

EGU25-9140, updated on 08 Oct 2025

<https://doi.org/10.5194/egusphere-egu25-9140>

EGU General Assembly 2025

© Author(s) 2025. This work is distributed under the Creative Commons Attribution 4.0 License.



Building a global archive of flood events for the last decade based on Sentinel-1

Andrea Betterle¹, Bernhard Bauer-Marschallinger², Franziska Kraft³, Sandro Martinis³, Patrick Matgen⁴, Florian Roth², Tobias Stachl⁵, Wolfgang Wagner², Claudia D'Angelo¹, and Peter Salamon¹

¹European Commission - Joint Research Centre, Disaster Risk Management Unit, Italy (andrea.betterle@ec.europa.eu)

²Technical University of Vienna, Vienna, Austria

³German Aerospace Center, Munich, Germany

⁴Luxembourg Institute of Science and Technology, Luxembourg, Luxembourg

⁵EODC, Vienna, Austria

The observation of floods from space using Synthetic Aperture Radars (SAR) is a powerful means to understand how inundations unfold across space and time, together with the ensuing impacts. The systematic quantification of the extension of flooded areas and its dynamics is crucial to inform mitigation strategies and organize rescue efforts. Spatiotemporal trends in flood impacts can also help interpret the joint dynamics of climate and exposure, the first for example being associated with climate change while the second with socio-economical evolution. Furthermore, a comprehensive and consistent knowledge of flood events can help to quantify the effectiveness of legislative frameworks attempting to reduce flood impacts, such as the European Flood Directive (2007/60/EC).

This contribution presents the effort in building a global archive of flood events — featuring not only flood extent but also water depth — based on the flood delineations provided by the Copernicus Global Flood Monitoring (GFM). The flood delineations provided by GFM based on Copernicus Sentinel-1 SAR are enhanced using terrain topography, and they are complemented with water depth estimates obtained via the recently released algorithm FLEXTH (Betterle and Salamon, NHESS, 2024). The flood archive will have a global coverage at 20 m spatial resolution, spanning from 2015 until present. The procedure behind the construction of the dataset will be presented, together with the forthcoming steps of combining flood depth maps with exposed asset to further complement the database with flood impacts.