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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Impact of asymmetric uncertainties in ice sheet dynamics on regional sea level projections" *by* Renske de Winter et al.

Anonymous Referee #1

Received and published: 14 June 2017

Reviewer comments of:

"Impact on asymmetric uncertainties in ice sheet dynamics on regional sea level projections" by Renske de Winter et al.

recommendation:

minor revision

general comments:

The paper copes with the problem of propagating non-symmetrical sea level uncertainty distributions from ice sheet and glacier melting into the combined sea level rise. Since the authors use spatially varying self attraction and loading sea level change pat-

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Discussion paper

terns, the estimates are furthermore varying in space. Compared to the case where symmetric distributions were used, the authors find mostly positive increases in the median of sea level change, and even larger increases in the higher percentiles of these projections. Furthermore, the authors study the effect of correlated contributors and alternative probability density functions.

I found the paper easy to read, with a clear message, and it may possibly be suitable for policymakers. I would therefore recommend the paper for publication. There are however a few minor issues which, when addressed, would improve the paper in my opinion.

* Explain the link between the combination of theoretical pdf's and the discretized formula's as provided in the paper. For example, eq 1 is a discretized convolution over the domain (-infty,infty) which comes from summing 2 contributions each with a different pdf. By briefly explaining the theoretical origin of eq. 1(and 6), one could make the paper more accessible to readers not so familiar with probabilistic theory.

* Uses of high percentile SLC estimates for coastal defense. This got me admittedly somewhat confused. As far as I understood, and I could be wrong, coastal defense infrastructure is commonly determined from high percentiles values of storm surge from models subjected to prescribed sea level rise, and not so much from the direct high percentile of this sea level rise itself. So my request would be to describe more clearly how these high percentile SLC values enter safety standards, rather than simply saying that they are used to define safety standards.

* Motivate choice of picking out locations Denmark Strait, New York and East Pacific. Why did the authors choose these locations? I can also imagine that locations in the West Pacific and Indian Ocean where large mega-cities exists will be highly relevant, not to mention that they are in the far field.

minor remarks:

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page 2 l19: "is under debate": is it possible to add a reference here to a paper discussing this debate?

p2 l30 " An asymmetric probability density function for the Greenland .. can also no be included" Why is this? due to instability in the marine terminating glaciers? l30 also no -> also not

p3 l12 use distribution -> use a distribution

p3 l13 of by Bamber -> from Bamber

p3 l33 are published -> have been published

p6 l10 from -1.9 m to +1.03 m -> from -1.09m close to the melting sources to +1.03m in the far field

p7 l3 -> Adopting an asymmetric -> As mentioned before, adopting ..

p7 l6 Explain *why* you corrected the change of the higher percentiles for the local median SLC

p7 l24 Maybe add: as it can potentially narrow down the uncertainty of SLC projections

p8 l17 that when -> that, when

p8 l20 SLC projections -> its projections

p8 l20-21 "The ratio .. expert judgment" Would it be fair to mention that an increase in temperature in the climate may partly explain such correlations?

fig 2 caption Eest -> East

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