Conceptual and methodological frameworks for large scale and high resolution analysis of the physical flood susceptibility of buildings

*** General comments:

This is an interesting manuscript, generally well written, well organized, and well referenced. It addresses a pressing topic in natural hazards and NHESS, it is quite conceptual and exploratory.
The authors propose a novel framework for classification and characterization of the physical flood susceptibility of buildings applicable in large scale, based on high resolution spatial data. The approach is somewhat complex and 'data-greedy'.
Regarding its wide adoption, challenges of the case-study does not contribute to convince one of the feasibility of the approach for generalized operational implementation, despite the extreme high resolution of the imagery used.
Still, the paper provides an excellent overview of the problem, state-of-the-art and proposed solution, including honest conclusions.

I suggest including a Discussion section separate from Conclusions where the issues raised, as well as the challenges and assumptions of the approach could be systematically addressed.

I recommend the paper should be accepted after minor revisions.

*** Specific comments:

The paper aims at estimating *a priori* the flood susceptibility of buildings – although correlated, this is a different exercise from assessing flood damage *a posteriori*. However, the paper focuses on the latter approaches almost from the start (ln. 15). Can this issue be clarified?
If the former analyses are scarce but nevertheless existing (ln. 13), can these be referenced?

As justification for need of a new approach, the authors list the extensive time and resources required by field work among the difficulties of adapting existing susceptibility (or damage?) assessment methods to large scales (ln. 18). However, doesn't this problem still apply also to this method, since it relies on rather expensive data (VHR imagery and DSM) AND field work to collect values of susceptibility for buildings?
The case-study further puts in evidence the difficulties of relying on automatic methods based on RS and the need for costly and time-consuming manual editing…

It is said that HR images (…) allow for high efficiency through global availability and relatively low-costs (p. 5697, ln. 8). "Global availability" of HR optical imagery is mostly theoretical, given practical limitations such as cost (aerial imagery) and limited coverage of high latitudes, cloud cover, etc. (satellite imagery). The mentioned "Low-costs" are compared to which alternatives?

It is said that "…identification of individual buildings (…) can be done by automatic or semi-automatic extraction from remote sensing data." (p. 5701, ln. 15). Not always, as the test demonstrates…

Regarding the case-study, why was this study area selected (p. 5707)? What are the main features of this area? Can a map be included, with the extent and location?

It is mentioned that "inconsistencies could be overcome with higher spatial resolution of the DSM" (p. 5708). However, so far studies show that these can only be reduced and not completely eliminated, as 100% accuracy in building extraction is not yet attainable.

Also it is said that “buildings that did not fit the criteria of accuracy were manually edited” (p. 5708, ln. 2). What are these accuracy criteria?

In Table 3, what is the role of the parameter ‘Susceptible volume’? It does not seem to be taken in consideration for computation of the building’s volume degradation in Table 4, as one would expect.

In Figs. 6 and 7, the potential deterioration is shown in in m^3. Wouldn’t it be more useful, including for comparison of impact functions among individual buildings as well as taxonomies in same area to have this scale standardized between 0-1, with 1 being the total volume of the building?

*** Technical corrections

(p. 5697, ln. 17) “…the conceptual and methodological frameworks and results of implementing and testing of a methodology **are** presented.”

(p. 5701, ln. 2) operationalisation