

Comments for Manuscript: Earth System Science Data

Article ID: [essd-2024-184](#)

Title: Above ground biomass dataset from SMOS L band vegetation optical depth and reference maps

In the manuscript, to improve the accuracy of the AGB estimates, the authors produce a harmonized AGB dataset from the L-VOD and analyze the impact of different factors on the AGB/VOD calibration. Global maps derived from SMOS L-VOD and reference AGB maps are thought to be of fundamental importance to address the uncertainty in the estimates of AGB spatial distribution and temporal evolution. Averaging the SMOS L-VOD over a year and linking it to a pre-existing AGB map is a well-established method to derive a spatial relationship between both quantities. After temporal extrapolation of this relation, global AGB time series are derived from the L-VOD, allowing to retrieve vegetation biomass values up to 300 Mg ha⁻¹ from 2011 onwards. Overall, the paper is very well written and scientifically rigorous.

My only recommendation is that an additional analysis/discussion be provided showing the uncertainties of input datasets, methods, and final results.

Here are my concerns about this manuscript:

1. The section of Abstract is too lengthy now, which should be written in a pithy style, with some specific quantitative results.
2. The logical structure of the manuscript is somewhat confusing, such as the methods and results section. It is recommended to consult an expert for further polishing.
3. In Discussion section, please give evidence to support these findings in the manuscript.
4. In Conclusion section, the cited references should be deleted. Meanwhile, give some specific numbers to conclude the research results.