**Biogeosciences
Discussions**

Interactive
Comment

Interactive comment on "Quantification of terrestrial ecosystem carbon dynamics in the conterminous United States combining a process-based biogeochemical model and MODIS and AmeriFlux data" *by* M. Chen et al.

Anonymous Referee #2

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General comments

The authors conducted a comprehensive modeling study to quantify carbon dynamics of conterminous United States by coupling a process based biogeochemical model (TEM) and remote sensing (MODIS-EVI and LSWI) data. They used Ameriflux data to parameterize and evaluate the process model. The modified model (SAT-TEM) shows an improvement in estimates of net ecosystem exchange and gross primary productivity as compared to the previous model (TEM).

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Interactive Discussion

Discussion Paper

Overall, the manuscript is well structured, and presents thorough background information. Methods are explained well and results are concise and well discussed.

Specific comments

Abstract: The authors did not talk about comparison of TEM and SAT-TEM. They mentioned, "new version of TEM generally captured the expected temporal and spatial patterns of regional carbon dynamics", but did not state if this is an improvement over the previous model. What does "generally" mean in comparison to the previous model?

Methods: P2732-L18 and P2741-L8,9-numbers should be written as subscript in "C3 and C4". What was the time-step for model-yearly, monthly, daily, or half hourly? The authors utilized only one site per ecosystem type (total 6 sites) for parameterization. It would be helpful to know why they only picked one site per ecosystem type. Why they didn't use multiple sites within one ecosystem type for estimating parameters and addressing site-specific variability?

Technical corrections

Equation 4: CA should be f(CA,GV)

Figure 4:

1. Y-axis should be "Simulated or Predicted GPP" not "Similated GPP".

2. Regression lines are missing for TEM (solid blue line).

Figure 6a: Use same color scheme as in 6b-c.

Figure 7: It will be helpful if relative standard deviation is defined in the figure description.

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