



On the potential of using smartphone sensors for wildfire hazard estimation through Citizen Science

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Weather conditions that can enhance wildfire potential are a problem faced by many countries around the world. Wildfires can have major economic impacts as well as prolonged effects on populations and ecosystems. Distributing information on fire hazards to the public and first responders in real-time is crucial for fire risk management and risk reduction. Although most fires today are caused by people, weather conditions determine if and how fast the fire spreads. In particular, research has shown that atmospheric vapor pressure deficit (VPD) is a key parameter predicting the dryness of vegetation and the available fuel for fires. VPD is determined from the environmental air temperature and relative humidity, both of which are readily obtained from smartphones carried by the public. In this study we use smartphone data from the OpenSignal company, collected during almost 4 years and from more than 40,000 users per day, to estimate VPD values. We have found that smartphone data can provide useful information about fire risk and danger. Here we present two case studies from wildfires in Israel and Portugal in which VPD is calculated using calibrated temperature and relative humidity measurements from smartphones. Given the rapid growth in the number of smartphones around the globe, we propose applying smartphone data for meteorological research and fire-weather applications. Possible users of these results could be wildfire researchers; public policy specialists in wildfire, climate and disaster management; engineers working with big data; low-income countries; and citizen science advocates.