

Interactive comment on “Mid-Late Holocene event registered in organo-siliciclastic-sediments of Lagoa Salgada carbonate system, Southeast Brazil” by Anna Paula Soares Cruz et al.

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We thank Reviewer #2 for the very constructive review of our manuscript. Below, we provide a point-by-point response to the Reviewer #2. To facilitate the review, we copied the Reviewers' comments and inserted our comments after that.

Reviewer #2 (Specific comments): The introduction needs some work. This is now not well focused. It is unclear for the reader why the Lagoa Salgada is important for this kind of investigation. You deeply described the global importance of the 4.2 ka event but it is presently unclear why your case study is important to investigate this. Furthermore, the cited references on the 4.2 events are not always up to date. So an

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effort in the improvement of this section is strongly required.

Authors: Agree. Done. We dedicated one paragraph trying to explain the importance of the Lagoa Salgada in this investigation.

Reviewer #2: Methods Methodology is generally well described but some additional data are required. Can you please provide more details about the coring operation? Did you use a vibracore or a hand corer? What is the elevation of the top of the core with respect to the current msl? Furthermore, how did you reconstruct the depositional environment? It seems that you did not use meio or macrofaunal assemblages to define the palaeoenvironments. This is a bit surprising because these proxies are widely used to this purpose. Grain sizes usually should be corroborated by these data. So, you should at least explain why you did not perform this kind of analysis (maybe lack of faunal assemblages??).

Authors: The core was collected using a Vibracore (page 3, line 3) with a PVC tube. The core was split in two halves and sliced every 2cm for resolution. The core head is located at present day sea level, estimated from the best available Digital Elevation Model, built using the most detailed topographical map available at: ftp://geoftp.ibge.gov.br/cartas_e_mapas/bases_cartograficas_continuas/bc25/rj/versao2018/ (IBGE, 2018). Detailed information is available at Nota Técnica (notatecnica_bc25_rj_2018-05-23.pdf). DEM generation method and detailed information is available at the Metadata document, (Metadados_MDE_RJ25.pdf). All documents are available at the IBGE site. Vertical accuracy is ~1m, with the DEM classified every meter. Present water level at Salgada Lake is at 0m msl for both the vectorized topographical map and DEM. One year monthly observation of the water level at the lake, yields an average of a few centimeters of depth, with no water being the most common (personal communication from Douglas Rosa da Silva; Kátia Leite Mansur; Leonardo Fonseca Borghi de Almeida, authors of Distribution and Growth Morphology of the Recent Microbialites: the Case of Lagoa Salgada, Rio de Janeiro – Brazil). Thus, the Salgada Lake core top is considered to be at present-day sea level.

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We didn't use faunal assemblages (e.g. foraminifera) due to the low preservation potential at this age. We only observed *Quinqueloculina* sp. and *Ammonia* sp., which bring no additional faunal information showing just an evaporitic environment with extreme faunal restriction.

Reviewer #2: Discussions I generally agree with the discussions, but I don't think they are always based on the results. As I said before, I think the palaeo-environmental reconstructions are a bit weak because only based on grain size and geo-chemical analysis. Furthermore, there is a large discussion focused on the vegetation but no pollen (or similar) analysis are reported. However, my major concern is related to the use of Martin & Suguio, 1992 RSL reconstruction provided in figure 5. This sequence of high and low sea-level stands needs to be better explained. From an isostatic point of view this is quite complex to justify. Do you think there are other factors controlling the sea-level evolution in this area? This is a major part of your discussion and it is now not fully explained in the manuscript. I do understand the RSL highstand reported by Castro et al., 2014 at about 5000 BP. On the contrary, the yo-yo shape of the RSL curve reported by Martin & Suguio, 1992 needs clarification.

Authors: We agree that the lack of pollen data leaves our discussion a little weak. However, we use pollen analysis made in lakes in southeast region to corroborate with ours proxies and emphasize the influence of the climate in this region.

We just used the Martin and Suguio (1992) sea level curve, in the last paragraph of the discussion, to demonstrate that the sea level change during 4.2 kaBP may also have caused a change in the environmental conditions of the region. However, we included in the discussion, that the lack of data during this period, in both sea level curves (Castro et al 2014 and Martin and Suguio, 1992), make this hypothesis of sea level regression merely speculative, and the influence of climate change a more plausible alternative to the environmental changes that occurred during this period.

Please also note the supplement to this comment:

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<https://www.clim-past-discuss.net/cp-2019-27/cp-2019-27-AC2-supplement.pdf>

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2019-27>, 2019.