Risk Assessment Tools for GDEs – A case study from South East, South Australia

(2008 - 2010)
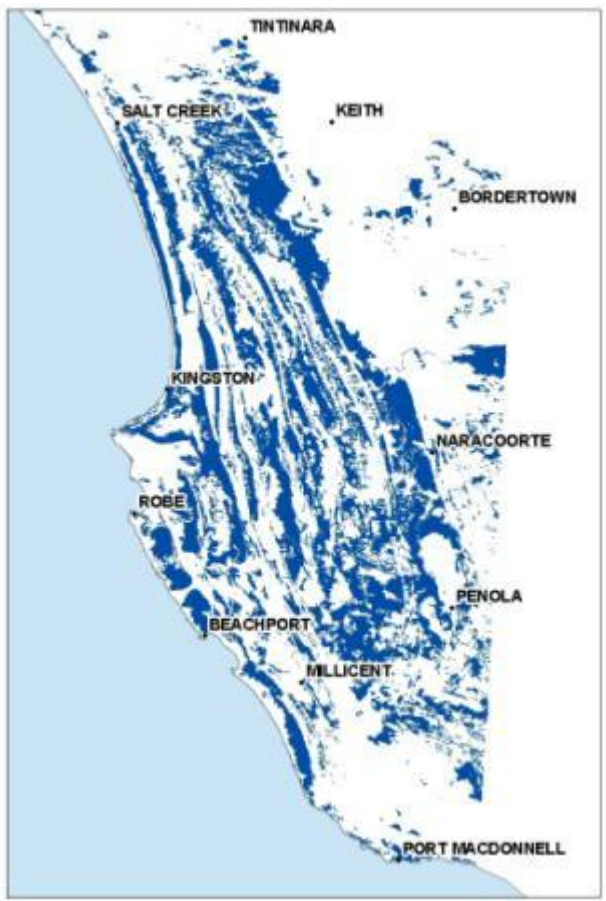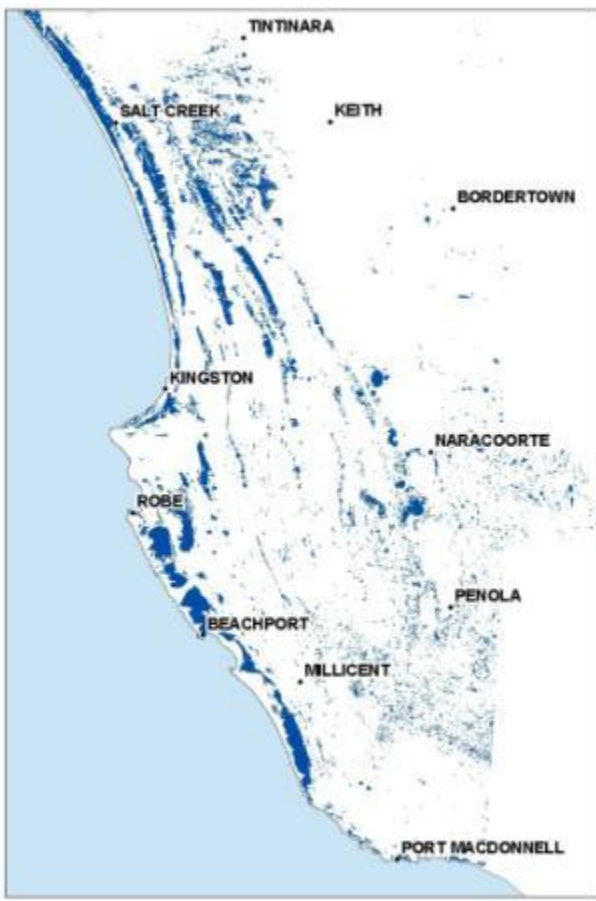
Project Background

Pre-European wetland extent

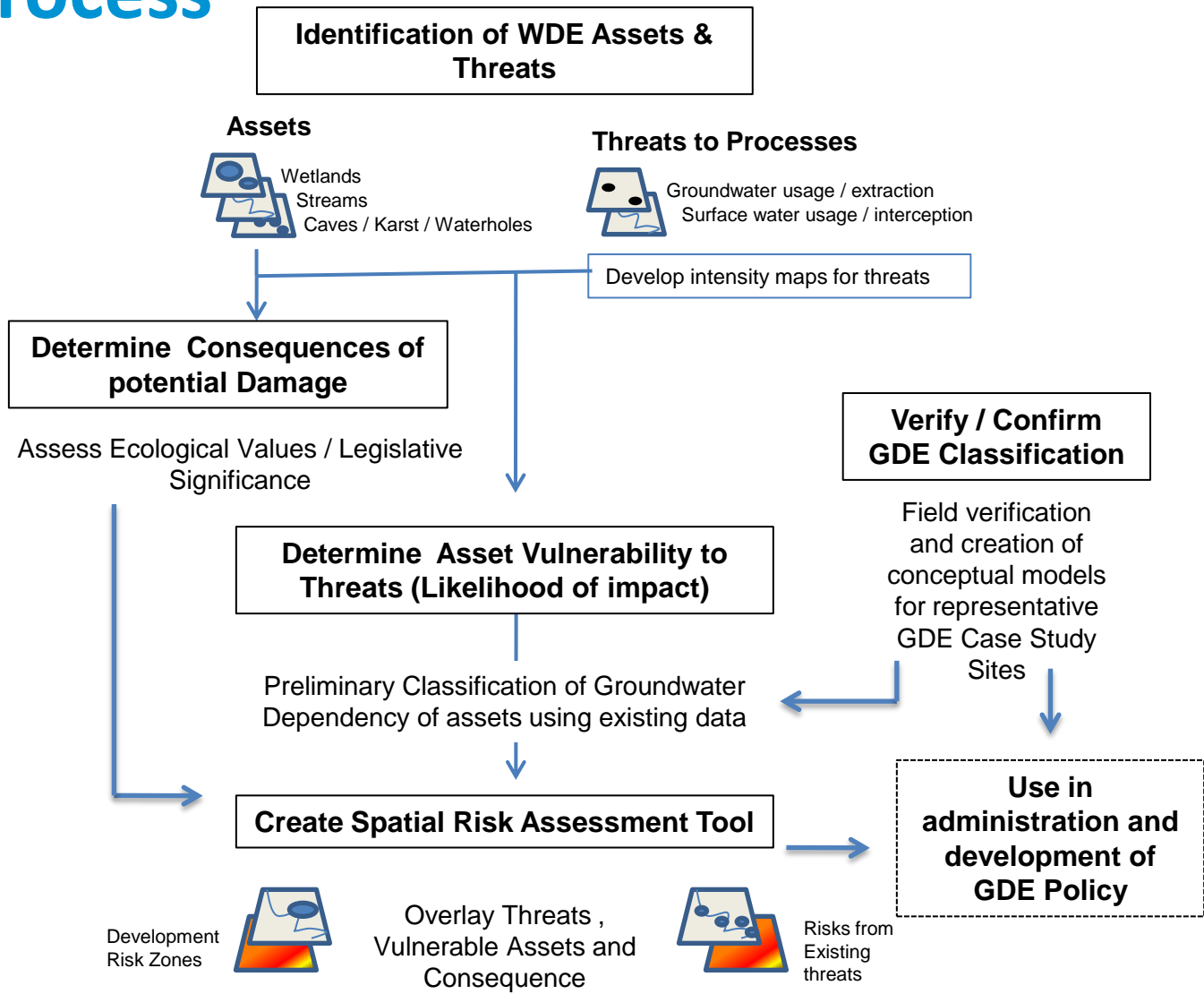**Current wetland extent**

Study Area – South East, SA

- <6% of the regions wetlands remain
- Over 16000 mapped wetland features
- Likely high degree of groundwater dependence on the shallow groundwater
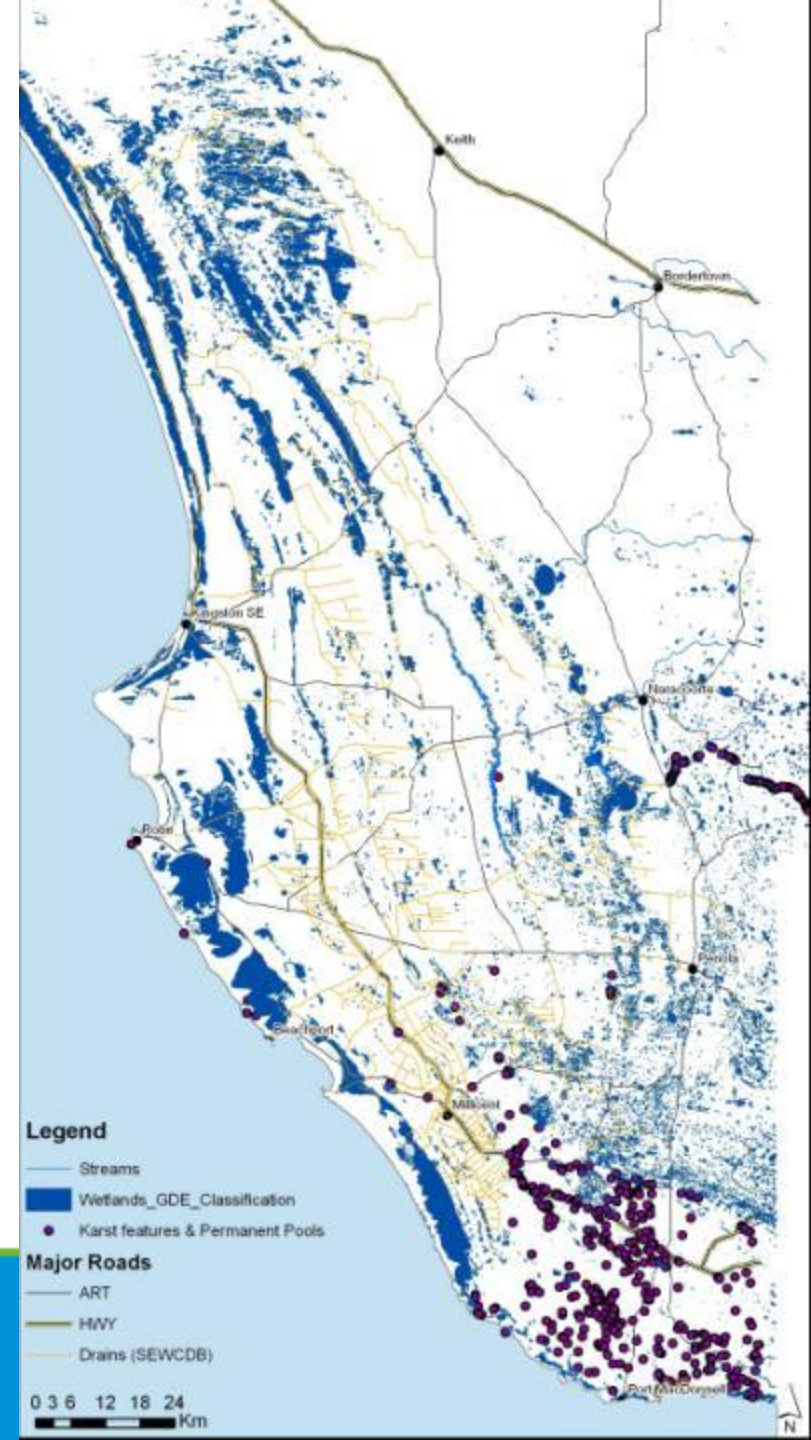- Groundwater level decline causing changes in wetland water regime

Process

Identification of WDE Assets & Threats

Assets

Wetlands
Streams
Caves / Karst / Waterholes

Threats to Processes

Groundwater usage / extraction
Surface water usage / interception

Develop intensity maps for threats

Determine Consequences of potential Damage

Assess Ecological Values / Legislative Significance

Verify / Confirm GDE Classification

Field verification and creation of conceptual models for representative GDE Case Study Sites

Determine Asset Vulnerability to Threats (Likelihood of impact)

Preliminary Classification of Groundwater Dependency of assets using existing data

Create Spatial Risk Assessment Tool

Use in administration and development of GDE Policy

Development Risk Zones

Overlay Threats, Vulnerable Assets and Consequence

Risks from Existing threats

Process

Identification of Water Dependent Ecological Assets

Existing spatial data identifying WDEs was collated, including:
• Wetlands mapping and biological and physico-chem inventory data;
• Streams;
• Instream permanent pool mapping;
• Karst features;
• Aquatic species records (Biological databases / Native Fish Inventory)

Legend
— Streams
■ Wetlands_GDE_Classification
• Karst features & Permanent Pools
Major Roads
— ART
— HWY
— Drains (SEWCDB)

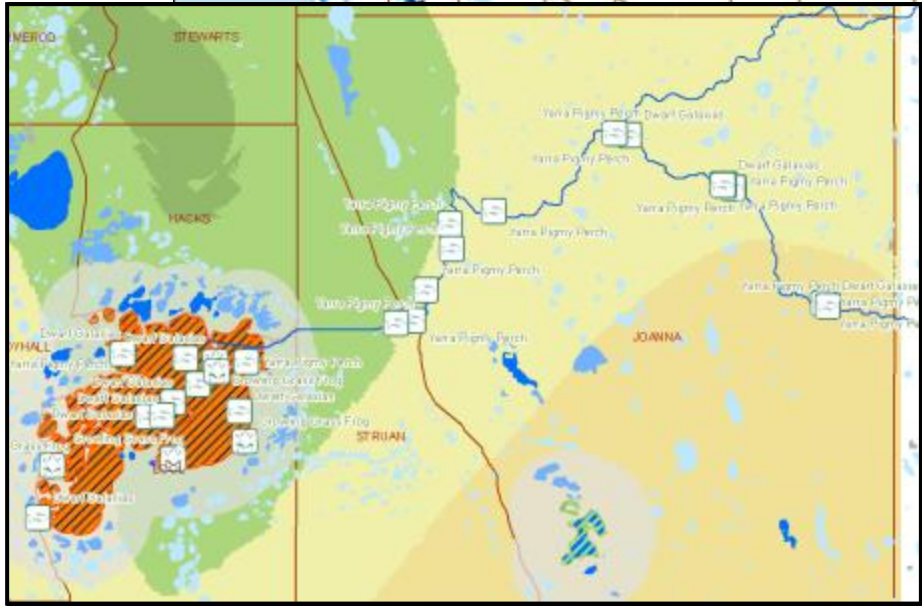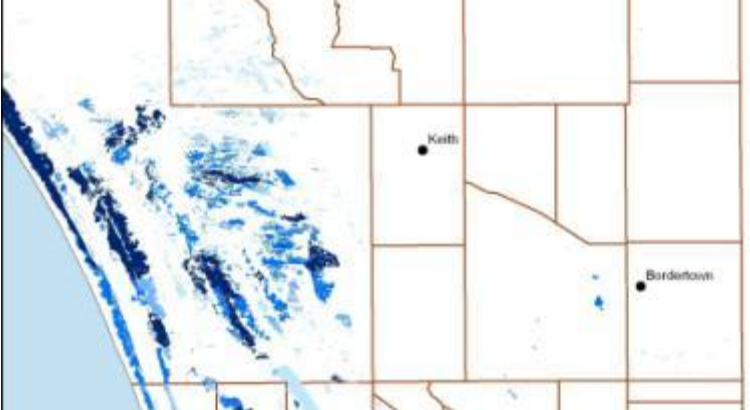0 3 6   12 18 24
Km

Process

Determine Consequences of Potential damage

WDEs were prioritised to identify ecosystems of ecological significance, based on:

1. Landscape naturalness and connectivity
2. Diversity & richness
3. Threatened species and ecosystems
4. Special features

Specific matters of legislation and policy identified, including:
- EPBC Act – threatened aquatic species
- State threatened aquatic species
- RAMSAR sites
- Specific Water Allocation Plan policy area (proposed buffers / groundwater trigger levels)


Legend

Significant Wetlands
Ecological Significance Level

- Very High
- High
- Moderate
- Low
- Not Assessed

0 3 6 12 18 24
Km

Process

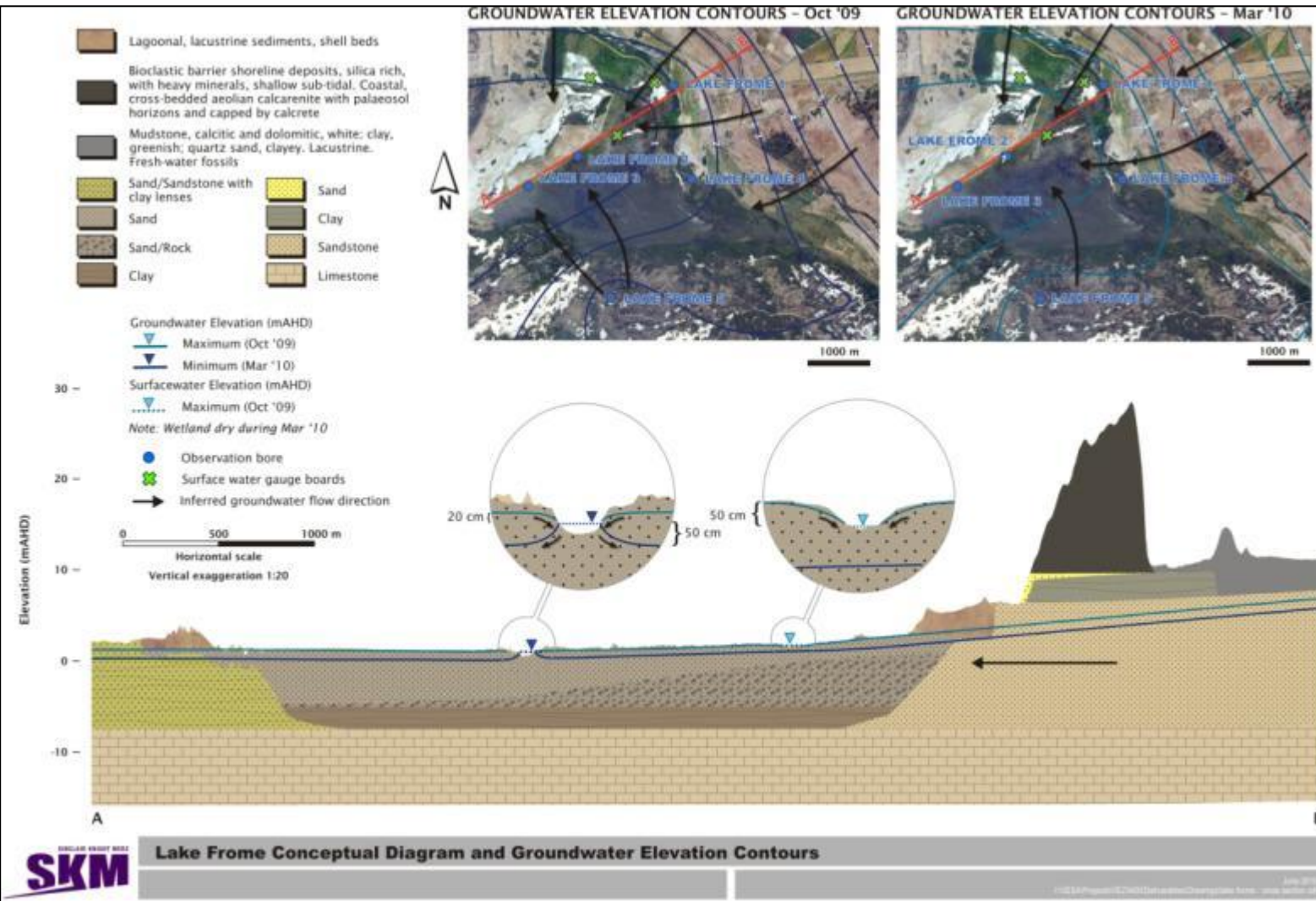**Verification of the GDE Classification**

GDE Case Study Monitoring Sites

- 14 sites (wetland / wetland complexes), chosen for:

  - High ecological value

  - High risk (groundwater affecting activities)

  - Representative wetland types (e.g. Karst sinkholes, coastal lakes, inland inter-dunal, grass and sedge marshes)

  - Different levels of likelihood and seasonality of groundwater dependence as identified through the landscape scale classification
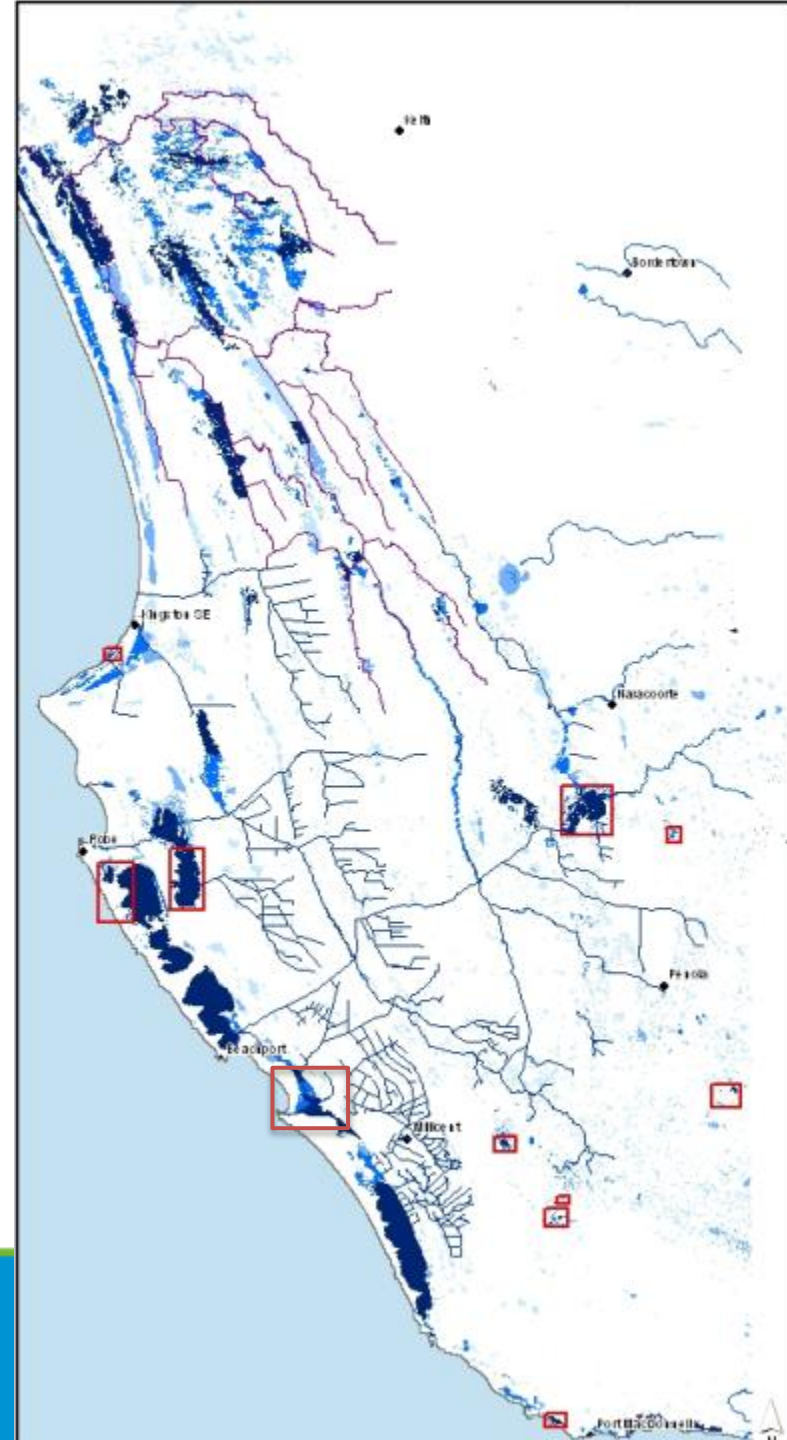
Outputs – conceptual diagrams

- Identify stratigraphic barriers to flow

- Conceptualise seasonality of groundwater discharge, recharge and flow direction.

- Up-scale to improve confidence / validate landscape scale classification

Lake Frome Conceptual Diagram and Groundwater Elevation Contours

GDE Classification Matrix – South East

Classification Category GDE Likelihood	Depth to Watertable (Spring Avg (closest to ground level))
Very High (Connected)	<0
High (Connected)	0 – 5
Moderate (Potentially Connected)	5 – 10
Low (Potentially Disconnected)	>10