

Can weather indices predict the probability of large areas burnt in the Sydney region?

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Although weather has a major impact on fire spread, few studies have examined its relationship with area burnt. Indices can act as surrogates for weather variables. The forest fire danger index (FFDI) is determined by both drought (drought factor (DF)) and ambient (relative humidity, air temperature, wind velocity (FFDI-DF)) conditions. Using long term historical records (1960-2003) on fire occurrence in the Sydney region, we examined the probability of large areas burnt (> 1000 ha) in relation to DF and FFDI-DF on ignition day. The relative contribution of ambient and drought conditions to the occurrence of > 1000 ha burnt was of interest. Logistic regression was used to relate the probability of >1000 ha burnt and the explanatory variables. Interaction terms were considered. Analyses showed a positive additive, rather than interactive effect, of the ambient and drought indices i.e. as each index increased there was a corresponding increase in the probability of large areas burnt. On the Central Coast, higher probabilities of large areas burnt were reached at lower values of both indices than in the Blue Mountains. Current climatic modelling indicates an increase in the frequency of days with high and extreme FFDI. Our work infers a coincident increase in the occurrence of large areas burnt. This will be especially critical for the more fire sensitive native biota in reserves adjacent to major urban areas, where arson is more likely and there are other management imperatives such as life/property protection.

Managing bushfire in a changing climate