Monitoring flood inundation extent with means of Sentinel – 1 and Landsat 8 satellite images

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Floods are among the most devastating natural hazards in the world, widely distributed leading to significant economic and social damages than any other natural phenomenon. The aim of this study was to develop a straightforward approach for flood area mapping in Strymonas River, Greece. This region experiences annual flooding and has caused several times in the recent past loss of livelihoods. For the needs of the study two Landsat 8 and two Sentinel-1 images were used along with the reference vector inundation data derived from the freely distributed Copernicus programmed data (European Flood Awareness System- EFAS). Various image analysis methods were implemented to monitor flood extent including images subtraction, classification methods and application of threshold values. Radar and optical sensor data were combined in order to enhance the operational capacity of satellite data. A strong agreement was found between Sentinel-1 flood extent monitoring and Copernicus EFAS data. The results denoted the potential of both radar and optical images in effective monitoring of flood inundation phenomena.

Keywords: Sentinel-1, Landsat 8, floods, classification, Copernicus EFAS