Reviewer 1 comment:

Plants live or dead and their residues are the combustible materials that funnel wildland fires. The diversity of plants or even of vegetation types prompted the need of reducing them to a number of sizable classes, i.e. fuel types, that could be manageable for a number of practical uses in relation to fire modelling. Pettinari and Chuvieco present here a world classification of fuels using the Fuel Characteristics Classification System. The approach is not novel, and has been previously applied to other areas, including a full continent, by various authors including those of this paper.

Your reply:

Please note that the main author of the other paper was the same person, as both articles are part of the same research. The Pettinari et al. (2014) article was a first attempt to derive a global product using FCCS, taking a continent as a study case, and it allowed us to test the method and include several improvements for this global product that are specified in the manuscript in Section 4.1.

Editor comment:

Please make sure the added value of this study in comparison to your earlier paper is clearly stated in the introduction, e.g. what is the new objective to make clear it is not repetitive and what methodological challenges arise with scaling up your product to the global scale.

Reviewer 1 comment:

As a validation exercise, the authors related their product for one of the variables they computed (e.g. biomass) using other products independently derived. While their results are more or less comparable, this cannot be considered as a true validation. Actually, some of the papers they cite did such a validation against true ground data and highlighted the differences between the various products and the true ground data. Having a global fuels map is something very much needed, but the basis of such map need to be firm, and to achieve that, real validations are needed. Without that, being this exercise a notable one, it falls short of the rigor that it is needed to be accepted as a true progress in this field. I can but encourage the authors to use existing database to test their results against field data, at a minimum in a number of representative sites and, at a minimum as well, for at least one of the main purposes for which this product is supposed to be used. After this is made the paper may be subject to critical review.

Your reply:

The comparison of our results with the biomass products was not a validation, but a first assessment of our results, which we consider to be acceptable at this stage. Any global dataset requires a generalization of the parameters, and that will make it unfeasible to validate the results in local sites. Regarding the test of the results for some of the main purposes of the product, we are currently working on another article using this fuelbed map, along with climatic information, to obtain fire behaviour parameters such as reaction intensity and compare them with other related information (fire radiative power) that could improve the assessment of our product. The description of the inputs used, the methodology and the results entail the writing of another article, though, due to the extent of the information to be provided.

Editor comment:

Your product requires a decent and clear validation, avoiding circularity or comparing modelled variables against data used for parameterization for example. Please revise your manuscript accordingly, where you describe the source of data used to validate which variable of your product and at which spatial scale this was done. If site or plot data are not representative, because they do not match conceptually, or global data of the required variables are not provided then use other source of data. Explore and explain how products such as Carvalhais et al. (Nature 2014) for biomass, litter and soil carbon data can be used. Either way, the validation procedure should be clearly described in the revised manuscript and data demand on what needs to be done to allow for a validation at the global scale

which is obviously a huge data gap. This information is very important to put the quality of the product into the right context.

Reviewer 1 comment:
P11 19-20: A critical point here is to determine the validity of the RS methods to assess biomass. The paper cited indicates that there are large discrepancies between RS (you use both approaches used in that comparison) and ground-based methods. It is unclear how these discrepancies so fundamental can be reconciled.
Your reply:
The two biomass maps described in the cited paper were derived from both RS and ground-based information (Mitchard et al., 2013). The authors of both maps used field plot data to obtain relationships between the field AGB information and GLAS footprints in order to extrapolate that AGB to the GLAS covered area. In that sense, the authors do not see the differences between the two sources of information as discrepancies, but as complementary data that can very well be used together.
We also believe that approach to be useful, being one of the main advantages of the use of RS for different applications: the possibility to extrapolate field plot information into large areas using the data provided by RS, always acknowledging the limitations of these approaches, which are being reduced as more research is done in this field.

Editor comment:
Please include this explanation in the manuscript text.

Reviewer 2 comment:
The application of the results of this study for fire behaviour prediction is justified if local more detailed data are not available. The Authors should nevertheless explain how this downscaling can be performed for a smaller area if a more detailed fuel map is required.
Your reply
As we have stated in the other comments and in the text (P17 L21-24), the objective of this map is for global and regional applications, and is not intended to be used for local fire behaviour prediction. The global fuelbed parameters were created using mean information of canopy cover and height globally, as well as several representative existing fuelbeds of Photo Series. To obtain a local fuelbed map, we would suggest creating a custom map with the same methodology for the creation of the global map, using the same data sources (or even better, local sources of information if available). In that way, if mean values need to be obtained they would only include local variation and would better describe local conditions. Part of our current analysis of automation will tackle this issue.
Editor comment:
Please include this explanation in the manuscript text.

Reviewer 2 comment:
Remarks to other comments: Regarding the comment of P. Fernandes that the fact that the authors used the FCCS approach to select and present their fuel bed parameters is a limitation of the work and of its applications. I understand that the parameters that are provided are basic ones and can be used by other fire behaviour models rather than Rothermel. For example the assessment of crown fires requires parameters that are available in this database and not present in common databases. I recommend that the Authors justify better their option of selecting FCCS and explain if it is or not a limitation of the work.
Your reply
We appreciate your comment. We have included some more information on the reasons for using FCCS in the answer to Dr. Fernandes (below), which could also be included in the text.
Editor comment:
Please include this explanation in the manuscript text.

Editor comment to your reply to the interactive comment by P. Fernandez:
Your explanation of the validity and conceptual limitation of your product in reply to the interactive comment by P.Fernandez is very important. Please integrate these points in your manuscript.