

Interactive comment on “Deglacial and Holocene vegetation and climatic changes at the southernmost tip of the Central Mediterranean from a direct land-sea correlation” by S. Desprat et al.

Anonymous Referee #1

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Since our understanding of Quaternary climate change across the Mediterranean as a whole is still a matter for lively debate, this is a timely paper which makes a strong contribution to the subject and is of international significance. It makes an original contribution in spite of being part of a larger, multi-proxy project, although it is a shame that the Peyron paper, which comprises the most important aspect of the data analysis, has been presented separately. I have annotated the pdf version to edit minor corrections to the English writing style and consistency of e.g. decimal places. My comments otherwise are as follows. My main concern is that inferences might be

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affected by chronological uncertainty and, possibly, by time lags in pollen response. Introduction, justification for the study and methodology needs very little attention. My only real comment is that it is not just the southern Mediterranean which is still open to doubt – see comment box. Ln 202. Methods and results could be confused with the model development. Maybe reword 'by considering the relative proportion of different pollen assemblages. The methods and results for application of MAT to our data are presented separately, in Peyron... Fig 1: include abbreviations for ocean circulation in the caption. Fig 2: y axis should read Age (cal yr BP). Caption should explain what the error envelope is. Ln 222 Why were only four samples analysed in PZ1? This seems to be a variable zone, so it would be valuable to analyse at a higher resolution to allow closer comparison with the pollen signals of PZ2 and PZ3. Ln 249 PZ3 seems mainly to be characterised by a peak in Ephedra and a decline in temperate tree taxa. In Fig 4, there is not a clear second peak in semi-desert plants. Please discuss in more detail. PZ3 has some cereal-type grass pollen. Does this mean it is too difficult to split cereal type off, feeding into discussion below of agricultural signals? Fig 4: caption should specify whether Pinus is excluded here from the tree sum. Ln 251. The age-depth model is published elsewhere, but it is also necessary to discuss uncertainty here. Could the approximate GS-1 age boundaries be due to chronological uncertainty? Where other sites in the region appear to show a response to cooling, is there the same age range as in your study site? Ln 294 This argument assumes no time lag in response here and in the Alps. Would be useful to add some discussion linked to distance away from refugia. Alps are more likely to have lower altitude Quercus, which might cause differences in apparent response time to climate shifts? Ln 316 You discuss age uncertainty here. The start of GS-1 is also 300 years 'too old'. If you have an estimated reservoir effect of several hundred years, then this difference does not seem so large. This is worth more critical discussion, since the difference compared to MIS/ice core stage boundaries is not consistent. Ln 367 This statement is not clear – please reword. Ln 371 Very interesting critique of pollen source area. Could this also affect earlier parts of the record? Ln 498. I have not

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read this paper – is the gradient based on vegetation change? The lake-level signal tells a different story, so it would be useful to add a note here to clarify. Ln 503. This contradicts your assertion elsewhere that winter recharge is vital for summer plant growth. Maybe discuss these two ideas together. Fig 6: It would be useful to extend this diagram back to before GS-1, if some of the other records extend that far back? Fig 7. This uses the semi-desert pollen signal rather than the Mediterranean forest, which forms part of the earlier interpretation. If representativity were simple, you should be able to compare this sequence with the Med pollen signal from the Alboran Sea. From the data, it is not simple! Maybe add discussion of this – the correlation of reduction of forest cover in Alboran with increased aridity in your sequence looks good. Can you justify correlating pollen with the mid-Europe inferred lake-level data, however, since you note the seasonality effects earlier on. Otherwise the broader discussion sections are an excellent read, with clear discussion of uncertainty which will generate active debate. I would not suggest major changes to this, although the chronological uncertainty remains – with this number and regular frequency of shifts in the early to mid Holocene, there is a danger of erroneous pattern matching. One additional conclusion which seems apparent from the study is that there is now a strong need for combined palynological and lake-level studies.

Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/8/C3126/2013/cpd-8-C3126-2013-supplement.pdf>

Interactive comment on Clim. Past Discuss., 8, 5687, 2012.

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