

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
<https://doi.org/10.5194/nhess-2021-61-RC2>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Review of nhess-2021-61

Anonymous Referee #2

Referee comment on "A paradigm of extreme rainfall pluvial floods in complex urban areas: the flood event of 15 July 2020 in Palermo (Italy)" by Antonio Francipane et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-61-RC2>, 2021

This research investigates on flood risk management of complex coastal urban areas. The case study of the city of Palermo is presented. Severe flooding events impacted the city in recent years. The meteo-climatic forcing and the dense urbanization are the major causes of flood risk for the city where natural channels were substituted by artificial sewer/drainage systems, urban growth increased the nuisance effects of flash floods linked to climate change with related increase of the frequency and severity of rainfall events.

The flood monitoring systems of the city seems also to be inadequate, and not being able to provide accurate, timely and distributed information of inundation events especially in the pre-event and during the event phases. The rainfall-induced fast flooding phenomena were the subject of citizen-driven observations that may present an important source of information to understand and mitigate the adverse impacts of floods.

As a result, this paper explores methods for developing useful and validated flood models in support of flood risk management and mitigation. Authors demonstrate to have solid knowledge, and scientific hydro-modelling tools (integrating geospatial, hydrologic and hydraulic modelling) and to provide interesting insights for how to develop accurate flood models and validate findings by means of available information. This is a relevant topic for this journal, matching NHESS topics of interest. Nevertheless, I see there are some major issues with this work that I do hope authors will address to improve this submission that – to my view and knowledge – is of interest for a potential publication on the NHESS journal. The general remarks and specific comments are provided here below.

General comments

- **The introduction is missing to specify the scientific question or specific science advancement(s) proposed in this work.** In the introduction you extensively introduced the issues of coastal Mediterranean areas affected by intense rainfall storms and flooding, with focus on the Palermo case study. Then, while mentioning uncertainties associated to urban growth and climate change, you referenced the flood adaptation and mitigation measures and more specifically the floodability concept. The use of integrated hydro-modelling is also cited (but not properly references with citations of authors' works or related works to the methods used). As a result, it is not clear – reading the introduction – where this work is specifically pointing to. The manuscript of course include these information afterwards (methods, results later inserted), but I'd suggest authors to insert a paragraph in the introduction to properly guide the reader, citing relevant works and share with the reader the general and specific scientific aims of this work. See also next comment in this regard.
- **The use of crowdsourcing is spread out from the methods to the results, but not cited in the introduction.** I see this part as relevant for this work. You are validating your flood model using crowdsourced data. While waiting the revised work to understand the major focus (see general comment n.1) and you show how satellite images (supplementary) as well as standard flood observations from the regional agencies are not supporting with actionable information for post-event reconstruction. So, as also shared in specific comments, I see the material section as the one needing to be expanded to include the crowdsourcing and also other EO material citing pros and cons, inaccuracies and opportunities. As also suggested in the specific comments, this work needs some restructuring (some material information inserted in the results etc., see specific comments).
- **The manuscript title and the discussion.** I am missing to see the link of the title and introduction to the discussion points. To what I read I think the "paradigm" in the title is not motivated and adequately linked to the final outcomes and critical discussion point of this work. To date, I'd think that post-event reconstruction would be a key-word and focus of this work. But, I see also a lot of potential in the information on meteo-climatic forcings and the way authors design the hydro-modelling of the complex system where natural channels and related hydrologic forcings are linked to the modelling within the city. The complex hydrologic domain is also a key factor of the challenges of similar cases.
- **Writing and structure.** I think the language needs some polishing and improvements. See specific comments. The structure editing may help in making the flux of information easier to read (as already requested in previous general comment n.3).

Specific comments

See attached commented PDF

Please also note the supplement to this comment:

<https://nhess.copernicus.org/preprints/nhess-2021-61/nhess-2021-61-RC2-supplement.p>

[df](#)