

Interactive comment on “Examining the sensitivity of the terrestrial carbon cycle to the expression of El Niño” by Lina Teckentrup et al.

Anonymous Referee #1

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This manuscript investigates the impacts of different expressions of El Niño on the long-term terrestrial carbon storages, using a DGVM LPJ-GUESS with the manipulated climate forcing. They pointed out that CP and EP events can significantly influence the interannual variability of terrestrial carbon cycle, but cannot lead to NBP trend. Therefore, they suggest that future simulations of carbon cycle may not need to well simulate the expressions of El Niños in Earth System model. The method is well described and writing is clear with concise and clear conclusions. Some minors: (1) L120: “associated with El Niño events according to the best fit in duration and amplitude in ONI . . .”. Because there are actually 6 CP, 7 EP, and 2 Mix, you can clearly show the replacement relationships in the table for the manipulations (like in Table A1). It can be more straightforward for us to understand it. (2) The units in spatial patterns in Figure B1–B4

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are not correct. For example, flux is $\text{gC} \Rightarrow \text{gC}/\text{m}^2/\text{yr}$?, carbon pool is $\text{gC yr}^{-1} \Rightarrow \text{gC}$? (3) In Discussion: Some aspects can be mentioned further. a) ENSO diversity (Capotondi et al., 2015): Although replace the CP and EP events based on their durations and amplitudes, every ENSO event is unique with different spatial impacts. b) Changes in frequency of ENSO occurrence in future: Though it maybe doesn't influence your conclusions, you can discuss that frequency change may have some influences.

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