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Interactive comment on "Response of tidal flow regime and sediment transport in North Male' Atoll, Maldives to coastal modification and sea level rise" *by* Shuaib Rasheed et al.

Anonymous Referee #1

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*Overall: This is a very well written and structured paper, and I really enjoyed reading it as it filled a much needed gap in this part of the science. Please may the authors address these two main issues through out the paper, in addition to the points mentioned below. Thank you. - -More connection with oceanographic wind and wave driven processes the explain why some of the changes have occurred. -Revisit assumptions with 2m of SLR.

*Does the paper address relevant scientific questions within the scope of OS? Yes – this paper is well set up and structured. It has clear aims and objectives which are in the scope of the journal and suitable for the wider readership.

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*Does the paper present novel concepts, ideas, tools, or data? The paper starts off very descriptive, which is unusual for a journal article to have such a substantial literature review. I think this is OK though as the authors are describing a very specific area that is not known by many oceanographers. Therefore the set up is undertaken well.

Some the reclamation did occur prior to 1997 (e.g. on Male – I think is the 1970s). Also, did beach nourishment for tourist islands occur prior to 1997? Would this affect your model outputs too? In line 240, some additional information on calibration, especially with the tide gauge would be appreciated please.

Fig 6 – it's difficult to see some of the symbols and the difference between then (my eyes are getting older!)

Fig7 – a) It doesn't look like have islands here other than around Greater Male' or it goes over an island. Also applied to Fig 8.

Fig7 – b) Coarseness of scales (e.g. grain size) would be appreciated here please. I don't quite believe all the numbers as on a reality check there is nourishment / lagoons etc given the scale of the information provided. This may not be able to be captured, and if so, a caveat needs to be added.

In Section 4.1 I would welcome some more discussion of the results please. For instance, why is there a lot of pebbles and gravel on the western side of the island? What is driving this? Relating back to the oceanography and wave data would be advantageous. Also, some greater comparisons to the 56 sites. This is glossed over some what, but is an important calibration for the overall dataset.

The start of Section 4.2 could be seen as misleading. Much of this land claim has been on Hulhumale' and then numerous small harbours and airports. When Hulhumale' Phase 2 was constructed, how long was there suspended sediment for? What happens to the eroded sediment? Given the scale of land reclamation in the Maldives, it would be interesting to explain more about the grain size and sediment movement wrt to the

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islands which are partly reclaimed (the smaller ones) or have substantial nourishment schemes (i.e tourist islands). For the latter, erosion maybe an issue. These two factors are key development issue and income factor, so understanding this could be a very useful contribution. Furthermore, as the nation is on average 1m above mean sea-level, a 2m rise would make the coastline very, very different. This assumption only considers erosion, but not the fact that some could disappear completely. I know that this depends on the rate of SLR too and contradicts some of Kench's work above, but missing this out puts a big hole in your argument here, and therefore is worthy of greater discussion.

Line 330, the wind driven factors warrants more explanation here please, e,g, duration, permanency, where else seen, influence on grain size, waves (especially long period waves). This would also strength the issues on the discussion / meaning of results as noted two paragraphs above.

Fig 8 – position a1 is unclear on the larger map.

Line 350. Not sure I agree here that coastlines should be static and the work of Kench and others shows this is not the case. Whilst there are numerous islands that are artificial with a sea wall, many are not, as about 20% of the nation is of inhabitable islands (tourist or local). Admittedly, quite a few of these are probably around the capital, but it remains that this is not a valid assumption.

*Are substantial conclusions reached? Yes

*Are the scientific methods and assumptions valid and clearly outlined? Yes, this is really clear throughout. A little more information on the set up and bathymetry would have been welcomed as this comes from a new paper.

*Are the results sufficient to support the interpretations and conclusions? Yes

*Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes – and code

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provided (not checked)

*Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes

*Does the title clearly reflect the contents of the paper? Yes – but I don't think the SLR was treated well in the paper, so the authors may like to revisit this.

*Does the abstract provide a concise and complete summary? This is probably weaker as there is more about the paper set-up than key results. I didn't learn so much from the abstract itself, so would welcome more results here.

*Is the overall presentation well structured and clear? Yes

*Is the language fluent and precise? Yes

*Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes

*Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? I am concerned about the SLR being unrealistic as the assumptions made have flaws.

*Are the number and quality of references appropriate? Yes

*Is the amount and quality of supplementary material appropriate? OK.

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