



## Fire monitoring from space: from research to operation

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Each summer fires rage through European forests, burning hundreds of thousands of hectares per year, as a result of the many (up to 60000) forest fires that usually occur annually in Europe. Fires can threaten public health and safety, destroy property and cause economic damages. Despite of their medium extension (the average burnt area is less than 6 ha), much smaller if compared with other regions like the USA and Canada, the number of simultaneous active fires in Europe can be very high, fomented by weather conditions that, especially in summer times and for countries of South Europe, are particularly favourable to a rapid and dramatic development of flames. Fires still are not only a social problem, but also an environmental emergency, producing a continuous impoverishment of forests and possibly indirectly triggering other natural hazards (e.g. making slopes, without the trees action, more prone to landslides). Additionally, there is a general concern about the loss of biodiversity and the contribution to land degradation that fires may cause.

Earth Observation satellite systems have been largely tested for fire detection and monitoring from space. Their spectral capability, synoptic view and revisit times can offer an added value in the operational use not only in real time, during fires fighting activities, but also in near-real or delay time during the phases of risk management and mitigation. However, the practice of an actual operational use of satellite products by end-users is still not usual at European level.

This work is based on the experience carried out jointly by CNR-IMAA and the National Civil Protection Department (DPC), in the framework of a five-year agreement in which the operational use of an Earth observation satellite system for fires spotting and monitoring is tested. Satellite-based products, developed not only for detecting fires but also for continuously monitoring their evolution in time domain, have been provided to Civil Protection Department for the whole summer campaign on forest fires fighting, supporting their activities in routinely managing and monitoring forest fires risk.

The experimented satellite system has demonstrated to provide valuable information that can be used by civil protection staff also in support to organization and allocation of fire fighting resources on ground, especially when, during the high risk periods, there are or are expected a large number of contemporary events.

Training activities, devoted to make DPC staff fully able to self operate the provided satellite-based tool, were also carried out during this collaborative experience, which represents a best practice of a useful integration of satellite added value products within the operational framework of an expert user.