

Day 2 Masterclass Seminars

Seminar 1

Tasmanian Wildfires Jan-Feb 2013,

Jon Marsden-Smedley (University of Tasmania)

Jon's talk will cover the Forcett-Dunalley, Repulse, Bicheno, Giblin River, Montumana, Molesworth and Gretna fires that occurred during the 2012/13 Tasmanian fire season. The weather conditions, fuels, site conditions and corresponding fire boundaries and areas burnt have been mapped. Detailed weather, fuel, site and fire behaviour data has been collated for 12 fire runs burning with moderate to extreme rates of fire spread and intensity. The observed rates of fire spread for these fires was compared with predictions made by fire prediction models.

The Project Vesta, Phoenix-Rapidfire and Buttongrass moorland models provided good predictions of head fire spread rate. The McArthur Fire Behaviour model under-predicted the head fire spread rate and the CSIRO grassland fire model over-predicted the head fire spread. The Phoenix-Rapidfire model under-predicted flank fire spread rate. The main driver of the extreme levels of fire behaviour observed during these fires was a combination of surface weather conditions and atmospheric instability, with these factors being in the extreme to catastrophic range when the fires were making their major fire runs.

The Forcett-Dunalley, Repulse and Bicheno fires all burnt into recently burnt areas with corresponding low fuel hazard levels, which were effective at reducing or stopping high intensity fire behaviour.

Seminar 2

Fire Regime History & Seasonal Dynamics in Australia

Grant Williamson (University of Tasmania)

Fire regimes are known to vary across the Australian continent, with significant local patterns in seasonality, intensity, return times and interannual variation. A database of satellite-derived active hotspots for 12 years are used to determine fire season start, end, and peak dates across Australia. These fire season 'moments' are compared with meteorological and fire weather variables in order to understand the triggers of fire season onset. Northern Australia has the most clearly defined fire regime, with predictable drought-driven annual fire season. Arid zones are driven largely by fuel rather than immediate weather conditions, leading to high intra-annual variability as a result of rainfall. Southern Australia, with longer fire return times, is difficult to analyse given the length of the satellite record and the high degree of stochasticity due to ignitions. However, many meteorological factors associated with fire season, such as the Keetch-Byram Drought Index (KBDI) - a drought measure, show significant trends over the previous century.

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The Fire Masterclass was brought to you by the Landscapes and Policy Hub.



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Fire Masterclass

9-11 October 2013

Hobart

The Masterclass Program

Day 1: Dunalley Field Excursion

Day 2: Morning Seminars

Styx Valley Excursion

Workshop Dinner (7.30pm)

Day 3: The Workshop

Convenor: Professor David Bowman

The Fire Masterclass was made possible thanks to the support of the Landscapes and Policy Hub.

Landscapes and Policy Hub

Day 3 Fire Masterclass Workshop

Friday, 11 October 2013

Times	Topic	Presenter
8.30am	Welcome and Introductions	David Bowman
9.00am	Scene Setting Talks: Predicting and projecting future fire activity	
	Projections, Predictions, or Trends? The challenges of projecting changes to fire regimes under climate change	Bec Harris
	Modelling weather & load	Hamish Clarke
	Challenges of predicting future fire regimes – top-down or bottom-up approach?	Matthias Boer
	Fire in the future: the journey may be just as important as the destination	Ross Bradstock
	Fire futures for a flammable continent: Imagining types of change in fire regimes	Dick Williams
	Predicting fire behaviour from plant species	Phil Zylstra
	Challenge of predicting fire in response to climate change	David Bowman
10.45am	Morning Tea	
	Plenary Presenter	Dr Fang Li
	The logic of global models and how you think fire can be built into these models.	
12.30pm	Lunch	
	Workshopping: Discussions, dreams & deliberations	David Bowman
	Directions - where to from here	Ted Lefroy
4.00pm	Official close followed by refreshments	

Abstract: Plenary Presenter Dr Fang Li

Fire is an important earth system process and a global scale disturbance agent in terrestrial ecosystems. So far, almost all commonly-used dynamic global vegetation models and global earth system models include fire schemes. In Dr Li's presentation at the Fire Masterclass, she will provide some background information about global earth system models and dynamic global vegetation models, and the interactions between fire, vegetation, carbon and atmosphere.

Dr Li will provide a review of fire schemes used in current global models. She will then describe her new global fire scheme that includes modelling fire occurrence, fire spread, fire impact, agricultural fires, deforestation fires in tropical closed forests, peat fires and the socio-economic impact on fire. She will present its performance in the dynamic global vegetation component of the Institute of Atmospheric Physics/Chinese Academy of Sciences Earth System Model and the National Center for Atmospheric Research's land surface model, (Community Land Model 4.5 within the Community Earth System Model 1.2).

Dr Li will conclude by overviewing her latest work quantifying the impact of fire on the net carbon balance of global terrestrial ecosystems during the 20th century based on the Community Land Model 4.5.

Masterclass Participants

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Biography: Dr Fang Li

We welcome visiting academic, Chinese global vegetation modeller Dr Fang Li as guest plenary speaker at the Fire Masterclass in Hobart on Friday, 11 October.

Dr Li is currently an associate professor at the Institute of Atmospheric Physics/Chinese Academy of Sciences (IAP/CAS). Her research involves developing global ecosystem disturbance modules for earth system models to investigate the interactions between disturbance, vegetation (carbon) and atmosphere, and reconstruct and project the long-term variability of ecosystem disturbance in the context of global change.

Dr Li is one of the developers of the ecosystem component in the Chinese Academy of Sciences' *Earth System Model* and the National Center for Atmospheric Research's *Earth System Model* CESM. Her global fire model is being used in the Chinese Academy of Sciences' *Earth System Model*, the Institute of Atmospheric Physics' *Dynamic Global Vegetation Model*, and the National Centre for Atmospheric Research's *Community Earth System Model* 1.2.

Dr Li obtained her Bachelor of Arts with a major in atmospheric dynamics from the Nanjing University of Information Science and Technology in 2003. In 2008, she received her Doctor of Philosophy majoring in climatology at the Atmospheric Physics/Chinese Academy of Sciences.