

Interactive
Comment

Interactive comment on “Response of CO₂ and H₂O fluxes of a mountainous tropical rain forest in equatorial Indonesia to El Niño events” by A. Olchev et al.

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We thank the anonymous reviewer (REV1) for his timely comments on our manuscript, which gives us the opportunity for interactive discussion. This is highly appreciated.

Comment: “However, my major concern is that this manuscript is quite limited in scope, due to the fact that the El Niño response is only studied on a single site. In my opinion the paper would benefit from adding additional sites from the same region (Indonesia, South-East Asia, or North Australia) to study if the observed El Niño effects on surface fluxes can be generalized. Such findings would be of high value for modelling work. Nevertheless, even with only one site included, this is a well presented study for a

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Interactive Discussion

Discussion Paper



region that is relatively data-poor.”

Answer: We absolutely agree with reviewer on the importance of the consideration of the regional patterns of ecosystem responses to ENSO events in SEA and that an analysis of additional sites from ENSO influenced regions, as named by reviewer, will extend the scope of the analysis to a wider perspective. However, as the reviewer correctly mentioned, the region is relatively data poor and, therefore, we focused our manuscript on a single case study, with long-term series of thoroughly measured fluxes in a pristine mountainous tropical rainforest growing in Central Sulawesi, Indonesia. The investigated ecosystem type (mountainous rain forest) constitutes the main remaining parts of the tropical rain forests in Sulawesi and equatorial regions of SEA and we found it suitable to start investigating the ENSO effects with this important ecosystem type. As commented by the reviewer: this single case study enriches the data basis for the region.

Comment: “However, I was confused by the way the two steps in the analysis are presented on page 4413. The first step is described as a correlation analysis between “NEE, GPP, . . . and SST-anomalies”. But are you correlating flux (e.g. NEE)-anomalies with SST-anomalies or monthly absolute flux values (e.g. NEE) with SST anomalies in this first step? The second step is presented as a “more accurate analysis” where absolute deviations of monthly fluxes from the average are calculated. In fact, these ‘absolute deviations’ are flux-anomalies according to me. In addition, I suggest describing in more detail what is meant by a ‘more accurate analysis’. (Is this really the good wording?).”

Answer: 1) In the first step that were the absolute values. We will add this information to the manuscript as: “In the first step to assess the possible impact of ENSO events on CO₂ and H₂O fluxes the possible correlation between the absolute values of monthly NEE, GPP, RE, ET and SST anomalies in Nino4 and Nino3.4 regions (Nino4 and Nino3.4 indexes) were analyzed”. 2) We agree also that the phrase “more accurate analysis” is not quite correct and we will rephrase this in the revised manuscript as: “In

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12, C1761–C1763, 2015

Interactive
Comment

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Interactive Discussion

Discussion Paper



the second step of data analysis we analyzed the correlation between the deviations of monthly flux values from monthly averages over the entire measuring period and the Nino4/Nino3.4 indexes. The deviation in the case of GPP (Δ GPP) was estimated as ... (see the supplement to this comment) ”

We accept the suggestions given in comments 1-3. 1) We will use “rainforest” everywhere in text; 2) the study of Malhi et al 1999 was conducted in Amazon region – we will add this information to the text; 3) we will use “intra-annual” instead of “annual” in text, where it is necessary.

We thank REV1 especially for his/her comment 4 on Figure 4. From this we noticed that during the editing and re-coloring processes the graph for the global radiation (G) trend was accidentally replaced by the graph for GPP. Both graphs for GPP and for G have actually similar shapes. The corrected figure 4 is given in the supplement to this comment.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/12/C1761/2015/bgd-12-C1761-2015-supplement.pdf>

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