

International Journal of Wildland Fire

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Contents	Volume 19	Issue 5	2010
Linear model for spread rate and mass loss rate for mixed-size fuel beds Domingos X. Viegas, Miguel Almeida, Ana I. Miranda and Luis M. Ribeiro <i>International Journal of Wildland Fire</i> 19, 531–540			A linearised model to estimate the properties of composite fuel beds based on the mass fraction of each fuel component is proposed. The model is tested against a series of laboratory experimental results obtained both in no wind and wind-induced fire fronts for up to four-component fuel beds.
Environmental determinants of lightning- v. human-induced forest fire ignitions differ in a temperate mountain region of Switzerland Björn Reineking, Patrick Weibel, Marco Conedera and Harald Bugmann <i>International Journal of Wildland Fire</i> 19, 541–557			We evaluated the importance of weather, forest composition and human activities on forest fire occurrences in the Swiss Canton Ticino during the period 1969–2005. The suitability of fire and weather indices varied strongly between lightning- and human-induced fires, suggesting that the index choice should take ignition source into account.
Evaluating Landsat Thematic Mapper spectral indices for estimating burn severity of the 2007 Peloponnese wildfires in Greece Sander Veraverbeke, Willem W. Verstraeten, Stefaan Lhermitte and Rudi Goossens <i>International Journal of Wildland Fire</i> 19, 558–569			This paper evaluates the performance of three different spectral indices for estimating burn severity. The difference between pre- and post-fire indices was calculated and correlated with field data of severity. In addition the burned pixels' bitemporal shifts in the corresponding bispectral feature spaces were studied. Results reveal the importance of the short-wave and mid-infrared spectral region as a complement to the near-infrared spectral region for assessing post-fire effects. Further research directions for estimating burn severity with remote sensing data are given.
Experimental investigation of the physical mechanisms governing the spread of wildfires Frédéric Morandini and Xavier Silvani <i>International Journal of Wildland Fire</i> 19, 570–582			Fire experiments were conducted in the field in order to gain a deeper understanding of the heat transfer mechanisms that control the spread of wildfires. The results showed the existence of two different fire spread regimes that were either dominated by radiation or governed by mixed radiant–convective heat transfer.
Development of post-fire crown damage mortality thresholds in ponderosa pine James F. Fowler, Carolyn Hull Sieg, Joel McMillin, Kurt K. Allen, Jose F. Negrón, Linda L. Wadleigh, John A. Anhold and Ken E. Gibson <i>International Journal of Wildland Fire</i> 19, 583–588			We introduce a new tool for analysing fire effects. This study used piecewise logistic regression to locate mortality thresholds of ponderosa pine based on 6633 trees in five Intermountain West wildfires. Crown scorch volume (>85%) and crown consumption volume (>40%) mortality thresholds could be incorporated into post-wildfire marking guidelines.
Ignition and fire spread thresholds in gorse (<i>Ulex europaeus</i>) Stuart A. J. Anderson and Wendy R. Anderson <i>International Journal of Wildland Fire</i> 19, 589–598			Experiments were conducted in gorse (<i>Ulex europaeus</i> L.) to determine the threshold conditions for fire ignition and spread. The moisture content of the elevated dead fine fuel layer was the most important variable determining success. Ignitions failed at moisture contents above 36%, and fires only spread at moisture contents below 19%.
Long-term post-fire succession of <i>Pinus brutia</i> forest in the east Mediterranean Ali Kavgacı, Andraž Čarni, Saime Başaran, Mehmet Ali Başaran, Petra Košir, Aleksander Marinšek and Urban Šilc <i>International Journal of Wildland Fire</i> 19, 599–605			We studied post-fire long-term regeneration of <i>Pinus brutia</i> forest in south-western Turkey using the synchronical approach. We analysed species richness pattern as well as floristic and functional diversity. The process of direct recovery was studied and compared in a broader Mediterranean scale.

Volatile and semi-volatile organic compounds in smoke exposure of firefighters during prescribed burning in the Mediterranean region

Toussaint Barboni, Magali Cannac, Vanina Pasqualini, Albert Simeoni, Eric Leoni and Nathalie Chiaramonti
International Journal of Wildland Fire **19**, 606–612

The present work reports on the chemical analysis of smoke released by prescribed burnings in Corsica. Smoke from biomass burning allowed the identification of 79 compounds. Among these compounds, we have shown that there was a potential health risk for firefighters.

Fire severity effects on soil organic matter from a ponderosa pine forest: a laboratory study

Jeff A. Hatten and Darlene Zabowski
International Journal of Wildland Fire **19**, 613–623

Burning at low to moderate severity was found to have increased labile forms of C at the expense of recalcitrant forms. These results may explain the increase in C and N mineralisation occurring after low- to moderate-severity fire.

Paired *Eucalyptus* forest catchment study of prescribed fire effects on suspended sediment and nutrient exports in south-eastern Australia

Hugh G. Smith, Gary J. Sheridan, Patrick N. J. Lane and Christopher B. Sherwin
International Journal of Wildland Fire **19**, 624–636

The effect of two prescribed fires on suspended sediment and nutrient exports was investigated in two small *Eucalyptus* forest catchments in south-eastern Australia. The burns resulted in minor changes in exports, with peak suspended sediment exports only slightly exceeding the average annual load from a nearby undisturbed catchment.

Is the net new carbon increment of coppice forest stands of *Quercus ilex* ssp. *ballota* affected by post-fire thinning treatments and recurrent fires?

Francisco R. López-Serrano, Jorge De Las Heras, Daniel Moya, Francisco A. García-Morote and Eva Rubio
International Journal of Wildland Fire **19**, 637–648

This study investigated the effects of different post-fire thinning intensities and recurrent fires on stock and net new carbon increment in a 6-year-old coppice stand of *Quercus ilex* regenerated after a fire in 1993 and after a new fire in 2001. Four degrees of thinning were applied.

Implementation of quantitative bushfire risk analysis in a GIS environment

Dale Atkinson, Mark Chladil, Volker Janssen and Arko Lucieer
International Journal of Wildland Fire **19**, 649–658

Bushfires pose a significant threat to lives and property. A map quantifying this risk was generated for greater Hobart, Tasmania, by demonstrating the implementation of modern approaches to bushfire risk analysis in a Geographic Information System (GIS) environment that incorporate the dynamic effects of bushfires.

Economic optimisation of wildfire intervention activities

David T. Butry, Jeffrey P. Prestemon, Karen L. Abt and Ronda Sutphen
International Journal of Wildland Fire **19**, 659–672

We describe how two tools of wildfire management, wildfire prevention education and prescribed fire for fuels management, can be used together so as to minimise the combination of management costs and economic losses resulting from wildland fire.

Does the post-fire organic layer compress beneath the snowpack?

T. B. Splawinski, D. F. Greene, S. Gauthier and Y. Bergeron
International Journal of Wildland Fire **19**, 673–676

Dense seedbeds are better for small boreal germinants than are porous seedbeds. We asked if, after fire, the charred, brittle organic material would be compressed sufficiently by snow so that the seedbed became more suitable. We found that although compression occurred, it was not great enough to increase germination success.



Fuel reduction burn in Florida.
Photo: David Sussman