

“Thermal legacy of a large paleolake in Taylor Valley, East Antarctica as evidenced by an airborne electromagnetic survey”

by Krista F. Myers et al.

Response to Reviewer Report #1, Steano Nerozzi & Editor, Dr. Liz Bagshaw

Initial response from authors: 4 June 2021

Final response from authors: 24 June 2021

### **Editor Comment:**

Dear Ms. Myers and co-authors,

Thank you for the submission of your response to the Reviewers' comments. I am pleased to see a positive set of reviews, with some constructive suggestions that you have addressed in your initial response. The revised Figure 6 is a significant improvement. I am happy to accept your paper for publication in the journal, subject to the minor technical corrections listed below.

Reviewer Nerozzi assessed the revision and makes the following comments on the revised manuscript:

Fig. 5: I'm personally against connecting dots in a plot unless there is a good reason to do so. This is because that assumes a linear and constant change between two measurements, which is likely not the case given the high interannual lake level variability. However, I'll leave the choice of keeping the lines or not to the authors.

**Author Response: We appreciate this comment, and we have removed the lines from the lake level plot (Figure 5) because we agree that it is incorrect to assume a linear and constant change between two measurements of lake level.**

- Fig. 6: The choice of colors for resistivity is definitely better than the previous version of the same figure. However, my recommendation is still to opt for a more linear scale - the jump in resistivity between brine and permafrost is dramatic (100

to 1000 ohms over a very short distance) and I bet it would still show up even with a very simple visually linear scale.

Therefore I ask you to consider these points carefully before uploading your final revised manuscript. I know you have invested significant time into redrawing the figures (especially Fig. 6). If they can be modified again without too much difficulty I would suggest following the Reviewer's suggestions to increase the accessibility of your paper to the widest possible audience.

**Author Response: We are glad to hear that the reviewer and editor agree that the color ramp is an improvement, however we are not going to revise the figure with a linear color ramp because a) A linear color would produce images where the structure is visible, but the values on the figure would be completely unreadable. Also a linear scale would be extremely difficult to capture the variation across three orders of magnitude. The log scale balances seeing contrasts in both the low and high resistivity limits (which is needed in this region), and b) If we were to make this edit, it would require re-doing the figures in the specialized inversion software (Workbench), which would take a lot of time. We appreciate that the reviewer and editor acknowledge that this type of modification is not quick, which is why we are not going to make this revision.**

Please do let me know if you think this is possible within a reasonable timescale, or whether you would prefer to keep the figures as they are. I now request that you upload your updated manuscript including the changes detailed in your response. Thank you for your contribution to The Cryosphere, I look forward to reading your revised manuscript.

Kind regards,  
Dr Liz Bagshaw