

Contents

Volume 32 Issue 2 2022

Using soil moisture information to better understand and predict wildfire danger a review of recent developments and outstanding questions

Erik S. Krueger, Matthew R. Levi, Kevin O. Achieng, John D. Bolten, J. D. Carlson, Nicholas C. Coops, Zachary A. Holden, Brian I. Magi, Angela J. Rigden and Tyson E. Ochsner

International Journal of Wildland Fire 32, 111–132

Relating McArthur fire danger indices to remote sensing derived burned area across Australia

Sami Ullah Shah, Marta Yebra, Albert I. J. M. Van Dijk and Geoffrey J. Cary

International Journal of Wildland Fire 32, 133–148

Fire propensity in Amazon savannas and rainforest and effects under future climate change

Mariana Martins Medeiros de Santana, Rodrigo Nogueira de Vasconcelos and Eduardo Mariano-Neto

International Journal of Wildland Fire 32, 149–163

A dynamic and evidence-based approach to mapping burn potential

Richard van Dongen, Jaume Ruscalleda-Alvarez and Carl R. Gosper

International Journal of Wildland Fire 32, 164–177

Non-parametric comparative analysis of the spatiotemporal pattern of human-caused and natural wildfires in Galicia

M. F. Marey-Pérez, Isabel Fuentes-Santos, Paula Saavera-Nieves and Wenceslao González-Manteiga

International Journal of Wildland Fire 32, 178–194

Coupled fire-atmosphere simulation of the 2018 Camp Fire using WRF-Fire

Kasra Shamsaei, Timothy W. Juliano, Matthew Roberts, Hamed Ebrahimian, Branko Kosovic, Neil P. Lareau and Ertugrul Taciroglu

International Journal of Wildland Fire 32, 195–221

The dynamics of burning activity on degraded peatland in two villages in Central Kalimantan, Indonesia

Samuel Robb, Yanetri Asi Nion, Trisna Anggreini, Russell Richards, Ammar Abdul Aziz, Stephen Joseph and Paul Dargusch

International Journal of Wildland Fire 32, 222–237

Soil moisture is an underused resource for improving fire danger rating systems and fire management worldwide. We review key studies describing relationships between wildfires and *in situ*, remotely sensed, and modelled soil moisture; describe the potential to incorporate soil moisture into wildfire danger assessments; and identify outstanding challenges and opportunities.

We explored the relationship of the McArthur fire danger classes with the satellite-derived daily burned area. The findings suggest that satellite-derived daily burned area may not be a suitable metric for informing McArthur fire danger classes across Australia because it can be subjected to lagged detection.

Amazon fire patterns are affected by farming and fires are more common in savanna patches than in forests owing to socio-economic–environmental factors. By the end of the century, under scenarios with higher emissions, an expansion of fire propensity is expected, resulting in threats to biodiversity, traditional peoples and global human wellbeing.

Fire management is a crucial part of managing many environments. We present a burn potential model developed using satellite imagery that predicts when an area may be able to ‘carry’ fire. The model accounts for rapid or delayed vegetation cover response since the last burn due to climate variability.

This work analyses human-caused and natural wildfire behaviour in Galicia (Spain) through non-parametric inference techniques for point processes. Our results show that both spatial and spatio-temporal distribution and dependence structure of fires depend on their cause, suggesting a need for different models to predict arson, negligence and natural fire hazard.

Through sensitivity analyses and by comparing with real-world fire perimeters for the 2018 Camp Fire, the performance and challenges of wildland fire simulation with the WRF-Fire simulation platform are investigated.

Significant greenhouse gas (GHG) emissions reductions were only achieved with full rewetting. Unconstrained availability of livelihood alternatives will not lead to full rewetting where drained peatland cultivation supports the incumbent livelihood. Livelihood alternatives displacing drained peatland cultivation are essential for sustained reduction in fire risk and GHG emissions.

Short-term effects of the depth of masticated slash after salvage logging on fuel and vegetation response

Cristina Fernández

International Journal of Wildland Fire **32**, 238–243

This study aimed to evaluate how post-fire masticated slash depth affected vegetation regeneration to provide information for forest management planning. The masticated slash depth did not have significant effects on vegetation cover or species diversity 2.5 years after treatments. A lower slash depth favoured pine regeneration.

Burned vegetation recovery trajectory and its driving factors using satellite remote-sensing datasets in the Great Xing'An forest region of Inner Mongolia

Qiyue Zhang, Saeid Homayouni, Pengwu Zhao and Mei Zhou

International Journal of Wildland Fire **32**, 244–261

The LandTrendr model was used to evaluate and categorize the post-fire vegetation change and then combined with Geodetector to analyze the potential driving factors in the Great Xing'An Range of Inner Mongolia. This study will increase understanding of burned vegetation recovery in China.

Tree spatial pattern and mortality prediction in burned patches of Dahurian larch (*Larix gmelinii* Rupr.) forest that experienced a mixed-severity wildfire

Jili Zhang, Lifu Shu, Mingyu Wang, Rui Wei, Lizhong Wang, Shuo Wang and Guang Yang

International Journal of Wildland Fire **32**, 262–276

A larch-dominated forest exhibited density-dependent post-fire mortality patterns at short distances and increased aggregation among surviving trees post-fire. A widely used USA tree mortality model performed acceptably for this species. This study could potentially inform management strategies for conifer forests with similar structures and fire regimes.

Improved laboratory method to test flammability metrics of live plants under dynamic conditions and future implications

Timothy S. Miller, Alexander I. Filkov and Trent D. Penman

International Journal of Wildland Fire **32**, 277–295

The role of live vegetation in altering fire behaviour is increasingly being recognised. To accurately represent the exposure of a live plant to an approaching fire front, a replicable and precise method of testing flammability was developed. It provides a more realistic representation of plant flammability in the natural environment.

Relationships between building features and wildfire damage in California, USA and Pedrógão Grande, Portugal

Simona Dossi, Birgitte Messerschmidt, Luís Mário Ribeiro, Miguel Almeida and Guillermo Rein

International Journal of Wildland Fire **32**, 296–312

This paper presents a statistical analysis of two post-fire building inspection databases of wildland-urban interface (WUI) damage in California and Portugal. Results compare considered building features' relative correlation to damage, and propose the Wildfire Resistance Index: an index applied to the vulnerability of WUI buildings to wildfire ignition and damage.

Corrigendum to: Altered mixed-severity fire regime has homogenised montane forests of Jasper National Park

R. D. Chavardès and L. D. Daniels

International Journal of Wildland Fire **32**, 313–314

Corrigendum to: Atmospheric turbulent structures and fire sweeps during shrub fires and implications for flaming zone behaviour

Marwan Katurji, Bob Noonan, Jiawei Zhang, Andres Valencia, Benjamin Schumacher, Jessica Kerr, Tara Strand, Grant Pearce and Peyman Zawar-Reza

International Journal of Wildland Fire **32**, 315–315



Burned larch forest. See Zhang *et al.* pp. 262–276. Photo by Jili Zhang.