

Comparing extreme precipitation between data from rain gauges, weather radar and high-resolution climate models

Arnbjerg-Nielsen, Karsten; Thomassen, Emma Dybro; Thorndahl, Søren Liedtke; Andersen, Christoffer Bang; Gregersen, Ida Bülow; Sørup, Hjalte Jomo Danielsen

DOI (link to publication from Publisher):
[10.5194/egusphere-egu22-2624](https://doi.org/10.5194/egusphere-egu22-2624)

Creative Commons License
CC BY 4.0

Publication date:
2022

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Arnbjerg-Nielsen, K., Thomassen, E. D., Thorndahl, S. L., Andersen, C. B., Gregersen, I. B., & Sørup, H. J. D. (2022). *Comparing extreme precipitation between data from rain gauges, weather radar and high-resolution climate models*. Abstract from EGU General Assembly 2022, Vienna, Austria. <https://doi.org/10.5194/egusphere-egu22-2624>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

EGU22-2624

<https://doi.org/10.5194/egusphere-egu22-2624>

EGU General Assembly 2022

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



Comparing extreme precipitation between data from rain gauges, weather radar and high-resolution climate models

Karsten Arnbjerg-Nielsen¹, Emma Dybro Thomassen^{1,2}, Søren Liedtke Thorndahl³, Christoffer Bang Andersen³, Ida Bülow Gregersen⁴, and Hjalte Jomo Danielsen Sørup¹

¹Technical University of Denmark, Section Climate and Monitoring, Lyngby (karn@env.dtu.dk)

²Danish Meteorological Institute, Copenhagen, Denmark

³Aalborg University, Aalborg, Department of the Built Environment

⁴Ramboll DK, Copenhagen

The representation of extreme precipitation at small spatio-temporal scales is of major importance in urban hydrology. The present study compares observations from tipping bucket gauges and a C-band radar to two sets of re-analysis climate model output data for a historic period of 14 years where there is full spatial and temporal overlap between datasets. The reanalysis data are based on models with different parametrizations and spatio-temporal resolutions, one being a “convective-permitting” model while the other uses a convective parametrization scheme to account for convective rainfall. The study focuses on an area of approximately 100 by 150 km.

The datasets are compared with respect to seasonality of occurrence, intensity levels and spatial structure of the extreme events. All datasets have similar seasonal distributions, and comparable intensity levels. There are, however, clear differences in the spatial correlation structure of the extremes. Seemingly, the radar data is best representation of a “real” spatial structure for extreme precipitation, even though challenges appear in data when moving far from the physical radar. The spatial correlation in point observations is a valid representation of the spatial structure of extreme precipitation. The convective-permitting climate model seem to represent the spatial structure of extreme precipitation much more realistically, compared to the coarser convective parameterized model. However, improvement could be made for the shortest durations and smallest spatial scales.