Plinius Conference Abstracts
Vol. 12, Plinius12-57
12th Plinius Conference on Mediterranean Storms
Corfu Island Greece, September 2010

Mediterranean Firestorm, are extreme wildfires a specular aspect of floods?

P. Fiorucci, L. Molini, and A. Parodi
CIMA Research Foundation, Italy (paolo.fiorucci@cimafoundation.org)

Severe weather and rainfall extremes predictors are a long standing issue for risk mitigation and civil protection purposes, analogously this work is focused on finding precursors for extreme wildfires throughout Mediterranean regions. Mediterranean storm are usually related with extreme precipitation and consequent floods. In this paper we propose to consider extreme wildfires in the Mediterranean as a specular aspect of "traditional" Mediterranean storms. Floods are related with soil moisture conditions, vegetation cover and topography but the main driver is represented by extreme precipitation. Rainfall is well evident in its happening. Nevertheless, the necessity of measuring it has become fundamental since the implementation of instruments needed to prevent floods. Wildfires are usually considered as the complex results of several heterogeneous aspects. Many peculiarities make Mediterranean wildfires different from other natural risk, fire ignition, human caused in more than 90% of fire occurrences, being the most evident.
Fire spread and fire damages are related with vegetation cover, topography, moisture content and wind conditions but also with the ability to cope with the fire front. In the international literature all these aspects are considered to define tools able to predict and manage wildfire risk. Strong winds and high temperature are often considered as the main drivers in extreme wildfire risk conditions. Strong winds are usually associated also to floods event during Mediterranean storm but in this case it is evident it doesn't the main driver.
The observation of the extreme events occurred during the 2007 summer season put in evidence extremely low relative humidity to the soil layer associated with the occurrence of extreme events. In summer 2009 the same meteorological scenario characterized the extreme fires occurred in Sardinia. In this paper we propose to consider the imperceptible absence of water content in atmosphere and in particular in the layer closest to the soil as the main driver of extreme Mediterranean wildfires exactly as precipitation for floods. Unfortunately the very low density of hygrometers is insufficient to produce observed relative humidity fields. Usually, hygrometers are used only in agrometeorology.
For this reason, analyses have been carried on a database composed by considering several case studies, i.e. the most severe wildfires occurred in Sardinia during the period 1989-2009. As first guess, has been chosen as the most relevant pre-condition for fire triggering. The meteorological fields needed for this study have been provided by three-hourly ERA-Interim reanalysis at the original resolution of 0.7°. Despite the day-night cycle has a very strong influence on relative humidity at the ground, minimal around 35% are revealed to occur often in the very proximity of the burnt areas less than 24 hours before the break out of the fire. Results and their robustness are here presented and discussed.