QCoast2100
COUNCILS LEADING COASTAL ADAPTATION

Knowledge & Information Sharing Forum

Mackay REGIONAL COUNCIL

Mackay Regional Council's Coastal Adaptation Journey

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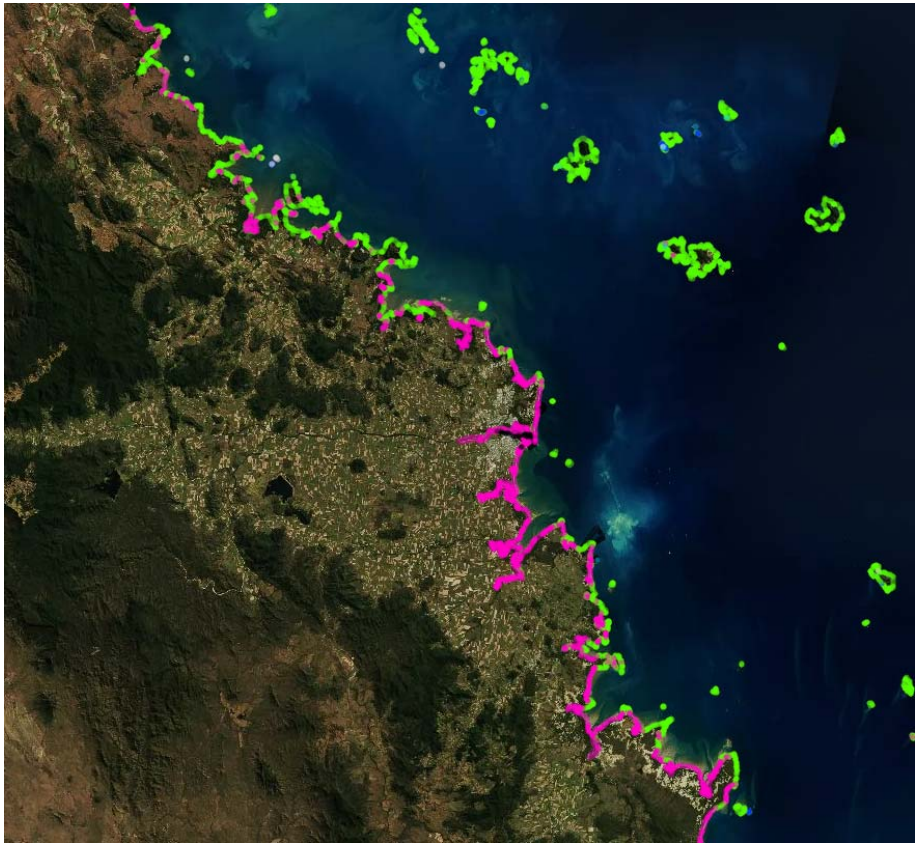
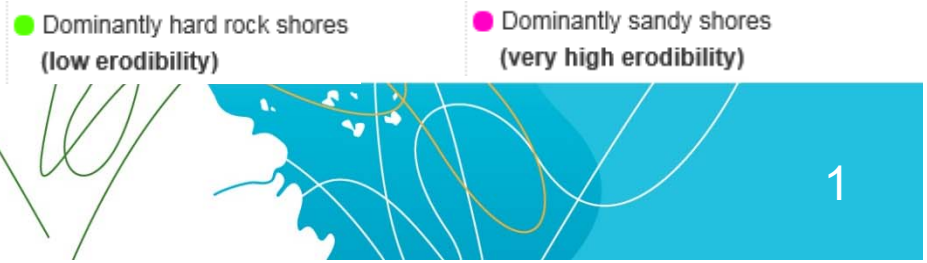
Presentation overview

- Introduction - Mackay Region
- Coastal and Inland Flood Hazard Adaptation Study (CIFHAS)
- Adaptation Journey - McEwens Beach
- Summary
- Where to from here



Source: CoastAdapt Shoreline Explorer – Mackay LGA



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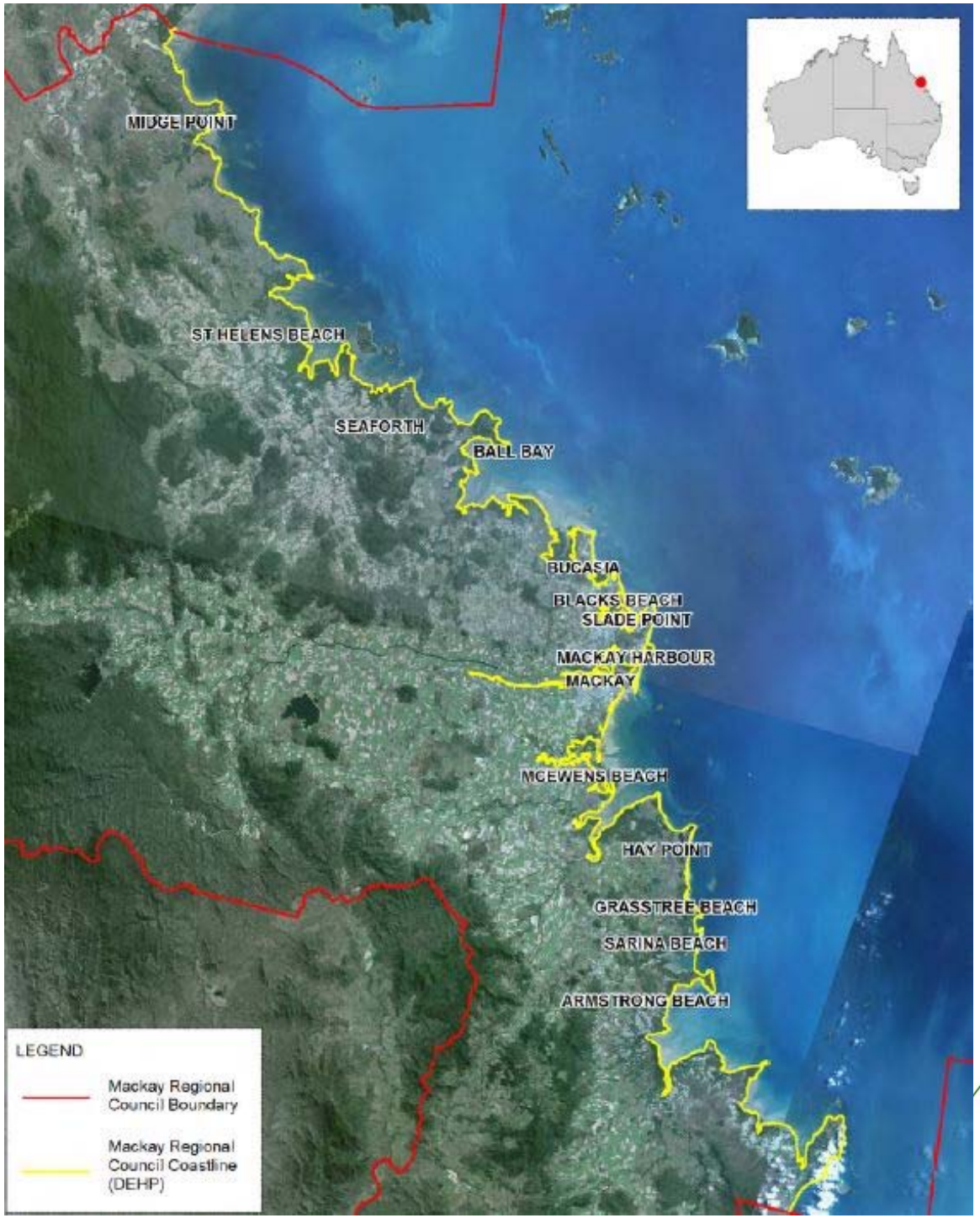


Mackay Region

320 km coastline

Population of 123,000

24 + coastal communities

1.4 cyclones per year

Pioneer River

40% properties affected by coastal and flood hazards

Mackay's coast

- large tidal range – around 6.5m
- semi-diurnal tides (high water occurs twice daily)
- beaches - low frontal dunes, flat beach profiles with wide tidal flats extending up to 2km in low tides

Social values (from a beach community)

- fishing
- communal use of beach
- natural settings & wildlife
- water views
- well maintained parklands

Sarina,
Campwin and
Grasstree
Beaches

Blacks Beach

recent development 170 m
setback from foredune

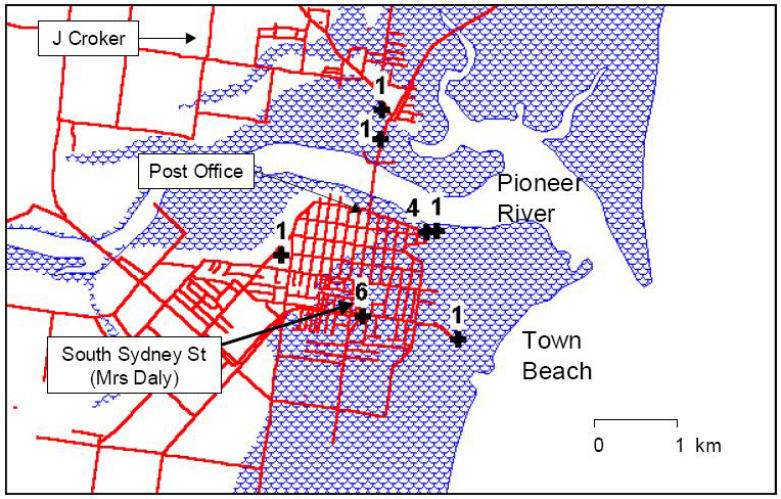
Lamberts Beach “Cyclone Dylan”
31 January 2014

Photo courtesy of Daily Mercury, Peter Holt Photo

Mackay's Significant Coastal and Flood Events in last 150 years

- **1898 Cyclone Eline** - resultant flooding changed the mouth of the Pioneer River
- **1918** Cyclone & Floods
- **1958** Flood in the Pioneer River - largest flood in recorded history
- **1988** Cyclone Charlie caused flooding, mostly in rural areas
- 2008 Flash Flood – 6 hr rainfall of 736 mm
- **2014** Cyclone Dylan – largest storm tide in measured history (last 29 years)

Mackay CBD following 1918 cyclone



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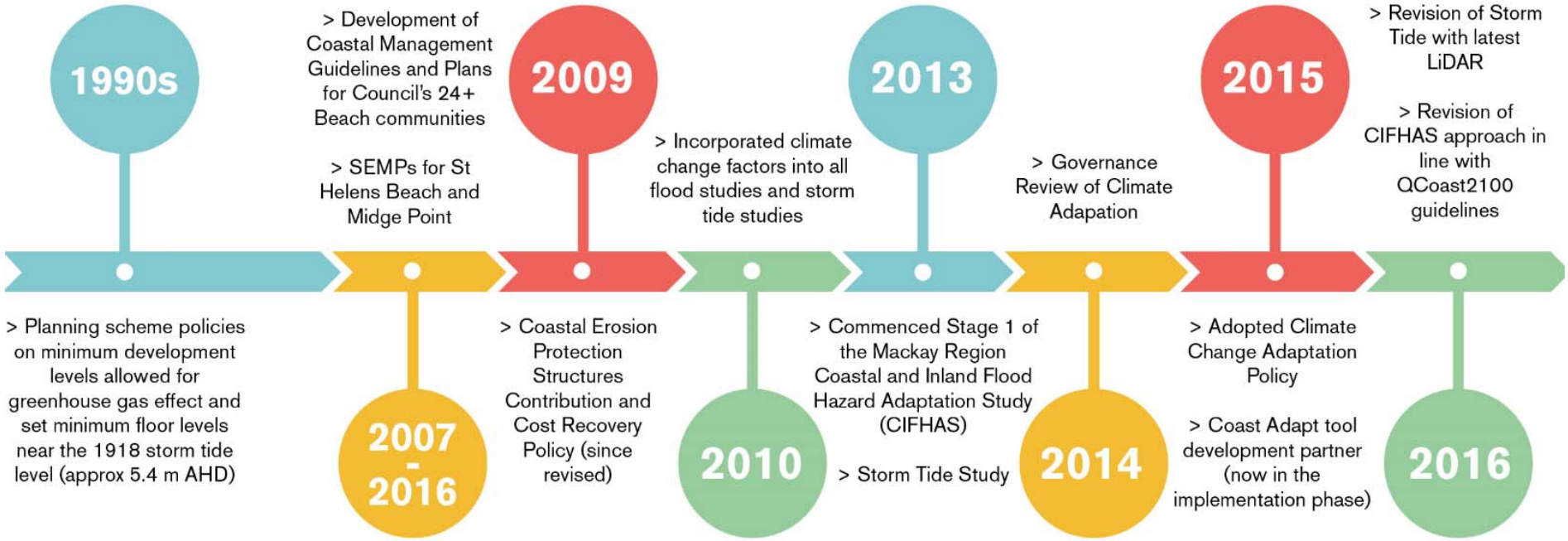
Mackay's Coastal Adaptation Journey



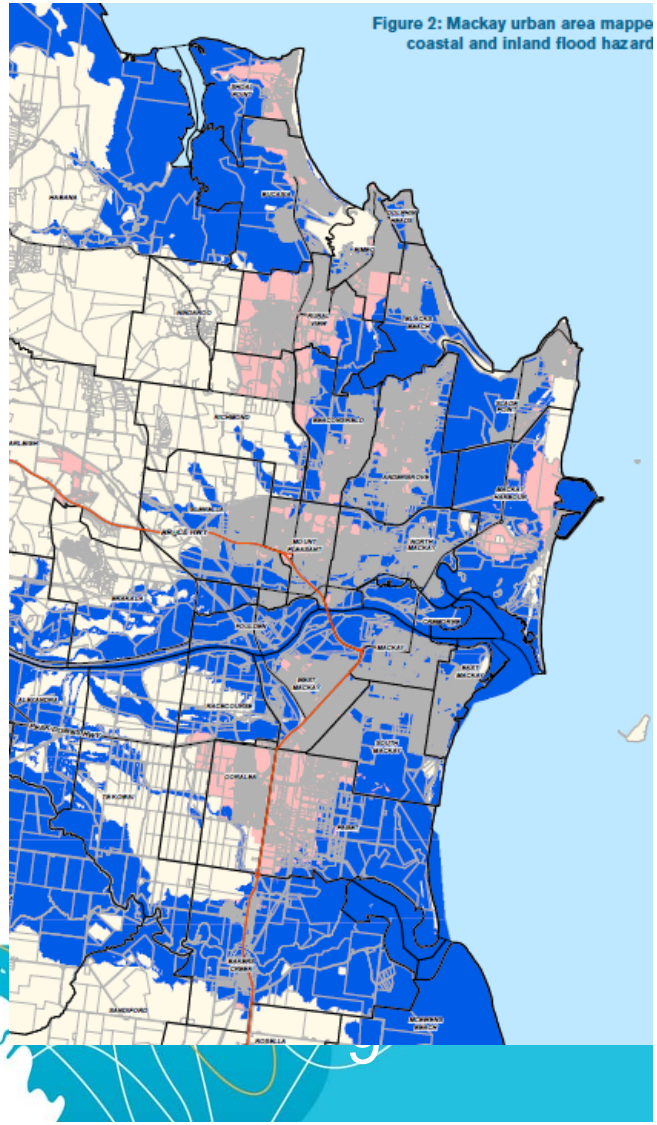
Mackay Coastal and Inland Flood Hazard Adaptation Study (CIFHAS)

Objective

To identify adaptation options that will minimise the impact of flooding and coastal hazards on the community both now and into the future.

Basis for Study (Stage 1)

Guideline for Preparing a Coastal Hazard Adaptation Strategy (Qld Govt, April 2013)



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Climate variability considered in the CIFHAS study

Sea Level Rise

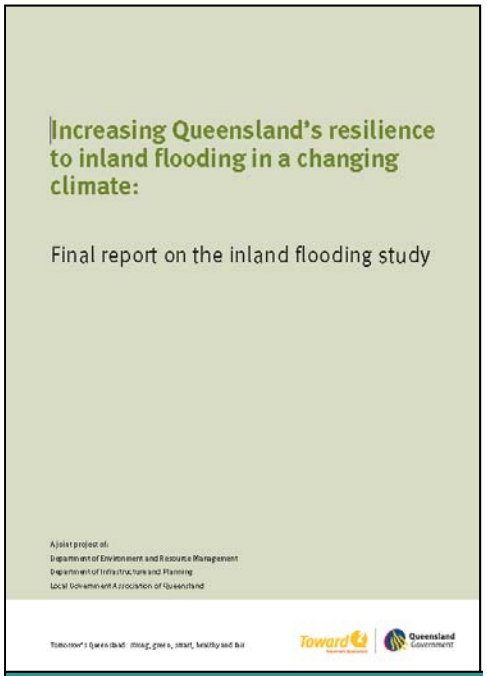
- 0.8 m sea level rise by the year 2100

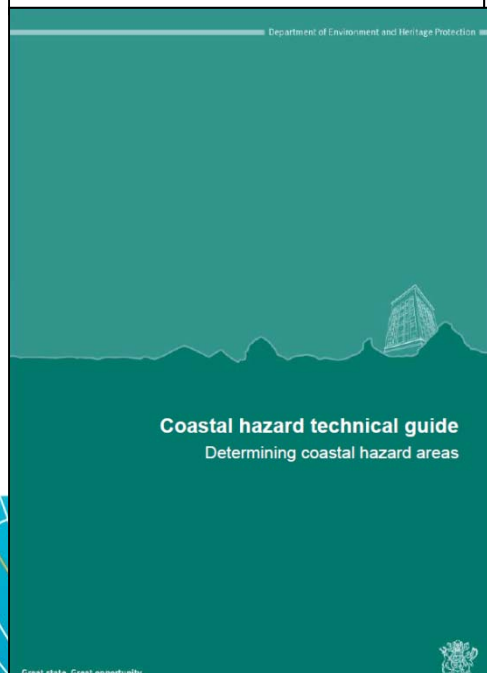
Cyclone intensity

- 10% increase in the maximum cyclone intensity

Rainfall intensity

- 20 % increase in rainfall intensity resulting from a 5% increase in rainfall intensity for each degree increase in temperature.





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Mackay CIFHAS Stages 2013-2016

Stage	Step	Task
1	**1.1**	**Identify areas at risk**
	1.2	**Identify current and known future exposed 'assets' (residential, commercial, community) and assess their vulnerability to hazards by 2100, including an assessment of risks.**
	1.3	**Identify potential adaptation options (e.g. avoid, accommodate, defend or retreat)**
1B	**1.4**	**Internal Review and Communication Planning**
2	2.1	Consult the community about potential adaptation options
3	3.1	Undertake a socio-economic appraisal of adaptation options
	3.2	Select preferred adaptation options
	3.3	Develop an implementation program and financial plan
4	4.1	Engage in community consultation on the draft adaptation strategy
5	5.1	Develop a process for monitoring, evaluating and reviewing the adaptation strategy

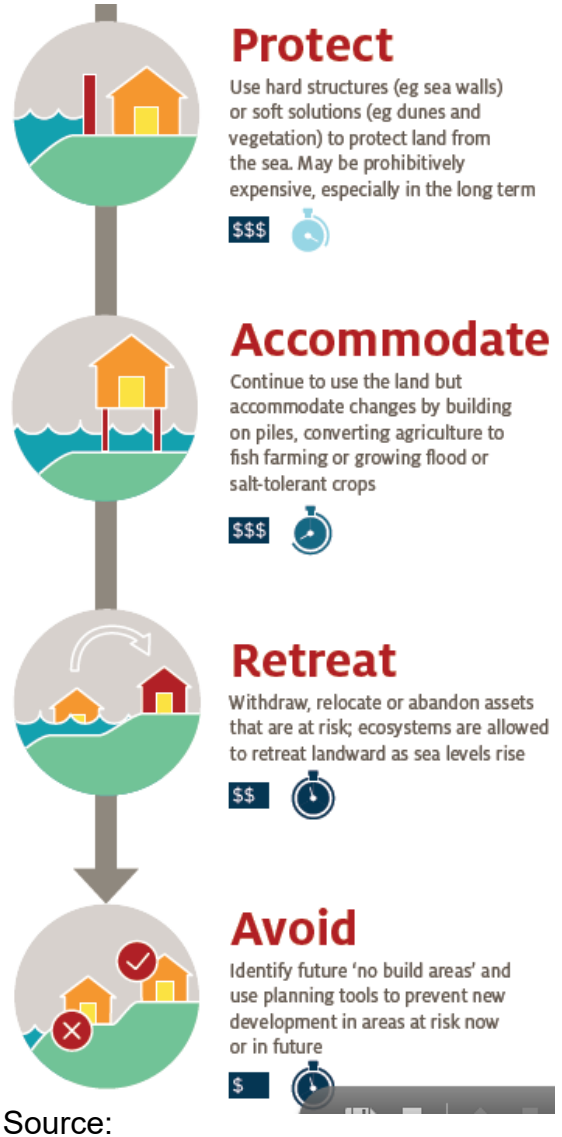
Mackay Coastal and Inland Flood Hazard Adaptation Study (CIFHAS)

Stage 1 provided:

- Risk assessment
- 400+ detailed maps
- Advice on minimum development floor levels, community education & engagement
- Identified adaptation options focusing on Mackay – levees & seawalls

Challenges

- External – political, natural disasters, local issues
- Community involvement in assessing risk
- Areas of 'high concern'
- Rezoning
- An on-going journey!



Source:
Coast Adapt Infographic - What should we consider in adapting to sea level rise

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Mackay CIFHAS in line with QCoast 2100 Guidelines

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McEwens Beach

Coastal Adaptation Journey

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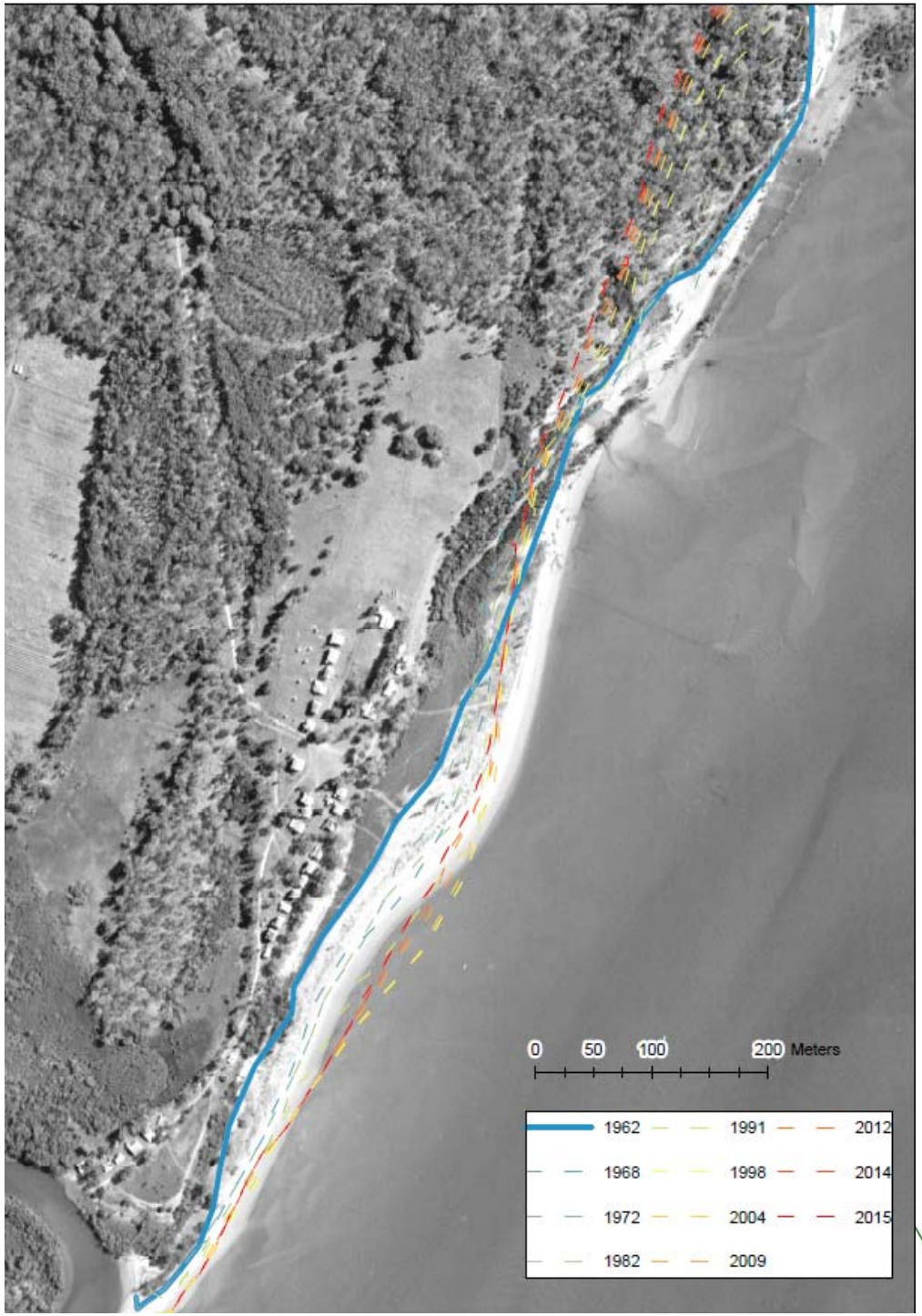
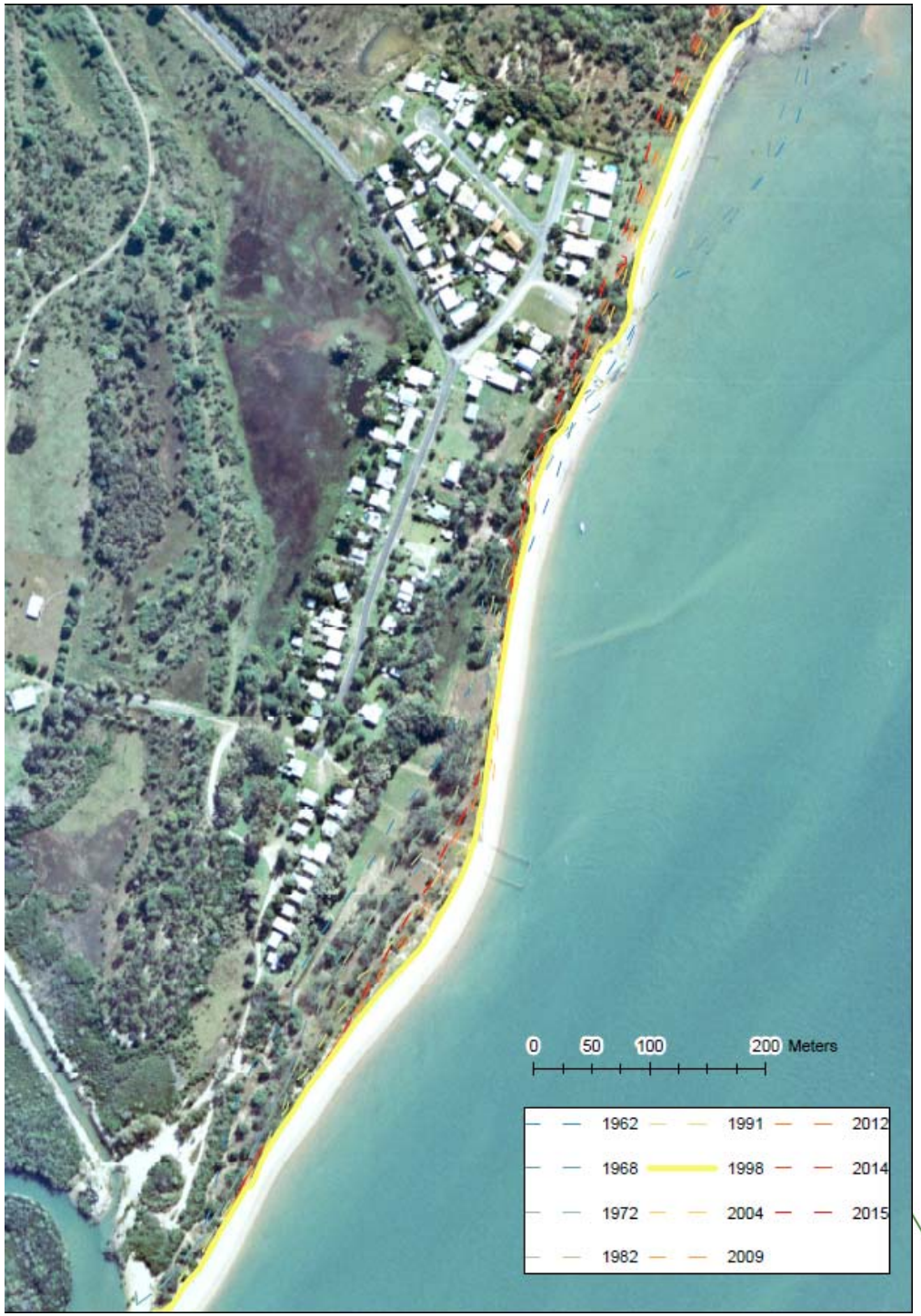


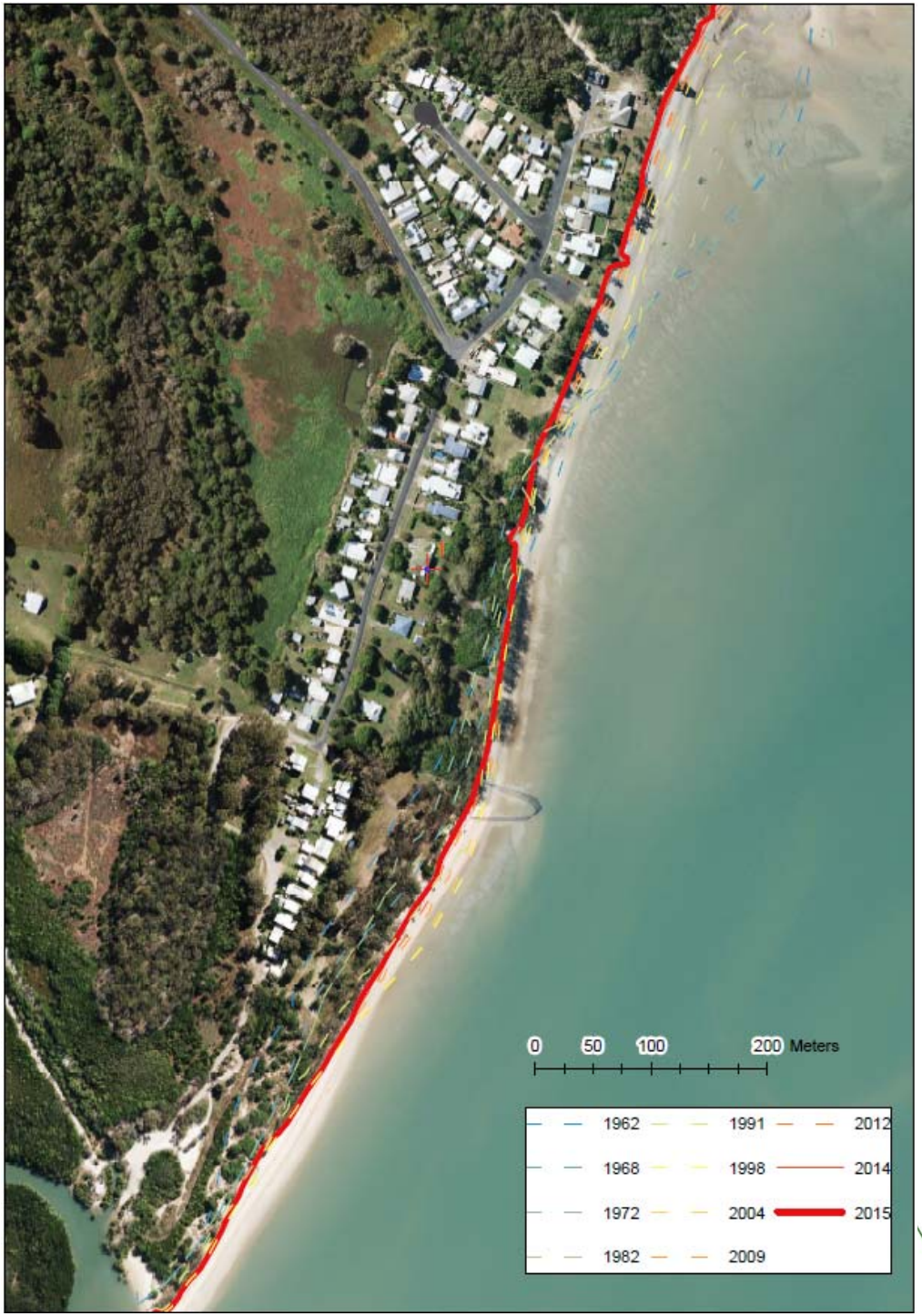
1962
McEwens Beach

- 26 dwellings
- holiday destination
- northern beach area undeveloped



1998
McEwens Beach

- 69 Dwellings
- Population of around 120
- From 1962 to 1998 (36 yrs) McEwens beach has experienced:
  - Northern beach – 87m erosion (loss)
  - Southern beach – 75m accretion (gain)



2015
McEwens Beach

- 79 dwellings
- Population of around 140
- From 1962 to 2015 (53 yrs) McEwens beach has experienced:
  - Northern beach – 95 m erosion
  - Southern beach – 50 m accretion


McEwens Beach Rd
MCEWENS BEACH
Joyce Ct
Aura St
Waltz Av
22
0
12
10
8
6
3
18
2
19
21
23
38
40
37
39
41
43
Extent of McEwens
Beach Erosion Protection (Stage 1)
2003
2016

CoastAdapt

Australian Government

Department of the Environment and Energy

NCCARF
National
Climate Change Adaptation
Research Facility

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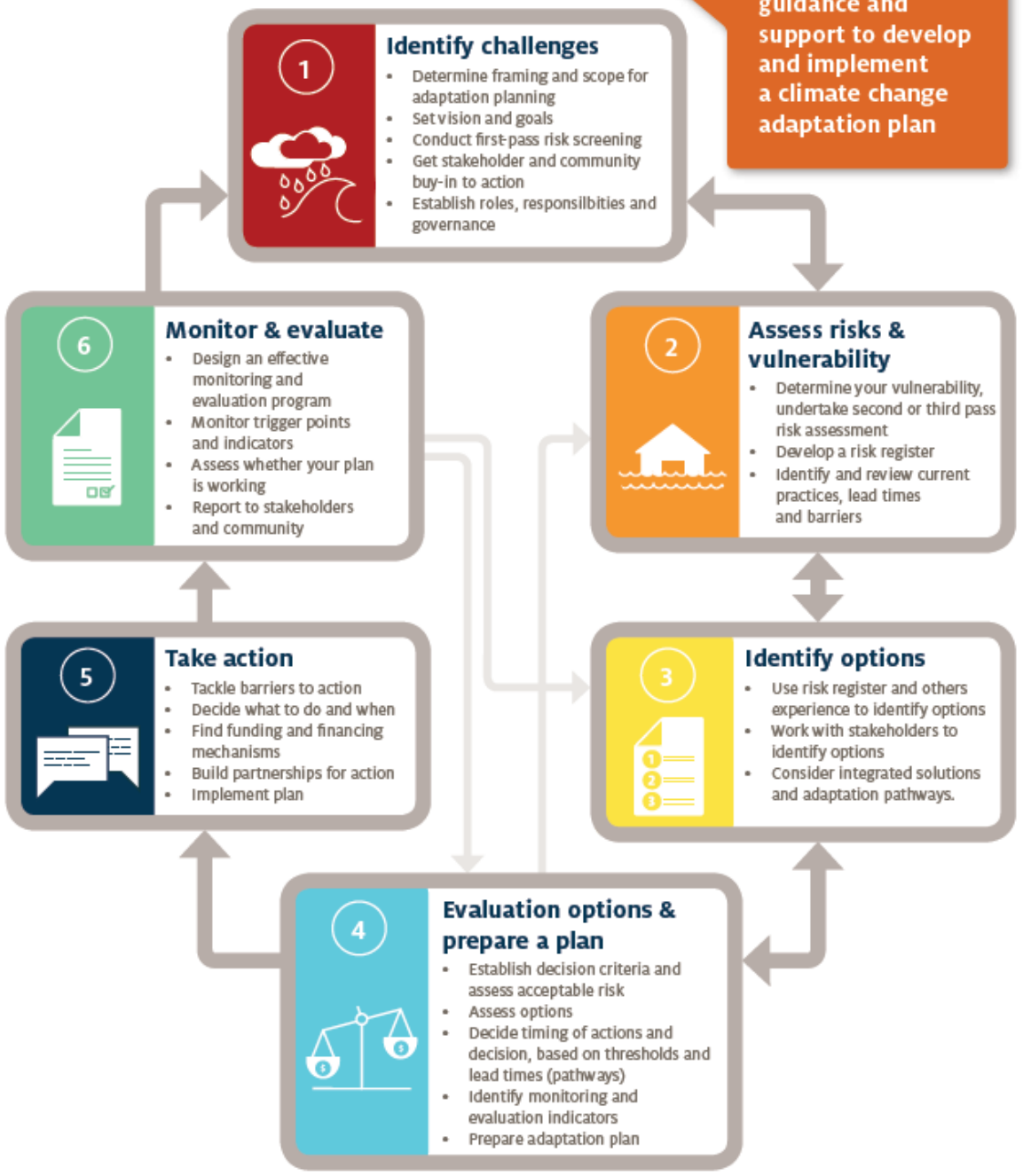
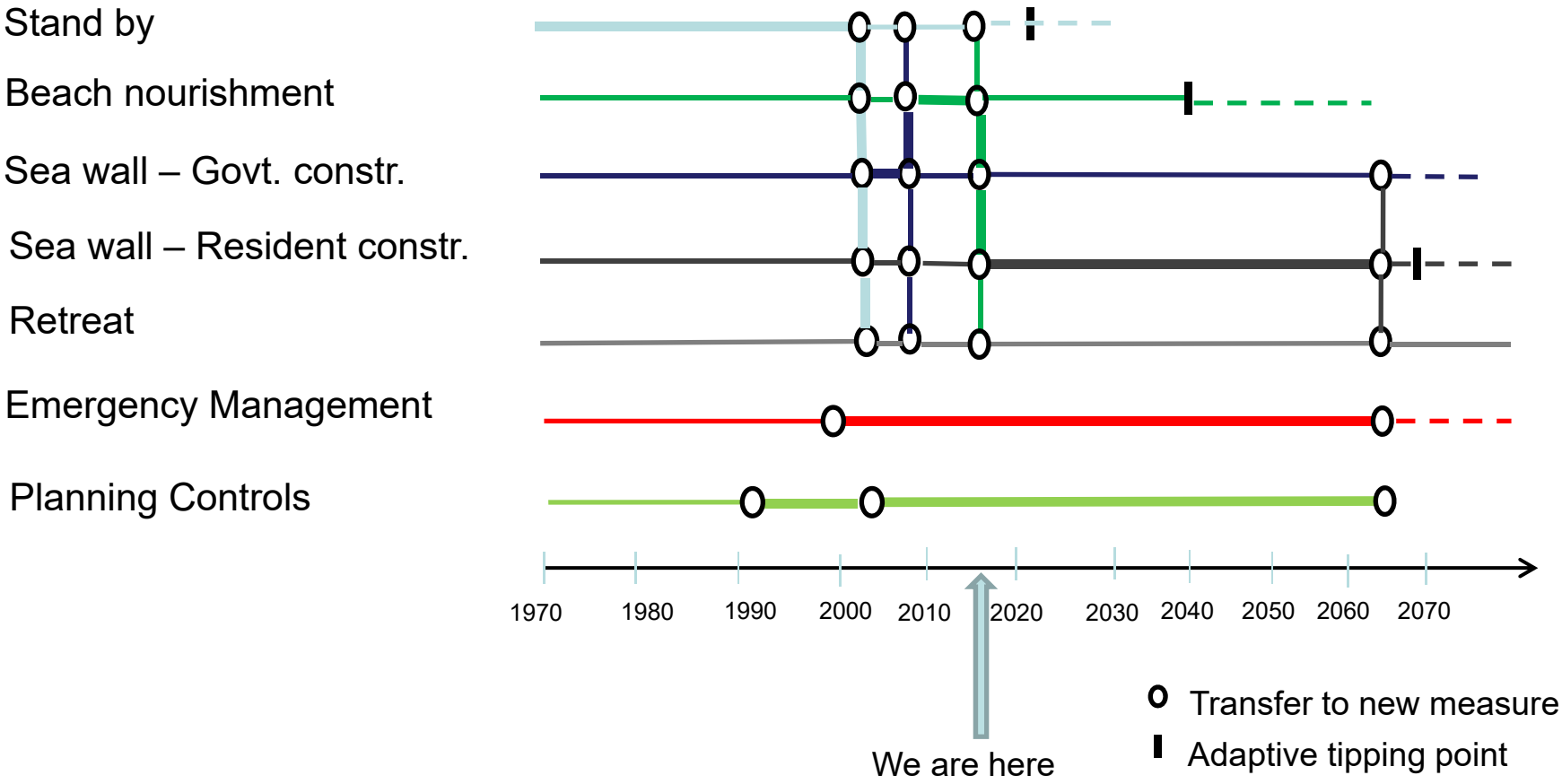
The six steps of the C-CADS process

C-CADS provides guidance and support to develop and implement a climate change adaptation plan

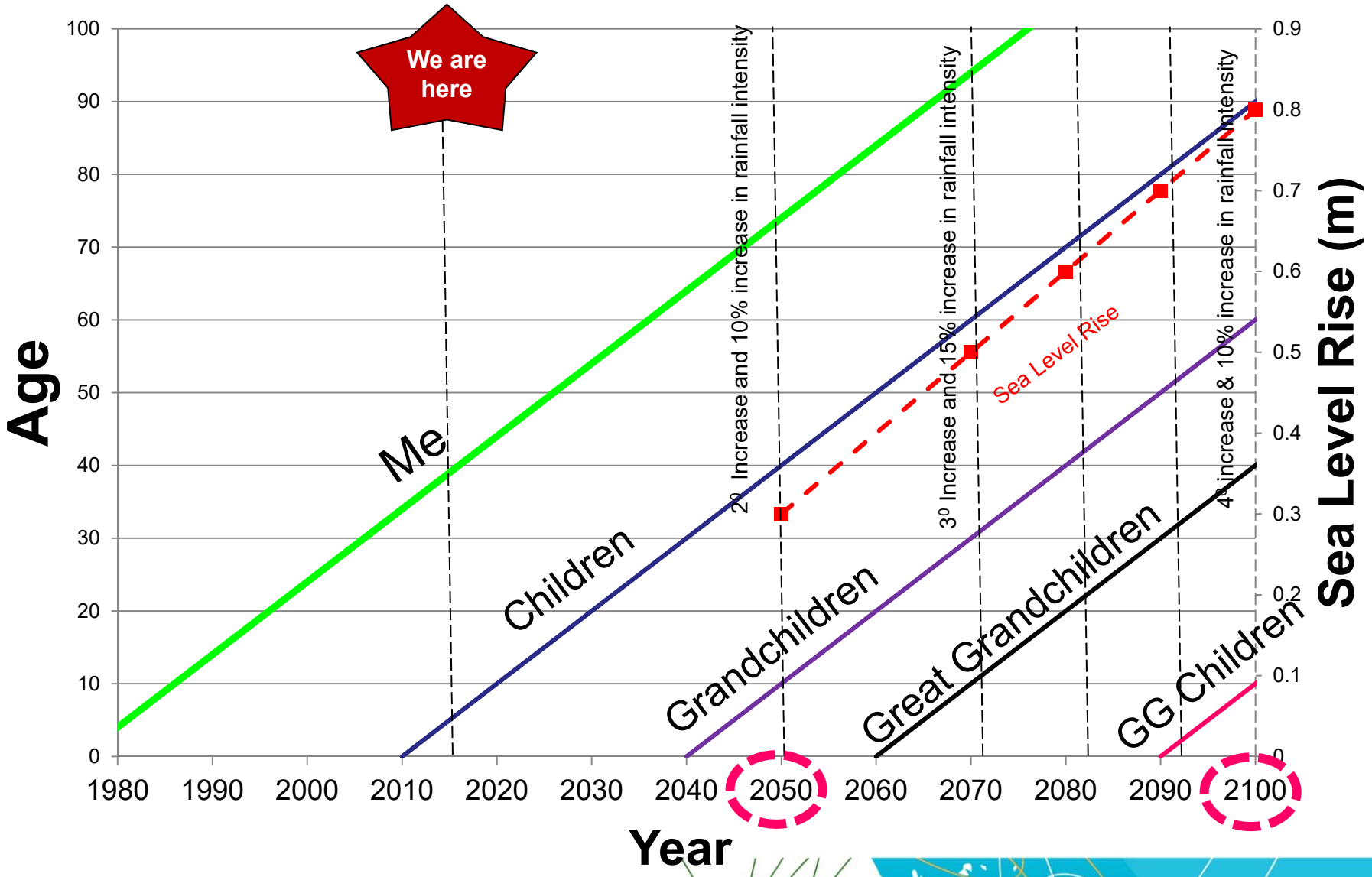


Example of options & an adaptation plan for McEwens Beach

Measures



Climate Variability Timeline



Summary

- Council is keen to ensure our communities are active, healthy and resilient
- Our decisions respect and protect our environment and community now and into the future
- Embed climate adaptation within Council's operations and look at coastal issues holistically
- Talking with the community needs to be specific to the local issues, the ownership of assets affected and the availability of Council resources
- We have time!
- Our built environment may look very different in 30+ years

Where to from here

- Council will apply for $QCoast_{2100}$ funding for Phases 1 to 5 to expand on existing work aimed at addressing climate change related coastal hazard risks
  - a community engagement and awareness campaign
  - a coastal hazard risk assessment and
  - a terrestrial LIDAR (light detection and ranging) survey of floor levels of residential and commercial properties within coastal hazard areas
- Other projects include:
  - Local coastal plans
  - Coasts and Communities Program (joint initiative with Reef Catchments)
  - Flood Information portal
  - Floodplain Management Plan and local flood damage assessments for socio economic assessments
  - Continued engagement with key stakeholders – DNRM, EHP, Insurers regarding latest flood and storm tide data and hazard information