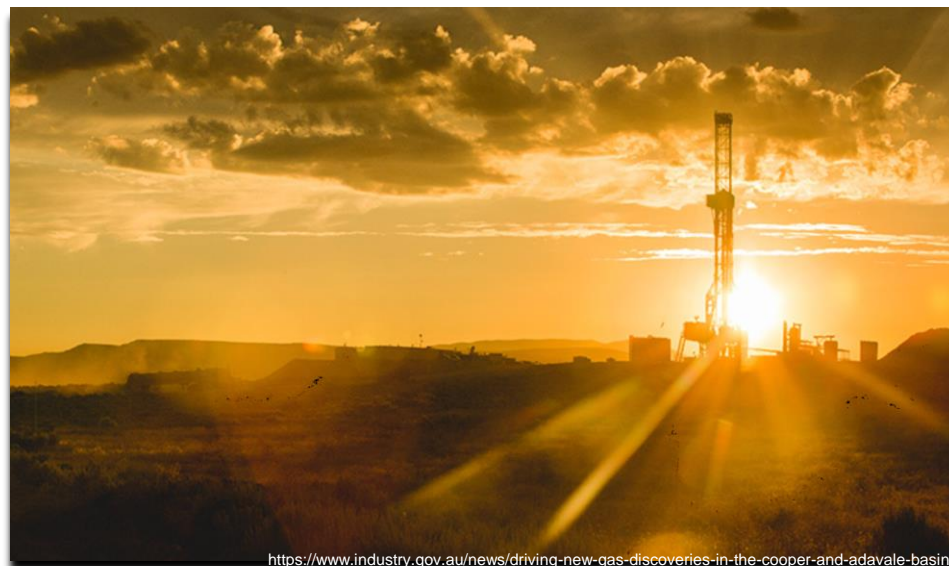




Trusted Environmental and Geological Information

*Supporting resource
development in a
changing world*

Dr Sarlae McAlpine
Dr Meredith Orr, Dr Darren
Ferdinando and Stephen Hostetler



<https://www.industry.gov.au/news/driving-new-gas-discoveries-in-the-cooper-and-adavale-basins>

The Trusted Environmental and Geological Information Program



Collaborative

- Collaboration with CSIRO, pairing geological and environmental expertise



Stakeholder-focused

- Formal stakeholder engagement to ensure data and information is useful, usable and used



Multi-disciplinary

- Petroleum, hydrogen, carbon capture and storage, minerals, surface water, groundwater and the environment

Scope

State of knowledge

- Petroleum, hydrogen, groundwater and carbon storage, minerals (including critical minerals), coal

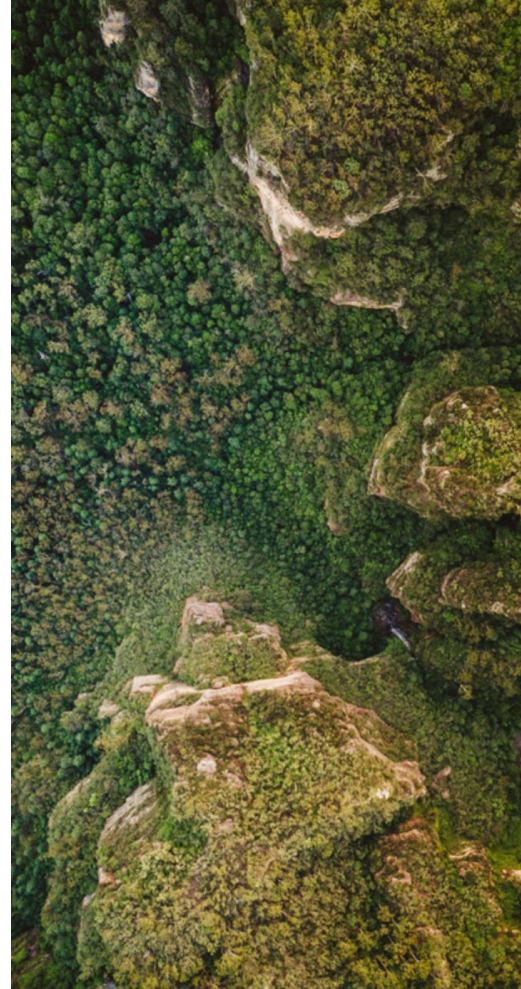
Resource Assessments

- The geological potential for petroleum, hydrogen, groundwater and carbon storage

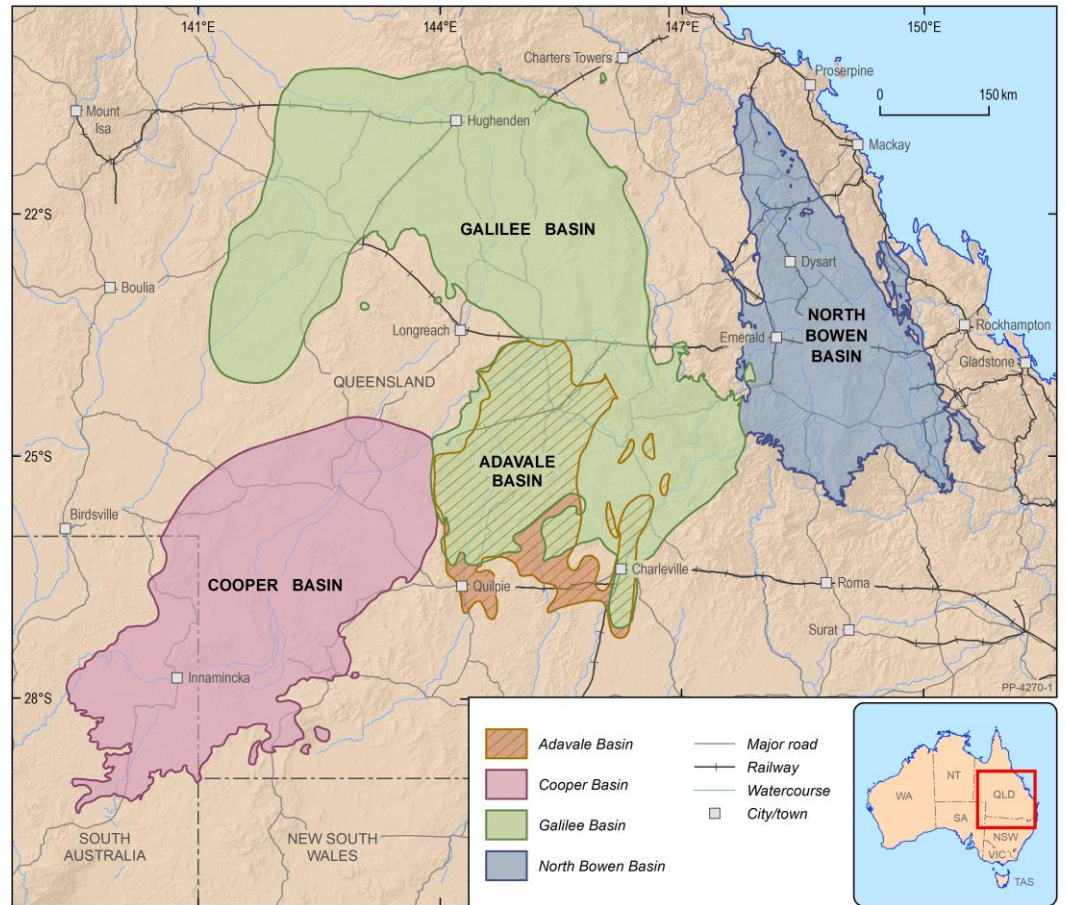
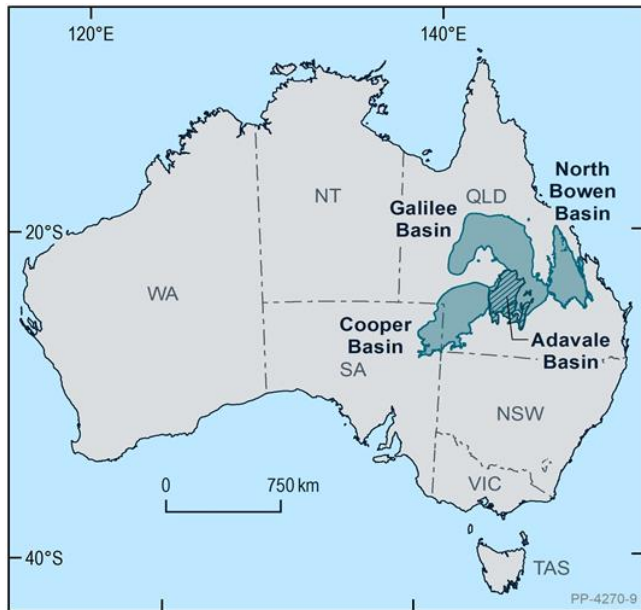
Environmental Assessments

- Potential impacts and hazards with associated with development

Baseline data repository



Basin locations



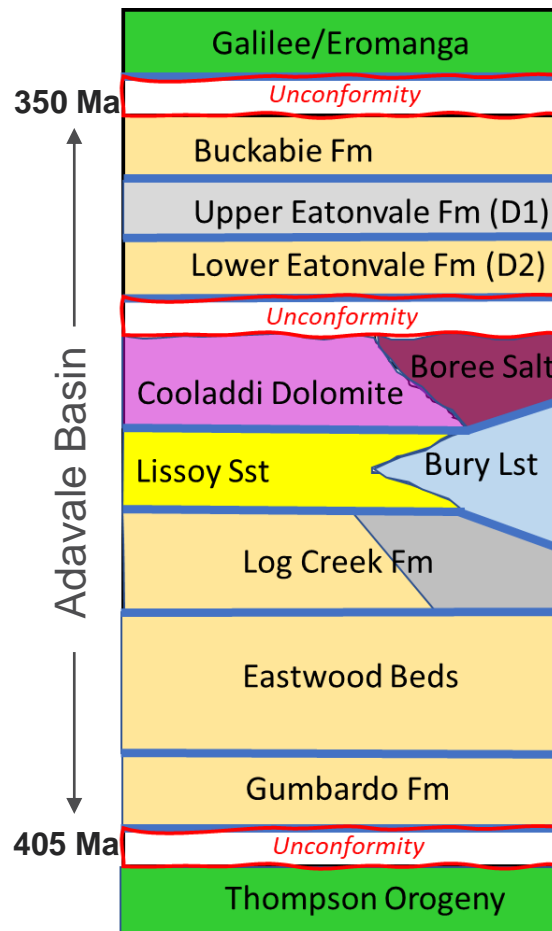
Baseline data repository

Open source ← → Trusted information

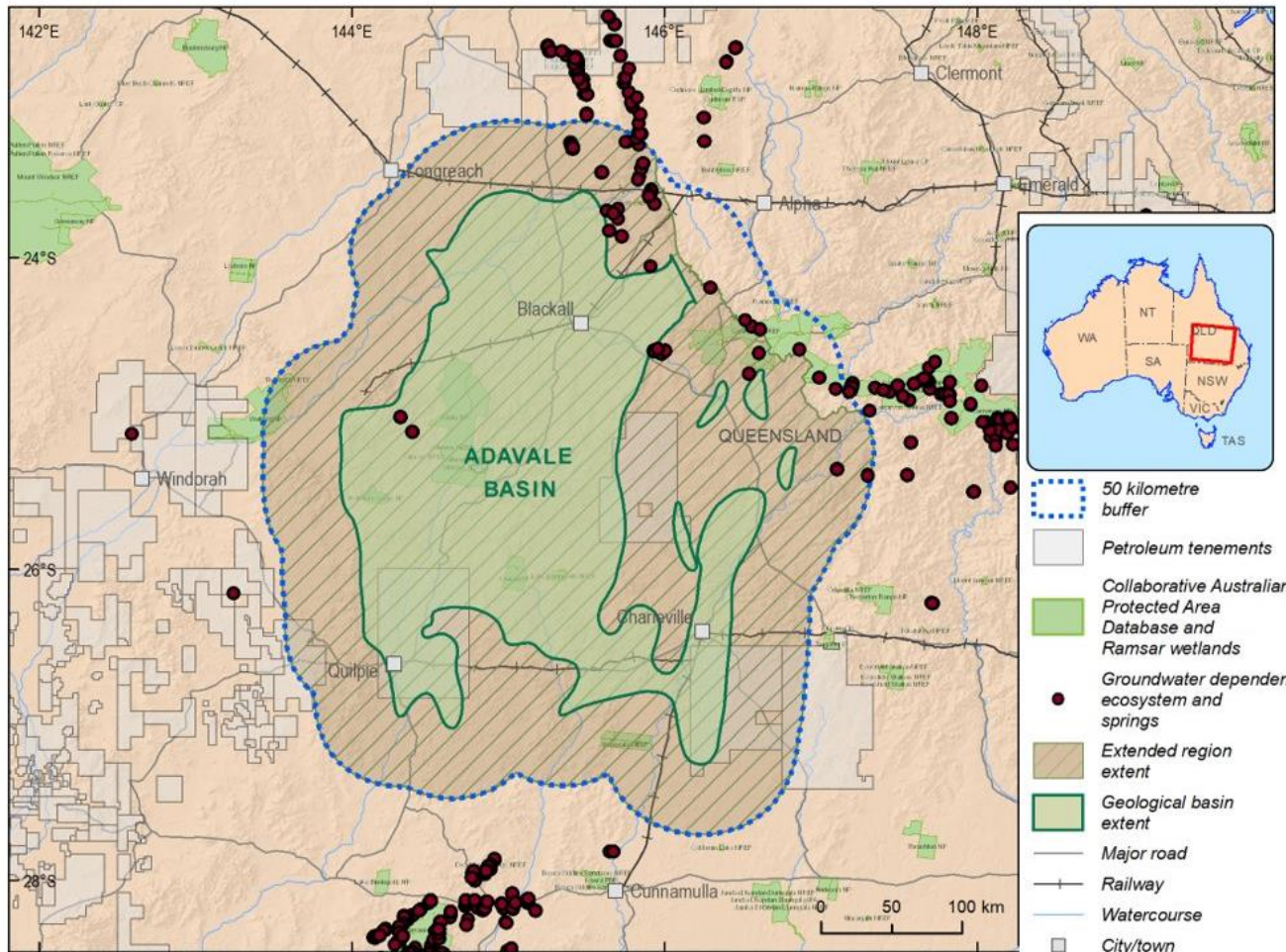
Basin geology	Resource assessments	Groundwater	Surface water	Ecology
Stratigraphic frameworks	→	→		
Key geological surfaces and depths	→	→		
Lithology maps	→	→		
Structural elements	→	→		
	← Gross depositional environment	→		
	← Porosity, permeability, lithotyping	→		
	Reservoir containment and continuity			
	Hydrocarbon occurrences			
	Unallocated groundwater resources			
		← Salinity		
		← Aquifer yield		
		← Pressure and flow surfaces		
		Climate	→	
		GW connectivity	→	
			← GW-Surface water connectivity →	
			Surface water and ecological assets	
				← Protected environmental matters

Adavale Basin

- 2000-3500 m deep
- Underlies Galilee, Eromanga and Lake Eyre basins
- Deposited between 405 to 350 Ma
- One modest sized gasfield at Gilmore
- Boree salt occurrence

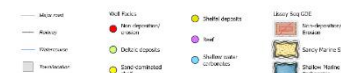
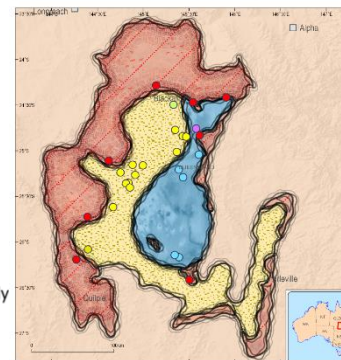
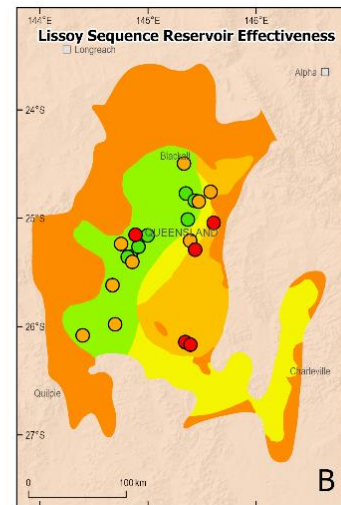
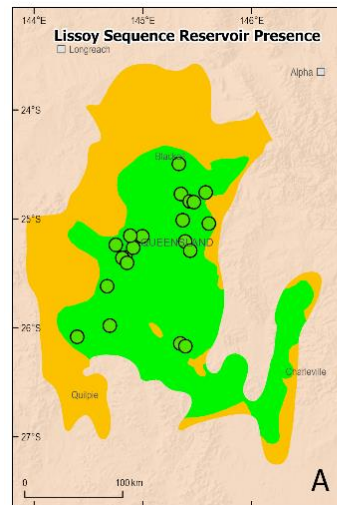


Assessment Extent



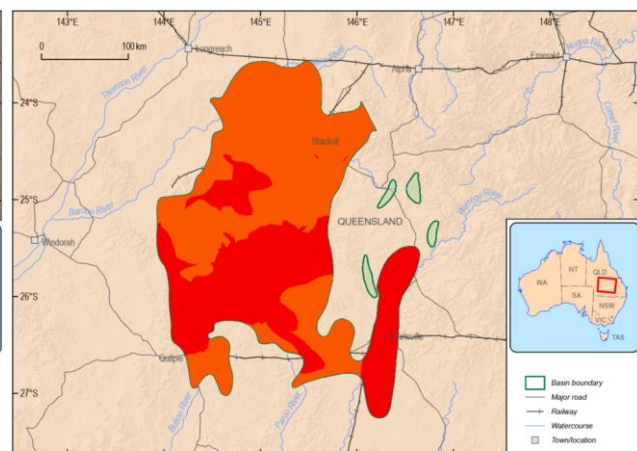
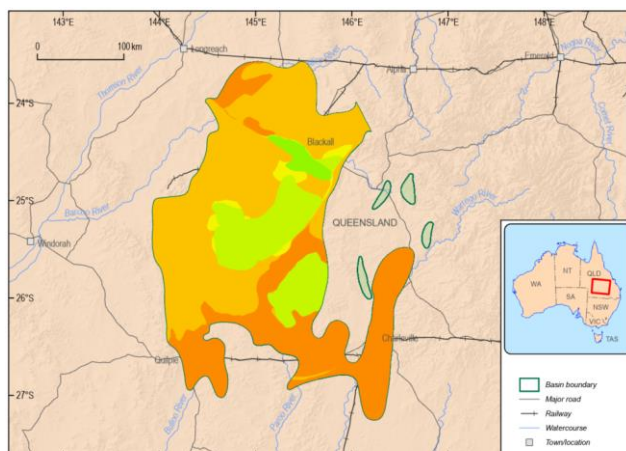
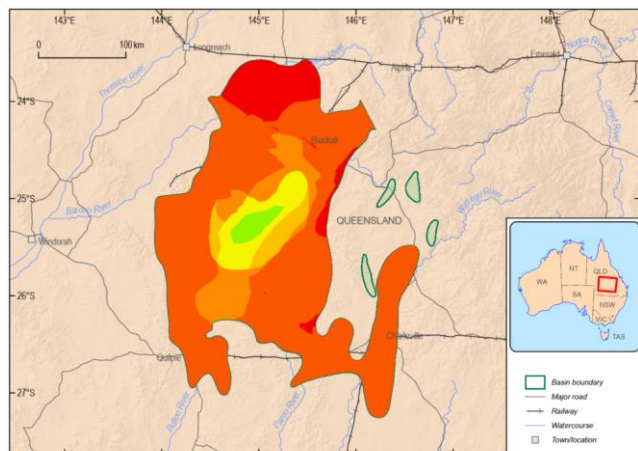
Resource Potential

- Resource Potential assessed for: conventional and unconventional hydrocarbon, carbon capture and storage and hydrogen.
- Play-based, spatial assessments based on geological criteria.
- For each play we analyse the geological elements that make a successful conventional or unconventional hydrocarbon accumulation or CCS site.
- Every play has 35 geological elements that are assessed.



Resource Assessments

From the play-based approach we layer the various geological elements to show the areas where there is potential for hydrocarbons or carbon storage

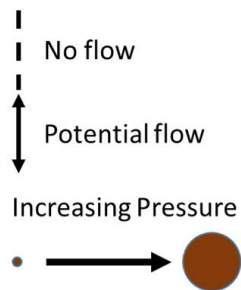
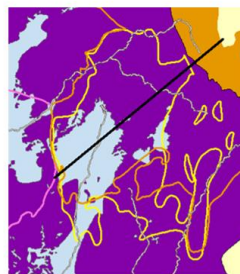
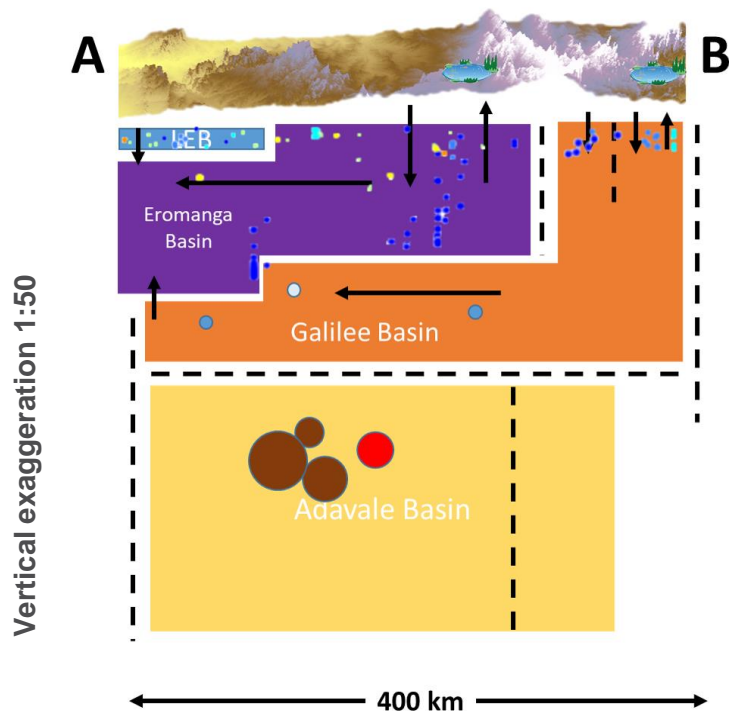


Adavale Basin
Conventional Hydrocarbons

Adavale Basin
Unconventional Hydrocarbons

Adavale Basin
Carbon Capture & Storage

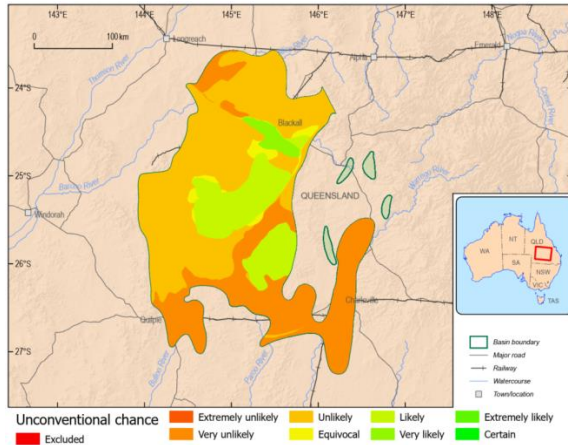
A groundwater perspective



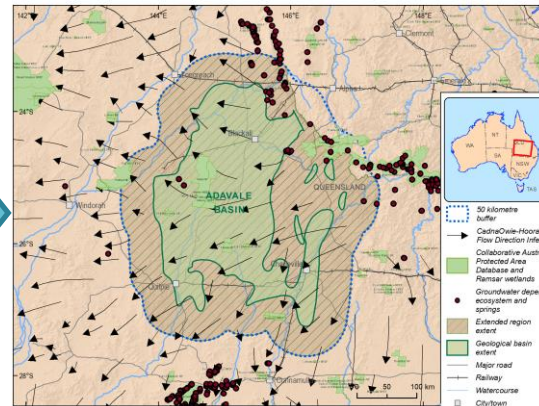
Salinity (mg/L)	Use
● <500	All purposes, domestic and irrigation
● 501-1500	Most purposes, upper limit for drinking
● 1501-3000	Limited irrigation, all livestock
● 3001-7000	Most livestock (not pigs, horses)
● 7001-14 000	Some livestock (beef, cattle, sheep)
● 14 000-35 000	Limited industrial use, ore processing
● 35 000-100 000	Seawater and above, ore processing
● >100 000	Brine production, ore processing

Linking resource and environmental assessments

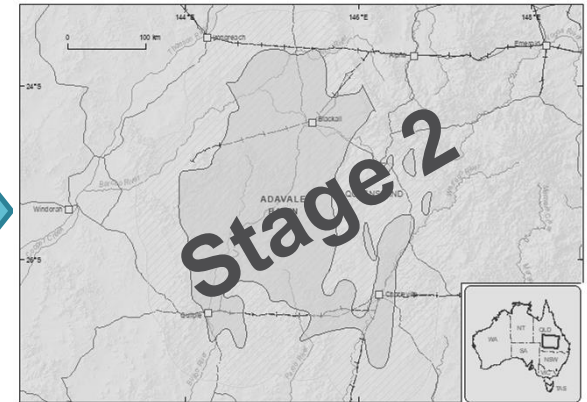
Resource potential maps

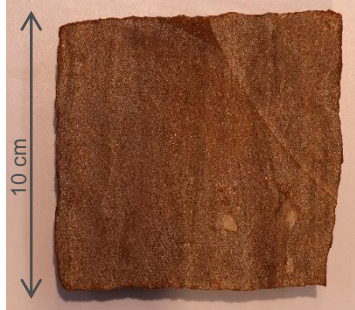
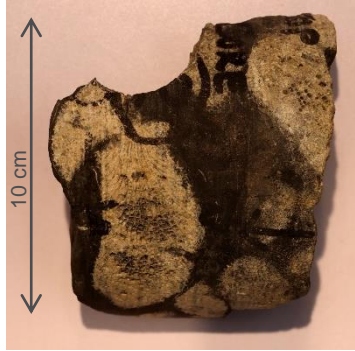


combined with environmental assessments



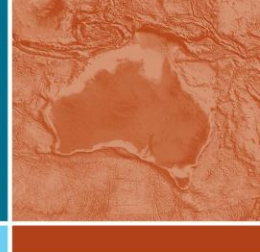
define areas of concern for potential impacts





Summary

- Linked resource and environmental assessments
- Products include regional-scale maps that characterise the conventional and unconventional energy potential as well as groundwater quality, flow and yield
- Evidence-base for decision makers
- An understanding of resources potential
- A data repository of transparent, trusted baseline geological and environmental data
- Optimisation of the regulatory pathway while safeguarding environmental protections, increase regulatory efficiency, and accelerating energy resource development in a changing world



For more information

<https://www.ga.gov.au/about/projects/resources/trusted-environmental-and-geological-information-program>

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Gilmore 1 – Log creek Formation

10 cm