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Hydrology and Earth System Sciences
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Discussions

Interactive comment on "Identification of spatiotemporal patterns of biophysical droughts in semi-arid region – a case study of the Karkheh river basin in Iran" *by* B. Kamali et al.

B. Kamali et al.

bahareh.kamali@eawag.ch

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1- The paper aims at investigating drought propagation for different sub basins. . .... Reply- We could provide extensive response to this question. It appears that the reviewer is not familiar with these concepts and metrics as he/she refers to them as models and does not know how exactly SRI is calculated. These metrics are not drought prediction models, they are tools developed for defining and monitoring droughts. They allow analysts to determine the rarity of a drought at a given time scale of interest for any rainfall station with historic data. Here, we are looking at drought from different angles: meteorological, hydrological, and agricultural point of view and comparing them

to actual drought occurrences. There are a long list of references (have already provided a few in the manuscript) where these metrics are compared in different parts of the world. There are many metrics of drought derived from analyses of rainfall and temperature. It is clear that drought is a consequence of climate anomalies, as well as of water use practices. However, many societal impacts are more directly related to hydrologic conditions, which results from both climate and water use practices. Modern hydrologic models provide very valuable tools for devising concepts other than existing climate-based drought indices by simulating hydrologic variables such as runoff. In this paper we contrast the behavior of SRI with that of the well-known SPI during drought events in a semi-arid region. Although the SRI and SPI are similar when based on long periods, the SRI incorporates hydrologic processes that determine seasonal lags in the climate on streamflow. As a result, on monthly to seasonal time scales, the SRI is a useful complement to the SPI for depicting hydrologic aspects of drought. In case the reviewer missed, Figure 3,5 and 6 are comparing SPI, SRI, and SMDI to actual drought events.

2- In its currently presented form the results are not reproducible owing the incomplete methods ..... Reply- We do not describe the SWAT model and its calibration in this manuscript in any great details because this has been done in two already published papers. We are sorry that this had not been referenced at the appropriate location in the manuscript even though the references appear in the manuscript.

Ashraf Vaghefi, S., Mousavi, S. J., Abbaspour, K. C., Srinivasan, R., and Arnold, J. R.: Integration of hydrologic and water allocation models in basin-scale water resources management considering crop pattern and climate change: Karkheh River Basin in Iran, Reg. Environ. Change, 15, 475–484, doi:10.1007/s10113-013-0573-9, 2013a.
Ashraf Vaghefi, S., Mousavi, S. J., Abbaspour, K. C., Srinivasan, R., and Hong, Y.: Analyses of the impact of climate change on water resources components, drought and wheat yield in semiarid regions: Karkheh River Basin in Iran, Hydrol. Process., 28, 2018–2032, 2013b.

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We could easily correct this oversight.

3- In my view there is potential to conduct further analysis.... Reply- Yes, we agree that there is always room for more and much more analyses. But the analyses must be weight against the objectives of the work being done, importance of the message being conveyed, size of the manuscript, etc.. But with rejecting the manuscript, reviewer does not seem to believe the paper could be improved to the level of being published. So, the suggestion of further analyses is in contradiction with his/her judgement. When we review manuscripts, if there is a chance for improvement, which there always is, we call for a "revision" and not "rejection".

4- There is a large body of literature on comparing different drought indicators..... Reply- We believe have done this as much as necessary in the discussion. We have a problem with the very general and cliché comments of the reviewers such as "the introduction is poorly written", "not enough analysis is done", "not enough comparison is made", etc. These are not helpful in a review process. More concrete and expert suggestions would be constructive and helpful to make a better paper.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 5187, 2015.