

Clim. Past Discuss., referee comment RC2
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Comment on cp-2021-26

Anonymous Referee #2

Referee comment on "Five thousand years of fire history in the high North Atlantic region: natural variability and ancient human forcing" by Delia Segato et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-26-RC2>, 2021

This manuscript entitled **5 kyr of fire history in the High North Atlantic Region: natural variability and ancient human forcing** by Segato and colleagues, is a timely executed study of past biomass burning reconstructed from levoglucosan, BC, and ammonium and associated drivers, in the Nord Atlantic Region based on an ice core record from Greenland. The manuscript is based on quality data and statistical analysis, generally clearly written, and well referenced.

General comments

Although the manuscript reads well, there are many typos and unclear sentences, therefore I ask the authors to carefully check the English. The authors described in detail the association of biomass burning with climate and humans, but they do a less good job at linking biomass burning with the vegetation more systematically. For example, vegetation is not just vegetation, but it is composed of various species /assemblages that burn differently. At the minimum, the authors should work on the comparison of this record with the pollen records from Greenland and Iceland. Results and methods are also mixed in chapter 3.3.

Specific comments

- A fine suggestion, but where is the link with biomass burning?

L43 the increase in what?

L53, l.250, l.319 regarding Siberia please see a recent paper covering this region
<https://www.sciencedirect.com/science/article/abs/pii/S0277379120304571>

l.174 ff. This chapter is a mix of methods and results. Please have a similar chapter i.e, statistical analysis at the Methods, where you describe what you did and why and leave here (3.3) only the text that belongs to Results. For example l. 175-182 read like methods.

- 223 5-4.5 kyr is not exactly early Holocene
- 239, 254, and many other places, please report the age in a consistent manner not mixed.
- 287 here is the only place you mention the role of vegetation on biomass burning and then a bit in the next chapter 4.1.3. If you know that Island may have been the main source of levoglucosan, and surely also Greenland, why not checking the pollen /plant macrofossils literature from the two regions and discuss a bit more on the potential influence of the amount of biomass, the type (composition) and fuel moisture on biomass burning during the past 5 kyrs and not only snapshots in time. It would make your paper more complete. Look how nicely this comes on 4.1.3, so why not also before Viking colonisation.

L 299 typos

l.303 and l. 306 what do you mean by 25 % vegetation? Tree cover? Or completely loss of all vegetation types i.e, including shrub and grasslands.

- 303-305 sentence unclear, please rephrase

L314 could you be more specific on the land cover conversion?