RAINFORESTS ON FIRE: ASSESSING BUSHFIRE RISK IN TASMANIA'S WET FOREST TYPES

bushfire&natural HAZARDS CRC

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A PROPOSAL TO CALIBRATE THE PHOENIX RAPIDFIRE BUSHFIRE PREDICTION MODEL FOR TASMANIA'S WET FOREST TYPES TO BETTER ASSESS FUTURE BUSHFIRE RISK AND TO IMPROVE MODEL PERFORMANCE

INTRODUCTION

Context

In response to fires in January 2013 and the subsequent Tasmanian Bushfires Inquiry, the Tasmanian State Fire Management Council (SFMC) produced a report in July 2014 to assess the statewide fire risk and to help develop a strategic fuel management plan.

Background

The Phoenix Rapidfire model was used to simulate bushfires over five years under eight different fuel management regimes:

- Individual fires were simulated annually over a uniform grid of 11,059 ignition points statewide
- Three Assumptions:
    - Bad fire weather can be generalized in a "typical" day (95th percentile FFDI for each BOM climate region)
    - Bushfire ignitions are distributed uniformly across the state
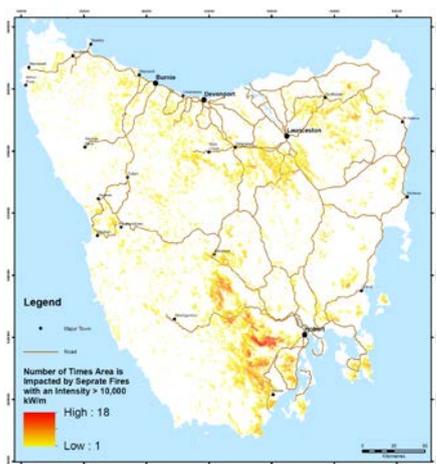   - Fuel curves are similar to those in Victoria – especially for wet forests

JUSTIFICATION

In Tasmania, intense fires occur in wet forests

Figure 1 shows a map of the extent and frequency of simulated bushfires under the minimum possible fuel load. Figure 2 shows the distribution of wet forests in Tasmania. Notice the that the region exhibiting the most high-intensity fire activity overlaps with the densest region of wet forests in south-central Tasmania. As a result of it's proximity, human populations in Hobart are extremely vulnerable (Fig. 3).

PROPOSED WORK

To address the assumptions listed, we propose the following:

- Use model simulations from SFMC report to identify which wet forests in Tasmania represent the biggest risk of high-severity fires.
- Sample fuel loads across a chronosequence of Tasmanian wet forest sites to develop fuel curves specific to these forest types.
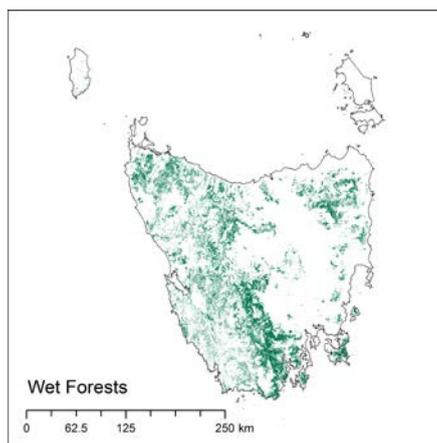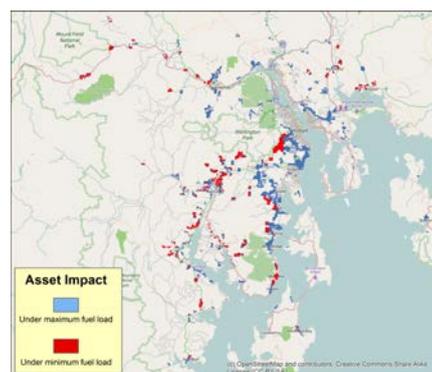   - Collect microclimate data to further assess fire danger

Figure 3: Settled areas impacted by fires under maximum and minimum fuel loads

- Use existing permanent plot data to look at fuels across a continental climate gradient, studying the influence of climate on fuel curves in wet forests.

- Incorporate newly calibrated fuel curves into the Phoenix model and rerun simulations using higher resolution meteorological data and sampling from a distribution of ignition points based on observations. This will provide an updated bushfire risk assessment for the state.

END USER STATEMENT

The Tasmania Fire Service is very excited by the opportunity to better understand the nature of wet forest fuels, as this is a big gap in our current understanding and ability to model bushfires and bushfire risk in Tasmania.

This project is being undertaken by James Furlaud, a PhD candidate at the University of Tasmania.
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REFERENCES

Richards, R., Ferguson, S., Cornish, K., Whight, S., and Williamson, G. (2014). Bushfire in Tasmania: a new approach to reducing our statewide relative risk. Technical report, Tasmanian State Fire Management Council.

Figure 1: Map of simulated fires from Phoenix

Figure 2: Wet forest distribution in Tasmania