

## **The effect of large forest fires on floods and landslides. The case of the 2007 fires in Ileia, Greece.**

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### **Abstract**

Although forest fires are considered an integral part of Mediterranean forest ecosystems, they nevertheless constitute one of the most devastating natural hazards. Apart from the direct consequences, fires induce longer term effects in the geomorphological and hydrological processes, influencing environmental factors that in turn can affect the occurrence of other natural hazards, such as floods and mass movement phenomena. This work focuses on the forest fire of 2007 in Peloponnese, Greece that burnt 1773 km<sup>2</sup>, causing 78 fatalities and very significant damages in property and infrastructure and went down as the largest fire in the country's record. It examines the occurrence of flood and mass movement phenomena, before and after this mega-fire and studies different influencing factors to investigate the degree to which the 2007 fire and/or other parameters have affected their frequency.

Observational evidence based on several data sources collected during the period 1989-2016 show that the 2007 fire has contributed to an increase of average flood and mass movement events frequency by approximately 3.3 and 5.6 times respectively. Fire affected areas record a substantial increase in the occurrence of both phenomena, presenting a noticeably stronger increase compared to neighbouring areas that have not been affected. Examination of the monthly occurrence of events showed an increase even in months of the year where rainfall intensity presented decreasing trends. Although no major land use changes have been identified and chlorophyll is shown to recover 2 years after the fire incident, differences in the type of vegetation as tall forest has been substituted with lower vegetation are considered significant drivers for the observed changes in hydrogeomorphic response of the fire affected basins.

*Λέξεις κλειδιά: floods, landslides, wildfires, forest-fires, geomorphology.*