

Comment on “A century scale human-induced hydrological and ecological changes of wetlands of two large river basins in Australia (Murray) and China (Yangtze): development of an adaptive water resource management framework” by Kattel et al.

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General comments

This study uses measurements of subfossil cladoceran zooplankton in three wetlands in Australia and China to analyze hydrological changes in the last century. These hydrological changes were in turn coupled to human activity and changes in water use policy. In general the paper reads well, although some parts might benefit from some restructuring. Also, I think the description and application of the ‘adaptive water resources management framework’ is very unclear. From the abstract and conclusions it is not clear at all why this has been introduced, and what the authors have learned from it. I would suggest to leave out the parts about this adaptive water resource management framework. I think it is poorly described what the proposed framework exactly is, how it was applied to the case studies and what we can learn from it. I think the authors did a nice job in using an alternative measurement technique (at least in hydrology) to analyze the development of two human-influenced river basins. This by itself, including a comparative discussion, is very interesting. I think that the authors should choose to either leave out the WRM framework, or significantly improve the implementation of this framework in the paper. Then, the paper might be suitable for publication in HESS. If the authors have any questions about this review, or want to discuss anything, they are welcome to contact me.

Specific comments

Fig. 1, 2: I would suggest to have a consistent style for these figures. Now it looks like a copy-paste exercise, but I assume you want it to look like an integrated story.

Fig. 4-6: I would like to suggest to find a better way to present the results. It’s a lot of information and it’s not very clear what it means by just looking at it. At least it would be good to consider having consistent font type and font size on the axis and subtitles of the figures.

Line 283: Hydrological framework? What do you mean by this? It sounds like you’re going to present a scientific framework for analyzing change, but in fact you present graphs of river flow. Perhaps you should integrate the descriptions of these figures in Section 2., at the site description.

Line 352: Spell out CA, PCA,

Methods:

- This section is a bit unstructured. Also, the technique you're using is not very standard in hydrology. It would be good to spell out what the link is between subfossil cladoceran zooplankton and diversity and ecological conditions. Therefore I proposed to restructure it:
 - What questions do you want to answer?
 - What information do you need?
 - What techniques did you use to retrieve the information you need, and why did you select these?
 - How did you apply the technique(s) to your case studies?
 - Are there any flaws?
- Was there any additional data used? If so, I suggest to mention it in the methods section.
- Later in the paper you mention a lot of species. Perhaps you can consider explaining what kind of species are an indicator of what.

Results:

- I am not sure whether you should present the results in a comparative manner. Both river basins had a completely different development timeline, and it's obvious that you're measures will show this.
- What is value of naming the specific species? Does this say anything about the hydrology or ecology?
- What is the N2 diversity index? This should be mentioned in the Methods section.
- I would like to suggest to also restructure the results section. I would separate this section in three subsection, one for each site. I think it is better to present your findings separately for the different sites. Also, I would suggest to present your findings in terms of changes in hydrological and ecological conditions, rather than naming the species. The species names do not read pleasantly and have no meaning to most readers. However, you can use them to back up statements about a hydrological change. Perhaps you can express it in terms of N2 index or density of littoral species?

Line 543: Density of littoral species, how is this calculated?

Line 549: different trends: what different trends did you find? How did you test the presence of trends?

Line 649: spell out N and P.

Line 839: van Emmerik et al. (2014) presented the modeling study in which a strong coupling between human development and ecosystem health in the Murrumbidgee River Basin (MRB) was demonstrated. Kandasamy et al. (2014) provided a good overview of the development, including demonstration the 'pendulum swing', of the MRB. I suggest to cite both studies here.

References

Kandasamy, J., Sounthararajah, D., Sivabalan, P., Chanan, A., Vigneswaran, S., and Sivapalan, M.: Socio-hydrologic drivers of the pendulum swing between agricultural development and environmental health: a case study from Murrumbidgee River basin, Australia, *Hydrol. Earth Syst. Sci.*, 18, 1027-1041, doi:10.5194/hess-18-1027-2014, 2014.

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