

## ***Interactive comment on “Sources and characteristics of terrestrial carbon in Holocene-scale sediments of the East Siberian Sea” by Kirsi Keskitalo et al.***

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We are grateful to all the three reviewers for their comments on the manuscript. These constructive and overall positive comments have improve the manuscript during revisions. The referee comments are given first and our response follows. All references to line numbers refer to the revised track-changes document. Please find the revised manuscript and supplementary information as track-changes documents attached (one .pdf file).

Reviewer #2, Thomas Cronin

C1

### GENERAL COMMENTS

“This is an excellent, well-written paper. Minor queries are made as inserted comments in the attached PDF. Minor revision is needed, but an organic geochemist should also read the paper.”

### RESPONSE

Thank you for the positive and supportive comment.

### SPECIFIC POINTS

1) “This sentence “The CuO-derived lignin and cutin product” sounds like all readers will know what you are talking about, can you expand and clarify a little.” (L24-26)

An explanation about lignin and cutin products has been added to the text (L25). There is also a method description given in Sect 2.5 and a more detailed explanation of lignin and cutin compounds in lines 283–286.

2) “hemisphere” (L34)

The word hemisphere has been added to the text for clarification (L34).

3) “cite Tesi 2016 a before 2016 b ?” (L44)

Thank you for your comment. Citations regarding the Tesi et al. (2016) papers have been changed accordingly (i.e. Tesi et al. 2016a cited first).

4) “Also new papers in CP by Jakobsson and Cronin” (L101)

Thank you for the reference, we have added Cronin et al. (2017).

5) “less sea ice than when? where?” (L104)

The word less is referring to the period when the sea is covered in ice compared to summer months. The sentence has been rephrased (L110–112).

6) “due to its...” (L380)

C2

The change has been made accordingly.

7) “perhaps since the authors make a direct comparison between early Holocene and future, additional text is needed discussing other aspects of this comparison [a widely studied topic in terms of the EH Thermal maximum, Kaufman, others]. For example, atm/ CO<sub>2</sub>, rate of SL rise, Arctic early holocene temperature and sea ice regimes. I'm not asking for a big review, just a little more appreciation of the literature on this topc.” (L432-434)

We agree and decided to add background information regarding the rate of the sea level rise, temperature and sea ice conditions in the beginning of the Holocene to the background and study area section (Sect 2.1) of the manuscript (L102–106). We have left the conclusion part as it originally was in the manuscript.

8) “here and in the text it would be nice to discuss the rate of SL rise in the early Holocene since few papers address this important time when, globally, the final 20-25 meters of SL rise was happening [versus MWP1a, MWP1b]” (Figure 3).

Thank you for your comment. We have added a sea level rise rate during the early Holocene in the text to provide this background information (L102–103).

Please also note the supplement to this comment:

<https://www.clim-past-discuss.net/cp-2017-20/cp-2017-20-AC3-supplement.pdf>

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Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2017-20>, 2017.