



IX International Conference on Forest Fire Research and 17th International Wildland Fire Safety Summit Special Issue

Contents

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IX International Conference on Forest Fire Research and 17th International Wildland Fire Safety Summit: introduction to special issue (Part 1)

Domingos Xavier Viegas and Luís Mário Ribeiro
International Journal of Wildland Fire 32, 1–3

Here we introduce the first of three special issues arising from the IX International Conference on Forest Fire Research, held 14–18 November 2022, Coimbra, Portugal. This issue (Part 1) comprises eight papers covering a wide variety of themes. All papers in the issue are published Open Access.

Future expansion, seasonal lengthening and intensification of fire activity under climate change in southeastern France

François Pimont, Julien Ruffault, Thomas Opitz, Hélène Fargeon, Renaud Barbero, Jorge Castel-Clavera, Nicolas Martin-StPaul, Eric Rigolot and Jean-Luc Dupuy
International Journal of Wildland Fire 32, 4–14

Projections of fire activity in southeastern France show that very large increases in fire metrics arise mostly from an intensification in the already fire-prone region during the core of the current fire season and only to a lower degree from an expansion of the fire-prone region and lengthening of the season.

Disentangling the factors of spatio-temporal patterns of wildfire activity in south-eastern France

Jorge Castel-Clavera, François Pimont, Thomas Opitz, Julien Ruffault, Miguel Rivi re and Jean-Luc Dupuy
International Journal of Wildland Fire 32, 15–28

We leveraged Bayesian spatio-temporal modelling to disentangle the contributions of climatic and non-climatic drivers for fire activity in Mediterranean France. We showed that recent fire-weather increase caused the increase of fire probability in the west; but in the east, it was over-compensated by a reduction of escaped-fire probability.

The role of helicity and fire-atmosphere turbulent energy transport on potential wildfire behaviour

Jiawei Zhang, Marwan Katurji, Peyman Zavar-Reza and Tara Strand
International Journal of Wildland Fire 32, 29–42

Temperature perturbations resulting from solar heating of Earth's surface can induce buoyancy-driven wind turbulence. Using experimental numerical simulations, this work investigates how atmospheric wind turbulence, under different atmospheric conditions, can change the energy transfer within the fire area and subsequently impact fire behaviour.

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 Zavar-Reza
International Journal of Wildland Fire 32, 43–55

Multi-modal observations of fire behaviour and overlying atmospheric turbulence were carried out for four wind-driven gorse bush experimental fires. Novel image velocimetry analysis outlined the dynamics and scales of motion of fire sweeps in relation to overlying atmospheric coherent turbulent structures. Results are useful for evaluating coupled fire–atmosphere model simulations.

Comparing two methods to measure oxidative pyrolysis gases in a wind tunnel and in prescribed burns

David R. Weise, Timothy J. Johnson, Tanya L. Myers, Wei Min Hao, Stephen Baker, Javier Palarea-Albaladejo, Nicole K. Scharko, Ashley M. Bradley, Catherine A. Banach and Russell G. Tonkyn
International Journal of Wildland Fire 32, 56–77

Oxidative pyrolysis gases were measured in a wind tunnel and small prescribed burns using two analytical methods. Gas composition measured by FTIR spectroscopy differed between wind tunnel and field fires. The relative amount of the primary fuel gases (CO, CH₄) was not significantly affected by fire location.

Comparing particulate morphology generated from human-made cellulosic fuels to natural vegetative fuels

Sayaka Suzuki and Samuel L. Manzello

International Journal of Wildland Fire **32**, 78–85

In wildland–urban interface fires, particulates from combustion of natural vegetative and human-made fuels may have deleterious effects on the environment. Particulate samples were taken during both flaming combustion and smouldering combustion states. The morphology of the generated particulates is greatly influenced by the state of combustion for both fuels.

Deep peat fire persistently smouldering for weeks: a laboratory demonstration

Yunzhu Qin, Dayang Nur Sakinah Musa, Shaorun Lin and Xinyan Huang

International Journal of Wildland Fire **32**, 86–98

Smouldering fire in peatland is one of the largest wildfire phenomena on Earth that can burn slowly deep underground without flame. Laboratory experiments on tall peat soil samples revealed burning, propagation and emission physics of deep smouldering wildfires in peatland.

Burnt wood management enhances soil multifunctionality at the medium term after a large wildfire in north-west Spain

José Manuel Fernández-Guisuraga, Leonor Calvo, Sara Huerta and Elena Marcos

International Journal of Wildland Fire **32**, 99–110

Post-fire treatment consisting of leaving burnt logs and felled branches in close contact with the forest floor promotes the ability of the soil to sustain high values of multiple functions simultaneously in the medium term after wildfire, as compared to straw mulching application.



Conference information and photograph of attendees watching a laboratory demonstration.