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Climate of the Past Discussions

Interactive comment on "Extreme storms during the last 6,500 years from lagoonal sedimentary archives in Mar Menor (SE SPAIN)" *by* L. Dezileau et al.

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General comments: This paper presents an interesting multi proxy approach to unravel past flooding events and linking them to climate variations. An impressive range of methods has been used and a multitude of data is analysed and interpreted. The main problem of this study is that only one core was studied and I believe the paper needs a discussion on possible lateral variation and the limitations of using only one core. Also, this paper would greatly benefit from checking by a native English speaker.

Specific comments: - Section 1-Introduction: You mention that historic tsunamis from the Algerian coast have been modelled (l.67-68). Do these models show possible flooding of the Mar Menor area by these events? - Section 3-Material and methods:

What exactly is a simplified piston corer? - Section 4.2-Sediment source: As you have taken samples from the barrier, it would be good to present the results. Also add a discussion how these results compare to the grain-size distribution of the sand layers in the core. Similar distribution, suggesting the sand in the cores originates from the barrier? - Section 4.3: Variations in taxon richness and species richness is discussed here. Maybe add information on variations in the number of specimens (total abundance)? Does this tell you anything? - Figure 6 + section 4.2: Figure 6 shows the abundance of 4 different species, but only 3 of them are discussed in the text. Could you add some information on Bittium reticulatum? Are all other species mentioned in line 211-216 irrelevant to the interpretation? As you have counted more than those 4 species, why not add a table or graph with all species counted, in percentage of total counts? - Section 5.2: In the discussion of past historical events it would help readers who are less familiar with the topography of the area to give some more information on how these records relate to the site. E.g.: How far are the Torrevieja harbour and the cities of La Union and Cartagena, mentioned in the text, from the Mar Menor lagoon? Where is Zemmouri located? This could be a map or added text. - Section 5.2, l. 326-331: Alvarez-Gomez et al (2011) used numerical simulations to identified tsunami sources and the areas of maximum impact. Could you expand on this? Did they identify tsunami sources in the Western Mediterranean or only Algerian sources? Where did their study show the main impact areas? What source is associated with the mentioned max. wave height of 0.5-1 m? - Section 5.2, l. 338-343: If tsunamis are extremely rare and of low magnitude in this part of the Mediterranean and cannot have caused overwash of the Mar Menor lagoon barrier, could they have deposited those boulders on the Algerian coast? Add to the discussion that the age of the boulders does not correspond to any of the marine overwash events in the Mar Menor lagoon. - Section 5.3, l. 357-360: I think a short discussion is needed on how hematite stained grains relate to temperature/climate.

Technical corrections: - I have not added corrections associated with English grammar or vocabulary. As mentioned above, the English of this paper can be improved. I

suggest asking a native English speaker to proof read the document. - Check capitals Figure/figure - Section 2-Study site: There are quite some location names in the text of the paper that are not shown in figure 1 - Figure 1: I know the coordinates on the side of the figures give the scale, but I would suggest adding a scale bar as well. - Section 3.5, l. 147: Several methods are two methods, I think. - Figure 2: Would it be possible to show the photography and Xray images of the whole core? - Section 4.2, l. 171: Terrigenous fraction –Do you mean the sediment input in the lagoon is controlled by two sources terrestrial (from rivers) and marine (overwash events)? - Figrure 3: To show the link between grain-size and XRF results I suggest combining figures 3 and 4. Percentages of clay, silt and sand could be shown in 1 graph in 3 different colours and added next to the XRF curves. This would help see the trends more clearly. - Figure 5: Needs a little more information in the caption: What are the different colours (brown, blue, yellow), the grey bands. The text states (section 3.3 l.132-133): "species richness (S), taxon abundance (ni) and total abundance (N). The caption in figure 5 says it shows taxon and species richness and the legend shows S and N, indicating species richness and total abundance. Should this be S and ni? Or should the caption read species richness and total abundance? Please also indicate in the caption what scale corresponds to what curve. - There are two section 4.3, please correct numbering. - Figure 6: Add a comment about the very different scales of each graph. Also, can you please explain what the numbers in the scale mean? How many specimens were counted? Would it be more informative to show scales in percentage of total counts? - Figure 7: According to the figure caption there are 17 radio carbon dates, but in the curve there are 18 dates shown. Do I understand correctly that additional information on the other dating techniques used will be published in a separate paper? - Section 5.1, l. 280-181: Do you mean that the sand washed into the lagoon by storms/tsunamis did not reach as far into the lagoon as the location of the core, but may be found closer to the barrier? - Section 5.2, l. 301: Wave heights associated with this storm were higher than 8 m –is this in the lagoon? - Figure 8: The scale of the % hematite stained grains ranges from -10 to 10, which doesn't seem to make sense -negative percent-

ages? In the second graph, please indicate which of the two species is indicated in red and which in black. Is the species R. Ventricosa in figure 8 the same as C. Venricosus in figure 6 and text?

I hope my comments will be helpful in improving the manuscript for publication.

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