

## ***Interactive comment on “Moisture sources contribute to precipitation change in the Three Gorges Reservoir Region during 1979–2015” by Ying Li et al.***

### **Anonymous Referee #1**

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This paper has addressed an important scientific question regarding the moisture sources contribution to the change in precipitation over the Three Gorges Reservoir Region. Title and abstract reflect the content of the paper clearly. This paper has outlined the details about the data, model and methodology clearly. My main concern is about the conclusions derived from the results. In general, this geographic region (TGRR) is influenced by the south-west monsoon (mainly in summer) which brings moisture from the Arabian Sea and Bay of Bengal, as is suggested by figures 3 and 4. Results also suggest (as is expected) the influence of westerlies system on the moisture source region. Then, the authors claim that the decreased precipitation over the TGRR during 1979-2015 is mainly due to the decreased moisture contribution from

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the source regions which span over the southwest of the TGRR, especially around the southeastern tip of the Tibetan Plateau. In order to establish the above-mentioned causation, authors presented trend analyses (figures 6,7 ) and the time series (figure 8), which suggest the association between the SWS region and the TGRR. No physical mechanism is provided to explain how the decreasing moisture contribution from the SWS region (including the southeastern tip of the Tibetan Plateau) leads to the decreasing precipitation over the TGRR. In other words, it is not clear what is the pathway of this causation. Furthermore, is this the case only for summer? How does this conclusion hold true during the winter and spring when the westerlies influence is strong? This part is not clear as well. Authors have selected two boxes to identify two source regions, i.e. SWS and SS. The result of figure 8 depends a lot on how the box is defined. What do we know about the general variability and trend in moisture over the SWS region? Some form of visualization/analysis on a large-scale map (focusing TGRR) would help the readers in later section. In summary, the use of moisture tracking model in identifying the dominant source regions of moisture is useful. Hence, the first part of the conclusions is convincing and clear. But another key point of the conclusions associated with the role of specific geographic region as a source of moisture in increasing/decreasing the precipitation over the TGRR is not clear.

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