



Natural
**Hazards
Research**
Australia

National Bushfire Research: Past, Present and Future

Dr Richard Thornton, CEO

5 May 2022

Our story

A national research centre since 2003 - 18 years research

Catalyst – major natural hazards events

A broad scope - started with bushfire, now all natural hazards

Funded from Australian Government and all States, private and NFP sectors

10-year term - ~\$11m pa

An independent not-for-profit research organisation



A forum of knowledge
A collective of people
A network of learning

RESEARCH DRIVING CHANGE
LEARN, SHARE, DISCUSS,
QUESTION, COMPARE, THINK

Driving change

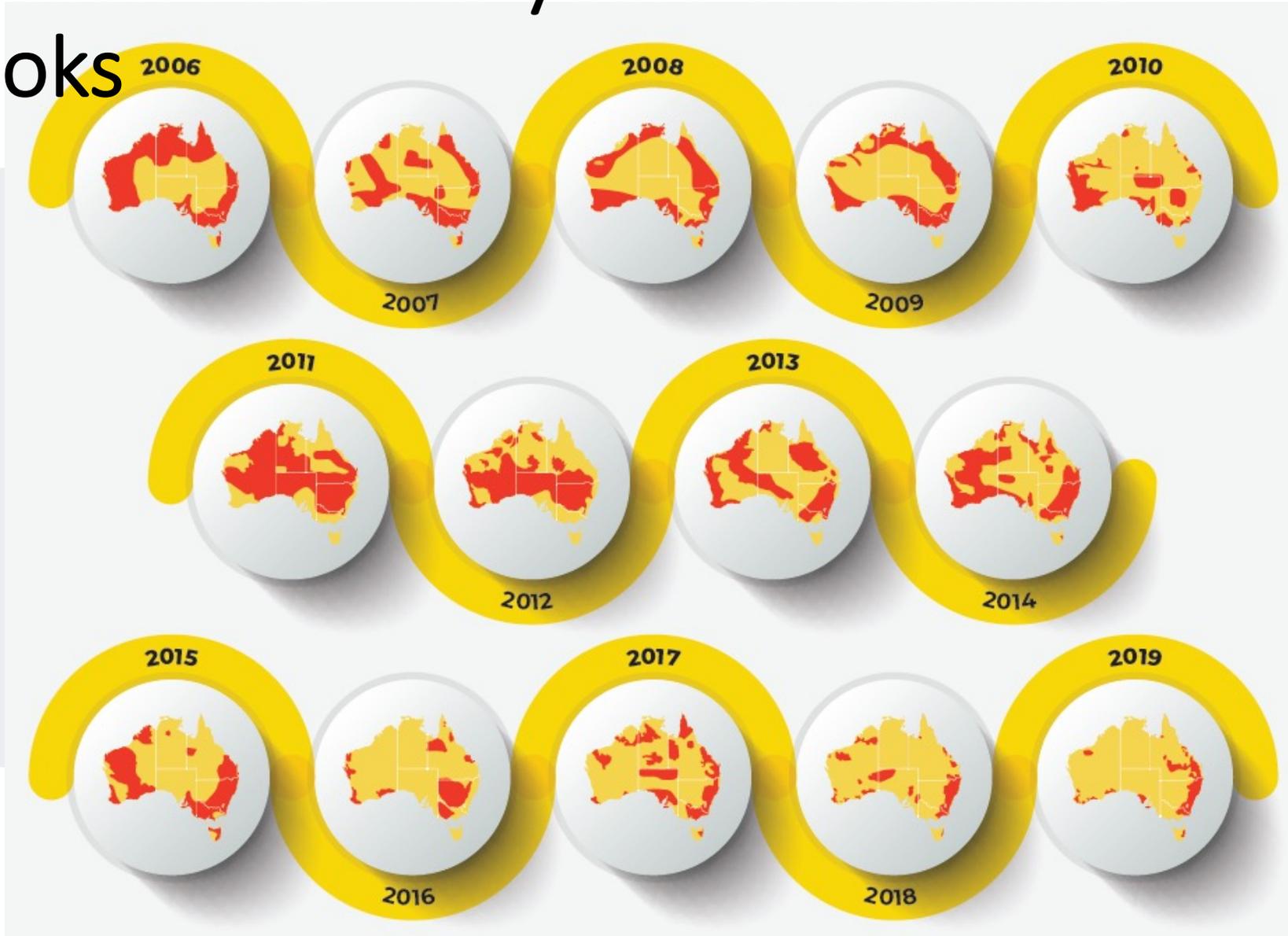


The Sweet Spot

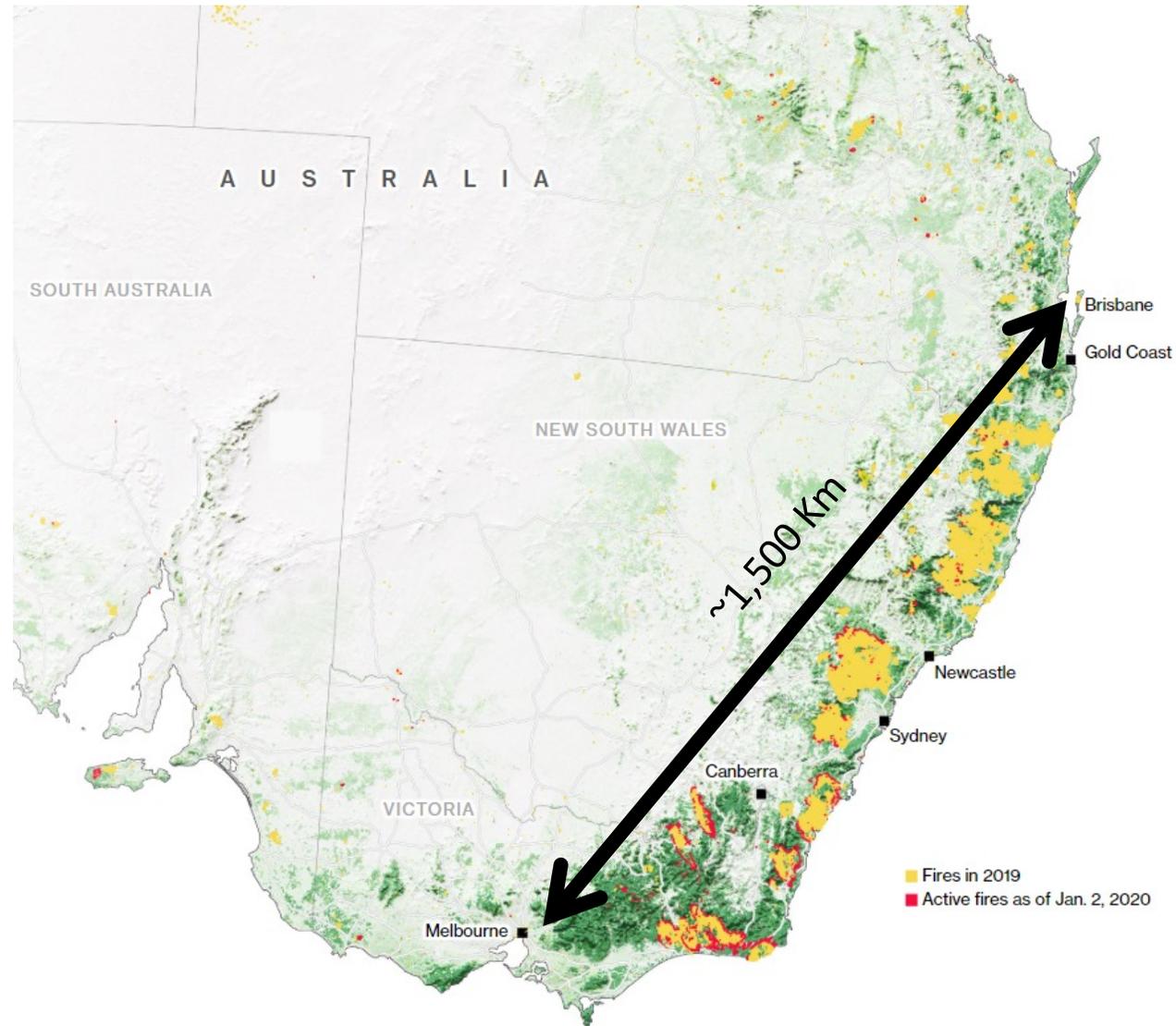
Bushfire in Australia



Australian Fire - 13 years of bushfire outlooks



2019-2020 Black Summer fires



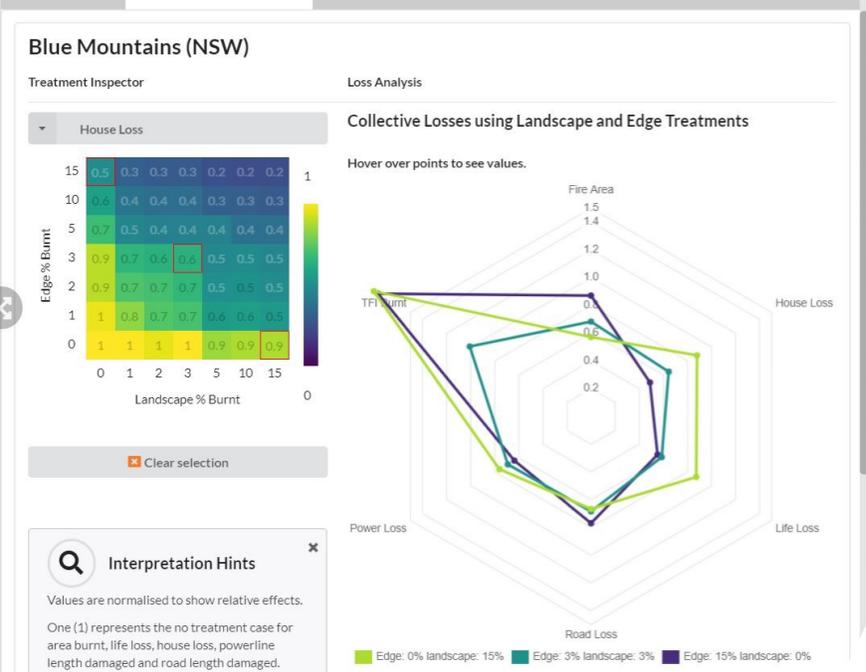
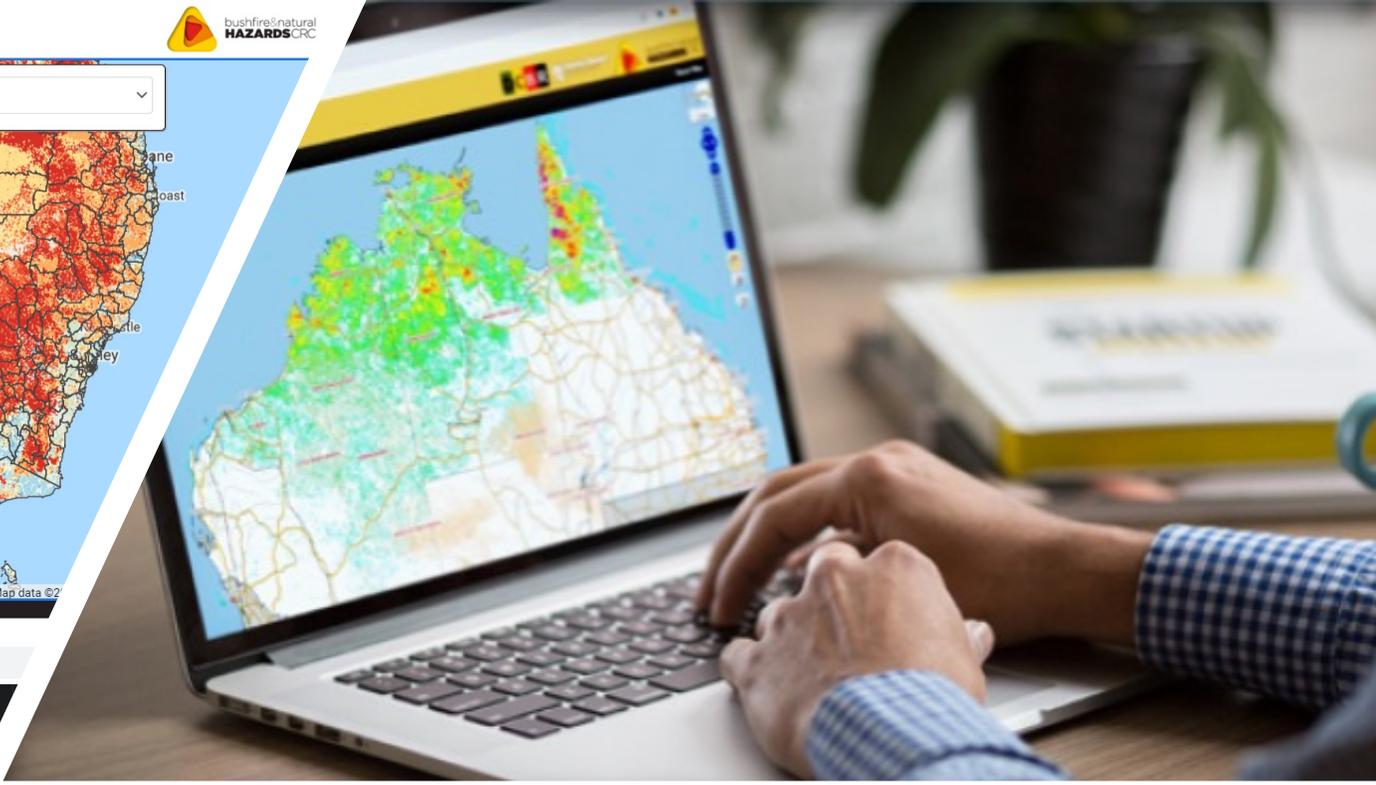
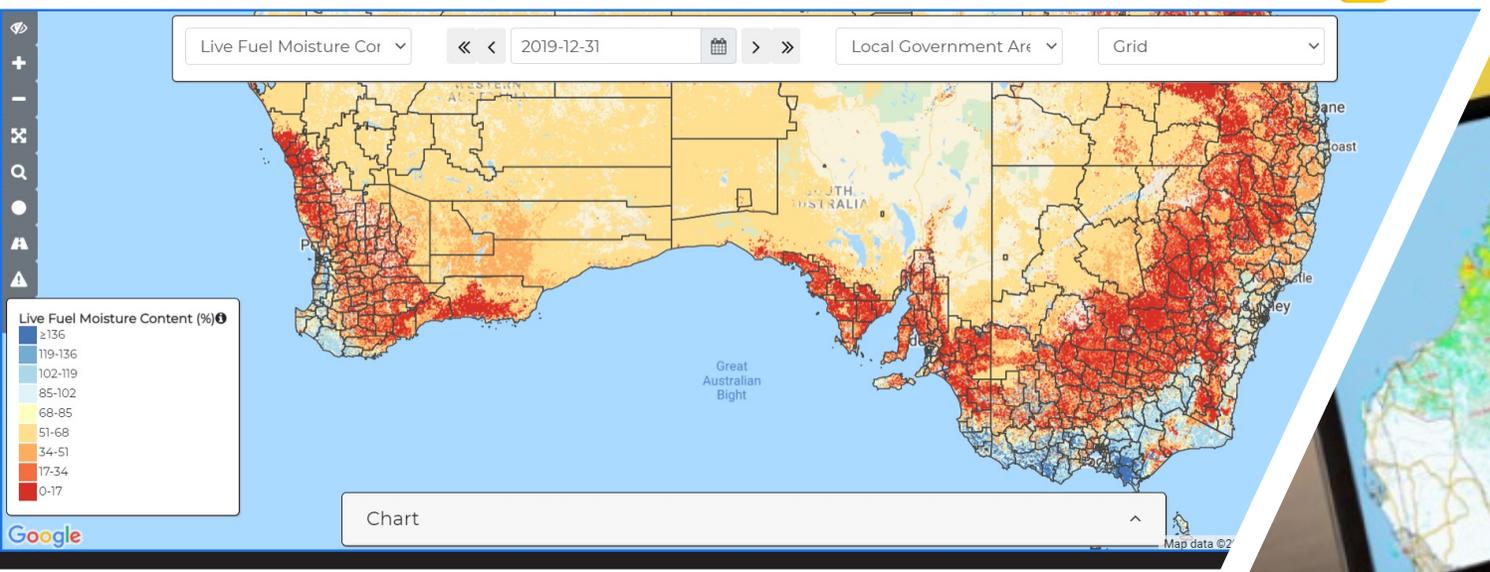
Source: Australian Government Bureau of Meteorology, NASA Fire Information for Resource Management System

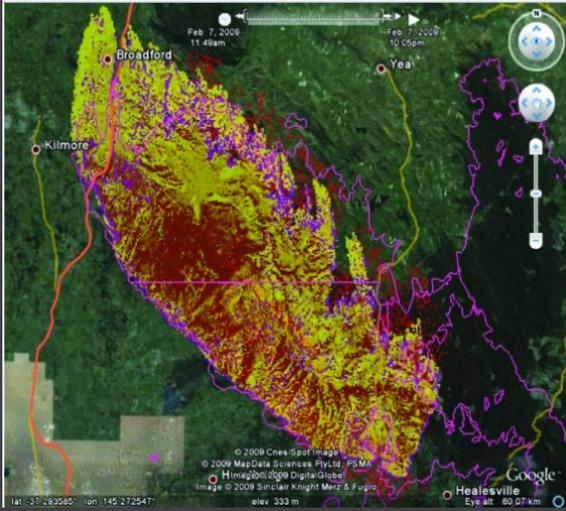




Fires in the landscape

We now know what conditions will lead to large and destructive fires, how to predict when they occur, and how to manage them when they do.







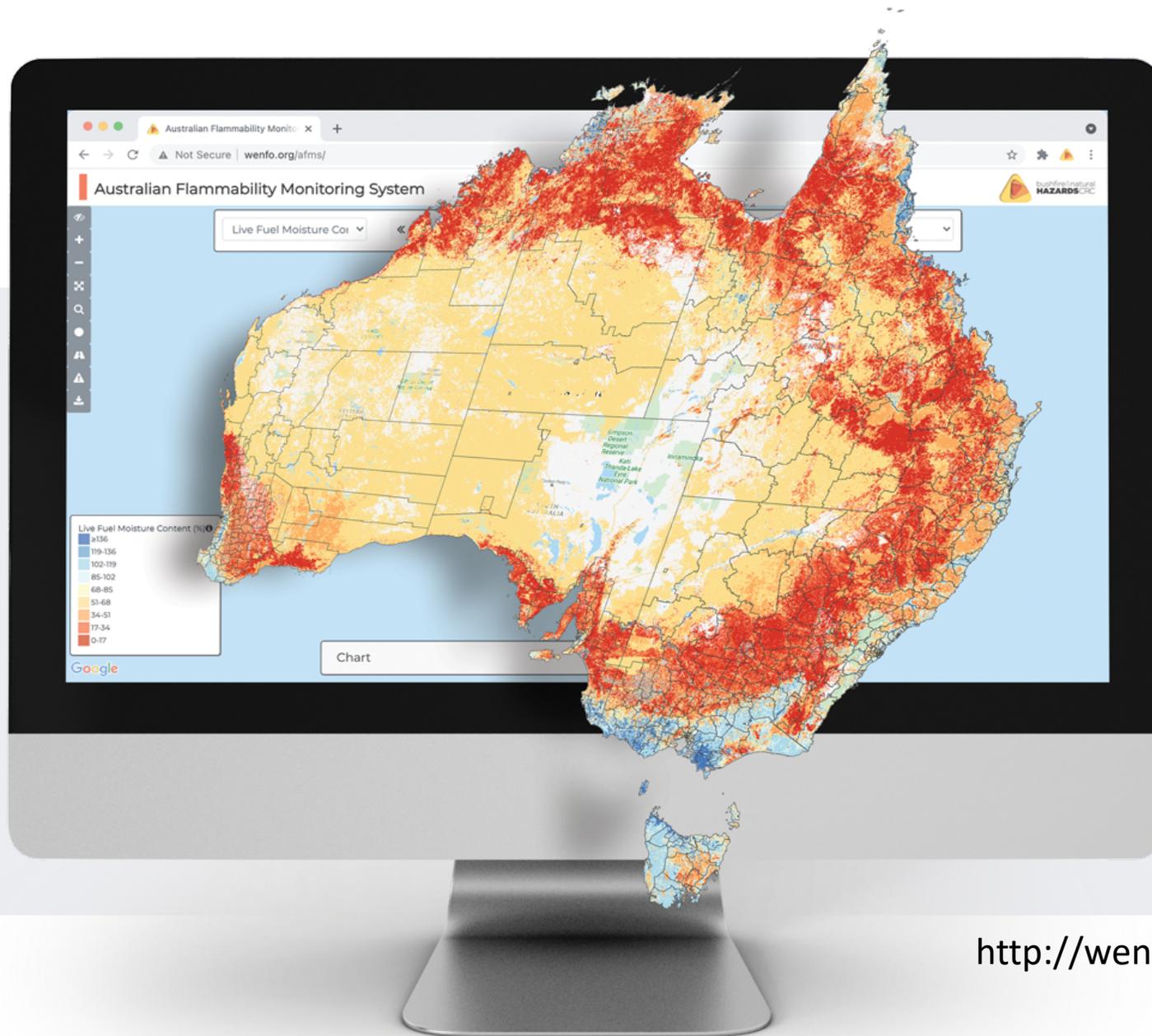
Velocity-driven lateral spread



Pyro CB



Coupled fire-atmosphere



<http://wenfo.org/afms/>



We now know that simply telling people there is a threat is not good enough to get action in all people. We need to target and refine the message, across a range of audiences – young/old, urban/rural, migrants, tourists, etc.



Australian Disaster Resilience Handbook Collection

GUIDELINE 1

Warning Message Construction: Choosing your words

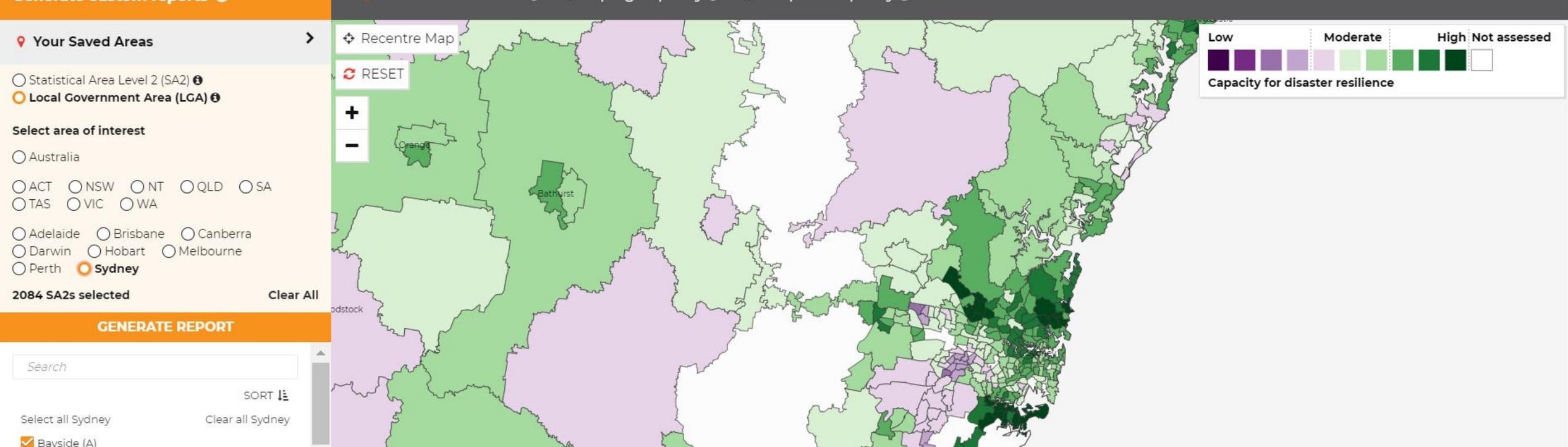
Key considerations for writing effective warning messages



Disaster resilience



We now know what we mean when we say all communities are different when it comes to natural hazards.



- Strengths and barriers to resilience
- Coping capacity
 - Social character
 - Economic capital
 - Emergency services
 - Planning/built environment
- Adaptive capacity
 - Social and community engagement
 - Governance and leadership
- Community capital
- Information access

Future workforce

We now know how to better equip our people to succeed in complex and challenging environments.





Emergency Breakdown

Team Psychology

PURPOSE
This tool is designed to help people recognise breakdown within co-located and distributed teams, and provide some pre-resolution strategies.

COGNITION
PURPOSE
This aide memoire person should be used to the team and the member is best use

WHAT IS COGNITION
A cognitive bias is a preference and belief can be influenced

WHAT TO LOOK FOR WHEN IDENTIFYING BREAKDOWNS...

HOW YOU MIGHT RESOLVE BREAKDOWNS...

COMMUNICATION
STEP ONE: ASSESS AVAILABLE INTELLIGENCE AND DECISIONS

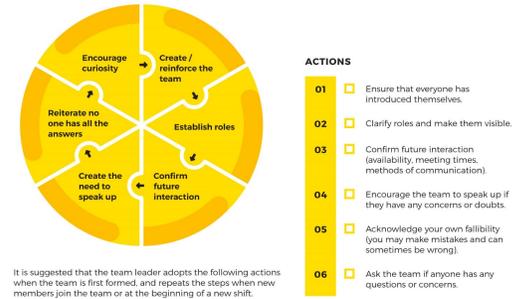
COORDINATION
STEP TWO: DETERMINE THE MEANING OF THE INTELLIGENCE AND DECISIONS

COOPERATION

Psychological Safety Checklist

PURPOSE
This checklist can be used to create a psychologically safe decision making environment. The checklist acknowledges that there are simple strategies to use so that people can feel safe while enhancing or establishing trusting relationships very quickly.

WHAT IS PSYCHOLOGICAL SAFETY?
Psychological safety is a shared belief that the team is safe for interpersonal risk taking, where people feel that they can speak up in the face of authority or power gradients, disagree with a preferred option, or identify and then talk about something that just doesn't feel quite right. Creating a psychologically safe environment requires the following strategy:



Key Tasks Cognitive Aid

PURPOSE
This tool is designed as a prompt to help regional and state-level incident and emergency management teams. It ensures they are undertaking tasks that are important to effective performance, especially when under stress, fatigue or pressure. It is a cognitive aid, providing a checklist of key tasks that need to be completed during an emergency.

USING THE AID
The checklist is reasonably high level and is divided into five phases of incident management that are common to regional control centres (RCC) and state control centres (SCC). The actual tasks required in each phase, and the order that they are undertaken, will differ between centres, depending on jurisdictional arrangements, agency protocols and hazard type. It is likely that managers will work through each phase several times in a cyclical manner.

READINESS PHASE
Preparing for the likely escalation of incidents

- Understand what resources are available for incidents (vs. those likely to be required)
- Reviewed the current and forecast weather conditions
- Reviewed relevant intelligence (e.g. planned community or other events)
- Reviewed the incidents currently underway and their respective status
- Identified the potential risks to the community
- Reviewed any precautions or restrictions in place (e.g. fire bans, road closures)
- Checked for existing information relevant to likely incidents (e.g. pre-action reviews)
- Ensured the control centre:
 - is suitably resourced (level, staffing and facilities)
 - is organised (roles and responsibilities)
 - is suitably configured (e.g. no significant constraints to information flow or collaboration)
- Ensured adequate liaison and coordination is occurring with internal parties (e.g. state and other regions)
- Ensured adequate liaison and coordination is occurring with external parties (e.g. other agencies, medical) who we need to work with or keep informed

ESCALATION PHASE
Responding to escalating incident activity

- Reviewed the resources available for incidents (vs. those likely to be required) (i.e. gap analysis) and other relevant intelligence
- Reviewed the incidents currently underway and their respective status and identified the likely consequences
- Ensured the control centre:
 - is suitably resourced (e.g. activation level, staffing and facilities)
 - is organised (e.g. personal know their roles and are working in them)
 - is suitably configured (e.g. no significant constraints to information flow or collaboration)
- RCC - Ensure adequate liaison and coordination is occurring with internal parties (e.g. state and other regions)
- Ensured adequate liaison and coordination is occurring with external parties (e.g. other agencies, medical) who we need to work with or keep informed

Emergency Non-Technical Skills

PURPOSE
This tool helps emergency and incident management teams enhance non-technical skills (such as communication or leadership skills) to develop more effective teamwork capabilities. There are seven core non-technical skill categories, divided into elements and behavioural markers. To help ensure that both positive (helpful) and negative (unhelpful) behaviours are considered in the checklist - these are marked in italics.

The EMNTOs can be used in several ways:

- as a **simple checklist** by completing the unhelpful markers to quickly capture which non-technical skills are in play for a team and of a shift or during exercises
- to facilitate an **after-action review** at the end of a shift or during exercises
- to collect **more detailed data** to ascertain how well non-technical skills are being used, by completing the shaded columns.

COMMUNICATION
Effective communication is a timely manner. Information is passed on accurately and understood by others. Team members ensure that information has been received and understood by others. Inappropriate communication procedures are used.

COORDINATION
Clear roles, responsibilities and expectations. There is a clear and common purpose. Actions are always carried out as expected. Everyone has a common understanding of the situation. The role and responsibilities of team members are clear.

ADJUSTING TO DEMANDS
Everyone is adjusting to meet the demands of the situation. Team members are not correcting any mistakes made by others.

COOPERATION
Contributes to a positive team environment. Everyone shows willingness to work as a team. Team members see open and approachable. Team members do not exhibit conflictive and just in each other.

ALIGNMENT OF EFFORTS AND MANAGEMENT OF CONFLICT
Everyone is following team objectives without getting in each other's way. Different views are expressed effectively. Individuals are creating unnecessary conflict.

LEADERSHIP
Creates a suitable team environment. Good behaviour is consistently modelled. Inclusive behaviours are modelled that enable others to speak up and offer suggestions and constructive comment. Others are not treated with respect.

PROVIDES FOCUS, DIRECTION AND COORDINATION
There is a focus on the important tasks at hand. Appropriate direction and guidance are provided. Team members are well coordinated within the team.

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A new national Centre for natural hazards research



The Hon. David Littleproud MP
Minister for Agriculture, Drought and Emergency
Management
Deputy Leader of the Nationals

The Hon. Christian Porter MP
Minister for Industry, Science and Technology

Thursday 1st July 2021

World Class Natural Hazards Research Centre

The Australian Government is providing \$85 million to fund ten years of critical natural hazards research through the establishment of Natural Hazards Research Australia (NHRA).

The new Centre will deliver world-leading, evidence-based research to inform how we move towards zero preventable deaths, better prepare communities to deal with natural disasters, and develop technological solutions to mitigate risks.

Minister for Emergency Management David Littleproud said that the Centre will tackle different aspects of critical natural hazards research and develop solutions that are multidisciplinary.

"We need research that translates into action to meet contemporary challenges faced by emergency services and communities across Australia," Minister Littleproud said.

"Floods, cyclones and bushfires are a natural part of the Australian landscape, so it's crucial that we continue to strengthen our resilience and response efforts to ensure the impact on lives, communities and the environment is minimised," he said.

Minister for Industry, Science and Technology Christian Porter said that by providing long-term support for NHRA, the Government is backing evidence-based research to deliver real-world outcomes and innovative solutions.

The Centre's establishment principles

- **Defined** by users
- **Framed** by natural hazards
- **Contextualised** by themes
- **Influenced** by a range of factors
- Useful, Usable and USED

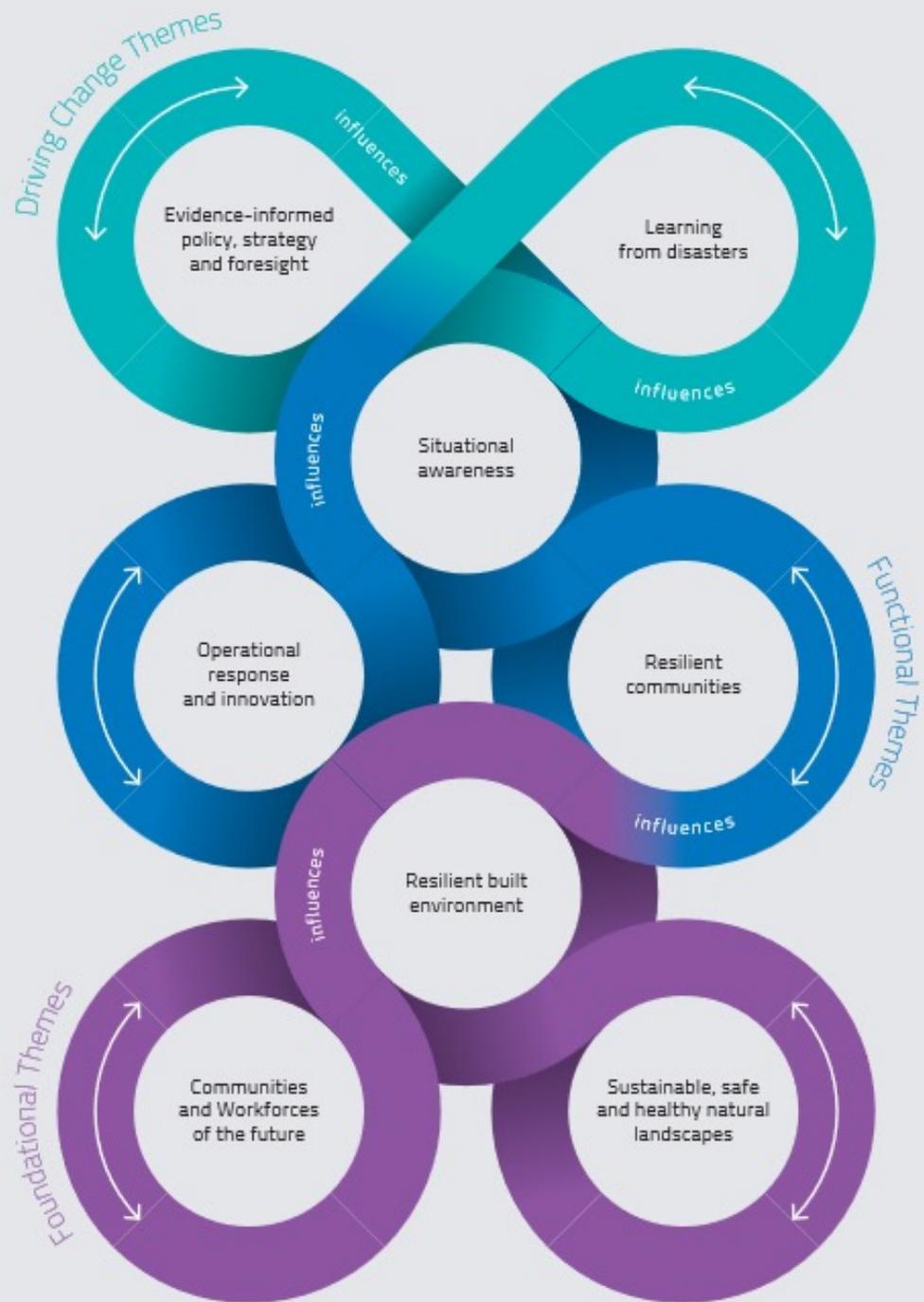


The natural hazard context

- Bushfire
- Flood
- Cyclone
- Heatwave
- Storm
- Coastal inundation and erosion
- Earthquake
- Tsunami
- Landslide



Themes and Influencing factors



- Climate change
- Demographics
- Building regulations
- Land use planning
- Community behaviour
- Capacity, capability
- Catastrophic, cascading, concurrent events
- Critical infrastructure
- Politics
- Finance and economics
- New technology
- Organisational change
- Research translation
- Ecosystem services

Some challenges

- We have a tendency to look at risk treatments in isolation and ignore interplays
- We have a tendency to see fuel management, suppression and response as a panacea
- We have a tendency to deflect the difficult discussions
- Tendency to work through public expenditure (HRB, fire response, etc.) to protect private assets
- Who actually owns the risk here?
- No public consensus on degree of hazard reduction: we know what too little or too much looks like
- What does a right policy response look like here given trade offs – environment, economics, community expectations

All the time:

- Remembering that fires are inevitable, and indeed required by our environment
- The frequency of bad fire days will only increase, and the exposure is also increasing as are the valuations for assets



Questions?

Be involved
Shape the future

Follow us on social media
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