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TRIBUTE 'TRIgger BUffers for inundaTion Events': the importance of flood hazard and vulnerability assessment

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The recent socioeconomic and environmental impacts of extreme flood events occurred in Europe are testimony to the disastrous consequences that such future hazards are likely to pose. Managing inundation risk requires prevention measures in close cooperation with Civil Protection authorities. This topic underlies the TRIBUTE (TRIgger BUffers for inundaTion Events) project (ECHO/SUB/2016/742480/PREV08), whose aim is to help Europe-wide national, regional and local CP authorities answer the following vital question in case of flooding: "Should I initiate an evacuation and how long do I have to evacuate safely?".
In the framework of the TRIBUTE project, the technique used for assessing the time that an evacuation should be recommended is the so-called 'trigger buffer'. An evacuation trigger buffer is a pre-established boundary that circumscribes an area in such a way that when floodwaters coming from any direction cross the buffer, an evacuation is recommended. The final aim of the project will be to develop a web service and a mobile application allowing users to select desired sensible points and know related trigger buffers during a specific inundation event. The service will have pan-European coverage.
For this purpose, the developed model will be fed, among others, with current estimates of inundation hazards from satellites and information on the vulnerability and coping capacity for the threatened site.

Two different activities are of particular interest to these tasks: i) the assessment and mapping of inundation vulnerability indicators for risk evaluation purposes in sensitive areas, and ii) the exploitation of satellite datasets for real-time detection of extreme rainfall events in these areas. The way in which these issues have been addressed will be presented and discussed in this contribution. In particular, the updated version of ITHACA's (www.ithacaweb.org) Extreme Rainfall Detection System (ERDS), a service for the monitoring of exceptional rainfall events, with a nearly global geographic coverage, is presented. This system is able to analyze near real-time rainfall amount for different lead times, with the aim to deliver hourly extreme rainfall alerts. The system uses, as base data, the GPM (Global Precipitation Measurement) mission IMERG (Integrated Multi-satellite Retrievals) products. Additionally, flood vulnerability maps showing the spatial distribution of flood-prone elements, with particular attention to the population and the built environment, are produced using a simplified methodology based on open datasets available at European scale. In the proposed methodology, the population density, the location of vulnerable points of interest, and proper indicators of the complexity and density of the transportation network that fall within the identified trigger buffers are taken into consideration, and, finally, they are combined to create a final vulnerability map with European coverage.