

Interactive comment on “Millennial-scale precipitation variability over Easter Island (South Pacific) during MIS 3: inter-hemispheric teleconnections with North Atlantic abrupt cold events” by O. Margalef et al.

Anonymous Referee #2

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GENERAL COMMENTS: I read this report on the most recent work from Rano Aroi on Easter Island (Rapa Nui) with great interest. The topic of linkages between paleoecological events the subtropical Southern Ocean and the rest of the planet is of great importance for our understanding how the ocean-climate system functions both today and in the past, and Rapa Nui occupies a unique geographical position. This article builds on the previous, detailed work of Margalef et al. (2013) on the Rano Aroi wetland and the paleoclimate processes affecting it. This manuscript addresses topics of main-line interest to Climates of the Past. It is well-written, thoroughly referenced, and

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appropriately illustrated with figures. The title is appropriate, the abstract conveys the main points, and the overall conclusions are of wide interest. I especially like the global scale of the research question.

SPECIFIC COMMENTS: But I have problems with the chronostratigraphy on which the authors base their global correlations. The age-depth model (from Margalef et al., 2013), is based on a large number of AMS- ^{14}C analyses of pollen extracted from their sediment cores. There are numerous dates that are too young in comparison to the favored interpretation of the age- depth relationship. The authors suggest this is a result of sediment mixing by deeply rooting plants and/or by the capsizing of floating islets of peat when the wetland had open water in its center. Regardless of the exact cause, the fact is that there are other ways to construct an age-depth curve through the ^{14}C dates reported in Margalef et al. (2013).

Wouldn't it make more sense that the older dates (to the right in Margalef et al., 2013 Figure 3) represent pollen that was reworked from older sediment layers? It seems to me that it is more likely that "old" pollen is reworked into younger deposits than vice versa.

Have the authors tried to apply an alternate age-depth models to their Rano Aroi data? If so, do the resulting variations in hydrology fit or not fit their proposed teleconnections to the chronologies of other (global) climate events?

Along this same line, millennial-scale conclusions require millennial-scale age control. The ecological shifts between different wetland types that the authors are using to infer precipitation changes very likely caused changes in sedimentation rates over millennial time scales. Such changes may only be fully revealed by closely spaced dating, closer that the authors have at this stage.

I would be much more willing to accept (and even applaud) the results of this study if the authors could demonstrate that their chronostratigraphy is accurate and precise.

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