

Abstract

OFIDIA2: An Operational Platform for Fire Danger Prevention and Monitoring[†]

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Preventing and fighting wildfires in the forests and rural areas of Epirus and Apulia has become increasingly demanding due to climate change and socioeconomic factors, i.e., the economic crisis, lack of fuel management, ageing population, and rural area abandonment. OFIDIA2 (Operational Fire Danger prevention platform 2), funded by the Interreg Greece-Italy 2014–2020 Programme, proposed a pragmatic approach to improve the operational capacity of the stakeholders to detect and fight forest wildfires. A data analytics system was designed and implemented within the project to manage, transform, and extract knowledge from heterogeneous data sources, through forecasting models such as weather, fire danger, and fire behaviour models and near-real-time data coming from different sources.

The high-resolution weather forecasting network previously developed in OFIDIA project was enhanced by using a mesoscale configuration of the WRF-ARW model over the Central Mediterranean Sea. A nested domain over Southern Italy allows for obtaining high-resolution weather forecasts (2 × 2 km) and processing data into fire danger models.

Fires, fuel, topography, and weather data were collected from several sources and used to calibrate and run fire models (FlamMap and Wildfire Analyst) in the Apulia (Italy) and Epirus (Greece) regions. Based on the analyses of recurrent weather conditions leading to large fires, fire metric maps for prevention and fire-fighting activities were produced.

Finally, a decision support system (DSS) was also developed to provide support for: (1) the acquisition of real-time data through weather stations, wireless sensor networks, HD video cameras, and drones; (2) the selection of fire behaviour scenarios by means of mathematical models; and (3) the prevention of emergencies thanks to weather forecast information with fire danger indices at high resolutions.

The project included the design of two mobile apps for sending alert notifications to the Civil Protection in case of a potential fire hazard and for the management of volunteers fleets.

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