

# *International Journal of Wildland Fire*

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Probability based models for estimation of wildfire risk <i>Haiganoush K. Preisler, David R. Brillinger, Robert E. Burgan and J. W. Benoit</i>	133–142		A probability-based model is presented for estimating fire risk. The model is based on grouped data at the 1 km <sup>2</sup> -day cell level. It is useful for assessing the utility of fire danger and fire weather indices and for estimating total numbers of expected fires for a given region and time period.
Slope and wind effects on fire propagation <i>Domingos X. Viegas</i>	143–156		The simultaneous effect of arbitrary wind velocity and slope gradient on the spread of a fire front is considered. A mathematical model to estimate the resulting rate of spread is proposed. Laboratory experiments of point ignition fires in a slope with wind are used to validate the proposed model.
Heating effects on water repellency in Australian eucalypt forest soils and their value in estimating wildfire soil temperatures <i>Stefan H. Doerr, William H. Blake, Richard A. Shakesby, Frank Stagnitti, Saskia H. Vuurens, Geoff S. Humphreys and Peter Wallbrink</i>	157–163		Temperature thresholds for water repellency destruction in Australian eucalypt forest soils are examined. Repellency, present in all samples before treatment, increased during heating, but was abruptly eliminated at between 260°C and 340°C depending on heating duration. Post-fire water repellency status may be useful in hindcasting soil temperature reached during wildfire.
Multi-decadal variability of forest fire risk—eastern Australia <i>Danielle C. Verdon, Anthony S. Kiem and Stewart W. Franks</i>	165–171		Climate variability is shown to influence the incidence of high to extreme fire risk on multi-temporal scales in New South Wales, Australia. During El Niño events the probability of daily high, or greater, fire danger is significantly increased. The fire risk during El Niño years is elevated even further when the Inter-decadal Pacific Oscillation (IPO) is negative. A likely example of this enhancement of El Niño impacts is the severe forest fires experienced in New South Wales during the spring/summer of 2002–2003—the first El Niño event in the current negative IPO phase. The potential to use simple indices of climate variability to predict forest fire risk is demonstrated to be significant.
Impact of antecedent climate on fire regimes in coastal California <i>Jon E. Keeley</i>	173–182		In southern California there is relatively little link between antecedent climate and fire activity. In much of the western U.S. the primary link between climate and fire is through fuel moisture (current year signals) and herbaceous fuel load (lag year signals). In southern California the anomalous annual foehn wind conditions over-ride both of these fuel signals.
Effects of seeding ryegrass ( <i>Lolium multiflorum</i> ) on vegetation recovery following fire in a ponderosa pine ( <i>Pinus ponderosa</i> ) forest <i>Angela D. Barclay, Julio L. Betancourt and Craig D. Allen</i>	183–194		Vegetation transects stratified by treatment, burn intensity and site characteristics were measured in two consecutive years after fire in New Mexico ponderosa pine to examine the influence of post-fire seeding on native vegetation recovery. Both the initial success of seeding and the impacts on native vegetation were heavily influenced by precipitation in the two years. Post-seeding studies should span five or more years, or incorporate rainfall simulations, to account for the effects of climate variability.

<p>Effects of heating on some soil physical properties related to its hydrological behaviour in two north-western Spanish soils <b>R. García-Corona, E. Benito, E. de Blas and M. E. Varela</b></p>	195–199	<p>This paper reports the effect of temperature on some soil physical properties related to its hydrological behaviour of two forest soils in NW Spain. Heating below 220°C caused no significant changes on aggregation-related soil properties, increased water repellency and strongly decreased the hydraulic conductivity. At 380 and 460°C, water repellency was destroyed and the low hydraulic conductivity can be attributed to the aggregate breakdown observed.</p>
<p>A semi-transparent model of bushfire flames to predict radiant heat flux <b>I. K. Knight and A. L. Sullivan</b></p>	201–207	<p>A semi-physical model of radiant heat flux (RHF) from a bushfire flame front is proposed that treats the flame front as a semi-transparent volume of carbon particle emitters. Unlike many previous RHF models for bushfire flames, this model does not assume surface-like emission, emissivity of the flame front or variation of temperature within the flame. The RHF therefore is dependent only on the geometry of the flame front and the optical properties of the flame. The performance of the model is compared to measurements of flames generated by a propane-fuelled flame and a traditional opaque box RHF model.</p>
<p>Topography and forest composition affecting the variability in fire severity and post-fire regeneration occurring after a large fire in the Mediterranean basin <b>Maria José Broncano and Javier Retana</b></p>	209–216	<p>This study relates the spatial variability in tree mortality and post-fire regeneration occurring after a large fire in NE Spain. The variability of fire severity depended on elevation, aspect, and tree density. Mortality of stems caused by fire was very high in the different species, while tree seedling regeneration showed large differences among burned plots.</p>
<p>An integrated numerical system to estimate air quality effects of forest fires <b>A. I. Miranda</b></p>	217–226	<p>A numerical system developed to estimate the effects of forest fires on air quality is described. The system was applied to simulate plume dispersion from a wildfire in Portugal. Results indicate a significant impact on the local air quality. Estimated carbon monoxide concentration levels were high, exceeding the recommended hourly limit value of the World Health Organization, and ozone concentration values pointed to photochemical production.</p>
<p>The post-fire measurement of fire severity and intensity in the Christmas 2001 Sydney wildfires <b>Chris J. Chafer, Mark Noonan and Eloys Macnaught</b></p>	227–240	<p>Wildfire is an integral component of the south-eastern Australian environment. The pattern of wildfires across the landscape is affected by topographical features, weather conditions, vegetation community structure and fuel reduction strategies. This paper shows how it is possible to use satellite imagery and geographic information systems to map the spatial variation of wildfire severity, fire intensity and pre-fire fuel loads with a high degree of accuracy.</p>