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Climate of the Past Discussions

Interactive comment on "Proxy benchmarks for intercomparison of 8.2 ka simulations" *by* C. Morrill et al.

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Morrill et al. present an updated synthesis of climate anomalies surrounding the 8.2 ka event, a new target for PMIP (3rd comparison). Results are similar to previous reviews but now have more refined of northern hemisphere cooling and some sense of its season. Likewise, estimates of changes in monsoon regions, tropics, and southern hemisphere are more extensive than previous reviews. This paper should be published with only a few minor revisions, mostly to reflect work that has been published since this paper was likely submitted/finalized for submission.

In the intro, there is now geochemical data from Hudson Strait (Carlson et al., 2009, GRL) and northwest Labrador Sea (Hoffman et al., 2012, GRL) that directly constrain the timing and forcing of the 8.2 ka event; be good to mention these (although it is

asking to reference my work, these studies pertain to arguments that the 8.2 event wasn't caused by Lake Agassiz; e.g., Alley & Augustdottir and Rohling & Palike reviews in 2005, plus more recent arguments by Condron & Winsor, 2011, GRL).

Also in the intro, I would at least mention that there is still a Laurentide ice sheet before/during the 8.2 event that was still affecting climate (Carlson et al., 2008, Nature Geoscience; Renssen et al., 2009, Nature Geoscience).

In terms of North Atlantic records, two papers are either published/or in press from the Labrador Sea that include Mg/Ca temps and d18Osw records covering the 8.2 ka event (Hoffman et al. 2012 GRL, northwest LS; Winsor et al., 2012/in press, G3 northeast LS) that show cooling and decreased d18Osw; the cooling is likely a summer signal given the foraminifera habitat. Another two papers of Young et al. (2011 GRL; 2012 Science) provide evidence for at least ice-margin standstills in west Greenland and Baffin Island, respectively, during the 8.2 ka event; again likely summer signals.

In the methods, over what interval must the record have </= 50 yr resolution? For many records, resolution varies. Also, some records that may not make this cutoff could be included in Fig. 5 (i.e., Cariaco Mg/Ca and Ti records for instance).

Also in terms of methods, with all these records, have the authors thought of using EOF analysis to see if these patterns hold up under such an objective analysis? EOF analysis has proven useful in defining the Younger Dryas (Clark et al., 2002, Nature; Shakun & Carlson, 2010, QSR, Clark et al., 2012, PNAS). Just a thought that may be worth trying and easy to do if they have the records already in digital format.

And, in defining magnitude of the event, I do not see a discussion of proxy uncertainty. For calibrated temps which I am more familiar with, this is no better than at least 1 C and more likely 1.2-1.5 C. Are the anomalies significant in terms of the proxy used? This should be addressed.

Finally, the d18O comparison, the authors mix together marine and terrestrial records;

are the marine records d18Osw or just raw d18O? the former is the hydrologic record, the latter is both temp and hydrologic changes. Sufficient records exist now to define d18Osw changes during the 8.2 event (e.g., see Hoffman et al., 2012 for the North Atlantic); maybe worth breaking this down a bit more if the paper is supposed to be a benchmark for models, the users of which often mistake one proxy for another.

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