

Toward seamless high-resolution flash flood forecasting over Europe based on radar nowcasting and NWP: An evaluation with case studies

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Flash floods induced by heavy rain are one of the hazardous natural events that significantly affect human lives. Because flash floods are characterized by their rapid onset, forecasting flash flood to lead an effective response requires accurate rainfall predictions with high spatial and temporal resolution and adequate representation of the hydrologic and hydraulic processes within a catchment that determine rainfall-runoff accumulations.

We present extreme flash flood cases which occurred throughout Europe in 2015-2016 that were identified and forecasted by two real-time approaches: 1) the European Rainfall-Induced Hazard Assessment System (ERICHA) and 2) the European Runoff Index based on Climatology (ERIC). ERICHA is based on the nowcasts of accumulated precipitation generated from the pan-European radar composites produced by the EUMETNET project OPERA. It has the advantage of high-resolution precipitation inputs and rapidly updated forecasts (every 15 minutes), but limited forecast lead time (up to 8 hours). ERIC, on the other hand, provides 5-day forecasts based on the COSMO-LEPS NWP simulations updated 2 times a day but is only produced at a \sim 7 km resolution.

We compare the products from both systems and focus on showing the advantages, limitations and complementarities of ERICHA and ERIC for seamless high-resolution flash flood forecasting.