

**Topical Editor Decision: Publish subject to minor revisions (review by editor)** (21 Apr 2019) by Falk Huettmann

Comments to the Author:

Fairbanks Alaska, 18th April 2019

Dear Editors, Colleagues,

Thanks for the final version and submission with a detailed reply! I am happy to provide my review for ESSD-2018-113. Overall, the authors did a nice and great job to reply and address concerns expressed by the two reviewers. It's GOOD. However, a few typos and small errors are found in the rebuttal letter, as well as in the MS text. Considering the importance of this MS, its data and coverage, this looks somewhat careless and so I kindly ask to correct the ones in the MS text (see below for a list). Again, they are minor but they will make the MS and data much better.

Once done, we can move ahead into production and approve the MS for publication. I congratulate the authors and thank them for their work. This is a relevant MS and data set indeed.

Yours Falk Huettmann, Associate Editor

University of Alaska Fairbanks (UAF)

Thank you for your positive appreciation.

List of a few typos and English corrections in the MS text:

Thank you for the suggestions of corrections. In the new revised version of the manuscript, the modified sentences have been highlighted in yellow.

Abstract: LAI needs to be mentioned as a term first and then followed by the abbreviation. Please correct.

It is what we did in the first submitted version of the manuscript. For the revised version, we followed the suggestion of the first reviewer who gave the following recommendation:

*«Through the **abstract** there are three instances in which you define acronyms that are not used through the abstract. - then I would suggest to use the entire word and then when the paper start in the Introduction you define those acronyms.»*

Accordingly, we removed all the abbreviations from the abstract and then defined the acronyms in the Introduction section. Were we wrong ?

First phrase of the MS is very clumsy; please correct and use proper English; ideally two phrases.

As suggested, the first phrase was modified as:

*«The Global Climate Observing System, GCOS, identified the leaf area index, LAI, as one of the main terrestrial essential climate variables, ECVs, to be monitored from systematic long-term satellite and in situ measurements (GCOS, 2011; Bojinski et al., 2014). The LAI corresponds to the one half the total green leaf area per unit horizontal ground surface area (Watson, 1947; Chen and Black, 1992). Similarly, the plant area index, PAI, corresponds here to the above-ground areal extent of green*

*vegetation. Both LAI or PAI are related to the fraction of absorbed photosynthetic active radiation (0.4–0.7  $\mu\text{m}$ ) by the green vegetation, fAPAR (Myneni and Williams, 1994; Fensholt et al., 2006), and to the canopy green cover fraction, fCover, i.e. the amount of green vegetation distributed in a horizontal plane (Carlson and Ripley, 1997).»*

Line 9: needs plural of ECV

- corrected

Line 17: 'on' reads odd in that phrase, please correct.

The phrase

*«The Sahel is a vast ecoclimatic and biogeographic region extending south of the Sahara on 6000 km long and 400-600 km wide, from the Atlantic Ocean to the Red Sea (Le Hou  rou, 1989) »*

has been changed to:

*«The Sahel is a vast ecoclimatic and biogeographic region extending south of the Sahara over 6000 km long and 400-600 km wide, from the Atlantic Ocean to the Red Sea (Le Hou  rou, 1989)»*

Line 43: in situ should likely be in italics.

- Corrected

Page 5 line 15 and line 30: paragraph spacing looks odd, please check and make consistent as needed.

- Checked and corrected

Throughout the MS text authors refer to LAI and always use both: the full term and the abbreviation. I suggest to introduce LAI once and then use the abbreviation only. It's consistency what is needed here. Please check and correct; can likely be done easily with find-replace.

- Checked and corrected

Page 7: Section 4.1 needs to be 5.1; please check and correct.

- Thank you for noticing, corrected.

Page 7: Section 4.2 needs to be 5.2; please check and correct.

- Thank you again for noticing, corrected.

Conclusion: Reads like an abstract but not a conclusion. Please focus on the conclusion (what is concluded from this work ?!). I suggest to change a phrase or two to achieve it.

As suggested, we changed the last sentence of the conclusion:

*«Among others, this data set can be used to validate moderate resolution satellite products, to establish relationships between satellite vegetation indices and vegetation variables, to evaluate land surface models, to interpret surface fluxes, and above all, in association with other data sets to study the decadal response of semi-arid ecosystems to the current climatic change.»*

Acknowledgements: This is in the discretion of the authors, but I would always thank the reviewers (with name or without), it's more transparent and considerate that way. Anyways, that's up to the authors.

As suggested, the acknowledgements have been changed to :

*«The two reviewers and the topical Editor who provided helpful suggestions and comments on earlier versions of this manuscript are gratefully acknowledged.»*

Figure 1: Legend needs to be consistent (Town should be in lower case then)

On the map of Figure 1, the name 'Hombori' has been changed to 'HO'. We hope it corresponds to your recommendation.

Figure 5: Both have exactly the same R2, yes ?

The actual R2 values are approximately the same, more precisely  $R2=0.7367$  for Agoufou, and  $R2=0.7403$  for Kelma. Accordingly, we decided to give the same value '0.74' on both figures.

Finally, in my view, generalizing from a few sites to all of Mali etc should be done and stated very carefully – specifically when not modeled. So perhaps authors can add a phrase to that effect; just to make sure.

The objective will be more to extend these preliminary results to the Sahel belt and to similar semi-arid ecosystems than to the whole Mali which exhibits from North to South, very different climate and ecosystems, with the Sahara desert to the North, to the tropical moist forests in the South.

We slightly modified the end of the conclusion by adding more general perspectives related to the monitoring of the 'greening' Sahel.

*«Among others, this data set can be used to validate moderate resolution satellite products, to establish relationships between satellite vegetation indices and vegetation variables, to evaluate land surface models and to interpret surface fluxes. More specifically, this data set can be useful to interpret the current greening trend that is observed widely over the Sahel since the 1980s' drought.»*

Non-public comments to the Author:

NA, but well done!