

RESPONSES TO REFEREES

Colour code:

Blue = Referees' comments

Black = Authors' responses

RESPONSES TO REFEREE #1: Clark Sherman

1) RSL indicators

“description of RSL indicators given in Section 3 and Table 1 seems somewhat narrow keying on “the highest in situ corals””

“final evaluation of the data, which appears restricted to assessing the depth ranges of individual species (or genera)”

“there is no mention of coralline algae as important indicators of paleosea level”

“facies analysis is another critical component of paleosea level determination in conjunction with identification of coral-algal assemblages”

In situ reef assemblages, including corals and associated biota (i.e., coralline algae, vermetid gastropods and encrusting foraminifera), provide more accurate constraints on palaeo-water depths compared to reconstructions based only on individual coral species or genera. However, the dataset that supports our review of MIS 5e reef deposits from tropical Pacific Islands, does not include details regarding the composition of reef assemblages and concerns coral identification mostly at the genus or family levels.

The revised manuscript (Sections 6.6 - ‘Uncertainties and data quality’ and 7 - ‘Future research directions’) mentions the importance of studying the associated biota (i.e., coralline algae, vermetid gastropods and encrusting foraminifera) as well as facies analysis to reconstruct depositional environments, thus following recommendations made by Camoin and Webster (2015) regarding the establishment of an “ideal” dataset.

2) Quality of radiometric ages

“Calcite content is a critical first filter for U-Th ages. However, even samples that pass this mineralogic test can later be found to exhibit open-system behavior with respect to U and/or Th when precise geochemical measurements are conducted as part of the dating process”

Evaluation of the quality of radiometric ages includes the mineralogical assessment, but also the closed versus open system behaviour of radioisotopes. Datapoints obtained outside closed-system conditions are highlighted in the database. The information on the acceptance of radiometric ages has been often directly taken from the original publication. In addition, the quality of the ages that are reported in the WALIS database has been reviewed by Peter Chutcharavan and Andrea Dutton who compiled a U-series database for MIS 5e corals (see this Special Issue, manuscript in review).

This clarification has been added to Section 1 - 'Introduction'.

3) Depth range of taxa

"I was confused by the statement: "Records which had the following characteristics were excluded from the analysis: (1) those for which the difference between Max Depth and Min Depth were > 0,2 m"."

In the OBIS database the "Max Depth" and "Min Depth" values define the depth range of each record. In this database, if a coral taxon is observed between 0 and 10 m, then the Min Depth would be 0 and the Max Depth would be 10. To be able to graphically represent the depth distribution of each coral taxon and see where it peaked, we have selected records associated with a specific depth (or nearly so – with a limit set arbitrarily to 0.2 m), following the method used by Hibbert et al. (2016, 2018). For the maximum depths at which the taxa have been recorded, the whole data set has been considered.

4) Organization of the manuscript

"I would recommend placing "Section 6.6 - Uncertainties and data quality" near the beginning of the manuscript, at least prior to Section 5. In reading through the paper and seeing ages or RSL indicators deemed as reliable or accepted, I kept wondering what criteria were being used."

We added a brief summary of the uncertainties and data quality to Section 1 - 'Introduction' while referring the reader to Section 6.6 for more details. Concerning the quality of the ages, we also added to Section 1 that the "information on the acceptance of radiometric ages has been often directly taken from the original publication" and we refer to Chutcharavan and Dutton (this Special Issue) who reviewed the quality of the ages.

“Section 5 might be better titled as "Relative sea-level records", to better differentiate it from Section 3.”

Changed.

RESPONSES TO REFEREE #2: Blake Dyer

1) Estimation of palaeo-RSL

“As a non-expert or someone not intimately familiar with WALIS, trying to unravel the conversion to paleo-RSL is impossible.”

“I suggest that the introduction to section 5 include a general workflow from data to paleo-RSL interpretations.”

“An additional sentence after line 44 in the introduction could be helpful too”

We added a new figure (Figure 14) to the introduction to Section 5 - ‘Relative sea-level records’ explaining the general workflow from reported palaeo-elevations to the estimated palaeo-RSL. Furthermore, we revised Section 1 - ‘Introduction’ by explaining the structure of the manuscript, i.e., the content of the different sections, to better guide the reader.

2) Uncertainties and data quality

Section 6.6: “I strongly agree with the comment from Clark that the information seems to come too late in the manuscript.”

“I would encourage the authors to include in the introduction a very brief summary of the uncertainties and challenges associated with estimating paleo-RSL from the data in the database. This section could refer readers to section 6.6 for a more complete discussion.”

Both referees stated that Section 6.6 - ‘Uncertainties and data quality’ comes too late in the manuscript. See reply to Clark Sherman’s comment 4).

ADDITIONAL CHANGES

- Data points for Saipan, Northern Mariana Islands, from Muhs et al. (2020) have been added to the WALIS database and accordingly text has been added to Sections 2, 5 and 6.1. A map showing the site locations (Figure 12) has been added.
- RSL data points for Oahu, Hawaii, from Hearty et al. (2007) have been added to the WALIS database and accordingly text has been added to Sections 2 and 5.
- New coral taxa have been added to Table 2.
- References for the Mariana Islands have been added to Section 6.4
- Two tables (Tables 8 and 9) have been added to Section 6.6 to provide a better overview of the evaluation of the RSL data and the age information.
- Six references have been added to the list of references.