

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2  
<https://doi.org/10.5194/nhess-2021-394-RC2>, 2022  
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## **Comment on nhess-2021-394**

Anonymous Referee #2

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Referee comment on "Brief communication: Critical infrastructure impacts of the 2021 mid-July western European flood event" by Elco E. Koks et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-394-RC2>, 2022

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This brief communication provides an overview of the impact of the July 2021 flood (Germany, Belgium, the Netherlands) on important (critical) infrastructure systems (Transport Infrastructure, Electricity and gas supply, Drinking water supply and wastewater, Solid waste, Telecommunication, Healthcare and education) as well as the progress in rebuilding these important systems. Problems in the field of risk assessment of infrastructure disasters are identified and statements are made for future activities to improve risk modeling for critical infrastructure. Thus, the draft meets the content requirements for a brief communication. Overall, the manuscript needs some revisions; however, the summary of information from media and other work is an important contribution to research on the highly topical example of a severe extreme event that was not foreseen and has highlighted our limitations in risk management.

### **Minor major comment:**

- The authors should rethink the structure in Section 2 and 3. The argumentation of the paragraph L149-154 is interesting, but does not quite fit very well.
- Section 3 "Critical Infrastructure Impacts" really only addresses the transportation infrastructure aspect; can you please comment a bit more on the other topics discussed in section 2?

### **Minor comments:**

- The following specifications for "Brief communications" from the publisher side were not met:
 

[https://www.natural-hazards-and-earth-system-sciences.net/about/manuscript\\_types.html](https://www.natural-hazards-and-earth-system-sciences.net/about/manuscript_types.html)

„Brief communications have a ... maximum 20 references, and an abstract length not exceeding 100 words.“

Even if I find the aspect with the citations (caused by various media reports) less relevant and it is rather important to link/appreciate the work of others --> Decision of the editor/publisher
- L19: See also for Germany:
 

Junghänel, P. Bissolli, J. Daßler, R. Fleckenstein, F. Imbery, W. Janssen, F. Kaspar, K. Lengfeld, T. Leppelt, M. Rauthe, A. Rauthe-Schöch, M. Rocek, E. Walawender u. E. Weigl (2021): Hydro-klimatologische Einordnung der Stark- und Dauerniederschläge in Teilen Deutschlands im Zusammenhang mit dem Tiefdruckgebiet „Bernd“ vom 12. bis 19. Juli 2021, Deutscher Wetterdienst 2021 [https://www.dwd.de/DE/leistungen/besondereereignisse/niederschlag/20210721\\_bericht\\_starkniederschlaege\\_tief\\_bernd.pdf](https://www.dwd.de/DE/leistungen/besondereereignisse/niederschlag/20210721_bericht_starkniederschlaege_tief_bernd.pdf)

Maybe there are similar reports from the other two weather services for the respective country?
- Figure 1:
 

A detailed integration of the relevant rivers in all three countries would be very desirable; it is unclear which data come from which dataset; How (and by whom) exactly was the flooded area determined? When is this flooded area evaluation from? Country boundaries could be a bit thicker for better distinguishability? The city names should be in English (e.g. Köln à Cologne); Why is the scale 200 - 225 mm used in the colorbar, when it is not used in the figure? This gives a false impression of the maximum values.
- L20: „Rhine“
 

In Germany, the tributaries such as the "Ahr" and "Erft" were particularly affected.
- L23ff: Newly published "Press release from Munich RE from 2022/01/10": <https://www.munichre.com/en/company/media-relations/media-information-and-corporate-news/media-information/2022/natural-disaster-losses-2021.html>
- L23ff:
 

How are the loss amounts to be understood? Total loss or Insured loss; Direct loss or Indirect loss?
- The captions of Section 2 and Section 3 are identical.
- Figure 2: To avoid confusion; the damage was not on 11 August 2021, but the images are from the 11 August --> Recording date
- Figure 3 is not referenced in the text.
- L140 „...which hampers verification and validation with observed impacts.“
 

Suggestion: Maybe add „on smaller scales“
- L140ff: I miss in the reference the detailed literature citation from "Van Ginkel et al. (2021)".
 

On which data/models are the estimations of the river flood risk based for all road segments in Europe?
- L141: "...for all road segments in Europe."
 

Really for all? Or only for a part of the "road categories" (e.g. highways, trunk roads,...)
- L143: „... relatively small rivers...“
 

Please give examples
- L143: „During the event, ...“
 

Suggestion: „During the event in 2021, ...“
- L143: I miss in the reference the detailed literature citation from "Dottori et al., 2021".
 

As this is already the second missing citation; please check again if all citations are mentioned in the references.
- L145: "...flow velocities at multiple places."
 

Could you provide values here and make an assessment of them?

- L146: „...correspondence to the model“.  
Unclear what exactly is meant; to the model in Van Ginkel et al.?
- L147: “Figure 2”  
Maybe better suitable: Reference to Section 2.1
- L157f: “...freeboard requirements.”  
Please explain.
- L171ff: Another problem here is that the data basis is miserable.
- Section 4:  
Comment from RC1: “The three findings are not surprising and sound a bit generic, given the existing literature in science about this. But maybe it is still very important to stress these points once more after this important event, so as to hope to improve the risk management practices in Germany, at least.”  
I agree with this statement