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The innovation of the FloodHub system for a reliable flood early warning and crisis management

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Flood has become the most frequent and deadliest type of disaster by far, responsible for the 43.5% of deaths in 2019. What is more, the number of flood events has extremely increased during the last decade (2000-2019), compared to the previous one (1980-1999) (CRED 2020). Therefore, policy and decision makers, more than ever, need efficient flood monitoring tools in order to facilitate their work towards increasing disaster resilience, especially in the urban and peri-urban areas, where most of the population and critical infrastructure are located. For this purpose, the FloodHub system has been developed by the Center of Earth Observation and Satellite Remote Sensing BEYOND, at the National Observatory of Athens, in the framework of the EuroGEO Disaster Resilience Action Group, supported by on-going actions (SMURBS / ERA-PLANET and Excelsior H2020 projects and the sponsor Hellenic Petroleum S.A.). The innovation of the system lies in the integration of different data sources, so as to deliver a reliable flood early warning system, and an operational awareness picture of the crisis every 5' to the relevant authorities, namely on three levels: municipality, region, and national civil protection. FloodHub allows the near-real-time ingestion and assimilation of hydrometeorological measurements from in-situ telemetric stations, Sentinels data, and crowdsourced data, in a multi-source data fusion concept, using sophisticated hydrologic and hydraulic modelling and statistical regression techniques. It offers increased reliability through a continuous validation and optimization of results, automation in assimilating flood modeling in real time, computational efficiency, openness, flexibility, scalability, transferability, and the speed to meet rapid awareness during the crisis. Therefore, FloodHub is a useful tool in the hands of the relevant authorities and key stakeholders, contributing to an effective flood risk and crisis management. This is in line with the requirements for the implementation of the EU Floods Directive 2007/60/EC, the Sendai Framework for Disaster Risk Reduction, the UN SDGs, as well as the GEO's Societal Benefit Areas.