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Comment

## ***Interactive comment on “Probabilistic hurricane-induced storm surge hazard assessment in Guadeloupe, Lesser Antilles” by Y. Krien et al.***

### **Anonymous Referee #1**

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In the present article the author describe the method for estimate of extreme storm surges in the Guadeloupe region using the probabilistic approach. Probabilistic approach is also widely used for estimate of other marine hazards, such as tsunamis. The basis of the method relies on an extensive database, which gives adequate statistical distribution of considered events. In the case of insufficient statistics, it is not possible to give a proper estimate of the frequency of occurrence of extreme events. Regarding the paper by Krien et al., I am concerned about the completeness of the considered database of storm surge statistics, which covers years from 1980 till 2011. This database contains only four large events, which does not seem to be sufficient.

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Therefore, I think, that the proposed database of historical data should be extended by the hypothetical simulations of possible events.

Another major point regards the statistics of atmospheric processes (cyclones). Indeed, statistics of atmospheric processes (cyclones) is well known. Using appropriate wind data, modern numerical storm surge models (ADCIRC-SWAN) can describe the sea level changes with a high accuracy. In this paper the authors propose the technique of "extrapolation" of extreme storm surge statistics to very long periods of observation in order to assess the return periods of events of up to 1000 years. However, the authors do not describe the statistics of atmospheric storms, used to generate synthetic series of storm surges. So, it is unclear what type of extreme distribution was used in this case.

Accordingly, the phrase "Only storms with maximum wind speeds higher than 120 or 205 km h<sup>-1</sup> (for the 100 and 1000 year surge levels respectively) and within a 100 km radius from Pointe-a-Pitre were considered in the first place" requires at least a reference.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 401, 2015.

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