Biogeosciences

Discussions

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Interactive
comment

Interactive comment on "Accounting for El Niño-Southern Oscillation influence becomes urgent for predicting future East African ecosystem responses" *by* Istem Fer et al.

Anonymous Referee #2

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The Major Problem The conclusion of the paper states: There is a relationship between the East African rainfall and ENSO events in agreement with previous studies (so nothing new), and climate models (CMIP5) are not good at capturing rainfall variability due to ENSO (also not new), therefore the future vegetation would be different from what is simulated using these climate models outputs. Both of these conclusions are already known. Thus what is new in this manuscript is the projection based on CMIP5 climate models that do not capture the most important parameter – precipitation, and very probably they also not to capture properly the temperature, which are required as inputs to the LPJ-GUESS model. Therefore the authors provide the statement that the future would be different from what is simulated using these climate models outputs.

Why than should be the manuscript published? The manuscript can be still useful if the authors would concentrate on the model projected differences between two plausible scenarios. If we succeed in controlling CO2 emission, we may follow a path close to the RCP4.5 scenario. If we fail to control the emission it would be close to RCP8.5. I recommend considering these two scenarios, and concentrating on model projected differences between the two alternatives (RCP4.5 and RCP8.5). This will require a major revision or a re-submission, but it will significantly improve the quality of the paper. Fact that some papers were published using only RCP8.5 should not be an excuse to continue this less than the best possible practice.

Minor Points: (1) Several CMIP5 climate models were used for the presented study. How were these models selected from about 40 existing models and why? What was the criterion for the selection? If different models would be used how would be the results changed? (2) There have been several papers published recently suggesting two kinds of El Nino events (EP and CP El Nino) with the suggestion that the future global warming will produce more El Nino just of one type. Is your El Nino projection in agreement with this statement? (3) The models used for future projection should be supported by showing an agreement with the past observations (necessary but not sufficient condition). This is not a guarantee that the models will provide reliable future projections, but if models cannot agree with the past observations their use for future projections is not justified. Since the LPJ-GUESS requires the precipitation and temperature as a part of input, please show how the ensemble mean of the CMIP5 models used simulate the past precipitation and temperature of East Africa. (4) It is now 2017, why are you using only 1951-2005 as a historical period? Historical models simulations can be extended till present (e.g. 2016) using parts (2005-2016) of future RCP projections. (5) Consider how your projections confirm or contradict recent observations of widespread greening (e.g. Forzieri et al, Science 2017; Brandt et al, Nature Ecology and Evolution 2017). (6) I don't see the urgency implied in the title. Please, consider a different title.