

Interactive comment on “Eddy covariance carbon flux in a scrub in the Mexican highland” by Aurelio Guevara-Escobar et al.

Anonymous Referee #2

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This paper looks at tower-based NPP estimates at a drylands site in Mexico and compares the results to MODIS NPP product. The authors find that the site is a net carbon sink and that the MODIS product underestimated GPP at this site. While these findings are interesting, the manuscript appears to lack a clear research question, and does not propose a way forward for this work: what are the large-scale implication for this site being a net carbon sink even though other similar sites are not? Can the MODIS product be combined with other data to improve the comparison with the in-situ data (beyond changes to the algorithm by the MODIS science team)? Has the MODIS product been used in other studies that are therefore obtaining biased results because they did not realize the issue with the MODIS product? Overall, the data is interesting but again, it seems like the analysis needs to be taken one step further before the manuscript is

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publishable.

Introduction

There has been a lot of work recently on the importance of water-limited environments for carbon sequestration. It would be good to expand on current work, explain what the current hypothesis is for why savannas/drylands are thought to be so important for carbon sequestration and why this had been missed until recently. Properly embedding this work within this body of work would help raise its importance. After that, defining what the research question is, beyond "adding one more dataset" to the list, is missing.

Methods

Section 2.3 of the Methods gives the impression that the MODIS GPP product was consumed without a full understanding of how this product is generated from the MODIS data. Since the deviation of the MODIS product from the in-situ data is at the core of the manuscript, it would be helpful to flesh out how GPP is estimated for the MODIS product. It would make the argument in the discussion stronger.

Results and discussion

Lumping results and discussion together often leads to a weaker discussion, and I think it is indeed the case here: splitting the two sections would allow the authors to expand on the broader impacts of the study, linking it back to other work, and further explaining the repercussions of MODIS' underestimation. The effect of the different photosynthesis mechanisms eluded to in the abstract would be interesting to further develop in the discussion as well. Finally, the link with carbon sink and overgrazing is alluded to but never actually discussed, even though it would be of interest to many other parts of the globe.

Specific comments:

L127: Why was Licor used only on a single occasion? Could the measurements have been repeated on a different day? L 138: which made difficult measuring their abun-

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-460>, 2020.

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