

I have finished my report on the revised version of Costa et al. 'Modelling extreme water levels using intertidal topography and bathymetry derived from multispectral satellite images'. I'm happy to inform that I'm more satisfied with the current version of this study which clarified several issues I had from the original submission. However, I still think the revised manuscript is quite complicated to understand and unbalanced (e.g. compare length of results vs methods). Part of the difficulties I have to comprehend relates to the use of the language and the length and complexity of methods. The latter extends from pg 5 to 15 excluding details allocated in supplementary material. The revised submission needs a good review by the authors emphasizing on the appropriate use of scientific language (conciseness, objectiveness, etc...) and attention to detail. As an overseas academic based in Australia whose first language is not English, I understand some of the language difficulties are not restricted to Mr. Costa only. A thorough revision is therefore needed. This should start on Ln3 (missing space between L.L.); full address for 1 and reduced address for 2 (Ln4 and 5) and follows down all the way to the reference list. The figures are difficult to understand and the captions need improving. Since the study was conducted in similar estuaries in NZ, a revised discussion would also need to contemplate the range of estuarine morphologies and forcing for the international audience. Below are some of the minor issues I detected.

Minor:

Ln 12- four instead of 4

Ln24 sea-level rise instead of sea level rise. Please revise this throughout paper (E.g. Ln34...). Note that we write 'sea level' and 'sea-level rise'.

Ln36 Not sure I agree with the fact that inundated areas in estuaries are generally shallow. What do you mean by this assertion? What do you consider shallow? 2, 5, 20, 50 m below msl. Some estuaries are deeper than that.

Ln 37 Consistency--Consider placing 'which are areas flooded and exposed...' into (). Alternatively take out the () of 'which are generally shallow'.

Ln 44 reword this sentence as the way it is written it seems that ~70% of the coast has not been surveyed, when in fact the whole world has been surveyed. What scale are you talking about? Make sure you are referring to large scale (e.g 1:100)

Ln 104-113 \_ Is this explanation needed on a scientific paper? This seems to be a statement adapted from Mr. Costa's thesis. Please consider revising it.

Ln115 you previously indicated that you had three specific objectives (Ln98). Do you want to elaborate more on this Fig caption to indicate that (a) not only shows the steps taken to derive SDT/SDB but also to investigate stats relations/sources of errors?

Ln118 What's Aotearoa? Some part of text you say Aotearoa NZ, some others are only NZ. Is there a difference? for the international reader?

Ln119 (Figure 2A)

Ln 120 the spring tide ranges from 1.4 to 1.9 m within estuaries

Ln121-123- Revise text. Is the use of BUT appropriate? I don't understand what's being said here. Storm surges add <0.5 m but the max surge was 2,29 m? I guess you mean the extreme sea level. Similar for the next sentence--- Tauranga = 0.88 m

Ln135 1 x 1 m – Add space

Fig 2 I have a major cartographic issue with this figure. Your use of different shapes and colours is completely inappropriate here. It makes the reader completely lost. See: You use coloured circles to represent the four locations (nothing wrong with it!). Then in B, you use different symbols with different colours and sizes to represent the different gauges. This is clearly a thematic cartography problem as we don't normally vary all three elements at once. In doing so, I tend to relate the Moturiki gauge with the Tauranga Harbour in A – they are both green circles! Then you complicate things with the D plots: Omokoroa is represented by black stars when legend in B shows red star, Hairini is also a black triangle and Oruamatua a black box. Finally, you mess it up one more time with the yellow and red symbols in legends! When I read the caption to try to understand this Fig, I don't find a reason why you have four gauges in B and only three plots in D. What's wrong with Moturiki (Green)? You need to spend more time on this figure. A lot of your issues come from the symbology in B. Try to make it easier for the reader.

Ln191 The threshold is set using the Otsu approach (Otsu, 1979) – Refine text to avoid repetition of the author's name

Table 1 – Surface area column – Round the area values to represent the approximation you indicated. Why are they in italic?

Fig 3 – This Fig summarises the framework for deriving topographic data. OK, but what is 4 Post-Processing? Why is this stage not explained as the other three? Why does it come before 3 in this framework? The caption also needs attention. It indicated that this is the framework and that NDWI is the index used, but stops there. The caption is extremely limited for such a complicated figure!

Fig 5 – Make this a 3 x 3 plot figure instead of a 4x4x1. Use your programming skills to make better use of the page's space.

Ln 225 What is a sub-estuary? Please clarify.

Ln247 Can you expand on “ The model approximates the predicted data well (Sup B)”? How well? Please use a stat method to be more precise here. A single sentence will do it. Then refer to Sup B.

Ln255- Rewrite this sentence to indicate that only groundwater can be a potential source of error. If that's what you mean

Ln263 - 265– Rewrite paragraph to make your point clearer for the reader.

Ln330/331 I assume  $R^2$  is  $R^2$  Please use superscript. Revise whole text

Ln332 – There's no Figure 6C

Ln335 – Is this a separate equation or part of plot 7?

Fig. 8 - Align the bottom two plots in relation to the second and third columns

Ln359/365 Use spaces  $RMSE \sim 7cm$ , etc...

Fig 10 Why are the gauge symbols different from Fig2? Delete the ')' from y-axis in top left plot (after 60S)

Ln386-390 – Discuss with your co-authors the need of this paragraph. This is supposed to be a discussion of your results and not a summary of what was done!

Ln391 'Our' – Throughout text you write possessive forms. Stick to scientific language. Avoid Ours, We, etc... What about: '4.1 Waterline method for....limitations'; 4.2 Correction methods for... ?

Ln400 New Zealand

Ln 401 Our results also show.

Ln401-402 I'm not sure I understand this discussion. I was under the impression that all estuaries were quite similar and only groundwater had the potential to reduce the accuracy. Here you are indicating that that environmental conditions such as complex morphology can also reduce it. There's a weak argument here. Maybe you referring to the different estuarine types and stages of evolution and how this can interfere with results but this needs better arguments and references.

Given the range of estuaries and the international audience of this journal. Is there space for micro x macro tidal discussion in here? Is NDWI a good proxy in macrotidal settings or flat (low slope) shorelines?

Ln 455 Rewrite we are not eliminating horizontal errors. This is not scientific language at all!

Fig 11- I'm completely lost here. What am I looking at? I see the three profiles. The points are waterlines, but the map has lines, which I suppose are SDT WLH according to the legend below...Not sure what you mean here. Then on the right, you indicate p1 being the dyn. Corr, WLH 1; p2 being the dyn corr WLH2... Do you see what I am seeing?

Ln483 Capital letters- Check manuscript for proper names. We say Arcachon Bay, Maketu Estuary (Ln317)

Ln492 This is such a big claim considering that your method was only tested locally under limited conditions and restricted estuarine settings. Please reframe this to place your findings accordingly.

Ln492 – 508 You keep indicating that the waterline-SDT performs better than the ratio-log-SDT, but the text suggests that the latter is done on px-by-pixel basis. Is this the reason why the former outperforms the latter? Shouldn't you be comparing only the lines here?

Fig 12. Fix caption –missing ) after d1. Expand caption to explain why left is better than right.

Ln518 would be more uncertain than what?

Ln593 onwards: My editorial eye couldn't let this pass without a comment. A comprehensive revision of the reference list is needed. There are references in CAPITAL letters; typos; several words together; wrong author names; wrong abbreviations; lack of abbreviations, missing information; etc... These start in the very first ref (below) but extent throughout the list

Almeida, L. P., Efraim de Oliveira, I., Lyra, R., Scaranto Dazzi, R. L., Martins, V. G., andHenrique da Fontoura Klein, A.: Coastal Analyst System from Space Imagery Engine (CASSIE): Shoreline management module, *Environ. Model. Softw.*, 140, 105033, <https://doi.org/10.1016/j.envsoft.2021.105033>, 2021.

Some of these issues are observed on a single ref.: 'Costa, W., Bryan, K. R., Coco, G., Zealand, N., andZealand, N.: ASSESSING THE USE OF SATELLITE DERIVED BATHYMETRY IN ESTUARINE STORM SURGE MODELS – STUDY CASE : TAURANGA, 2021.'