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Ocean Science
Discussions

Interactive comment on "An ensemble study of extreme North Sea storm surges in a changing climate" *by* A. Sterl et al.

Anonymous Referee #1

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Review of "An ensemble study of extreme North Sea storm surges in a changing climate"

by A. Sterl, H. van den Brink, H. de Vries, R. Haarsma and E. van Muijgaard.

General Comments:

This is a thorough well documented study of how storm surges might change with climate change. I recommend it be published. I have two main comments the authors should consider prior to publication and some additional detailed comments are given below.

Firstly, the authors note that the study is done with one climate model only. The authors recognise this is inadequate but I believe they do too little to qualify their results.

Secondly (and related), I retain some skepticism that the models (all of the GCMs and the reanalysis products) have high enough resolution to adequately capture the most extreme winds, and possibly any potential changes in winds. The ECMWF winds are increased by 10% but why that value is not really justified. The best justification would appear to be the sea levels in Figure 3. What about the other models?

Detailed Comments:

Page 1032, Line 13: Suggest "uncertainty. In the one model used in this study, we find".

Line 23: Suggest "The plan included massive"

Page 1033, Line 2: Suggest "system to be able to withstand"

Line 13: This of courses misses model biases, which may be dominant.

Page 1034, line 11: Suggest "models, four were"

Line 17: Suggest " is not statistically significant"

Line 21: There is no right panel. Also Figure 1 is not yet referred to.

Page 1036, line 7; Suggest "In summary, all models"

Page 1037, line 22: "results from"

Page 1038, line 23: "surge height, simulated"

Page 1040, lines 15-18: I think this is a weak justification that the winds are appropriate, even though I not the emphasis on wind changes.

Page 1041, line 5: Should this be lower rather than higher?

Line 13-14: Justify the 10% factor. On line 14, should this be "to other model data sets", and if so what about compared to real winds?

Page 1042, line 17: "North Sea, Figure 5"

Line 25: I think relevant is the wrong word here, these winds are still relevant. Perhaps change relevant to dominant.

Page 1043, line 6: Suggest “not change surge heights greatly at the”

Page 1044, line 12: Suggest “water level on the coast as,”

Page 1045, lines23-25: This is an important point and should be in the abstract.

Figure 2, 3 and 7: Some of the lettering is barely legible.

Figure 5: Some of the lettering is illegible. What is the scale? Has the ERA winds been increased by 10% as earlier noted necessary.

Figure 9: Some of the lettering is illegible. What is the units of the scale in (a)?

Interactive comment on Ocean Sci. Discuss., 6, 1031, 2009.