Geophysical Research Abstracts
Vol. 13, EGU2011-11992, 2011
EGU General Assembly 2011
© Author(s) 2011

Spatio-temporal relative humidity patterns and extreme wildfires in the Mediterranean

Paolo Fiorucci, Luca Molini, and Antonio Parodi
CIMA Research Foundation, Italy (paolo.fiorucci@cimafoundation.org)

Thousands wildfires spread every year through the Mediterranean countries. Mass media always stress the major role of arsonist in fire ignition and the role of extremely hot temperature and strong winds in fire propagation. However, only rare events can be considered as a civil protection emergency. For this reason, it is extremely important to be able to discriminate and to predict extreme danger conditions in order to avoid fire ignitions by means of preventive actions. In case of extreme wildfires it is not important the cause of ignition because in severe weather conditions the causes of ignition are often related with negligence. In addition, in certain region extreme wildfires occur both in summer and winter when the role of hot temperature is negligible.
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. 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 spatio temporal relative humidity patterns in the layer closest to the soil as the main driver of extreme Mediterranean wildfires. The hourly data, from 1st January 2007 till now, gathered by more than 200 hygrometers of the National hydro-meteorological network have been analyzed. The minimum values of 48h moving average and their coefficient of variation have been analyzed in connection with the most severe events occurred in Italy. Despite the day-night cycle has a very strong influence on relative humidity at the ground, minimal around 30% 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 show that extreme Mediterranean wildfires are determined by anomalies (extremely dry) in spatio temporal distribution of relative humidity in the PBL.