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DisasterHub: A mobile application for enabling crowd generated data fusion in Earth Observation disaster management services

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The rapid changes in climate over the last decades, together with the explosion of human population, have shaped the context for a fragile biosphere, prone to natural and manmade disasters that result in massive flows of environmental immigrants and great disturbances of ecosystems. The magnitude of the latest great disasters have shown evidence for high quality Earth Observation (EO) services as it regards disaster risk reduction and emergency support (DRR & EMS). The EO community runs ambitious initiatives in order to generate services with direct impact in the biosphere, and intends to stimulate the wider participation of citizens, enabling the Openness effect through the Open Innovation paradigm. This by its turn results in the tremendous growth of open source software technologies associated with web, social media, mobile and Crowdsourcing.

The Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing of National Observatory of Athens has developed, in the framework of the BEYOND Centre of Excellence for EO-based monitoring of Natural Disasters (http://www.beyond-eocenter.eu), a rich ecosystem of Copernicus compliant services addressing diverse hazardous phenomena caused from climate and weather extremes (fires, floods, windstorms, heat waves), atmospheric disturbances (smoke, dust, ozone, UV), and geo-hazards (earthquakes, landslides, volcanoes). Several services are delivered in near-real time to the public and the institutional authorities at national and regional level in southeastern Europe. Specific ones have been recognized worldwide for their innovation and operational aspects (e.g. FIREHUB was awarded the first prize as Best Service Challenge in the Copernicus Masters Competition, 2014). However, a communication gap still exists between the BEYOND ecosystem and those directly concerned by the natural disasters, the citizens and emergency response managers. This disruption of information flow between interested parties is addressed by DisasterHub, an application proposal that won the MYGEOSS Second Call for Innovative Apps (http://beyond-eocenter.eu/index.php/ann-blog/197-disasterhub-mygeoss).

DisasterHub will fill the gap by introducing a mobile application that will act as a middleware between mobile users and BEYOND services, building on the concept of citizen observatories in support of Copernicus, GEO, GEOSS, and UN-SPIDER. In this context the roadmap for generating beneficial EO services through DisasterHub is sketched in two main branches: (i) ingestion, processing and fusion of big multimodal data with additional spatiotemporal evidences (originated from Core Copernicus, GEO, GEOSS) for deriving higher value DRR and EMS products, (ii) interlinking the web and mobile platforms for the exchange and ease access of the societies to open EO/crowd generated data.

The benefited communities will be effectively enlarged through DisasterHub mobile app. Mutually the BEYOND ecosystem will profit from the large amount of tagged information returned from the field, forming a unique input to the production chains and assimilation of predictive modeling. In conclusion DisasterHub will showcase in the EO community an enhanced EO services ecosystem with a software infrastructure for easy access of mobile users to the real-time monitoring and early-warning systems of BEYOND and tools for incorporating crowd-sourced data with open geospatial and socioeconomic data via open/linked data ingestion mechanisms (APIs), retrieved from the GEOSS Data-CORE, Copernicus and other EU portals.