

Interactive comment on “Development of flood probability charts for urban drainage network in coastal areas through a simplified joint assessment approach” by R. Archetti et al.

Anonymous Referee #1

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General comments:

The paper outline a method by which to assess how big a proportion of an urban coastal area is flooded based on properties of precipitation and sea surge.

The modelling approach up until and including Figure 7 is a standard application of urban network modelling as they have been carried out by researchers and practitioners since the middle of the 1980ies using programs such as SWMM, InfoWorks, MOUSE and similar software packages. The key novelty of the paper is the transformation from Figure 7 to Figure 8, whereby it is possible to determine vulnerability in terms of ex-

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changing one hazard (precipitation) with another (sea level). The appropriateness of transformation is then tested on a short historical time series.

Other authors have published work on how these hazards are correlated and drawing isocurves for return periods of combined hazards by using copula functions. It would be interesting to see the authors develop a framework of how to interpret the isolines in relation to the hazards.

Specific comments: p3801, line 27 onwards: Two critical durations are mentioned, based on different times of concentrations of the sub-catchments. However, in both cases up to 75% of the entire catchment is flooded, meaning that the loadings of the sub-catchments overlap. That suggests the use of one design storm for each return period that covers all durations, such as a Chicago Design Storm. That will allow an easier interpretation of the results as well and a clear conversion between return period of each of the hazards.

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