

→ Focus on fire spread simulators

On the path to better models for fire managers

▶ Developing the tools to predict the spread and direction of a bushfire has become the focus of Bushfire CRC researchers combining the best of Australian and New Zealand experience, with valuable input from international colleagues.

Bushfire spread simulators estimate where a fire is likely to spread over certain time intervals based on fire behaviour models for the vegetation being burnt that include fuels, weather, fuel moisture and topography to predict spread rate, flame height and intensity.

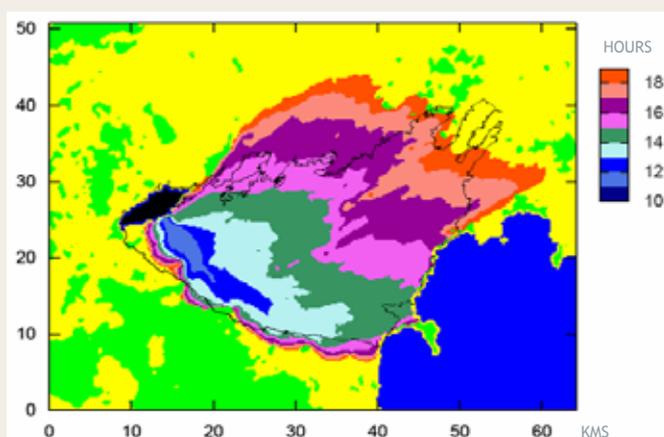
Several Bushfire CRC projects are developing better information, models and decision support tools for a range of vegetation types to provide better operational fire behaviour predictions. These research projects are:

- Fire behaviour modelling (A1.1)
- Fuel classification and grassland curing (A 1.3 and 1.4)
- Fire weather fire danger (A2)
- Bushfire risk modelling - simulation model (A4)
- Computer simulator modelling project (A5).

Collectively, these projects will give fire and land managers better models to conduct prescribed burning programs, fire suppression, and fire risk modelling.

FIRE SIMULATION WORKSHOPS

In January 2006 the First International Fire Simulation Workshop was held in Christchurch, New Zealand. The Bushfire CRC co-hosted the workshop with the Ensis Bushfire Research Group. Participants came from Australia, New Zealand, Canada and the USA. Five simulation models, in various states of completion,



were presented and evaluated in terms of their usefulness for bushfires in Australia and New Zealand. These were:

- Farsite - from the USDA
- Prometheus - from Canada
- Fire Growth Model - from Ron Shamir at the CFA
- Phoenix - A bushfire risk management model by Dr Kevin Tolhurst, University of Melbourne (Project A4)
- Bushfire CRC Computer Simulation Modelling (Project A5), Professor George Milne at the University of Western Australia.

These simulators are systems that combine different fire behaviour models with multi-dimensional mathematical models to predict rates of spread in complex environmental conditions varying spatially and temporally. The model being developed in Project A5 is a new mathematical approach to modelling fire for Australian conditions.

The second fire simulation workshop was held in Sydney in July this year, prior to the Bushfire CRC Fire Managers' Research Workshop, to provide end users with an update on the fire simulation projects and to clarify End Users needs.

OUTCOMES

These workshops concluded that the Bushfire CRC fire simulation research needs a coordinated approach to provide:

- A range of models for operational and strategic fire management planning and;
- User friendly decision support tools which can model physical reality, allow scenario modelling and provide readily accessible fireground information.

The validation of all fire spread models will be undertaken at a future workshop. Such validation will analyse such aspects as:

- Software performance - speed, accuracy, cost
- Meeting End User specifications
- Flexibility in design to adapt to future improvements in fire behaviour modelling.

The successful use of fire simulation models depends on the quality of the inputs such as accurate information on fuel types and weather conditions for a given location. Bushfire CRC research has made significant progress on understanding fuel types and how they burn. Coupling this with a better understanding of the models now available, we can start to integrate this information into useable tools for fire managers.

▶ LEFT: THE BUSHFIRE CRC COMPUTER SIMULATION MODEL DISPLAY OF THE WANGARY SOUTH AUSTRALIA GRASSLAND FIRE OF JANUARY 2005.