Australia's natural hazards research capability

Andrew Gissing
Chief Executive Officer
Natural Hazards Research Australia

Our vision

That communities will be safer, more resilient and sustainable in the face of natural disasters

Our mission

To work with partners and the community on research that is useful, actionable and supportive of better decision-making to save lives and protect communities.

Participants

FEDERAL

Australian Government
Department of Industry, Science, Energy and Resources

NATIONAL PARTNERS

Energy Networks Australia

Australian Red Cross

afac

Green Cross

AUSTRALIAN CAPITAL TERRITORY

ACT Government

NEW SOUTH WALES

NSW Government Customer Service

NSW Government Planning & Environment

Fire + Rescue NSW

NSW National Parks and Wildlife Service

NSW Rural Fire Service

SES NSW State Emergency Service

NSW Government

QUEENSLAND

Healthy land & water

Queensland Government

SOUTH AUSTRALIA

CFS

Government of South Australia
Department for Environment and Water

Government of South Australia
South Australian Fire and Emergency Services Commission

SES Rescue

Metropolitan Fire Service South Australia

VICTORIA

CFA

Victoria State Government
Energy, Environment and Climate Action

EMV Emergency Management Victoria

Fire Rescue Victoria

SES

NORTHERN TERRITORY

Northern Territory Government

WESTERN AUSTRALIA

Government of Western Australia
Department of Biodiversity, Conservation and Attractions

Government of Western Australia
DFES Department of Fire & Emergency Services

Government of Western Australia
Landgate

TASMANIA

Tasmanian Government

Sustainable Timber Tasmania

Tasmania Fire Service

Research institutions

Natural Hazards Research Australia

Research and Implementation

Progress

- More than 50 funded core research projects
- 61 postgraduate scholar and associate students
- Contributions to National Climate Risk Assessment
- 24 of 24 2ND National Action Plan actions supported
- Supporting implementation of Royal Commission Recommendations

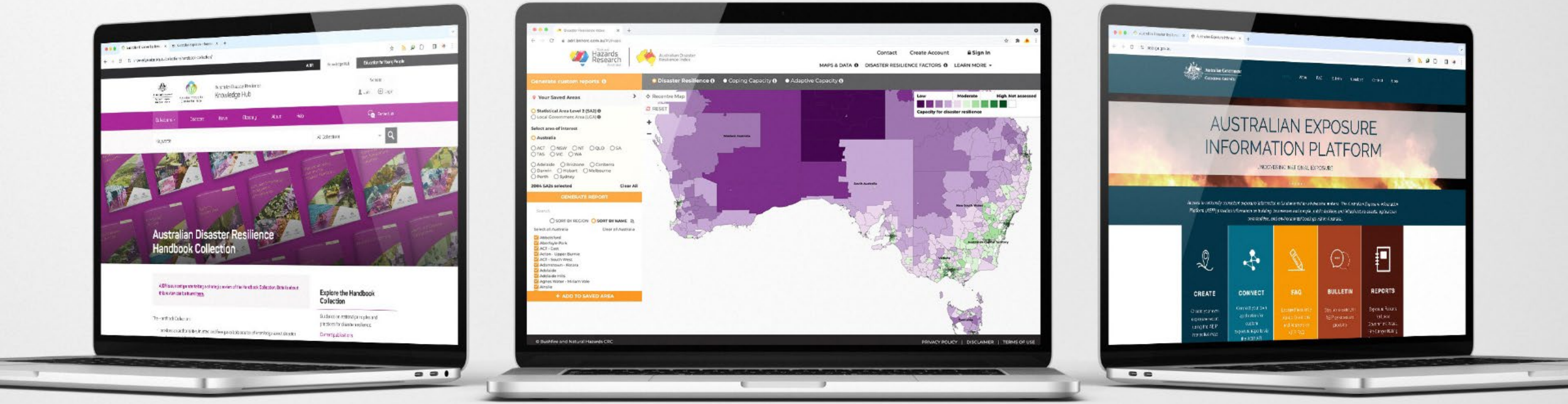
More in 2024

- Announcement of new projects
- More rounds of user driven research investment
- First Nations Scholarship and Fellowship

NHRA RESEARCH INFORMED
AIDR HANDBOOK
18,348
DOWNLOADS

AUSTRALIAN DISASTER
RESILIENCE INDEX
491,000
USER SESSIONS

AUSTRALIAN EXPOSURE
INFORMATION PORTAL
40,000
REPORTS GENERATED

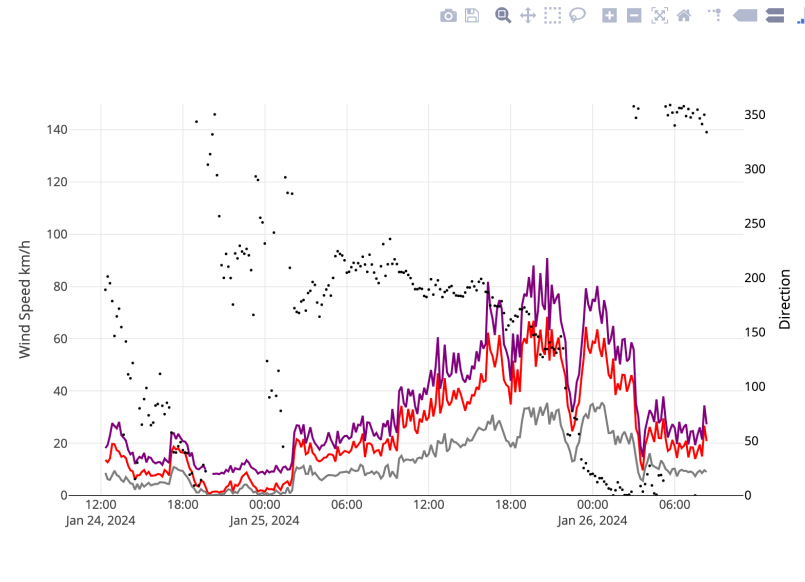


"The value of these CSAs is they are informed by the research and they are nationally consistent – no matter which state or territory you're in, you'll hear the same safety messages."


SES
Natural
Australia's

JAMES COOK UNIVERSITY
AUSTRALIA

Tower 1 | Tower 2 | Tower 3 | Tower 4 | Tower 5 | Tower 6 | Camera 1 - Not in use | Camera 2 - Not in use



Wind | Pressure

FRONTIER SI

Australian Government
Geoscience Australia

Natural Hazards Research Australia

Cultural land management resources

Principles and protocols for cultural land management governance and research

Natural hazards managements agencies and research institutions all have legal and ethical obligations to engage with Indigenous peoples no matter where they work in Australia. **Everywhere is Country and Indigenous peoples speak for Country.** Nonetheless, starting or maintaining intercultural collaborations can present many obstacles, and there is a need for guidance on how to best work together for the benefit of Country. The following summarises a review of relevant collaborative principles, processes and protocols for agencies and research institutions. It is only a **starting point** for local and in-depth conversations.

PRINCIPLE

1. SELF-DETERMINATION TO PRACTICE CULTURE ON COUNTRY
- Cultural land management must be self-determined and rights based
- Indigenous peoples have the right to speak authoritatively about Country
- Cultural leadership and resurgence through caring for Country 'our way'

2. RECONCILIATION, EQUITY AND SOCIAL JUSTICE
- (Re)centre women and their unique role within Country
- Support truth-telling and healing
- Address racism and promote cultural safety

3. HEALTHY COUNTRY, HEALTHY SPIRIT, HEALTHY PEOPLE
- Healing Country and healthy people are interrelated
- Centre Country, culture and kin in contemporary land management
- Cultural land management is living knowledge and culture

4. EMPOWERMENT OF INDIGENOUS KNOWLEDGE-HOLDERS
- Empower Indigenous knowledge and knowledge-holders
- Manage, protect, and share knowledge
- Transfer and maintain the rekindling of knowledge

5. BENEFITS WITH AND FOR INDIGENOUS COMMUNITIES
- Impact and value come through engagement and inclusion
- Strong partnerships are based on shared understanding, respect and trust
- Accountability through outcome monitoring and reporting

6. RECOG...
- Indigenous peoples and cultures are diverse
- Embed flexible and purpose-built policy and processes
- ...Indigenous cultural ...cultural authority

EXAMPLE PROCESS
- Develop collaborative structures that respect Indigenous self-determination
- Resource and support representative bodies to act as partners
- Resource and support capacity-building according to self-determined pathways
- Resource and support Indigenous women's access to sacred and significant sites
- Develop awareness of historical and contemporary issues facing Indigenous peoples
- Develop training and policies to foster cultural safety and acceptance
- Resource and support Indigenous peoples' connection to Country and culture
- Develop policies that consider, measure, and monitor cultural and natural values
- Regulatory changes to dismantle barriers to full participation in cultural practices on Country
- Recognise and support Indigenous knowledge and knowledge-holders
- Develop policies to protect Indigenous Cultural and Intellectual Property
- Recognise and support community learning pathways, processes and priorities
- Resource and support Indigenous peoples to define measures of success for policies and programs that affect them
- Resource and support meaningful and trusting connections with community
- Resource and support transparency in monitoring and reporting
- Resource and support strengths-based approach to reflect local capacities
- Resource and support local processes for decision-making
- Develop staff understanding of local cultural authority

EXAMPLE PROTOCOL
- Establish free, prior and informed consent mechanisms for collaborations
- Require co-design and co-delivery with representative bodies
- Establish agreements that provide long-term and secure access to Country
- Establish guidelines for identifying and protecting sacred and significant women's sites
- Make place-based cultural sensitivity training compulsory for all staff
- Establish a cultural safety framework and embed it in all induction processes
- Establish formal partnership arrangements to support on-Country practice
- Establish bio-cultural monitoring including tangible and non-tangible Indigenous values
- Establish exemptions for Elders and children to be involved in cultural fire activities
- Renumerate all Indigenous participants in research activities
- Develop local agreements that protect Indigenous Cultural and Intellectual Property
- Develop project timeframes to reflect community processes and priorities
- Establish self-determined advisory groups to lead definition of measures of success
- Support role continuity and prioritise retention of staff working with Indigenous peoples
- Establish procedures for public on partnership outcomes and benefits
- Develop localised agreements with Indigenous peoples
- Maintain awareness of Indigenous peoples' cultural calendar and significant periods
- Identify full range of Indigenous representatives, including men and women

Natural Hazards Research Australia

Artwork on reverse: 'Those that live here' by Maddi Moser (Taungurung)


Rural Fire Service Queensland
BURKETOWN
61
RFBAQ GRANTS
www.ruralfire.qld.gov.au

Assisted Relocations

SUNCORP | Natural Hazards Research Australia

27 May 2024


RAA23
aidr.org.au


EXTREME
CATASTROPHIC
MODERATE
Plan and prepare
HIGH
Be ready to act
EXTREME
Take action now to protect life and property
CATASTROPHIC
For your survival, leave bushfire risk areas
The dry Dirt cracks under the blazing sun's heat .
It was a code red day . The water was scarce and the blazing sun seemed to be everywhere.


WBBomb
Fire
Showcase

Award – Early Career Researcher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CHALLENGE
FINAL
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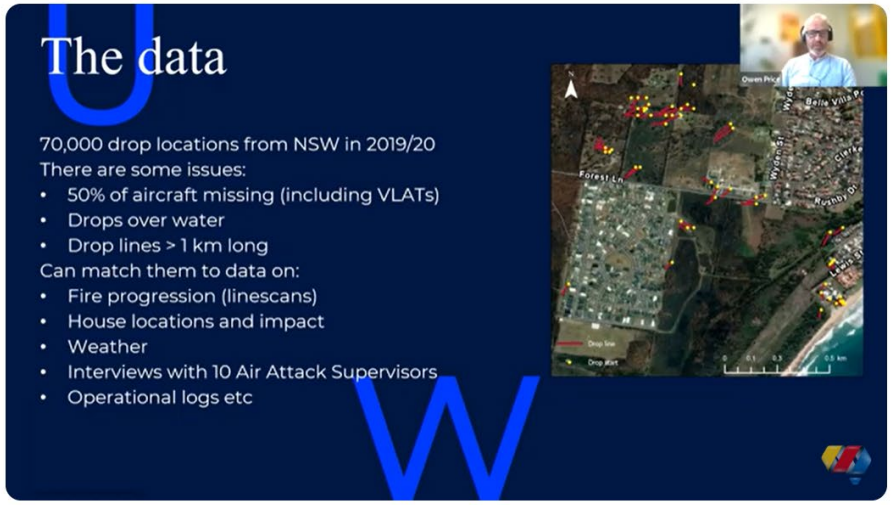
CALAMITY, HOW C SOURCES FROM ACRO
SOCIETY BE ACCE ND CONNECTED IN N
INNOVATIVE WA VE DISASTER RE
AND LINK THOS E THE RESOURCES
SUPPORTS WIT HAT ARE MOST IN N
WINNER – 2023
Natural
Hazards
Research
Australia

Translating research



Webinar 2: Fire prediction and behaviour | Understanding the Black Summer bushfires through research

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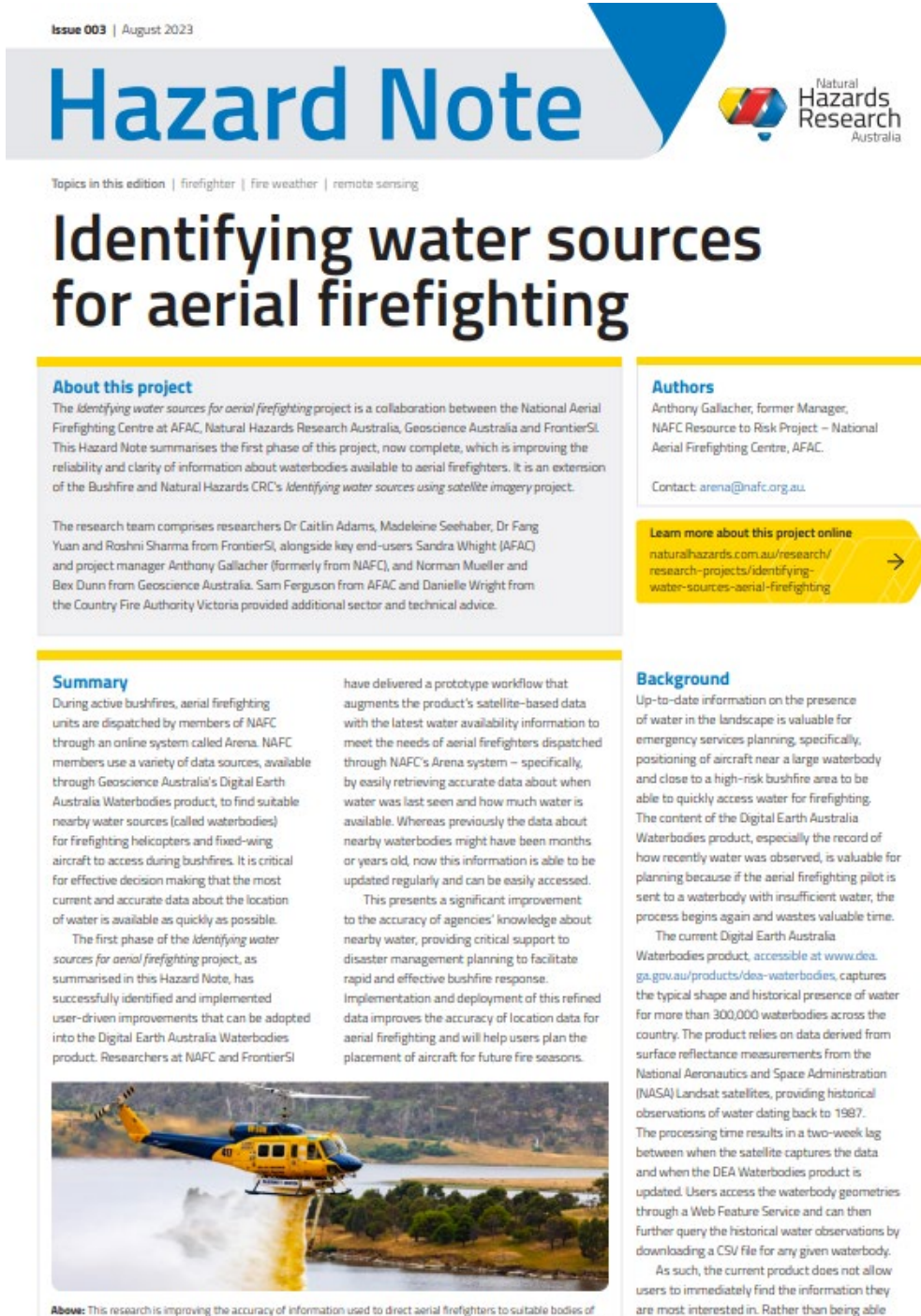

Issue 003 | August 2023

Hazard Note

Natural Hazards Research Australia

Topics in this edition | firefighter | fire weather | remote sensing

Identifying water sources for aerial firefighting

About this project

The *Identifying water sources for aerial firefighting* project is a collaboration between the National Aerial Firefighting Centre at AFAC, Natural Hazards Research Australia, Geoscience Australia and FrontierSI. This Hazard Note summarises the first phase of this project, now complete, which is improving the reliability and clarity of information about waterbodies available to aerial firefighters. It is an extension of the Bushfire and Natural Hazards CRC's *Identifying water sources using satellite imagery* project.

The research team comprises researchers Dr Caitlin Adams, Madeleine Seehaber, Dr Fang Yuan and Roshni Sharma from FrontierSI, alongside key end-users Sandra Whight (AFAC) and project manager Anthony Gallacher (formerly from NAFC), and Norman Mueller and Bex Dunn from Geoscience Australia. Sam Ferguson from AFAC and Danielle Wright from the Country Fire Authority Victoria provided additional sector and technical advice.

Authors

Anthony Gallacher, former Manager, NAFC Resource to Risk Project – National Aerial Firefighting Centre, AFAC.

Contact: arena@nafc.org.au

Learn more about this project online
naturalhazards.com.au/research/research-projects/identifying-water-sources-aerial-firefighting

Summary

During active bushfires, aerial firefighting units are dispatched by members of NAFC through an online system called Arena. NAFC members use a variety of data sources, available through Geoscience Australia's Digital Earth Australia Waterbodies product, to find suitable nearby water sources (called waterbodies) for firefighting helicopters and fixed-wing aircraft to access during bushfires. It is critical for effective decision making that the most current and accurate data about the location of water is available as quickly as possible.

The first phase of the *Identifying water sources for aerial firefighting* project, as summarised in this Hazard Note, has successfully identified and implemented user-driven improvements that can be adopted into the Digital Earth Australia Waterbodies product. Researchers at NAFC and FrontierSI have delivered a prototype workflow that augments the product's satellite-based data with the latest water availability information to meet the needs of aerial firefighters dispatched through NAFC's Arena system – specifically, by easily retrieving accurate data about when water was last seen and how much water is available. Whereas previously the data about nearby waterbodies might have been months or years old, now this information is able to be updated regularly and can be easily accessed.

This presents a significant improvement to the accuracy of agencies' knowledge about nearby water, providing critical support to disaster management planning to facilitate rapid and effective bushfire response. Implementation and deployment of this refined data improves the accuracy of location data for aerial firefighting and will help users plan the placement of aircraft for future fire seasons.

Above: This research is improving the accuracy of information used to direct aerial firefighters to suitable bodies of

Background

Up-to-date information on the presence of water in the landscape is valuable for emergency services planning, specifically, positioning of aircraft near a large waterbody and close to a high-risk bushfire area to be able to quickly access water for firefighting. The content of the Digital Earth Australia Waterbodies product, especially the record of how recently water was observed, is valuable for planning because if the aerial firefighting pilot is sent to a waterbody with insufficient water, the process begins again and wastes valuable time.

The current Digital Earth Australia Waterbodies product, accessible at www.dea.ga.gov.au/products/dea-waterbodies, captures the typical shape and historical presence of water for more than 300,000 waterbodies across the country. The product relies on data derived from surface reflectance measurements from the National Aeronautics and Space Administration (NASA) Landsat satellites, providing historical observations of water dating back to 1987. The processing time results in a two-week lag between when the satellite captures the data and when the DEA Waterbodies product is updated. Users access the waterbody geometries through a Web Feature Service and can then further query the historical water observations by downloading a CSV file for any given waterbody.

As such, the current product does not allow users to immediately find the information they are most interested in. Rather than being able

Natural Hazards Research Australia

Be Ahead of READY

What's to be done?

> Doing more of the same is no longer sufficient. Small step changes won't get us there in time. As natural hazard threats evolve, we must transform to **be ahead of ready**.

Be **Ahead** of
READY


IDEAS...

FASTER AND BETTER DECISIONS

Imagine...

...when a severe natural hazard threatens that emergency services could in real time forecast, identify and triage people and properties most in need, and then automatically task autonomous assets with minimal human intervention to provide lifesaving assistance, warnings and other support.

Be Ahead of READY

BETTER WARNINGS

PERSONALISED WARNINGS

Imagine...

...as a natural hazard threatens you receive an emergency warning tailored to your personal circumstances that prompts you to take action.

Be Ahead of READY

RESILIENT HOMES AND COMMUNITIES

Imagine...

...that no new homes were exposed to high hazard and frequent natural hazard impacts and existing homes in high-risk areas were retrofitted to ensure resilience to impacts or their residents were supported to relocate to safer areas

Be Ahead of READY

DYNAMIC MEASUREMENT OF RISK AND RESILIENCE

Imagine...

...we could have a continuous snapshot of natural hazard risk and resilience across Australia.

Be Ahead of READY

WORKFORCE CAPABILITY

Imagine...

...that when a severe natural hazard threatens, there was confidence in the capability and capacity to meet the threat.

Be Ahead of READY

INVESTMENT INFORMED BY TRIPLE BOTTOM

Imagine...

...if we understood the true costs of natural hazards to effectively allocate resources to maximise disaster risk reduction outcomes for communities.

Be Ahead of READY

PUBLIC-PRIVATE PARTNERSHIPS TO DELIVER INNOVATION

Imagine...

...disaster management could directly leverage the innovation, research and development progress of commercial enterprises by being a partner from concept to delivery.

Be Ahead of READY

Natural Hazards Research Australia

Be part of the journey

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