

## ***Interactive comment on “South Atlantic island record reveals a South Atlantic response to the 8.2 kyr event” by K. Ljung et al.***

**K. Ljung et al.**

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### **Response to SC S336 : ‘Uniqueness of 8.2 event’**

*This very short comment is intended only to make two points. The first is to congratulate the authors on obtaining this very interesting dataset: it looks as though they have done a very careful piece of analysis from a rather unique location, with good age control. I also appreciate the attempt to put their findings in context by showing what a climate model, that has been shown to have some skill in reproducing the North Atlantic 8.2k signal, would predict in this region.*

*However, I also wish to add some caution. As some of the authors are well aware, people claim to find the 8.2k event all over the world. In most cases they are just describing what happens around 8.2 ka BP, which is nothing special compared to what*

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*happens at any other part of the Holocene. This has caused immense confusion in the literature. Only in a few cases (until now almost exclusively around the North Atlantic) is the "event" really something special: unique in the Holocene, and of the same length and character as the signature event in Greenland. In this case, the authors have done a very careful job, and the event they are describing has the merit of being at the correct date, and of the correct duration (within uncertainties) compared to the marker event in Greenland. However, the authors correctly claim that they have a similar event at 7.5 ka BP (albeit somewhat less clear in the 1st PC they have derived), and we do not have data from any later period to see if similar events really recur later ("as part of a pattern of recurring Holocene events"). But the authors cannot have it both ways: either this is one of a recurring sequence of events, similar to Bond8217;s IRD events, in which case it is not unique and cannot be clearly said to be caused by a unique forcing event; or else this is the unique 8.2 k event seen in Greenland: that event does NOT recur again, and probably for a very good reason that there is no longer a Lake Agassiz to cause the freshwater pulse simulated by the model. I think we cannot really tell at this point. The duration and timing of the event shown by the authors makes it extremely tempting to assume this is really the 8.2 k event and I think I believe it. But without a longer context to show that this is unusual compared to other events in the climate of this region, it is unwise to be quite as definite as the authors are.*

This is a very interesting and important question concerning the 8.2 ka event and Holocene climate change. The pattern of the 8.2 ka event as the most pronounced fluctuation during the Holocene is mainly described from continental records responding to atmospheric changes in the North Atlantic region. In many marine records the pattern is different. The 8.2 ka event appears to be present but not always as the strongest fluctuation. One example is the Oppo et al (2003) record where proxies for overturning circulation show a response around 8200 years ago, but it is not the strongest and most pronounced weakening of the overturning circulation in the Holocene. Our record is a response to the changes in the Atlantic circulation and as such it is in agreement with this marine record. From the marine records it is also clear that the overturning

circulation has been variable throughout the Holocene. The effect of the 8.2 ka event induced in the South Atlantic by the weaker overturning circulation can therefore be part of a pattern of recurring ocean circulation changes in the Atlantic.

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Interactive comment on Clim. Past Discuss., 3, 729, 2007.

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