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Discussions

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Interactive comment on "Timescales of emergence of chronic nuisance flooding in the major economic centre of Guadeloupe" *by* Gonéri Le Cozannet et al.

Anonymous Referee #2

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The paper addresses future increase in flood risk in locations where flooding is currently rare and infrastructure is therefore built close to sea-level, using Guadeloupe in the Caribbean as a detailed case-study. On this island as with several others, inland areas are very steep and challenging for building, so much development has focussed on very low-lying areas which were formerly mangrove. The paper focusses on nuisance flooding, ie that due to predictable high tides in calm weather, rather than hurricane-related extreme water levels.

The paper would benefit from a little rearrangement, some improvement of figures, and a thorough copy-edit for English but is otherwise good. A general suggestion - this is a

specific case study, but can other islands adopt the methodology directly? Is the code available for immediate reuse with simple substitution of the location? Where in the world would this be directly applicable?

Minor suggestions:

I think the paper may be more simply laid out if you discussed the geography, defined the 4 cut-offs (0.5m, 0.8m, 1.0m, 2.0m) , discussed which sites these encompass, then just stuck to these heights?

line 125 is effectively "since we're talking about protecting an airport, we are inherently in RCP8.5 scenario, as a lower scenario would involve changing this infrustructure anyway!" - an interesting take!

line 205 I'm not familiar with this method, I'm trusting you here.

Fig 4: GNSS results vs INSAR - it would be good to plot these together if possible - could you overlay the numbers from Table 2 on Fig 4 so we can see it in context? Recommend sticking to mm/yr or cm/yr throughout the paper, try not to mix units.

318 Label the scenarios A, B as in subsequent figures.

325 Is the flooding associated with cyclones also related to waves & high rainfall? It won't affect your results if you're taking them out but might be worth noting.

And what about the chronic flooding? If (line 365) there is already chronic flooding, how high above the tidal height those days did this occur? At which sites? How often? Does this mean you need to allow say 40cm for rainwater? Or more?

370 "every two days between 2060 and 2100" be careful here. Do you mean, every other day, or every day for half the year, or every spring tide, or something else? It might make quite a bit of difference to adaptation policy.

377 "For our high-end scenario, chronic flood events driven by sea-level rise occur one decade earlier than for the upper bound of the likely range. (dotted line on fig 6)

Fig 1 According to your map Fig 1, substantial areas are at 0m (should this actually be labelled 0-2m?) and would therefore be underwater more than half the time already. (Fig 5). Or is there a datum error? Local TG at chart datum? Since 0.8m is used as a key cut-off, it would be very useful to have a colour boundary on the map at this height, also at 1m.

Fig 5 - can you indicate on the figure when flooding starts at some location? Fig 5a please replot with years labelled.

Fig 7: Isn't this figure effectively just an extra (top) panel in Fig 6? Why not keep it together for simplicity? Fig 6 & 7 I suggest adding the caption from fig 3 so the lines are labelled on the same plot, there is plenty of space & it will enable easier reuse of the figure. Always better to avoid scrolling though pages if possible! Fig 6 : include the heights (0.8m, 1.0m, 2.0m) somewhere? Fig 6: Maybe change the x axis to start at year 2000?

Bourdon/Boudon & Chiozzoto 2012 is a key paper, but is not consistently spelt. The reference is not adequate to find it. It's some kind of local report? Is it online? Does it have a doi? Please translate the title. If it's not readily available, some of the quoted text could be more helpful, particularly the data in Table 4.... well OK, in a sense it doesn't matter, it's just that you've defined 3 sets of sites, with "Low vulnerability" as "at 2m" etc. B&C2012 is used to justify this choice? You could just stick to these numbers and maybe list some examples of each in Table 4, for the sake of interest.

Within the timescale of your paper, the high vulnerability sites may be flooded not just at high tide but over the whole tidal cycle. This seems worthy of a mention?

IPCC reference missing doi. And several others. Please check all references.

Data availability statement?

Language: The paper needs a thorough copy-edit for English. Some sentences will need significant changes, so the authors must ensure that their intended meaning is

preserved. Eg (there are many more examples!) 32 since->for 44 their->the 46 to->with etc etc

60 future mean relative sea-level? 165 artificialized - > reclaimed? 215 ...data from these days are removed... 312 suspicious -> suspect 314 Similarly to what has been conceptualized to address deep uncertainties affecting climate-induced sea-level rise projections -> In a similar manner to climate scenarios for SLR projections [ref], to address deep uncertainties we define... etc 349 which->what

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