Spot-fire Project: research and utilisation

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Photo: Randall Bacon.
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.

Project starts 2020…!
Modelling dynamic fire propagation

NEAR FIELD MODELLING OF VORTICITY-DRIVEN LATERAL SPREAD
Modelling dynamic fire propagation

NEAR FIELD MODELLING OF VORTICITY-DRIVEN LATERAL SPREAD

Coupled fire - atmosphere model simulation

Approx. 10 hours to run on NCI supercomputer

Near field model simulation

Approx. 10 seconds to run on a laptop.

Modelling vorticity-driven wildfire behaviour using near-field techniques

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Frontiers in Mechanical Engineering. Special Issue on Wildland Fire
Modelling dynamic fire propagation

V-FIRE PYROTRON EXPERIMENTS

- No increase in vertex speed under no-wind conditions
- Significant increase in the vertex speed in the presence of wind
- Results confirm that fireline interactions can influence the behaviour and spread of coalescing fire fronts
- Further research is required to understand the precise mechanisms driving this behaviour
Modelling the spotting process

WIND-TERRAIN EFFECTS ON SPOTTING DISTRIBUTION

Modelling the spotting process

WIND-TERRAIN EFFECTS ON SPOTTING DISTRIBUTION
Modelling the spotting process

WIND-TERRAIN EFFECTS ON SPOTTING DISTRIBUTION

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Modelling the spotting process

COMBINING SPOTTING WITH VLS

(a)

(b)
Modelling the spotting process

COMBINING SPOTTING WITH VLS

No firebrands

\[ \kappa = 0.0075 \]

\[ \kappa = 0.0050 \]

\[ \kappa = 0.0025 \]
Things to ponder...

- How do we deal with non-ballisitic embers?
- What sort of approach should we use to model them?
- How do we link with other work; for example, work on downslope winds?