

Use of fire for wildfire suppression during the fires of 2007 in Greece

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Abstract:

In 2007 Greece faced its worst forest fire season on record. It started early in June and continued until late September. Especially in the period of August 24-27 many of the fires could be described as megafires since, according to the definition, they "exhibited fire behavior characteristics that exceeded all efforts at control". During those days fighting the fire fronts using direct attack was practically impossible. As use of fire for firefighting is not recognized and explicitly legislated for in the Greek law and it was not one of the firefighting tools that the Greek Fire Brigades had prepared and trained for, even indirect attack was not an option. Thus fires run completely out of control. The total burned area reached 270,000 ha, more than 100 villages and towns were affected, and the death toll reached 79 people including citizens, firefighters and Greek Air-Force pilots. However, amidst the chaos, in a series of cases, people used fire unofficially as a last resort measure for controlling fire fronts or saving properties.

We became aware of these events while following some of these fires to document their behaviour. There were also some short references to such events in the TV broadcasts which run continuously during those days. Combining our first-hand experience with post fire interviews and on-site visits that we carried out in the first weeks after the fires, we developed a dataset of 18 documented cases with dependable information. Many more cases were recorded but omitted because we were not completely sure about the details, or the information was incomplete. The dataset included such variables as location, date and time of the use of fire and type of the operation (backfire or burn-out operation), vegetation type, slope, relative humidity, wind speed, type of fire (crown/surface), number of people involved and if professionals participated, if mechanical equipment were used, length of the operation (m) and its duration, and the final outcome (success/failure) distinguishing "global success" (if it stopped a fire front) or "local success" if it achieved to protect a settlement..

The dataset was analyzed mainly through descriptive statistics. It was found that 71% of the fires that were carried out in nighttime were successful, whereas this percentage dropped to 44% for daytime operations. Furthermore, and in spite of the small sample size, we developed a probit model for evaluating the contribution of various factors to the probability of success when using fire for fire control. Wind speed and vegetation type were identified as the two most influential factors affecting this probability.

The most interesting conclusion of the work is that overall, even in such extreme conditions, the use of fire to stop a wildfire is not an effort done in vain. It appears that it is a much better option than doing nothing in such an otherwise hopeless situation. Obviously, the alternatives have to be weighed very carefully and safety must not be compromised.

Additional Keywords: backfire, burn-out, firefighting, indirect attack, megafires