

Interactive comment on “Carbon Exchange in an Amazon Forest: from Hours to Years” by Matthew N. Hayek et al.

Anonymous Referee #1

Received and published: 17 June 2018

This paper investigates the influences of climate, phenology, and disturbance to NEE across various timescales in an evergreen Eastern Amazon forest using a statistical model to represent eddy covariance-derived NEE. What I concerned is the research questions are not clear and lack of storyline through the manuscript. I am curious to know what environmental drivers are responsible for the hourly, seasonal and interannual variability of NEE, respectively, and how many are the relative contributions to the variability of NEE between exogenous changes and endogenous biophysical changes.

Throughout the abstract, it should be more quantitative in nature. For example, how many are the relative influences of climate, phenology, and disturbance to NEE across various timescales?

Line 46-49 please cite the references for each driver respectively.

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Line 81-82 did Urbanski et al. (2007) answer this question?

Please double check and use the same term: R/RE.

Line 80-89 what are relationships among these three questions? Each question looks individual.

Line 94 There was 1918 mm of annual rainfall. Why did it have a 5 month long dry season?

Line 91-98 Please describe more about the climate condition (temperature), species composition, vegetation/soil type, forest age, water table depth etc.

Line 143-145 did you create the correlation and verified each other for these three data sets?

Line 165-170 did you make any validation for predicted CWD from the box model?

Line 172 what is the low-parameter empirical model?

Line 222-225, these sentences should be placed in Methods, rather than Results.

Line 227-230 since Hutyra et al. (2007) has reported these results, what is the sense of your results here? Same problem with line 238-239.

Line 271 Were there any disturbance for 1998-2000?

Line 762 how about the dry seasonal? Why only 9 days, rather than 90 days?

The results section is pretty confusing. Please organize the idea logically. As your title: 'Carbon Exchange in an Amazon Forest: from Hours to Years', what environmental drivers are responsible for the hourly, seasonal and interannual variability of NEE, respectively? How many are the relative contributions to the variability of NEE between exogenous changes and endogenous biophysical changes?

How did you define the hourly, seasonal and interannual variability of NEE?

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Line 325 what is the R^2 between modeled and observed annual NEE?

It is also difficult to follow the Discussion section. What are the relationships between these four subtitles? They look pretty individual. Did you discuss the hourly and seasonal variability of NEE? Why don't you focus on explaining your results instead of talking about implications so much? The reader is really curious about your findings.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2018-131>, 2018.

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