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Predicting the extension of the area burnt by forest fires in Italy by means of drought indicators

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Abstract

Wildfires are a serious concern for Italy, where large extensions of woods are burned every year. Although the large majority of fires has a human origin, the total burned area shows a clear dependency on weather and climate conditions. Here we statistically analyse the burned area data and explore their relationships with respect to indicators of meteorological drought, namely the Standardized Precipitation Index and the Standardized Precipitation Evapotranspiration Index, based on precipitation and temperature during summer. We show that precipitation alone can be used to build an empirical, data-driven model for burned area and used for reliable predictions on a large portion of the country. Including temperature, on the other hand, allows for a better performance of the prediction model in the southern regions. This illustrates the different relevance of the individual drivers depending on the regional climatic and ecosystem characteristics.

Keywords: Drought indicators, empirical models, prediction