

International Journal of Wildland Fire

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Contents	Volume 15	Issue 2	2006
<p>Evaluation of MM5 model resolution when applied to prediction of National Fire Danger Rating indexes Jeanne L. Hoadley, Miriam L. Rorig, Larry Bradshaw, Sue A. Ferguson, Kenneth J. Westrick, Scott L. Goodrick and Paul Werth <i>International Journal of Wildland Fire</i> 15, 147–154.</p>			<p>National Fire Danger Rating System (NFDRS) indexes were computed using MM5 gridded weather predictions. Predicted indexes were evaluated using a case study of the 2000 fire season in Northern Idaho and Western Montana. Although model predictions consistently underestimate fire danger, the model does well in capturing trends and extreme changes in NFDRS indexes.</p>
<p>A process-based model of fine fuel moisture Stuart Matthews <i>International Journal of Wildland Fire</i> 15, 155–168.</p>			<p>This paper describes a new model of fine fuel moisture for use in fire danger and fire behaviour prediction. The model represents the physical processes in a litter layer that determine fuel moisture and may be applied to a variety of fuel types. The model has been tested against observations from two Australian fuel types.</p>
<p>Parametric study of an eruptive fire behaviour model Domingos X. Viegas <i>International Journal of Wildland Fire</i> 15, 169–177.</p>			<p>Forest fires behave dynamically in the sense that their rate of advance and other spread properties change with time even if the overall conditions do not change. In some conditions the rate of spread increases suddenly due to the feedback between the fire and the surrounding flow. A mathematical model proposed by the author to predict this eruptive fire behaviour is analyzed to demonstrate the difference in the behaviour of four main fuel types. It is demonstrated that fire eruption occurs more rapidly in light and porous fuels than in heavy and compact fuels.</p>
<p>Laboratory fire spread analysis using visual and infrared images J. Ramiro Martínez-de Dios, Jorge C. André, João C. Gonçalves, Begoña Ch. Arrue, Anibal Ollero and Domingos X. Viegas <i>International Journal of Wildland Fire</i> 15, 179–186.</p>			<p>This paper describes automatic image processing techniques used to measure fire geometry with space–time resolution close to the continuum from movies of visual and infrared cameras. The techniques, which have significant potentialities for fire modelling in the field of forest fires, are demonstrated in laboratory fires but can also be extended to fires in the open.</p>
<p>Spatial distribution of ignitions in Mediterranean periurban and rural areas: the case of Catalonia Anna Badia-Perpinyà and Montserrat Pallares-Barbera <i>International Journal of Wildland Fire</i> 15, 187–196.</p>			<p>How do human and territorial conditions determine the number of ignitions in a given area? What about if this area is congested with human activity or, on the contrary, is a rural activity area? To answer these questions we have written this paper, and its results would imply prescriptive policies in each case.</p>
<p>Modelling the effects of distance on the probability of fire detection from lookouts Francisco Castro Rego and Filipe Xavier Catry <i>International Journal of Wildland Fire</i> 15, 197–202.</p>			<p>Early fire detection is very important for fire fighting. Lookout towers are a very important component of fire detection in Portugal. This paper proposes a new approach for estimating the probability that a fire is first detected by a lookout tower as a function of their relative distance.</p>
<p>Relationships between prescribed burning and wildfire occurrence and intensity in pine–hardwood forests in north Mississippi, USA Stephen Brewer and Corey Rogers <i>International Journal of Wildland Fire</i> 15, 203–211.</p>			<p>The effectiveness of prescribed burning in reducing the severity of wildfires in upland hardwood forests is poorly understood. Prescribed burning did not reduce the incidence of large or intense wildfires in a national forest in north Mississippi, USA. Fuel accumulation among years was minimal in upland hardwood forests in this national forest.</p>

Remote sensing of fire severity in the Blue Mountains: influence of vegetation type and inferring fire intensity
Kate A. Hammill and Ross A. Bradstock
International Journal of Wildland Fire **15**, 213–226.

Remote sensing of patterns of vegetation damage caused by fire is a potential way to map fire intensity. This paper explores the usefulness of SPOT2 and Landsat7 imagery for this purpose, using a case study in rugged terrain in the Blue Mountains near Sydney, Australia.

Combustion properties of *Bromus tectorum* L.: influence of ecotype and growth under four CO₂ concentrations
Robert R. Blank, Robert H. White and Lewis H. Ziska
International Journal of Wildland Fire **15**, 227–236.

Data on the influence of atmospheric CO₂ concentration on combustion properties of vegetation is almost non-existent. Using a cone calorimeter, we measured combustion characteristics of the invasive annual grass *Bromus tectorum* as affected by growth in four different concentrations of atmospheric CO₂. Total heat released was significantly less for plants grown at pre-industrial CO₂ compared to plants grown at higher CO₂ concentrations. Combustion of vegetation as atmospheric CO₂ increase may be more complete due to less char formation.

Vegetation and topographical correlates of fire severity from two fires in the Klamath-Siskiyou region of Oregon and California
John D. Alexander, Nathaniel E. Seavy, C. John Ralph and Bill Hogoboom
International Journal of Wildland Fire **15**, 237–245.

Vegetation structure and topographic characteristics are linked to patterns of fire severity. This study uses pre-fire data from two wildfires to evaluate the degree to which topographic and vegetation characteristics can be used to predict fire severity. This information can be used to inform land management decisions about fuel treatments.

Predicting and mitigating weed invasions to restore natural post-fire succession in Mesa Verde National Park, Colorado, USA
M. Lisa Floyd, David Hanna, William H. Romme and Timothy E. Crews
International Journal of Wildland Fire **15**, 247–259.

Recently, wildfires in Colorado have become vulnerable to invasion by non-native plants. We investigated post-fire weed patterns and created a model to predict vulnerable sites. Communities that lacked re-sprouting species on particular soils and those of high biodiversity were most vulnerable. Restoration using native grasses was effective in reducing weeds.

Persistence of obligate-seeding species at the population scale: effects of fire intensity, fire patchiness and long fire-free intervals
Mark K. J. Ooi, Robert J. Whelan and Tony D. Auld
International Journal of Wildland Fire **15**, 261–269.

Understanding how obligate-seeding species persist under particular fire regimes requires knowledge of their population dynamics. This study of *Leucopogon* shrubs from south-eastern Australia found that low intensity, patchy fires caused lower mortality than higher intensity fires, and that regular inter-fire recruitment occurred. We discuss the implications of these results for both short-term and long-term population persistence.

Establishment of non-native plant species after wildfires: effects of fuel treatments, abiotic and biotic factors, and post-fire grass seeding treatments
Molly E. Hunter, Philip N. Omi, Erik J. Martinson and Geneva W. Chong
International Journal of Wildland Fire **15**, 271–281.

Wildfires have the potential to encourage establishment of non-native species that may pose threats to long-term recovery of the burned ecosystem. Post-fire seeding for erosion control may further encourage establishment of non-native species. Treating landscapes with mechanical thinning and prescribed fire may have potential for reducing the severity of wildfires while not encouraging non-native species establishment.

Research note
Effect of heat on seed germination of *Pinus sylvestris* and *Pinus nigra* ssp. *pallasiana*
Ibrahim Turna and Ertugrul Bilgili
International Journal of Wildland Fire **15**, 283–286.

The germination success of many tree species is highly dependent on the intensity and duration of heat that it is subjected to during forest fires. This study indicated that seeds of Scots pine and Anatolian black pine do not necessarily need fire for successful regeneration, but fires may have a positive effect on germination by removing crown cover, thereby providing more light for the seeds deposited to the ground.
