Natural Hazards Research Australia

The Predictions in Public Project:

Evidence-based principles for communicating predictions to the public during an emergency

Reflections on Research Translation

June 20, 2025

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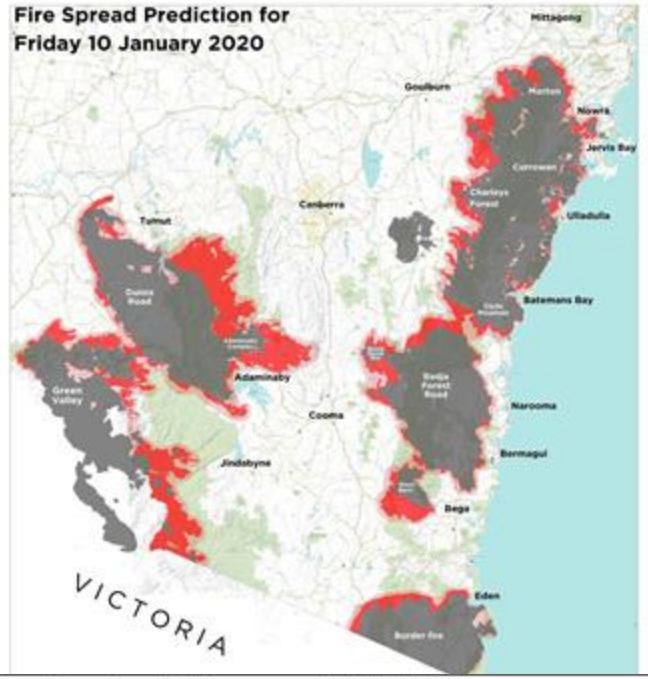
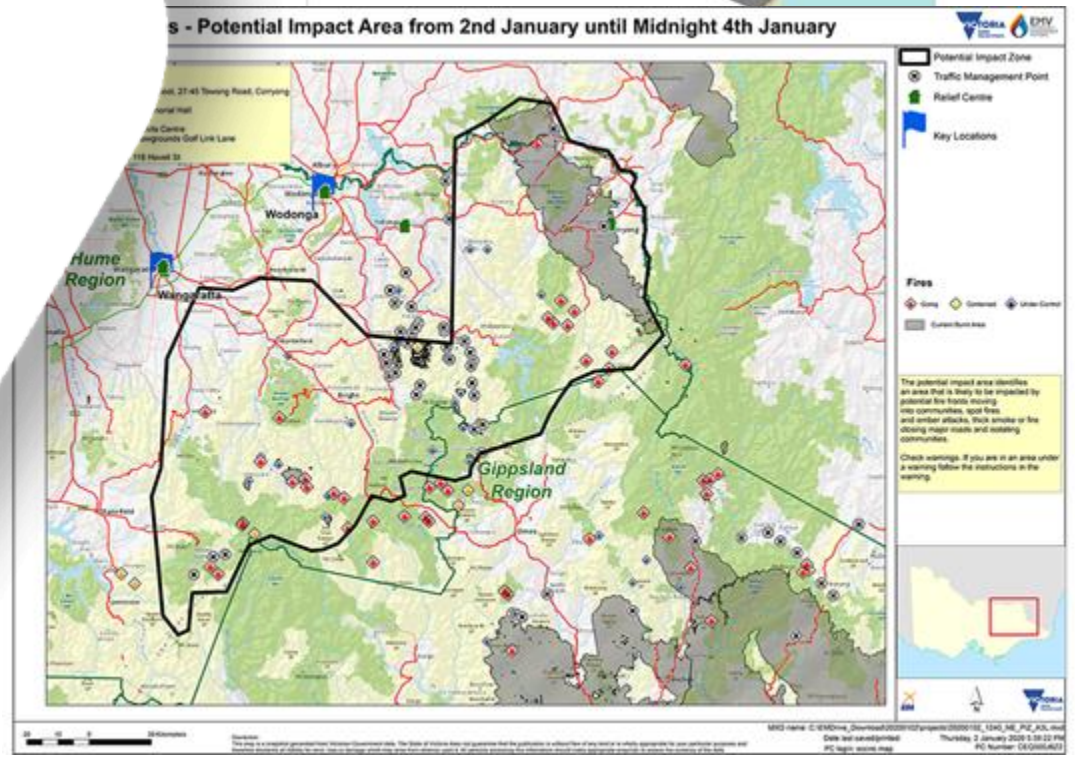
Background

- Technological advancements
- Expectations from the public
- Recommendations from reviews, inquiries, and royal commissions
- Political pressure
- Previous research in Victoria:
  - Support for use of predictions in public
  - Concerns for how to embed predictions into existing warning products and when and how to release them.





Project Aim

To use **empirical evidence** and **collaborative processes** to contribute to the develop of **national evidence-based guidance** for the future use of public-facing predictive fire spread products during an emergency.

Project Stakeholders

Project team

- Chloe Begg (CFA)
- Angela Gardner (Vic Dept Ed)
- Paula Dootson (QUT)
- Amy Griffin (RMIT)
- Erica Kuligowski (RMIT)
- Timothy Neale (Deakin Uni)

Project Steering Committee:

Representatives from **AFAC PSG** and **AFAC WG** from each Australian jurisdiction.

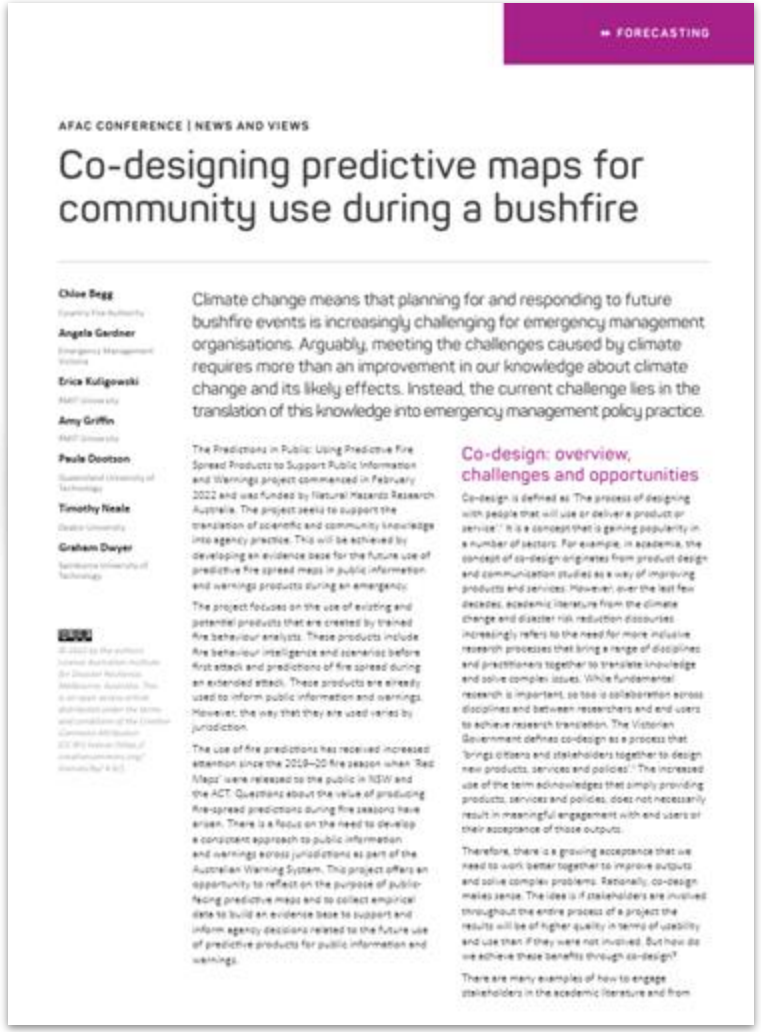
- **TAS** - Mark Chladil (PSG); Heather Stewart (prev. Peter Middleton) (WG)
- **WA** - Jackson Parker (PSG); Anni Fordham/Deana Pullella/TimVella (WG)
- **QLD** - Moo Price (prev. Jack Emueleus) (PSG); Jennifer Kerr (prev. Alex Battye and Anna Grohn) (WG)
- **NSW** - Laurence McCoy/David Field (PSG); Ben Shepherd (prev. Anthony Clarke) (WG)
- **VIC** - Chris Morton (prev. Phillip Brien and Alice Gower) (PSG); Reegan Key/Marc Unsworth/Peter Wall (WG)
- **ACT** - Ailish Milner/Ryan Lawrey (PSG); Leighton Bush (prev. James Morris) (WG)
- **SA** - Simeon Telfer (prev. Mike Wouters) (PSG); Monique De Silva (WG)
- **NT** - Don MacCorquodale (prev. Akshy Athukorala)
- **BOM** - Vikki Heinrich (prev. Fiona Dunstan)

Why collaborative research?

- **The PiP approach to collaborative research** assumes that if **those who are supposed to benefit from the research are actively involved in each step of the research**, the translation of that research into practice will be more effective than if they were not involved throughout.

- Research translation as a **process** rather than an output.

- **Translation that goes both ways** – research ↔ practice.



FORECASTING

AFAC CONFERENCE | NEWS AND VIEWS

Co-designing predictive maps for community use during a bushfire

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Climate change means that planning for and responding to future bushfire events is increasingly challenging for emergency management organisations. Arguably, meeting the challenges caused by climate requires more than an improvement in our knowledge about climate change and its likely effects. Instead, the current challenge lies in the translation of this knowledge into emergency management policy practice.

The Predictions in Public: Using Predictive Fire Spread Products to Support Public Information and Warnings project commenced in February 2022 and was funded by Natural Hazards Research Australia. The project seeks to support the translation of scientific and community knowledge into agency practice. This will be achieved by developing an evidence base for the future use of predictive fire spread maps in public information and warnings products during an emergency.

The project focuses on the use of existing and potential products that are created by trained fire behaviour analysts. These products include fire behaviour intelligence and scenarios before first attack and predictions of fire spread during an extended attack. These products are already used to inform public information and warnings. However, the way that they are used varies by jurisdiction.

The use of fire predictions has received increased attention since the 2019–20 fire season when 'Red Maps' were released to the public in NSW and the ACT. Questions about the value of producing fire-spread predictions during fire seasons have arisen. There is a focus on the need to develop a consistent approach to public information and warnings across jurisdictions as part of the Australian Warning System. This project offers an opportunity to reflect on the purpose of public-facing predictive maps and to collect empirical data to build an evidence base to support and inform agency decisions related to the future use of predictive products for public information and warnings.

Co-design: overview, challenges and opportunities

Co-design is defined as 'The process of designing with people that will use or deliver a product or service'. It is a concept that is gaining popularity in a number of sectors. For example, in academia, the concept of co-design originates from product design and communication studies as a way of improving products and services. However, over the last few decades, academic literature from the climate change and disaster risk reduction discourses increasingly refers to the need for more inclusive research processes that bring a range of disciplines and practitioners together to translate knowledge and solve complex issues. While fundamental research is important, so too is collaboration across disciplines and between researchers and end users to achieve research translation. The Victorian Government defines co-design as a process that 'brings citizens and stakeholders together to design new products, services and policies'. The increased use of the term acknowledges that simply providing products, services and policies, does not necessarily result in meaningful engagement with end users or their acceptance of those outputs.

Therefore, there is a growing acceptance that we need to work better together to improve outputs and solve complex problems. Rationally, co-design makes sense. The idea is if stakeholders are involved throughout the entire process of a project the results will be of higher quality in terms of usability and use than if they were not involved. But how do we achieve these benefits through co-design?

There are many examples of how to engage stakeholders in the academic literature and from

Challenges for Research Translation

Challenges for EM agencies:

Current research use:

- Issues related to access to research and relevance of research to a specific context (e.g., resourcing, capability and governance).
- Research translation not part of people's job description.

Incentives:

- Lack of time and capability to work through the implications of the research and its practical relevance for their work/organisation.

Challenges for research institutions:

Methods and skills:

- Research often yields generic, non-contextual findings.
- Problem definitions driven by theory, not real-world needs.
- Results communicated using outdated 'knowledge deficit' model.
- Limited capability for joint knowledge creation with stakeholders.

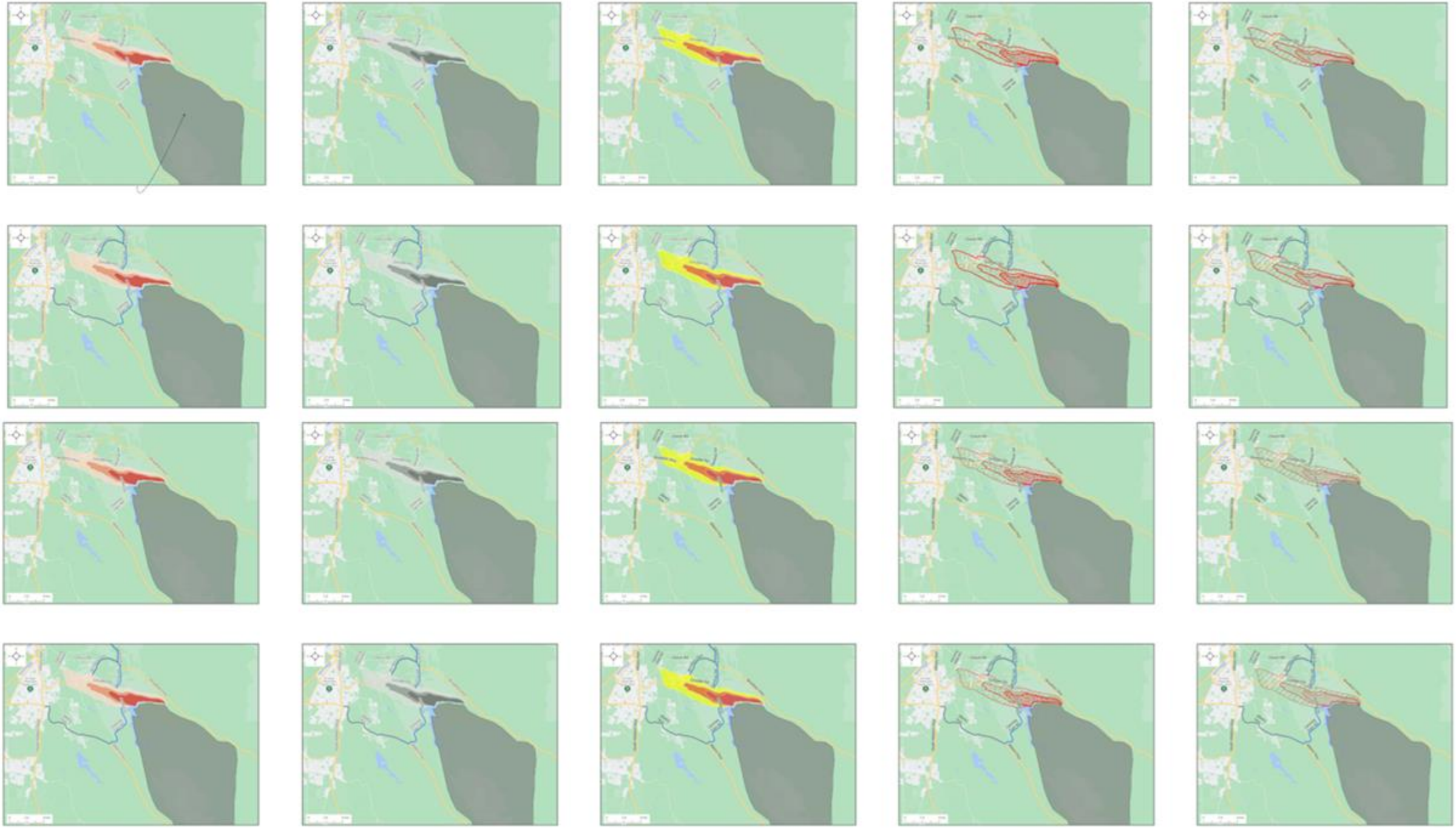
Incentives:

- Emphasis on objectivity can limit relevance to practice.
- Impact defined by journal publications.
- Limited funding for translation.

A traditional project would have…

- Identified community needs
- Created maps that meet those needs
- Produce reports with recommendations for what agencies need to deliver to meet community needs.

Instead, we….

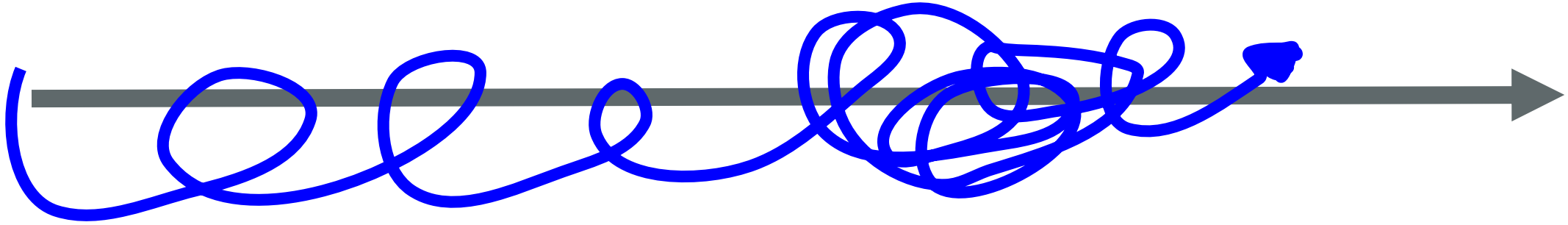


Project Design

Phase 1:
Understanding current agency practice and community comprehension and use of existing public-facing map-based products (i.e., incident warning maps and fire spread prediction maps).

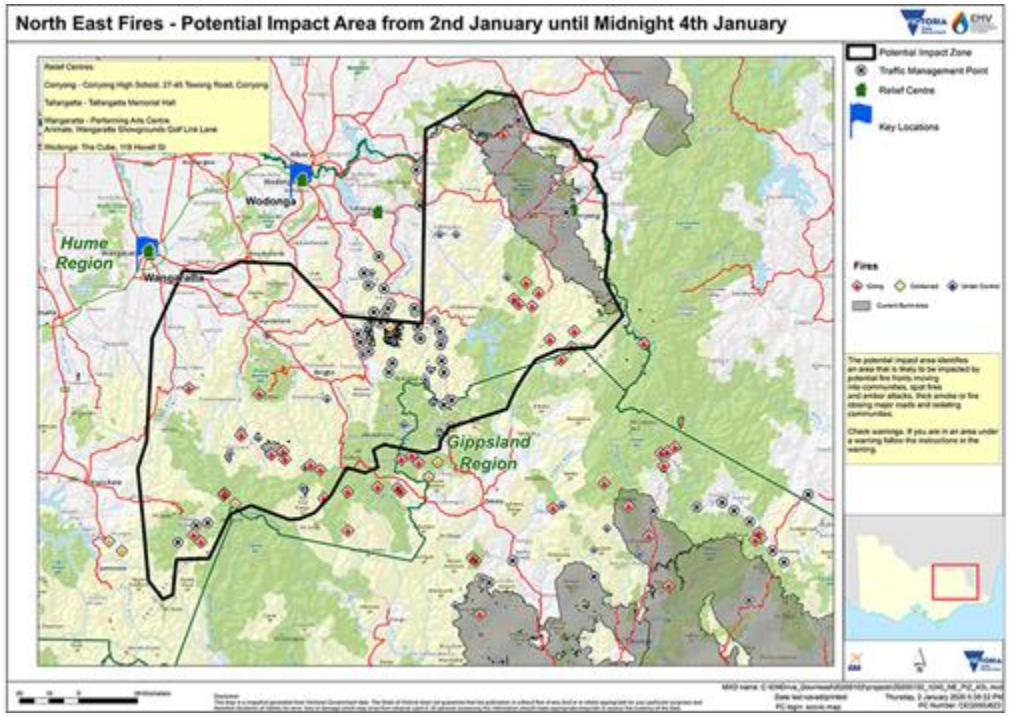
Phase 2:
Development and community testing of public-facing fire spread prediction map concepts.

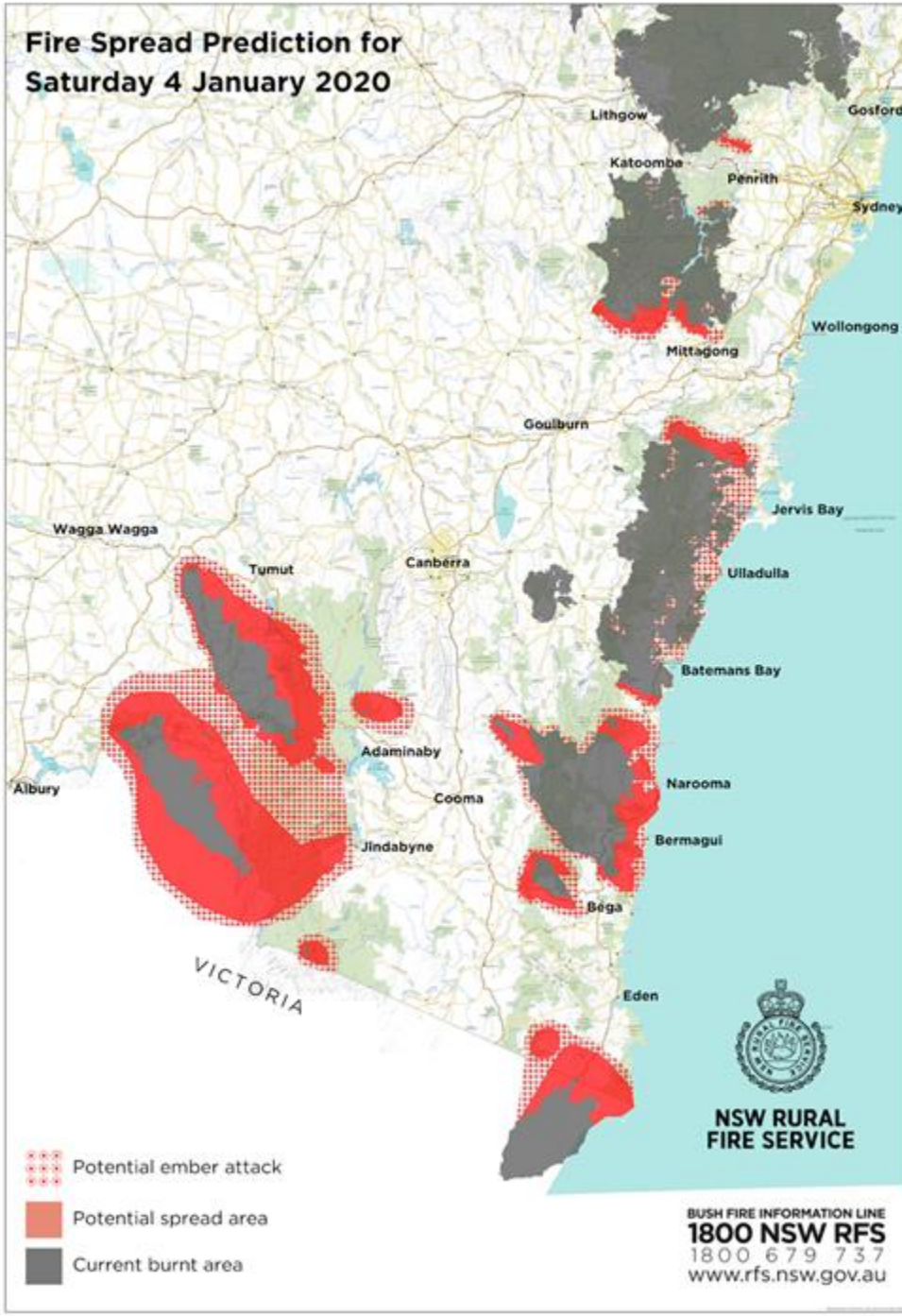
Phase 3:
Development of practical outputs for agency use.



Current Practice: Fire Agencies

- Agencies are under pressure to **improve the timeliness** and **accuracy of warnings**.
- Predictive products have been used in the past to **raise awareness** and to **encourage early evacuation**.
- Also, **two different products** that have been used in the past:
  - PIA
  - FSPM

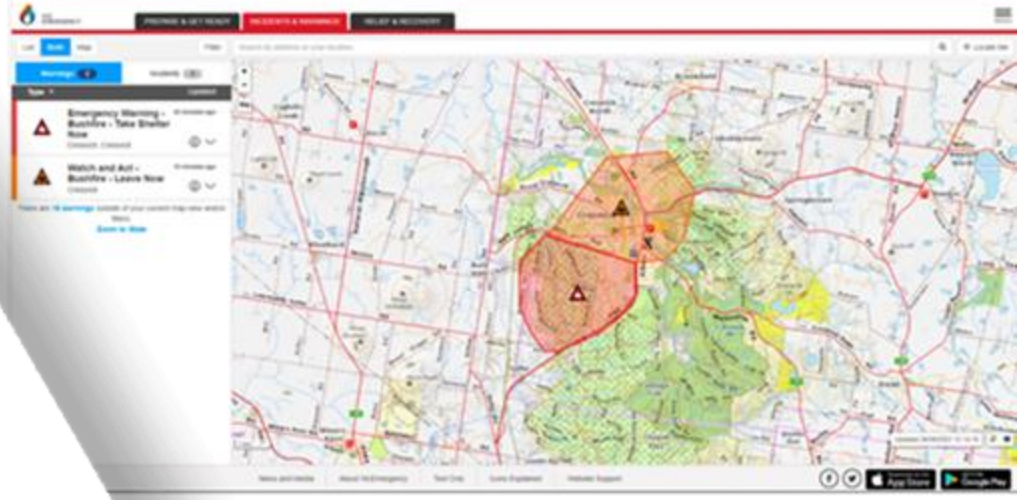


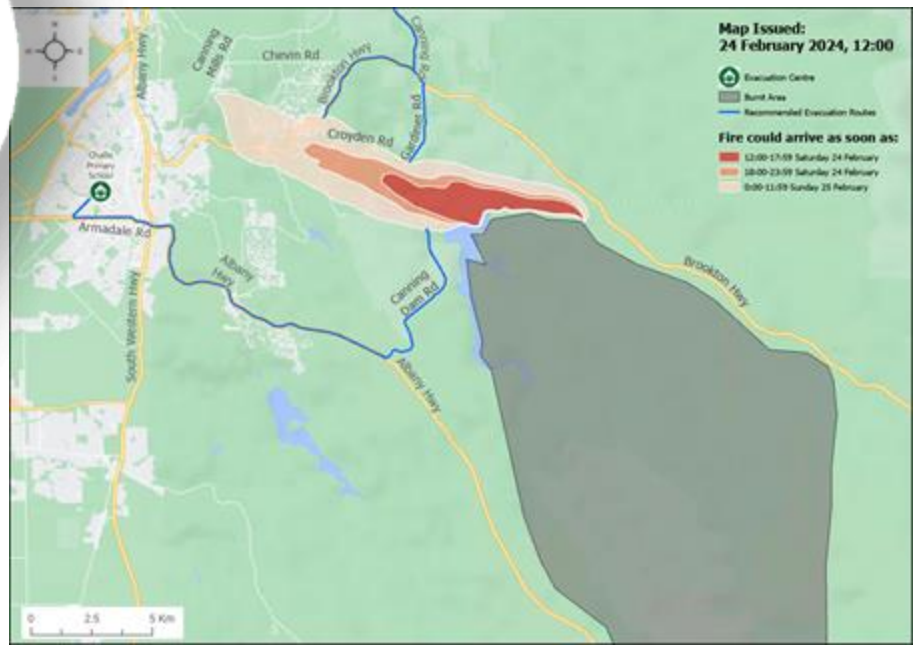


Current Practice: Fire Agencies

Consensus from the **Project Steering Committee** that:

- Predictive products and warnings are **separate products:**
  - **Warnings = current risk**
  - **Predictive products = potential risk over the next 12-24hrs.**
- Predictive products should support the Calls to Action in the warnings by providing extra risk context/information.

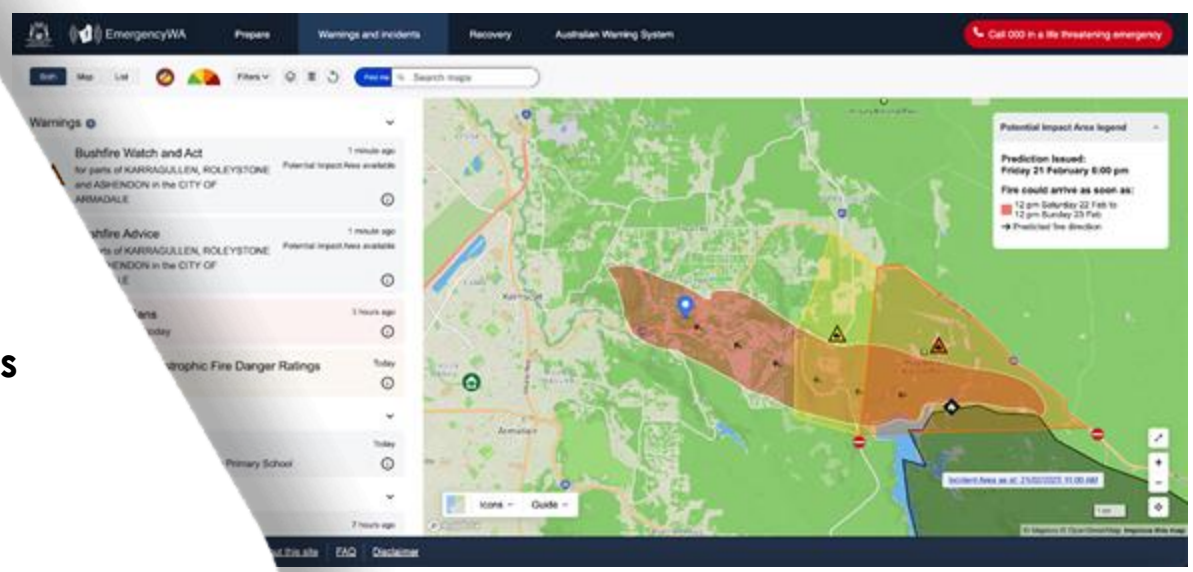


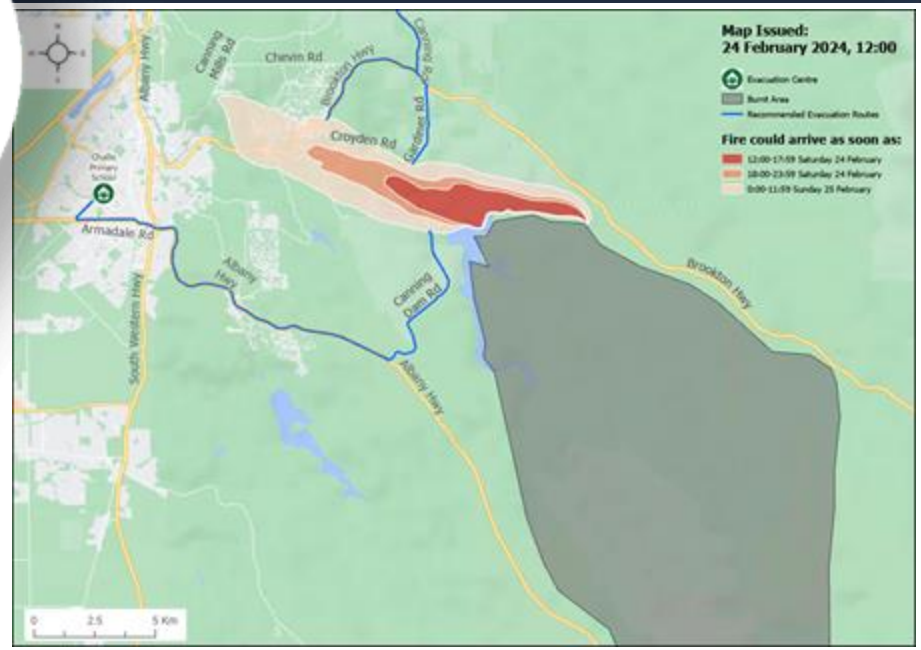


Community Expectations

- Members of the **public have similar expectations for warnings and predictive products. They are using them to understand:**
    - their **location** in relation to the fire hazard,
    - the **direction** of the fire hazard,
    - **how long** they have until it reaches them, and
    - how to **evacuate** safely including routes and specific locations.

- If people **cannot find that information** in agency products they will **delay action**, seek additional information, or infer based on their knowledge/social and environmental cues.
- **Predictive products** are perceived to be **more accurate than warnings**.
- **Predictive products encourage people to leave earlier than warnings.**





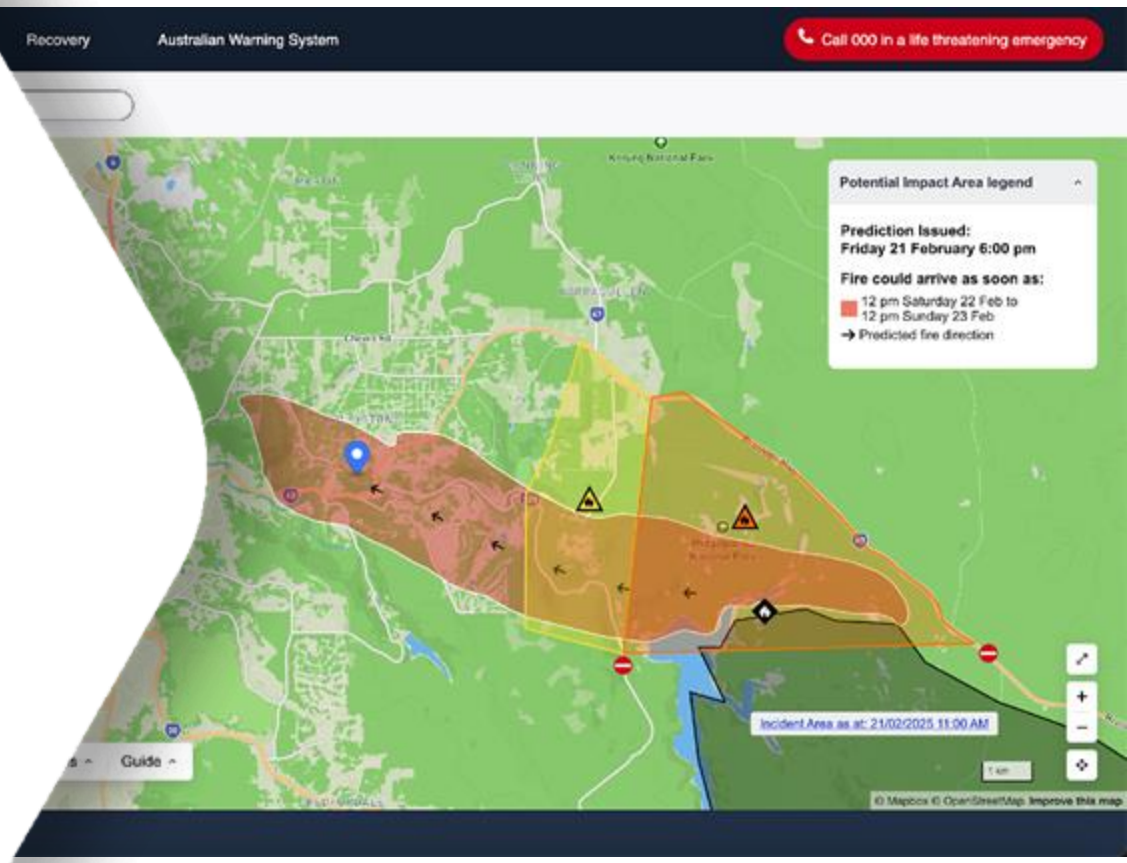
Challenges:

What we know:

- Community members are seeking specific information, regardless of whether it is presented in warnings or predictive products.
- If they cannot find that information in agency products, they will likely delay action.
- Fire agencies do not always have access to the information the public are seeking.

Challenges:

- Communicating uncertainty.
- Balancing community expectations with the existing fire agency governance, systems and capabilities to improve community safety.
    - What are the repercussions of not meeting community expectations?
    - Will providing more information improve community safety?



Next Steps

It's complex, but we are working on it by…

- ✅ Completing community research
- ✅ Utilisation: Finalising evidence-based principles + 2 additional practical outputs

Principle 1: Triggers for map production, dissemination, and updates

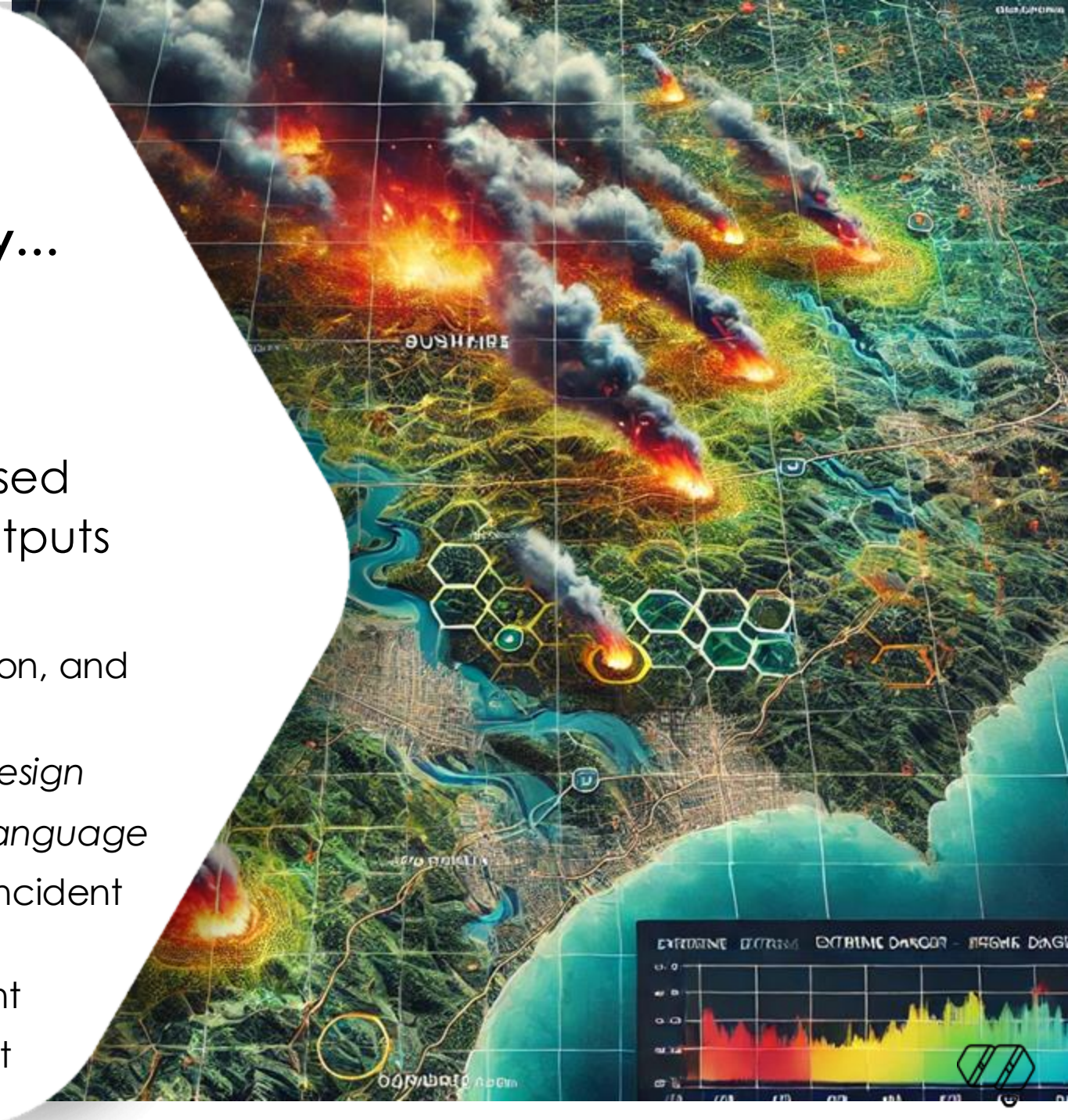
Principle 2: Communicating risk and uncertainty - *Design*

Principle 3: Communicating risk and uncertainty - *Language*

Principle 4: Ensuring predictive maps complement incident warning maps

Principle 5: Community education and engagement

Principle 6: Feasibility and authorisation environment



Thank you!

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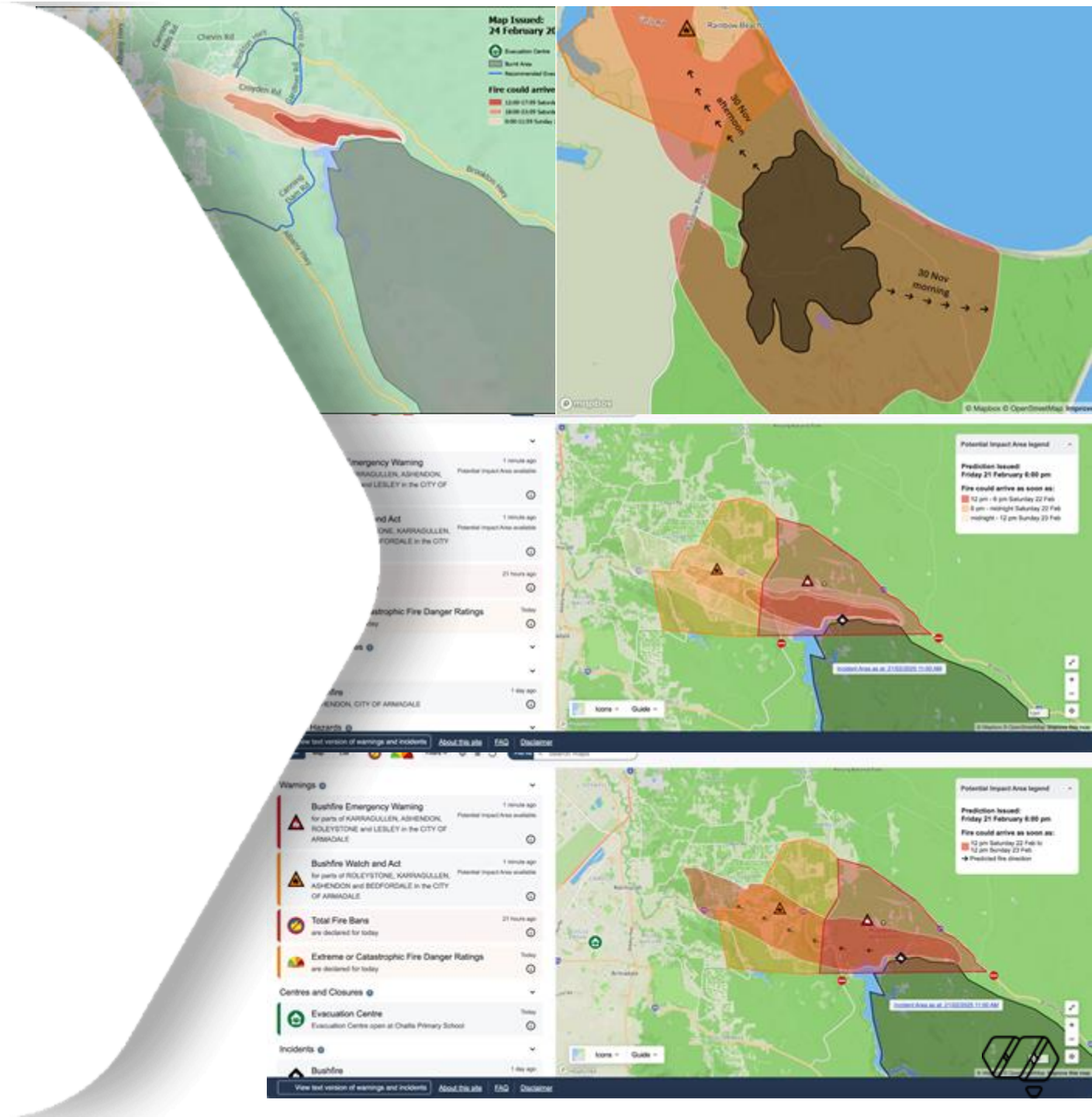
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