

Interactive comment on “A standardized database of Marine Isotopic Stage 5e sea-level proxies on tropical Pacific Islands” by Nadine Hallmann et al.

Alessio Rovere

arovere@marum.de

Received and published: 23 January 2021

As guest editor of the WALIS SI, I would like to thank Paul Blanchon and Barbara Mauz for taking the time to comment on this paper.

Paul Blanchon brings up a potential weakness with the approach we propose for coral reef terraces in Rovere et al., 2016 (later modified and coded by Lorscheid and Rovere, 2019). I remain convinced that, for most reefs globally, the indicative range we propose for coral reef terraces (MLLW to Breaking depth) is reasonable. But I am aware that, as Blanchon points out, there are exceptions (dealing with natural environments, that's hardly a surprise).

It is worth pointing out that we tried to be clear in both papers cited above that the

C1

"remote" indicative meaning (i.e., based only on hydrodynamic considerations), should only be adopted only when no quantitative data on modern analogs is available (for example, see Rovere et al., 2016, page 423, subpoint "Modern analog" and Lorscheid and Rovere, page 6). For this particular MS, I would suggest the authors highlight this potential caveat in the text, maybe advising the readers of the limits of this "remote" approach, inviting future researchers in these areas to properly address the modern analog problem.

Unfortunately, many studies on LIG indicators do not report modern analog quantitative information (a practice that is instead more consolidated in Holocene sea-level studies), therefore I suspect that many authors in WALIS will use the "remote" indicative meaning. For this reason, we will try to re-iterate the limitations of this approach in the editorial that will collate all the contributions, to properly inform readers. For which concerns the use of single corals as RSL indicators (brought up by both Blanchon and Mauz), I would point out to another paper in discussion in ESSD, where this issue is also partially addressed: <https://essd.copernicus.org/preprints/essd-2020-381/>. Also, the pros and cons of this approach are also highlighted in Rovere et al., 2016. We will also try to elaborate on this point within the upcoming editorial, keeping in mind that there is no one-fits-all approach to establish the indicative meaning of LIG datapoints, with local conditions and preservation often dictating the choice.

One further consideration (that might also apply to parts of the comment by Barbara Mauz) is that WALIS aims to collate data into a unique, standardized database. As already stressed in Rovere et al. (2016), the quantification of the indicative meaning for LIG proxies should be regarded as a "geological interpretation", which must be reported separately from other primary data (e.g., elevation). This is implemented in the WALIS structure. When all the data will be standardized within a single database, it will be relatively easy for any end-user to back-calculate paleo RSL from the primary data using different indicative ranges for selected proxies, in case better modern analog data or better interpretations will become available. It will be also possible to

C2

group several indicators within the same area/outcrop and apply statistical analyses to condense several indicators into a single paleo RSL estimate. This will be up to the end-users: in this sense, WALIS aims to be a starting point for further studies, following the example set by other existing databases (I am thinking, for example, of PALEO DB, <https://paleobiodb.org/> or SISAL, <https://researchdata.reading.ac.uk/256/>).

Overall, I take note of this interesting discussion and I will try to highlight these aspects in the editorial that will close the SI (that will be co-authored by the SI guest editors). Thank you again for sharing your thoughts.

Alessio Rovere

References cited: Lorscheid, T. and Rovere, A., 2019. The indicative meaning calculator—quantification of paleo sea-level relationships by using global wave and tide datasets. *Open Geospatial Data, Software and Standards*, 4(1), pp.1-8.

Rovere, A., Raymo, M.E., Vacchi, M., Lorscheid, T., Stocchi, P., Gomez-Pujol, L., Harris, D.L., Casella, E., O'Leary, M.J. and Hearty, P.J., 2016. The analysis of Last Interglacial (MIS 5e) relative sea-level indicators: Reconstructing sea-level in a warmer world. *Earth-Science Reviews*, 159, pp.404-427.

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2020-261>, 2020.