Community comment on "Brief Communication: Critical Infrastructure impacts of the 2021 mid-July western European flood event" by Elco Koks et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2021-394-CC2, 2022

Comment on behalf of the Royal Meteorological Institute of Belgium (RMI)

We would like to comment on the introduction of the paper, in which the 2021 mid-July extreme precipitation event is shortly described. The rainfall accumulations displayed in Figure 1 are largely underestimated with respect to the rain gauges observations made in Belgium.

Here are a few values regarding precipitation accumulation over 3 days (between July 13, 6:00 UTC and July 16, 06:00 UTC) in Belgium:
- 16 rain gauges (all located in Wallonia) recorded rainfall exceeding 150mm over 3 days.
- 5 rain gauges (all located in the Province of Liège) recorded rainfall exceeding 200mm over 3 days:
  RAINFALL, LOCATION, LAT, LON
  291.6mm, Jalhay, 50.54697, 6.005596
  260.8mm, HOCKAI, 50.48306, 5.987644
  229.3mm, Spa, 50.47864, 5.910008
  216.0mm, MONT RIGI, 50.51078, 6.073438
  208.2mm, Neu-Hattlich, 50.57327, 6.157926
- The largest observed 3-days accumulation reaches 291.6mm.

A map of Belgium with the 3-days precipitation total is available on the RMI website: https://www.meteo.be/nl/info/nieuwsoverzicht/2021-een-nat-jaar-met-extreme-neerslag (see 2nd figure).

As source for the rainfall data displayed in Figure 1, the authors mention the E-OBS dataset which is a gridded dataset that largely relies on the ECA-D initiative ("The station data collated by the ECA&D initiative [...] form the basis of E-OBS.", Cornes et al., 2018). The ECA-D database contains very few precipitation data for Belgium (Could you list the Belgian precipitation stations involved in the E-OBS dataset?). The E-OBS is thus currently not suitable to represent rainfall at regional scale over Belgium.

The attribution study of the heavy precipitations of mid July (Kreienkamp et al., 2021) provides a map of the rainfall accumulation (see Figure 6 or https://www.worldweatherattribution.org/heavy-rainfall-which-led-to-severe-flooding-in-western-europe-made-more-
likely-by-climate-change/) that also relies on E-OBS but "extended by numerous stations"
("An enhanced, non-public E-OBS dataset that includes more observational data in the
most recent years (mostly additional data starting in 2004 or 2008), and additional data
from regional and federal authorities was produced specifically for the analysis of the
heavy precipitation discussed here.", Kreienkamp et al., 2021)
This map published in (Kreienkamp et al., 2021) highlights that the largest 48h
accumulations are located in Belgium.

As a conclusion, Figure 1 should either be removed and replaced by the references
mentioned above, or corrected regarding rainfall accumulation in Belgium. In the latter
case, the authors are invited to contact the Royal Meteorological Institute of Belgium to
obtain rainfall observations in Belgium.

We also recommend the authors to check the reliability of the rainfall accumulation
displayed on Figure 1 for Germany, the Netherlands and Luxembourg with the respective
national meteorological and hydrological services. In order to properly depict the severity
of this event, it is essential that all available rainfall observations are well taken into
account.

References

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