



FIRES MONITORING SYSTEM

Fires monitoring is important for the effect that fires have during the event and in the post-event phases; they, in fact, besides the caused damages and losses, actively contribute to the global carbon balance and Green House Gasses (GHGs) emission and are one of the causes of soil erosion. Even the estimation of burned areas is a further element that must be monitored and included as a carbon dioxide source in the framework of the Kyoto Protocol and as key issue in the framework of prevention of hydrological hazards. Another important issue to be considered is the importance of having a large scale overview in case of emergency. This overview of fires and burned areas makes possible to see the evolution and the movements of a fire hazards in those places which are impossible to get to due to the presence of dense vegetation or to the impossibility to see from aircrafts or helicopter because of the strong presence of smoke from fires. The use of satellites images and their spectral bands allows the detection of fires, burned areas and the estimation of their evolution. The possibility to combine the land cover layer (through the use of ancillary data or a land cover classifier), with the thermal bands values permits to create a **multilayer approach** through which it is possible to filter information and to estimate the presence of forest fires or other thermal sources. This system permits to operate in:

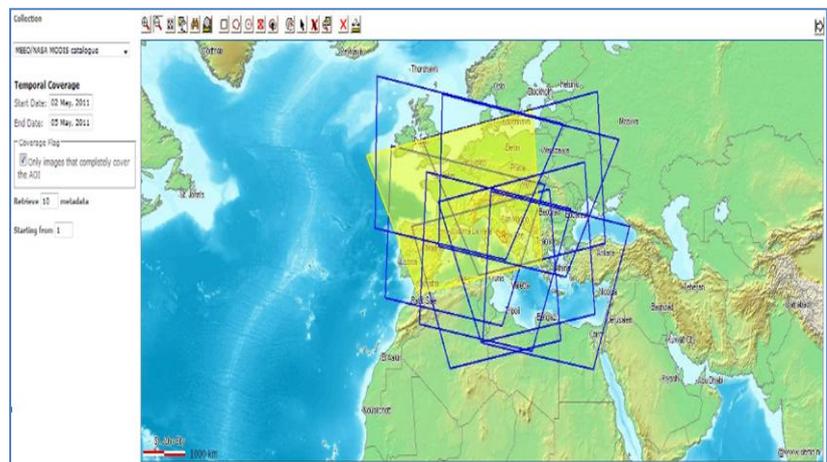
SINGLE IMAGE PROCESSING

FULLY AUTOMATIC ALERTING SYSTEMS

SINGLE IMAGE PROCESSING --- FULLY AUTOMATIC ALERTING SYSTEMS

This tool is important for monitoring fires and burned areas that could occurred in remote areas where smokes and fires don't permit helicopters or airplanes to flight over, but also to be able to monitor wide areas to better understand the evolution of the occurring event.

The SINGLE IMAGE PROCESSING model permits to process MODIS or AATSR single images and to apply all the processing steps required to identify the candidate burned areas and the candidate fired areas through the identification of vegetation changes. This is possible considering a bi-temporal approach. One image is taken on the date in which the event to be monitored occurred, and the second is taken the day before. This permits to identify vegetation changes and anomalies in Thermal band analysis.



The FULLY AUTOMATIC SYSTEM FOR FIRES MONITORING AND ALERTING permits to select the area of interest and the time range to be monitored. Then the system will automatically check the MODIS images availability and processes all the images found in order to check whether candidates burned areas or fire are detected, through the use of a company-owned thermal anomalies algorithm (SOMAFID). If any fire or candidate burned area is detected then the system alerts, by mean of email, the user about the anomaly detected. Due to the combination of TERRA and AQUA satellites, which have a revisiting time from one to two days and shifted of few hours from the two satellite's passes, it is possible to monitor the presence of fires or burned areas every day and in two different time of the day.

