can't substantiate that claim myself. For me it is hard to believe that FSR responses can be predicted from a statistical relationship with mean river discharge, basin area, and the geographical latitude at the outlet as proposed by equation (2). There are certainly a number of other factors that control FSR responses to flow alterations, not the least previous anthropogenic modifications of the respective river system.

So I would argue that the final claim of the paper that "the new model...has a potential to be used in assessing the impact of flow alteration on freshwater ecosystem change" is not substantiated through the analysis presented.

Other comments:

15 years of discharge data is a rather short period for establishing flow characteristics.

It is not clear, why the authors repeatedly mention that their river routing model does not consider the effects of anthropogenic water use. The paper does not attempt to provide a comprehensive assessment of future flow alterations anyways. If it did, it would also need to also account for land use changes (I haven't checked the original literature on the model, but land use is not mentioned in the paper).

Figures 1 and A1 to A4 are too small to be interpreted by the reader.

The manuscript should be revised also in terms of the english language used.

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