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Interactive comment on "Post-glacial flooding of the Beringia Land Bridge dated to 11,000 cal yrs BP based on new geophysical and sediment records" *by* Martin Jakobsson et al.

Anonymous Referee #3

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Jakobsson and co-authors present findings from two marine cores in the Bering Strait, of which one is used to constrain the timing of the flooding of the Bering Land Bridge. The sedimentological data are presented and interpreted in conjunction with seismic profiles, and suggest a transition from a near-shore to a marine continental shelf environment, interpreted as the flooding of the land bridge, at around 11 ka. The new data are an important contribution to the discussion about the timing of the opening of this gateway, which has strong implications for both ocean circulation and human migration.

Overall, the findings are presented well and the text is written clearly. However, I found that there is an imbalance in the level of detail given in the different subsections. The

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Discussion paper

description of the methods is very detailed (in places possibly too detailed, for example in section 2.3), as is the description of acoustic stratigraphy (section 3.1). For section 3.1 it would be good to introduce the importance of this lengthy description (if deemed necessary) with 1-2 introductory sentences. On the other hand, I find the discussion of the geochemical data rather short. For example, there seem to be differences in timing between the shifts of different parameters. Is this significant and meaningful? Similarly, I would have wished some more depth in the discussion of the broader implications (page 11). For example, in lines 25-26 on that page, the authors state that "the opening may have well boosted primary production and enhanced the productivity of higher trophic organisms for instance along the American west coast". I am not sure what the authors mean exactly (maybe American east coast?), and they should look for evidence for this, as well as compare to data from the Arctic. The same could be said for the connection to AMOC.

Regarding the discussion and presentation (Figure 2) of sea level data, I was missing some more recent references and data, as well as mention of the discussion surrounding MWP-1b, due to the different findings in Tahiti and Barbados (e.g., Abdul et al., 2016, Paleoceanography, as well as the comment by Bard et al. and the reply).

The relationship between the two cores should be made clearer. State somewhere why 2-PC1 is shown, if it only covers the late Holocene. Regarding the age models: Was the tephra not found in core 4-PC1? The implications of the assumed reservoir ages for the interpretation should be discussed in the discussion section. Why is the reservoir age assumed for the whalebones so different from that assumed in this study, and what are the implications for the comparison?

The beginning of the discussion section on page 8 sounds more like introductory text. On the other hand, the discussion of the seismic stratigraphy should be introduced briefly (e.g., something like "The seismic data allow us to…").

On page 9, the discussion of age constraints (line 19-20) should be moved below the

discussion of the geochemical changes, i.e., before the last sentence of this paragraph.

Figures:

I like the figures and think they are useful, but their order should be changed slightly. If Figure 3 was moved back, behind current Figure 6, the order would be more logical: First the bathymetric setting (3+4), then physical properties in relation to seismic lines, and then comparison of physical properties with geochemical data. I also think age-depth plots should be included.

Figure 4: Indicate direction (especially since it is opposite to that in other figures). The last sentence of the legend can be omitted, as the line is clearly labeled in the figure.

Figure 6: Labels “A” and “B” are missing. The overlay of the core data onto the seismic profile does not seem necessary. Line 6: “resampled”.

Figure 8: I am not sure if this figure is really necessary, but it should not be shown as the last figure, being entirely based on model results from a different study. If anything, it should be part of the introduction. The figure is furthermore missing a legend.

Minor comments:

P. 2, L. 21: According to Table 1, the literature dates begin at 10,300, not at 10,200? Make the core names consistent throughout the manuscript.

P. 4, L. 31: What is the error of the d13C measurements?

P. 6, L. 9-12: Could this difficulty be an explanation for discrepancies with the ARDEM bathymetry?

P. 7, L. 7: “. . ., but increases substantially. . .”

P. 7, L. 8-9: proximal-proximal?

P. 7, L. 10: “. . .at around 400 cm”

P. 7, L. 17-18: Check citation style

P. 7, L. 30: What is meant by a peak in sediment bulk density and p-wave velocity? Do the authors refer to the decrease?

P. 9, L. 22: "... to show when silicate-rich Pacific waters" (I am assuming that the bio-silicate is produced at the site and not imported).

P. 11, L. 23: What is meant by "the opening of the Bering Strait short-circuits the transport of Pacific surface water to the North Atlantic..."? A better word might be "allowed"?

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