

Response to J.-S. Kim comment on “Contrasting terrestrial carbon cycle responses to the two strongest El Niño events: 1997–98 and 2015–16 El Niños”

Dear Kim,

Thank you very much for your constructive comments. We have tried our best to re-summarize the results, and modify this manuscript accordingly. The following is our point-by-point reply to the comments.

- (1) Statistical significance In Fig. 3 to 6, the composite results are shown by averaging anomalies for eight El Niño events, except for 1982-83 and 1991- 92. However, authors did not show significance levels, so it is hard to say common features in El Niño events. In addition, two extreme cases have the larger anomalies than composite results, but it is needed that how significant between extreme cases and composite results as normal cases. By using bootstrap estimation, it can be possible to address P-value and significant levels. Then, it would be more clearer that how anomalies in soil wetness and air temperature act regional terrestrial carbon flux, especially for two extreme El Niño events.

Reply: Thanks very much for your suggestions. Statistical significance is indeed needed for the composite analysis. So we have added the statistical significant test in Figs. 3 to 6 in the modified paper through the popular bootstrap estimation.

- (2) Seasonal evolution Recently, Kim et al. (2016) argued that carbon flux in South Asia lead to the delayed peak in the ENSO-related carbon cycle. Authors already analysed regionally, but more detail analysis, as like Kim et al. (2016), is needed in order to understand different features in the delayed peak for two extreme El Niño events.

Reply: Thanks very much for your suggestions. Actually, we also suggested that the ENSO-related carbon cycle had the delayed relationship (Qian et al., 2008; Wang et al., 2016). Seasonal evolution during the El Nino events is also a good topic. In this paper, we covered some information of seasonal evolutions in total C flux anomaly section (seen in Figure 2-4). Actually, we also want to present the spatial

seasonal evolutions during the 2015/16 El Nino with temperature and precipitation regional contributions by model sensitivity experiments in another paper.

Technical Corrections:

1. Line 24 and 373: El Nino -> El Niño

Reply: Thanks very much for your corrections. We have modified them accordingly.