

## ***Interactive comment on “A journey of a thousand miles begins with one small step – human agency, hydrological processes and time in socio-hydrology” by M. W. Ertsen et al.***

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Received and published: 7 February 2014

Response to Reviewer 2, point 1

Indeed, our approach – expressed in the equations in section 3 – is calculating the 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. The assumption is based on the fact that climate variability is highly correlated between upland and lowland. We will include a clearer discussion on the method and its rationale. This will also be the case for

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the issue of additional steps and assumptions, especially the assumption that climatic variability has not changed over time. Indeed, the CF method demands that climatic variability has not changed over time. In term of the one thousand year of tree-ring series, there is no evidence indicating climate changes in the uplands. Because most CF methods are used for forecasting climatic variables, it typically calculates the additive and multiplicative change factors between a baseline and a future scenario. But for our case, it is for the past, and thus we modified the equations. The additive and multiplicative change factors are between reconstructed tree-ring data and upland observed data.

Response to 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 (focusing on hydrology, geomorphology and water management) 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 2, point 3

In terms of the suggestions made by the reviewers to improve section 5, on the hydraulic model of a small-scale irrigation management system, we will include more discussion and information on what we did and how that is relevant to Hohokam water management.

Please see the reply to reviewer 1 for more general replies.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 14265, 2013.

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