

## ***Interactive comment on “Abrupt seasonal transitions in land carbon uptake in 2015” by Chao Yue et al.***

**Chao Yue et al.**

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We thank Matthias Forkel very much for the constructive comments. Please find attached our responses.

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Discussion paper



Review of "Abrupt seasonal transitions in land carbon uptake in 2015" by Chao Yue et al.

Matthias Forkel, 2017-03-08

**1. Does the paper address relevant scientific questions within the scope of ACP?**

The article by C. Yue et al. addresses annual and seasonal variabilities in global land carbon uptake and the relations with climate and vegetation. This paper is within the scope of ACP.

**2. Does the paper present novel concepts, ideas, tools, or data?**

The paper is based on well established datasets and methods to generate such data (CO<sub>2</sub> measurements, NDVI data, atmospheric inversion). The title and the abstract of the paper mainly highlights one finding of the study about "abrupt seasonal transitions in land carbon uptake". This finding is not really new (except the focus on 2015) but the results of the study are a good opportunity to remind the land carbon cycle community about such mechanisms and to point to the year 2015 as a remarkable example of such seasonal transitions.

**3. Are substantial conclusions reached?**

The entire study is focussed on anomalies of the land carbon uptake in the year 2015 relative to the period 1981 to 2015. Consequently, the conclusions are very specific for climate/carbon cycle mechanism in this year. To make this paper more interesting for the land carbon cycle community and to reach more substantial and less specific conclusions, I would recommend to perform similar analyses also for other years and to finally draw conclusions about general mechanisms in comparison to specificities in single years. In this point, I completely agree with Anonymous Referee #1.

[Response] We examined extensively the relationship between anomalies in land carbon uptake, NDVI and climate variations. These new analyses are incorporated in the substantially revised results and discussion section.

**4. Are the scientific methods and assumptions valid and clearly outlined?**

Overall, yes. For some datasets, I would expect scientific references additionally to the URLs from which the data was obtained (especially in Sections 2.2.2 and 2.2.3). The only exception is the analysis of NDVI data (Section 2.2.1): For example, the authors calculated "seasonal mean standardized NDVI". Although I have some experience with NDVI data (Forkel et al., 2013), I cannot imagine what this term means. How were NDVI values standardized? Why? Furthermore, mean NDVI values of winter seasons in northern

Fig. 1.