Spot-fire Project: research and utilisation

Research Advisory Forum / 2018

Jason J. Sharples\textsuperscript{a,e}, James E. Hilton\textsuperscript{b,e}, Andrew L. Sullivan\textsuperscript{c,e} (Research Team)

Stuart Matthews\textsuperscript{d,e} (End User Representative)

\textsuperscript{a} University of New South Wales
\textsuperscript{b} CSIRO Data 61
\textsuperscript{c} CSIRO Land and Water
\textsuperscript{d} New South Wales Rural Fire Service
\textsuperscript{e} Bushfire and Natural Hazards CRC
Modelling dynamic fire propagation

PYROGENIC POTENTIAL (NEAR FIELD) MODEL

This is currently the only two-dimensional fire propagation model that can do this!

These considerations are critical for understanding spot fire coalescence and deep flaming!
Modelling dynamic fire propagation

PYROGENIC POTENTIAL (NEAR FIELD) MODEL

VLS Laboratory Experiment

Coupled fire-atmosphere model simulation (several hours)

Pyrogenic potential model simulation (a few seconds)
Extreme bushfire development

The geometry and expanse of the burning region influences the pyroconvective potential of a bushfire.

Possible implications for burning rates and involvement of larger fuels (e.g. Finney and McAllister)
Utilisation

WHAT IS GOING ON HERE?
Utilisation

Development of education and training materials for firefighters and fire behaviour analysts:

- Dynamic fire behaviours
  - Junction fires
  - Vorticity-driven lateral spread
  - Mass spotting and spot-fire coalescence
- Extreme bushfire development
- Prescribed burning tactics
Utilisation

Development of tools for identifying regions prone to mass spotting

- Scaled to fit operational practice and embedded in current operational frameworks
- Automatically incorporates relevant spatial information, including forecast updates or scenario inputs
- Training packages including video material.