

Response to anonymous referee #2

We thank the reviewer for his/her helpful comments, and have implemented the suggestions as described in detail below.

General comments

The author explored the impact of two different type of El Nino (canonical-type and modoki-type) on runoff over the U.S. The topic treated here is quite interesting from both scientific and societal viewpoints. The impact of the present study must be huge because people in the US are very keen about such information. The analysis seem to be good for understanding their impacts in the present-day. However, it does not seem to be enough for the future response in a warmer climate as discussed in the following. Therefore, additional analysis may be necessary prior to acceptance.

Specific comments

1) The composite analysis by Figs. 1-7 seems to be enough to explore the impact of two different types of El Nino in the present-day. However, only Table 2 doesn't seem to be enough for exploring the future response in a warmer climate. It is better to add some figures related to the response to global warming, for example, same as Fig. 4, but for the period of 2050-2099. Also, the author should touch on the topic of how the two-types of El Nino will change in a warmer climate, for example, frequency, intensity, and its atmospheric response. Cai et al (2015) may be helpful for that discussion. Cai et al., Nature Climate Change, 5, 849–859 (2015)

Response: We added a new figure (Fig. 7) showing the composite of runoff anomaly during the two types of El Niño by using NCAR-CCSM4 RCP4.5 outputs for the period of 2050-2099 in revised manuscript. Its related discussions are given in the section 3.3.2 in the revised manuscript. How the two types of El Niño will change in a warmer climate, including frequency, intensity and its associated impacts, is also discussed on the 3rd paragraph of a new section i.e., Section 4 in the revised manuscript. Reference of Cai et al., (2015) is also added.

2) P3L17: Weng et al. (2007; 2009) explored the teleconnection by El Nino Modoki relative to canonical type.

Weng, H., K. Ashok, S. K. Behera, S. A. Rao, and T. Yamagata, 2007: Impacts of recent El Nino Modoki on dry/wet conditions in the Pacific rim during boreal summer. Climate Dyn., 29, 113–129.

Weng, H., S. K. Behera, and T. Yamagata, 2009: Anomalous winter climate conditions in the Pacific rim during recent El Nino Modoki and El Nino events. Climate Dyn., 32, 663–674.

Response: These references have been added in the revised manuscript (section 4). We also carefully compared the figures from the suggested references, the results are consistent, which further strengthens the robustness of our findings.

3) P5L11: The period of the analysis is 1999-2009? In the Fig. 2 caption, the period of 1990-2009 is written.

Response: Our study period is 1990-2009, not 1999-2009. Thanks for pointing out the typo in the current version of the discussion paper. We have corrected this in revised manuscript.