

CHRMAP Community Reference Group

Meeting Outcomes Report — Meeting 4: Alternative Coastal Adaptation Options Research

Date: Wednesday 18 March 2026
Time: 5.30pm – 8.00pm
Location: Civic Centre Conference Rooms 2 & 3
102 Boas Avenue, Joondalup
Facilitator: Claire Paddison – 361 Degrees

Attendees

Presiding Member: Cr Adrian Hill

Elected Members: Deputy Mayor John Raftis
Cr Phillip Vinciullo

Community Members: Shirree Blazeski
Fabienne Hill Faskel
Dr Arnold van Rooijen
Ben Allen
Dr Brian Luinstra
Annette Ellerby

City Officers: Rebecca Maccario, Manager Strategic and Organisational Development
Chris Jansen, Manager Engineering Services
Danielle Bowler, Environmental Development Coordinator
Nicole Adams, Coastal Hazard Planning Officer
Charles Sullivan, Principal Project Engineer Coastal and Civil

Subject matter experts:

Apologies: Cr Rebecca Pizey
Cr Matthew Count
Jamie Parry, Director Governance and Strategy
Daniel McKeon
Ryan Hunter
Druimé Nolan
Shannon Dee

Overview

The purpose of the meeting was for CRG members to discuss the outcomes from the research project on alternative coastal adaptation options for the City of Joondalup coastline, prepared by Griffith University and Integrated Coastal Management (ICM) consultants.

The objectives of the meeting were to:

- understand the purpose and objectives of the alternative coastal adaptation options research project.
- provide feedback on the alternative coastal adaptation outcomes that were identified, including the advantages and disadvantages with each identified option.
- provide feedback on the identified outcomes and their applicability to the City's coastline.

Outcomes

Items 2 and 3 – Welcome and overview of the session

Presiding Member, Cr Adrian Hill, provided an Acknowledgement of Country, welcome to the meeting and thanked members for their continued input and commitment to the group.

Cr Hill thanked all members for participating, acknowledging the community members, Elected Members and City Officers. Cr Hill noted the apologies for the meeting. Cr Hill noted that one member had resigned from the group and a new member has joined the group, although the new member was unable to join the meeting.

Cr Hill asked for any conflict of interest items to be raised, of which there was none.

Cr Hill provided a summary of outstanding actions from the last meeting:

1. The City sent out a CHRMAP CRG Teams invite link to all members – completed on 13 November 2025. Please could members accept the Teams invite if they haven't already as there are still some invitations pending acceptance.

Item 3 – Overview of the session by Facilitator

Claire Paddison provided an overview of the agenda, background, purpose and objectives of the meeting and summarised the rules of engagement.

Item 4 – Project updates – Presentation by City Officers

City officers presented updates regarding progress on City of Joondalup coastal projects including:

- CHRMAP Technical Steering Group (TSG): the TSG reviewed the Research of Alternative Coastal Adaptation Options report and comments were included in the final report.
- Asbestos removal at Hillarys Dog Beach: the Hillarys Dog Beach has legacy asbestos containing material (ACM) on site, due to beach shacks being demolished and buried on site in the 1970s. Ongoing erosion at this site has caused the ACM to be exposed. The beach was closed in August 2025 after a severe storm exposed large amounts of ACM. The ACM was removed and the beach was re-opened after a couple of weeks. The site has been surveyed to determine the extent of any remaining ACM, and a remediation action plan will be developed.
- Partnership projects with Perth NRM:
 - Project 1: installed a CoastSnap cradle at Iluka Foreshore, undertook revegetation and fencing at Pinnaroo Point, and a community planting day is planned for Pinnaroo Point in June 2026.
 - Project 2: planning to install matting, sand traps and fencing at Iluka Foreshore in 2026.
- Coastal maintenance works: the City continues ongoing programs to clear sand buildup from paths at Sorrento Beach, Mullaloo Beach and Pinnaroo Point (dog beach) and replace it onto beaches. The City completed hydromulching at Hillarys Dog Beach to slow sand loss by wind and completed sand trap fencing at Sorrento Beach.

- Artificial surf reef pre-feasibility study: a pre-feasibility study was commissioned by the City to investigate an artificial surf reef. The report will be presented to Council on 24 March 2026 and a link was provided to the Council Agenda on the CHRMAP CRG Teams site.
- Sand bypassing project: sand bypassing is completed annually in October-November and moves approximately 10,000m³ of sand from Sorrento Beach to Hillarys Beach, to mimic the natural sand flow pattern that has been interrupted by the Hillarys Boat Harbour.
- Maintenance works for existing groynes and seawalls: two existing groynes in Sorrento (central and southern groynes) and two existing seawalls (Mullaloo Surf Lifesaving Club and Sorrento Surf Lifesaving Club) require maintenance works. Mullaloo seawall works are now complete. Groynes work will commence in early April and is aimed to be completed by early June 2026. Repairs on the Sorrento Beach seawall have commenced this week and will be completed towards the end of May 2026.
- Coastal monitoring project: the City has partnered with the Cities of Stirling and Wanneroo, as part of the Northern Beaches Alliance (NBA) group, to investigate offshore sources of sand (via dredging) that can be used for sand nourishment programs. Additionally, as part of the NBA, twice yearly aerial imagery is captured and used to map shoreline movements. The City's Coastal monitoring program continues annually to measure the shoreline and vegetation changes each year and provide management recommendations.
- Coastal Hazard Assessment: A coastal hazard assessment identifies the coastal hazard areas over 100 years. The City's Coastal Hazard Assessment was conducted in 2016 and is due for renewal. The coastal hazard assessment uses a series of calculations that are provided in State Planning Policy No. 2.6 (SPP2.6) to calculate hazard risk areas. SPP2.6 is currently being reviewed, including the sea level rise data used for these calculations. The City's new coastal hazard assessment is likely to commence in 2026/27 once the sea level rise data is available from the SPP2.6 review which is anticipated to be finalised by the end of 2026. The complete review of SPP2.6 is expected to take several years.
- Hillarys-Pinnaroo Foreshore Reserve Detailed Adaptation Options Assessment: the Hillarys to Kallaroo stretch of coast has been experiencing significant erosion issues and is receding. Pinnaroo Point has been recommended as a coastal erosion hotspot area in the recent review by the state government. A detailed adaptation options assessment will be completed for this site, which will look at all the feasible adaptation options that might work specific to this location. The outcomes from the Research of Alternative Coastal Adaptation Options report can be used for this options assessment, where consultant coastal engineers will further refine what options would be suitable for this stretch of coastline, considering sediment movement, modelling, cost estimates and downdrift impacts. The City intends to release a Request for Quotation for this work in 2026.

The slides from the presentation can be found at Appendix 1.

Questions and discussion topics:

Member question: Can the City confirm the correct terminology for a seawall versus a retaining wall.

City response – The wall at Mullaloo Beach is a single leaf limestone seawall which is mostly a screen wall. The section on the north side of the pathway which leads to the beach access mat is a retaining wall due to sand build up behind it over decades. The wall at Sorrento Beach is a retaining wall as it retains the carpark and building area. It is agreed that there is a need to clarify the terminology used.

Member question: Was any research done to see whether the Sorrento groynes are now necessary at Sorrento Beach?

City response – Yes, research was undertaken supported by historical aerial imagery which deemed them necessary to prevent coastal erosion.

Member question: Is the asbestos removal at Pinnaroo Point having a negative effect on coastal erosion?

City response – Building materials and asbestos were uncovered at Hillarys Dog Beach during a large storm in August 2025. The storm erosion also caused dangerous cliffs in the dunes. The beach was closed due to safety concerns, the asbestos containing materials and protruding building materials were removed, and the dunes were reshaped. The asbestos removal and beach shaping works were not impacting on coastal erosion, no vegetation was cleared and asbestos was removed from already open sandy areas.

Member question – there is an area of dune that looks as if it has been cleared at Whitfords Nodes park. Is this part of the asbestos removal? The contractor involved was not wearing PPE for asbestos handling, vegetation looked like it was being damaged, and sand was being deposited back onto the beach. It was unclear if this was clean sand or could be contaminated with ACM.

City response – Asbestos Containing Material (ACM) removal was only undertaken at the Hillarys Dog Beach area, and the beach and carpark were closed during this time following all ACM removal regulations. All works were done in already cleared sandy areas. The works being described at Whitfords Nodes is likely the IVAC sand removal system, where wind-blown sand is removed from paths and rocky areas and returned to the beach. City staff will investigate the purpose of the sand removal at Whitfords Nodes beach dunes and provide further information.

Member question: For the sand bypassing project, why was the figure of 10,000m³ selected? Was this based on a scientific investigation to determine how much was available?

City response – The bypass sand volume was selected based on a minimum maintenance volume to maintain the beach width for community amenity several years ago. This volume was used for a multi-year contract. The volume moved is not a total replacement of what is lost each year and may not be enough to maintain beach amenity and width. However, higher sand bypass volumes require higher costs and hence would be a budget decision for Council.

Member question: Please clarify the difference between asbestos and asbestos containing materials (ACM). CRG members have received community enquiries regarding asbestos.

City response – The City will focus communications on ACM and be clear with terminology. Asbestos related communications website links will be provided to the group.

Action: The City will provide asbestos related communications website links to the CRG so the members are aware of ACM related City communications.

Action: The City will provide information to the group regarding the purpose of the sand removal at Whitfords Nodes beach dunes.

Item 5 – Alternative coastal adaptation options research outcomes

A City Officer provided an overview of the Research of Alternative Coastal Adaptation Options final report.

The slides from the presentation can be found at Appendix 1.

Questions and discussion topics:

Member statement: the report lacked tangible details and provided only high-level options.

City response – this report highlights all of the options that could be possible at a high level. These options can then be investigated more thoroughly during a detailed adaptation options assessment for each site.

Member statement: the report lacks some detail about down drift impacts from implementing some of these options.

City response - down drift impacts would be included in a more detailed adaptation options assessment specific to a site.

Member question: has the report been shared externally?

City response – the report has currently been shared with Department of Planning, Lands and Heritage (DPLH), Department of Transport (DoT), UWA and WALGA as a part of the CHRMAP Technical Steering Group and they reviewed the draft report. The Northern Beaches Alliance are aware of this project and are interested in accessing the report once it is publicly available.

Member question: will the options in the research report be considered for the Hillarys-Kallaroo Foreshore Detailed Adaptation Options Assessment?

City response – yes, the report will inform future site-specific detailed studies.

Member question: have you considered funding for adaptation options?

City response – the City needs to understand which options are suitable for each site before investigating funding opportunities.

Member statement: The Hillarys Boat Harbour Masterplan has not been taken into account. Will this be included in future works?

City response – the contractor that will be appointed to conduct the Hillarys to Kallaroo Foreshore Reserve Detailed Adaptation Options Assessment will need to consider the Hillarys Boat Harbour Masterplan and the impacts to the beach north of the boat harbour.

Item 6 – Workshop session

Working in two small groups, all CRG members provided comments on the shortlisted adaptation options from the alternative coastal adaptation options report, based on three typologies:

1. Onshore structures – rock filter units, rock groynes, geofabric groynes, sloping rock revetments and seawalls, vertical seawalls, hybrid seawall-dune systems.
2. Offshore structures – multipurpose artificial reef, submerged breakwaters and low crest barriers, detached breakwaters, offshore islands, living speed bumps.
3. Sand management options – dune enhancement/revegetation, sand fencing/brushing/dune trapping, sand bypassing, beachface nourishment, shoreface/nearshore nourishment, largescale sand nourishment, beach scraping and reprofiling, backpassing and enhanced backpassing.

Due to small participant numbers in attendance, small group discussions were held for typology one (onshore structures) and typology three (sand management options), with typology two (offshore structures) discussed as a plenary session.

Participants were asked to discuss and provide any additional comments regarding the outcomes of the technical, environmental, economic and social feasibility for any of the alternative adaptation options.

A City Officer recorded all comments for each alternative adaptation option typology.

The raw comment sheets are provided in Appendix 2.

Summary of discussions:

Onshore structure options:

- The community will have a difficult time accepting any hard structures as a solution, if erosion is not clearly visible at the time.
- It is important to balance adaptation options with the value of the asset being protected. For example, if the asset at risk is low value, such as a toilet block, it would not be worth constructing a hard structure as an adaptation option to protect it, when moving the toilet block would be a better option. The community value of an asset is important, more than the economic cost.

- Community acceptance of any adaptation option will be based on the level of erosion and the assets at risk on a site-by-site basis. Currently the community don't see the threats. It is important to define the trigger points and define what is worth protecting versus retreating and/or removing the assets.
- The hybrid seawall-dune system is probably the most palatable option as perceived by the community in the onshore structure typology. The buried seawall will only be exposed when erosion is threatening infrastructure and by this time, erosion is extreme and impacting on infrastructure and the seawall is already there and accepted by the community. It is proactive instead of reactive. Reactive works cause community concern. This option would ideally have buy-in with the local Friends Group in regard to revegetation and maintenance of the dune vegetation.
- Overall, the community are against 'rocks on beaches' options, which applies to many of the onshore structure options.
- There is minimal community support for groynes (rock or geofabric) due to their impact to current use and amenity.
- Even if groynes are shown to be the most effective option to manage erosion, there will be a struggle to get the community on board.
- The community appreciates the City's beaches in their natural state, currently with little development.
- If an amenity benefit is provided with a particular adaptation option, then the community are more likely to accept it. For example, a fishing jetty with a hidden groyne underneath can provide erosion protection as well as improved amenity and access. However, this can get complicated if numerous adaptation options are required at one site.
- Rock filter units are more flexible and natural looking than concrete seawalls, particularly at rocky beaches such as Iluka and Burns Beach. These bags can provide a last attempt effort to protect valuable infrastructure.
- Vertical seawalls are the least preferred option in the onshore structures group due to the loss of the beach and amenity.

Sand management options:

- Dune enhancement and revegetation:
 - This option is expected, welcome and business as usual.
 - There are ongoing community concerns over glyphosate use for weed control in sand dunes.
 - Is revegetation working to prevent erosion impacts?
 - Dune revegetation is not a solution on its own, however it may slow down erosion. Vegetated dunes can provide storm resilience.
 - Dune revegetation can be effective if there is a rocky outcrop behind the groynes and there is potential for rock reinforcement in front of vegetated dunes.
 - Is there a sand deficit?
 - There is a limited amount of sand and the City is currently looking into offshore beach nourishment options through the Northern Beaches Alliance.
- Sand fencing, brushing, dune trapping:
 - Improvements can be short lived and gone within a few months. Sand moves quickly and can cover fences.
 - The community may not understand the purpose of wind fencing and having the fencing on site may encourage people to enter the dunes and shelter from the wind behind the fences.
 - It is unclear how effective this option is at retaining sand.
- Sand bypassing:
 - Sand bypassing is currently being completed by the City, trucking 10,000m³ of sand annually from Sorrento Beach to Hillarys Beach. This is planned to continue.
 - There were community complaints from nearby residents when this program was completed at night. It is now completed during the day with fewer complaints.
 - Currently the City is not moving enough sand to balance the sand lost to erosion. There is community perception that sand bypassing is a waste of money if not enough sand is moved.
- Beachface nourishment:
 - Almost as accepted as sand bypassing.
 - Expensive and the positive effects don't last for long.

- Shoreface or nearshore nourishment:
 - Concerns about turbidity and impacts to the seabed.
 - Recognised as a soft option but still requires environmental impact consideration.
 - This option may be more palatable to the community.
 - Probably not going to reinstate the beach.
- Large scale sand nourishment:
 - It is important to ensure seagrass meadows are not impacted or removed.
 - This option could be palatable if it was completed near shore and there are no environmental impacts.
- Beach scraping and reprofiling:
 - Business as usual.
 - Community is fairly comfortable with this option.
 - Does this include seaweed removal, or could retaining seaweed prevent erosion?
- Backpassing and enhanced backpassing:
 - This option may be acceptable with the community.
 - Environmental impacts and social impacts of moving sand would need to be investigated.
 - Need to be careful about what types of sand are moved to ensure the correct quality.

Offshore structure options:

- The acceptance of all options will be focussed on the amenity or loss of amenity.
- Solutions that can be funded externally would be favoured. All options are dependent on funding models.
- All offshore structures need to keep in mind other infrastructure and state planning policies, for example offshore data cables.
- Offshore structures could be the best long-term options and could be reframed as 'nature-based options' if they include some biodiversity improvements.
- A surf reef could be accepted by the City of Joondalup community, however there are community members that are also opposed to an artificial reef.
- A reef that creates habitat or has multiple uses would be favoured, for example a reef constructed for erosion control that also can be used for snorkelling and habitat has double benefits, and a community amenity benefit. It is important to link adaptation options back to community amenity benefits, or a perceived loss of amenity.
- Any works with rocks in the offshore environment need to protect existing water quality. For example, there have been changes to water quality at the Ocean Reef Marina which may be due to breakwater rock quality/chemistry and/or changes to ocean currents.

Additional comments:

- Due to natural cycles of erosion, we may now be experiencing the worst part of the erosion cycle, and it may start to improve. There may be perception by the community that things are getting better due to these natural cycles. However, sea level rise will continue to worsen over time, which is likely to worsen erosion impacts.
- When doing feasibility assessments of options, it is important to get the weightings for each scoring option correct.
- The feasibility results in the report appropriately respond to the community preference for maintaining a natural sandy beach, while balancing the need to consider some low impact structural options where necessary in the future. This approach acknowledges the community values and prioritises them but communicates that in an ever-changing climate these actions may need to be paired together in certain circumstances to deliver the outcome the community needs.
- These statements from the report are supported and should be the focus for future communications:
 - "Nourishment is now widely regarded internationally as a flexible, low-visibility measure that preserves beach amenity while working with natural processes, and available studies indicate that offshore sand reserves are likely sufficient to support ongoing campaigns".
 - "Based on the feasibility ranking (Table 4), the recommended approach for Joondalup is not to select a single 'best' option, but to build a combined portfolio in which high-scoring measures provide the dependable foundation, and mid-ranked measures are used selectively to solve specific problems the foundation cannot solve on its own."

Additional comments provided after the meeting:

- The report gave a good overview of coastal erosion mitigation practices with global case studies. More local and national examples would have been useful.
- Any adaptation options need to be communicated in a way that displays other benefits to the community, other than reducing erosion. For example, a lot of people fish from the Burns Beach groyne or swim laps between the groynes at Sorrento.
- While some members of the public may be against one adaptation option, more of the community might be in favour for that option if they were given an understanding of its recreational benefits. This is applicable across multiple adaptation options.
- Like seagrass, macro algae (seaweed) is very important for natural habitats and subsequently coastal fishing. However, seaweed also reduces wave energy, therefore reducing coastal erosion. Coastal vegetation has also been widely proved to be essential for dune maintenance and in reducing coastal erosion.
- The vast majority of people in the City of Joondalup are likely to have little idea of the real risks of erosion on the coast, or may not think sea level rise is real or relevant to Western Australia. Waiting for erosion to be visually obvious to the public is irresponsible and would result in more expensive reactive reactions to re-establish coastlines, which would also be largely destructive to the natural environment. Communication needs to be delivered about future risks and the long-term benefits of adaptation pathways.
- It is important that the CHRMAP outlines how to best serve community values over the next 100+ years, rather than the immediate future. Keeping a section of the community happy immediately may risk values of the broader community in decades to come.
- A combination of adaptation options is supported to achieve and maintain ideal coastal conditions. Adaptation options should be tailored to each section of the coastline and assessed in detail by coastal engineers and modellers.

Conclusions from discussions:

- Clear, consistent communication with the community will be critical to building awareness of the need to consider a range of coastal adaptation options. This approach should recognise the varying conditions and requirements of different coastal locations, supported by proactive, long-term planning and delivery.
- It is important to balance the cost of the adaptation option with the value of the asset at risk. Retreat is always an option for low-value assets, such as footpaths and toilet blocks.
- Community acceptance of any 'hard' adaptation option will be increased if the adaptation option provides an amenity benefit.
- 'Rocks on beaches' and seawalls are the community's least preferred options.
- Hard infrastructure options are the least palatable by the community, unless the erosion risk is clear and imminent.
- Waiting for erosion to be visually obvious to the public is irresponsible and would result in more expensive reactive options being implemented, instead of proactive options.
- Communication needs to be delivered about future erosion risks and the long-term benefits of adaptation pathways, with a focus on the 100+ year timeframe and the community benefit from the long-term adaptation pathways.
- Combinations of adaptation options tailored to each specific site is important.

Item 7 – Next steps and next meeting

City Officers and Claire Paddison provided an update about the next steps, including:

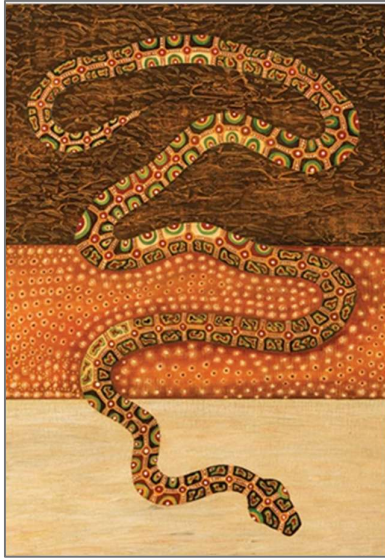
- The next CHRMAP Community Reference Group meeting will be held on 22 July 2026 with the topic to be confirmed.
- State Planning Policy 2.6 sea level rise information will likely be ready by late-2026. This information will be used to update the hazard lines in the City's new Coastal Hazard Assessment. This means there may be a delay in project works and changes to the CHRMAP project plan which would need to be presented to Council for endorsement. The group will be kept updated.

Item 8 – Close

The Presiding Member thanked members for their participation in the meeting and provided the following summary:

- Thanks to everyone for coming and contributing.
- Overall, it was a great discussion, and the group seemed to enjoy these more technical discussions as we progress further into the CHRMAP process.

Appendix 1 — Presentation slides



The City of Joondalup acknowledges the Traditional Custodians of this land, the Whadjuk people of the Noongar nation. We recognise the culture of the Noongar people and the unique contribution they make to the Joondalup region and Australia. We pay our respects to Elders past and present and all Aboriginal and Torres Strait Islander peoples.

Image: Sandra Hill, *Wutt Paadalainny (Moving Camp Together)*, 2008 (detail)

CHRMAP Community Reference Group Meeting 4 Alternative coastal adaptation options research – 18 March 2026



Agenda



1. Arrival and supper
2. Welcome
3. Meeting overview
4. Project updates
5. Alternative adaptation options research project
6. World Café - review research outcomes
7. Next steps and next meeting
8. Close



Agenda item 4 – Project updates

Project updates – CHRMAP TSG



CHRMAP Technical Steering Group (TSG):

- Last meeting held on 5 March 2026
- Discussed the final alternative coastal adaptation options report



Project updates – asbestos removal



Asbestos removal at Hillarys Dog Beach:

- Legacy asbestos contamination from old beach shacks that were buried on site
- Erosion has continued to expose buried asbestos
- Beach closed in August 2025 following a severe storm which uncovered asbestos containing materials
- Site surveying is now complete - to identify asbestos extent and locations
- Remediation options assessment plan completed
- Remediation works will progress in 2026.



Project updates – Perth NRM projects

Partnership projects with Perth NRM:

Project 1:

- CoastSnap installation at Iluka Foreshore
- Revegetation and sand trap fencing at Pinnaroo Point – commenced in February 2026
- Community planting day at Pinnaroo Point in June 2026
- City will continue weed control and tubestock maintenance



Project 2:

- Installation of matting, sand traps and fencing at Iluka Foreshore, in partnership with Friends Group in 2026

Project updates – coastal maintenance

Coastal maintenance works:

- Sand management on beach paths (ongoing):
 - Completed Nov – March/April annually
 - Clear sand from paths and replace onto beaches – Sorrento, Mullaloo, Pinnaroo Point (dog beach)
 - IVAC sand extraction
- Completed hydromulching at Hillarys Dog Beach to slow down sand loss by wind
- Completed sand trap fencing and revegetation at Sorrento Beach



Project updates – artificial surf reef

Artificial surf reef pre-feasibility study:

- Several surf breaks lost by Ocean Reef Marina development
- Artificial surf reef requested by community
- Pre-feasibility assessment report will be presented to Council on 24 March 2026



Project updates – sand bypassing project

Sand bypassing project:

- Completed annually
- Move ~10,000m³ sand from Sorrento to Hillarys Beach north
- Completed for 2025 in Oct-Nov – 10,150 m³
- 10,000m³ planned for 2026



Project updates – groyne and seawall maintenance

Maintenance works for existing groynes and seawalls:

- Sorrento groynes – two groynes (central and southern) require maintenance works
- Seawalls – Mullaloo SLSC and Sorrento SLSC seawalls require maintenance works
- Works will commence March-April 2026



Project updates – coastal monitoring

Northern Beaches Alliance projects:

- Offshore sand source investigation
- Aerial imagery – captured in April and October annually

Coastal monitoring program:

- Continues each year to measure shoreline movement
- Includes analysis of aerial imagery from NBA coastal surveys
- 2024/25 data report finalised in Sept 2025

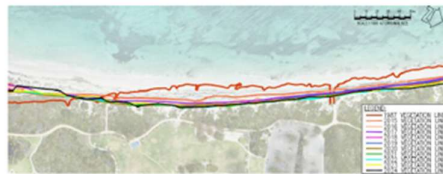


Figure 9.2 Shoreline Movement at Hillarys Beach Park

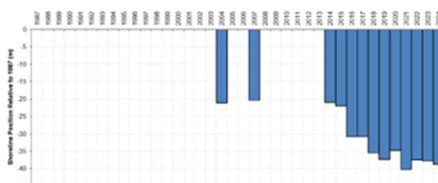


Figure 9.4 Vegetation Line Movement at CH3500 (Hillarys Beach Park)

Project updates – Coastal Hazard Assessment



Coastal Hazard Assessment (CHA):

- Current CHA is 10 years old
- Waiting on SPP2.6 review completion and new sea level rise data to be available for hazard calculations
- CHA likely to commence in 2026/27



m p rogers & associates pl
consulting engineer coastal and ports

B274 Rev 1
 June 2016

City of Joondalup

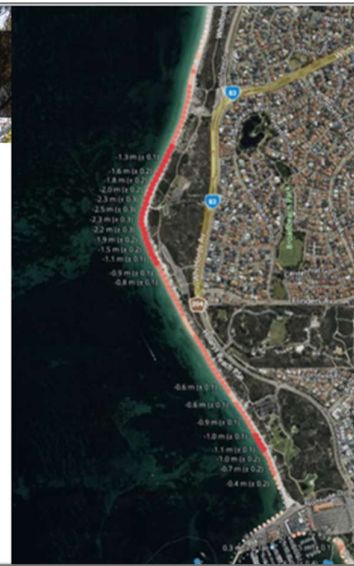
Joondalup Coastal Hazard Assessment

www.coastandports.com.au

Project updates – Hillarys-Kallaroo Foreshore

Hillarys-Kallaroo Foreshore Reserve detailed adaptation options assessment:

- Pinnaroo Point is recommended to be classified as a WA coastal erosion hotspot by Department of Transport
- Ongoing erosion and continually receding shoreline
- Assessment will look at potential adaptation options suitable for this site
- Likely to be undertaken in 2026/27.



Questions

Agenda item 5 – Alternative coastal adaptation options research outcomes

Alternative coastal adaptation options research



- Griffith University and ICM consultants commenced research in July 2025.
- Researching new / innovative alternative coastal adaptation options locally, nationally and internationally, including feasibility on the City's coastline.
- Draft report reviewed by the TSG.
- Final report completed in February 2026.



Alternative coastal adaptation options research – out of scope options

Out of scope options include:

- Storm surge / inundation focused measures
- Planned retreat and tenure mechanisms
- Statutory planning and development controls
- Catchment and urban water interventions
- Emergency management and preparedness



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



Accommodate
Continue to use the land but accommodate changes by building on piles, converting agriculture to fish farming or growing flood- or salt-tolerant crops.



Protect
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.



Retreat
Withdraw, relocate or abandon assets that are at risk; ecosystems are allowed to retreat landward as sea levels rise.



Alternative coastal adaptation options research – Feasibility Assessment

Score	Technical feasibility	Environmental feasibility	Economic feasibility	Social feasibility
5	Proven and reliable; straightforward to design and build; adaptable over time.	Minimal, reversible impacts; approvals straightforward.	Low capex and low O&M; limited studies and monitoring.	Enhances amenity and access; minimal visual impact; strong support likely.
4	Feasible with standard studies; manageable sensitivities.	Manageable impacts with mitigation; approvals achievable.	Moderate capex and O&M; scalable; some monitoring.	Mostly consistent with amenity and access; manageable disruption; likely acceptable.
3	Feasible but design-sensitive; needs modelling, trials, or tighter controls.	Noticeable impacts or uncertainty; targeted studies and monitoring; approvals not straightforward.	Moderate to high cost and/or ongoing operations; studies and monitoring are material.	Mixed outcomes; some amenity, access, or surf/safety impacts; acceptance depends on design and engagement.
2	Site-dependent and complex; higher risk of unintended effects; constructability constraints.	Higher impact risk or uncertainty; approvals likely difficult.	High capex and/or high O&M; specialist delivery and monitoring add substantial cost.	Likely opposition due to footprint, access disruption, or perceived industrialisation.
1	Unlikely to work as intended.	Likely unacceptable or not approvable.	Very high cost and lifecycle burden.	Very low social licence likely.

Feasible options for the City after the Feasibility Assessment

Ranking	Option	Score	Description
1	Dune enhancement / revegetation	18	Essential enabling layer that strengthens the dune buffer, improves post-storm recovery, and delivers strong ecological and social outcomes; best paired with sand supply measures.
2	Sand fencing, brushing, and dune trapping	18	Low-cost dune building and recovery support that helps retain benefits between sand campaigns; depends on correct placement, access control, and ongoing maintenance.
3	Hybrid seawall dune-system	15	Selective asset-protection layer that maintains a sandy frontage if kept buried; performance depends on reliable sand cover, monitoring, and replenishment triggers under sea level rise.
4	Sand bypassing	14	Restores sediment continuity where transport is interrupted; can reduce reliance on hard controls; requires repeat operations, monitoring, and clear operational governance.
5	Beach face nourishment	13	Core on-beach sand addition to rebuild beach width and storm buffer; repeatable but dependent on sand source, access, approvals, and ongoing campaign planning.
6	Shoreface or nearshore nourishment	13	Sand placement offshore to reduce on-beach disruption; outcomes and approvals can be more complex in sensitive marine settings and require monitoring and adaptive management.
7	Large scale sand nourishment projects	13	Larger-volume campaigns that can create a longer-lasting buffer where continuous frontage and reliable supply exist; requires staging areas, approvals, and monitoring.
8	Beach scraping and re-profiling	13	Tactical post-storm recovery tool to rapidly rebuild buffers under defined triggers and limits; not a primary long-term stabilisation measure.
9	Backpassing and enhanced backpassing	12	Operational sand redistribution that can support targeted hotspots where suitable donor areas exist; constrained by donor availability and risk of shifting impacts to the borrow site.
10	Rock filter units	11	Localised or interim toe/transition protection and emergency response option; not a whole-of-frontage erosion solution and may face approvals constraints near sensitive habitats.
11	Living speed bumps	11	Pilotable nearshore roughness concept intended to reduce wave-energy concentration at hotspots; benefit is uncertain on exposed coasts and requires modelling and clear success criteria.
12	Rock groynes	10	Technically able to trap sand but can displace impacts downdrift and impose ongoing governance burdens; generally low social licence due to visible planform control.
13	Slipping rock revetments and seawalls	10	Asset protection option with clear constructability; still entails trade-offs for beach width and amenity and needs careful siting and overtopping/transition management.
14	Geotabric groynes	9	Potential trial-scale control with some reversibility; still carries transport disruption risks and reputational issues if exposed, damaged, or poorly maintained.
15	Multipurpose artificial reefs	8	High design sensitivity and uncertain measurable shoreline benefit; best treated, if at all, as a staged pilot only where modelling indicates clear retention benefits.
16	Submerged breakwaters and low-crest barriers, incl. submerged islands	8	High cost and environmental uncertainty with acceptance risks; only progress where modeling shows clear net benefit and impacts are manageable.
17	Vertical seawalls	8	Proven to protect assets but high trade-offs for beach amenity and approvals; best treated as a targeted last-resort protection measure in constrained locations.
18	Detached breakwaters	8	Potentially effective but typically low environmental and social feasibility; high trade-off option with major approvals complexity and amenity impacts.
19	Offshore islands	8	Transformative, high-cost concept with significant ecological, circulation, and social licence risks.

Alternative coastal adaptation options research – typologies

Alternative adaptation options grouped in typologies for workshop:

- **Typology 1 - Sand and dune management**
 - revegetation, fencing, bypassing, beachface nourishment, shoreface nourishment, large scale nourishment, scraping, back-passing
- **Typology 2 - Onshore structures**
 - rock filter units, rock groynes, geofabric groynes, revetments, seawalls, hybrid dunes
- **Typology 3 - Offshore structures**
 - artificial reef, submerged breakwaters, detached breakwaters, offshore islands, living speed bumps

Questions

Agenda item 6 – World Cafe

Working in three groups, all CRG members will work through (in rotation) a review of the shortlisted adaptation options across the following typologies:

- **Typology 1 - Sand and dune management** (revegetation, fencing, bypassing, beach face nourishment, shoreface nourishment, large scale nourishment, scraping, back-passing)
- **Typology 2 - Onshore structures** (rock filter units, rock groynes, geofabric groynes, revetments, seawalls, hybrid dunes)
- **Typology 3 - Offshore structures** (artificial reef, submerged breakwaters, detached breakwaters, offshore islands, living speed bumps).

Three rounds of 15 mins - are there any additional comments regarding the outcomes of the technical, environmental, economic and social feasibility for any of the options?

Agenda item 7 - Next meeting



CHRMAP CRG Meeting 5
22 July 2026

Topic - to be confirmed

Appendix 2 – Group discussion notes

Typology 1: Sand and dune management discussion notes

CRG feedback – Typology 1 – Sand and dune management

Dune enhancement / revegetation	Sand fencing, brushing, dune trapping	Sand bypassing	Beachface nourishment	Shoreface or nearshore nourishment	Largescale sand nourishment	Beach scraping and reprofiling	Backpassing and enhanced backpassing
<ul style="list-style-type: none"> - Expected, welcome, norm - Frustrations with glyphosate - Is it working? - Sand deposit - Dune could provide resilience during storm. - Never a solution on its own. - Slows down erosion. - Easy win. - Can be effective if rock outcrop behind grasses - Makes system more resilient. - Possibly rock reinforcement in front. 	<ul style="list-style-type: none"> - Gone within a few months - Want trying to achieve? - Sand blows & covers fence. - Could be waste of money. - Keep basic picket & wire. - People use as windbreak & sit in dunes. - Is it effective on a cost level? - Serrate SLSC - how much is it holding sand back? - City monitors sand movements. - Expensive to move 10,000m³. Big job. - Grant funding from DTM (30% funding) 	<ul style="list-style-type: none"> - Currently being done - trucking from Sorrento to Hillways - BAV - Annoys residents (used to be at night - now during day). - How much sand do we need? - We are not moving enough sand. It's a waste of money if not enough sand moved. 	<ul style="list-style-type: none"> - Almost accepted as sand bypassing - Expensive - Doesn't last long. 	<ul style="list-style-type: none"> - Concerns about toxicity & impacts to seabird. - Soft option - Environmental impacts consideration. - May be more palatable to community. - Are we going to spend the money on this? - Probably not going to reinvigorate the beach. 	<ul style="list-style-type: none"> - Not removing seagrass meadow - Palatable if near shore & no environmental impacts. 	<ul style="list-style-type: none"> - BAV - Fairly comfortable - Seaweed removal - does seaweed prevent erosion? 	<ul style="list-style-type: none"> - May be ok with the community. - Are there environmental impacts from moving sand? - Need to be careful about types of sand we move, (is it suitable?) - What are the impacts from taking sand off beaches? or any negative impacts?

Typology 2: Onshore structures discussion notes

CRG feedback - Typology 2 - Onshore Structures

What are the trigger points? + what is worth protecting vs retreat

Community acceptance of options based on level of erosion or assets at risk on a site by site basis. Currently don't see the threads.

Proactive vs reactive work

Rock filter units	Rock groynes	Geofabric groynes	Sloping rock revetments and seawalls	Vertical seawalls	Hybrid seawall dune-system
<p>more flexible + natural looking than concrete seawalls</p> <p>- could work well at rocky beaches eg Iluka + Burns Beach</p>	<p>- PSD in groynes</p> <p>- Even if most effective - will struggle to get community on board.</p> <p>↳ applies to all rock-options.</p> <p>↳ community appreciates little development on beaches</p> <p>- if you provide amenity benefit - you can get community buy-in eg hidden groyne hidden under a jetty</p> <p>↳ difficult if many structures are needed eg 17 fishing jetties</p>	<p>- little support for any groynes impacts to current use + amenity</p>	<p>General - people not wanting rocks on beaches</p>	<p>- people opposed</p> <p>- least preferred option - loses beach + amenity</p>	<p>- ongoing maintenance + sand nourishment</p> <p>- most community palatable</p> <p>- implemented on hotspot only - not entire beach</p> <p>- exposed only when erosion is threatening infrastructure (community acceptance)</p> <p>- Good to have buy-in in Friends Group for maintenance</p> <p>- Imp't to communicate well, proactive work can anger community</p>

Typology 3: Offshore structures discussion notes

Need to clarify WQ issues from ORM - chemistry of rocks + currents + in pods or WQ - perception
 Submerged multi-purpose reef eg snorkelling + erosion control would be accepted by community link back to amenity or perceived loss of amenity. Acceptance of all options will be favoured or amenity by community
 Solution: that can be funded externally would be favoured. All dependent on funding models.

CRG feedback – Typology 3 – Offshore Structures

Keep in mind other infrastructure - eg state cables + existing infrastructure + State planning
 Could be best + long term options
 Could all be reframed as 'nature based'

<p>Multipurpose artificial reef There may be perception by community that things are getting better due to natural cycles.</p>	<p>Submerged breakwaters and low crest barriers, inc submerged islands</p>	<p>Detached breakwaters</p>	<p>Offshore islands</p>	<p>Living speed bumps</p>
<p>- Surf reef would be popular for amenity creates habitat - supported by (w) community - there are community members opposed to an artificial reef</p>				