

## Web service systems for the management of natural disasters – The case study of the FLIRE DSS in urban and rural areas

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### Abstract

Wildfires and Floods are among the worst natural disasters in 21<sup>th</sup> century with socioeconomic impacts that cost billions of euros. Loss of human lives, destruction of private and public properties, degradation of health and quality of life as well as disruption of economic activities, are among the impacts that cause. Flood events occur usually after the case of wildfires and the combination of these cause significant impact in areas. Both disasters are depended on the same weather data and the investigation of them traditionally has been conducted separately. This approach overlook the “*collect once – use for many purposes*” model which when is adopted result in the increase of the accuracy and economies while these phenomena are tightly interrelated as fires exacerbate the flood risk and the preceding flood dramatically reduce the fire risk.

FLIRE DSS is a web-based Decision Support System that change this and is designed for the effective, robust and combined risk assessment and management of both forest fires and flash floods. It is a DSS for the integrated weather information management, forest fire management and floods information management. FLIRE DSS adopt the distributed architecture of the components of the system while is accessible from the web with no prior installation of any add on. FLIRE DSS is consists of three different modules and five applications under the FLIRE Server. The server uses FTP and HTTP communication protocols and web service technologies, while the GUI has been designed and developed based on the user's requirements, goals and needs. Visual Basic, Javascript, Google Maps API and Ajax have been used for the design and implementation of the FLIRE DSS. The weather data are organized in XML and KML format and are redistributed per request in other components and models of the system, when needed.

**Keywords:** Natural Disaster, Fire-Flood interaction, Web DSS, What-If Scenarios

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