

SMUFF – Seamless probabilistic multi-source forecasting of heavy rainfall hazards for European flood awareness

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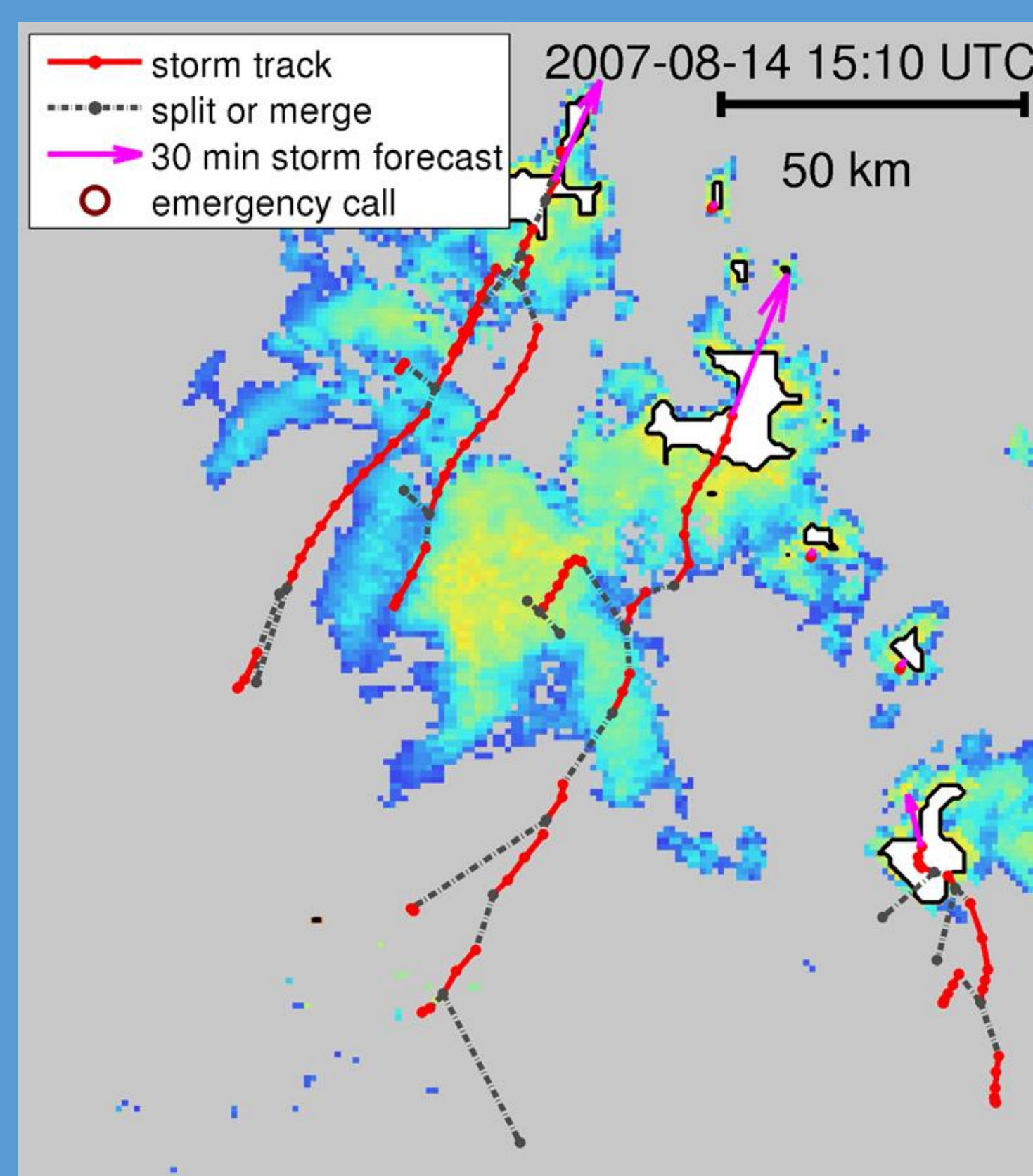
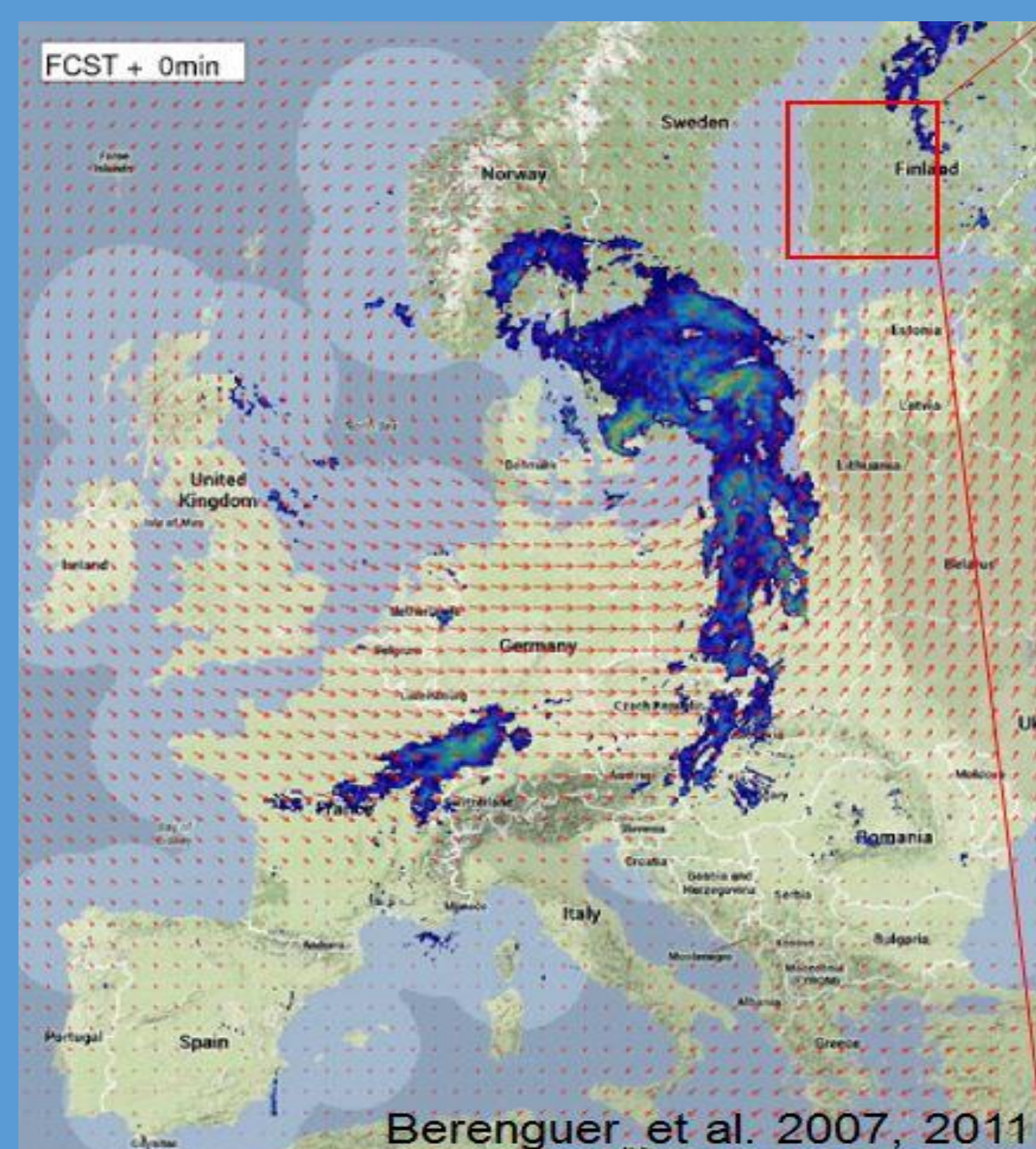
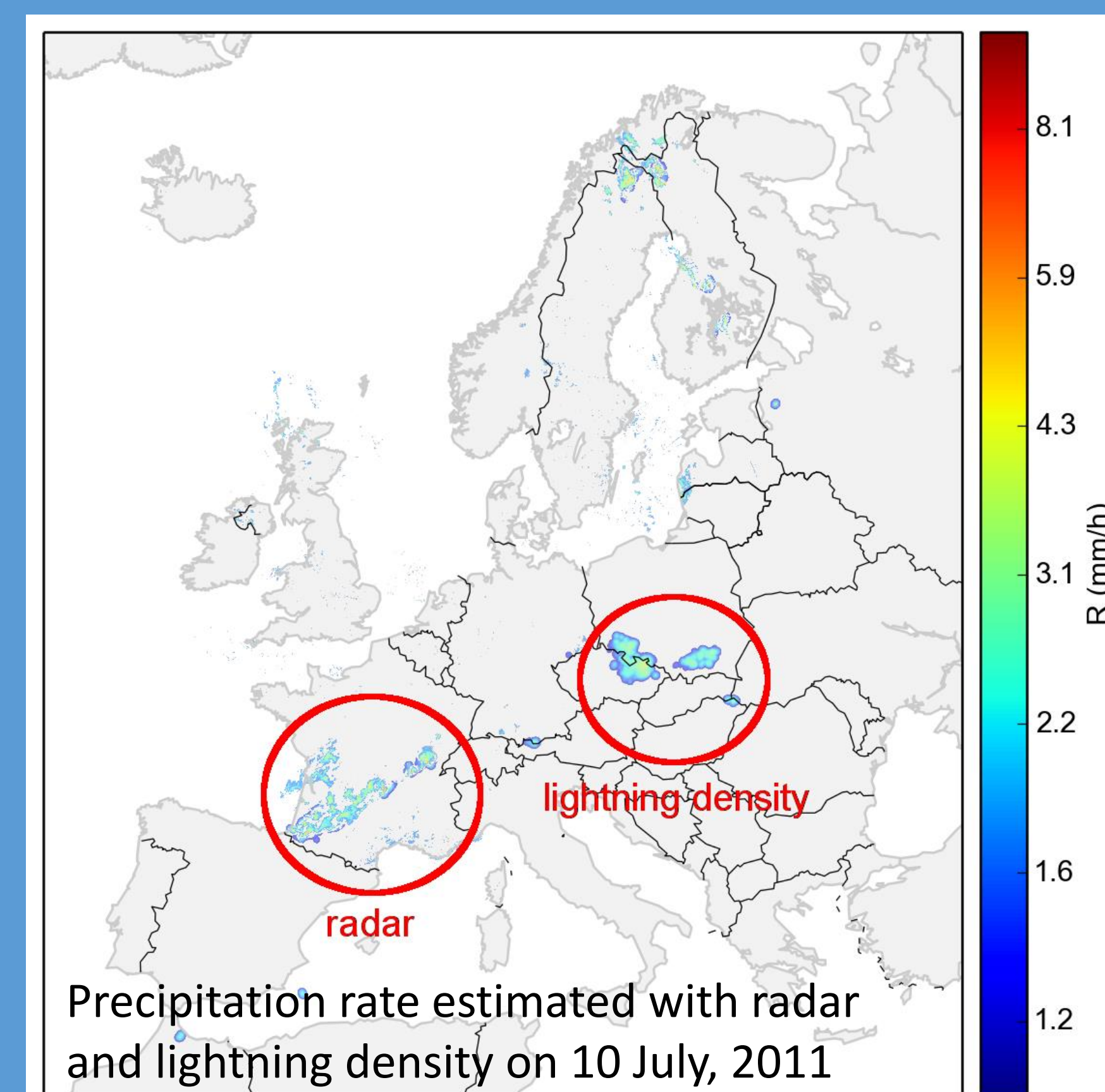
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Operational pan-European precipitation composite

- An improved precipitation composite is based on combined dataset of
 - EUMETNET Operational Programme for the Exchange of weather Radar (OPERA) composite with resolution of 2 x 2 km, every 15 minutes
 - EUMETSAT Convective Rainfall Rate (CRR) satellite product
 - Vaisala GLD360 lightning network
- It is real-time, extended beyond the radar coverage, and quality – controlled
- Will be validated against observation networks and gauge-adjusted radar composites

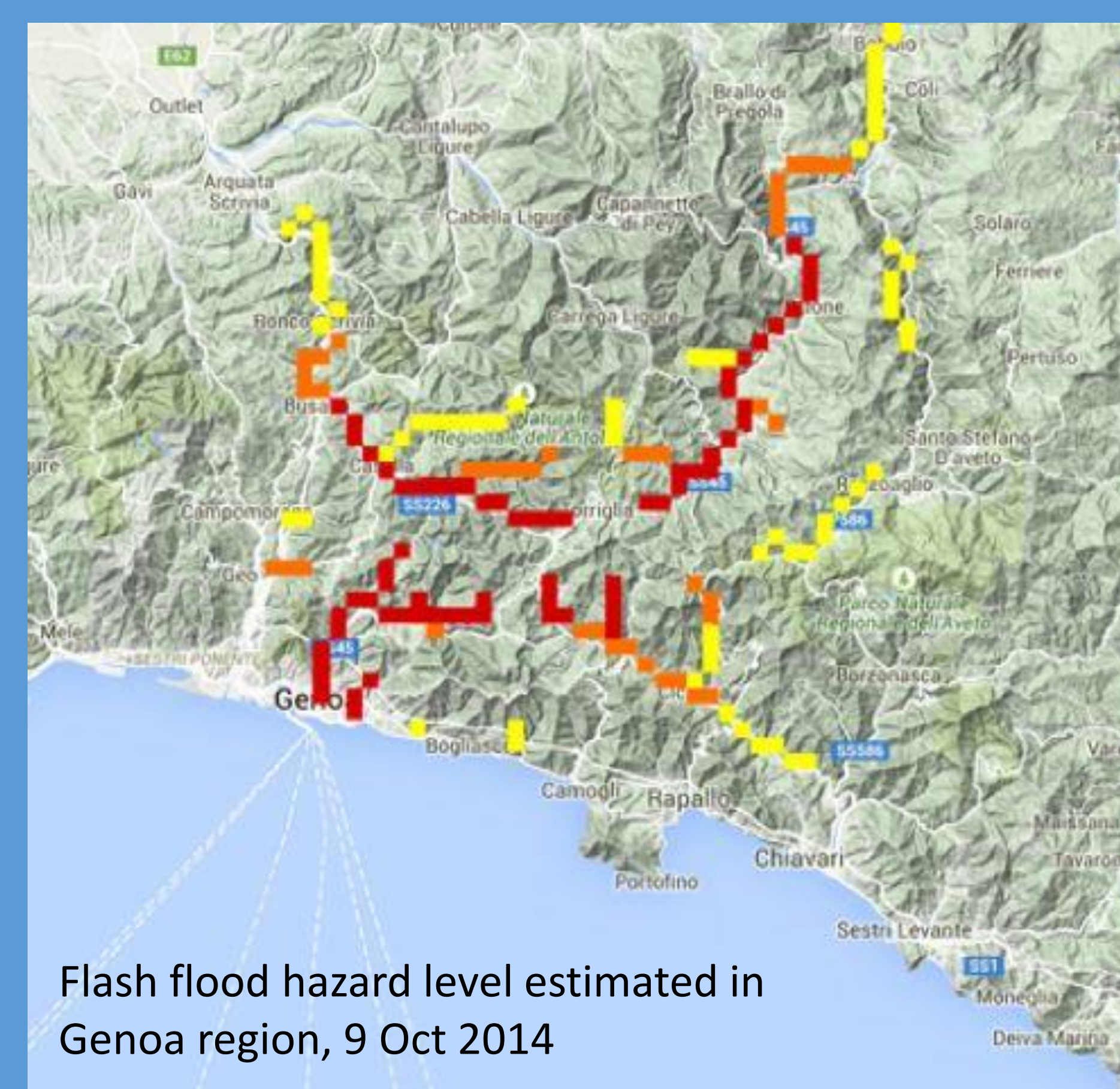


Implementing probabilistic rainfall forecasts in local and European scales

- Using a stochastic space-time model optimized to the European climate, a probabilistic nowcast of precipitation is created
- Seamless and dynamic blending of probabilistic nowcasts and numerical weather prediction (NWP) models provide forecasts of precipitation for lead times 15 min-5 days
- Uncertainty in the precipitation forecasts, which can affect the associated hazard and risk forecasts, is characterized based on a dynamically-blended ensemble of precipitation forecasts

Transformation of ensemble rainfall forecasts to flash-flood hazard predictions on the EFAS platform

- Utilizing a flash-flood hazard algorithm, which is currently implemented to very-short range forecasts in the European Flood Awareness System (EFAS) platform to transform the rainfall nowcasts to flash-flood hazard levels
- Simplified risk analysis (of exposure and vulnerability) provide rapid uniform risk forecast across Europe
- Pluvial urban flood risk forecasts are demonstrated focusing on localized storm water hazards from convective rainfall
- Feasibility of the flash-flood hazard forecasting is demonstrated within the operational system of the Finnish civil protection



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