



bushfire&natural  
**HAZARDS**CRC

# THE BUSHFIRE AND NATURAL HAZARDS CRC

**Dr Richard Thornton**

CEO

[www.bnhcrc.com.au](http://www.bnhcrc.com.au)



Australian Government  
Department of Industry,  
Innovation and Science

**Business**  
Cooperative Research  
Centres Programme

# TODAY'S DISCUSSION

a) Australia's R&D landscape and our PhD system

b) The CRC Programme

c) The Bushfire and Natural Hazards CRC

# THE PHD IN AUSTRALIA

- 1) 1948 - first 3 PhD graduations
- 2) 2011 - Australian universities graduate 6,780 PhDs

# THE PHD IN AUSTRALIA

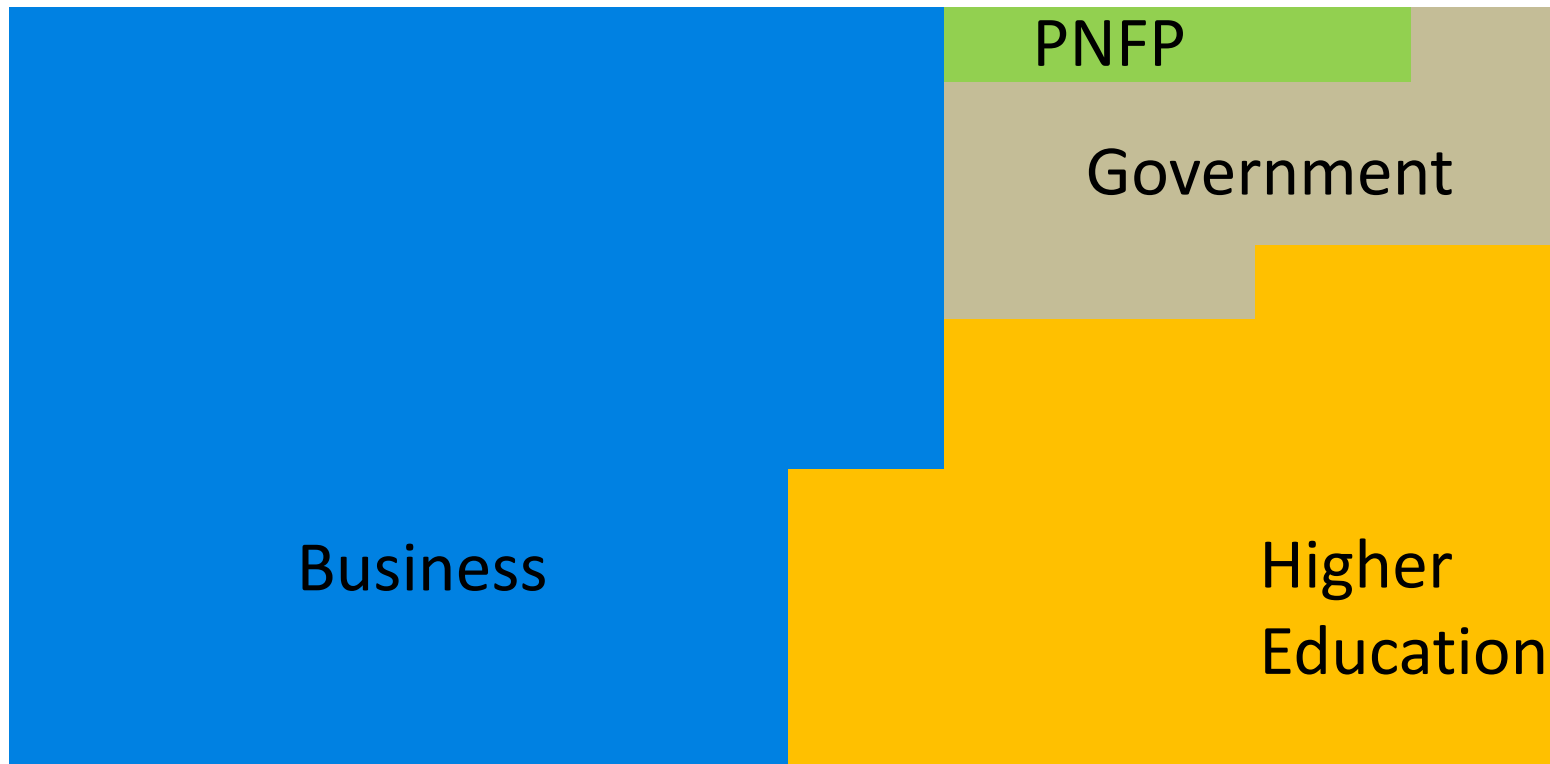
- 1) Australian PhDs (generally) follow the UK model of research apprenticeship
- 2) US PhDs (generally) follow the German model of skill and knowledge development

# THE VALUE OF A PHD

1) Virtually every Top 10 business leader in Australia has two degrees

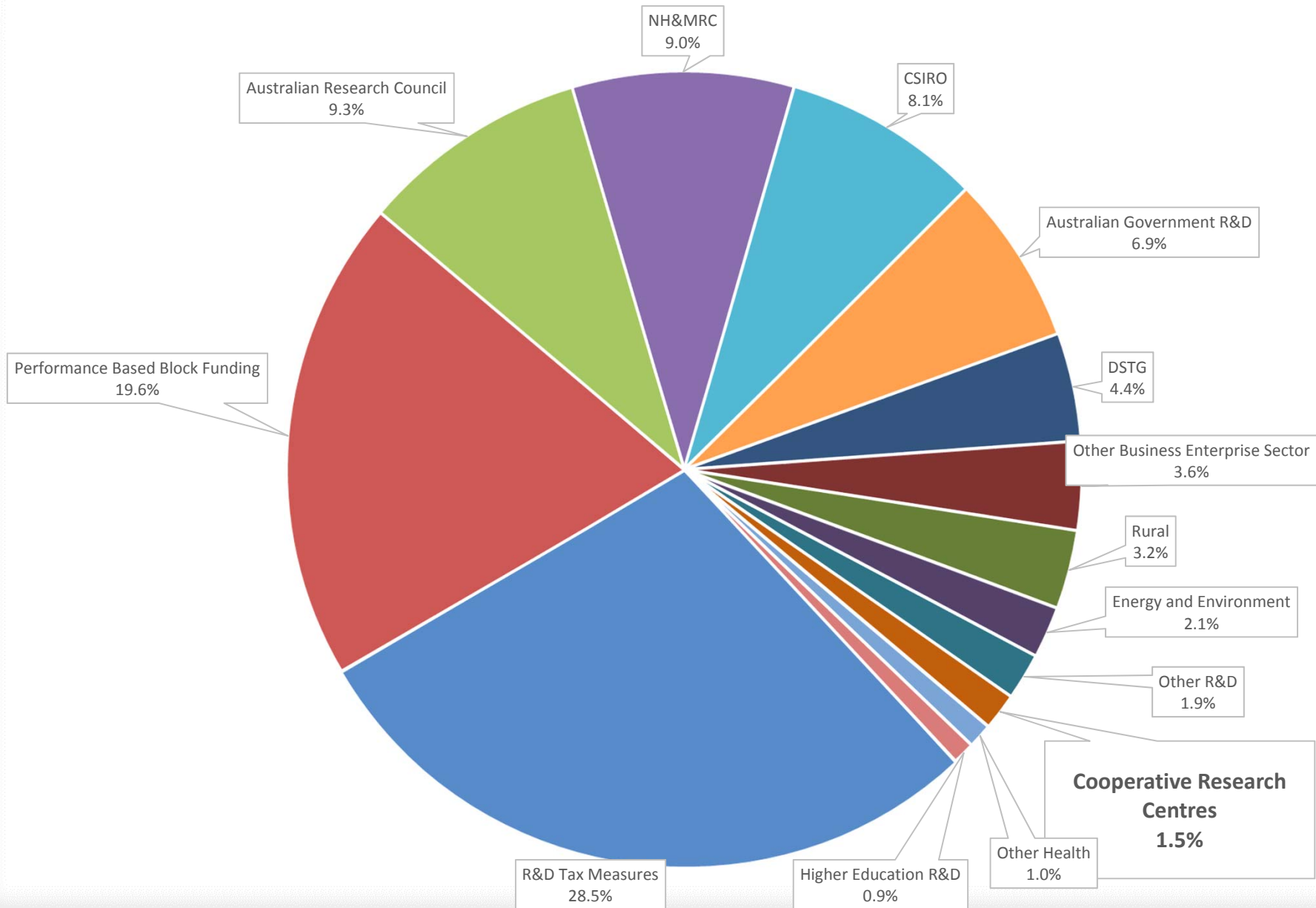
- a) Dr. Martin Parkinson – Secretary PM&C
- b) Dr. Andrew Mackenzie – CEO, BHPB
- c) Dr Ziggy Switkowski – Chair NBNC

# WHO DOES R&D IN AUSTRALIA?



## CRC PROGRAMME HISTORY:

- Established 1990;
- Industry-led collaboration;
- 17 selection rounds completed;
- 212 CRCs funded;
- ~ \$4b Commonwealth: ~ \$14b Participants;
- 33 Active CRCs.









# NOTICE

**THIS IS A MULTIPLE  
HAZARD AREA**

**PERSONS ENTERING THIS PROPERTY  
MUST COMPLY WITH ALL SAFETY  
REGULATIONS**

***DO NOT ENTER***  
**WITHOUT PERMISSION AND  
NOTIFICATIONS OF THE  
HAZARDS WITHIN**

Tasmania

Western  
Australia

land

outh  
es

Australian  
Capital  
Territory

# NATURAL HAZARDS IN AUSTRALIA

Hazard (risk)	Location	Deaths (1900-2011)
Cyclone	Northern Australia (WA, NT, Qld)	1,285
Large Wildfires	Southern and mid-Australia (Vic, NSW, Tas, SA, WA, ACT, Southern Qld)	866
Riverine & Flash Flooding	All Australia	1,221
Storm & storm surge	Coastal areas	140
Earthquake	SA, NSW, WA	16
Heatwave	All Australia	4,555

# WHAT IS A COOPERATIVE RESEARCH CENTRE

- 1) A joint venture between Commonwealth, End-users and researchers
- 2) Pooled value model – sum of the parts greater than individual efforts





# BUSHFIRE AND NATURAL HAZARDS CRC

- 1) From 1 July 2013 under Australian Government CRC Program
  - a) \$47m over 8 years;
  - b) Total funds \$130M (cash and in-kind)
  
- 2) Approximately 50 partners:
  - a) ~30 end user organisations
  - b) ~20 research organisations
  
- 3) Guiding Principles
  - a) National focus
  - b) Large scale of problem
  - c) Multi hazard
  - d) Filling a gap in knowledge
  - e) Sizable impact
  - f) Likelihood of adoption



# KEEPING IN TOUCH

- 1) [www.bnhcrc.com.au](http://www.bnhcrc.com.au)
- 2) Hazard News and Hazard Notes – sign up on our website
- 3) Follow us on Twitter (@BNHCRC) and like us on Facebook



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# RESEARCH PROGRAM

## An overview

Dr Michael Rumsewicz  
Research Director



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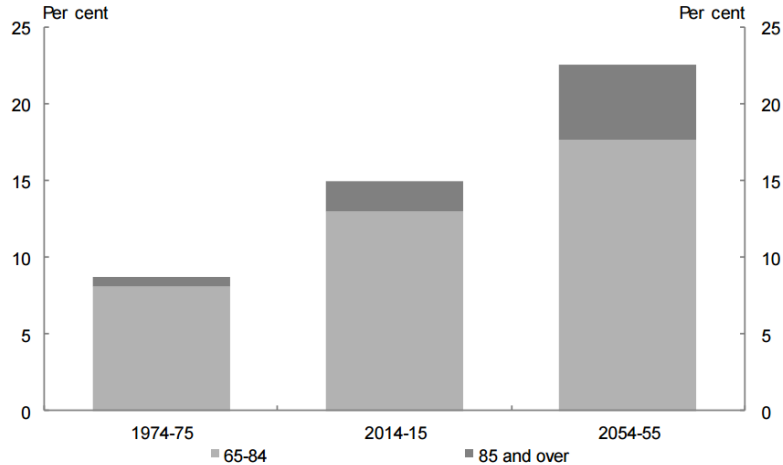
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# CRITICAL DRIVERS - DEMOGRAPHICS

**Chart 1.6 Proportion of population aged 65 and over**

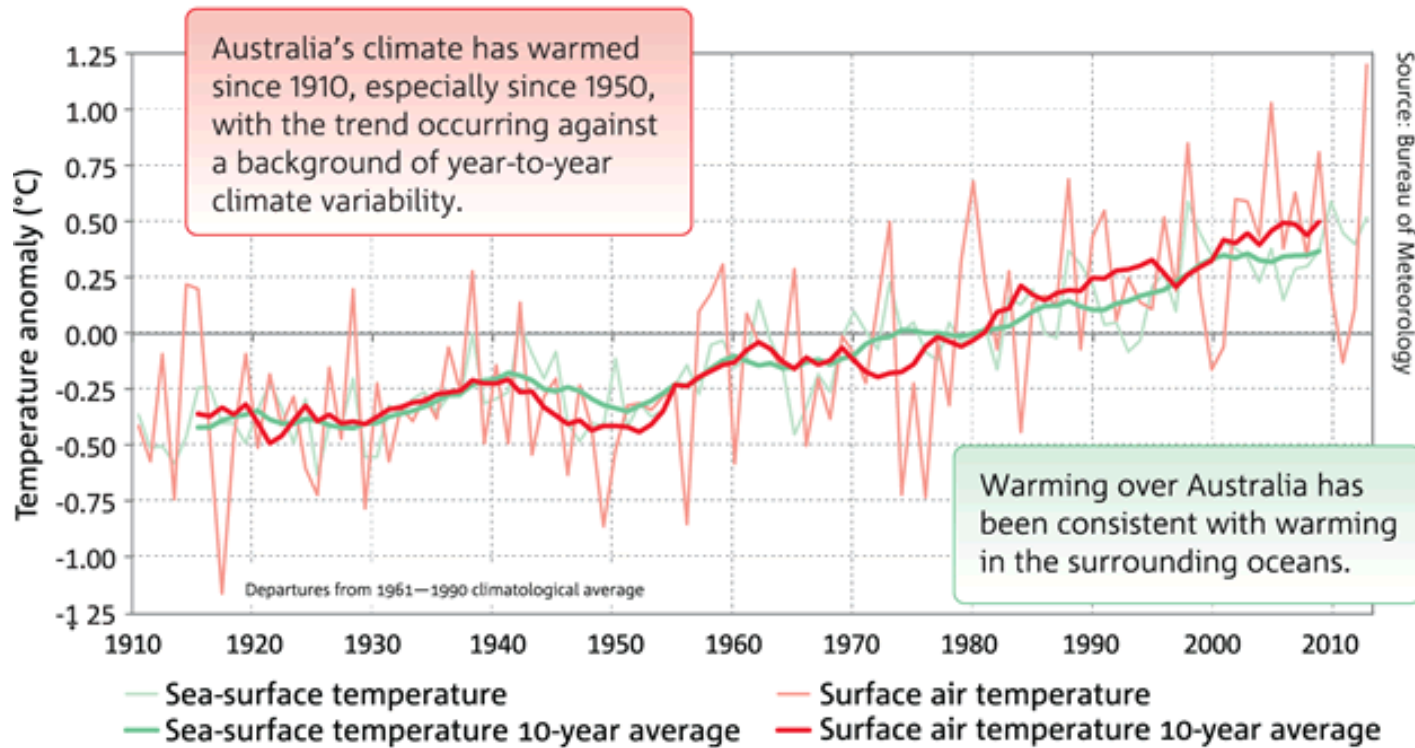


- Aging population
- Expanding peri-urban interface
- Tree/sea-changers v movement from rural to urban
- Modern living

**Table A.2 Demographic projections**

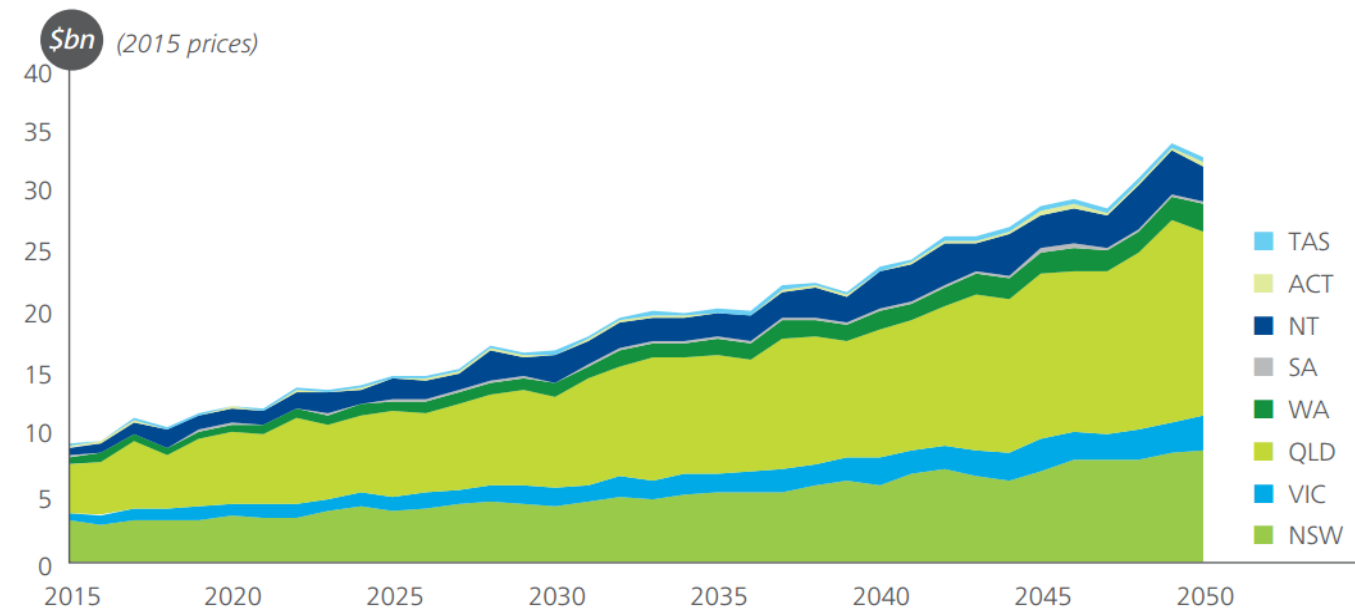
	2014-15	2024-25	2034-35	2044-45	2054-55
Population (millions)	23.9	28.0	32.0	35.8	39.7
0-14	4.5	5.3	5.9	6.3	6.9
15-64	15.8	17.8	19.9	22.1	23.8
65-84	3.1	4.3	5.2	5.9	7.0
85 and over	0.5	0.6	1.0	1.5	1.9

# CRITICAL DRIVERS – CLIMATE CHANGES



# CRITICAL DRIVERS – ECONOMICS

Chart ii: 2015–50 forecast of the total economic cost of natural disasters, identifying costs for each state



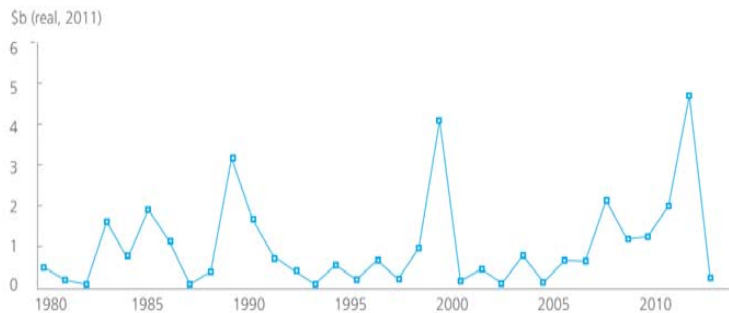
Source: Deloitte Access Economics analysis

# CRITICAL DRIVERS – RESILIENCE



# CATASTROPHIC EVENTS ARE INEVITABLE

## Major events



Source: Insurance Council of Australia (2013)

## Disaster Resilience

communities, infrastructure, businesses

## Connectedness

An all of public, private, community sector issue

Victoria : #weworkasone

## Mitigation

always better than response or recovery!

Now a focus on managing consequence  
Still issues with making mitigation happen:

Politics and political capital

Funding anomalies

Timing

# IMPACTS OF DISASTERS IN AUSTRALIA

Natural Hazard	Deaths 1900-2011
<b>Extreme heat</b>	<b>4,555</b>
<b>Flood</b>	<b>1,890</b>
<b>Tropical cyclone</b>	<b>1,234</b>
<b>Bush/ grassfire</b>	<b>965</b>
<b>Lightning</b>	<b>192</b>
<b>Wind storm</b>	<b>140</b>
<b>Landslide</b>	<b>95</b>
<b>Tornado</b>	<b>55</b>
<b>Hail storm</b>	<b>18</b>
<b>Earthquake</b>	<b>16</b>
<b>Rain storm</b>	<b>12</b>

Lucinda Coates, Katharine Haynes, James O'Brien, John McAneney, Felipe Dimer de Oliveira, Exploring 167 years of vulnerability: An examination of extreme heat events in Australia 1844–2010, *Environmental Science & Policy*, Volume 42, October 2014, Pages 33 -44, <http://dx.doi.org/10.1016/j.envsci.2014.05.003>



*Labelling the fire as an “out of scale” event should not be either an excuse or an explanation for any shortcomings that occurred. Is it not part of the role of fire and emergency managers to anticipate, plan and be ready for extreme and “out of scale” events?*

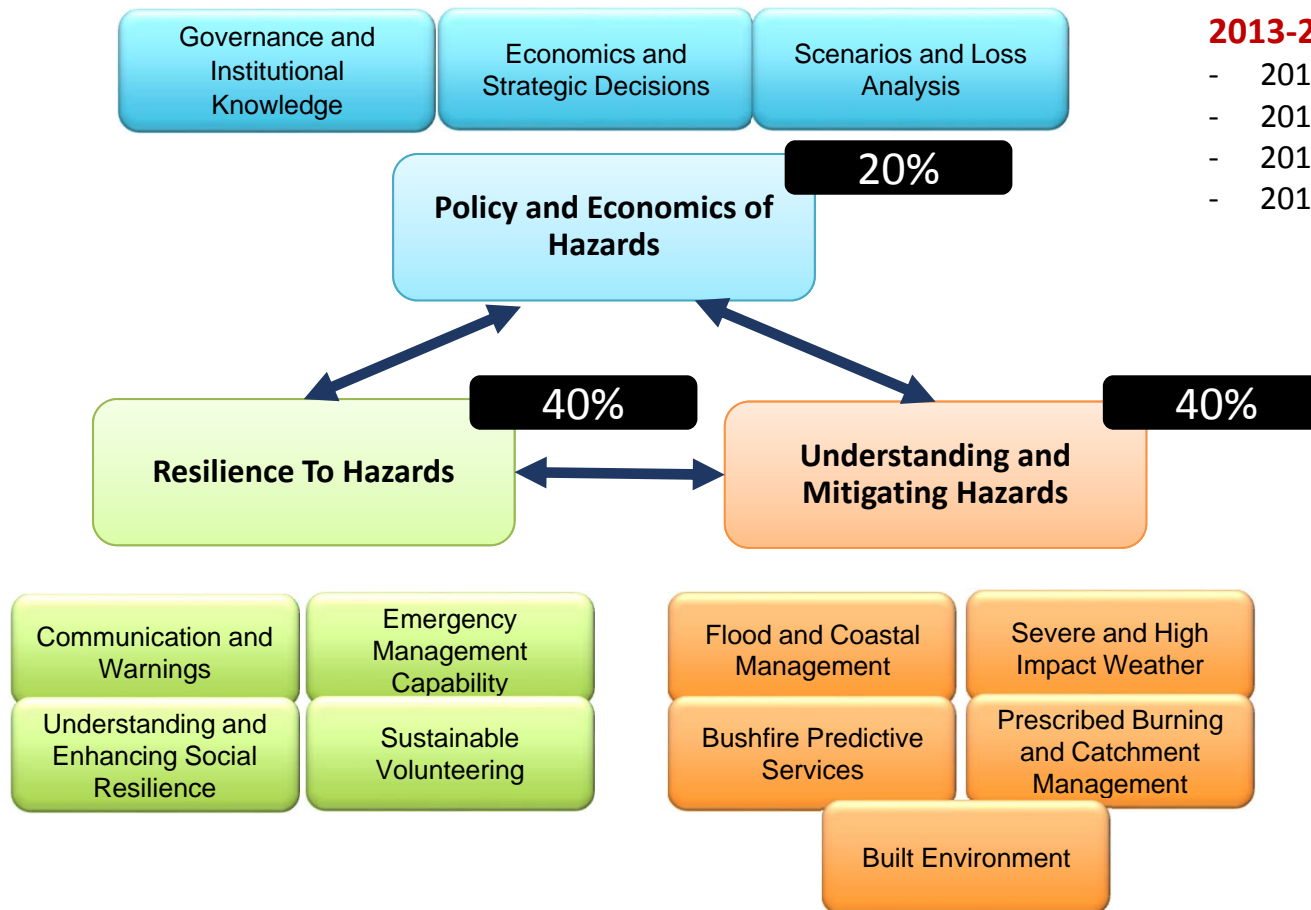
*When plans have an **over-reliance on what happened in the past**, the risk is that one misses the potential for a future that is different, unseen, and unimaginable. Hindsight, learning the lessons of the past, is necessary, but **planning should be driven also by imagination and foresight**. Are we planning for the next fire? Or are we planning for the next “firestorm”? What do we think that will look like? In this setting, the **greatest failure may well be the failure to imagine**.*

**In this setting, the greatest failure may well be the failure to imagine**

E Ferguson - Special Inquirer:

“Reframing Rural Fire Management” Report of the Special Inquiry into the January 2016 Waroona Fire  
WA

# RESEARCH ACTIVITIES 2013-2021



## 2013-2021

- 2013: Official start
- 2014: 39 projects commenced
- 2016: Review of program
- 2017: 8 new projects commence



# WHERE ARE WE?



Month 45 of 96

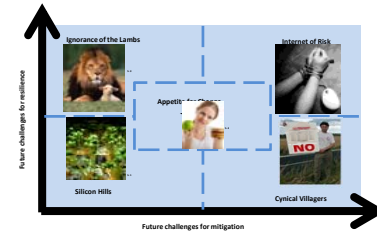
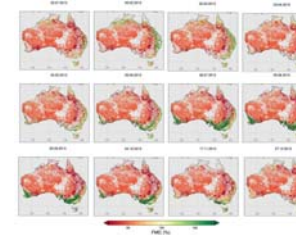
## In FY 2015-16

- 7 book chapters
- 57 journal papers
- 79 conference papers
- 92 reports



## Prototypes

- Fuel load estimation
- Fuel flammability
- Hazard mitigation planning
- ...



## Policy influence

- Sustainable volunteering
- Flood death prevention
- National warnings review
- ...



## Engagement

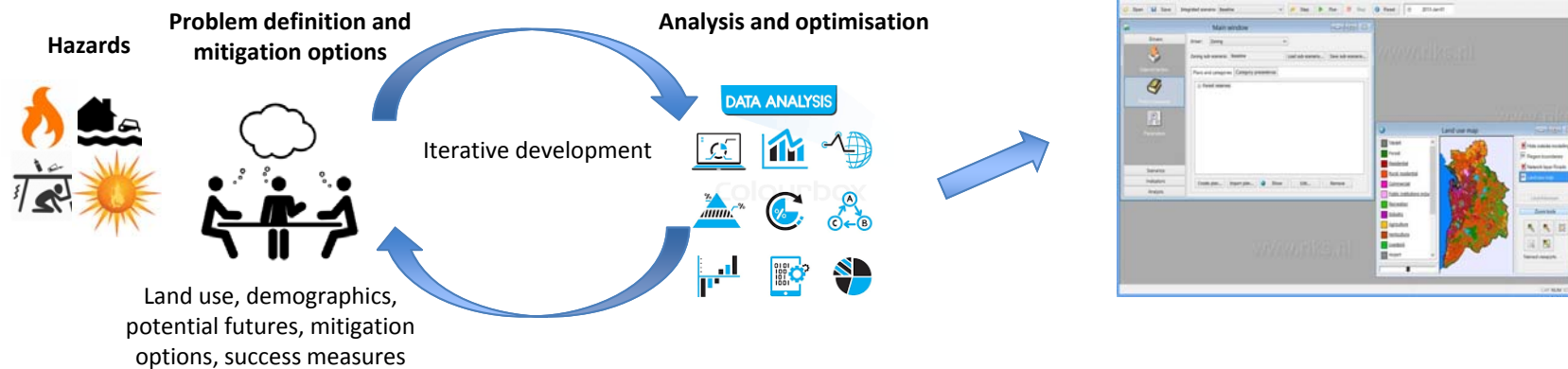
- AFAC16 Research Forum: 400+
- Two RAFs: 2 x 100+
- Many AFAC Groups, ANZEMC
- Many Workshops
- .....



# MITIGATION DECISION SUPPORT SYSTEM

*Multi-hazard decision support system, comprising processes and tools, that allows users to understand current and future risk in a consistent and transparent manner.*

*This will allow all agencies involved in natural hazard risk reduction to have a common approach to discuss, and assess policies on a broad range of indicators, allowing for more effective risk reduction and planning decisions and improved community safety.*



- Informed, open policy development
- Transparent analysis
- Near optimal long term risk reduction portfolios

- Case studies underway in three states
- Strong support for further case studies in two more states
- Extensions to existing case studies being sought

# MULTI-HAZARD STUDY OF PREPAREDNESS, RESPONSE AND RECOVERY COMMUNICATIONS

## Aim:

To develop evidence-based strategies that motivate appropriate action and increase informed decision-making during the response and recovery phases of disasters.

## Some findings to date:

1. Add precision to updates and instructions
2. Integrate stories that personalise risk to reflect trends in community Tweets
3. Recognise power of emotions and engage in preparation at appropriate times during recovery
4. Ground-truth confirm cause of damage and overcome familiarity bias for next disaster – anchoring for next event

## Outcomes:

- Has informed design of NSW SES advertising program on flood death prevention (2, 3)
- Has informed design of messaging by SEQwater for dam releases
- Informed the Australian Review of Warnings and now developing sections of the Australian Warnings Handbook



# OUT OF UNIFORM:

building community resilience through non-traditional emergency volunteering

## Research Questions:

- How does non-traditional volunteering contribute to community resilience throughout the phases of EM?
- How can the EM sector support non-traditional volunteering?
- What models or approaches will enable EM agencies to maximise opportunities for engaging non-traditional volunteers, while minimising risks?

## Case Studies:

- Recovery: Pinery (SA) fires, Community on the Ground Assistance (Black Saturday)
- Community Engagement: Be Ready Warrandyte
- Co-ordination: EV-CREW (Qld)

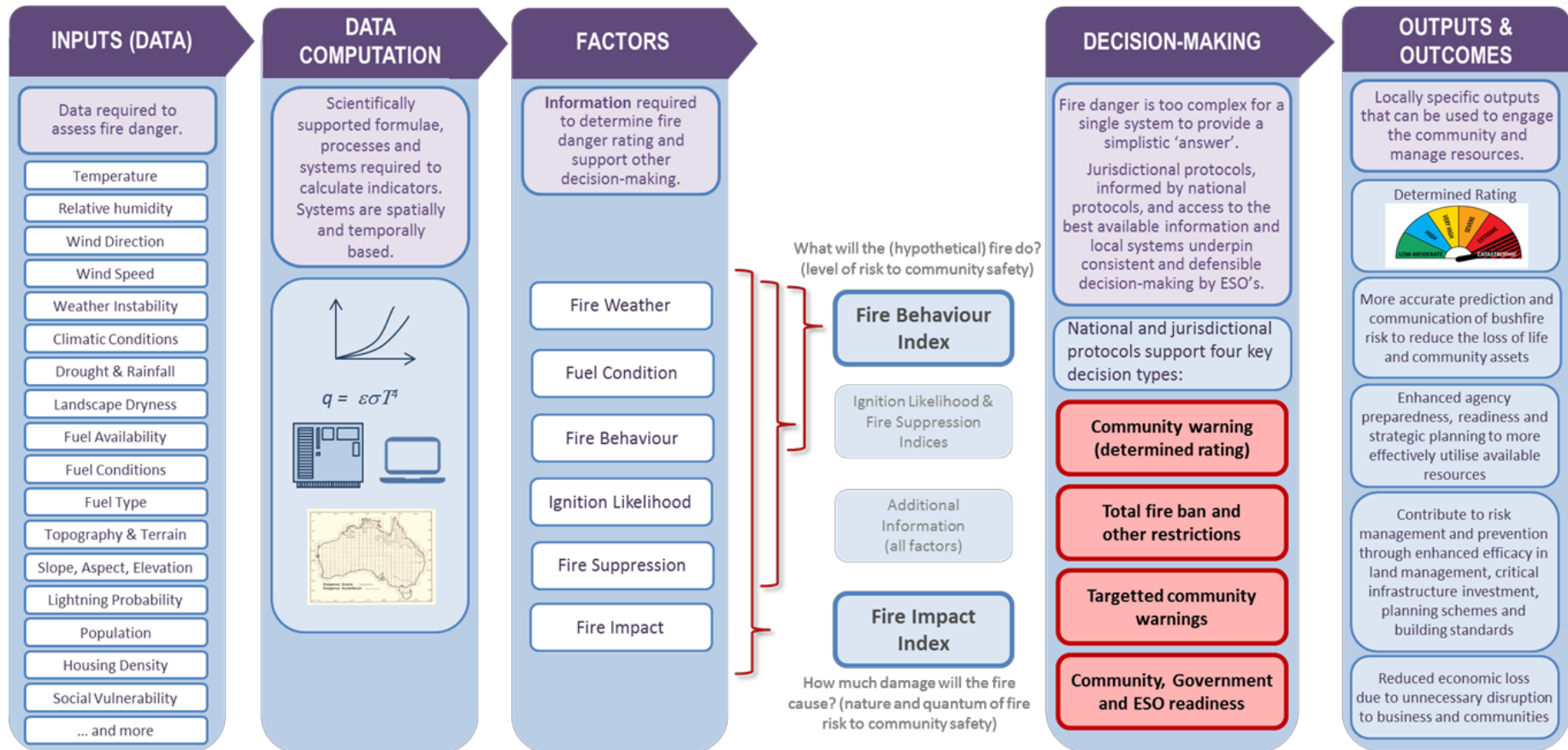
## Outcomes:

- Developing sections of the Australian Spontaneous Volunteering Handbook
- Developing guidelines for understanding volunteer group maturity levels

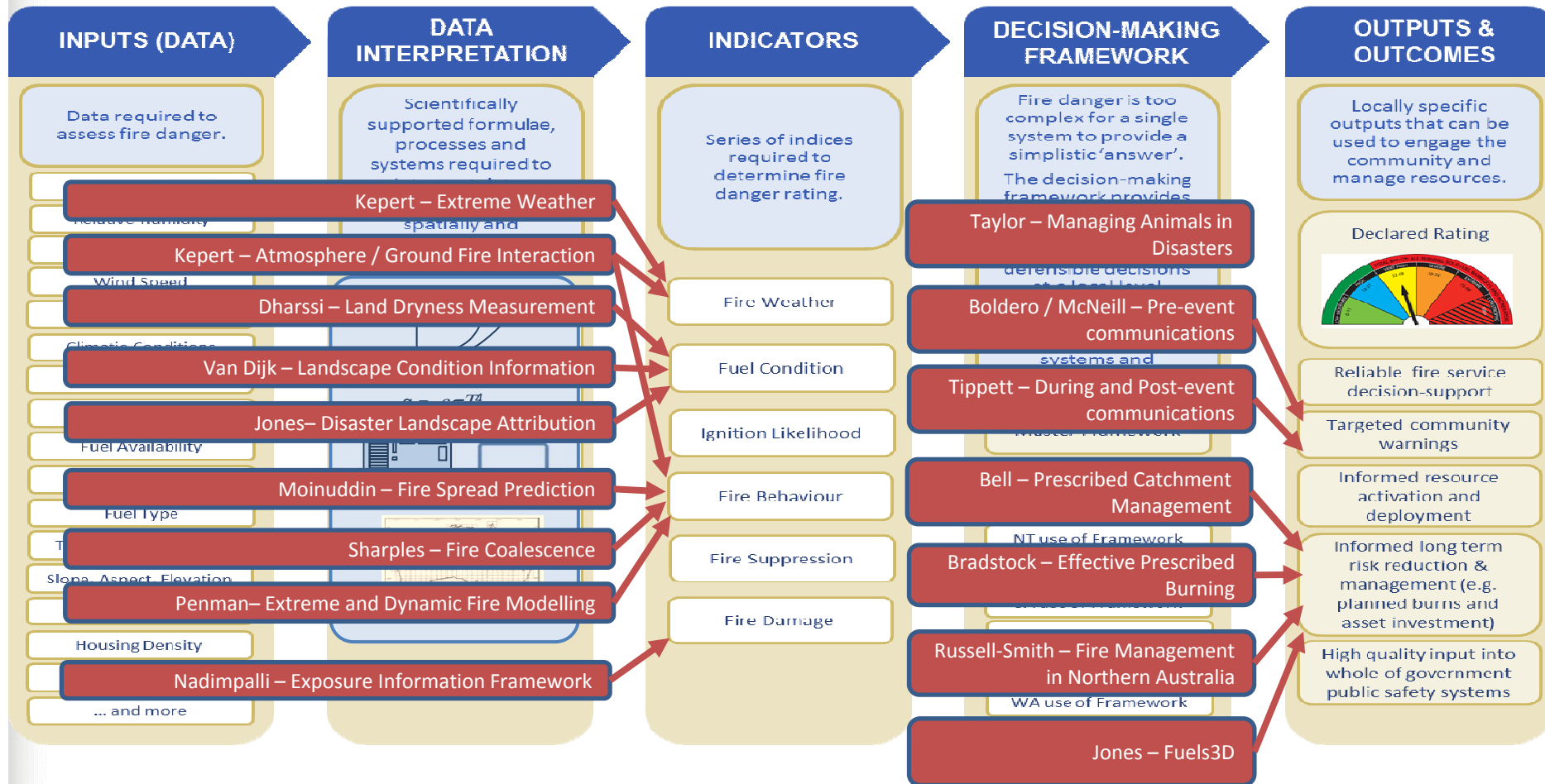




# PROPOSED FIRE DANGER RATINGS SYSTEM



# FIRE DANGER RATINGS SYSTEM - BNHCRC FUNDED RESEARCH



# CRITICAL SUCCESS FACTORS



- Use is everything – importance of end-user engagement
- Multi-disciplinary approach is the key to finding solutions to ‘Wicked Problems’
- End-user developed research questions – not researcher-led
- Focus on use at the beginning of the project with utilisation plans developed early.
- Ongoing engagement – researcher end-user teams
- Continual communications through many channels

**IT'S NOT JUST THE RESEARCH**

**Communication**

**Communication**

**Communication**



# RESEARCH ADVISORY FORUMS

- Held twice yearly
  - Policy and Economics, and Resilience clusters in April / May
  - Understanding and Mitigating Hazard clusters in October / November 30 minute project presentations throughout the next two days – [HERE](#)
- In parallel, breakout rooms for workshoping activities
  - Researchers and end users
  - Detailed discussions on research utilisation
    - How exactly does the research make it into practice?
    - No arm waving!



# CRC MID TERM: SHOWCASE 2017

- July 2017
- Marks midway point of CRC
- Opportunity to listen to, digest and discuss the learnings and outcomes from across all the whole research program.
- Hear about the new projects and initiatives.
- Take home a package of publications that summarise the key findings of each project and point to ongoing ways of participation in research utilisation.
- Celebrate achievements and reaffirm the goals that will take us through the next four years of national research into natural hazards.
- Get involved!



# NATIONAL NATURAL HAZARDS RESEARCH AGENDA

A national natural hazards research agenda, consisting of succinct, high value problem statements across a spectrum of topics supporting natural hazards disaster resilience.

Broader than the BNHCRC research program and our ability to fund necessary research, it

- Informs the 2017-2021 BNHCRC research program.
- Will act as a guide to Australian research sector on high value areas of national strategic importance.

To be released in 2017





# AUSTRALIAN INSTITUTE FOR DISASTER RESILIENCE

Partnership between AFAC, the Australian Red Cross and the Bushfire & Natural Hazards CRC under a contract with the Australian Government through Emergency Management Australia, delivering:

- 1) Emergency Management Doctrine
- 2) Networking and National Capability Development Program
- 3) Schools Education Program
- 4) Volunteer Leadership Support Program
- 5) Knowledge Management
- 6) Publications, including AJEM
  - Michael Rumsewicz now Editor in Chief
  - Free online – four editions a year.

**AIDR is an major vehicle to utilisation of our research**

Australian Institute for  
Disaster Resilience



# KEEPING IN TOUCH

- 1) Twice annual Research Advisory Forums
- 2) Briefings via AFAC and other outlets
- 3) Conference and journal publications
- 4) Our website – [www.bnhcrc.com.au](http://www.bnhcrc.com.au)
- 5) Via Hazard News and Hazard Notes – sign up via the website
- 6) Follow us on Twitter (@BNHCRC) and like us on Facebook
- 7) Call us!