

Interactive comment on “Developments in large-scale coastal flood hazard mapping” by M. I. Vousdoukas et al.

Anonymous Referee #1

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The manuscript represents the very first approach to the problem of coastal flooding at an European scale. The paper is very well written and is based on a rigorous approach.

It is notable the fact that four different methodologies are compared, spacing from a simple bath-tub approach to more sophisticated numerical modeling.

Regarding the literature review a littlebit extra can be done. The author on page 2-lines 52-58 presents basically two approaches with different potential of application but also variable computing requirements, e.g. bath-tub in a GIS environment against numerical modeling. A third intermediate solution, a dynamic reduced model like LISFLOOD is finally considered.

In reality a fourth approach can be considered, the use of sophisticated GIS methodologies, e.g. the Cost-Distance Approach, thus introducing a "proxy" for inundated

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surface characteristics, like the presence of obstacles or passageways. This new approach has been recently compared to more detailed hydrological estimations using wave run-up calculations and the results are promising. Likewise other approaches, it has been used for the application of the flood directory, the method and reference case study can be found in the recent paper on NHES by Perini et al., 2016 (DOI: 10.5194/nhess-16-181-2016). Another interesting application is the one by Sekovski et al., 2015 (DOI: 10.5194/nhess-15-2331-2015), to predict increased vulnerability to urban growth.

Regarding the approximation that the authors used for the introduction of coastal structures in the DTM, described at page 5, lines 170-172, I think it is a clever solution. However, can they clarify why they use a 5 year return period level? Is not a littlebit low? My experience is that defense structures are built with an elevation which corresponds to much higher safety levels, if not, low-lying areas behind dykes would be flooded too regularly. Personally I would have a chosen at least a 10 return period level.

At page 6 the authors say that Xynthia is the best documented flood in Europe. This is not true, the 1953 flood in the Netherlands, Belgium and the UK is very well documented. If they mean that Xynthia is more documented regarding the flood extent using for example satellite-based methods I agree. But I believe the statement should be rephrased.

On the same page, at line 190 they say that the flood extend was obtained by field measurements. Who did these measurements? Are they publicly available? Also, the sentence at line 191 is a broken one.

Some reviewing is needed for the reference list.

1) The reference by Breilh et al. should come before Boetle et al. 2) Is the paper by Dottori already published? Add page numbers. 3) The paper by Vousdoukas et al. at line 483 is now published. Please upgrade.

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