bushfire&natural HAZARDSCRC

CHALLENGES IN NATURAL HAZARD RESEARCH

Dr Richard Thornton
Chief Executive Officer

Dr Michael Rumsewicz
Research Director

www.bnhcrc.com.au

Australian Government
Department of Industry, Innovation and Science

Business Cooperative Research Centres Programme

OVERVIEW

1) Hazards in Australia
2) Drivers – climate, population, economics
3) Why resilience?
4) What is the Bushfire and Natural Hazards CRC
5) National Natural Hazards Research Agenda

SOME NATURAL HAZARDS IN AUSTRALIA

Hazard (risk)	Location
Cyclone	Northern Australia (WA, NT, Qld)
Large Wildfires	Southern and mid-Australia (Vic, NSW, Tas, SA, WA, ACT, Southern Qld)
Riverine Flooding	All Australia
Flash Flooding	All Australia
Storm surge & Tsunami	Coastal areas
Earthquake	SA, NSW, WA

Critical drivers - Demographics

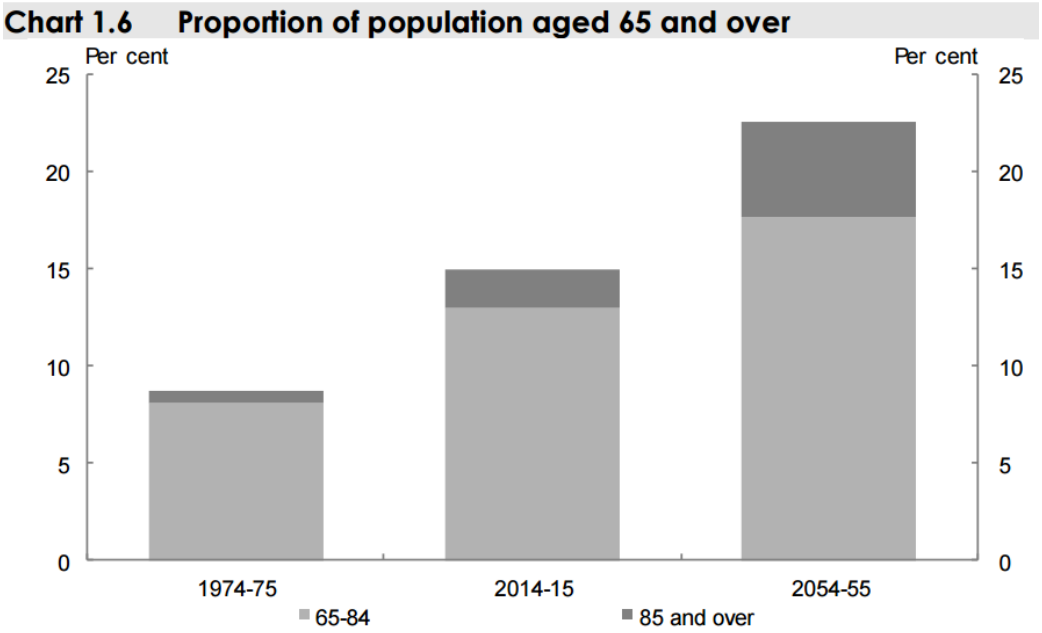
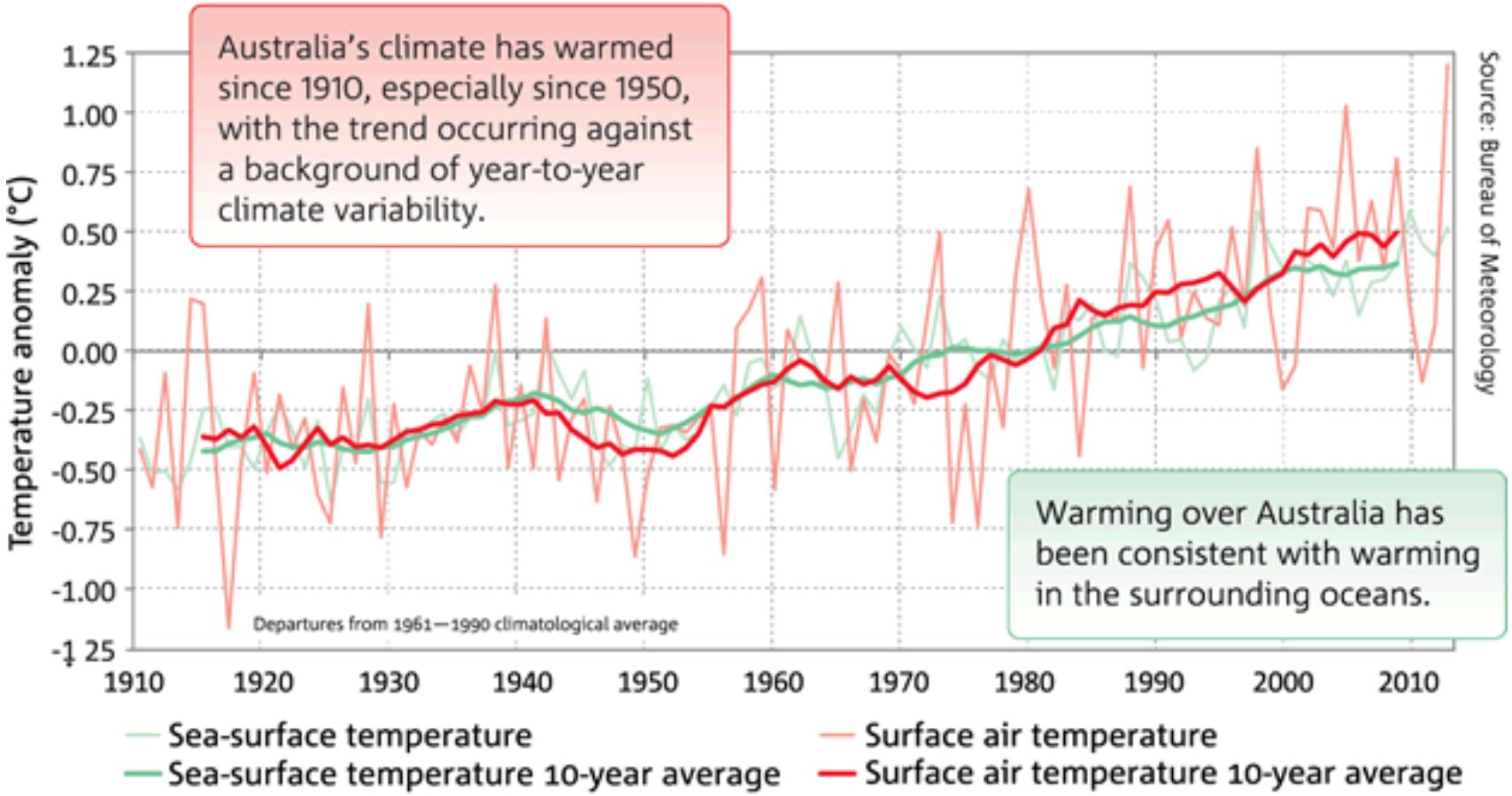


Table A.2 Demographic projections

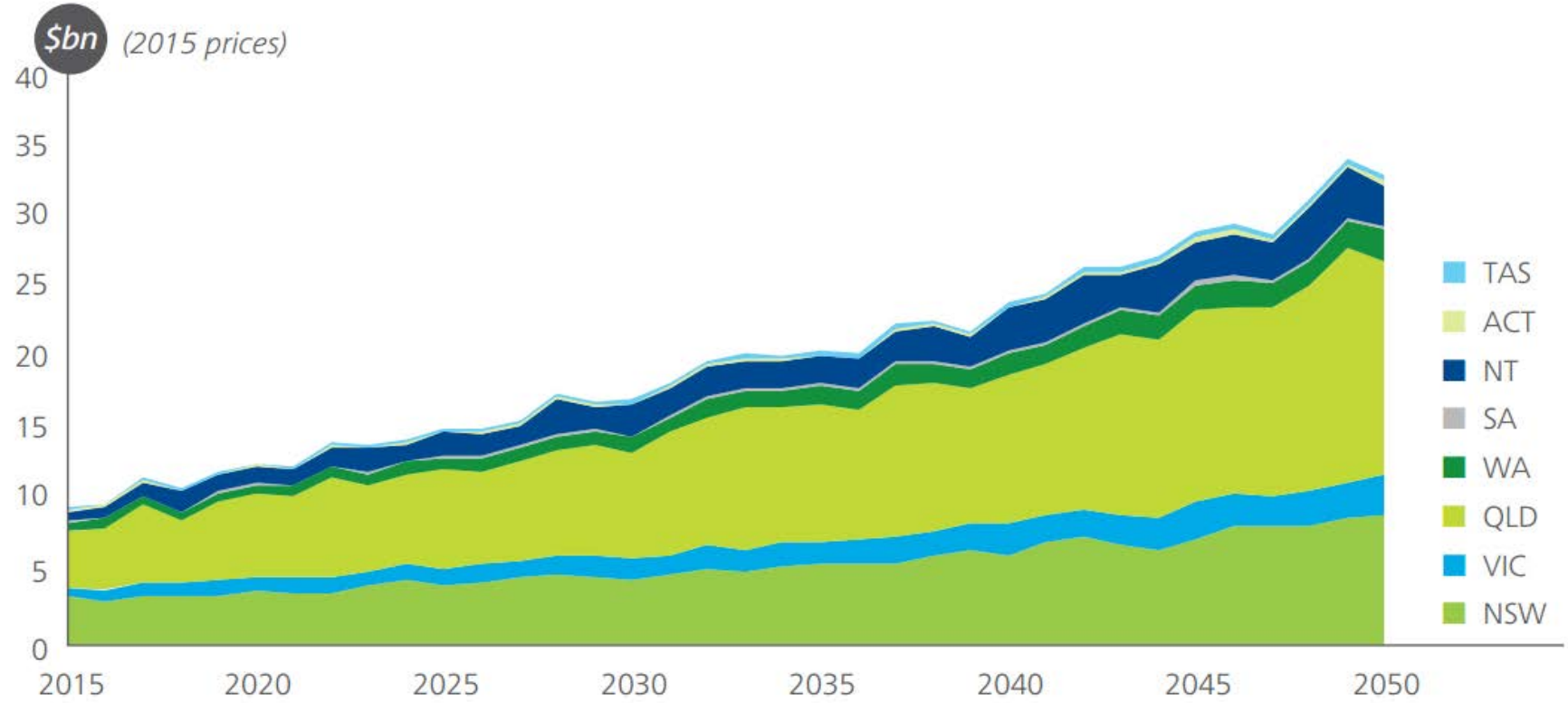
	2014-15	2024-25	2034-35	2044-45	2054-55
Population (millions)	23.9	28.0	32.0	35.8	39.7
0-14	4.5	5.3	5.9	6.3	6.9
15-64	15.8	17.8	19.9	22.1	23.8
65-84	3.1	4.3	5.2	5.9	7.0
85 and over	0.5	0.6	1.0	1.5	1.9

Critical drivers – climate changes



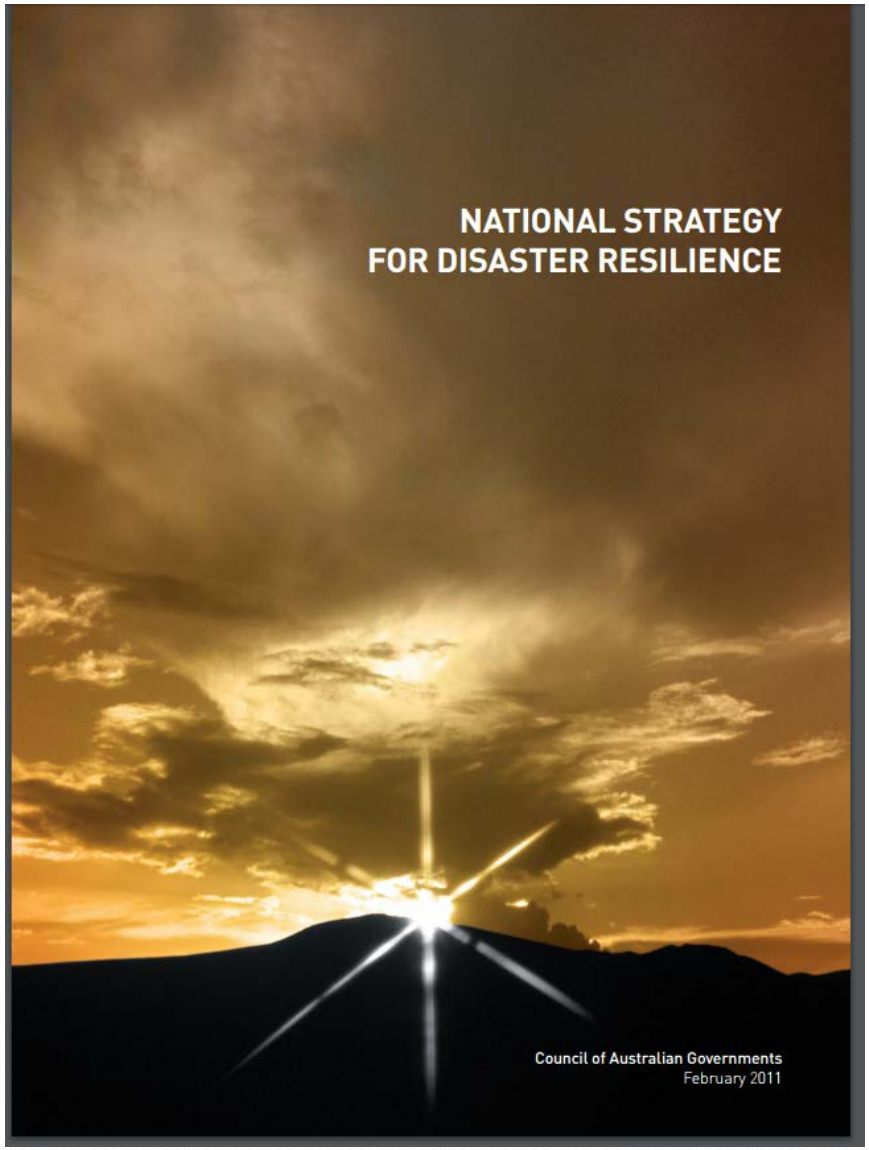
Critical drivers – Economics

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



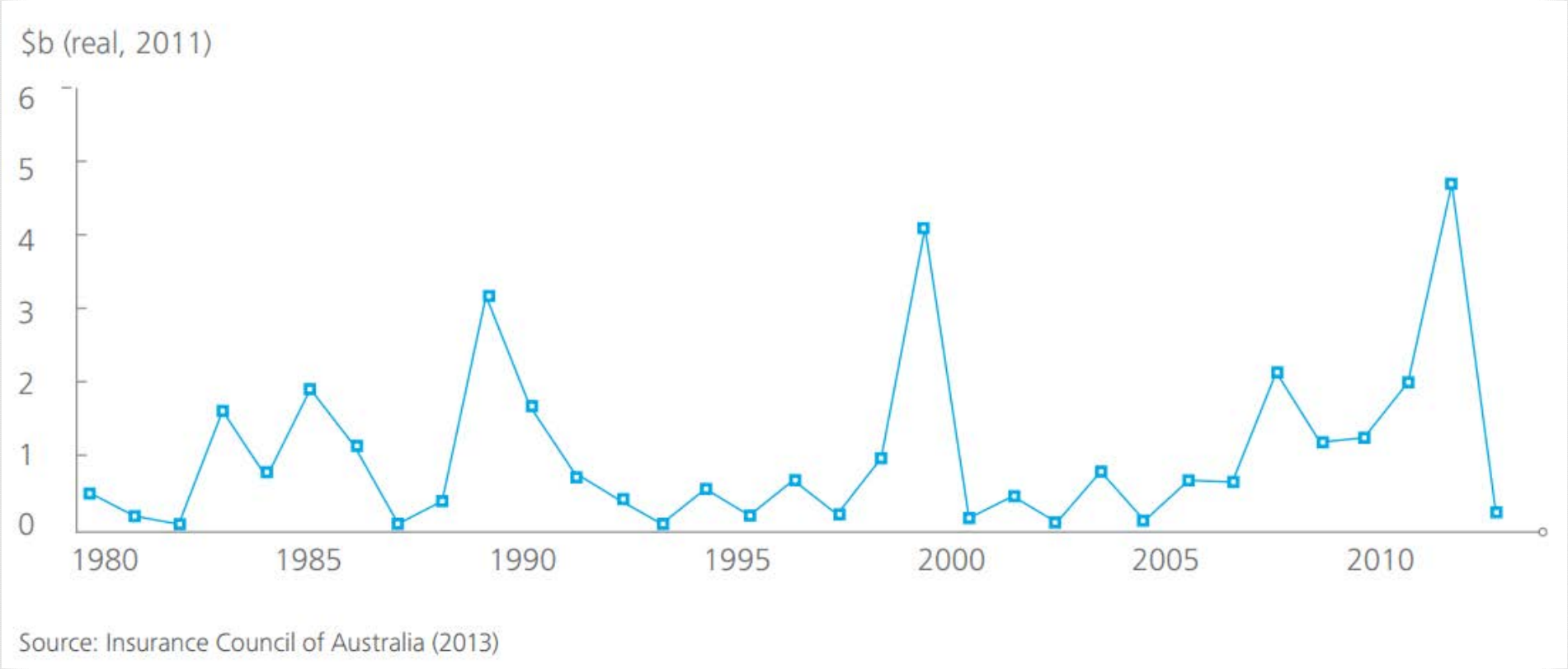
Source: Deloitte Access Economics analysis

Critical drivers – Resilience



CATASTROPHIC EVENTS ARE INEVITABLE

Major events



Source: Insurance Council of Australia (2013)

CATASTROPHIC EVENTS ARE INEVITABLE

Disaster Resilience

communities, infrastructure, businesses

CATASTROPHIC EVENTS ARE INEVITABLE

Connectedness

An all of public, private, community sector issue

Victoria : #weworkasone

CATASTROPHIC EVENTS ARE INEVITABLE

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

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

THE CHALLENGE

Avoiding the valley of death
– the virtual chasm that separates
applied research from making a difference

Figure out what matters most, making sure the right people are involved

Identify and analyse the possibilities, making sure the right people are involved (maybe different from first time)

Convert ideas into action, making sure the right people are involved (maybe different from second time)

THE CHALLENGE

Figure out what matters most, making sure the right people are involved

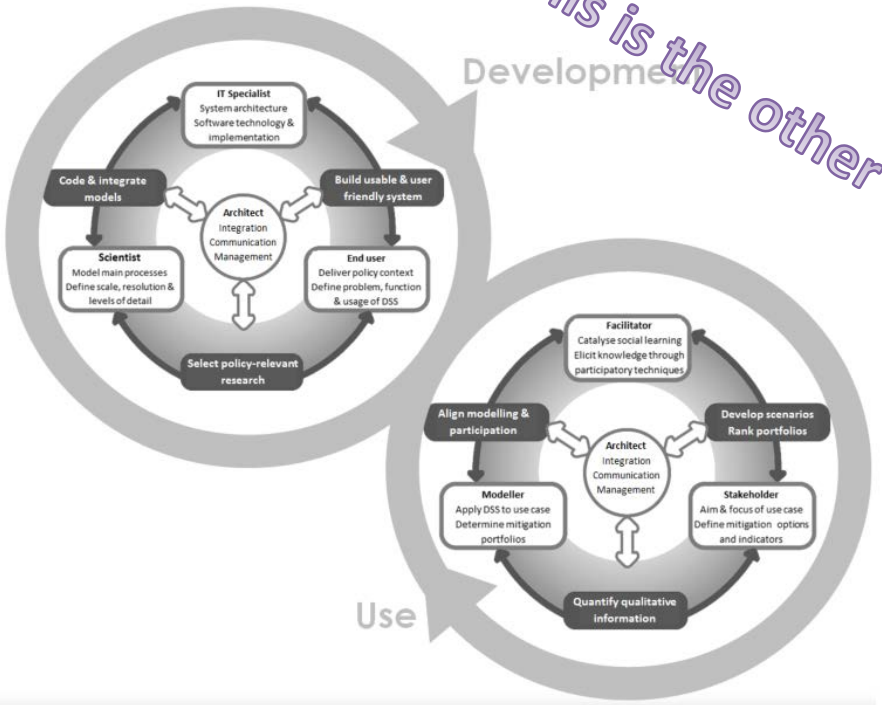
This is the hard part!

Integrated Project Teams
= Researchers + End users

Credit: Holger Maier, et al

THE CHALLENGE

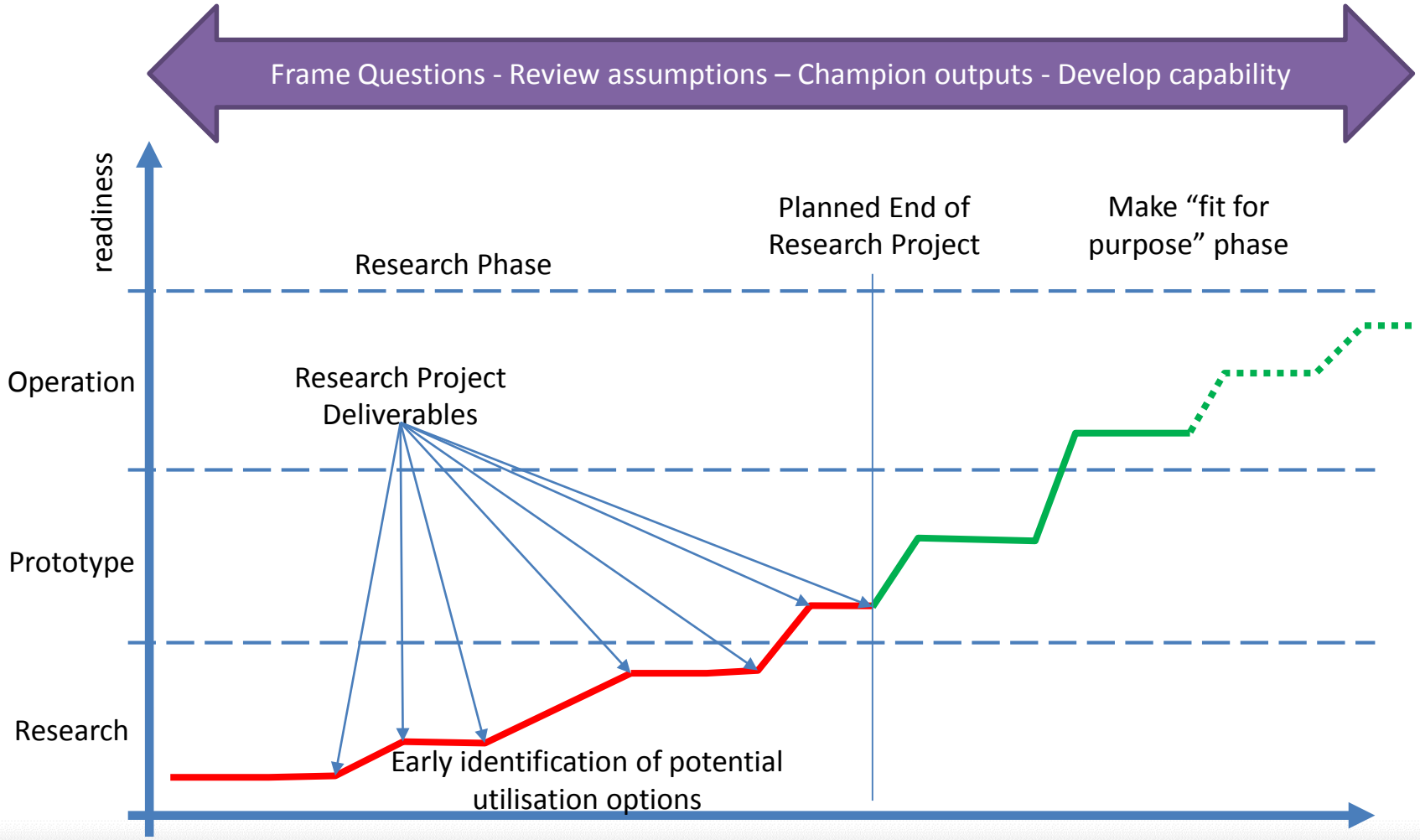
Identify and analyse the possibilities, making sure the right people are involved (maybe different from first time!)



This is the other hard part!

Credit: Holger Maier, et al

PROJECT ROADMAPS & TECHNOLOGY READINESS LEVEL EVOLUTION



THE CHALLENGE

Convert ideas into action, making sure the right people are involved(maybe different from second time!)

Yes, this is the hardest part!

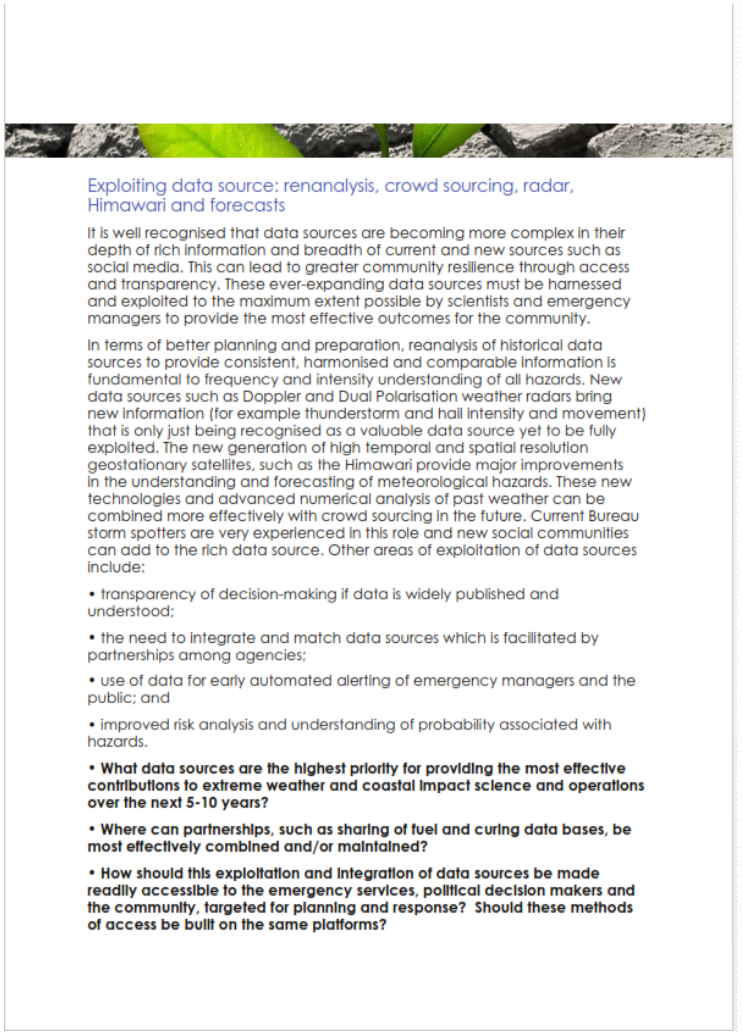
Credit: Holger Maier, et al

A NATIONAL NATURAL HAZARDS DISASTER RESILIENCE AGENDA

A national natural hazards 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.



Exploiting data source: renanalysis, crowd sourcing, radar, Himawari and forecasts

It is well recognised that data sources are becoming more complex in their depth of rich information and breadth of current and new sources such as social media. This can lead to greater community resilience through access and transparency. These ever-expanding data sources must be harnessed and exploited to the maximum extent possible by scientists and emergency managers to provide the most effective outcomes for the community.

In terms of better planning and preparation, reanalysis of historical data sources to provide consistent, harmonised and comparable information is fundamental to frequency and intensity understanding of all hazards. New data sources such as Doppler and Dual Polarisation weather radars bring new information (for example thunderstorm and hail intensity and movement) that is only just being recognised as a valuable data source yet to be fully exploited. The new generation of high temporal and spatial resolution geostationary satellites, such as the Himawari provide major improvements in the understanding and forecasting of meteorological hazards. These new technologies and advanced numerical analysis of past weather can be combined more effectively with crowd sourcing in the future. Current Bureau storm spotters are very experienced in this role and new social communities can add to the rich data source. Other areas of exploitation of data sources include:

- transparency of decision-making if data is widely published and understood;
- the need to integrate and match data sources which is facilitated by partnerships among agencies;
- use of data for early automated alerting of emergency managers and the public; and
- improved risk analysis and understanding of probability associated with hazards.

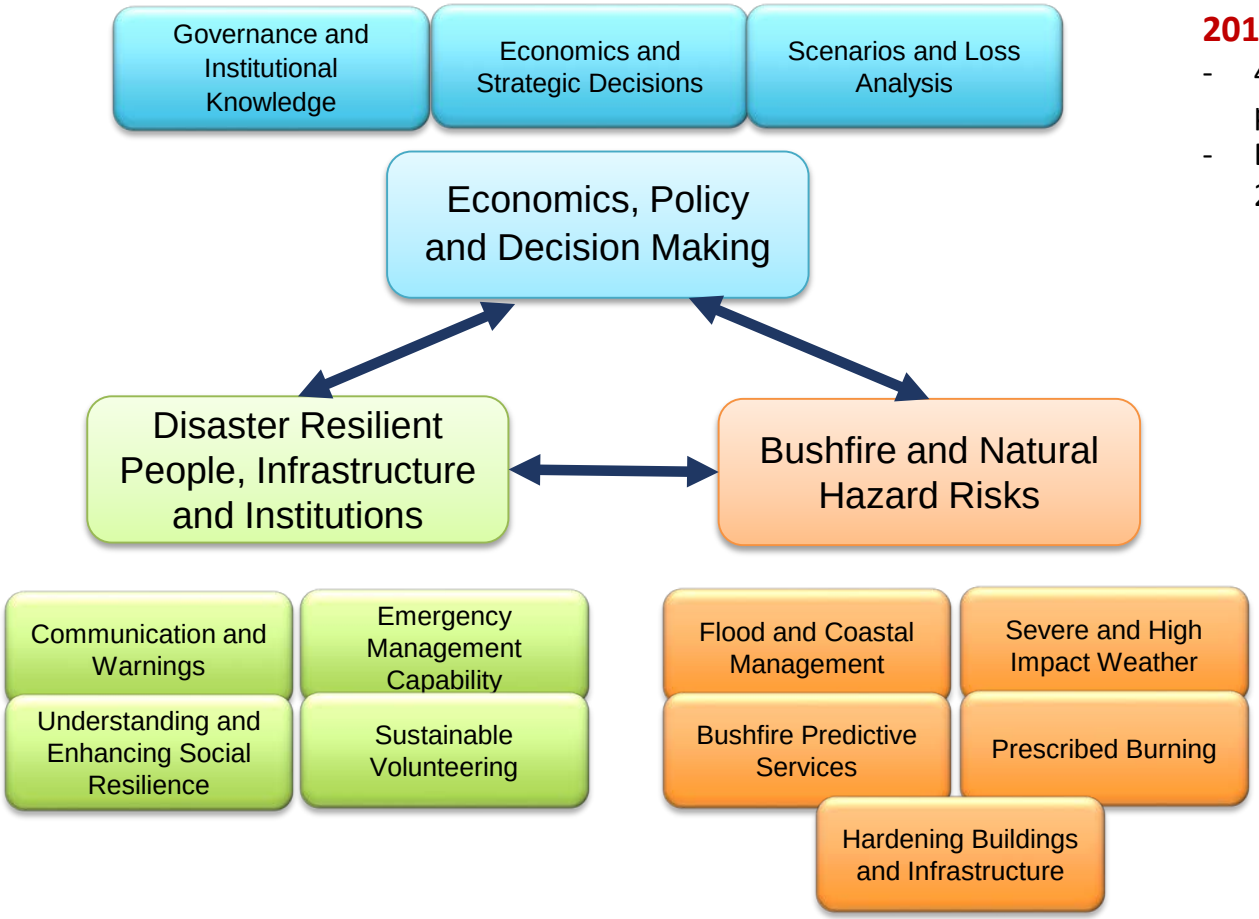
- **What data sources are the highest priority for providing the most effective contributions to extreme weather and coastal impact science and operations over the next 5-10 years?**
- **Where can partnerships, such as sharing of fuel and curing data bases, be most effectively combined and/or maintained?**
- **How should this exploitation and integration of data sources be made readily accessible to the emergency services, political decision makers and the community, targeted for planning and response? Should these methods of access be built on the same platforms?**

NATIONAL RESEARCH AGENDA

Theme	Lead organisations, networks or committees
Recovery	ANZEMC RSC Australian Red Cross
Capability	ANZEMC CDSC
Economics and risk mitigation	ANZEMC RAMMS
Built environment	AFAC Built environment technical group
Operations	AFAC Urban and SES operations group
Community Safety	AFAC Community Safety Group
Predictive services	AFAC Predictive Services Group
Bushfire	FFMG, RLMG, PSG
Community engagement	ANZEMC CESC AFAC CE Technical Group
Land use planning	Planning Institute of Australia (PIA) Geoscience Australia

Theme	Lead organisations, networks or committees
Flood	NFRAG
Insurance	Willis Re
Work, health & safety	AFAC WH&S Tech Group AFAC Mental health and well-being network
Volunteering	AEMVF, AFAC (VMTG)
Severe Weather and Coastal Management	BoM
Remote sensing	Geoscience Australia
Diversity	AFAC
Remote and indigenous issues	Remote Economic Participation CRC
Warnings	AFAC Warnings Group

RESEARCH ACTIVITIES 2017-2021



2017-2021

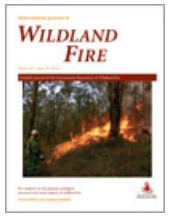
- 47 research and utilisation projects
- Eight new projects from 2013-2017 program:
  - Diversity
  - Catastrophic events
  - Mental health and well-being in emergency services
  - Mental health and well-being during recovery
  - Damage prediction for coastal management
  - Land use planning
  - Flood death prevention
  - Resilience issues in indigenous communities

WHERE ARE WE?

Month 42 of 96

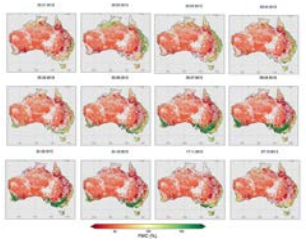
In FY 2015-16

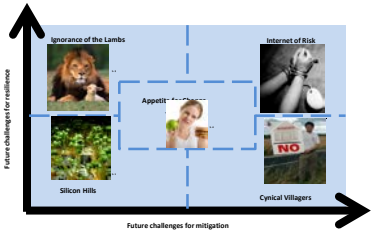
- 7 book chapters
- 57 journal papers
- 79 conference papers
- 92 reports



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
- ……

KEEPING IN TOUCH

1) 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