Biogeosciences Discuss.,
https://doi.org/10.5194/bg-2020-409-SC1, 2021

Biogeosciences Discussions
Open Access
EGU

Interactive comment on "Quantifying the Importance of Antecedent Fuel-Related Vegetation Properties for Burnt Area using Random Forests" *by* Alexander Kuhn-Régnier et al.

Meg Krawchuk

meg.krawchuk@gmail.com

Received and published: 21 February 2021

The manuscript "Quantifying the importance of antecedent fuel-related vegetation properties for burnt area using random forests" quantifies biophysical drivers of burned area across the globe with a particular focus on understanding how characterization of fuel build-up (and likely curing of fine fuels) in the months leading up to fire contribute to prediction in variability of area burned. The study is important and timely in that it aims to improve models of fire activity at a global scale, relevant to global fire-vegetation-climate system. The results of the study improve our knowledge of fire-fuel-climate relationships and the geography of them. In general, this is a robust study that appears

Printer-friendly version

Discussion paper

to focus mostly on the novelty of the modelling aspects rather than novelty in what is learned ecologically. Along the lines of the latter, ecological learning and context, I feel the authors could improve the introduction and discussion substantially for the modeller and non-modeller audience by delving in more depth to the wide range of existing fire studies that have asked this same question about antecedent conditions and fire activity, and placed the work and findings within that context.

Also, many of the figure captions are very hard to digest. Please consider providing the take home message to the reader to help them work through the often dense load of abbreviations and description. In other words, hold the reader by the hand. E.g., for most readers, Figure 6 caption is close to cryptic?

Line comments:

Title. I wonder if a title that describes the key findings might be more interesting than the current, methods-related title?

l. 21. The sentence on human impacts seems out of place with flow of ideas.

l. 27. This jump between fire events and fire regimes would benefit from more detail. Perhaps avoid the fire regime terminology here, and focus on events only?

l.29. not clear what is meant here by climate becoming increasingly important. It is important. Do you mean more-so that climate change will increase fire activity/severity?

ll.19-32. This paragraph has a lot of material packed in that would benefit from clearer organization and focus.

ll. 53-62. Seems like connecting the ideas to the global work on a similar topic e.g., by Krawchuk and Moritz (2011) https://doi.org/10.1890/09-1843.1, and references therein, would be helpful and warranted. I know this might seem self-centred, but it's actually pointedly relevant.

l. 105. Why would you fill those data gaps with the minimum value? I don't easily follow

Printer-friendly version

Discussion paper

the rationale. If less than 50% data, should these not be excluded from the dataset, or at least a median or mean be used?

ll. 122-125. I can see what you're trying to do with these simplifying equations, but they still need further explanation to help the reader understand the process.

Section 2.4 There are portions of this section that I don't understand. This is not your fault, it's just a bit over my head. But wanted to mention that I'll just need to trust the authors that the calculations are appropriate and correct.

ll.209/210. Interesting that the model can't capture the zeroes. I suspect this is largely based on uncertainty with the ignition-related variables?

l. 234. Interesting that there isn't a pattern.

Ll 252/253. This is very neat. And the geography is interpretable. Excellent.

ll. 299/300. Could you please make it clearer what the new learning is that we gained from this analysis. There is quite abundant literature on antecedent climate/vegetation effects on fire. You do have a novel contribution, but please highlight what it is.

l.307/308. These temporal scales of fuel build up are on the order of 50-100 years, so not really a relevant comparison to your 1-2 years timescales, is it?

l. 346. I don't follow this statement "Moisture-limited regions were more strongly affected by suppression of fire at instantaneous timescales". From what evidence is this statement based, how does this fit into your analyses and interpretation? What does it mean? Might be because this is a confusing use of the term "suppression".

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2020-409, 2020.