

National multi-hazard approach to evacuation modelling

Evacuation modelling use and needs in Australia

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Collaborative Consulting Co and CSIRO



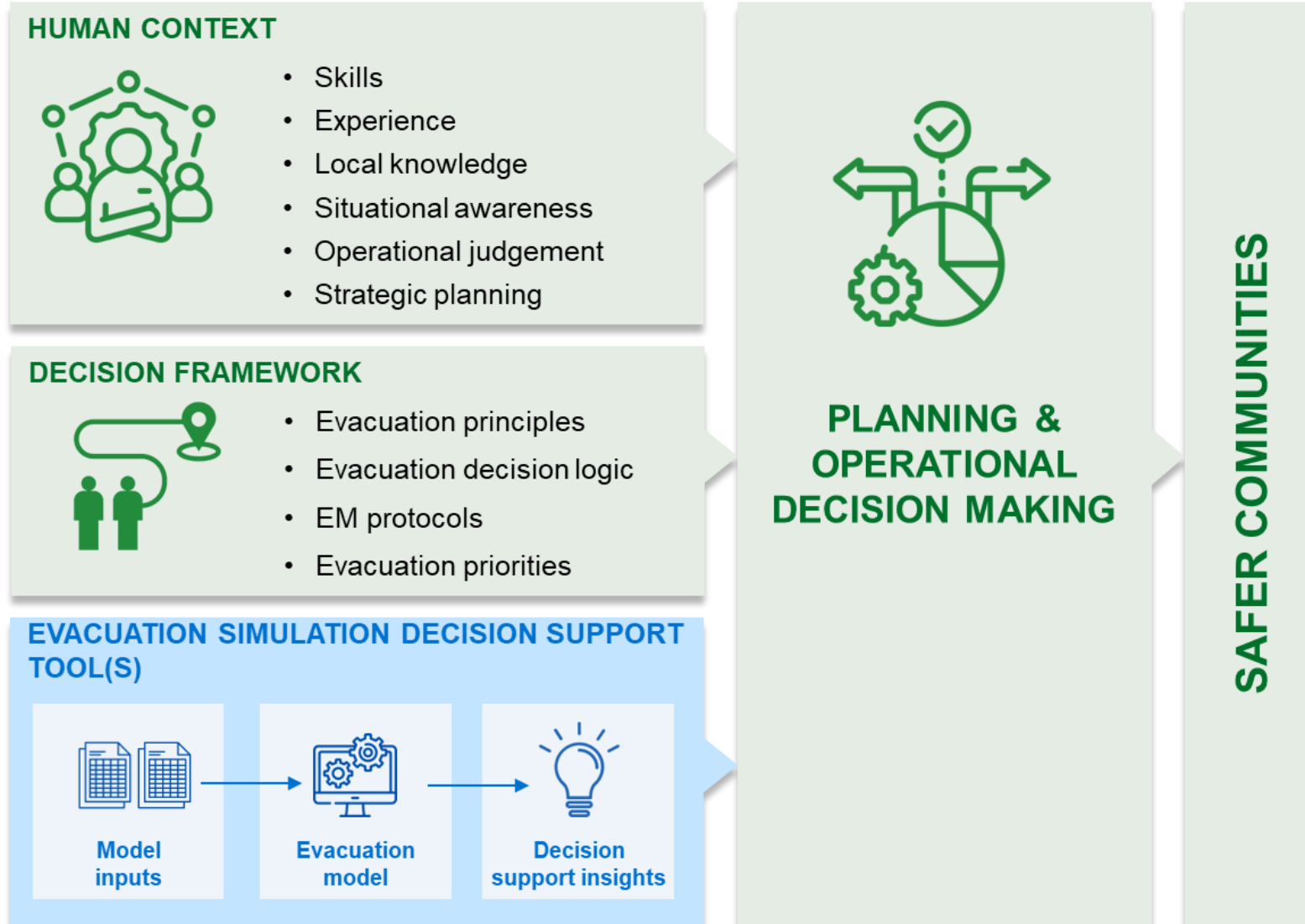
About the project

Evacuation is a **critical risk management strategy to natural hazards** to protect and preserve life.

This project aims to:

1. Provide a **comprehensive understanding** of evacuation modelling in Australia
2. Identify **new applications** for evacuation modelling
3. Develop a **national roadmap** for evacuation modelling

Evacuation decision-making context

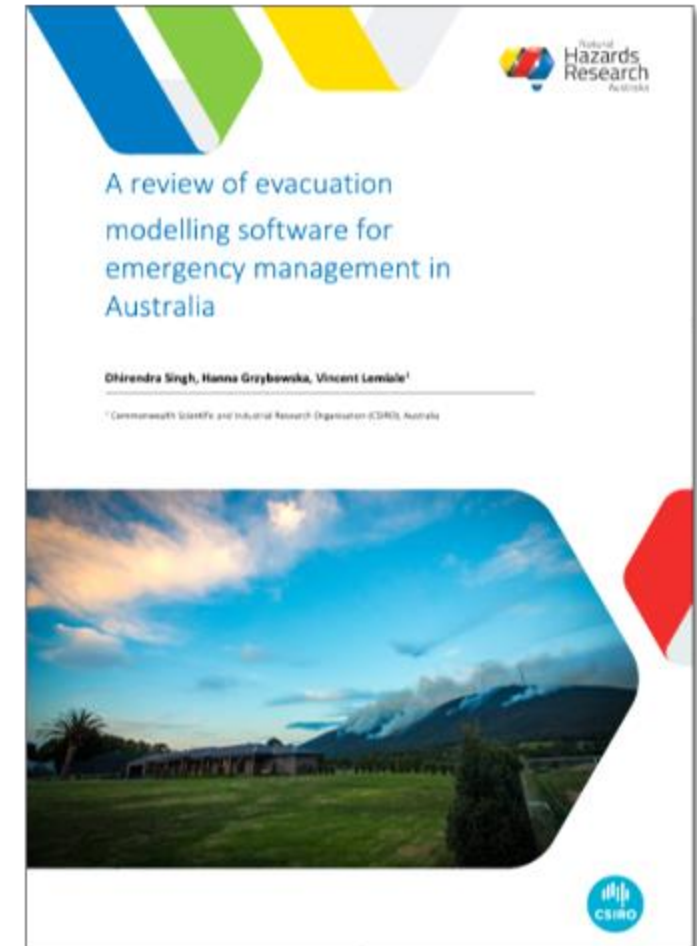


Evacuation modelling in Australia



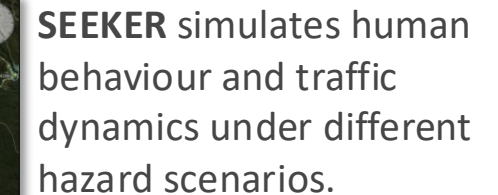
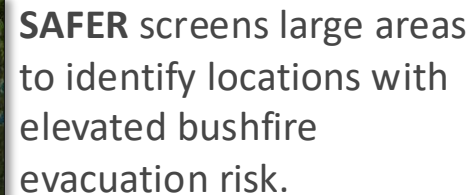
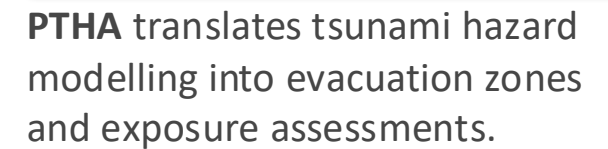
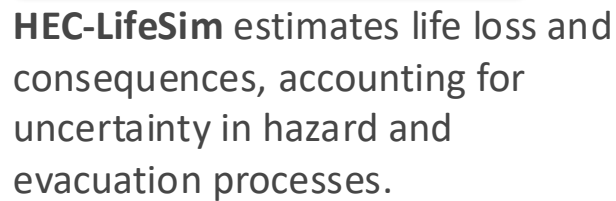
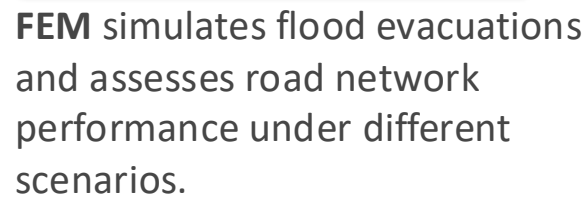
- We identified 11 evacuation models, with **6 active***.
- Applications focus on **flood** and **bushfire** hazards, with some use for tsunami and cyclone scenarios.
- Active models are either **dynamic**, where movement responds to a changing hazard, or **static**, where it is assessed under assumed hazard conditions.
- Active models are **spatial** and **road-based**. Other transport modes are not represented.

* One tool was reclassified as active following agency feedback.



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What this means for the sector



1. There is a **clear gap between planning capability and operational use**, as no tools are currently used in real-time evacuation decision-making.
2. **Tools use varies across jurisdictions**, with the strongest uptake in NSW and VIC, some use in WA and QLD, and no clear evidence of use in other jurisdictions.
3. There is significant overlap in model capabilities, suggesting that **standardising inputs, outputs, and functional requirements across tools can align effort and aid adoption and use by agencies**.

Pre-mortem approach



Designing for failure before it happens

Working backwards enables us to understand planning, preparedness and response aspects of the life-cycle.



3. MITIGATING ACTIONS

What must be true to avoid this scenario?

2. CAUSES / EVACUATION RISKS

**What caused these failures?
What must go wrong for this to happen?**

1. REASONABLE WCS

The worst-case scenario happened. What does this look like?



Decision-makers



Direct users

Response agencies including Incident Controllers, PIOs, Planning and Intelligence functions within IMTs

Police including Evacuation Managers

Local government, roads and transport agencies including urban planners, risk officers and road network planners

Indirect users

Community

Recovery agencies

Ministers and senior executives

Hospitals and health services

Social services, NGOs and humanitarian organisations

Facilities including aged care providers, schools and correctional facilities

Local industry including tourism, agriculture, livestock and accommodation sectors

Emerging themes



User requirements	
1. Effective warnings and public information	Do warnings reach people, do they trust them, and do they act on them?
2. Behavioural response insights	Who will act, who can act, and who needs support?
3. Clear and timely triggers	When do we act, what can we do, and what happens if we do it?
4. Common operating picture	Are we all seeing the same thing, and can we act on it?
5. Route and traffic planning	Can the network cope, where will it fail and how do we move people through it?
6. Resilient infrastructure	Where will systems fail, and how can we strengthen them?
7. Facility planning	Who is at risk and how do we help them?

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