AN INTRODUCTION FOR RESEARCH PROJECT END USER REPRESENTATIVES

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1 INTRODUCTION

This document has been prepared for people nominated as end-users of the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC).

BNHCRC research is, first and foremost, driven by the needs of end users. Your role is to work with researchers as part of integrated project teams to ensure their work is meeting the needs of your organisation as well as those facing similar issues across Australia. With other end users, you can ensure that CRC efforts are used to address the problems facing management of natural hazards in Australia today.

CRC research is long term, developing from research into adoption over the 8 years of funding the CRC has secured, and potentially beyond. The projects will be shaped by your knowledge, experience and understanding of the environment in which you operate. The research projects themselves may not deliver tangible outcomes for 3 years or more, but the process of identifying how that research can and should be used starts now. We ask that you keep this in mind as an end user, and think more broadly than the issues of this season or this year, instead looking 3, 5 or 10 years into the future.

As an end user of the CRC, you will come into contact with some of the best researchers from Australia and overseas working in their fields, as well as other practitioners trying to address similar problems to you. This is a unique opportunity to develop your networks, and I hope you make the most of it.

The remainder of this document describes the purpose, structure and arrangements for researchers and end users, as background for your role. The CRC is still establishing itself, so arrangements may be altered to better suit the research and end-user processes needs to deliver the best outcomes.

Each research Cluster has a Lead User Representative, who are detailed in Section 8 of this document. Please feel free to contact them if you have any queries about your role.

Welcome to the Bushfire & Natural Hazards CRC. We hope you enjoy the experience, actively engage with the researchers and help shape a valuable and productive research program.

Michael Rumsewicz
Research Manager
Bushfire and Natural Hazards Cooperative CRC
2 BACKGROUND

The Bushfire and Natural Hazards CRC purpose is to conduct high quality applied research inspired by end-users, to:

- reduce the risks from natural hazards;
- contribute to the national disaster reliance agenda;
- build Australian research capacity; and
- enable Australian small-to-medium enterprise to be innovative in natural hazard products.

End user engagement is central to the CRC’s operation. To place this engagement in context, a model of a “Research to Capability” process is depicted below, together with examples of how the process is being enacted within the Bushfire and Natural Hazards CRC. The Bushfire and Natural Hazards CRC’s core business is focussed on the top four boxes, but at the same time the CRC must be aware of the end user environment towards which its research is directed (bottom two boxes).

Successfully delivering on the purpose of the CRC requires teams of high quality researchers and end users working together to:

- frame the research questions;
- understand the context of the industry;
- review findings as research progresses;
- engage stakeholders; and
- identify paths to utilisation.
3 SETTING THE RESEARCH DIRECTIONS

A two-day workshop was held in Melbourne on 25-26 March with key participants from the states and territories, the Commonwealth, a number of NGOs and selected hazard experts to scope out the problems needing particular attention.

A set of high-level problem statements were developed covering strategic issues aligned with the Council of Australian Governments (COAG) National Strategy for Disaster Resilience (NSDR) and the National Bushfire Policy Statement.

The problem statements were considered in the context of natural hazards organised around five main research themes:

- Data and Knowledge;
- Disaster Resilience;
- Decision Support and Resource Investment;
- Risk Mitigation Policy and Planning, and
- Emergency Management Practice.

The workshop led to development of a call for research proposals to address key knowledge gaps in the Bushfire and Natural Hazards space, with initial proposals submitted in April 2013.

The research proposals were reviewed for alignment to identified needs and technical excellence. An evaluation team was established – primarily end-user focused, with one retired senior academic, to ensure the process was fair and balanced.

This process led to approximately 35 proposals being selected for potential funding. The project leaders of those proposals were brought together with end user participants at a workshop in Melbourne on May 23-24 2013 to identify synergies between proposals and refine the scope. Revised proposals were provided in June 2013 and further refinement of scope and budget was subsequently undertaken.

From this process three overarching themes of research, based on twelve clusters of interrelated projects, were subsequently formed to be the basis for the Bushfire and Natural Hazards CRC user driven research program. The overall research program is shown below.
Economics, Policy and Decision Making deals with economics and the interface between risk-based priorities and the practice of decisions to allocate resources where the potential for some of the greatest tangible benefits can be made.

Resilient People, Infrastructure and Institutions aims to improve the conceptualisation of resilience and the factors that both promote and inhibit its development. Improved understanding of these factors is intended to contribute to and optimise the development of a capability to identify vulnerability, manage the risk and enable resilience.

Bushfire and Natural Hazards Risks seeks better forecasts of likely events and precursor conditions; greater accuracy of forecast tools and more timely forecasts. This leads to increased preparedness for the impacts of natural hazards, improved communications and warnings and enhanced ability to predict and mitigate the risk.
4 OVERALL GOVERNANCE OF THE RESEARCH PROGRAM

The key roles in the overall governance of the research program is shown in the figure below.

The role of the Committee includes, but is not limited to, oversight of:
- The development of the research strategy
- The development and operation of the Research program
- The development and operation of the Education program
- The development and operation of the Research Utilisation Strategy

Research Advisory Forum
a) Every BNHCRC partner has a seat.
b) Every project presents each year - two theme focussed meetings per year at locations rotating around the country.
c) Attended by ~50 end-users over two days.
d) Provides confidential feedback on direction, progress, quality and user needs.
e) Provides an opportunity for cluster and project level workshops between researchers and end-user representatives.
5 MAINTAINING AND REFINING RESEARCH FOCUS

The key roles in the day-to-day operations of the research projects are shown in the figure below and are aimed at ensuring the delivery of a high quality, relevant research program that seeks to develop knowledge that can be developed into high impact, usable outputs for CRC stakeholders.

**Overall Research**
- Overall Research Program Responsibility
  - Project agreements, acceptance of deliverables, payments, project tracking
  - Relationship Development
  - Research Utilisation
  - Education Program
  - Approval of any proposed changes to project deliverables

**Cluster Lead User Representative**:
- All Cluster Lead Users are senior staff in organisations, with national representation roles
- Convene cluster meetings of Integrated Project Teams
- Guide discussion and resolution of BNHCRC feedback and strategic advice to projects
- Develop cohort of end-users involved in the research program
- Provide reports to Research Manager on a per project basis
- Provide End User focussed advice to Research Manager. Cluster Lead User Representatives are not accountable for the projects – the role is to provide advice to the projects and to the Research Manager to assist in project utility, quality and focus.
- Facilitate, where necessary, linkages to potential end users / data / facilities / … that may assist the projects.

**Cluster Lead Researcher**:
- All Lead Researchers are internationally reputed in their area of expertise
- Provide strategic oversight and quality assurance of cluster research
- Guide discussion and resolution of BNHCRC feedback
- Provide Research focussed advice to Research Manager and Projects

**Integrated Project Team comprising Project Leader, Researchers, Users**

**Project Leader**:
- Sets technical direction and responsible for quality of project research outcomes.
- Responsible for recruiting, timeliness of delivery against milestones and deliverables, managing to project budget and project level reporting.
- Provide advice to the Research Manager on overall health of the Project.
- Most are internationally reputed, with a blend of middle career researchers with excellent track records.

**Researchers**:
- Responsible for carrying out the research, managed by the Project Leader, informed by Users.

**Users**:
- Essential to long term project success through framing of research questions, development of common language within the Integrated Project Team, on-going review of the research questions, facilitating access to data/information/people to support project goals, identification of potential use of research outputs, development of roadmap taking the research through to utilisation
- Provide advice to the Project as it develops on how the research can be made more valuable to End Users.
- Provide advice to the Cluster Lead User Representative (and consequently the Research Manager) on user related aspects of the Project.
- Not responsible for directing the projects – the focus of the role is to provide advice to the project and to the Research Manager to assist in project utility, quality and focus.
- Develops and maintains the Project Readiness Roadmap.
6 IDENTIFYING MECHANISMS FOR KNOWLEDGE APPLICATION

Each Integrated Project Team will inevitably develop its own local culture, language and way of working. For the initial tranche of BNHCRC funded projects, the aim is to develop knowledge through high quality research that has potential use by the BNHCRC stakeholders. The process of recognizing the form that such use may take, and the path to get it there, starts at the beginning of the projects, not at the end. The user members of the integrated project teams are essential to successful utilisation of research project knowledge.

To assist in developing a common understanding between researchers, users and management, the BNHCRC is requiring that projects, from the beginning, develop Utilisation Readiness Roadmaps. These Roadmaps are a device for establishing a common understanding of where projects are at any given time, and the effort required to convert the knowledge produced into a usable output.

The roadmap shows in a figure the timing of project deliverables, and an end-user assessment of where in the Research/Prototype/Operations spectrum each deliverable sits. Moreover, the figure gives an indication of what steps will be required to convert the research outputs into “products” that are “fit for purpose”. Examples of such products are training materials, software systems, processes or even simply reports. The readiness level for a usable product may vary significantly across projects.

The aim in undertaking this process is ensure that the entire integrated project team is on the same page regarding the relative position of research project deliverables compared to take up by end users. This process should be on-going, commence in the project definition phase, and assist in managing expectations and identifying potential barriers to utilisation before projects progress too far. The active participation of users is essential to the success of the projects, as the users have the domain knowledge to frame the important questions, recognise how the research might be used, and identify the path to utilisation.
The Roadmaps use a simplified version of Technology Readiness Levels developed by NASA (see below), a 9 point scale where 1 represents “blue sky research” and 9 describes a fully operational mission critical system.

TRL 9: Actual system “proven” through successful system and/or mission operations

TRL 8: Actual System completed and “qualified” through test and demonstration (in the operational environment)

TRL 7: System prototype demonstration in the planned operational environment

TRL 6: System/subsystem model or prototype demonstration in a relevant environment

TRL 5: Component validation in a relevant environment

TRL 4: Component validation in a laboratory environment

TRL 3: Analytical and experimental critical function and / or characteristic proof of concept

TRL 2: Technology concept and / or application formulated

TRL 1: Basic principles observed and reported

Adapted from: Technology readiness assessments: A retrospective
See also http://en.wikipedia.org/wiki/Technology_readiness_level for a general introduction to the topic.

While the NASA approach is technology focussed it can be readily adapted to the wide range of projects being carried out within the BNHCRC. The important point is to ensure that Integrated Project Teams understand and agree where the major research activities of the projects end and the migration to utilization focused activities begins. Note that this does not mean that utilization activities only commence when the research phase is completed - an understanding of the potential utilization of the research must be developed early in the research phase. Nor does it mean the research necessarily ends at this point. What is needed is an idea of what “fit for purpose” means for each project and when research outputs can begin to be drawn out into usable “products” – sometimes a mission critical system (TRL 9 on the NASA scale), a desktop program for long term scenario planning (maybe TRL 5), documented processes, training packages, services, or even simply reports. The final readiness level may vary significantly between projects.

The BNHCRC research projects are not necessarily expected to produce immediately usable products within the project – for technology based projects the outputs will most likely be at most at a readiness level of 4 or 5 at completion. However, the path to utilization will have been identified well before the end of the research project, and plans put in place for taking the research outputs through to utilization, including identification of resources required. The specifics will vary from project to project.
7 TRANSLATING RESEARCH OUTPUT INTO PRODUCT

BNH CRC project funding in the first four years of operation is targeted towards developing knowledge in each of the themes and clusters.

Research will continue in the second four years of operation, while some of the CRC funds will be expended towards supporting utilization of the knowledge outcomes of the initial tranche of research projects. Each research project is different and some may go further towards “fit for purpose” than others – there is no “one size fits all”. In some cases, significant effort and possibly money may be required from CRC partners or other sources to define and develop the nature of the products developed from the knowledge developed through the CRC.

Research outputs could include, but are not limited to:
- Models, algorithms
- Software
- Insight
- Advice, recommendations

Fit for purpose products developed from the research outputs could include, but are not limited to:
- Operational software
- Knowledge, Data
- Standards
- Processes
- Training
- Services.

In any case, the early identification of the likely form of such products by users involved with the research projects will be essential to likely development of such products and subsequent development of capability by partners of the Bushfire and Natural Hazards CRC.
8 Research Program and Key Personnel - At a Glance

Full, up-to-date listings of key personnel can be found on the Bushfire and Natural Hazards CRC website, www.bnhcrc.com.au

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<thead>
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<th>Role</th>
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