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Review of nhess-2021-134

Dominik Paprotny (Referee)

Referee comment on "Chronicle of a forecast flood: exposure and vulnerability on the southeast coast of Spain" by Rubén Giménez-García et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-134-RC2>, 2021

Dear Authors,

I reviewed your manuscript "Chronicle of a forecast flood: exposure and vulnerability on the southeast coast of Spain" and I must admit straight away that my opinion about it is negative. It is related not as much to errors or weakness of the text or figures, which were largely listed by Reviewer #1, but by the wholesome value of the study. In this, I disagree with Reviewer #1. The topic of the influence of growing exposure on flood losses is very important, but the paper doesn't contribute anything new here. Specifically:

- The paper is a very narrow case study, consisting of 2 small municipalities, which Spain alone had 8131 as of 2020. This would be not a problem if something particularly interesting was happening in that location, but from the paper doesn't appear to be the case, as there is no clear trend: depending on the scenario and municipality, newer building were more frequently built inside flood zones compared to those outside them, or not.
- There is no connection made between the analysis of exposure of buildings and the historical events analysed earlier. Can the losses in 2016 and 2019 can be quantitatively shown to be increased by new constructions? Or that earlier events led to restricting of construction in flooded areas? Are any of the flood hazard map an approximation for the past events? How relevant are the exposure changes relative to climate change?
- The study only analyses buildings and their area, without giving any consideration or providing the reader an idea as to the function of those, population living in them, their economic value or amount of economic activity taking place there, who built them or how flood management in the area works. Whenever such aspects are mentioned, there are taken from literature. Consequently, the whole conclusion section has no relation to the paper. Just one most striking example: "The study carried out reveals how, in order to cover the growing residential needs of the tourist boom in coastal areas, San Javier is disproportionately increasing its real estate portfolio, spreading urban development over areas at obvious risk of flooding, which increases exposure and vulnerability of the infrastructure and population." But the study doesn't make any

analysis of vulnerability (only exposure), doesn't mention infrastructure or population, doesn't show that residential or tourism-related building are the ones more frequently built on floodplains, and also suggests that the municipality owns and has built all buildings, thus showing no lessons were learnt from past floods. Similarly, the title or abstract has little connection with the actual contents of the paper.

- The study doesn't mention at all any studies on the impact on growing exposure, many of which were carried out from local to global scales. Therefore, it is not possible to say if the area studied is in any way related to trends in exposure-adjusted flood losses in Spain or Europe. Below I list some literature that I suggested checking for context.
- There is very little description of the data (including their quality), which is largely caused by the fact that the study is, in essence, a simple intersection of two datasets provided by government agencies.

In summation, I have to answer negatively on several review criteria (nos. 2–6, 8–10, 13–14). Still, I encourage the authors to continue their research, as with more depth to the analysis, better connection to flood management and relevant literature in the field, a good and significant study can be achieved.

Kind regards,

Dominik Paprotny

Literature on the impact of growing flood exposure:

- A.J. Stevens, D. Clarke, and R. J. Nicholls, Trends in reported flooding in the UK: 1884–2013, *Hydrological Sciences Journal* 61, 50 (2016).
- S. Fuchs, M. Keiler, and A. Zischg, A spatiotemporal multi-hazard exposure assessment based on property data, *Natural Hazards and Earth System Sciences* 15, 2127 (2015).
- J.I. Barredo, D. Saurí, and M. C. Llasat, Assessing trends in insured losses from floods in Spain 1971–2008, *Natural Hazards and Earth System Sciences* 12, 1723 (2012).
- A.J. Stevens, D. Clarke, R. J. Nicholls, and M. P. Wadey, Estimating the long-term historic evolution of exposure to flooding of coastal populations, *Natural Hazards and Earth System Sciences* 15, 1215 (2015).
- G. Sofia, G. Roder, G. Dalla Fontana, and P. Tarolli, Flood dynamics in urbanised landscapes: 100 years of climate and humans' interaction, *Scientific Reports* 7, 40527 (2017).
- B. Jongman, P. J. Ward, and J. C. J. H. Aerts, Global exposure to river and coastal flooding: Long term trends and changes, *Global Environmental Change* 22, 823 (2012).
- J. I. Barredo, Normalised flood losses in Europe: 1970–2006, *Natural Hazards and Earth System Sciences* 9, 97 (2009).
- D. Paprotny, A. Sebastian, O. Morales Nápoles, and S. N. Jonkman, Trends in flood

- losses in Europe over the past 150 years, *Nature Communications* 9, 1985 (2018).
- R. A. Pielke and M. W. Downton, Precipitation and damaging floods: Trends in the United States, 1932–97, *Journal of Climate* 13, 3625 (2000).
 - R. P. Crompton and K. J. McAneney, Normalised Australian insured losses from meteorological hazards: 1967–2006, *Environmental Science & Policy* 11, 371 (2008).