Geophysical Research Abstracts
Vol. 20, EGU2018-12215, 2018
EGU General Assembly 2018

Characteristics and impacts of the November 2017 catastrophic flash flood in Mandra, Greece.

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On November 15th 2017, a high intensity convective storm with orographic effects reaching up to 300mm in 8 hours (200mm in 3 hours only) locally in a small area (18 km x 4 km zone) of a mountain slope hit the western part of the region of Attica in Greece, causing flash floods with catastrophic effects in the towns of Mandra and Nea Peramos and the tragic loss of 24 people, making it the most deadly flood in Greece in the last 40 years.

This study describes a number of novel procedures and sensors that were used to document and analyse the hydrogeomorphic response and associated impact of this disaster.

The research team approached the area during the first minutes of the flood and carried out several flights of an Unmanned Aerial Vehicle (UAV) monitoring the ground situation. Using aerial and ground observations the team developed a detailed record of the physical characteristics of the flood along with impacts across the hit area.

Evidence collected during the flash flood and in post-flood investigations in the area made possible an accurate delineation of flood extent, a detailed description of geomorphic processes, a determination of water levels across the inundated area, as well as estimation of peak runoff and detailed record of its diverse impacts.

High-resolution rainfall estimates from the X-band polarimetric radar of National Observatory of Athens were used to analyse the space-time dynamics of triggering rainfall and were combined with the Kinematic Local Excess Model (KLEM) to simulate the dynamics of the hydrologic response.

The collection of evidence testifies on the extremity of the event and further highlight the great potential of UAV sensors for the detailed and accurate mapping of similar hazards.