



Stakeholder Communication and Engagement Summary Report

Bundaberg Regional Council





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EXECUTIVE SUMMARY

Overview

Consultation and engagement have underpinned the development of Bundaberg Regional Council's Coastal Hazard Adaptation Strategy (CHAS), during all aspects of work throughout Phases 3 – 8.

Stakeholder communication and engagement has been structured under four themes and aligned with best practice principles from the International Association for Public Participation (IAP2). These key themes and associated activities are:

- Continuous engagement, achieved through:
 - Project branding
 - Project website
 - Community values survey
- Event based engagement, achieved through:
 - Community information pop-ups
 - Education activities
- Targeted engagement, achieved through meetings with:
 - Stakeholder Advisory Group
 - Community Reference Group
 - Project Control Group
- Media led engagement, achieved through:
 - Media releases
 - Use of social media
 - Newspaper advertisement

A dedicated project website ensured transparency in communicating the CHAS purpose, processes and outcomes with the public. This was one of the key aspects of communication and enabled a means of providing additional opportunities for interested parties to get involved throughout the CHAS process.

Survey respondents, community representatives and key stakeholders have directly influenced the outcomes of the CHAS, by local knowledge, preferences, and an understanding of what is valued by the community.

Continuous Engagement

Project branding was established at the start of Phase 3 and has been used on all material such as presentations, emails, letterheads and media posts. It was also used on the project website which was established to provide an opportunity for all interested stakeholders to engage throughout the project. All consultation material has been shared via the website and a contact portal available for comment, feedback and community interest. The dedicated project website enabled key project information to be communicated, provide engagement opportunities and a way to contact the Council project team, which ensured transparency into the project progress. The website offered access to a document library with information on the following:

- Community Reference Group,
- Fact Sheets;
- Media Releases;



- Community Reference Group Meeting Minutes; and
- Coastal Hazard Mapping.

Fact Sheets made available to the community throughout the project are provided in Appendix B.

During Phases 3 and 4, to understand what the coast means to the community including what specific items the community values, a survey open to the public was released to drive the people-centred coastal adaptation approach. 661 people answered the survey online. Some key findings were that the overall most important characteristic of the coast is a relaxed lifestyle, with 53% responding as such, with the highest overall concern to the community being dune erosion.

Successful implementation of the CHAS is dependent on involvement of the community to ensure options and adaptation approaches considered do not have a detrimental effect on these values and sense-of-place.

A second survey targeted at key stakeholders was also carried out during Phases 3 and 4. There were approximately 24 organisations invited to participate in the survey, and whilst it is recognised the survey relates to assets, infrastructure and coastal management arrangements there were few detailed responses received. Overall, 10 responses to the survey were received.



**661 people undertook the
Community Values Survey**
**53% of people said 'Relaxed
Lifestyle' is the most important
characteristic of living by the
coast.**

Event Based Engagement

There were three (3) event-based info pop ups on the coastal foreshore of Bundaberg during Phase 3. The community pop-up sessions provided opportunity for the community to find out more about what the CHAS is, how coastal hazards pose risk to Bundaberg, and what is being done by Bundaberg Regional Council to adapt to these risks. Another purpose of the pop-up sessions was to inform the community about how they can get involved in the CHAS development and invite participation in the Community Reference Group (CRG).

To provide a more informed education style-activity to the community, an expert interview with Professor Gavin Smith, from the Coastal Resilience Centre, United States Department of Homeland Security Centre for Excellence, was filmed for the community to gain a greater understanding of coastal hazard management, particularly on how community values directly inform decision making for better project outcomes. Professor Gavin Smith shared his experiences of growing up in Texas, and also provided expert intelligence to the project team on how community values can shape adaptation planning approaches.

Targeted Engagement

A Stakeholder Advisory Group (SAG) and Community Reference Group (CRG) were established in Phase 3 to guide the development of the CHAS throughout the remaining Phases.

SAG workshops enhanced stakeholder awareness about the CHAS project, and established a relationship for this group to provide feedback and input based on their perspectives, knowledge areas and organisations they represent. Stakeholder engagement underpinned the development of the CHAS. The SAG provided continual input into the development of the Strategy and assisted Council to connect the local community to project information.

The CRG is a group of interested, voluntary community members established to liaise between Council and the community to help inform the development of the adaptation options and strategies as part of the CHAS.



The CRG was formed by self-nomination, advertised in various social media, online and news media posts. The nomination form was easy to fill out and assisted in collecting demographic data from nominees, to assist the CRG being a diverse representation of the Bundaberg community.

Throughout the CHAS development process, the CRG formally met 9 times. These meetings/workshops provided continual input into CHAS outcomes, and provided transparency into the decision-making process undertaken by Bundaberg Regional Council and the associated project team. All CRG meeting minutes are provided in Appendix A.

To support the holistic delivery of the CHAS, a Project Control Group (PCG) was established to provide transparency and collaboration opportunities across various areas of Bundaberg Regional Council. The members of the PCG were selected to represent a wide cross-section of Council work areas. This group provided input and a variety of perspectives contributed to a balanced approach being taken throughout the decision-making process.

Media Led Engagement

A combination of media releases, social media, newspaper, and online news features were used to communicate with the public about the CHAS project. These media channels were also important to inform the community of opportunities to be involved and consulted during CHAS activities. Invitation for participation in the CRG, advertising the pop-up events and educational videos were promoted via media-led engagement.

The Bundaberg Now online news website posted a number of links to Council media releases, news about the project and how the community can make a submission on the CHAS during the 28-day consultation period.

Social media posts via Council's Facebook page reached over 13,000 people during the public consultation period. All media releases and social media posts are provided in Appendix C.



Public Consultation Period

The intention of the formal consultation period was to allow the public to make formal submissions on the CHAS. The 28-day formal consultation submission period opened on the 3 August 2020 and closed on the 31 August 2020.

The following documentation and resources were made publicly available via the Our Coast Bundaberg Region Coastal Hazard Adaptation Strategy website and links advertised via social media and media outlets:

- A CHAS Summary Document, specifically written for the community
- Coastal hazard mapping portal; and
- Series of explanatory factsheets.

The following activities were undertaken as part of the public consultation program:

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- A public notice of the CHAS consultation was published in the Bundaberg Now News on 28 July 2020, 3 August 2020 and 10 August 2020;
- Community Reference Group meeting held on 23 July 2020 to provide the CRG members with a summary of the proposed draft documentation and consultation period;
- A Stakeholder Advisory Group meeting was held on 24 July 2020 to provide key stakeholders with a summary of the proposed draft documentation and consultation period;
- The draft CHAS Strategy and Action Plan, factsheets, submission form and other supporting information were available on the Bundaberg Region Coastal Hazard Adaptation Strategy Our Coast website;
- An information session, by invitation was held at the Burnett Heads Progress and Sports Association; and,
- Media releases and articles on Council's Bundaberg Now Website and social media posts.

A summary of the submissions received, and Council's Responses are found in Appendix D.



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1 INTRODUCTION

The Coastal Hazard Adaptation Strategy (CHAS) process is driven by the communities affected, for the communities affected. This is a key focus of the CHAS and Bundaberg Regional Council who have actively involved the community and stakeholders throughout each Phase, in accordance with QCoast Guidelines. This has been achieved through adapting a 'co-design' approach, with stakeholder engagement being embedded within each Phase of the project and creating opportunities for the community to shape project outcomes, rather than just inform stakeholders what these outcomes are.



FIGURE 1-1 IAP2 SPECTRUM OF PUBLIC PARTICIPATION

This consultation and engagement approach is in accordance with best practice guidelines for the International Association for Public Participation (IAP2). The spectrum shown in Figure 1-1, demonstrates the variety of engagement purposes, depending on the stakeholder. This report identifies the stakeholders that have been engaged, and how each type of participation has been enabled throughout this project. Further to the IAP2 principles, CHAS project engagement focused upon transparency, participation, local empowerment, demand driven, downward accountability and enhanced capacity.

Acknowledging Council's desire for the project to have a community driven development outcome, the engagement model has been centred around a shared leadership and community engagement model. This approach allowed leadership and actions to be shared with communities and organisations participating and contributing to decision making and adopting responsibility for action towards the desired outcomes. This collaborative arrangement in shared decision making, management and responsibility is the model for success in working toward a future of community driven development outcomes.

This report presents the methodology for communication and engagement and is prefaced by a continuous review process throughout the project, as to what worked well with different stakeholders, where improvements were made, and risks managed. The activities are split across the following four key themes within Phases 3 – 8 of CHAS:

1. Continuous Engagement;
2. Event Based Engagement;
3. Targeted Engagement; and,
4. Media Led Engagement.

Stakeholders identified during CHAS Phases 3 – 8 include these broad categories:

- The general public – all who have an interest in outcomes affecting Bundaberg's community and coastline;
- Affected communities - residents and businesses in coastal settlements that are likely to be impacted by coastal hazards in the future;
- Key stakeholders – persons or organisations that have been specifically identified for engagement; and,
- Council coordination - Council staff from a wide range of areas.



Identifying the stakeholder type helps to design the best communication and engagement activity to suit the level of engagement best suited for each category. This is collated in Table 1-1, which demonstrates the four key themes used to categorise engagement, what engagement modes were used, the corresponding stakeholders, and which aspect of the IAP2 spectrum has been applied.

TABLE 1-1 OVERVIEW OF CHAS STAKEHOLDER AND COMMUNITY ENGAGEMENT WORKS COMPLETED

Engagement Modes	Engagement	Purpose	Stakeholders Engaged	IAP2 Spectrum
Continuous Engagement	Project branding	Developing <i>Our Coast</i> branding helped the public to identify related material and created a continual, consistent journey for the public to follow through the CHAS Phases 3-8.	The general public	Inform
	Project website	Having a dedicated website for the project enabled transparency and the public to follow developments throughout the project. It also provided a method for direct engagement from any interested parties, through the contact function.	The general public	Inform
	Community values survey	Taking key questions to the community via the values survey enabled a better understanding of what the community values about coastal areas which informed the decision-making processes in the project.	The general public Affected communities	Involve
Event Based Engagement	Presence at community events & event-based info pop-ups	While providing information online is important, event-based engagement enables active broadcasting of the project. Having Council staff present at community events to discuss what the project involves and answer questions is actively engaging the public.	The general public	Inform
	Education activities	Further engagement efforts to inform the public of the CHAS, specific education activities enable more in-depth exploration of project purpose, process and outcomes.	The general public	Inform
Targeted Engagement	Stakeholder Advisory Group (SAG) meetings	Key stakeholders from public and private organisations, peak bodies and industry were identified and invited to provide local knowledge to inform project outcomes.	Other stakeholders	Consult
	Community Reference Group (CRG) meetings	Community members who are residents and business owners of coastal settlements have invaluable knowledge about their community. The community were invited to form the CRG to input directly into the decision-making process.	Affected communities	Collaborate

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Engagement Modes	Engagement	Purpose	Stakeholders Engaged	IAP2 Spectrum
	Project Control Group (PCG) meetings	Many areas of Council are involved in managing coastal hazards effectively and preserving the amenity and lifestyle Bundaberg's coast offers. Forming this steering group has enabled decisions to be made in a balanced way for enhanced overall project outcomes.	Council coordination	Empower
Media Led Engagement	Social media	The project has used media channels to provide information to the public about the project purpose, process, and outcomes. This has been key to enabling project transparency and advertise opportunities for the public to get involved. Using social media, newspaper and media releases catered to different demographics to widen the audience reached.	The general public	Inform
	Newspaper adds		The general public	Inform
	Media releases		The general public	Inform

The Bundaberg Coastal Hazard Adaptation Strategy has had direct input from the community to be informed, consulted, involved in the project, and to create opportunities for stakeholders to collaborate with the project team to shape its outcomes.



2 CONTINUOUS ENGAGEMENT

2.1 Communication and Engagement Plan

Initial planning enabled the community engagement and stakeholder participation components to be mapped out, to ensure these aspects were considered in each phase and had direct input into CHAS outcomes. Stakeholder analysis, opportunities for engagement, and targeted consultation groups were identified and established.

As well as this, project branding, videos, a project website and media-led engagement was planned to ensure the public was informed, had opportunities to get involved, and CHAS outcomes were shaped by bringing the community along each step of the way. Project stakeholders played a vital role in the decision-making process, ensuring transparency and contributing diverse perspectives.

2.2 Project Branding

Project branding of works associated with the CHAS is an important form of communication, enabling the community to be aware of works associated with CHAS, and recognise the project in media, events and opportunities for feedback through consistency of messaging.

2.2.1 Project Branding Style

A project branding style guide has been developed by Place Design Group in cooperation with Bundaberg Regional Council and the project team at Water Technology. The style guide has been created to communicate the look and feel of the 'Our Coast' project. The master logo, shown in Figure 2-1, is used on all operational activities associated with Our Coast.



FIGURE 2-1 MASTER LOGO (COLOUR)

All documents and presentations created for the project is following the same colour scheme as the logo.

2.3 Website

A project website was established to provide an opportunity for all interested stakeholders to engage throughout the project. All consultation material was shared via the website and a contact portal available for comment, feedback and community interest. The web address is below and will remain active until April 2021.

<https://ourcoast.bundaberg.qld.gov.au/bundaberg-region-coastal-hazard-adaptation-strategy>.



This website considers accessibility, by providing a 'select language' function at the top of the page. A search function enhances the ease of use for the public to navigate this site. It also provides the public means to contact Council about this project, with a phone number and email address clearly listed in the top panel, together with a 'contact us' online form where a message can be sent to the project team. Links to social media and other projects provides a way to find further information for anyone interested.

The website includes a login and 'have your say' function, as well as the ability for the public to register their interest to receive project update notifications.

Having a dedicated project website enabled key project information to be communicated, provided engagement opportunities and a way to contact the Council project team, and ensured transparency into project progress. The website offered access to:

- Invitation to register for project updates;
- Information about the project team and how to contact Council about this project;
- Opportunity to 'share your story' through photos, videos and text relating to coastal hazards;
- Information about the Community Reference Group and how to get involved;
- A summary of the project, links to QCoast2100, the CHAS timeline and progress, and regular project updates; and,
- A document library of downloadable files relating to the Community Reference Group, mapping, media, and factsheets.



FIGURE 2-2 SCREENSHOT OF PROJECT WEBSITE

New project updates were posted regularly. This communicates to the public that this project is active, and that Council is dedicated to this project being transparent to the public, inviting them to follow along for the journey, and contribute their thoughts or voice their concerns. The following sections provide a copy of the website posts then project updates that are available on the Our Coast website. Text is highlighted in blue to signify the content that has been provided online.



2.3.1 Website Posts

2.3.1.1 Website Post: Project Information – May 2018

This initial website post provides an overview of what the CHAS project is, providing background information on coastal hazards.

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

These hazards have the potential to significantly impact the livelihoods and lifestyles of coastal residents and the natural environment. Decisions and actions that help to prepare for the adverse consequences of a changing climate as well as taking advantage of the opportunities are known as climate adaptation. The CHAS will be developed in consultation with the community with a focus on ensuring there is broad understanding of the vulnerabilities and risks associated with a changing climate and the need for climate adaptation.

2.3.1.2 Website Post: Share Your Story – May 2018

This second website post sets the tone of the website that its key function is to provide transparency and welcome input from the community. This post enabled the public to upload their contribution and get involved.

***Share Your Story** Involvement from the local community and stakeholders is being sought as part of the information gathering exercise to assist with the understanding of the coastal hazards along the Bundaberg Region coastline. The project team would like to hear from people who have any supporting information about coastal hazards such as photos, videos and stories.*

This could be information relating to beach erosion, storm tides, tidal flooding or impacts from historical cyclone events that have impacted our coastline. This information is important to provide locally specific details to support the development of the CHAS and will help build a publicly accessible record over time.

2.3.1.3 Website Post: What do you Value on Our Coastline? May 2019

This website post invites the public to participate in the Community Values Survey, and key survey information including purpose, closing dates and a link to complete the survey online.

What do you value on Our Coastline?

To help shape Our Coast, we need to hear from you. What do you love about living by the coast? How would you like to see it look in the future? What is important to you that you would like to see protected in the future? The values survey has been extended another 2 weeks and closes on 17 May 2019. Help us to understand what is important to you by completing the survey today.

2.3.2 Project Updates

2.3.2.1 Project Update 1 – May 2018

This first project update introduces the public to the 'project team', being the consultants assisting Council in delivering the CHAS project. This is important in providing the community reassurance that outcomes are informed through collaboration and expert input.

Council has appointed coastal environmental consultants, Water Technology to undertake the CHAS. Water Technology is currently undertaking Phase 3 which is to identify the areas exposed to coastal hazard both now and in the future. Coastal hazards being considered include both short term and long-term erosion and storm



tide inundation of low-lying coastal land. A range of future sea level rise scenarios are being considered to understand how the hazard is likely to change over time. The output of Phase 3 will be updated coastal hazard mapping for the Region.

Share Your Story Involvement from the local community and stakeholders is being sought as part of the information gathering exercise to assist with the understanding of the coastal hazards along the Bundaberg Region coastline. The project team would like to hear from people who have any supporting information about coastal hazards such as photos, videos and stories. This could be information relating to beach erosion, storm tides, tidal flooding or impacts from historical cyclone events that have impacted our coastline. This information is important to provide locally specific details to support the development of the CHAS and will help build a public accessible record over time. You can share this information via the Share Your Story link on this website by completing the form, describing your information, and then uploading it.

2.3.2.2 Project Update 2 – June 2018

This update relates to works undertaken during CHAS Phase 3 and communicates that this project combines on-site knowledge and inspection with detailed modelling processes and balanced by involving the community at the earliest stages of the project.

The Our Coast project team undertook a site inspection of the coastline, looking at key erosion prone areas, locations likely to be affected by storm tide inundation and the existing coastal structures. They have also been progressing with the detailed modelling to assess the erosion hazard along the coastline and mapping of the storm tide inundation areas.

Our Coast project team held two Community Pop Ups, one in Bargara on 22 May 2018 and the other at Moore Park Beach on 23 May 2018 which gave the community a chance to find out about the project and discuss their concerns about coastal hazards. Council will be holding further Community Pops Ups throughout the delivery of the project. Please register for updates here to be kept informed.

Calls for applications to join the Community Reference Group (CRG) have now closed. Council will be contacting the successful applicants shortly and advising them of forthcoming meetings. All minutes of the CRG meetings will be made available on this site.

2.3.2.3 Project Update 3 – December 2018

This update announces the formation of the Community Reference Group, the first meeting, and introduces the community values survey.

The Our Coast project team has completed detailed coastal process modelling to assess the areas likely to be impacted by storm tide inundation and coastal erosion along the Bundaberg Region's coastline. This assessment will be used to enhance the understanding of the areas which are likely to be affected by existing and future coastal hazards.

The updated information will be used to help identify how coastal hazards may affect a range of assets such as buildings, roads, infrastructure, recreation and the natural environment.

Following the call for applications for the Community Reference Group (CRG) earlier in the year, members have been appointed and the first CRG meeting was held on the 9 August 2018 at Council's office in Bundaberg. The CRG were introduced to the Our Coast project team and were given a briefing on the project, their roles and responsibilities and the projects program and activities.

A second CRG was held on the 18 October 2018 where Professor Gavin Smith of the US Department of Homeland Security's Coastal Resilience Centre, a globally recognised expert in climate adaptation, disaster recovery and resilience and Stephen Dredge of Meridian Urban facilitated a workshop session. The CRG



identified characteristics of their communities and the things they value about the coast to shape how the CHAS considers and examines particular aspects of coastal living.

Council will be launching the first Our Coast survey to the community in January 2019 and is seeking input from the wider Bundaberg community about what features of the coast are valued above others and what concerns they have about the impacts of coastal hazards may have on coastal living.

2.3.2.4 Project Update 4 – April 2019

This update summarises the CRG meetings to-date and elaborates on the group's function and contribution. It also provides an update on CHAS progression on asset analysis.

A third CRG was held on the 21 March 2019 to invite CRG members to share their experiences with coastal hazards e.g. storm tide inundation or coastal erosion. The CRG provided local observations and identified a range of infrastructure assets, environmental and cultural features and properties exposed to present day and future coastal hazards. The group also provided valuable input into the CHAS project by 'ground truthing' the coastal hazard mapping created in the earlier Phases of the CHAS. The mapping viewed by the CRG is available in the Document Library. The CRG was also invited to consider what might be deemed as acceptable, tolerable, or unacceptable levels of risk to different assets, features and property.

The Our Coast project team has also completed the early analysis of the assets and features that are exposed to the storm tide inundation and coastal erosion extents identified in the earlier Phase of the CHAS. This analysis will undergo a full risk assessment process to enhance the understanding of the consequences of existing and future coastal hazards. This will be presented to the next CRG meeting scheduled for May 2019 where the group will discuss risk tolerability in more detail and help to prioritise the assets and features based on community values.

2.3.2.5 Project Update 5 – August 2019

This project update presents the results of the Community Values survey, including participation rates and top results. It also outlines the latest CRG meetings and how this community input will be used in Phase 6.

The results of the community values survey revealed what resident's value most about the Bundaberg Region coastline and will be used to shape the CHAS. More than 600 residents participated in the survey and the headline findings are presented in section 2.4.1.1.

The results from the community values survey will be used to assist to shape the future strategy and manage the risks of coastal hazard by providing guidance and a framework by which adaptation options to coastal hazards will be identified.

The fourth and fifth CRG meetings were held in May and June 2019 where members contributed to developing and validating the complex vulnerability and risk assessment processes as part of Phases 4 and 5 of the CHAS. For example, at the fourth CRG meeting the group provided input to the risk assessment assumptions including looking at the scales of consequence of coastal hazard across a range of scenarios and sea level conditions. At the fifth CRG meeting the group were provided the preliminary results of the coastal hazards risk assessment across the Bundaberg Coastal Region and consideration was given to acceptance and tolerance levels the community has to coastal hazard risks and how this acceptance or tolerance level may change over time with rising sea level conditions. The group were presented with the priority areas, i.e. those settlements subject to intolerable risks and the sea level scenario that triggers the intolerable risk.

The CRG also provided input to the vision of resilience for the Bundaberg Coastal Region to understand what the future state for the coastal settlements in terms of coastal hazard risk is and how each adaptation option can help to achieve this.



The statements of vision coupled with the community values survey insight will provide the framework for Phase 6 where the project team will discuss potential adaptation options to reduce or maintain risk from coastal hazard.

2.3.2.6 Project Update 6 – November 2019

This project update provides a summary of the latest CRG meetings and how the input provided by the community is shaping outcomes in Phases 7 and 8.

Further CRG meetings (6 and 7) were held in August and October 2019 where members contributed to developing and validating the long list of adaptation options to mitigate coastal hazard now and under future sea level rise scenarios. A range of options were presented to the community group from the “Compendium” of adaptation measures, including regenerative options such as beach nourishment, dune construction and regeneration; coastal engineering options such as seawalls, artificial reefs and groynes; land use planning options such as land buy-back; development controls and non-structural options such as disaster management, education and awareness campaigns.

The group also reviewed the pros and cons of each option and provided feedback to the project team about the suitability of the options for each coastal settlement in the context of the current and future coastal hazard risks i.e. settlements may experience a change in risk profile over time – How will we mitigate the risk going forward? Is there a scenario where defend is no longer an option? Do we continue to monitor the sea level until it reaches certain levels?

As part of Phase 7, the CRG also provided input to the ranking and screening of adaptation options by considering the costs, benefits, effectiveness, viability, and negative impacts of the long list of options. The project team have used the CRG input in conjunction with technical expertise to refine the long list of options and to determine the multi criteria assessment. This assessment will assist the economic appraisal of the adaptation options for input into the final strategy document in Phase 8.

2.3.2.7 Project Update 7 – May 2020

As the first for the 2020 year, this update welcomed the audience back to the project and shared context as to why climate adaptation is of great importance and to refocus attention. It provided a summary of the CRG meeting outcomes and gave specifics of the Phase 7 project progression.

Did you know that under the [Global Commission of Adaptation](#), 2020 is the year of Action on Climate Change Adaptation? This is a welcome reminder of the importance of coastal hazard adaptation planning across Queensland, and the work undertaken locally to protect Our Coast, Bundaberg’s stretch of over 100km of beautiful coastline.

The CHAS project held the first Community Reference Group meeting (CRG 8) of 2020, being a great opportunity to share with the community the progress Bundaberg Regional Council and wider project team has made since the last CRG meeting.

As a part of CRG meeting 8, Council provided the community a way to directly contribute to how adaptation options are prioritised. Using multi-criteria analysis is a best practice method and enables further refinement to adaptation options identified during Phase 6. Criteria used in this assessment include:

- *EFFECTIVENESS in reducing coastal hazard risks – degree to which options present long-term or short-term solutions (that may require additional management action or upgrades in the future)*
- *TECHNICAL VIABILITY - highlight adaptation options that require a high level of technical feasibility, requiring significant engineering to progress*



- *ADAPTABILITY - ability for the option to be reversible/adaptable in the future, to meet the complex nature of climate trends (e.g. sea level rise faster than predicted)*
- *IMPACTS on beach accessibility and amenity - the level of impact on the community's ability to access and enjoy the beach*
- *IMPACTS on environment and culture – the level of impact on environmental features, ecosystems, habitats and cultural heritage of coastal environments*
- *APPROVALS - highlight the legislative and approval requirements (or impediments) to implementing an option within the current legal framework*
- *COST - capital and ongoing maintenance costs of implementing an adaptation option*

For each of these, an A3 poster was set up around the meeting room, and participants given coloured 'sticky dots' that they assigned to the criteria posters to demonstrate their preferred criteria ranking. These results were used to validate previously developed criteria weighting through the Project Team, to directly include community perspectives into Phase 7 outcomes.

From here, the project team is working towards finalising Phase 7 and entering Phase 8, in preparing the final Coastal Hazard Adaptation Strategy document. This will include a short summary video to share with you.

2.3.2.8 Project Update 8 – August 2020

The final project update wraps up the online engagement, provides details on the CHAS draft document launch and 28-day consultation period. This update should 'close the loop' by summarising Phase 8 works and present final outcomes, as well as thanking the community and stakeholders for following the project and their input contribution.

Council has completed the draft Strategy and Action Plan which will be released to the public for a 28-day period of community consultation from 3 August 2020 to 31 August 2020.

Council is seeking feedback from members of the community on the strategy and action plan. Have your say!

Views from the Community Reference Group meeting held in March 2020 were used to inform options analysis and prepare adaptation pathways to mitigate the impact of coastal hazards in priority settlements along the Bundaberg coastline. These pathways provide options to maintain the current risk profile, modify or transform our coastal settlements in response to sea level rise.

The options appraisal favours adaptation approaches such as beach nourishment, raising key access routes, disaster management, community education and land use planning. These adaptation options are risk informed and based on sea level rise triggers. This means that some actions only need to be implemented by the time a given sea level trigger is reached.

Council intends to monitor the sea level rise triggers using the tidal gauge at Rosslyn Bay (near Yeppoon). This gauge is specially prepared and managed to accurately record sea level change as part of the Australian Baseline Sea Level Monitoring Project. This data will be used as the sea level rise evidence for the Bundaberg Region.

Further information is available in the draft strategy document available for download [HERE](#).

Remember, submissions must be lodged by Monday 31 August 2020.

2.3.3 Website Document Library

The website includes a document library with information on the following:



- Community Reference Group;
- Fact Sheets;
- Media Releases;
- Community Reference Group Meeting Minutes; and
- Coastal Hazard Mapping.

The following sections provide a summary of the material available under each section of the Our Coast website document library.

2.3.3.1 Community Reference Groups Document Library

The website includes documents relating to the CRG meetings held throughout the life of the project, specific documents include:

- Terms of Reference
- Nomination Form (for CRG participation)
- Community Reference Group Meeting Minutes. Throughout the project, there were nine (9) Community Reference Group meetings. The minutes and slides from each workshop are publicly available for download through the website, and are categorised by date, as follows:
 1. CRG Meeting 1 – 9 August 2018
 2. CRG Meeting 2 – 18 October 2018
 3. CRG Meeting 3 – 21 March 2019
 4. CRG Meeting 4 – 9 May 2019
 5. CRG Meeting 5 – 6 June 2019
 6. CRG Meeting 6 – 15 August 2019
 7. CRG Meeting 7 – 24 October 2019
 8. CRG Meeting 8 – 5 March 2020
 9. CRG Meeting 9 – 23 July 2020

These meeting minutes and slides provide a wealth of information for anyone seeking further details on project purpose, progression, and outcomes.

Please refer to the Appendix A for all meeting minutes and slides of the Community Reference Group meetings.

2.3.3.2 Draft Strategy and Action Plan

The website includes the Draft Strategy and Action Plan. During the 28-day (3 August 2020 to 31 August 2020) consultation period the Draft Coastal Hazard Adaptation Strategy and accompanying factsheets were available for download.



FIGURE 2-3 DRAFT STRATEGY AND ACTION PLAN AVAILABLE FOR DOWNLOAD DURING CONSULTATION PERIOD

2.3.3.3 Project Fact Sheets

To provide the community with an understanding of the CHAS during the life of the project, fact sheets were provided with explanations and illustrations.

The facts sheets uploaded to the website include:

- The CHAS Processes
- Understanding Coastal Hazards
- What is Coastal Hazard Mapping
- What does a CHAS involve?



FIGURE 2-4 CHAS FACTSHEET EXAMPLES

The facts sheets were updated during the consultation period to provide the community a baseline on the technical terminology, approaches used and definitions. The fact sheets made available during the consultation were as follows and are available in Appendix B:

- CHAS Adaptation Pathways Factsheets
- CHAS Risk Assessment Factsheet
- CHAS Sea-Level Rise Factsheet as shown in Figure 2-5
- CHAS Understanding Coastal Change Factsheet.



How does sea-level rise affect our coast?

Through the Coastal Hazard Adaptation Strategy (CHAS), Bundaberg Regional Council is actively planning to avoid or reduce the impacts of coastal hazards, both now and into the future.

Sea level rise and an increase in cyclone intensity for the Queensland coastline may result in permanent inundation of low-lying land, bigger storm tides and coastal erosion of the shoreline. These natural processes contribute to shaping the unique landforms of each coastal region but can have adverse impacts on our communities and settlements.

Sea-level trigger points

When sea levels reach certain points in the future, the coastal hazards may be intolerable, these are known as trigger-points for action. A risk informed and trigger based approach provides future investment certainty in an otherwise uncertain world. The Coastal Hazard Adaptation Strategy has adopted 3 increments of sea level rise being 0.2m, 0.4m, and 0.8m as triggers for action.

How do we measure sea-level rise trigger points?

Sea-level rise trends are measured by the tidal gauges at Roslyn Bay (near Yeppoon). This tidal gauge indicates a sea level rise trend slightly higher than the global trend of 3.4mm per year.

Baseline sea level monitoring at Roslyn Bay for the period 1996 to 2017 compared to the global mean sea level rise is shown here. This data will be used as the sea level rise evidence for the Bundaberg Region.

Sea-level rise increases exposure to coastal hazard risk

The Intergovernmental Panel on Climate Change (IPCC) projections for climate change are based on Representative Concentration Pathways (RCP) which capture future trends of how concentrations of greenhouse gases will change in the future and impact upon our climate, temperature and sea-levels.

- By 2100, sea-level rise on the Queensland coast is expected to reach 0.8 metres above the average level observed between 1986 and 2005
- Tropical cyclones will become less frequent but those which do occur are expected to be more intense and may track further south.
- Significant economic costs, environmental and societal impacts occur as a result of these events.

A rough rule of thumb...

Approximately a 1cm rise in sea level on a gently sloping beach, will bring the water 1m further inland.

More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

1300 883 699
bundaberg.qld.gov.au/ourcoast

FIGURE 2-5 CHAS SEA-LEVEL RISE FACTSHEET

2.3.3.4 Media Releases

The website includes all media releases produced to notify the community of the CHAS project. The media releases are presented in Appendix C, and an example is shown in Figure 2-6.

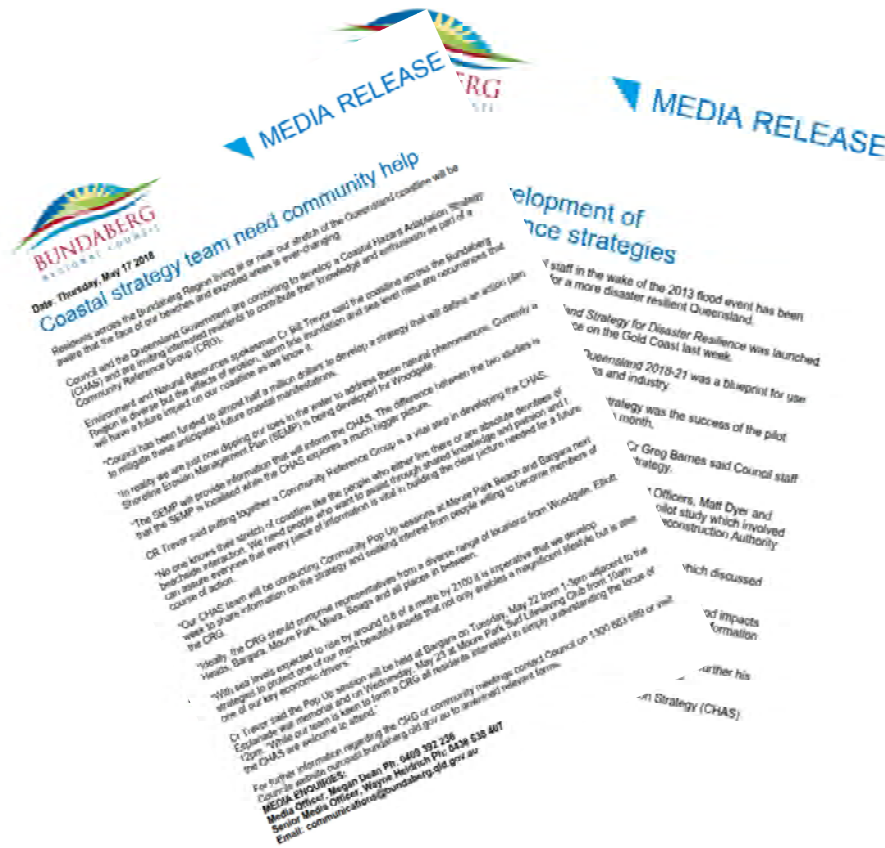


FIGURE 2-6 EXAMPLE CHAS COUNCIL MEDIA RELEASES

2.3.3.5 Coastal Hazard Mapping

The website includes links to the coastal hazard mapping and interactive mapping portal. The CHAS took a settlement-based approach and the following settlements were mapped to communicate coastal hazards to the CRG:

- Winfield;
- Miara Norval Park;
- Moore Park Beach;
- Burnett Heads;
- Bargara;
- Innes Park;
- Elliott Heads;
- Coonarr;



- Woodgate Beach;
- Walkers Point and,
- Buxton

For each of these settlements, the coastal hazards have been mapped as a starting point, to identify the drivers of the project, and what is being required to adapt to. These maps highlight erosion prone and storm tide inundation areas, under a range of sea level rise and Annual Exceedance Probability (AEP) scenarios. The maps also show the Highest Astronomical Tide (HAT) lines. Providing the public access to coastal hazard maps enables transparency and communicates why developing a CHAS is important.

Furthermore, an interactive portal was made available to the community during the 28-day consultation period (3 to 31 August 2020). A screenshot of the coastal hazard mapping portal is shown in Figure 2-7. The mapping portal shows sea level rise scenarios for +0.2m, +0.4m and +0.8m above HAT only.

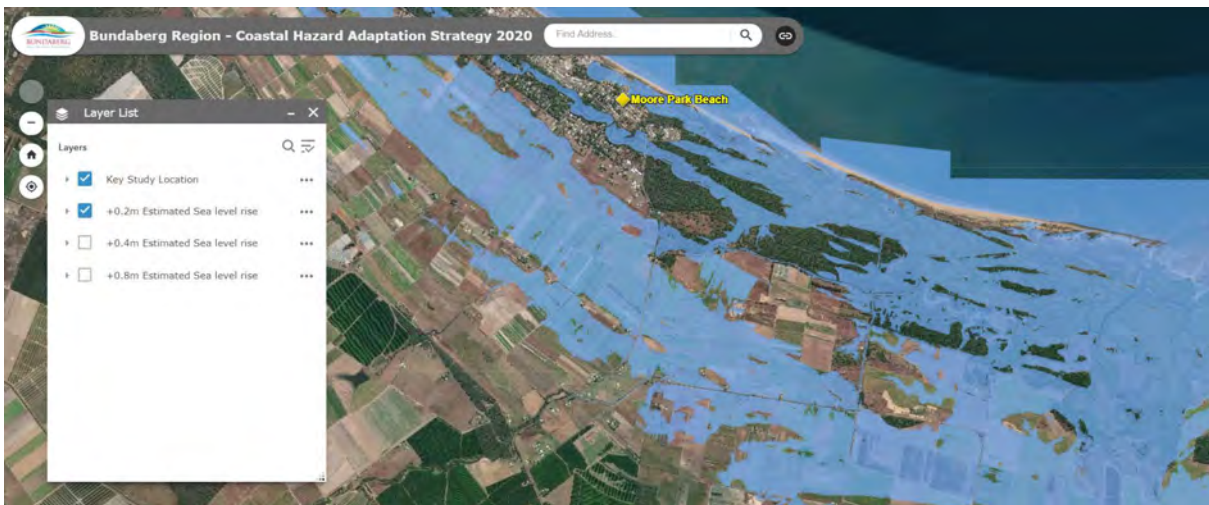


FIGURE 2-7 COASTAL HAZARD INTERACTIVE MAPPING PORTAL

As outlined throughout Section 2.3, the project website provides a wealth of information and ensures transparency in project purpose, processes, and outcomes.



2.4 Stakeholder Surveys

To understand what the coast means to the community and stakeholders, what specific items the community values and help to drive the people-centred coastal adaptation approach the following two surveys were undertaken:

1. Community Values Survey

- The Community Values Survey was open to the public and did not assume any prior knowledge of coastal hazards, risk or climate adaptation, making it suited to a public audience.

2. Stakeholder Advisory Group Survey

- The Stakeholder Advisory Group Survey was more specific, and based on this audience group which assumed prior knowledge of CHAS subject matter.

This section summarises the survey and results.

2.4.1 Community Values Survey

Community values underpins the coastal adaptation pathways. Successful implementation of the CHAS is dependent on involvement of the community to ensure options and adaptation approaches considered do not have detrimental effect on these values and sense-of-place. 661 people answered the survey online. A complete overview of the survey with response is shown in Figure 2-8.



Our Coast – Community Values Survey

Bundaberg Regional Council is embarking upon Our Coast – a coastal hazard adaptation strategy that will guide the way we manage and interact with our ever-changing coastline. To help shape our work, we need to hear from you. What do you love about living by the coast? How would you like to see it look into the future?

Each person and each community in the coastal area is unique. Your experiences of living with the coast will help us to understand what you value – both as individuals and as a community. These values will help drive our understanding of what matters to you – things that need protecting, things that need to change, and things that should stay the same. This information will help us set appropriate strategies for coastal adaptation over time in a way that aligns with your community's values.

Section 1 – About You

1. Do you live in the Bundaberg Regional Council area?

- Yes, permanently
- Yes, but temporarily depending on the time of year (for example, for part of the year in a holiday home)
- No, but I own a business in the area
- No, I'm a visitor from elsewhere in Australia
- No, I'm a visitor from overseas
- Other (please specify) _____

If you answered yes to Question 1, where do you live?

Coastal Areas:

- Bargara
- Burnett Heads
- Itines Park/ Coral Cove
- Elliott Heads
- Riverview
- Corinar
- Woodgate Beach
- Walkers Point
- Buxton
- Moore Park Beach

2. Do you work in the Bundaberg Regional Council area?

- Yes
- No

If yes, where is the location of your workplace? (Please specify) _____

If yes, do you work in or own a business that is associated with tourism and / or use of the beach?

- Yes
- No

If yes, please specify the type of business _____

3. What are the top 5 ways you use the coastal area and the main activities you do while you are there? (Limit to top five)

- Enjoying scenic view / experiencing the natural coastal environment (i.e. being part of nature)
- Spiritual / cultural connection
- Recreational activities in or on the water (e.g. swimming, surfing, kayaking, paddle boarding, boating)
- Recreational activities at the water's edge (e.g. fishing, reading, playing in the sand)
- Social events with friends / family (e.g. barbeque, picnics)
- Community events
- Visiting cafes, restaurants and shops
- Work / business activities
- I don't use it but I value having the coastal area
- I don't use it and don't value it
- Other (please specify) _____

4. Rate how significantly you value the qualities or characteristics of the coastal environment?

	Not all important	Slightly important	Important	Very important	Extremely important
Sense of community					
Presence of native animals					
Safe and easy access to the beach					
Relaxed lifestyle					
Sport and recreation activities					
Heritage and culture					
Boat ramps and jetties are accessible					
Wide sandy beach					
Foreshore areas with car parking					
Restaurants and shops close to the foreshore parks and reserves					
Functioning infrastructure and essential services (roads, sewage systems, water supply)					

5. What concerns you have about the coastal environment? (Please tick all that apply)

	Not all important	Slightly important	Important	Very important	Extremely important
Local jobs / commercial opportunities					
Tourism and visitors					
Regulated development					
Affordable housing					
Other (please specify) _____					

6. On the following scale, how much do you agree / disagree with the following statements?

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
We want to handover the coast to our grandchildren in a better state than now.					
We have a desire for self-organisation and reliance in the event of a natural hazard or disaster.					
We are a tight knit community					
We have a strong sense of ownership of the coast					
We are connected to a sense of place here on the coast					

For those statements you answered where you agreed or strongly agreed, what do you think are the challenges to maintain these positions? Please specify _____

Section 2 – The Coast

7. Gender

- Female
- Male
- Prefer not to say

8. Age Group

- 0-24 years
- 25-44 years
- 45-64 years
- 65+ years
- Prefer not to say

Section 3 – More about you

Please answer these following additional questions about you to ensure we receive responses from a cross section of our community.

Section 4 – Feedback

9. How did you hear about the Our Coast project?

- Council's website
- Council's Our Coast website
- Social media
- Newspaper
- Local magazine
- Community Pop Up Events
- Letter direct to household
- Other (please specify) _____

Thank you for your time in completing the Community Values Survey.
Please return to OurCoast@bundaberg.qld.gov.au

Section 1 – About You

1. Do you live in the Bundaberg Regional Council area?

- Yes, permanently
- Yes, but temporarily depending on the time of year (for example, for part of the year in a holiday home)
- No, but I own a business in the area
- No, I'm a visitor from elsewhere in Australia
- No, I'm a visitor from overseas
- Other (please specify) _____

If you answered yes to Question 1, where do you live?

Coastal Areas:

- Bargara
- Burnett Heads
- Itines Park/ Coral Cove
- Elliott Heads
- Riverview
- Corinar
- Woodgate Beach
- Walkers Point
- Buxton
- Moore Park Beach

2. Do you work in the Bundaberg Regional Council area?

- Yes
- No

If yes, where is the location of your workplace? (Please specify) _____

If yes, do you work in or own a business that is associated with tourism and / or use of the beach?

- Yes
- No

If yes, please specify the type of business _____

3. What are the top 5 ways you use the coastal area and the main activities you do while you are there? (Limit to top five)

- Enjoying scenic view / experiencing the natural coastal environment (i.e. being part of nature)
- Spiritual / cultural connection
- Recreational activities in or on the water (e.g. swimming, surfing, kayaking, paddle boarding, boating)
- Recreational activities at the water's edge (e.g. fishing, reading, playing in the sand)
- Social events with friends / family (e.g. barbeque, picnics)
- Community events
- Visiting cafes, restaurants and shops
- Work / business activities
- I don't use it but I value having the coastal area
- I don't use it and don't value it
- Other (please specify) _____

4. Rate how significantly you value the qualities or characteristics of the coastal environment?

	Not all important	Slightly important	Important	Very important	Extremely important
Sense of community					
Presence of native animals					
Safe and easy access to the beach					
Relaxed lifestyle					
Sport and recreation activities					
Heritage and culture					
Boat ramps and jetties are accessible					
Wide sandy beach					
Foreshore areas with car parking					
Restaurants and shops close to the foreshore parks and reserves					
Functioning infrastructure and essential services (roads, sewage systems, water supply)					

5. What concerns you have about the coastal environment? (Please tick all that apply)

	Not all important	Slightly important	Important	Very important	Extremely important
Local jobs / commercial opportunities					
Tourism and visitors					
Regulated development					
Affordable housing					
Other (please specify) _____					

6. On the following scale, how much do you agree / disagree with the following statements?

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
We want to handover the coast to our grandchildren in a better state than now.					
We have a desire for self-organisation and reliance in the event of a natural hazard or disaster.					
We are a tight knit community					
We have a strong sense of ownership of the coast					
We are connected to a sense of place here on the coast					

For those statements you answered where you agreed or strongly agreed, what do you think are the challenges to maintain these positions? Please specify _____

FIGURE 2-8 COMMUNITY VALUES SURVEY PAGES 1-4



2.4.1.1 Community Values Survey Results Summary

Responses to the first question shows that 91% of those who completed the survey are permanently living in the Bundaberg Regional Council area. A follow up question of which location showed that Bargara, Burnett Heads and Innes Park/Coral Cove had the highest rate of 27%, 18% and 19% respectively.

The results are summarised in Table 2-1. The importance of qualities or characteristics of the coastal environment is summarised in Table 2-2, with the highest rated characteristic shown. The overall most important characteristic is a “Relaxed Lifestyle”, with 53% and the highest overall concern to the community is dune erosion.

TABLE 2-1 COMMUNITY SURVEY RESULTS

#	Top 5 ways people use the coast:	Top 5 qualities & characteristics of the coast:	Top 5 concerns about the coast:
1	Enjoying views	Presence of native animals	Dune erosion
2	Recreational activities (in the water)	Relaxed lifestyle	Water quality
3	At the water's edge	Sandy beaches	Loss of vegetation
4	Socially	Functioning infrastructure	Safe beach access
5	Visiting cafes, restaurants etc.	Regulation of development	Population growth

TABLE 2-2 IMPORTANCE OF COASTAL CHARACTERISTICS

Quality/characteristic	Importance	%
Sense of community	Extremely important	34.26%
Presence of native animals	Extremely important	51.02%
Safe and easy access to the beach	Extremely important	48.62%
Relaxed lifestyle	Extremely important	53.32%
Sport and recreation activities	Important	33.71%
Heritage and culture	Important	31.14%
Boat ramps and jetties are accessible	Extremely important	27.19%
Wide sandy beach	Extremely important	39.89%
Foreshore areas with car parking	Important	28.41%
Restaurants and shops close to the foreshore parks and reserves	Important	26.85%
Functioning infrastructure and essential services	Extremely important	53.15%
Local jobs	Extremely important	33.46%
Tourism and visitors	Extremely important	29.50%
Regulated development	Extremely important	40.37%
Affordable housing	Important	30.30%

5057-08_R10_V02_Stakeholder Communication and Engagement Summary









2.4.1.2 Handwritten Responses

The 6 received handwritten surveys were all completed by residents from Innes Park/Coral Cove, within 100-200 metres from the beach or foreshores. The handwritten response provided data on the top 5 ways the responders use the coastal area. The responses received reflected the online survey i.e. the top 5 responses were:

1. Enjoying views;
2. Recreational activities in the water;
3. Recreational activities at the water's edge;
4. Social events; and,
5. Visiting cafes.

TABLE 2-3 COMMUNITY VALUES SURVEY ANALYSIS

Community Values Survey		MCA Ranking	Alignment
The Community Values Survey told us:		1. Effectiveness	Adaptation solutions need to be effective to preserve what the community cares about.
The community care about:	The ability for ongoing coastal recreation 	2. Adaptability	To be effective, solutions also need to be able to be adaptable to future climate conditions.
	Preservation of a relaxed lifestyle 	3. Impact on beach access	The community ranked impacts to beach access as their 5 th highest concern, so this is reflected in the MCA weighting.
	Enjoying coastal scenery 	4. Technical viability	The community rank 'functioning infrastructure' as highly important, as reflected in MCA criteria.
The community are concerned about:	Dune erosion 	5. Impact on environment	Environmental impacts are considered in all projects. The community are most concerned about dune erosion, and the adaptation solutions take this into account.
	Water quality 	6. Approvals	This is an internal council process and shouldn't impact the way adaptation solutions are selected.
	Loss of sandy beaches 	7. Costs	The MCA is followed by a Cost-Benefit Analysis, which will assess project costs in more detail.

Graphics source: The Noun Project 2020.



2.4.2 Stakeholder Advisory Group (SAG) Survey

The SAG was formed to consult key stakeholders throughout the project which is discussed further in Section 4.1. These stakeholders consisted of representatives from non-government organisations, building asset owners, environmental and cultural groups, economic and industrial groups, and State Government departments.

Survey questions were more technical than that of the community values survey, assuming a more in-depth knowledge base.

2.4.2.1 SAG Survey Results

There were approximately 24 organisations invited to participate in the survey, and whilst it is recognised the survey relates to assets, infrastructure and coastal management arrangements there were few detailed responses received. Overall, 10 responses to the survey were received. Table 2-4 summarises both the questions and responses to the SAG Survey.

TABLE 2-4 STAKEHOLDER ADVISORY GROUP SURVEY QUESTIONS AND RESPONSE SUMMARY

Aspect	Question	Response Summary
Existing assets and infrastructure	What infrastructure or assets do you currently have or manage on the Bundaberg coast? Are they currently susceptible to flooding or erosion?	Many stakeholders responded that they did not own assets in the coastal region. Major asset owners include the Port Authority, Maritime Safety Queensland and Ergon Energy.
	What is the typical design life for your assets? Do you plan to renew or upgrade infrastructure? If so, what sort of design life would you expect to design your assets for?	The survey respondents that are asset owners have advised that typically the asset life is between 10 and 35 years.
	What are the current maintenance requirements of your assets?	Asset maintenance regimes varied from 1 to 4 years.
	What is the current value of your assets?	Few provided a response to this question and is treated commercially confidential.
Existing and past inundation or erosion mitigation arrangements	Do you have an existing approach in your organisation to adaptation to cope with climate change? E.g. do you consider sea level rise in the design process?	No stakeholder indicated that there is a long-term strategy for climate change and possible consequences.
	If not, would there be a particular trigger or threshold that would change your future plans for infrastructure?	Many state-owned entities are governed by policy development by governmental agencies and subject matter experts. Typically, if assets become impacted then there is a response.
	Have you been involved in past flooding or erosion mitigation projects? What was chosen and why? What worked and did not work, and why?	In response to flooding or erosion events, most asset owners have relocated or updated assets.
Ideas for future mitigation	What ideas do you have for potential adaptation options?	Emerging technologies and change in demands typically considered over climate change and sea level rise impacts.



Aspect	Question	Response Summary
	Do you have a 'level of service' you would expect an engineered adaptation option to provide? Is there a minimum expectation of flood mitigation performance?	Not many responses to this particular question, however anecdotally, safety should be the first consideration.
Constraints and management arrangements	An adaptation solution might require trade-offs (e.g. inundation protection but less visual amenity or water access, for example). What comments do you have on this issue?	Most responses referred to existing practices of consultation and approvals that are followed as part of the process.
	Do you envisage any constraints to the implementation of an engineered adaptation option (e.g. physical, environmental, social, financial, legal, statutory, regulatory, planning, etc)?	It was noted that any works on land below high water mark (outside of a canal) would require owner's consent from the Department of Natural Resources, Mines and Energy (DNRME).
	Are there any opportunities or co-benefits that could be achieved from an engineering adaptation solution?	No comments offered.
	Who do you feel should be responsible for protecting assets with regard to climate change?	No comments offered.



3 EVENT BASED ENGAGEMENT

3.1 Community Information Pop-up Sessions

During Phase 3 and 4 there were three (3) event-based info pop ups on the coastal foreshore of Bundaberg. An overview of the pop ups is included in Table 3-1. In August 2020, Council staff were invited by the Burnett Heads Progress Association to inform the group about the CHAS process and how to make a submission during the consultation period. This event was by invitation only.

The community pop-up sessions provided opportunity for the community to find out more about what the CHAS is, how coastal hazards posed risk to Bundaberg, and what is being done by Bundaberg Regional Council to adapt to these risks. Another purpose of the pop-up sessions were to inform the community about how they can get involved in the CHAS development.

TABLE 3-1 COMMUNITY POP-UP SESSION DETAILS

Date	Location	Agenda
May 18, 2018	Woodgate Beach	Shoreline Erosion Management Plan activities provided an opportunity to introduce CHAS to the community
May 22, 2018	Moore Park Beach (Surf Club Drive)	<i>Investing today for a resilient tomorrow</i> Learn more about the CHAS, meet with Councillors and members of the project team
May 23, 2018	Bargara Esplanade (opposite Ricks Café, near Anzac Memorial)	<i>Investing today for a resilient tomorrow</i> Learn more about the CHAS, meet with Councillors and members of the project team
Consultation presentation event by invite		
August 11, 2020	Burnett Heads Progress Association	<i>Coastal Hazard Adaptation Strategy – Consultation</i> Council staff invited to inform the Burnett Heads Progress Association about the CHAS process and how to make a submission during the consultation period

These sessions were informal in nature, providing unstructured, one on one conversation opportunities to anyone walking past or particularly interested in discussing the CHAS. The sessions were run by Councillors and the project team who set up a display sign, posters and had materials available to aid communication. Two staff members facilitated the stall for two hours in different locations along the coastal foreshore.

Community pop-up sessions were also advertised on Facebook leading up the event. This included a summary of the event purpose and event details (location and times). While Facebook posts about these events serve a purpose to inform the community about these events, the main interactions were likely to have been from people passing by.



FIGURE 3-1 COMMUNITY POP UP SESSION AT BARGARA, 22ND MAY 2018

3.2 Education Activities

During the CHAS process, two short videos have been produced to provide another mode of information delivery to the community. Both these videos have been made publicly available to support the communication of the CHAS purpose, process, and outcomes. Due to COVID-19 restrictions, additional educational activities to be completed during Phases 7 and 8 were not viable.

3.2.1 Expert Interview - Managing Coastal Hazards

During the CHAS development, an expert interview with Professor Gavin Smith, from the Coastal Resilience Centre, United States Department of Homeland Security Centre for Excellence was filmed to provide the community with a greater understanding of coastal hazard management, particularly how community values directly inform decision making for better project outcomes. Professor Gavin Smith shared his experiences of growing up in Texas, and how community values can shape adaptation planning approaches.



FIGURE 3-2 INTERVIEW WITH PROFESSOR GAVIN SMITH (COASTAL RESILIENCE CENTRE), DWAYNE HONOR (BRC) AND MATT DYER (BRC)

3.2.2 Our Coast CHAS Summary Video

As a part of the final deliverables during Phase 8, a short video summarised the CHAS purpose, process, and outcomes. This video is designed for a public audience, to communicate that extensive studies have been undertaken to formulate the CHAS.

The video comprises aerial videography of the Bundaberg coastline, overlaid with text, animation, and music. Animation was chosen as an effective way to demonstrate future hazards and solutions. By using sketches, coastal erosion is shown by dashed lines, and inundation is signified by blue water. Adaptation solutions are demonstrated including buried seawalls, road raising, and beach nourishment.

Project branding was used for consistency, and animation colour references the colour palette of this branding style. The video features Our Coast and Bundaberg Regional Council's branding, and lists the consultants delivering the CHAS production and is available at the following link:

<https://www.youtube.com/watch?v=7FCRzQTPv3I&t=27s>

Our Coast video transcript

Our Coast: Bundaberg's Coastal Hazard Adaptation Strategy is here to help you understand and plan for future change. We want to nurture the places we love, even when things might change.

Many of our towns and beaches are at risk of coastal hazards like erosion and inundation. The Coastal Hazard Adaptation Strategy helps prepare you for extreme events, if, and when they might happen.

For places like Moore Park Beach, erosion and inundation is already happening. Moving homes and facilities away from the risk could better protect our communities, similarly, upgrades to key access roads could help combat the risk of sea level rise and community isolation.

For homeowners at Kelly's Beach, coastal erosion will continue to occur (an identified erosion zone), but collaborative and collective solutions could be explored.



Everyone has a role to play in adapting to change.

At Woodgate Beach erosion and lost sand is an ongoing issue. However, this can be managed by Council beach nourishment works to ensure our beaches can be protected and enjoyed for generations to come.

There are many ways to become more hazard prepared and protect the things we love most about our coast.



FIGURE 3-3 OUR COAST CHAS SUMMARY VIDEO



4 TARGETED ENGAGEMENT

4.1 Stakeholder Advisory Group Consultation Workshop

Stakeholder Advisory Group (SAG) workshops were held to engage a wide range of knowledgeable stakeholders relevant to coastal hazard response. These workshops were held in May 2019 and after COVID-19 restrictions were lifted in July 2020. The workshops were attended by a wide cross-section of stakeholders from non-government organisations, building asset owners, environmental and cultural groups, economic and industrial groups, and State Government Departments, in addition to those listed in Table 4-1.

TABLE 4-1 STAKEHOLDER ADVISORY GROUP INVITEES

Invitee list
■ Surf Lifesaving Queensland
■ Maritime Safety Queensland
■ Volunteer Marine Rescue
■ Rural Fire Service Queensland
■ State Emergency Service
■ Bundaberg Port Authority
■ Energy Queensland (formerly Ergon)
■ Telstra
■ NBN
■ Sunwater
■ APA (gas)
■ Port Curtis Coral Coast (Aboriginal Peoples Charitable Trust Board) / Gidargill
■ Landcare
■ Burnett Mary Regional Group
■ National Parks and Wildlife Service
■ Queensland Reconstruction Authority
■ Department of Natural Resources, Mines and Energy (Land Services)
■ Department of State Development, Manufacturing, Infrastructure and Planning
■ Department of Environment and Science
■ Canegrowers Bundaberg
■ Bundaberg Sugar
■ Urban Development Institute of Australia
■ Tourism Board



The SAG workshops provided an opportunity to share the technical aspects of coastal hazard planning.

The first workshop provided a summary of the CHAS development work and how to become directly involved in the risk assessment, optioneering and adaptation pathways approach. This included:

- A summary of coastal risks including coastal erosion and storm tide inundation, including cause, hazard drivers and impacts;
- The process of asset identification in Bundaberg;
- A summary of the risk assessment process, including risk, likelihood and consequence; and,
- An introduction to risk, tolerance and acceptability concepts;

The second workshop summarised the final stages of the CHAS, its findings and the recommended adaptation pathways developed during Phases 7 and 8. This workshop also presented the Draft Strategy and Action Plan document prior to the consultation period.

Delivering this information was important to provide all stakeholders with an understanding of the CHAS purpose, process and intended outcomes. The SAG workshops included time for participants to ask questions and share responses to the question 'what is important to you?'.

The SAG workshops enabled stakeholder awareness about the CHAS project, and to establish a relationship for this group to provide feedback and input based on their perspectives, knowledge areas and organisations they represent. Stakeholder engagement underpinned the development of the CHAS. The SAG provided continual input into the development of the Strategy and assisted Council to connect the local community to project information.

Throughout all aspects of work the CHAS has utilised a co-design approach, whereas during the SAG workshops people were invited to provide local knowledge and information.



4.2 Project Control Group Meetings

To support the holistic delivery of the CHAS, a Project Control Group (PCG) was established to provide transparency and collaboration opportunities across various areas of Bundaberg Regional Council. This group provided input and a variety of perspectives contributed to a balanced approach being taken throughout the decision-making process.

The members of the PCG were selected to represent a wide cross-section of Council work areas, including infrastructure, finance, disaster management, strategic planning, marketing, management, parks and natural areas, and elected Councillor perspectives.

The purpose of the PCG was to assist in the decision-making process and ensure transparency throughout the CHAS development. These meeting were run by members of the project team, primarily Bundaberg Regional Council.

There were 9 PCG meetings held throughout the project and an overview is provided in Table 4-2.

TABLE 4-2 OVERVIEW OF THE PCG MEETINGS

When	Phase	Meeting/Workshop Purpose
PCG Meeting 1 2 May 2018	Phase 3	Establish the group, introduce members and give an overview of the project.
PCG Meeting 2 10 September 2018	Phase 3 and 4	Provide update on actions from the last meeting, the CHAS progression and the transition into Phase 4 work.
PCG Meeting 3 22 March 2019	Phase 4 and 5	Provide update on actions from last meeting, the CHAS progression and risk assessment assumptions.
PCG Meeting 4 7 June 2019	Phase 5	Provide update on actions from last meeting and the CHAS progression, including community values survey, asset identification, adaptation options and community engagement.
PCG Meeting 5 19 July 2019	Phase 5	Provide update on actions from last meeting and the CHAS progression, including risk assessment and intolerable risk.
PCG Meeting 6 17 October 2019	Phase 6	Provide update on actions from last meeting and the CHAS progression, including risk assessment, community consultation and Strategy launch, and MCA methodology.
PCG Meeting 7 13 February 2020	Phase 7	Provide update on actions from last meeting and the CHAS progression, including Phase 6 results, MCA evaluation criteria and weighting, and summary of remaining activities in Phases 7-8.
PCG Meeting 8 24 June 2020	Phase 7 and 8	Provide update on actions from last meeting and the CHAS progression, including Phase 7 results, present the draft Phase 8 deliverables prior to full Council endorsement.
PCG Meeting 9 10 September 2020	Phase 8	Provide update on actions from last meeting and the CHAS progression, including results of the public consultation period and final Phase 8 deliverables.

5057-08_R10_V02_Stakeholder Communication and Engagement Summary



These meetings shaped the outcomes of the CHAS. Key decision points throughout each Phase of the CHAS were presented to the PCG to provide technical guidance to ensure the project could progress.

4.3 Community Reference Group Meetings/Workshops

4.3.1 Overview of the CHAS Community Reference Group

The Community Reference Group (CRG) is a group of interested, voluntary community members established to liaise between Council and the community to help inform the development of the adaptation options and strategies as part of the CHAS.

The CRG was formed by self-nomination, advertised in various social media, online and news media posts.

Throughout the CHAS development process, CRG formally met 9 times. These meetings/workshops provided continual input into the CHAS outcomes, and provided transparency into the decision-making process undertaken by Bundaberg Regional Council and the associated project team. Meeting minutes and slides provided a wealth of information for anyone seeking further details on project purpose, progression, and outcomes.

Please refer to the Appendix A for all meeting minutes and slides of the CRG meetings.

The CRG consisted of 16 members from a range of suburbs across Bundaberg. During this time, a mix of shorter meetings and longer workshops were held. Meetings were held in the evening for approximately 2 hours and a light supper was provided afterwards. Workshops were run as half-day sessions, enabling topics to be explored in-depth and workshop activities completed to gain input from CRG members.

Members of the CRG are shown in Figure 4-1.



Coastal Hazard Adaptation Strategy Community Reference Group

The Community Reference Group is made up of residents passionate about our coastal areas, from around the region.

They have played an active part in forming the Strategy since August 2018.

CRG Member	Representation
Julie Fauser	Archies & Kellys Beach, Bargara
Ian Graham	Bargara to Elliott Heads
George Martin	Bundaberg Region Coastline
Heath Greville	Burnett Heads
Terry Kelly	Burnett Heads, Mon Repos, Port Bundaberg
Chris McLoughlin	Burnett Heads, Port Bundaberg, Mon Repos
Lloyd Blake	Coonarr Beach & Palm Beach
Sharon Jackson	Elliott Heads, Coral Cove, Coonarr, Innes Park, Bargara, Burnett Heads
Josephine Ferris	Innes Park, Kalina Beach
Russell Stewart	Moore Park Beach
Shanelle Pekin	Moore Park Beach
Tony Ricciardi	Woodgate Beach
Collin Turner	Woodgate Beach
Robert Bell	Woodgate Beach
Joe Russo	Woodgate Beach
Jennifer Parry	Woodgate Beach & Walkers Point



More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

1300 883 699
bundaberg.qld.gov.au/ourcoast



FIGURE 4-1 CHAS COMMUNITY REFERENCE GROUP MEMBERSHIP

A part of the CRG function was to keep the CHAS project team in touch with locals that will be partly responsible for implementing the CHAS. Community and other stakeholders' existing and future capacity to undertake recommended works is important consideration during the development of the CHAS. This ensures final outcomes are relevant and that the CHAS is responsive to the needs, perspectives and values of the Bundaberg community. Workshops and meetings were designed to be informative and interactive as shown in Figure 4-2, providing opportunity for members to provide feedback and be engaged.



The voluntary role of CRG members was designed to:

- Provide input into the development of the CHAS;
- Communicate information and update their respective networks to ensure they are kept informed as to the projects progress;
- Act as a conduit for community feedback on the CHAS's development to the consultant and Bundaberg Regional Council;
- Provide input to the understanding of the communities existing concerns, vulnerability and risk-tolerability associated with coastal erosion and inundation;
- Gather collective thoughts and ideas from their respective networks to help identify and assess a range of suitable adaptation options to manage the Bundaberg Region coastline
- Collectively assist in developing the criteria to assess the adaptation option assessment criteria and weighting used during the MCA process; and,
- Communicate the messages from the CHAS into the wider community.



FIGURE 4-2 PHOTO OF CRG MEMBERS PARTICIPATING IN MEETING 2

4.3.2 Overview of CRG Meetings and Workshops

Meeting dates, purpose and how the CRG contributed during each meeting has been summarised in Table 4.3. The following sections outline each meeting in more detail and summarises the collaborative approach taken in shared decision making, management and responsibility in the development of community driven outcomes.



TABLE 4-3 OVERVIEW OF CRG MEETINGS

When	Meeting/Workshop Purpose	Community Reference Group Role
CRG Meeting 1 9 August 2018	The first CRG meeting provided an opportunity to introduce each other, the project team and go into detail about why a CHAS is needed and what work is involved to produce this.	Introduced to the CHAS phases and the role the CRG will play in producing this strategy. Preliminary meeting dates were suggested for future meetings, aligning with each of the CHAS phases.
CRG Meeting 2 18 October 2018	Identify and discuss the community's experiences living, working, and playing along Bundaberg's coastline.	Help to describe the unique characteristics of their communities and the things they value about the coast that need to be considered and examined as part of the CHAS study.
CRG Meeting 3 21 March 2019	Refresh the group about the CHAS and share progress, such as the coastal hazard mapping extents. Share community's experience of coastal hazard. Discuss and understand the community and asset exposure to coastal hazard across the Region.	Share their experience of coastal hazard and help to determine what the consequences of coastal hazard. Help to value and prioritise the assets identified in the coastal hazard mapping.
CRG Meeting 4 9 May 2019	To develop an understanding of acceptability / tolerability thresholds and differences depending on location / demographics Discussion of value-based assessment and for input into social and environmental consequence assessments.	Help to determine risk tolerance and acceptability levels for the community and assets identified in the coastal hazard mapping. Help to determine what the measures of success will be for the CHAS.
CRG Meeting 5 6 June 2019	Present the first pass risk assessment and asset prioritisation to be reviewed and refined through input from the CRG based on understanding personal attitudes, desire to rebuild etc. Identify a vision for each coastal settlement based on the CRG's input into adaptation pathways.	Broad agreement on outcomes of risk assessment allowing more detailed evaluation of risk acceptability and tolerability. Begin to shape the settlement transect of the CHAS by defining community aspiration and set the 'requirements' that adaptation must meet.
CRG Meeting 6 15 August 2019	Inform the CRG of outcome of risk assessment, identify preferred adaptation options on settlement specific basis, identify potential future scenarios and adaptation pathways and understand the next Phase of the CHAS.	Continuing to shape the settlement-based approach to the CHAS program by acknowledging different risks to different settlements and therefore different adaptation approach, or 'pathway'.

5057-08_R10_V02_Stakeholder Communication and Engagement Summary



When	Meeting/Workshop Purpose	Community Reference Group Role
<p>CRG Meeting 7 24 October 2019</p>	<p>Presentation of a long list of adaptation options for the CRG to assist with development of evaluation criteria.</p> <p>Initiate discussions on community-based MCA and conjoint analysis to provide the CRG with time to consider input prior to Phase 7 workshop.</p>	<p>Provide initial feedback to validate conjoint analysis evaluation criteria for Phase 7.</p> <p>Assist to evaluate the potential success of adaptation options.</p> <p>Validate the 'shortlisting of options' for input into MCA and assist development of conjoint analysis survey which will be launched next time.</p>
<p>CRG Meeting 8 5th March 2020</p>	<p>Introduction and recap of CHAS progression, updates and activity about adaptation option screening for MCA criteria weighting.</p>	<p>CRG members were consulted about what weighting should be given to criteria used to calculate MCA outcomes. The weighting informed by the CRG was taken onboard and the final weightings used by the project team amended to reflect this outcome.</p>
<p>CRG Meeting 9 23 July 2020</p>	<p>Recognition of the CRG and to present the Draft strategy prior to public release. Advice provided of how to make a submission during consultation.</p>	<p>Acknowledgment and recognition of the CRG's role in the CHAS, also present and validate the results of the Phase 7 options appraisal and Phase 8 preferred adaptation pathways.</p>



4.3.2.1 Community Reference Group Meeting 1 – August 2018

This was the first meeting with the Community Reference Group (CRG) and acted as an introduction to the CHAS.

During the meeting, a progress report was given on the 8 Phases of the CHAS project, noting that the first 2 Phases have been completed. During these Phases Water Technology was engaged to undertake community engagement planning and a technical scoping study was completed. The CRG members were informed of the project governance. The CRG members were advised that Council needed assistance with amplifying the findings, learnings, and messaging throughout the community. It is difficult to connect with everyone that Council should be talking to. The CRG is to help Council to connect with the community and enable two-way communication.

The CRG asked questions throughout, however this opening session was more of an informative exercise.

4.3.2.2 Community Reference Group Meeting 2 – October 2018

The CRG provided feedback on the characteristics of their communities, what they valued, and how they saw further interaction with the community could occur as the CHAS process continues. The following diagram provides a summary of this feedback and provides an avenue for how to work up the content of future CRG meetings.

As noted in the Place-based Community Values Cycle below, the CRG members prioritised Place, the Community, and the Landscape above other community characteristics.

Challenges articulated by the CRG included the level of autonomy currently provided to communities to manage the coast, the extent of 'red-tape' and regulation, and the changing nature of the coastal landscape through events such as erosion.

Next steps that arose as a result of the CRG included undertaking a community-level survey, providing 'listening posts' periodically at key locales along the coast for community feedback (possibly manned by the CRG members), and considering how to further involve other community groups and school-age children.

Place-based Community Values Cycle



FIGURE 4-3 COMMUNITY VALUES CYCLE



A cycle of Place-based values is evident in the views expressed by the CRG. The concept of ‘Place’ is held very strongly by the community members. All their contributions at the workshop appeared to be driven via this cycle expressed in Figure 4-3..

Key findings from the CRG meeting revealed a strong love of the coast leads to a deep connection to Place. This results in a strong sense of ownership over the coast, and the creation of tight-knit communities. This appears to drive a strong desire for self-determination, a desire for self-organisation and self-reliance The CRG validates the findings of the Community Values Survey, particularly being able to hand over the coast to subsequent generations in a manner that retains the values currently held.

4.3.2.3 Community Reference Group Meeting 3 – March 2019

The CRG presented the results of Phase 3, i.e. the Coastal Hazard Mapping. Following from the previous CRG meeting, the group members provided insights from their past direct and indirect experiences of coastal hazard. Specifically, involving a mapping exercise, members identified assets and features exposed to coastal hazard under the following categories and plotted these onto the map.

- Infrastructure (Roads/Pipes)
- Recreational Uses
- Environmental/Cultural Assets
- Properties/Buildings

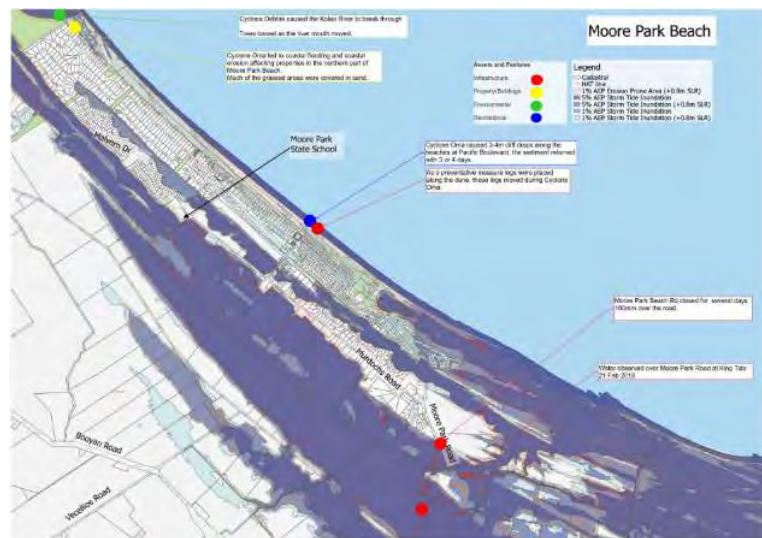


FIGURE 4-4 EXAMPLE OF MAPPING AND CRG OBSERVATIONS

The CRG noted that the mapping (as shown for Moore Park Beach in Figure 4.3) was particularly useful to visualise the discussions about coastal hazard and sea level rise and the potential impacts upon the Bundaberg Region. Some key observations include:

- Woodgate Road gets cut with the onset of sea level rise. This is a main access route in and out of Woodgate;
- Theodolite Creek BBQ and picnic area which is new is exposed to coastal hazards;
- The Causeway Road, at Kelly’s Beach is affected at high tide and after heavy periods of rainfall, so too does the intersection near Bargara Road and Holland Street near Nielsen Park;
- The Basin is considered a culturally significant site. The CRG questioned how the use of this will change over time;
- In Moore Park Beach, water has been observed over Moore Park Road on multiple occasions, most recently at king tide on 21 February 2019 and it has been closed for several days in the past.

The CRG members articulated an awareness of the changing picture of coastal hazards and potential impacts, both today and with the onset of sea level rise. Specifically, the CRG members expressed concerns of risk to assets and features that were not acceptable nor tolerable and expressed a fairly united view that some



acceptance and tolerance to losing assets or land is unavoidable. This subject matter was explored further in the following CRG Meeting held in May 2019.

4.3.2.4 Community Reference Group Meeting 4– May 2019

The CRG members provided input into exercises to determine the acceptability and tolerability of coastal hazard risks. The project team presented a description of consequence analysis and risk assessment¹. The CRG members provided valuable input into the risk assessment process by defining social impacts on the scale of catastrophic, major, moderate, low through to insignificant as shown in Figure 4-5.

The CRG members also noted that loss of a bridge for over 12 months would constitute a catastrophic social impact. Similarly, the group stated that a catastrophic impact would be a loss of electricity and communication infrastructure for over a week, a moderate impact for less than half a day and an insignificant loss of less than half hour.

Environmental features and assets were also considered in this exercise whereas economic impacts will undergo quantitative assessment only. The CRG members noted that a loss of beach for over one year would be a catastrophic consequence, whereas a loss of beach for 6 to 12 months would be considered as a major consequence. This CRG input was used to validate the risk assessment in Phase 5.

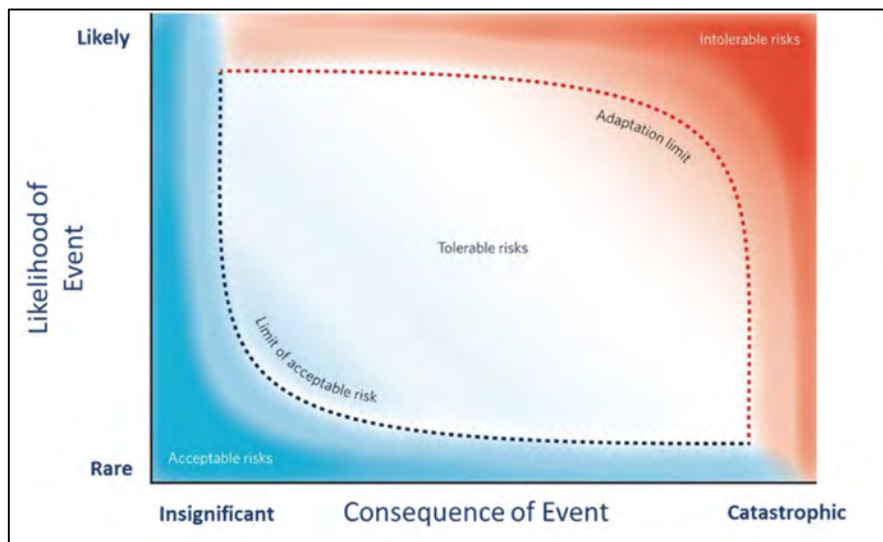


FIGURE 4-5 RISK AND TOLERABILITY SCALE

The CRG also articulated where the assets and features sat along the graph of tolerability, i.e. defining whether the community can live with a risk but as much as reasonably practical should be done to reduce risk, or whether action is required now to avoid or reduce the risk. The group also defined what would be acceptable loss. Generally, the group accepted impacts to park areas and assets, pathways and boardwalks and were tolerable of impacts upon local roads, Council land and environmental features. However, impacts to residential properties, key infrastructure such as bridges, electricity, sewerage and water supply is generally listed as intolerable.

Adapting to coastal hazards including accepting impacts is a view expressed by the CRG members, i.e. most CRG members accepted a longer duration of impacts upon park assets, park areas and natural areas than on

¹ As per page 24 of the QCoast 2100 Minimum Standards and Guidelines



key infrastructure. Most contributions tended to show that impacts of coastal hazards on key infrastructure and residential property would constitute a major and catastrophic consequence. The results of the exercise aligned with the community values survey results, i.e. reiterating the strong desire of residents to live within the coastal environment and retain the ability to hand over the coastal settlements to future generations.

4.3.2.5 Community Reference Group Meeting 5– June 2019

The project team facilitated a workshop exercise with the CRG members to identify the first principles of the Bundaberg CHAS. The workshop provided principles upon which the future actions, policies and recommendations can be based, tested and supported for future decision-making. Through discussion, the workshop explored the principles for adaptation across the following four themes:

- Resilient Economy;
- Resilient Environment;
- Resilient Settlements; and
- Resilient Society.

Using the outputs from previous CRG meetings discussion took place on how coastal hazard risks to the community and to priority assets can be best mitigated. The project team presented preliminary findings from the vulnerability analysis (via mapping) and the technical risk assessment process to validate the technical evidence with the CRG via a group exercise to test the risk assessment consequence matrix looking at present day 1% AEP (Annual Exceedance Probability) storm tide mapping in coastal areas with 0.8 m sea level rise. Discussions were had regarding the mapping for Burnett Heads, Woodgate Beach and Bargarra.

The visioning exercise validated and expanded on the findings of the Community Values Survey to further underpin the resilience and adaptation principles for the Strategy and Action Plan.

The risk and vulnerability exercises presented in the workshop, whilst complex in nature, provided confidence the technical process reflected the perceptions of the community in terms of economic, social and environmental consequences of coastal hazard and sea level rise.

As the project moved into the tail end, significant datasets and technical information which can be complex was presented. Feedback was requested and the group agreed that this session had been more beneficial than others, with the CRG members now having a better understanding of the process.

4.3.2.6 Community Reference Group Meeting 6– August 2019

The project team presented a series of graphs displaying the changing levels of risks for sea level rise scenarios of present day, 0.2 m, 0.4 m and 0.8 m for the main settlement areas, Coonarr Beach was used as an example, at 0.2 m sea level rise the risk rating moves from low (present day) to high/extreme. This is due to Coonarr Beach Road being permanently inundated by sea water and becoming impassable, ultimately resulting in permanent isolation and an intolerable risk to the community.

Members reviewed benefits and concerns (pros and cons) of four high level adaptation options - Avoid, Retreat, Accommodate and Defend and undertook an exercise of ranking adaptation options for each of the priority settlement areas. CRG members identified and scored the adaptation options for five key community areas (Moore Park Beach, Bargarra, Innes Park/Coral Cove, Coonarr, and Woodgate Beach/Walkers Point).

Each group considered and noted where risk becomes intolerable, and what measures may be undertaken for their assigned priority settlement for the respective sea level rises. Example feedback from this future planning scenario is shown in Figure 4-6.



3 BREAK-OUT 3: FUTURE SCENARIO PLANNING

- Unpack potential future adaptation options if the settlement reaches the certain "trigger"
- The settlements may experience a change in risk profile over time – How will we mitigate the risk going forward?
- Is there a scenario where accommodate or defend is no longer an option? Do we continue to monitor the sea level until it reaches certain levels?

Table 31 Moore Park Beach future scenario planning

MOORE PARK BEACH					
NO INTERVENTION	Option	SEA LEVEL CONDITIONS			
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.6m Sea Level Rise
AVOID	Land use planning				
	No build		0.3m		
	Education				
	New infrastructure				
RETREAT	Strengthen building setback		0.3m		
	Buyback land				
	Strategy / education				
	Realignment		0.3m		
ACCOMMODATE	Flood resilient infrastructure				
	Wetland restoration				
	Riparian corridor				
DEFEND	Seawall				
	Levees		0.3m		
	Education				

FIGURE 4-6 EXAMPLE FUTURE SCENARIO PLANNING EXERCISE FEEDBACK IN CRG MEETING 6

The settlement-based approach to the assessment led to recognition that different settlements are subject to different risks and adaptation pathways. Based on the observations and assessment of pros and cons, a suite of adaptation options was produced to assist how the CHAS developed Phases 7 and 8 of the project. The initial consultation process and work for the CHAS will provide a baseline strategy. As time progresses, with availability of more information and the refinement of processes there will need to be subsequent revisions, e.g. possibly a review in 5-10 years' time, dependent upon what is deemed most relevant by Council. The CRG discussed that this is a strategic body of work using a minimum standards and guidelines document from the QCoast 2100 program, but this needs to be locally relevant. The CRG members indicated that it had been a good session; being very informative, interesting and thought-provoking, with different discussions and scenarios giving rise to different thought patterns.



4.3.2.7 Community Reference Group Meeting 7– October 2019

Further to CRG Meeting 6, this CRG meeting aimed to undertake screening exercises to assist with refinement and evaluation of the potential success of adaptation options. The members worked through the various options available and applied the ‘screening’ process based on some of the identified issues. The CRG members formed small groups relevant to the six key priority settlements and were provided with mapping and pro-forma sheets with some adaptation options, indicative costs, and pros and cons.

The CRG contributed to developing and validating the long list of adaptation options to mitigate coastal hazards now and under future sea level rise scenarios. A range of options were presented to the community group from the “Compendium” of adaptation measures, including regenerative options such as beach nourishment, dune construction and regeneration; coastal engineering options such as seawalls, artificial reefs and groynes; land use planning options such as land buy-back; development controls and non-structural options such as disaster management, education and awareness campaigns.

The group also reviewed the pros and cons of each option and provided feedback to the project team about the suitability of the options for each coastal settlement in the context of the current and future coastal hazard risks that settlements may experience a change in risk profile over time.

MOORE PARK BEACH						
	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Seawalls	Cost: \$\$\$\$\$	Mitigates erosion and inundation Provides a hard line of defence (very limited residual risk for erosion to occur landwards of the seawall)	Would grow against wall. Comes and goes. Hard barrier to access the beach. Can initially be built to current conditions (no SLR) and retrofitted later on to account for SLR to reduce initial capital cost. Long beach compartment and therefore long seawall required. Often constructed as buried seawalls with beach nourishment to provide amenity and satisfy state approval requirements.	Moore Park Beach is a significant for turtle nesting. Seawalls at Moore Park Beach are likely to be located as far landward as possible allowing dune to retreat landward, providing the opportunity for turtles to nest. Seawalls would need to be designed to ensure they do not adversely impact tidal flushing of the small creeks to the south, as this may negatively impact water quality and ecological condition.	Effective in preventing inundation if build high enough (but possible impact on stormwater runoff and view lines). Effective against erosion.	Likely ■ Buried sea walls preferred ■ Don't need to be as large as what you may think. Sand will come and go.

FIGURE 4-7 EXAMPLE SCREENING PROCESS EXERCISE FEEDBACK IN CRG MEETING 7

4.3.2.8 Community Reference Group Meeting 8 – March 2020

The group opened the CRG meeting by working through a scenario planning tool online game by the LA Times in the USA, titled “The Ocean Game - The Sea is Rising – Can you Save your Town”, to conceptualize some of the challenges faced with storm tide inundation and sea level rise and public decision making processes. The following observations were noted from working through the scenarios of the online game:

- CHAS process helps us put a plan in place for the future and acting when the time eventuates
- Compulsory acquisition of land for roads can be a very expensive option
- There is devaluation of property caused by storm tide inundation and erosion, increasing insurance costs and decreasing demand for these properties
- Council should look at adopting an active approach of responsibility to inform potential buyers that it may be beautiful today but may not stay this way forever
- The reality of proposing a plan to buy out property owners and move homes away from the coast would be a measure of last resort.
- Different people have different attitudes and lifestyle considerations which affects decision making which can outweigh monetary incentives at differing times. Incentives can provide options and insurance can also be a major factor to decision making



- There are already some areas of the Bundaberg coastline that have effectively become uninsurable due to coastal hazards.

The group moved to undertaking the weighting criteria ranking exercise. The MCA criteria have been aligned to the results of the community values survey which identified the top ways that the community likes to use the coast and major concerns. The Technical Project team workshoped the process in January 2020 which was also reviewed with the Project Control Group (PCG). The following observations were made with regard to the weightings between the CRG members and the Technical Project Team, noting the below differences:

- Impact on environment – rated quite a bit lower by the Technical Project Team
- Technical Viability – rated quite a bit higher by the Technical Project Team; and
- Group discussion followed with consensus that the rankings were similar, excepting the middle ranks and recommending that the Technical Project Team should consider adjusting Technical Viability down and Impact on Environment up.

The MCA criteria weighting assessed by the CRG members has enabled community views to be directly represented in the final adaptation options chosen in Phase 7.

4.3.2.9 Community Reference Group Meeting 9 – July 2020

The group reflected on the development of the CHAS through Phases 3-7, with community and stakeholder engagement used to validate the technical work and the CRG have helped to keep the project on target. Phases 3, 6, 7 and 8 of QCoast 2100 reporting have been independently expert peer reviewed.

The results of the Phase 7 options appraisal, Phase 8 preferred adaptation pathways and the final action plan, were presented noting the following:

- MCA final weightings used, including an example, the results from the show alignment towards ‘soft engineering’ solutions, e.g. beach nourishment in comparison to seawalls.

The CHAS Summary Brochure with Action Plan was presented, with each of the CRG member in attendance at the meeting provided with an early release copy. Council has endorsed the draft document for public release for the consultation period running from 3-31 August 2020.

The group were encouraged to download from the website to view the material.

The methods for the public to share their comments on this work and make a submission were detailed.

At the close, Cr Bill Trevor thanked all for being involved with the community reference group for the CHAS, acknowledging the long timeframe of the program. Mayor Jack Dempsey responded acknowledged the Chair, Deputy Mayor Bill Trevor, for all that he had done for this group and fellow Councillors Wayne Honor and Jason Bartels. He also conveyed a “big” thank you to the CRG members and to Dwayne Honor and Richard Sharp and both their teams.



5 MEDIA-LED ENGAGEMENT

The use of media plays a vital role in communicating with the public about projects. As the CHAS sought involvement from the community every step of the way, media was a communication tool utilised to achieve this. As well as this, the scale of this project and the impact it will have in enabling adaptation and resilience makes it 'news-worthy'.

A combination of media releases, social media, newspaper, and online news features were used to communicate with the public about the CHAS project. These media channels were also used to inform the community of opportunities to be involved and consulted during the CHAS activities. These individual channels were used to link interested readers to the project website, where upcoming events, further project details and contact information could be found.

5.1 Media Releases

Numerous media releases were produced throughout the CHAS project. The website provides a link to each of the media releases, dated as follows. All media releases are presented in Appendix C.

- April 2018 – Council funded to develop coastal hazard adaptation strategy;
- April 2018 – Bundaberg gets funding to prepare for climate change;
- May 2018 – Call for community help;
- June 2018 – Applications extended for coastal strategy team nominations;
- July 2018 – CRG to help design coastal hazard strategy;
- July 2019 – More than 600 people respond to community values survey;
- July 2020 – CHAS Community Reference Group thanked;
- August 2020 – Have your say on Coastal Hazard Adaptation Strategy.



FIGURE 5-2 EXAMPLE MEDIA RELEASE

5.2 Online News Articles

Numerous online news articles were published that announced the beginning of the CHAS project, what this project involved and where more information could be found. Bundaberg Now articles also appeared on the Bundaberg Now Facebook page. A summary of titles and publish dates include:

- Bundaberg Regional Council news online: Council funded to develop coastal hazard adaptation strategy
 - 13 April 2018
- Queensland Government: Bundaberg to get \$451,000 to prepare for climate change
 - 23 April 2018
- Bundaberg Regional Council news online and News Mail: Coastal strategy team need community Help
 - 17 May 2018, 22 May 2018
- Bundaberg Regional Council online news: Application Extended for coastal strategy team nominations
 - 4 June 2018
- Bundaberg Regional Council online news: CRG to help design coastal hazard strategy
 - 24 July 2018
- Bundaberg Now online news: CHAS Community Reference Group thanked
 - 28 July 2020



- Bundaberg Now online news: Have your say on Coastal Hazard Adaptation Strategy
 - 3 August 2020

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ABOUT US EDITIONS ADVERTISE SUPPLEMENTS WHAT'S ON

Coastal hazard strategy

Beach erosion at Woodgate

Bundaberg Regional Council has secured almost half a million dollars to compile a strategy aimed at reducing the future risk of beach erosion and flooding on coastal settlements.

Environment and Natural Resources spokesman, Councillor Bill Trevor, said the funds, provided by the Queensland Government through a QCoast 2100 grant, will enable Council to pursue an eight phase process in developing a Coastal Hazard Adaptation Strategy (CHAS).

"We are currently experiencing erosion problems in locations across the Bundaberg Region including Woodgate, Moore Park and Miara.
"With a changing climate these risks may increase with more intense storms and projected sea level rise.

"The Woodgate Beach community is currently engaged with Council consultants Water Technology to assist in developing the Woodgate Shoreline Erosion Management Plan and these results will feed into the CHAS.

"Scientists are projecting that sea levels may rise by up to 0.8 of a metre by 2100 and tropical cyclones, while becoming less frequent, are expected to be more intense and track further south.

"Obviously a rise in sea levels, coupled with severe weather events can provide the combinations necessary for some shoreline areas to be threatened through erosion and inundation."

Project Manager, Dwayne Honor, said Council is developing a CHAS which encompasses the entire Bundaberg Region coastline.

"The CHAS will explore hazards linked to erosion, storm tide inundation and sea level rise and the potential impacts on communities, infrastructure and the environment.

"The strategy will be developed in consultation with the community with a focus of ensuring there is broad understanding of the vulnerabilities and risks associated with a changing climate and the need for climate adaptation."

Mr Honor said Bundaberg Regional Council was only the seventh of 41 eligible councils to receive full funding for the eight phase development of its CHAS.

FIGURE 5-3 NEWS ARTICLE – AUSTRALIA'S NATIONAL LOCAL GOVERNMENT FOCUS APRIL 2018

5057-08_R10_V02_Stakeholder Communication and Engagement Summary



FIGURE 5-4 ONLINE NEWS ARTICLE – BUNDABERG NOW – AUGUST 2020



5.3 Newspaper Project Advertisement

16 NEWS SATURDAY, MAY 19, 2018 NEWS-MAIL.COM.AU

RTM ROAD TECH MARINE
Parts and accessories for boating, cruising and 4WD enthusiasts

CLEARANCE SALE!
UP TO 50% OFF
HUNDREDS OF SPECIALS IN-STORE

50% OFF SELECTED JETSKI COVERS MOORING LINES	40% OFF SELECTED SKI TUBES BATTERY CHARGERS LED WORK LIGHTS
30% OFF SELECTED LED LANTERNS & TORCHES BILGE PUMPS TRAILER & VEHICLE LIGHTS FOLDING FURNITURE	SAVE UP TO \$200 ON 12V 4WD RECOVERY WINCH E-GO QUICKIEY CARAVAN MOVER SINE WAVE INVERTERS

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Investment: The GHD Engineers office on Baroth St was purchased for \$2,130,000 at auction.

Bundy office sells for \$2m

TAHLIA STEHBENS
tahliastehbens@news-mail.com.au

A SIGNIFICANT office investment is the talk of the town in Bundaberg this month. The space was snatched up for an impressive \$2,130,000 on a solid yield of 7.4% at Burgess Rawson's Flagship May portfolio auction in Melbourne.

The property is tenanted by GHD Engineers, which has more than 200 offices worldwide, on a secure 10-year lease through to 2023 with options extending to 2033. Burgess Rawson Queensland director Pat Kelly said Bundaberg's growing population and well performing commercial real estate scene secured the property's appeal.

"Bundaberg is a major sugar cane city and its tourism market is booming, attracting more than 1.2 million visitors annually," Mr Kelly said. "Home to over 94,400 people, the city is continuing to grow at an impressive rate."

PRIME SITE: Commercial property news in the NewsMail every Thursday

Concerned about coastal hazard?

If your local knowledge and passion can help us to develop the Coastal Hazard Adaption Strategy please nominate for the Our Coast Community Reference Group.

Our Coast is a joint initiative of Bundaberg Regional Council and the Queensland Government aimed at preparing and protecting the region's coastline from the effects of severe weather and sea level rises.

Come and see us at:

Bargara
Tuesday, May 22 from 1-3 pm
adjacent the Esplanade war memorial

Moore Park
Wednesday, May 23 from 10 am-12 pm
at Moore Park Surf Lifesaving Club

For more information:
or to download a nomination form visit ourcoast.bundaberg.qld.gov.au






FIGURE 5-5 CHAS PROJECT ADVERTISEMENT, MAY 2018

5057-08_R10_V02_Stakeholder Communication and Engagement Summary



5.4 Social Media Posts

The following section shows selected social media posts throughout the project. Please refer to Appendix C for all social media posts used to update the wider community of key milestones and events.

FIGURE 5-6 FACEBOOK POST – MAY 2018



5057-08_R10_V02_Stakeholder Communication and Engagement Summary



FIGURE 5-7 FACEBOOK POST – JUNE 2018



FIGURE 5-8 FACEBOOK POST – OCTOBER 2018

Bundaberg Regional Council ✓
October 20, 2018 · 🌐

A professor experienced in storm surge and tidal inundation events in the United States is sharing knowledge with Bundaberg Regional Council officers engaged in compiling a local Coastal Hazard Adaptation Strategy (CHAS).

Professor Smith, from the Department of City and Regional Planning, University of North Carolina and the Coastal Resilience Centre of Excellence, said he was delighted to find that the Bundaberg Regional Council had a proactive approach to preparing its community for the effects of coastal and sea level changes brought about through a changing climate. Read more here: <https://bit.ly/2J7UV4T>

19

Like Comment Share

Bundaberg Regional Council ✓
August 8 at 5:00 PM · 🌐

🌐 After more than two years of development with input from community consultation and a dedicated Community Reference Group, we've developed the Bundaberg Region Coastal Hazard Adaptation Strategy.

👉 The draft Strategy and Action Plan has been released to the public for a 28-day period of community consultation – until 31 August 2020.

⚠️ We are now asking for your input, particularly from residents in coastal areas.... [See More](#)

YOUTUBE.COM
Bundaberg CHAS

2,011 People Reached 36 Engagements [Boost Post](#)

FIGURE 5-9 FACEBOOK POST – AUGUST 2020



6 PUBLIC CONSULTATION SUMMARY

6.1 Overview of the Public Consultation

In accordance with the CHAS Minimum Standards and Guidelines, prior to the finalisation of a CHAS, a minimum 28-day formal public consultation period is recommended. The intention of this public consultation period is to allow the public to make formal submissions on the CHAS. The 28-day formal consultation submission period opened on the 3 August 2020 and closed on the 31 August 2020.

The following documentation and resources were made publicly available via the Our Coast Bundaberg Region Coastal Hazard Adaptation Strategy website and links advertised via social media and media outlets:

- A CHAS summary document, specifically written for the community;
- Coastal hazard mapping portal; and
- Series of explanatory factsheets.

The following activities were undertaken as part of the public consultation program:

- A public notice of the CHAS consultation was published in the Bundaberg Now News on 28 July 2020, 3 August 2020 and 10 August 2020;
- A CRG meeting was held on 23 July 2020 to provide the CRG with a summary of the proposed draft documentation and consultation period;
- A Stakeholder Advisory Group meeting was held on 24 July 2020 to provide key stakeholders with a summary of the proposed draft documentation and consultation period;
- The draft Strategy and Action Plan, factsheets, submission form and other supporting information were available on the Our Coast Bundaberg Coastal Hazard Adaptation Strategy website;
- An information session, by invitation was held at the Burnett Heads Progress and Sports Association; and
- Media releases and articles on Council's Bundaberg Now website and social media posts.

Upon completion of the consultation period, a publicly available document setting out Council's response to the submissions received was prepared and are found in Appendix D.



APPENDIX A COMMUNITY REFERENCE GROUP (CRG) MEETING MINUTES



OUR COAST
COMMUNITY REFERENCE GROUP (CRG)

MINUTES OF MEETING

HELD AT THE FUNCTION ROOM, COUNCIL ADMINISTRATION BUILDING ON
THURSDAY, 9 AUGUST 2018 COMMENCING AT 6.00 PM

PRESENT:

CRG Members – Chris McLoughlin, Ian Graham, Heath Greville, Tony Ricciardi, Derek Bester, Jennifer Parry, Collin Turner, George Martin, Sharon Jackson, Terry Kelly, Lloyd Blake, Joe Russo, Shanelle Pekin.

Council - Cr Bill Trevor (Chair), Cr Jason Bartels, Dwayne Honor (Project Manager), Nick MacLean (Natural Resource Management), Matt Dyer (Disaster Management) and Robyn Laing (Stakeholder Engagement).

Project Consultant – Jo Tinnion, Water Technology

APOLOGIES:

Apologies were tendered for – CRG Members: Russell Stewart, Julie Fauser, Robert Bell, Rob James, Josephine Ferris; Councillors Jack Dempsey and Wayne Honor and Council Officer, Evan Fritz (Strategic Planning)

BUSINESS OF MEETING

1. Welcome and Introductions

The Chair welcomed CRG members and thanked them for participating in this project. He stated that we have a coastline we want to protect into the future and will endeavour to keep it in as good if not better condition than we found it. He explained there would be an overall plan for the whole coastline (Coastal Hazard Adaptation Strategy) and that will include action items for individual beach areas, such as Shoreline Erosion Management Plans (SEMPS). Residents living along the coastline have knowledge that we don't have and Council would like to tap in to this information.

2. Our Coast Briefing by the Project Team

Dwayne Honor and Jo Tinnion addressed the meeting giving background information on the QCoast2100 program. Funding has been made available to Bundaberg Regional Council to

develop a Coastal Hazard Adaptation Strategy (CHAS). The aim of this project is to support coastal Councils to identify coastal hazards and climate change risks. Adaptation strategies are intended to mitigate coastal hazard risk for Councils and communities. Council will utilise a trigger based approach and seeks to understand the cascading consequences of climate change on the coastline, along with major weather events. We are trying to understand the interconnected nature of critical infrastructure and how this impacts the community as a result of rising sea levels and coastal flooding. Our Coast is the project name for the CHAS and seeks to quantify what to expect if the sea levels rise under a range of different scenarios so we can forward plan mitigation and adaptation measures to address. The CHAS will be used to address coastal risks likely to be faced now and into the future by -

1. Identifying coastal hazards
2. Understanding vulnerabilities and risks
3. Engaging with the community to understand the preferred approach to adaptation and the most fit for purpose solution
4. Determining costs, priorities and timeframes for implementation of adaptation options.

A progress report was given on the eight phases of the CHAS project; noting that the first two phases have been completed. During these phases Water Technology was engaged to undertake community engagement planning and a technical scoping study was completed.

- Phase 3 - Coastal hazard mapping of erosion caused by gradual change as well as large events (currently in progress)
- Phase 4 - Identifying infrastructure and assets at risk and determining what's important to the community (August to October 2018)
- Phase 5 - Mapping of how risk is distributed across the region (determining what is acceptable through to not acceptable) – CRG feedback will help Council understand the community's tolerability to the risk, enabling Council to undertake risk prioritisation of public infrastructure, built environment and community assets (October to December 2018)
- Phase 6 - Engaging the community on different adaptation options (January to March 2019)
- Phase 7 - Prioritising adaptation solutions based on a conjoint analysis; CRG and community to help with ranking the adaptations options (March to May 2019)
- Phase 8 – Developing a road map on how to manage future coastal hazards (June to August 2019)

CRG Members were informed of the project governance (refer to page 11 of the presentation attached to these minutes) explaining that Council will provide resourcing, direction and process for the project. The CRG will provide Council feedback, community values and local knowledge.

Jo Tinnion explained that Water Technology had brought together a broad multi-disciplinary panel of national experts to guide Council in this project (refer to Page 12 of the presentation).

Supporting Projects such as the Miara rock wall and the Woodgate Beach SEMP were discussed. The Woodgate Beach SEMP is a 15 – 20 year shore line erosion management plan that defines in detail why beach erosion is happening and methods to best manage it. The SEMP will be submitted to the Queensland Government for review and approval giving Council the authority to undertake proactive erosion and buffer zone management works when triggered by an event. This body of work will be directly connected to the overarching CHAS.

CRG Members were advised of the Project website – ourcoast.bundaberg.qld.gov.au
This website is Council's primary tool for sharing information, minutes of meetings etc.

3. CRG Roles and Responsibilities

The Terms of Reference were tabled and taken as read. Section 1.1.2 outlined the role of the CRG member. CRG Members were advised that Council needed assistance with amplifying the findings, learnings and messaging throughout the community. It is difficult to connect with everyone that Council should be talking to. The CRG is to help Council to connect with the community and enable two way communication with the community. Council needs the help of the CRG to measure community values and determine weighting when prioritising the adaptation options.

The CRG members resolved to accept the Terms of Reference for OUR COAST Community Reference Group.

4. Questions and Answers:

CRG member acknowledged the importance of having a scientific base but felt Council needed to get down to the common sense level and ensure local knowledge was considered. The Project Manager responded that this was largely the purpose of the CRG and encouraged such feedback to validate the engineering and scientific work.

CRG member asked whether there was indigenous representation. The Project Manager advised that Council will be connecting with indigenous representative as part of a larger Stakeholder Advisory Group and in accordance with arrangements under Councils Indigenous Land Use Agreement (ILUA)

CRG member asked if the Insurance Council should be involved and the Project Manager advised that Council has linkages with the Insurance Council of Australia who are keen to help Council with this project, where possible.

CRG member asked confirmation of source for the figure of 0.8m sea level rise. The Project Manager advised that the Queensland Government has set that figure of 0.8m sea rise for 2100. Given inherent uncertainty in absolute values, Our Coast will be uniquely adopting a trigger based approach. For example, what's the consequence of a 0.2m sea rise; a 0.4m sea rise and a 0.8 m sea rise? This allows us to talk about the consequences of sea level rise without needing to know the exact timing.

CRG member asked if electrical assets will be included and the Project Manager stated that Council will try to identify all critical infrastructure including Ergon's infrastructure. Council needs that information to understand the cascading effects.

The Chair advised the Meeting that no one beach is more important than another beach. From time to time some beaches might get ahead of the others based on the risk or threat. Some of the shoreline is under State control and there is no infrastructure in those areas. He stated that, "we would deal with it as a group; we are all together".

5. Future Meeting Dates

CRG Members present agreed to holding bi-monthly meetings (giving two weeks' notice) to be held at Council's Function Room, main administration building, 190 Bourbong Street, Bundaberg commencing at 5.30 pm.

Half day workshops proposed for phases 4, 5, 6, 7 will be hosted by an independent facilitator to help Council to extract the right information. It was agreed that Council would send out a week date and a potential weekend date and select the date by the greater representation. All workshops will have a minimum of two weeks' notice. Briefing material will be provided before the workshop so Members who are unable to attend will still be able to access the information.

This concluded the business of the CRG Meeting at 7.10 pm.

Cr Bill Trevor Chairperson
OUR COAST community Reference Group



OUR
COAST

Investing today for a resilient tomorrow

Welcome!

Bundaberg Region Coastal Hazard Adaptation Strategy

Community Reference Group Meeting 9th August 2018



Agenda

- Welcome & Introductions
- Our Coast briefing by the Project Team
- CRG roles and responsibilities
- Acceptance of Terms of Reference
- Questions and Answers
- Future meetings and logistics

Cr Bill Trevor

Dwayne Honor & Jo Tinnion

Background

- The Queensland Government, in partnership with the Local Government Association of Queensland is investing \$12 million to help coastal councils and their communities plan and prepare for storm tide, coastal erosion and rising sea levels resulting from climate change.
- **Coastal hazards adaptation program – QCoast 2100** is open to coastal councils
- The aim of the QCoast2100 program is to support coastal councils in their progression from identifying coastal hazards and climate change risks through to the decision-making and implementation phases.
- Our Council was successful in securing a total of \$499,227



What is the purpose of a CHAS?

- A coastal hazard adaptation strategy (CHAS) is to **assess the risk from the projected effects of climate change** over the **medium to long term**;
- Propose adaptation measures to mitigate these impacts; and
- Establish an implementation program for the mitigation measures.
- Adaptation strategies are **intended to mitigate coastal hazard risk for councils and communities** identified through informed, coordinated and timely actions over the long term.

Why do a CHAS?

- 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.
- How we plan now is critical to the long-term functionality and protection of homes, businesses, infrastructure and services along the coast. By reducing future exposure to the risks of flooding, storm tides and coastal erosion, it is expected there will be significant financial benefit from avoided impacts.
- We have a duty of care to manage risk into the future



We need to make future decisions

Council will need to make decisions about managing and responding to coastal hazards as a result of climate change.

The CHAS will be used to address coastal risks likely to be faced now and into the future

- Identify coastal hazard areas
- Understand vulnerabilities and risks
- Engage with the community to understand their preferred approach to adaptation
- Determine costs, priorities and timeframes for implementation of adaptation options

Guiding Principles

- Fit for purpose based on best available science, data and information
- Adopts an adaptive management approach to allow flexibility over time
- Considers locally specific objectives within regional context
- Stakeholder communication and engagement is a critical element



What are the Phases?

April - June
2018

August
2019



Coastal hazard mapping for a range of scenarios

Mapping and prioritisation of key assets

Risk prioritisation

Resilience and adaptation optioneering

Conjoint and MCA analysis led prioritisation

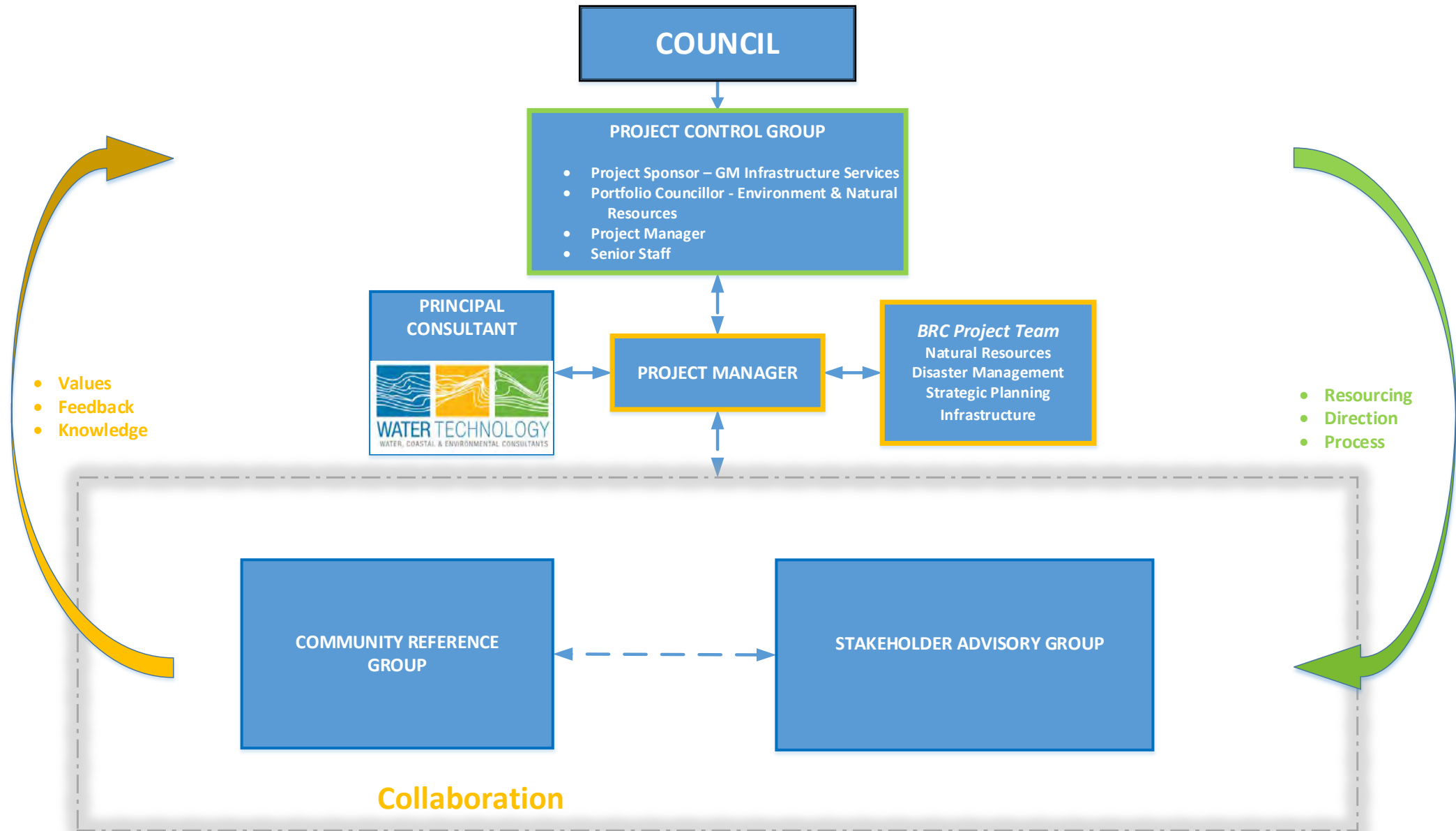
Pathway development with process and plans for adaptive capacity

Community and Stakeholder Engagement

Where are we currently at?

- Phase 1 – Stakeholder Communication and Engagement Plan – Completed July 2017
- Phase 2 - Scoping Study - Completed July 2017
- Phases 3 to 8 tendered late 2017
- Water Technology team appointed March 2018 - Total Contract Value of \$503,592.73
- Currently completing technical work for Phase 3

Project Governance





JAMES DAVIDSON
ARCHITECT



frc environmental

Supporting Projects



- Woodgate Beach Shoreline Erosion Management Plan semp.bundaberg.qld.gov.au
- Woodgate Beach is experiencing shoreline erosion problems as a result of the dynamic coastal environment, through the interaction of tidal currents and waves.
- More recently, Woodgate Beach has suffered loss of foreshore vegetation, creating cliffs and erosion around the boat ramp. The erosion is starting to impact how the community and visitors can use the beach and its facilities.
- Council seeks to undertake erosion and buffer zone management works at Woodgate Beach and has engaged coastal engineering specialists Water Technology to undertake the Shoreline Erosion Management Plan (SEMP).

Project Program

Phase 4 – Mapping and prioritisation of a key assets and development of resilience baseline

August to October 2018

Phase 5 – Mapping of how risk distributed across region in terms of acceptability through to unacceptable

October to December 2018

Phase 6 – Development of settlement specific adaptation options inc issues, opportunities and constraints

January to March 2019

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance

March to May 2019

Phase 8 – Strategy and Implementation Plan linked to resilience baseline improvements coupled with development of monitoring and evaluation process

June to August 2019

Learn More - Project Website

ourcoast.bundaberg.qld.gov.au



CRG Roles & Responsibilities



Questions?



Future Meetings?

Phase 4 – Mapping and prioritisation of a key assets and development of resilience baseline

August to October 2018

Phase 5 – Mapping of how risk distributed across region in terms of acceptability through to unacceptable

October to December 2018

Phase 6 – Development of settlement specific adaptation options inc issues, opportunities and constraints

January to March 2019

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance

March to May 2019

Phase 8 – Strategy and Implementation Plan linked to resilience baseline improvements coupled with development of monitoring and evaluation process

June to August 2019



BUNDABERG REGION COASTAL HAZARD ADAPTATION STRATEGY

Community Reference Group

TERMS OF REFERENCE

1.1 Background

1.1.1 Purpose

Many coastal communities face coastal erosion and inundation risks. 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 significantly impact the livelihoods and lifestyles of coastal residents and the natural environment. Decisions and actions that help to prepare for the adverse consequences of a changing climate 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 the entire 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.

More specifically the CHAS will:

- Identify coastal hazard areas.
- Understand the vulnerabilities and risks to communities, infrastructure and the environment.
- Engage with the community to understand their preferred approach to adaptation; and
- Develop costs, priorities and time frames for implementation of adaptation options.

The Bundaberg Region Coastal Hazard Adaptation Strategy Community Reference Group (CRG) is a group of interested, voluntary community members established to liaise between Council and the community to help inform the development of the adaptation options and strategies as part of the Coastal Hazard Adaptation Strategy (CHAS).

1.1.2 Role

In summary, the voluntary roles of the CRG are to:

- Provide input into the development of the CHAS.
- Communicate information and update their respective networks to ensure they are kept informed as to the project's progress.
- Assist Council to connect the local community to project information.
- Act as a conduit for community feedback on the Coastal Hazard Adaptation Strategy's development to the consultant (Water Technology) and Bundaberg Regional Council.
- Provide input regarding existing community concerns, areas of vulnerability and tolerability associated with coastal erosion and inundation.
- Gather collective thoughts and ideas from their respective networks to help identify and assess a range of suitable adaptation options to manage the Bundaberg region coastline.
- Collectively assist in developing the criteria to assess adaptation options and weighting used during the multi criteria assessment.
- Participate in the launch of the CHAS.

The CRG will publically report and provide feedback on issues raised during development of the Bundaberg Region Coastal Hazard Adaptation Strategy.

1.2 Community Reference Group

1.2.1 CRG Chair

A Chairperson will be appointed by Council to conduct and manage meeting proceedings with the objective of ensuring the meetings are run fairly and without bias. At times, the Chair will be supported by an independent facilitator.

The role of the Chairperson includes:

- Ensuring individual CRG members are heard and can contribute to the process. At times the Chairperson may have to mediate the process to ensure all parties in the discussion are heard, actions are summarised and a conducive working relationship is maintained.
- Contribute to the preparation of meeting agendas and minutes and communicate with individual members on a regular basis.
- Overseeing preparation of the meeting minutes
- Ensuring distribution of the meeting minutes
- Overseeing independent reporting on behalf of the CRG
- Attending the community information sessions as part of the wider public consultation for the project (occurring from TBC); and
- Collating issues raised by the CRG and forwarding to Council for a response.

1.2.2 Representation

Voluntary representation on the CRG will be sought from a range of stakeholder groups via an open Expression of Interest invitation.

The CRG members should be representative of a range of key interests, positions and concerns and who collectively represent a wide cross-section of the community, including people directly impacted by coastal erosion and inundation, leaders from the education and community services sector, representatives of community groups, environmental groups, and our business and industry leaders.

It is intended that the CRG would include approximately 25-30 individuals from a wide geographic spread. The final selection of representatives will be at the discretion of Council.

Other interested stakeholders that may not be selected onto the CRG will be kept updated and informed on project progress through newsletters, factsheets, Council's website and/or copies of meeting minutes or project reports.

1.2.3 Appointment of New Members

Council may appoint new members to the CRG.

1.2.4 Removal of Existing Members

Council may remove existing members on request from the relevant member or the Chair.

1.2.5 No Payment

Participation in the CRG is voluntary and no payment shall be made by Council to any member for attendance or disbursements.

1.3 Recruitment and Selection of CRG members

1.3.1 Recruitment and advertising

During May 2018, the Bundaberg Regional Council invited the general public to express interest to join the Community Reference Group (CRG).

This has been advertised in a range of local newspapers throughout May 2018, appeared on the Bundaberg Regional Council website and social media, and was communicated through a variety of other local networks.

Applications were available online at www.bundaberg.qld.gov.au or hard copies of the application form could be collected from Council's Customer Service Centres and submitted by either:

- Email: ourcoast@bundaberg.qld.gov.au
- Mail: CEO Bundaberg Regional Council
PO Box 3130
BUNDABERG Qld 4670

Applications close at 4.30pm, Monday 4 June 2018.

1.3.2 Selection process

The Council shall select the membership of the CRG giving consideration to their:

- Locality (focus areas include Winfield, Miara, Moore Park Beach, Burnett Heads, Bargara, Innes Park, Coral Cove, Elliot Heads, Coonarr, Woodgate Beach, Walkers Point and Buxton)
- Representation of stakeholders: Ability to represent one or more stakeholder groups.
- Capacity to communicate: Ability to communicate information from the CRG to other interested stakeholders
- Constructive participation: Ability to commit to working constructively and cooperatively as part of the CRG. They should also agree to fulfil their role as laid out in the Community Reference Group Charter (refer section 1.5 of this document).
- Interest: Members should be able to demonstrate interest in one or more issues relevant to the proposed project.
- Capacity and skills to contribute: Members should be able and willing to commit to the role and responsibilities of the CRG, and actively participate in the business of the CRG.
- Availability and flexibility: Members should be available and willing to meet on the agreed dates during 2018 and 2019, at a mutually agreed time and venue.

Following an assessment of the individuals based on the above-mentioned considerations, the Bundaberg Regional Council, will select members to collectively represent a wide cross section of our community, including:

- People likely to be directly impacted by coastal erosion and inundation
- leaders from the education and community services sector; and
- business and industry leaders.

The number of community representatives on the CRG will not exceed 30 or to Council's discretion.

If a member is unable to attend a CRG meeting or activity, a formal apology should be provided to the Chairperson prior to the meeting.

1.3.3 Bundaberg Regional Council and Water Technology Project Team

The Bundaberg Regional Council Team for the Coastal Hazard Adaptation Strategy involves the following personnel:

- Mayor and Councillors
- General Manager Infrastructure Services, Mr Stuart Randle
- Project Manager, Mr Dwayne Honor
- Disaster Management Officer, Mr Matt Dyer
- Manager Strategic Planning, Mr Evan Fritz
- Operational Supervisor - Natural Resource Management, Mr Nick MacLean
- Marketing Adviser, Mr Beau Jackson

The Water Technology consultancy team assisting with project delivery includes:

- Principal Engineer - Jo Tinnion
- Principal Planner – Stephen Dredge
- Independent Facilitator – Neil Dufty

1.3.4 Meetings

The CRG will meet bi-monthly and more often as determined by Bundaberg Regional Council in close collaboration with the CRG and with the Chairperson. If a member sees the need for additional meetings, the member can contact the Chairperson to arrange it.

CRG meeting dates, times and venues will be determined at the first meeting in consultation with all parties.

CRG meetings may involve the Council project support team and Water Technology technical advisors on an as needs basis or as requested to attend.

The CRG will work together to attempt to reach decision by consensus. There may however be times when decision by consensus cannot be reached and a matter has to be put to a vote at the Chairs discretion.

Meetings will be advertised to inform the community of their occurrence and outcomes published. Bundaberg Regional Council is responsible to assist in the coordination of meetings including distributing meeting agendas, minutes and reports.

1.3.5 Meeting Agendas

A set of standing agenda items will be developed at the first meeting based on the scope and purpose of the CRG.

If any CRG member wishes to discuss an issue at a meeting, it needs to be raised and included on the agenda. Meeting agendas will be prepared by the Chair of the Community Reference Group at either the conclusion of each meeting or in the interim between meetings and finalised to allow the agenda to be distributed at least three working days in advance of the next meeting. The Chair may also introduce late matters not listed on the Agenda during the meeting.

1.3.6 Reporting and Transparency

All meetings will be recorded.

CRG meeting agendas and minutes will be open to the public and published on a dedicated project page of the Bundaberg Regional Council website.

Reporting will be objective and attempt to capture the views of the CRG members and the community.

1.3.7 Communication with the broader community

CRG members are encouraged to discuss issues and disseminate information about the project with the wider community, including special interest groups.

The CRG may seek to develop content to include in Media Releases to the media, or to adopt other approaches for public dissemination of information, however the Chairperson is to ensure the discussion is balanced and has the final veto on the media/public statement.

Only the Chairperson can act as CRG spokesperson and speak to the media on behalf of the CRG.

1.4 Bundaberg Regional Council Support

Bundaberg Regional Council recognises that support for the CRG is imperative to its success. The Council will provide a project support team to assist the CRG process which will involve:

- Project Manager & Technical Support;
- Administration Officer ;
- Communications expertise; and
- Divisional Councillors.

Council has nominated the CRG Chairperson to be responsible for collating the issues raised by the CRG and for coordinating a formal response. The Council-employed project staff will commit to supporting the objectives of the CRG through:

- Regular meeting attendance as requested/required;
- Recognition of the need to communicate and consult; and
- Appropriate and timely response to issues raised by the CRG.

Any correspondence and or project information will be provided to CRG members as soon as practicable prior to a meeting. Reports or information will be emailed to members.

Responses to issues raised within the CRG will be provided in a timely manner once the facts are available. Issues raised by the CRG which are of a technical nature will be referred to the project consultants to give advice through Council. Non-technical issues will be referred to Council for consideration and formal response.

1.5 CRG Charter

All prospective CRG members must agree to abide by the Terms of Reference (TOR) and agree to these terms prior to meeting attendance and participation. This document is not subject to alteration at any point in the future, unless agreed to by all parties (including Council).

A copy of the CRG Terms of Reference is available to any party upon request.

CRG members must ensure they have read and agreed with the below terms in order to be considered or accepted as a CRG member.

CRG members should be willing to and agree to:

- Attend all scheduled meetings. If you are unable to attend a meeting, the Chairperson should be notified with a formal apology and any comments or discussion points raised by your local stakeholder/community/group should be tabled via email, phone or letter to the Chairperson prior to the meeting
- Review CRG meeting minutes

- Verbally report to the CRG on communication activities and stakeholder concerns
- Review and comment on correspondence and/or project material
- Provide information to Bundaberg Regional Council on relevant issues concerning their local community and/or stakeholder group in relation to the Bundaberg Regional Coastal Hazard Adaptation Strategy
- Feed information from Bundaberg Regional Council back to their local community/group; and
- Only make comments to the media or in public forums on behalf of themselves or the stakeholders they represent, not on behalf of the CRG.

Each member of the CRG commits to the following conduct points:

- Ensure any issues raised are directed at the organisations involved (e.g. Council, consultants) and not at an individual or personal level
- Respect and listen to the opinions of others, including during meetings
- Ensure issues are placed on the agenda prior to the meeting to ensure a prepared response/comment can be delivered
- Recognise that active participation in the CRG forum is crucial to the success of the group
- Any complaints regarding the process are raised in the CRG forum to enable the opportunity for resolution and/or in writing to the CEO of Bundaberg Regional Council.

1.6 Bundaberg Regional Council – Decision Making Authority

Bundaberg Regional Council recognises that support for the Bundaberg Region Coastal Hazard Adaptation Strategy Community Reference Group is imperative to its ongoing success.

As Council is not able to delegate its decision-making responsibility, the Council will consider the CRG's recommendations as part of its evaluation processes but is not bound by them.

1.7 Exit Process

The Community Reference Group will disband once the Bundaberg Region Coastal Hazard Adaptation Strategy (expected to be finalised in August 2019) has been adopted by Bundaberg Regional Council and publically released on Councils website.

Addendum A – Additional Project Information

From early June 2018 through to August 2019 Bundaberg Regional Council will seek ideas and feedback from the community to help develop a Coastal Hazard Adaptation Strategy for the Bundaberg Region coastline. This public engagement and consultation program is supported by the dedicated, independently facilitated Community Reference Group that will be in place for the duration of the project.

The CHAS will be developed through eight phases, Phases 1 and 2 are completed and involved development of a plan for stakeholder communication and engagement (Phase 1) and a scoping of the coastal hazard issues for the area (Phase2). The CRG will be involved in Phases 3 to 8 which are:

- Phase 3: Identifying areas exposed to current and future coastal hazards
- Phase 4: Identifying key assets potentially impacted
- Phase 5: Risk assessment of key assets in coastal hazard areas
- Phase 6: Identify potential adaptation options
- Phase 7: Socio economic appraisal of options
- Phase 8: Strategy development, implementation and review

In addition to the community consultation and engagement activities, technical inputs from key stakeholder organisations will be sought at critical points in the process. The ideas and feedback from the public, Community Reference Group members, and the Technical Working Group representatives will be considered and within the development of the CHAS.

To assist with the development of the strategy, the CRG will be involved in assisting Council and their consultants to identify key assets, both natural and built within the community, helping to understand their value and the reasons they are important. This value mapping exercise undertaken in Phase 4 will be an important element helping to frame the identification, assessment and selection of adaptation options in Phase 6.

During the delivery of Phase 4 and 5 the CRG will be engaged with assisting to develop a resilience baseline considering the exposure, vulnerability and tolerability of assets and settlements potentially affected by coastal hazard. This will assist with undertaking the risk assessment in Phase 5 where identification will be undertaken on when and where risk due to existing and future coastal hazards are acceptable, tolerable or unacceptable to the assets, helping to inform suitable adaptation options.

Phase 6 will involve the development of adaptation options relevant to specific areas relative to risk, community expectation and feasibility. To assist in gaining ownership, these will be discussed with the CRG to help understand future response options. Discussing these options with the CRG also will present an opportunity to consider whether the options are required now, or in the future; this is a fundamental consideration.

The Multi-Criteria Assessment (MCA) undertaken in Phase 7 will provide a robust and transparent tool to refine resilience strategies informed by the public consultation by assessing them against a set of agreed weighted criteria. When assessing adaptation options, it is of critical importance to obtain extensive “buy-in” from the community, Council and stakeholders, particularly when structural mitigation works are required. To achieve this, the CRG will be involved in the appraisal and selection of the adaptation options from the very early stages of Phase 7, through a Choice-Based Conjoint Analysis (CBCA). The aim of the CBCA will be to understand which criteria are used and valued the most by the community when it comes to coastal hazard adaptation options. The outcomes of the CBCA will be used to assign weights to the evaluation criteria in the MCA.

Draft CRG Meeting Program

- Meeting 1 – Week commencing 6 August 2018
- Meeting 2 – Week commencing 8 October 2018
- Meeting 3 – Week commencing 28 January 2019
- Meeting 4 – Week commencing 6 May 2019



BUNDABERG REGION COASTAL HAZARD ADAPTATION STRATEGY

Community Reference Group

NOMINATION FORM

The Chief Executive Officer
BUNDABERG REGIONAL COUNCIL
Po Box 3130
BUNDABERG QLD 4670

Dear Sir

I hereby nominate for a position on the Community Reference Group (CRG) for the Coastal Hazard Adaptation Strategy (CHAS)

As a member of the CRG, I would act as a conduit for community feedback on the development of the Coastal Hazard Adaptation Strategy to both Bundaberg Regional Council and its consultant, Water Technology. In this role, I will gather the collective thoughts and ideas from my networks to help identify and assess a range of suitable adaptation options to reduce coastal hazard risks along the Bundaberg region coastline. I will provide input into the development of the adaptation strategy, connect people to project information and participate in the launch of the Coastal Hazard Adaptation Strategy for the Bundaberg Region.

I will abide by the Terms of Reference should I be selected by Council to represent my community on the Community Reference Group.

Name of Nominated Person	
Postal Address	
Locality you are representing	
Email	
Phone / Mobile	
Briefly explain your interest in joining the CHAS CRG (Describe how your participation will benefit the project.)	
<ul style="list-style-type: none">• Representation• Capacity to communicate• Genuine interest• Capacity and skills to contribute	

Signature of Nominated Person

Email nomination to ceo@bundaberg.qld.gov.au
All nominations must be received by 4:30pm
Monday 4th June 2018

MINUTES OF MEETING

Bundaberg Coastal Hazard Adaptation Strategy Community Reference Group (CRG)

Held At:	Function Room, Bundaberg Regional Council Administration Centre 190 Bourbong Street, Bundaberg
Date & Time:	Thursday, 18 October 2018, 6:00 pm – 8:30pm
Present:	<i>CRG Members</i> – Russell Stewart, Chris Mcloughlin, Heath Greville, Josephine Ferris, Tony Ricciardi, Jennifer Parry, Colin Turner, George Martin, Julie Fauser, Terry Kelly, Lloyd Blake, Robert Bell, Joe Russo, Rob James, Shanelle Pekin
	<i>Council</i> – Cr Bill Trevor (Chair), Cr Jason Bartels, Cr Wayne Honor, Dwayne Honor (Project Manager), Matt Dyer (Disaster Management), Evan Fritz (Strategic Planning) and Natalie McDonald (Senior Administration Officer)
	<i>Project Consultant</i> – Stephen Dredge (Meridian Urban); Fraser Ramsay (Meridian Urban) <i>Guest Speaker</i> – Professor Gavin Smith (US Department of Homeland Security's Coastal Resilience Centre)
Apologies	<i>CRG Members</i> – Ian Graham <i>One resignation was noted</i> – Derek Bester – Woodgate <i>Project Consultant</i> - Jo Tinnion (Water Technology)
	<i>Council</i> – Mayor Jack Dempsey, Cr Scott Rowleson, Stephen Johnston (CEO), Stuart Randle (General Manager Infrastructure Services) and Nick MacLean (Natural Resource Management)

BUSINESS OF MEETING

1. Introductions and Welcome (Cr Bill Trevor & Dwayne Honor)

The Chair welcomed the CRG members to the workshop and fellow Councillors, Jason Bartels and Wayne Honor. He commented that looking at the issues faced in Bundaberg and meeting with Professor Gavin Smith today and examining some of the issues faced in the US, they are challenged with things on a much bigger scale and it was of great interest to learn of the innovative ways they are dealing with these issues.

Dwayne Honor (Project Manager) introduced Stephen Dredge, Project Consultant from Meridian Urban (Planning Adaption & Coastal Resilience) with Fraser Ramsay supporting him. He also introduced special guest, Professor Gavin Smith from the Department of Homeland Security's Coastal Resilience Centre in the US. He noted Council officers Evan Fritz (Strategic Planning) and Matt Dyer (Disaster Management) were also in attendance, assisting him as the project manager. CRG member profiles for the project website were requested by the Project Manager. All members were in agreement with Council staff to follow up.

Cr Wayne Honor clarified that he is a Councillor and advised the meeting that Dwayne Honor is his son and also a Council officer.

Dwayne Honor addressed the meeting advising the discussions would focus on community values. *Our Coast* is the project name given for the Coastal Hazard Adaptation Strategy (CHAS). Council has secured approximately \$500,000 in funding from the Queensland Government for this project. Dwayne reiterated on the background, purpose and the reasons to develop the CHAS (a copy of the presentation is attached to these minutes – *Annexure A*).

Dwayne updated the meeting on the progress of the Woodgate SEMP project and that it was currently undergoing technical review advising that further updates will be provided on completion.

2. Community Values – What are they and why are they Important (Professor Gavin Smith)

Introductory presentation from Gavin Smith on practical examples of how community values have shaped adaptation planning in the United States.

Professor Smith addressed the meeting giving an insight into his experiences growing up in a small coastal community on the US east coast, and an overview of his working career, focusing on climate adaptation, disaster recovery, risk reduction and hazard mitigation programs. A copy of the presentation is attached to these minutes (*Annexure A*). From leading a risk reduction team after Hurricane Fran, and working with local government on long-term recovery policies and programs following Hurricane Floyd, he has also worked in the private sector leading large scale coastal recovery projects and also does advisory and consultancy works. He commented that in the US they have a lot of money that comes in to deal with recovery projects noting that even with development of pre-disaster development programs, good mapping and data, challenges are still experienced with low lying coastal areas.

Professor Smith talked about the importance of thinking about environmental values, cultural and historical values, as an important foundation to build strategies to adapt to a changing climate. He also spoke about developing and looking at ways of where and how to build in a way that does not present additional risk; and managing risk perception and communication. People want to live on the coast hence the importance of considering adaptation strategies and solutions in the sense of 'community' and not just from an adaptation perspective as a key point.

CRG member asked about barrier islands and Fraser Island. Professor Smith suggested generally barrier islands helped in protecting the coastline. Discussions were had on populations of the small town where he grew, Galveston and the Houston metropolitan area, which is growing rapidly with increasing highways and rooftops, exacerbating flooding.

Cr Wayne Honor queried whether recovery operations are orchestrated by the Army Corp or by Councils. Professor Smith confirmed that recovery is via a combination of all levels of government.

CRG members enquired about the high tide/low tide variance in Professor Smith's home town. He responded that it was a shallow bay with an elevation of about 4 feet.

**3. Our Coastal Communities – Who are they and why are they Special?
(CRG Members, facilitated by Gavin Smith and Stephen Dredge)**

An interactive session was held to seek comment from the CRG members on their lived experience of their communities via comments noted on stickers by CRG members and posted up on the “Values” Wall.



Dwayne Honor advised the session was to gain an understanding of community values, what is important and what may be acceptable trade-offs from the members and community. These need to be understood and aligned with adaptation pathways based on sound engineering practice and science. The CHAS aims to achieve these goals.

A CRG member questioned the interactive session, the intent and what was being said and indicated that they did not agree with all of it and requested the opportunity to challenge some of the things raised. Dwayne Honor reinforced that sentiment, and encouraged all to speak their minds so a full understanding can be gained of their values, and to put their hands up and ask questions and challenge what is being said if they felt so. The discussion must be based on a battle of ideas and not a battle of people to get the best outcome for the project.

Stephen Dredge (Meridian Urban) addressed the meeting, building upon the introduction by Professor Smith, reinforcing the aim of the workshop was to gain an understanding of what the community holds dear to them and the things that might be lost, considering social values, family traditions, cultural heritage and economic values.

Discussion points included:

- Loss of sand dunes and resulting property subsidence.
- Difficulty working through government regulations and not understanding the approvals process for coastal development.
- Professor Smith suggested that if residents are happy to look after their own properties, that this may be a way of helping protect the coastline. Informed self-reliance is a big part of resilience and can be very powerful and is unique here. Also educating Residents to ensure they have required information and understand the rules and regulations that need to be adhered to. This is a really important value if you can capture and build on it.
- Moore Park Beach has receded about 1m per year for the last 16 years. Vegetated dune systems are highly valued and reinforce natural defences, this includes tree planting.
- Discussion on vehicle access at Moore Park Beach referencing recent media articles on beach restoration and sand dune protection. Protecting dune systems is high value, but needs to be balanced against lifestyle.
- CRG Member suggested we need to live with coastal changes and accept the changes that come. An important value is dealing with coastal hazards.
- There are strong social networks and community groups on our coastline but they will not fight for the environment. We want people to enjoy the outdoors into the future and need a proactive community to achieve that.
- Everyone is here for the environment. We are not thinking socially. If we do not have plans to protect the environment, we will not be able to enjoy our social and lifestyle activities.
- Why live on the Coast, if not for the environment? – There are plenty of places in town to live otherwise.
- The current coastal environment provides a good lifestyle, particularly for young families and makes the region a great place to raise children.
- Cr Honor suggested benchmarking is needed. Residents need to be doing things for the correct reasons.
- Cr Trevor advised that once you go outside the boundaries of your own property, the land is controlled by different authorities, rules and regulations, e.g. State legislation for reserve land - Council enforces the law on behalf of the State. Cr Trevor reiterated the importance of having an agreed plan in place and working together on a solution. Council is duly bound to investigate requests received and respond, by law, e.g. advice of unauthorised works on a river bank and consequently as a result, neighbourhood disputes can often be inflamed.
- Cr Jason Bartels spoke of beautification and stabilisation of foreshore works at Moore Park Beach (near surf club) involving planting of grasses and trees – doing a stage every year.
- Farmers are facing increased regulations about reefs etc. and are a good steward of the land. We need a good social fabric otherwise too many things have to be shut down. Want to work together to protect it. Work collectively to save it, and think about the next generation as well.
- An incredible sense of place occurs on our coastline, we stick together.
- People come to the beach and love the fresh air. Definitely a great lifestyle on our coastline and that is what you want to protect.

- Discussions were had regarding the use of the word “environment” – some comments noted:
 - Suggested Habitat may be better word to use to describe it.
 - Got to have the infrastructure to support the environment. Talking about it is a waste of time.
- Planting of casuarina trees was discussed versus planting grasses. Observations included very little erosion with the right grasses, whereas many trees had been washed out in cyclones and severely damaged dunes with their roots etc. leading to much more loss.

After the interactive session and upon categorisation, Stephen Dredge informed the meeting that the environment was coming up as being a strong indicator as well as the beaches themselves; the turtles; the diversity of the area, and the lifestyle. Having an informed community and sense of ownership was also strong.

A list of the comments provided has been collated and *attached* to these minutes (*Annexure B*).

4. Our values – What are the things we value, and how are they Interconnected? (CRG Members, facilitated by Gavin Smith and Stephen Dredge)

A further interactive session was held to discuss with CRG members on what characteristics they value, why, and how they might be interconnected with CRG members; noting on a chart on the wall their importance taking into consideration the following aspects:

- | | |
|-----------------|------------------|
| - Social | - Building |
| - Environmental | - Economic |
| - History | - Infrastructure |

A summary of the values has been collated and attached to these minutes (*Annexure C*).

Stephen Dredge wrapped up on the interactive sessions and thanked all for facilitating the day. He commented that he is hearing a deep connection to Place rather than Environment and a sense of ownership with members very passionate about the Coast, increased responsibility and the desire for self-organisation to communicate with other community groups. A strong sense of values has been gained from the interactive sessions, which they will now work on, to obtain a solid background.

It was commented that people are not used to making decisions like this and that in society there are lots of choices and uncomfortable experiences. Dwayne Honor advised the exercise focusses people to think about what is it that they value the most about our coastline to build our understanding on how we measure these things. We do get opposing values and often they are interconnected.

Cr Honor commented that there was not much emphasis placed on history and that all needs to be taken into account - Looking at the changes since settlement of man; e.g. looking at middens now showing on the ocean front.

Cr Trevor suggested values are going to vary along the coast line. Not one point of view will suit everyone with so many different values from Woodgate to Moore Park and everywhere in between.

5. Closing – Where to from here

Discussions were had regarding:

- Whether CRG members need to go back to their community to discuss values etc., through progress association meetings and the like, so everyone in the community has a chance to have their say. Community feedback is available on the website and to publicise this would be a good thing. Community Facebook pages were also suggested as a good communication tool. Different communities have different focuses.
- Projecting values into the future. It was noted there were no younger people in the group e.g. school age, however, the fundamental things of living on the Coast would probably not change.
- Cr Honor commented it is up to us to mitigate some of the damage of the past and make our mark so we can hand this environment to our grandchildren, however in some instances we may need to act quite quickly.
- The Project Manager suggested conducting an online survey to test the Public's viewpoint and get an overall picture. It was agreed this was a good idea. CRG member asked if it would be like what was up on the board and the Project Manager responded that a format was not yet decided. It was suggested it should be simple and straight forward but shared with the group for comment before release.
- The audience for completion of the on-line survey and using different media to reach all age groups.
- Members liaising with their community groups.
- The Chair suggested to look at doing both. Cr Honor considered that more value comes from a group session and face to face discussion, rather than an online survey.
- CRG Member suggested printing out flyers and distributing for comment, and including high school in distribution.
- Discussions were had on timeframe for survey and promotion. A draft survey is to be prepared for review by members. A media campaign could be run, working with the media team to put together a strategy to amplify participation in the survey. CRG Member advised they would be happy to go down to Bargara to approach people and ask their opinions. The Project Manager suggested a group could be supported to do that as a Listening Post.

Action Item from discussions:

Survey to be put together and circulated to the reference group for review before sending out to the public.

6. Future Meeting Dates

The next meeting would be scheduled in *late November/early December* to discuss:

1. The outcome of the survey;
2. The outcomes from the interactions sessions held at this meeting; and
3. Phase 3 outcomes – Coastal hazard mapping.

The Chair thanked all in attendance for coming along and having a say, and reiterated the importance to attend whether you agree or disagree and to speak up and communicate your viewpoints. Only this way, will we get a true feel of community values. He noted different areas will have different needs and wants and different values but we must try.

This concluded the business of the CRG Meeting at 8.10 pm.

Cr Bill Trevor, Chairperson
OUR COAST Community Reference Group

Annexure A



OUR
COAST

Investing today for a resilient tomorrow

Welcome!



Bundaberg Region Coastal Hazard Adaptation Strategy

**Community Reference Group Workshop
18th October 2018**



Agenda

- Welcome & Introductions *Dwayne Honor*
- Community values – what are they and why are they important? *Gavin Smith - USA*
- Our coastal communities – who are they and why are they special? *Stephen Dredge & Gavin*
- Our values – what are the things we value, and how are they interconnected?
- Where to from here? *Dwayne Honor*

Background

- The Queensland Government, in partnership with the Local Government Association of Queensland is investing \$12 million to help coastal councils and their communities plan and prepare for storm tide, coastal erosion and rising sea levels resulting from climate change.
- **Coastal hazards adaptation program – QCoast 2100** is open to coastal councils
- The aim of the QCoast2100 program is to support coastal councils in their progression from identifying coastal hazards and climate change risks through to the decision-making and implementation phases.
- Our Council was successful in securing a total of \$499,227



What is the purpose of a CHAS?

- A coastal hazard adaptation strategy (CHAS) is to **assess the risk from the projected effects of climate change** over the **medium to long term**;
- Propose adaptation measures to mitigate these impacts; and
- Establish an implementation program for the mitigation measures.
- Adaptation strategies are **intended to mitigate coastal hazard risk for councils and communities** identified through informed, coordinated and timely actions over the long term.

Why do a CHAS?

- 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.
- How we plan now is critical to the long-term functionality and protection of homes, businesses, infrastructure and services along the coast. By reducing future exposure to the risks of flooding, storm tides and coastal erosion, it is expected there will be significant financial benefit from avoided impacts.
- We have a duty of care to manage risk into the future



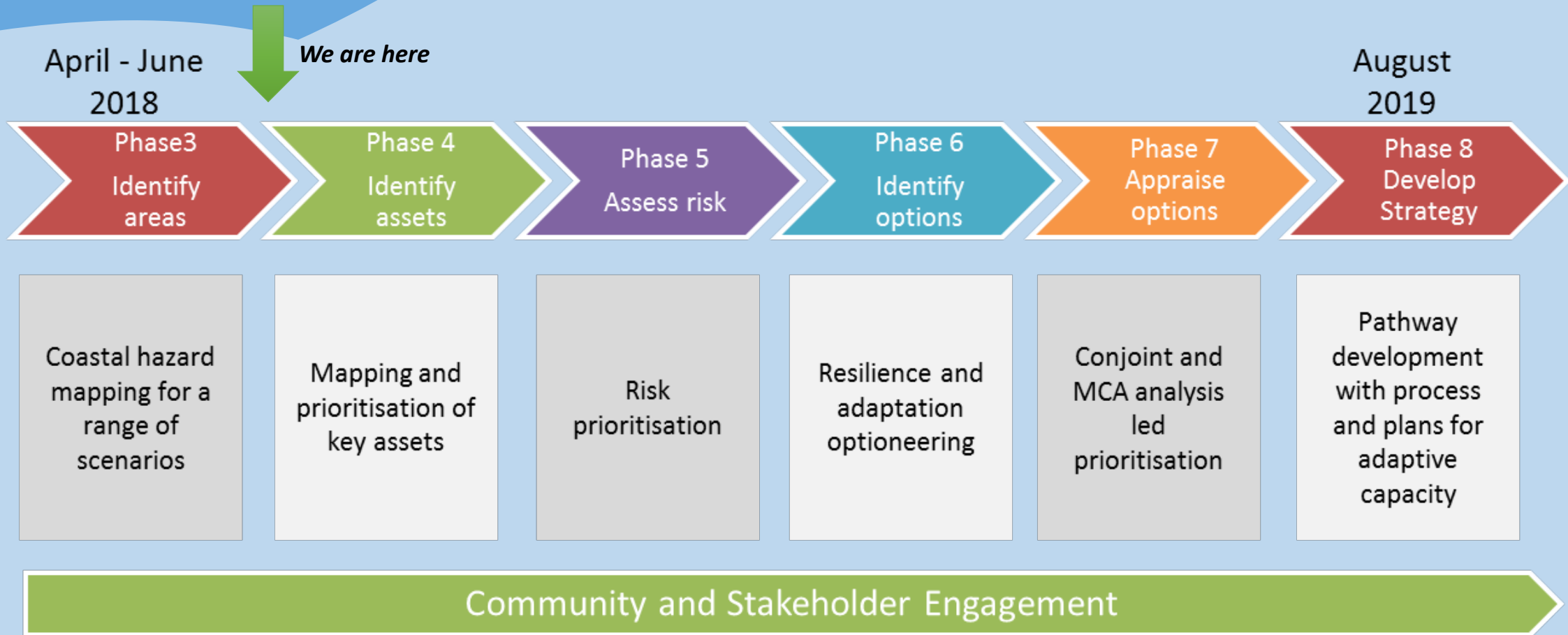
We need to make future decisions

Council will need to make decisions about managing and responding to coastal hazards as a result of climate change.

The CHAS will be used to address coastal risks likely to be faced now and into the future

- Identify coastal hazard areas
- Understand vulnerabilities and risks
- Engage with the community to understand their preferred approach to adaptation
- Determine costs, priorities and timeframes for implementation of adaptation options

What are the Phases?



Where are we currently at?

Completed Phase 3 - the detailed coastal process modelling assessing areas likely to be impacted by storm tide inundation and coastal erosion.

This data will be used to enhance the understanding of the areas which are likely to be affected by existing and future coastal hazards.

The updated This information will used to help identify how coastal hazards may affect a range of assets such as buildings, roads, infrastructure, recreation and the natural environment.

Community Values

What Are They And Why Are They Important To Our Project?

We're going to hear from Professor Gavin Smith's experiences of growing up on the coast of Texas, and how community values can shape good adaptation planning approaches







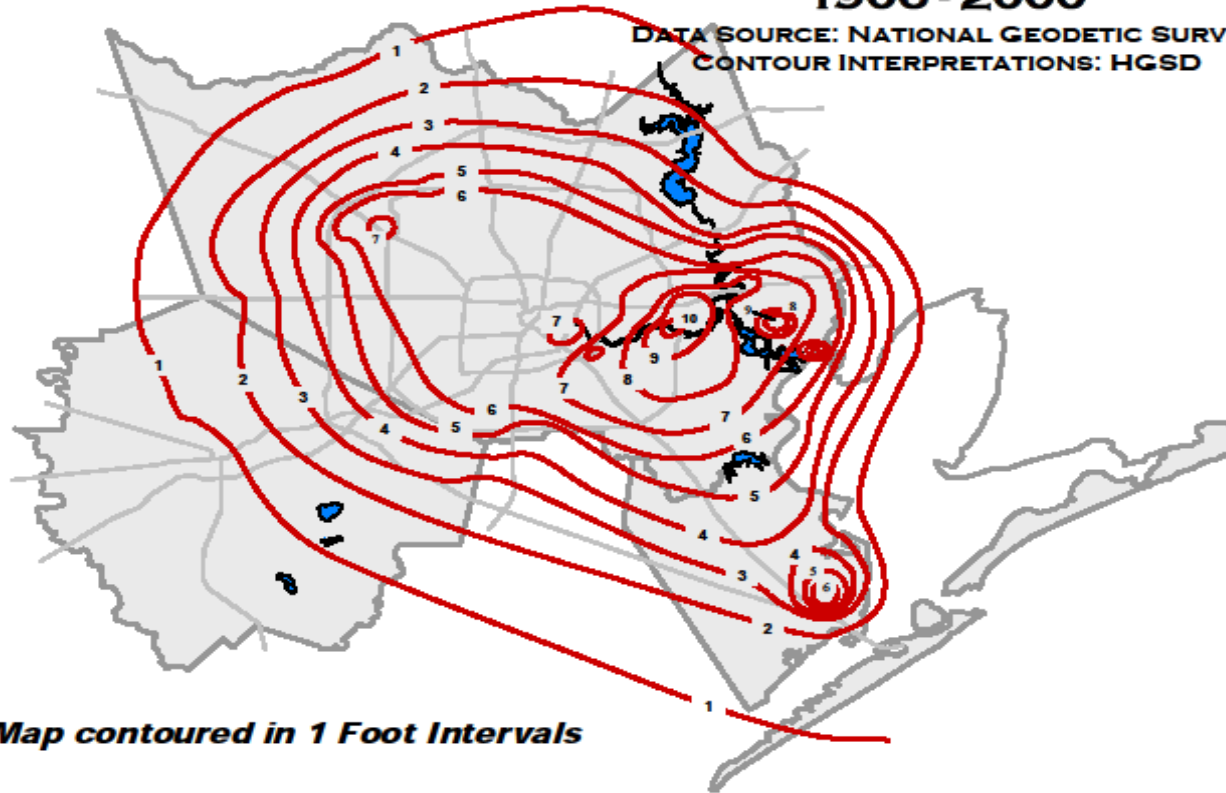
Houston Ship Channel

Bolivar Peninsula

Galveston Island

SUBSIDENCE 1906 - 2000

DATA SOURCE: NATIONAL GEODETIC SURVEY
CONTOUR INTERPRETATIONS: HGSD



Map contoured in 1 Foot Intervals



ISAIAH P. WALKER HOUSE

DURING THE LATE 1920s AND EARLY 1930s, THE CITY OF SHOREACRES BECAME A WEEKEND HAVEN FOR RESIDENTS OF NEARBY HOUSTON. FAMILIES BUILT WEEKEND HOMES, REFERRED TO AS FISH CAMPS, WHERE THEY COULD ENJOY FISHING AND BOATING ACTIVITIES ON GALVESTON BAY. ISAIAH P. WALKER, VICE-PRESIDENT OF A HOUSTON-BASED FURNITURE RETAIL ESTABLISHMENT, THE STOWERS FURNITURE COMPANY, PURCHASED A TRACT OF LAND FROM SHOREACRES REALTY, INC. IN 1928 WITH HIS WIFE, ANNIE, FOR THE CONSTRUCTION OF THEIR OWN WEEKEND HOME.

NOW NICKNAMED "LITTLE CASTLE" AND "TREE HOUSE," THE HOME WAS COMPLETED IN 1932 AND DEMONSTRATES POPULAR ARCHITECTURAL INFLUENCES FROM THE PERIOD IN WHICH IT WAS BUILT, AS WELL AS UNIQUE DESIGN ELEMENTS THAT CONTINUE TO SET IT APART FROM NEIGHBORING HOMES. THE WALKERS HIRED THEIR SON-IN-LAW, PRESTON PLUMB, JR. TO CONSTRUCT THE HOME IN A STYLE REMINISCENT OF THE TUDOR REVIVAL HOMES PLUMB AND HIS FATHER BUILT IN THE COMMUNITY OF WEST UNIVERSITY PLACE NEAR RICE UNIVERSITY. THE TWO-STORY HOME'S EXTERIOR FACADE IS CONSTRUCTED OF THICK STONE, CUT IN ROUGH FORM. A TURRET RISING OVER THE ROOF, ENCASING A SPIRAL STAIRCASE, GIVES THE HOME A CASTLE-LIKE APPEARANCE.

THE MOST PROMINENT AND DISTINCT FEATURES OF THE WALKER HOME ARE FOUR CONCRETE "FAUX BOIS" PINE TREES THAT FRAME THE PORCH ON THE SOUTH SIDE OF THE HOUSE. THESE MOLDED CEMENT COLUMNS WERE MADE IN THE STYLE OF "EL TRABAJO RUSTICO," POPULARIZED DURING THIS PERIOD BY THE MEXICAN ARTIST DIONICIO RODRIGUEZ. THE WALKER HOUSE IS THE ONLY KNOWN RESIDENCE IN HARRIS COUNTY TO UTILIZE THESE UNIQUE "FAUX BOIS" COLUMNS AND IS THE OLDEST EXTANT FISH CAMP RESIDENCE IN SHOREACRES.

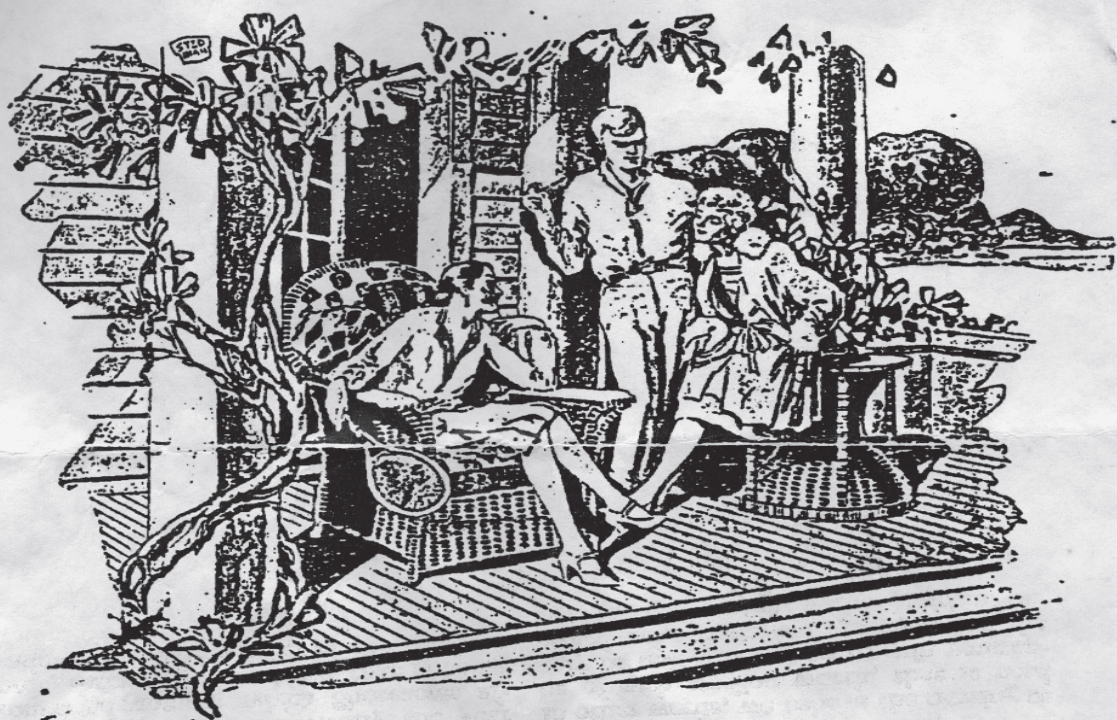
RECORDED TEXAS HISTORIC LANDMARK - 2012
MARKER IS PROPERTY OF THE STATE OF TEXAS







MEMBER 0883



Here's the way to a Country Club Home of your own

If you love the great out-of-doors . . . with its health producing forces . . . the tingle of a freer life in a Country Club Home of your own, where you can enjoy all the comforts and conveniences of the city, plus the innumerable pleasures of the seaside and the woodland confines . . . read the story of SHOREACRES.

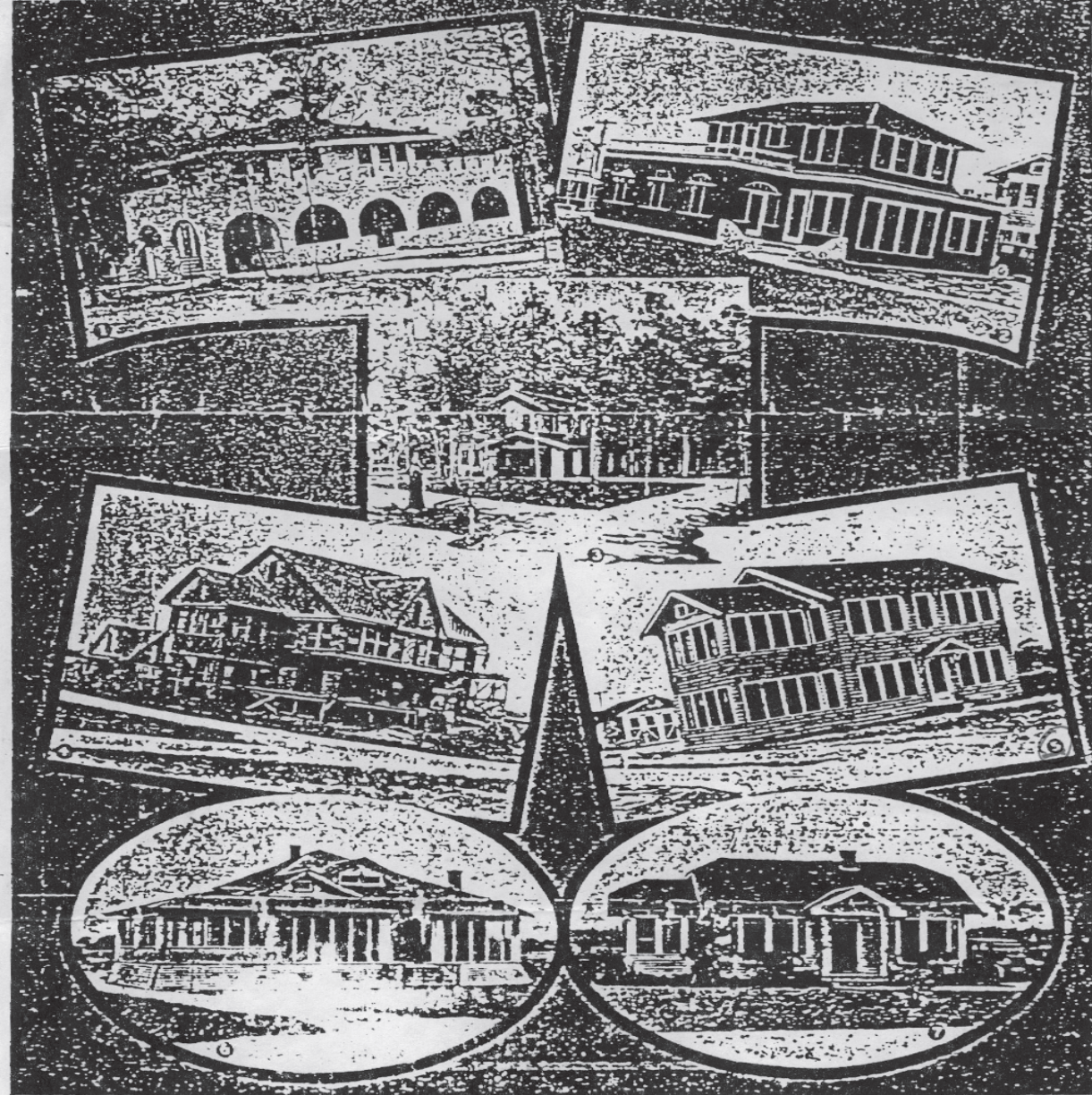
Therein you will find the answers to the many questions that were in your mind when you decided to ask for more complete information about the Seagrove Section of this Country Club community.

It presents a real opportunity for you to obtain for yourself and family the year 'round advantages which Shoreacres affords, through a special offer that is being made to a limited number of people, for a limited time only.

In preparing the information which follows, we have confined our remarks to the facts governing the proposition and to the special offer itself, without any attempt to bring undue influence to bear, with catchy phrases or high-sounding platitudes.

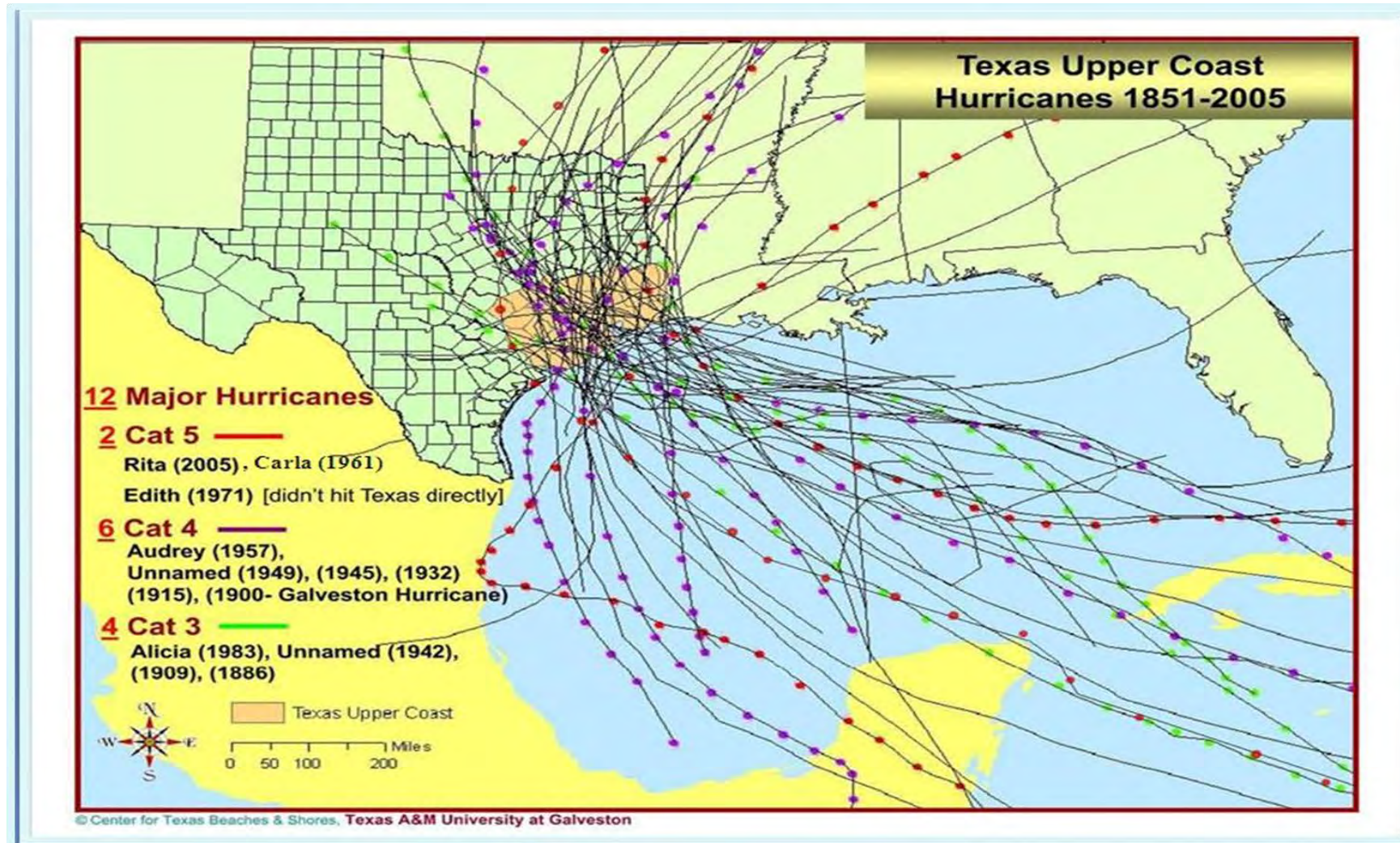
In other words, we believe the offering to be of such sterling worth, that it need only be unfolded to you to gain your approval and acceptance. We commend the facts to you for your careful consideration.

See Inside for Special Offer



SOME SHOREACRES HOMES

- | | |
|-----------------------------------|-----------------------------------|
| 1. R. W. GILLETTE | 4. F. L. ECK (Under Construction) |
| 2. JOHN EMBRY - JOHN HORROCKS NOW | 5. JOHN H. CROOKER - NOW OURS |
| 3. FRANK DAVIS | 6. O. H. CARLISLE |
| | 7. HOWARD BRAININ |









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Coastal Construction & Demolition
TEL 804-757-7127





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City Hall**

**MUNICIPAL COURT
POLICE
DEPARTMENT**

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RECOVERY
IN FULL SWING
CHECK CITY WEBSITE**

601





CAT

CAT

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- [Shoreacres' Shorts Newsletter Archive](#)
- [City News Briefs](#)
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- [Photo Gallery](#)
- [Storm & Flood Info](#)

flickr
City Photo Album

[CITY JOB POSTINGS](#)

[Application Form](#)

City Defines Flood Surge Hazard Area and Restricts Use of Fill Dirt

The City of Shoreacres has amended its Flood Damage Prevention Ordinance to address special flood surge hazards at the east end of the City approaching Galveston Bay. [\[Flood Damage Prevention Ordinance 2007-04\]](#) The significant hazard associated with tidal surges and hurricane wave wash was convincingly demonstrated by Hurricane Ike. [\[slides\]](#) In response the City has adopted new regulations to control the use of fill dirt in future construction in the east most portion of the city. [\[Flood Damage Prevention Ordinance \(amendment\) 2009-46\]](#)



A thirteen street area east of Sunrise Drive to the shoreline of Galveston Bay has been designated a flood surge hazard area. This area of Shoreacres was inundated by waters from Hurricane Ike tidal surge and hurricane wave wash on September 13, 2008. [\[Map\]](#)

Located within the areas of flood surge hazard are areas designated by FEMA as Coastal High Hazard Areas (Zones V1-30, VE, and/or V) and special flood hazard areas (Zone AE).

In addition to meeting all previously existing provisions of the Flood Damage Prevention Ordinance, the following seven new provisions also apply:

- (1) All new construction and substantial improvements in Coastal High Hazard Areas (Zones V1-30, VE, and/or V) shall be elevated on pilings and columns so that the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level plus one foot free-board.
- (2) All new construction and substantial improvements in special flood hazard areas (Zone AE) shall be elevated on pilings and columns so that the lowest floor is elevated to or above the base flood elevation plus one foot free-board.
- (3) The pile column foundation and the structure attached thereto are anchored to resist floatation, collapse, and lateral movement due to the effects of wind and water loads.
- (4) New construction and substantial improvements have the space below the lowest floor free of obstruction or enclosed with non-supporting breakaway walls, or open lattice work.
- (5) A registered professional engineer or architect must develop or review the structural design, specifications, and plans and certify that the designs and methods of construction to be used meet accepted standards of practice for meeting the provisions of CFR 60.3(e)(4)(ii) and breakaway walls (§60.3(e)(7)).
- (6) Prohibit the use of fill for structural support of buildings.
- (7) Prohibit the use of fill to raise the grade of any lot above the minimum required to achieve proper drainage.



Our Coastal Communities

Who are they and why are they special?

An Interactive 'Sticky Wall' Session

Categories to Consider

- Social & Cultural
- History & Heritage
- Buildings & Structures
- Environment
- Economy & Business
- Infrastructure

Use the coloured paper and pens to write down the characteristics you value of the coastal areas where you live, work and play

Stick your papers to the Sticky Wall in the right spots!

Our Values

What are the things we really value, and how are they interconnected?

An Interactive 'Sticky Wall' Session

Understanding the relationships and interconnections between characteristics can help us identify the core values of what it means to be a coastal community

This can help us create themes that capture the essence of Bundaberg's coastal communities

Let's draw connections between different characteristics on the Sticky Wall to uncover these relationships

Let's rate the characteristics as well

Is there an 'X-Factor' about a coastal place you love? Write it down and mark it with an X!

Where to from here?

- Thank you for your contribution!
- The project team will map these values and interrelationships in more detail following the workshop
- It will be used to inform the next phases of the project

Questions?



Annexure B



Bundaberg Coastal Hazard Adaptation Strategy

Community Reference Group Workshop 18 October 2018

Community Comments – From ‘Sticky Wall’ Session

#	Comment	Theme	Sub-Theme
1	The big windsurfing event at Burrum Point every year. People travel to from all over.	Economy	Social
2	Living by the sea - fishing - Enjoying Beach - Swimming - Kayaking	Social	N/A
3	My house	Social	Building(s)
4	Infrastructure - State Development Area - is it a suitable location for investment - are other areas more suitable?	Infrastructure	Economy
5	Accommodation	Building(s)	Economy
6	Mon Repos Turtle Centre	Building(s)	Environment, Economy
7	Community Group Involvement	Social	N/A
8	Parklands	Social	Environment, Infrastructure
9	I feel like this place belongs to me & I know its secrets	Social	History/Heritage
10	Bargara - cycling the coast	Environment	Social
11	The small amount of people: Woodgate is like a secret location	Social	N/A
12	Protection of all properties. Along coastline e.g. Creek inlets	Building(s)	Social
13	Bargara - dune stability	Environment	N/A

14	More signs for new people or visitor's Animal protection.	Social	Environment
15	Economic future, jobs for our children and future generations - the port Barnett Heads town centre	Economy	Infrastructure, Economy
16	Bargara - Master Plan centre of town away from coast.	Infrastructure	Building(s)
17	The feelings of freedom I get on the beach	Social	Environment
18	Erosion of beaches and dune management	Environment	N/A
19	Woodgate - a peaceful place to live & safe Good community spirit - shoreline path, men's shed, Woodgate events living with the wildlife - kangaroos Dunes need to be maintained and vegetation augmented	Social	Environment
20	Coast care groups	Environment	Social
21	Individuals vegetating erosion prone areas and watering	Environment	Social
22	Individual responsibility for property works to address repairs, subsidence & erosion	Infrastructure	Social, Building(s)
23	The bush and walking through it	Environment	N/A
24	Bargara: Moneys Creek - plan to clean - flow to ocean	Environment	N/A
25	Appropriate zoning to handle population growth - building heights, density, etc	Infrastructure	Social, Building(s)

26	Early settlement at Burnett Heads - Fishing village and strong marine heritage. Historic buildings and locations - Lighthouse and Anglican Church	History/Heritage	Environment, Building(s)
27	Parking - family friendly	Infrastructure	Social
28	Fishing	Social	Environment
29	Coast is dynamic - live with the change	Social	Environment, Infrastructure
30	Erosion at Moore Park Beach - 1m/year	Environment	N/A
31	The tiny community of Walkers Point	Social	N/A
32	Education - Turtles	Social	Environment
33	Protected dune systems	Environment	N/A
34	Distress to see erosion - no answer in sight	Environment	N/A
35	The bush turkeys and the frilled necked lizards	Environment	N/A
36	Quiet lifestyle low security - Woodgate	Social	Building(s), Infrastructure
37	Victorian caravans in Winter	Economy	Social
38	Sand dune loss near beach front properties	Building(s)	Environment, Infrastructure
39	Communication between Government, property owners & stakeholders - to be improved	Social	N/A
40	Repairing underground infrastructure - is sinking	Infrastructure	Social, Building(s)
41	Freedom of property owners to fix their own properties without excessive council costs/permissions	Building(s)	Economy
42	tree protection and natural foreshore protection	Environment	N/A
43	Local workshops	Social	N/A

44	Lifestyle - even in settled areas - has that laid-back feel	Social	N/A
45	Shoreline beautification	Environment	Infrastructure
46	Mon Repos limits more people going in	Social	Environment
47	sandfill destruction - 2013 cyclone drastic effect on local feeling	Environment	Social
48	Environment, information/education	Environment	Social
49	Expanding turtle trail cycling from Burnett Heads to Elliot Heads, Great for tourism	Infrastructure	Social, Economy
50	in shore habitat - maintaining marine SPP	Environment	N/A
51	Foreshore access recreation fishing (family traditional visitation) Middens (Shell mounds) Turtle beach Port access for produce	Social	Environment, Economy
52	BRC's media statement on decisions without public consultation	Social	N/A
53	Community sport and recreational facilities	Infrastructure	Social
54	Surfing, ocean, swimming	Social	Environment
55	Tourists have different values to locals	Social	Economy
56	Kalina Beach turtles	Environment	N/A
57	Turtles	Environment	N/A
58	Building restrictions/constraints	Building(s)	Infrastructure
59	Ongoing rehabilitation costs! Versus long term – need to fix/find a solution	Economy	Environment
60	Observing marine life e.g. whales, dolphins, dugong, turtles, fish, etc	Environment	N/A
61	fishing, swimming - taking dogs for a walk - picnics with family	Social	Environment, Infrastructure
62	Kayaking	Social	N/A

63	7m sand dune loss - erosion	Environment	Social
64	Turtle trail positioning & old council approved plans	Infrastructure	Building(s)
65	Devaluing of mangroves	Environment	Social
66	No fees, clear rules, limited red tape	Infrastructure	Social, Economy
67	Fresh water creeks	Environment	N/A
68	Beach protection, trees, plants	Environment	N/A
69	Environment/turtles	Environment	N/A
70	Sand dune subsidence - septic system - personal cost	Environment	Infrastructure, Economy
71	Benchmarking & surveying needed	Infrastructure	Building(s)
72	Natural features that ameliorate coastal hazards - events	Environment	Social
73	Improved dune vegetation integrated with plans to control erosion	Environment	N/A
74	Native environment	Environment	N/A
75	Beaches	Environment	N/A
76	Transfer of turtle eggs from Woodgate	Environment	N/A
77	Tracks through national parks	Infrastructure	Environment
78	Diversity: closely settled, natural	Building(s)	Social, Environment
79	Beach driving, fishing, paddle boarding	Social	Environment
80	Boat access, beach - creek, river	Environment	Social
81	How nice the beach is at Woodgate used to be and the need to keep it	Social	Environment
82	Fishing, family get to have fun	Social	N/A
83	Lifestyle - turtle trail, publicly accessible foreshore and beach. Biking, swimming, walking parks	Social	Environment, Infrastructure
84	Off road vehicles (ORV's) on beaches	Environment	Social
85	Using our assets e.g. basalt boulders & collection from industry N/C for walls and repairs	Infrastructure	Building(s)

86	Maintaining a local, sustainable fishery instead of imported seafood	Economy	Social, Environment
87	Tourists having different values to the community	Social	N/A
88	Coastal paths	Infrastructure	Social
89	Adequate beach access	Infrastructure	Social
90	Shell middens at Walkers Point	Environment	Social
91	Running from ranger's house to Burrum Point and back	Social	N/A
92	Local businesses (e.g. tourism) - Industries (e.g. fishing, prawning) - Events (e.g. regattas)	Economy	Social
93	Heritage buildings, indigenous places, locations of historic events	History/Heritage	Social, Building(s)

Key CRG Observations & Next Steps

#	Comment	Theme	Sub-Theme
1	Representation from kids - schools	Social	N/A
2	Listening posts - use CRG to talk to people	Social	N/A
3	Amplify the website and survey	Social	N/A
4	Don't want to move even if disaster. Community pull together during disasters	Social	N/A
5	Good stewards of the land	Social	Environment
6	Tight knit community sense of ownership is very strong	Social	N/A
7	Hand over to our children and grandchildren	Social	N/A
8	We love where we live and hold onto the values	Social	Environment, History/Heritage
9	Values will change along the coast	Social	N/A
10	Bringing out local knowledge and history	Social	History/Heritage
11	People want everything? Is that possible?	Social	N/A
12	Deep connection to place	Social	History/Heritage
13	Sense of ownership	Social	Building(s)
14	Proactive communities guiding outcomes rather than reactive after things happen	Social	N/A
15	Key values - informed self-reliance	Social	N/A
16	Better communication between individuals & other groups	Social	N/A
17	Informed community is key	Social	N/A
18	Indigenous representation	Social	History/Heritage
19	Community self-organisation - caring	Social	N/A
20	Environmental protection, lifestyle	Social	Environment

Our Analysis of CRG Observations

A cycle of place-based values is evident in the views expressed by the CRG. The concept of 'Place' is held very strongly by the community members – all of their contributions at the workshop appeared to be driven via this cycle expressed below.

A strong love of the coast leads to a deep connection to place – whatever that place may be along the coast. This results in a strong sense of ownership over the coast, and the creation of tight-knit communities – likely of commonly held views on the value of the coastal places. This in turn appears to drive a strong desire for self-determination – expressed as a desire for self-organisation and self-reliance. All of this is for the express purpose of leaving a lasting legacy – being able to hand over the coast to subsequent generations in a manner that retains the values currently held.

Place-based Community Values Cycle



6. WE WANT TO HAND OVER THE COAST TO OUR GRANDCHILDREN

Our Coast is a special place. We want to do what we can to give our children and grandchildren a place that provides the same values that we cherish now.



5. WE HAVE A DESIRE FOR SELF-ORGANISATION & SELF-RELIANCE

Because we love the coast and feel responsible for it, each of our tight knit communities wants to be able to have a greater role in determining the future of our coast.



4. WE ARE TIGHT-KNIT COMMUNITIES

Our sense of ownership means we band together as discrete communities. Each community is different, but we are all tight-knit.



1. WE LOVE WHERE WE LIVE



We live on the coast because we love all that it has to offer – the natural places, the lifestyle, the sounds, the smells, the views, and the people.

2. WE ARE DEEPLY CONNECTED TO PLACE



We feel deeply connected to the coast and its values. We wouldn't want to live anywhere else.

3. WE HAVE A STRONG SENSE OF OWNERSHIP



Because we love the coast and are deeply connected to it, we feel like we own it and are responsible for it. Whether we are residents, business owners, or farmers, we feel like stewards of this land.

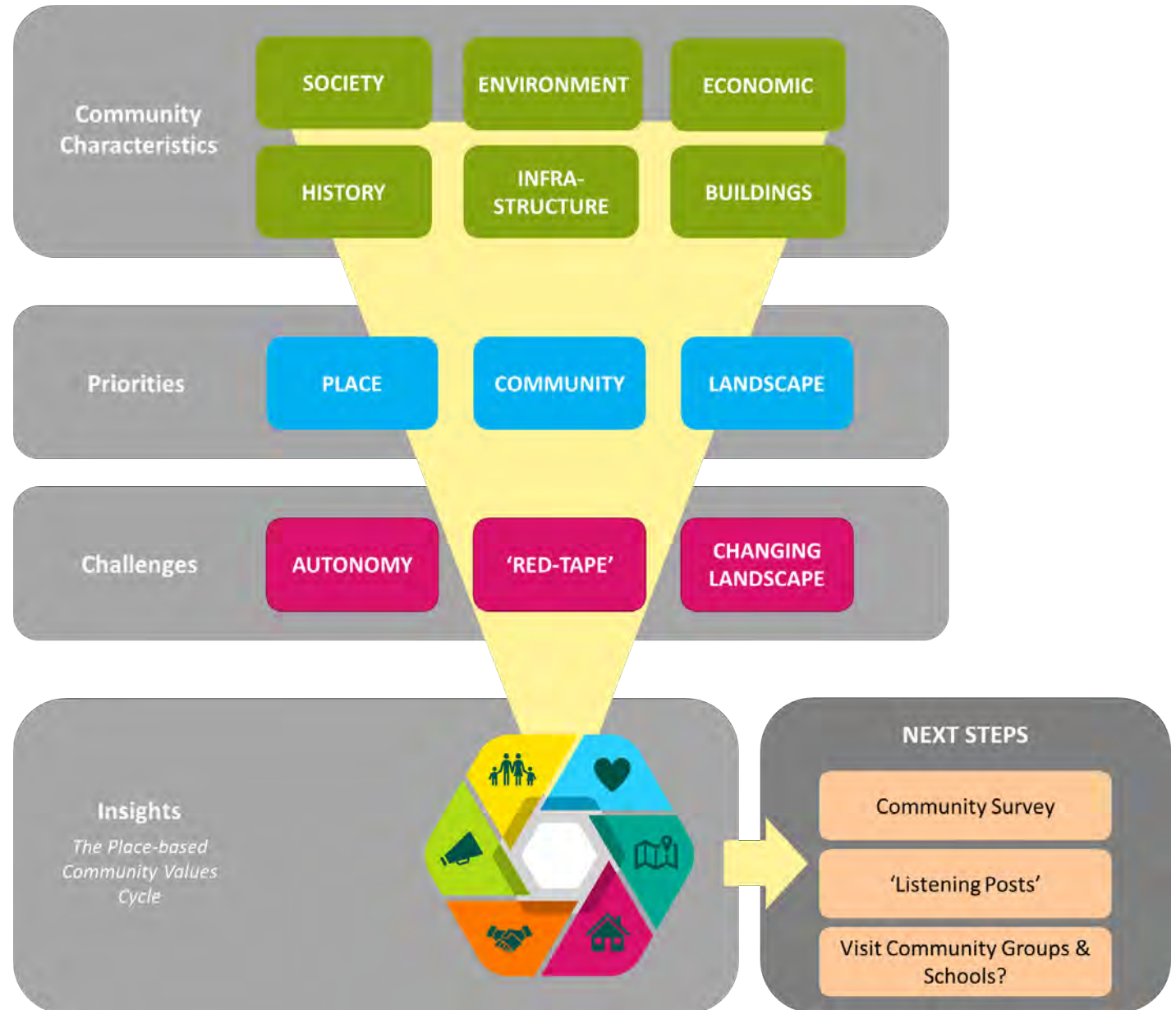
Summary of CRG Observations

The CRG provided excellent feedback in the session on the characteristics of their communities, what they valued, and how they saw further interaction with the community could occur as the CHAS process continues. The following diagram provides a summary of this feedback, and provides an avenue for how to work up the content of future CRG meetings.

As noted in the Place-based Community Values Cycle above, the CRG members prioritised Place, the Community, and the Landscape above other community characteristics.

Challenges articulated by the CRG included the level of autonomy currently provided to communities to manage the coast, the extent of 'red-tape' and regulation, and the changing nature of the coastal landscape through events such as erosion.

Next steps that arose as a result of the CRG include undertaking a community-level survey, providing 'listening posts' periodically at key locales along the coast for community feedback (possibly manned by CRG members), and considering how to further involve other community groups and school-age children.



MINUTES OF MEETING

Bundaberg Coastal Hazard Adaptation Strategy Community Reference Group (CRG)

Held At:	Function Room, Bundaberg Regional Council Administration Centre 190 Bourbong Street, Bundaberg
Date & Time:	Thursday, 21 March 2019, 6:00 pm – 8.00 pm
Present:	<p><i>CRG Members</i> – Russell Stewart, Chris Mcloughlin, Heath Greville, Josephine Ferris, Tony Ricciardi, Jennifer Parry, Collin Turner, George Martin, Robert Bell, Shanelle Pekin,</p> <p><i>Council</i> – Cr Bill Trevor (Chair), Cr Jason Bartels, Cr Wayne Honor, Cr Greg Barnes, Dwayne Honor (Project Manager), Evan Fritz (Strategic Planning), and Sally Obst (Natural Areas) Beth Whitworth (Disaster Management), and Natalie McDonald (Senior Administration Officer)</p> <p><i>Project Consultant</i> - Jo Tinnion & Richard Sharp (Water Technology)</p>
Apologies	<p><i>CRG Members</i> – Julie Fauser, Sharon Jackson, Terry Kelly, Joe Russo, Rob James, Lloyd Blake, Ian Graham</p> <p><i>Council</i> – Cr Scott Rowleson</p>

BUSINESS OF MEETING

1. Introductions and Welcome (Cr Bill Trevor)

The Chair welcomed the CRG members to the workshop and fellow Councillors, Jason Bartels, Wayne Honor and Greg Barnes. He noted that tonight's meeting would also incorporate a "mapping" exercise in the adjoining room. Each of the members around the table gave a brief introduction of themselves to all in attendance, as requested by the Chair. A copy of the minutes of the last meeting were circulated to all at the meeting (with a copy having previously being emailed) and they were accepted as read.

Dwayne Honor asked for comments on the Draft Community Value Survey which had been circulated by email to all the CRG members prior to the meeting. No comments were received and it was agreed by the Members that the survey be circulated to the community.

Our Coast Update (Dwayne Honor & Jo Tinnion)

Project Update.

Dwayne Honor commenced with the *attached* Powerpoint Presentation (**Annexure A**) and advised that we would be looking at Phase 3 Coastal Hazard Mapping, with the interactive session (as noted by

the Chair) to be held next door in the Council Chambers. The exercise seeking member's knowledge of their past experiences of coastal hazards and asset exposure, to map on the series of maps placed on the tables.

2. Output from CRG Meeting No 2 (Dwayne Honor & Jo Tinnion)

Description of how output from meeting used to develop Community Values Cycle and Community Values Survey.

Jo Tinnion (Project Consultant of Water Technology) recapped on the previous meeting, noting the gathered information was analyzed to provide insight into characteristics of the community and what is valued, and to develop the Place Based Community Values Cycle. These values will help us shape and mitigate coastal risks and forms an important part of the CHAS' philosophy.

3. Our Coastal Communities – Hazard and Exposure (Jo Tinnion)

An introduction to coastal hazard by sharing the extent mapping, followed by discussion of what impacts from coast hazard the group has experienced and key assets and features of value.

Jo Tinnion (Project Consultant of Water Technology) presented coastal mapping, storm tide inundation and coastal erosion. The storm tide mapping will allow comparison between today and in the future.

The Storm Tide mapping was derived using the Natural Disaster Resilience Program (NDRP) Storm Tide Hazard Interpolation Study (GHD, 2014) commissioned by the Queensland Government Department of Science, Information Technology, Innovation and the Arts (DSITIA). This was a state-wide study to provide storm tide hazard information across Queensland. Data from previous studies were normalised and brought together to estimate storm tide levels for 5% to 0.01% AEP events across the state.

The Erosion Prone Area mapping focussed upon key study locations which were considered in detail, namely Miara, Moore Park Beach, Bargara, Innes Park, Coonarr and Woodgate Beach. No analysis was undertaken on the remainder of Council's coastal areas, instead the existing Queensland Government data for erosion prone areas was adopted for all other areas. This has been estimated by using a buffer zone which takes into account a number of complex interactions of the many physical processes acting on any particular foreshore.

Cr Trevor commented that early climate change predictions from decades past differed to that of today and earlier rates of sea level rise may not have been fully realised. Jo Tinnion highlighted that a trigger based approach was specifically being adopted in the Bundaberg CHAS so clear decision points and adaptation pathways can be established and enacted if necessary. In this way if climate predictions do not eventuate, then no further action is required.

The CRG members moved to the interactive session to undertake the mapping exercise to identify their experiences and observations of storm tide inundation and coastal erosion and the impact on assets in their communities' area of representation. Their comments were plotted on the area based maps by category:

- | | |
|----------------------------------|-------------|
| 1. Infrastructure – Roads/Pipes | Red Dots |
| 2. Recreational | Blue Dots |
| 3. Environmental/Cultural Assets | Green Dots |
| 4. Property/Building | Yellow Dots |

- Refer **Annexure B** for copy of area based maps with comments;
- Refer **Annexure C** for Table summarising the settlement based observations of the CRG members.

Jo Tinnion advised the mapping will allow an understanding of what is currently happening in each community to inform adaptation options in future work.

Discussions were had on the interactive mapping session with the following comments noted:

- CRG Member noted that the mapping was great, however it would be beneficial to get it out to the greater community for feedback. By consensus it was decided that digital versions of the mapping be made available on the project website.
- Dwayne Honor encouraged the group to have these conversations, and suggested marking up areas identified by their discussions on Google Maps and sending through to the OurCoast email address.
- A CRG Member suggested going back to their community groups to capture the information. Dwayne Honor advised maps could be made available for members to take to their Community Group meetings.
- Dwayne Honor noted resourcing concerns with two key members of the group, Matt Dyer (Disaster Management) and Nick MacLean (Natural Resource Management) moving on from Council.
- It was suggested Divisional Councillors could assist by bringing information captured from community group meetings to the CRG Reference Group meeting.
- There is potential for further meetings at Moore Park, Burnett Heads, Woodgate and Winfield/Miara

4. Future Meetings (Jo Tinnion)

The dates and purpose of future CRG Meetings are noted in the table below:

Phase 5 – Mapping of how risk is distributed across region in terms of acceptability through to unacceptable	Thursday, 9 May 2019 – 12 pm to 4 pm
Phase 6 - Development of settlement specific adaptation options including issues, opportunities and constraints	Thursday, 6 June 2019 – 6 pm to 8.30 pm

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance	Thursday, 18 July 2019 – 12 pm to 4 pm
Phase 8 – Strategy and implementation Plan linked to resilience baseline improvements coupled with development of monitoring and evaluation process.	Thursday, 15 August 2019 – 6 pm to 8.30 pm

5. Closing:

The Chair thanked all in attendance.

This concluded the business of the CRG Meeting at 7.15 pm.

Cr Bill Trevor, Chairperson
OUR COAST Community Reference Group

ANNEXURE A



OUR
COAST

Investing today for a resilient tomorrow

Welcome!

Bundaberg Region Coastal Hazard Adaptation Strategy

Community Reference Group Workshop #3
6.00pm to 8.30pm
21st March 2019



Agenda

- Welcome & Introduction Cr Bill Trevor
- Our Coast update from Project Team Dwayne Honor and Jo Tinnion
- Output from CRG Meeting #2 Dwayne Honor and Jo Tinnion
- Our coastal exposure – coast hazard and assets All
- Future meetings and workshops Dwayne Honor

CHAS leading the way

- Queensland Government and LGAQ won the Award for Climate Adaptation at Australian Coastal Councils Association conference

8 March 2019

- 'QCoast2100 – Developing Coastal Hazard Adaptation Strategies for Queensland's local governments.'

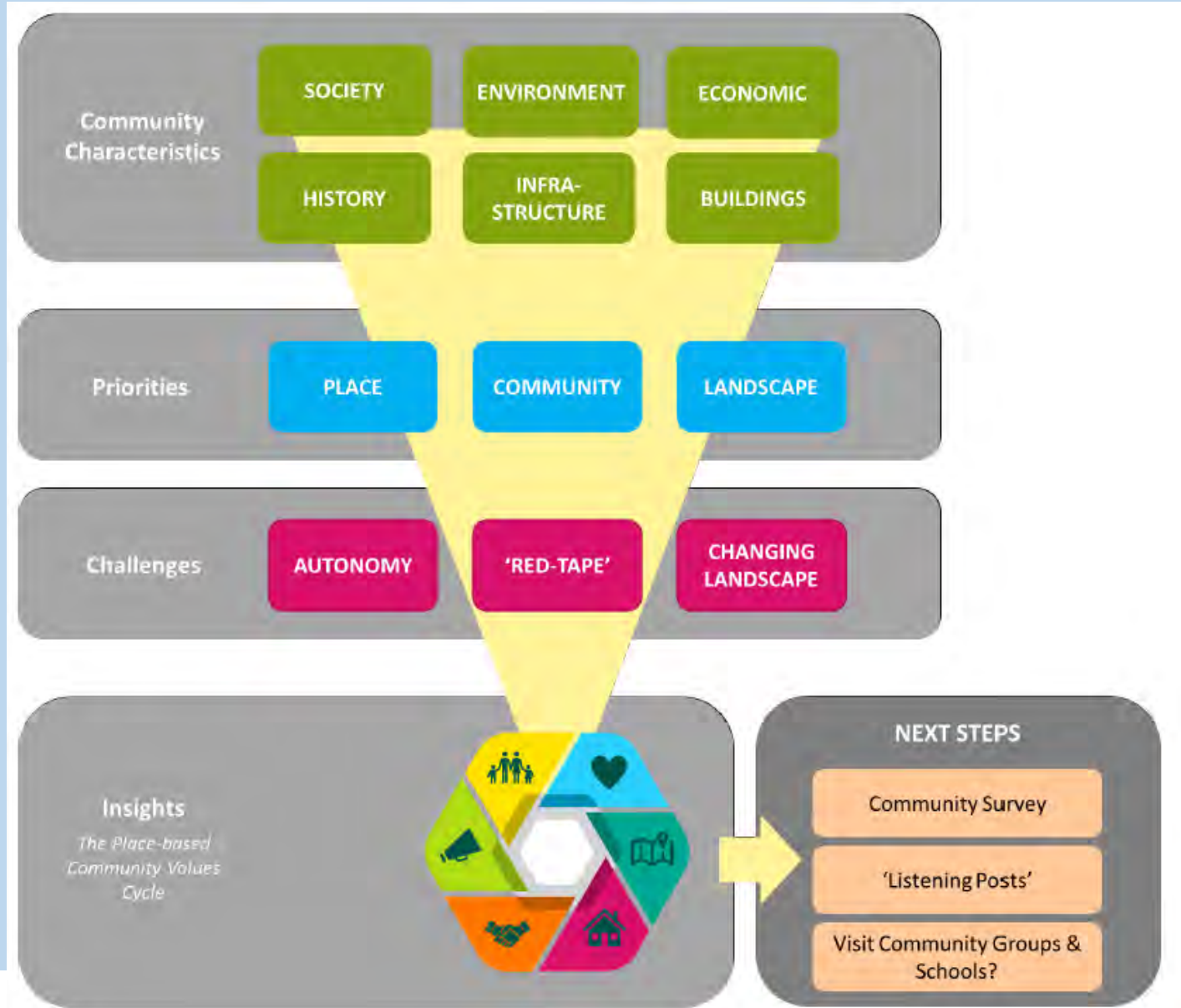


Our Coast Update



CRG Meeting #2

- Feedback analysed helping in understand community characteristics, priorities and challenges
- Insights gained leading to development of the Place Based Community Values Cycle
- Potential actions identified including Community Values Survey



Place Based Community Values Cycle



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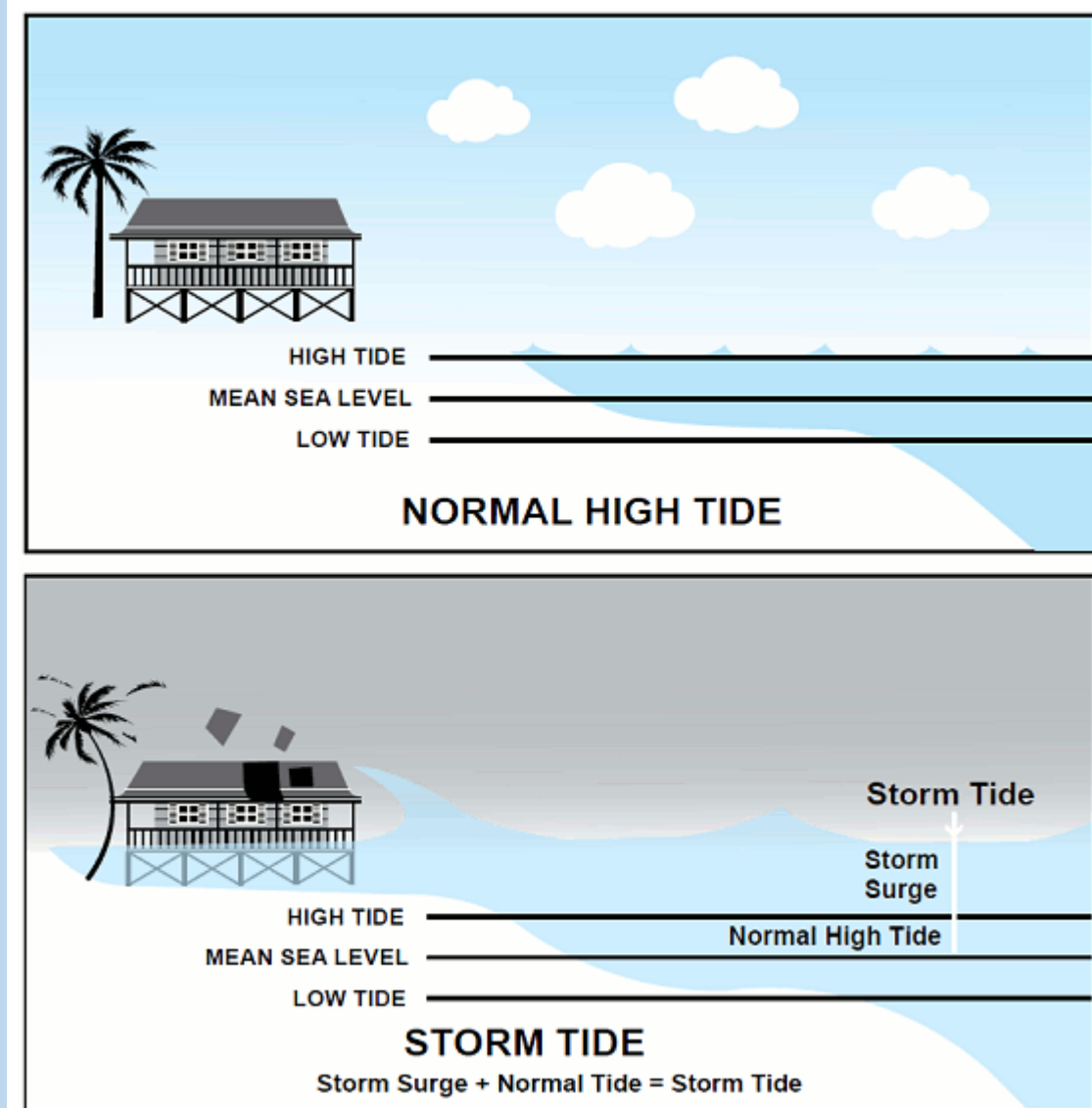
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Storm tide inundation

Storm tide inundation or coastal flooding by the sea is caused by an abnormal elevation of the sea level over expected tide levels.



Credit: Cassowary Coast Regional Council
<http://www.cassowarycoast.qld.gov.au/stormtide>

Coastal Erosion

Coastal erosion is the loss of coastal lands due to the net removal of sediment or bedrock from the shoreline.

Coastal erosion can be caused by winds, wave and other natural forces.

Beach erosion occurs when waves and currents remove sand from the beach system.



Our Coast Values

What are the key assets and features valued by the community?

We would like to hear your experiences of coastal hazard:

- Storm tide inundation
- Coastal erosion

Do you recall the specific impacts of recent tidal events?

This exercise will help to frame the CHAS and assist in the settlement-based asset identification and risk assessment process.

Future Meetings

At the start of each phase we will seek your feedback and broad agreement as the CHAS develops:

Phase 5 – Mapping of how risk distributed across region in terms of acceptability through to unacceptable

9 May 2019

Phase 6 – Development of settlement specific adaptation options inc issues, opportunities and constraints

6 June 2019

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance

18 July 2019

Phase 8 – Strategy and Implementation Plan linked to resilience baseline improvements coupled with development of monitoring and evaluation process

15 August 2019

Questions?



ANNEXURE B

Our Coast - Bundaberg Region Coastal Hazard Adaptation Strategy

Community Reference Group Workshop 3

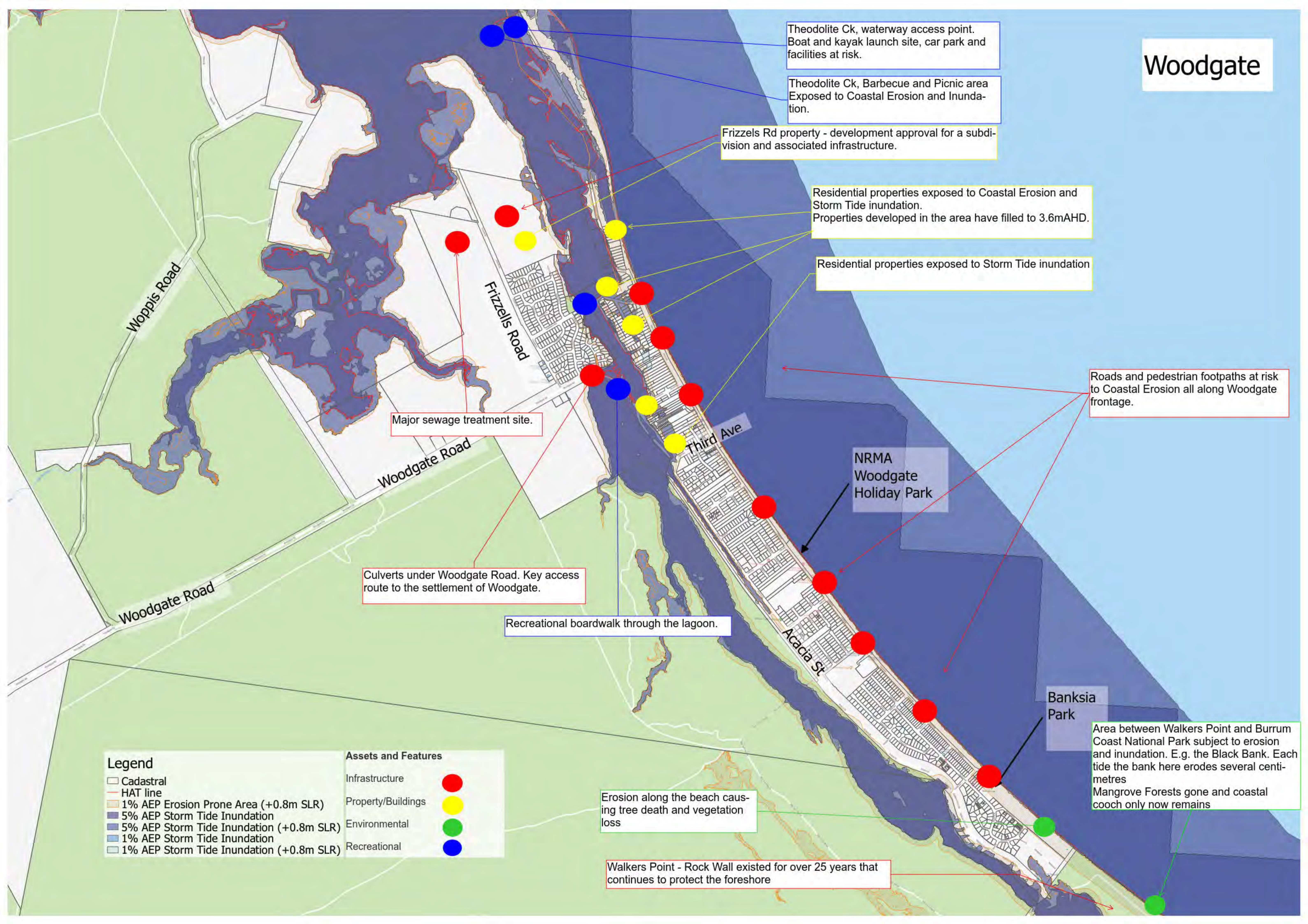
21 March 2019

Discussion of the Community's Experience of Coastal Hazard

MAPS

- Woodgate
- Winfield
- Nielsen Park / Bargara
- Moore Park Beach
- Innes Park / Coral Cove / Elliott Heads / Riverview
- Coonarr
- Buxton
- Burnett Heads

Woodgate



Theodolite Ck, waterway access point. Boat and kayak launch site, car park and facilities at risk.

Theodolite Ck, Barbecue and Picnic area Exposed to Coastal Erosion and Inundation.

Frizzels Rd property - development approval for a subdivision and associated infrastructure.

Residential properties exposed to Coastal Erosion and Storm Tide inundation. Properties developed in the area have filled to 3.6m AHD.

Residential properties exposed to Storm Tide inundation

Roads and pedestrian footpaths at risk to Coastal Erosion all along Woodgate frontage.

Major sewage treatment site.

Culverts under Woodgate Road. Key access route to the settlement of Woodgate.

Recreational boardwalk through the lagoon.

NRMA Woodgate Holiday Park

Banksia Park

Area between Walkers Point and Burrum Coast National Park subject to erosion and inundation. E.g. the Black Bank. Each tide the bank here erodes several centimetres. Mangrove Forests gone and coastal cooch only now remains

Erosion along the beach causing tree death and vegetation loss

Walkers Point - Rock Wall existed for over 25 years that continues to protect the foreshore

Legend

- Cadastral
- HAT line
- 1% AEP Erosion Prone Area (+0.8m SLR)
- 5% AEP Storm Tide Inundation
- 5% AEP Storm Tide Inundation (+0.8m SLR)
- 1% AEP Storm Tide Inundation
- 1% AEP Storm Tide Inundation (+0.8m SLR)

Assets and Features

- Infrastructure
- Property/Buildings
- Environmental
- Recreational

Winfield

2013 Riverine flood event caused widespread damage to properties.

Properties affected by inundation from Baffle Creek

Boaga - fishing habitat - recreational fishing very popular in Baffle Creek, generally.

Rocky Point Road

Rocky Point Road

Winfield State School

Winfield Road

Duck Creek Road

Assets and Features

- Infrastructure
- Property/Buildings
- Environmental
- Recreational



Legend

- Cadastral
- HAT line
- 1% AEP Erosion Prone Area (+0.8m SLR)
- 5% AEP Storm Tide Inundation
- 5% AEP Storm Tide Inundation (+0.8m SLR)
- 1% AEP Storm Tide Inundation
- 1% AEP Storm Tide Inundation (+0.8m SLR)

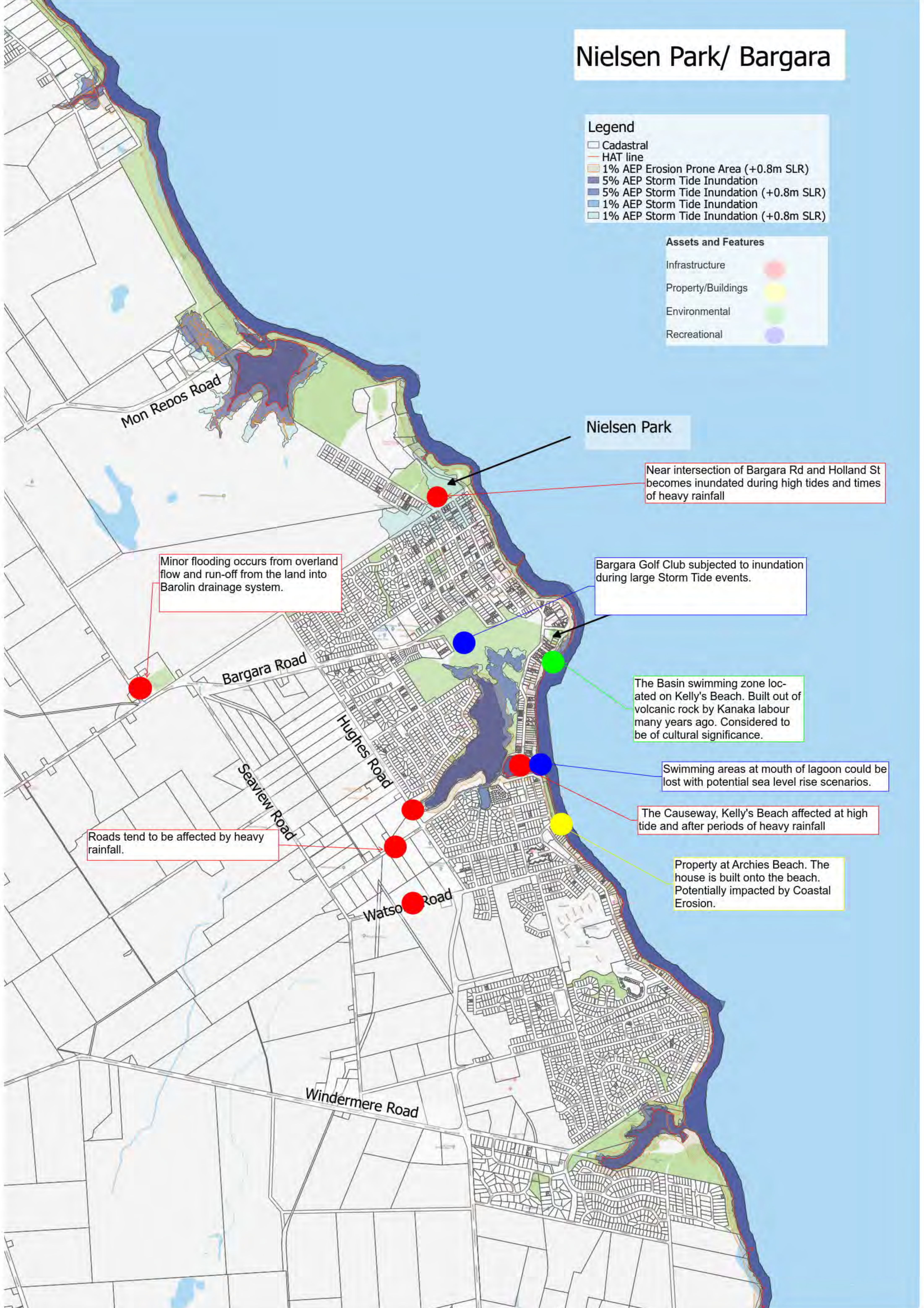
Nielsen Park/ Bargara

Legend

- Cadastral
- HAT line
- 1% AEP Erosion Prone Area (+0.8m SLR)
- 5% AEP Storm Tide Inundation
- 5% AEP Storm Tide Inundation (+0.8m SLR)
- 1% AEP Storm Tide Inundation
- 1% AEP Storm Tide Inundation (+0.8m SLR)

Assets and Features

- Infrastructure ●
- Property/Buildings ●
- Environmental ●
- Recreational ●



Nielsen Park

Near intersection of Bargara Rd and Holland St becomes inundated during high tides and times of heavy rainfall

Minor flooding occurs from overland flow and run-off from the land into Barolin drainage system.

Bargara Golf Club subjected to inundation during large Storm Tide events.

The Basin swimming zone located on Kelly's Beach. Built out of volcanic rock by Kanaka labour many years ago. Considered to be of cultural significance.

Swimming areas at mouth of lagoon could be lost with potential sea level rise scenarios.

The Causeway, Kelly's Beach affected at high tide and after periods of heavy rainfall

Roads tend to be affected by heavy rainfall.

Property at Archies Beach. The house is built onto the beach. Potentially impacted by Coastal Erosion.

Mon Repos Road

Bargara Road

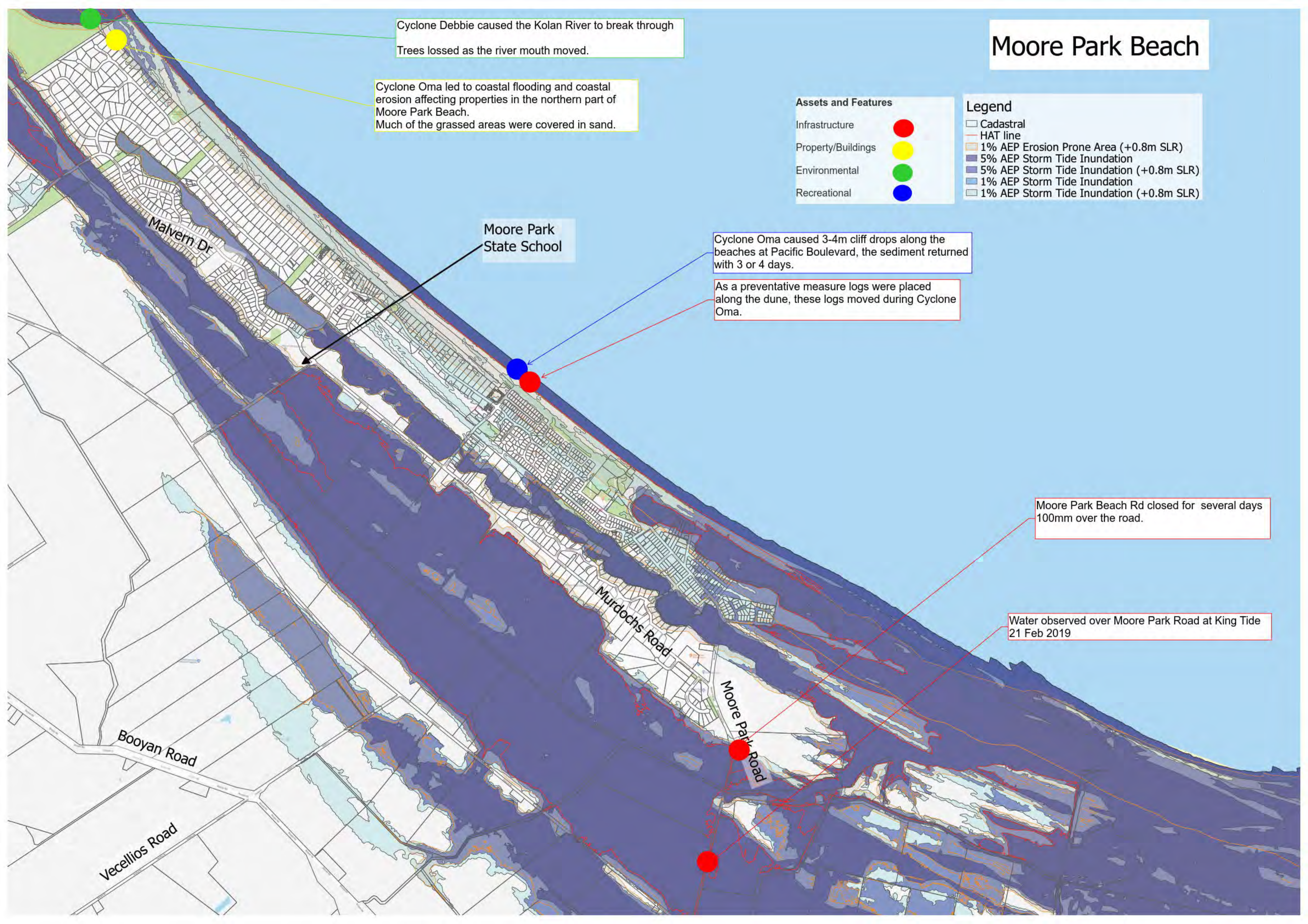
Seaview Road

Hughes Road

Watson Road

Windermere Road

Moore Park Beach



Cyclone Debbie caused the Kolan River to break through
Trees lossed as the river mouth moved.

Cyclone Oma led to coastal flooding and coastal
erosion affecting properties in the northern part of
Moore Park Beach.
Much of the grassed areas were covered in sand.

Moore Park
State School

Cyclone Oma caused 3-4m cliff drops along the
beaches at Pacific Boulevard, the sediment returned
with 3 or 4 days.

As a preventative measure logs were placed
along the dune, these logs moved during Cyclone
Oma.

Moore Park Beach Rd closed for several days
100mm over the road.

Water observed over Moore Park Road at King Tide
21 Feb 2019

- Assets and Features**
- Infrastructure ●
 - Property/Buildings ●
 - Environmental ●
 - Recreational ●

- Legend**
- Cadastral
 - HAT line
 - 1% AEP Erosion Prone Area (+0.8m SLR)
 - 5% AEP Storm Tide Inundation
 - 5% AEP Storm Tide Inundation (+0.8m SLR)
 - 1% AEP Storm Tide Inundation
 - 1% AEP Storm Tide Inundation (+0.8m SLR)

Malvern Dr

Murdochs Road

Moore Park Road

Booyan Road

Vecellios Road

Innes Park/ Coral Cove/ Elliott Heads/ Riverview

Properties at these locations have experience 2 to 3 metres in lateral movement of the foreshore from January to March 2019. The mouth of the creek approximately 8m.

The shoreline is encroaching close to the buildings.

Natural rock formation protects the properties well from coastal hazards.

Innes Park Reserve is an important and popular parkland

Innes Park

Barolin Esplanade and surrounding roads are considerably road.

Legend

- Cadastral
- HAT line
- 1% AEP Erosion Prone Area (+0.8m SLR)
- 5% AEP Storm Tide Inundation
- 5% AEP Storm Tide Inundation (+0.8m SLR)
- 1% AEP Storm Tide Inundation
- 1% AEP Storm Tide Inundation (+0.8m SLR)

Assets and Features

- Infrastructure ●
- Property/Buildings ●
- Environmental ●
- Recreational ●

Back Windermere Road

Coral Cove Dr

Atkinsons Road

Elliott Heads State School

Elliott Heads Road

Submarine Lookout

Elliott Heads Life Savers Park and Holiday Park at risk to Coastal Erosion

Properties exposed to Coastal Erosion risk.

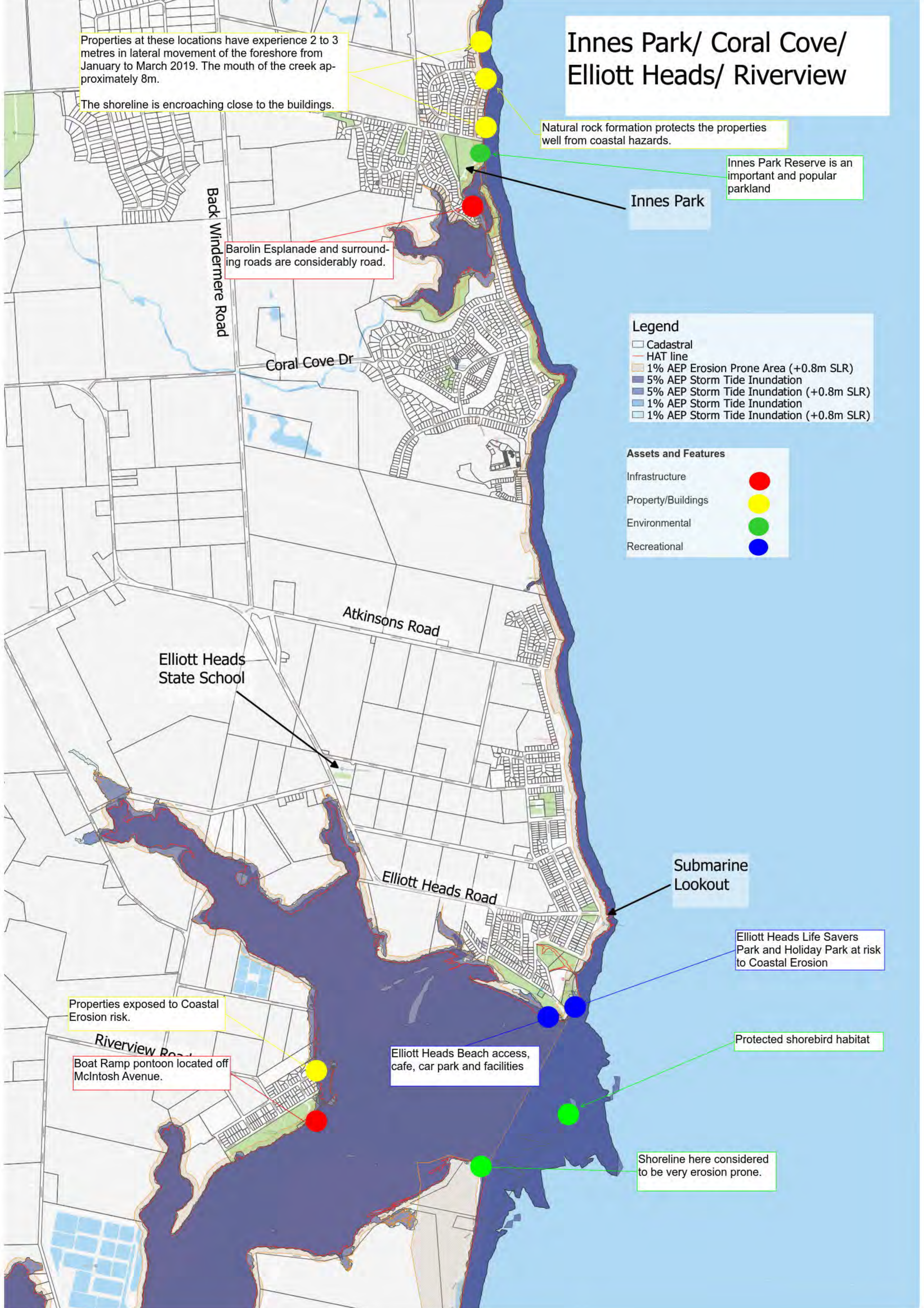
Boat Ramp pontoon located off McIntosh Avenue.

Elliott Heads Beach access, cafe, car park and facilities

Protected shorebird habitat

Shoreline here considered to be very erosion prone.

Riverview Road



Coonarr

Coonarr Road to be resurfaced with bitumen (currently unsealed)

8 properties at risk to Coastal Erosion and isolation during Storm Tide inundation events

Coonarr Beach Rd regular cut by king tides - single access and egress to 8 properties on foreshore.

Mangroves and Salt-mashes habitat of environmental significance

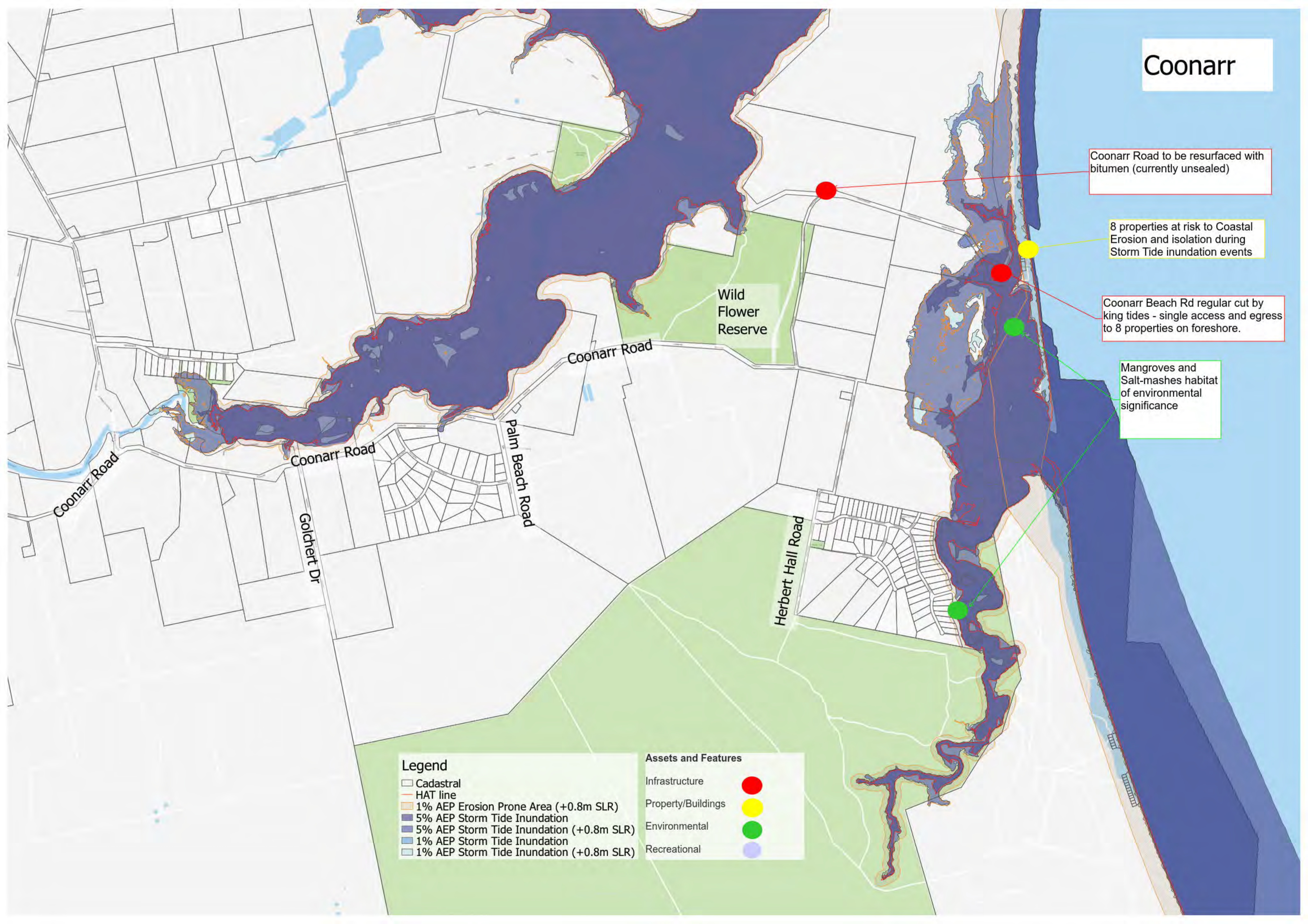
Wild Flower Reserve

Legend

- Cadastral
- HAT line
- 1% AEP Erosion Prone Area (+0.8m SLR)
- 5% AEP Storm Tide Inundation
- 5% AEP Storm Tide Inundation (+0.8m SLR)
- 1% AEP Storm Tide Inundation
- 1% AEP Storm Tide Inundation (+0.8m SLR)

Assets and Features

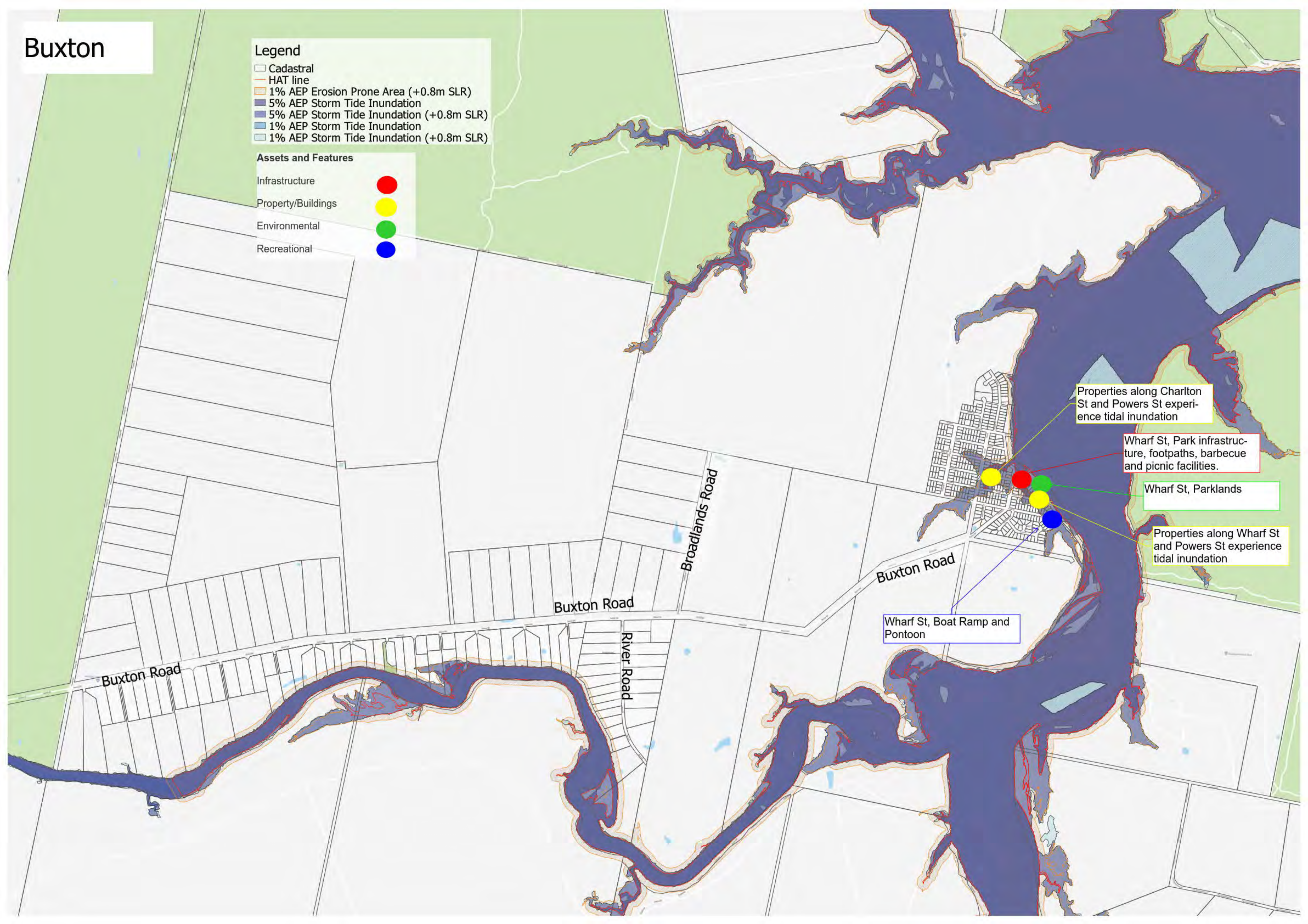
- Infrastructure ●
- Property/Buildings ●
- Environmental ●
- Recreational ●



Buxton

- Legend**
- Cadastral
 - HAT line
 - 1% AEP Erosion Prone Area (+0.8m SLR)
 - 5% AEP Storm Tide Inundation
 - 5% AEP Storm Tide Inundation (+0.8m SLR)
 - 1% AEP Storm Tide Inundation
 - 1% AEP Storm Tide Inundation (+0.8m SLR)

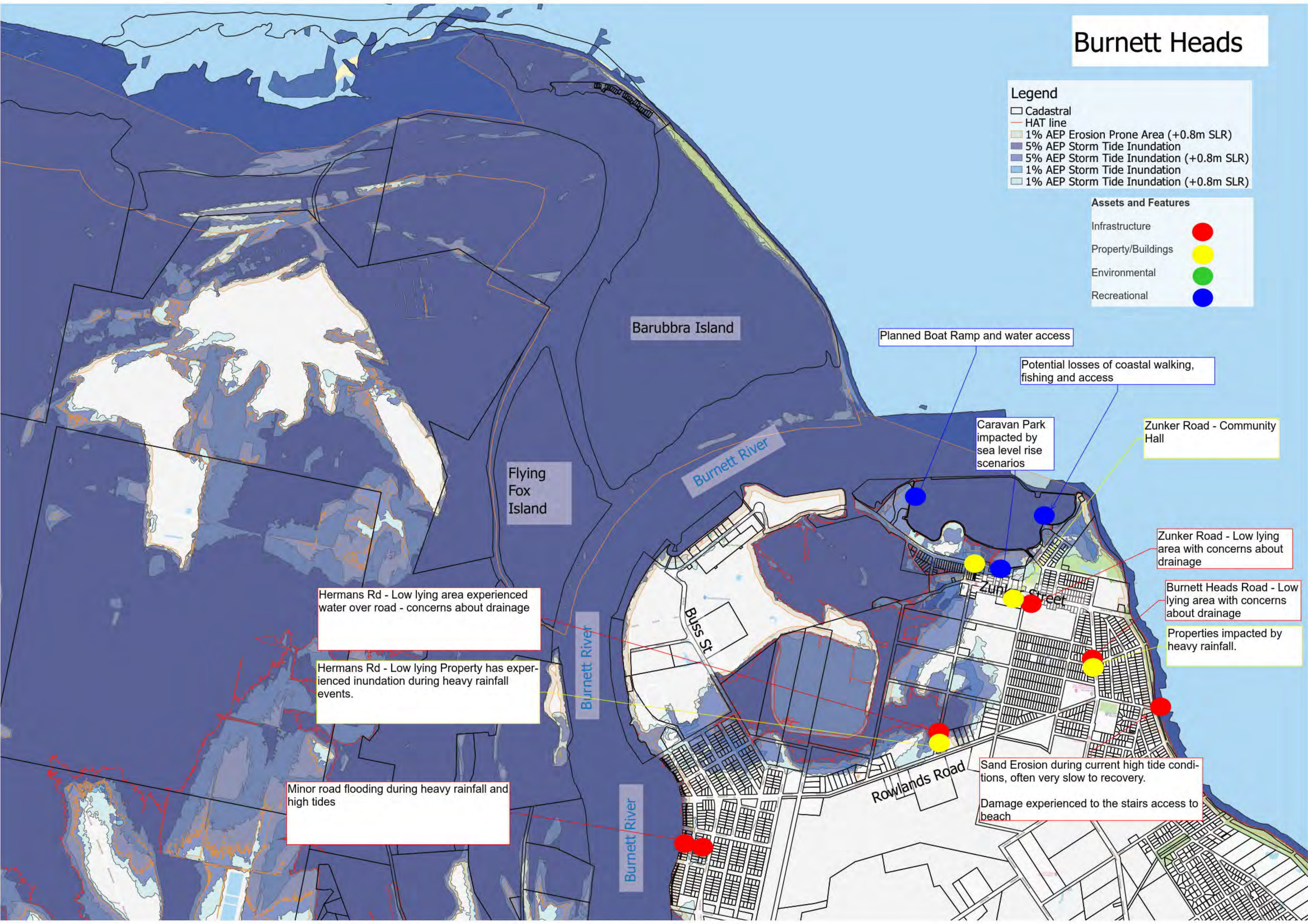
- Assets and Features**
- Infrastructure ●
 - Property/Buildings ●
 - Environmental ●
 - Recreational ●



Burnett Heads

- Legend**
- Cadastral
 - HAT line
 - 1% AEP Erosion Prone Area (+0.8m SLR)
 - 5% AEP Storm Tide Inundation
 - 5% AEP Storm Tide Inundation (+0.8m SLR)
 - 1% AEP Storm Tide Inundation
 - 1% AEP Storm Tide Inundation (+0.8m SLR)

- Assets and Features**
- Infrastructure ● (Red)
 - Property/Buildings ● (Yellow)
 - Environmental ● (Green)
 - Recreational ● (Blue)



Barubbra Island

Planned Boat Ramp and water access

Potential losses of coastal walking, fishing and access

Caravan Park impacted by sea level rise scenarios

Zunker Road - Community Hall

Flying Fox Island

Burnett River

Zunker Road - Low lying area with concerns about drainage

Hermans Rd - Low lying area experienced water over road - concerns about drainage

Burnett Heads Road - Low lying area with concerns about drainage

Hermans Rd - Low lying Property has experienced inundation during heavy rainfall events.

Properties impacted by heavy rainfall.

Buss St

Minor road flooding during heavy rainfall and high tides

Sand Erosion during current high tide conditions, often very slow to recovery.

Damage experienced to the stairs access to beach

Burnett River

Rowlands Road

Burnett River

ANNEXURE C

Our Coast - Bundaberg Region Coastal Hazard Adaptation Strategy

Community Reference Group Workshop 3

21 March 2019

Discussion of the Community's Experience of Coastal Hazard

Coastal Hazard Exposure -	
Date and Time	21 March 2019, 6.00pm - 8.30pm
Location	Bundaberg Administration Centre, Bundaberg Regional Council Offices, Bundaberg
Workshop purpose	Refresh the group about the CHAS and share progress, such as the coastal hazard mapping extents Undertake a mapping exercise to: <ul style="list-style-type: none">• Share community's experience of coastal hazard• Discuss and understand the community and asset exposure to coastal hazard across the region.

Outcomes of mapping exercise:

The following table summaries the settlement based observations from the community reference group members.

Settlement	Woodgate / Walkers Point	Moore Park Beach	Burnett Heads	Innes Park / Coral Cove / Elliott Heads / Riverview	Nielsen Park / Bargara	Buxton	Coonarr	Winfield	
Observations									
Recreational	<p>Theodolite Creek BBQ and picnic area is due for an upgrade in the coming months, this is subject to inundation in the 5%AEP Storm Tide event and in the Erosion Prone Area</p> <p>The Walkers Point boat ramp is unsafe to use, frequent bogging and often visiting boat users get stuck</p> <p>Recreational boardwalk through the lagoon.</p>	<p>Cyclone Oma caused 3-4m cliff drops along the beaches at Pacific Boulevard, the sediment returned with 3 or 4 days.</p>	<p>Harbour Esplanade: Planned Boat Ramp and water access</p> <p>Near Harbour Potential losses of coastal walking, fishing and access</p> <p>Near Lighthouse Park: Caravan Park impacted by sea level rise scenarios</p>	<p>Elliott Heads Beach access, cafe, car park and facilities</p> <p>Elliott Heads Life Savers Park and Holiday Park at risk to Coastal Erosion</p>	<p>Swimming areas at mouth of lagoon could be lost with potential sea level rise scenarios.</p>	<p>Wharf St, Boat Ramp and Pontoon exposed to Coastal Hazards</p>			
Environmental	<p>Area between Walkers Point and Burrum Coast National Park subject to erosion and inundation. E.g. the Black Back.</p> <p>Each tide the bank here erodes several centimetres Mangrove Forests gone and coastal cooch only now remains</p> <p>Erosion along the beach causing tree death and vegetation loss.</p>	<p>Cyclone Debbie caused the Kolan River to break through</p> <p>Trees losses as the river mouth moved.</p>		<p>Elliott Heads: Protected shorebird habitat</p>	<p>The Basin swimming zone located on Kelly's Beach. Built out of volcanic rock by Kanaka labour many years ago. Considered to be of cultural significance.</p>	<p>Wharf St, Parklands exposed to Coastal Hazards</p>	<p>Mangroves and Salt-mashes habitat of environmental significance</p>	<p>Boaga - fishing habitat - recreational fishing very popular in Baffle Creek, generally</p>	

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Infrastructure</p>	<p>Roads and pedestrian footpaths at risk to Coastal Erosion all along Woodgate frontage.</p> <p>Major sewage treatment site</p> <p>Culverts under Woodgate Road. Key access route to the settlement of Woodgate.</p> <p>Walkers Point - Rock Wall existed for over 25 years that continues to protect the foreshore.</p>	<p>As a preventative measure logs were placed along the dune, these logs moved during Cyclone Oma.</p> <p>Moore Park Beach Road closed for several days - 100mm over the road.</p> <p>Water observed over Moore Park Road at King Tide 21 Feb 2019</p>	<p>Near Powers St, Minor road flooding during heavy rainfall and high tides</p> <p>Sea Esplanade - Sand Erosion during current high tide conditions, often very slow to recovery. Damage experienced to the stairs access to beach</p> <p>Burnett Heads Road, Hermans Road and Zunker Road - Low lying area with concerns about drainage</p>	<p>Barolin Esplanade and surrounding roads are considerably road</p> <p>Boat Ramp pontoon located off McIntosh Avenue.</p>	<p>Near intersection of Bargara Rd and Holland St becomes inundated during high tides and times of heavy rainfall</p> <p>Minor flooding occurs from overland flow and run-off from the land into Barolin drainage system.</p> <p>Wessells Road, Hughes Road and Watsons Road tend to be affected by heavy rainfall.</p> <p>The Causeway, Kelly's Beach affected at high tide and after periods of heavy rainfall</p>	<p>Wharf St, Park infrastructure, footpaths, barbecue and picnic facilities at risk to Coast Hazard</p>	<p>Coonarr Beach Rd regular cut by king tides - single access and egress to 8 properties on foreshore.</p> <p>Coonarr Road to be resurfaced with bitumen (currently unsealed)</p>	
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Property	<p>Frizzels Rd property - development approval for a subdivision and associated infrastructure.</p> <p>Residential properties exposed to Coastal Erosion and Storm Tide inundation. Properties developed in the area have filled to 3.6mAHD</p> <p>Residential properties exposed to Storm Tide inundation</p>	<p>Cyclone Oma led to coastal flooding and coastal erosion affecting properties in the northern part of Moore Park Beach. Much of the grassed areas were covered in sand.</p>	<p>Burnett Head Rd - Properties impacted by heavy rainfall.</p> <p>Hermans Road - Low Lying Property has experienced inundation during heavy rainfall events</p> <p>Zunker Road - Community Hall impacted by future coastal hazard scenarios.</p>	<p>Riverview Properties exposed to Coastal Erosion risk.</p> <p>Innes Park Properties have experience 2 to 3 metres in lateral movement of the foreshore from January to March 2019. The mouth of the creek approximately 8m. The shoreline is encroaching close to the buildings.</p> <p>Innes Park - natural rock formation protects the properties well from coastal hazards.</p>	<p>Property at Archies Beach. The house is built onto the beach. Potentially impacted by Coastal Erosion</p>	<p>Properties along Charlton St and Powers St experience tidal inundation</p> <p>Properties along Wharf St and Powers St experience tidal inundation</p>	<p>8 properties at Coonar Beach at risk to Coastal Erosion and isolation during Storm Tide inundation events</p>	<p>Properties affected by inundation from Baffle Creek</p> <p>2013 Riverine flood event caused widespread damage to properties.</p>
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MINUTES OF MEETING

Bundaberg Coastal Hazard Adaptation Strategy Community Reference Group (CRG)

Held At:	Function Room, Bundaberg Regional Council Administration Centre 190 Bourbong Street, Bundaberg
Date & Time:	Thursday, 9 May 2019 – 12 pm to 4 pm
Present:	<i>CRG Members</i> – Russell Stewart, Josephine Ferris, Jennifer Parry, Collin Turner, Robert Bell, Terry Kelly
	<i>Council</i> – Cr Bill Trevor (Chair), Cr Jason Bartels, Cr Wayne Honor, Cr Greg Barnes, Dwayne Honor (Project Manager), Evan Fritz (Strategic Planning), and Sally Obst (Natural Areas), and Natalie McDonald (Senior Administration Officer)
	<i>Project Consultant</i> - Jo Tinnion & Richard Sharp (Water Technology)
Apologies	<i>CRG Members</i> – Chris Mcloughlin, Ian Graham, Heath Greville, Tony Ricciardi, George Martin, Lloyd Blake, Julie Fauser, Shanelle Pekin, Sharon Jackson, Joe Russo <i>Resignation Received:</i> Rob James
	<i>Council</i> – Cr Scott Rowleson, Beth Whitworth (Disaster Management)

BUSINESS OF MEETING

1. Introductions and Welcome (Cr Bill Trevor)

Dwayne Honor welcomed all, being the first workshop of the CHAS, including Facilitator, Neil Dufty and Water Technology project managers, Jo Tinnion and Richard Sharp. Councillors, Bill Trevor, Wayne Honor, Jason Bartels and Greg Barnes were also in attendance. He noted that only 6 CRG members were in attendance today.

The Chair, Cr Bill Trevor also welcomed the CRG members to the workshop and fellow Councillors, Jason Bartels, Wayne Honor and Greg Barnes and advised he was looking forward to Neil taking us through today's workshop. He raised a couple of points from recent discussions that he wished to clarify regarding the purpose of the CHAS, with some members expecting that the project was not progressing fast enough with locally specific projects which is where they were really keen to get in and do something.

The CHAS has been developed to assist in understanding and adapting to climate change, looking at coastal erosion, storm tide inundation and sea level rise and the potential impacts on the community, infrastructure and the environment. The result of the CHAS, in consultation with the community reference group and key stakeholders, would be a strategy aimed at reducing future risk in coastal areas of beach erosion and flooding and increasing community resilience.

Cr Trevor noted that unless we get over-arching plans in place, State approval would need to be sought each time something needs to be done. This may involve localised studies, for example dune restoration and beach nourishment works as is intended along the Woodgate foreshore under our proposed Woodgate SEMP. State approved overarching plans will allow Council to do things, e.g. providing value for money. Unless we get State Government approval and have a strategic position on what is required and why, it does not matter what we do at the ground level as it is unlikely to be supported.

A copy of the minutes of the last meeting were circulated to all at the meeting (with a copy having previously being emailed) and they were accepted as read and are to be published on the Our Coast website.

2. Previous CRG Meeting Recap (Richard Sharp & Jo Tinnion)

Project Update

Richard Sharp gave a project update and recap to date, noting that currently the CHAS is in the middle of phase 4 & 5. *The Powerpoint presentation from the meeting is attached at Annexure A.*

The maps from the previous CRG Meeting are now available on the website at: <https://ourcoast.bundaberg.qld.gov.au/bundaberg-region-coastal-hazard-adaptation-strategy>

The Community Values survey is still out for comment with 500+ responses received to date. The closing date has been extended to 17 May.

Neil Dufty of Molino Stewart welcomed everyone to the workshop. All in attendance gave a brief introduction of themselves and where they lived.

3. Community Values (CRG Members facilitated by Neil Dufty) - Breakout 1

Break Out Activity 1 – Completing the Community Values Statements worksheet (refer *Annexure B1*). The group was asked to write down their responses, considering the identified values, scenarios mapped at the previous meeting, and what could change in the future.

Comments are summarized at Annexure B2 - Understanding of how the Community Values statements are affected by future coastal hazard predictions to assets and functions i.e. with the increase in properties and infrastructure exposed. Individually, Community Reference Group members provided thoughts on a particular locality of how the value is impacted by changing coastal hazards.

4. Risk Assessment and Consequence Assessment (CRG Members facilitated by Neil Dufty) - Breakout 2

Break Out Activity 2 – Completing the Consequence Assessment Matrix (*refer Annexure C1*). The group was asked to consider what they think would be catastrophic, high, moderate, low and insignificant impacts for their beach/coastal area, considering coastal processes, seasonal changes and natural cycles. If it could never recover, would that be catastrophic?

Comments are summarized at Annexure C2 - CRG's input will assist with consequence assessment qualitative definitions.

5. Risk Tolerance & Acceptability (CRG Members facilitated by Neil Dufty) - Breakout 3

Break Out Activity 3. Richard Sharp introduced the Risk Assessment graph (*refer Annexure D1*) and the group discussed assets that are exposed to Coastal Hazard. Each of the 4 group 'stuck' Asset Labels onto the Acceptability / Tolerability graph. Neil Dufty highlighted there were quite a few similarities, yet quite a few differences to take on board amongst the 4 groups.

Comments are summarized at Annexure D2 - This task will provide the team a baseline understanding current management options and acceptability (or not) of current risk treatments.

**6. Summary and Introduction to Adaptation Options
(CRG Members facilitated by Neil Dufty – Interactive Session)**

Refining the focus areas for the next phases of the CHAS study. Introduction of Adaptation Options.

A Brainstorming exercise was held with the group giving consideration of adaptation options. *Points for consideration are noted at Annexure E.*

At next meeting, all ideas noted will be reviewed and analysed.

7. Where to From Here? – Next Meeting (Richard Sharp & Jo Tinnion)

The next CRG Meeting is scheduled for Thursday 6 June 2019 (6 pm – 8.30 pm) - Adaptation Principles Workshop to initiate discussions of potential adaptation options and implementation pathways.

Richard Sharpe thanked all in attendance for their input at this workshop. At the next meeting, the information collated from the workshop will be further discussed with the CRG members.

Dwayne Honor asked for feedback on the day's workshop and what had been discussed. A CRG member commented it would have been preferable to have more CRG members in attendance. It was thought the day session may have been a reason for the low attendance and that a night time session may be preferable for all to attend (5.30 / 6 pm through to 9 pm).

Neil Duffy commented he had run lots of these types of workshop and that quite a lot of heavy/conceptual thinking and discussion is required at these sessions, and to consider whether a night time session would suit this type of workshop. This position was supported by a number of the CRG members present.

Other comments included :

- Members will make it work to be part of the Group.
- Happy with times today – people are fresh. Cannot meet everyone's schedule.
- People have to travel home after workshops which can be quite late if at night
- Can do day or night.

The CRG members indicated they felt it had been a good session.

8. Closing:

The Chair thanked all in attendance.

This concluded the business of the CRG Workshop at 3.30 pm.

Cr Bill Trevor, Chairperson
OUR COAST Community Reference Group



ANNEXURE A

ANNEXURE A




OUR
COAST

Investing today for a resilient tomorrow

Welcome!

Bundaberg Region Coastal Hazard Adaptation Strategy

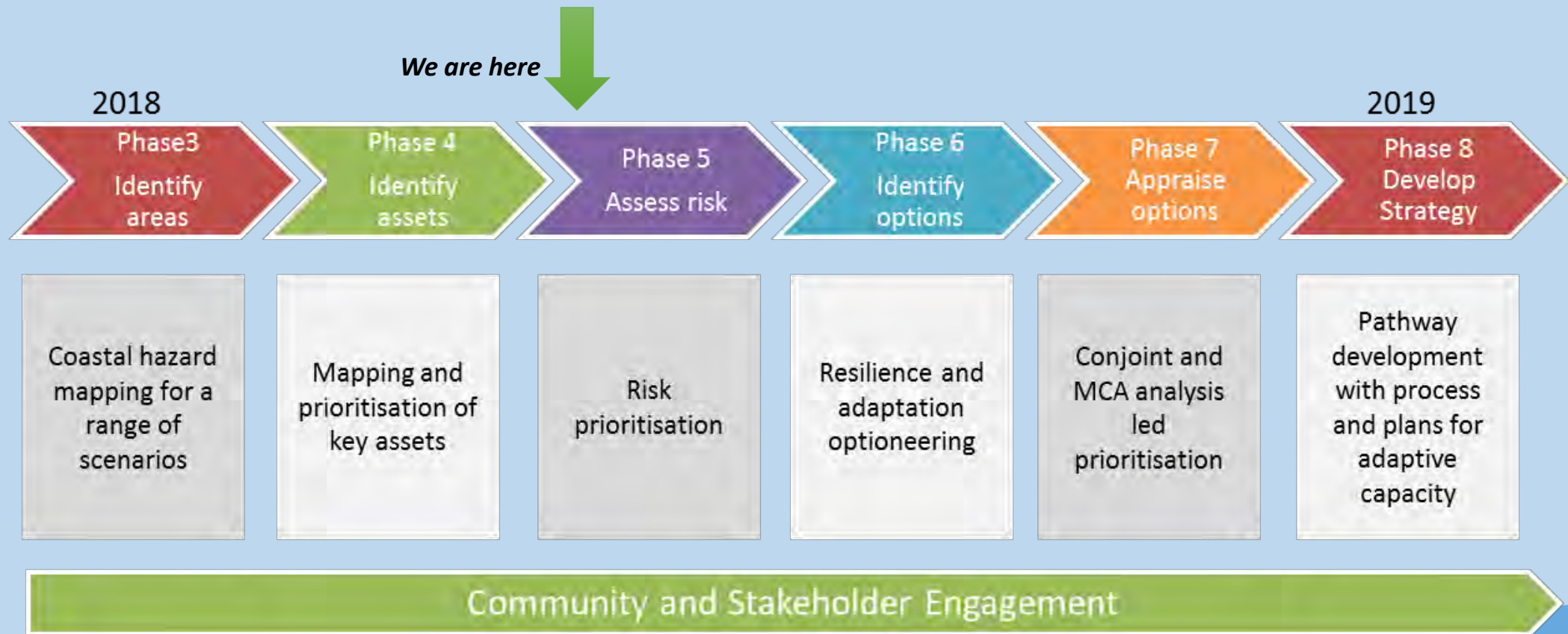
Community Reference Group Workshop #4
12.00 to 4.00pm
9 May 2019



Agenda

12.00	Working Lunch	<i>CRG Members</i>
12.15	Introductions	<i>Dwayne Honor</i>
12.20	Previous CRG3 Recap	<i>Richard Sharp – WaterTechnology</i>
12.40	Community Values Breakout 1	<i>Neil Dufty - Facilitator</i>
13.20	Risk assessment and consequence assessment Breakout 2	<i>Neil Dufty - Facilitator</i>
14.00	Comfort Break	
14.20	Risk Tolerance and Acceptability Breakout 3	<i>Neil Dufty - Facilitator</i>
15.00	Summary and Introduction to Adaptation Options	<i>Richard Sharp – WaterTechnology</i>
15.20	Where to from here?	<i>Dwayne Honor</i>

Our Coast Update



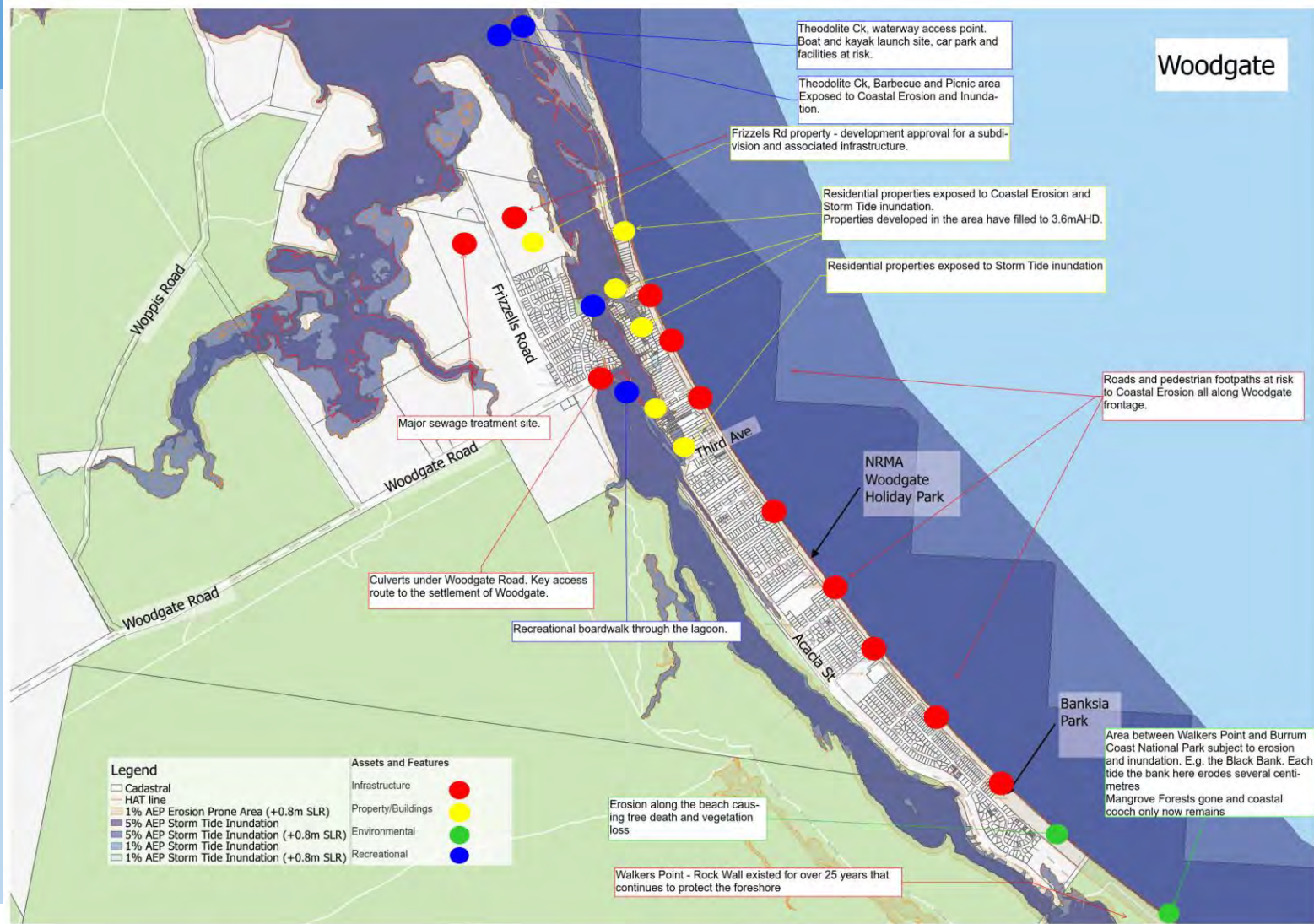
Previous CRG 3

- CRG members shared their experiences of Coastal Hazard
- Developed an understanding of key assets and features from a settlement-based viewpoint
- Available online

<https://bundychas.engagementhub.com.au>



Woodgate



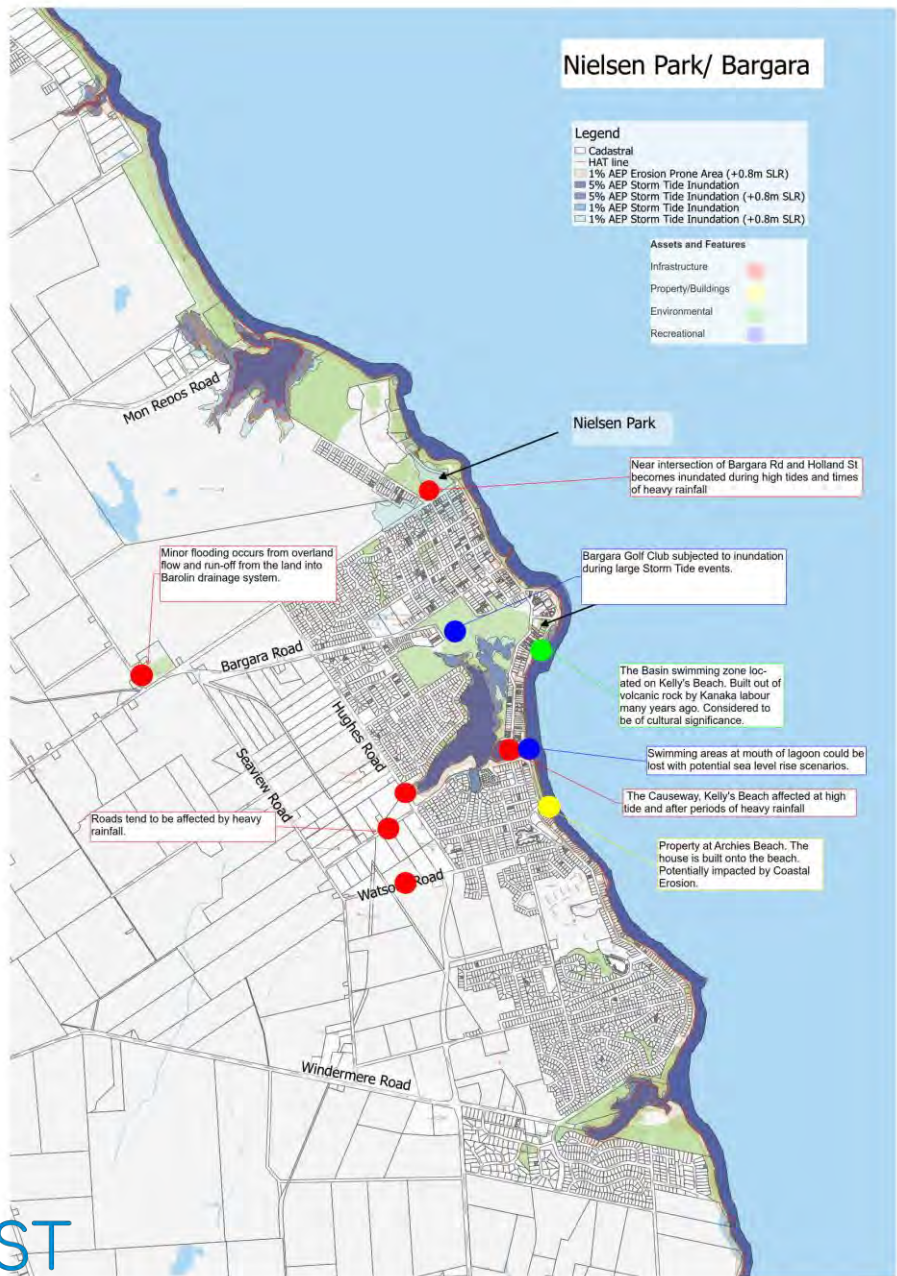
Nielsen Park/ Bargara

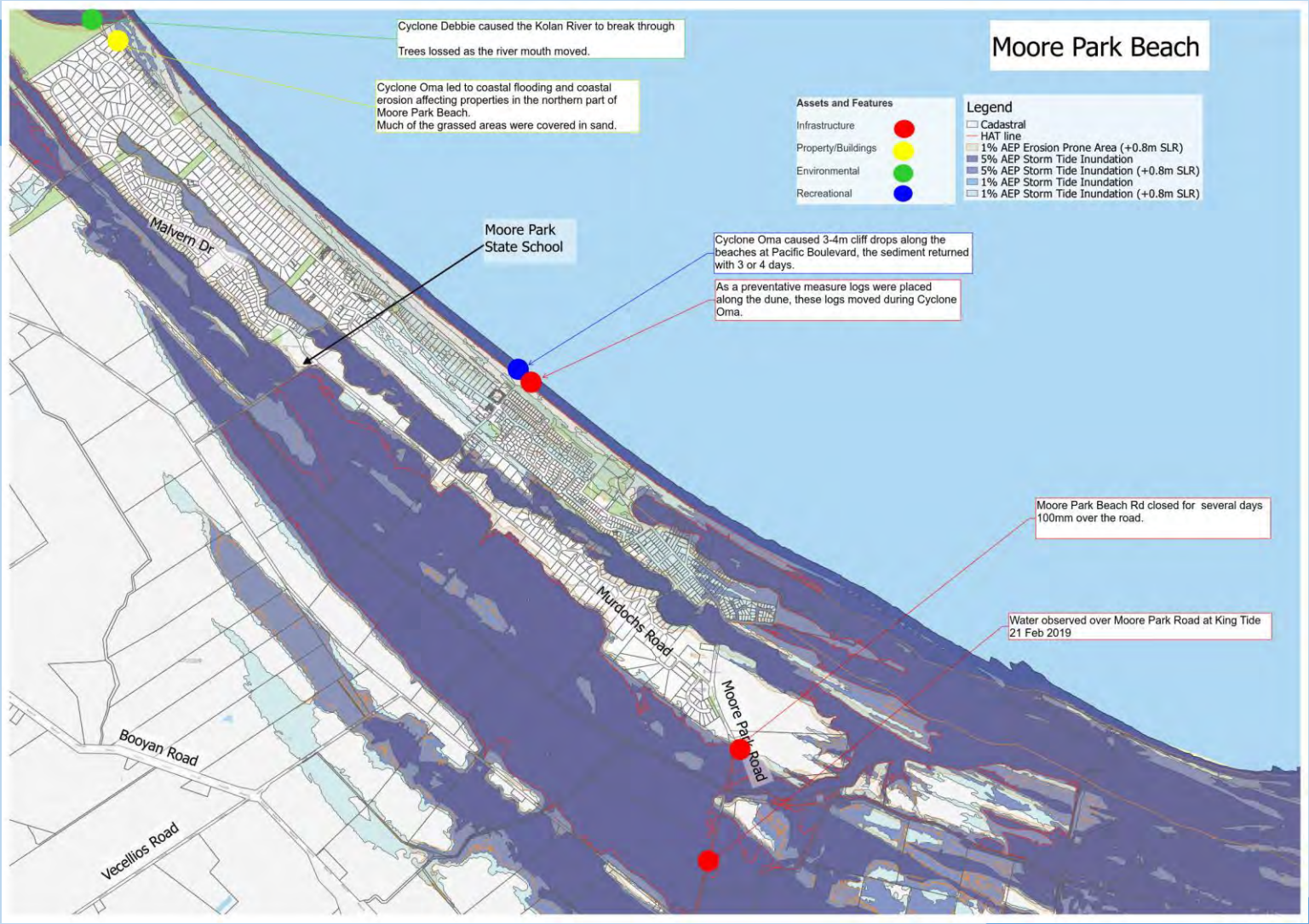
Legend

- Cadastral
- HAT line
- 1% AEP Erosion Prone Area (+0.8m SLR)
- 5% AEP Storm Tide Inundation
- 5% AEP Storm Tide Inundation (+0.8m SLR)
- 1% AEP Storm Tide Inundation
- 1% AEP Storm Tide Inundation (+0.8m SLR)

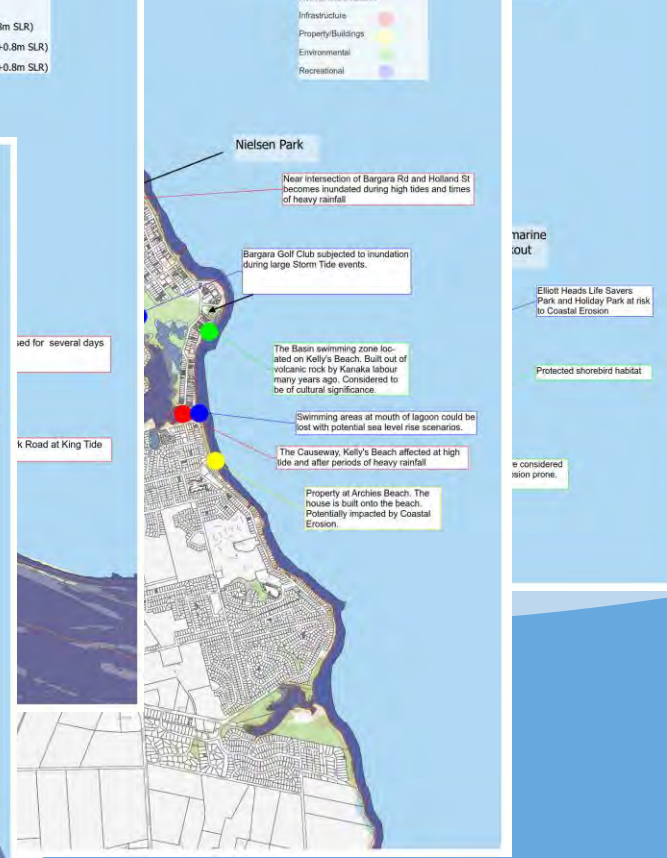
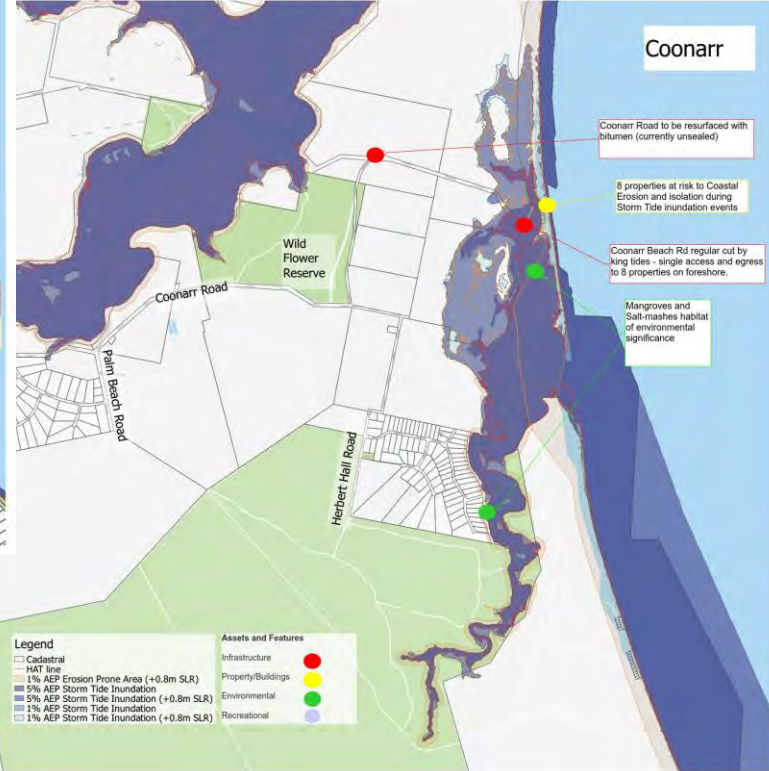
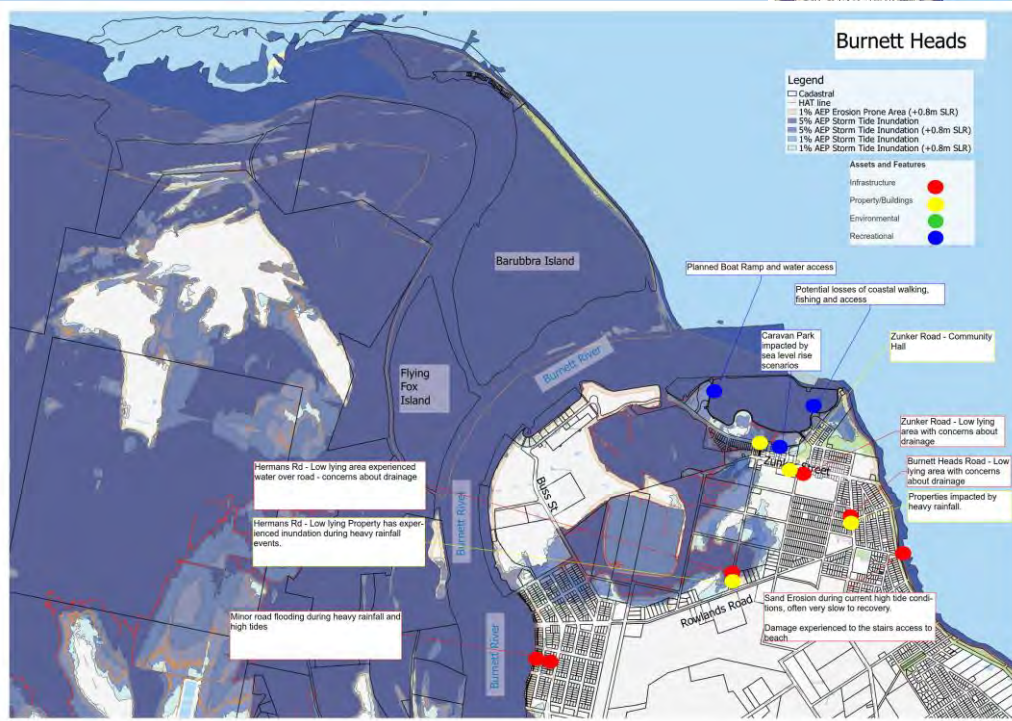
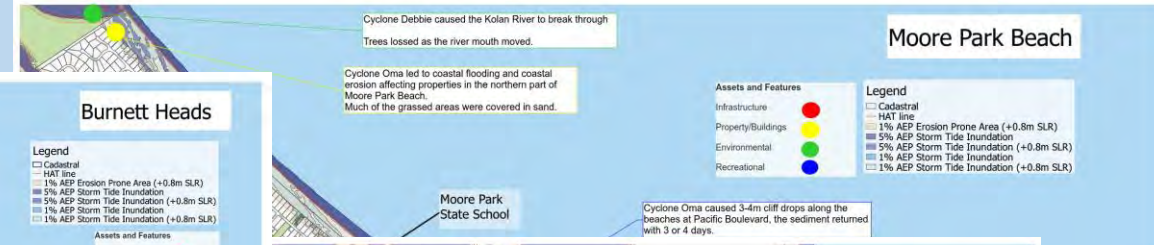
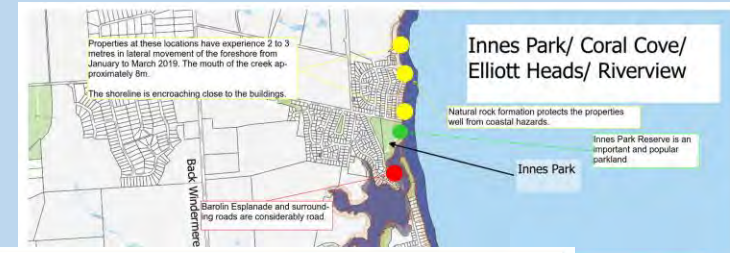
Assets and Features

- Infrastructure
- Property/Buildings
- Environmental
- Recreational





Previous CRG 3



Community Values



6. WE WANT TO HAND OVER THE COAST TO OUR GRANDCHILDREN

Our Coast is a special place. We want to do what we can to give our children and grandchildren a place that provides the same values that we cherish now.



5. WE HAVE A DESIRE FOR SELF-ORGANISATION & SELF-RELIANCE

Because we love the coast and feel responsible for it, each of our tight knit communities wants to be able to have a greater role in determining the future of our coast.



4. WE ARE TIGHT-KNIT COMMUNITIES

Our sense of ownership means we band together as discrete communities. Each community is different, but we are all tight-knit.



1. WE LOVE WHERE WE LIVE



We live on the coast because we love all that it has to offer – the natural places, the lifestyle, the sounds, the smells, the views, and the people.

2. WE ARE DEEPLY CONNECTED TO PLACE



We feel deeply connected to the coast and its values. We wouldn't want to live anywhere else.

3. WE HAVE A STRONG SENSE OF OWNERSHIP



Because we love the coast and are deeply connected to it, we feel like we own it and are responsible for it. Whether we are residents, business owners, or farmers, we feel like stewards of this land.

Break out 1: Individual Activity

Understanding of how the Community Values statements are affected by future coastal hazard predictions to assets and functions i.e. with the increase in properties and infrastructure exposed.

Individually - write up your thoughts on a particular locality of how the value is impacted by changing coastal hazards.

Discuss and feedback.

Look at the stats for your area of interest

How does the picture change with Sea Level Rise?

How does that impact the Community Values?

Consequence Assessment

- Reminder that we are undertaking the Phase 5 Risk Assessment
- For each asset – the assessment of the level of risk is conducted by understanding both Likelihood and Consequence (or Impact)
- Risk = Likelihood x Consequence
- This is where the CRG inputs into the Consequence Rating

	Social Impacts (EXAMPLE)	Environmental Impacts (EXAMPLE)
Catastrophic	Widespread semi-permanent (over 1 year) impact to community services, wellbeing or culture. Loss of life.	Severe and widespread, permanent impact on multiple ecosystems
Major	Long-term (> 1 month) disruption to community services, wellbeing or culture. Injuries/ illness.	Severe and widespread semi-permanent impact on one or more ecosystem
Moderate	Medium-term (> 1 week) disruption to community services, wellbeing or culture. Minor injury/illness	Substantial impact on one or more ecosystem
Minor	Short-term (>1 day) disruption to community services, wellbeing or culture. Isolated injury/ illness	Small, contained and reversible impacted to an isolated ecosystem
Insignificant	Very short-term (>1 hour) disruption to community services with alternatives available. Negligible injuries/illness	Little or no environmental impact.

Break out 2: Individual Activity

- Please fill out the Consequence Matrix
 - One matrix for each broad asset type
 - CRG members to write in what they think catastrophic, high, moderate, low and insignificant impacts are.
- CRG's input will assist with consequence assessment qualitative definitions.

Choose an Asset Type.

Consider:

How widespread and for how long the asset might be unavailable.

Any other comments?

Comfort Break – 20 Minutes



Risk Tolerance and Acceptability



Residential Property



Culturally Significant Assets

Risk Tolerance and Acceptability

- CHAS Phase 5 Risk Assessment
- For each asset – the assessment of the level of risk is conducted by understanding both Likelihood and Consequence (or Impact)
- Risk = Likelihood x Consequence.

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Likely	Low	Medium	High	Extreme	Extreme
	Possible	Low	Medium	High	High	Extreme
	Unlikely	Low	Medium	Medium	High	Extreme
	Rare	Low	Low	Medium	Medium	High

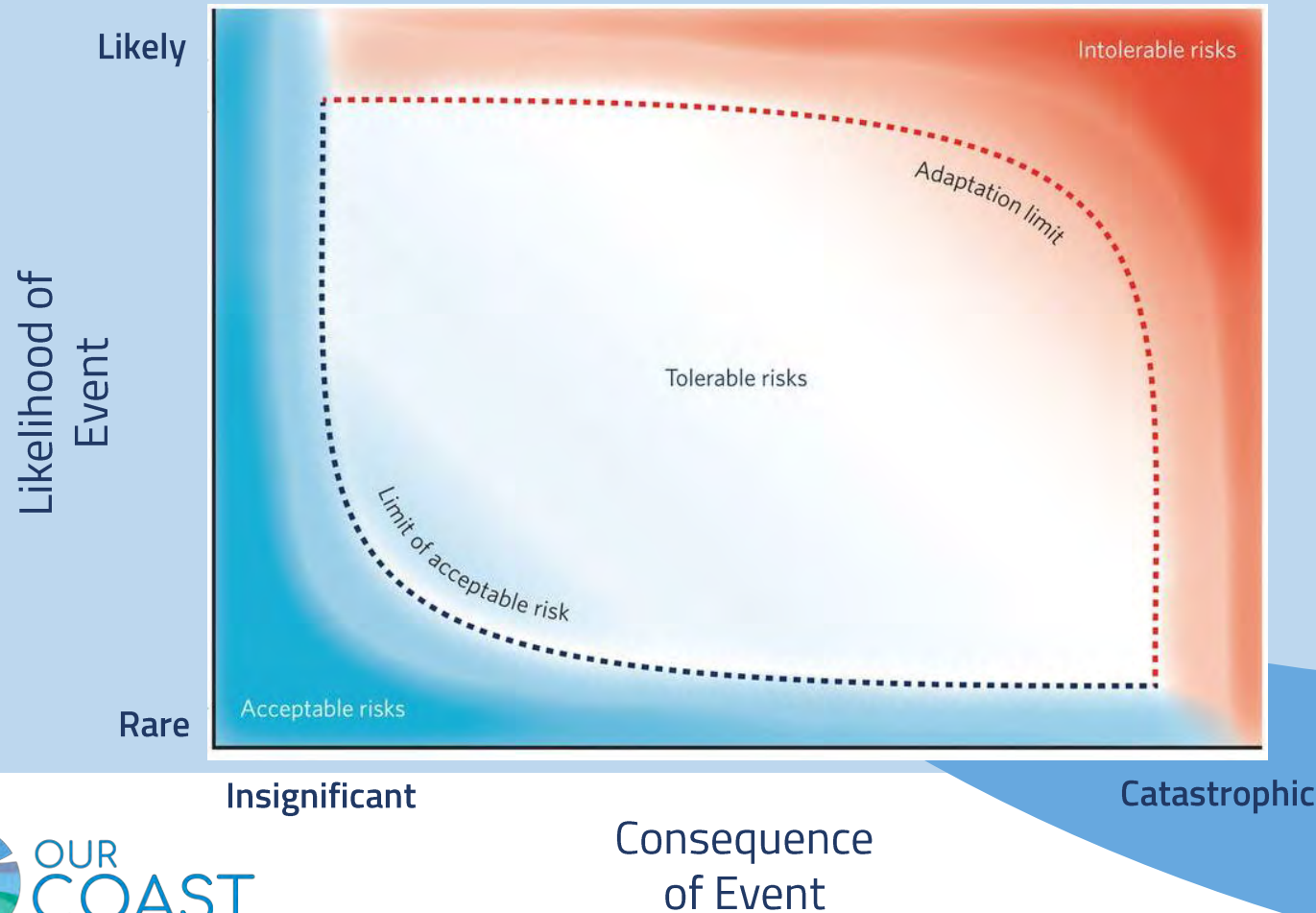
Risk Tolerance and Acceptability

Unacceptable/intolerable: A risk that requires action to avoid or reduce risk

Tolerable: A risk that is low enough to allow exposure to continue, and high enough to require new treatments or actions to reduce risk. Society can live with this risk but as much as reasonably practical should be done to reduce risk.

Acceptable: A risk that is sufficiently low to require no new treatments or action. Society can live without action.

Risk Tolerance and Acceptability



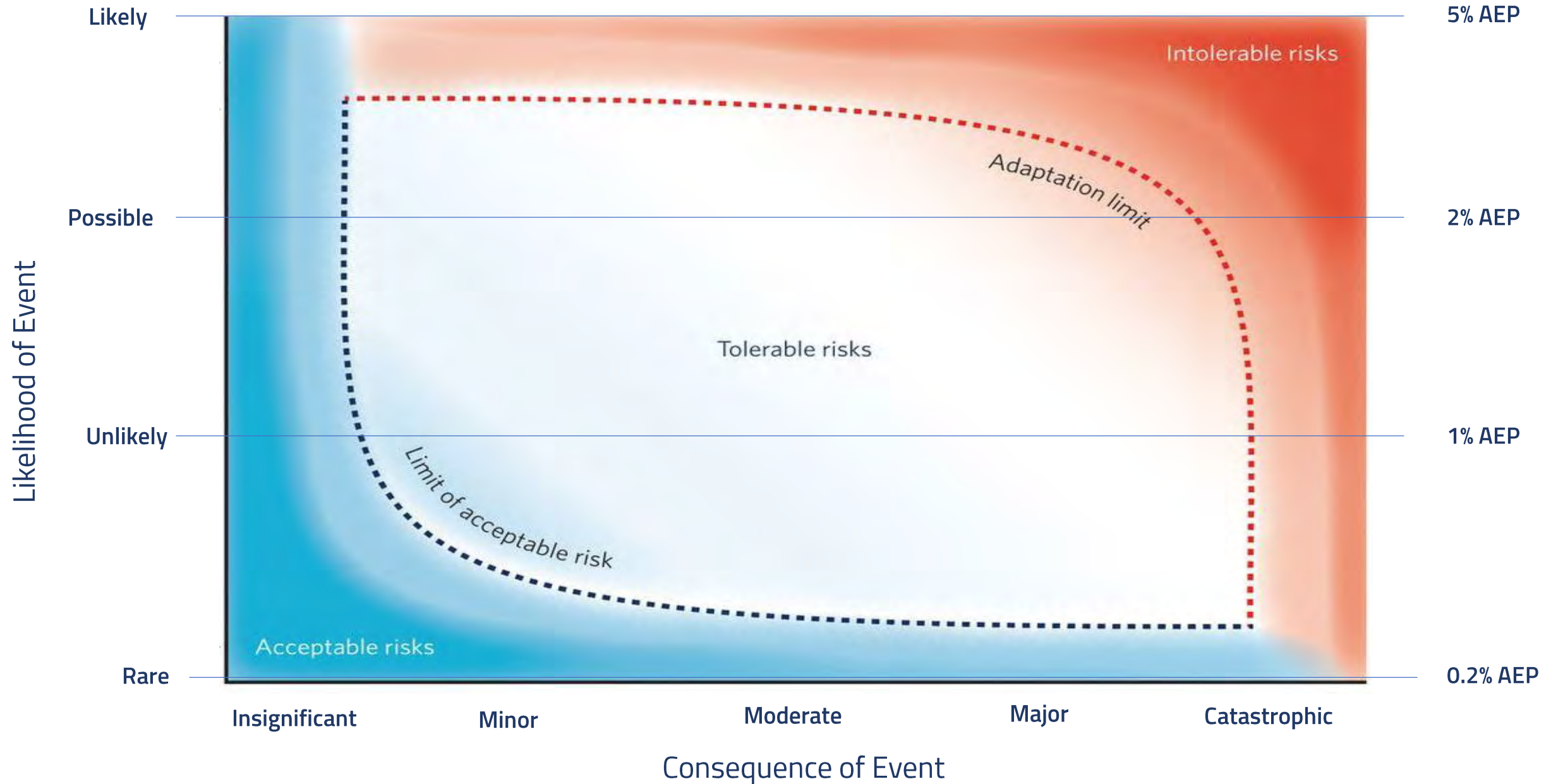
Break out 3: Small group activity

- Discuss assets that are exposed to Coastal Hazard.
- Asset Labels to be 'stuck' onto the Acceptability / Tolerability graph.
- Baseline understanding current management options and acceptability (or not) of current risk treatments.

Do you recall the level of impacts of recent tidal or erosion events?

This exercise will provide a baseline understanding of the Tolerance and Acceptability of Risk

Break Out Activity 3: Acceptability/Tolerability

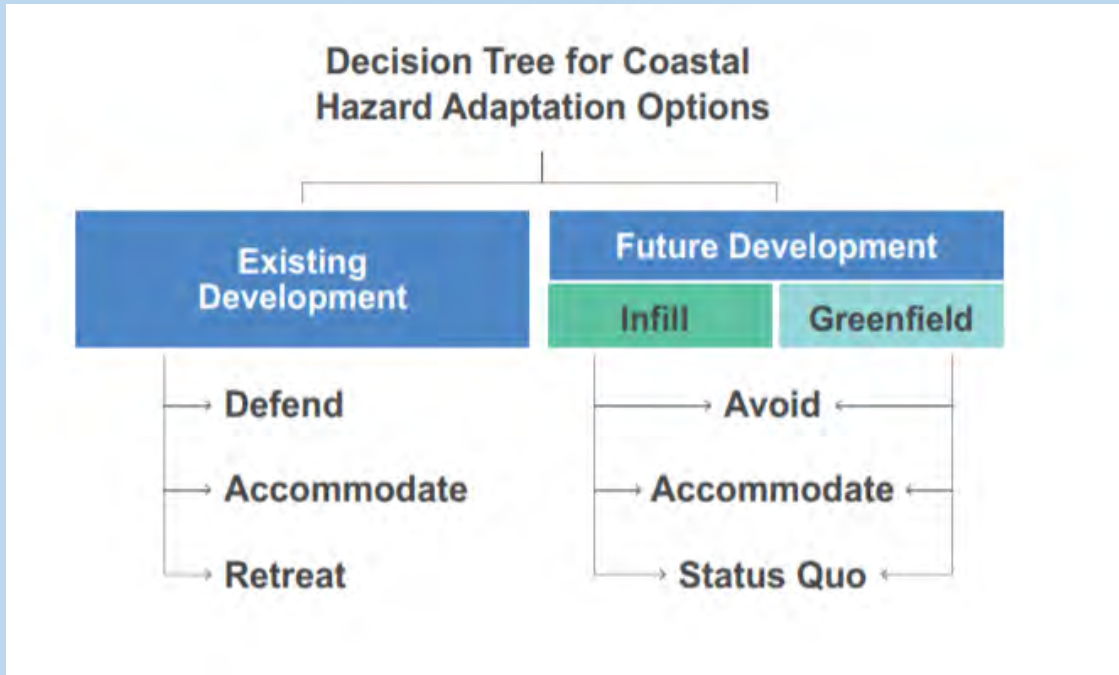


Reference tools

Reference material available to determine the impacts of the coastal hazard:

- Graph of 'tolerability'
- Depth maps
- Assets at risk
- Definitions of Acceptable, tolerable and intolerable

Adaptation Options



Adaptation Options

Theme	Category	Option
Resilient Society	<ul style="list-style-type: none">• Education and Awareness	
Resilient Settlements	<ul style="list-style-type: none">• Development Controls	
	<ul style="list-style-type: none">• Land use change or restriction	
Resilient Economy	<ul style="list-style-type: none">• Structural	
Resilient Environment	<ul style="list-style-type: none">• Soft options	

Where to from here?

At the start of each phase we will seek your feedback and broad agreement as the CHAS develops:

Phase 6 – Development of settlement specific adaptation options inc issues, opportunities and constraints

6 June 2019

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance

18 July 2019

Phase 8 – Strategy and Implementation Plan linked to resilience baseline improvements coupled with development of monitoring and evaluation process

15 August 2019

Questions?





ANNEXURE B

ANNEXURE B1

Where is your location of interest?



1



1. WE LOVE WHERE WE LIVE

We live on the coast because we love all that it has to offer – the natural places, the lifestyle, the sounds, the smells, the views, and the people.



2



2. WE ARE DEEPLY CONNECTD TO PLACE

We feel deeply connected to the coast and its values. We wouldn't want to live anywhere else.



3



3. WE HAVE A STRONG SENSE OF OWNERSHIP

Because we love the coast and are deeply connected to it, we feel like we own it and are responsible for it. Whether we are residents, business owners, or farmers, we feel like stewards of this land.





4



4. WE ARE TIGHT-KNIT COMMUNITIES

Our sense of ownership means we band together as discrete communities. Each community is different, but we are all tight-knit.





5



5. WE HAVE A DESIRE FOR SELF-ORGANISATION & SELF-RELIANCE

Because we love the coast and feel responsible for it, each of our tight knit communities wants to be able to have a greater role in determining the future of our coast.





6



6. WE WANT TO HAND OVER THE COAST TO OUR GRANDCHILDREN

Our Coast is a special place. We want to do what we can to give our children and grandchildren a place that provides the same values that we cherish now.



ANNEXURE B2

Breakout Activity 1 – Impacts upon the shared Community Values

Understanding of how the Community Values statements are affected by future coastal hazard predictions to assets and functions i.e. with the increase in properties and infrastructure exposed. Individually Community Reference Group members provided thoughts on a particular locality of how the value is impacted by changing coastal hazards.

Where is your location of Interest?	General Comments	We love where we live	We are deeply connected to place	We have a strong sense of ownership	We are tight-knit communities	We have a desire for self-organisation and self-reliance	We want to hand over the coast to our grandchildren
Bundaberg Coast from hinterland	No access to traditional recreation areas on coastal strip: <ul style="list-style-type: none"> ■ fishing, ■ swimming ■ camping ■ 4WD ■ retirement impact 	Could change in the future Places could become isolated Loss of recreational areas	All hinges on recreation & safety in retirement	True, so we need to think about changes due to sea rises or possible impacts	We need to collaborate or we can all loose	Strength relies on commonality of through (backed by planning)	Act now Be prepared Make plans
Moore Park Beach	Residential properties will continue to be devalued	Facilities, i.e. walking access to be built to withstanding sea level rise and flood	Residents will move away from the area if beach erosion continues thus limiting their recreational usage	Most of the community assists in preservation of the environment			Improve coastal preservation of sand movement and coastal protection
Burnett Heads	I have great concerns re State Development Area at Port Bundaberg. Development on a floodplain clearly has impacts on adjoining community, i.e. Burnett Heads	Agree	I have spent many years on community organisations to improve our town, i.e. south head parklands, coastal walkways etc. Feel proud of our achievements.	True <u>but</u> I have reservations of the process of defining the Port State Development Area. I feel the process is deeply flawed and poorly developed	Very true	Master Planning is critical	Most coastal centre I know of have failed to achieve this.
Bargara	Beach erosion in the marine park and storm threats to foreshore properties	Reduced threat of cyclones being beneath the tropics but ready and resilient. The community is “close” and may residents know each other. Beyond family and health, the local lifestyle is the most valued asst for most residents	This is a very strong sentiment and the reason that it is such a strong destination for retirees	There is a very strong respect of the environment without being “over the top” Communities work together and protect both flora and fauna and are quick to jump on any wrong doings	The sense of ownership is particularly strong and communities respect each other’s nuances.	I absolutely agree, however government red-tape is seen as the number 1 hurdle and often deters community involvement	To maintain Bargara’s sense of community where residents keep their identity. A safe, calm and relaxing atmosphere were strolling and alfresco dining are prominent. With a high demographic of retirees, golf, bowls plan a prominent part of sporting activities

Where is your location of Interest?	General Comments	We love where we live	We are deeply connected to place	We have a strong sense of ownership	We are tight-knit communities	We have a desire for self-organisation and self-reliance	We want to hand over the coast to our grandchildren
Innes Park	<p>Coastal Erosion</p> <p>Dune loss effected monthly by king tides & rainfall (when it happens)</p> <p>Safe access to beach</p> <p>Property values due to the unknown</p> <p>Dunes for the turtles</p> <p>Anxiety how long will the beach be here for, before our homes end up in the ocean</p>	<p>Completely utterly agree</p> <p>No other place like it</p>	<p>Whether talking about my home or the coast Innes Park, Bargara, Moore Park – its one and the same.</p> <p>Love living on the coast.</p> <p>How it makes me feel or any of my family when over my home feels like heaven on earth. My home has been there for 40 year, recently we have fixed erosion issues to help my property still be there in the next 40 years</p>	<p>When seeing the wrong thing happen, have the sense to speak up; stop damage in its tracks!</p> <p>Whether by machine or personal damage</p> <p>Want to have the opportunity to fix what needs fixing without red tape</p>	<p>Social no beach means difficult to work on beach, i.e. dog walking, which leads to social connection</p> <p>We need our beaches and parks to stay human and connect the old fashioned way/through joy of loving where we are which gives personal connection</p>	<p>Let homeowners fix what they need to easy access rules, cut out the fees and red tape. So we can all help ourselves, without risk of being fined for doing what is needed to help ourselves</p>	<p>Definitely want there to be all the parks, beach access and facilities for our grandchildren and so on.</p> <p>Put simple steps in place</p> <p>Letters to all coastal homeowners of what is allowed and what is not</p>
Woodgate Beach		<p>Access to each is important</p> <p>Beach should be safe</p> <p>4WD could be a problem</p> <p>Coastal recreation to be encouraged, i.e. sailing, fishing, etc,</p>	<p>Road access to be maintenance or not allow to be cut off by floodway/inundation</p> <p>Mangroves are essential as fish nurseries and are an essential connection for fisherman</p>	<p>Subtle guidance is needed.</p> <p>Many in QLD feel ownership allows virtually freedom to do as they wish</p>	<p>True for most of us, but this comment is based on events along the QLD/SE coast</p> <p>Some would allow self-interest to overcome community interest and values, i.e. clearing of dunes for views and increased property values.</p>	<p>A well thought out message is essential</p> <p>e.g. Why should we care the foreshore?</p> <p>Why is suitable dunal vegetation essential?</p> <p>Why would clearing dunal vegetation result in lower property values and eventually long-term retreat from coast.</p>	<p>COASTAL RETREAT IS NOT AN OPTION!</p> <p>The landscape will change. It has never been static.</p> <p>Plans must evolve with time and situation (2 people)</p> <p>Dunal and Foreshore management is essential</p> <p>Long Term – ingress of saltwater may render bore water useless for gardens, etc.</p>
Woodgate Beach	<p>If erosion continues to occur at Woodgate beachfront the sea will break through. If this happens road out (of the settlement) will be cut, property values fall and community enjoyment disappear.</p>	<p>Would disappear with sea intrusion.</p>	<p>Wide beaches mixed with nature plant and animal.</p>	<p>We want to stay here</p>	<p>Community helps one another</p>	<p>We participate in the planning process</p>	<p>They want to enjoy our values</p>

Where is your location of Interest?	General Comments	We love where we live	We are deeply connected to place	We have a strong sense of ownership	We are tight-knit communities	We have a desire for self-organisation and self-reliance	We want to hand over the coast to our grandchildren
Woodgate Beach	<p>Beach erosion impacts beaches, in particular, at high tide where there is no beach.</p> <p>Family activity is not possible at this time</p> <p>An updated emergency evacuation plan is needed</p>	Visual erosion would detract from the overall beauty of the beach and views	It is enjoyable, quiet and very relaxed as a small community. Low crime	Ownership was demonstrated in the aftermath of 2013 cyclone	During the aftermath of 2013 cyclone, Woodgate residential assisted with beach clean up as Council resources were stretched because of the floods in Bundaberg	There are always a small enthusiastic group who will do things for the community i.e. weed, rubbish etc	Access to the township – one road in – out may be affected.
Walkers Point (Woodgate)	<p>Please note: for number 6 I am no interested in handing anything over to future generations of humans per se, but if I apply this same approach to conservation of natural environment, I can accepted it more happily.</p> <p>Number 6 for me could be better paraphrased as: we want to preserve our coast for its own intrinsic sake and the environmental values it embodies so that it may continue to exist in perpetuity.</p>	If the integrity of the environment (built, natural & cultural) is impacted beyond a certain level, then this value will be severely compromised.	Values here could change causing peoples behaviours to change – they could move away, develop negative attitude towards Council for a perceived lack of action regarding pertinent issues	People could become apathetic if assets are damaged and they are not able to participate in their management.	<p>Communities could become alienated from each other to their detriment.</p> <p>Narrow focus may prevent innovation and change and problem solving could be compromised.</p>		



ANNEXURE C

Consequence Assessment



Social Impacts upon Asset	
Catastrophic	Loss time: Scale of disruption: Other impacts:
Major	Loss time: Scale of disruption: Other impacts:
Moderate	Loss time: Scale of disruption: Other impacts:
Minor	Loss time: Scale of disruption: Other impacts:
Insignificant	Loss time: Scale of disruption: Other impacts:

Consequence Assessment



Environmental Impacts upon Asset	
Catastrophic	Loss time: Scale of impacts: Other:
Major	Loss time: Scale of impacts: Other:
Moderate	Loss time: Scale of impacts: Other:
Minor	Loss time: Scale of impacts: Other:
Insignificant	Loss time: Scale of impacts: Other:

ANNEXURE C2

Breakout 2 - Community Reference Group input into Consequence and Impact Assessment

CRG members to write in what they think catastrophic, high, moderate, low and insignificant impacts are. CRG's input will assist with consequence assessment qualitative definitions

Table 1 – Settlement Assets and Infrastructure

Asset / Feature	Residential Property	Council Infrastructure	Communications and Electricity Supply	Pathways, Boardwalks and Footbridges	Roads / Bridges	Water Supply and Waste Water Management	Stormwater and Culverts	
Level of Impact	Example impact	Impacts						
Catastrophic	Loss time: Scale of impacts: Other:	Total destruction Storms, floods, surges etc, Damage / cost / property value	Loss of WTP and WWTP. Loss of widespread communications at the same time. Widespread loss of electricity infrastructure (sub-stations, etc)	1 week Sewage disposal including health risks	Permanent Entire sections, settlement – wide, loss of tourism Loss of access to other features, recreation	2 weeks Social significant, medical, food supplies Loss of sole arterial road > 1 year bridge(s)	2 weeks 3 days No toilet flush etc, pumping of fresh water No water	1 day Access to properties, salt inundation, damage to assets, gardens, landscape, erosion Blockages, high tides, excessive rain
Major	Loss time: Scale of impacts: Other:	Damage moderate Less than total loss Personal stress / family dysfunction	Loss of WW and Water Supply Lines (pipes) > 30 days (assuming that water can be airlifted or otherwise provided) Loss of Council communications	1 day	1 year +/- Settlement – wide, takes time to repair due to red tape Costly repairs, tourism	1 week Loss of 1 or more connector roads removing vehicle access for communities	1 week 2 days No water Notice of event	12 hours Access to properties, salt inundation, damage to assets, gardens, landscape, erosion Blockages, high tides, excessive rain
Moderate	Loss time: Scale of impacts: Other:	External landscape Moderate damage Dealing with insurance	Inability to mobile debris removal – prevention of disease Total loss of disaster management control centre	Half day	Months Section. Take time to repair due to red tape, disabled access compromised Costly	2/3 days Water over road, < 6 hours, significant damage to road pavements, potential to damage stormwater routes	2/3 days 12 day No water Notice of event	8 hours Access to properties, salt inundation, damage to assets, gardens, landscape, erosion Blockages, high tides, excessive rain
Minor	Loss time: Scale of impacts: Other:	6 hours / close to Bundy 6 hours timing tides Stress – associated with unknown		> 2 hours	1 week +/- (temporary) Section Loss of foot access	Half day Water over road, < 3 hours, damaged road surface	Half day 12 hours No water Notice of event	4 hours Access to properties, salt inundation, damage to assets, gardens, landscape, erosion Blockages, high tides, excessive rain

	Asset / Feature	Residential Property	Council Infrastructure	Communications and Electricity Supply	Pathways, Boardwalks and Footbridges	Roads / Bridges	Water Supply and Waste Water Management	Stormwater and Culverts
Insignificant	Loss time: Scale of impacts: Other:		Short term loss of sewage capability and water supply Flooding of park, fallen isolated trees, localised fallen power lines	Half hour	+/1 day (temp) Limited and localised eg fallen tree, etc Neg (minor)	> half hour Water over road, < 1 hour, large potholes	> half hour 4 hours Total no water Notice of event	1 hour Access to properties, salt inundation, damage to assets, gardens, landscape, erosion Blockages, high tides, excessive rain

Table 2 – Environmental and Cultural Assets and Features

		Natural Areas	Beaches	Boat Ramps Parks Assets
Level of Impact	Example impact	Impacts		
Catastrophic	Loss time: Scale of impacts: Other:	Permanent Wide spread (unable to repair) across the region Loss of actual landscape, loss of biodiversity, extinctions (localised), impacting other industries: tourism, fisheries and infrastructure	1+ years Total loss of sand, dunes and vegetation No access, no visitors, beach closure, loss income, loss amenities, loss value, lifestyle impacts, liquidity loss Turtle nesting, social networking, non use of beach, environmental, properties, valuations, cost, stress Loss of access, tourism.	Permanent Loss of tourism, recreational fishing, loss of water oceans, public amenities
Major	Loss time: Scale of impacts: Other:	+ 1year Wide spread (across most of the region), difficult to repair Impacting other infrastructure – creating a 'new normal'	6-12 months Major beach erosion No access, no visitors, beach closure, loss income, loss amenities, loss value, lifestyle impacts, liquidity loss Turtle nesting, social networking, non use of beach, environmental, properties, valuations, cost, stress	1-2 years No public amenities, community, angst, severe complaints
Moderate	Loss time: Scale of impacts: Other:	+/- 6 months Localised pockets Requires landscape intervention (revegetation, fencing, groundworks etc)	3-6 months Minor beach erosion 2 weeks No access, no visitors, beach closure, loss income, loss amenities, loss value, lifestyle impacts, liquidity loss Turtle nesting, social networking, non use of beach, environmental, properties, valuations, cost, stress	6-12 months Access difficulties

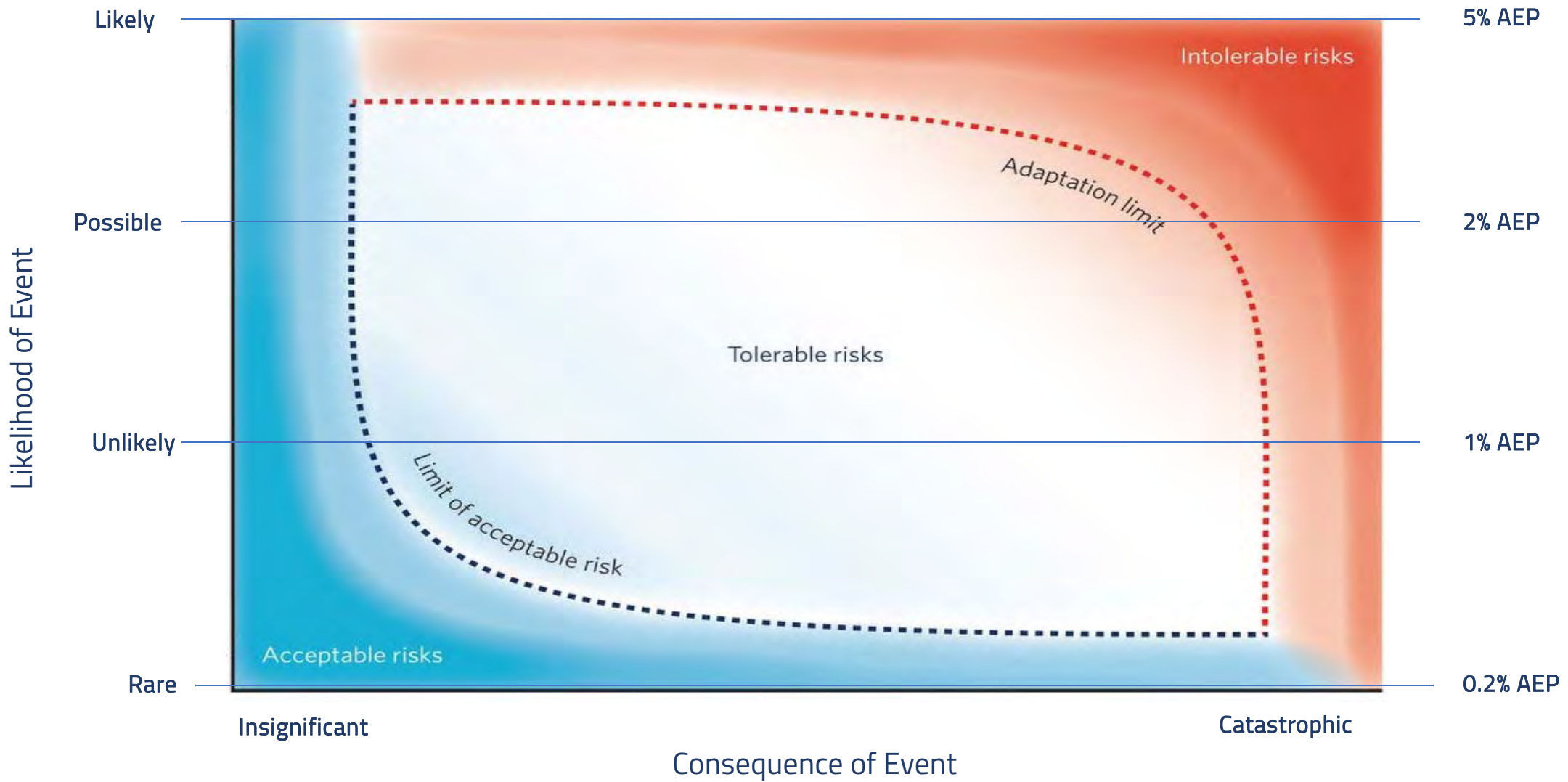
		Natural Areas	Beaches	Boat Ramps Parks Assets
Minor	Loss time: Scale of impacts: Other:	1 week +/- (temporary) Localised Change in the appearance of the landscape (short – term)	7 days Partial beach erosion, expectation of renewal Restricted beach access, short term visual amenity, temporary lifestyle inconvenience, no access at high tide Turtle nesting, social networking, non-use of beach, environmental, properties, valuations, cost, stress	1-6 months Loss of access to water, public safety issues
Insignificant	Loss time: Scale of impacts: Other:	1 day + (temporary) Natural regeneration within an ecological acceptable timeframe Isolated and impacting individuals rather than entire ecosystem Limited (just inundation – no permanent damage)	2 days Tide coming and going of dune growth and depletion As above, minor public safety issues with access (barricading) Sand coming and going Temporary lack of movement on beach by pedestrians	Up to 1 month Community frustration, lack of access to facilities



ANNEXURE D

ANNEXURE D1

Break out 1: Activity

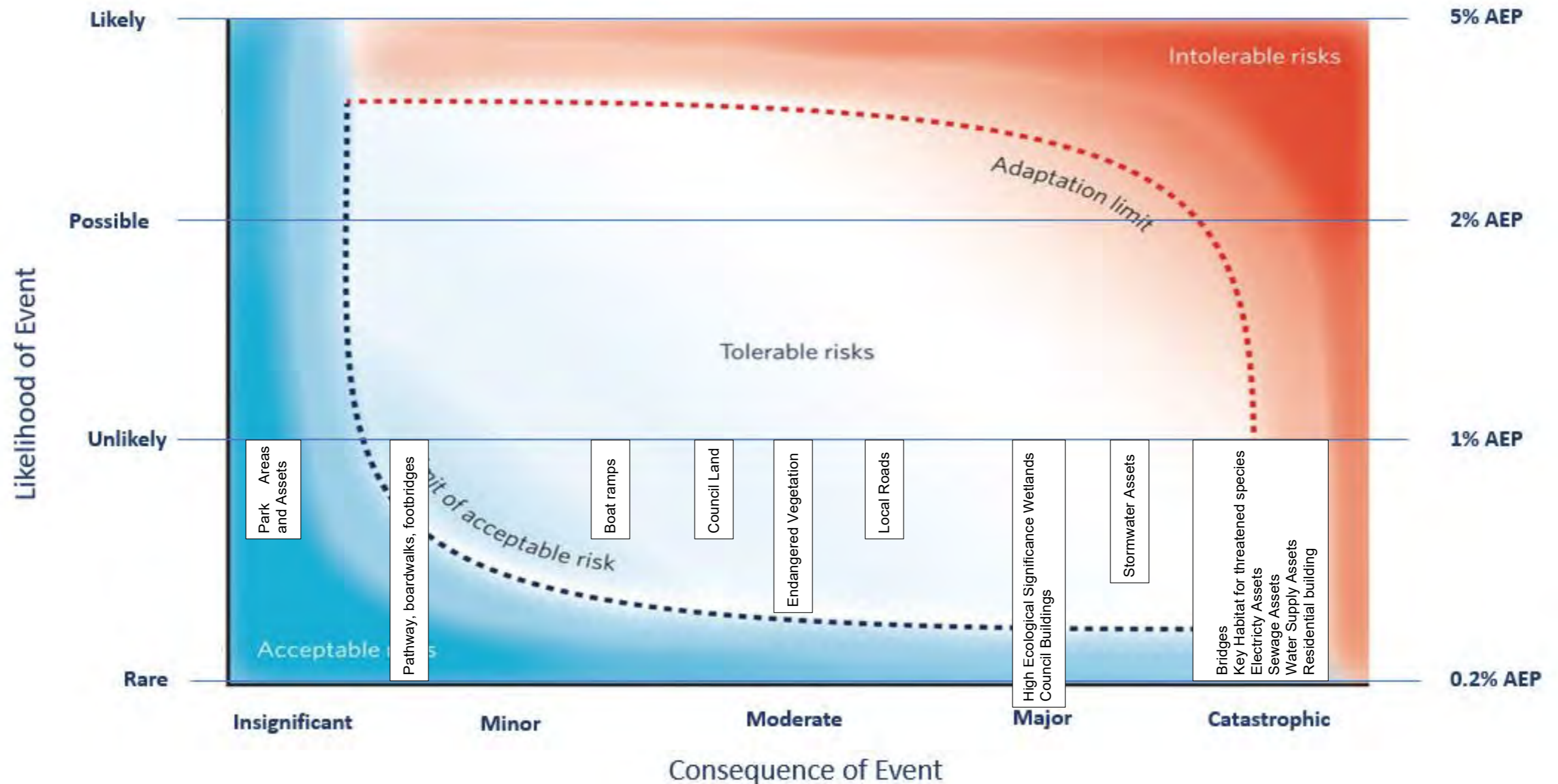


ANNEXURE D2

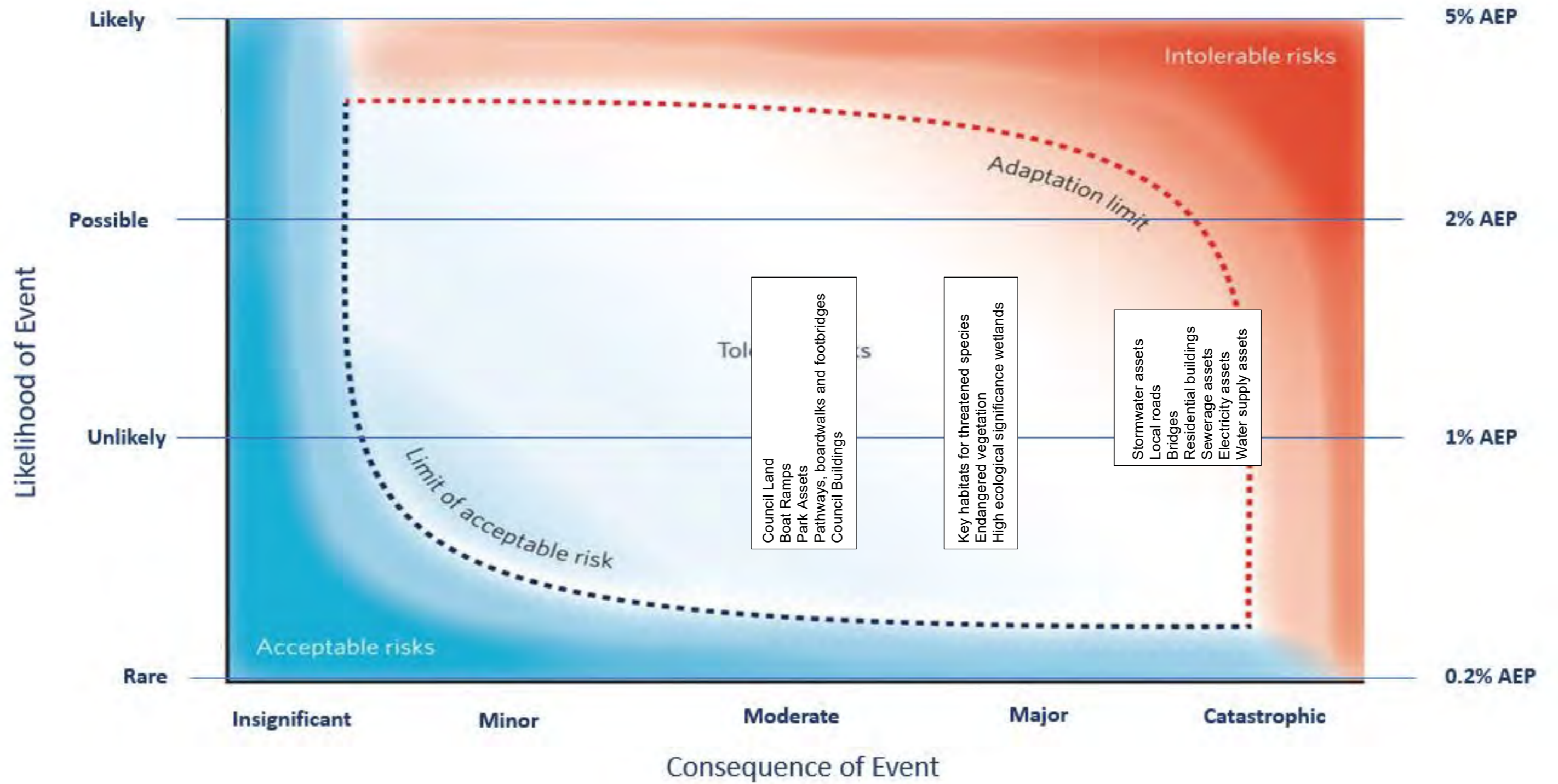
Breakout Activity 3 – Community Reference Group input into the Risk Acceptability and Tolerability

Discuss assets that are exposed to Coastal Hazard. Asset Labels to be 'stuck' onto the Acceptability / Tolerability graph. This task will provide the team a baseline understanding current management options and acceptability (or not) of current risk treatments.

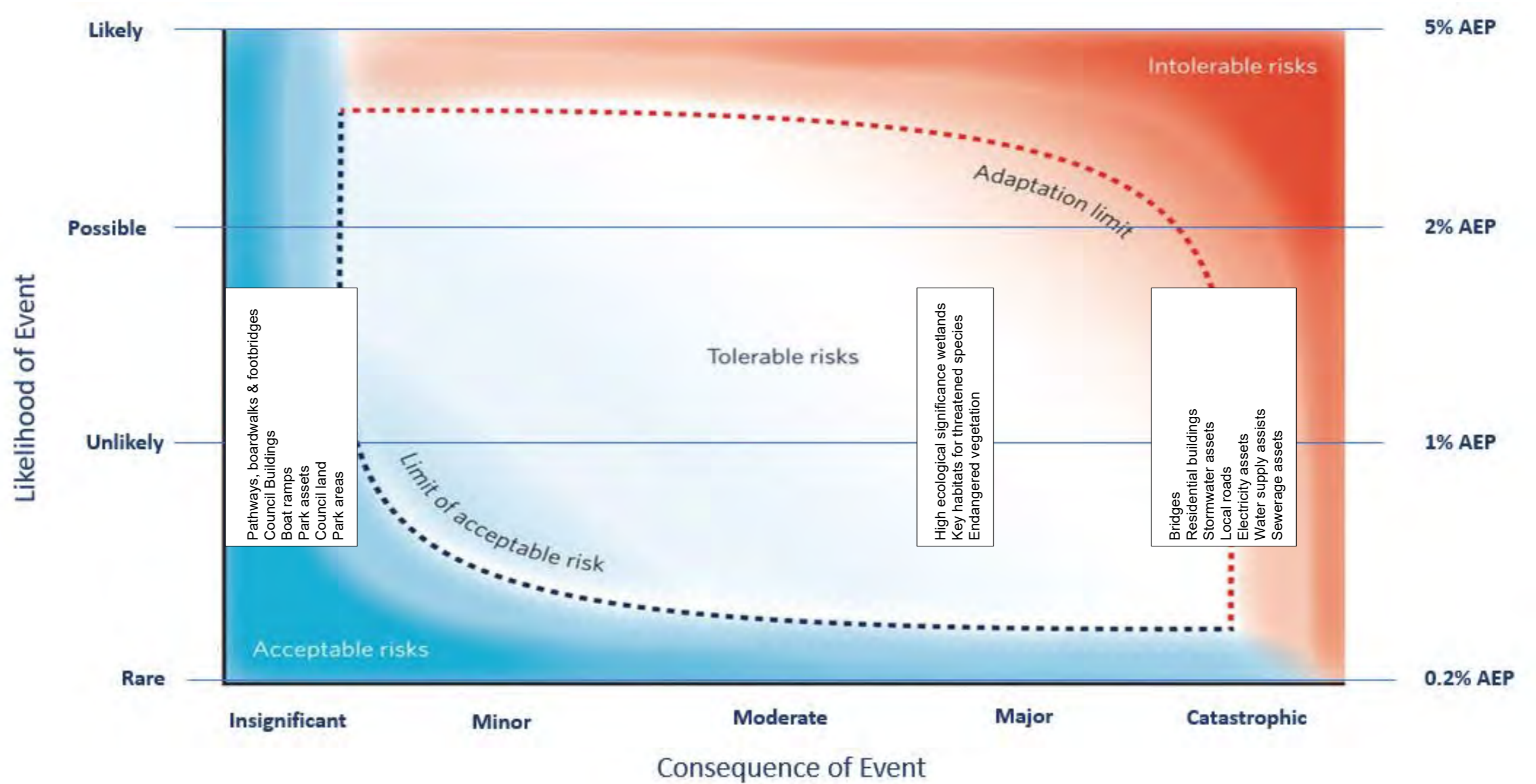
Group 1 - Acceptability / Tolerability



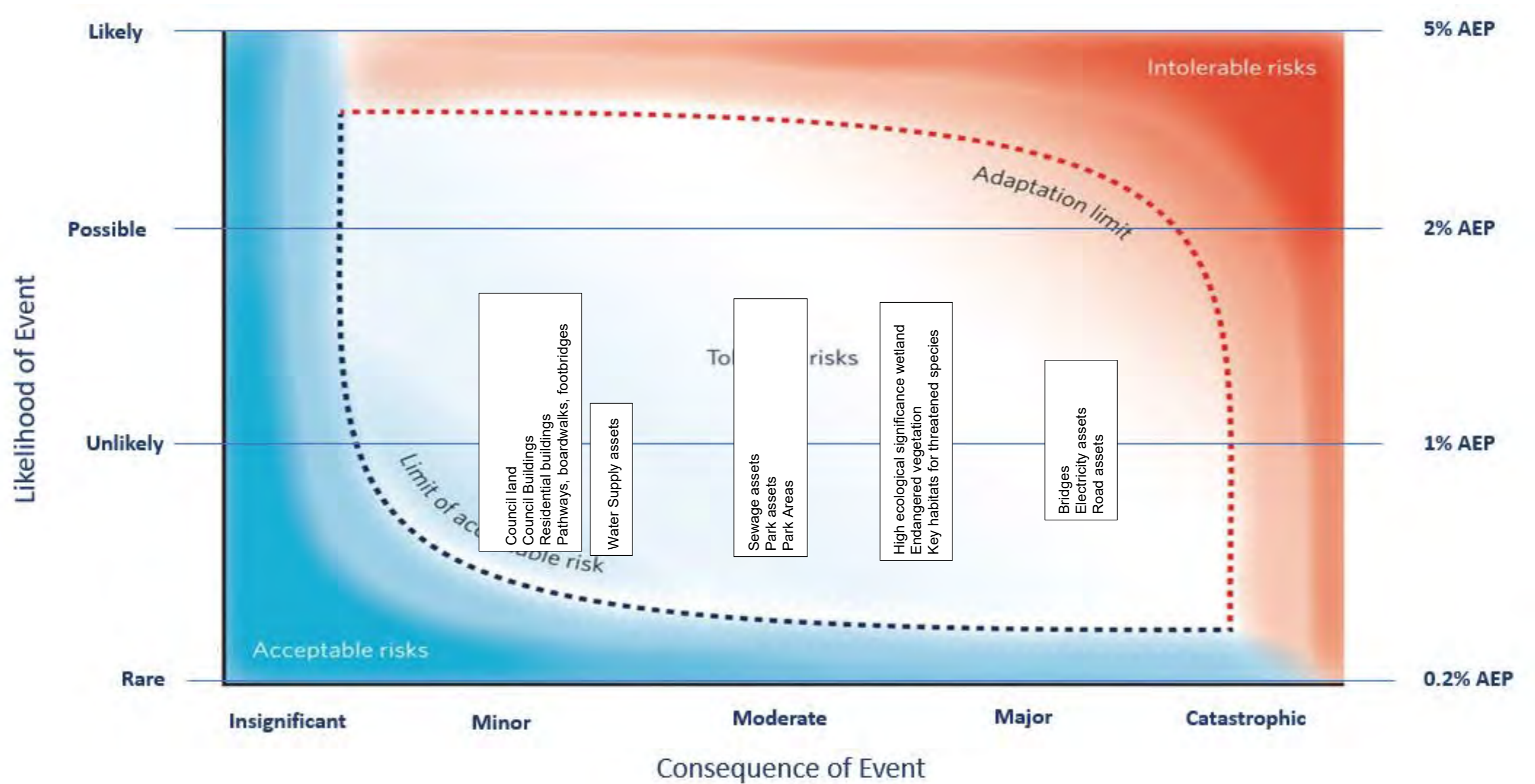
Group 2 - Acceptability / Tolerability



GROUP 3 - ACCEPTABILITY / TOLERABILITY



GROUP 4 - ACCEPTABILITY / TOLERABILITY





ANNEXURE E



ANNEXURE E

Brain Storming Scoping Exercise - Adaptation Options:

- Free location for rocks drop off for rock walls - future beach rehabilitation
- Planning options different e.g. Elliott Heads - Burnett Heads - to Woodgate
- Building controls
- Sound environmental knowledge & mapping – flora/fauna and human
- Groynes
- Beach recharge/nourishment
- Retreat development
- Education and awareness – coastal festival
- Public hazard risk reduction
- Dune revegetation
- Information sessions to residents - on foreshore - what to do re dune revegetation
- Artificial reefs
- Emergency management plans
- Structural – move key infrastructure / lifting road access
- Evacuation education
- Sea walls
- Green construction - mangrove forests
- Partnerships with federal & state governments
- Seed bank for native vegetation
- Landcare as a supplier of native vegetation
- More water for tourism recreation
- Rezoning of land to increase tourism, e.g. Caravan parks
- Rezoning of land to increase buffer zones
- Back-zoning of land back to former zone - compensation
- Education tourists – local values
- Mobile sea school for youth



MINUTES OF MEETING

Bundaberg Coastal Hazard Adaptation Strategy Community Reference Group (CRG)

Held At:	Function Room, Bundaberg Regional Council Administration Centre 190 Bourbong Street, Bundaberg
Date & Time:	Thursday, 15 August 2019 – 4 pm to 6.30 pm
Present:	<i>CRG Members</i> –Chris McLoughlin, Heath Greville, Lloyd Blake, Jennifer Parry, Collin Turner <i>Council</i> – Cr Bill Trevor (Chair), Cr Wayne Honor, Cr Scott Rowleson, Cr Greg Barnes, Dwayne Honor (Project Manager), Evan Fritz (Strategic Planning), Sally Obst (Natural Areas), Natalie McDonald (Administration) <i>Project Consultant</i> – Richard Sharp (Water Technology); Facilitator: Neil Dufty (Molino Stewart)
Apologies	<i>CRG Members</i> – Josephine Ferris, Julie Fauser, Robert Bell, Shanelle Pekin, Sharon Jackson, Joe Russo, Tony Ricciardi, Russell Stewart, Ian Graham, George Martin, Terry Kelly <i>Council</i> - Cr Jason Bartels, Beth Whitworth (Disaster Management)

BUSINESS OF MEETING

1. Introductions and Welcome (Dwayne Honor)

Dwayne Honor welcomed all to the meeting advising that we were now moving to the tail end of the project. He also welcomed project consultant, Richard Sharp from Water Technology and Facilitator, Neil Dufty of Molino Stewart and Councillors Bill Trevor (Chair), Wayne Honor, Greg Barnes and Scott Rowleson.

The minutes of the previous meeting as circulated to all in attendance at the meeting (with a copy having previously being emailed to the CRG members) were accepted as read and are to be published on the Our Coast website.

Dwayne Honor explained a lot of work has been done recently on the risk assessment component, with the previously scheduled meeting being cancelled for the project team to interpret and analyse the data and technical information. He hoped tonight's presentation would be straightforward. Having looked at vulnerability and risk assessment, we now need to consider adaptation options and what to do about this risk - identifying mitigation options (Phase 6 of the project).

2. Previous CRG 5 Recap & Settlement Visions (Project Team)

Richard Sharp recapped on the previous CRG meeting – *Refer Powerpoint presentation (Annexure A)*:

- Progress of vulnerability and risk assessment
- Validating the consequence scale assumptions
- Visioning - Resilient Society, Resilient Environment, Resilient Economy, Resilient Settlements
- Categorising Settlements.

3. Summary of Priority Areas and Assets - Brief (Project Team)

Richard Sharp presented a series of graphs displaying the changing levels of risks for sea level rise scenarios of present day, 0.2 m, 0.4 m and 0.8 m for the main settlement areas, and then a slide displaying the critical assets for each settlement vulnerable to intolerable risks - *Refer Powerpoint presentation (Annexure A)*.

Dwayne Honor provided further clarification on the meaning of the graphs. Coonarr Beach was used as an example, at 0.2 m sea level rise the risk rating moves from low (present day) to high/extreme. This is due to Coonarr Beach Road being permanently inundated by sea water and becoming impassable, ultimately resulting in permanent isolation and an intolerable risk to the community. In summary, the risk profile graphs are giving us an understanding of what would occur if we adopted a “do nothing” approach. This is important for us to understand, as it will underpin the adaptation options that we are now looking to develop which will focus on reducing those areas of intolerable risk back to intolerable and use sea level rise increments as our triggers for action. The work tonight is about what we can do to reduce or eliminate the intolerable risks.

From the Asset Exposure table, it was noted that at 0.8 m sea level rise, the percentage of stormwater mains at risk indicated 9% and education institutions 7%.

“A rough rule of thumb – approximately a 1 cm rise in sea level on gently sloping beach will bring the water 1 m further landward.”

Cr Trevor raised that with the trigger based approach, if any climate scenario is realised, Council should be in a good position to have State approvals underway or already sought to proceed with any actions. The CHAS will be vehicle to highlight what these things need to be for us to proceed with confidence. He also raised concerns regarding the financial impact of future predicted triggers not being realised. Richard Sharp stated that with this approach, a plan is put in place should certain triggers be realised, however, if they do not occur than no or limited action will be required and this provides Council a proactive way to manage future climate risk along the coastline.

An introduction was given to the four adaptation concepts – avoid, defend, accommodate and retreat; with picture examples circulated around the table - *Refer Annexure B*.

4. Breakout Activity 1 – Adaptation Categories (Facilitator – Neil Dufty)

Members reviewed benefits and concerns (pros and cons) of four high level adaptation options - Avoid, Retreat, Accommodate and Defend.

The benefits and concerns discussed and identified by the CRG members are noted at *Annexure C*.

5. Breakout Activity 2 – Settlement Specific Options (Facilitator – Neil Dufty)

Ranking of adaptation options for each of the priority settlement areas – Members provided with settlement triggers and proforma to identify and score each option identified for the settlement.

The CRG member identified and scored the adaptation options for five key community areas (Moore Park Beach, Bargara, Innes Park/Coral Cove, Coonarr, and Woodgate Beach/Walkers Point). – Refer *Annexure D*.

6. Breakout Activity 3 – Future Scenario Planning (Facilitator – Neil Dufty)

CRG members participated in small groups with a priority settlement provided to each group to consider possible triggers and adaptation options for future scenarios, e.g. 0.4 m, 0.8 m sea level rise. Key Question: Is there a scenario where “accommodate” or “defend” is not an option?

Each group considered and noted where risk becomes intolerable, and what measures may be undertaken for their assigned priority settlement (Moore Park Beach, Kellys Beach (Bargara), Innes Park and Coral Cove, Coonarr, Woodgate Beach/Walkers Point) for the respective sea level rises - Refer *Annexure E*. The columns represent the sea level rise trigger, those highlighted yellow are considered intolerable (i.e. Coonarr Beach 0.2 m is intolerable). The red arrows represent where the CRG members considered action would be required to start, stop or continue. Again using Coonarr Beach as an example, raising the road to retreat or access was considered something that should start to be planned from now and ultimately implemented prior to 0.2 m being reached. Whereas, artificial reefs to buffer the impacts of sea level rise were considered something that should be started at 0.4 m sea level rise onwards.

7. Summary and Refine (Richard Sharp & Neil Dufty)

Neil Dufty thanked all for attending and their time and contribution into the workshop. The information collected at tonight’s workshop will be analysed with the work Water Technology is undertaking and will be presented for review in the later stages of this project. He expressed he had learnt a lot from the process and hoped the members had too, with the workshop activities not just being an exercise in filling in the sheets, but part of the whole process in reaching an end result.

Richard Sharp concluded that fantastic work had been done tonight. From the work undertaken based on a settlement approach of five key priority areas, it is recognised that different settlements are subject to different risks and adaptation pathways. A suite of adaption options will be produced which will help shape how we move forward into phases 7 and 8 of the project. Phase 7 will look at cost analysis/benefit.

The initial consultation process and work for the CHAS will provide a baseline strategy. As time progresses, with availability of more information and the refinement of processes there will need to be subsequent revisions, e.g. possibly a review in 5-10 years' time, dependent upon what is deemed most relevant by Council. In the United Kingdom, they commenced the process in 1996 and have a fairly mature understanding of climate risks. Cr Honor expressed this initial work provides a basis for future generations to develop with clear understanding and knowledge of future risks and ensures informed decisions can be made wherever possible.

Dwayne Honor advised there is no right or wrong pathway in this process being used to develop the CHAS. This is a strategic body of work using a minimum standards and guidelines document from the QCoast 2100 program, but this needs to be locally relevant. The project team is doing a lot of technical work in parallel which is then being validated with the community reference group and Council. He noted the issue raised that some areas are not identified in the risk mapping and advised this will be a process of continuous improvement as information and modelling is updated. The maps are for planning purposes and developed for scenario planning and informed discussion of adaption options.

Bundaberg Regional Council is one of the furthest advanced of similar sized coastal councils in Queensland, apart from the smaller Whitsunday and Douglas Regional Councils who have completed their CHAS.

The CRG members indicated that it had been a good session; being very informative, interesting and thought-provoking, with different discussions and scenarios giving rise to different thought patterns. Dwayne Honor encouraged feedback at any time and invited CRG members to send through their comments to the *OurCoast* email address.

8. Where to From Here? – Next Meeting

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance.

9. Closing:

The Project Manager and Chair thanked all for attending.

This concluded the business of the CRG Workshop at 6.25 pm.

Cr Bill Trevor, Chairperson
OUR COAST Community Reference Group

ANNEXURE A



OUR
COAST

Investing today for a resilient tomorrow

Welcome!

Bundaberg Region Coastal Hazard Adaptation Strategy

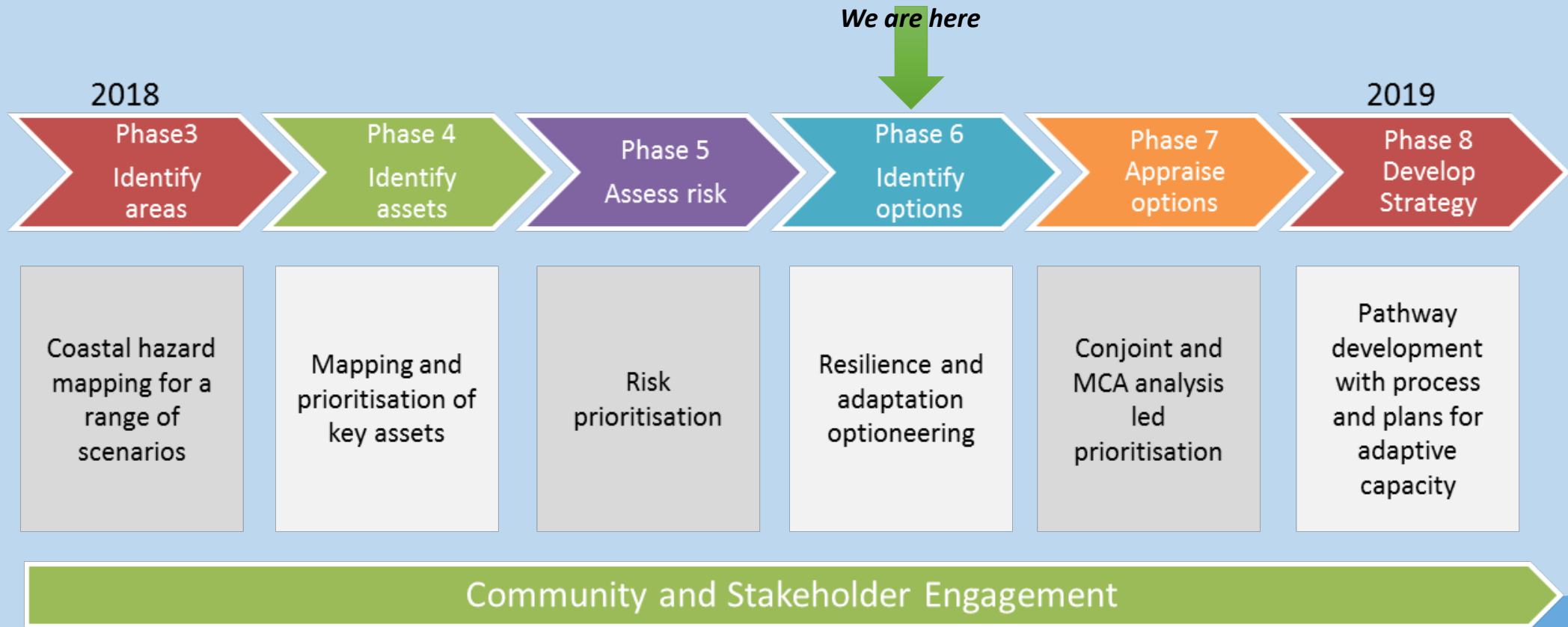
Community Reference Group Workshop #6
4 to 6.30pm
15 August 2019



Agenda

Item	Lead	Timing
Introductions	Dwayne Honor	5 mins
Previous CRG 5 Recap	Project Team	10mins
Summary of priority areas and assets	Project Team	10mins
Break out activities		
1. Adaptation categories	Facilitated session	20 mins
2. Settlement specific options	Facilitated session	20 mins
3. Future scenario planning	Facilitated session	20 mins
Summary and Refine	Project Team	10mins
Where to from here?	Dwayne Honor	5mins

Our Coast Update



Previous CRG Recap

Vulnerability and Risk Assessment progress and early outputs

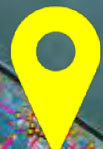
Validating the Consequence Scale assumptions

Visioning activity about what 'Resilience' looks like across four themes
'Settlements', 'Environment', 'Economy', and 'Society'.





Moore Park Beach



Previous CRG

- Legend**
- Coastal Area Boundary
 - Erosion Prone Area (1% AEP + 0.8m SLR)
 - Storm Tide Inundation (1% AEP Present Day SLR)
 - Storm Tide Inundation (1% AEP + 0.8m SLR)
- Building Footprints**
- Commercial and Industrial Buildings
 - Non-Habitable Buildings
 - Residential Buildings
- Assets and Infrastructure**
- Council Assets
 - Council Land
 - Natural Land
 - Economic Land
 - Roads
 - Stormwater Infrastructure
 - Electricity Infrastructure
 - Water and Sewerage Infrastructure

Burnett Heads



VULNERABILITY

Previous CRG

We contributed to visions for a
Resilient Society – Resilient Environment – Resilient Economy – Resilient Settlements
Do some places have different futures to others?



Since previous CRG – Settlement Visioning

How?





Extract vision statements for coastal settlements and townships to 2031 from the Bundaberg Regional Planning Scheme 2015

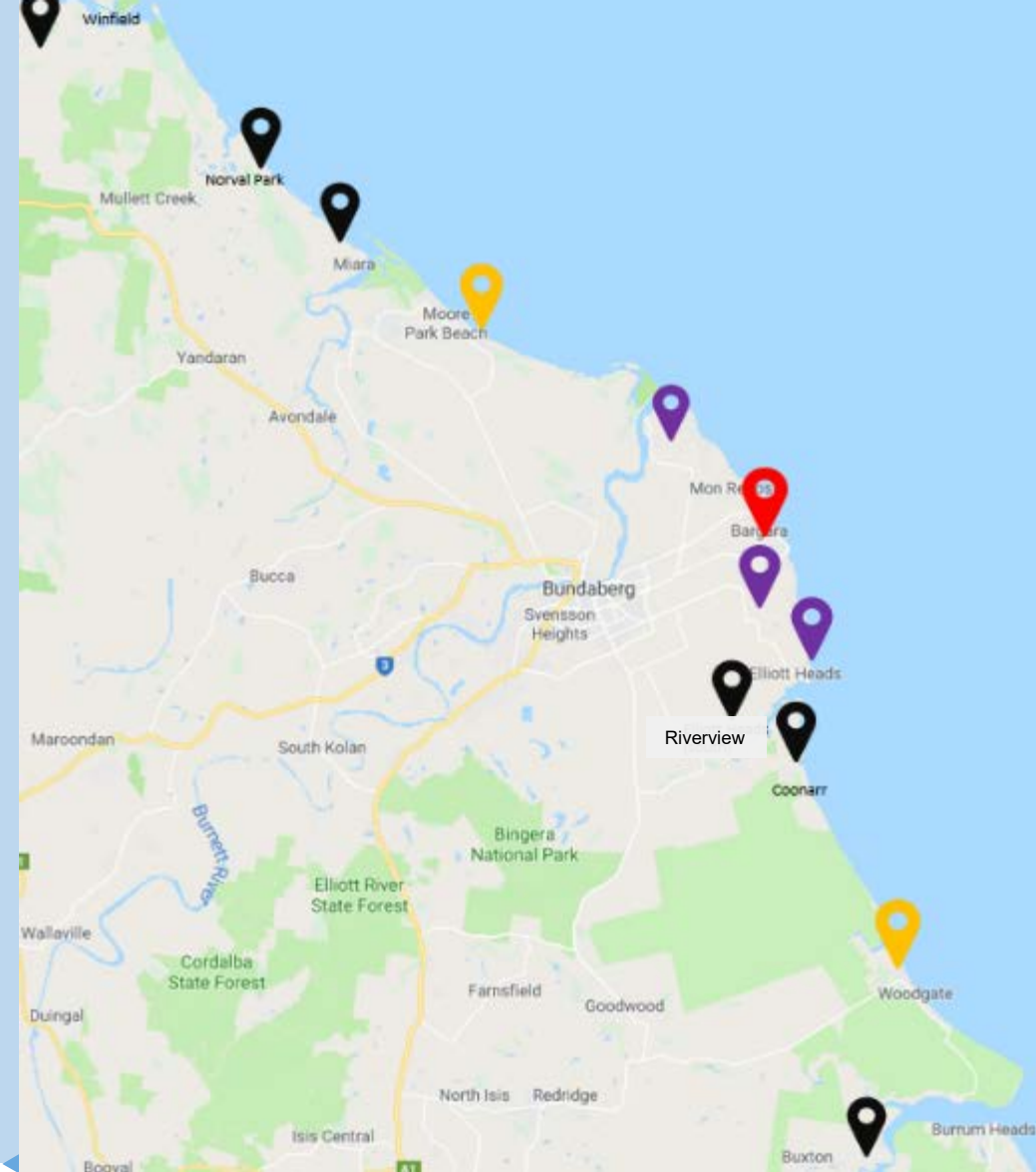
Why?

To determine existing growth intent for each settlement AND understand the implications of coastal hazard risks upon the vision



Settlements were categorised by pattern of growth and infrastructure vision into 'place typologies'

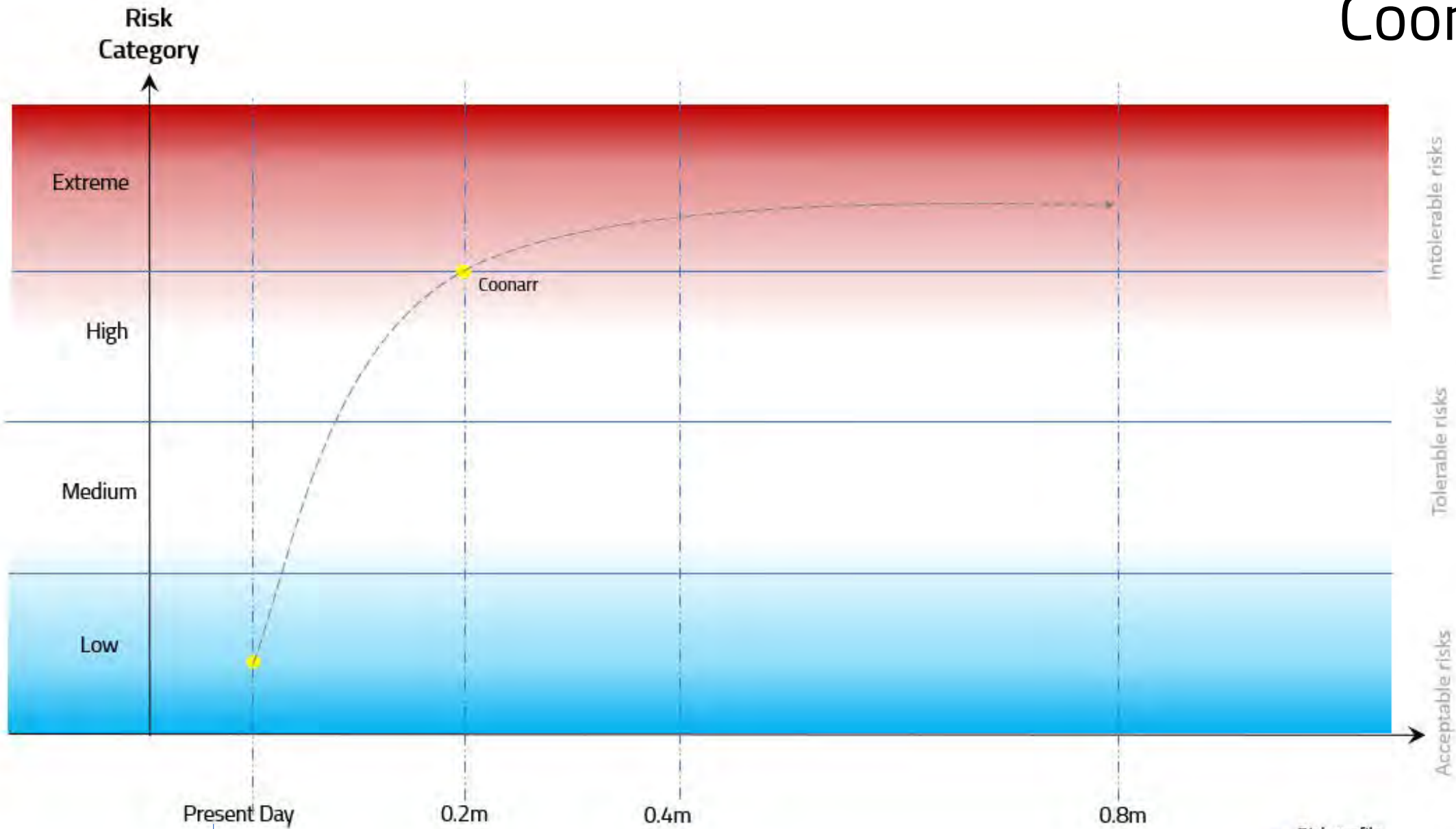
-  **Destination Coastal Growth Hub** for Bargara reflecting its primacy in the coastal urban growth plan;
-  **Coastal Townships** for Moore Park Beach and Woodgate reflecting small amounts of local centre and community use zones with services sufficient to support residences and modest growth visions;
-  **Coastal Growth Centres** for Burnett Heads, Innes Park, Coral Cove and Elliott Heads reflecting their role in providing residential growth and supported by services at Bargara; and
-  **Coastal Character Villages and Localities** of Buxton, Winfield, Miara and Coonarr reflect the visions for limited growth and services



Priority Areas

The following slides show the locations subject to intolerable coastal hazard risk.

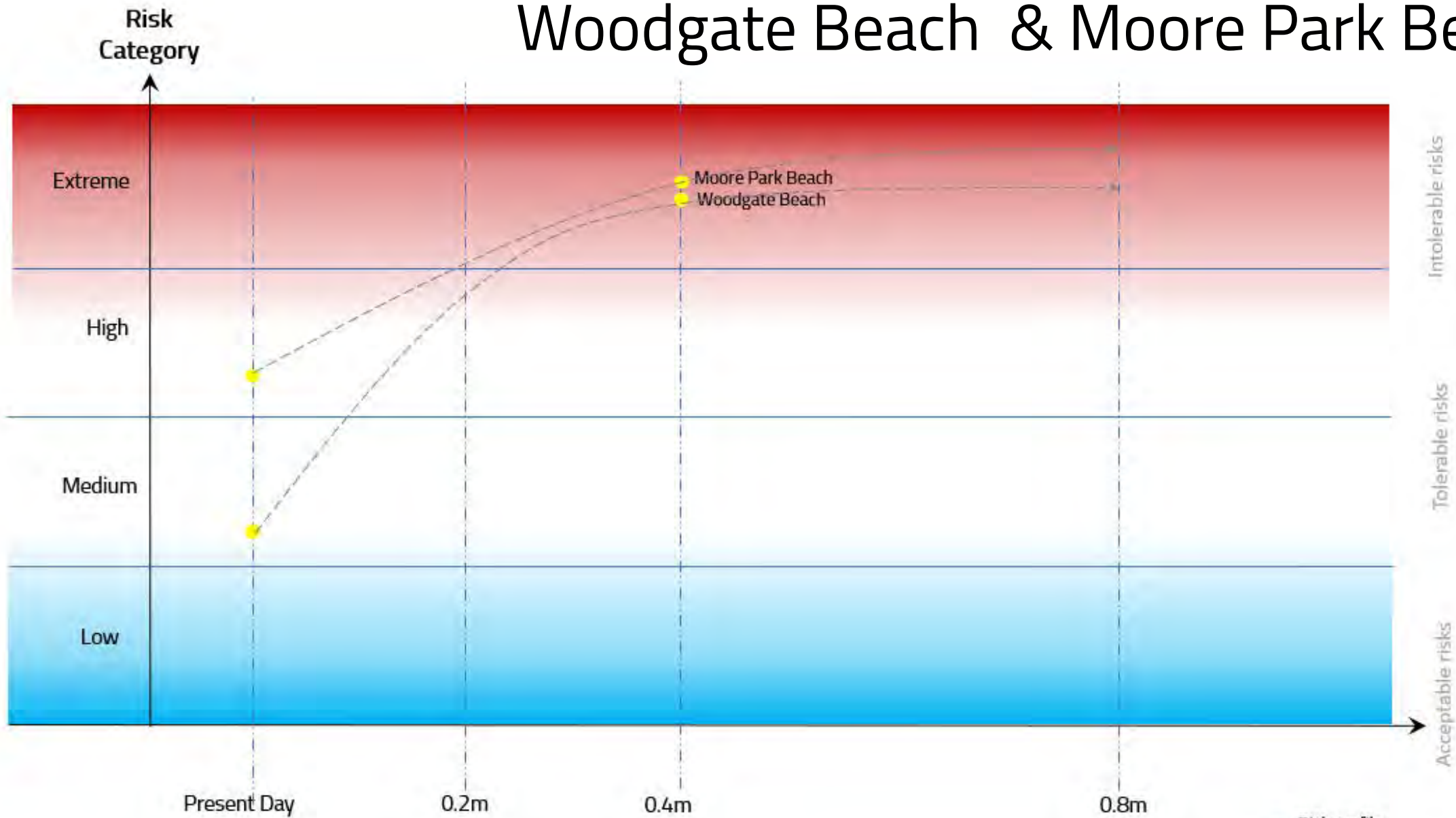
The graphs represent the changing level of risk in different sea level scenarios. These show the **'trigger' points** where we may need to **act to reduce or eliminate intolerable risks**.



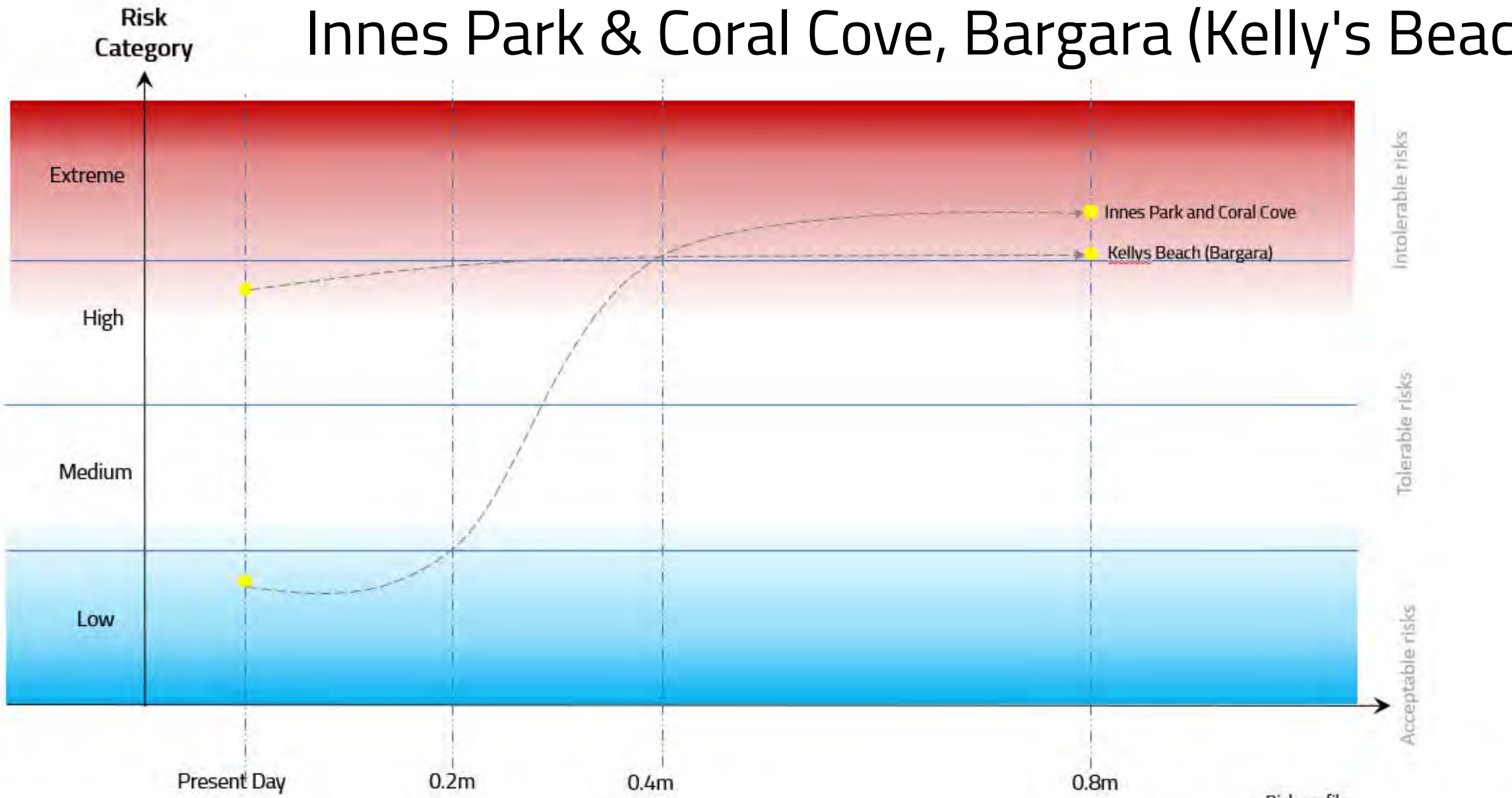
Sea-Level Conditions

- Risk profile
- Risk from storm tide inundation
- Risk from coastal erosion

Woodgate Beach & Moore Park Beach



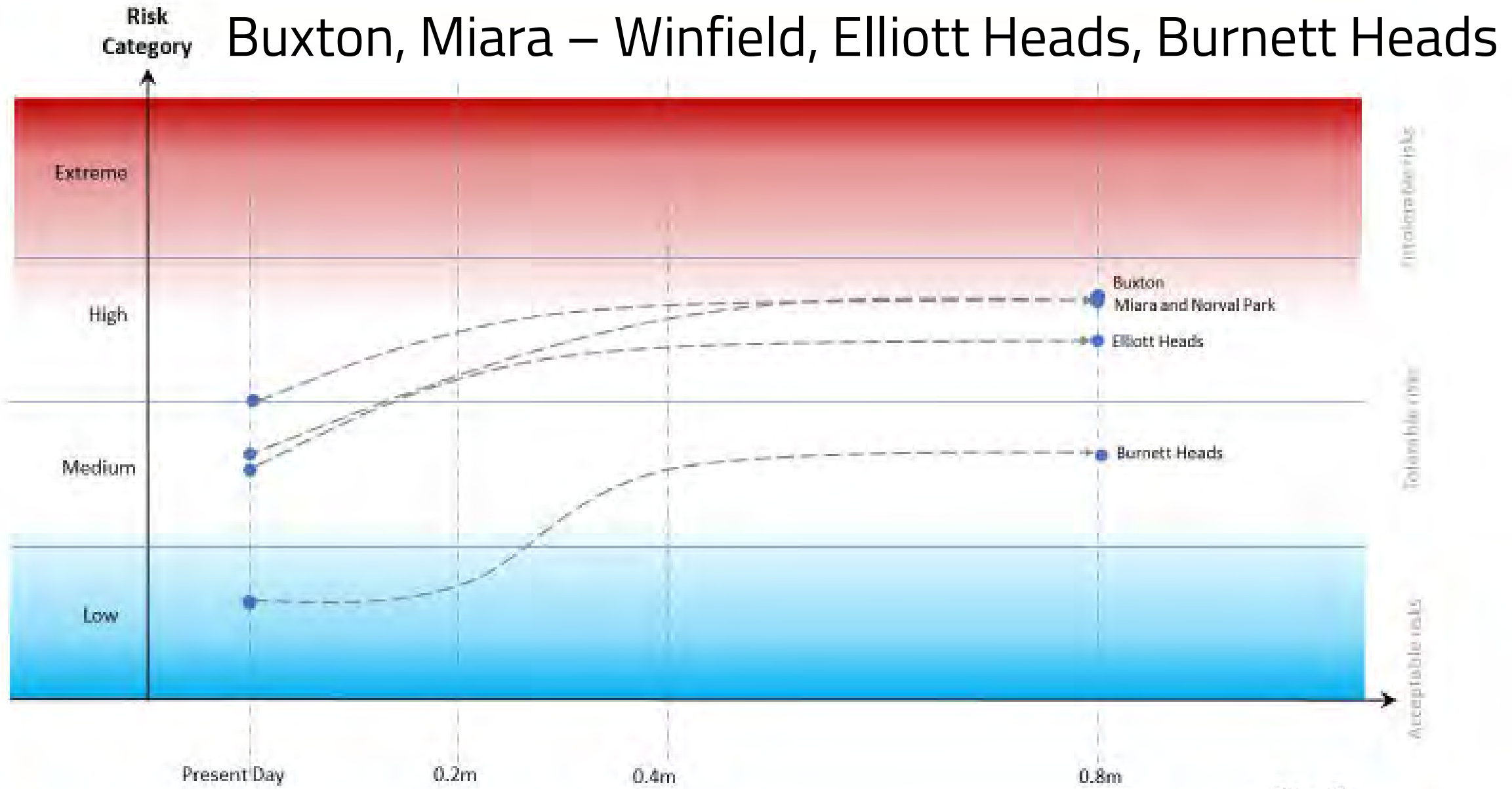
Innes Park & Coral Cove, Bargara (Kelly's Beach)



Sea-Level Conditions

- Risk profile
- Risk from storm tide inundation
- Risk from coastal erosion

Buxton, Miara – Winfield, Elliott Heads, Burnett Heads



Sea-Level Conditions

- Risk profile
- Risk from storm tide inundation
- Risk from coastal erosion

Bundaberg Regional Council Coastal Hazard Adaptation Strategy

Phase 4 and 5 report summary

Asset exposure

Asset	What percentage of assets are at risk from storm tide inundation and coastal erosion?		
	Present Day	0.4m Sea Level Rise	0.8m Sea Level Rise
Residential buildings	1%	2%	3%
Roads / access	1%	1%	2%
Powerlines	1%	1%	2%
Water supply mains	1%	2%	4%
Stormwater mains	2%	6%	9%
Sewerage mains	1%	1%	2%
Educational institutions	4%	5%	7%
Environmental	33%	36%	36%

A rough rule of thumb...

Approximately a 1 cm rise in sea level on a gently sloping beach...

...will bring the water 1 m further landward

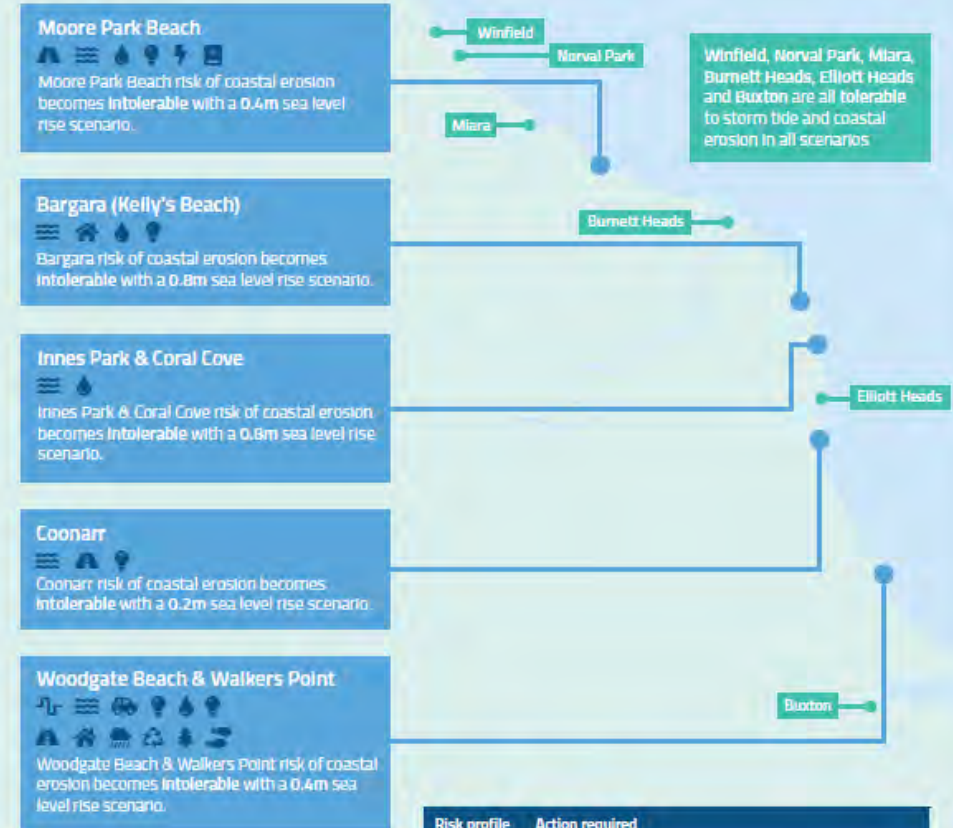


Risk and vulnerability assessment

Based on community feedback, research and stakeholder engagement the project has developed a risk and vulnerability assessment to prioritise assets considered key to council and the broader community.

Each coastal community has different assets and different levels of tolerance to the risks associated with coastal erosion and storm tide inundation.

A range of future climate predictions has been assessed including 0.2m, 0.4m and 0.8m of sea level rise.



Risk profile	Action required
Intolerable	Immediate action required to avoid or reduce the risk
Tolerable	Short to medium term action required to avoid or reduce the risk
Acceptable	Accept risk - take no action

In Phase 6 Council will identify adaptation options to reduce or eliminate the intolerable risk to these priority locations and assets.

Questions?

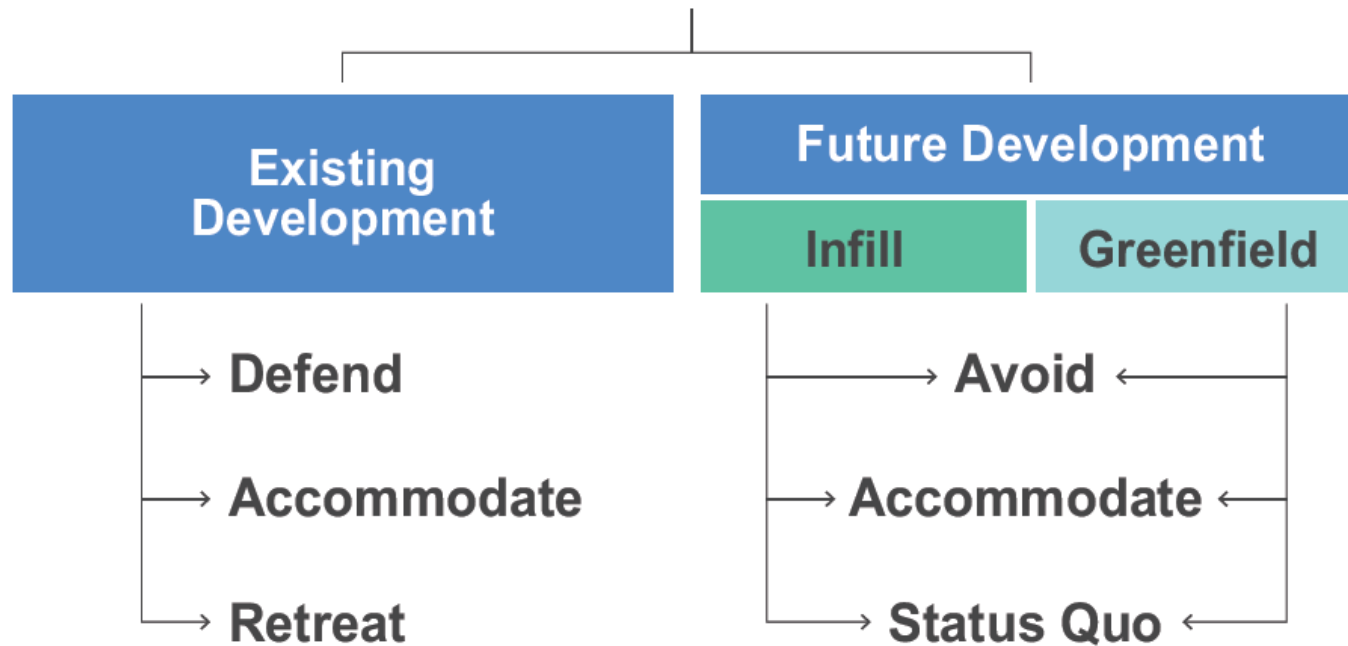


Breakout Activities



Adaptation Categories

Decision Tree for Coastal Hazard Adaptation Options



Break out 1: Adaptation Categories

- **Avoid**
- **Retreat**
- **Accommodate**
- **Defend**

Review benefits and concerns with four high level categories.

World Café / Round-robin style
Have a turn at each station

Short Break



Settlement Specific Options

Consider Adaptation Options across the four categories for each of priority areas.

In your opinion, score the option 1-10

Based on whether this option will help achieve the vision, eliminate or reduce risk, and it's appropriateness for that area.



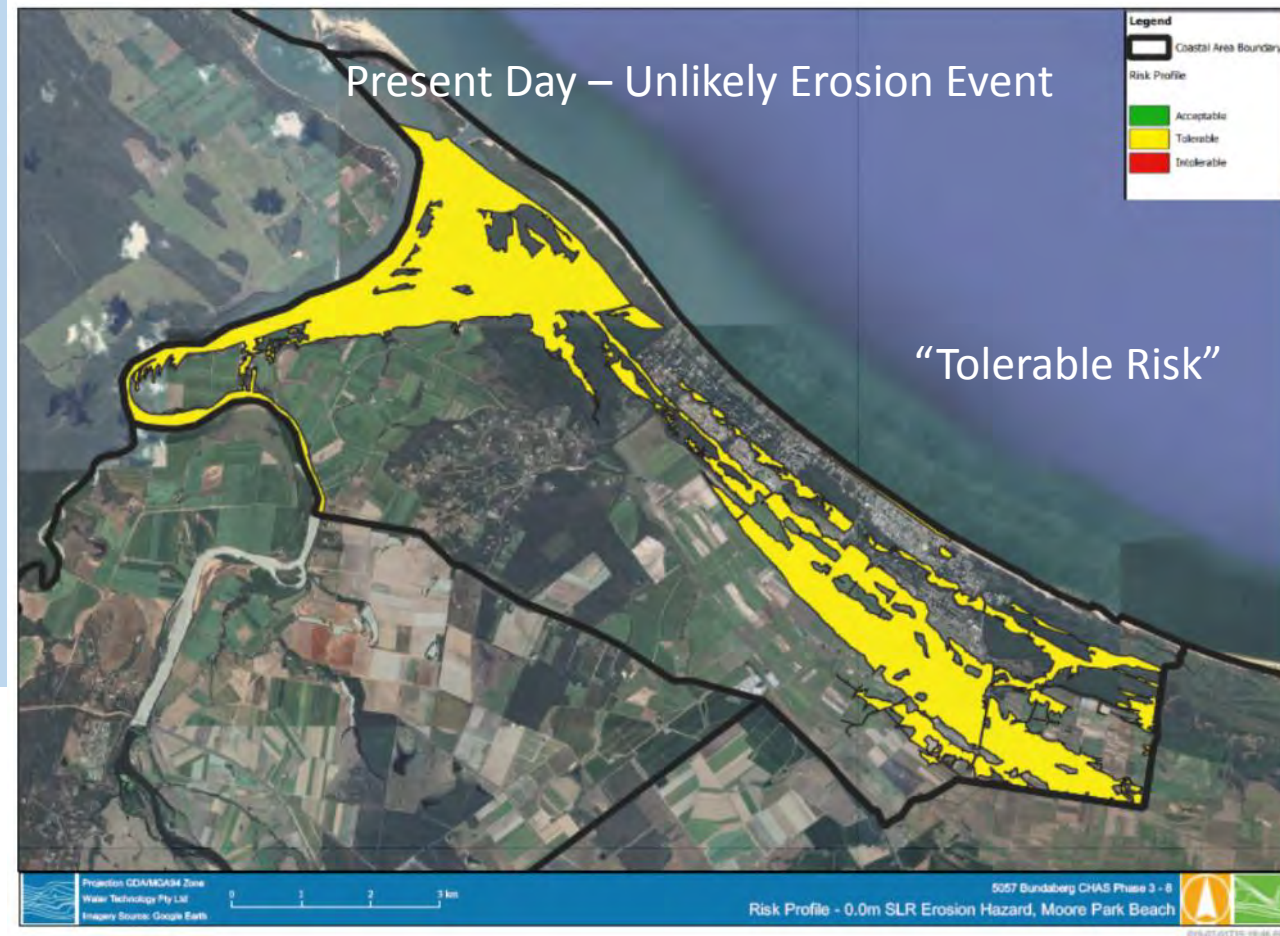
Break out 2: Settlement Specific Options

Using the:
"Compendium" of
Adaptation
Options,
Triggers,
Proforma.

In Pairs or
individually:
Which Options
are suitable for
which
settlement?

Identify and then
rank the
adaptation
options for each
settlement

Scenario Planning – Priority Areas



Break out 3: Scenario Planning

Using:
Trigger points,
Understanding of
Adaptation
Options.

In Small Groups:
Unpack potential
future adaptation
options if the
settlement
reaches the
certain "trigger"

Is there a
scenario when
'defend' or
'accommodate'
are no longer an
option?

Summary and Refine



Where to from here?

During each phase we will seek your feedback and broad agreement as the CHAS develops:

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance

September 2019

Phase 8 – Strategy and Implementation Plan linked to resilience baseline improvements coupled with development of monitoring and evaluation process

October 2019

Questions?



ANNEXURE B

Adaptation options



Avoid

Avoid the risk (e.g. develop new urban areas elsewhere or construct new infrastructure in low hazard areas)

Low Cost

Long-Term protection



Identify future 'no-build areas' and use planning tools to prevent new development in areas at risk now or in future





Source: <http://www.marinebusiness.com.au/news/marina-development-planned-for-burnett-heads>

Land-use planning



Avoid the risk



Source: https://www.bundaberg.qld.gov.au/files/BRC_RUBYANNA_NL_Issue_7_Web.pdf

New infrastructure



Avoid the risk

Retreat

Retreat from the hazard zone (e.g. relocate or building setbacks).

Medium Cost

Long-term Protection



Withdraw, relocate or abandon assets that are at risk; ecosystems are allowed to retreat landward as sea levels rise





Source: <https://www.couriermail.com.au>

Land buy back / Land swap



Retreat from the hazard zone



Source: www.gov.uk Medmerry Managed Realignment: shortlisted for PM's Better Public Building Award

Managed Realignment



Retreat from the hazard zone

Accommodate

Accommodate the hazard (e.g. increase resilience through retrofitting buildings)

High Cost

Medium Term Protection



Continue to use the land but accommodate changes by building on piles, converting agriculture to fish farming or growing flood- or salt-tolerant crops

\$\$\$





Source: <https://getready.qld.gov.au/be-prepared/>

Education and awareness



Accommodate the hazard



Source: <https://www.realestate.com.au/sold/property-house-qld-nudgee+beach-121996490>

Raise land and floor levels



Accommodate the hazard



Source: <https://interiorzine.com/2018/06/21/open-concept-kitchen-living-room-55-designs-ideas/>

Building retrofitting and improved design



Accommodate the hazard



Source: <https://www.abc.net.au/news/2018-06-05/brisbane-council-help-for-residents-to-mitigate-future-flooding/9835868>

Flood resilient public infrastructure



Accommodate the hazard



Source: <https://www.hakaimagazine.com/news/reinforce-and-build/>

Beach Nourishment



Accommodate the hazard



Source: <https://palmwoodsrevegetation.com.au/maroochy-river-waterway-rehabilitation-project/>

Riparian corridor restoration and generation



Accommodate the hazard

BEFORE



AFTER



Source: <http://www.ceeweb.org/wetland-restoration-in-romania-and-eastonia-completed/>

Wetland restoration



Accommodate the hazard

Defend

Defend from the hazard (e.g. increase buffers, improved awareness and preparedness to extreme events)

High Cost

Medium Term Protection



Use hard structures (eg sea walls) or soft solutions (eg dunes and vegetation) to protect land from the sea. May be prohibitively expensive, especially in the long term

\$\$\$





Source: <https://gcwa.qld.gov.au/gold-coast-seaway-history/>

Seawalls



Defend from the hazard



Source: <https://www.hakaimagazine.com/news/reinforce-and-build/>

Beach Nourishment



Defend from the hazard



Source: <http://www.southernhabitat.com.au/projects/dune-stabilisation-north-cronulla-beach/>

Dune construction and regeneration



Defend from the hazard

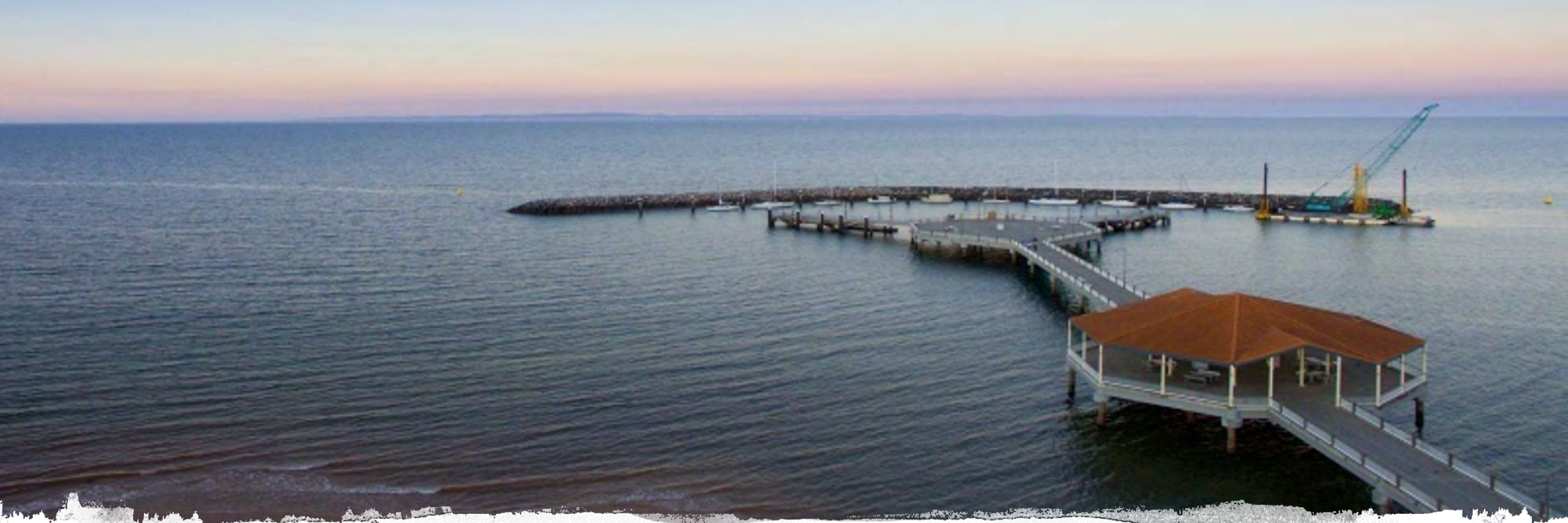


Source: <https://www.divingthecrab.com/artificial-reefs/>

Artificial reefs



Defend from the hazard



Source: <https://www.visitmoretonbayregion.com.au/blog/the-redcliffe-jetty-history>

Detached breakwaters



Defend from the hazard



Source: <https://pantaimoribb.weebly.com/coastal-managment-in-australia.html>

Groynes and artificial headlands



Defend from the hazard



Source: <https://www.spur.org/publications/urbanist-article/2009-11-01/strategies-managing-sea-level-rise>

Sea dykes or levees



Defend from the hazard



Source: <https://photorator.com/photo/84016/inflatable-storm-surge-barrier-ramspol-the-netherlands-photo-credit-freddy-schinkel>

Storm surge barriers



Defend from the hazard



MEETING MINUTES – Bundaberg Regional Council CHAS – CRG 6 Breakout Activities

1 BREAK-OUT 1: ADAPTATION CATEGORIES

- Consider adaptation categories: Avoid, Retreat, Accommodate and Defend.
- Review benefits and concerns with four high level categories

ADAPTATION OPTIONS:

OPTION	PROS	CONS
AVOID	<ul style="list-style-type: none"> ■ Low cost ■ Long-term protection ■ Eliminating future risk 	<ul style="list-style-type: none"> ■ Perception of decreased property values ■ Uninsurable property ■ Splitting community up ■ Pressure on other land e.g. agricultural
RETREAT	<ul style="list-style-type: none"> ■ Avoiding cost to next generation 	<ul style="list-style-type: none"> ■ Economic cost ■ Social cost ■ Loss of community values ■ Trust in Council
ACCOMMODATE	<ul style="list-style-type: none"> ■ Working together instead of fighting ■ Environmental benefits 	<ul style="list-style-type: none"> ■ Costs to owners ■ Tapping into core structure (maybe not adaptable)
DEFEND	<ul style="list-style-type: none"> ■ Retain community ■ Tourism (e.g. beach nourishment) ■ Reduces threat of hazards ■ Recreational benefits 	<ul style="list-style-type: none"> ■ Low cost benefit ■ 'Levee paradox' – i.e. promotes a feeling of safety behind and development may be "encouraged" ■ Can change character of community ■ Increase maintenance burden ■ Amenity impacted ■ Non- sustainable



2 BREAK-OUT 2: SETTLEMENT SPECIFIC OPTIONS

- Consider Adaptation Options across the four categories for each of priority areas, in your opinion, score the option 1-10
- Based on whether this option will help achieve the vision, eliminate or reduce risk, and its appropriateness for that area.
- Which Options are suitable for which settlement?
- Identify and rank adaptation options for each settlement.
- **This provides the project team commentary on how these options perform against the CHAS mandatory evaluation criteria e.g. environmental and social impact and community acceptability**

Table 1 Adaptation options – community acceptability

Category	Moore Park Beach	Score	Bargara	Score	Innes Park and Coral Cove	Score	Coonarr	Score	Woodgate Beach and Walkers Point	Score
No intervention										
Avoid	New higher roads	6	Land use planning if any rebuilds or change of use	4			New arterial road (two-ways in, one flood proof)	10	Land use plan	7
	No housing at high water level	-			Town planning changes	5	Avoid development	3	Avoid development in National Park	-
			Upgrade infrastructure	8	No new buildings	1				
	Upgrade infrastructure	4	Prevent further development	7	New infrastructure	8			Prevent further development	3
					Land use planning	9	Prevent further development	8	Infrastructure in Walker's Point restrict beach access and tightly controlled management points	9
	No new buildings	3					Town planning changes	5	Town planning changes	5
	New infrastructure	7			Avoid development in intolerable areas (mostly wetland areas)	10	Land uses reconsidered	2		
	Land use planning	9								
Retreat	Buy-back beach properties affected	2	Land buy-back as properties go up for sale	1			Move township	1	Coastal land buy-back	3
			Encourage future accommodation venues at other spots on the coastline (Nielsen's, Burnett Heads, Elliott Heads, 'boat harbour' port	5					Buy-back land	1
	Management realignment	1			Setbacks	2			Management realignment	1
			Buy-back 5 properties opposite Crawford Park and more to the South on Woongarra Scenic Drive		Buy-back land	1				
	Setbacks	7			SEMP Strategy	8				



Category	Moore Park Beach	Score	Bargara	Score	Innes Park and Coral Cove	Score	Coonarr	Score	Woodgate Beach and Walkers Point	Score
	Buy-back land	1			Managed realignment	2				
	SEMP Strategy	8								
	Managed realignment	6			Potentially retreat from northern residential area	5				
					Coolanblue Ave properties (eastern alignment) need to relocate	5				
Accommodate	Bridges on arterial road	4	As properties are rebuilt or renovated lift to higher height	5	Community education	10	Raise road	3	Community education	10
	Raise road	2	Community education	10	Plan development areas	5	Sandbag walls and strong walls	8	Upgrade sewerage infrastructure for Walkers Point	7
	Community education	10	Retrofit structures	5	Identify contour lines for high water	5	Artificial reef as a buffer	-	Retrofit structures	5
	Retrofit structures	5	Plan development areas	5	Land use planning – specific controls on buildings	10	Retrofit structure	1	Plan development areas	5
	Plan development areas	5	Identify contour lines for high water	5	Flood resilient infrastructure	5	Plan development areas	5	Identify contour lines for high water	5
	Identify contour lines for high water	5	Raise Barolin Esplanade from inundation area	5	Wetland restoration	8	Identify contour lines for high water	5		
	Land use planning – specific controls on buildings	10	Declare “Benefitted Area” with property owners levied for x number of years with State and Council contributing (rock wall)	10	Education	10	Upgrade infrastructure	3	Identify contour lines for high water	5
	Flood resilient infrastructure	9	Raise sections of Miller St	9	Riparian corridor	8	Raise roads to retreat or access	9		
	Wetland restoration	5			Bridge	1				
	Education	10			Alternative coastal road	7				
	Riparian corridor	7			Upgrade the water and sewerage infrastructure	-				
	Strengthen buildings	2			Strengthen building	7				
					Raise roads or alternative access road	4				
Defend	Build canal or water channel from river behind town to control the water	7	Artificial reef	8			Defence wall or levee to protect road	4	Artificial reef	8
	Wall / levee around town	7	Groyne / sea wall	9	Artificial reefs	9	New wetland nearby to absorb tidally water		Groyne sea wall	7
	Beach affected property well in front	9	Beach nourishment	6	Sea wall	1	Vegetate sand hills with severe erosion from human intervention	7	Beach nourishment	8



Category	Moore Park Beach	Score	Bargara	Score	Innes Park and Coral Cove	Score	Coonarr	Score	Woodgate Beach and Walkers Point	Score
	Lagoons wetlands	10	Walls on private property	10	Beach groyne	2	Artificial reef	8	Private property walls	9
					Artificial reef	-			Canals	4
	Buried sea wall	5	Prevent incursion into valuable agricultural land	10			Dune rehab	7	Artificial reef	8
	Groin	4	Approach raised for Innes Park / Coral Cove particularly relevant to Kellys Beach and Miller St given the value of properties to tourism – might be more of a relevance for government here?	7	Individual property owner's decision to defend. Coastal properties could be coordinated by government?	-	Beach replenishment	4	Buried sea wall	5
	Dune rehab	7					Prevent incursion into valuable agricultural land	10	Dune rehabilitation	7
	Beach replenishment	5								
	Sea wall	3							Mangrove rehabilitation	9
	Beach groyne	2								
	Artificial reef	4							Beach replenishment	4
	Levees	8							Beach erosion	10
									Beachside residential	8
									Vegetate erosion areas	10
									Obtain more accurate contour to identify risk areas	7



3 BREAK-OUT 3: FUTURE SCENARIO PLANNING

- Unpack potential future adaptation options if the settlement reaches the certain “trigger”
- The settlements may experience a change in risk profile over time – How will we mitigate the risk going forward?
- Is there a scenario where accommodate or defend is no longer an option? Do we continue to monitor the sea level until it reaches certain levels?

Table 31 Moore Park Beach future scenario planning

MOORE PARK BEACH					
	Option	SEA LEVEL CONDITIONS			
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise
NO INTERVENTION					
AVOID	Land use planning				→
	No build		0.3m		→
	Education				→
	New infrastructure			→	
RETREAT	Strengthen building setback		0.3m		→
	Buyback land				→
	Strategy / education				→
	Realignment		0.3m		→
ACCOMMODATE	Flood resilient infrastructure				→
	Wetland restoration				
	Riparian corridor				→
DEFEND	Seawall				→
	Levees		0.3m		→
	Education				→



Table 3-3 Kellys Beach (Bargara) future scenario planning

KELLYS BEACH (BARGARA)					
	Option	SEA LEVEL CONDITIONS			
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise
NO INTERVENTION					
AVOID	Land use planning if any rebuilds or change of use				
RETREAT	Encourage new accommodation to be built at alternative locations (Nielsen's Park, Elliot Heads, Burnett Port,				
	Buyback land				
ACCOMMODATE	Lift properties as they are rebuilt or renovated				
DEFEND	Walls to defend private property				
	Artificial Reefs				
	Groyne / Sea Wall				
	Beach Nourishment				



Table 34 Innes Park and Coral Cove future scenario planning

INNES PARK AND CORAL COVE					
	Option	SEA LEVEL CONDITIONS			
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise
NO INTERVENTION					
AVOID	Planning controls to avoid development in affected area	→			
RETREAT	New road to avoid inundation	→			
	Coolanblue properties – eastern / coasted side				
	Start plans for new road (corridor)	→		→	→
	Potential voluntary buy back of coastal properties (other property owners may defend)	→			
	Build corridor and/or bridge crossing			→	→
ACCOMMODATE	Road – bridge over Palmer Creek	→			
	Start planning for potential bridge crossing		0.3m →	→	→
DEFEND	Coolanblue properties – eastern coastal side	→			
	Individual property owners defend (subject to government approval) – could be coordinated? Question of when to defend. E.g. does government assist defending when we ultimately defend roads and other infrastructures?			→	→



Table 35 Coonarr future scenario planning

COONARR					
	Option	SEA LEVEL CONDITIONS			
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise
NO INTERVENTION					
AVOID	Land use considered				→
	Avoid development				→
RETREAT	Raise roads to retreat or access		→		
ACCOMMODATE	Sandbag walls / stone walls				→
	Artificial reef as a buffer				→
DEFEND	Vegetate sand hills				→

Table 35 Woodgate Beach & Walkers Point future scenario planning

WOODGATE BEACH & WALKERS POINT					
	Option	SEA LEVEL CONDITIONS			
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise
NO INTERVENTION					
AVOID	Community education				→
	Upgrade sewerage – Woodgate	→			
	Upgrade sewerage – Walkers Point		→		
	Restrict beach access to certain point - Woodgate	→			
RETREAT	Buy land back				→
	Manage re-alignment				→
ACCOMMODATE	Identify contour lines for high water and obtain more accurate data	→			
	Retro fit structure			→	
DEFEND¹	Artificial Reef	→			
	Mangrove rehabilitation	→			
	Buried seawall	→			
	Beach nourishment	→			
	Dune revegetation	→			

MINUTES OF MEETING

Bundaberg Coastal Hazard Adaptation Strategy Community Reference Group (CRG)

Held At:	Function Room, Bundaberg Regional Council Administration Centre 190 Bourbong Street, Bundaberg
Date & Time:	Thursday, 24 October 2019 – 5.30 pm to 7.30 pm
Present:	<i>CRG Members</i> – Chris Mcloughlin, Heath Greville, Josephine Ferris, George Martin, Julie Fauser, Sharon Jackson, Robert Bell, Terry Kelly
	<i>Council</i> – Cr Bill Trevor (Chair), Cr Greg Barnes, Dwayne Honor (Project Manager), Evan Fritz (Strategic Planning), Sally Obst (Natural Areas), Natalie McDonald (Administration)
	<i>Project Consultant</i> – Richard Sharp (Water Technology)
Apologies	<i>CRG Members</i> – Russell Stewart, Ian Graham, Lloyd Blake, Collin Turner, Jennifer Parry, Tony Ricciardi, Shanelle Pekin, Joe Russo
	<i>Council</i> – Cr Scott Rowleson, Cr Jason Bartels, Cr Wayne Honor, Beth Whitworth (Disaster Management)

BUSINESS OF MEETING

1. Introductions and Welcome (Dwayne Honor)

Cr Trevor welcomed all to the meeting and advised that this session was an important step with the CRG members to commence validating some of the assumptions/options workshopped to date.

The Project Manager, Dwayne Honor noted the apologies from Cr Scott Rowleson, Cr Jason Bartels and Cr Wayne Honor. He also welcomed Project Consultant, Richard Sharp and the return of CRG Member, Julie Fauser to the meeting.

The session would be quite in-depth with the work being difficult to explain, but would do our best with the use of pictures. Tonight is all about a screening process and working through the long list of adaptation options. The breakout activities will involve looking at the pros and cons of the options for each of the settlement areas and then screening them.

We are currently nearing the end of phase 6 of the project. Phases 4-5 has been a challenging body of work and timeframe wise, it has taken 2-3 months longer than scheduled. It has been very important to take this time to get it right, as the optioneering and adaptation options in the latter phases hinge on this information. The decision tree for adaptation options is based upon the QCoast 2100 Minimum Standards and Guidelines document. The previous CRG meeting took us on the journey through the trigger-based approach and adaptation options for future sea level rise scenarios of 0.2 m, 0.4, 0.8 m, looking at existing verses future development.

2. Previous CRG 6 Recap

Richard Sharp recapped on the previous CRG meeting and reiterated the 3 levels of sea rise considered and where the risk rating becomes an intolerable risk for the key settlement areas, working through the risk assessment graphs in the PowerPoint presentation. The graphs provide a trigger for action as to when the risk needs to be addressed. He noted the economic component as being the most challenging. Richard also gave an update on the progress of the project since the last CRG, noting the Technical team has been working behind the scenes with phases 6, 7 and part of phase 8 progressing.

Refer attached Powerpoint presentation (Annexure A).

3. Summary of Long List of Adaptation Options (Project Team)

Refer attached Powerpoint presentation (Annexure A).

Richard Sharp worked through and discussed the adaptation options for each of the key settlement areas:

- Miara, Winfield and Norval Park
- Moore Park Beach
- Burnett Heads
- Innes Park and Coral Cove
- Elliott Heads
- Coonarr
- Woodgate Beach and Walkers Point
- Buxton.

A CRG member raised the State Government storm tide inundation mapping and the Watsons/Durdins Road area of Bargara. Dwayne Honor commented this area would most likely be impacted by localised flooding rather than storm tide, however, the link to the State mapping is to be circulated with these minutes and is noted below:

State Coastal Hazard Property Mapping:

<https://apps.des.qld.gov.au/map-request/coastal-hazards/>

Council Hazard Mapping:

<https://www.bundaberg.qld.gov.au/downloads/file/498/flood-hazard-area-maps-1-2018>

A CRG member queried the time element for the scale of sea level rise adopted from 0.2 m to 0.8 m. Monitoring of sea level rise was raised and Dwayne Honor advised the Roslyn Bay sea level monitoring station will be utilised as our measuring tool, being in close proximity to the Bundaberg region.

Dwayne displayed the monitoring graph:

"Trends of mean sea level change from the Australian Baseline Sea Level Monitoring Project sites at Cape Ferguson and Roslyn Bay for the period 1996 to October 2017" from the Qld Government website link:

<https://www.stateoftheenvironment.des.qld.gov.au/climate/coasts-and-oceans/sea-level>

He noted the global average shown in orange, the blue being Cape Ferguson, with Roslyn Bay displayed in red and actually shows the greater increase over time. It accounts for seasonal variations and metrological impacts.

Dwayne Honor reiterated the importance of a trigger-based approach adopted for the CHAS is that we can measure and monitor impacts over time.

4. Structural Options for the Priority Settlements including cost, viability, approval, risks, reversibility (Project Team)

Breakout Activity 1 – Benefits and Concerns – CRG members review benefits and concerns (pros and cons) of the long list of structural options for the priority settlements including cost, viability, approval, risks and reversibility

Richard Sharp advised the breakout exercises will assist with refining and to evaluate the potential success of adaptation options, He worked through the various options available.

5. Proposed Options and Screening (Project Team)

Breakout Activity continued - Screening the Physical Options – CRG members reminded of last CRGs scenario planning output. Each group to look at the proposed options and go about ‘screening the options’ based on some of the identified issues.

The CRG members formed small groups relevant to the six key priority settlements and were provided with mapping and pro-forma sheets with some adaptation options, indicative costs, with pros and cons.

Refer Annexure B – Results of the Breakout Sessions

6. Summary and Refine (Richard Sharp)

The CRG members supported the options that were put through into the screening program.

Cr Trevor suggested that cost will play a major role in decisions and while we may look to funding opportunities, if these events are happening State-wide, all Councils will need to consider internal funding as well as State Funding.

A cost benefit analysis will be undertaken in Phase 7.

A member of the CRG raised his concerns around insurance premiums. It was felt that the effect of climate change and the rising costs of insurance premiums could make it unaffordable for the younger generation and in turn, have an adverse effect on property values. Richard Sharp advised there was an article on the ABC yesterday – property insurance and climate change).

<https://www.abc.net.au/news/2019-10-23/the-suburbs-facing-rising-insurance-costs-from-climate-risk/11624108>.

7. Where to From Here? – Next Meeting

Phase 7 – Multi-Criteria Analysis (MCA) of adaptation options informed by conjoint analysis survey to develop a list of options with high social, economic and environmental performance.

The project team is working on the conjoint analysis survey and the method for circulation, which is likely to be electronically. The survey will consist of 2 options with a choice of A or B (random selection) to provide weightings for evaluation.

Cr Trevor thanked all for their time in attending.

8. Closing:

The Chair thanked all for attending.

This concluded the business of the CRG Workshop at 7.15 pm.

Cr Bill Trevor, Chairperson
OUR COAST Community Reference Group

ANNEXURE A



Welcome!

Bundaberg Region Coastal Hazard Adaptation Strategy

Community Reference Group Workshop #7
5.30 to 7.30pm
24 October 2019



Agenda

Item	Lead	Timing
Introductions	Dwayne Honor	5 mins
Previous CRG 6 Recap	Project Team	10mins
Summary of long list of adaptation options	Project Team	10mins
Break out activities		
1. Benefits and concerns of structural options	Facilitated session	20 mins
2. Screening the options	Facilitated session	20 mins
Summary and Refine	Project Team	10mins
Where to from here?	Dwayne Honor	5mins

Our Coast Update



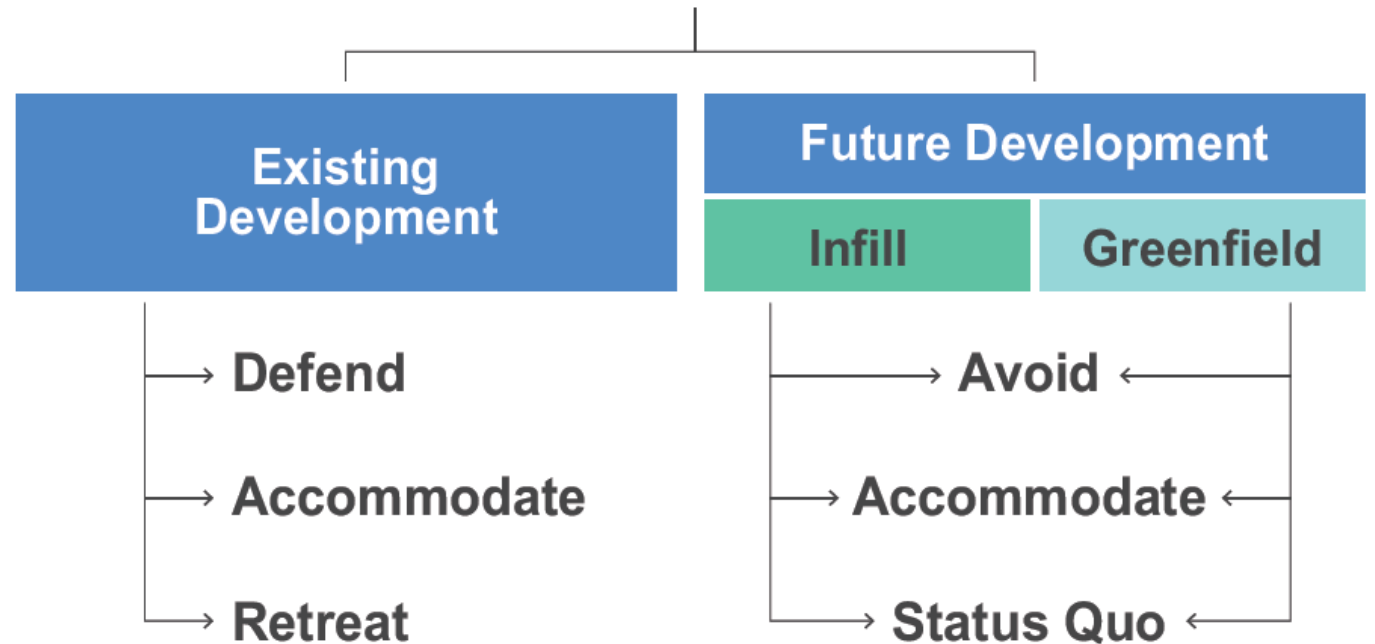
Previous CRG

Reviewed benefits and concerns with four high level categories.

Considered adaptation options across the four categories for each priority area – ranked options

Considered future ‘trigger-based’ adaptation options if settlement reaches certain sea level scenario

Decision Tree for Coastal Hazard Adaptation Options



Reminder of Risk Assessment

Risk Assessment

Summary of the results of the vulnerability and risk assessment, showing the priority assets within each settlement recommended to be considered for identification of adaptation options to reduce or eliminate the risks.

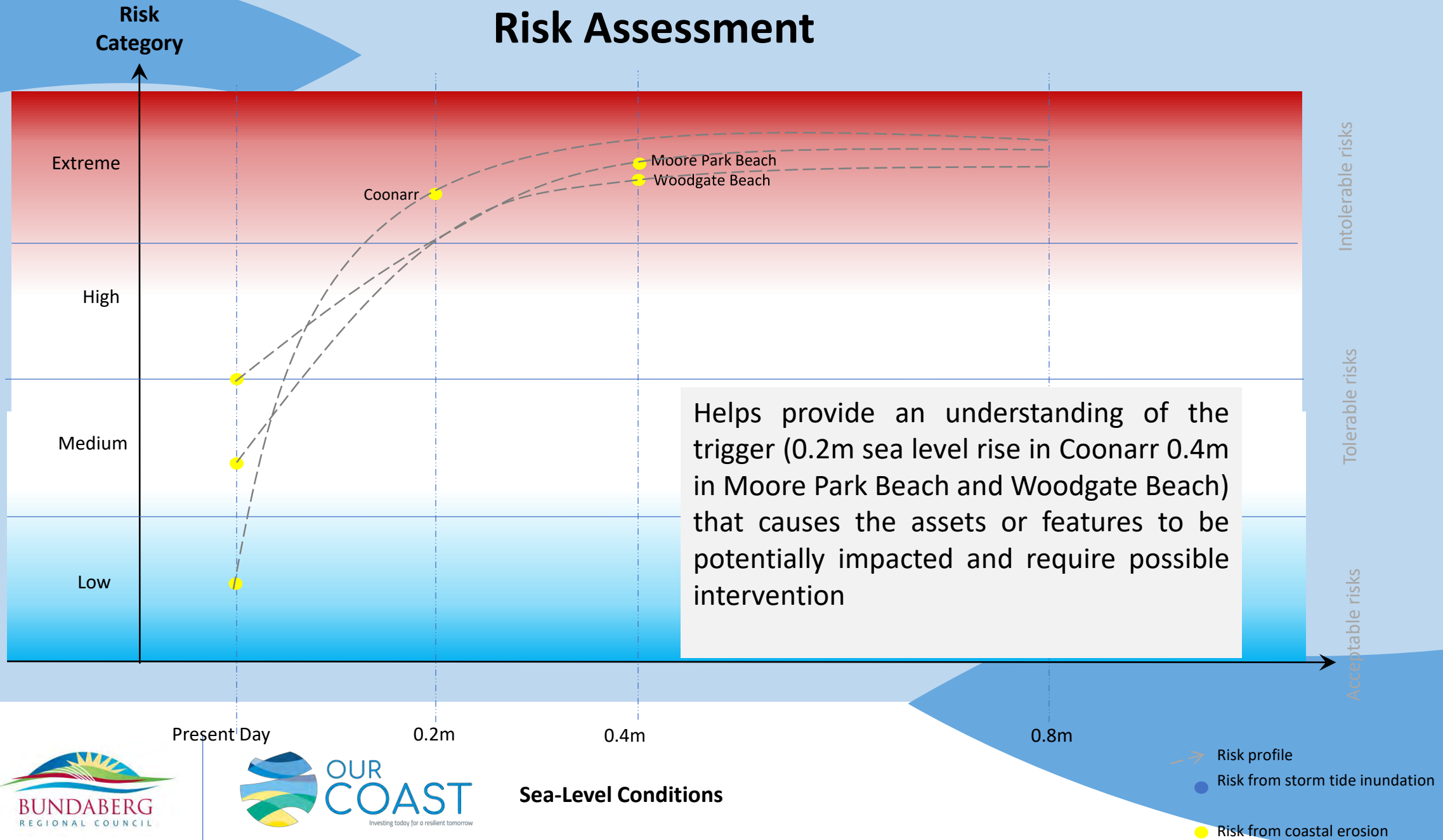
SETTLEMENT	VULNERABILITY ASSESSMENT Highly critical assets	RISK EVALUATION				Description
		Storm tide inundation	Sea level rise scenario	Coastal erosion	Sea level rise scenario	
Miara, Winfield and Norval Park	<ul style="list-style-type: none"> Roads / access Road bridges Beach and other environmental assets Electricity transformer 	Tolerable	All scenarios	Tolerable	All scenarios	Potential for major damages to buildings and infrastructure. Regular inundation of key access routes.
Moore Park Beach	<ul style="list-style-type: none"> Roads / access Road bridges Beach Water supply (inc groundwater supply) Powerlines Electricity transformer School 	Tolerable	All scenarios	Intolerable	0.4m	Potential for catastrophic damages to buildings and infrastructure. Potential isolation of community.
Burnett Heads	<ul style="list-style-type: none"> Roads / access Road bridges Beaches and other environmental assets Water supply Electricity transformer Wastewater Treatment Waste Disposal Stormwater/Culverts 	Intolerable	0.8m	Tolerable	All scenarios	Potential for catastrophic damages to buildings and infrastructure.

Risk Assessment

Summary of the results of the vulnerability and risk assessment, showing the priority assets within each settlement recommended to be considered for identification of adaptation options to reduce or eliminate the risks.

SETTLEMENT	VULNERABILITY ASSESSMENT Highly critical assets	RISK EVALUATION				Description
		Storm tide inundation	Sea level rise scenario	Coastal erosion	Sea level rise scenario	
Innes Park and Coral Cove	<ul style="list-style-type: none"> Water supply Sewer mains Beaches and other environmental assets 	Tolerable	All scenarios	Intolerable	0.8m	Potential for catastrophic damages to buildings and infrastructure.
Elliott Heads	<ul style="list-style-type: none"> Residential Properties Beach and other environmental assets Water Supply Powerlines 	Tolerable	All scenarios	Tolerable	All scenarios	Potential for major damages to buildings and infrastructure.
Coonarr	<ul style="list-style-type: none"> Roads / access Powerlines Beaches and other environmental assets 	Tolerable	All scenarios	Intolerable	0.2m	Potential isolation of community.
Woodgate Beach and Walkers Point	<ul style="list-style-type: none"> Residential properties Roads / access Woodgate WWTP Water supply Powerlines Stormwater and culverts Waste management Beaches and other environmental assets 	Intolerable	0.8m	Intolerable	0.4m	<p>Potential for catastrophic damages to buildings and infrastructure.</p> <p>Potential isolation of community.</p>

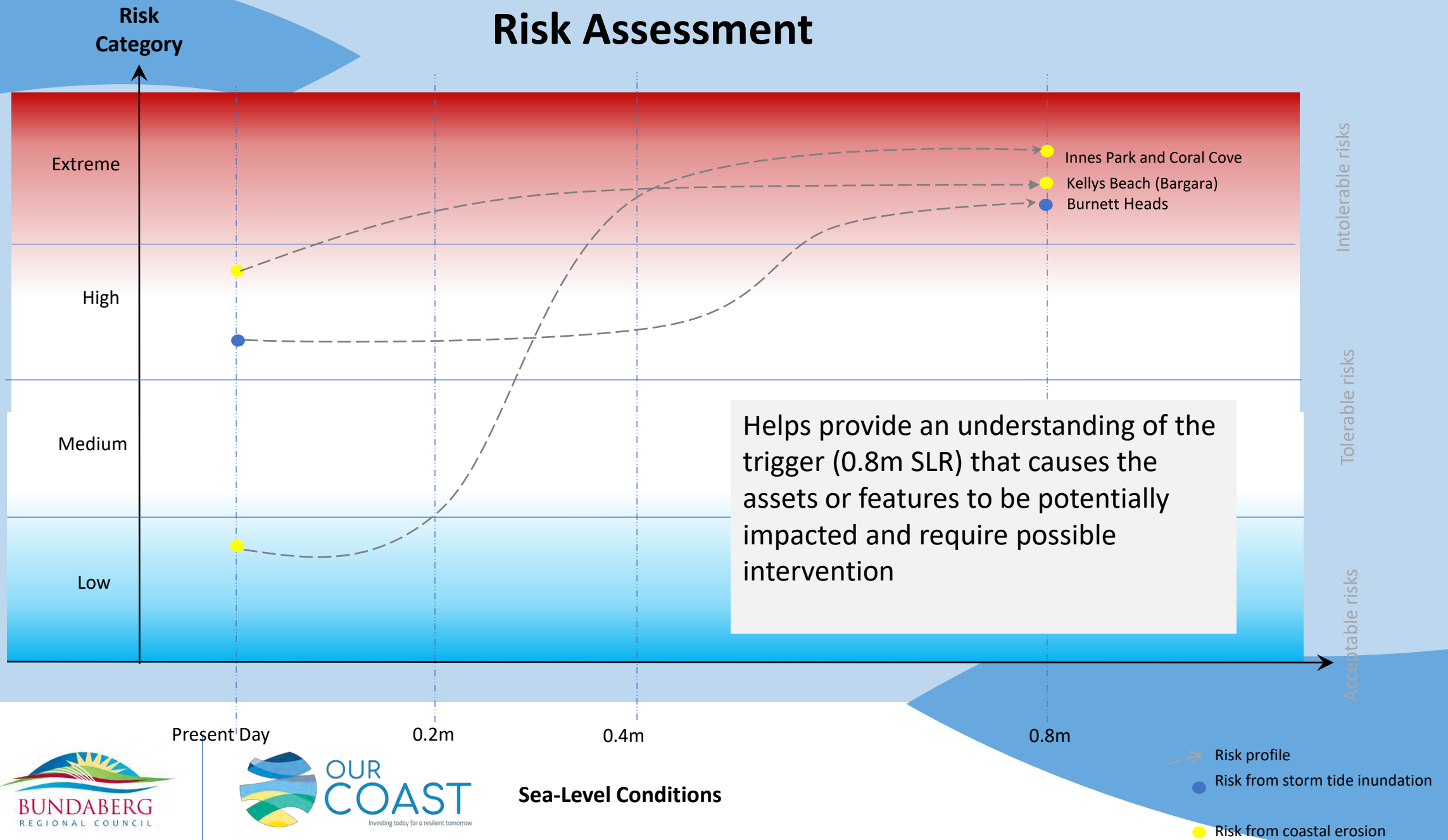
Risk Assessment



Sea-Level Conditions

- Risk profile
- Risk from storm tide inundation
- Risk from coastal erosion

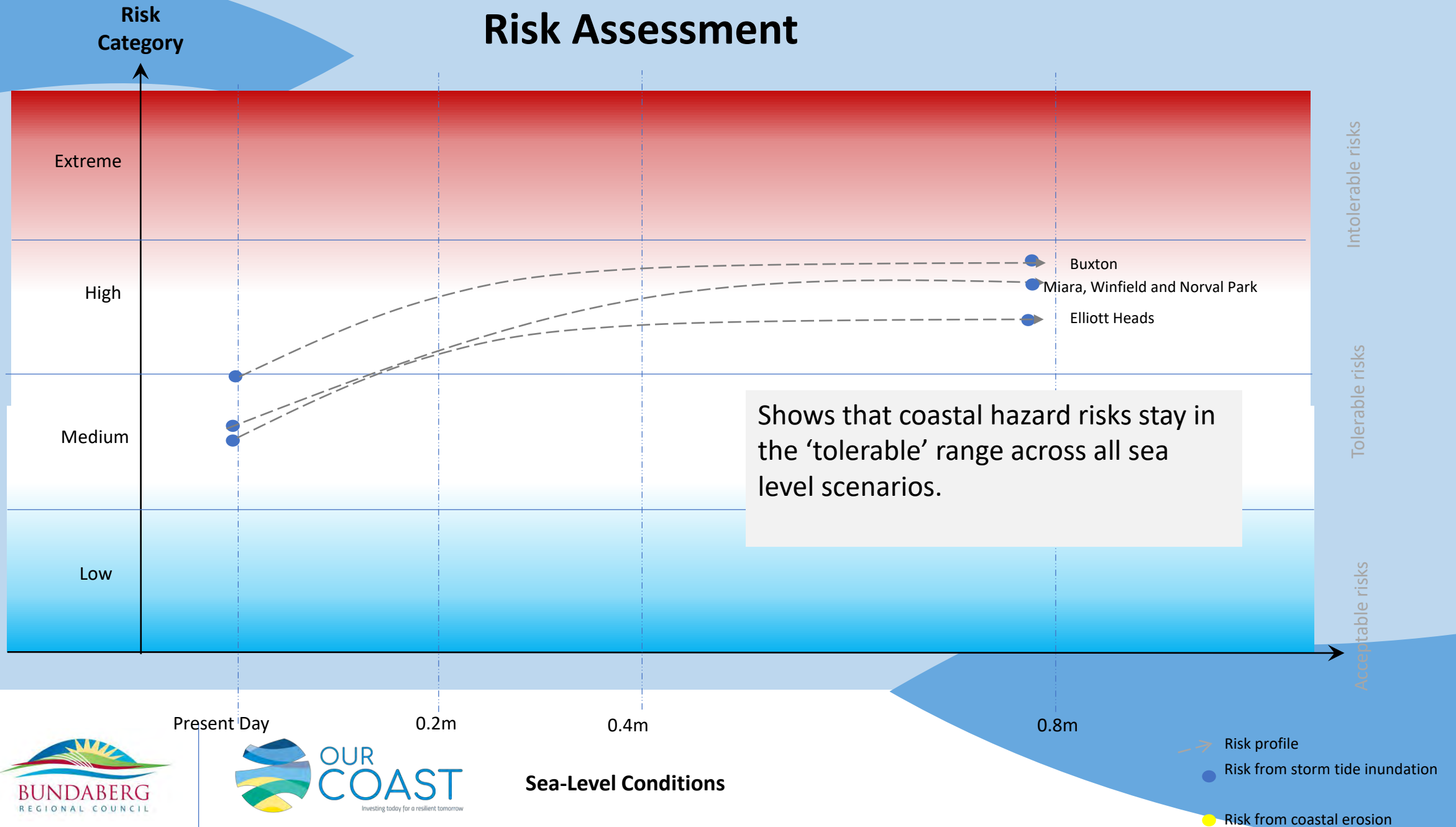
Risk Assessment



Sea-Level Conditions

- Risk profile
- Risk from storm tide inundation
- Risk from coastal erosion

Risk Assessment



Sea-Level Conditions

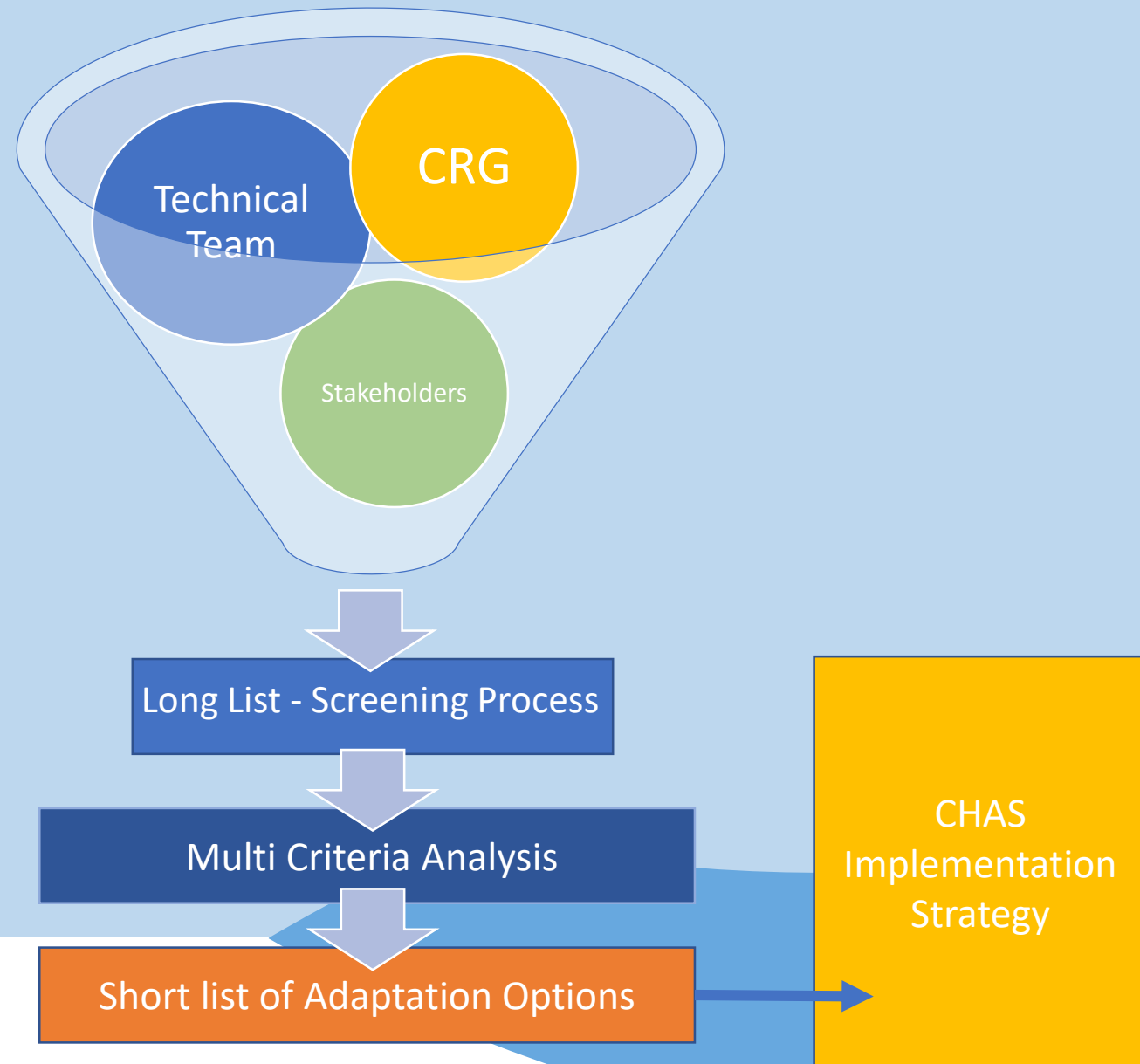
- Risk profile
- Risk from storm tide inundation
- Risk from coastal erosion

Since previous CRG

- Phase 6, 7 and parts of Phase 8 have progressed
- Phase 6:
 - Long list of adaptation options researched and documented
 - Long list “screened” down to specific options for each settlement.
- Phase 7:
 - Draft Evaluation Criteria

Appraisal Process

- Suggested Options
- Initial screening process
- MCA and CBA
- Final Short List
- Implementation Strategy
 - Non-structural
 - Physical options

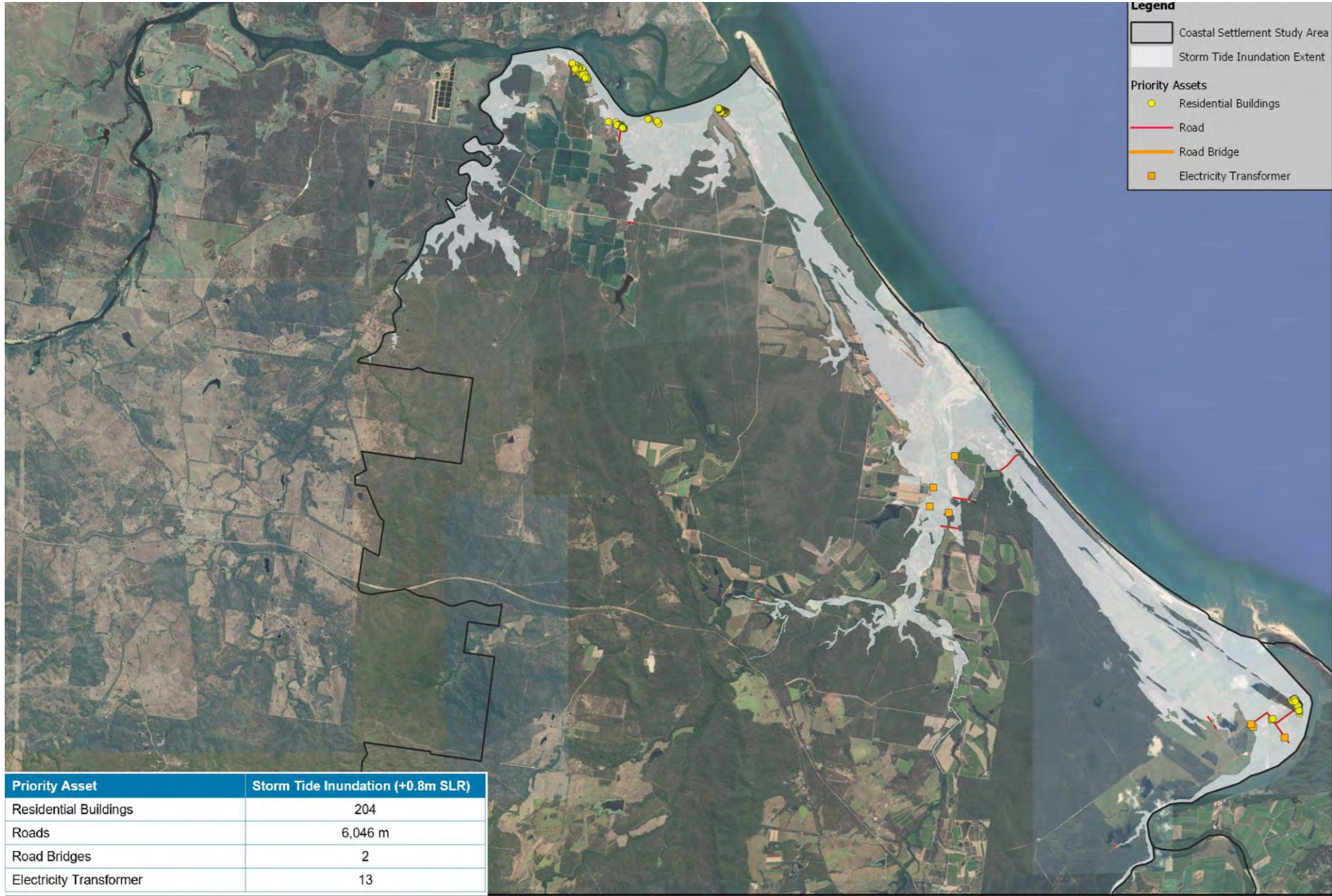


Adaptation Options

Options to be put forward into the pathways process

Miara, Winfield and Norval Park





Miara, Winfield and Norval Park Adaptation Options

Conserve vegetation areas and monitor erosion

Council currently monitoring erosion in Colonial Cove, on Baffle Creek

Land use planning - new infrastructure and/or assets built outside hazard zones

Disaster Management

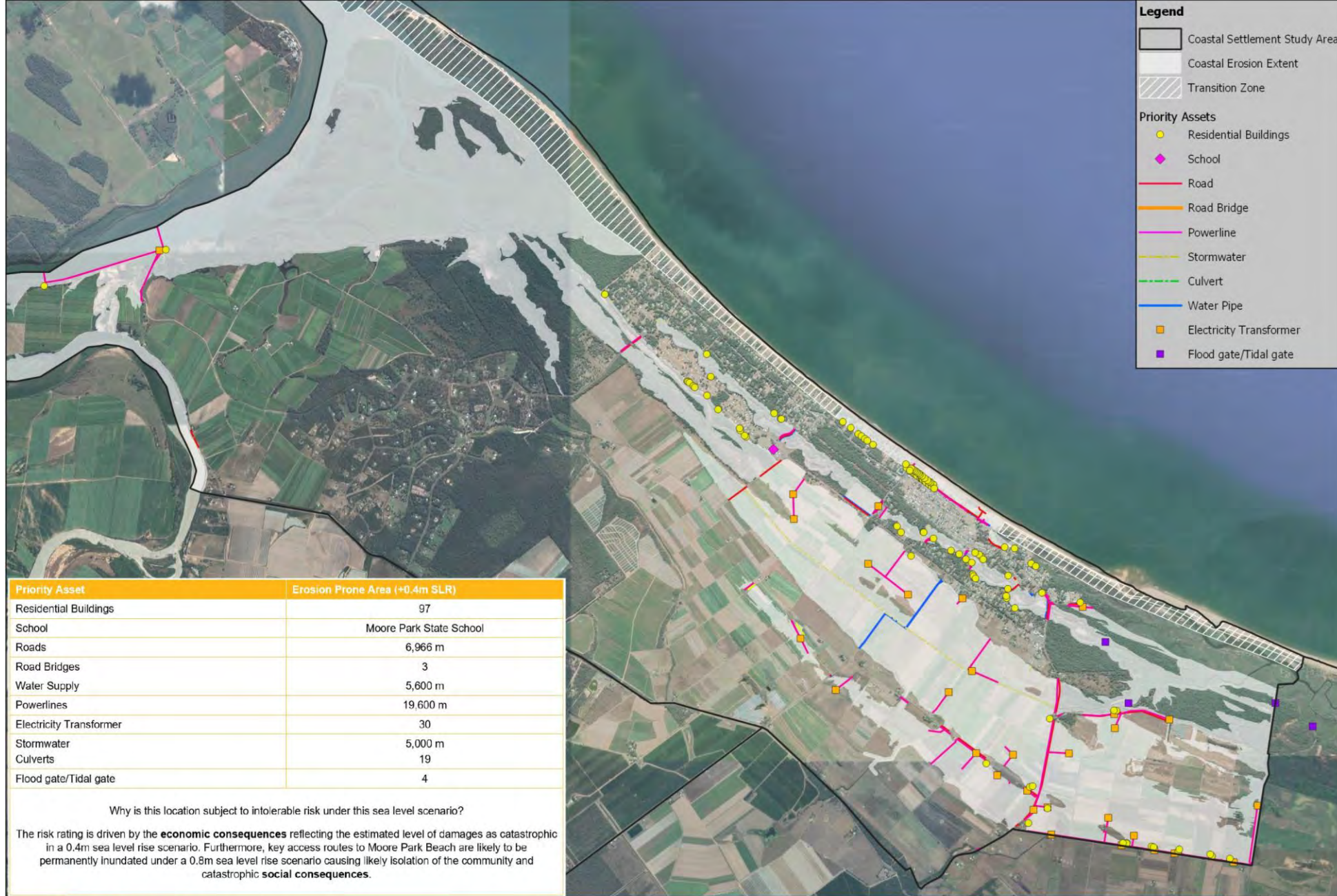
Prevention – Preparedness – Response – Recovery

Land buy-back

No physical options recommended



Moore Park Beach



Adaptation Options



Raise Key Access Roads

Land use planning - new infrastructure and/or assets built outside hazard zones

SEMP

Disaster Management

Prevention – Preparedness – Response – Recovery

Land buy-back

Remove Tidal gates – allow fish passage and inundation

Raising Key Access Roads

Road Upgrades **Moore Park Rd, Murdoch Linking Rd and Malvern Drive.**

Raising Road	Reduces frequency of isolation, and allows the road to be more frequently available as an evacuation route and accessible for emergency services.
Constructing Causeway	Inundation will still occur but will be passable and recover immediately from inundation event.
Routine Maintenance (10yr Program)	Repair after inundation event to reduce cost. Isolation will still occur.



Moore Park Beach Adaptation Options

Resilient
infrastructure
(existing
assets)

Resilience of infrastructure effective for continuation of service to community. Effective against inundation but not against erosion.

Water Supply (major >150mm) \$

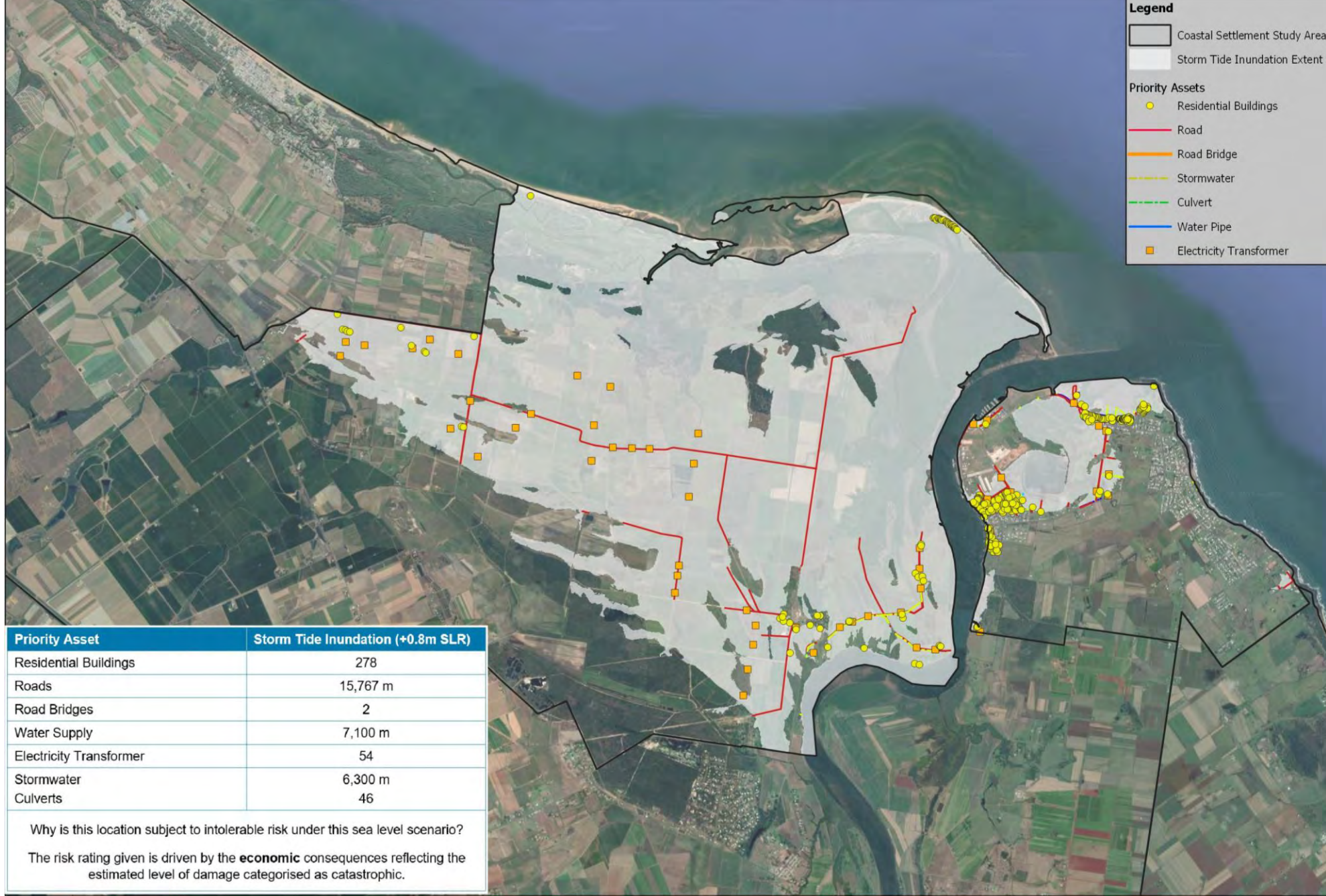
Electricity Network \$\$

Stormwater Drainage \$\$\$



Burnett Heads





Burnett Heads Adaptation Options

Conserve vegetation areas and monitor erosion

Land use planning - new infrastructure and/or assets built outside hazard zones

Disaster Management

Prevention – Preparedness –
Response – Recovery

Land buy-back



Bargara



Bargara - Adaptation Options



SEMP

Resilient Infrastructure

Conserve vegetation areas and monitor erosion

Mon Repos: Site Specific Investigation with QPWS (DES)

Land use planning - new infrastructure and/or assets built outside hazard zones

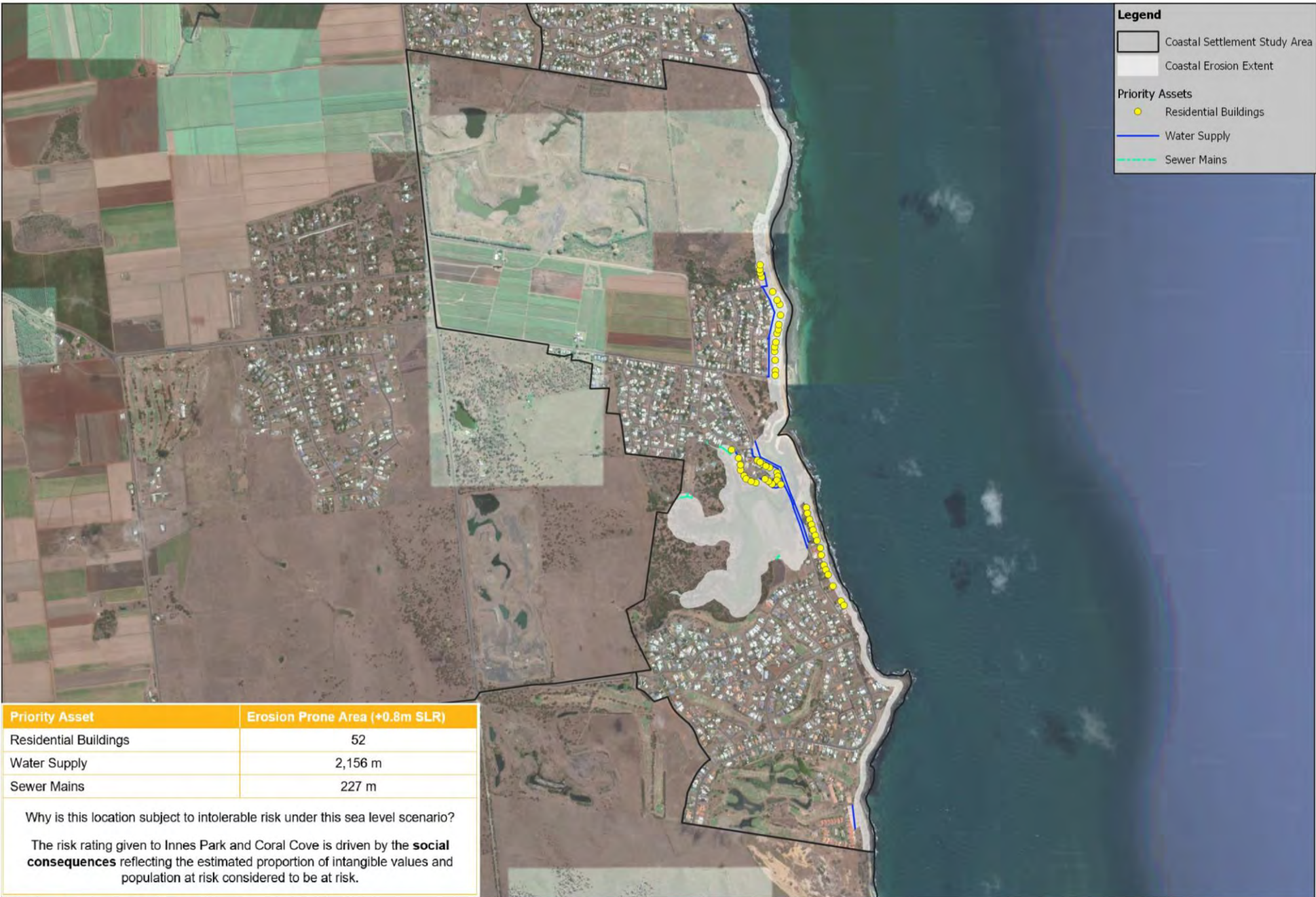
Disaster Management

Prevention – Preparedness – Response – Recovery

Land buy-back

Allow estuarine wetlands to colonise dune habitat

Innes Park and Coral Cove



Innes Park, Coral Cove - Adaptation Options

Disaster Management

Planning scheme measures such as; land-use zoning, development setback

Land buy back, land swap.






Allow Intertidal and subtidal reefs to be inundated more frequently / to greater depths.

Resilient infrastructure (active strategy for infrastructure planning)



Elliott Heads

Legend

-  Coastal Settlement Study Area
-  Storm Tide Inundation Extent
- Priority Assets**
-  Residential Buildings
-  Powerline
-  Water Pipe



Priority Asset	Storm Tide Inundation (+0.8m SLR)
Residential Buildings	2
Powerlines	254 m
Water Supply	1,900 m


 Projection: GDA/MGA94 Zone
 Water Technology Pty Ltd
 Imagery Source: Google Earth



Elliott Head - Adaptation Options

Conserve vegetation areas and monitor erosion

New infrastructure and/or assets built outside hazard zones

Land buyback

Disaster Management

Prevention – Preparedness – Response – Recovery

No physical options

Coonarr



Why is this location subject to intolerable risk under this sea level scenario?

The risk rating given is driven by the **social consequences** that considers isolation to communities categorised as catastrophic. Coonarr Beach Road is considered a key access route to the settlement of Coonarr and is likely to be permanently inundated in the 0.2m sea level rise scenario.

Coonarr - Adaptation Options

- Raise key access roads
- Beach nourishment/ dune regeneration
- Disaster management
- Planning scheme measures such as; land-use zoning, development setback,
- Land buy back, land swap.
- Allow estuarine wetlands to colonise dune habitat – will result in loss of dune habitat and increase in estuarine wetland



Raising Key Access Roads

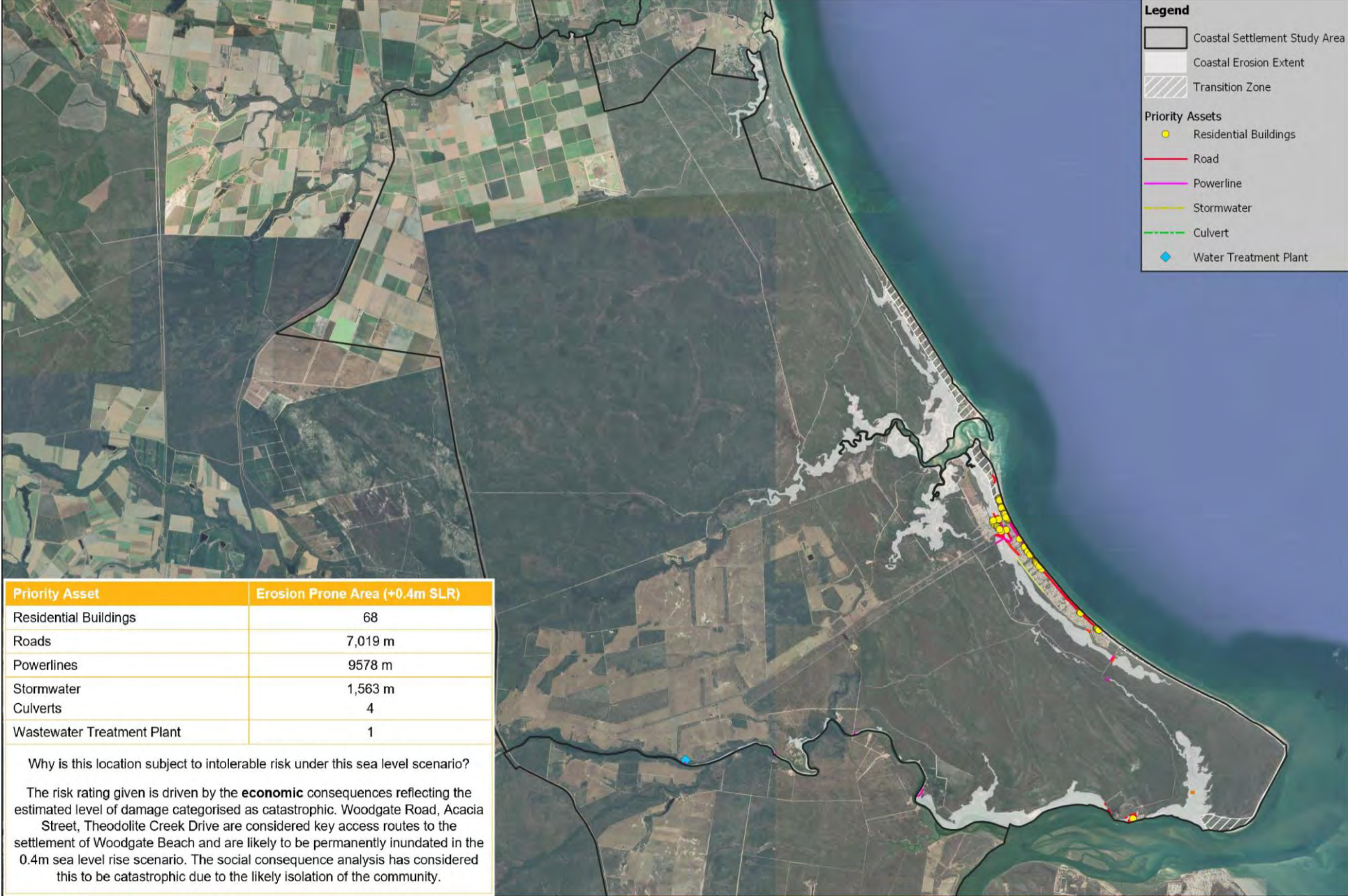
Coonarr Beach Rd

Raising Road	Reduces frequency of isolation, and allows the road to be more frequently available as an evacuation route and accessible for emergency services. Low initial cost for raising Coonarr Rd
Constructing Causeway	Inundation will still occur but will be passable and recover immediately from inundation event.
Routine Maintenance (10yr Program)	Repair after inundation event to reduce cost. Isolation will still occur.



Woodgate Beach and Walkers Point





Woodgate Beach - Adaptation Options

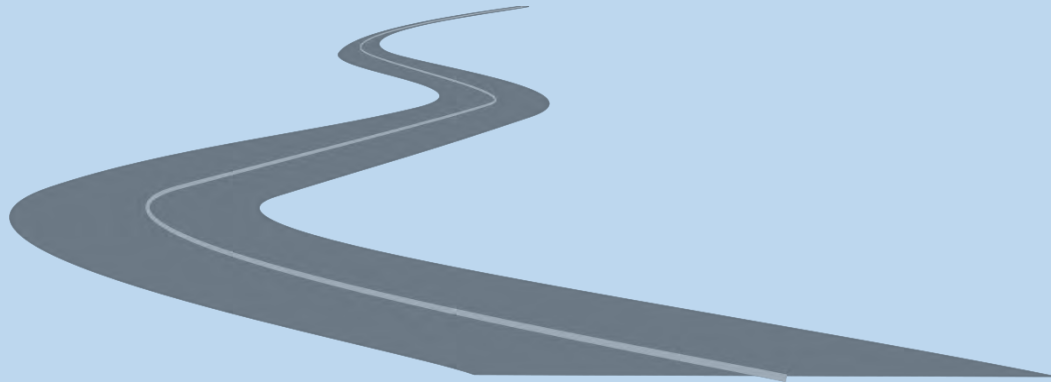
- Raise key access roads
- Asset Management and resilient infrastructure (active strategy for infrastructure planning)
- Settlement Strategy (structure planning), planning options
- Land-use planning
- Disaster Management
- Planning scheme measures such as; land-use zoning, development setback,
- Land buy back, land swap
- Allow estuarine wetlands along the Burrum River to colonise dune habitat.



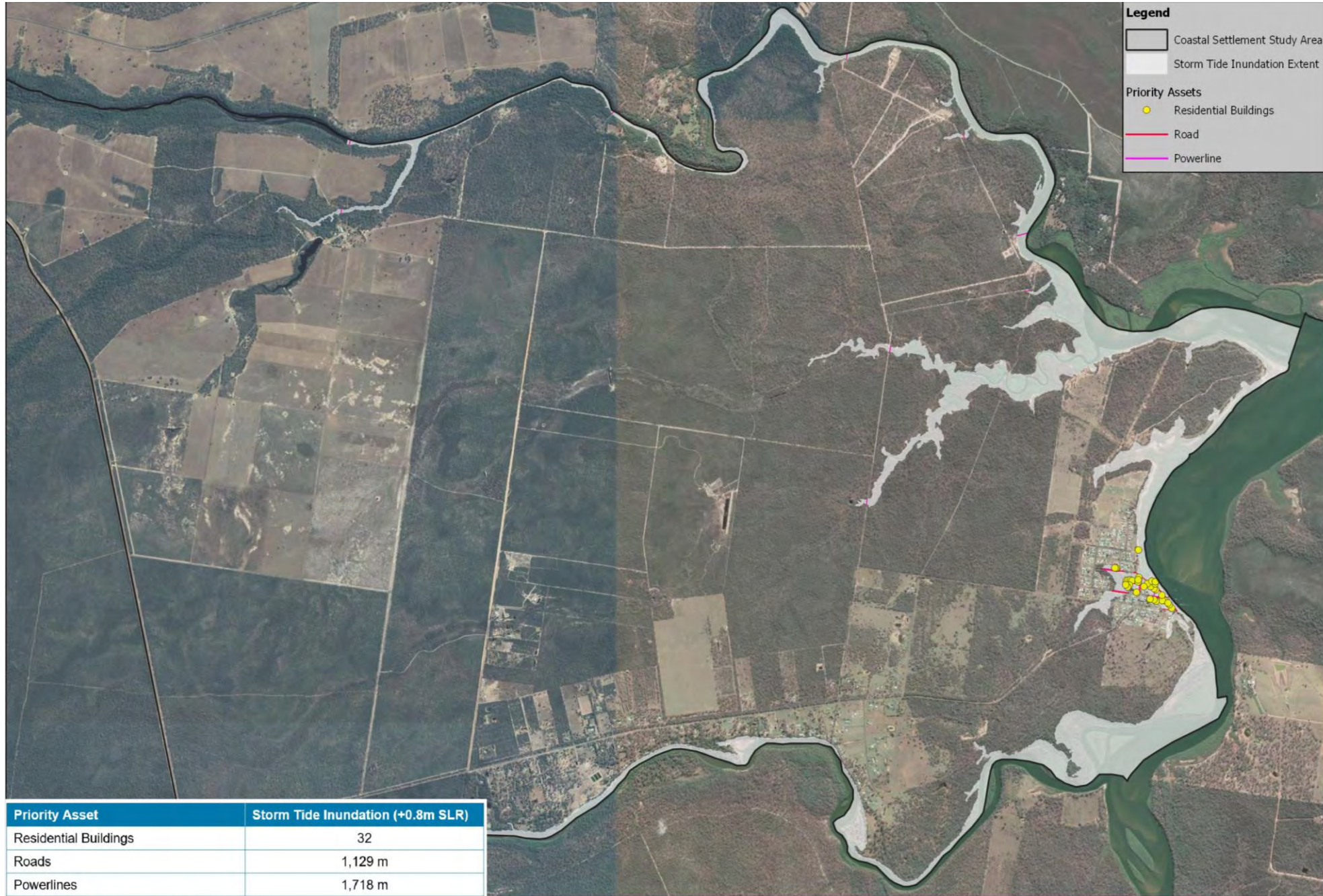
Raising Key Access Roads

Adaptation options for: **Walkers Point Rd, Theodolite Creek Rd, Paperbark Court – First Ave, and Acacia Street**

Raising Road	Reduces frequency of isolation, and allows the road to be more frequently available as an evacuation route and accessible for emergency services.
Constructing Causeway	Inundation will still occur but will be passable and recover immediately from inundation event.
Routine Maintenance (10yr Program)	Repair after inundation event to reduce cost. Isolation will still occur.



Buxton



Legend

- Coastal Settlement Study Area
- Storm Tide Inundation Extent
- Priority Assets**
- Residential Buildings
- Road
- Powerline

Priority Asset	Storm Tide Inundation (+0.8m SLR)
Residential Buildings	32
Roads	1,129 m
Powerlines	1,718 m



Buxton - Adaptation Options

Conserve vegetation areas and monitor erosion

New infrastructure and/or assets built outside hazard zones

Land buyback

Disaster Management

Prevention – Preparedness – Response – Recovery

Recap of Scenario Planning Output



Moore Park Beach

MOORE PARK BEACH						
	SEA LEVEL CONDITIONS					Screening
	Option	Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise	
NO INTERVENTION						
AVOID	Land use planning					Included
	No build		0.3m			Included
	Disaster Management / Community Education					Included
	New infrastructure					Included
RETREAT	Strengthen building setback		0.3m			Included
	Buyback land					Included
	Realignment		0.3m			Included / not a preferred option
	Wetland restoration					Included - suggested retreat options
ACCOMMODATE	Flood resilient infrastructure					Included
	Riparian corridor					Omitted – effectiveness against coastal hazard
DEFEND	Seawall					Included
	Levees		0.3m			Omitted – feasibility and practicality

Bargara

BARGARA						
	SEA LEVEL CONDITIONS					Screening
	Option	Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise	
NO INTERVENTION						
AVOID	Land use planning					Included
RETREAT	Land Buyback					Included
ACCOMMODATE	Lift properties as they are rebuilt or renovated					Included – Land Use planning / Development Control
DEFEND	Artificial Reefs					Included
	Groyne / Sea Wall					Included
	Beach Nourishment					Included

Innes Park and Coral Cove

INNES PARK AND CORAL COVE						
	Option	SEA LEVEL CONDITIONS				Screening
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise	
NO INTERVENTION						
AVOID	Planning controls to avoid development in affected area	→				Included
RETREAT	New road to avoid inundation	→				Omitted – no likely isolation
	Start plans for new road (corridor)	→		→	→	Omitted – no likely isolation
	Buy back	→				Included
ACCOMMODATE	Road bridge	→				Omitted – no likely isolation
	Start planning for potential bridge crossing		0.3m	→	→	Omitted – no likely isolation
DEFEND	Seawall / Artificial Reef			→	→	Included
	Individual property owners defend			→	→	Omitted – not in councils' remit

Coonarr

COONARR						
	SEA LEVEL CONDITIONS					Screening
	Option	Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise	
NO INTERVENTION						
AVOID	Land use planning				→	Included
	Avoid development				→	Included
RETREAT						
ACCOMMODATE	Raise roads		→			Included
DEFEND	Vegetate sand hills				→	Included
	Sandbag walls / stone walls				→	Included

Woodgate Beach and Walkers Point

WOODGATE BEACH & WALKERS POINT						
	Option	SEA LEVEL CONDITIONS				Screening
		Present Day Sea Level	0.2m Sea Level Rise	0.4m Sea Level Rise	0.8m Sea Level Rise	
NO INTERVENTION						
AVOID	Community education	→				Included
	Upgrade sewerage – Woodgate		→			Included
	Upgrade sewerage – Walkers Point	→				Included
	Restrict beach access to certain point - Woodgate	→				Omitted - effectiveness against SLR / Erosion
RETREAT	Buy land back	→				Included
	Manage re-alignment	→				Omitted – effectiveness against coastal erosion
ACCOMMODATE	Identify contour lines for high water and obtain more accurate data	→				Included – part of continuous monitoring
	Retro fit structure	→				Included
DEFEND¹	Artificial Reef		→			Included
	Mangrove rehabilitation		→			Included
	Seawall		→			Included
	Beach nourishment		→			Included
	Dune revegetation		→	→		Included

Breakout Activities

Focus to Physical Options

i.e. those options that change erosion or inundation extents

Screening Physical Options

Review benefits and concerns of adaption options for the priority settlements including:

- Moore Park Beach
- Burnett Heads
- Bargara
- Innes Park and Coral Cove
- Woodgate Beach and Walkers Point



Screening Physical Options

Beach nourishment	Natural solution, effective against erosion risk along shore front. Cost: \$\$
Dune reconstruction / revegetation	
Seawalls	Effective in mitigating risk to both erosion and inundation. Possible impacts on stormwater runoff and view lines. Cost: \$\$\$\$
Levees / Storm Surge Barrier / Dyke	Storm Surge Barrier, effective in preventing inundation if built high enough (but possible impact on stormwater runoff and view lines). Poor water quality, loss of vegetation. Large environmental impacts Cost: \$\$\$\$\$
Artificial Reef	Reduction of wave forces, change erosion patterns. Only 20 yr life span – impacts on existing reefs – only effect where sufficient sediment supply Cost: \$\$\$\$
Groynes & Beach Nourishment	Only effective where there is sufficient long-shore sediment transport or with beach nourishment. Existing headlands already provide a holding structure for beach nourishment. Not effective against inundation or SLR. Cost: \$\$\$\$

Category	Moore Park Beach	Score	Bargara	Score	Innes Park and Coral Cove	Score	Coonarr	Score	Woodgate Beach and Walkers Point	Score
	Buy-back land	1			Managed realignment	2				
	SEMP Strategy	8								
	Managed realignment	6			Potentially retreat from northern residential area	5				
					Coolanblue Ave properties (eastern alignment) need to relocate	5				
Accommodate	Bridges on arterial road	4	As properties are rebuilt or renovated lift to higher height	5	Community education	10	Raise road	3	Community education	10
	Raise road	2	Community education	10	Plan development areas	5	Sandbag walls and strong walls	8	Upgrade sewerage infrastructure for Walkers Point	7
	Community education	10	Retrofit structures	5	Identify contour lines for high water	5	Artificial reef as a buffer	-	Retrofit structures	5
	Retrofit structures	5	Plan development areas	5	Land use planning – specific controls on buildings	10	Retrofit structure	1	Plan development areas	5
	Plan development areas	5	Identify contour lines for high water	5	Flood resilient infrastructure	5	Plan development areas	5	Identify contour lines for high water	5
	Identify contour lines for high water	5	Raise Barolin Esplanade from inundation area	5	Wetland restoration	8	Identify contour lines for high water	5		
	Land use planning – specific controls on buildings	10	Declare "Benefitted Area" with property owners levied for x number of years with State and Council contributing (rock wall)	10	Education	10	Upgrade infrastructure	3	Identify contour lines for high water	5
	Flood resilient infrastructure	9	Raise sections of Miller St	9	Riparian corridor	8	Raise roads to retreat or access	9		
	Wetland restoration	5			Bridge	1				
	Education	10			Alternative coastal road	7				
	Riparian corridor	7			Upgrade the water and sewerage infrastructure	-				
	Strengthen buildings	2			Strengthen building	7				
					Raise roads or alternative access road	4				
Defend	Build canal or water channel from river behind town to control the water	7	Artificial reef	8			Defence wall or levee to protect road	4	Artificial reef	8
	Wall / levee around town	7	Groyne / sea wall	9	Artificial reefs	9	New wetland nearby to absorb tidally water		Groyne sea wall	7
	Beach affected property well in front	9	Beach nourishment	6	Sea wall	1	Vegetate sand hills with severe erosion from human intervention	7	Beach nourishment	8

Breakout Activity 1: Benefits and Concerns

Assist to evaluate the potential success of adaptation options.

Reference Material:
List of Physical Options
Mapping of Benefits

2 or 3 Groups
Look at 1 or 2 priority settlement per group
Review screening process
Open discussion about key considerations

Breakout Activity 2: Screening the Physical Options

Provide initial feedback to validate evaluation criteria for Phase 7

Reference Material:
List of Physical Options
Mapping of Benefits

Fill in the last column

Likely to be achieved?
Achieved with modification?
Unlikely to achieve?

Summary and Refine

Are the CRG happy with the suggested Adaptation Options?

Options put into Pathways Approach and Strategy Document

- Land use planning - new infrastructure and/or assets built outside hazard zones
- SEMP
- Disaster Management
- Land buy-back
- Resilient Infrastructure
- Conserve vegetation areas and monitor erosion
- Mon Repos: Site Specific Investigation with QPWS (DES)
- Raise Key Access Roads
- Beach nourishment / Dune Revegetation
- Allowing wetlands to adapt – e.g. estuarine habitat migration

Summary and Refine

Are the CRG happy with the screening of Physical options?

Screening of Physical Options via:

Considerations:

- Costs
- Benefits
- Adverse Impacts
- Environmental Impacts
- Assessment of Effectiveness

Outputs:

- Likely to achieve
- Achieve with modification
- Unlikely to achieve

Evaluation Criteria

Proposed criteria for Bundaberg CHAS

1. Cost
2. Impact on access to coastal areas for recreation (e.g. camping, fishing, swimming)
3. Impact on natural/cultural/landscape value
4. Flexibility to respond to unexpected climate outcomes (upside / downside)
5. Effectiveness – people and property, environment
6. Feasibility – i.e. complexity of implementation (technical, stakeholder / social, institutional)

Where to from here?

During each phase we will seek your feedback and broad agreement as the CHAS develops:

Phase 7 – MCA of adaptation options informed by conjoint analysis to develop list of options with high social, economic and environmental performance

November 2019

Phase 8 – Strategy and Implementation Plan linked to resilience baseline improvements coupled with development of monitoring and evaluation process

Post –LocalElection 2020

Questions?



ANNEXURE B

INNES PARK

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Beach nourishment / Dune (re-)construction	\$\$\$\$\$	Natural solution Creates additional buffer for erosion and inundation protection. Increases natural habitat.	Dispersion of sand along the beach can impact the creek outlets (e.g. closure) and water quality in the creeks if not addressed appropriately. Impact on visual amenity Impact on view lines. If the dune height increases stormwater runoff must also be considered/addressed.	Negative impacts minimal, assuming: <ul style="list-style-type: none"> ■ sand is placed outside of the turtle nesting or hatching season ■ sand is not placed over rocky foreshores or seagrass beds ■ similar particle size to existing sand ■ sand is placed gradually ■ dune revegetation is of native plants ■ sand is needed to be placed over buried sea walls 	Effective against erosion and inundation if built high enough Also effective against Sea Level Rise Moore Park Beach is a very long beach and placed sand can potentially disperse quickly without any additional holding structure (e.g. groyne). If no regular re-nourishment is undertaken the effectiveness will be reduced over time. Does not address inundation from the creeks and wetlands behind the dune. Dune reconstruction will increase effectiveness compared to beach nourishment alone.	Likely with modification <ul style="list-style-type: none"> ■ Ensure correct vegetation and a mix of plants e.g. trees, grass, shrubs, coastal natives eg. 12 varieties



Beach Nourishment

- Artificial addition of sand to a beach system, increasing the buffer against erosion or halting erosional losses
- Reduces the risk of storm tide inundation when combined with dune creation and vegetative stabilisation
- Long term beach nourishment requires continuous monitoring of shoreline changes

MOORE PARK BEACH

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Seawalls	Cost: \$\$\$\$\$	Mitigates erosion and inundation Provides a hard line of defence (very limited residual risk for erosion to occur landwards of the seawall)	Would grow against wall. Comes and goes. Hard barrier to access the beach. Can initially be built to current conditions (no SLR) and retrofitted later on to account for SLR to reduce initial capital cost. Long beach compartment and therefore long seawall required. Often constructed as buried seawalls with beach nourishment to provide amenity and satisfy state approval requirements.	Moore Park Beach is a significant for turtle nesting, Seawalls at Moore Park Beach are likely to be located as far landward as possible allowing dune to retreat landward, providing the opportunity for turtles to nest. Seawalls would need to be designed to ensure they do not adversely impact tidal flushing of the small creeks to the south, as this may negatively impact water quality and ecological condition.	Effective in preventing inundation if build high enough (but possible impact on stormwater runoff and view lines). Effective against erosion.	Likely <ul style="list-style-type: none"> ■ Buried sea walls preferred ■ Don't need to be as large as what you may think. Sand will come and go.



Seawall

- Structure separating land and water areas designed to prevent coastal erosion and other damage due to wave action and storm tide inundations.
- Normally very large structures as they are designed to resist the full force of waves and storm surges
- Often incorporated into a Shoreline Erosion Management Strategy in combination with beach nourishment and dune regeneration
- Does not typically require continuous maintenance; however, extreme storms can damage the structures and intervention can be required.

BURNETT HEADS

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Sea Dykes	Cost: \$\$\$\$\$	Prevents storm tide inundation up to the design event - in this case the 1% AEP event plus 0.8m SLR.	Hard engineering solution, Large structure, Negative effect on access to foreshore, Highly likely any beach will disappear in front of large barrier, Must cover the full-length front and may require expensive upgrade in the future	Loss of visual amenity Loss of high value wetland complex comprising mangrove shrubland, Preventing tidal water from inundating this area would lead to the degradation of this eco-system. Likely to be higher variation in salinity in the creek, loss of tidal fluctuation, prolonged periods of high and low water depending on rainfall. Mangroves and saltmarsh likely to die-off Loss of fish habitat Prevention of fish passage Ponding or flooding landward of the dyke following storm events resulting in poor water quality, mosquito breeding risk	Effective against wave force and inundation, very effective in combination with other options, can be arranged as green corridors along tidal waters,	Likely with modification <ul style="list-style-type: none"> ■ Location of wall to protect houses but preserve wetlands. ■ Possibly combine with Port's build of Port Bypass road from cane fields or to Buss Street to save cost.



Sea Dyke

- An artificially constructed fill or wall commonly designed to regulate water levels and to avoid inundation from storm tides.
- Usually earthen, covered with vegetation and parallel to the shore of low-lying coastlines
- Can be used to control extreme water levels associated with storm tides and in conjunction with sea level rise.

BARGARA

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Beach nourishment Dune (re-)construction	Cost: \$\$\$\$	Natural solution Creates additional buffer for erosion and inundation protection, increases natural habitat.	Sand will block the creek outlet and impact on water quality and flooding. Pushed out as soon as a big rain. Natural self-opening capacity of the creek will be limited. Can be addressed by installing outlet pipe. Don't get that – 'Causeway' it the problem. Limited public benefit, majority will benefit private properties. Stormwater runoff must also be considered/addressed. Yes/Yes	Impact tidal flushing of Moneys Creek and Kelly's Creek. There is nearly not tidal flushing. Likely to exacerbate poor water quality issues in the lagoon Kelly's Creek is a small coastal creek that may intermittently be tidally inundated, or discharge to the sea. Beach nourishment may also adversely impact this creek? Significant areas of reef close to the shore at the northern section of the area that would be negatively impacted – would it?	Effective against erosion and inundation if build high enough (can potentially impact on views). Can also be effective against SLR, however, Existing headlands will act as a holding structure and sand loss will be limited. If no regular re-nourishment is undertaken the effectiveness will be reduced over time. Even now Kelly's beach needs to be renourished every year.	Likely with modification ■ Ensure correct vegetation and a mix of plants e.g. trees, grass, shrubs, coastal natives eg. 12 varieties



Beach Nourishment / Dune Reconstruction

- Artificial addition of sand to a beach system, increasing the buffer against erosion or halting erosional losses
- Reduces the risk of storm tide inundation when combined with dune creation and vegetative stabilisation
- Long term beach nourishment requires continuous monitoring of shoreline changes

BARGARA

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Seawalls	Cost: \$\$\$\$\$	Stopping erosion and inundation, provides a hard line of defence (very limited residual risk for erosion to occur landwards of the seawall)	Loss of beach in front of seawall. Disagree, it comes back. See what units did on Kelly's Beach. Hard barrier to access the beach. Not there. Can initially be built to current conditions (no SLR) and retrofitted later to account for SLR to reduce initial capital cost. Can potentially blend in well into rocky foreshore Impact on stormwater runoff and view lines. Not at all.	A significant beach for turtle nesting, although lighting reduces success rates. Loss of turtle nesting habitat. - Rubbish Seawalls would need to be designed to ensure they do not exacerbate poor tidal flushing, poor water quality and ecosystem health of Moneys Creek nor water quality, ecosystem health of Kelly's Creek, or adversely impact the reefs in the area.	Effective in preventing inundation if build high enough Effective against erosion.	Likely with modification <ul style="list-style-type: none"> ■ Buried sea walls preferred ■ Along Kelly's & Archie's. ■ Correct stabilising plants can be introduced.



Seawall

- Structure separating land and water areas designed to prevent coastal erosion and other damage due to wave action and storm tide inundations.
- Normally very large structures as they are designed to resist the full force of waves and storm surges
- Often incorporated into a Shoreline Erosion Management Strategy in combination with beach nourishment and dune regeneration
- Does not typically require continuous maintenance; however, extreme storms can damage the structures and intervention can be required.
- This would be the first chose. Then plant the correct trees to stabilize.
- The causeway should be a bridge
- Rock wall needs to be built now from halfway along Kelly's Beach (pathway down) to lifesavers Tower at entrance to Moneys.

BARGARA

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Groynes	Cost: \$\$\$\$\$	Increased amenity compared to seawall as a beach can be maintained.	Only effective where there is sufficient long-shore sediment transport. Only effective against erosion if undertaken in combination with beach nourishment and if sand buffer is maintained (re-nourishment campaigns). Existing headlands already provide a holding structure for beach nourishment. Not effective against inundation or SLR.		Only effective in combination with beach nourishment. Headland already provides holding structure	Unlikely to achieve <ul style="list-style-type: none"> ■ Can't see any benefit.



Groynes

- Structures built perpendicular to the shoreline that traps sand moving along the coast.
- Only effective in areas with sufficient longshore sediment transport rates.
- Recommended for a whole beach compartment as they cause the accumulation of material on one side but erosion in the lee side.
- They do not require high levels of maintenance; however extreme storms can damage the structures and intervention may be required.

BARGARA

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Artificial reef	Cost: \$\$\$\$\$	Reduction of wave forces and change erosion patterns, recreational and public amenity can be enhanced, does not require high level of maintenance, does not impact coastal landscape, create new coastal ecosystems and shelter for species.	Hard engineering solution, if poorly designed can accelerate erosion, lifespan of 20 years, not designed for permanent inundation, initial costs can be high	Possible impact on existing natural reefs.	Only effective if there is sufficient sediment supply in the area, which is questionable due to the rocky nature of this part of the coast. If no sufficient sediment supply is available this option would only be effective in combination with beach nourishment.	Unlikely to achieve <ul style="list-style-type: none"> ■ Can't see any benefit ■ What else would it impact?



Artificial reef

- Submerged structure designed to reduce wave energy and erosive processes on the coastal foreshore
- Typically constructed with sand filled geotextile bags which are filled inside a spilt-hull hopper dredge
- Can also be constructed with rocks or concrete blocks
- Normally designed to be effective for 20 years
- Do not require high levels of maintenance, however extreme storms can damage the structure and intervention may be required

INNES PARK AND CORAL COVE

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Artificial reef	Cost: \$\$\$\$	Reduction of wave forces and change erosion patterns, recreational and public amenity can be enhanced, does not require high level of maintenance, does not impact coastal landscape, create new coastal ecosystems and shelter for species.	Hard engineering solution, if poorly designed can accelerate erosion, lifespan of 20 years, not designed for permanent inundation, initial costs can be high	<p>There are extensive intertidal and subtidal reefs of high ecological value in the vicinity of the proposed artificial reefs. The artificial reefs would need to be carefully designed and placed to ensure these reefs were not adversely impacted.</p> <p>While there are seagrass beds offshore and to the south of Innes Park, these are likely to be offshore of the proposed artificial reefs.</p> <p>The artificial reefs would also need to be carefully placed to avoid sand accumulation in the entrance to Palmer Creek, which may result in a reduction in tidal exchange and adverse impacts to water quality and ecosystem health.</p>	Only effective if there is sufficient sediment supply in the area, which is questionable due to the rocky nature of this part of the coast. If no sufficient sediment supply is available this option would only be effective in combination with beach nourishment.	<p>Unlikely to achieve</p> <ul style="list-style-type: none"> ■ Can't see any benefit ■ What else would it impact?



Artificial reef

- Submerged structure designed to reduce wave energy and erosive processes on the coastal foreshore
- Typically constructed with sand filled geotextile bags which are filled inside a spilt-hull hopper dredge
- Can also be constructed with rocks or concrete blocks
- Normally designed to be effective for 20 years
- Do not require high levels of maintenance, however extreme storms can damage the structure and intervention may be required

COONARR

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Beach nourishment	Cost: \$\$\$\$	Natural solution, Creates additional buffer for erosion and inundation protection.	Dispersion of sand along the beach can impact the creek outlets (e.g. closure) and water quality in the creeks.	Negative impacts minimal, assuming: <ul style="list-style-type: none"> ■ sand is placed outside of the turtle nesting or hatching season ■ sand is not placed over rocky foreshores or seagrass beds ■ similar particle size to existing sand ■ sand is placed gradually ■ dune revegetation is of native plants Shallow reefs offshore of the proposed sand placement at Coonarr, and seagrass further offshore. It is likely that modelling is required to ensure that sand is not displaced over these habitats.	Effective against erosion and inundation if build high enough (can potentially impact on views). Can also be effective against SLR, however, if the dune height increases stormwater runoff must also be considered/addressed. Sand can potentially disperse quickly without any additional holding structure (e.g. groyne). If no regular re-nourishment is undertaken the effectiveness will be reduced over time. Does not address inundation from the creeks and wetlands behind the dune. Dune reconstruction increases effectiveness compared to beach nourishment alone.	Unlikely to achieve <ul style="list-style-type: none"> ■ Property Buy-Back to be explored here
Dune (re-)construction			Only benefits a number of private properties. (no public benefit) Impact on view lines. Management of beach access points required. No public benefit.			



Beach Nourishment / Dune Reconstruction

- Artificial addition of sand to a beach system, increasing the buffer against erosion or halting erosional losses
- Reduces the risk of storm tide inundation when combined with dune creation and vegetative stabilisation
- Long term beach nourishment requires continuous monitoring of shoreline changes

COONARR

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Seawalls	Cost: \$\$	Stopping erosion and inundation, provides a hard line of defence (very limited residual risk for erosion to occur landwards of the seawall)	<p>Loss of beach in front of seawall.</p> <p>Hard barrier to access the beach.</p> <p>Can initially be built to current conditions (no SLR) and retrofitted later on to account for SLR to reduce initial capital cost.</p> <p>Can potentially blend in well into rocky foreshore</p> <p>Impact on stormwater runoff and view lines.</p>	<p>While turtles nest on this beach, nests are in lower numbers than at Moore Park Beach and Bargara. Nesting habitat would be lost where seawalls are placed at HAT.</p> <p>Seawalls would need to be designed to ensure they do not adversely: impact the offshore shallow reefs and seagrass impact tidal flushing of Coonarr Creek, as this may negatively impact water quality and ecological condition.</p>	<p>Effective in preventing inundation if build high enough</p> <p>Effective against erosion.</p>	<p>Unlikely to achieve</p> <ul style="list-style-type: none"> Property Buy-Back to be explored here



Seawall

- Structure separating land and water areas designed to prevent coastal erosion and other damage due to wave action and storm tide inundations.
- Normally very large structures as they are designed to resist the full force of waves and storm surges
- Often incorporated into a Shoreline Erosion Management Strategy in combination with beach nourishment and dune regeneration
- Does not typically require continuous maintenance; however, extreme storms can damage the structures and intervention can be required.

COONARR

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Artificial reef	Cost: \$\$	Reduction of wave forces and change erosion patterns, recreational and public amenity can be enhanced, does not require high level of maintenance, does not impact coastal landscape, create new coastal ecosystems and shelter for species.	Hard engineering solution, if poorly designed can accelerate erosion, lifespan of 20 years, not designed for permanent inundation, initial costs can be high	Artificial reefs in this area would need to avoid adverse impacts to: <ul style="list-style-type: none"> the shallow offshore reefs and seagrass tidal flushing of Coonarr Creek. 	Only effective if there is sufficient sediment supply in the area If no sufficient sediment supply is available this option would only be effective in combination with beach nourishment.	Unlikely to achieve <ul style="list-style-type: none"> Property Buy-Back to be explored here



Artificial reef

- Submerged structure designed to reduce wave energy and erosive processes on the coastal foreshore
- Typically constructed with sand filled geotextile bags which are filled inside a spilt-hull hopper dredge
- Can also be constructed with rocks or concrete blocks
- Normally designed to be effective for 20 years
- Do not require high levels of maintenance, however extreme storms can damage the structure and intervention may be required

WOODGATE BEACH AND WALKERS POINT

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Beach nourishment Dune (re-)construction	Cost: \$\$\$\$\$	Natural solution, Creates additional buffer for erosion and inundation protection, increases natural habitat.	Dispersion of sand along the beach can impact the creek outlets (e.g. closure) and water quality in the creeks. Impact on view lines. Management of beach access points required	Negative impacts minimal, assuming: <ul style="list-style-type: none"> ■ sand is placed outside of the turtle nesting or hatching season ■ sand is not placed over rocky foreshores or seagrass beds ■ similar particle size to existing sand ■ sand is placed gradually ■ dune revegetation is of native plants ■ does not impact tidal flushing of Theodolite Creek <p>There is some seagrass offshore of the proposed sand placement at Woodgate. It is likely that modelling is required to ensure that sand is not displaced over this habitat.</p>	Effective against erosion and inundation if build high enough (can potentially impact on views). Can also be effective against SLR, however, if the dune height increases stormwater runoff must also be considered/addressed. Sand can potentially disperse quickly without any additional holding structure (e.g. groyne). If no regular re-nourishment is undertaken the effectiveness will be reduced over time. Does not address inundation from the creeks and wetlands behind the dune. Increased effectiveness compared to beach nourishment alone.	Likely with modification <ul style="list-style-type: none"> ■ Buried sea walls preferred ■ Not stable on its own, requires complementary work. ■ Needs to keep dune height below view lines.



Beach Nourishment

- Artificial addition of sand to a beach system, increasing the buffer against erosion or halting erosional losses
- Reduces the risk of storm tide inundation when combined with dune creation and vegetative stabilisation
- Long term beach nourishment requires continuous monitoring of shoreline changes

WOODGATE BEACH AND WALKERS POINT

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Seawalls	Cost: \$\$\$\$\$	Stopping erosion and inundation, provides a hard line of defence (very limited residual risk for erosion to occur landwards of the seawall)	Loss of beach in front of seawall. Hard barrier to access the beach. Can initially be built to current conditions (no SLR) and retrofitted later on to account for SLR to reduce initial capital cost. Long beach compartment and therefore long seawall required.	Seawalls are likely to be built close to HAT or the upper extent of dune vegetation at this beach, as there is little space between assets and the beach. Dune would gradually erode up to the seawall, and turtle nesting habitat would be removed. Seawalls would need to be designed to ensure they do not adversely: <ul style="list-style-type: none"> ■ impact the offshore seagrass ■ impact tidal flushing of Theodolite Creek, as this may negatively impact water quality and ecological condition. 	Effective in preventing inundation if build high enough (but possible impact on stormwater runoff and view lines). Effective against erosion.	Likely with modification <ul style="list-style-type: none"> ■ Buried sea walls preferred ■ Not stable on its own, requires complementary work i.e. beach nourishment ■ Needs to keep dune height below view lines. ■ Don't want to destroy amenity of beach.



Seawall

- Structure separating land and water areas designed to prevent coastal erosion and other damage due to wave action and storm tide inundations.
- Normally very large structures as they are designed to resist the full force of waves and storm surges
- Often incorporated into a Shoreline Erosion Management Strategy in combination with beach nourishment and dune regeneration
- Does not typically require continuous maintenance; however, extreme storms can damage the structures and intervention can be required.

WOODGATE BEACH AND WALKERS POINT

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Groynes	Cost: \$\$\$\$\$	Increased amenity compared to seawall as a beach can be maintained.	Only effective where there is sufficient long-shore sediment transport. Only effective against erosion if undertaken in combination with beach nourishment and if sand buffer is maintained (re-nourishment campaigns).		Only effective in combination with beach nourishment. Not effective against inundation or SLR.	Unlikely to achieve <ul style="list-style-type: none"> ■ Can't see any benefit.



Groynes

- Structures built perpendicular to the shoreline that traps sand moving along the coast.
- Only effective in areas with sufficient longshore sediment transport rates.
- Recommended for a whole beach compartment as they cause the accumulation of material on one side but erosion in the lee side.
- They do not require high levels of maintenance; however extreme storms can damage the structures and intervention may be required.

WOODGATE BEACH AND WALKERS POINT

	Costs	Benefits	Adverse Impacts	Environmental Impacts	Assessment of Effectiveness (SLR)	SCREENING PROCESS (Likely / Modification / Unlikely to Achieve)
Artificial reef	Cost: \$\$\$\$\$	Reduction of wave forces and change erosion patterns, recreational and public amenity can be enhanced, does not require high level of maintenance, does not impact coastal landscape, create new coastal ecosystems and shelter for species.	Hard engineering solution, if poorly designed can accelerate erosion, lifespan of 20 years, not designed for permanent inundation, initial costs can be high	Artificial reefs in this area would need to avoid adverse impacts to: <ul style="list-style-type: none"> the shallow offshore reefs and seagrass tidal flushing of Theodolite Creek 	Only effective if there is sufficient sediment supply in the area If no sufficient sediment supply is available this option would only be effective in combination with beach nourishment.	Unlikely to achieve <ul style="list-style-type: none"> Not effective / no benefit



Artificial reef

- Submerged structure designed to reduce wave energy and erosive processes on the coastal foreshore
- Typically constructed with sand filled geotextile bags which are filled inside a spilt-hull hopper dredge
- Can also be constructed with rocks or concrete blocks
- Normally designed to be effective for 20 years
- Do not require high levels of maintenance, however extreme storms can damage the structure and intervention may be required



MINUTES OF MEETING

Bundaberg Coastal Hazard Adaptation Strategy Community Reference Group (CRG)

Held At:	Function Room, Bundaberg Regional Council Administration Centre 190 Bourbong Street, Bundaberg
Date & Time:	Thursday, 5 March 2020 – 6.00 pm to 7.30 pm
Present:	<i>CRG Members</i> – Chris McLoughlin, Heath Greville, Josephine Ferris, Jennifer Parry, George Martin, Robert Bell, Terry Kelly
	<i>Council</i> – Cr Bill Trevor (Chair), Cr Jason Bartels, Dwayne Honor (Project Manager), Evan Fritz (Strategic Planning), Sally Obst (Natural Areas), Natalie McDonald (Administration)
Apologies	<i>CRG Members</i> – Russell Stewart, Ian Graham, Lloyd Blake, Collin Turner, Tony Ricciardi, Shanelle Pekin, Sharon Jackson, Joe Russo, Julie Fauser
	<i>Council</i> – Cr Wayne Honor, Cr Greg Barnes, Cr Scott Rowleson, Beth Whitworth (Disaster Management)

BUSINESS OF MEETING

1. Introductions and Welcome (Dwayne Honor)

Cr Trevor thanked all for attending the meeting and hoped they had a good Christmas. He advised we are now approaching the finish line and it is exciting to be progressing towards the implementation plan and possibly the opportunity to progress some of the outcomes in this year's budget, dependent on the local government elections in March.

The Project Manager, Dwayne Honor welcomed all, noting it has been some time since the last meeting, but expressed the ethos to only get the group together when there was something of value to work through. The minutes of the previous meeting were accepted and are to be published on the *Our Coast* website.

The session tonight will work through validating the multi-criteria analysis weightings and gaining some insight into the final implementation plan. Dwayne Honor presented a PowerPoint to the group (*refer Annexure A*).

Our CHAS project is aligned with the types of projects (*Slide 1*) and thinking to address and adapt to climate change, with Bill Gates being one of the prominent leaders in this area in current times. This is not a new challenge across the globe and our Council is not the only one trying to work through the complexity of issues.

The group worked through a scenario planning tool on-line game by the LA Times in the USA, titled “*The Ocean Game - The Sea is Rising – Can you Save your Town*”, to conceptualize some of the challenges faced with storm tide inundation and sea level rise, etc. and public decision making processes.

Website Link: <https://www.latimes.com/projects/la-me-climate-change-ocean-game/>

The following discussions/comments are noted from working through the scenarios of the game:

- The CHAS process helps us put a plan in place for the future and acting when the time eventuates – Building of groyne and pathways at Hervey Bay is an example.
- Compulsory acquisition of land for roads etc. – The process through the land courts for agreement can be a very expensive option.
- Council where lived previously did not build on erosion-prone sites.
- There is devaluation of property caused by storm tide inundation and erosion, increasing insurance costs and decreasing demand for these properties.
- Council should look at adopting an active approach of responsibility to inform potential buyers that it may be beautiful today but may not stay this way forever.
- The reality of proposing a plan to buy out property owners and move homes away from the coast would be a measure of last resort. Different people have different attitudes and lifestyle considerations which affects decision making which can outweigh monetary incentives at differing times. Incentives can provide options and insurance can also be a major factor to decision making.
- There are already some areas of the Bundaberg coastline that have effectively become uninsurable due to coastal hazards.

The game highlighted to the group the complexities of the issues and that not one size fits all scenarios. “*Our CHAS process enables best practice decision-making informed by science, so we are not just ‘taking a guess’ like in the game.*”

2. Overview of CHAS Progress (Dwayne Honor)

Dwayne Honor recapped on progress of the CHAS to date (*refer Powerpoint Presentation*):

- Phase 3 – Identification of Erosion Prone Areas - Miara, Moore Park Beach, Bargara, Innes Park, Coonarr, and Woodgate Beach (April – December 2018);
- Phase 4 – Identification of Assets – BRC, TMR, Telstra, Energy Qld, Sunwater etc. (December 2018 – April 2019);
- Phase 5 – Assessment of Risk – Triggers for Intolerable Risk – 0.2 m, 0.4 m & 0.8 m sea level rise (March – September 2019);

3. Adaptation Option Screening (Dwayne Honor)

- Phase 6 – Identify and Screen Options – Maintain/Modify/Transform (August – December 2019).

The Technical Project Team screened the long list of options by a high-level analysis of the following criteria: Cost, Benefits, Adverse Impacts/Challenges, Alignment to Principles, Effectiveness.

The Moore Park Surf Life Saving Club beach erosion and land swap of State land was discussed.

4. Evaluation Criteria Weighting – What, Why, How (Dwayne Honor)

Dwayne Honor advised Council is now at Phase 7 of the project and determining the multi-criteria analysis as summarised below:

1. Cost – Putting the Measure in Place.
2. Impacts on Access - Beach Accessibility and Amenity.
3. Impact on Environment and Culture.
4. Adaptability – To Unexpected Climate Trends.
5. Effectiveness – In reducing Risks from Coastal Hazards.
6. Approvals – Difficulty in Obtaining Approval to Construct.
7. Technical Viability – Difficulty in Achieving Construction of the Option.

The MCA criteria has been aligned to the results of the community values survey which identified the top ways that the community likes to use the coast and are concerned about.

There is no right or wrong answer with the MCA evaluation. The Technical Project team workshoped the process in January 2020 which was also reviewed with the Project Control Group (PCG) to come up with a proposed weighting result which we wish to validate with the CRG member tonight. The Technical Project Team worked through the decision-making framework, Analytic Hierarchy Process (AHP), by comparing and focusing on two of the criteria, e.g. Cost vs Effectiveness, Impacts vs Technical Viability. This process provides a more accurate weighting when undertaken as a group.

The group moved to undertaking the weighting criteria ranking exercise. The 7 criteria as noted above were printed on A3 Sheets and placed on the wall, and the group were given 10 stickers each to place on the criteria which they ranked as important to themselves and the Bundaberg Community (*Refer Annexure B noting that red text equals Ranked Priority 1-7; and green is the sticker count*). The CRG ranking results compared to the Technical Group are as follows:

CRG MEMBERS

1. Effectiveness
2. Impact on Environment
3. Adaptability
4. Impact on Access
5. Cost
6. Technical Viability
7. Approvals

TECHNICAL PROJECT TEAM

1. Effectiveness
2. Adaptability
3. Impact on Access
4. Technical Viability
5. Impact on Environment
6. Approvals
7. Cost

The following points were raised by the group for discussion and consideration:

- How costs are to be met? - For example, if each ratepayer were to be levied an amount each year, this could have an influence on the rank (i.e Funding availability can change).
- If 'cost' was ranked at the top - this could eliminate many potential adaptation options and negate future funding sources for climate adaptation. Funding streams from government can change into the future and may enable adaptation options to be implemented.

- Cost is considered an item that the Council as elected officials are best to determine based on funding availability at the time (including any external sources). The MCA and subsequent Cost Benefit Analysis will be used to further screen options and provide Council a “pool” of projects to decide from.
- Reaching trigger point targets was raised, including availability of funding, agreement on options and the likelihood of reaching predicted sea level rise over a predicted period i.e 10 years from now.
- It is likely that the whole coastline would be impacted at the same time. From observations, the further the community live away from the area of concern, the less their consideration is to impacts and adaptation options because they do not feel the consequence directly.
- On any adaptation option, e.g. cost vs impact on beach access, all competing interests would be weighed up. The cheaper alternatives would not be considered if they did not address the issue.
- Whole of Life Costs (WOLC) on preferred options will be undertaken based on trigger levels. The intent is to optimise when “X” amount of funding would be required to deliver the required outcome prior to intolerable impacts being reached.
- Consideration should be given to new development approvals and ensuring they are placed in safer areas. There should be clear understanding that present conditions will not reflect future.
- Brisbane River has large floodplains that are developed and while heavily impacted by floods, they are now some of the most vibrant places for people to live – need to balance the provision of community value and development opportunity, while ensuring future climate measures are considered and put in place.
- Coastal areas have always been dynamic and consideration to settlements being kept away from these zones is important. Coastal creeks tend to transition, and Coonarr Beach was discussed as an example.
- Protecting the environment with flora and fauna to provide a buffer zone within all areas while being flexible to specific settlement need was considered important
- It was observed that sometimes the community is willing to sacrifice the environment to improve drainage and public health concerns i.e. mosquitoes and low-lying water bodies. Group discussion highlighted that may have been a historical position and way of thinking, but clearly emphasized the community has now moved on towards preservation of our environment as a key value.

The following observations were made with regard to the weightings between the CRG members and the Technical Project Team, noting the below differences:

- Impact on environment – rated quite a bit lower by the Technical Project Team;
- Technical Viability – rated quite a bit higher by the Technical Project Team; and
- CRG looking from community viewpoint with Project Team looking from technical viewpoint.

Group discussion followed with consensus that the rankings were similar excepting the middle ranks and recommending that the Technical Project Team should consider adjusting Technical Viability down and Impact on Environment up.

5. CHAS Implementation Plan

The proposed design of the strategy document was presented to the group (refer Slide 27 - Annexure A) and how it will come together with settlement action plans.

6. Where to from here

Consideration will now be given to the final MCA in consultation with the Project Consultant and Council as the decision maker.

Tonight is the last CRG workshop on subject matter, with the final meeting to be held to preview the draft CHAS strategy document before public consultation.

The Strategy document will initially be presented to the new Council work completed to date and the consultative process with the CRG members. Following Council endorsement, the draft will be released for public feedback. After the public consultation period, all submissions will be reviewed and a final version of the strategy will be presented to Council for adoption.

QCoast 2100 funding requires the strategy to be finalised by October 2020. Douglas Shire Council has completed their strategy and Bundaberg Regional Council is the next most advanced. It is not known whether all Councils will be able to complete the strategy in time.

Dwayne conveyed his appreciation in everyone's involvement to date, particularly as the project duration had extended considerably. A certificate of appreciation will be provided to each member.

A CRG Member wished to commend Council for sticking with the project which was expressed as a good thing. The trigger-based approach was considered an excellent outcome with a fair bit of wisdom built into the minimum standards and guidelines document. Members looked forward to seeing some of the outcomes implemented at Woodgate Beach and Moore Park Beach.

It was queried whether the CHAS would interact with other types of disaster management – e.g. fires last year. Dwayne Honor advised that as part of the technical work, Council determined that the risk consequence table in the QCoast 2100 minimum standards and guideline could not be applied to the Bundaberg coastline. Following consultation with the QCoast 2100 program, the Queensland Emergency Risk Management Framework (QERMF) was instead applied. This brings horizontal alignment to the CHAS and means the outputs can be neatly integrated to the next version of Council's disaster management plan. The QERMF must be used as the basis for all future updates to disaster management plans in Queensland.

7. Closing

The Chair thanked all for attending, including the presenters, Dwayne Honor and staff, and also fellow Councillor, Jason Bartels. The minutes from this meeting will be circulated via email. Should CRG members have any further comments, please email through to ourcoast@bundaberg.qld.gov.au.

Cr Trevor thanked all the CRG members for their efforts in attending the project workshops and knows that a lot of people in the broader community are looking towards the outcomes of the CHAS strategy.

This concluded the business of the CRG Workshop at 7.43 pm.

Cr Bill Trevor, Chairperson
OUR COAST Community Reference Group


ANNEXURE A



Welcome!

Bundaberg Region Coastal Hazard Adaptation Strategy

Community Reference Group Workshop #8
6.00 to 7.30pm
5 March 2020



Agenda

ITEM	Lead	Timing
Introductions	Dwayne Honor	5 mins
Overview of CHAS Progress	Project Team	10 mins
Adaptation Option Screening	Project Team	20 mins
Evaluation Criteria Weighting: what, how and why?	Project Team	35 mins
CHAS Implementation Plan	Project Team	10 mins
Where we are headed	Dwayne Honor	10mins

Climate-Adaptation Year of Action

- **Global Commission on Adaptation (GCA)**
- Year of Action to Accelerate Climate Adaptation
 - Target for Resilient Cities
 - Climate-Smart Land Use Planning
 - Nature based solutions
 - Locally-led action
 - Resilient Infrastructure
 - Prevent disasters by investing in early warning systems



Protecting Our Coast “A Wicked Problem”

- Difficult or impossible to solve
- Incomplete or contradictory knowledge
- Many opinions
- Large economic burden



Coastal CC adaptation - Game

This game demonstrates the complexity of adaptation solutions for coastal hazards.

The CHAS process enables best practice decision-making, so we are not just 'taking a guess' like in this game.



[Click here](#)

Phase 3 – identify areas April – December 2018

Legend

Key Study Location

Erosion Prone Areas Extent (Water Technology, 2018)

Erosion Prone Areas (Combined Coastal and Estuarine)

1% AEP Storm Tide Inundation Extent (QLD State Mapping - GHD, 2014)

1% AEP Storm Tide Inundation

Music Park Beach



Phase 3

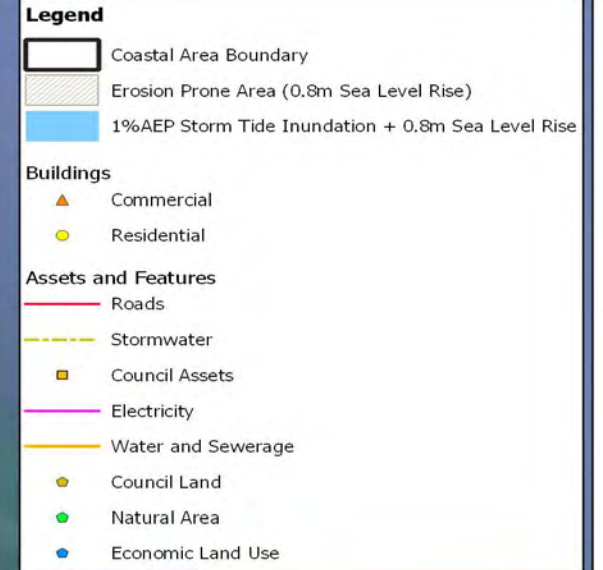


Source: Water Tech, May 2018



Source: Water Tech, Jan 2019

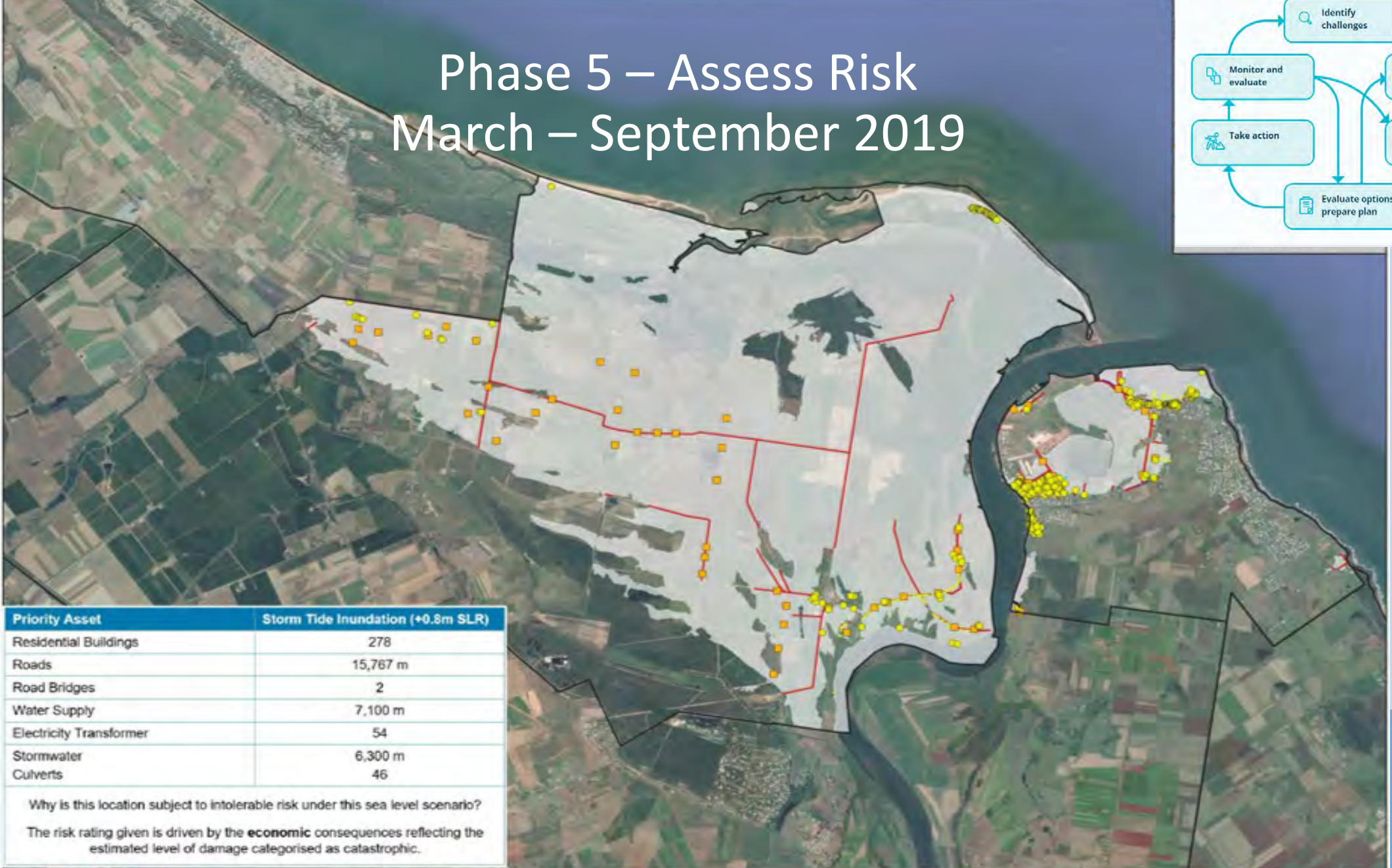
Phase 4 – Identify assets December 2018 – April 2019



Data considered in the asset counts were obtained from the following organisations:

- Bundaberg Regional Council
- Department of Transport and Main Roads, Queensland Government
- Telstra
- Energy Queensland (formerly Ergon)
- Sunwater
- Queensland Herbarium (regional ecosystems and habitat types).

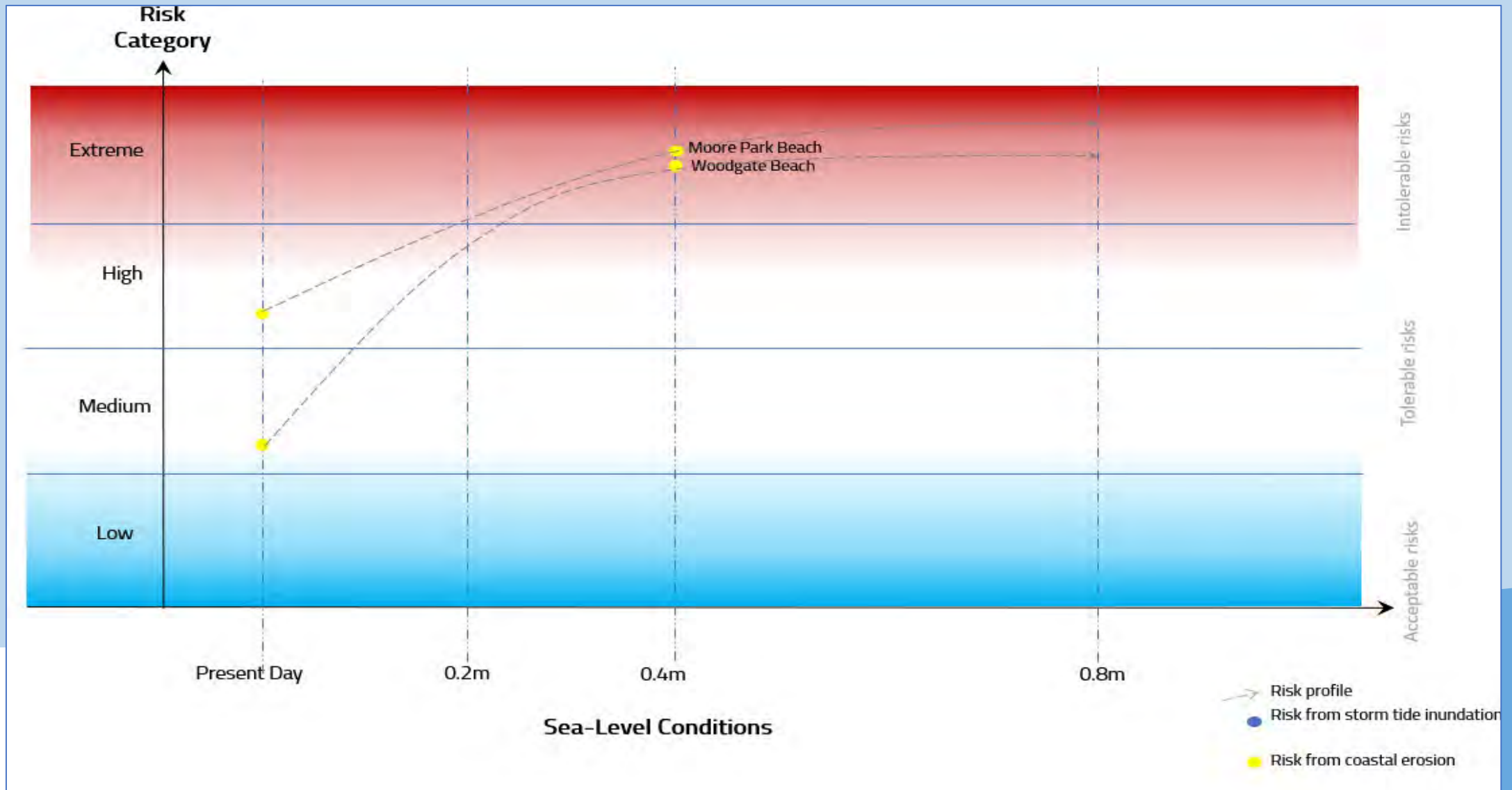
Phase 5 – Assess Risk March – September 2019



Priority Asset	Storm Tide Inundation (+0.8m SLR)
Residential Buildings	278
Roads	15,767 m
Road Bridges	2
Water Supply	7,100 m
Electricity Transformer	54
Stormwater Culverts	6,300 m

Why is this location subject to intolerable risk under this sea level scenario?
 The risk rating given is driven by the **economic** consequences reflecting the estimated level of damage categorised as catastrophic.

Phase 5 – Assess risk



Phase 5 – Assess Risk

The settlements identified as being subject to intolerable risks are considered priority locations, the sea level rise scenarios which ‘trigger’ the risk to become intolerable are:



0.2m slr

Coonarr



0.4m slr

Woodgate Beach &
Walkers Point

Moore Park Beach



0.8

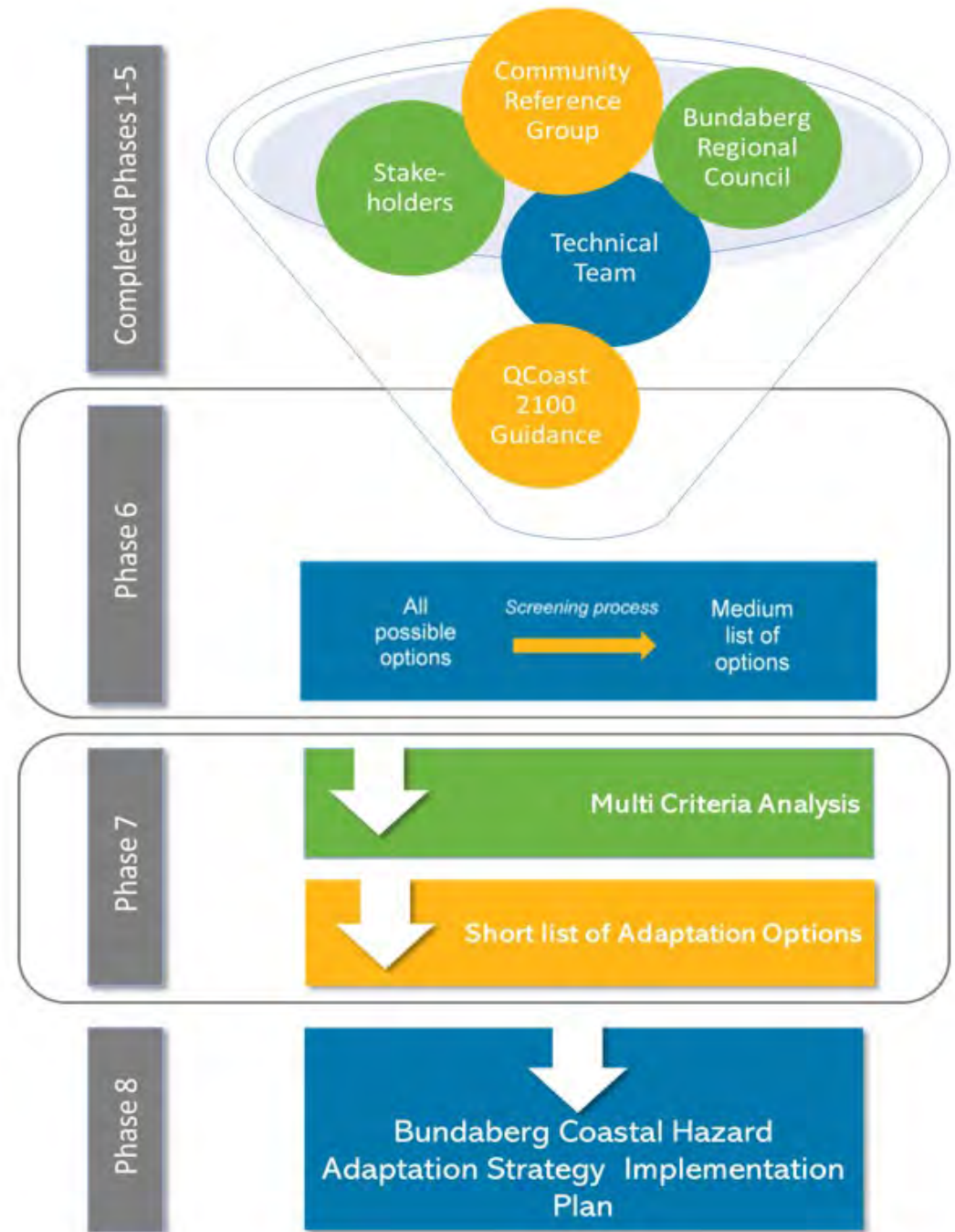
Bargara

Innes Park & Coral
Cove

Burnett Heads

Phase 6 – Identify and Screen Options

August – December 2019



Phase 6 - Screening Process

In Phase 6 the project team screened the long-list of options by a high-level analysis of the following criteria:

- COSTS
- BENEFITS
- ADVERSE IMPACTS / CHALLENGES
- ALIGNMENT TO PRINCIPLES
 - Resilient Society, Economy, Settlements and Environment
- EFFECTIVENESS
 - Against inundation, erosion and SLR

TABLE 6-15 ADAPTATION OPTIONS FOR MOORE PARK BEACH

Option	Costs	Benefits	Adverse Impacts / Challenges	Alignment to Principles	Assessment of Effectiveness (SLR)	Scenario	Screening
Maintain							
Disaster Management	\$	Builds resilience through communication and messaging Coordinates preparation to disasters. No environmental impacts	Does not remove hazards of sea level rise, inundation or erosion May lead to complacency in community or not all community engaged. May not achieve complete audience – selective hearing	<ul style="list-style-type: none"> ✓ Society ✓ Economy ✓ Settlements ✓ Environment 	Partially effective	Now	Shortlisted
Education and Awareness Campaigns	\$	Enhanced understanding of coastal processes, adaptation options and implications for specific neighbourhoods Understand frequency of events into the future Mutual capacity building	Does not remove hazards of sea level rise, inundation or erosion Communicating 'wicked problems' is complex, how to engage audience? Community values are interrupted In many cases the community is unable to visualise solutions Fear of loss	<ul style="list-style-type: none"> ✓ Society ✓ Economy ✓ Settlements ✓ Environment 	Partially effective	Now	Shortlisted
Building retrofitting	Private Cost	More economical than reconstruction or lifting, however depending on construction methods and materials suitable to withstand inundation, may add notable cost	Does not remove hazards of sea level rise, inundation or erosion Access roads might still be impacted, causing interruption of services and isolation Natural processes to continue	<ul style="list-style-type: none"> ✗ Society ✗ Economy ✗ Settlements 	Not effective	N/A	Ruled out

Screening



Shortlisted



Shortlisted



Ruled out

Phase 6 – Maintain

All Possible Options									
Best practice : Land Use Planning, Design Options, Engineering Options	Miana Wfield	Moore Park Beach	Burnett Heads	Bangara	Innes Pk & Coral Cove	Elliott Heads	Coonarr	Woodgate Beach	Burton
Maintain									
Disaster Management	✓	✓	✓	✓	✓	✓	✓	✓	✓
Education and Awareness	✓	✓	✓	✓	✓	✓	✓	✓	✓
Building Retrofitting	✗	✗	✗	✗	✗	✗	✗	✗	✗
Land Use Planning	✓	✓	✓	✓	✓	✓	✓	✓	✓
Resilient Infrastructure	—	✓	✓	✓	✓	—	—	✓	—
Roads and Access	—	✓*	—	—	—	—	✓*	✓*	—
Erosion Monitoring	✓	—	—	✓	—	—	✓	—	✓

Key: — Not Applicable ✓ Considered and Shortlisted ⚠ Considered and not preferred ✗ Considered and Ruled Out
 * Multiple options considered / partially shortlisted

Phase 6 – Modify

All Possible Options									
Best practice , Land Use Planning, Design Options, Engineering Options	Miana W'field	Moore Park Beach	Burnett Heads	Bargara	Imes Pt & Coral Cove	Elliott Heads	Coonarr	Woodgate Beach	Buxton
Modify									
Beach Nourishment	-	✓	-	✓	✓	-	✓	✓	-
Wetland Restoration	-	-	-	-	-	-	-	-	-
Artificial Reefs	-	-	-	✗	✗	-	✗	✗	-
Breakwaters	-	-	-	-	-	-	-	-	-
Seawalls	-	✓	-	✓	✓	-	✓	✓	-
Groynes	-	-	-	⊘	-	-	-	⊘	-
Dykes	-	-	-	-	-	-	-	-	-
Storm Surge Barriers	-	-	✓*	-	-	-	-	-	-

Key:
- Not Applicable
 ✓ Considered and Shortlisted
 ⊘ Considered and not preferred
 ✗ Considered and Ruled Out
 * Multiple options considered / partially shortlisted

Phase 6 - Transform

All Possible Options									
Best practice , Land Use Planning, Design Options, Engineering Options	Miana Wetland	Moore Park Beach	Burnett Heads	Bangara	Innes Pt & Coral Cove	Elliott Heads	Coenam	Woodgate Beach	Burton
Transform									
Land Swap	✓	✓	✓	—	—	✓	—	—	—
Land Buy-Back	—	—	⊘	⊘	⊘	⊘	✓	✓	✓

Key: — Not Applicable ✓ Considered and Shortlisted ⊘ Considered and not preferred ✗ Considered and Ruled Out
 ● Multiple options considered / partially shortlisted

Multi Criteria Analysis: Weighting the Evaluation Criteria

MCA Criteria Explained

1. COST

Capital and Maintenance Costs over the life of the project

2. IMPACTS on beach accessibility and amenity

The level of impact upon the community's ability to access to the beach and attractiveness of the beach

3. IMPACTS on environment and culture

Specifically on environmental features, ecosystems, habitats and cultural heritage

MCA Criteria Explained

4. ADAPTABILITY

Ability for the option to be reversible / adaptable in the future, which is particularly relevant where there is considerable uncertainty unexpected climate trends (example: sea level rise faster than predicted)

5. EFFECTIVENESS in reducing coastal hazard risks

Whether an option presents a long or short term solution that would require additional management action or upgrades in the future

6. APPROVALS

highlight the legislative and approval requirements (or impediments) to implementing an option within the current legal framework

7. TECHNICAL VIABILITY

highlight where certain options may or may not be technically feasible or would require significant engineering (or other) investigations and construction/implementation capabilities

Alignment to Community Survey

<i>Community Values Survey</i>	<i>Alignment to MCA Criteria</i>
Top ways people use the coast:	
<ul style="list-style-type: none"> • enjoying view/ coastal scenery • recreational activities (incl. water-based, water's edge) • social activities • visiting cafes, restaurants etc 	Beach access and amenity
Top qualities and characteristics of the coast:	
<ul style="list-style-type: none"> • presence of native animals 	Environment and culture
<ul style="list-style-type: none"> • relaxed lifestyle 	Environment and culture, Beach access and amenity
<ul style="list-style-type: none"> • sandy beaches 	
<ul style="list-style-type: none"> • functioning infrastructure 	Effectiveness, Adaptability, Technical viability
<ul style="list-style-type: none"> • regulation of development 	Environment and culture, Approvals, Technical viability
Top concerns about the coast:	
<ul style="list-style-type: none"> • dune erosion • water quality • loss of vegetation 	Environment and culture, Beach access and amenity
<ul style="list-style-type: none"> • safe beach access 	Beach access and amenity

MCA Criteria Weighting

Evaluation criteria are not equally important in defining the preferred options. This is addressed by providing a weight for each criterion.

Weighting can be done simplistically by ranking the criteria in order of importance. For instance:

1. COST
2. EFFECTIVENESS
3. IMPACTS
4. TECHNICAL VIABILITY
5.

However this approach assumes that the difference in importance between two subsequent criteria is the same, which is a substantial simplification.

As per the QCoast2100 Minimum Standards and Guidelines, the workshop approach has been the preferred method to avoid introducing bias into the process.

MCA Criteria Weighting

A more accurate weighting can be achieved by undertaking pairwise comparisons between criteria, such as:

COST vs EFFECTIVENESS
COST vs IMPACTS
COST vs TECHNICAL VIABILITY

EFFECTIVENESS vs IMPACTS
EFFECTIVENESS vs TECHNICAL VIABILITY

IMPACTS vs TECHNICAL VIABILITY

This method is commonly used for decision-making, called Analytic Hierarchy Process (AHP).

With respect to *AHP priorities*, which criterion is more important, and how much more on a scale 1 to 9?

	A - wrt AHP priorities - or B?	Equal	How much more?
1	<input checked="" type="radio"/> COST	<input type="radio"/> IMPACT on beach accessibility/amenity	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
2	<input checked="" type="radio"/> COST	<input type="radio"/> IMPACT on environment and culture	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
3	<input checked="" type="radio"/> COST	<input type="radio"/> ADAPTABILITY to unexpected climate trends	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
4	<input checked="" type="radio"/> COST	<input type="radio"/> EFFECTIVENESS	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
5	<input checked="" type="radio"/> COST	<input type="radio"/> APPROVAL difficulty	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
6	<input checked="" type="radio"/> COST	<input type="radio"/> TECHNICAL viability	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
7	<input checked="" type="radio"/> IMPACT on beach accessibility/amenity	<input type="radio"/> IMPACT on environment and culture	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
8	<input checked="" type="radio"/> IMPACT on beach accessibility/amenity	<input type="radio"/> ADAPTABILITY to unexpected climate trends	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
9	<input checked="" type="radio"/> IMPACT on beach accessibility/amenity	<input type="radio"/> EFFECTIVENESS	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
10	<input checked="" type="radio"/> IMPACT on beach accessibility/amenity	<input type="radio"/> APPROVAL difficulty	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
11	<input checked="" type="radio"/> IMPACT on beach accessibility/amenity	<input type="radio"/> TECHNICAL viability	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9
12	<input checked="" type="radio"/> IMPACT on environment and culture	<input type="radio"/> ADAPTABILITY to unexpected climate trends	<input checked="" type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9

CRG Criteria Ranking Exercise

10 Stickers!

Comparison: TWG Ranking



Category	Weighting	Ranking	Description
Effectiveness	34.1%	1	In reducing risks from coastal hazards
Adaptability	22.5%	2	Ability to adapt to unexpected climate trends
Impact on access	15.9%	3	Impacts on beach accessibility and amenity
Technical Viability	11.0%	4	Difficulty in achieving construction of the option
Impact on environment	9.3%	5	Impacts on the environment and culture
Approvals	3.7%	6	Difficulty in obtaining approval to construct
Cost	3.5%	7	Cost of putting the measure in place

The top three criteria to consider the adaptation options are:

- Effectiveness
- Adaptability
- Impact on Beach accessibility

Next step - MCA Process

- Apply the MCA to all options identified in Phase 6
- The weighted score of the MCA will allow identifying those options that will be assessed in detail with CBA
- Each Adaptation Option will be first evaluated, or scored, against each criterion
- Weighting applied to each score
- The aim is to prioritise the structural options, from 1 (most important or desirable) to 15 (least important)



CHAS Implementation Plan:

‘Sneak Peak’ of the final CHAS document



Concept Document – Design ideas



OUR COAST

BUNDABERG COASTAL HAZARD ADAPTATION STRATEGY

Things we have learnt listening to the community

A strong love of the coast is almost universal. It leads to a deep connection to place – whatever that place may be along the coast. This results in a strong sense of ownership over the coast, and the creation of tight-knit communities – likely of commonly held views on the value of the coastal places. This in turn appears to drive a strong desire for self-determination – expressed as a desire for self-organisation and self-reliance. All of this is for the express purpose of leaving a lasting legacy – being able to hand over the coast to subsequent generations in a manner that retains the values currently held.



CASE STUDY MON REPOS TURTLE CENTRE

The new \$22 million Loggerhead Turtle centre at Mon Repos officially opened in early November 2019.

The centre offers a state-of-the-art experience with touchscreen televisions and vivid displays. The centre is now a year-round tourist destination operated by Queensland Parks and Wildlife Service. The highlight of the centre is the immersive theatre room, where you slip off your shoes and step onto sand as the turtle nesting experience is recreated. Mon Repos supports the largest population of nesting marine loggerhead turtles in the South Pacific and is critical to the survival of this endangered turtle.

OUR VALUES/ PRINCIPLES

FIRST PRINCIPLES DISCUSSION

During phase 1 and 2 of the project the community and stakeholders were consulted on core values and principles for an adaptation strategy. What are some of the essential outcomes? What are some of the non-negotiable aspects of any future strategy? What are the community values which must be raised up in the strategy?



RESILIENT SOCIETY

- » connectivity of people and place
- » overcoming fear of loss and taking charge of the future
- » be aware of the frequency of events into the future – more catastrophic events will happen quicker
- » overcoming perception with knowledge and education on risk
- » communicating the 'real' situations during disaster events
- » a connect community drives success; and
- » have confidence in our area



RESILIENT SETTLEMENTS

- » commercial centres resilient to coastal hazards
- » initial infrastructure is sensitively located and designed – WTP etc
- » adjust new development to risk – build smarter
- » multiple ways in and out from key locations
- » stepping interventions over time, plus no 'one size fits all' approach
- » resilient building design is critical
- » clear identification of risk areas



RESILIENT ECONOMY

- » stronger relationships with the media – positive stories on the economy – before and after events
- » use 'Bundaberg Now' as an option
- » the more channels the better
- » incentivising tourism activities outside the hazard areas
- » avoid changing economic dynamics too quickly; and
- » economic vitality notwithstanding the risks



RESILIENT ENVIRONMENT

- » let natural processes happen as much as possible
- » communicate environmental changes using the Roslyn Bay SLR gauge
- » maximise the ability of the coast to be dynamic
- » maximise the use of healthy, mature wetlands to buffer (as they are resilient)
- » strengthen what we have and reinforce it
- » protection of cultural sites, e.g. shell middens; and
- » can't work in isolation of state interests i.e. QPWS

Concept Document - Design Ideas

Moore Park Beach

Moore Park Beach is a coastal township which will cater for modest growth reflecting and preserving character, identity and history of the relaxed coastal settlement. It supports facilities and services for local residents and visitors drawing its character and lifestyle from surrounding natural features.

Storm tide and permanent inundation at 0.8m sea level rise scenario places almost the entire community at intolerable risk and extensive areas of medium risk. Where individual properties are not specifically impacted the surrounding infrastructure and access loss isolates the community.

Moore Park Beach has the highest value of all settlements at risk (\$233.2 million) and has been identified as a priority area for adaptation

to future coastal hazards. Areas specifically at risk include homes on the foreshore, the Moore Park Beach Surf Club and Holiday Park.

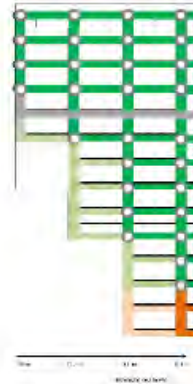
Overtopping of tidal gates is already occurring and the risk to the settlement becomes intolerable under a 0.4m sea level rise.

Access routes to the settlement of Moore Park Beach are likely to be permanently inundated in the 0.8m sea level rise scenario. The social consequence analysis has

Adaptation for the coastal settlement of Moore Park Beach will require an immediate focus on disaster management, education and awareness campaigns. Planning for physical interventions against coastal erosion may commence at 0.2m; and isolation risk by raising Murdoch's Linking Road at 0.4m of sea level rise.

considered this to be catastrophic due to the likely isolation of the community.

The options to raise and maintain roads are complex. In addition, any proposal to provide physical intervention from storm tide on the beach front will not address the erosion and permanent inundation running parallel to the coast at the rear of the settlement which is characteristic of both Moore Park Beach and Woodgate Beach.



BUILDING LOCAL ACTION PLANS

A broad action plan can be developed for each locality using the universal model above and may take the look of Figure seven below which has been developed for Miara, Winfield and Norval park pathway to adaptation.

The model takes the objectives reflected in the pathway which in this instance is maintain and transform only. There are no modify solutions for this location. Under each objective are tools and actions in step two. Step three provides insights into how this might be measured and monitored. Step four asks for review and reflection on the pathway and the continued efficiency of the tools chosen and the results of the monitoring.



EXAMPLE: Moore Park Beach

- Range of measures and trigger points
- MCA and CBA will refine the preferred pathway (highlighted)
 - E.g. causeway at Moore Park Rd then maybe a buried seawall and raising key access road

Disaster management

Education and awareness campaign

Land use planning

Resilient infrastructure (Water)

Building retro fitting

Construct causeway ¹

Land buy-back

Resilient infrastructure (Electricity)

Sea wall / rock wall

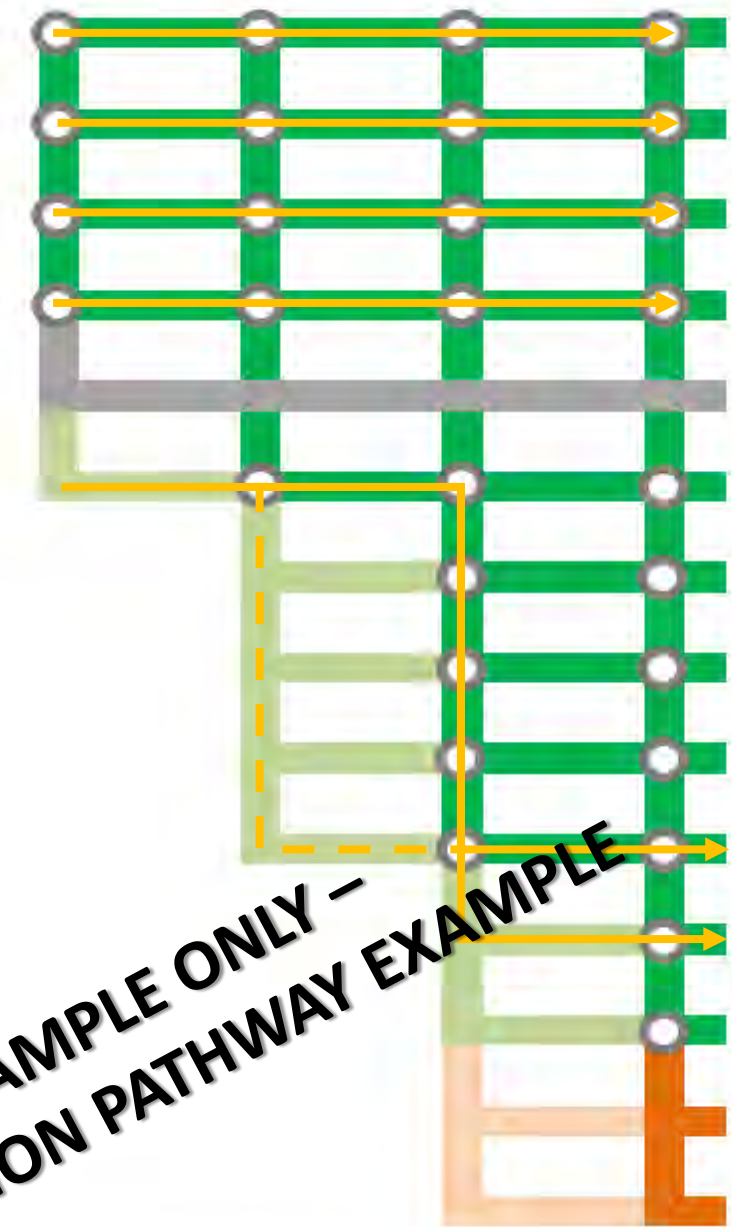
Beach nourishment / dune (re-) construction

Raising road ²

Construct causeway ²

Raising roads ^{1,2}

Construct causeway



**SAMPLE ONLY –
ADAPATION PATHWAY EXAMPLE**

Now 0.2 m 0.4 m 0.8 m

Increasing sea levels →

Where to from here?

We have incorporated your feedback and ideas into consideration for the design and content and will come back and present prior to the launch.

CHAS Implementation Strategy document and associated 'launch' later in 2020

Phase 8 – Present to CRG the Strategy and Implementation Plan followed by public consultation period.

April / May 2020

Phase 8 – Finalised Strategy and Implementation Plan Launch

September 2020

Coastal CC adaptation - Game

This game demonstrates the complexity of adaptation solutions for coastal hazards.

The CHAS process enables best practice decision-making, so we are not just 'taking a guess' like in this game.



[Click here](#)

What we learn

How the game applies to Our Coast?



[Click here](#)

Questions?



ANNEXURE B



• EFFECTIVENESS



16

*In Reducing Risks from
Coastal Hazards*

1/2



IMPACT ON ENVIRONMENT

16

*Impacts on the Environment
and Culture*

1/2




ADAPTABILITY



14

*Ability to Adapt to
Unexpected Climate Trends*

3




IMPACT ON ACCESS

*Impacts on Beach Accessibility
and Amenity*



4



COST

9

***Cost of Putting the Measure
in Place***

5



TECHNICAL VIABILITY

*Difficulty in Achieving
Construction of the Option*

6

8

APPROVALS



6

*Difficulty in Obtaining
Approval to Construct*

7



MINUTES OF MEETING

Bundaberg Coastal Hazard Adaptation Strategy Community Reference Group (CRG)

Held At:	Bundaberg Multiplex Sport & Convention Centre – Function Room 2 1 Civic Avenue, Bundaberg West
Date & Time:	Thursday, 23 July 2020 – 6.00 pm to 7.30 pm
Present:	<i>CRG Members</i> – Chris McLoughlin, Heath Greville, Jennifer Parry, Collin Turner, Robert Bell, Sharon Jackson, Terry Kelly
	<i>Council</i> – Cr Bill Trevor (Chair), Mayor Jack Dempsey, Cr Jason Bartels, Cr Wayne Honor, Dwayne Honor (Project Manager), Evan Fritz (Strategic Planning), Sally Obst (Natural Areas), Trish Mears (Communications), Natalie McDonald (Administration)
	<i>Project Consultants</i> – Richard Sharp (Water Technology), Julie Brook (Meridian Urban)
Apologies	<i>CRG Members</i> – Russell Stewart, Ian Graham, Lloyd Blake, George Martin, Tony Ricciardi, Shanelle Pekin, Joe Russo, Julie Fauser, Josephine Ferris
	<i>Council</i> – Cr Greg Barnes, Beth Whitworth (Disaster Management)

BUSINESS OF MEETING

1. Introductions and Welcome

The Chair, Cr Bill Trevor welcomed all to the meeting, including:

- CRG members;
- Mayor Jack Dempsey;
- Fellow Councillors Wayne Honor and Jason Bartels;
- Project Consultants, Richard Sharp and Julie Brook; and
- Project Manager, Dwayne Honor and the project team.

Now at the finalisation stage of the CHAS, with tonight being the last CRG meeting and a draft to be presented that hopefully all are in agreeance with, to be released for public comment and then to Council for adoption. The challenge has been to stay focused with the planning of the strategy, rather than thinking about and getting into the “doing phase”.

The Project Manager, Dwayne Honor also wished to recognise the work of the CRG members in getting to this point.

2. How the CRG has shaped the CHAS (Project Team)

Dwayne Honor presented a PowerPoint (*Refer Annexure A - slides 1-18*), recapping on the work to date. Council has just completed Phase 8, being the final stage of work. He displayed a graph on Queensland Coastal Councils' progress on the CHAS to date, with a lot of Councils being in Phases 4-6 and unlikely to finish the work by QCoast 2100 timeframes and reinstating that Bundaberg Regional Council is on track to complete.

The group reflected on the development of the CHAS through phases 3-7, with community and stakeholder engagement used to validate the technical work and the CRG have helped to keep the project on target. Phases 3, 6, 7 and 8 of QCoast 2100 reporting have been independently expert peer reviewed. We are still awaiting the outcome of Phase 8, but do not expect anything of concern. We are also meeting with the stakeholder advisory groups tomorrow.

The overview recognised the CRG members' contribution to the CHAS, a strategic long-term vision for the management and adaptation of coastal hazards, and included:

- Sessions held;
- Community values;
- Assets exposed to coastal risk;
- Risk rating/triggers (acceptable to intolerable) for our 11 coastal settlements:
 - The more symbols denoted against a settlement, the greater the impact on key assets.
 - Settlement-based approach adopted, e.g. what is critical for one settlement can be different to the others.
- Adaptation options and shortlisting.

3. Options Appraisal and Preferred Options (Project Team)

- Final CHAS Action Plan

Richard Sharp presented *Slides 19 to 28*, the results of the Phase 7 options appraisal, Phase 8 preferred adaptation pathways and then looked at the final action plan, noting the following:

- Multi-criteria analysis and final weightings, including an example.
- The results from the benefit-cost ratio to MCA score, showing an alignment towards 'soft-engineering' solutions, e.g. beach nourishment in comparison to seawalls. It was noted on the graph, the high score in the top right-hand quadrant (*Slide 24*), being the preferred adaptation approach.
- Implementation - The trigger-based approach has been adopted. The whole idea is to ensure that risks are maintained in the tolerable range – and actions to reduce risk for settlements occur before reaching triggers. Dwayne compared the graph displaying the trigger decision point (*Slide 25*) in COVID-19 terms, e.g. we want to flatten the curve - we do not wish to progress into the area highlighted in red as this is intolerable risk to our community.
- The Adaptation Pathway graphs were explained:
 1. Light green – Start to plan/investigate adaptation options
 2. Dark green – Consider implementing adaptation options.
 3. Dark green with yellow line – Preferred adaptation option for implementation.
- Sea level rise triggers for intolerable risk were highlighted.

- Rosslyn Bay sea level rise monitoring station is to be used to measure sea level rise, with data from 1996 shown on the graph. A general upward trend of 0.1 m in the 20-year period is shown. Evidence and risk-based decisions can be made from this recorded sea level rise over time.
- Other Councils have chosen to adopt a time-based approach.
- Our adopted approach is based on triggers of measurable sea level rise – not time; which provides greater certainty. The trigger-based approach anchored on sea level rise is unique to BRC at present.

4. Documentation and Consultation (Project Team)

The CHAS is now at Phase 8, and we are about to enter the public consultation period with the following draft documentation prepared:

- A Summary Brochure with Action Plan was presented, with each of the CRG member in attendance at the meeting provided with an early release copy.

Council has endorsed the draft document for public release for the consultation period running from 3-31 August 2020. The document will be available for download from the *OurCoast* website (www.bundaberg.qld.gov.au/ourcoast) and we wish to encourage the public to download from the website to view the material.

One of the key objectives towards the end of the draft strategy document is an Adaptation Pathway Map for every settlement on our coastline (each being unique), and at the very end, an Action Plan. The Action Plan is to be read in conjunction with the Pathway Maps.

Three years of work has been undertaken and converted into an easily digestible visual document. We have attempted to remove all the complexities of the work to date, in the design of the document, to provide a straight-forward, easy to read document for the public to understand what the CHAS work is, what it means to each settlement and how everyone can apply it.

Dwayne asked the CRG members to take the document away to read at their leisure, and let him know if they have any question (email to ourcoast@bundaberg.qld.gov.au.) He requested the CRG Members not to share the document until it is made public on the 3 August 2020.

- The group viewed the promotional video which summarises the journey of the CHAS and will be available to view on the website.
- Fact sheets have also been developed to accompany the Summary Brochure and promotional video, for download on the website. It has come to light that the public are not aware there is a monitoring station at Rosslyn Bay for sea level rise, not even some Councils; and accordingly we have developed the Fact Sheets to educate people on this station.
- An email will be sent out to all CRG Members on the 3 August 2020 (public release date), providing the link to download the documentation from the *OurCoast* website.
- Responses from key stakeholders and the community during the public consultation period will be collated and a technical review undertaken, with a final draft version of the CHAS presented to Council for adoption.

5. How to make a Submission (Dwayne Honor)

The methods for the public to share their comments on this work and make a submission is detailed on *Slides 34-36* and includes:

- On-line submission - Link to the *OurCoast* website (website will be updated by 3 August);
- Written submission via mail or drop off to a Customer Service Centre;
- Email to ourcoast@bundaberg.qld.gov.au.

The following questions/points were discussed:

- In the Action Plan, “Now” column, what does Implement ‘Maintain’ strategy mean?
 - ‘Maintain’ is to manage current risk and ensure we stay on the pathway. Actions include disaster management, education and awareness programs, and land use planning. Reference was made to the pathway diagram. Every settlement will be slightly different dependent on risk.
- When approaching a trigger point, how does the community know we have reached that point?
 - Monitoring via the Rosslyn Bay Monitoring Station (Department of Environment and Science website) which is also accessible to the public. Provides historical context and body of information to make informed decisions (1996 to current date). It was noted Rosslyn Bay has the highest trend level on the Queensland coastline.
 - Council would have meetings once we are getting close to the trigger points and would inform the public as part of monitor and review elements of the strategy. Council would be the main conduit with the State Government to start conversations.
 - Long term – Council would actively promote information prior to trigger points being reached.
- Fielding enquiries from the public, e.g. for adaptation options and specific location (sea wall is noted for Kellys Beach, Bargara, however no location is noted for Burnett Heads).
 - Technical work identified areas of interest as a scenario planning exercise. Detail of such would be determined in project plans leading up to the trigger points being reached. A multifaceted approach will need to be considered, e.g. boat moorings, access to beach by 4WD.
 - The CHAS does not provide that level of definition/accuracy - it provides a helicopter view of long-term issues that we anticipate will impact our community.
 - Individual Shoreline Erosion Management Plans (SEMP) will be developed and will show this level of detail, but we do not have these plans yet. The CHAS gives us the grounding of where and when to initiate these at a whole of coastline level.
 - Minutes are also available on the *OurCoast* website detailing work with the CRG.
 - It may be that more qualitative information needs to be included in the draft.
- By having a CHAS in place, it provides a model with action points; achieved from input/discussions from different spheres of the community with varying mindsets and knowledge.
 - Most may take a personal view, but it will be a talking point.
 - Gives a better opportunity to be prepared, act and budget for costs, e.g. cost of permits.
 - Change to mouth of Kolan River - Had to think about Miara Caravan Park – this could happen anywhere in the community. Permit costs were excessive, in addition to operational costs.

6. Acknowledgement and Recognition of Members

With the formal part of the night now concluded, Cr Bill Trevor thanked all for being involved with the community reference group for the CHAS, acknowledging the long timeframe it had run for, with a few disappearing along the way with an interest in the “doing phase”. However, to move forward and get to a place where we are able to implement projects, the planning firstly needs to be done to achieve a document that also has State approval. During this time, all involved have been able to speak their mind and provide input, which Council really does appreciate.

The Mayor has come along tonight, not only due to his interest in the project, but to officially thank each one for the time they have put in and in taking back to their communities. He also thanked Richard Sharp and Council staff, who have been working diligently behind the scenes.

It has been a big project, with BRC having a large coastline at the mercy of cyclones and weather events, with a lot of infrastructure (homes and Council infrastructure) to be managed.

Mayor Jack Dempsey responded - The CHAS came to fruition with the LGAQ lobbying the State Government to commit ~\$12 m funding across the State, predominately to coastal Councils. He acknowledged the Chair, Deputy Mayor Bill Trevor, for all that he had done for this group and fellow Crs Wayne Honor and Jason Bartels. He also conveyed a “big” thank you to the CRG members and to Dwayne Honor and Richard Sharp and both their teams. The development of the CHAS is a further step for Council and the goal to build “Australia’s best regional community”. For the future, it takes the community to not be scared of the hazards of where we live, but understand them and overcome their apprehensions with factual work like the CHAS. This is how we achieve progress.

The CRG for the Bundaberg CHAS was the largest ever undertaken by Council and has been really important in identifying key information and developing the strategy. He commended the completion of Phases 3-8 as no mean feat and being a tremendous effort, considering some of the other Councils are only completing Phase 2 and Douglas Shire being the only Council to complete theirs to date.

The CHAS will provide a document at local government level that is supported by the wider community, allowing decision making processes, now and into the future and giving us peace of mind.

Time is one of the most important commodities to give and caring about the community – with this work we move forward together. Different skillsets and opinions promote informed decision making and ultimately, we are all better off as a result.

The Mayor presented Certificates of Appreciation to the CRG Members for their dedicated contribution to the CHAS (with CRG members collecting from the presentation table due to COVID-19).

This concluded the business of the CRG Final Meeting at 7.06 pm, with the group breaking for refreshments.

Cr Bill Trevor, Chairperson
OUR COAST Community Reference Group

ANNEXURE A



OUR
COAST

Investing today for a resilient tomorrow

Bundaberg Region Coastal Hazard Adaptation Strategy

Community Reference Group Meeting #9

23rd July 2020



Agenda

Item	Timing
How the CRG has shaped the CHAS	10 mins
Options appraisal and preferred pathways - Final CHAS Action Plan	20 mins
Documentation and consultation	10 mins
How to make a submission	5 mins
Acknowledgment and recognition of members	15 mins

Coastal Hazard Adaptation Strategy (CHAS)

Background



QCoast2100 approved funding for **31 Councils**

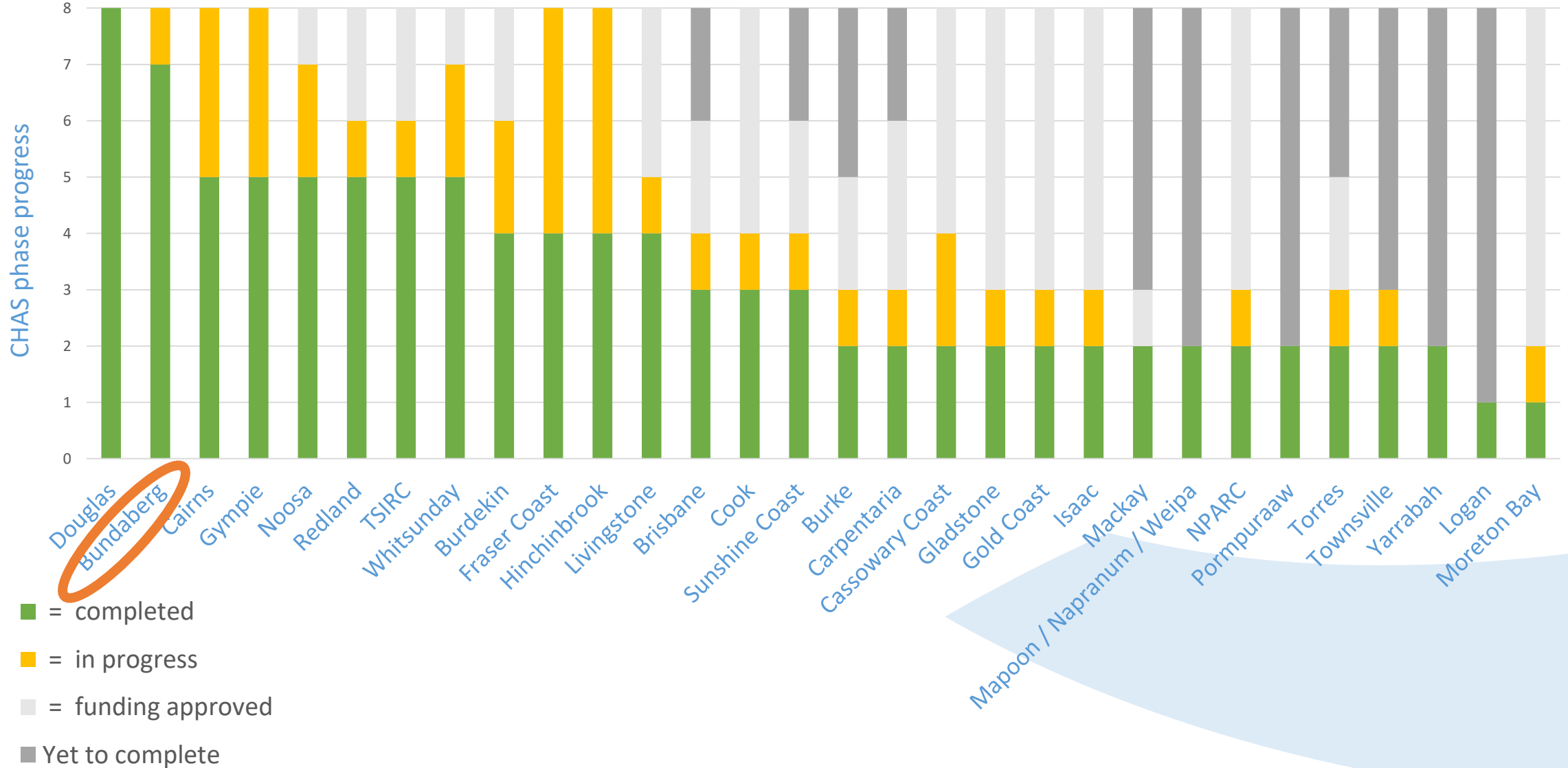
QCoast2100 expect all Councils to be complete by
October 2020

BRC awarded:
\$48,227 in 2017
\$451,000 in 2018

September 2020 completion

CHAS Project delivered through eight phases
Phase 1 to 7 are complete.

Coastal Council Progress

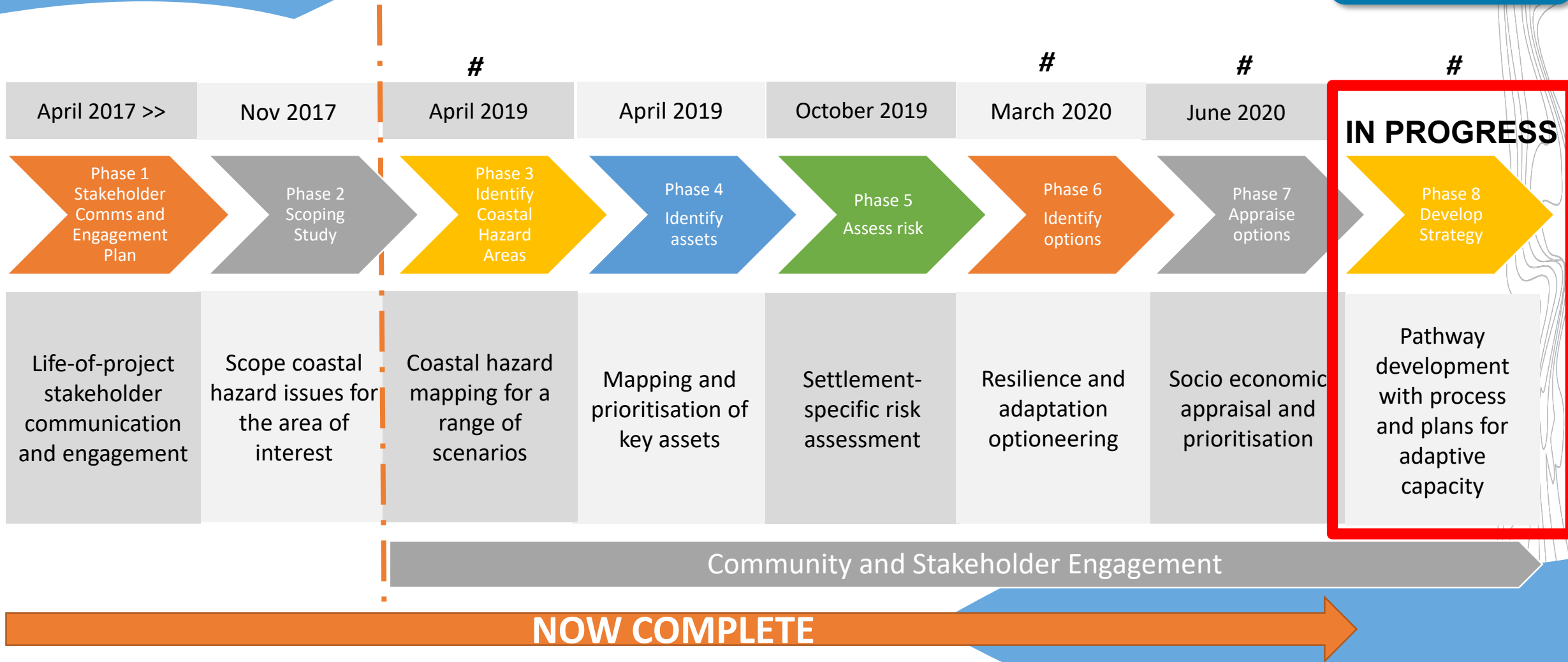


How the CRG has shaped the CHAS



Development of the CHAS

Background



- Qcoast 2100 Expert Panel Review Undertaken

Stakeholder and Community Engagement



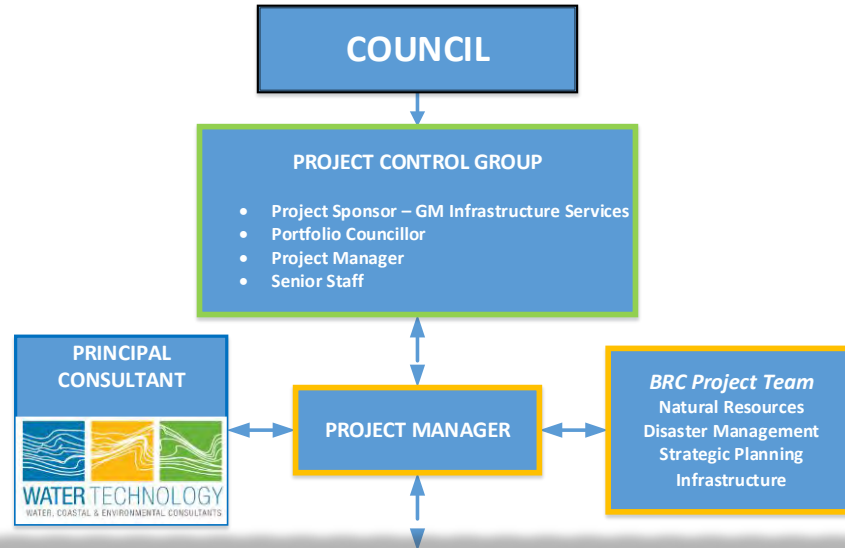
PROJECT GOVERNANCE STRUCTURE COASTAL HAZARD ADAPTATION PROJECT



- Values
- Feedback
- Knowledge



- Resourcing
- Direction
- Process



COMMUNITY REFERENCE GROUP

Cr Bill Trevor (Chair)
 Cr Wayne Honor
 Cr Jason Bartels
 Cr Greg Barnes
 Cr Scott Rowleson

Chris McLoughlin, Heath Greville, Lloyd Blake, Jennifer Parry, Colin Turner, Josephine Ferris, Julie Fauser, Robert Bell, Shanelle Pekin, Sharon Jackson, Joe Russo, Tony Ricciardi, Russell Stewart, Ian Graham, George Martin, Terry Kelly

STAKEHOLDER ADVISORY GROUP

- Bundaberg Port Authority
- Ergon, Telstra, NBN
- Landcare
- PCCC/Gidargil
- Canegrowers
- Burnett Mary Regional Group
- Surf Life Saving
- State Emergency Service
- Rural Fire Brigade
- Department of Natural Resources, Mines & Energy
- National Parks & Wildlife
- Department of State Development
- Department of Environment and Heritage Protection
- Maritime Safety Authority
- Queensland Reconstruction Authority
- Bundaberg Sugar
- UDIA
- Tourism Board

CRG Recap 2018 / 2019

August 2018 – Introductions, what, why, where, when?

October 2018 – CRG identified characteristics and things they value about the coast with Prof. Gavin Smith of US Dept Homeland Security's Coastal Resilience Centre

March 2019 – validated and helped to identify key assets exposed to coastal hazards.

May 2019 – development of the vulnerability and risk assessment processes. Assisted the prioritisation of assets and features based on community values.



Community Values

October 2018

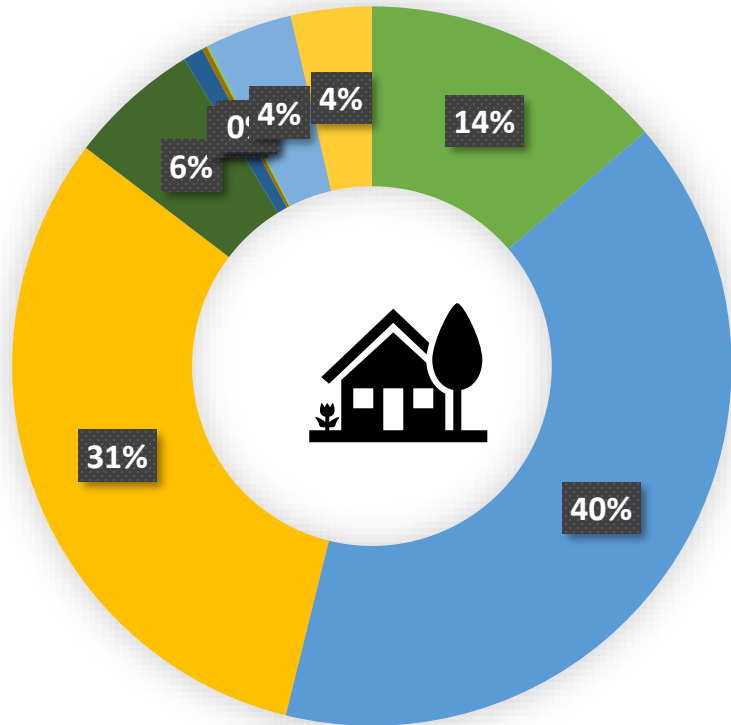


The concept of 'Place' is held very strongly by the community

This results in a strong sense of ownership over the coast

Desire for self-organisation and self-reliance.

Assets exposed to coastal hazards



- Miara, Winfield and Norval Park
- Moore Park Beach
- Burnett Heads
- Bargara
- Innes Park and Coral Cove
- Elliott Heads
- Coonarr
- Woodgate Beach
- Buxton

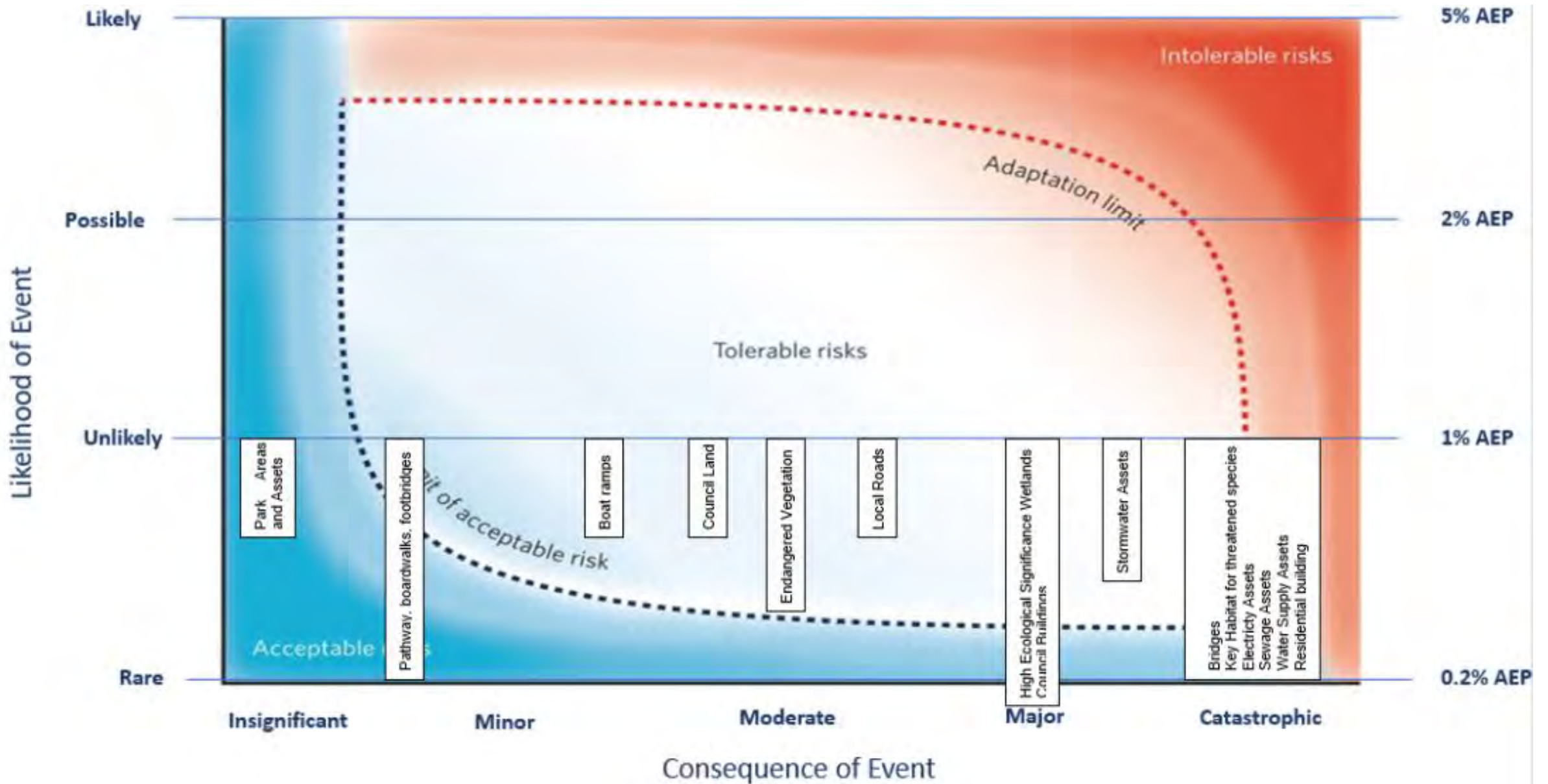
965 Residential Buildings

34.4km Roads

92.6km Power lines

Assessing Consequence and Risk Tolerability

May 2019



CRG Recap 2019 / 2020

June 2019 – understanding of tolerability, priority settlements and developed a vision of resilience for the strategy

August 2019 – validated and helped to identify long list of adaptation options, input into the evaluation criteria

October 2019 – suitability of options for each settlement shortlisting the adaptation options; shortlisted options.

March 2020 - Multi criteria analysis criteria weighting enable views to directly represent outcomes.



COASTAL HAZARD RISK ASSESSMENT

June 2019

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 0.6m sea level rise scenario.

Potential for catastrophic damages to buildings and infrastructure.

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.

MOORE PARK BEACH

Risk of coastal erosion becomes **intolerable** with a 0.4m sea level rise scenario. Risk of storm tide inundation is **tolerable** with all scenarios.

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

BARGARA

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.

COONARR

Risk of coastal erosion becomes **intolerable** with a 0.2m sea level rise scenario. Risk of storm tide inundation is **tolerable** with all scenarios.

Potential isolation of community.

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.

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

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

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.

Principles of Resilience

June 2019

Collectively developed characteristics of resilience for the Bundaberg coastline

These form guiding principles for the adaptation strategy and preferred pathways for coastal settlements.

The infographic is set against a background of a coastal landscape with a building and trees. It features four white text boxes, each with a circular icon in the top right corner. The icons are: a yellow circle with three white figures (Resilient People), a blue circle with a white house (Resilient Settlements), an orange circle with a white upward-pointing arrow (Resilient Economy), and a green circle with a white hand holding a plant (Resilient Environment).

RESILIENT PEOPLE

- » connectivity of people and place
- » overcoming fear of loss and taking charge of the future
- » be aware of the frequency of events into the future – more catastrophic events will happen quicker
- » overcoming perception with knowledge and education on risk
- » communicating the 'real' situations during disaster events
- » a connected community drives success; and
- » have confidence in our area

RESILIENT SETTLEMENTS

- » commercial centres resilient to coastal hazards
- » infrastructure is sensitively located and designed
- » adjust new development to risk – build smarter
- » multiple ways in and out from key locations
- » stepping interventions over time
- » no 'one size fits all' approach
- » resilient building design is critical
- » clear identification of risk areas

RESILIENT ECONOMY

- » stronger relationships with the media, generate positive stories on the economy before and after events across multiple channels
- » incentivising tourism activities outside the hazard areas
- » avoid changing economic dynamics too quickly; and
- » economic vitality notwithstanding the risks

RESILIENT ENVIRONMENT

- » let natural processes happen as much as possible
- » communicate environmental changes using the Rosslyn Bay data
- » maximise the ability of the coast to be dynamic
- » maximise the use of healthy, mature, resilient wetlands to buffer communities
- » strengthen what we have and reinforce it
- » protection of cultural sites, e.g. shell middens; and
- » recognise partnerships for mutual benefit.

Adaptation Optioneering

August 2019

Moore Park Beach	Score	Berges	Score	Innes Park and Coal Cove	Score	Cronam	Score	Woodgate Beach and Walkers Point	Score
Buy-back land	1			Managed realignment	2				
SEMP Strategy	8								
Managed realignment	6			Potentially retreat from northern residential area	5				
				Coolanblue Ave properties (eastern alignment) need to relocate	5				
Bridges on arterial road	4	As properties are rebuilt or renovated lift to higher height	5	Community education	10	Raise road	3	Community education	10
Raise road	2	Community education	10	Plan development areas	5	Sandbag walls and strong walls	8	Upgrade sewerage infrastructure for Walkers Point	7
Community education	10	Retrofit structures	5	Identify contour lines for high water	5	Artificial reef as a buffer	-	Retrofit structures	5
Retrofit structures	5	Plan development areas	5	Land use planning – specific controls on buildings	10	Retrofit structure	1	Plan development areas	5
Plan development areas	5	Identify contour lines for high water	5	Flood resilient infrastructure	5	Plan development areas	5	Identify contour lines for high water	5
Identify contour lines for high water	5	Raise Barolin Esplanade from inundation area	5	Wetland restoration	8	Identify contour lines for high water	5		
Land use planning – specific controls on buildings	10	Declare "Benefitted Area" with property owners levied for x number of years with State and Council contributing (rock wall)	10	Education	10	Upgrade infrastructure	3	Identify contour lines for high water	5
Flood resilient infrastructure	9	Raise sections of Miller St	9	Riparian corridor	8	Raise roads to retreat or access	9		
Wetland restoration	5			Bridge	1				
Education	10			Alternative coastal road	7				
Riparian corridor	7			Upgrade the water and sewerage infrastructure	-				
Strengthen buildings	2			Strengthen building	7				
				Raise roads or alternative access road	4				
Build canal or water channel from river behind town to control the water	7	Artificial reef	8			Defence wall or levee to protect road	4	Artificial reef	8
Wall / levee around town	7	Groyne / sea wall	9	Artificial reefs	9	New wetland nearby to absorb tidally water		Groyne sea wall	7
Beach affected property well in front	9	Beach nourishment	6	Sea wall	1	Vegetate sand hills with severe erosion from human intervention	7	Beach nourishment	8

Shortlisting Adaptation Options

We screened the long-list of options by a high-level analysis of the following criteria:

- COSTS
- BENEFITS
- ADVERSE IMPACTS / CHALLENGES
- ALIGNMENT TO PRINCIPLES
 - Resilient Society, Economy, Settlements and Environment
- EFFECTIVENESS
 - Against inundation, erosion and SLR

TABLE 6-15 ADAPTATION OPTIONS FOR MOORE PARK BEACH

Option	Costs	Benefits	Adverse Impacts / Challenges	Alignment to Principles	Assessment of Effectiveness (SLR)	Scenario	Screening
Maintain							
Disaster Management	\$	Builds resilience through communication and messaging Coordinates preparation to disasters. No environmental impacts	Does not remove hazards of sea level rise, inundation or erosion May lead to complacency in community or not all community engaged. May not achieve complete audience – selective hearing	<ul style="list-style-type: none"> ✓ Society ✓ Economy ✓ Settlements ✓ Environment 	Partially effective	Now	Shortlisted
Education and Awareness Campaigns	\$	Enhanced understanding of coastal processes, adaptation options and implications for specific neighbourhoods Understand frequency of events into the future Mutual capacity building	Does not remove hazards of sea level rise, inundation or erosion Communicating 'wicked problems' is complex, how to engage audience? Community values are interrupted In many cases the community is unable to visualise solutions Fear of loss	<ul style="list-style-type: none"> ✓ Society ✓ Economy ✓ Settlements ✓ Environment 	Partially effective	Now	Shortlisted
Building retrofitting	Private Cost	More economical than reconstruction or lifting, however depending on construction methods and materials suitable to withstand inundation, may add hottable cost	Does not remove hazards of sea level rise, inundation or erosion Access roads might still be impacted, causing interruption of services and isolation Natural processes to continue	<ul style="list-style-type: none"> ✗ Society ✗ Economy ✗ Settlements 	Not effective	N/A	Ruled out



Development of the CHAS

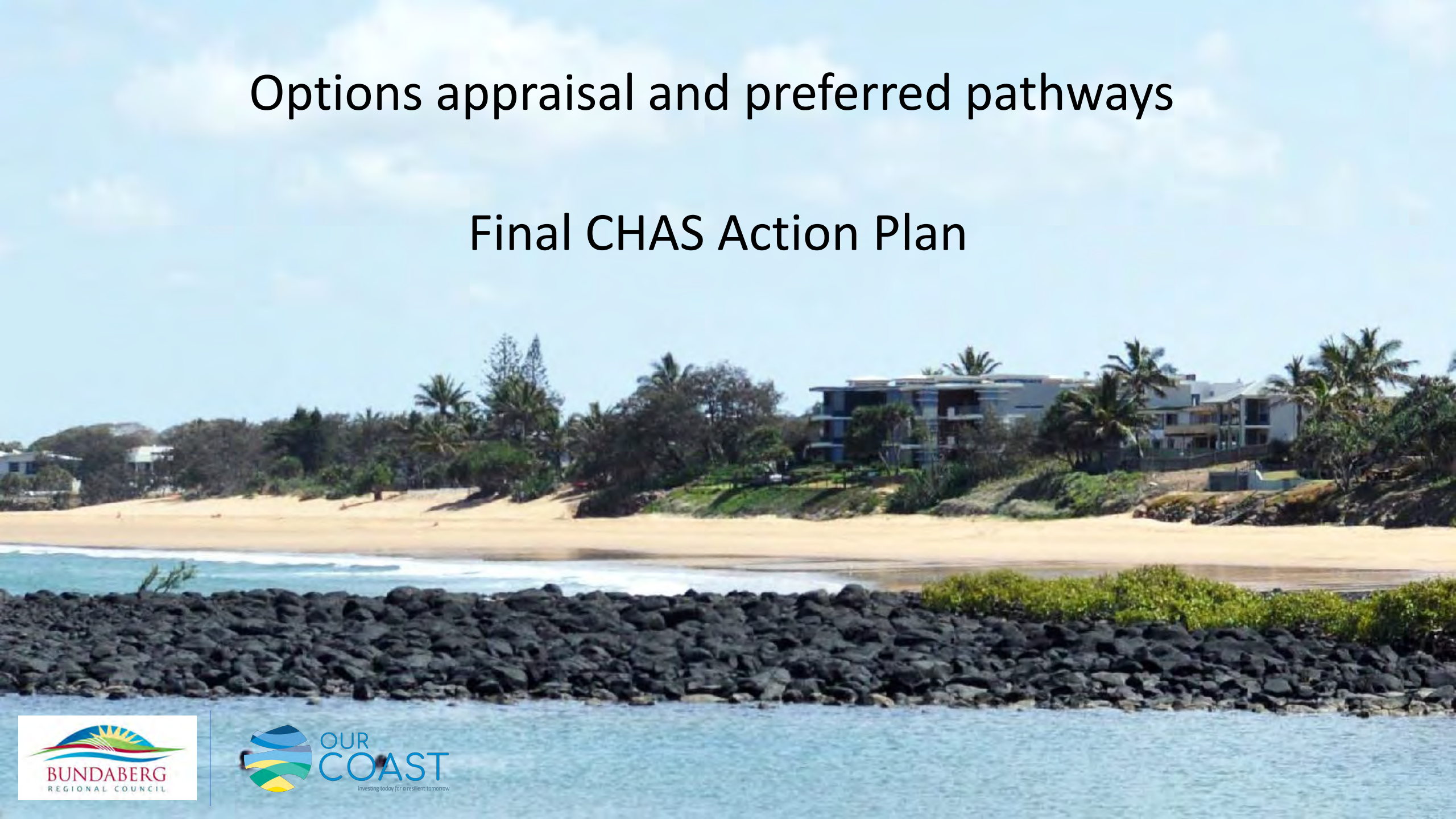


CRG Contribution to the CHAS

- Co-design approach
- Local knowledge and preferences
- What is valued by the community
- Validation of technical findings
 - Assets, settlements at risk
 - Adaptation options
 - Appraisal of options.
- Found soft-engineering approaches favourable
- Strategic long term vision for the management and adaptation of coastal hazards

Options appraisal and preferred pathways

Final CHAS Action Plan



Multi-Criteria Analysis (MCA)



CRG recommended further weighting for:

- Technical viability
- Cost

To reduce the weighting for:

- Effectiveness

The CRG generally agreed with the weightings applied to the remaining criteria

MCA – Final Weighting

Rank	MCA Criterion	Priority Weighting Council	Final Weighting
1	Effectiveness	34.1%	32%
2	Adaptability	22.5%	22%
3	Impact on Access	15.9%	15%
4	Technical Viability	11.0%	13%
5	Impact on Environment	9.3%	9%
6	Approvals	3.7%	5%
7	Cost	3.5%	4%
	TOTAL	100%	100%



Extract from MCA: example Beach Nourishment

Here's how we applied the weighting to each of the shortlisted physical options:

Criteria	Objective	Performance – 0.4m Sea level rise	Score	Weighting score x weight =	Weighted score
Effectiveness	Reduce erosion and storm risks to property and people	Reduces damages on buildings and infrastructure	66.6	32%	21.3
Adaptability	Ability to be adapted based on unexpected climate trends	Highly adaptable	78.0	22%	17.2
Beach Impact	Minimise impact on beach access and amenity	Positive impact on long-term amenity and minimal impacts to access.	100.0	15%	15.0
Env. Impact	Minimise impact to the environment	Temporary impacts to water quality	91.5	13%	11.9
Tech. Viability	Adaptation options that are technically viable	Widely used solution to mitigate coastal erosion	81.8	9%	7.4
Approval	Minimise difficulty in obtaining required permits	Several conservation significant species and impact assessments likely.	30.0	5%	1.5
Cost	Cost-effective adaptation options implemented	Requires ongoing maintenance however, the overall cost low compared to other sites	70.9	4%	2.8
				Total Score	77.1
MCA ranking compared to other options:		1 st			

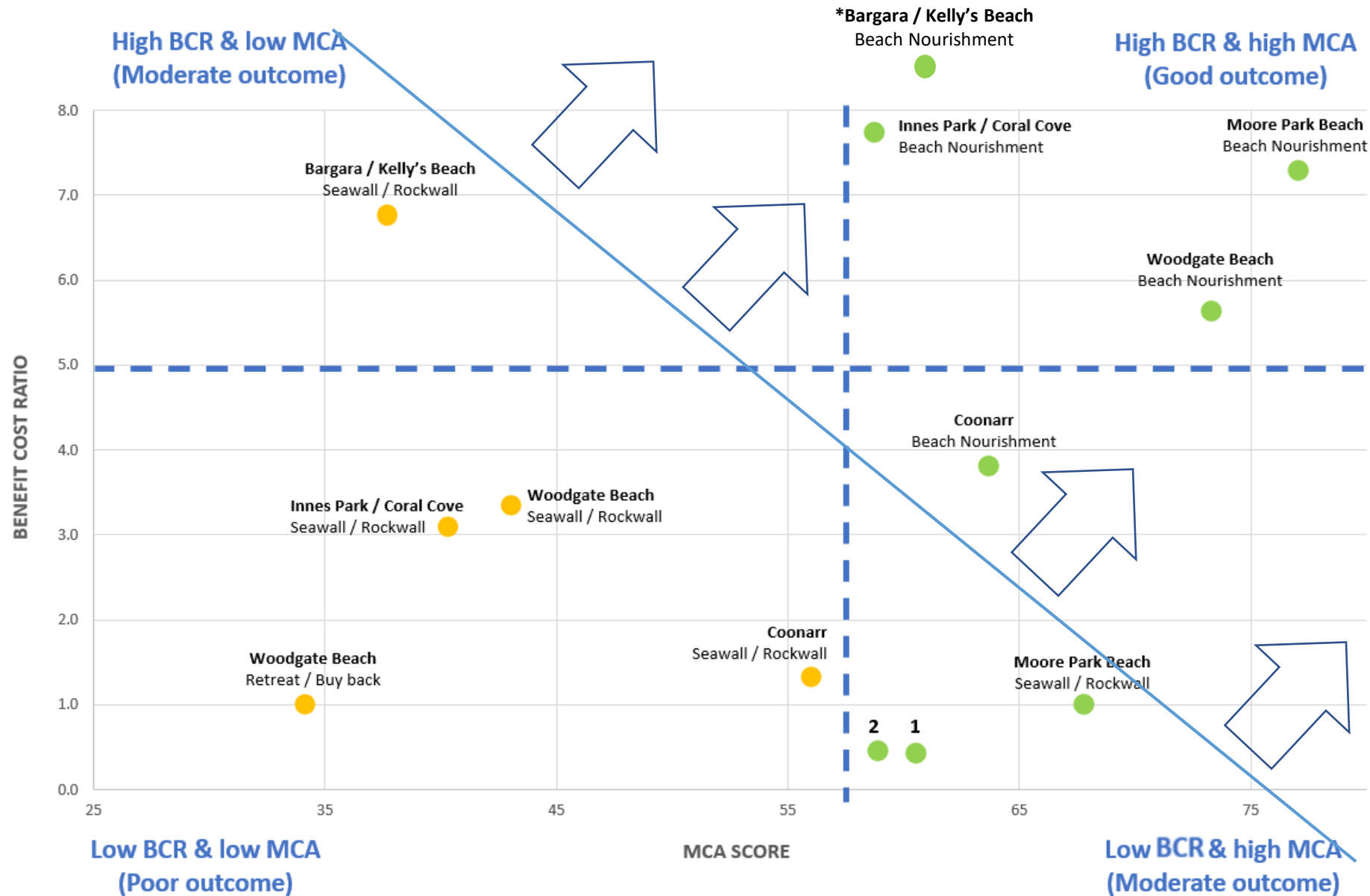
Results of Phase 7

We did a Cost Benefit Analysis (CBA) and MCA on the shortlisted physical options

- Combination of both economic appraisal and multi-criteria analysis
- Derived the final list of adaptation options, in preferential order
- Informs our 'Preferred Pathways' for adaptation in each settlement.
- Results favourably for the traditionally 'soft-engineering' approach of beach nourishment in comparison to seawalls



BENEFIT COST RATIO TO MCA SCORE



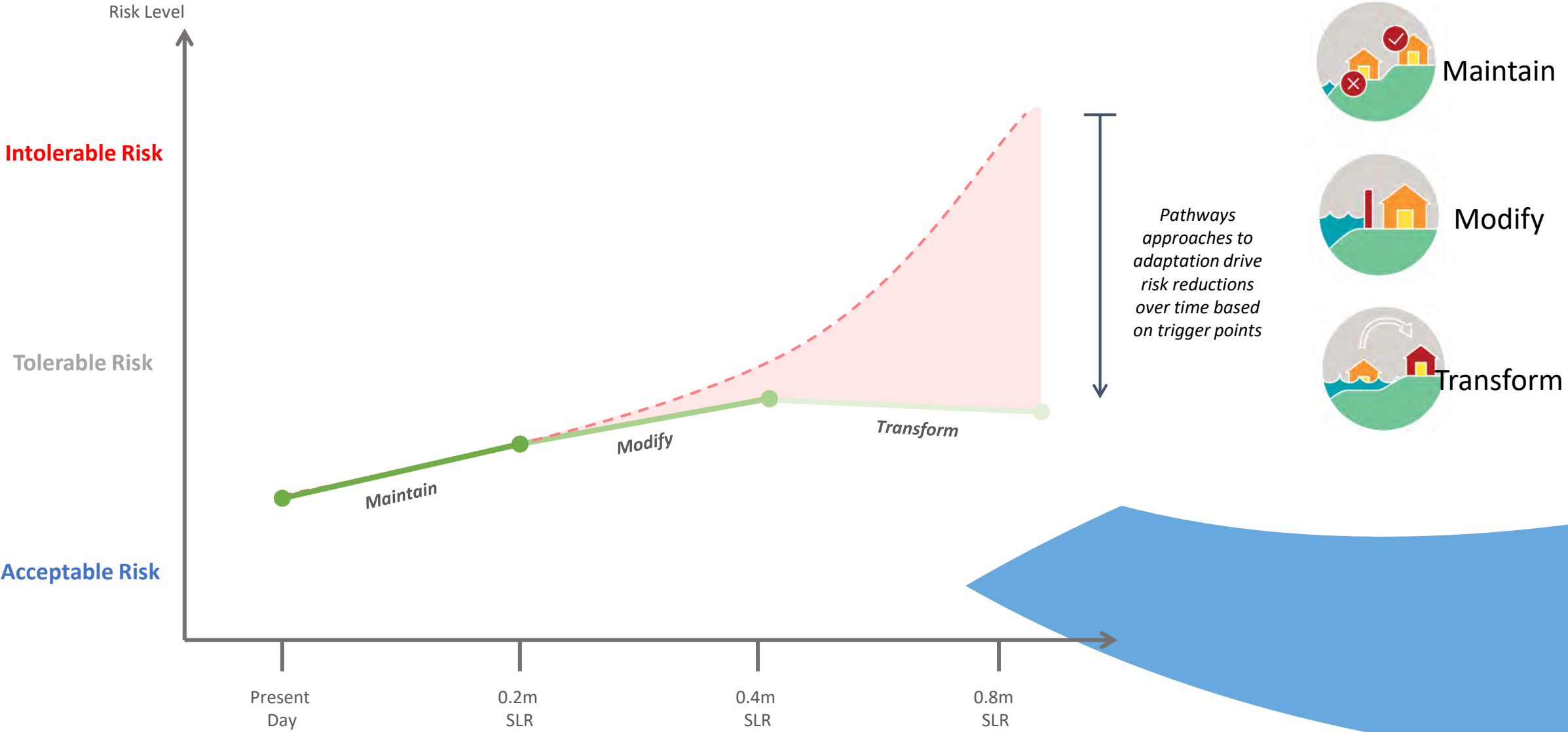
- Preferred Adaptation options
- Non preferred Adaptation options

***Bargara / Kelly's Beach Beach Nourishment**

MCA SCORE OF 58, Benefit cost ratio of 38.
This adaptation option has the highest CBA ratio.

- 1 Burnett Heads Storm Surge Barrier**
- 2 Coonarr Retreat / Buy Back**

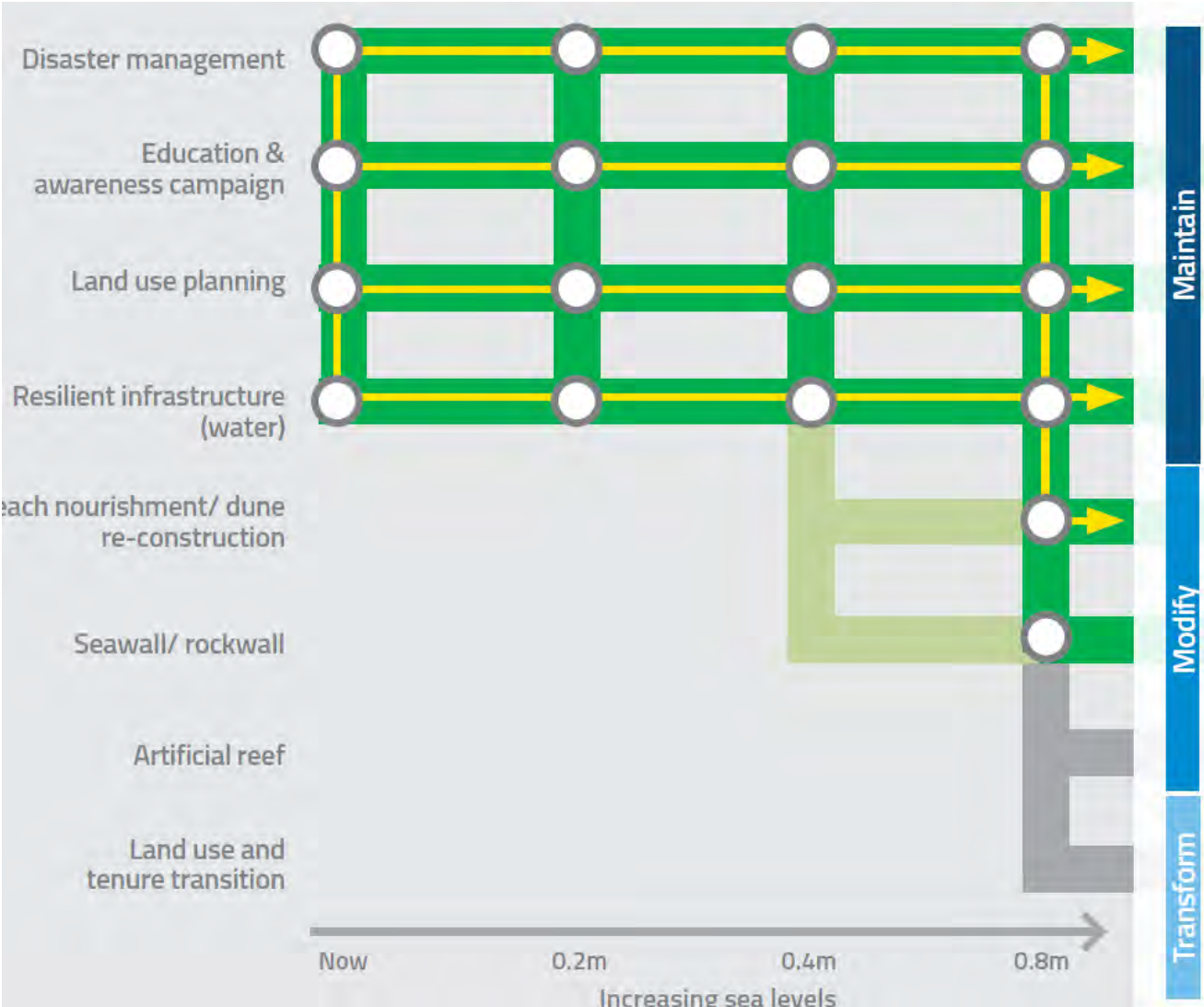
A trigger-based approach



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 adaptation 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



Which sea level rise scenario triggers intolerable risk?



0.2m slr

Coonarr



0.4m slr

Woodgate Beach &
Walkers Point

Moore Park Beach



0.8m slr

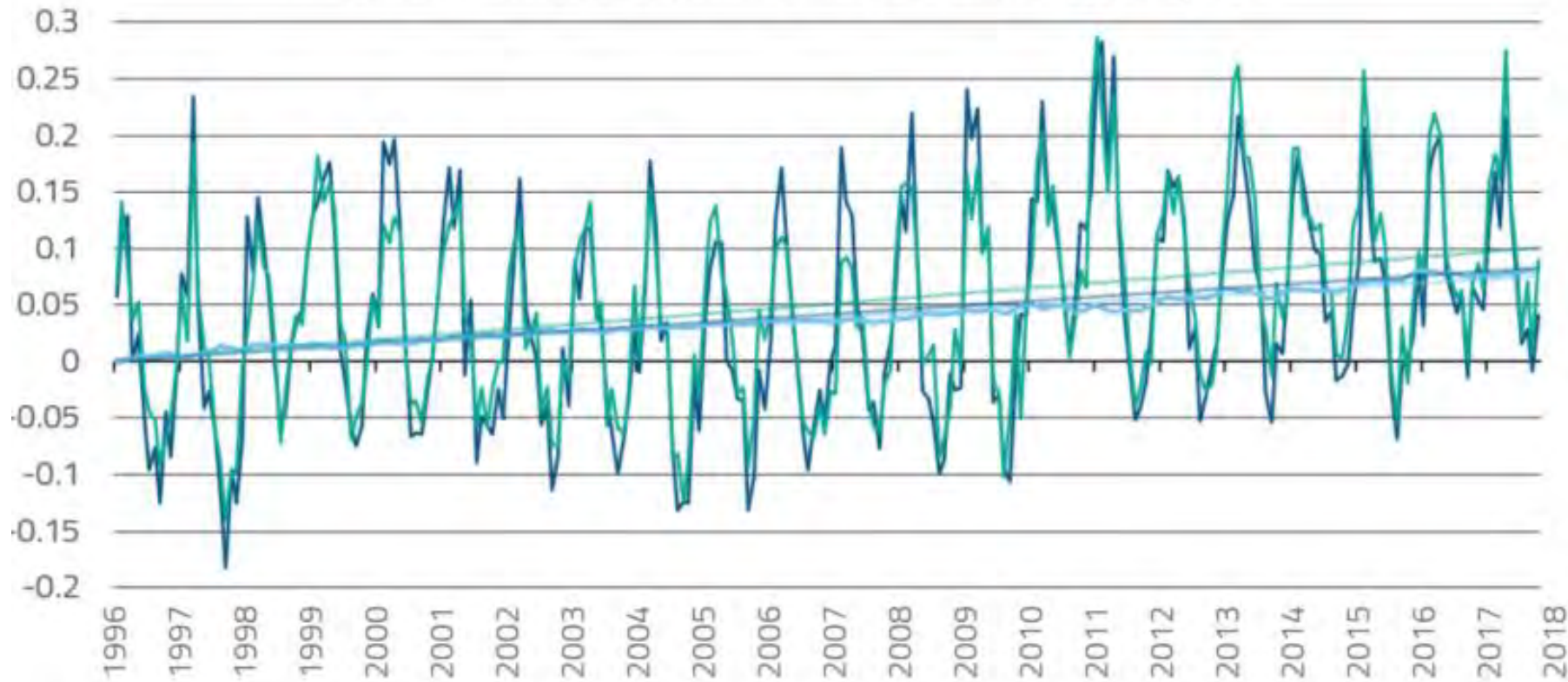
Bargara

Innes Park &
Coral Cove

Burnett Heads

How will we monitor Sea Level Rise?

Mean Sea Level Rise 1996-2017, Rosslyn Bay Qld



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

— Cape Ferguson
— Rosslyn Bay
— Global



Documentation and Consultation



Documentation in Phase 8:

Completed:

CHAS Summary Brochure
Promotional Video & Fact Sheets

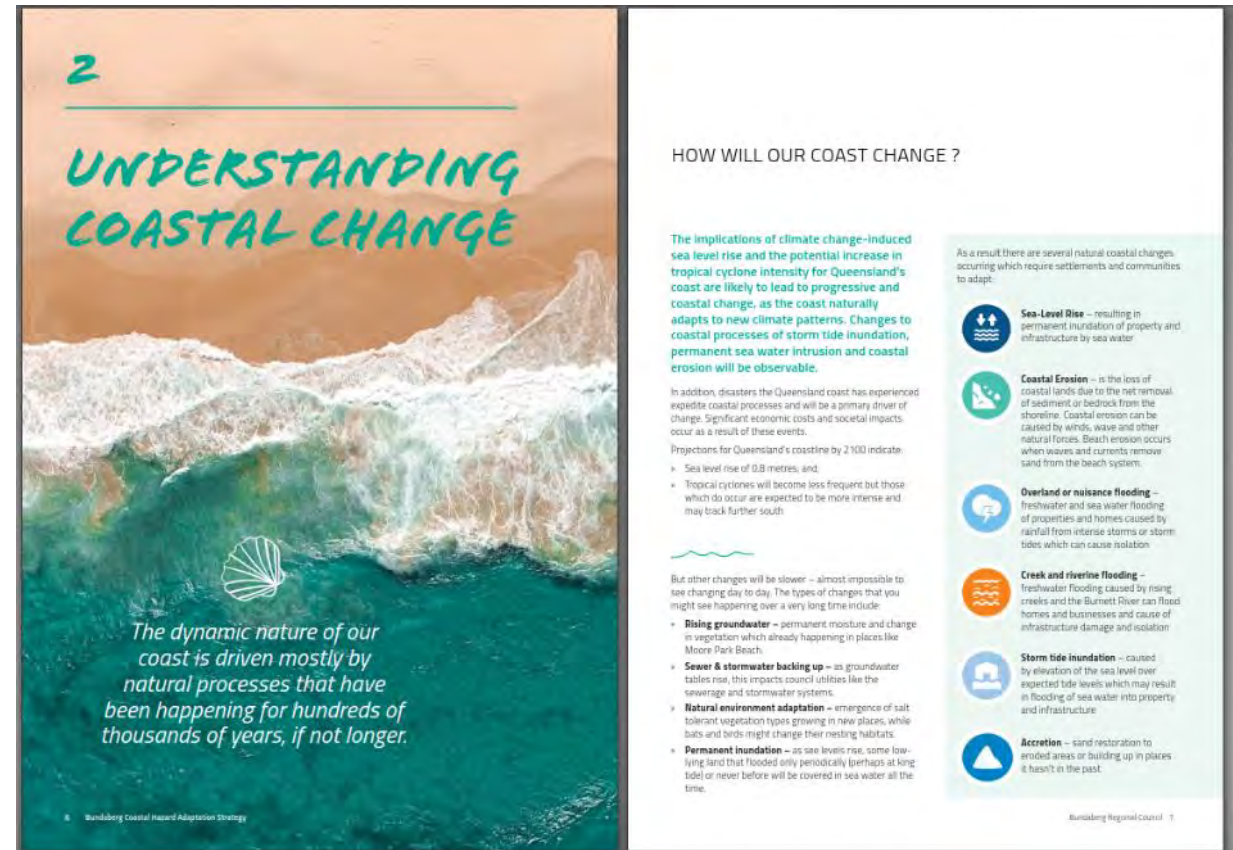
Remaining work:

Technical Review of Submissions
Consultation Report
Final Version of CHAS

CHAS Summary Brochure

[Link to Document](#)

Contains summary of coastal change, adaptation principles, risk assessment, adaptation pathways, trigger based approach and Action Plan of risk reduction measures



Promotional Video

[Link](#)

Draft Fact Sheets

Understanding coastal change

Our coastline changes every day. Sand moves with the currents and tides, creating different landforms. Flora and fauna move with it, thriving in new habitats over time. New businesses open, new residents arrive. The community shares and values our coast creating endless coastal lifestyle meanings as our community stories evolve. As sure as the tide rises and falls, our coast will be slightly different tomorrow than it was today.

Natural coastal changes occurring in the Bundaberg Region which require settlements and communities to adapt:

The implications of climate change-induced sea level rise and the potential increase in tropical cyclone intensity for Queensland's coast are likely to lead to coastal change, as the coast naturally adapts to new climate patterns. Changes to coastal processes of storm tide inundation, permanent sea water intrusion and coastal erosion will be observable. In addition, natural disasters speed up coastal processes and will be a primary driver of change. Significant economic costs and societal impacts occur as a result of these events.

Climate change may affect coastal processes

- Sea level rise resulting in permanent inundation of property and infrastructure by sea water
- Storm tide inundation caused by elevation of the sea level over expected tide levels which may result in flooding of sea water into property and infrastructure
- Storm frequency intensity and/or direction changes changes to wave and storm surge patterns
- Rainfall and runoff changes increase/decrease sediment supply to rivers

More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

1300 883 699
bundaberg.qld.gov.au/ourcoast

How does sea-level rise affect our coast?

Through the Coastal Hazard Adaptation Strategy (CHAS), Bundaberg Regional Council is actively planning to avoid or reduce the impacts of coastal hazards, both now and into the future.

Sea level rise and an increase in cyclone intensity for the Queensland coastline may result in permanent inundation of low-lying land, bigger storm tides and coastal erosion of the shoreline. These natural processes contribute to shaping the unique landforms of each coastal region but can have adverse impacts on our communities and settlements.

Sea-level trigger points

When sea levels reach certain points in the future, the coastal hazards may be intolerable, these are known as trigger-points for action. A risk informed and trigger based approach provides future investment certainty in an otherwise uncertain world. The Coastal Hazard Adaptation Strategy has adopted 3 increments of sea level rise being 0.2m, 0.4m, and 0.8m as triggers for action.

How do we measure sea-level rise trigger points?

Sea-level rise trends are measured by the tidal gauges at Rosslyn Bay (near Yeppoon). This tidal gauge indicates a sea level rise trend slightly higher than the global trend of 3.4mm per year. Baseline sea level monitoring at Rosslyn Bay for the period 1996 to 2017 compared to the global mean sea level rise is shown here. This data will be used as the sea level rise evidence for the Bundaberg Region.

Sea-level rise increases exposure to coastal hazard risk

The Intergovernmental Panel on Climate Change (IPCC) projections for climate change are based on Representative Concentration Pathways (RCP) which capture future trends of how concentrations of greenhouse gases will change in the future and impact upon our climate, temperature and sea-levels.

- By 2100, sea-level rise on the Queensland coast is expected to reach 0.8 metres above the average level observed between 1986 and 2005
- Tropical cyclones will become less frequent but those which do occur are expected to be more intense and may track further south
- Significant economic costs, environmental and societal impacts occur as a result of these events

A rough rule of thumb...

Approximately a 1cm rise in sea level on a gently sloping beach... will bring the water 1m further landward

More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

Coastal hazard risk assessment

Overview

Coastal hazards, both now and in the future have the potential to have adverse impacts on Bundaberg Region communities, assets, buildings and the services that keep our settlements functioning. The risk assessment component of the Coastal Hazard Adaptation Strategy helps us to understand the level of risk over a range of sea level scenarios. It also helps us identify settlements subject to intolerable risks and prioritise a broad range of adaptation options to reduce these risks to acceptable levels.

Understanding risk

- Identify assets exposed to coastal hazards
- Prioritisation of key assets
- Risk assessment
- Risk Analysis and evaluation
- Identify series of triggers where potential risk becomes intolerable

Rating of a given risk: Risk = Consequence x Likelihood

Low	Medium	High	Extreme
Acceptable	Tolerable	High	Intolerable

Example

Consequence
e.g. communities may become isolated as roads become permanently inundated

Likelihood
e.g. a 1-in-100 year storm event can trigger coastal erosion and permanent sea water inundation. This is likely to occur within our lifetime.

Finding the risk rating
Using the rating for consequence and likelihood, find the risk rating from the risk matrix.

Low	High	Extreme
Low	Low	High
Medium	Medium	Medium

The distribution of exposure, vulnerability and risk across the Bundaberg region has shown that the impacts of coastal hazards affect the settlements in each locality in differing ways.

More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

1300 883 699
bundaberg.qld.gov.au/ourcoast

How to Make a Submission



Public Consultation

CHAS Summary Brochure

4 x Factsheets

Quick poll

Online Submission Portal


Bundaberg.qld.gov.au/ourcoast



CHAS Public Consultation

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 strategy will address 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 settlements while also increasing the resilience of our community in response.

The CHAS will be informed by the best available science, data and information. Council recognises that both the community and key stakeholders have a significant role to play in the development of the CHAS. This website has been set up as a tool for digital engagement, a place to share information on the project and provide opportunities for you to have your say regardless of your location.

The CHAS will be developed in consultation with the community to ensure there is broad understanding of the

Document Library

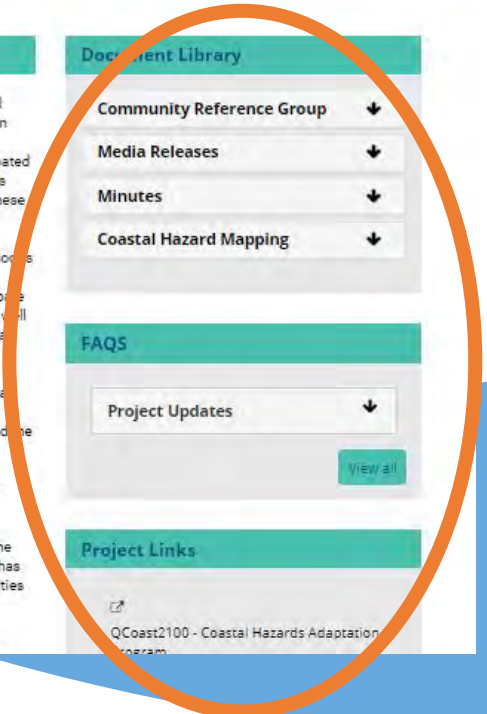
- Community Reference Group
- Media Releases
- Minutes
- Coastal Hazard Mapping

FAQS

Project Updates

Project Links

QCoast2100 - Coastal Hazards Adaptation Program



Submissions

How can I have my say?

Online Submission Form

www.bundaberg.qld.gov.au/ourcoast

Written correspondence to:

Our Coast Submission, PO Box 3130, Bundaberg QLD 4670

Or to any customer service centre

Email: ourcoast@bundaberg.qld.gov.au

Submissions must be lodged by **Monday 31 August by 4pm.**

On behalf of Council,
We thank you for your participation!





APPENDIX B COASTAL HAZARD ADAPTATION STRATEGY FACTSHEETS



COASTAL HAZARD ADAPTATION STRATEGY

What does a CHAS involve?

COASTAL ADAPTATION PLANNING

Many coastal communities currently face **coastal erosion and inundation risks**. It is also 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 significantly impact the livelihoods and lifestyles of coastal residents and the natural environment.

Decisions and actions that help to prepare for the adverse consequences of a changing climate, as well as taking advantage of the opportunities, are known as **climate adaptation**.

To assist in understanding and adapting to variations in climate Bundaberg Regional Council is developing a Coastal Hazard Adaptation Strategy (CHAS) for the entire coastline of our area. 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.

More specifically the CHAS will:

- Identify coastal hazard areas
- Understand the vulnerabilities and risks to communities, infrastructure and the environment
- Engage with the community to understand their preferred approach to adaptation
- Develop costs, priorities and time frames for implementation of adaptation options

HOW MAY A CHANGING CLIMATE EFFECT THE COAST?

*Climate changes on all timescales from **short-term fluctuations**, such as El Niño events, through to **glacial-interglacial fluctuations** lasting many thousands of years. Humans, and the environment in which we live, have adapted to these changes.*

Current projections for Queensland's coastline by 2100 are:

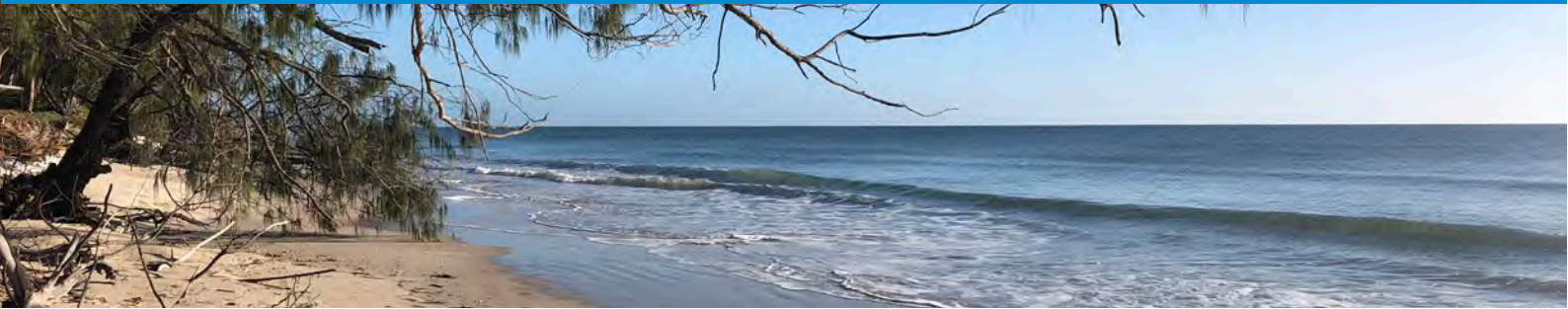
- Projected sea level rise of 0.8 m
- Tropical cyclones are predicted to become less frequent but those that do occur are expected to be more intense

The likely impacts associated with these changes mean that rising sea levels combined with storm tides are likely to cause accelerated erosion and increased risk of inundation which we need to better understand.

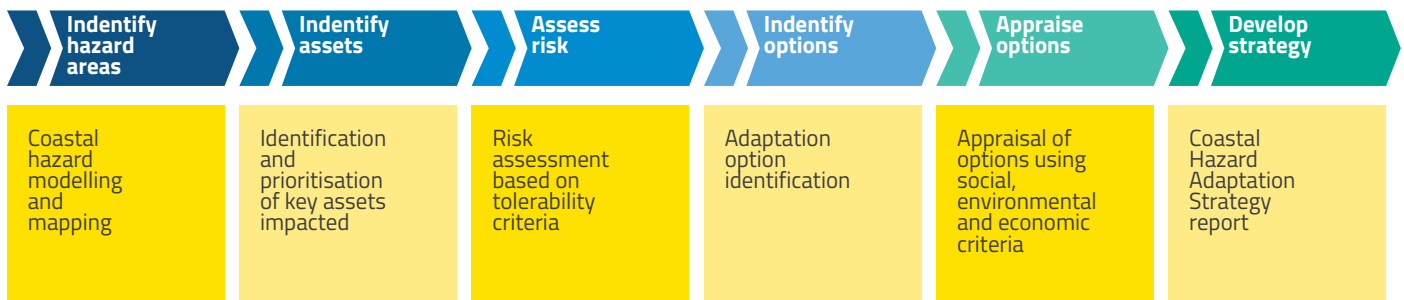
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W bundaberg.qld.gov.au

Bundaberg Our Coast
ourcoast.bundaberg.qld.gov.au

COASTAL HAZARD ADAPTATION STRATEGY



The CHAS Process



Community and Stakeholder Engagement

HOW WILL THE PROJECT BE UNDERTAKEN?

The CHAS is being funded by the Local Government Association of Queensland (LGAQ) QCoast₂₁₀₀ program and Bundaberg Regional Council. The QCoast₂₁₀₀ program provides funding, tools and technical support to Queensland coastal councils to prepare plans and strategies to address coastal hazard risks as a result of the changing climate.

The CHAS project will be developed through eight phases as described in the document "Developing a Coastal Hazard Adaptation Strategy: Minimum Standards and Guideline for Queensland Local Governments". The first two phases, which involved the scoping and planning for the Bundaberg region CHAS, were completed in 2017.

WHAT IS HAPPENING NOW?

Our consultants Water Technology are currently undertaking Phase 3 which will identify the areas exposed to coastal hazard both now and in the future. Coastal hazards being considered include both short term and long-term erosion and storm tide inundation of low lying coastal land. A range of future sea level rise scenarios are being considered to understand how the hazard is likely to change over time. The output of Phase 3 will be updated coastal hazard mapping for the region.

We have launched Our Coast, the online tool that has been created to help with engagement with all those people who have an interest on the coast.

You can find all the information you need at ourcoast.bundaberg.qld.gov.au.

HOW CAN I BE INVOLVED?

Do you have a great story about the Bundaberg region coastline? Have you seen changes that have taken place over time? Do you have memories of past storms and their impact on the coastline? What is important to you about the coastline of our region?

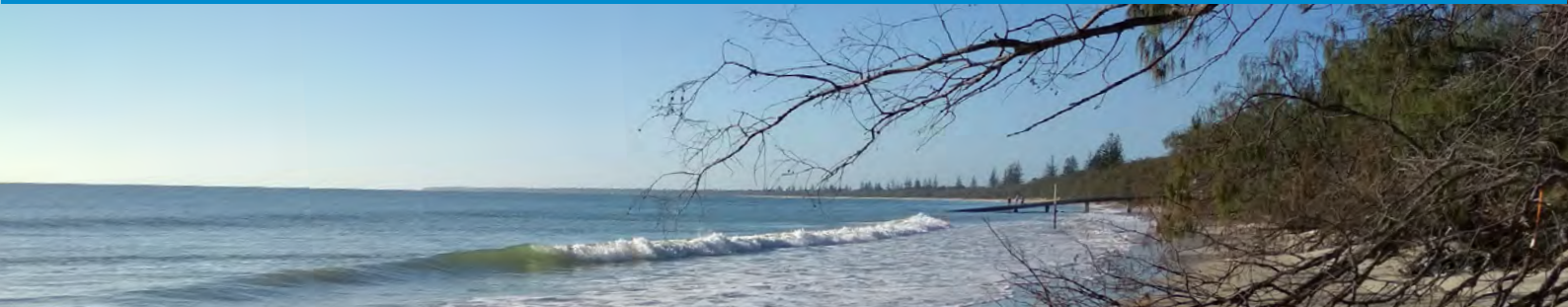
Involvement from the local community and stakeholders is being sought as part of the information gathering exercise to assist with the understanding of the coastal hazards along the Bundaberg region coastline. The project team would like to hear from people who have any supporting information about the coast such as photos, videos and stories. This information is important for our project team to provide additional locally specific details to support the development of the CHAS.

You can sign up for regular project updates, news and details of future community events through Our Coast, the online tool developed specially for this project. You can also share your own information through Our Coast, uploading stories, photos and other information that you think may be useful for the project.

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Bundaberg Our Coast
ourcoast.bundaberg.qld.gov.au

COASTAL HAZARD ADAPTATION STRATEGY



Understanding coastal hazards

WHAT ARE COASTAL HAZARDS?

*Coastal communities are vulnerable to impacts from coastal hazards such as coastal erosion and storm tide inundation. Both **coastal erosion and storm tide inundation are naturally occurring coastal processes** and the impacts of these coastal hazards are predicted to increase in the future as a result of projected sea level rise and the increase in cyclone intensity.*

Coastal erosion can be classified as short term or long term and results in the loss of land to the sea. Short term erosion occurs as a result of extreme weather events such as a severe storm or cyclone. After the event has passed, normal beach processes usually result in the beach being restored naturally. Long term erosion happens slowly over time as a consequence of changes in water level and currents. The impacts of the changing climate mean that sea level rise will increase coastal erosion with land being lost to the sea and low-lying land may be permanently inundated. Intensified cyclone activity will increase the severity of coastal erosion.

Storm tide is the combination of the normal tide and storm surge. Storm surge is the increase or decrease in water level associated with a severe weather event such as storm or cyclone. Storm tide inundation is the temporary flooding of low lying land caused by elevated water levels as result of a storm.

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Sea level rise will increase the severity and frequency of storm tide inundation and will cause inundation to occur further inland. The predicted increased cyclone and storm intensity from a changing climate will add to the magnitude of storm tide events and the extent of inundation.

WHY DO WE NEED TO PLAN FOR COASTAL HAZARDS?

*Both coastal erosion and storm tide inundation may adversely **impact on infrastructure, buildings and the natural environment** along the Bundaberg region coastline. We are currently experiencing erosion problems across the Bundaberg region including at Woodgate, Moore Park and Miara. It is anticipated the impacts from the changing climate will exacerbate these problems. Local economies may be affected through disruption to business as a result of coastal hazards. Social and cultural values may be affected as well as recreational opportunities.*

We need to plan now for a changing climate and how it may affect the coast. The benefits of planning now are:

- Understanding of the likely changes to the coast and vulnerabilities of existing assets
- Ability to plan for the protection of important assets (infrastructure, buildings etc)
- Avoidance or reduction in costs to the community and council
- Limitation or reduction to future exposure to risks through planning

Bundaberg Our Coast
ourcoast.bundaberg.qld.gov.au

How does sea-level rise affect our coast?

Through the Coastal Hazard Adaptation Strategy (CHAS), Bundaberg Regional Council is actively planning to avoid or reduce the impacts of coastal hazards, both now and into the future.

Sea level rise and an increase in cyclone intensity for the Queensland coastline may result in permanent inundation of low-lying land, bigger storm tides and coastal erosion of the shoreline. These natural processes contribute to shaping the unique landforms of each coastal region but can have adverse impacts on our communities and settlements.

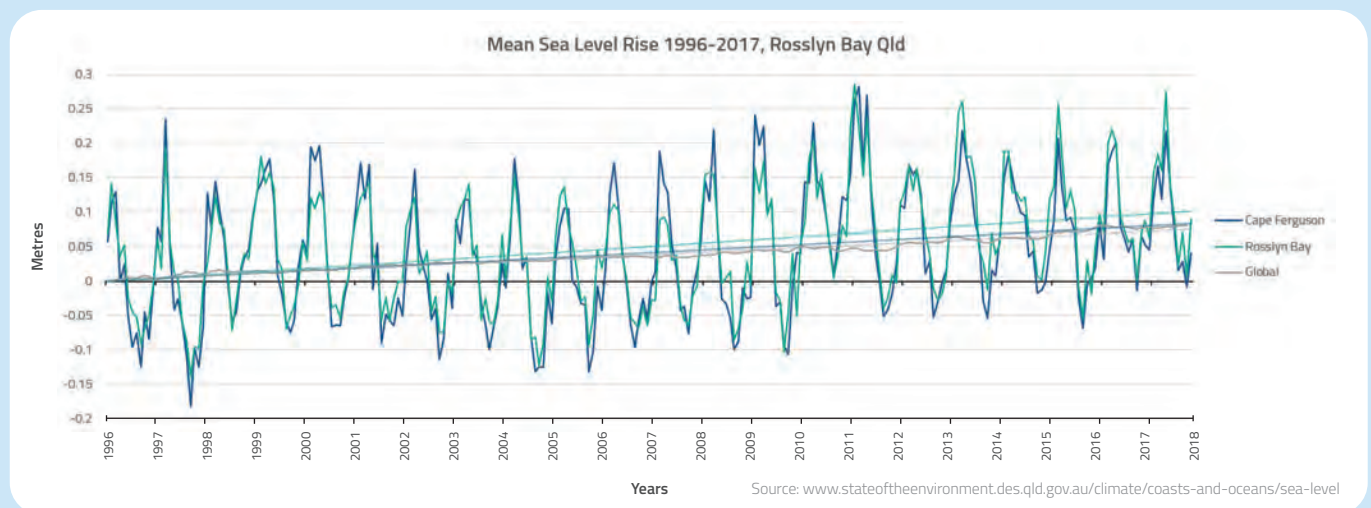
Sea-level trigger points

When sea levels reach certain points in the future, the coastal hazards may be intolerable, these are known as trigger-points for action. A risk informed and trigger based approach provides future investment certainty in an otherwise uncertain world. The Coastal Hazard Adaptation Strategy has adopted 3 increments of sea level rise being 0.2m, 0.4m, and 0.8m as triggers for action.

How do we measure sea-level rise trigger points?

Sea-level rise trends are measured by the tidal gauges at Rosslyn Bay (near Yeppoon). This tidal gauge indicates a sea level rise trend slightly higher than the global trend of 3.4mm per year.

Baseline sea level monitoring at Rosslyn Bay for the period 1996 to 2017 compared to the global mean sea level rise is shown here. **This data will be used as the sea level rise evidence for the Bundaberg Region.**



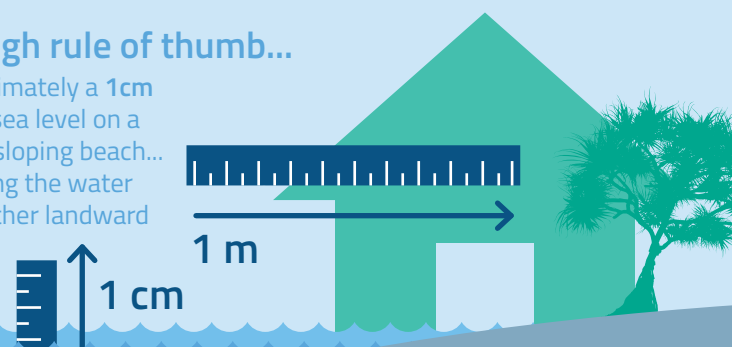
Sea-level rise increases exposure to coastal hazard risk

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- By 2100, sea-level rise on the Queensland coast is expected to reach 0.8 metres above the average level observed between 1986 and 2005
- Tropical cyclones will become less frequent but those which do occur are expected to be more intense and may track further south
- Significant economic costs, environmental and societal impacts occur as a result of these events

A rough rule of thumb...

Approximately a 1cm rise in sea level on a gently sloping beach... will bring the water 1m further landward

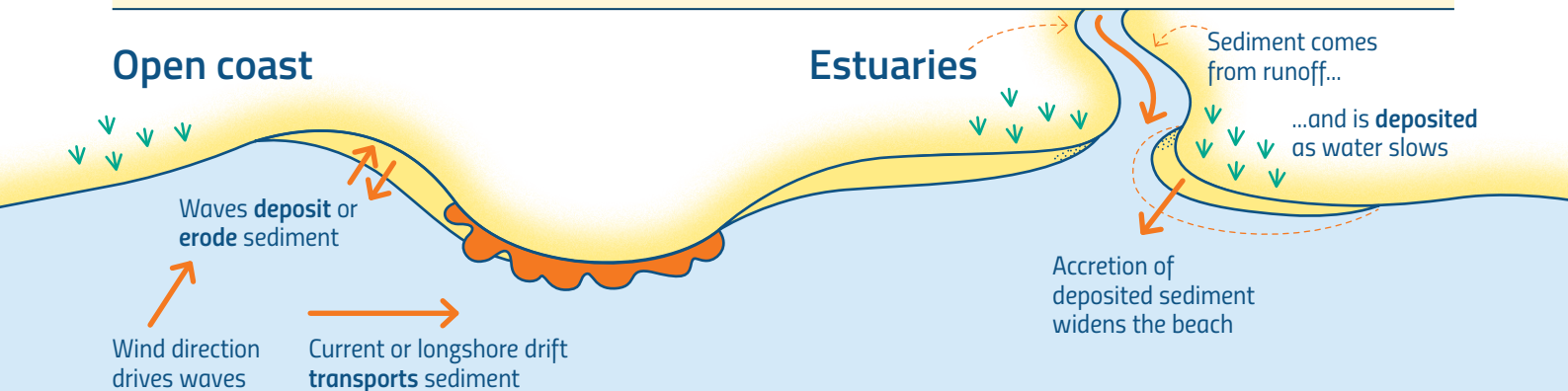
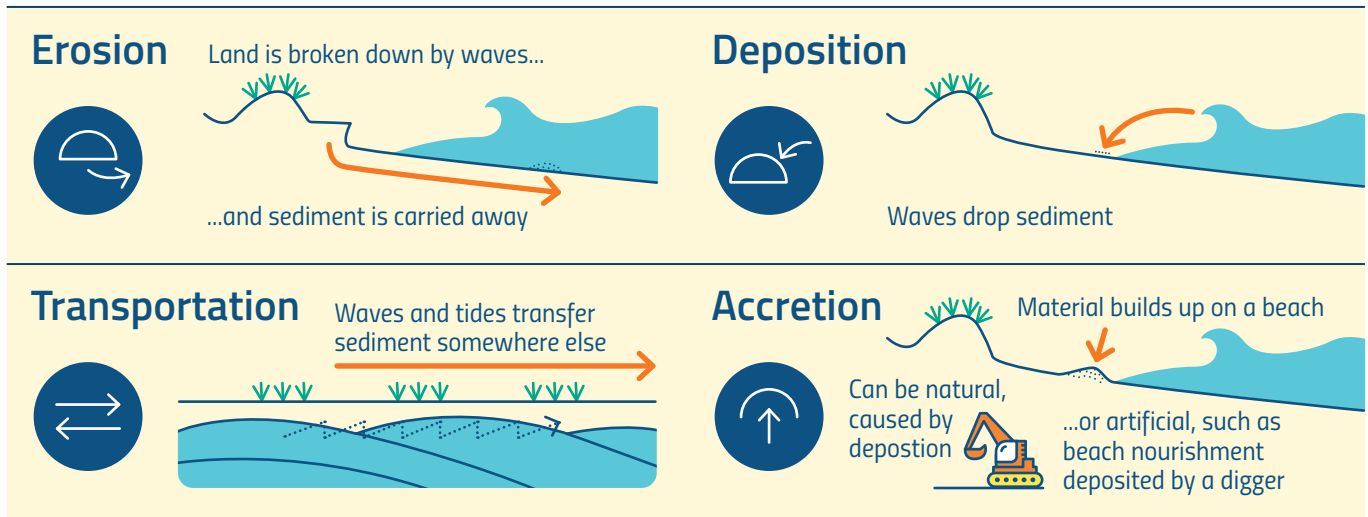


More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

Understanding coastal change

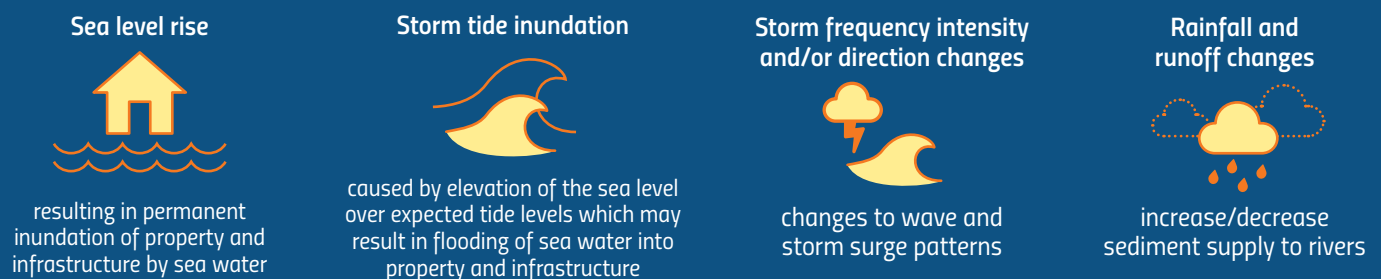
Our coastline changes every day. Sand moves with the currents and tides, creating different landforms. Flora and fauna move with it, thriving in new habitats over time. New businesses open, new residents arrive. The community shares and values our coast creating endless coastal lifestyle meanings as our community stories evolve. As sure as the tide rises and falls, our coast will be slightly different tomorrow than it was today.

Natural coastal changes occurring in the Bundaberg Region which require settlements and communities to adapt:



The implications of climate change-induced sea level rise and the potential increase in tropical cyclone intensity for Queensland's coast are likely to lead to coastal change, as the coast naturally adapts to new climate patterns. Changes to coastal processes of storm tide inundation, permanent sea water intrusion and coastal erosion will be observable. In addition, natural disasters speed up coastal processes and will be a primary driver of change. Significant economic costs and societal impacts occur as a result of these events.

Climate change may affect coastal processes



More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

Coastal hazard risk assessment

Overview

Coastal hazards, both now and in the future have the potential to have adverse impacts on Bundaberg Region communities, assets, buildings and the services that keep our settlements functioning. The risk assessment component of the Coastal Hazard Adaptation Strategy helps us to understand the level of risk over a range of sea level scenarios. It also helps us identify settlements subject to intolerable risks and prioritise a broad range of adaptation options to reduce these risks to acceptable levels.

Understanding risk

1. Identify assets exposed to coastal hazards
2. Prioritisation of key assets
3. Risk assessment
4. Risk Analysis and evaluation
5. Identify series of triggers where potential risk becomes intolerable

Rating of a given risk: Risk = Consequence x Likelihood

Low	Medium	High	Extreme
Acceptable	Tolerable		Intolerable

Example



Consequence

e.g. communities may become isolated as roads become permanently inundated



Likelihood

e.g. a 1-in-100 year storm event can trigger coastal erosion and permanent sea water inundation. This is likely to occur within our lifetime.



Finding the risk rating

Using the rating for consequence and likelihood, find the risk rating from the risk matrix:

Consequence	Major	Medium	High	Extreme
	Moderate	Low	Medium	High
	Minor	Low	Low	Medium
		Unlikely	Possible	Likely
		Likelihood		

The distribution of exposure, vulnerability and risk across the Bundaberg region has shown that the impacts of coastal hazard affect the settlements in each locality in differing ways.

More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

Coastal change adaptation pathways

Climate change and sea level rise will continue to influence coastal hazards such as storm tide inundation and coastal erosion. As sea levels continue to rise, impacts from coastal hazards are expected to become more severe. Through the Coastal Hazard Adaptation Strategy (CHAS) Council can work together with the community to build the resilience of the coastline and adapt to coastal change.

How can we adapt?

There are a range of ways we can adapt to coastal change in the Bundaberg region. Across each settlement three broad adaptation categories can be applied:



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.



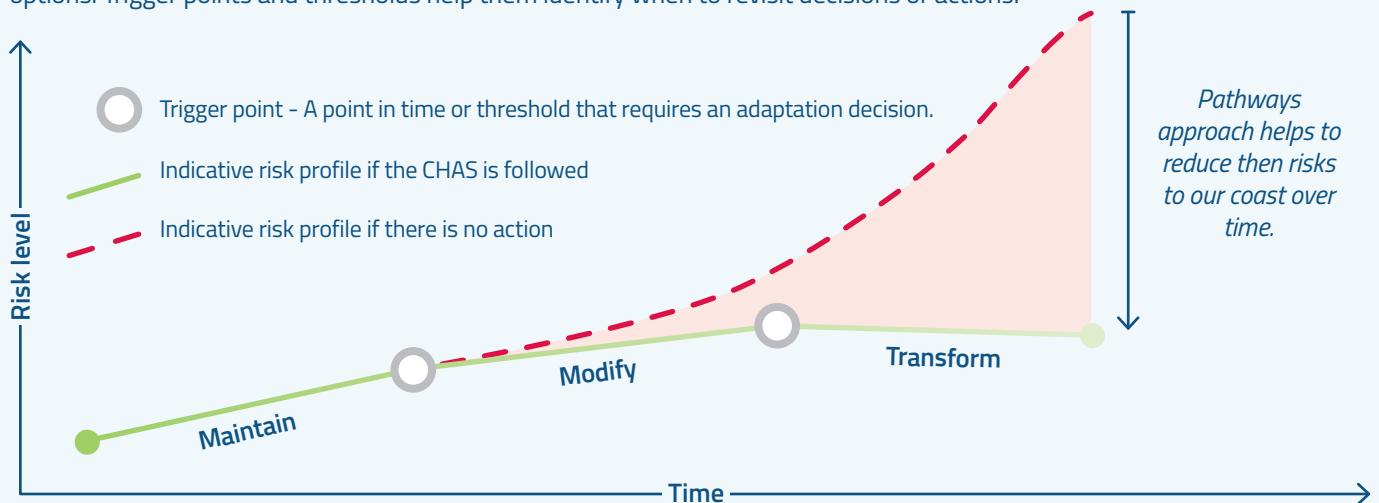
Transform

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.

A responsive, flexible and long-term implementation plan considers all possible adaptation options along with the effectiveness, acceptability and consequences of any option.

The costs of maintaining the current coastline shape and asset positions will likely become inefficient in the face of natural change or prohibitively expensive in the future.

The adaptation pathways approach allows decision makers to plan for, prioritise and stagger investment in adaptation options. Trigger points and thresholds help them identify when to revisit decisions or actions.



More information on coastal adaptation can be found at coastadapt.com.au or qcoast2100.com.au

Adaptation options include

There are three categories of options considered for adapting to coastal change in the Bundaberg Region:

1. Maintain

There are a range of options available in this category that seek to maintain the current risk profile.



Disaster management

Council, the State Emergency Service, volunteer and local disaster management groups play an important role in keeping the community safe. The local disaster management plan outlines activities within the key stages of prevention, preparedness, response and recovery. Disaster management strengthens community disaster preparedness and coordinates systematic responses to potential coastal hazard events.



Land use planning

Land use planning responses such as zoning, development controls and risk mapping are employed to avoid the risks for new development in a strategic and future sense. The visions for each settlement must align with coastal change to ensure projected in-fill development is appropriate and a risk-based approach to planning is in place.



Education and awareness campaigns

Council provides extensive resources as part of their disaster management activities for community awareness. The information is valid for all hazards and assists the community in the lead up to potential natural hazard events. The resources provided include a household emergency plan guide, an emergency kit guide, an evacuation plan template, preparing pets information; and relevant emergency contact numbers.

Including specific information to enhance understanding of coastal processes, adaptation options and impacts of coastal changes can build resilience in the community through communication and messaging.



Resilient Infrastructure

Building or replacing infrastructure assets that are resilient to coastal hazards increases the service to the community and is necessary for the ongoing function of a settlement. This approach also minimises interruptions to services such as drainage, roads, water supply and electricity during and after coastal hazard events. Using the evidence and supporting data available to asset owners, future infrastructure and asset planning decisions can build in resilience based on an understanding of coastal hazards.

2. Modify

There are a range of options in the Modify category that form physical alterations to protect people and property from the impacts of climate change, sea level rise, coastal erosion, permanent inundation or storm tide inundation.



Beach nourishment

Beach nourishment is the artificial addition of sand to a beach system, increasing the buffer against erosion or preventing further loss of sand. This option reduces the risk of storm tide inundation when combined with dune creation and vegetative stabilisation. A long-term beach nourishment strategy requires continuous monitoring of shoreline changes to identify timing of renourishment campaigns.



Seawalls

A wall or embankment structure put in place to stop tidal inundation or coastal erosion. Seawalls are often constructed in combination with beach nourishment and dune regeneration to provide a last line of defence under the coastal dune, reducing the risks of erosion and floods.



Raising key access roads

Raising the level of key access routes reduces the frequency of inundation and mitigates the risk of isolation to affected communities. Raising the road level or construction of causeway crossing which may experience inundation ensures a key access road remains available as an evacuation route, allows emergency services access and improve logistics during recovery.



Storm surge barrier and earth dyke

Barriers and dykes are an artificially constructed wall designed to avoid inundation from storm tides. Barriers and dykes are hard engineered structures usually made from earth and rock covered with vegetation, grass or esplanade to maintain a public amenity value.

3. Transform



Land-swap

Land swap may be applied to assets or buildings that are impacted by intolerable risks. The land swap activity is dependent on availability of an alternative site but is fully effective in removing risk to life and property.



Land use and tenure transition

Land use and tenure transition should be applied to areas subject to high hazards where it may be appropriate to cease occupation of the property in order to free residents from dangerous situations and intolerable risks.



APPENDIX C

MEDIA RELEASES AND SOCIAL MEDIA POSTS





C-1 Media Releases

5057-08_R10_V02_Stakeholder Communication and Engagement Summary

Date: Thursday, April 12 2018

Council funded to develop coastal hazard strategy

Almost half a million dollars has been secured by Bundaberg Regional Council to compile a strategy aimed at reducing the future risk of beach erosion and flooding on coastal settlements.

Environment and Natural Resources spokesman Cr Bill Trevor said the funds, provided by the Queensland Government through a QCoast 2100 grant, will enable Council to pursue an eight phase process in developing a CHAS or Coastal Hazard Adaptation Strategy.

“Many coastal communities face coastal erosion and inundation risks. We are currently experiencing erosion problems in locations across the Bundaberg Region including Woodgate, Moore Park and Miara. With a changing climate these risks may increase with more intense storms and projected sea level rise.

“The Woodgate Beach community is currently engaged with Council consultants Water Technology to assist in developing the Woodgate SEMP (Shoreline Erosion Management Plan) and these results will feed into the CHAS.

“Scientists are projecting that sea levels may rise by up to 0.8 of a metre by 2100 and tropical cyclones, while becoming less frequent, are expected to be more intense and track further south.

“Obviously a rise in sea levels, coupled with severe weather events can provide the combinations necessary for some shoreline areas to be threatened through erosion and inundation.”

Project Manager Dwayne Honor said Council is developing a CHAS which encompasses the entire Bundaberg Region coastline.

“The CHAS will explore hazards linked to erosion, storm tide inundation and sea level rise and the potential impacts on communities, infrastructure and the environment.

“The strategy will be developed in consultation with the community with a focus of ensuring there is broad understanding of the vulnerabilities and risks associated with a changing climate and the need for climate adaptation.”

Mr Honor said Bundaberg Regional Council was only the seventh of 41 eligible Councils to receive full funding for the eight phase development of its CHAS.

He said the project was not about being alarmist but rather ensuring the Bundaberg Region and its residents are on the front foot of adaptation planning, aware of potential risks and were confident that Council was preparing for any eventuality.

“The work will be undertaken by consultants Water Technology and the community will become involved as soon as project frameworks and timelines are fully developed.”

MEDIA ENQUIRIES:

Media Officer, Megan Dean Ph: 0409 392 236

Senior Media Officer, Wayne Heidrich Ph: 0438 638 407

Email: communications@bundaberg.qld.gov.au

Date: Thursday, May 17 2018

Coastal strategy team need community help

Residents across the Bundaberg Region living at or near our stretch of the Queensland coastline will be aware that the face of our beaches and exposed areas is ever-changing.

Council and the Queensland Government are combining to develop a Coastal Hazard Adaptation Strategy (CHAS) and are inviting interested residents to contribute their knowledge and enthusiasm as part of a Community Reference Group (CRG).

Environment and Natural Resources spokesman Cr Bill Trevor said the coastline across the Bundaberg Region is diverse but the effects of erosion, storm tide inundation and sea level rises are occurrences that will have a future impact on our coastline as we know it.

“Council has been funded to almost half a million dollars to develop a strategy that will define an action plan to mitigate these anticipated future coastal manifestations.

“In reality we are just now dipping our toes in the water to address these natural phenomenons. Currently a Shoreline Erosion Management Plan (SEMP) is being developed for Woodgate.

“The SEMP will provide information that will inform the CHAS. The difference between the two studies is that the SEMP is localised while the CHAS explores a much bigger picture.

CR Trevor said putting together a Community Reference Group is a vital step in developing the CHAS.

“No one knows their stretch of coastline like the people who either live there or are absolute devotees of beachside interaction. We need people who want to assist through shared knowledge and passion and I can assure everyone that every piece of information is vital in building the clear picture needed for a future course of action.

“Our CHAS team will be conducting Community Pop Up sessions at Moore Park Beach and Bargara next week to share information on the strategy and seeking interest from people willing to become members of the CRG.

“Ideally, the CRG should comprise representatives from a diverse range of locations from Woodgate, Elliott Heads, Bargara, Moore Park, Miara, Boaga and all places in between.

“With sea levels expected to rise by around 0.8 of a metre by 2100 it is imperative that we develop strategies to protect one of our most beautiful assets that not only enables a magnificent lifestyle but is also one of our key economic drivers.”

Cr Trevor said the Pop Up session will be held at Bargara on Tuesday, May 22 from 1-3pm adjacent to the Esplanade war memorial and on Wednesday, May 23 at Moore Park Surf Lifesaving Club from 10am-12pm. “While our team is keen to form a CRG all residents interested in simply understanding the focus of the CHAS are welcome to attend.”

For further information regarding the CRG or community meetings contact Council on 1300 883 699 or visit Councils website ourcoast.bundaberg.qld.gov.au to download relevant forms.

MEDIA ENQUIRIES:

Media Officer, Megan Dean Ph: 0409 392 236

Senior Media Officer, Wayne Heidrich Ph: 0438 638 407

Email: communications@bundaberg.qld.gov.au

Media Release

Date: Monday, June 4, 2018

Applications extended for coastal strategy team nominations

Residents across the Bundaberg Region living at or near the coastline are being asked to share their stories and experience to develop a plan for its future protection.

Council and the Queensland Government are combining to develop a Coastal Hazard Adaptation Strategy (CHAS) and are inviting interested residents to contribute their knowledge and enthusiasm as part of a Community Reference Group (CRG).

Applications to join the CRG have now been extended to 4pm, Monday, June 11.

Environment and Natural Resources spokesman Cr Bill Trevor said the coastline across the Bundaberg Region is diverse but the effects of erosion, storm tide inundation and sea level rises are occurrences that will have a future impact on our coastline as we know it.

“Council has been funded to almost half a million dollars to develop a strategy that will define an action plan to mitigate these anticipated future coastal impacts.

“In reality we are just now dipping our toes in the water to address these natural phenomenon. Currently a Shoreline Erosion Management Plan (SEMP) is being developed for Woodgate.

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“With sea levels expected to rise by around 0.8 of a metre by 2100 it is imperative that we develop strategies to protect one of our most beautiful assets that not only enables a magnificent lifestyle but is also one of our key economic drivers.”

For further information including nomination forms for the CRG contact Council on 1300 883 699 or visit Councils website ourcoast.bundaberg.qld.gov.au to download relevant forms.

All media enquiries to Council's Communications Team

communications@bundaberg.qld.gov.au

bundaberg.qld.gov.au

Date: Tuesday, June 5 2018

Council aids in development of State disaster resilience strategies

Knowledge gained by Bundaberg Regional Council staff in the wake of the 2013 flood event has been instrumental in providing strategies that will provide for a more disaster resilient Queensland.

Resilient Queensland 2018-21 – Delivering the Queensland Strategy for Disaster Resilience was launched at the Floodplain Management Australia national conference on the Gold Coast last week.

Minister for State Development Cameron Dick said *Resilient Queensland 2018-21* was a blueprint for use across government, the community, not-for-profit sector, business and industry.

The Minister said that central to the creation of the new state-wide strategy was the success of the pilot Burnett Catchment Flood Resilience Strategy, which was finalised this month.

Bundaberg Regional Council Disaster Management portfolio spokesman Cr Greg Barnes said Council staff had contributed significantly to the development of the Burnett Catchment strategy.

“Council’s Manager of Design, Dwayne Honor along with Disaster Management Officers, Matt Dyer and Emma Anderson represented the interests of the Bundaberg Region through the pilot study which involved the collaboration of North and South Burnett Regional Councils, the Queensland Reconstruction Authority and Cherbourg Aboriginal Council.

“Dwayne Honor was also part of an expert panel at the Gold Coast national conference which discussed the new resilience measures.

“Dwayne’s significant experience in the wake of the 2013 flood and in particular his study of flood impacts on catchments across the region including the Burrum, Kolan and Burnett provided invaluable information to guide the strategy”

Cr Barnes said the receipt of a prestigious Churchill Fellowship in 2015 had allowed Dwayne to further his studies overseas with a focus on the impacts of extreme storm surge on coastal communities.

“This is one reason why Dwayne is currently heading up our Coastal Hazard Adaptation Strategy (CHAS) and Shoreline Erosion Management Plan (SEMP).”

MEDIA ENQUIRIES:

Media Officer, Megan Dean Ph: 0409 392 236
Senior Media Officer, Wayne Heidrich Ph: 0438 638 407
Email: communications@bundaberg.qld.gov.au

Date: Tuesday, July 24 2018

Community reference group to help design coastal hazard strategy

The appointment of a Community Reference Group to assist with the implementation of Council's Coastal Hazard Adaptation Strategy (CHAS) will ensure project involvement at a community level and input from numerous residents with knowledge of the region's coastline.

Council, at its Ordinary Meeting today, accepted the nominations of 18 residents from across the region as members of its CHAS Community Reference Group.

Environment portfolio spokesman Cr Bill Trevor said the practice of establishing similar reference groups in the past had proven invaluable for Council in ensuring a community layer existed within the consultative framework.

"In instances like this when we are dealing with historical facts in relation to the dynamics of our coastline, where better to get reliable information and to test proposed solutions than with people holding first-hand knowledge through living within the project area."

Cr Trevor said he was delighted to see that five women were also a part of the new CRG. "The balance and perspective women provide within any committee organisation is well-recognised and respected," he said

"The CRG members come from locations across the region including Moore Park Beach, Innes Park, Elliott Heads, Bargara, Burnett Heads, Mon Repos and Woodgate Beach.

"There are seven representatives from Woodgate Beach and Walkers Point. Areas of Woodgate Beach are also currently involved as a trial site in a Shoreline Erosion Management Plan (SEMP) project and the findings from this study will easily transpose into the broader CHAS project."

Under the CRG Terms of Reference members of the group are required to assist in informing the study while also relaying information through their respective networks to keep the community updated.

"These people are at the grass roots level and are able to access community thoughts and ideas and bring them to the discussion table. Their personal interest and desire to assist their community with this study is commendable," said Cr Trevor.

"In broad terms the CHAS will explore the expectation that many coastal communities will face significant erosion and possible inundation as sea levels rise in the coming decades.

"We need to understand the vulnerabilities and risks to our exposed areas and develop strategies that will manage or mitigate this should the expectation become a reality."

The CHAS Community Reference Group was selected following advertising through newspapers, radio and online during May calling for expressions of interest.

MEDIA ENQUIRIES:

Media Officer, Megan Dean Ph: 0409 392 236

Senior Media Officer, Wayne Heidrich Ph: 0438 638 407

Email: communications@bundaberg.qld.gov.au

Date Friday October 19, 2018

Coastal strategy pleases visiting Professor

A professor experienced in storm surge and tidal inundation events in the United States is sharing knowledge with Bundaberg Regional Council officers engaged in compiling a local Coastal Hazard Adaptation Strategy (CHAS).

Professor Gavin Smith visited Bundaberg this week and consulted with officers and a community reference group engaged in compiling the CHAS. Professor Smith is from the Department of City and Regional Planning, University of North Carolina and is the Director of the Coastal Resilience Centre of Excellence.

Dwayne Honor, Council's Branch Manager of Engineering Services said Professor Smith was briefed on Council's CHAS which is exploring the impact of future sea level rises as they relate to the coastline of the Bundaberg Region.

"It is anticipated that sea levels could rise some 0.8m by 2100 leading to coastal flooding, beach erosion and storm tide issues and Professor Smith is in Bundaberg to share his experiences from similar circumstances in the United States.

Professor Smith said he was delighted to find that the Bundaberg Regional Council had a proactive approach to preparing its community for the effects of coastal and sea level changes brought about through a changing climate.

"Unfortunately in the US we often throw a lot of money at the disasters after they have happened and it's a fact that we don't do a good enough job planning before the events."

He said that planning in the wake of disasters was really challenging and often led to sub-optimal outcomes.

Professor Smith said Council appears to be on the right track with its strategy. They are exploring a broad range of scenarios and it's a great initiative to form community reference groups with people who have significant local knowledge.

"When we build human settlements close to the coast we have to recognise that our coastline is constantly changing and the implementation of land use planning and looking at how and where you build are critical considerations."

Dwayne Honor said the CHAS was progressing well and it was anticipated a report could be finalised by around August next year.

ENDS

Direct all media enquiries to:

Email: communications@bundaberg.qld.gov.au

Media Officer, Megan Dean Ph: 0409 392 236

Senior Media Officer, Wayne Heidrich Ph: 0438 638 407

More than 600 residents respond to coastal hazard survey

By **Megan Dean** - 7 July 2019



The Coastal Hazard Adaption Strategy survey results have been revealed.

The results of a recent survey which reveals what residents value most about the Bundaberg Region coastline will be used to shape a Coastal Hazard Adaption Strategy (CHAS).

The CHAS is part of the Our Coast project, a joint initiative of Bundaberg Regional Council and the Queensland Government, aimed at preparing and protecting the region's coastline from the effects of climate change.

Bundaberg Regional Council environment portfolio spokesman Cr Wayne Honor said more than 600 residents participated in the survey.

"To identify what the community values about our coastline Council launched a community values survey in January this year and we received an overwhelming response," Cr Honor said.

"It is clear from the level of participation that the Bundaberg Region coastline is very important to our community members.

"Enjoying the view, recreational activities and providing a habitat for native animals were some of the reasons people said they love the coast. Dune erosion, water quality and loss of vegetation ranked highly among the top concerns.

"The survey results provide us with an important insight in to the aspects of the coastline that residents feel strongly about and identify the values we are trying to protect for future generations to enjoy."

Coastal Hazard Adaption Strategy survey results

The top five ways people use the coast:

- Enjoying view
- Recreational activities (in the water)
- At the water's edge
- Socially
- Visiting cafes, restaurants etc

The top five qualities and characteristics of the coast:

- Presence of native animals
- Relaxed lifestyle
- Sandy beaches
- Functioning infrastructure
- Regulation of development

The top five concerns about the coast:

- Dune erosion
- Water quality
- Loss of vegetation
- Safe beach access
- Population growth

Cr Honor said the CHAS project was being driven by the communities affected, for the communities affected.

"We have 110 km of pristine coastline and it is one of our region's biggest drawcards.

"The CHAS is currently investigating how risks associated with coastal hazards will affect the communities along the coast now and into the future.

"The results from the community values survey will be used to assist to shape the future strategy and manage the risks of coastal hazard.

"The input from the community through this CHAS survey will help develop a future strategy where community values of coastal living are considered and, where possible, preserved."

For more information on the project head to ourcoast.bundaberg.qld.gov.au.

Council recently started [remedial works](#) on significantly eroded access points along Woodgate Beach.

- Other news: [Readers' top 10 stories of 2019](#)
- [Elliott Heads Holiday Park popular](#)
- [Concreting traineeship cements career goals](#)

CHAS Community Reference Group thanked

 **Trish Mears** 28 July 2020

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Members of the Bundaberg Region Hazard Adaptation Strategy Community Reference Group were thanked for their important work.

A group of residents passionate about our coastal areas have been thanked for their work as part of the Community Reference Group for the Bundaberg Region Coastal Hazard Adaption Strategy (CHAS).

Community Reference Group Chair, Cr Bill Trevor, said they had been an integral part of forming the Strategy.

“We first started this process in April 2017 and the Community Reference Group has played an active part in forming the Strategy since August 2018,” Cr Trevor said.

“They have been involved from the early days, of identifying characteristics and things they value about the coast, through to identifying key assets exposed to coastal hazards and validating the vulnerability and risk assessment process.

“They have also assisted helped define our community values and form a long term strategic vision for the management and adaptation of our coastline.”

Community Reference Group Member George Martin said it had been a very worthwhile experience.

“I’ve had an interest in good coastal planning since the 1970’s, growing up in northern NSW,” George said

“Poor coastal development decisions back then stimulated my interest.

“Not much has changed! The recent loss of coastal residences along the central NSW coast is a timely reminder about the importance of getting coastal planning “right” – adjusting for bad decisions of the past and ensuring that in a future of rising sea levels and increasing severity of coastal storms, coastal resources are protected.

“I applaud the collaborative approach sponsored by the Queensland Government and LGAQ to support coastal councils to undertake this important work.

"LGAQ's QCoast2100 program sponsorship, backed by technical expertise at the state level provides a great "canvas" for local people to steer their own regional strategy for addressing coastal hazards.

"CRG members represent a variety of coastal stakeholders, and brought experience and reality checking to the work of Council's team as they undertook the background work to underpin the draft strategy.

"The draft strategy now provides the opportunity for wider scrutiny by the community.


"Input by community members through the public consultation phase will further strengthen the strategy, hopefully resulting in a pragmatic and workable approach to protecting the coastal resources of our region for future generations."

At their final meeting, the Draft Strategy and Action plan was presented to the Community Reference group, prior to public release next week.

"We will be releasing the strategy on 3 August and look forward to receiving input from the community until 31 August," Cr Trevor said.

- **Previous news:** [More than 600 residents respond to coastal hazard survey](#)
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Have your say on Coastal Hazard Adaptation Strategy

 **Trish Mears** 3 August 2020

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Bundaberg region residents are invited to have their say on the draft Bundaberg Coastal Hazard Adaptation Strategy

After more than two years of development with input from community consultation and a dedicated Community Reference Group, Bundaberg Regional Council has developed the Bundaberg Region Coastal Hazard Adaptation Strategy.

We are now seeking feedback from the community on the draft.

“Bundaberg Regional Council is only the second local government in Queensland to complete a Coastal Hazard Adaptation Strategy and I am very proud of everyone who has been involved in the process,” Mayor Jack Dempsey said.

“We are now looking forward to having input from the public, particularly residents in coastal areas.”

The draft Strategy and Action Plan has been released to the public today for a 28-day period of community consultation – until 31 August 2020.

Chris McLoughlin, who was a member of the Community Reference Group, said it was a very worthwhile exercise and he’s hoping people will have their say.

“It was fantastic to work with my fellow community reference group members who are united by the goal of ensuring our coastal communities are ready for whatever challenges are ahead of them,” Chris said.

“We’ve contributed to a draft plan that is flexible and provides the necessary steps to protect each community along our coast.

"I encourage anyone who lives in our coastal towns or is passionate about the future of our coast to go through the plan and contribute to it.

"It's important that we all have our say so future generations can continue enjoy living on our spectacular Turtle Coast."

"As well as inviting submissions, the website is running a survey poll on some key questions regarding climate impacts along our coastline which we are encouraging residents to respond to," Mayor Dempsey said.

The draft Bundaberg Region Coastal Hazard Adaptation Strategy document is available for download [here](#).

Supporting information, the survey poll and details of how residents can make written submissions is available online [here](#).

Submissions will be accepted until 4.45pm Monday 31 August, 2020.

This video explains some more about the Bundaberg Region Coastal Hazard Adaptation Strategy

The video explaining the Bundaberg Regional Coastal Hazard Adaptation Strategy

- **More news:** [CHAS Community Reference Group thanked](#)

TAGS [coast](#)

[More news](#)





C-2 Social Media Posts

 **Bundaberg Regional Council**
8 March 2018 · 🌐

Involvement from the local community is being sought as part of an information gathering exercise by the project team developing a shoreline erosion management plan (SEMP) for Woodgate. Cr Bill Trevor, said three workshops have been planned by [Water Technology](#), the company contracted by Council to produce the SEMP. The first workshop will be in the form of a drop in session with residents invited to attend the Woodgate Community Hall next Thursday, March 15 anytime between 12.30pm and 7pm. For more head to <http://www.bundaberg.qld.gov.au/.../woodgate-beach-erosion-in...>



👍❤️ 13 10 shares

👍 Like 💬 Comment ➦ Share

FIGURE C-1 FACEBOOK POST – MARCH 2018



Bundaberg Regional Council

20 May 2018 · 🌐 · 🌐

If your local knowledge and passion can help us to develop the **Coastal Hazard Adaption Strategy** or you just want to learn more come and see us at:

Bargara - Tuesday, May 22 from from 1-3pm adjacent to the Esplanade war memorial

Moore Park - Wednesday, May 23 at Moore Park Surf Lifesaving Club from 10am-12pm.

<https://ourcoast.bundaberg.qld.gov.au/>



👍 3

👍 Like

💬 Comment

➦ Share

FIGURE C-2 FACEBOOK POST - MAY 2018



FIGURE C-3 FACEBOOK POST – MAY 2018

5057-08_R10_V02_Stakeholder Communication and Engagement Summary






FIGURE C-4 FACEBOOK POST – JUNE 2018




FIGURE C-5 FACEBOOK POST – OCTOBER 2018



 **Bundaberg Regional Council**  February 7, 2019 

A study has identified parts of the shoreline at Woodgate are being eroded at the rate of 65 centimetres a year.
Council is proceeding to commission design work and costings on a control strategy.
<http://bundynow.com/hv12>





BUNDABERGNOW.COM

Woodgate erosion management plan to be designed and costed – Bundaberg Now


   38 18 Comments 17 Shares

FIGURE C-6 FACEBOOK POST – FEBRUARY 2019



FIGURE C-7 FACEBOOK POST – JANUARY 2020



Bundaberg Regional Council 

August 8 at 5:00 PM · 

🌐 After more than two years of development with input from community consultation and a dedicated Community Reference Group, we've developed the Bundaberg Region Coastal Hazard Adaptation Strategy.

👉 The draft Strategy and Action Plan has been released to the public for a 28-day period of community consultation – until 31 August 2020.

⚠️ We are now asking for your input, particularly from residents in coastal areas.... **See More**

YOUTUBE.COM
Bundaberg CHAS

2,011
People Reached

36
Engagements

Boost Post

FIGURE C-8 FACEBOOK POST - AUGUST 2020

5057-08_R10_V02_Stakeholder Communication and Engagement Summary



Bundaberg Now
August 10 at 6:00 PM · 🌐

Learn more about the Bundaberg Region Coastal Hazard Adaptation Strategy and how to have your say. Read more:
<http://bundynow.com/chas>

NIGHTLY NEWS

5,914 People Reached 279 Engagements **Boost Post**

👍❤️😄 20 2 Comments 8 Shares

👍 Like 💬 Comment ➦ Share B, N ▼

FIGURE C-9 FACEBOOK POST - AUGUST 2020



APPENDIX D SUBMISSION SUMMARY REPORT (REDACTED)



Ref	Submitter Name	Service Address	Salutation	Property Address	Lot and Plan	Submission Summary	DRAFT Response
1						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> • Requests amendments to the CRG Minutes of the 23 July 2020. Specifically references to the long-list option to relocate properties raised in a previous CRG meeting. • Advocates for a rock wall on the northern side of Palmers Creek towards northern end of Coolanblue Avenue. 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p>CRG Minutes Update Thank you for highlighting the amendment to the CRG minutes for the meeting held on the 23 July 2020. Council have duly updated. It is confirmed that the option to relocate properties on Coolanblue Avenue was a long-list option raised by the CRG, but that this option was filtered out through the options analysis and screening phase and did not make its way into the final strategy.</p> <p>Rock wall at Coolanblue Avenue Council notes the suggestion for a rock wall in the location of Coolanblue Avenue to protect dunes from erosion. Council will plan and investigate implementation of physical adaptation options in locations that protect public assets and infrastructure when certain trigger points are reached, i.e. sea level rise or a significant erosion event. Council is also able to provide development assessment advice to landowners for coastal protection of privately owned assets. As part of implementing the CHAS we will consider what other roles Council can play in assisting and facilitating an outcome for those who wish to plan and investigate protection of private property. Any proposed works within a flood hazard area (riverine or localised flooding, or storm tide inundation), will require assessment, and will need to demonstrate compliance with Council's planning scheme to ensure the safety of people is protected and the risk of harm to property and the natural environment from flood and storm tide inundation is minimised. Aside from requiring Council assessment where a proposed development within an Erosion prone area triggers State referral, the development will also require assessment through the State Assessment and Referral Agency.</p>
2						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> • Supports the Strategy. • Mainly concerned that the Woodgate Plan (SEMP) identifies the need for adaptation work south and north of the boat ramp but no action taken on the implementation. Erosion continues to be a major concern for residents of Theodolite Creek. • Suggests resourcing by council will be key and options for co-financing of solutions with property owners should be further explored to hasten implementation. 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Council acknowledges the support for the CHAS Strategy and Action Plan and your input is appreciated. This response addresses matters raised in your submission in turn.</p> <p>Woodgate Shoreline Erosion Management Plan Progress The Woodgate Shoreline Erosion Management Plan (SEMP) highlights mitigation approaches to deal with localised erosion in the area of the Woodgate boat ramp and has been required to go through a rigorous legislative and approval process. The Development Application for Operational Works for Tidal Works to implement the proposed beach nourishment and buried sea wall south and north of the boat ramp has been recently approved by Council and state referral agencies. While approvals have now been provided, the project is not included in Councils current works program and will be considered as part of future budget processes.</p> <p>Co-financing of solutions with property owners Thank you for highlighting the suggestion for co-financing solutions with private property owners. This is a matter that Council is yet to consider, but has been noted for future review as part of implementing the CHAS action plan. Council will assist and advise landowners where possible who wish to plan and investigate implementation of similar options either individually or collaboratively.</p>
3						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> • Suggests successful communication and engagement is required with people who live within 2k of the oceanfront. 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Council acknowledges the support for the CHAS Strategy and Action Plan and your input is appreciated. This response addresses matters raised in your submission in turn.</p>

Ref	Submitter Name	Service Address	Salutation	Property Address	Lot and Plan	Submission Summary	DRAFT Response
							<p>Engaging with community who live near the oceanfront Council agrees that the successful implementation of the strategy requires targeted engagement within each of the coastal settlements with residents who are aware of local community and environmental issues. Council is aware that residents possess significant amounts of critical information which is often difficult to convey through established channels. The consultation strategy for the CHAS was to effectively engage through the Community Reference Group (CRG) and their broader networks.</p> <p>The implementation of the Action Plan and the strategy is a long-term process with significant opportunities to communicate and engage with residents as actions are planned and delivered.</p>
4						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> Concern about the lack of clearing of dead vegetation on the dunes and revegetation using plants that hold the beaches and dunes together. Suggests that dredging would help. Concerns raised about Council money being spent south of the Burnett River. The northern side is growing with more housing and more people. 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p>Vegetation on the dunes Council shares your concerns about appropriate vegetation used to mitigate erosion issues. The strategy identifies adaptation options in locations that protect public assets and infrastructure when certain trigger points are reached, i.e. sea level rise or a significant erosion event. This includes beach nourishment that can be combined with dune creation and revegetation in the settlements identified in the CHAS Strategy and Action Plan.</p> <p>Dredging During the development of the strategy and action plan, Council considered a long-list of options including dredging and beach nourishment. The focus of the CHAS is to mitigate the impacts of climate induced coastal hazards and beach nourishment options were considered to be most cost effective and have least impacts on the environment and amenity of the beach front. The high-level nature of the strategy does not consider the detailed site-specific feasibility of any physical mitigation option. Any works on the beaches will require full detailed feasibility study prior to commencement of works including obtaining the relevant approval.</p> <p>Concerns about lack of spending north of the Burnett River Through development of the CHAS Strategy and Action Plan, Council has undertaken a high-level risk-based approach to identifying areas potentially exposed to intolerable risks. This includes looking into the benefits and impacts of physical adaptation options that modify our settlements in response to intolerable risks. Council will plan and investigate implementation of these options in locations that protect public assets and infrastructure when certain trigger points are reached, i.e. sea level rise or a significant erosion event, and confirms this will be based on the evidence of risk as presented in the strategy.</p> <p>Council acknowledges our coastal settlements are experiencing growth. The role of land use planning is integral to creating settlements that are safer and more resilient for the future. The planning scheme and land use planning is a 'maintain' activity outlined on page 22: Land use planning responses such as zoning, development controls, coastal setbacks and risk mapping are employed to avoid the risks for new development in a strategic and future sense. The visions for each settlement must align with coastal change to ensure projected in-fill development is appropriate and a risk-based approach to planning is in place.</p>
5						<p>The submission makes the following points:</p> <ul style="list-style-type: none"> Clearing of vegetation on the dunes unacceptable Require sand socks on the beach to build up sand again. 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p>Clearing of vegetation on the dunes Council shares your concerns about clearing of vegetation on the dunes. Local laws are in place to protect native vegetation and under Subordinate Local Law No. 4 (Local Government Controlled Areas, Facilities and Roads) 2011, Schedule 1, Council can issue</p>

Ref	Submitter Name	Service Address	Salutation	Property Address	Lot and Plan	Submission Summary	DRAFT Response
							<p>fines for damaging or interfering with vegetation in all parks and reserves within the local government area. Council recognises the difficulties in the enforcement of this local law as gathering of appropriate evidence is often challenging.</p> <p>Further, marine plants are protected in Queensland, and activities such as the disturbance or removal of marine plants without an approval (or not complying with accepted development requirements) is a development offence. Marine plants grow on or adjacent to tidal lands, and apart from mangroves and seagrass, include salt couch, samphire vegetation, melaleuca (paper barks) and casuarina (coastal she-oaks).</p> <p>Sand socks to build up sand</p> <p>Your suggestion of implementing geotextile fabric socks to help accumulation of sediment and building up the beach and dune system is duly noted. The CHAS Strategy and Action identifies adaptation options in locations that protect public assets and infrastructure when certain trigger points are reached, i.e. sea level rise or a significant erosion event. This includes beach nourishment that can be combined with dune creation and revegetation in the settlements identified in the CHAS Strategy and Action Plan. The high-level nature of the strategy does not consider detailed site-specific feasibility of any physical mitigation option. Any works on the beaches will require a detailed feasibility assessment including identification of specific dune restoration techniques such as using geotextile socks.</p>
6						<p>The submission makes the following points:</p> <ul style="list-style-type: none"> Suggests the need for a long-term investigation into the viability of the turtle-nesting beaches in the Bundaberg Region. 	<p>Response</p> <p>Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p>Long term investigation into turtle nesting beaches</p> <p>Council shares your concern about the long term viability and potential loss of turtle nesting beaches. The CHAS identifies the need to investigate a resilience strategy for the Mon Repos Turtle Centre in partnership with the State Government – Queensland Parks and Wildlife Service. This investigation may also need to consider the loss of or changes to turtle nesting beaches along the Bundaberg Region’s coastline.</p> <p>The strategy outlines a role for everyone (page 25) differentiating between Council, the broader community and key stakeholders. The implementation of the Council roles and responsibilities lies with Council of course, extended across existing areas of responsibility and public land management</p> <p>Sea Turtle Alliance assistance</p> <p>Council also recognises that successful implementation of the CHAS Strategy and Action Plan requires ongoing partnership approaches with key stakeholders such as the Sea Turtle Alliance (STA) and intends to continue working with the Sea Turtle Alliance to mitigate impacts on endangered sea turtles.</p>
7						<p>The submission makes the following points:</p> <ul style="list-style-type: none"> Concern about the residential development on land adjacent to the Burnett Heads Boat Harbour and future sea level rise impacts on future development should consider sea level rise. 	<p>Response</p> <p>Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated. This response addresses matters raised in your submission in turn.</p> <p>Residential development on land adjacent to Burnett Heads Boat Harbour and future sea level rise impacts</p> <p>Council acknowledges concerns about future land uses located in areas considered at risk to sea level rise and permanent inundation. The role of land use planning is integral to creating settlements that are safer and more resilient for the future. The planning scheme and land use planning is a ‘maintain’ activity outlined on page 22: Land use planning responses such as zoning, development controls, coastal setbacks and risk mapping are employed to avoid the risks for new development in a strategic and future sense. The visions for each settlement must align with coastal change to ensure projected in-fill development is appropriate and a risk-based approach to planning is in place.</p> <p>Assessment of development proposals occur through the Bundaberg Region Planning Scheme. Due to the work in the CHAS, Council has the opportunity to adopt the localised mapping prepared in place of the existing Coastal Hazards mapping provided by</p>

Ref	Submitter Name	Service Address	Salutation	Property Address	Lot and Plan	Submission Summary	DRAFT Response
							<p>the State Government. Reviews of zoning on a finer scale, using the CHAS information and risk profiles, can reveal overlaps in intolerable risk and development potential to ensure future development is appropriate. It is through the Planning Scheme that changes to regulation governing development will occur to ensure development considers coastal hazards.</p> <p>Existing controls in Council's planning scheme and State referral assessment triggers will ensure that proposed development at Burnett Heads will need to consider, avoid and/or mitigate risks associated with storm tide inundation and coastal erosion.</p> <p>Any proposed development within a flood hazard area (riverine or localised flooding, or storm tide inundation) will require assessment and will need to demonstrate compliance with the Flood hazard overlay code in Council's planning scheme. This will be undertaken to ensure the safety of people is protected and the risk of harm to property and the natural environment from flood and storm tide inundation is minimised.</p> <p>Aside from requiring Council assessment, where a proposed development within an Erosion Prone Area triggers State referral, the development will also require assessment through the State Assessment and Referral Agency.</p>
8						<p>The submission makes the following points:</p> <ul style="list-style-type: none"> expresses concern about the for loss of nesting beaches for Loggerhead turtles that visit Oaks Beach Requests reconstruction of the rock wall at Oaks Beach 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p>Loss of nesting beaches The strategy highlights the need to investigate a resilience strategy for the Mon Repos Turtle Centre in partnership with State Government – Queensland Parks and Wildlife Service. This investigation may also need to consider the loss of or changes to turtle nesting beaches in areas such as Oaks Beach.</p> <p>Reconstruction of the rock wall at Oaks Beach The rock wall at Oaks Beach was subject to an extreme weather event in 2013. The stairs at the beach were somewhat undermined and the footings significantly exposed, this required some maintenance work and concreting to rectify. The rock wall itself was not compromised during this event, beyond being exposed.</p> <p>The strategy undertakes a regional approach to long term climate induced hazards. Through the CHAS Council has investigated high level benefits and impacts of physical adaptation options that modify our settlements in response to intolerable risks, rather than detailed site-specific investigations of particular assets such as the rock wall. Page 22 of the strategy outlines the maintain tasks, of which 'Resilient Infrastructure' is one. Resilient Infrastructure is an option that ensures assets are replaced, renewed and maintained to be adaptive to sea level rise and identified coastal hazards. The rock wall at Oaks Beach is an asset that Council will continue to maintain under the existing asset management commitments, including monitoring following extreme weather events.</p>
9						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> support for adaptive capacity and capacity building concepts; acknowledges broad reach of the strategy; concerned about omission of developers; requested information on process after risk is identified and how they are treated by 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p>Omission of reference to developers Land use planning is a 'maintain' adaptation option described on Page 22 of the strategy. This includes options such as zoning, development controls, coastal setbacks and risk mapping to avoid risks of new development in a strategic and future sense. The visions for each settlement must align with coastal change to ensure potential in-fill development is appropriate and a risk-based approach to planning is in place.</p> <p>Council has the opportunity to adopt the localised mapping prepared as part of the CHAS in place of the existing Coastal Hazards mapping provided by the State Government. Reviews of zoning on a finer scale, using the CHAS information and risk profiles, can reveal overlaps in intolerable risk and development rights to ensure future development is appropriate. It is through the</p>

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						<p>Council in the context of development;</p> <ul style="list-style-type: none"> • provides an example of Innes Park as having ‘catastrophic’ outcomes but is also identified as a growth area; • agrees that implementation is a challenge; • requests a list of references; • requests a list of contributors and minutes; • specific questions: <ul style="list-style-type: none"> ○ with whom does the ongoing management of this report and its implementation lie? ○ at what point will the strategy and its implementation be evaluated and adapted and by whom? ○ how are stakeholders not currently living in Bundaberg consulted? ○ how has evaluation of this strategy been undertaken at this point? To whom has it been specifically distributed for evaluation? 	<p>Bundaberg Region Planning Scheme that interaction with developers will occur to ensure development considers coastal hazards. Future revisions of the Planning Scheme will consider such points.</p> <p>The process from here Your submission requests information on the process now that risks are identified. Page 25 of the strategy outlines Council’s role and next steps:</p> <p>Council will be seeking to embed risk aware decisions as business as usual in planning and operations. The Bundaberg Coastal Hazard Adaptation Strategy works in tandem with many other aspects of Council business and community values and will be embedded into:</p> <ul style="list-style-type: none"> » land use planning and community visioning » building regulations » community facilities and support programs » asset management processes » infrastructure planning and cost-benefit analysis tasks » parks and environmental protection » emergency management and disaster recovery; and » monitoring and reporting systems <p>Council will need to develop a detailed implementation plan to achieve the above integration over the long term. This is acknowledged as a significant task which will take time to achieve across the organisation and has implications for Council’s current program delivery, responsibilities and budgets. This integration will be evident in future iterations of the Corporate Plan, Operational Plans, Planning Scheme Amendments and other public facing strategies. The CHAS is a long-term process and implementation of actions (per the action plan), triggers for change and measuring the efficacy of actions is a cyclical process across a number of years.</p> <p>Innes Park ‘catastrophic’ outcomes in the context of a growth area The Coastal Hazard Risk Assessment outcomes by place are shown on the maps across pages 14 and 15, where Innes Park is shown as having intolerable risk at 0.8m with potential catastrophic risk. This risk assessment can be fully appreciated when viewed in association with the maps provided on the Our Coast website. Figure 1 is an extract from the risk maps showing the extent of sea level rise in dark blue. The intolerable risk area is confined coastal strip and some estuarine areas. Figure two provides an extract from the Bundaberg Region Planning Scheme showing the intolerable risk area are mostly located in ‘green’ zones indicating recreational open space or environmental purposes. The dark pink ‘Emerging community zone’ on undeveloped land is the zone for growth. Proposals for development will need to comply with existing hazard mapping and any other planning scheme matters such as areas of environmental significance (i.e wetlands) for the highly vegetated creek areas through the planning framework and may be partially suitable for development. In summary, the growth areas are not significantly impacted by intolerable risk.</p> <div> </div> <p>Figure 1: Risk assessment map extract: Innes Park</p>

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							<p>References and Contributors: The process was conducted over almost three years and eight phases. Each phase resulted in a technical report containing full details of the process followed (in accordance with QCoast Guidelines), including all references and contributors from a range of technical professions. Each phase is overseen by the QCoast2100 team funded by the State Government and each technical report is independently peer reviewed. You can learn more about this process here. Council is happy to provide copies the technical documents containing all reference material upon request. For the list of participants, the minutes of the Community Reference Group and the minutes of all meetings are available to download on the Our Coast website here.</p> <p>Specific questions:</p> <ol style="list-style-type: none"> With whom does the ongoing management of this report and its implementation lie? The strategy outlines a role for everyone (page 25) differentiating between Council and the broader community. The implementation of the Council roles and responsibilities lies with Council of course, extended across existing areas of responsibility and public land management. Private landowners and community now have the ability to understand their own risk as outlined on page 13 and prepare strategies in accordance with their circumstance, values and risk. These community roles and responsibilities will be reinforced through education and awareness campaigns. At what point will the strategy and its implementation be evaluated and adapted and by whom? The strategy is targeted for adoption at an ordinary meeting of Council. Specific actions will be allocated a measurable outcome wherever possible in order for evaluation to occur and continuous improvement made and to recognise when triggers for 'modify' and 'transform' are reached. The CHAS has a 10 year life span following which Council will need to review. How are stakeholders not currently living in Bundaberg consulted? Each coastal council in Queensland has the opportunity to apply for funding and prepare a CHAS under the guidance of QCoast2100. A CHAS is specifically developed to inform local residents and authorities of risk in order they can prepare for it. Council used a variety of communication and engagement methods throughout the project phases including continuous engagement via the website which hosted all background information. The website has been referenced in social media posts and media releases by Council throughout the project to raise awareness of the project and how the community can be involved. It is therefore assumed that stakeholders outside of Bundaberg would have sight of Council social media and local online media. Materials from the CHAS will remain available on councils website. How has evaluation of this strategy been undertaken at this point? To whom has it been specifically distributed for evaluation? The strategy involves eight technical phases (see page 11). Each phase requires a technical report and confirmation of satisfactory completion by the funding body QCoast2100. The phases are evaluated by QCoast2100 independent panel members who provide feedback and confirm the strategy work complies with the CHAS process and minimum standards and guidelines. <p>We hope these responses have been of assistance. Thank you again for your submission. Council will consider the Bundaberg Coastal Hazard Adaptation Strategy at the Ordinary Meeting on 29 September 2020.</p>
10						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> Supports implementation of initiatives and controls that are 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Council acknowledges the support for the CHAS Strategy and Action Plan. Your input is appreciated and our response addresses matters raised in your submission as follows.</p>



Figure 2: Zoning map extract: Innes Park

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						<p>continually worked on so that the general public can see that the plan is underway and working. Ongoing feedback to the stakeholders and general public would be a way to achieve this.</p> <ul style="list-style-type: none"> • Suggests implementing the management of the beach at Coonarr including limiting 4WD driving and camping on the beach at Coonarr. • Voluntary dune management and beach monitoring at Coonarr. 	<p>Implementation of initiatives and controls to show plan is underway The strategy is targeted for adoption at an ordinary meeting of Council. Specific actions will be allocated a measurable outcome when triggers for 'modify' and 'transform' are reached. The CHAS materials are intended to remain available on Councils website, including updates on the implementation process. The strategy outlines a role for everyone (page 25) differentiating between Council and the broader community.</p> <p>Implementing management of the beach by limiting 4WD and camping on the dunes at Coonarr Restricting four-wheel driving and camping on the beach is not included in the CHAS Action Plan for Coonarr. Council duly notes your proposals for signage and access restrictions and will consider these items in further detail as part of implementing the CHAS.</p> <p>Voluntary dune management and beach monitoring at Coonarr Thank you for offering to volunteer to help with dune management and beach monitoring at Coonarr. Council will consider the implementation of citizen-science for use in our ongoing beach erosion and sea level rise monitoring program as this is part of the "Maintain" actions. Council will keep the public informed of ongoing actions such as monitoring as part of the CHAS implementation.</p>
11						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> • Supports the CHAS Strategy and Action Plan • Suggests that any proposed beach nourishment works should not be undertaken without a comprehensive Environmental Impact Assessment that examines potential impacts on marine flora (e.g. sea grass beds) and fauna such as migratory birds, dugongs, turtles, dolphins, fish, crustaceans and other marine life. • Suggests Council undertake climate change mitigation actions e.g. carbon offsetting and limiting fossil fuel consumption. 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Council acknowledges the support for the CHAS Strategy and Action Plan. Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p>Beach nourishment works require EIA to examine impacts Through development of the CHAS Strategy and Action Plan, Council has assessed technical viability including consideration of legislative approvals as part of the multi-criteria analysis (MCA) in Phase 7 of our work. This includes a high-level assessment of the benefits and impacts of physical adaptation options that modify our settlements in response to intolerable risks. Council will plan and investigate implementation of these options in locations that protect public assets and infrastructure when certain trigger points are reached, i.e. sea level rise or a significant erosion event.</p> <p>The high-level nature of the strategy does not consider detail site-specific feasibility of any physical mitigation option. Any works on the beaches will require full detailed feasibility assessment including obtaining all relevant approvals.</p> <p>Any proposed works within a flood hazard area (riverine or localised flooding, or storm tide inundation), will require assessment, and will need to demonstrate compliance with Council's planning scheme, to ensure the safety of people is protected and the risk of harm to property and the natural environment from flood and storm tide inundation is minimised. Aside from requiring Council assessment, where a proposed development within an Erosion prone area triggers State referral, the development will also require assessment through the State Assessment and Referral Agency.</p> <p>Climate Change Mitigation Actions Whilst climate change mitigation actions such as carbon offsetting and limiting fossil fuel consumption is out of scope for the Strategy, Council will continue to implement the Sustainable Bundaberg 2030 strategy.</p>
12						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> • Suggests relaxations to fees and permits for building approved walls and subsidised materials and suitable information and 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Council acknowledges the support for the CHAS Strategy and Action Plan. Your input is appreciated. This response addresses matters raised in your submission in turn. Council acknowledges your interest and proactive thinking towards mitigating coastal hazards on your property.</p>

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						<p>guidelines for construction of long-term barriers.</p>	<p><u>Relaxations to fees and permits for building approved walls and subsidised materials and suitable information for construction of barriers</u></p> <p>Council notes the suggestion regarding subsidised fees, permits and building materials. As part of implementing the CHAS, Council will further investigate how to best assist landowners who are planning to undertake their own implantation of physical works, either individually or collaboratively.</p> <p>As per the CHAS document, Council will plan and investigate implementation of these options in locations that protect public assets when certain trigger points are reached, i.e. sea level rise or a significant erosion event.</p> <p>Any proposed works within a flood hazard area (riverine or localised flooding, or storm tide inundation), will require assessment, and will need to demonstrate compliance with Council's planning scheme, to ensure the safety of people is protected and the risk of harm to property and the natural environment from flood and storm tide inundation is minimised. Aside from requiring Council assessment, where a proposed development within an Erosion prone area triggers State referral, the development will also require assessment through the State Assessment and Referral Agency.</p>
13						<p>This submission makes the following points:</p> <ul style="list-style-type: none"> • concern about Council's willingness to take hard decisions to protect better protect coastal ecosystems, public infrastructure and private property in the future • discussion on approvals and carry over to the planning scheme • request a greater emphasis on natural processes rather than asset protection • requests a more factual approach to the strategy • requests inclusion of a cross sectional diagram explaining coastal process • requests that the point is made more prominent that where asset are not evident no adaptation is required • concerns that the strategy has been under consulted and residents are not aware of the strategy • requests mapping is available on councils interactive mapping platform • requests a focus on education 	<p>Response</p> <p>Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Your input is appreciated and our response addresses matters raised in your submission as follows.</p> <p><i>Concern about implementation and 'tough' decision making</i></p> <p>The strategy is targeted for adoption at an ordinary meeting in the near future once submissions have been addressed and any changes made to the strategy. Once adopted Council will implement the strategy over time and Page 25 of the strategy outlines Council's role and next steps.</p> <p>The major task for Council internally is to ensure the strategy actions are embedded across all Council programs for risk aware decisions as business as usual. The Bundaberg Coastal Hazard Adaptation Strategy works in tandem with many other aspects of Council business and community values and will be embedded into:</p> <ul style="list-style-type: none"> » land use planning and community visioning » building regulations » community facilities and support programs » asset management processes » infrastructure planning and cost-benefit analysis tasks » parks and environmental protection » emergency management and disaster recovery; and » monitoring and reporting systems <p>Council aims to develop a detailed implementation plan to achieve the above integration. This is acknowledged as a significant task which will take time to achieve across the organisation and has implications for Council's current program delivery, responsibilities and budgets. This integration will be evident in future iterations of the Corporate Plan, Operational Plans, Planning Scheme Amendments and other public facing strategies. The CHAS is a long-term process and implementation of actions (per the action plan), triggers for change and measuring the efficacy of actions is a cyclical process across a number of years.</p> <p><i>Discussion on approvals and carry over to the planning scheme</i></p> <p>The role of land use planning is integral to creating settlements that are safer and more resilient for the future. The planning scheme and land use planning is a 'maintain' activity outlined on page 22: Land use planning responses such as zoning, development controls, coastal setbacks and risk mapping are employed to avoid the risks for new development in a strategic and</p>

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							<p>future sense. The visions for each settlement must align with coastal change to ensure projected in-fill development is appropriate and a risk-based approach to planning is in place.</p> <p>Assessment of development proposals occur through the Bundaberg Region Planning Scheme. Due to the work in the CHAS, Council has the opportunity to adopt the localised mapping prepared in place of the existing Coastal Hazards mapping provided by the State Government. Reviews of zoning on a finer scale, using the CHAS information and risk profiles, can reveal overlaps in intolerable risk and development potential to ensure future development is appropriate. It is through the Planning Scheme that changes to regulation governing development will occur to ensure development considers coastal hazards.</p> <p>A greater emphasis on natural processes rather than asset protection Council acknowledges coastal processes and the primacy of the natural environment through a range of its strategies and programs. The purpose of the CHAS is to understand risk from a human and built environment perspective.</p> <p>Request for a more factual approach Council acknowledges this request and agrees on the importance of evidence based and risk informed facts in developing this strategy. In engaging with all sectors of the community, many of which do not have an environmental or scientific background, Council seeks to balance the information suitable for a broad cross section of the community in a manner that can be easily understood. By presenting material in a place-based way “a focus on those at risk” is achieved as people look for their own property or locality risk levels.</p> <p>Council is happy to provide copies of the technical documents containing all reference material upon request.</p> <p>Requests inclusion of a cross sectional diagram explaining coastal process Thank you for this suggestion. Council agrees that the strategy will benefit from a three dimensional or cross-sectional diagram of coastal zones and processes. The strategy may be amended to incorporate a suitable diagram.</p> <p>Concerns that the strategy has been under consulted and residents are not aware of the strategy Consultation levels are a constant concern for Council. Effectively communicating issues to the wider community can be difficult, more so for specialist topics or where only part of the Bundaberg Region is affected. Council’s consultation strategy for the CHAS was to effectively engage with interested members through the Community Reference Group (CRG).</p> <p>Council acknowledges that the CHAS process was long, and this impacted the attendance of a number of CRG members. Regardless, implementation of the Action Plan and the strategy is a long-term process with significant opportunities to continue engagement activities as Council implements the trigger-based actions. In many respects, the finalisation of the CHAS represents the start of a much longer conversation with our community regarding risk based coastal adaptation.</p> <p>Requests mapping is available on councils interactive mapping platform Thank you for this suggestion and Council agrees that the mapping should remain publicly available. Once the CHAS is formally adopted by Council and the Action Plan commenced, a decision will be made on where the maps reside. In the short term they may stay on the Our Coast website. In the medium term they may be visually updated to form part of the interactive mapping system or as a planning overlay in the Bundaberg Region Planning Scheme through a planning scheme amendment.</p> <p>Requests a focus on education</p>

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							<p>Community awareness is a cornerstone of Queensland policies on disaster management and preparedness. It is fundamental to continuing the CHAS journey through time and the changing landscape. Page 22 states: Education and Awareness Campaigns: Council provides extensive resources as part of their disaster management activities for community awareness. The information is valid for all hazards and assists the community in the lead up to potential natural hazard events. The resources provided include a household emergency plan guide, an emergency kit guide, an evacuation plan template, preparing pets information; and relevant emergency contact numbers. Including specific information to enhance understanding of coastal processes, adaptation options and impacts of coastal changes can build resilience in the community through communication and messaging.</p> <p>Once the strategy is adopted by Council, part of the action planning and implementation will be to amend education and messaging to incorporate the CHAS findings and risk levels or maps.</p> <p>Thank you again for your submission. Council will consider the Bundaberg Coastal Hazard Adaptation Strategy at the Ordinary Meeting on 29 September 2020.</p>
14						<p>The submission makes the following points:</p> <ul style="list-style-type: none"> • Supports the CHAS • Concern over natural systems i.e. Bundaberg Regional Council's rich natural coastal assets including wetlands, mangroves, seagrass and coral reefs not adequately mapped or reflected • Concerns over the lack of attempt to identify implications of sea level rise or the proposed adaptation pathways such as beach nourishment, coastal hardening – sea walls/rock walls etc. on these natural ecosystem • Notes that Sea Level Rise (and Climate Change) were identified to the Council nearly a decade ago in the Wide Bay Burnett Regional Plan in 2011. • Expresses concern that Council continue to approve development in areas that are clearly going to be affected by a 0.8m Sea Level Rise scenario (particularly in settlements like Moore Park Beach and Burnett Heads) 	<p>Response Thank you for your submission to the Bundaberg Coastal Hazard Adaptation Strategy (CHAS). Council acknowledges the support for the CHAS Strategy and Action Plan. Your input is appreciated. This response addresses matters raised in your submission in turn. Council acknowledges your interest and proactive thinking towards mitigating coastal hazards.</p> <p>Concern over no adequate mapping of natural systems Council acknowledges this request and agrees that explanation of natural systems are integral. Council agrees that the strategy will benefit from further detail about Bundaberg Region's natural coastal systems and will insert a diagram of coastal zones and processes with appropriate text to communicate their importance to the overall strategy. Phase 4 of the technical work included asset counts using information from the Queensland Herbarium for regional ecosystems and habitat types.</p> <p>It is important to note that a balance must be reached in engagement with all sectors of the community, many of which may not have an environmental background. Council seeks to present the information in a manner suited to a broad cross section of the community in an understandable context. Council relies upon the more informed members of the community to assist in spreading the word and enhancing general understanding. By presenting material in a place-based way "a focus on those at risk" is achieved as people look for their own property or locality risk levels.</p> <p>Identify implications of proposed adaptation pathways on natural systems Council notes the potential implications of physical mitigation measures, such as seawalls and rock walls, may have on natural systems. Through development of the CHAS Strategy and Action Plan, Council has undertaken a high level investigation of the benefits and impacts of physical adaptation options that modify our settlements in response to intolerable risks. Technical viability, environment and social impacts of these physical measures were considered as part of the multi-criteria analysis (MCA) in Phase 7.</p> <p>Council is happy to provide copies of the technical documents containing all reference material upon request.</p> <p>Council will plan and investigate implementation of these options in locations that protect public assets and infrastructure when certain trigger points are reached, i.e. sea level rise or a significant erosion event. The high-level nature of the strategy does not consider detail site-specific feasibility of any physical mitigation option. Any works on the beaches will require full detailed feasibility study prior to commencement of works including obtaining the relevant approval and undertaken environmental impact assessments.</p> <p>Sea Level Rise identified in Wide Bay Burnett Regional Plan in 2011 Council notes that climate induced hazards have been on the radar of regional and local planning approaches for some time and notes the current Bundaberg Region Planning Scheme already includes 0.8m sea level rise projects as part of development</p>

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							<p>assessment. The CHAS intends to deliver a long-term risk-based response to coastal change and has been funded accordingly by the State Government and Local Government Association of Queensland (LGAQ) to achieve this.</p> <p>Approval of development in areas exposed to 0.8m Sea Level Rise scenarios</p> <p>Council acknowledges concerns about future land uses located in areas considered at risk to sea level rise and permanent inundation. The role of land use planning is integral to creating settlements that are safer and more resilient for the future. The planning scheme and land use planning is a 'maintain' activity outlined on page 22: Land use planning responses such as zoning, development controls, coastal setbacks and risk mapping are employed to avoid the risks for new development in a strategic and future sense. The visions for each settlement must align with coastal change to ensure projected in-fill development is appropriate and a risk-based approach to planning is in place.</p> <p>Assessment of development proposals occur through the Bundaberg Region Planning Scheme. Due to the work in the CHAS, Council has the opportunity to adopt the localised mapping prepared in place of the existing Coastal Hazards mapping provided by the State Government. Reviews of zoning on a finer scale, using the CHAS information and risk profiles, can reveal overlaps in intolerable risk and development potential to ensure future development is appropriate. It is through the Planning Scheme that changes to regulation governing development will occur to ensure development considers coastal hazards.</p> <p>Existing controls in Council's planning scheme and State referral assessment triggers will ensure that proposed development at Burnett Heads will need to consider, avoid and/or mitigate risks associated with storm tide inundation and coastal erosion.</p> <p>Any proposed development within a flood hazard area (riverine or localised flooding, or storm tide inundation), will require assessment, and will need to demonstrate compliance with the Flood hazard overlay code in Council's planning scheme, to ensure the safety of people is protected and the risk of harm to property and the natural environment from flood and storm tide inundation is minimised.</p> <p>Aside from requiring Council assessment, where a proposed development within an Erosion prone area triggers State referral, the development will also require assessment through the State Assessment and Referral Agency.</p>



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