Interactive comment on “AMO-like variations of holocene sea surface temperatures in the North Atlantic Ocean” by S. Feng et al.

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General comments

The paper addresses a very important subject, namely if the Atlantic Multidecadal Oscillation (AMO) found in the instrumental record (since c. AD 1850), with its 60–80 year cycle, also can be found in the proxy data extending through the whole Holocene. The authors especially address two climate events: the cold 8.2 ka event and the Medieval Warm Period (c. AD 800–1300). They can show, as have most previous studies, that the 8.2 ka event was cold over (most if not all of) the North Atlantic whereas the Medieval Warm Period was warm over (most if not all of) the North Atlantic. The results are important since they both stress the occurrence of major long-term variability and point to possible explanations for this variability in the climate system. I would therefore strongly suggest that the authors in a further article assess also the Northern Pacific region to investigate whether similar patterns during the Holocene can be found there, in order to gain a better understanding of the coherency of the decadal to centennial climate variability in the Northern hemisphere.

Specific comments

It falls outside my competence to discuss the technical aspects of the Feng et al. paper, but I do have some comments on their choice of terrestrial palaeotemperature proxy data and the presentation of that data in Table S1 and Table S2 (in the Supplement). Feng et al. compare the sea surface temperature (SST) during the 8.2 ka event and the Medieval Warm Period with the terrestrial palaeotemperature proxy data from the circum-North Atlantic region. However, much of the presently available data are not used. I consider this a shortcoming since more data would make their conclusions more solid, especially for the medieval period. Below, I will list some additional records that I suggest that Feng et al. incorporate in the final version of the paper.

For the Medieval Warm Period the following additional records, referred to by the original article they appeared in, should be included in Figure 5b and Table S2:

- Cook, T.L., Bradley, R.S., Stoner, J.S., and Francis, P., 2009: Five thousand years of sediment transfer in a high arctic watershed recorded in annually laminated sediments.


For the Torneträsk tree-ring chronology Feng et al. referred to Briffa and Osborn (1999) in Table S2, line 34. That is a very old version of the Torneträsk chronology. A much improved chronology, with significantly higher (April to August) temperature correlation, has been published in Grudd (2008), which is the proper work to refer to now:


For the 8.2 ka event the following additional records, refer to by the original article they appeared in, should be included in Figure 5a and Table S1:


Additional records, some not included in Feng et al., for the Arctic region of the North Atlantic are reviewed and referred to in: http://www.clim-past-discuss.net/5/1819/2009/cpd-5-1819-2009.pdf

In Table S1 and Table S2 Feng et al. refer to temperature changes in °C in a few isolated cases, but have not given any explanation why. In most cases, even when the temperature reconstruction in the original article they refer to are presented in °C, they just describe it as either “Warm” or “Cold”. I would strongly suggest that Feng et al. only use qualitative descriptions as “Warm” or “Cold”, and not quantitative statements in °C in order to give their presentation a greater uniformity.

In the discussion about the “Bond cycles”, I would like to see a reference to Wanner et al. (2008), where this topic is discussed in-depth:


Figure 5a–b should be allowed to be much larger in size, approximately the double size, so that the reader is able to easier see the details of the maps. The maps are far too small now to be convenient.

Minor remarks

In the text to Table S1 the authors should be clearer with what they consider to be “new” proxy records.

S1, line 22: Seppa should be spelled Seppä with “ä”.
S2, line 22: Soylegrotta should be spelled Søylegrotta with “ø”.

S2, line 35: Tornetraska should be spelled Torneträsk.
S2, line 31: Hardangerjokulen should be spelled Hardangerjøkulen with “ø”.

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