

Interactive comment on “Dominant climatic factor driving annual runoff change at catchments scale over China” by Z. Huang and H. Yang

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Overall it is a very good article and it can be publishable after considering the following comments: If the authors do not agree to the comments, a justification can be helpful. Data source: While evaluating the impacts of climate on runoff, we should always use the catchments which are minimally impacted by human disturbances by the ways of dams, reservoirs or irrigation. Else, that would result in improper assessment of influence of climate on annual runoff. Similarly, most of the studies related to climate elasticity and Budyko hypothesis have explored regions which have minimal impact of anthropogenic activities. Is that factor taken into account? If so, please mention that in the text otherwise it can be highlighted as future study. Purpose of Validation of the climate elasticity method: The authors have compared hydrologic model results with

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climate elasticity results. Based on table 3, one can observe that, $\Delta R/Re$ is comparatively closer to the observed data ($\Delta R/RO$) in only upper Hanjiang river basin. The authors have evaluated all the catchments in china based on this single river basin. To prove that the climate elasticity method is superior to hydrologic modeling on this evidence is not statistically significant. Usually, Hydrologic models are more prone to parameter uncertainties and are difficult to calibrate. But, once properly calibrated, they act as proxies for evaluating runoff where data is unavailable. Whereas, the climate elasticity models based on Budyko are easier to compute but cannot be applied to regions where the data is scarce. Each method has its pros and cons. Therefore, the authors can provide a justification on the choice of climate elasticity model in a more informed way. Comments: This article applies the runoff elasticity method as outlined by Yang and Yang (2011) and applies it to the dataset utilized in Yang et al., (2014). Hence, this can be termed as an extension of both these works. It provides the runoff elasticity to net radiation, temperature, wind speed and relative humidity which was not earlier evaluated. Even though this article is novel in this direction, there appears to be very less depth in their discussions and results. For example, in figure 8, what can be a possible reason which explains the dominance of radiation and wind speed in the south eastern and north eastern regions?

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