Clim. Past Discuss.,
https://doi.org/10.5194/cp-2019-54-RC1, 2019

Climate of the Past Discussions

Interactive comment on "Evidence of intense climate variation and reduced ENSO activity from δ^{18}O of *Tridacna* 3700 years ago" *by* Yue Hu et al.

Anonymous Referee #1

Received and published: 8 August 2019

The article presents a new oxygen stable isotope 40-year long record of a 3700 yr BP fossil giant clam Tridacna from the South China Sea. The fossil record is compared to a modern tridacna shell and instrumental data. The authors show clearly that the shells faithfully record SST variations with a nearly monthly resolution. The sclerochronological work is precise and performed with caution. Great attention was given to the effect of sampling resolution. All record were resampled at the same resolution for better comparison of SST ranges and variability. The fossil tridacna shell recorded EN SO variability as shown by the spectral analysis and the 3-7 filtered signal. ENSO signal showed a slightly lower frequency and stronger events at 3700 cal BP compared to the modern reference period. As the author acknowledge, the studied period is too short to draw conclusion on ENSO variability but the study provides high quality new

Printer-friendly version

Discussion paper

paleoclimate data. Such quantitative seasonally resolved datasets are necessary to achieve a more detailed understanding of the relationship between long-term background changes and seasonal to interannual climate variability.

I consider therefore that this is a valuable contribution that needs to be published with minor corrections. The text requires some work with the English. It is generally OK to be read and understood, except for a few sentences that I mention hereafter, but it contains numerous grammatical, syntax and vocabulary errors that need to be fixed. I did not note all the English errors because that is beyond a reviewer's work. In any case, languages issues should not prevent this paper from being published. I hope the journal can assist the authors with language edition. Besides this, the introduction and discussion should include a more complete bibliography of paleo-ENSO reconstruction. Key papers such as Koutavas et al. Paleoceanography (2012), Cobb et al. Science (2013), Carré et al., Science (2014) are neither cited nor discussed. A substantial part of the results and discussion is dedicated to changes in the SST seasonality. A new figure showing average seasonal cycles (mean and s.d.) from the fossil, modern, and instrumental record would summarize and clarify greatly the result.

Detail comments:

L59-60: "ontogenic reduction": do you refer to the decreasing growth rate with ontogeny?

L65: "uncertainties": did you mean "unclear"?

L76: "involved in Holocene Megathermal period": did you mean "part of the Holocene climatic optimum"?

L86: "trigger" should be "source of"

L91: Clement et al., 1999 is a modeling study, not a reconstruction.

L93-98: incomplete bibliography.

Printer-friendly version

Discussion paper

L123-125: “Due to . . . actual month”. This sentence needs to be rewritten. I understood that the records were resampled at 7 data points per year to have comparable time resolution across the records. This number was chosen because it corresponds to the lowest resolution achieved in the fossil record. The verb “rehandle” is used throughout the manuscript but I think “resample” would be more appropriate and clearer. What technique was used for the resampling? Linear interpolation?

L144-146: some clarification is needed about the radiocarbon date calibration. What DR value was used? “Conventional” cannot refer to the calibrated date. The calibrated date should not have a +/-28 year uncertainty. Calibration yields a 1sigma or 2 sigma confidence interval and a median date.

L163-167: this part is unclear. Are you comparing values of the internal standards obtained during the analyses of both shells? Is it the same standard material?

L170-171: “which contained. . .life span”. This is unclear

L192: “daily increments are obvious”. They are not to me on the figure. Clarify

L226: “perfect match, r=0.81”. perfect sounds too strong. Why is d18O(XY1) better correlate to d18O(SST) (r=0.91) than to d18O(predicted) (r=0.81) if this latter includes both SST and SSS and should therefore be more realistic?

L214 – L240: these paragraphs could be shorter and clearer if the information was better organized and presented.

L244: “variance” . Do tou refer to the seasonal range?

L244: 0.19% check this number.

L277: “ndcates” do you mean “associated with”?

L269-280: The total range of the signal includes not only seasonality but also interannual to decadal variability. To evaluate the change in the seasonal range, it would be more appropriate to estimate and compare the mean seasonal ranges.

L288: “Moreover. . .slope” this is unclear

L290-292: a figure of mean seasonal cycles would be useful

L296-299: these short introductions about global warming are not necessary

L320: unclear

L333: unclear

Interactive comment on Clim. Past Discuss., https://doi.org/10.5194/cp-2019-54, 2019.

Printer-friendly version

Discussion paper