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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Reconstruction of global gridded monthly sectoral water withdrawals for 1971–2010 and analysis of their spatiotemporal patterns" *by* Zhongwei Huang et al.

Anonymous Referee #1

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In this study, the authors reconstructed the global water withdrawal patterns from collected data by statistical downscaling. The spatial and temporal patterns of water withdrawal, along with sectoral divisions were analyzed. This work is not trivial. Estimating water withdrawal in a small watershed and considering various sectors is hard enough, not to say at the global scale. As a result, I do not think readers should blame the simplifications taken here.

However, I do have a concern of the irrigation part. It seems that the observations used for calibration is very sparse, especially in developing countries. For example, in the two major countries with water withdrawal – China and India, only data from West

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Bengal and Beijing were used. The result might be very biased because of the spatial variability of climate, water resources, and population density. Considering that 68% of water withdrawal is used for irrigation, this might lead to large errors in the final result.

Also in Table 2: The second column is a mixture of cities, counties and states. In addition, it is better to indicate which state the city is located as it is not uncommon for multiple cities to have the same name.

In Table 3, did you calibrate the R value in Japan and Spain too, or you just adopted the value from literature?

Overall, the study is novel, the topic is suitable to HESS, and the manuscript is well written. I suggest a minor revision addressing my concerns mentioned above.

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