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## Analysis of dry conditions compared with wildfires: an application in Calabria (Southern Italy)

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All over the world wildfires destroy property and vegetation and can have an adverse effect on slope stability and soil erosion. Even though the number and the size of wildfires are often related to changes in land cover, population, and fire management practices, climatic and soil conditions remain the main factors influencing the extension of burnt areas. The goal of the EC Project INDECS, in which this study has been carried out, is to develop an integrated approach to produce a series of climate indicators aimed at the high priority sectors of the Global Framework for Climate Services of the World Meteorological Organization (agriculture, risk reduction, energy, health, water), with the addition of tourism. The study area is Calabria, a region of Southern Italy frequently affected by wildfires. In this research, data about the burnt areas (monthly data of extension - in hectares - and the number of fires in the period 2008-2018), provided by means of the module “Rapid Damage Assessment” (R.D.A.) of E.F.F.I.S. (European Forest Fire Information System) have been compared with the Keetch-Byram Drought Index (KBDI). This index, ranging between 0 and 203.2 (extreme dry condition of the soil), is used all over the world for monitoring and forecasting forest fires. The index was calculated with the daily rainfall and temperature data of 79 stations presenting complete and homogeneous databases. The monthly mean values were evaluated and the KBDI values were averaged for each province, given that the data of the wild fires are available for each of the five provinces of the region. The comparison results show that the peaks of the burnt areas almost always correspond with the highest of the KBDI values. Analogous results were obtained considering the number of fires. It is important to highlight that the results can be influenced by the following factors: a) the KBDI monthly mean value is evaluated by means of a database with a variable number of monthly values owing to missing data; b) the extension of the burnt areas is determined by the efficiency of the fire monitoring system and by the rapidity of first response operations; c) the RDA module database of EFFIS is referred to burnt areas with an extension greater than 30 hectares (in Europe, these fires are about 75-80% of the total fires) and does not contain differences between natural fires and human-induced fires. However, the obtained results can help to predict the impacts that tendencies of the KBDI patterns can have on the territory as an extension of burnt areas. In this way, the present study gives a

useful service for agriculture and risk reduction sectors.

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