



## **Tasmanian Senate Inquiry Submission**

Thank you for the opportunity to make a submission to the Senate Inquiry into the 2016 Tasmanian Bushfires. The Bushfire and Natural Hazards Co-operative Research Centre (CRC) is a research organisation funded through the Commonwealth Government's Co-operative Research Centre program. It is also supported by state and territory fire, land management and state emergency services agencies as well as a range of non-government organisations. In particular the Bushfire and Natural Hazards CRC receives funding from the Tasmanian Government, with contributions from a number of stakeholder agencies including the Tasmania Fire Service.

The Bushfire and Natural Hazards CRC's strategic goals include increasing the resilience of Australia to the impacts of natural hazards. This includes environmental assets as well as people and property. The Bushfire and Natural Hazards CRC is now almost 3 years into its 8 year agenda. Much of the work of the Bushfire and Natural Hazards CRC's research agenda can help to address the terms of reference of the Senate's inquiry.

In relation to the specific terms of reference:

### **a) The impact of global warming on fire frequency and magnitude;**

While the Bushfire and Natural Hazards CRC is not conducting research directly on modelling climate change we do note that there is much work in Australia and around the world which is noting the increasing frequency of higher fire danger days. In recent times we have also seen days occur where the fire danger levels are higher than would normally be expected. Across Australia there appears to be fire seasons starting earlier and finishing later. This will create ongoing issues for resource sharing across the country and potentially internationally.

In the context of Tasmania, the fires seen in 2016 were unprecedented in recent times. Fires started by dry-lightning and continuing to burn are rare in this landscape. To see this behaviour is an indication of the level of dryness throughout this region. To link these fires or the precedent conditions to climate change is difficult, however, many researchers have pointed to this as a possibility. This should be considered alongside the extremely hot February, the hottest the world has ever seen, and the fact that the preceding year was the hottest year on record for the globe.

The Bushfire and Natural Hazards CRC's seasonal bushfire outlook noted that much of the South East of Australia had seen a decade of below average rainfall. The CRC first issued the outlook in September 2015 (<http://www.bnhcrc.com.au/hazardnotes/010>) but subsequently had to reissue the report with an increased risk owing to the exceptionally dry October across parts of the SE of Australia (<http://www.bnhcrc.com.au/hazardnotes/12>). Significantly this increased risk area included large parts of Tasmania. The updated assessment stated:



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*The potential for bushfire has been assessed as above normal across northern and eastern Tasmania, as well as in the Midlands and the South East. This is a significantly larger area than the September assessment. The bushfire potential in the remainder of the state is currently normal. The first half of spring has seen very low rainfall for almost all of Tasmania, especially in the west. Above-average daytime temperatures have increased evaporation rates, which further increases fuel dryness. The fire season has commenced in the eastern half of the state, with many fires proving difficult to control because of the dryness of fuels.*

It is clear that the prolonged rainfall deficit (the driest period ever recorded on Tasmania's west coast), the hottest year globally in 2015, the very hot start to 2016 and the influence of El Niño contributed to the scale of the fires seen in Tasmania this year.

### **(b) The availability and provisions of financial, human and mechanical resources;**

This is an operational issue for the Tasmanian Government, however the Bushfire and Natural Hazards CRC is conducting research around capability especially considering the way in which incident management teams co-ordinate with each other. The previous Bushfire CRC, of which the Bushfire and Natural Hazards CRC is now the custodian of the research, also conducted research on workforce issues including fitness and fatigue management. This work is available on the Bushfire CRC website [www.bushfirecrc.com](http://www.bushfirecrc.com)

### **(c) The adequacy of fire assessment and modelling capacity;**

The Tasmanian government has been an early adopter of the fire spread simulator Phoenix, which was developed by the Bushfire CRC along with the University of Melbourne. This simulator is one of the best available in Australia and provides an indication of the future path of fires. It is based upon science which is being updated through research at the Bushfire and Natural Hazards CRC, the University of Melbourne and also through work funded by the Victorian Department of Environment, Land, Water and Planning (DELWP) through the CRC. The model is only as accurate as the inputs though; the CRC is working with a range of partners to develop better landscape dryness measures, better weather forecasting and better use of remote sensing products to improve this accuracy.

Empirical fire spread models are also only as good as the observations and fire behaviour models which have been used. In the case of Phoenix the models used are the best currently available, however, there are many known limitations with those models. These limitations primarily occur at extreme fire danger levels, where there is substantial interaction between the fire and the atmosphere, which is why the Bushfire and Natural Hazards CRC has extensive research underway to produce better fire spread models. However, the simulations can also prove difficult at very low fire danger ratings levels in the types of fuels seen in these fires. The models may predict the fires should not spread and go out, but in peat they may continue to smoulder and reignite.





The Tasmanian government was also part of the Australian and New Zealand Emergency Management Committee's working group on a new National Fire Danger Rating System - a recommendation from the Victorian Bushfires Royal Commission. This was funded through the National Emergency Management Program and run by the Bushfire and Natural Hazards CRC. This project has developed a framework for updating the NFDRS to incorporate the best science. The next step for this project has recently been considered by the Australian and New Zealand Emergency Management Committee.

**(d) Australia's obligations as State Party to the World Heritage Convention;**

The Bushfire and Natural Hazards CRC has nothing to add under this term of reference.

**(e) World best practice in remote area fire management;**

Remote area firefighting is an arduous and labour intensive activity requiring extensive training and high levels of fitness. Australia is one of the leaders in this type of firefighting and maintains a national capability which is called upon as the needs arise. No one state can maintain all the resources required for firefighting on the worst days, as this would be cost prohibitive and wasteful. In Australia there are interstate agreements for sharing of resources, including remote area firefighting teams. Indeed these agreements also stretch to international agreements which have included New Zealand, USA and Canada.

Australia, through the Australasian Fire and Emergency Service Authorities Council (AFAC), the National Aerial Firefighting Centre and the Bushfire and Natural Hazards CRC, is in a unique and world-leading position in the co-ordination of national resources, in policy, practice, operations, and research. AFAC, the Bushfire and Natural Hazards CRC and the Australian Red Cross have formed a collaborative joint venture along with the Attorney-General's Department to establish and deliver the Australian Disaster Resilience Institute (formally the Australian Emergency Management Institute). This will have responsibility for the development of national doctrine, training and information for the whole sector.

**(f) Any related matter.**

What is different with these fires is the impact they had on sensitive natural ecosystems. They burnt through areas of important internationally significant natural heritage and burnt for an extended period, which would present problems even for large states.

These types of fires can only be contained and moderated by firefighting efforts, and require extensive rainfall to extinguish fires in peat and moss. Indeed there are fires around the world that have burnt for many years in these types of fuels. The fires can appear to be out only to reignite the next time there is hot dry weather.



The areas burnt this time were sensitive to effects of fire, but fire is part of the landscape and not completely unknown in these areas. It will take a very long time for the pre-fire state to recover and indeed some scientists have said that as a result of changed climate it may not ever recover to that state.

There is a need for urgent research to ensure that long term longitudinal data is collected. In particular to measure and assess damage, to monitor recovery, to consider the likelihood and impact of future fires on partly recovered ecosystems.

The Bushfire and Natural Hazards CRC is a national resource, which is funded by the states and territories. The centre has a fixed budget and lifetime with a research program across all natural hazards. It is in an ideal position to work with the Senate Committee in helping to define possible research that is needed to address knowledge gaps emerging as a result of the inquiry.

I have attached the Bushfire and Natural Hazards CRC's research booklet, which outlines the current research program. And more detail is available on the Bushfire and Natural Hazards CRC website [www.bnhcrc.com.au](http://www.bnhcrc.com.au)

The Bushfire and Natural Hazards CRC is in the process of refreshing its research agenda for the second half of the funding period, and would welcome any priority areas identified by the senate enquiry as part of the development of our program.

If the CRC can be of any further help to the senate committee, please contact me.