

Interactive comment on “Holocene hydrography evolution in the Alboran Sea: a multi-record and multiproxy comparison” by Albert Català et al.

Albert Català et al.

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We thank to Referee #2 for the useful comments and suggestions. Below we detail our replay point by point. RC#2: Some improvements in English are needed throughout the manuscript.

English has been improved by a native speaker.

RC#2: I think the paper is well-suited to be published in CoP, but given that >90% of the paper is devoted to a comparison of Mg/Ca & alkenone-derived SSTs and their implications, I suggest that the paper be accepted for publication, but not in the "Special Issue"

The Mg/Ca-Alkenone discussion is a necessary step in order to argue the paleoclimatic

C1

value/interpretation of the new Holocene high resolution Mg/Ca-SST record. This new Holocene SST record is the main goal of the paper. It is true that the 4.2 event is one structure among several others along the Holocene record. But we still believe that this record highlights the relevance of the 4.2 event in this Mediterranean region as a cold event but, it also marks an inflexion point in the main SST trends. These evidences support this as a period when fundamental changes occurred between the Mediterranean-Atlantic oceanic-atmospheric connections. For this reason, although we recognize that the 4.2 is not the only/main target of the manuscript, this event is relevant enough in the discussion of this manuscript in order to be considered for this special volume.

RC#2: lines 137-140: "...Seawater $\delta^{18}O$ ($\delta^{18}O_{sw}$) was obtained after removing the temperature effect, with the Shackleton paleotemperature equation (Shackleton, 1974) on the *G. bulloides* $\delta^{18}O$ signal using the *G. Bulloides* Mg/Ca-SST values. ..." In view of the issues discussed later (re Mg/Ca discrepancies with alkenone-derived SSTs) can you say whether this is significant in your derivation here? This may require a brief explanation, expanding on this point.

This is an interesting point raised by the reviewer. Considering the large differences in the deglacial warming recorded by alkenone and Mg/Ca SST reconstructions, the temperature correction on the $\delta^{18}O_c$ to obtain the $\delta^{18}O_{sw}$ would be very different regarding the chosen SST record. In this respect, it is very important to highlight that if any change occurred in the habitat preference of *G. bulloides* during the deglaciation, as it is argued in the manuscript, that will not only affect the Mg/Ca ratio but also $\delta^{18}O_c$. That brings us to a warning on the danger of applying SST corrections based in very different signal carriers which may have completely different response to the major environmental changes occurring during the deglaciation. This also stresses the relevance of the Mg/Ca-SST reconstructions as the only reliable tool to extract the temperature effect on the $\delta^{18}O$ signal of the foraminifera carbonate shells. A comment on this regard has been added in lines 375-379

C2

RC#2: lines 338-340: " : :from transitional to subpolar water (Kucera and Darling 2002; Kucera et al., 2005) but they start to be scarce in water with temperatures over 18_C.." RC#2: As this is written "they" refers to genotypes. I think "they" should be replaced by " G. bulloides"...?

Done, changed for G. bulloides.

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2018-163>, 2018.