An interoperable standard system for the automatic generation and publication of the fire risk maps based on Fire Weather Index (FWI)

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It has been implemented an automatic system to predict the fire risk in the Principality of Andorra, a small country located in the eastern Pyrenees mountain range, bordered by Catalonia and France, due to its location, his landscape is a set of a rugged mountains with an average elevation around 2000 meters. The system is based on the Fire Weather Index (FWI) that consists on different components, each one, measuring a different aspect of the fire danger calculated by the values of the weather variables at midday.

CENMA (Centre d'Estudis de la Neu i de la Muntanya d'Andorra) has a network around 10 automatic meteorological stations, located in different places, peeks and valleys, that measure weather data like relative humidity, wind direction and speed, surface temperature, rainfall and snow cover every ten minutes; this data is sent daily and automatically to the system implemented that will be processed in the way to filter incorrect measurements and to homogenizer measurement units. Then this data is used to calculate all components of the FWI at midday and for the level of each station, creating a database with the values of the homogeneous measurements and the FWI components for each weather station.

In order to extend and model this data to all Andorran territory and to obtain a continuous map, an interpolation method based on a multiple regression with spline residual interpolation has been implemented. This interpolation considerer the FWI data as well as other relevant predictors such as latitude, altitude, global solar radiation and sea distance. The obtained values (maps) are validated using a cross-validation leave-one-out method.
The discrete and continuous maps are rendered in tiled raster maps and published in a web portal conform to Web Map Service (WMS) Open Geospatial Consortium (OGC) standard. Metadata and other reference maps (fuel maps, topographic maps, etc) are also available from this geoportal.