

**Authors' response on 'Reversible ice sheet thinning in the Amundsen Sea embayment during the late Holocene', by Balco, Brown, Nichols, Venturelli et al.**

---

Dec 19, 2022

Here we index the revisions proposed in the authors' responses to locations in the revised MS. The line numbers refer to the revised manuscript, *not* the latexdiff comparison of original and revised versions.

**Briner review:**

1. Clarify reasoning about irreversibility/grounding line position vs. thinning in Section 1 and elsewhere
  - Revised text and broke out a new paragraph at page 2, lines 5-22.
2. Explain clearly about cold-based ice/no erosion during late Holocene cover in Sections 1 and 2
  - Noted that the ice-bed interface is frozen at p. 9, line 8+
  - Added a paragraph with a detailed discussion of subglacial erosion at p. 14, line 20
3. Additional context for 'irreversible' in Section 1
  - Included in revision at p. 2, lines 5-22
4. Clarify cosmogenic-nuclide vs. OSL sensitivity in Section 1
  - Revised text at p. 2, lines 22-31
5. Clarify that ice velocity representation is nonquantitative in Fig 1 caption
  - Edited Fig. 1 caption
6. Clarify that profile axes are truncated in Fig 2 caption
  - Edited Fig. 2 caption
7. Remove 'stable' on p. 6
  - Corrected at p. 4, line 33
8. Provide more context for loose rock recovered in fourth borehole
  - On further investigation, our response to this review comment was inaccurate. We went back and looked at notes and photos and in fact we could not verify that basal ice was present below the rock fragments that were recovered. We now make this clear at p. 10, lines 4-6.
9. Clarify detection limit issue for C-14

- This is now clarified at p. 12, lines 25-26. In addition, we discussed this issue at length in the response to the Lifton review.

#### 10. Clarifications and editing for concluding remarks in Section 6

- We thoroughly revised the concluding section on p. 21.

Finally, this review requested photos of the rock cores. Although, as we indicate in the response, these are not actually very interesting – they just look like rocks that could be from anywhere – and they are already available online, it would be possible to include core photos in the supplementary data. The supplement is currently 7.1 MB, and the core photos would add an additional 60 MB. Please let us know if you would like us to add these photos.

#### **Lifton review:**

As we discussed by email, (i) we included a thorough response to all of the questions and comments in this review in the authors' response, but (ii) as all the material in this response is highly technical and relevant only to certain aspects of the C-14 measurements, we have not included it in the main text of the paper. As we also discussed by email, we included a citation to the review response at p. 12, line 30. Finally, as indicated in the response, we added to the supplement all the MATLAB code needed to generate all figures and results shown in the response, as well as the requested data on Tulane measurements of the CRONUS-A standard. Although we did not revise any of our blank correction calculations as suggested by Lifton, we believe we have thoroughly explained the reasoning behind the approach that we have adopted, and we believe we have addressed all the concerns in his response in detail.

In addition, this review made 4 minor typographical corrections and suggestions (the 5th relates to technical aspects of C-14 measurements as discussed above), and these have all been corrected in the revised MS.