

Response to reviews on A journey of a thousand miles begins with one small step – human agency, hydrological processes and time in socio-hydrology

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We would like to express our thanks to the two reviewers, who both welcome our discussion on the importance of the temporal scale in modeling coupled human-water systems.

General response to Reviewer 1, point 1i, 1ii, 3 and 5; Reviewer 2, Intro and point 2

Both reviewers suggest that we offer more background on Hohokam society and geo-archaeology. We have rearranged the background information, especially in Section 5, providing some background on what is known of (pre-) Hohokam societies in this region. We decided not to include too much new text, given the comments on the wordiness of sections 1 and 2. We have shortened and – as much as possible – simplified the text. However, in a paper like ours – and a field like sociohydrology in general – readers would encounter terms that may not be immediately obvious to the HESS readership.

Response to Reviewer 1, point 1iii, and Reviewer 2, point 1

We have clarified our approach. Indeed, our approach is calculating monthly temperature/precipitation in our (lowland) study area, using the monthly observed data in the lowland and the difference/ratio between yearly reconstructed tree-ring data and yearly observed data in the upland.

Response to Reviewer 1, point 2, and Reviewer 2, point 1

We have considered including more discussion on trends in long-term climate in relation to short- to medium-term changes in irrigation and human agency in the region. However, this paper discusses the type of data needed to properly do so and does not focus on the actual analysis yet. We are working on that, and would like to reserve the results for another paper.

Response to Reviewer 1, point 4, and Reviewer 2, point 3

We have include more explanation what we did and how that is relevant to Hohokam water management.

Response to Reviewer 1, point 4i

We actually wanted to know whether control features would have been used in the first place, in relation to social organization. Although evidence is available on the general Hohokam society, the details of its water management are unknown, and we hope to apprehend it better by understanding the constraints of the physical system, which is what we are modeling.

Response to Reviewer 1, point 4ii

We have included some more emphasis on time reduction resulting from applying controls.

Response to Reviewer 1, point 4iii

Obviously, our simulation is a simplification. Our results clearly show lower delivery times and greater stability under certain control scenarios. We have not studied how these differences in irrigation delivery times between scenarios would have translated into markedly different societal/individual benefits yet. Comparing our findings with irrigation systems in general suggests that it is beneficial to have stability and lower demands in terms of coordinating actions.

Response to Reviewer 1, point 4iv

We have clarified our results in terms of total delivery times and volumes of water needed to fill up all the fields and canals.