

19 April 2016

Editor
Hydrology and Earth System Sciences
Copernicus Publications
Bahnhofsallee 1e, 37081 Göttingen, Germany

Dear Editor,

Re: Hydrol. Earth Syst. Sci. Response to Reviewer #3's comments

Thank you for your advice on the revised manuscript that I submitted previously to HESS. I am very pleased to receive highly constructive comments made by the Reviewer #3, Tim van Emmerik. Based on his advices, I have been convinced that the proposed adaptive water resource framework needs to be left out, thus I have removed the framework presented as Fig. 7 of the manuscript submitted previously.

In the revised manuscript, I have adopted the Section 5.3 accordingly in order to highlight the value of the adaptive water resource management approach in large river wetlands. Now I have renamed the subheading "*the potential use of an adaptive water resource management approach for the management of the Murray and Yangtze River wetlands*".

Below, I have addressed queries raised by the Reviewer #3 and adopted in point-by-point basis.

Would you please note that recently I have moved to Nanjing (China) working as an International Visiting Professorial Fellow at the Chinese Academy of Sciences (Nanjing). Because of the significant amount of funding support received from the CAS institute for this study, I have changed the order of my affiliation, and also have provided the new email contact details in the revised manuscript.

Yours sincerely,

Giri Kattel

On behalf of co-authors

Reviewer #3 comments and answers

General comments

".....some parts might benefit from ... restructuring.... application of... 'adaptive water resources management framework' is... 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 ... suggest leave out the parts about... 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 that the authors should choose to either leave out the WRM framework, orimprove the implementation of this framework in the paper....."

Answer: Thanks for this invaluable suggestion. The parts of the manuscript including the Title (LINE 1-3) submitted earlier have been restructured in the revised manuscript. For example, the clarity on ‘adaptive water resource management’ in Abstract (LINE 37-40, also highlighted), Introduction (LINE 178-189, also highlighted), Discussion (LINE 763-838, also highlighted) and Conclusion (LINE 854-857, also highlighted) all has been significantly improved as a result of this restructuring. Some unclear sections described on adaptive water resource management have been either removed or rephrased. For example, the ‘adaptive water resource management framework’ presented as Fig. 7 has been removed in the revised manuscript, and the content of the adaptive water resource management has also been rephrased.

Specific comments

Fig. 1, 2: I would suggest ... 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.

Answer: Thank you for good suggestions. However, there is a technical issue. Each of these figures was made by two different technical teams in Australia and China using some geographic information system data from the each river basin. On the other hand, the technician who assisted to create a map for Kings Billabong (Australia) has left the institute, and this has led to some difficulties to restructure this map.

Fig. 4-6: I would...suggest...find a better way to present..... 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.

Answer: Thank you for good suggestions. The presentation associated with Fig. 4, 5 & 6 has been improved by linking the assemblage and diversity change of cladocerans to hydrological changes of wetlands in revised manuscript (LINE 376-379, LINE 383-387, LINE 433-438, LINE 469-473, also highlighted). The font size and axis titles and subtitles have been slightly modified for better clarity.

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.

Answer: This has been rephrased as the ‘hydrological contexts’ of the flow of the Yangtze and Murray Rivers. The descriptions have now been included as a section within the Study Area/Site Description (LINE 282-307, also highlighted).

Line 352: Spell out CA, PCA,

Answer: This has been spelled out.

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....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 indicators of what?"

Answer: Thank you for this advice. In the revised manuscript, the method has been restructured (LINE 311-325, LINE 361-363 also highlighted).

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."

Answer: Indeed, both river basins had different development timelines, however, the results of cladoceran records were compared on the basis of their change (species-specific richness, and abundance prior and after the river regulation). In order to clarify the paragraphs have been rephrased (LINE 376-379, LINE 383-387, LINE 433-438, LINE 469-473, also highlighted).

"What is value of naming the specific species? Does this say anything about the hydrology or ecology?"

Answer: The reason for providing the species names was due to their species-specific response to wetland ecological conditions driven by hydrological modifications including the alteration in flow regimes and channel modifications, and flood-induced nutrient enrichment.

"What is the N2 diversity index? This should be mentioned in the Methods section."

Answer: The N2 diversity index proposed by Hill (1973) suggests that the number of species in an ecosystem is uniformly distributed (Hill, 1973). This has now been added in the Method Section (LINE 361-363, also highlighted).

"I would like to suggest ... also restructure the results section. I would separate this section in three subsections, one for each site. I think it is better to present your findings separately for the different sites. Also, I would suggestpresent 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?"

Answer: Thanks for your advice. I have separated the result section in three subsections with respect to the each site. I have presented the species names in the beginning of the each sub-section because this provides the nature of the diversity of the most common cladoceran species responding to environmental change as revealed by N2 index and its response to the past hydrological disturbances or changes. As a result of this restructuring, this has improved the structure and readability of the text (LINE 376-379, LINE 383-387, LINE 433-438, LINE 469-473, also highlighted).

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

Answer: The density of the species of both littoral and planktonic cladoceran was calculated as per gram dry weight (gDW⁻¹), and has been described in the Method Section (LINE 339).

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

Answer: The trend described here is changes in N2 diversity index over time.

Line 649: *spell out N and P.*

Answer: Done

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.

Answer: Thank you. Both references have now been added in revised manuscript.

References

Hill, M.O.: Diversity and evenness: A unifying notation and its consequences, *Ecology*, 54:427–432, 1973.

Kandasamy, J., Sountharajah, 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, 2014.

Van Emmerik, T.H.M., Li, Z., Sivapalan, M., Pande, S., Kandasamy, J., Savenije, H.H.G., Chanan, A. and Vigneswaran, S.: Socio-hydrologic modelling to understand and mediate the competition for

water between agriculture development and environmental health: Murrumbidgee River basin, Australia, *Hydrol. Earth Syst. Sci.*, 18, 4239-4259, 2014.