



Upgrading Field Work in Disaster Mapping with the Use of Unmanned Aircraft Systems

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The contribution of Unmanned Aircraft Systems (UAS, UAV or RPAS) is increasingly acknowledged, researched, tested and applied in a vast variety of fields. Earth Sciences are among the greatest beneficiaries of this development, in terms of having more than an eye in the sky during field work, approaching inaccessible locations and applying Structure from Motion (SfM) methodologies for research in geomorphology, geological mapping, hydrological modeling, mass movement mapping etc. Detailed mapping and evaluation of findings is a critical element of syn- and post-disaster period, for assessing the impacts and their spatial distribution, helping recovery by facilitating aid allocation, coordinating relief efforts, monitoring lifelines status, monitoring of clean-up, and assessing secondary effects or induced hazards.

In this paper, the research team summarizes the experience obtained during their involvement in natural disaster mapping of recent (2017-2018) significant catastrophic events in Greece. A survey team equipped with cost effective drones was deployed during and/or after disastrous earthquake, mass movement, flash flood and wildfire events. This resulted in a variety of product types in terms of contribution to post disaster research and emergency management, resulting also in a number of pros and cons in terms of prerequisites and risks of the process.

Mapping with drones is essentially field work, and is designed and executed as such. Moreover, it is aviation, so application of strict safety guidelines is a prerequisite. The combination of the two at disaster sites requires technical efficiency, expertise according to the disaster type, team coordination, pilot skills, experience and training, along with a flexible mission risk assessment at all times.

Herewith, results of disaster mapping are presented for the earthquake (2017) and mass movements (2017-2018) in Lesvos, the deadly flash floods in West Attica (Mandra, 2017, 2018) and the deadly wildfires in East Attica (Rafina, Mati, 2018). Pros, such as capturing of phenomena dynamics and intact disaster scenery in explicit detail and cons, such as risks, equipment limitations and safety issues are discussed, and some elementary guidelines for the overall process are proposed. Following the cycle of disaster management, the process involves steps to be taken during the pre-disaster phase, the warning/alarm phase, the impact and emergency response phase etc. so that a drone equipped team be readily operational and effective at any given time a disaster occurs.