# **SA Climate Ready Coasts**

# **DEW Data Workstream**

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overnment of South Australia

# SA CLIMATE READY COASTS PROGRAM

Climate change is causing increased exposure to coastal hazards.

The SA CRC Program comprises a series of connected projects that will:

- support consistent approaches to coastal hazard adaptation
- improve understanding of coastal risk
- increase capacity for and knowledge of coastal hazard adaptation planning
- enable evidence-based decisions and investments in the coast

#### Three year program funded by:

- Commonwealth Coastal and Estuarine Risk Mitigation Program
- SA Coast Protection Board
- LG Research and Development Scheme



epartment for Environment nd Water



# **DEW DATA WORKSTREAM**

Aim: Improve quality and availability of data for coastal hazard risk assessment

Projects include:

- Coastal data stocktake
- Coastal monitoring infrastructure project
- Statewide coastal erosion hazard assessment





**Government of South Australia** Department for Environment and Water

...by June 2025...

# **Project 1: Coastal Data Stocktake**

#### Aim: Compile list of coastal datasets including hazards, ecology, cultural heritage and infrastructure/assets

- ✓ Create a publicly accessible database of existing and isolated coastal datasets
- ✓ Identify actions to improve accessibility to, and sharing of, coastal datasets
- ✓ Determine gaps in coastal datasets to inform design of data acquisition and monitoring program needs





# **Project 2: Coastal Monitoring Infrastructure Network**

# Aim: Develop statewide network of coastal monitoring infrastructure

- Wave observation network
- Tide gauge + GNSS network

Acknowledgements

- Coast Protection Board
- Integrated Marine Observing System (IMOS)
- SARDI
- Flinders University (SA Waves)
- Flinders Ports
- BoM

All data will be publicly available!





# **SA Wave Observation Network**

- In partnership with IMOS, SARDI and Flinders University
- All sites to be part of the national IMOS network:
  - ✓ Northern Kangaroo Island
    ✓ Robe
  - ✓ Brighton
  - ✓ Ceduna
  - ✓Black Point
  - ✓ Spencer Gulf Entrance✓ Semaphore
- Prioritisation Framework developed to guide investment in future sites





### What wave data is being collected?

Wave buoys float on surface and measure:

- significant wave height
- peak period
- peak direction
- sea surface temperature
- wind speed and direction

Wave information provides input into models that analyse sediment transport, help us to understand coastal risk and coastal change, and is used in the design of coast protection works.







# SA Tide Gauge + GNSS Network

- Additional funding from Coast Protection Board
- Three tide gauges coupled with Global Navigation Satellite System (GNSS) receivers will be installed across SA
- DEW Coast Unit will install and maintain
- Flinders Ports will provide quality assurance
- Framework developed for prioritisation of sites:

✓ Elliston

**√Cowell** 

✓ Stenhouse Bay or Marion Bay



Prioritization Matrix										
Problem/Situation:			Tide Gauge Prioritisation							
			1	2	3	4	5	6	7	8
			Sites							
			Vivonne Bay	Stenhouse Bay	Elliston	Cowell/Franklin Harbor	Pt Augusta	Kingscote	Port MacDonnell	Southern Metro (Port Noarlunga or surrounds)
	Assessment criteria	Weight								
1	Proximity to high density settlements	5								
2	Profile locations	2								
3	CORS network	3								
4	Exisiting gaps in tide gauge network	6								
5	Existing data	1								
6	Current coastal hazard risk	4								
7										
8										
		Totals								
		Rank								

#### What tidal and positioning data is being collected?

Tide gauges measure:

- Surface water level relative to a datum
- Barometric pressure
- Ambient air temperature

Measurements record the magnitude of local storm tide events, providing valuable information on extent of land vulnerable to tidal inundation now and under various scenarios.

GNSS receivers support quantification of vertical land movement (uplift or subsidence).





## Why invest in a statewide coastal monitoring infrastructure network?

Monitoring data will inform:

- Hazard exposure assessments (model erosion, inundation)
- Analyses of vertical land movement (subsidence or uplift)
- Analyses of 'real change' in sea level rise (i.e. relative to vertical land movement)
- Records of storm tide levels under varying tidal and meteorologic conditions









# **Project 3: Coastal erosion hazard assessment**



Existing statewide coastal hazard datasets: ✓ sand drift  $\checkmark$  coastal acid sulfate soils ✓ storm surge and inundation  $\rightarrow$  critical data gap =

coastal erosion and long-term recession



# What is coastal erosion?



- loss of coastal land along a shoreline due to the impact of waves, wind, rain and tides.
- a natural coastal process exacerbated by severe storms and sea level rise



# Statewide coastal erosion hazard assessment

#### **Methodology**

#### Stage 1:

Areas identified for simplistic or detailed analysis.

#### Stage 2:

a. First pass assessment: calculations for storm cut, longterm change and erosion due to sea level rise.

b. Detailed assessment: probabilistic methodology used.

#### **Output:**

Visual representation showing potential extent of coastal erosion for varying timeframes under different scenarios including considerations of sea level rise.



Figure 1: Deterministic vs probabilistic approach



# Why invest in this statewide coastal erosion hazard assessment?

- Consistent assessment of erosion hazards
- First pass coastal erosion hazard assessment for every council area
- Second pass assessment in priority areas
- Identification of areas where data is poor
- Support investment in priority areas for data acquisition
- Provides a mapping layer
- Publicly available information
- Can be improved and updated as new data becomes available





# By June 2025...

- 1x coastal data stocktake database
- 7x wave buoys deployed
- 3x tide gauges coupled with GNSS receivers installed
- 1x statewide coastal erosion hazard assessment











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