Maps of risk of fire over Mediterranean Europe

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A procedure is presented that allows operationally generating daily maps of fire risk over Mediterranean Europe which is very prone to the occurrence of large fire events. The rationale of the developed methodology is to provide the user community with information on meteorological risk that will allow adopting the adequate measures to mitigate fire damage.

The generated maps of fire risk are based on an integrated use of meteorological information from ECMWF forecasts, on vegetation land cover from GLC2000 and on occurrences of active fires as detected by MSG-SEVIRI. The obtained levels of fire danger are associated to probabilities of occurrence of fires exceeding specified magnitudes. It is shown that statistical models based on two-parameter Generalized Pareto (GP) distributions adequately fit the observed samples of duration of active fires and that these models are significantly improved when the Fire Weather Index (FWI) is used as a covariate to model both the shape and scale parameters of the GP distributions.

Validation of results is performed in the period of July-August 2007-2009 and it is shown that a virtual absence of fire occurrences of large duration is characteristic of the classes of very low and low risk of fire. Fires of small duration concentrate in the classes of moderate, high and very high risk and there is a displacement of the modal class towards classes of higher risk with increasing duration.