# Scion Rural Fire Research Group

## Highlights August 2010 – April 2011

### Key Activity

The key activity undertaken before Christmas was the preparation and hosting of the 3rd NZ Rural Fire Research Workshop held in early December. Based around the theme of "Promoting Research Adoption", the workshop featured a number of presentations from end-users outlining examples of current and planned research implementation. This included 8 Scion presentations on specific research activities, and from the Bushfire CRC (on the 2009 Victorian bushfires social research, aerial suppression effectiveness) and University of Canterbury (on natural hazards research and fire-atmosphere linkages). A group discussion session was also held on promoting research uptake and implementation.

Feedback on the workshop from participants has been very positive. The workshop proceedings, presentations and discussion group feedback results are now available from the Scion Rural Fire Research website (www.scionresearch.com/fire).

### Rural firefighter workload & productivity

Richard Parker has completed his PhD and is continuing with data collection using his camera and sensor kits on firefighter activities. His aim is to collect more data on initial attack activities. This fire season's data has come mostly from the Blenheim area. Richard and Veronica were invited to Waiouru in January to attend a Defence rural fire training week and give a presentation on his results. Richard has produced a report summarising his PhD work to date, and this is available from the Scion Rural Fire Research website. A Rural Fire Research Update that summarises his most recent report is also available on the website for download.

### Social research

Reports on the mitigation of human-caused fires and findings from the public survey of fire danger communications have been completed and are being uploaded to the Rural Fire Research website. Summaries (in the form of Fire Technology Transfer Notes) are also currently being finalised highlighting the key findings from these research projects.

### Fire climate analysis

Results are also being finalised for two major fire climatology analyses to provide updated estimates of the effects of climate change on future fire danger and an improved description of fire climate severity across NZ. One is being conducted as part of a MAF-funded Sustainable Land Management Mitigation and Adaptation to Climate Change project. The results of the second analysis will be used to support definition of boundaries for proposed Enlarged Rural Fire Districts. Final reports on both projects are currently being finalised, with completion expected in the next few weeks.

### Grassland curing assessment

The second (full-season) pilot trial to assess the suitability of MODIS (Moderate Resolution Imaging Spectroradiometer) satellite imagery products for estimating the grassland curing across NZ is nearing completion. Feedback has been provided at regular intervals (roughly fortnightly) throughout the fire season by rural fire managers on the accuracy of two satellite map products against local visual assessments. A summary of the project to date is located on the Scion Rural Fire website. At the end of the current pilot trail, final results will be used to recommend a pathway forward for possible implementation of a national NZ grass curing monitoring system.

The final report from the Bushfire CRC grassland curing project containing results from the previous Australian and NZ trials has also just been published, and is available for download from the Bushfire CRC website (http://www.bushfirecrc.com/publications/citation/bf-2555).

### Fire growth simulation

A report and software user guide on the NZ-version of the *Prometheus* fire growth simulation model is currently being finalised. Discussions are also underway regarding the running of a follow-up fire simulation training course to aid implementation and use of this new fire prediction and planning tool. This course aims to bring together GIS staff that attended the original *Prometheus* course (held in May 2010) with fire behaviour specialists to increase awareness of the range of possible uses of the software, and to establish a base of trained operators who can work with fire behaviour specialists to begin applying *Prometheus* in operations and planning.

Version 5.3.2 of the *Prometheus* software has recently been developed by the Canadians and will be made available to Scion staff for testing before being released. Participants that attended last year's first NZ *Prometheus* training course will also be contacted in the near future with further historical fires used in the NZ validation phase that can be run as a refresher in use of the software.

### NZFDRS user guide

Work to develop the User Guide to the NZ Fire Danger Rating System is well advanced, with production of a series of worked examples outlining applications of the NZFDRS to various fire management activities. Drafts of the first series of applications have been circulated to project team members for review, and excellent feedback received on format and structure as well as specific content and level of detail within the worked applications to meet end-user needs. As a result of this feedback, a revised format has been developed and circulated for affirmation, and further application examples and background section drafts will be sent out over coming weeks.

It is hoped the interim version of the User Guide will be completed by June/July, and new worked examples added to this over time to create a substantive resource for supporting fire management planning.

## Other news

- Research staff completed marking of the Intermediate Fire Behaviour training course and Unit Standard 4648 Assessment workshops conducted during September 2010. Introduction of the new practical assessments to replace the wildfire case study requirement resulted in a total of 37 (of 45) participants successfully completing all the elements to achieve this NZQA Unit Standard (this will likely increase further, with several still to complete reassessments of elements they initially failed on). This represents a significant advance on US4648 completion rates in previous years.

- A fire behaviour tools training seminar (on the recently released fire behaviour field manual and calculator, and *Prometheus* fire growth simulation package) was successfully piloted to fire managers in the Otago/Southland region. Fire research staff are also available to present similar seminars in other parts of the country.
- Members of the research team participated in a NRFA/Bushfire CRC workshop held in December to develop a NZ seasonal fire weather assessment describing the likely severity of the 2010/11 fire season in different regions of the country. The resulting seasonal forecast was circulated to rural fire managers and the media. The production of future seasonal forecasts is likely to become an annual event.
- Grant Pearce also participated in a meeting coordinated by the NRFA to review the need for and requirements of a fire weather forecasting system to replace/improve the current MetConnect system. It was recommended a project team be formally established to support this and other NRFA initiatives around reviewing the Fire Weather Monitoring System, including the fire weather station network and fire danger rating calculations and output. Research staff also participated in a meeting to consider updating the NZ Wildfire Threat Analysis risk assessment methodology. Again, meeting participants strongly advocated for the research team to be a member of the Project Team being re-established by the NRFA to review the status and update requirements for the NZWTA System.
- Notification was also received from the NZ Fire Service Commission that 1 of the 4 Scion detailed proposals submitted to its Contestable Research Fund has been successful in gaining funding for 2011/12. This was the NIWA-led project on "Improving Forecasts of Fire Danger with New Coupled Weather and Land Models", which will investigate improvements to the FWI System using advances in hydrological and atmospheric sciences, and develop a prototype integrated fire weather information and forecasting system for providing access to fire danger rating and weather information. This 12-month project will commence in July.

## List of recent outputs:

### Reports


- Hide, S.A.; Tappin, D.C.; Langer, E.R.; Anderson, S.A.J. 2010. Assessment of the general public's perception of rural fire danger communications. Scion Rural Fire Research Group, Christchurch. Scion Contract Report No. 18088. 40 p.
- Hart, M.; Langer, E.R. (in press). Mitigating the risk of human caused wildfires: literature review and stakeholder study. Scion Rural Fire Research Group, Christchurch. Scion Contract Report No. 18090.
- Newnham, G.J.; Grant, I.F.; Martin, D.N.; Anderson, S.A.J. 2010. Improved methods for assessment and prediction of grassland curing: Satellite based curing methods and mapping - Final Report: Project A1.4. Bushfire Cooperative Research Centre, Melbourne, Australia. Report No. A.11.10 (November 2010). 86 p. (available at www.bushfirecrc.com)
- Parker, R.; Ashby, L. (2010). Rural firefighter exposure to fireground gases with relevance to physiological workload and fire suppression productivity. New Zealand Fire Service Commission Research Report No. 108. (Scion Client Report No. 18080). 24 p


### Fire tech notes & updates


- Renwick, R. & Pearce, G. 2011. Fire Behaviour Case study - Waiomu, 28 January 2008. Scion, Rural Fire Research Group, Christchurch. Fire Technology Transfer Note 40 (February 2011). 14 p.
- Scion. 2011. Rural Firefighter workload. Scion, Rural Fire Research Group, Christchurch. Rural Fire Research Update 7 (April 2011). 4 p.


### Presentations


- Clifford, V. 2011. Fire fighter workload and productivity. Presentation on behalf of R. Parker to the New Zealand Defence Force during rural fire training week. 12 January 2011, Waiouru.
- Pearce, G. 2011. Vegetation fire science; and Wildfire risk management. Lectures presented as part of Fire Engineering Summer School, Introduction to Fire Engineering (ENGR403-11SU1), University of Canterbury, 14 February 2011.