

SHORT-TERM FIRE RISK FORECAST FOR GREECE

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Target groups

Relevance to the case-study requirements

➤ Short term fire planners

Mediterranean forests are vulnerable to fire, primarily due to the long, hot and dry summers, the mild winters, the strong winds prevailing especially during the summer season and the intense terrain as well as the flammable xerophytic vegetation.

➤ Professional organisations, volunteers and NGOs

A tragic event demonstrates this vulnerability when during the summer of 2007 Greece experienced two extreme and unprecedented events. The first was the occurrence of three extreme heat waves that hit the country from late June to the end of August. The extremely high temperatures combined with a prolonged dry period triggered the ignition of the most extensive and destructive forest fires in the country's modern history. During that period a total of 2700 km² were destroyed and 84 people lost their lives. As extreme as this event may be, it is not unique; making the preparedness of civil protection services a high priority.

➤ Regional authorities and Civil Protection

The approach

In view, of the above issues and in collaboration with the weather forecasting team of the National Observatory of Athens (Dr. V. Kotroni and Dr. K. Lagouvardos), an application providing a three-day fire risk forecast was created. This application is based on the MM5 model output. The MM5 is a limited-area, non-hydrostatic, terrain-following sigma-coordinate model designed to simulate or predict mesoscale atmospheric circulation. MM5 has been developed at Penn State and NCAR in the USA as a community mesoscale model with contributions from users worldwide and has been used operationally at NOA since 2002. The fire risk application is hosted in the forecast website of the National Observatory of Athens (<http://cirrus.meteo.noa.gr/forecast/bolam/index.htm>) under 'Forest fires-CFWI' tab.

In order to assess fire risk the Canadian Fire Weather Index (FWI) is used. The FWI is one of the most widely used indices of fire risk and is suitable for use in the Mediterranean basin. It takes into account daily noon readings of temperature, humidity, wind speed and 24-hr accumulated precipitation (van Wagner, 1987). Noon meteorological output of these parameters produced by the MM5 model are used in order to calculate the fire risk index values.

References:

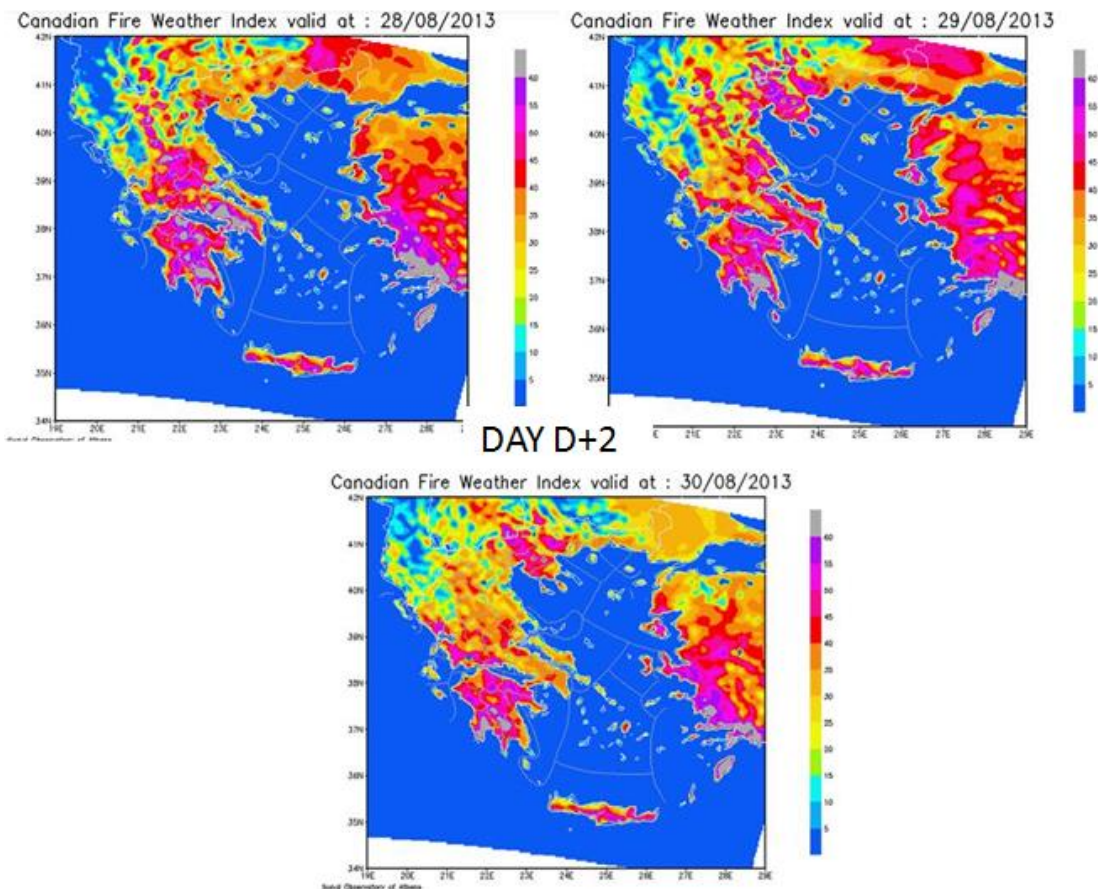
van Wagner, C. E., 1987. *Development and structure of a Canadian forest fire weather index system*, Forestry Tech. Rep. 35, Canadian Forestry Service, Ottawa.

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The product

DAY D

DAY D+1



The user has the capability to view the forecast map of the FWI index for the entire Greek territory for the current day (DAY D) as well as for the two following days (DAY D+1 and DAY D+2). Examples of these maps are shown above. The maps represent the potential fire risk for three days of late August, 2013, based on the meteorological output of the MM5 model.

Making the product usable

We anticipate that this application will be a useful tool in the hands of short-term fire planners and the fire and civil protection services as it will potentially allow for a more effective way of fire prevention and forest protection management.

However, as already mentioned Fire Weather Index takes into account only the meteorology of the area excluding other important parameters contributing to fire ignition such as land cover. For this reason we plan to explore the use of a more integrated index, combining the meteorology (FWI) with other parameters such as vegetation categories and altitude.

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