

Interactive comment on “Evolving water science in the Anthropocene” by H. H. G. Savenije et al.

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We are happy that the reviewer appreciated the historical reconstruction of the relation between water and humans and the interaction between humans and the environment. We thank him for his thoughtful and constructive comments.

1) The reviewer thinks that the authors are a bit too pessimistic in suggesting that humans have altered the world substantially with mostly negative impacts. Some areas are still rather unaffected and not all interventions have been negative. We therefore will change the word "most" to "many" in our statement: "Humans have changed catchment hydrology in many catchments of the world...."

2) The reviewer then requests a further discussion of the Anthropocene and what it entails. This remark also resonates a comment by the other reviewer. In this paper

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we simply prefer to follow Crutzen & Stoermer's (2000) proposal. However, it would be interesting to expand the definition of the Anthropocene into the realm of the social sciences. We could then observe that the Anthropocene is not only defined by the impact of humans on the Earth, but also vice versa, namely the human consciousness of its impacts and dependency on Earth, and that this latter fact will influence and change the way we live on Earth and how we impact her in future.

3) The reviewer indicates that also in historical times, landscapes and water resources systems have been manipulated substantially by humans, recalling the work of the Etruscans and Romans. In doing so he indicates that maybe there is nothing new, or that things are not as dramatic as presently believed in many circles. We partly agree. Indeed, the Sumerians destroyed and salinized the land at a large scale, which caused their society to collapse (Clive Ponting in "A green history of the world"). Europe was more deforested during the middle ages than today (for construction, ship building and fuel). There are many more examples of smaller or larger scale impacts, which were sometimes irreversible (as with small islands). But only after the industrial revolution, the impact has become global, affecting land, atmosphere and oceans alike. This is of unprecedented scale. We do not intend here to solve the ongoing discussion when precisely the start of the Anthropocene should be situated or even solve the dispute whether we can talk about a new geological epoch altogether. We would rather like to stick by the definition of Crutzen and Stoermer (2000).

4) The referee suggests to include a discussion on the potential for observing water levels and groundwater from space, as e.g. reported by Munyaneza et al. (2009). We thank you for this suggestion. We will strengthen the current section 4.2.1 ("Water governance at the local, watershed and river basin level") with this important insight.

5) The referee suggests that in the Anthropocene we could benefit from a new science of global and large scale hydrology as discussed by Gupta et al. (2013) in this same SI. We agree. This remark is consistent with a remark by the other reviewer. We will consider enriching our discussion section with this insight and formulate new and

appropriate and critical research questions that push the boundaries of our thinking.

6) The referee suggests to make a strong case for data sharing, which can be a powerful tool to enhance water knowledge, and to call for virtual observatories and laboratories to enhance our insight and understanding of global change processes. We fully agree with this point. We will include it in the discussion section and consider what avenues data sharing opens.

7) Finally the referee calls for making a connection to Panta Rhei (the new research decade of IAHS on the interaction between humans and water as an ever-changing process) and to mention Panta Rhei as the vehicle to study global change processes during the coming decade. Thank you for the suggestion. We will mention Panta Rhei in the concluding discussion section of the paper, together with the suggestion made by the other reviewer. We may include here also the Global Water Systems Project (GWSP) and Future Earth as the overarching ICSU initiative.

References:

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