

Interactive comment on “Underestimated effects of low temperature during early growing season on carbon sequestration of a subtropical coniferous plantation” by W.-J. Zhang et al.

Anonymous Referee #1

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Authors investigated the influences of the early spring temperature to net ecosystem exchange of subtropical forest by using long-term eddy flux dataset, and found that the forest had a high sensitivity to the spring air temperature compared with the summer drought. The results could provide useful information to readers who are interesting in the carbon cycle. I have some comments on this manuscript before the publication.

Major: 1. Authors emphasized the influence of spring air temperature to the carbon fluxes. But, as mentioned in the section 3.1, air temperature and solar radiation showed similar anomalies in the spring time. Although the influence of air temperature could be more important than that of radiation, the influence of radiation anomalies could not

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be negligible. The authors should conduct the similar analysis shown in Table 3 and 4 for radiation-related variables (e.g., cumulative radiation 1-2 and 1-3), and show the results in the tables. The possible influence of radiation anomalies should be discussed in the section 4 and 5.

2. The paper showed simple regression analyses in Figure 4, 6, and 8, and concluded that those had high correlations. Part of this statement could be true, but the high correlations were likely caused by comparison between two different clusters (year of 2005 and 2008 vs other years). If the data are analyzed within each cluster, these simple regressions could not work well. I suggested that some threshold values may exist in temperature-related variables to control the carbon fluxes. Authors should mention this point in addition to the simple regression analyses.

3. Although authors explained variations of EVI were caused the seasonality of above-ground biomass in the section 3.2, the seasonal variation of EVI seems to be large, considering that the forest is classified as evergreen needleleaf forest. It is necessary to show some evidence that aboveground biomass seasonally changed or to discuss other possible cause by citing previous several researches of vegetation index in coniferous canopy.

Specific: Page 1416 line 12: Sentence of “this Ta sensitive period” is vague. Revise this sentence.

Page 1417 line 11-16: Specify the landscapes other than coniferous trees (e.g., agricultural fields?).

Page 1421: line 8-9: How was the effect of the ice storm to the carbon flux?

Page 1421: line 6: “precipitation and solar radiation” -> “precipitation and solar radiation, respectively”?

Page 1421 line 16: The sentence of “The cold early growing ... not so in 2008 (Table 1).” seems to contradict Figure 2b. Rephrase the sentence.

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Page 1421 line 17-21: The sentence of “Because the . . . Eq. (2).” is not results, and should be moved in the section 2.3.

Page 1422 line 15: “no significant drop”: The drop of EVI in summer 2003 was small compared with that in spring 2005 and 2008, but was significant. Rephrase the sentence.

Page 1423 line 22-23: The sentence of “the synchronous less .. warmer condition.” contradicts the sentence of “The favorable water and heat condition in 2002 brought the high levels of photosynthesis . . .”. Clarify that the early spring in 2003 was favorable or not.

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