Australian Government
Geoscience Australia

Building Resilient Cities

Working across the value chain: An Australian perspective

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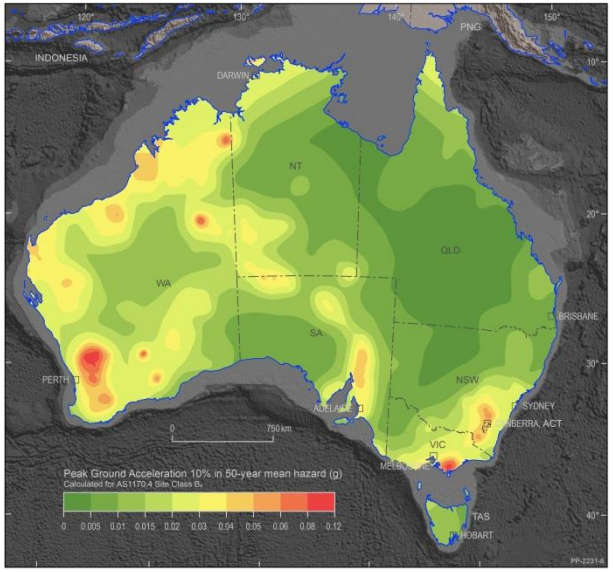
SUPPORTING AUSTRALIA'S COMMUNITY SAFETY

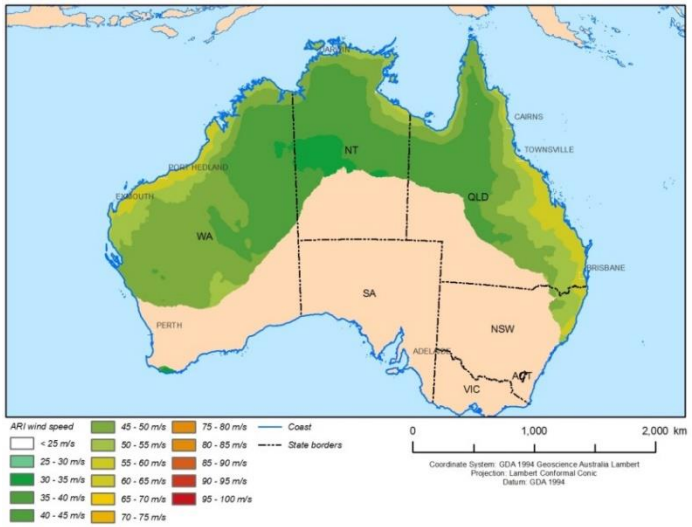
Natural hazards have a significant impact on Australia's economy, the environment and society. Floods, bushfires, cyclones and earthquakes result in loss of life, property and infrastructure, and damage our natural environment.

National probabilistic hazard assessments 2018



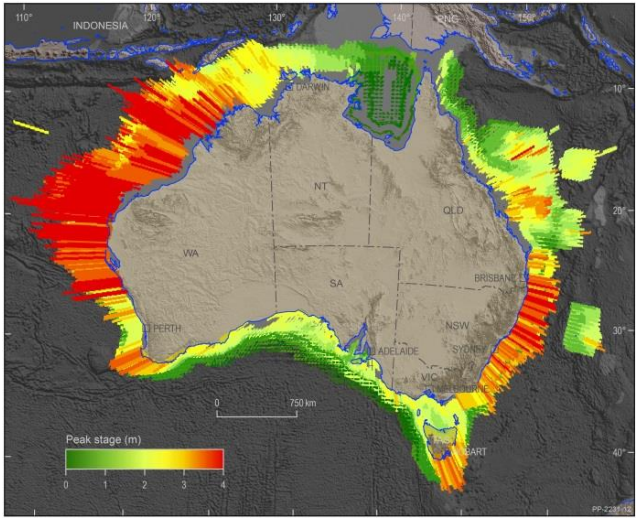
www.ga.gov.au/tcha

160K scenarios
400 locations



www.ga.gov.au/nsha

> 1M scenarios
15 km grid

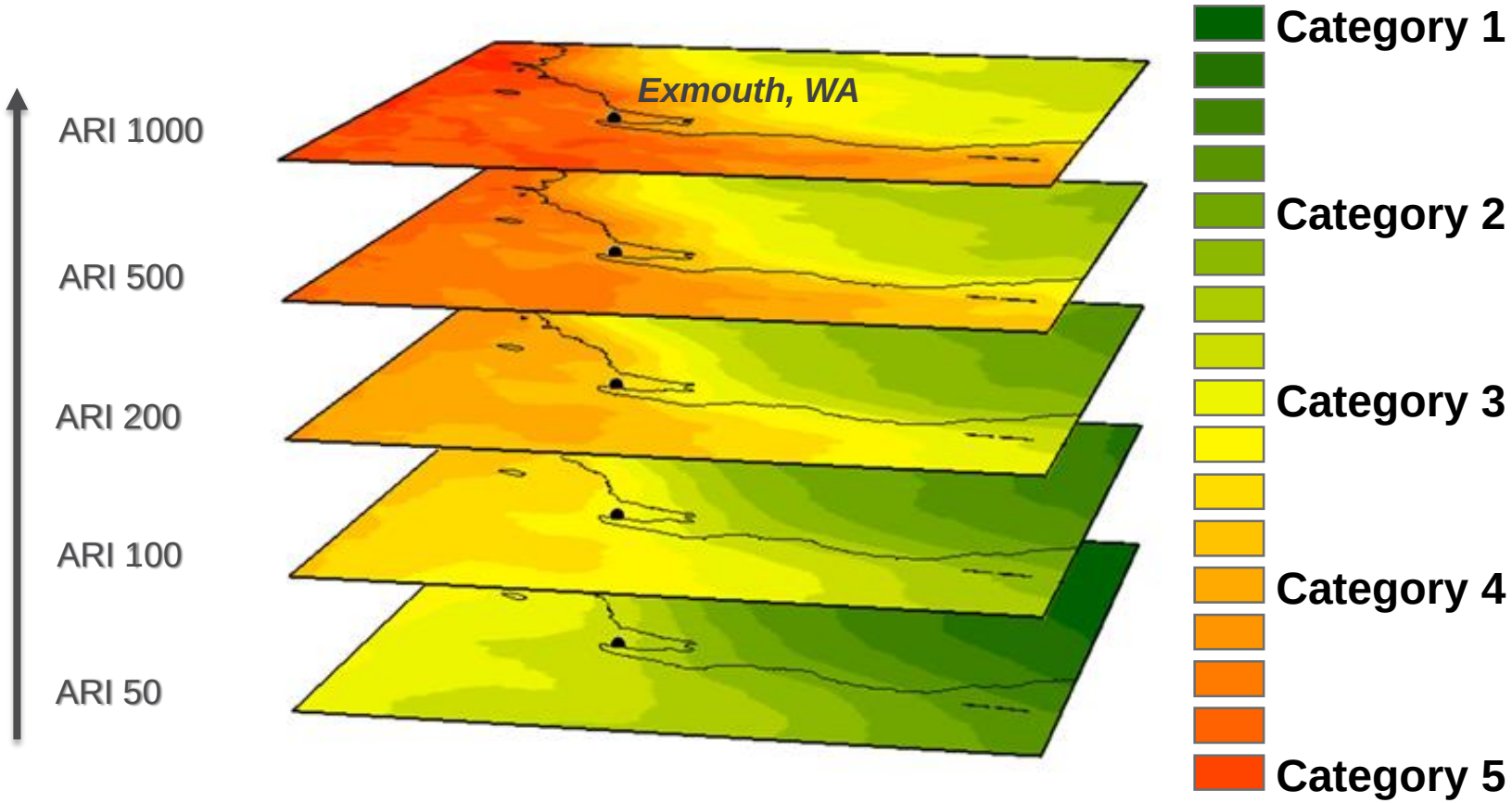


www.ga.gov.au/ptha

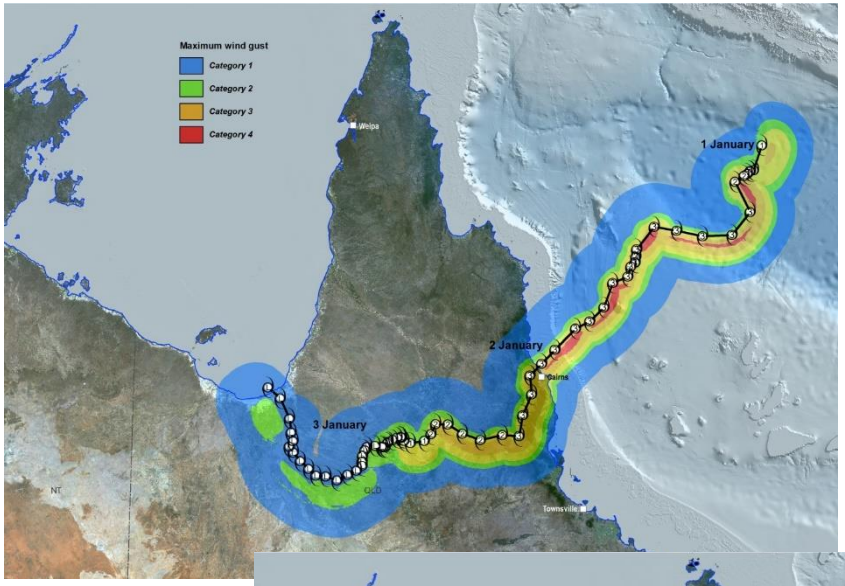
> 1M scenarios
~20K locations

Understanding and using hazard assessments

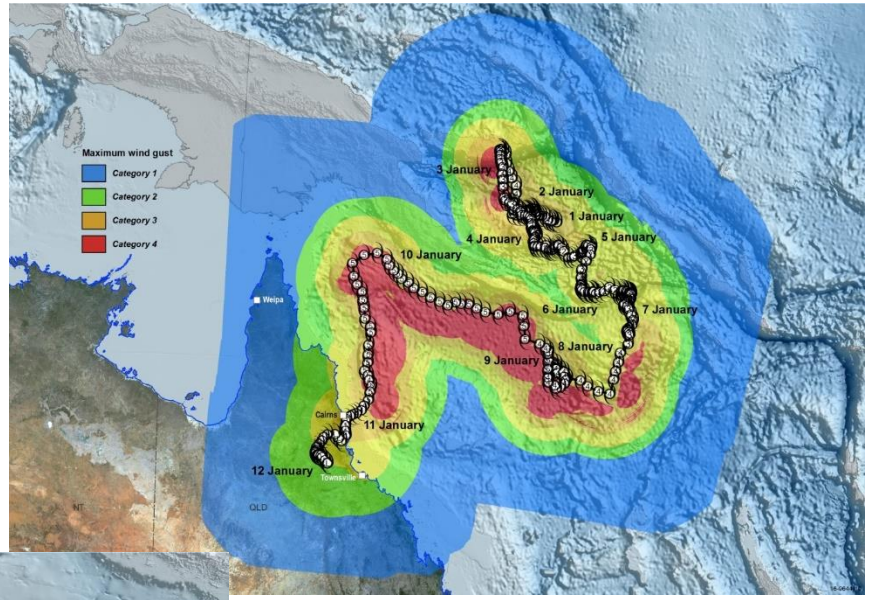
Not a single map



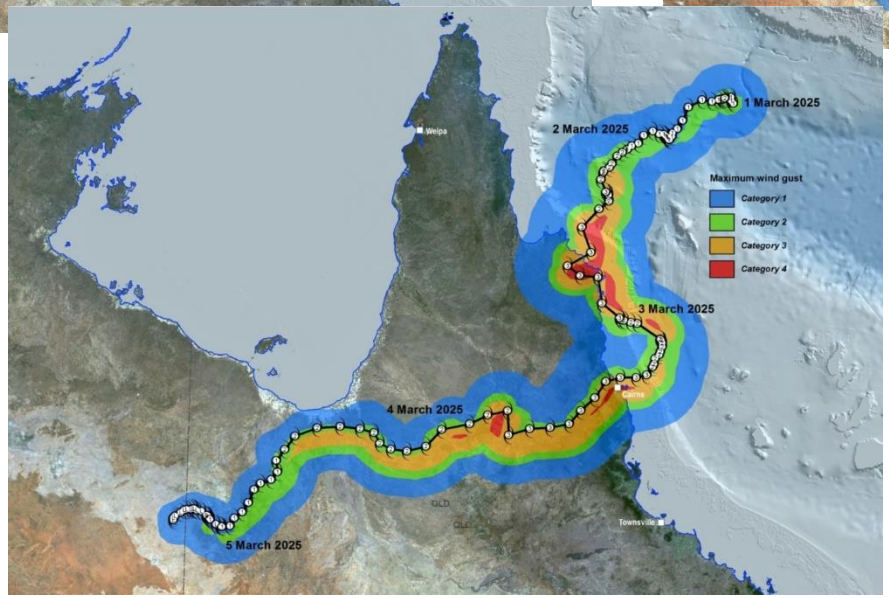
Every event IS different and WILL BE different to the last



Scenario 1

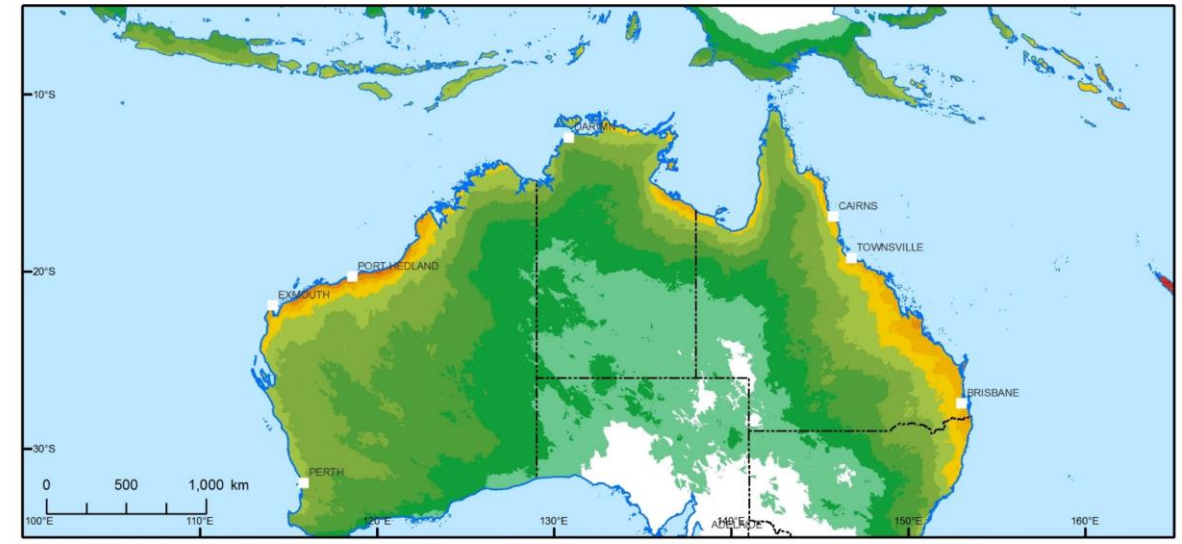


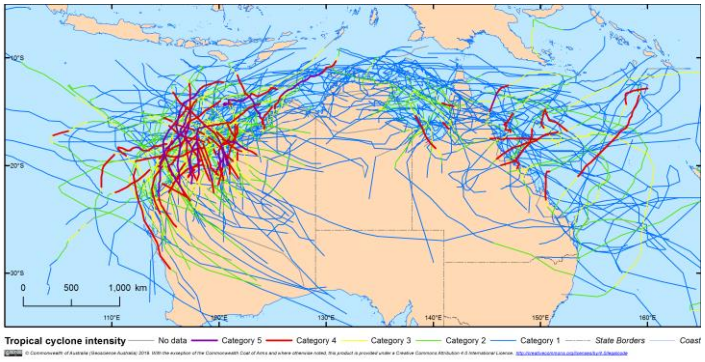
Scenario 2

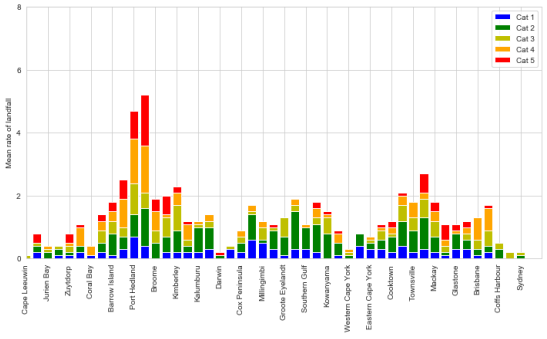


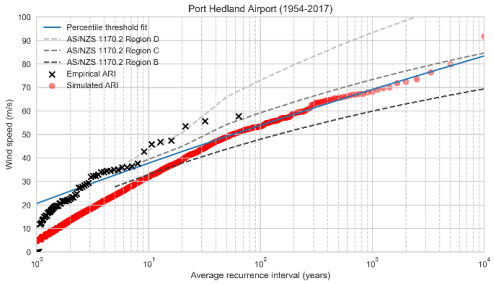
Scenario 3

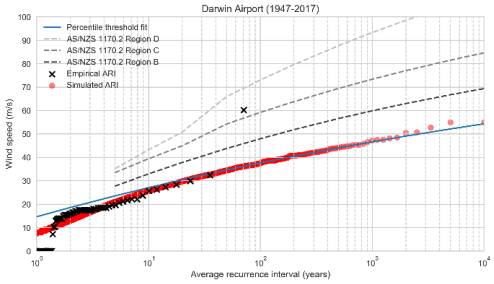
Tropical Cyclone Hazard Assessment 2018

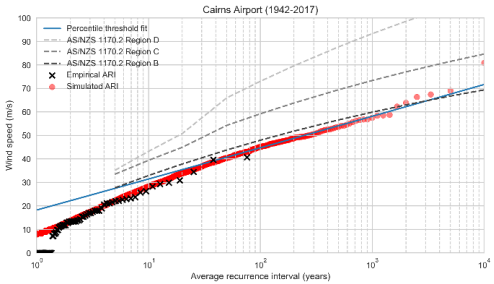






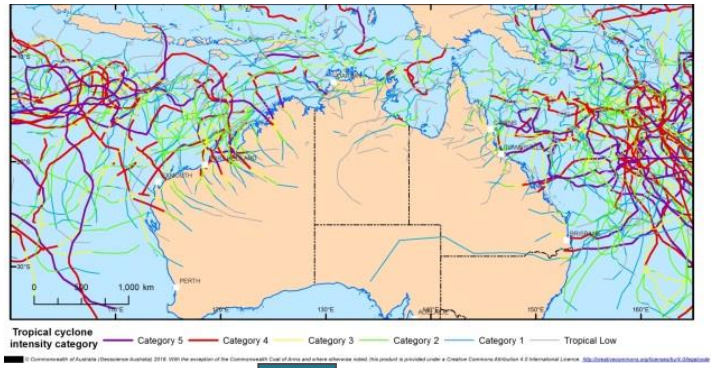


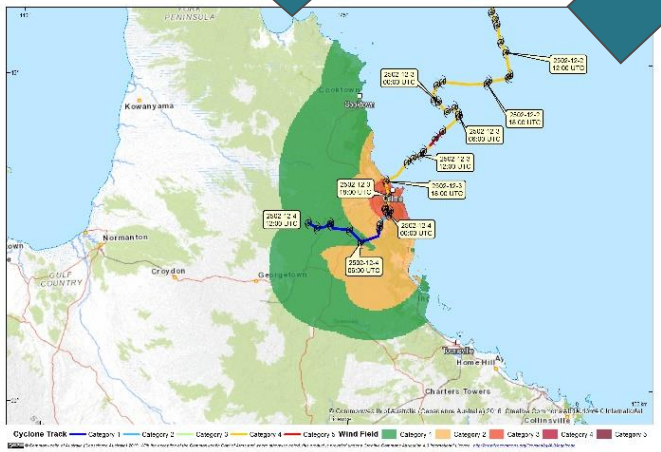


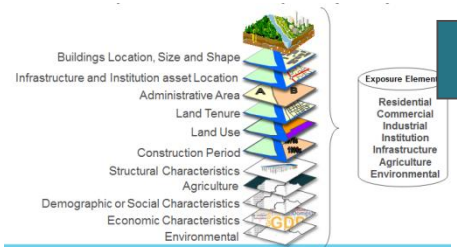


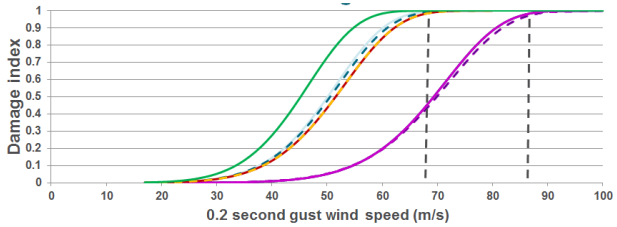
http://www.ga.gov.au/about/projects/safety/tcha

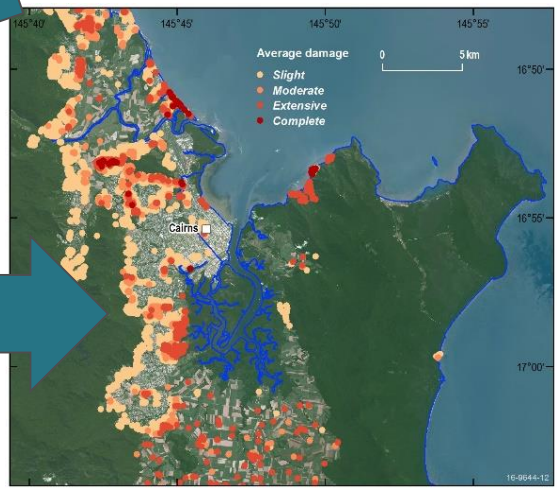
Using national-scale catalogues for local action











Using scenarios to guide planning

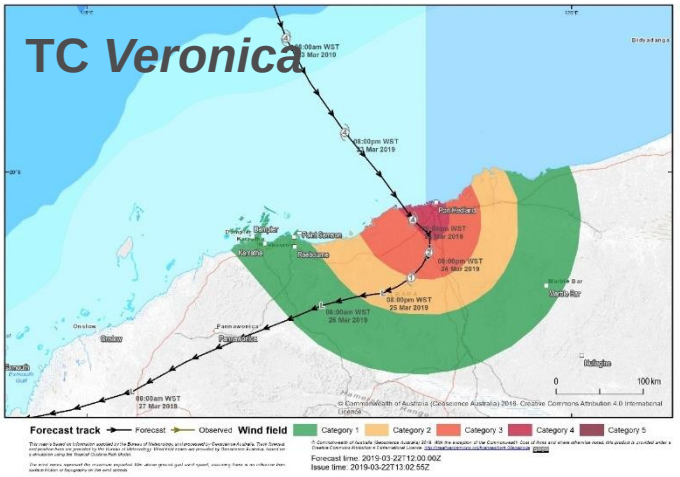
Scenarios are just one event and unlikely to match real-world events

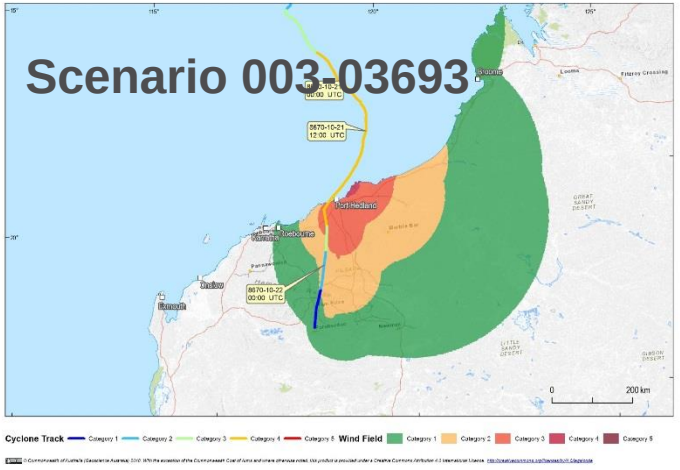
They can assist decision-making – both mitigation *and* event planning

Scenarios provide emergency managers with guidance on the potential scale of impacts

In the absence of other knowledge, this is invaluable!

"Don't let perfect get in the way of good" – Roger Mentha, Fire and Rescue NSW





EIRAPSI

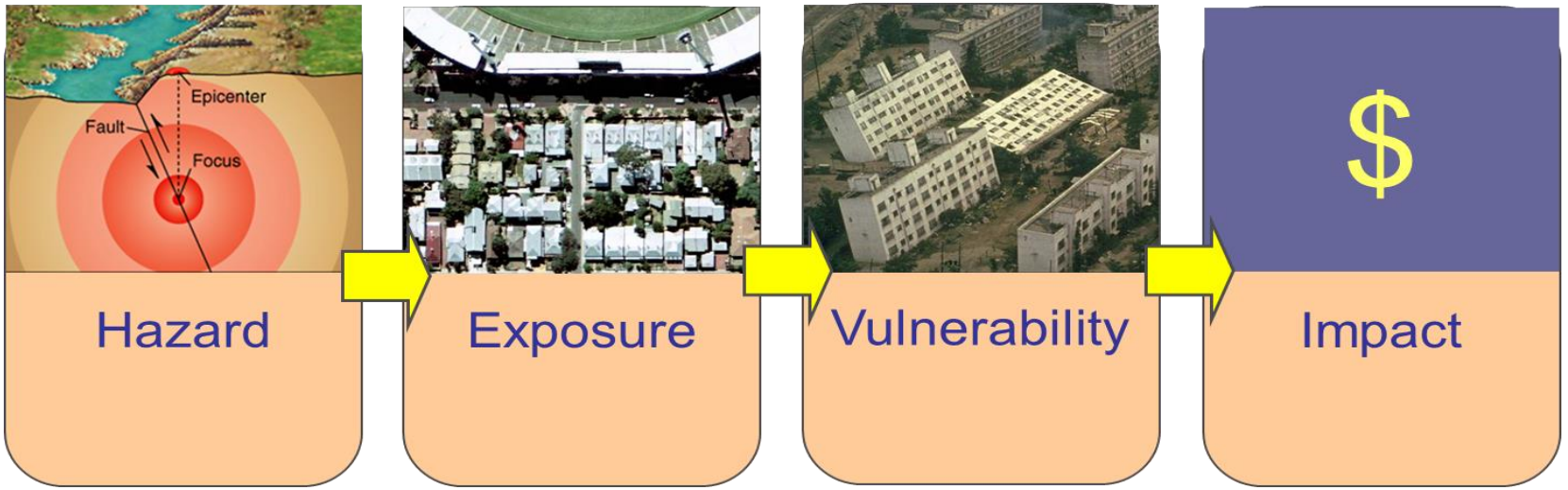
Earthquake Impact and Risk Assessment for Perth and Supporting Infrastructure

Department of Fire and Emergency Services	Lead WA Government agency and coordinator
Geoscience Australia	Risk modelling and infrastructure facility vulnerability assessment
Global Earthquake Model Foundation	Project co-funder providing vulnerability and infrastructure network modelling support
WA Main Roads	Industry partner and collaborator providing transport sector expertise & information
Western Power	Industry partner and collaborator providing electricity sector expertise & information
Water Corporation	Industry partner and collaborator providing water sector expertise & information





Approach - Natural Hazard Risk Framework



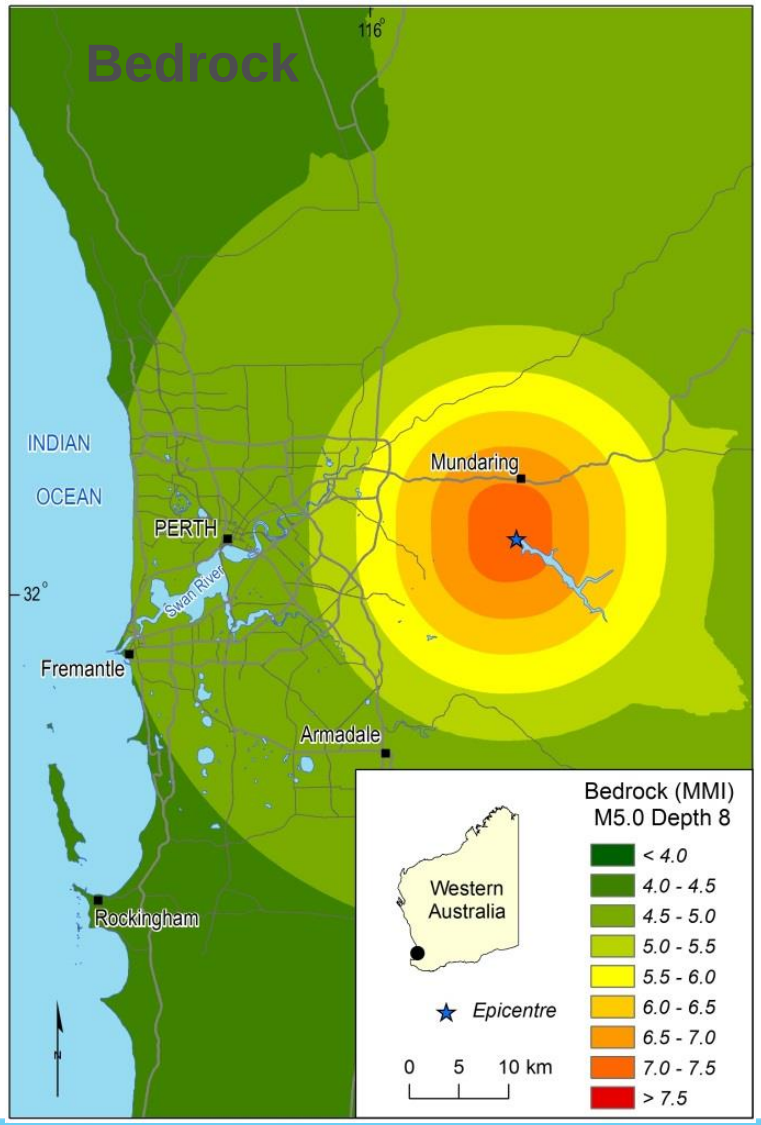
Latest Seismological Science

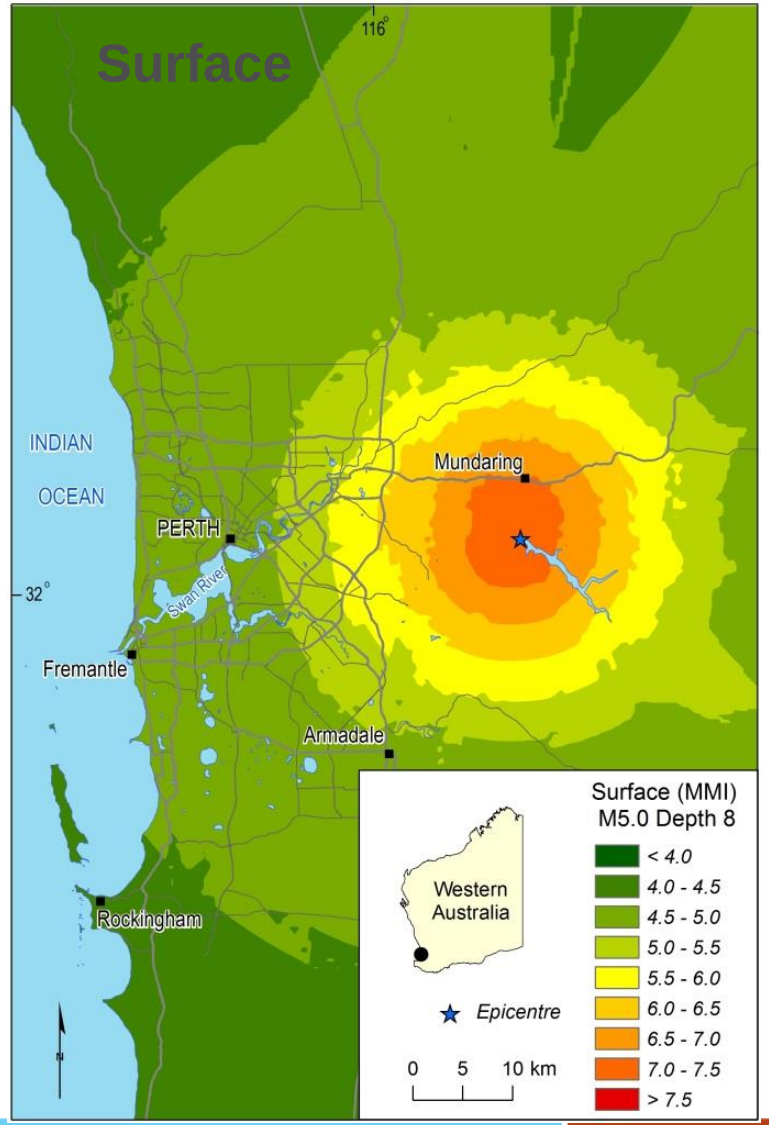
Improved Asset Information

Buildings and Critical Infrastructure
- As-built
- Mitigated

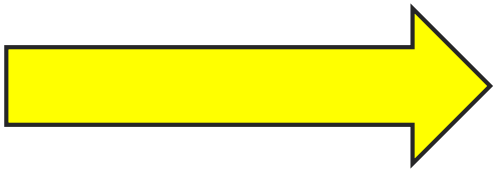
Broad Metric Range including EM Logistics

Ground Motions – Mundaring Weir 2,500yrs (M_W 5.0, Depth 8km)





Combined Impact Results



Impact	Mundaring Weir		
	500yr	1,000yr	2,500yr
Damaged Buildings	34,000	83,000	185,000
Building Triage	17,000	42,000	98,000
Uninhabitable Buildings	140	900	6400
Homeless Population	400	2,500	28,100
Injuries			
Slight	60	150	360
Moderate	5	20	120
Severe	-	-	-
Dead	-	-	-

Are We Ready for the Next Big Shake?

- Australia has ignored earthquake hazard in developing most of its built environment. This has resulting in vulnerable elements in our built environment.
- The understanding of Australian earthquake hazard has advanced and is informing future building regulation development and has highlighted issues with performance in rare events extreme. Rare earthquakes, in contrast to wind, can be very severe and the consequences beyond the limited experience we have in Australia
- The Emergency Management community has made significant strides in understanding the logistics of rare earthquakes to inform their planning.
- Information is needed on existing vulnerability and how to cost-effectively mitigate these.
- While we cannot say we are ready now, several initiatives are supporting the address of legacy vulnerabilities to make our communities more resilient.