



## **Hydrologic Simulation in Mediterranean flood prone Watersheds using high-resolution quality data**

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Flooding is a significant threat causing lots of inconveniencies in several societies, worldwide. The fact that the climatic change is already happening, increases the flooding risk, which is no longer a substantial menace to several societies and their economies. The improvement of spatial-resolution and accuracy of the topography and land use data due to remote sensing techniques could provide integrated flood inundation simulations.

In this work hydrological analysis of several historic flood events in Mediterranean flood prone watersheds (island of Crete/Greece) takes place. Satellite images of high resolution are elaborated. A very high resolution (VHR) digital elevation model (DEM) is produced from a GeoEye-1 0.5-m-resolution satellite stereo pair and is used for floodplain management and mapping applications such as watershed delineation and river cross-section extraction. Sophisticated classification algorithms are implemented for improving Land Use/ Land Cover maps accuracy. In addition, soil maps are updated with means of Radar satellite images. The above high-resolution data are innovatively used to simulate and validate several historical flood events in Mediterranean watersheds, which have experienced severe flooding in the past. The hydrologic/hydraulic models used for flood inundation simulation in this work are HEC-HMS and HEC-RAS. The Natural Resource Conservation Service (NRCS) curve number (CN) approach is implemented to account for the effect of LULC and soil on the hydrologic response of the catchment. The use of high resolution data provides detailed validation results and results of high precision, accordingly. Furthermore, the meteorological forecasting data, which are also combined to the simulation model results, manage the development of an integrated flood forecasting and early warning system tool, which is capable of confronting or even preventing this imminent risk.

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