



SHELL'S USE OF SCIENCE IN DE-RISKING PROJECTS

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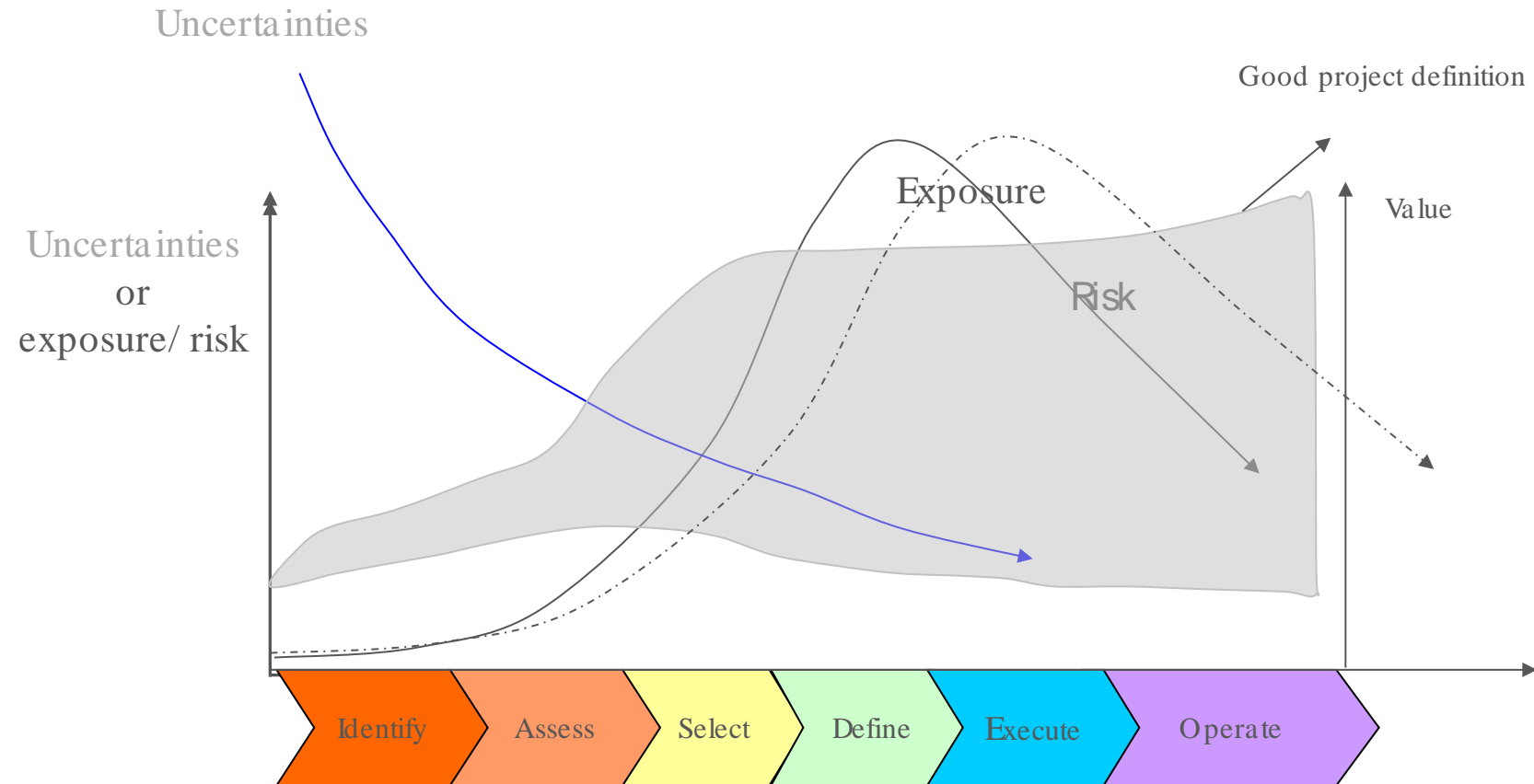




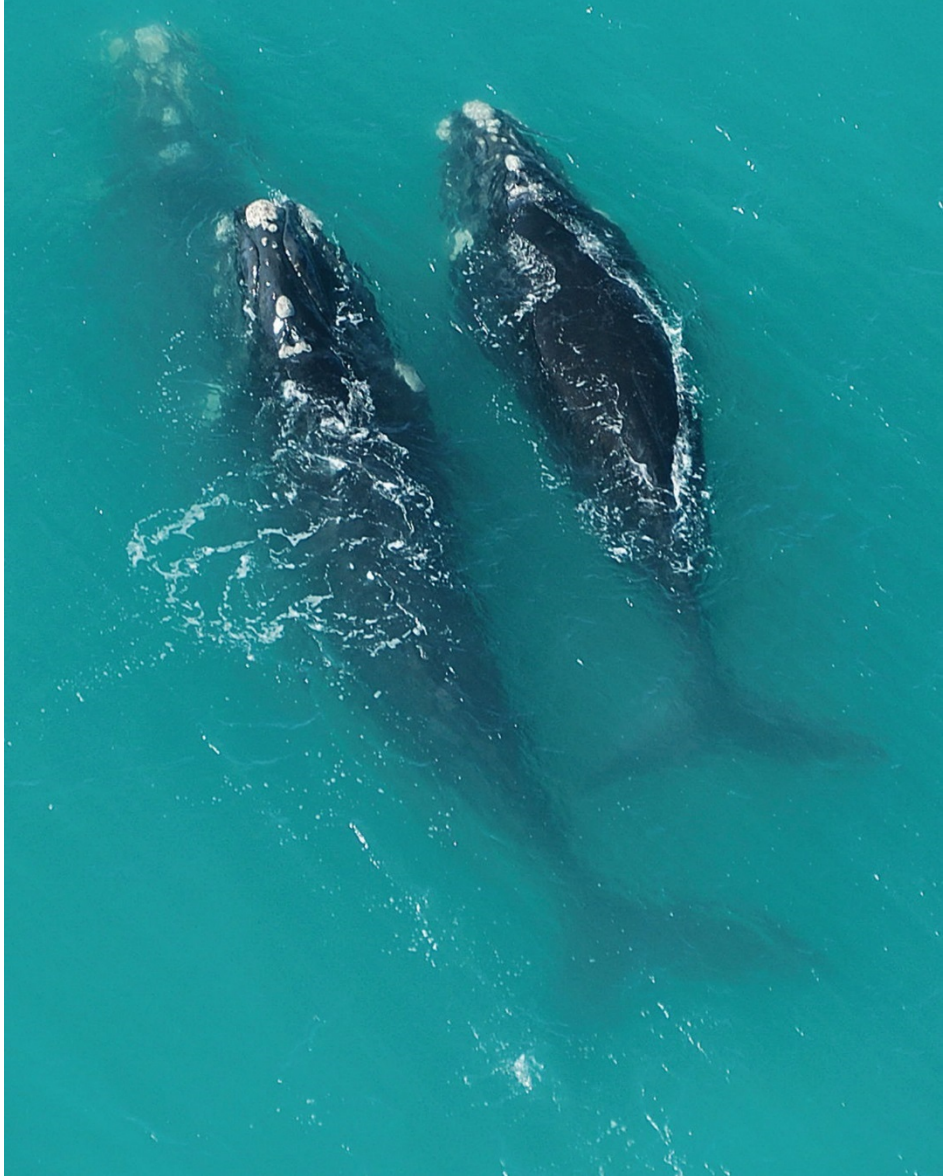
OVERVIEW

- Use of Science and Technology to De-Risk Projects
- Examples of Applying Science in the De-Risking Process:
 - ⇒ Understanding temporal frequency of whales
 - ⇒ Understanding groundwater and spatial constraints in the Karoo
- Supporting Scientific Research:
 - ⇒ Donating Seismic Data to Universities
 - ⇒ Funding Geological Science
- De-Risking the Karoo Basin

Use of Science and Technology to De-Risk Projects



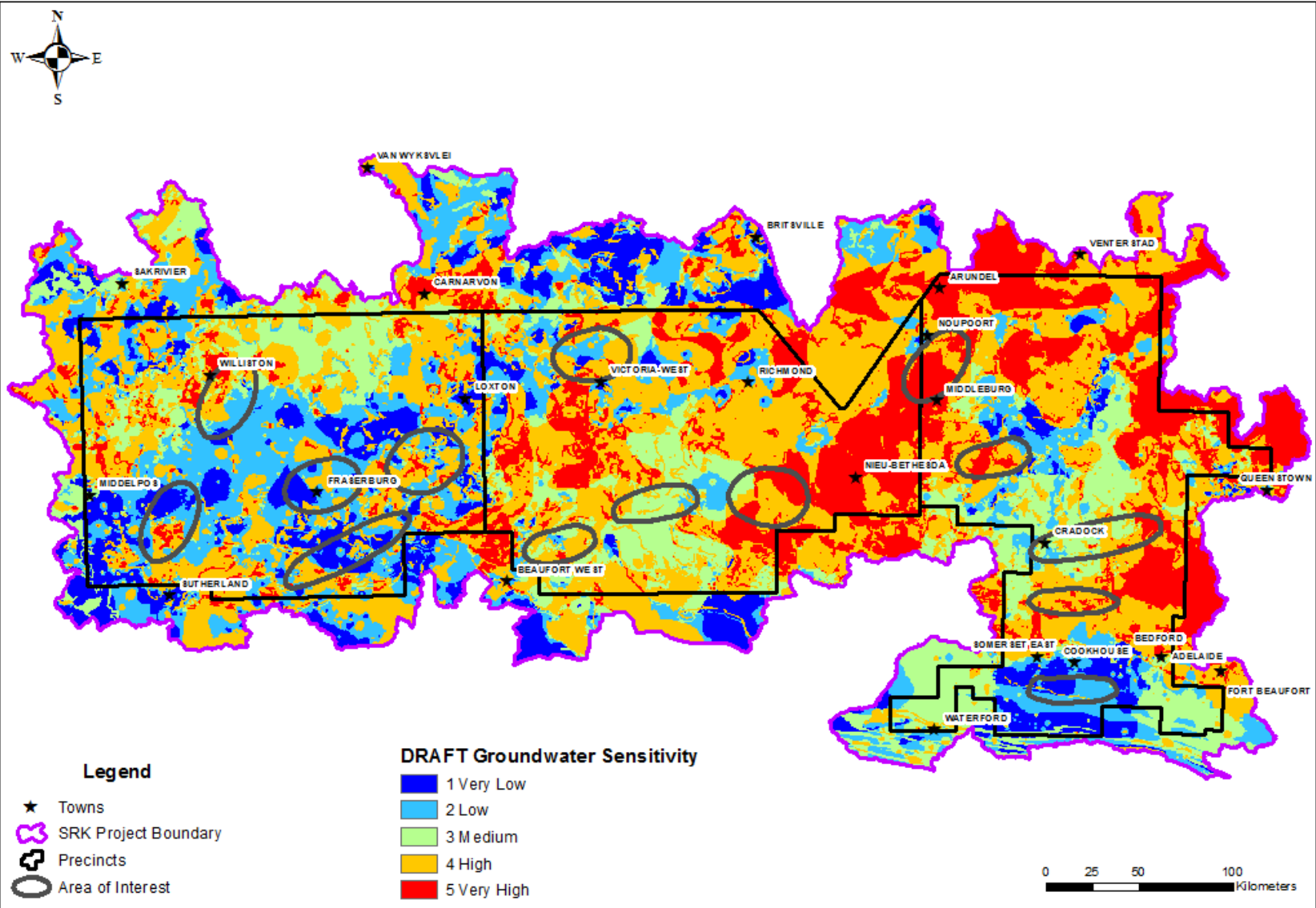
Example of Applying Science in the De-Risking Process



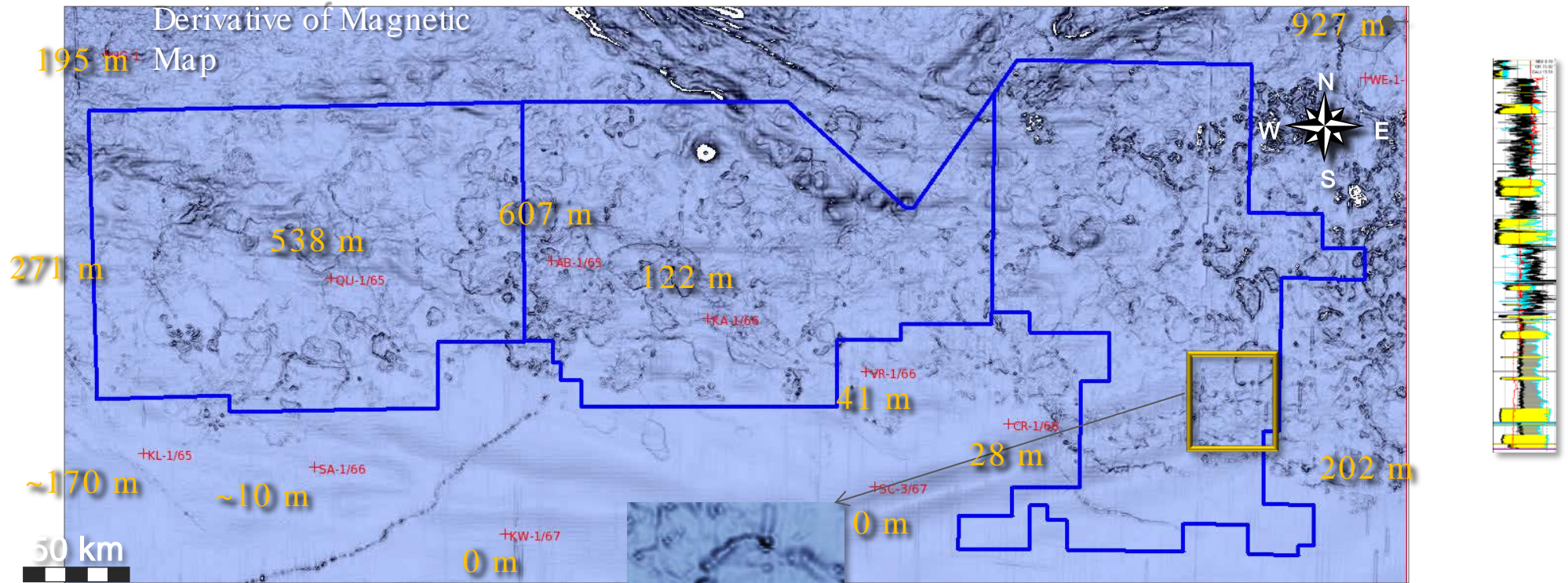
De-Risking Process: Understanding Temporal Frequency of Whales

		Possible Interaction Frequency	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Whales	Humpback	Daily	M	M	L	L	L	H	H	M	M	L	M	H
	Bryde's Offshore	Occasionally	H	H	H	L	L	L	L	L	L	L	L	L
	Sei	Occasionally	L	L	L	L	H	H	L	H	H	H	L	L
	Fin	Occasionally	M	M	M	H	H	H	M	H	H	H	M	M
	Southern Right	Rarely	H	M	L	L	L	H	H	H	M	M	H	H
	Minke	Rarely	M	M	M	H	H	H	M	H	H	H	M	M
	Bryde's Inshore	Very Rarely	L	L	L	L	L	L	L	L	L	L	L	L
	Blue	Very Rarely	L	L	L	L	L	H	H	H	L	M	L	L
	Pygmy right	Very Rarely	H	H	H	M	L	L	L	L	L	L	M	M

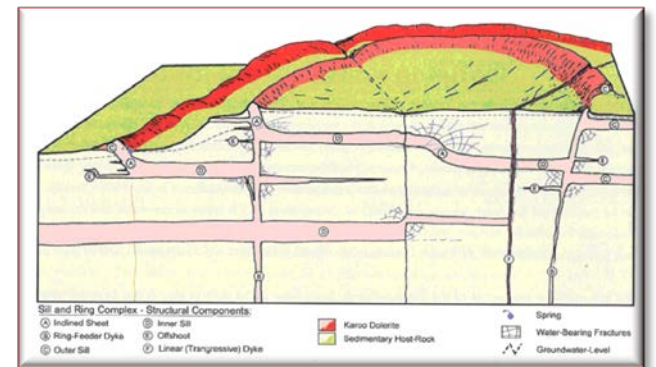
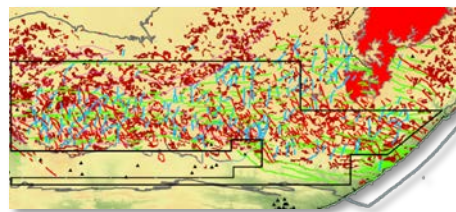
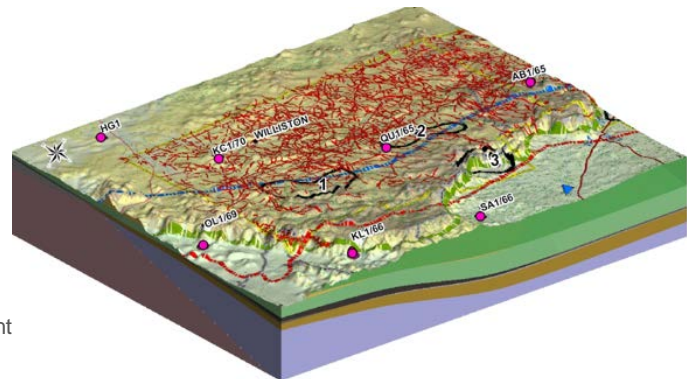
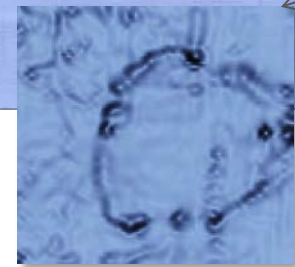
Example of Applying Science in the De-Risking Process: Groundwater



Example of Applying Science in the De-Risking Process: Dolerites & Faults

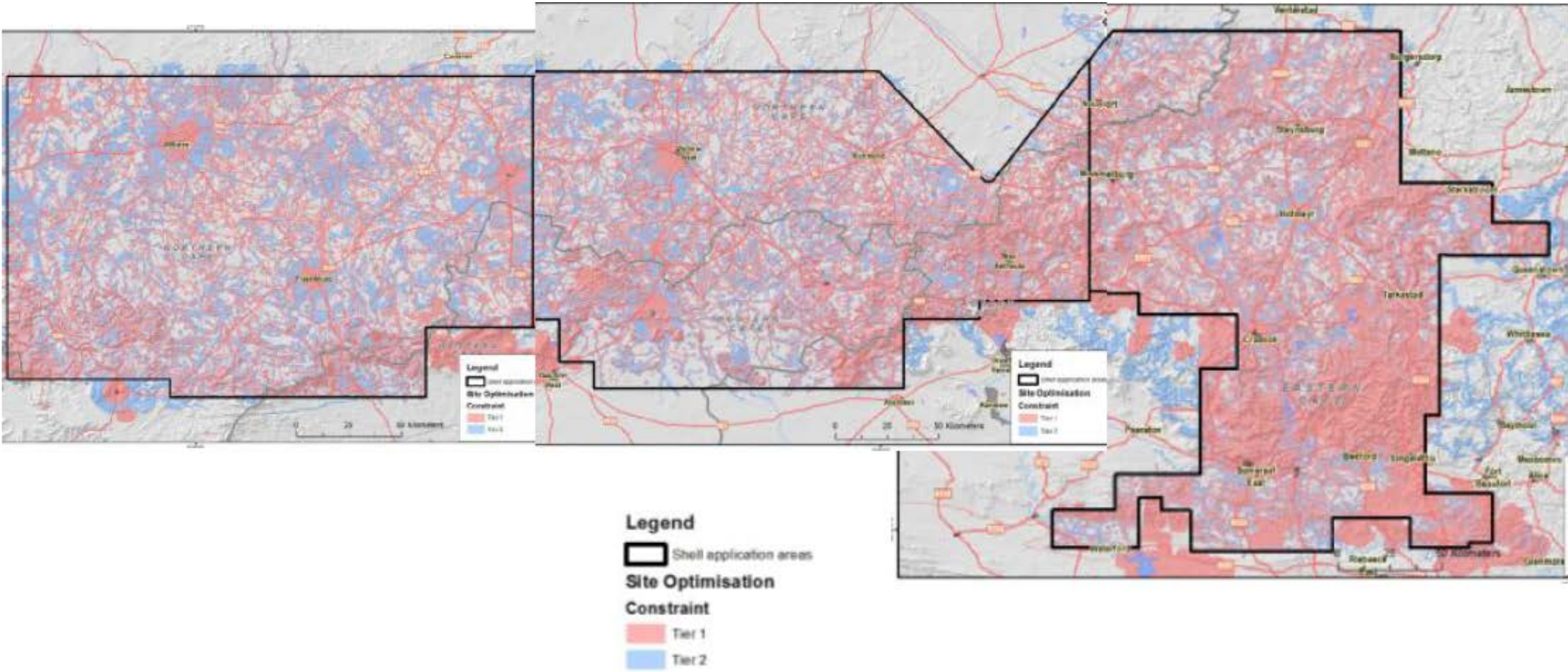
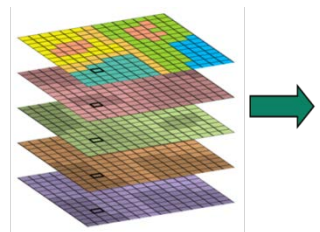


Source: M. Poupon, Q. van de Laarschot, 2011

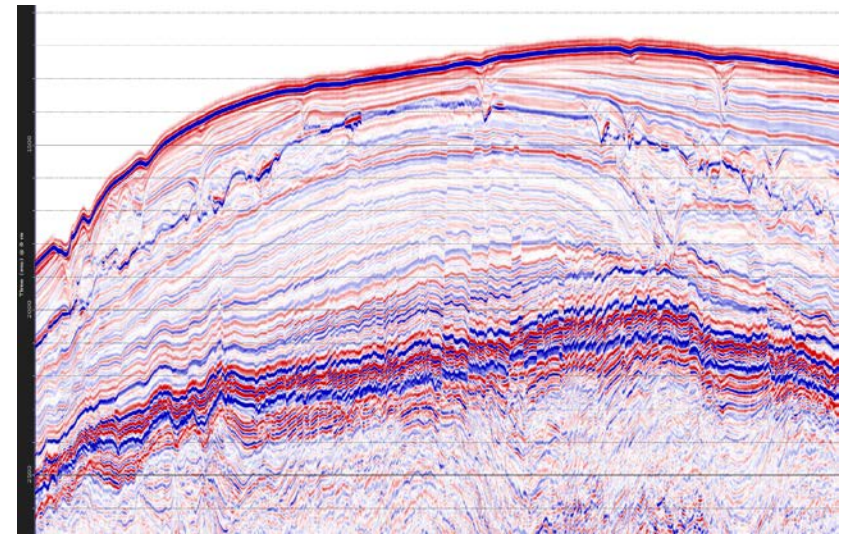
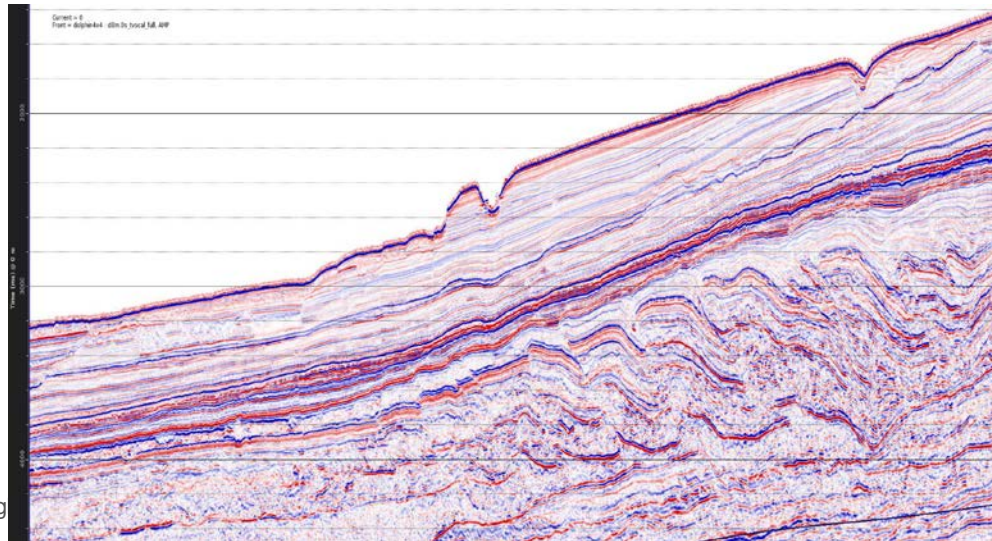
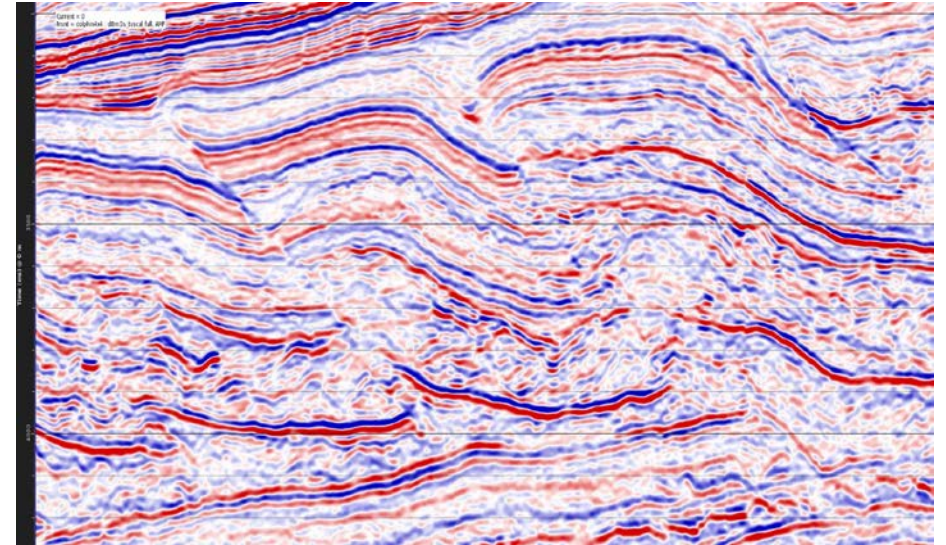
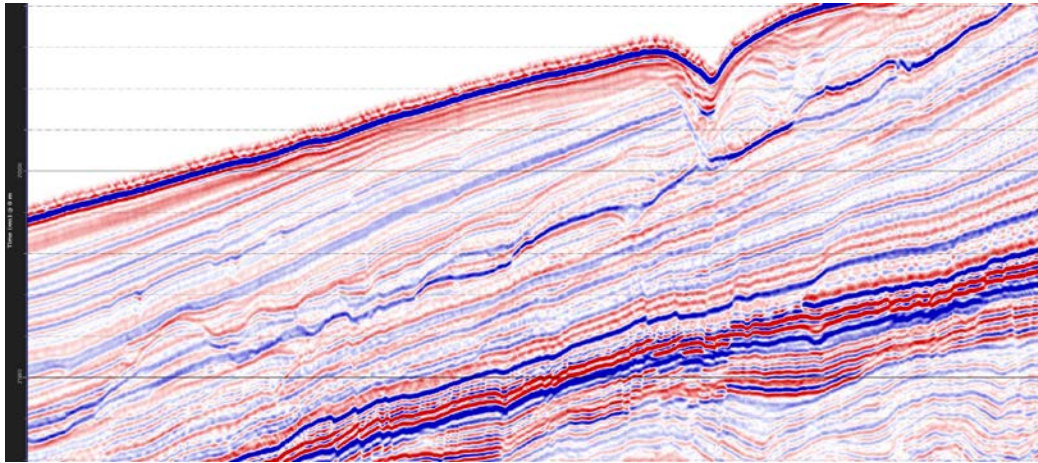


Source: L.Chevallier et al, 2001

Example of Applying Science in the De-Risking Process: Spatial Constraints



Supporting Scientific Research: Donating Seismic Data

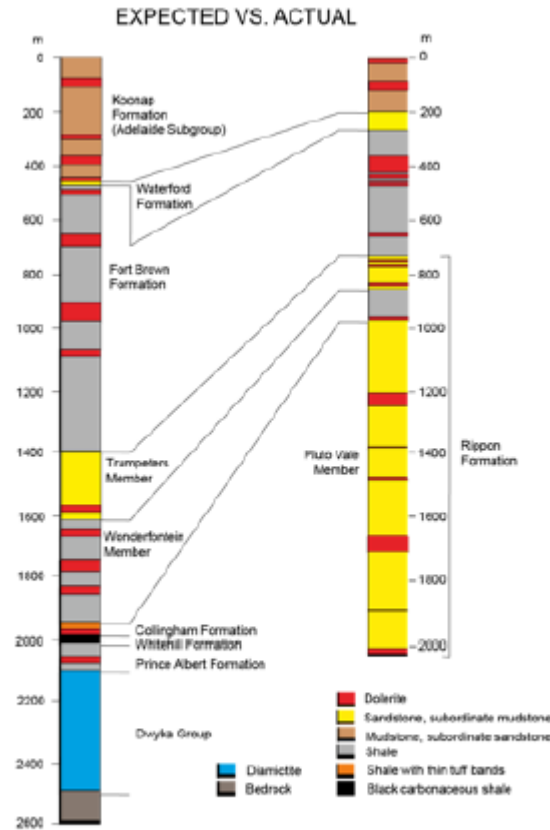


Supporting Scientific Research: The Karoo Research Initiative (KARIN)



6 m core (dolerite)
- Photo by Geoserve

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Shale gas potential of the Main Karoo Basin

Externality costs of coal-based electricity

South African timber products in green building

Perspectives of wild medicine harvesters in Cape Town

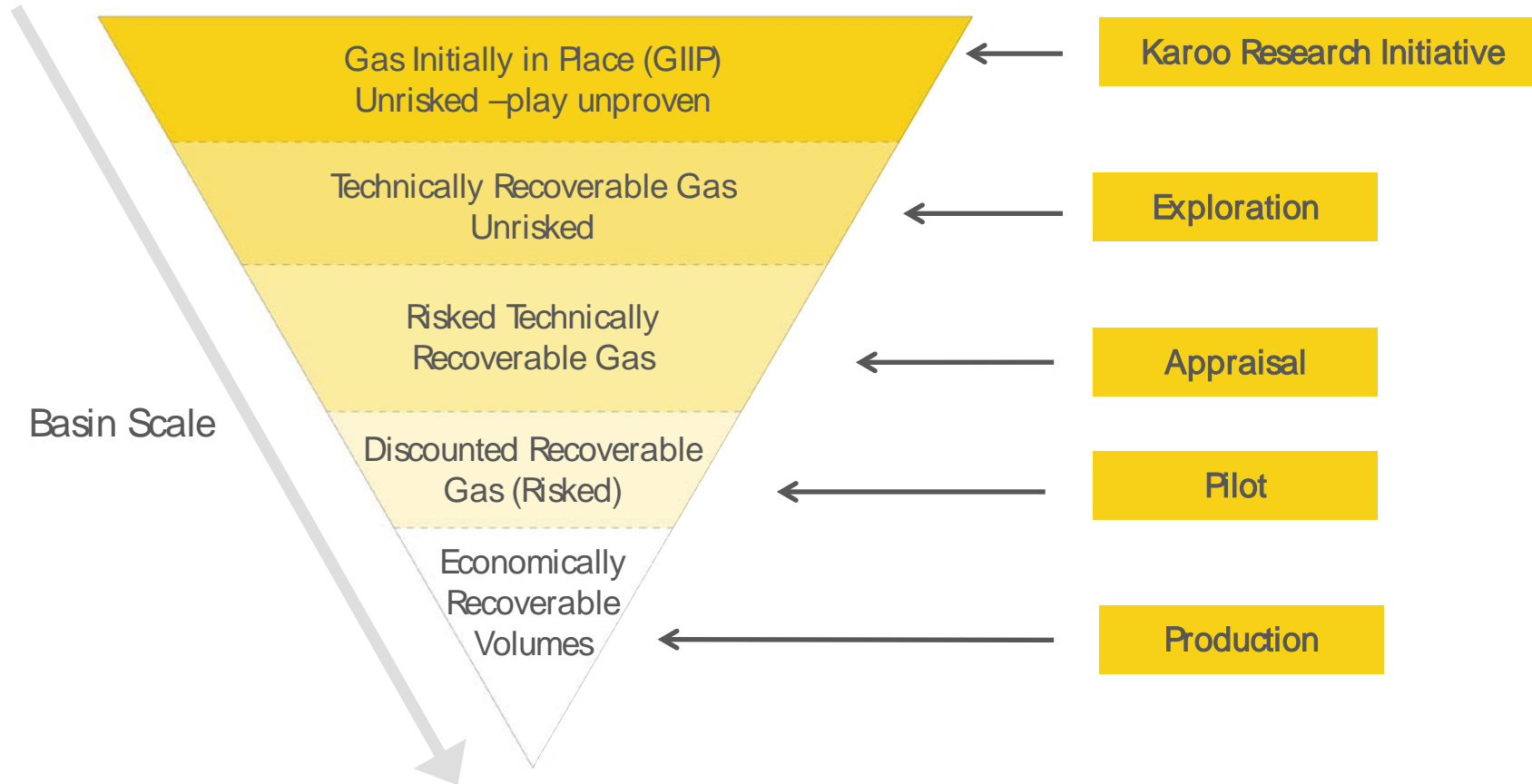
DNA barcoding for pollen identification

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De-Risking the Karoo Basin using Science & Technology



Shell Contributed To Karoo Scientific Assessment

