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Climate drivers of wildfire activity in the Mediterranean

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Abstract

Observed trends towards drier and warmer climate in the Mediterranean region are projected to continue due to accelerated climate change, leading to increased fire risk. Wildfires are an integral part of Mediterranean ecosystems. Yet due to the dense population and the extent of wildland-urban interface areas, fires usually have a direct financial cost when it comes to their suppression, property and infrastructures damages, crops and livestock losses. Even more importantly, wildfires in the Mediterranean can cause human losses, injuries, and health implications from associated air quality degradation, which highlights the significance of further research on the field. Climate drivers of wildfire danger are often accounted for by using a single index. The Canadian Fire Weather Index (FWI) is probably the most extensively used fire danger index of this kind. The FWI makes use of temperature, relative humidity, wind speed at noon, as well as daily rainfall, to estimate moisture in three layers of the forest floor, and to subsequently estimate a fire danger rating. Here, we investigate how good a predictor of burned area (BA) is the FWI for the Mediterranean region. We calculate correlation coefficients between the FWI calculated using meteorological reanalysis data and the MODIS observed burned area (BA), using monthly mean data for the 2001-2015 period. Results show that the BA in non-forested types of vegetation highly correlates with the FWI, while for forests correlations are weaker. The analysis is repeated for the different climate drivers that influence the FWI to detect potentially significant correlations.

Keywords: fire weather index; burned area;

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