



Global Wildfire Forecasts Using Large Scale Climate Indices

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Using weather readings, fire early warning can be provided 4-6 hours in advance to minimize fire loss. The benefit would be dramatically enhanced if relatively accurate long-term projections can also be provided. Here we present a novel method for predicting global fire season severity (FSS) at least three months in advance using multiple large-scale climate indices (CIs). The predictive ability is proven effective for various geographic locations and resolutions. Globally, as well as in most continents, the El Niño Southern Oscillation (ENSO) is the dominant driving force controlling interannual FSS variability, whereas other CIs also play indispensable roles. We found that a moderate El Niño event is responsible for 465 (272–658 as interquartile range) Tg carbon release and an annual increase of 29,500 (24,500–34,800) deaths from inhalation exposure to air pollutants. Southeast Asia accounts for half of the deaths. Both intercorrelation and interaction of WPs and CIs are revealed, suggesting possible climate-induced modification of fire responses to weather conditions. Our models can benefit fire management in response to climate change.