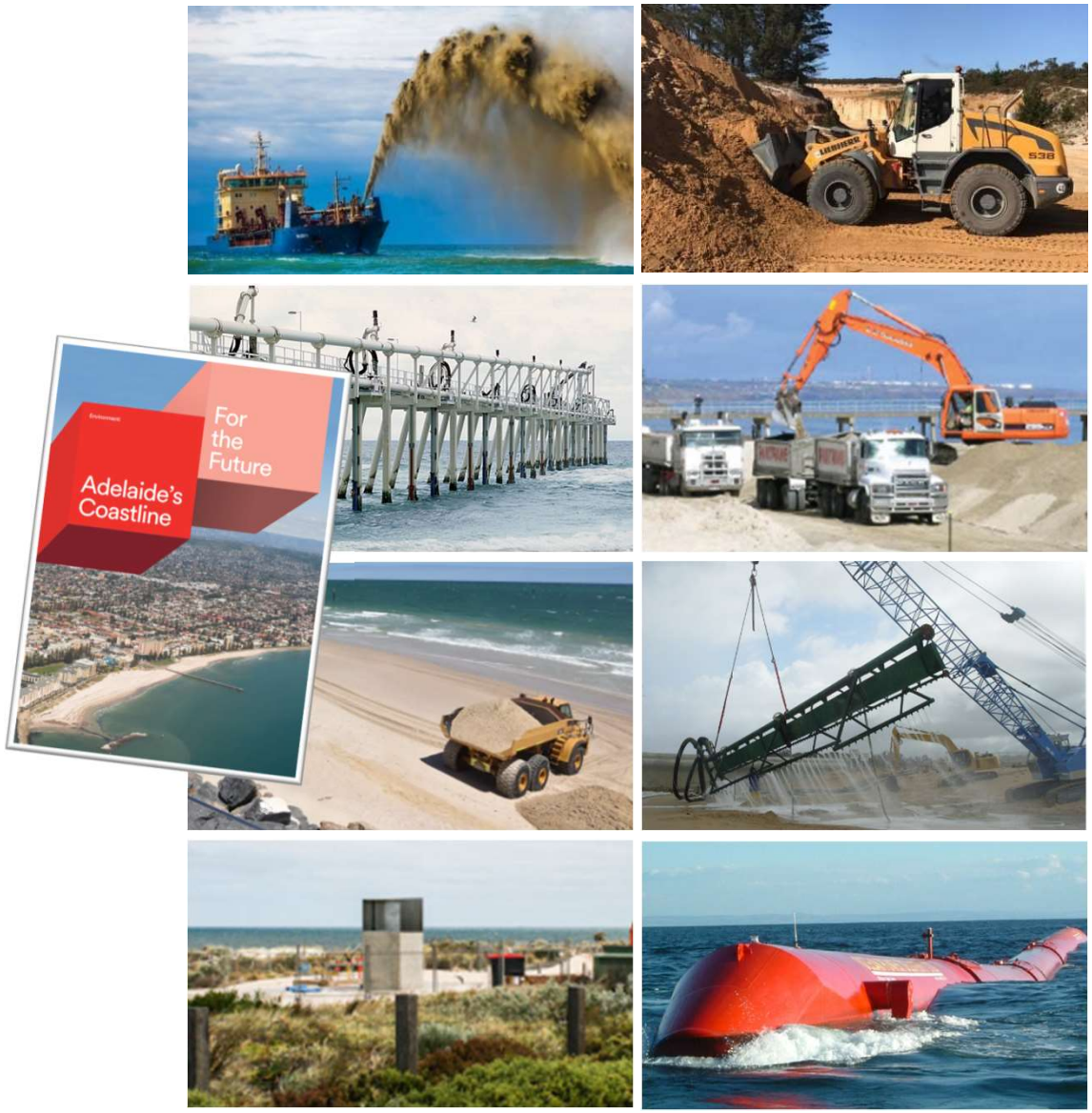
Adelaide Beach Management Review

WACRA, 8 June 2023

Chris Newby, Project Manager ABMR

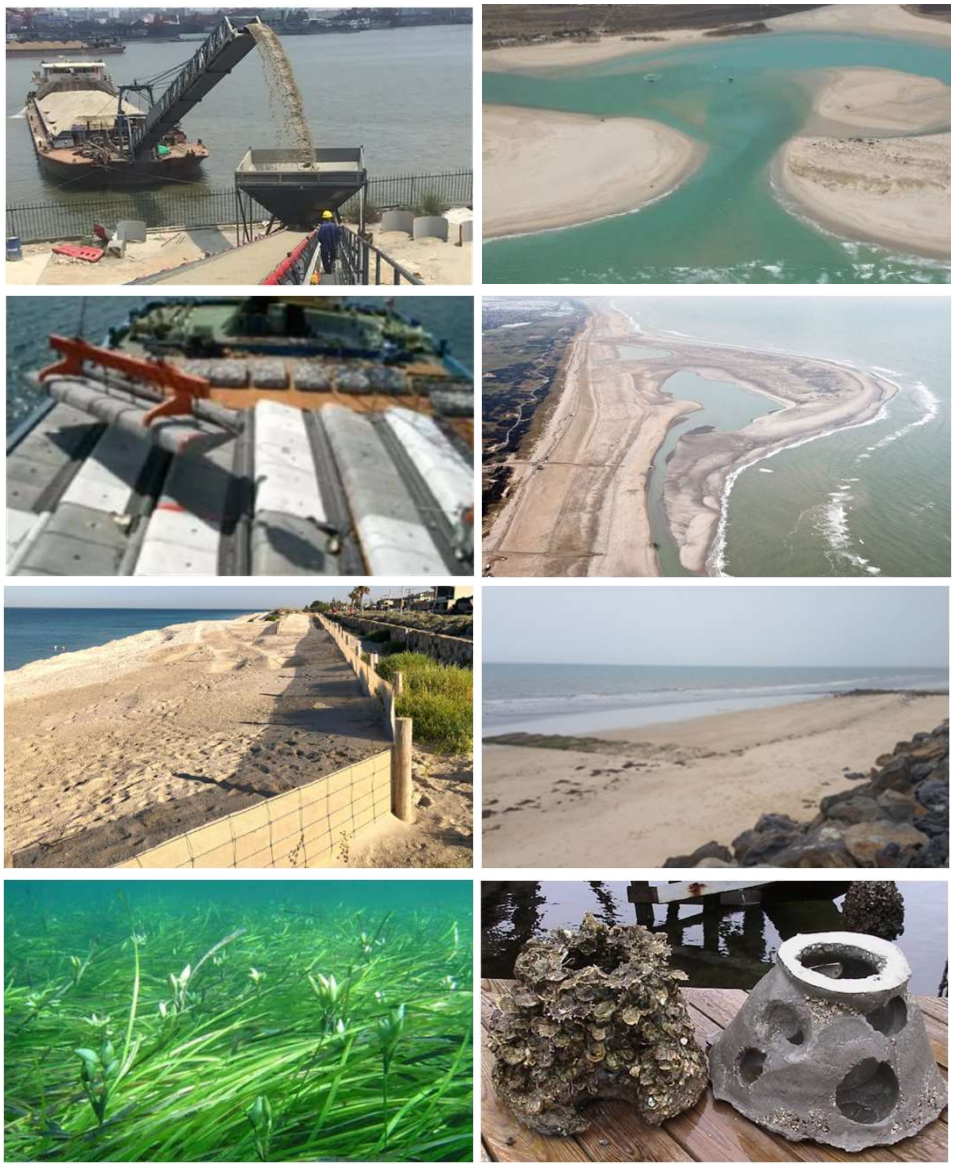
Review Goals

1. How to manage sand on Adelaide's beaches to achieve the following goals:
   - Minimise disruption for all communities
   - Avoid environmental harm
   - Maximise sand staying on beaches



Review Considerations

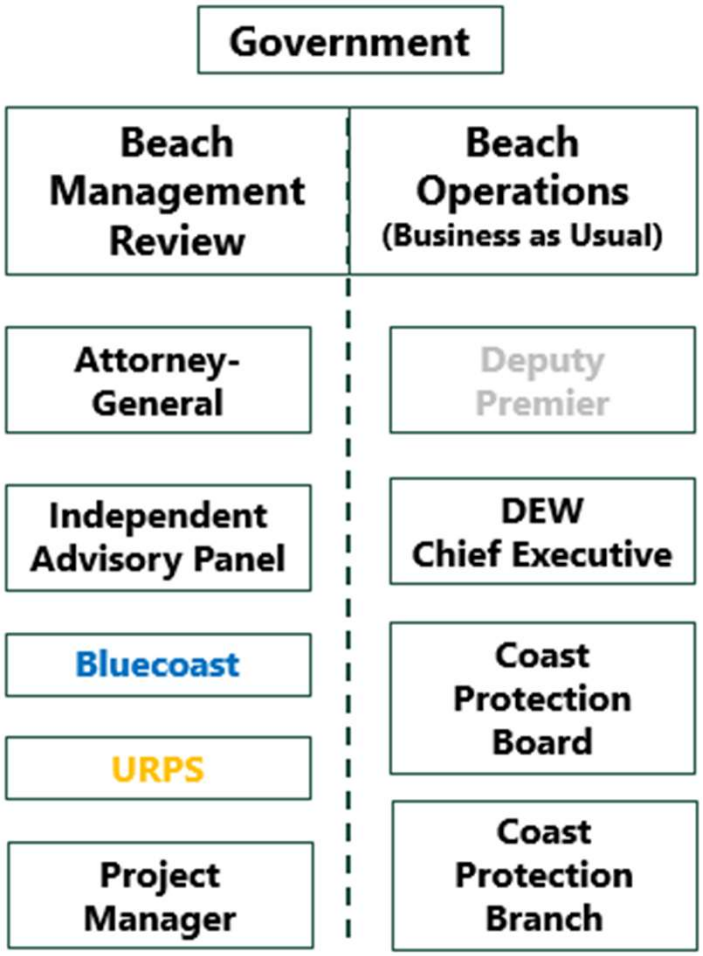
1. The Adelaide community's views on sand management options and the impact of current sand management practices
2. Lessons from international examples of sand management
3. What can be learned from the most up to date analysis of climate science



Governance Framework

Panel Members:

- Mark Searle, former CEO City of Marion
- Les Wanganeen, Kaurna representative
- Sarah Smith, Kaurna representative
- Professor Bev Clarke, social science expert, Flinders University
- Professor Emeritus Nick Harvey, coastal science expert, University of Adelaide
- Professor Emeritus Mike Young, environmental science expert, University of Adelaide



Review Process (Steps 1-5)

Review Process (Steps 6-9)

Review Shortlisting Report and confirm next stage of review *Opportunity for people to speak to their submissions* (IAP)
Oct 2023

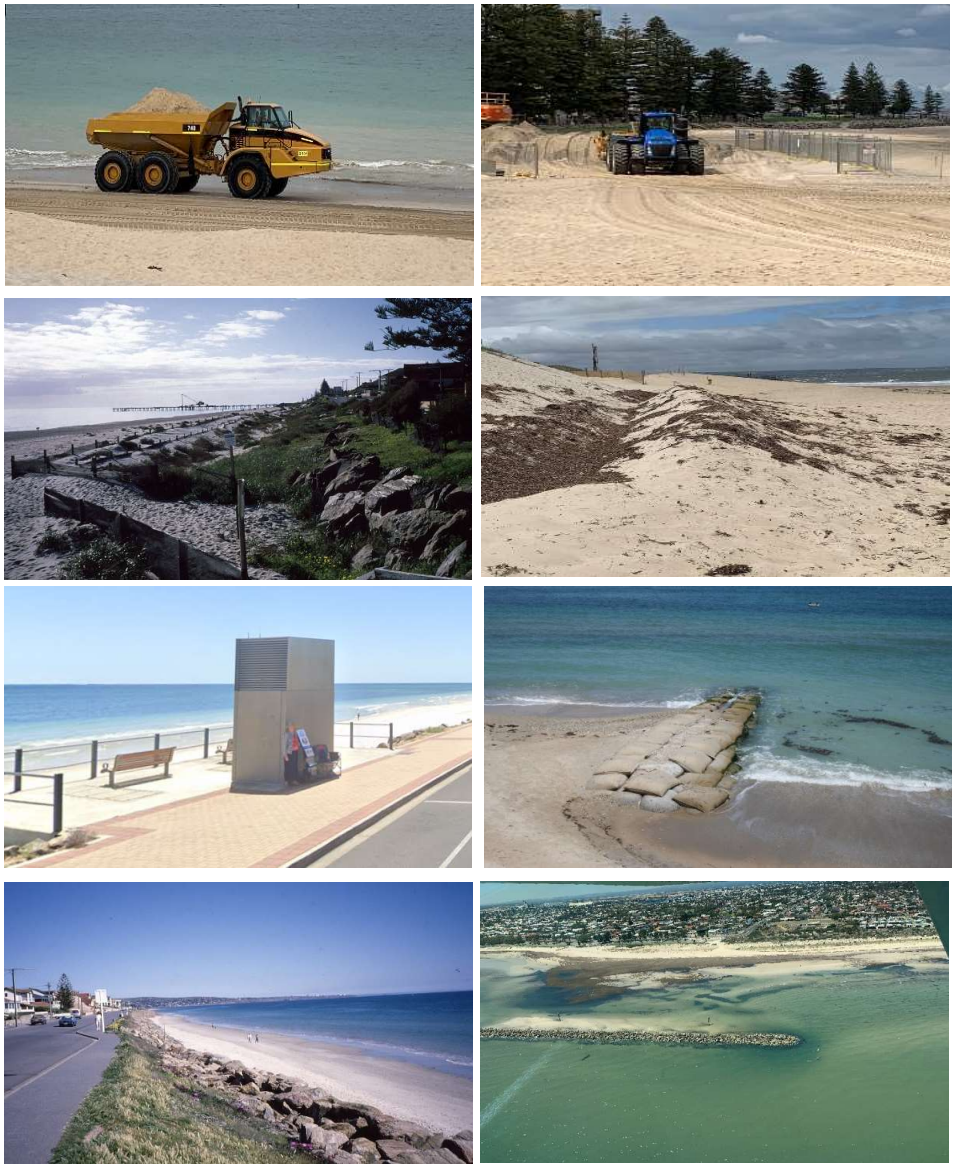
Assessment of shortlisted sand management approaches (Bluecoast)
Oct to Dec 2023

Review Assessment Report and confirm next stage of review (IAP)
Dec 2023

Community and stakeholders informed of the outcomes of the review and next steps
Early 2024

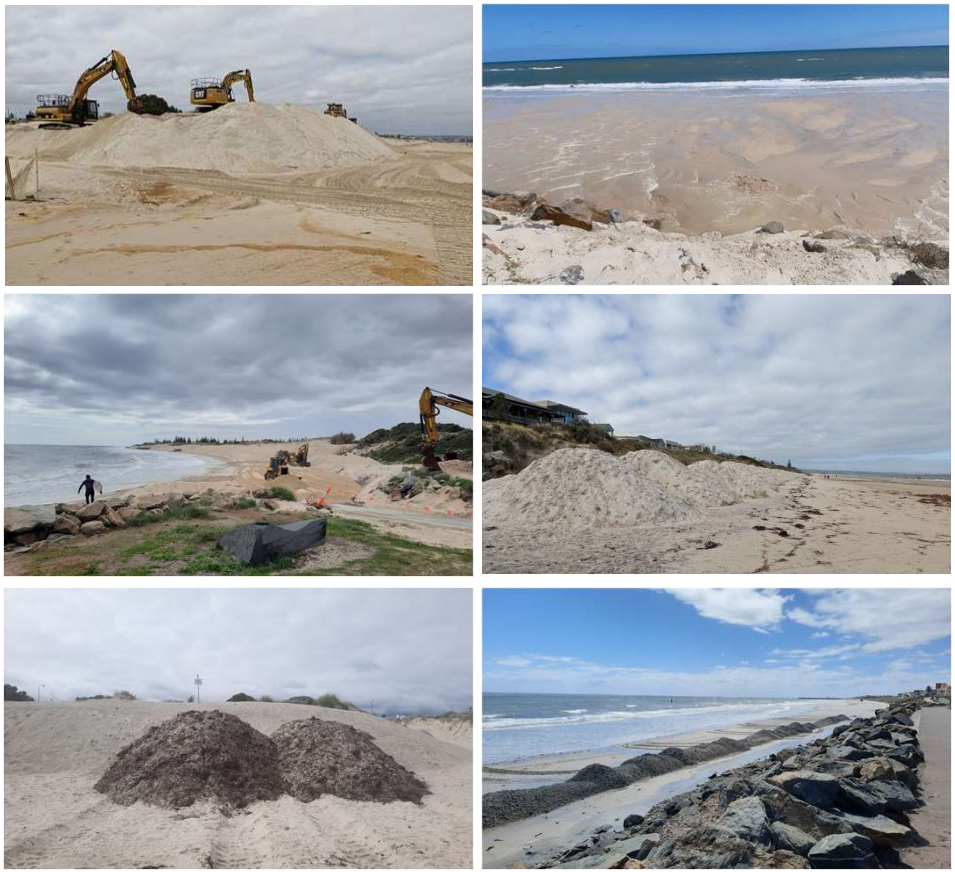
Current Management

- Beach replenishment
- Seawalls, groynes and breakwaters
- Dune management
- Survey and monitoring
- Adding extra sand
- Redistributing sand using trucks and/or pipeline
- Reusing seagrass wrack



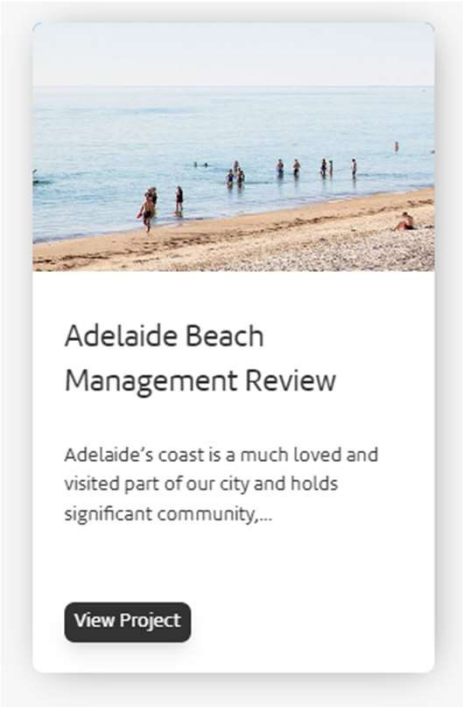
2022/23 Beach Replenishment

- 100,000m^3 to West Beach from quarries
- 15,000m^3 to Henley Beach and Henley Beach South from quarries
- 10,000m^3 to Semaphore Park from Semaphore breakwater
- 25,000m^3 to Glenelg North from West Beach Boat Ramp
- 80,000-100,000m^3 to southern beaches from Glenelg



Stage 1 Survey

- What is it about the coastline that is important to you?
- What does ‘minimising disruption to communities’ mean to you?
- What does ‘avoiding environmental harm’ mean to you?
- What does ‘maximising sand staying on the beaches’ mean to you?
- Are there any sections of the coast where more or less sand is needed?
- Are there any particular approaches that should be considered?



Survey closes 5pm 9 June 2023

www.yoursay.sa.gov.au/abmr

Stakeholder Workshop 15 May 2023

- Discussion on goals of the review
- Discussion on long list of options
- Over 60 attendees
  - Councils
  - Kaurna
  - Dune groups
  - Environmental groups
  - Resident groups

What data will the review use?

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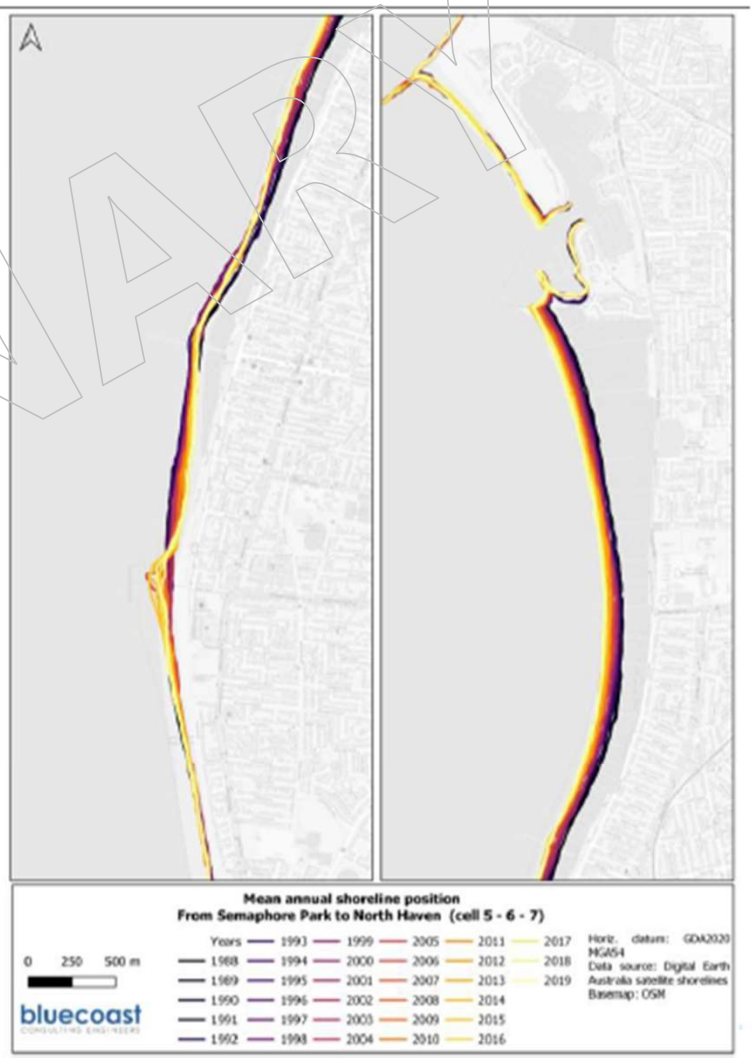
Example coastal monitoring data used in the review

Type	Description	Dates
Waves	Measured wave data at two locations along Adelaide metro beaches and a third near Kangaroo Island	2021 - 2023
Satellite-derived shorelines	DEA Coastlines – 33-years of annual mean sea level shorelines	1988 - 2021
Beach surveys	Beach profile surveys on semi-annual basis dating back to 1977	1977 - 2023
Detailed bathymetry+ dune surveys	Detailed bathymetry and dune surveys	1990 1995 2017
2022 sand sampling	Sand samples at 44 locations along beaches between Brighton and North Haven.	2022



Management of Adelaide metro beaches

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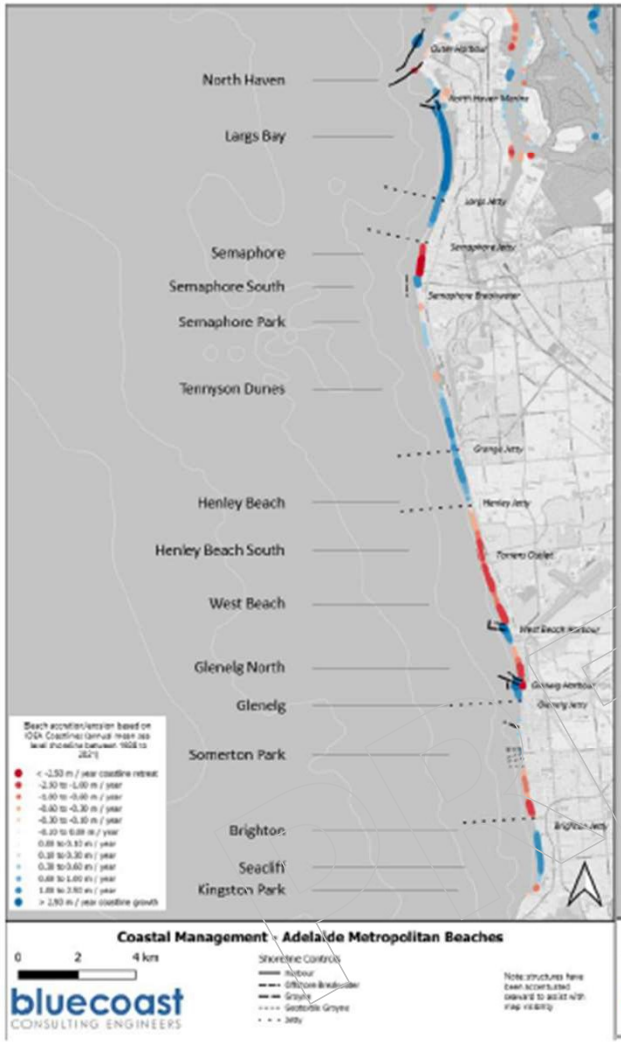

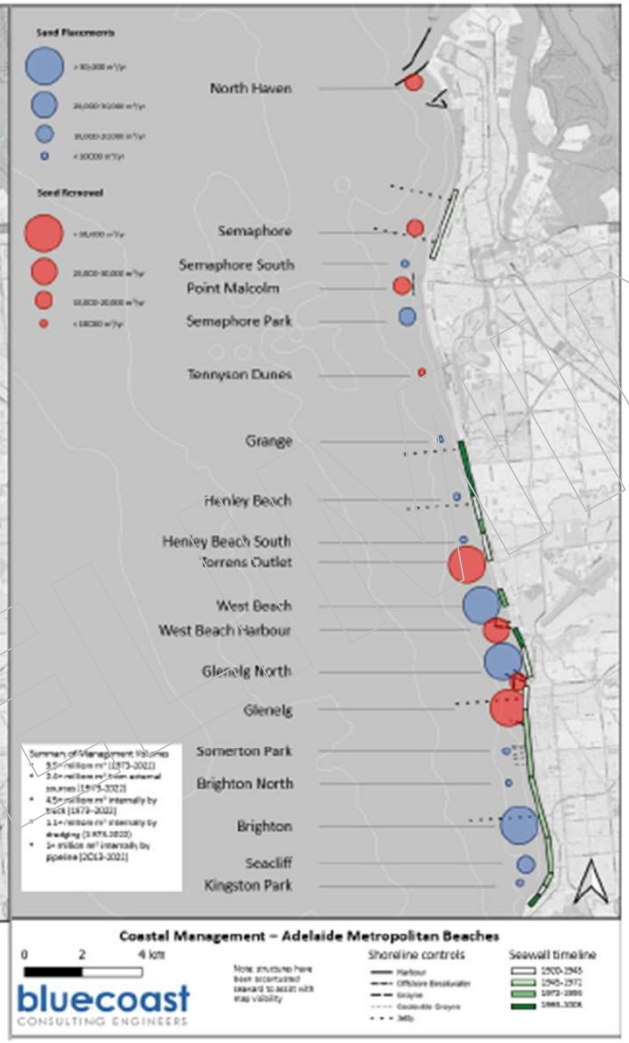

- Man-made coastal structures impact the natural sand movement processes causing downdrift erosion hotspots
- Beach nourishment activities conducted since 1973 have been effective
- Sand backpassing takes sand from areas of accretion and deposits it in areas of erosion
- Internal sand movements by truck, dredge and pipeline
- External sand is imported into the system (e.g. 600,000m^3 after 1993 using dredger, trucking currently supplying quarry sand to beach)

Sand movements and budget (preliminary)

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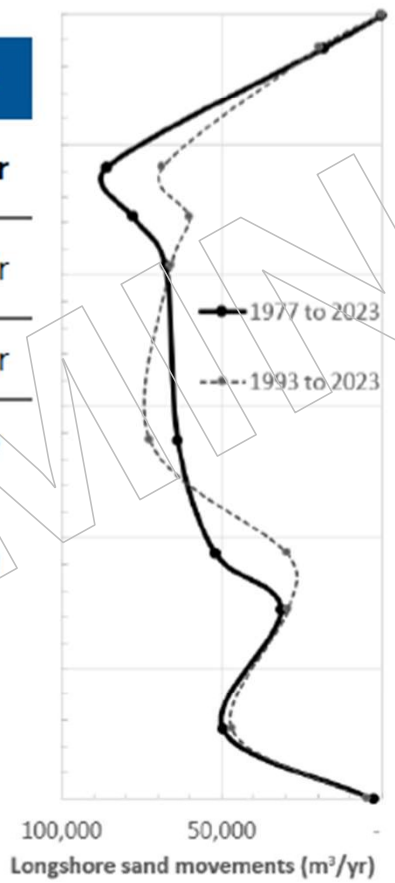
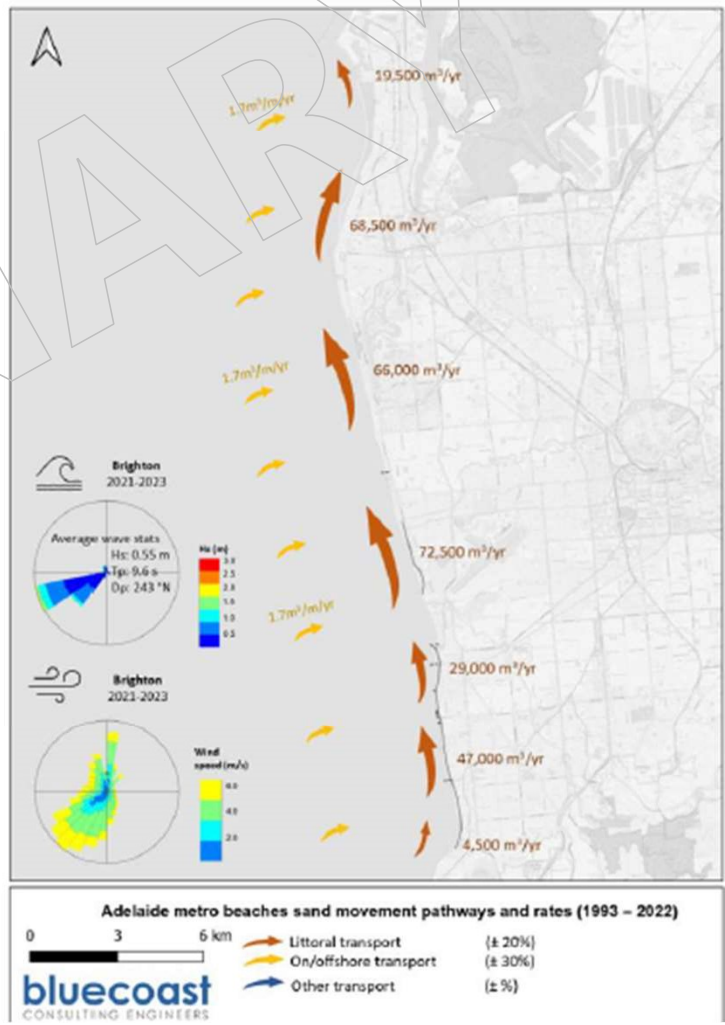
- **Have the metro beaches gained or lost sand?**

Parameter	1977 to 2022	1993 to 2022
Surveyed net rate of change (verified)	**+83,000m³/yr**	**+79,000m³/yr**
Net imported to system	39,000m³/yr	28,000m³/yr
Onshore supply	44,000m³/yr	51,000m³/yr

- Northward sand movements + lack of supply from the south → net sand deficit along southern beaches
- Northward sand movements + Outer Harbour & North Haven → accumulation along the northern beaches
- Shoreline structures influence longshore distribution of sand (i.e., accretion updrift, erosion downdrift)
- Role of seagrass and wrack
- Sea level rise and land subsidence





Adelaide metro beaches sand movement pathways and rates (1993 – 2022)

0 3 6 km

Littoral transport (± 20%)
On/offshore transport (± 30%)
Other transport (± %)

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Longlist of options (draft)

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Sand management

Backpassing

Transport method

Backpassing pipeline

Sand Carting

Mass nourishment (sand engine)

Backpass using dredger

Ongoing external replenishment

Collection method

Nearshore mobile collection

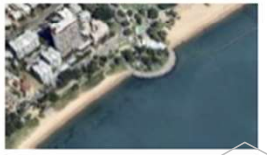
Land based collection

Fixed bypassing systems

Nearshore fixed collection

Removal of existing control structures

Slow sand movement



Shore based control structures

Offshore control structures

Reduce wave climate (e.g., artificial islands, shaped offshore dredging, wave energy converter array)

Coarse external sand

Relocate/ defend

Seawalls

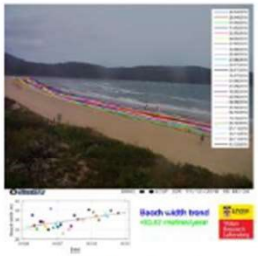
Planned retreat/relocation 'Migrate with sand'

'Do nothing'

Complementary management

Dune stabilisation

Restoration of seagrass/ artificial seaweed



Smart monitoring

Coarse filtering approach

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- **Is the option effective? (will it work?)**
  - Does it provide coastal protection?
  - Does it provide amenity?
  - Level of confidence in solution?
  - Adaptable to climate change?
- **Is the option practical? (can it be done?)**
  - Engineering feasibility?
  - Strategic alignment with action owner?
  - Does the owner have the financial capacity to deliver it?
- **Is the option acceptable? (should it be done?)**
  - Does it have acceptable environmental impacts? Is it expected to be approved?
  - Is it legal?
  - What is the expected level of community support?

	Is it effective?	Is it practical?	Is it acceptable?
Go	Provides a medium to long-term sandy buffer against coastal hazards	Can be implemented with available coastal management techniques	No adverse impacts and clear approval pathway
Slow	Provides a less effective sandy buffer against coastal hazards	Requires new technology or advances in existing technology or techniques	Acceptable impacts/ impacts can be managed with identified approval pathway
Stop	Does not provide adequate buffer	Can't be implemented	Unacceptable impacts / illegal or not likely to be approved

Stage 1 consultation closes
5pm 9 June 2023

Stage 2 consultation commences
August 2023 (TBC)

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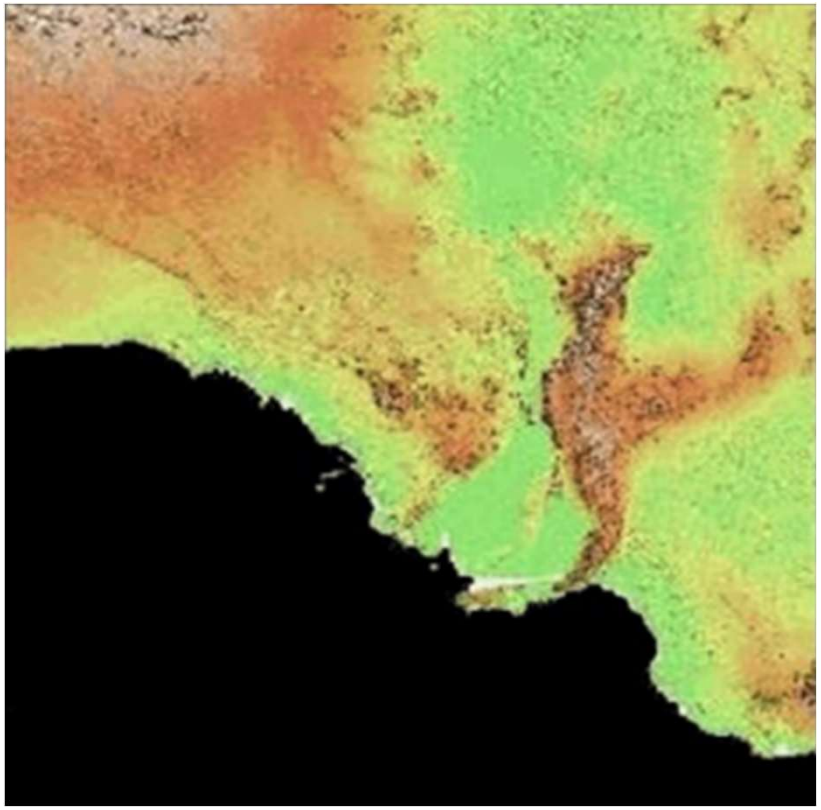
SOUTH AUSTRALIA

Government of South Australia
Department for Environment and Water

Historical Changes



10,000 years ago

Today


Seacliff, 1889

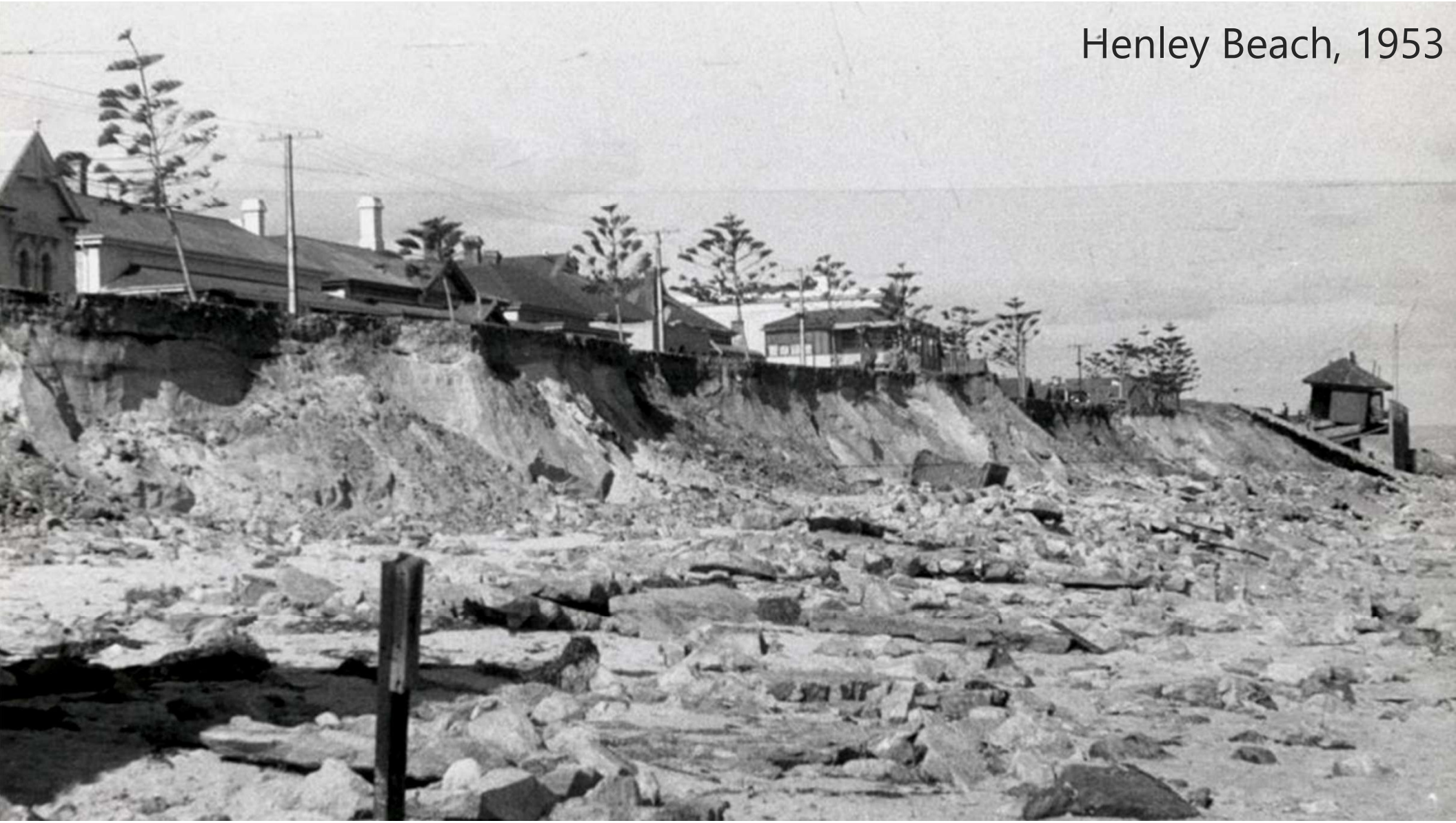

Wheatland St Seacliff, 1900

South Brighton, 1900

Brighton, 1930


Brighton, 1937


Glenelg, 1953


Henley Beach, 1953


South Brighton, 1953


Brighton, 1960


West Beach, 1968