



# **The Bundaberg Journey Coastal Hazard Adaptation Strategy**

Climate Council Webinar  
25<sup>th</sup> February 2021

***Dwayne Honor – Project Manager***



# Key Learnings – Bundaberg CHAS

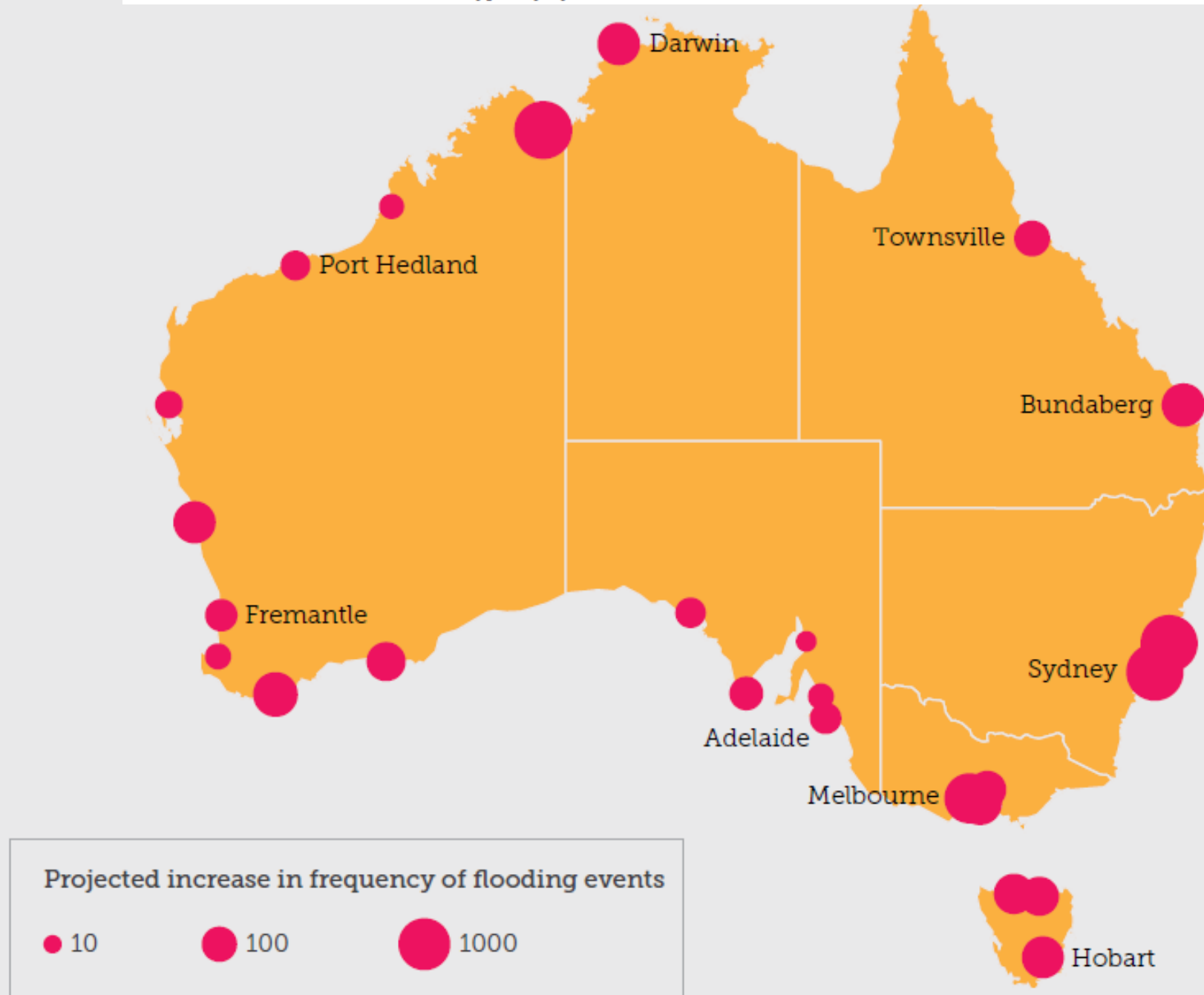
| Item                                              | Timing  |
|---------------------------------------------------|---------|
| Background – What was happening to our coastline? | 5 mins  |
| QCoast 2100 Program & Funding                     | 15 mins |
| What have we learnt?                              |         |
| Over to Elisa! .....                              |         |



# Background



**Figure 7:** A sea-level rise of only 0.5m would lead to very large increases in the incidence of extreme coastal flooding events in Australian coastal towns and cities, typically by a factor of several hundred (Hunter 2012).









# Cyclone removes beach protection

20th Mar 2009 7:52 AM

**NewsMail**  
CONNECTING OUR COMMUNITY



0



Darryl Hampson has watched Moore Park Beach slowly disappear into the ocean as the erosion gets worse every year.

NEWS

## Surf club to be demolished

30th Jun 2010 2:25 AM



0



8 COMMENTS



Mal Drews sits with two of the club's youngest members, Chloe and Ellisa Harris.

NEWS

## Caravan park danger

3rd Nov 2011 2:00 AM



0



9 COMMENTS



Mara Holiday Park regular Kay Watts is one of many holidaymakers extremely upset about the severity of beach erosion.

# Coastal Hazard Adaptation Strategy (CHAS)

Background



QCoast2100 approved funding for **31 Councils**

<https://www.qcoast2100.com.au/>



BRC awarded:

**\$48,227** in 2017

**\$451,000** in 2018

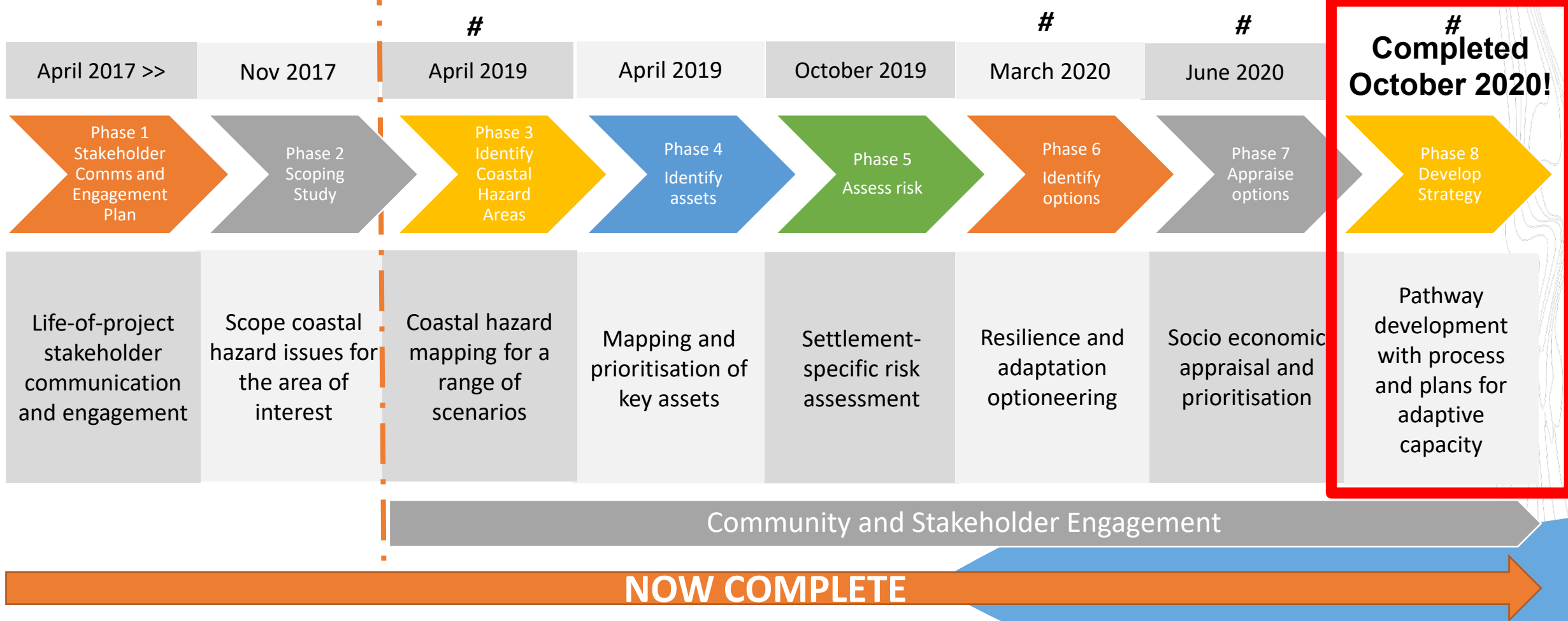
CHAS Project delivered through eight phases



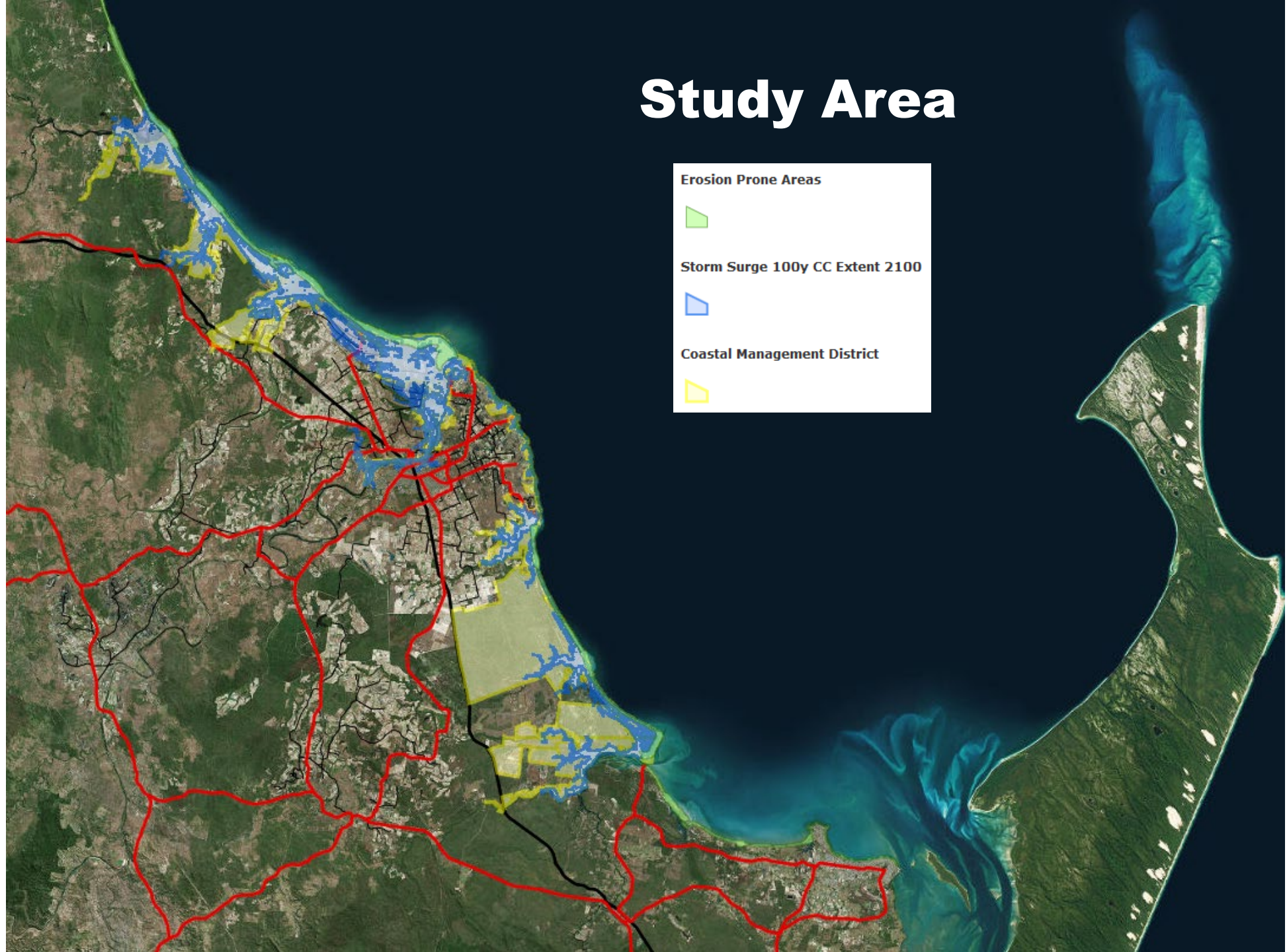
# Development of the CHAS

Background

Contract Signed April 2018 >>



# Study Area





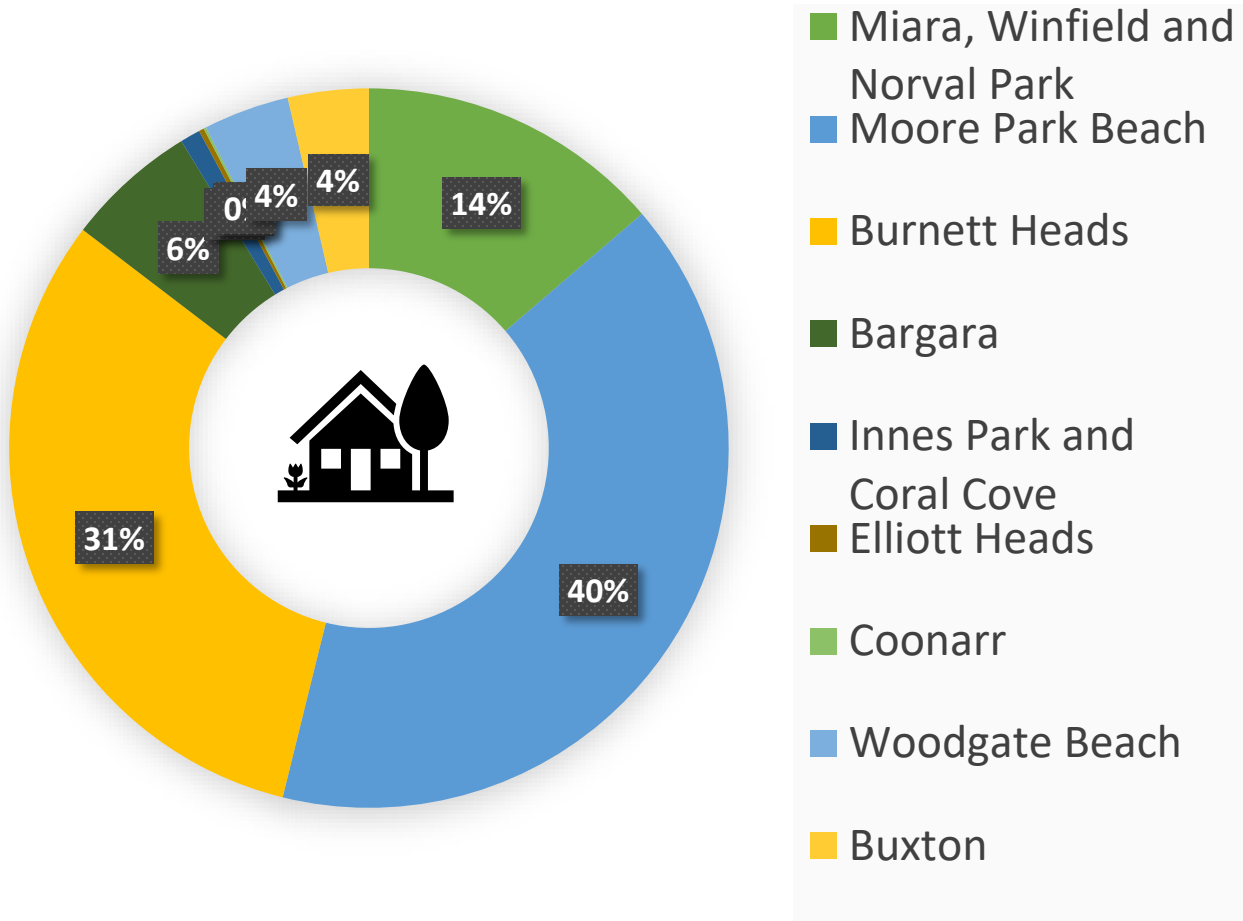
# What have we learnt?





# Assets exposed to coastal hazards

What have we learnt?

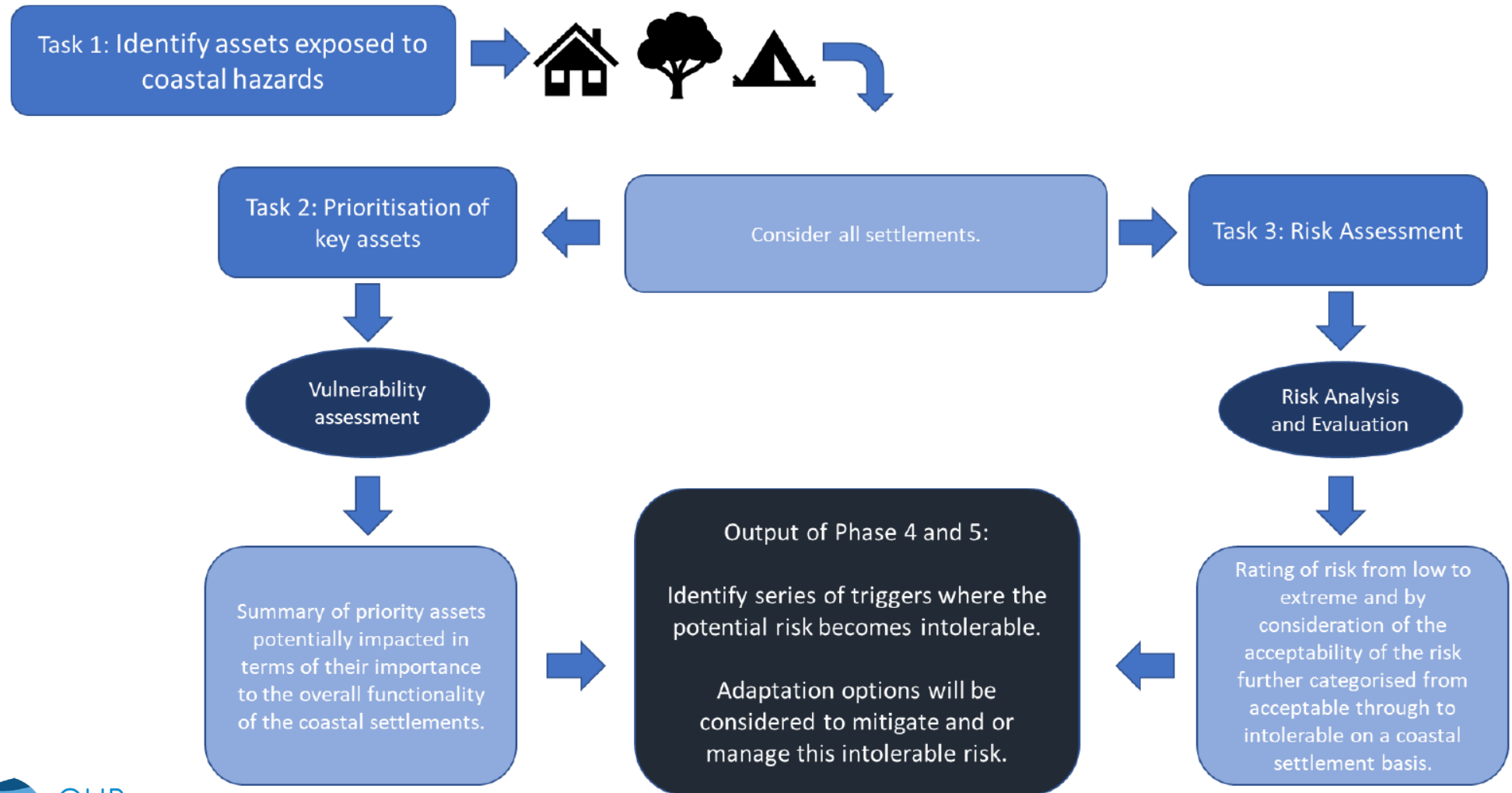


34.4km Roads

92.6km Power lines

# Phase 4 - 5

What have we learnt?





# Phase 4 – 5 (Adopted QERMF)

What have we learnt?

TABLE 5-1 CONSEQUENCE SCALES APPLIED TO RISK ASSESSMENT

| Consequence          | Economic – Queensland Emergency Risk Management Framework (QERMF)                                                                                                                                                                                                                                                                                                                                                                                                                           | Social – QERMF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Environmental – QERMF                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Catastrophic</b>  | Permanent decline of economic activity or government revenues from industries (e.g. mining, agriculture, tourism).<br>Loss or failure of an industry and / or loss of asset as a direct result of emergency event that requires Federal and State Government financial assistance.<br>The recovery from the loss of essential infrastructure would be prolonged and complicated and require Federal and State Government financial assistance.<br><br>(>\$100million damages) <sup>23</sup> | The community's social connectedness is irreparably broken, such that the community ceases to function effectively, breaks down and disperses in its entirety. This can be characterised by widespread loss of objects of cultural significance and impacts beyond emotional and psychological capacity across all parts of the community. <sup>23</sup><br><br>(>90% of intangible value lost)<br><br>Isolation of the community due to permanent inundation of key access route.                                                                                                               | Permanent destruction of an ecosystem or species recognised at the local, regional, State or national level and / or severe damage to or loss of an ecosystem or species recognised at the State and national level and / or significant loss or impairment of an ecosystem or species recognised at the national level. Permanent destruction of environmental values of interest.<br><br>Consequence rating > 160 |
| <b>Major</b>         | Longer term decline of economic activity (e.g. several years) or government revenues from industries (e.g. mining, agriculture, tourism).<br>Significant structural adjustment of an industry and / or significant damage to an asset that requires Federal and State Government financial assistance.<br>The recovery from loss of essential infrastructure would be possible through State Government financial assistance.<br><br>(\$10 to \$100million damages)                         | The community's social connectedness is significantly broken, such that extraordinary external resources are required to return the community to functioning effectively, with significant permanent dispersal. This can be characterised by reduced quality of life within the community, significant loss of or damage to most objects of cultural significance and impacts beyond emotional and psychological capacity in large parts of the community.<br><br>(>70% of intangible value lost)<br><br>Regular inundation of key access route that causes significant impacts to key services. | Minor damage to ecosystems or species recognised at the national level and / or significant loss or impairment of an ecosystem or species recognised at the State level and / or severe damage to or loss of an ecosystem or species recognised at the Local or regional level. Severe damage to environmental values of interest.<br><br>Consequence rating between 120 and 160                                    |
| <b>Moderate</b>      | Medium term decline of economic activity (12 months or more) or government revenues from industries (e.g. mining, agriculture, tourism). Impairment of an industry and / or damage to an asset that requires State Government financial assistance resulting in medium term (12 months or more). The recovery from loss of essential infrastructure is simple but requires financial assistance beyond the allocated budget.<br><br>(\$1 to \$10million damages)                            | The community's social connectedness is broken, such that community requires significant external resources to return the community to functioning effectively, with some permanent dispersal. This can be characterised by permanent damage to some objects of cultural significance and impacts beyond cultural and emotional capacity in some parts of the community.<br><br>(>50% of intangible value lost)                                                                                                                                                                                  | Minor damage to ecosystems and species recognised at the State level and / or significant loss or impairment of an ecosystem or species recognised at the Local or regional level. Significant damage to environmental values of interest.<br><br>Consequence rating between 80 and 120                                                                                                                             |
| <b>Minor</b>         | Short term decline of economic activity (less than one year) and / or government revenues from industries (e.g. mining, agriculture, tourism).<br>Minor damage to an industry and / or damage to an asset that requires the reallocation of budget for recovery, resulting in short term disruption (less than one year). The recovery from the loss of essential infrastructure achievable in short term through budget reallocation.<br><br>(\$250,000 to \$1million damages)             | The community's social connectedness is damaged, such that community requires some external resources to return the community to functioning effectively, with no permanent dispersal. This can be characterised by repairable damage to objects of cultural significance and impacts within emotional and psychological capacity of the community<br><br>(>20% of intangible value lost)                                                                                                                                                                                                        | Minor damage to ecosystems and species recognised at the Local or regional level.<br>Minor damage to environmental values of interest.<br><br>Consequence rating between 40 and 80                                                                                                                                                                                                                                  |
| <b>Insignificant</b> | Short term disruption to economic activity and / or loss of assets within an industry or sector. Inconsequential business sector disruption due to emergency event. Recovery from loss of essential infrastructure achievable within current budget allocations.<br><br>(<\$250,000 damages)                                                                                                                                                                                                | The community's social connectedness is disrupted, such that the reprioritisation and / or reallocation of existing resources is required to return the community to functioning effectively, with no permanent dispersal. There is no or minor damage to objects of cultural significance, and no adverse emotional and psychological impacts.<br><br>(<20% of intangible value lost)                                                                                                                                                                                                           | No damage to ecosystems at any level.<br>Inconsequential damage to environmental values of interest.<br><br>Consequence rating < 40                                                                                                                                                                                                                                                                                 |

<sup>23</sup> The consequence scale figures have been adapted from the Federal Department of Industry, Innovation and Science – Risk Management Handbook

# Phase 4 – 5 (Risk Profile)

What have we learnt?

- Storm tide inundation 5% AEP, 2% AEP, 1% AEP, 0.2% AEP
- Coastal erosion 5%AEP, 2% AEP, 1% AEP<sup>22</sup>
- Present-day sea-level conditions and 0.2m, 0.4m and 0.8m sea level rise scenarios have been assessed within the risk assessment.

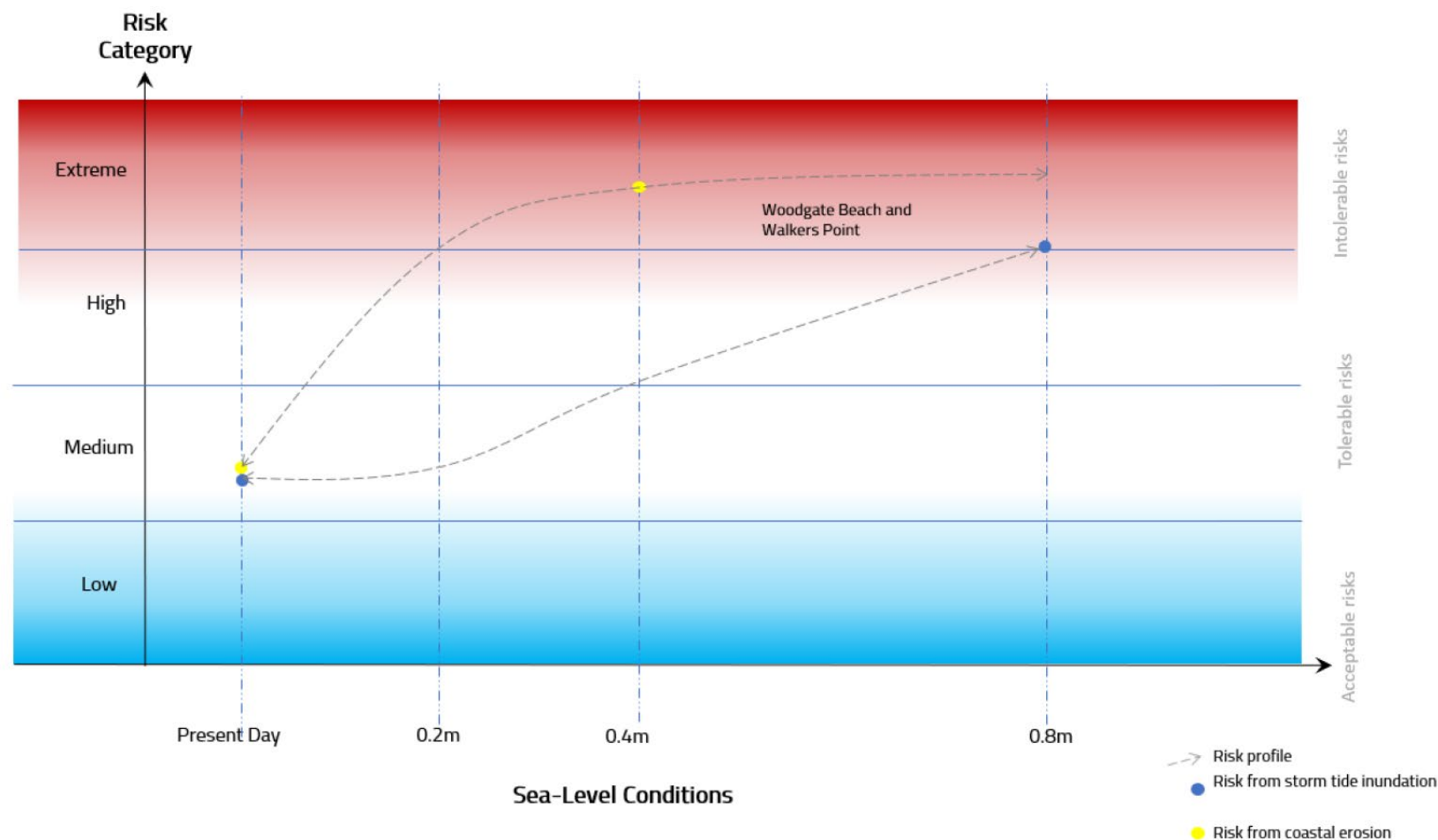


FIGURE 5-16 RISK PROFILE – WOODGATE BEACH AND WALKERS POINT

# COASTAL HAZARD RISK ASSESSMENT

There are a range of sea level scenarios considered in this risk assessment to identify and achieve an acceptable or tolerable level of risk for personal safety and property in coastal hazard areas.

This map is a preliminary guide to show where and when coastal hazard risk has been determined to become intolerable.

The key assets to each place are also shown by each settlement.

### MIARA, WINFIELD & NORVAL PARK

Risk of coastal erosion becomes **tolerable** with all scenarios.

Risk of storm tide inundation is **tolerable** with all scenarios.

Potential for major damages to buildings and infrastructure. Regular inundation of key access routes.

### BURNETT HEADS

Risk of coastal erosion becomes **tolerable** with all scenarios.

Risk of storm tide inundation becomes **intolerable** with a 0.8m sea level rise scenario.

Potential for catastrophic damages to buildings and infrastructure.

| Risk Rating  | Risk profile | Action required                                                  |
|--------------|--------------|------------------------------------------------------------------|
| Extreme Risk | Intolerable  | Immediate action required to avoid or reduce the risk            |
| High Risk    | Tolerable    | Short to medium term action required to avoid or reduce the risk |
| Medium Risk  | Tolerable    |                                                                  |
| Low Risk     | Acceptable   | Accept risk - take no action                                     |

### INNES PARK & CORAL COVE

Risk of coastal erosion becomes **intolerable** with a 0.8m sea level rise scenario.

Risk of storm tide inundation is **tolerable** with all scenarios.

Potential for catastrophic damages to buildings and infrastructure.

### ELLIOTT HEADS

Risk of coastal erosion becomes **tolerable** with all scenarios.

Risk of storm tide inundation is **tolerable** with all scenarios.

Potential for major damages to buildings and infrastructure.

### BUXTON

Risk of coastal erosion becomes **tolerable** with all scenarios.

Risk of storm tide inundation is **tolerable** with all scenarios.

Potential for major damages to buildings and infrastructure.

### WOODGATE BEACH & WALKERS POINT

Risk of coastal erosion becomes **intolerable** with a 0.4m sea level rise scenario.

Risk of storm tide inundation becomes **intolerable** with a 0.8m sea level rise scenario.

Potential for catastrophic damages to buildings and infrastructure. Potential isolation of community.

What could be affected?

Roads/ access

Road Bridges

Beach/ environmental assets

Water supply

Sewer mains

Powerlines

Distribution substation/ Electricity transformer

Schools

Residential buildings

Woodgate WWTP

Waste treatment

Waste disposal

Stormwater & culverts

Parks

Footbridges

What have we learnt?

Risk assessment is based on economic, social and environmental consequences of coastal hazard.

Priority settlements are those exposed to intolerable risks at some point in the future.



# Which sea level rise scenario triggers intolerable risk on the Bundaberg coastline?

What have we learnt?



0.2m SLR

Coonarr



0.4m SLR

Woodgate Beach &  
Walkers Point

Moore Park Beach



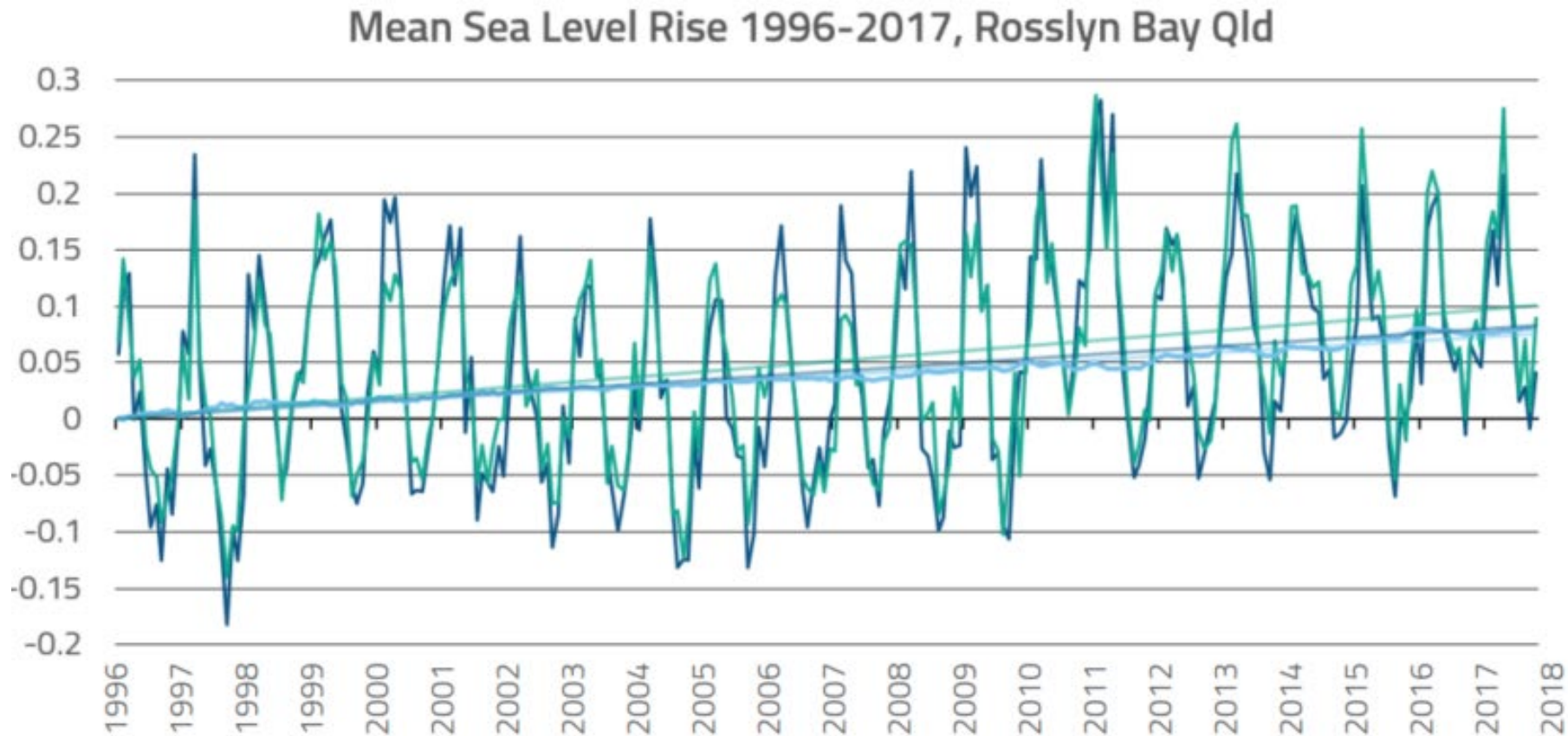
0.8m SLR

Bargara

Innes Park &  
Coral Cove

Burnett Heads

# How will we monitor Sea Level Rise?



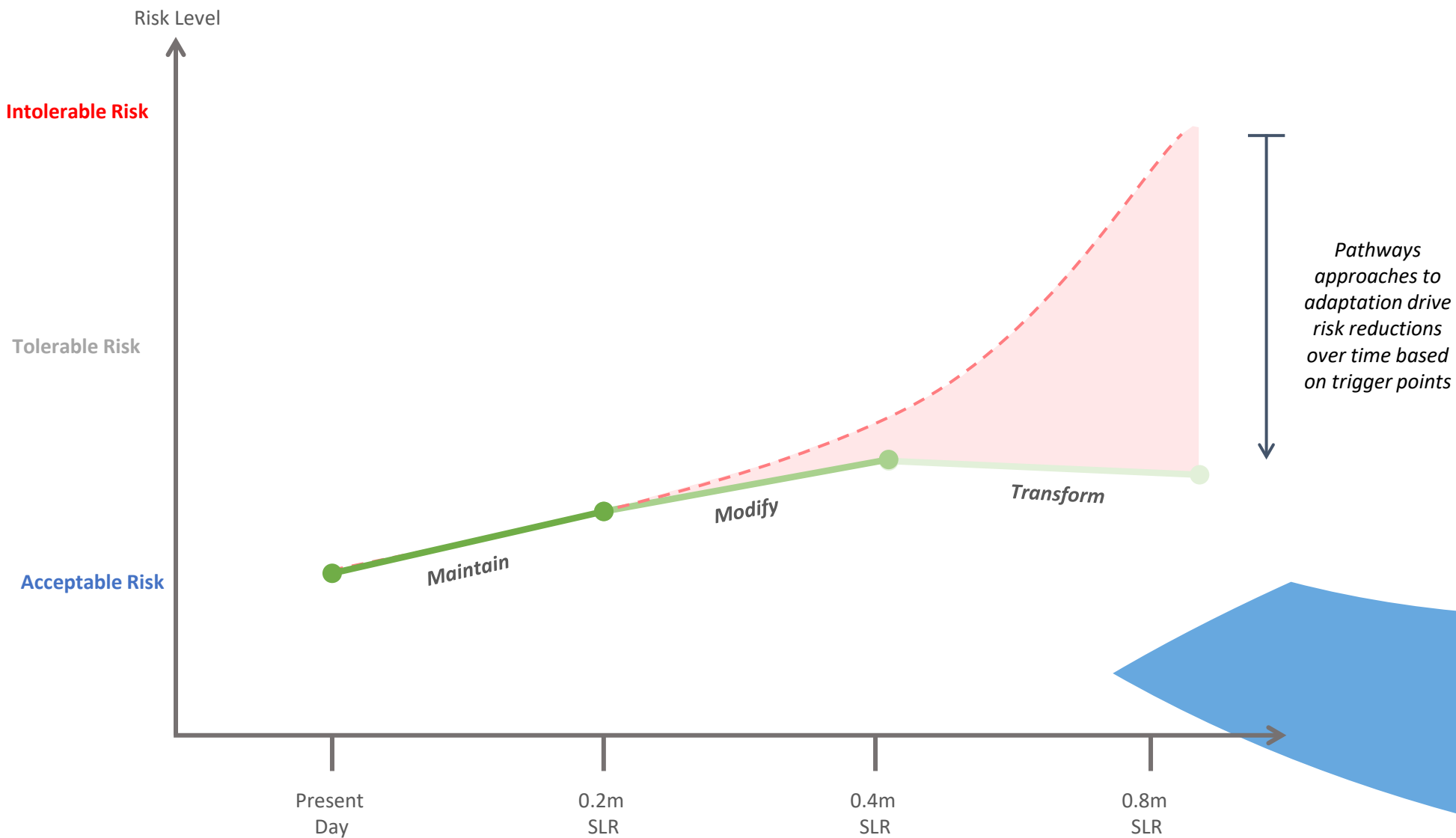
<http://www.bom.gov.au/oceanography/projects/abslmp/abslmp.shtml>

Triggers are evidence based.  
Monitor sea level rise via  
Rosslyn Bay SEAFRAME  
gauge



What have we learnt?

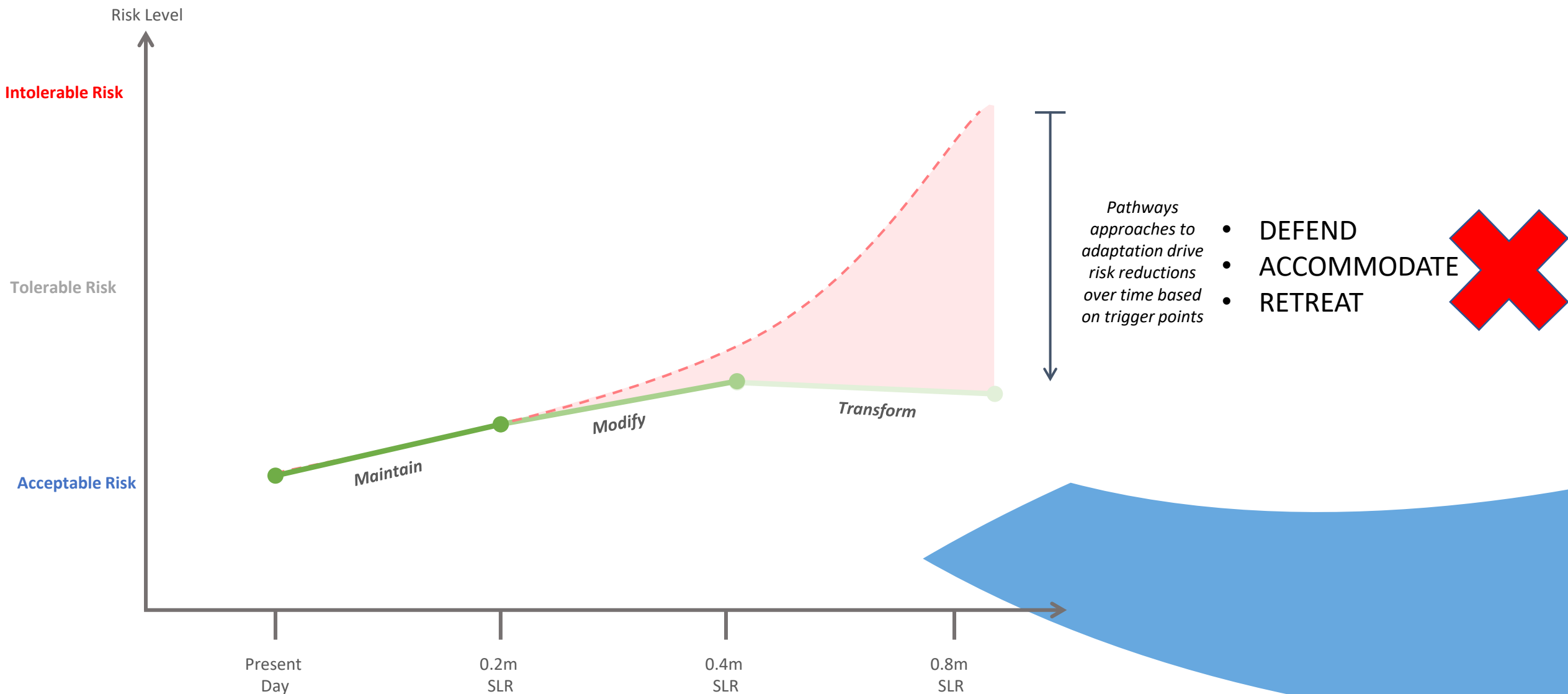
# What is a trigger-based approach?





What have we learnt?

# What is a trigger-based approach?



# What are adaptation pathways ?



## Maintain

Continue to use the land and maintain the current risk level. Activity in this category includes the constant work in the areas of disaster management, land use planning, asset planning and maintenance, and community education and awareness programs. These activities do not remove the risk or the hazard.



## Modify

Use of physical interventions that modify our settlements where the risk becomes intolerable. Activity in this category includes soft solutions such as beach nourishment and physical options such as raising key access roads to mitigate isolation risks; seawalls or storm surge barriers to protect the land from the sea.



## Transform

Relocate or withdraw assets that are exposed to intolerable risks, activity in this category include land use and tenure transition and land swap. Land use and tenure transition is complex to due to high capitalisation of coastal land and is generally only appropriate in certain circumstances when the land value becomes a true reflection of the risk level.

# Socio-Economic Appraisal Process

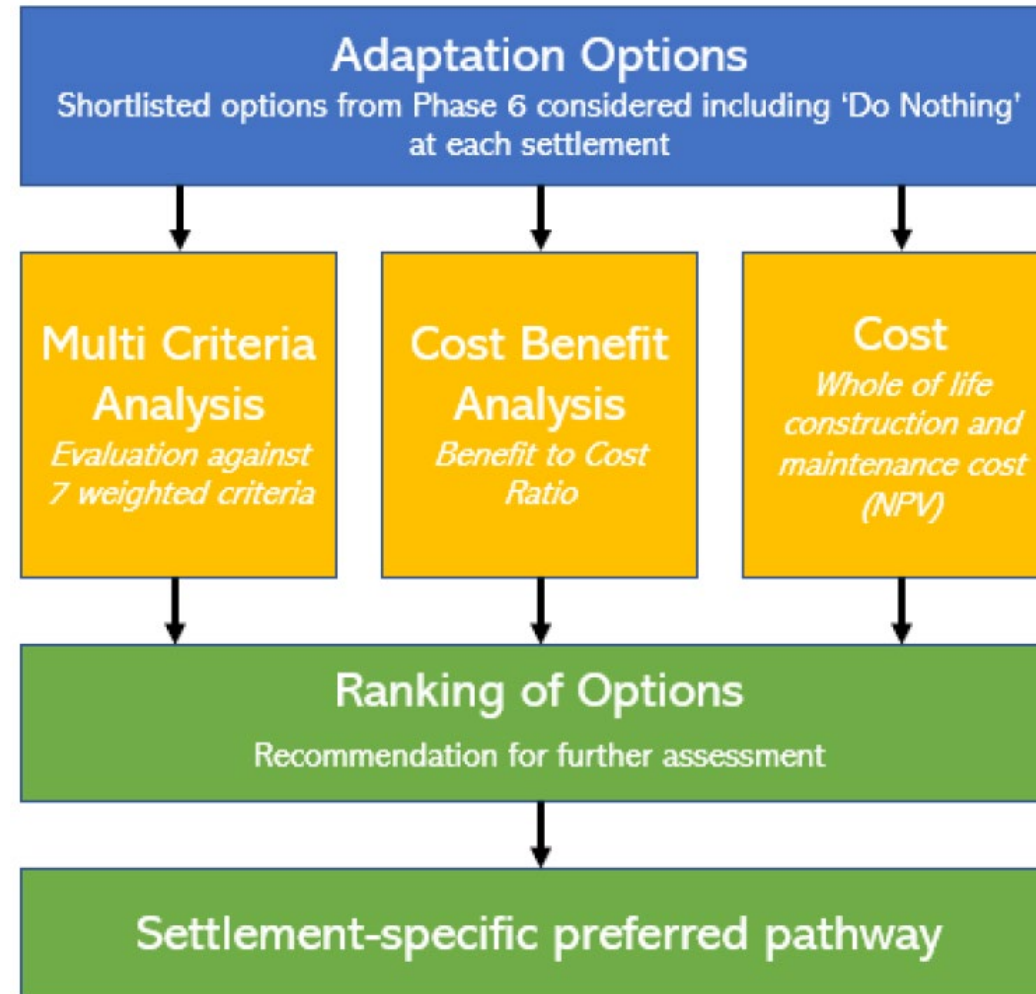


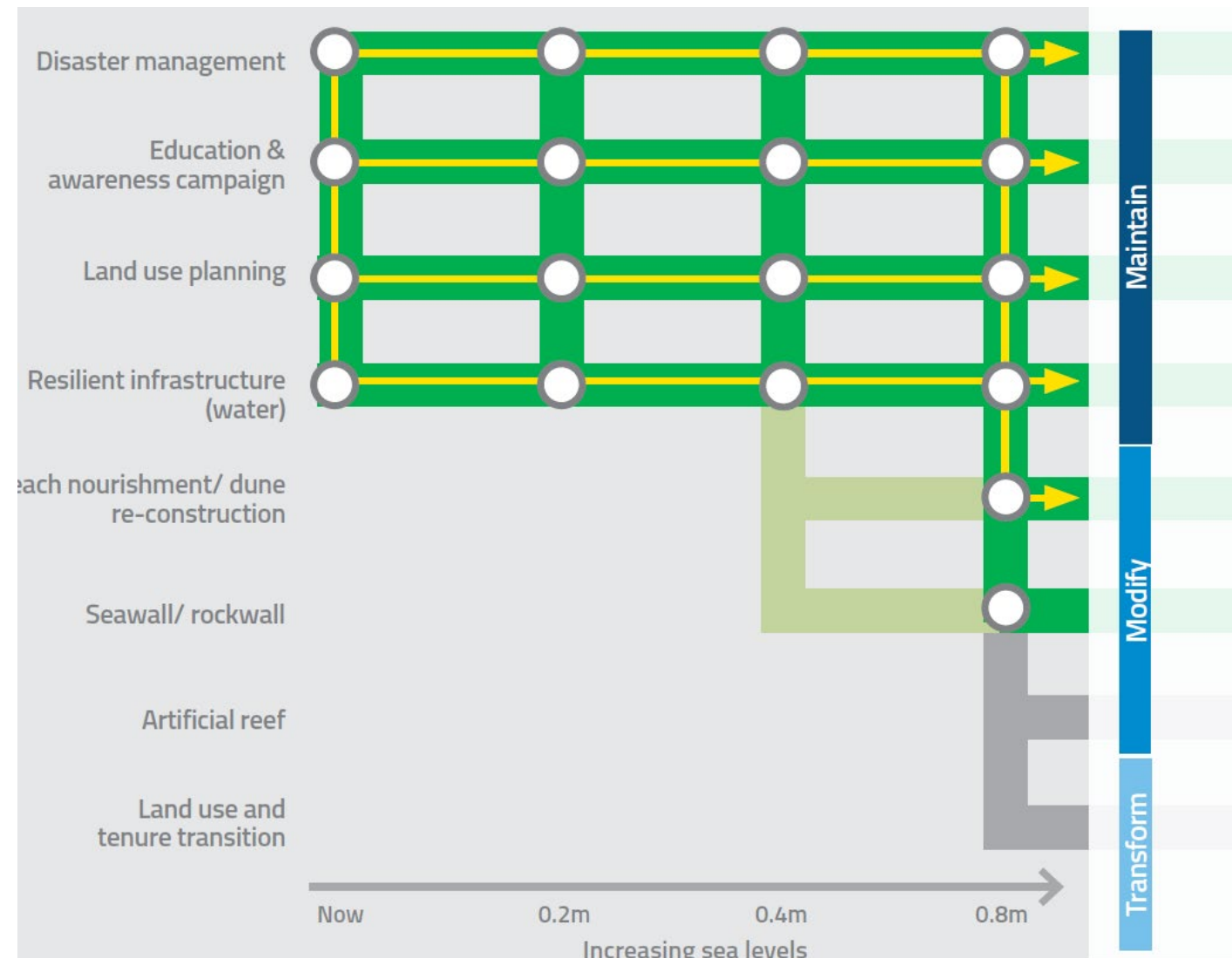
FIGURE A PHASE 7 SOCIO-ECONOMIC APPRAISAL PROCESS



# Adaptation Pathway

What have we learnt?

| Symbol | Interpretation                                                                                                                                                                                                                                                                 |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | Circles indicate decision points, that is, points in time when a decision needs to be made between alternate adaptation options. The timing of decision points has been set to coincide with present day conditions (now) and sea level rise scenarios of 0.2m, 0.4m and 0.8m. |
|        | Planning or investigation commences for adaptation option                                                                                                                                                                                                                      |
|        | Indicates when a non-preferred adaptation option would likely be implemented                                                                                                                                                                                                   |
|        | Preferred adaption option indicating the preferred pathway for adaptation                                                                                                                                                                                                      |
|        | Ruled out option, however this pathway indicates when planning or investigation would likely commence IF the option is reconsidered                                                                                                                                            |
|        | Ruled out option, however this pathway indicates when implementation would likely commence IF the option is reconsidered                                                                                                                                                       |



## What does this mean for Bundaberg?

### WHY

We have a **responsibility** to inform the community about the changing nature of their coast and **exposure to risk**

Opportunity to **connect actions to funding** which will be easier with supporting plans

We can make meaningful **trigger and risk-based decisions** in investment and the future of the community

### WHAT

Storm Tide Inundation 

Erosion 

Sea Level Rise 

MAINTAIN



DISASTER MANAGEMENT | LAND USE PLANNING | AWARENESS & EDUCATION | BEACH PROTECTION & NOURISHMENT | ROAD RAISING | STORM BARRIERS | LAND SWAP | LAND USE & TENURE TRANSITION

### HOW

Risk Understanding

Bundaberg Place Visions

Adaptation Pathways (Strategy)

Governance (Corporate Plan)

Action Plans

Monitor

Review & Improve

# Stakeholder and Community Engagement

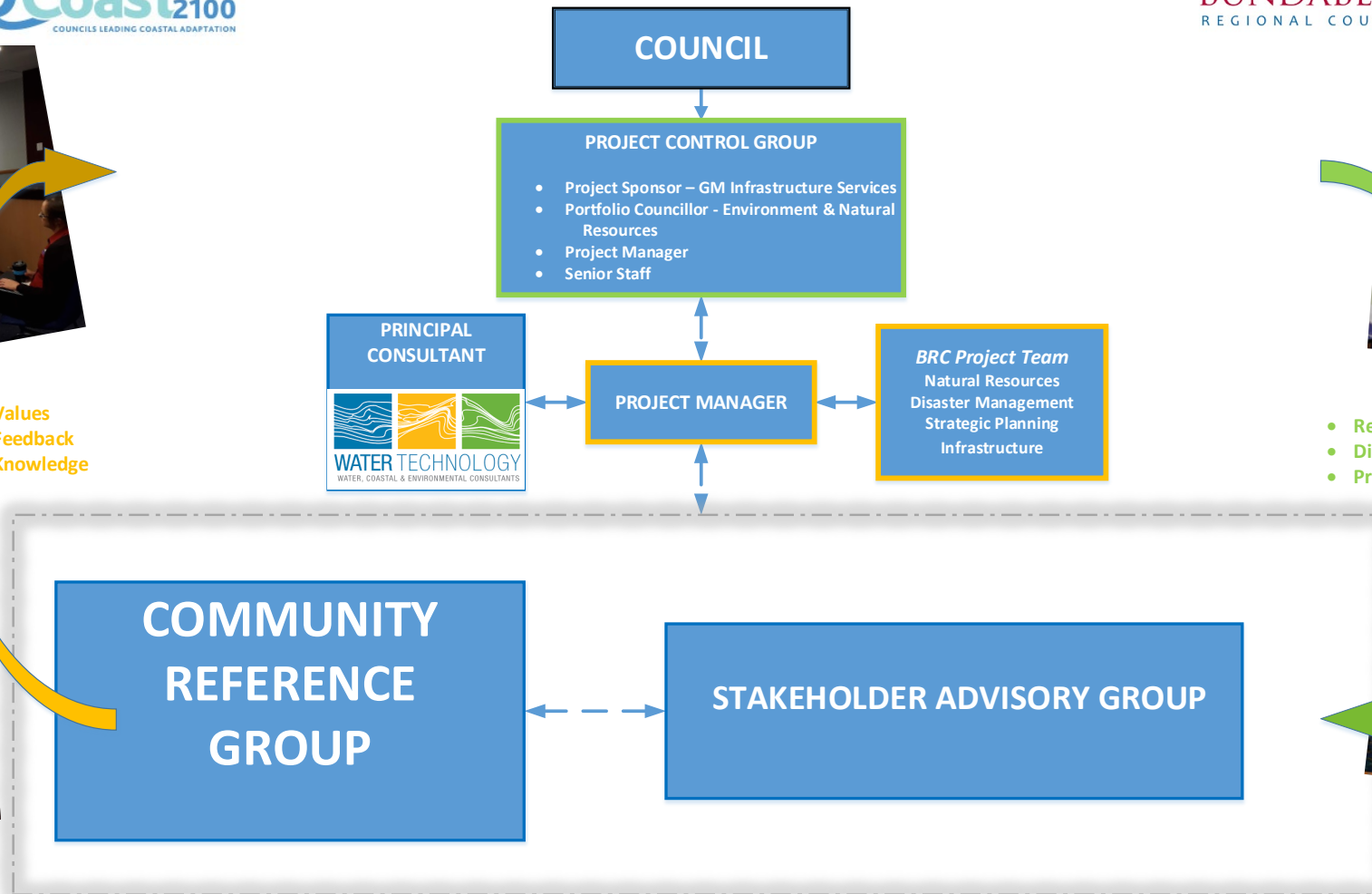
What have we learnt?



- Values
- Feedback
- Knowledge



- Resourcing
- Direction
- Process





# Public Consultation

Website update, media release

CHAS Summary Brochure

4 x Factsheets

Quick poll

Online Submission Portal

1300 883 699 | [ourcoast@bundaberg.qld.gov.au](mailto:ourcoast@bundaberg.qld.gov.au)

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## Bundaberg Region Coastal Hazard Adaptation Strategy

### Project Overview



Many coastal communities face coastal erosion and inundation risks. We are already experiencing erosion problems across the Bundaberg region including Woodgate, Moore Park Beach and Miara. It is anticipated that projected sea level rise and more intense storms from a changing climate may increase and extend these risks to areas currently at low or no risk.

These effects have the potential to impact the livelihoods and lifestyles of coastal residents and the natural environment. Decisions and actions that help to prepare for the adverse consequences of climate change as well as taking advantage of the opportunities are known as climate adaptation.

To assist in understanding and adapting to climate change, Bundaberg Regional Council is developing a Coastal Hazard Adaptation Strategy (CHAS) for its 110km of coastline. The CHAS will look at hazards such as coastal erosion, storm tide inundation and sea level rise and the potential impacts on the community, infrastructure and the environment.

The output from the CHAS will be a strategy aimed at reducing the future risk of beach erosion and flooding in coastal communities.

The CHAS will be a strategy aimed at reducing the future risk of beach erosion and flooding in coastal communities.

### Document Library

- Community Reference Group
- Media Releases
- Minutes
- Coastal Hazard Mapping

### FAQS

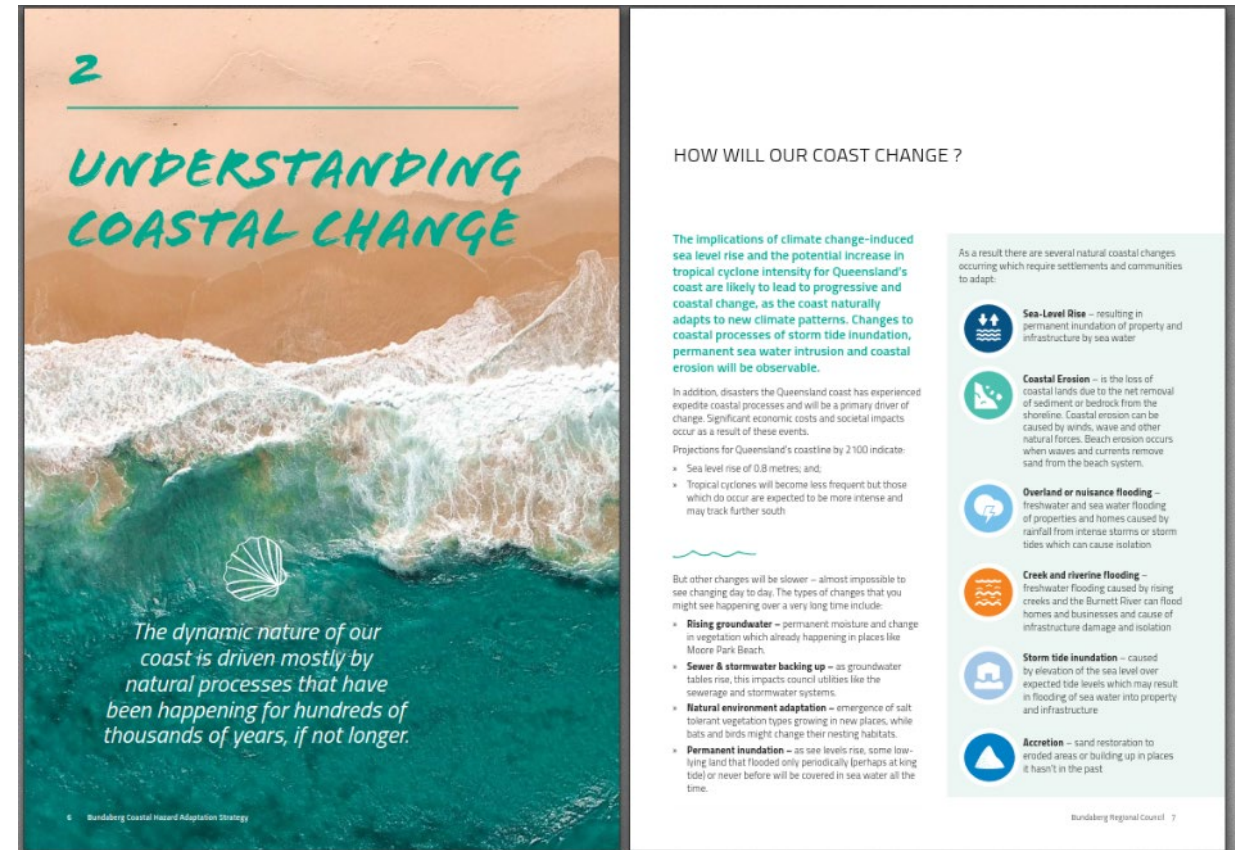
Project Updates

[View all](#)

[www.bundaberg.qld.gov.au/ourcoast](http://www.bundaberg.qld.gov.au/ourcoast)

## CHAS Summary Brochure

*Contains summary of coastal change, adaptation principles, risk assessment, adaptation pathways, trigger based approach and Action Plan of risk reduction measures in an easily digestible language*



# Documentation on Completion

**All technical work and final strategy now published online!**

Technical Evidence Report – Strategy and Implementation

CHAS Brochure

Promotional Video & Fact Sheets

Consultation Report

Final Version of CHAS

[www.bundaberg.qld.gov.au/ourcoast](http://www.bundaberg.qld.gov.au/ourcoast)



# Questions?

*[dwayne.honor@bundaberg.qld.gov.au](mailto:dwayne.honor@bundaberg.qld.gov.au)*

