

Interactive comment on “Evaluation of satellite based indices for primary production estimates in a sparse savanna in the Sudan” by M. Sjöström et al.

G. Wohlfahrt (Referee)

Georg.Wohlfahrt@uibk.ac.at

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The authors report on a study where they have used two remote sensing indices calculated from MODIS reflectances to infer gross primary production, measured by means of the eddy covariance method, of a savanna site in Sudan/Africa.

The topic of the manuscript is relevant as there is increasing interest in estimating carbon cycle components by means of remote sensing in order to track changes in the terrestrial source/sink strength. The manuscript makes a valuable contribution to this topic, is well written and organised and of interested to the readers of biogeosciences.

My only serious comment concerns the lack of an appropriate analysis which motivates

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the use of an area of 3x3 pixel around the flux tower (even if this is a standard product delivered for flux towers). The flux measured at an eddy covariance tower originates from the so-called footprint, the size of which changes with wind direction, wind speed and atmospheric stability. The extent of the footprint should be taken into account when choosing the area over which reflectances are measured - if not it cannot be guaranteed that remote sensing indices and the fluxes match. I thus suggest the authors conduct a footprint analysis with their data, for example by using the simple footprint model by Hsieh et al. (2000). Based on these results the authors may then (hopefully) justify their choice of pixels - the fact that results do not change much when only the center pixel is used is not convincing. In this context I wonder whether it would not be appropriate to indicate the variability among the 3x3 pixels with standard deviations in the appropriate figures.

Detailed comments: (1) Title: why not use "gross primary production" - this is what the manuscript is about (2) p. 2988, l. 23: "estimates of carbon" - too vague - pools/fluxes of carbon; carbon - CO₂, CH₄, VOC ? (3) p. 2998, l. 19: this is rather a summary than a conclusion (4) p. 2999, l. 16: who are the authors of this reference ? (5) Table 1: what does the lowermost line in the table refer to ? (6) Figs. 2, 3, 5, 6: why not express GPP as an 8-day daily average with units of gC/(m²d) instead of 8-day sums - this would make comparisons with other studies much easier

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