

Review of: Holocene sea-level change on the west coast of Bohai Bay, China.

The authors have produced 25 new SLIP record from the coast of china which will be a very useful addition to the records from this area. By calculating the residual between the SLIP and predicted relative sea-level from 2 GIA models, they have estimated a subsidence rate of the region and rates of RSL/

I do not have a background in the generation of sea-level data so I will focus my comments related to the section on GIA modelling and general questions.

I have a number of issues with the GIA modelling and the method as I have outlined in the section below which need to be addressed before the paper can be published.

Missing information:

I am not sure if the paper is supposed to have SOM material - as it was not uploaded with the main manuscript, but I found a version within the uploaded earlier version.

In this document:

- (i) what are the SLIP data on the graph? Is this different from the record in the paper? It is from a latitude of 33-37N.
- (ii) Table: the Bradley model is not shown but is referenced in the paper and is missing.

Given this information, I am reviewing the paper without using this information.

Abstract:

There is discussion in the abstract about information that is not provided in the paper: *Line 26-30*. This reads as a similar to the discussion and results in the Wang, 2015. I would suggest either revising the abstract to be related to what is presented in the paper or adding more work to the paper.

Introduction:

I would like the authors to provide an overview on the character of the Holocene sea level across China. As Zong, 2004 (given in the paper) has previously published, there is only a very minor highstand recorded at the other sites across the region. It is therefore important to put your new SLIP record into this context. A SLIP record which does not record a large highstand, as the authors have found is not unusual for the region. The authors do reference some other material, but as I state below it is not in English so unfortunately is not accessible by the wider scientific community to which ESD is aimed.

Page 3: line 70: 'During the Holocene the sea inundated the coastal area with the shoreline moving 80 km inland' (Wang et al., 2015). Can you state how this was determined? From briefly looking at this paper, it describes three of the cores described in this paper. Is this new study a follow on from this?

Page 3: line 71: Over 130 SLIPs established for the past 6000 calender years (Li et al., 2015)

Are the authors referring to another study from this region that has already published 130 SLIP? Where are these from? Are they relevant to the paper? If there are 130 extra points from this region - they should be included within this study as this paper is referred to through the study.

References:

The authors refer to a number of papers to give support to their statements in the paper (for example, Liu et al., 2015 (as listed above)). Unfortunately as these publications are not in English they are not likely to be accessible to the wider scientific audience. It would be useful if they authors can elaborate at least the method in the papers which the statements they use are based.

GIA modelling+ Residual: method

Fig7: List the earth model used in the figure caption.

Page 29: line 507: '*interpolated model data points*'. Do the authors use just the RSL prediction to take the residual, rather than generating a RSL at the exact location and time of each SLIP?

The authors have looked into the sensitivity to the ice sheet model in the GIA- but using two different ice sheet reconstruction in the generation of the predictions; ICE6G and ANU, which have very different end to the timing of global melting.

However I am surprising that this makes so little difference to the resultant RSL predictions? can the authors comment on this

(ii) *On Page 6: line 138: 'Intrinsic uncertainties are estimated from GIA predictions with the models listed above'*. This is not the case and the results do not support this statement, The authors do not consider the uncertainty to earth model. They reference in the paper, that Bradley et al. 2016 examined a range of earth model and concluded a very different range of earth model parameters were required to resolve the large overprediction to the SLIP data. I am not stating that this is the correct model to use.

However, a some of the ~ 5m overprediction to the SLIP data could be due to inaccurate model parameters. This needs to be considered to support the conclusion the authors draw regarding the rate of subsidence and geography evolution.

As the results in the paper are based on determining the residual between the predicted RSL and the SLIP, this needs to be considered.

Section 4.2:

In this section the authors have calculated rates: Please state over which time interval this is for? 9- 6ka have a very different rate c.f 0- 2ka. If the authors are calculating the rate from the data, how are they accounting for the errors?

Section 5.3: Line 233=237. The results for BRAD model are not provided.

Line 242: '*Because the misfit disappears in South of Bohai Bay' ...the most obvious explanation is the subsidence of the coastal plain'*

This is not a correct statement. The misfit does not appear. I do not disagree that some of this misfit is due to subsidence but with the evidence the authors have provided it is not possible to conclude all the misfits are related to this process.

Line 251: *'... early Holocene dominated by global sea-level rise and associated GIA effects which in the mid-late Holocene it is dominated by combination of tectonic subsidence.*

The authors do not provide the information to support this statement. There has been little discussion of the signal over the mid-late Holocene. What do the authors define as mid-late? (4-0ka?)