

***Interactive comment on “Comment on “Sea level
~400 000 years ago (MIS 11): analogue for present
and future sea-level?” by D. Q. Bowen (2010)
Can the extrapolation of uplift rates from MIS 5e
shorelines to MIS 11 replace direct and tangible
evidence of the latter’s sea-level history?” by
P. J. Hearty***

Anonymous Referee #1

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Summary

This comment has the potential to be very useful, but it is very hard to work through and needs considerable refinement to realize its usefulness. Although the author accuses Bowen of obfuscation using a ‘maze of numbers’, he is equally guilty of filibustering the reader with large amounts information of varying degrees of importance. In terms

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of real importance to the conclusions of Bowen's text, there are actually relatively few issues of objective significance raised in Hearty's comment. Nevertheless, these few points are very important and need to be published. Major changes are needed to the document before publication.

Key arguments:

Reading carefully it seems Hearty has valid, important and objective grievances on three key points. I would strongly advise him to keep to these so that any reader can properly understand the substantive issues in this potentially useful comment. As I read it there are solid grounds to comment on the following:

1. The literature of Hearty and colleagues has always contested that any high stand of up to 21 m (+/- ?) is brief and occurs at the end of MIS 11. The analysis of Bowen cannot rule this out, but focuses on the mean of 'typical' MIS 11 sea level at a variety of sites. Hearty correctly identifies that this is poorly dealt with in the Bowen paper and indeed that his estimate of the mean of 'typical' MIS 11 sea level is in close agreement with the sea level found by Bowen in his paper.

2. That Hearty and others have provided arguments against alternative explanations of the deposits in question (whether explained by hurricanes or tsunamis). I am not suggesting that these arguments are correct but I am suggesting that it is valid to expect that these explanations are cited in any discussion of these points of evidence.

3. That Bowen should not neglect outliers in his statistical analysis without discussing the potential bias this may have against alternative interpretations. I do note, however, that Bowen cites the mean and standard deviation with and without neglecting those outliers.

Although there are solid grounds on these points, there are important problems with Hearty's comment, which reads as a rather hastily written, rather than a carefully thought-through piece. These I list below.

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Comments:

1. Hearty has chosen to take a rhetorical style in his argumentation, which is quite unsuitable for reasoned argument and detracts greatly from his substantive arguments. There is no need to entitle sections 'Face the facts' or 'A red herring' and the use of exclamation marks and double question marks is unnecessary in any scientific document. I am not going to list all of the other points where Hearty strays from reason into rhetoric, but I strongly advise to keep to proper, reasoned discourse throughout the document. The only particular point of rhetoric I will mention is the use of the word 'facts'. There is an important distinction between the 'evidence' sourced over many years by the admirable and important fieldwork of Hearty and colleagues and their 'interpretation', which cannot be called 'fact'. Hearty's point of view is valid but contentious and he has yet to convince the broader community of these 'facts'.

2. The text is under-referenced and too specialized. I give non-exhaustive examples here:

Section1: first sentence: reference needed Section1: GIS, WAIS, sea-level equivalent volumes – original reference needed.

Section 2: 'best derived from rocks from stable carbonate platforms'...more explanation needed.

Section 2: association of sequences with MIS 11 – a brief note of the general techniques used is needed. 'correlation' is mentioned but specific dating techniques and uncertainties should be mentioned briefly to assist the reader.

Section 2: what is meant by 'slight adjustment'

3. Bowen is not setting out to carry out an extensive review of all MIS 11 terraces in his paper, but rather to consider terraces in uplifting areas. Hearty's expectation though seems to be that Bowen should review all of the evidence. The extensive tabled commentary provided by Hearty requests extensive citation of Hearty himself.

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This would only be necessary if Bowen were actually setting out to review all of the evidence, but this is not the case.

Hearty correctly identifies the substantive point that Bowen's work does not rule out a brief +21m high stand at the end of MIS 11 as well as other substantive points (see above). However, these substantive points do not require the type of extensive citation of Hearty's own work, as suggested in the table.

4. Section 3: It is not correct to say 'Bowen assumes sea levels and ages from MIS 5e'. In fact he provides a useful discussion of MIS 5e sea level and then from that discussion takes a reasonable range. This is a well-established technique in the literature, used many times. With reference to the points about MIS 5e in Hearty's table - the discussion of MIS 5e is easily adequate in Bowen. Bowen is not obliged to cite exhaustively all papers on MIS 5e (note also that Hearty is not suggesting to cite ALL the papers, merely his own).

5. Section 5: see discussion above. Bowen's paper is not 'rife with inaccuracies', but there are some substantive grievances in Hearty's comment that need airing. Hearty's comment would do well to make these points with a cool head, rather than introducing this hyperbole.

6. I am not going to go all through the 26 points in the table, but many of these are minor and detract strongly from the key substantive points in the comment. I strongly urge the author to keep strictly to substantive points which relate to the main conclusions of the Bowen's paper.

Interactive comment on Clim. Past Discuss., 6, 295, 2010.

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