

## ***Interactive comment on “Arctic Holocene proxy climate database – new approaches to assessing geochronological accuracy and encoding climate variables” by H. S. Sundqvist et al.***

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Review : “Arctic Holocene . . . . Climate Variables” Sundqvist and 20 others

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This massive collection and assessment of all paleo-climate records covering the Holocene is extremely useful and comprehensive. It is meant to be a resource for others to use and all I have to do is comment on its thoroughness and accuracy. I have contributed the data sets for the Canadian ice cores and checked carefully that what shows up in this compilation is accurate. It is. I can not assess the thoroughness in the non ice core subjects but given the range of the author list and the regional way the

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tasks were handed out I would guess that this is a comprehensive of all the Holocene records for polar regions. The files are easy to read and the META data and quantification of judgments of data quality and usefulness are well described and displayed. Putting all this on to the NOAA WDC-paleo is by far the best approach to making this massive collection assessable. It is clear that this is an ongoing process and there will be additions to the Holocene collection as time goes on. This is very publishable and valuable ms. Since this data set will become a “go-to” resource for Holocene work and be used by people not necessarily in the paleo-climate field, maybe it is an idea to have some sort of Wikipedia portal to this ms and to the data in WDC-paleo (NOAA). This is just a suggestion. It might need someone to write a short-ish Wiki article.

I have some specific comments that I will log wrt the page number in the ms.

P5 In “procedures and protocols” is noted that the data base is very heterogeneous in resolution, age accuracy, climate sensitivity and signal/noise. Maybe there should be a statement that it is possible and useful to put such a wide range of paleo records together and what one should expect to get. There is a considerable literature on the subject. It is well worth using all such series together but the case should be alluded with a few references, (eg. Fisher D.A., 2002. High- resolution multiproxy climate records from ice cores, tree rings, corals and documentary sources using eigenvector techniques and maps: assessment of recovered signal and errors. HOLOCENE, 12,3 , pp323-340).

P9 The Database structure as presented in the supplementary material is in xls format. While it is openable with old versions of Excel, I think it also a good idea to also store a purely ascii or txt version of the database. There is no guarantee that Excel will always exist or support the stored xls version. Ascii will go into anything including Excel.

P11 There is a discussion about there being some series that have been converted to proxy met variables, eg. Temperature. I noted in the Table 2 column about this having been done that neither Renland or Agassiz ice core O18 time

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series had been converted to temperatures. This is an error, see (Vinther B.M., Buchardt S.L., Clausen H.B., Dahl-Jensen D, Johnsen .J. Fisher D.A., Koerner R.M., Raynaud D., Lipenkov V., Andersen K.K., Blunier T., Rasmussen S.O., Steffensen J.P. and A.M. Svensson. Holocene thinning of the Greenland ice sheet. Nature , doi:10.1038/nature08355.3d,2009).

Table 2 The Logan O18 record as being a measure of the Aleutian low. This should be replaced with El Niño. I wrote the paper referenced.

P19 or Appendix A The discussion of “Glacier Ice” should make some specific reference to the time scales used for Greenland and Canadian ice cores. There has been a major effort to reconcile the time scales for all the Greenland ice core records. This has been done by various means and the reconciled chronology is called the GIC05 (Greenland Ice Core version 5) chronology. The major volcanic acid layer’s ages from GIC05 are those that are deferred to by the Canadian ice core series. In particular all the Agassiz ice cores have been tied into this Greenland chronology. The paper covering this process and its result should be in the reference list, (Vinther, B.M., Clausen, H.B., Fisher, D.A., Koerner, R.M., Johnsen, S.J., Andersen, K.K., Dahl-Jensen, D., Rasmussen, S.O., Steffensen, J.P. and A.M. Svensson Synchronizing ice cores from the Renland and Agassiz ice caps to the Greenland ice core chronology. Journal of Geophysical Research, 113,D08115, doi:10.1029/2007JD009143,2008 :10 pages,2008).

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