

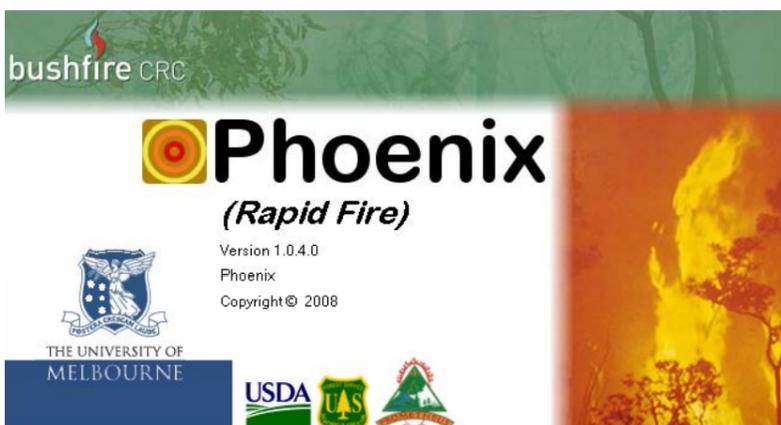
Assessing and Evaluating Bushfire Management Options in the Rural-Urban Interface using PHOENIX-RapidFire.

Kevin G. Tolhurst & Derek M. Chong

Department of Forest and Ecosystem Science, University of Melbourne, Victoria

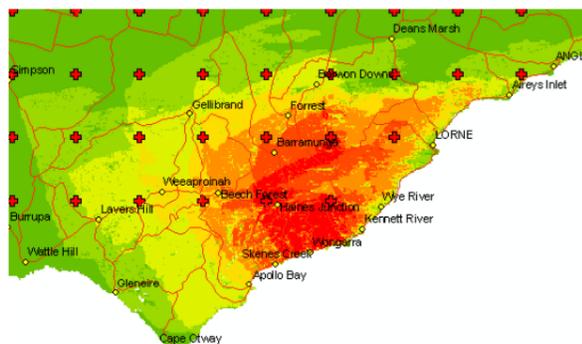
Andy Ackland

Department Sustainability and Environment, Victoria



HOW IT WORKS

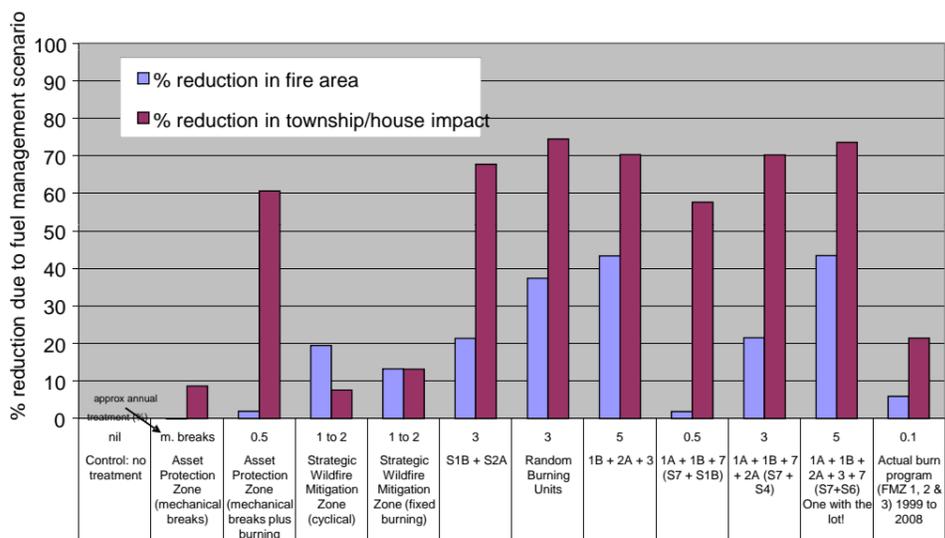
- PHOENIX-RapidFire is a fire simulation program that makes detailed and realistic characterizations of fire spread and other behaviour.
- Combining the characteristics of fires starting from a grid of ignition points under specified weather scenarios, provides an indication of fire potential across the landscape.
- Each fire can be given a relative weighting based on the probability of it starting at a particular point.
- The characteristics of a fire when it intersects with an identified value or asset is used to quantify the impact of the fire.
- The effects of different fire management strategies on mitigating against bushfire losses can be objectively quantified with this process. A cost-benefit analysis of different management strategies can then be undertaken.
- A worked example using PHOENIX-RapidFire in southern Victoria is given here.



THE PROCESS

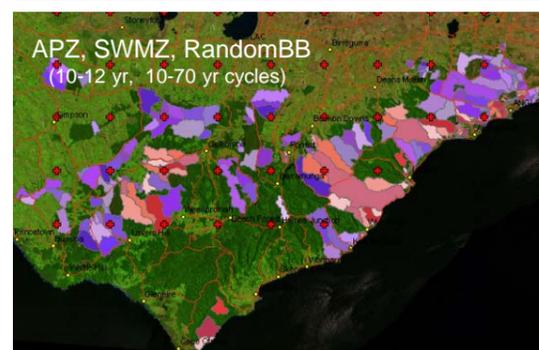
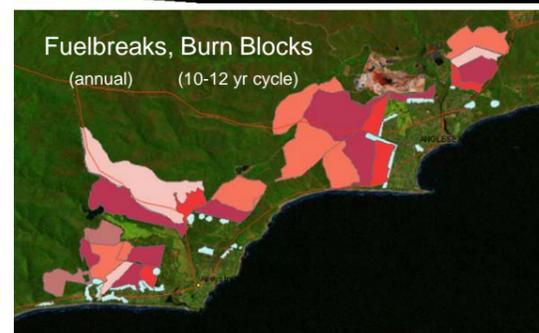
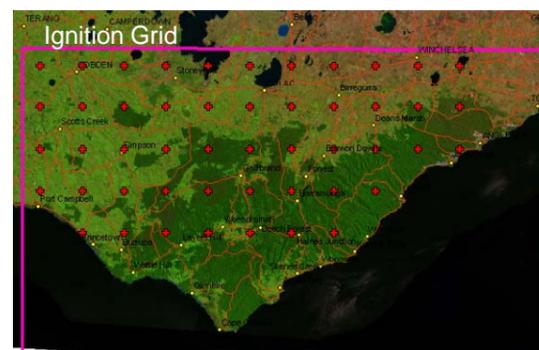
- A landscape of interest is defined (Otway Ranges in southern Victoria). (View the sequence of maps on the right hand-side of this poster)
- An grid of ignition points is created.
- The probability of a fire starting at each point is determined using historic data or a "Probability of Ignition" model.
- Various fire management options are devised and described spatially and temporally. For example, the pattern of prescribed burning, the response time of suppression resources, the level of suppression effort, road network, strategic firebreaks, etc..
- Weather scenarios for testing the management strategies are described in detail (hourly temperature, relative humidity, wind speed and direction).
- Assets and values of interest are spatially described and fire impact models selected.
- Fires are simulated and results of impacts summarized as a basis for evaluating different management strategies.

FDI 73



OUTPUTS

- Results from the simulation can be manipulated in several ways. Graph (left) shows the comparative reduction in house loss with each of 12 different management strategies. 60 to 70% reduction in house loss can be achieved with a number of strategies when the Forest Fire Danger Index is 73 (mid-Extreme).
- Results can be mapped to show the areas with the greatest likelihood of being burnt under the specified weather conditions (above). This provides a basis for choosing where to conduct fire prevention works and strategic fuel reduction programs.



CONCLUSIONS

- Prescribed burning can reduce, but not prevent catastrophic fires.
- A combination of close-in and widespread fuel management is needed to protect townships.
- We should measure our effectiveness in terms of "saves" not just "losses" and PHOENIX provides an objective basis for this.
- PHOENIX-RapidFire can demonstrate the benefits of different fire management options in terms of value and asset impact, not just hectares burnt.

Further Information:
kgt@unimelb.edu.au
derekmoc@unimelb.edu.au

Tolhurst, K.G., Shields, B.J. and Chong, D.M. (2008) PHOENIX: development and application of a bushfire risk management tool. *Australian Journal of Emergency Management*, 23(4), 47-54.