

Nat. Hazards Earth Syst. Sci. Discuss., community comment CC2
<https://doi.org/10.5194/nhess-2021-394-CC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.



Comment on nhess-2021-394

Michel Journée

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

Cornes, R. C., van der Schrier, G., van den Besselaar, E. J. M., and Jones, P. D.: An Ensemble Version of the E-OBS Temperature and Precipitation Data Sets, *J. Geophys. Res. Atmos.*, 123, 9391–9409, <https://doi.org/10.1029/2017JD028200>, 2018.

Kreienkamp, F., Philip, S.Y., Tradowsky, J.S., Kew, S.F., Lorenz, P., Arrighi, J., Belleflamme, A., Bettmann, T., Caluwaerts S., Chan, S.C., Ciavarella, A., De Cruz, L., de Vries, H., Demuth, N., Ferrone, A., Fischer, E.M., Fowler, H.J., Goergen, K., Heinrich, D., Henrichs, Y., Lenderink, G., Kaspar, F., Nilson, E., Otto, F.E.L., Ragone, F., Seneviratne, S.I., Singh, R.K., Skålevåg, A., Termonia, P., Thalheimer, L., van Aalst, M., Van den Bergh, J., Van de Vyver, H., Vannitsem, S., van Oldenborgh, G.J., Van Schaeybroeck, B., Vautard, R., Vonk, D., Wanders, N.: Rapid attribution of heavy rainfall events leading to the severe flooding in Western Europe during July 2021. *World Weather Attribution*, 2021