Clim. Past Discuss.,
https://doi.org/10.5194/cp-2019-65-RC2, 2019

Climate of the Past Discussions
Open Access
EGU

Interactive comment on "A south Atlantic island record uncovers shifts in westerlies and hydroclimate during the last glacial" *by* Svante Björck et al.

Anonymous Referee #2

Received and published: 31 July 2019

This paper presents a comprehensive, multi-proxy analysis of a sediment core from South Atlantic Nightingale Island. The data are used to reconstruct past hydroclimate, temperature and Southern Hemisphere westerly winds. The authors then explore interhemispheric linkages, including evidence for DO events and the bipolar see saw connecting Greenland and Antarctic records, and relationships between past SHW strength and atmospheric CO2.

Abstract 23 The abstract is a series of rather unrelated statements. It needs to be re-written following a standard structure, e.g.: 1. What problem did you study and why is it important? 2. What methods did you use to study the problem? 3. What were

Printer-friendly version

Discussion paper

your key findings? 4. What did you conclude based on these findings and what are the broader implications?

45 . . .(SHW) are a. . ..

48 . . .fluxes through physical. . .

75 This paragraph need to end with a clear statement of the aims of the paper – and how they will be addressed. Aims need to be presented in a logical order. For example using hydroclimate and temperature reconstructions to (1) reconstruct changes in the SHW in the Atlantic sector, (2) Identify interhemispheric linkages including evidence for DO events and the bipolar see saw linking Greenland and Antarctic records, and (3) determining if there is a link between past SHW strength and atmospheric CO2. Followed by a statement of why Nightingale Island is an ideal place to address these questions.

109 For each of the methods sections it would be helpful to state why the analysis was carried out in the leading sentence. E.g. on lines 285 and 291 there is no indication of why these analyses are being carried out.

133 Add something about the treatment of 14C outliers (in grey) on Figure 3. These are all younger ages so require an explanation. Lines 323-337 also avoids addressing this issue.

176 Provide a reference for this procedure.

328 Figure 4. It would be useful to have a common zoning system across all stratigraphic figures. The three PCA zones (line 489) dominate the discussion so I suggest using these here. It is not clear what the solid and dashed vertical black lines are on this figure – please explain in the caption. I strongly recommend plotting the 'productivity' indicators as fluxes (Cyperaceae pollen. Terrestrial diatoms, BSi, TOC) as this should provide a more accurate reconstruction of productivity through time.

399-347 These statements would be better placed in the methods. See comments on

Line 109 (above)

351 This statement needs qualifying. There are very few peak by peak similarities with EDML in these records – however I can see some reflection of the 3 PCA zones (line 489) across the different proxies.

357 State where these step changes are.

368 Figure 5. Please include a cluster analysis on this figure and also superimpose the PCA zones so that readers can see if the PCA zones are reflected in the pollen data. Ditto the diatom data (Fig. S2).

406 PCA – use capitals, cf. 417-418

555 and 622 Include the PCA zones on these figures as these are cited throughout the discussion.

581 State age and depth of this transition

586 Mark Antarctic LGM on figure

591 Replace 'good correspondence' with 'some correspondence'

604-609 The relationships with CO2 merit a separate subheading

630-653 This section could be strengthened by referring back to the original stated aims of the paper (see comments on Line 75 above).

676-678 This interpretation is not well-supported as the main phase of deglaciation was well after 18.6 Ka (see: Bentley, M. J., Ó Cofaigh, C., Anderson, J. B., Conway, H., Davies, B., Graham, A. C., Hillenbrand, C.-D., Hodgson, D. A., Larter, R. D., Mackintosh, A., and Verleyen, E.: A community-based geological reconstruction of Antarctic Ice Sheet deglaciation since the Last Glacial Maximum, Quaternary Science Reviews, 100, 1-9, 2014).

Interactive comment on Clim. Past Discuss., https://doi.org/10.5194/cp-2019-65, 2019.