CoastRI

Research Infrastructure connecting land and sea

Coastal Research Infrastructure (CoastRI) is an initiative of the National Collaborative Research Infrastructure Strategy (NCRIS)

NCRIS
National Research
Infrastructure for Australia
An Australian Government Initiative

The current state

- Our climate and oceans are changing at unprecedented rates

- The 2022 SoE Report indicates:
  - Our environment is deteriorating
  - Climate change threatens all native ecosystems
  - Environmental management isn't well coordinated
  - Environmental decline is affecting human wellbeing

- Our economies and communities rely on our natural resources in numerous ways – e.g. $81b Blue Economy increasing to >$100b by 2025

- We need more observations and data to prepare for future change, support decision-making, and facilitate sustainable use

The coastal challenge

- Over 50% of Australians live within 7 km of the coast – this is where we live, work and play
- To understand climate changes and increase preparedness we need understand implications of ocean processes on coastal habitats
- Increased real-time data can inform forecasting and predictions
- IMOS is leading a consortium of NCRIS capabilities to establish national-scale coastal research infrastructure to address these issues

There is an opportunity to create societal benefit and impact for coastal populations through partnership and collaborative approaches

Bureau of Meteorology
City planners
National, State and local governments
Emergency services
Finance and insurance
Industry (ports, shipping, tourism, fishing)
Indigenous communities
Home owners, beach users, the public

Establishing a CoastRI

Vision: Research infrastructure connecting land and sea

Objective: To gather comprehensive and integrated scientific data from diverse sources, enabling us to better understand, predict, and address the opportunities and imminent risks facing Australia's coast for all peoples.
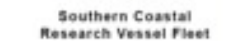
Challenges and opportunities

Ballina

Coastal Risk
Australia images
High tide in 2100
based on sea level
rise of 0.74 m

Logos (left side):
ACCESS — Australian Earth System Simulator, National Research Infrastructure
ARDC — Australian Research Data Commons
Atlas of Living Australia, ala.org.au
AURIN, aurin.org.au
AuScope
(Australian...)
HIA — HEAVY ION ACCELERATORS
IMOS
PHRN — Population Health Research Network
NCI AUSTRALIA
Southern Coastal Research Vessel Fleet
tern

CHALLENGES
Coastal erosion / change
Implications of sea level rise
Built environments resilience
Impact of human activity on coastal regions

Observing coastal environments
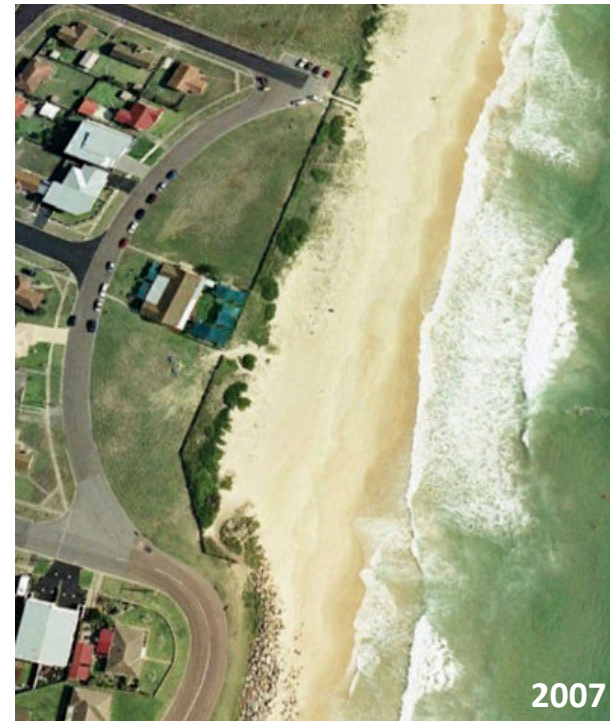
Data management and integration

Predictive coastal modelling commons

Evidence-based coastal adaptation
and future proofing

USERS
Resource Managers
Insurance Companies
Planners
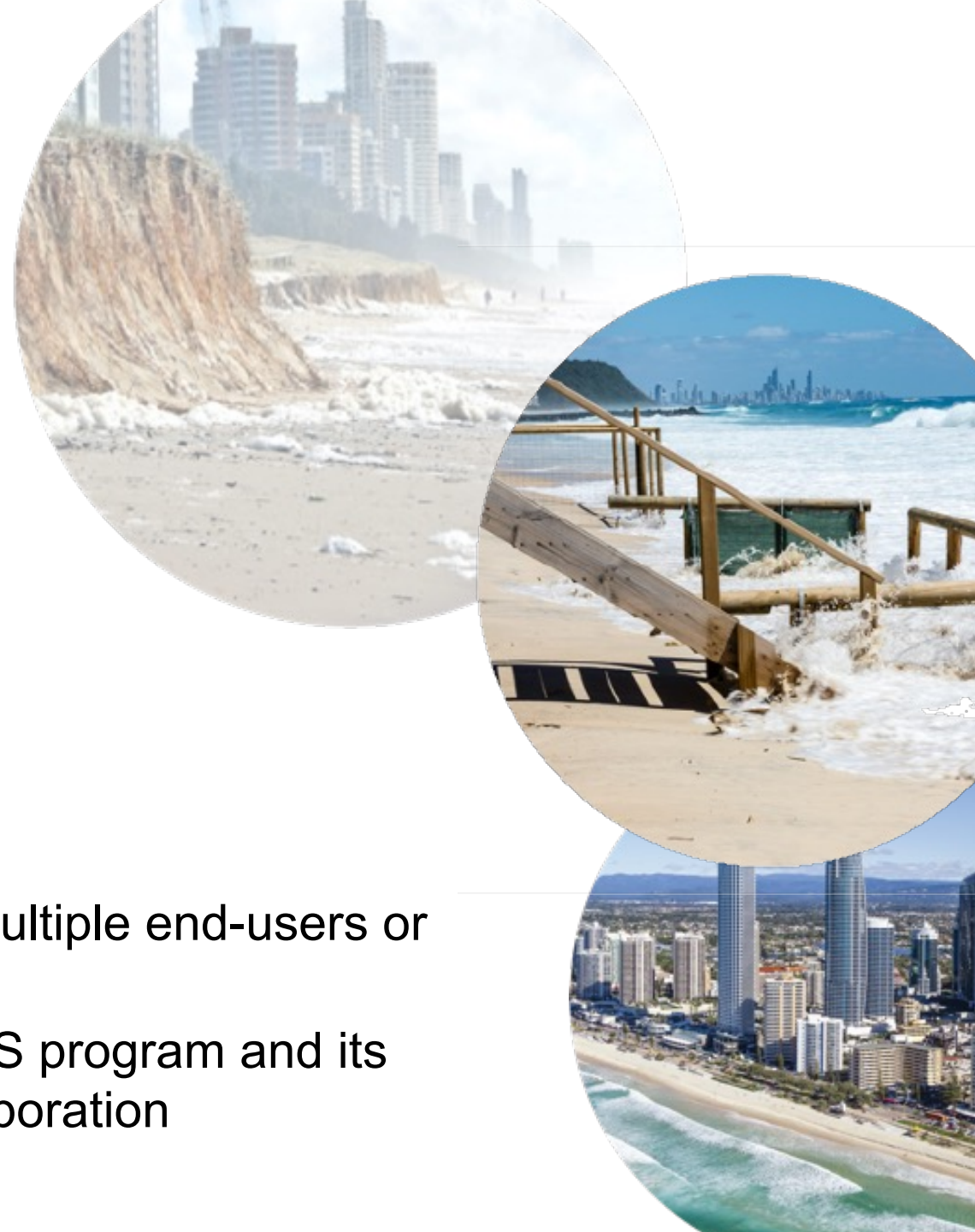
2007

2019

What's happening?

- The NCRIS consortium is conducting a consultation process to develop a proposal for the 2024 NCRIS funding round
- The proposed program will be designed to create a step-change advance in our understanding of our coastal environment by:

  - Collecting novel data streams
  - Aggregating existing but difficult to access data streams
  - Supporting modelling and forecasting
  - Enhancing and value-adding to existing programs and products
  - Underpinning planning and decision-making related to coastal change to support government, industry, cities and communities
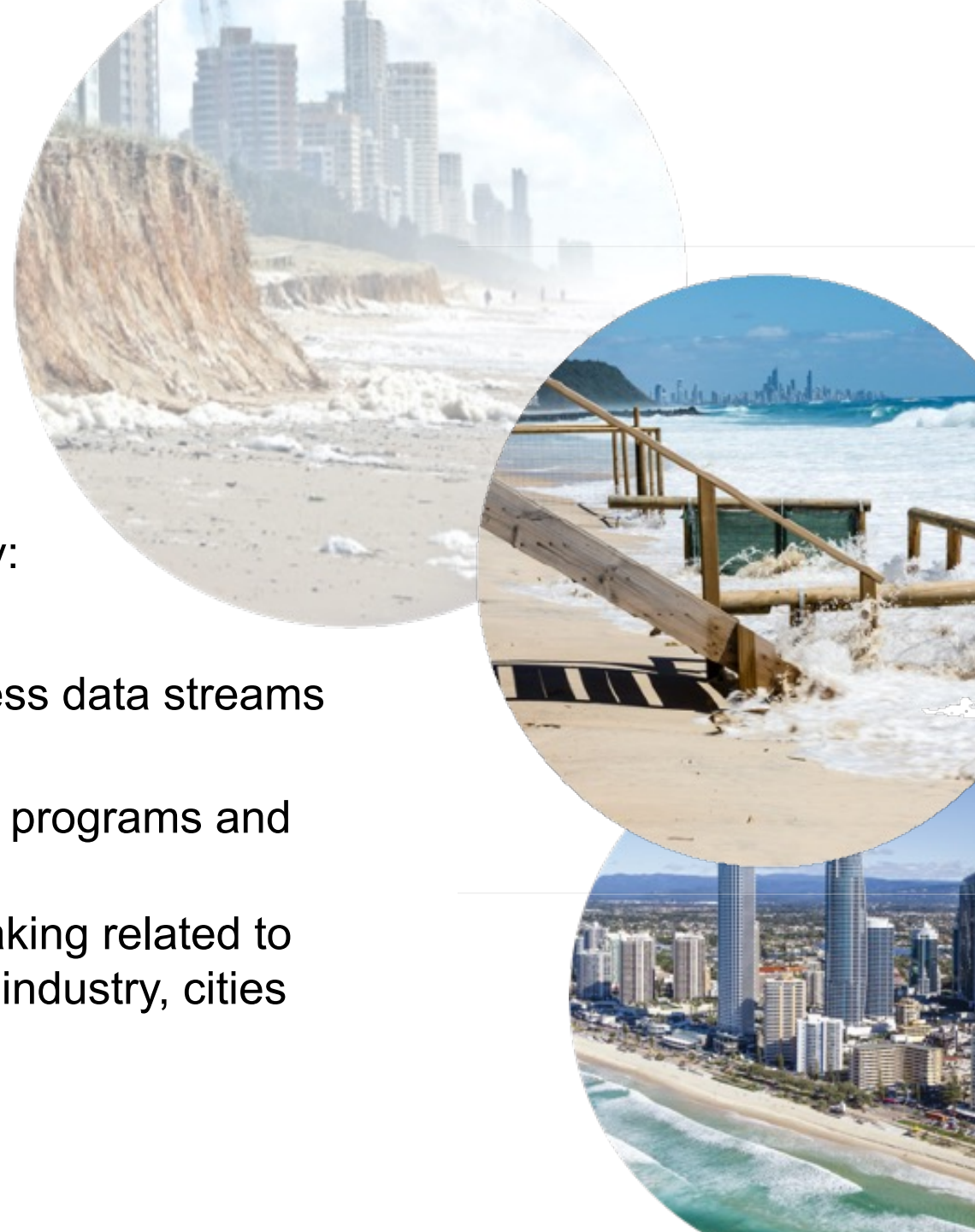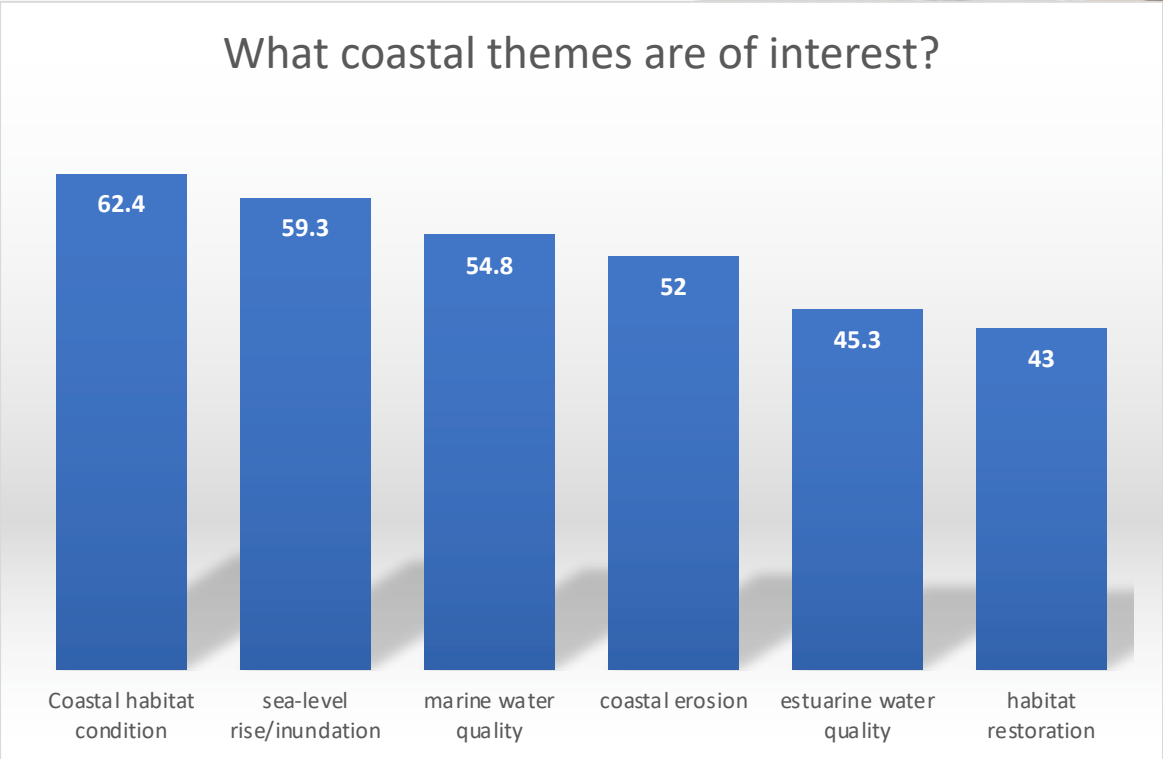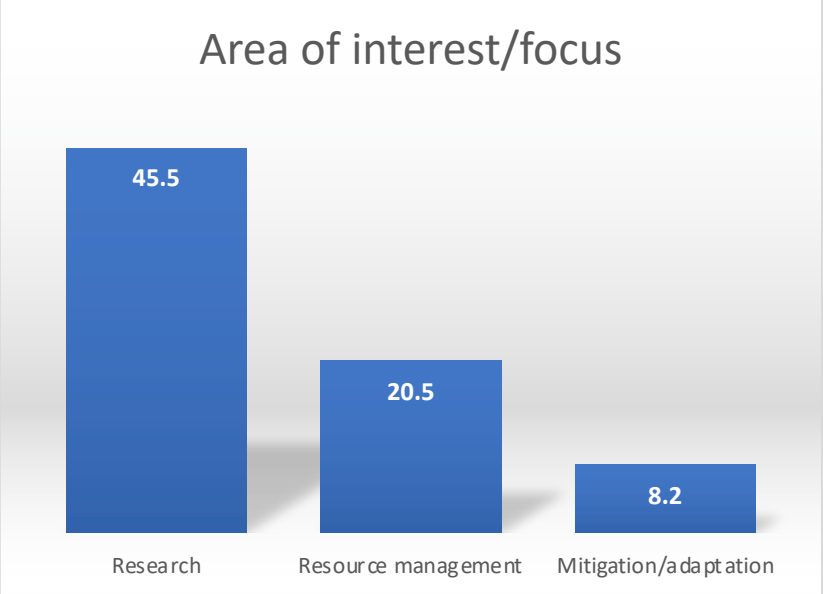
Designing CoastRI

- Consultation with end-users to identify:
    - Existing programs
    - Data/information needs
    - Use cases to support collection of new data streams (e.g. impact assessment, mitigation strategies, forecasting)
    - Opportunities for partnership and/or leveraging of existing activities
- Priority activities will:
    - Be broad/national-scale and have multiple end-users or data uses
    - Maximise the capability of the NCRIS program and its partners through cross-NCRIS collaboration
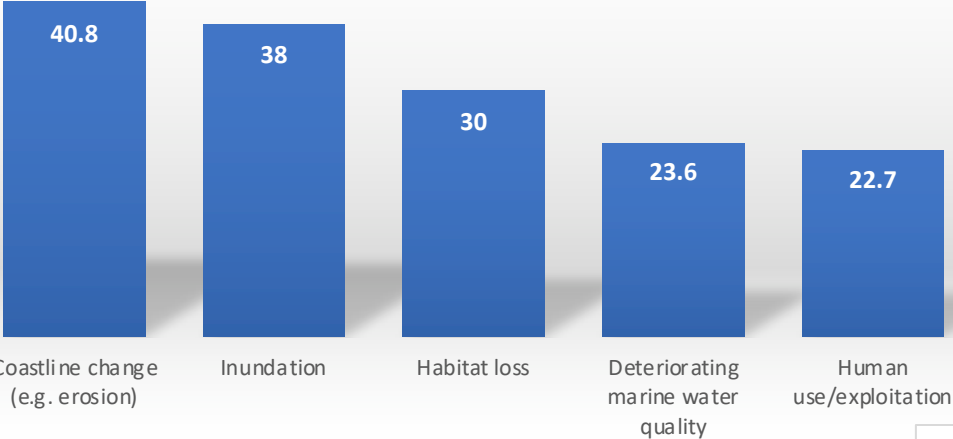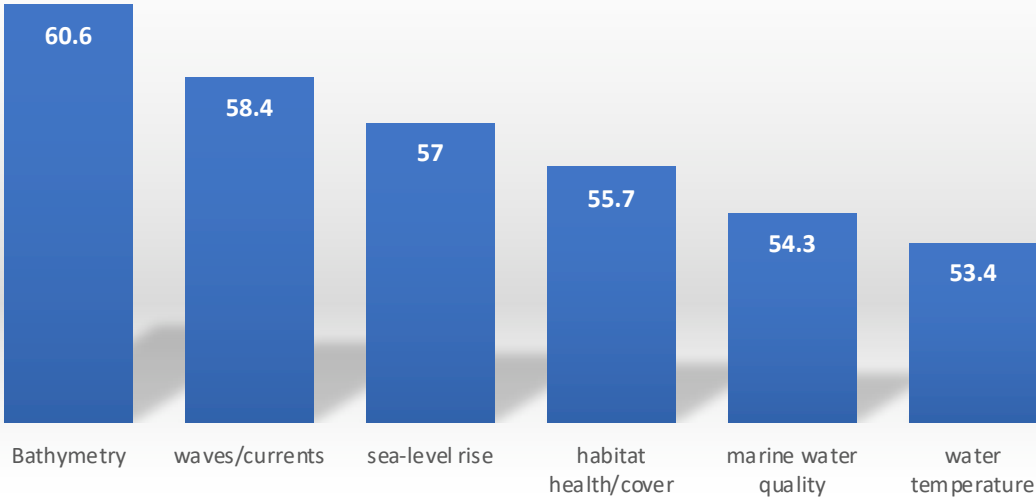
Initial survey results

Area of interest/focus

Research	Resource management	Mitigation/adaptation
45.5	20.5	8.2

What coastal themes are of interest?

Coastal habitat condition	sea-level rise/inundation	marine water quality	coastal erosion	estuarine water quality	habitat restoration
62.4	59.3	54.8	52	45.3	43

Initial survey results

Most pressing issues (ranked 1-2)

Coastline change (e.g. erosion)	Inundation	Habitat loss	Deteriorating marine water quality	Human use/exploitation
40.8	38	30	23.6	22.7

What observations/information is needed?

Bathymetry	waves/currents	sea-level rise	habitat health/cover	marine water quality	water temperature
60.6	58.4	57	55.7	54.3	53.4

Initial survey results

Why do you need this information?

- Modelling/forecasting/prediction: 69.2
- research: 60.6
- improve monitoring efforts: 53.4
- risk assessment/impact mitigation: 49.3
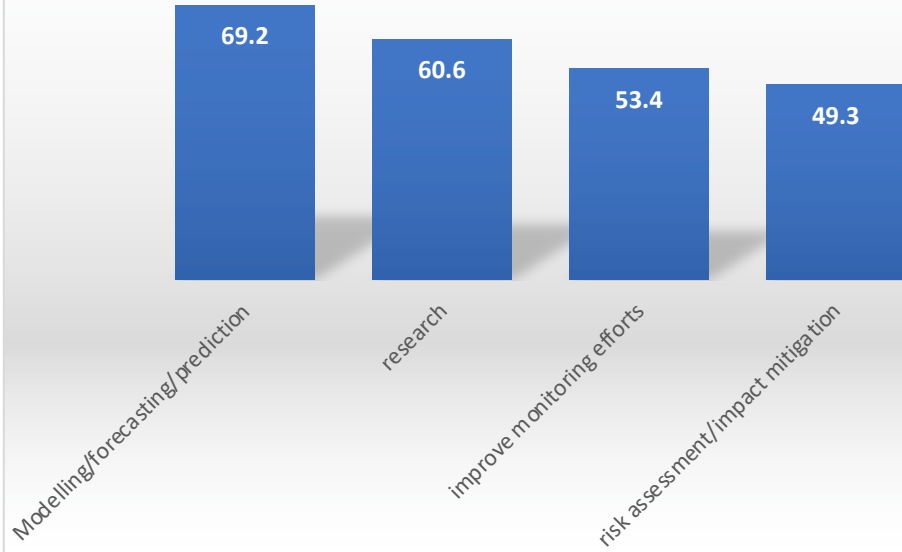
What format of data/information would you like?

- Data summaries (compiled map/graph): 60.7
- raw data in near real-time: 57.5
- interactive data dashboard: 54.3
- model outputs: 53.9
- delayed mode QA/QC data: 53
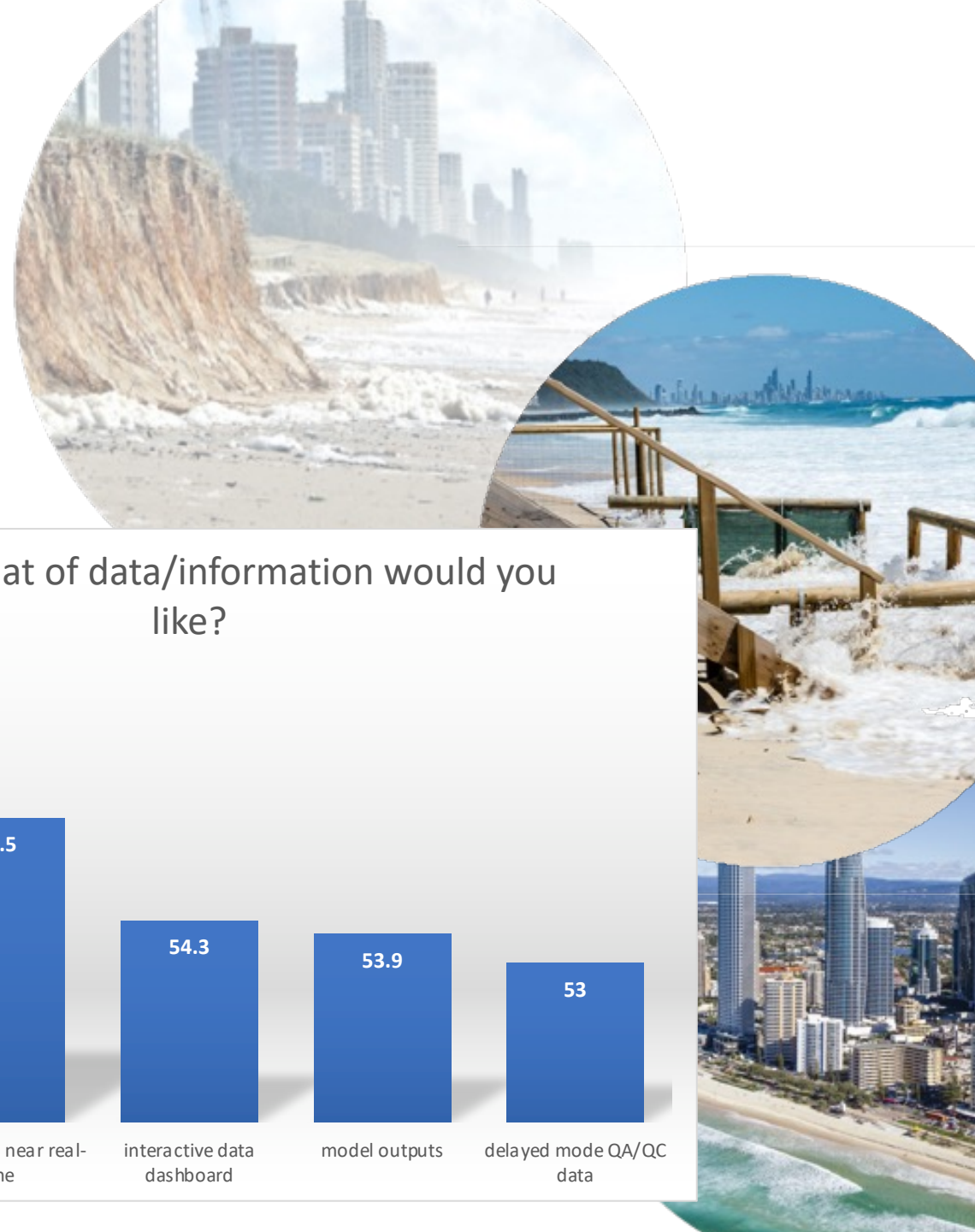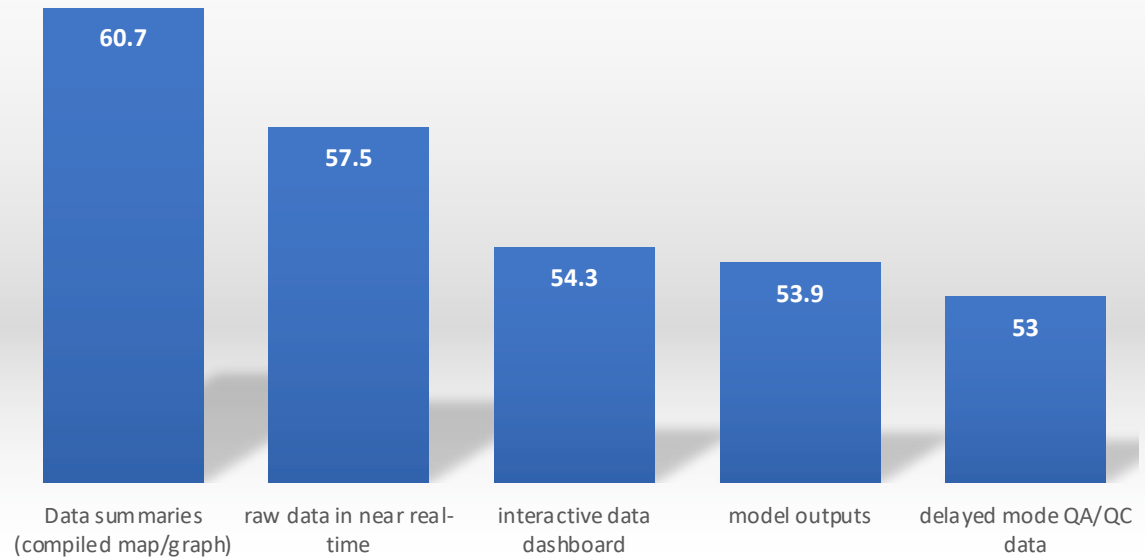
Initial consultation

- Emerging needs for consideration in CoastRI:
  - Collection and aggregation of tide data
  - Water level and water quality within estuaries
  - Coupled water level and land motion data
  - High-resolution, near real-time data streams for forecasting and prediction

Consultation is ongoing and will include state and local government, industry, First Nations communities and more
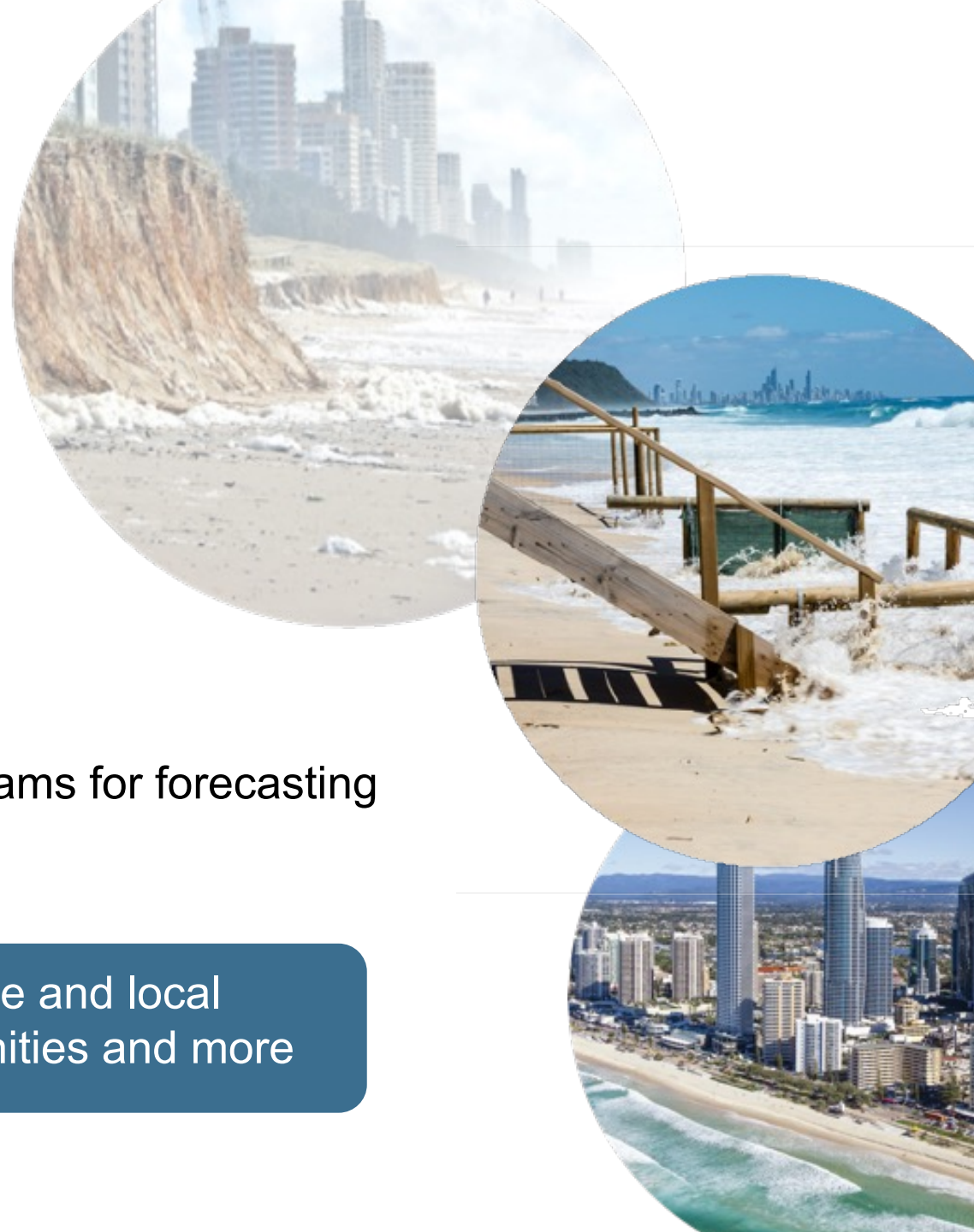
Timeline

- Oct-Dec: Prioritised consultation with state programs and end-users*
- Jan-Mar: Prioritised consultation with industry partners and end-users*
- Oct-Mar: Consultation and co-design with First Nations
- Apr-May: Program design, proposal drafting
- May: Independent review of the proposed program
- Submission to NCRIS (mid-year, date TBA)

*Note: consultation will occur outside these periods as needed
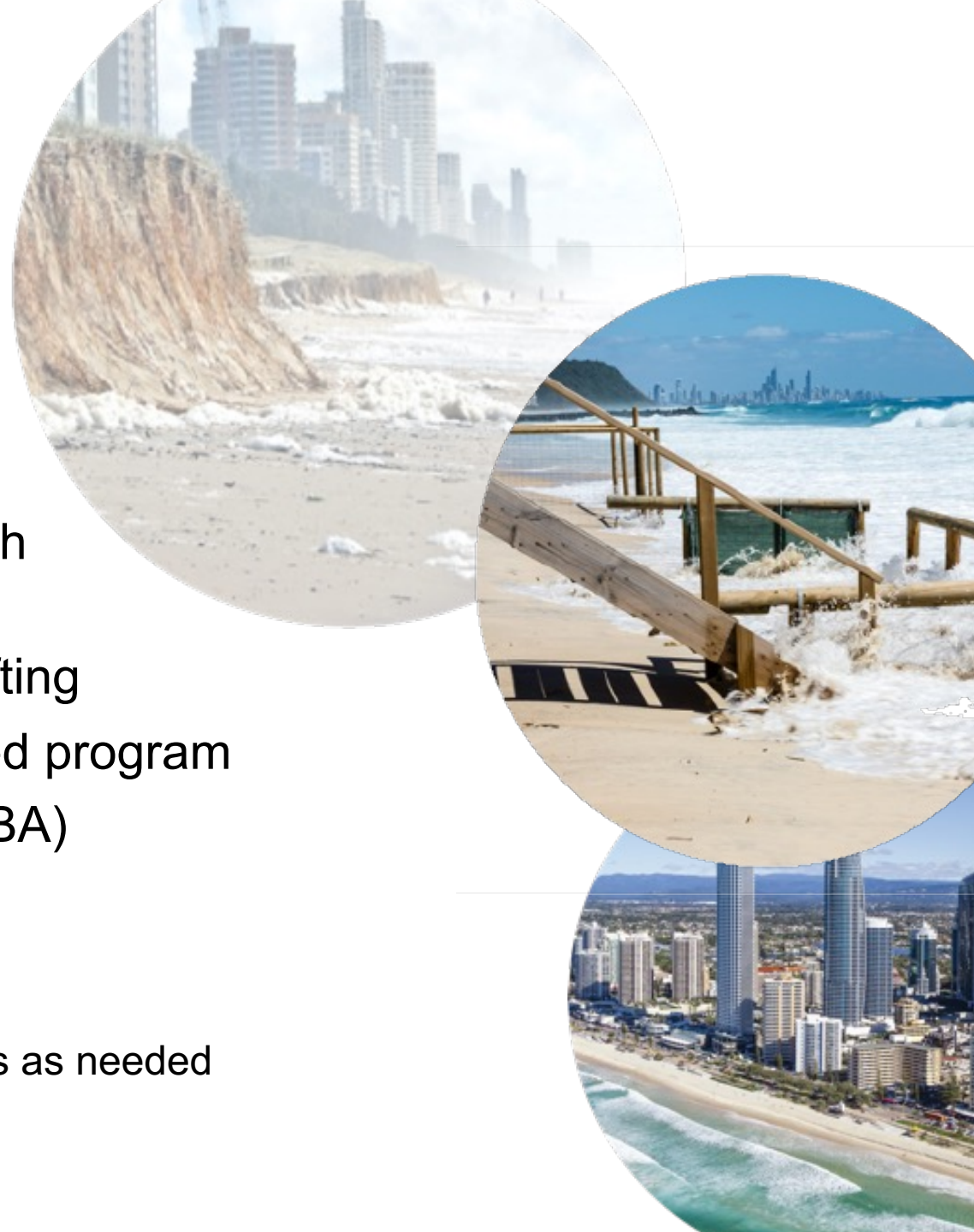
'No regrets' investment criteria

- Align with IMOS strategy and national priorities
- Clear pathways to uptake and use of the data to create impact
- Opportunity for co-investment
- Benefits for multiple stakeholders/end-users
- Avoid duplication of effort/ enhance capability
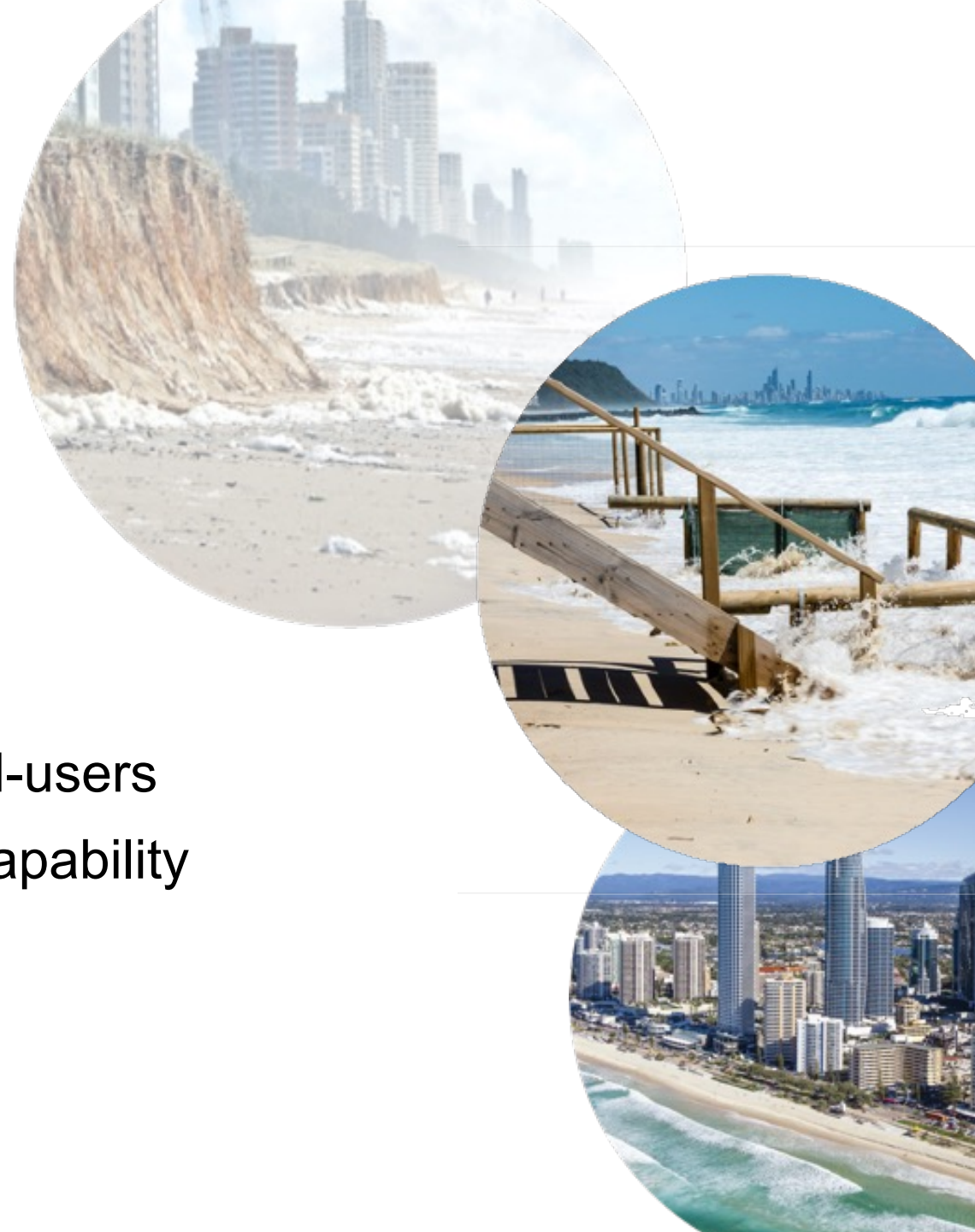
'No regrets' investment

- Coastal and estuarine moorings
  - In initial discussions
- Coastal wave buoys
  - Planning underway

State	Regional operators (incl existing Spotter buoy networks)	Expert advice / national perspectives
WA	Ryan Lowe (UWA), Jeff Hansen (UWA), Mike Cuttler (UWA)	Diana Greenslade (BoM waves), Mark Hemer (CSIRO), Clare Spillman (BoM marine heat waves), Alex Babanin (Uni Melb), Ian Young (Uni Melb)
VIC	Dan Ierodiaconou (DU), Jak McCarrol (DEECA)	
SA	Graziela Miot da Silva (Flinders), Mark Doubell (SARDI)	
NSW	Mike Kinsela (Uni Newcastle), Tom Doyle (NSW DPE)	
TAS	Mark Hemer (CSIRO)	
N. Australia	Jessica B or Madeline Cahill [AIMS]	
QLD	John Ryan (Qld DES), Tom Baldock (UQ)	

Thanks

Thanks for taking the time to join the discussion and help shape the scope and scale of the CoastRI program proposal

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