Nat. Hazards Earth Syst. Sci. Discuss., 3, C1611–C1614, 2015
www.nat-hazards-earth-syst-sci-discuss.net/3/C1611/2015/

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Estimation of insurance related losses resulting from coastal flooding in France" *by* J. P. Naulin et al.

Anonymous Referee #1

Received and published: 3 September 2015

Dear Editor, This paper by Naulin et al. presents the development of a modeling strategy to evaluate insurance losses resulting from coastal flooding with an application for a case study in France. The approach is interesting and well suitable for the journal but several points would need to be improved and therefore I think that moderate to major revisions are being requested before the paper can be accepted. General comments:

-Presentation. The English should be improved to reach the standard of an international journal such as NHESS, sections 3 and 4 would deserve a particular effort. Only 25 out of 45 references correspond to papers in international journals easily accessible, the rest corresponds to technical reports or national conference proceedings written in French that will be hardly accessible/understandable for future readers of NHESS. Could the author try to make an effort to avoid referring to grey literature and

find equivalent references in international journals when possible?

-Methodology for the hazard model. Several studies showed that massive flooding could limit water levels seaward compared to a situation where flooding would be prevented (Townend and Pethick, 2002; Bertin et al., 2014). Inside estuaries, water levels could be up to more than 1 m lower due to flooding, which has major implications in terms of flood modeling using 1 way-nesting, as it is the case here. Based on the information found on the website, the previmer system doesn't allow for the representation of any flooding: the water levels that the authors use for force their simplified flooding model may be locally too high and result in over predictions of the flooding. Yet, the opposite is often observed. Although I understand that this is not the main purpose of this study, I think this problem should be at least discussed. Also, P2818, L3-11: how is made the adjustment? Is this calibration valid for other storms than Xynthia?

-Methodology to compute wave-induced setup (section 2.1.2). Stockdon et al. suggested that "While H0 was used in this analysis as an equal measure of wave height between different sites, in practical applications, it may be preferable to use local wave measurement". Which H0 is used here? From P2819, L2, one can understand that these are local H0 extracted from the Previmer whereas L19-22 sates that "wave refraction and shoaling are not taken into account": why would these processes not be taken into account in the wave model of Previmer?

Along the text comments:

-Abstract, L.5: in regions where tides are large, a storm surge by itself is not a hazard, the hazard originates from the resulting water level (tide+surge).

-P2812, L.21: were atmospheric conditions really "extreme" during Xynthia? How do wind speed compare to those of recent extreme storms such as Hayan?

-P2814, L3-7: several studies conducted in the US over the last 5 years showed that it was nowadays possible to simulate storm surges and coastal flooding at regional

scale using unstructured-grid models with massive parallel techniques (e.g; Bunya et al., 2010). Although requiring large computational resources, this kind of approach should be mentioned as possible alternatives.

-P2816, L19-25: see previous general comment on the limitation of water levels due to massive flooding.

-P2817, L14-16: what are the spatial resolutions of these two atmospheric models?

-P2817, L17-19: for which period were obtained these values? Please try to provide more details when the reference corresponds to grey literature.

-P2817, L20-21: are you talking about reproducing water levels of the associated flooding during Xynthia? Is coastal flooding represented in the Previmer operational system?

-P2819, L16: how wave setup can be computed from a spectral wave model?

-P2820, L16-17: why not using a LIDAR-based DTM? Is this data not existing or available in France?

-P2821, L10-11: Could you try to better quantify the model skill, e.g. using the fit measurement of Aronica et al. (2002) or other appropriate metrics?

-P2821, L27: how do you know that water levels are underestimated by 0.4 m? Is there a tide gauge there?

-P2825, L1: the dikes are probably narrower than the 25 m resolution of the DTM.

-P2827, L2: Is that really extrapolated or interpolated? Is that reasonable to interpolate storm surge values between tide gauges?

References:

Aronica, G., Bates, P.D., Horritt, M.S., 2002. Assessing the uncertainty in distributed model predictions using observed binary pattern information within GLUE. Hydrol. Pro-

cess. 16, 2001–2016.

Bertin, X., Li, K., Roland, A., Zhang, Y.L.J., Breilh, J.F., Chaumillon, E., 2014. A modeling-based analysis of the flooding associated with Xynthia, central Bay of Biscay. Coastal Engineering 94, 80–89.

Bunya, S., Dietrich, J.C., Westerink, J.J. et al., 2010. A high resolution coupled riverine flow, tide, wind, wind wave and storm surge model for southern Louisiana and Mississippi: part1 âĂŤ model development and validation. Monthly Weather Review 138, 345–377.

Townend, I. and Pethick, J., 2002. Estuarine flooding and managed retreat. Philos. Trans. R. Soc. A Math. Phys. Eng. Sci. 360 (1796), 1477–1495.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 2811, 2015.