

# ***Interactive comment on “Reconstruction of Holocene oceanographic conditions in the Northeastern Baffin Bay” by Katrine Elnegaard Hansen et al.***

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This is a solid contribution to our increasingly detailed knowledge of changes in the oceanographic and glacial conditions in Baffin Bay and especially along the W Greenland margin. I do wonder about the continued use of a  $140 \pm 30$  yr ocean reservoir correction without some statement or recognition that this undoubtedly changed throughout the Holocene as shown by several papers using the Iceland tephra as key markers (e.g. Ericsson, Kristjansdottir)—because of that it seems to me sensible to use a  $\text{OCR}=0$  and a larger error estimate. That being said I doubt that this would make any substantial changes in their chronology or conclusions. Key aspects of the paper

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are the plots (Figs. 4 and 5) of the downcore changes in the % of foraminifera (section 3.3). The paper identifies (p. 10) “. . .four ecozones. . .” Which are identified on three two figures. However, I saw no discussion on how these 4 zones were identified. Were they identified by the “eyeball” method, constrained clustering, or. . .? The paleoenvironmental interpretation (Section 4) is primarily based on the foraminifera and I wonder would it not be more efficient to directly combine section 3.3 and 4 as the discussions of the Ecozones are inferring aspects of climate. In terms of the changes in the Holocene marine climate this paper, and I admit others that I have been a co-author on, neglect to mention the work in the 1970’s and 1980’s on the importance of marine mollusk faunas that were sampled and dated, often as part of efforts to date glacial isostatic uplift of the West Greenland and East Baffin Island coastal areas. I am thinking in particular of the 1st appearance of *Mytilus edulis*—the blue mussel (see refs below and references therein). On the east coast of Baffin Island *Mytilus edulis* invaded coastal waters ~8.2 ka 14C (~8.7 cal ka) and was present until about 3 ka . Another set of data that is worth looking at are the dates on the influx of wood to SW and W Greenland coasts carried around Greenland in the East Greenland and then West Greenland currents. These data would add important details that could be included on the summary figure Figure 8. On this figure and in the text they might consider what the effect might have been of the series of meltwater and sediment discharges through Hudson Strait (e.g. Barber et al., Jennings et al., ).

I often think that the detailed XRF-based geochemistry available is a method looking for answers. It would be interesting to compare the XRD mineral compositional data with the XRF data to gain a more detailed understanding of both (this was proposed and a method outlined by Eberl in the program “Hand Lense” USGS).

Conclusions: I enjoyed reading this paper. It provides valuable data to the growing body of literature documenting the complex of glaciological and oceanographic changes that effected the NW and W Greenland shelves and by inference the “downstream” margins of Baffin Island.

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