OFIDIA2: An operational platform for fire danger prevention and monitoring

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Abstract
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Abstract

Preventing and fighting wildfires in the forests and rural areas of Epirus and Apulia has become increasingly intense because of climate change and socio-economic factors, i.e., the economic crisis, lack of fuel management, ageing population, and rural area abandonment.

The project 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 heterogenous data sources, through forecasting models such as weather, fire danger, and fire behaviour models and near real time data coming from weather stations, wireless sensors, video cameras and drones (Figure 1).

The high-resolution weather forecasting network previously developed in OFIDIA1 [1] was enhanced by using a mesoscale configuration of the WRF-ARW model (2) over the Central Mediterranean Sea. A nested domain over the Southern Italy at ~2km horizontal resolution (3) allows getting high-resolution weather forecasts (2x2km) and processing data into fire danger models.

Fires, fuel, topography and weather data were collected from several sources and used to run and calibrate fire models (FlamMap [3] and Wildfire Analyst [4] in Apulia and Epirus regions. Based on the analyses of recurrent weather conditions leading to large fires, fire metrics' 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 sensors 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 also 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.

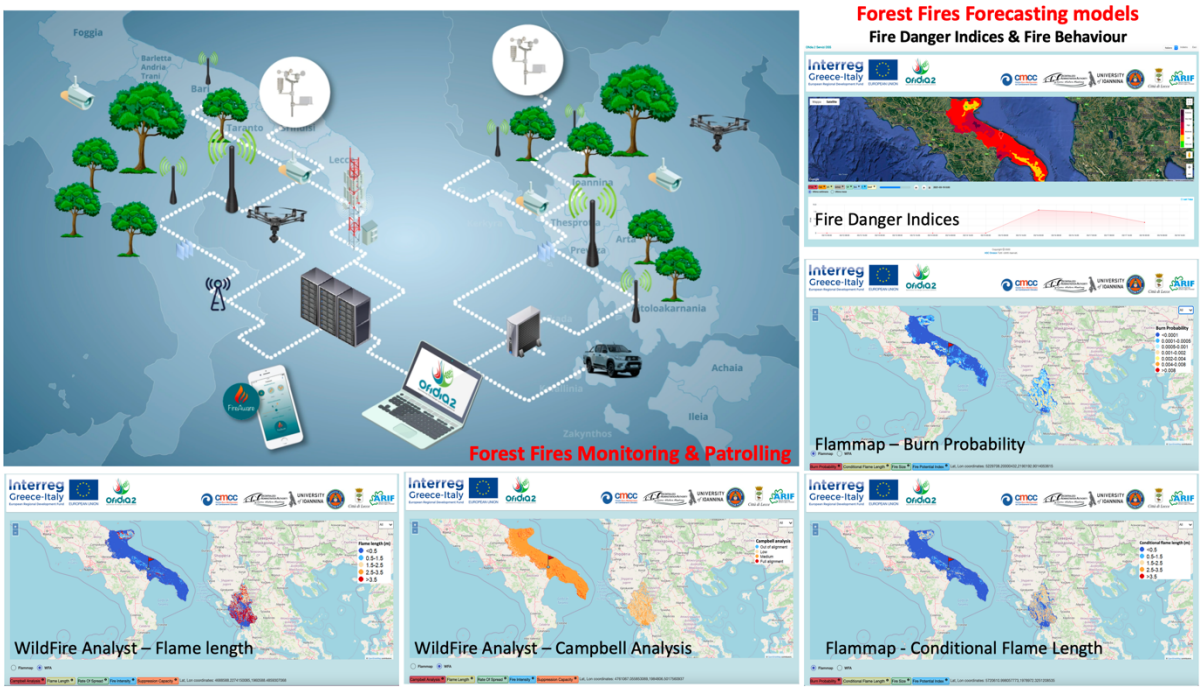

Figure 1. OFIDIA2 System

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