

## ***Interactive comment on* “Relationship between Holocene climate variations over southern Greenland and eastern Baffin Island and synoptic circulation pattern” by B. Fréchette and A. de Vernal**

### **Anonymous Referee #2**

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#### General Comments

I read above mentioned manuscript with great interest. This study presents an original approach of climate history, by comparing both terrestrial and marine results. I do think that this manuscript is suitable for Climate of the Past, however, there are few questions and I would appreciate an answer to these questions in the revised manuscript.

#### Specific comments

Pages 881-82, l. 25-27 and l 1-4. Fig.1 The map of location is not very detailed and

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very small. One could wonder where the studied sites are, in spite of the geographical coordinates. For instance, Qipisarqo is in South Greenland. This part of Greenland is also known for archaeological reasons: the Norse colonization and the creation of the Eastern settlement between 986 and 1450 AD. Some palynologists have performed pollen diagrams in this area. Is Qipisarqo very far from Eastern settlement? Is this site enough far away from zones of human impact? There is no information about the size of the lakes: are they big or small lakes? What is the size of the catchment area of these lakes? What is their depth? This is of a great importance to understand pollen rain: a big lake has a regional pollen rain representation and a small lake a local pollen rain representation.

Page 884, l. 5-8, and Supplementary Figure 1. Pollen sums are about 500 grains. Please add a sentence in the legend explaining what is included in the pollen-100%-sum. Spores, aquatics and foreign pollen grains should be excluded.

P 889, l. 1-5 Pollen assemblages dominated by *Betula* and *Ericaceae*. There is possibility to make the difference between pollen types in the *Ericaceae* family : *Empetrum* type, *Vaccinium* type and *Ericales* for indeterminate *Ericaceae*. One can regret that the different pollen types were not made by the pollen analyst. It is surprising (but not exceptional) to find *Ericaceae* as dominant taxa in pollen analysis. In Schofield et al., 2007\* (Qassiarsuk area), modern pollen rain analysis shows that *Vaccinium* type, *Empetrum* type and *Ericales* are usually underrepresented taxa. This fact should be underline. The following comment is more a reflection than a real question. Have you noticed that in Fredskild diagrams (Isoëtes, *Spongilla*, Klofto), when there are high percentages or influx of *Ericaceae*, there are also more important percentages or influx of *Alnus*? *Ericaceae* and *Alnus* seem to be associated. Do you know the ecological conditions of *Alnus* in Greenland today? (\*J. Edward Schofield<sup>1</sup>, Kevin J. Edwards and J. Andy McMullen. 2007. Modern pollen–vegetation relationships in subarctic southern Greenland and the interpretation of fossil pollen data from the Norse landna'm. *Journal of Biogeography*, 34, 473–488.)

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Pages 891-892, l. 13-26 and 1-11 The timing of the migration of *Alnus crispa* in south-west Greenland is very interesting. However I wonder about the distance from southern sites to northern sites. The time of migration from Fredskild sites (Isoëtes...) to Iversen site is very slow, about 3500 years... how do you explain that? One more time, I wonder about an eventual association between *Alnus* and heath.

Last detail, the reader is left alone to find out about datations, which sometimes are mentioned in uncalibrated (3500 14C years BP), and sometimes in calibrated (5600 cal. Years BP) or just "5000 years". This mix-up of dates is not of any use to the reader. Please use only calibrated/calendar ages throughout the text!

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Interactive comment on Clim. Past Discuss., 5, 879, 2009.

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