Biogeosciences

Discussions

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Interactive comment on "Stable isotope signatures of Holocene syngenetic permafrost trace seabird presence in the Thule District (NW Greenland)" *by* Sebastian Wetterich et al.

Anonymous Referee #1

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Review of ms 'bg-2019-71' submitted to Biogeosciences journal. The manuscript by Wetterich et al. is an interesting attempt of evaluation of the role of seabird as a factor controlling Arctic tundra development. It try to link seabird colonization with climate change over the last 5,000 yrs. The manuscript is well written, easy to read and understand. However, I would ask for some more explanation and small correction, mainly concerning sediment dating and presentation of analytical results.

1. The radiocarbon dating and age-depth modeling could be describe more detail. I know, that it was a topic of paper by Davidson et al. 2018, but still I have some doubts:
- Some samples for dating were collected from significantly thick core segments (even

10 cm long for topmost part of SI 1). Do author consider depth uncertinity in age-depth models? It can be significant. - Please give some details on geological settings. According to my knowlage, at least in Saunders Is there is a lot of carbonate rocks. It could substantially impact radiocarbon dating ('old carbon effect), since bulk sediment/peat samples were dated. How did the authors did overcome this issue? - What sediment/rocks were in the cores' basement? Are peat profile represent entire biogenic sedimentation on the spots? 2. How were the cores divided into zones/periods? What were the criteria? Was the division evaluated with statistical analysis (is it significant?) 3. Please give more detail on subfossil Testacea analysis methodology, namely how big samples were taken to analysis, counted quantities etc. I would see 'classical' percentage diagrams rather. 4. The values presented in the Table 2 (results for food and faeces) cannot have uncertainty 0.0. Please report at least measurement uncertainties. I hope, that in means calculation authors include measurement uncertainty and applied 'error propagation rule' for mean uncertainty calculations.

Small corrections: - Table 2: in row all GL zones should be '4400 to 540' - Page 1, row11: 'ground at sea' sounds tricky, consider change to 'area' - Page 5, row2: please report accuracy in ‰

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