

Kōrero mai | Let's talk

Adapting to sea-level rise

Te Wharau Charteris Bay

Let's find a way

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Let's talk about sea-level rise in southern Te Wharau Charteris Bay

We know that sea levels are rising in response to climate change. Locally, they've risen by more than 10 centimetres over the last 15 years in Whakaraupō Lyttelton Harbour. We expect to see a further 14 to 23 centimetres by 2050, and between 38 centimetres and 1 metre by 2100. Over time, this is going to have a big impact on how we live, use and move around our coastline and low-lying inland areas. We don't have all the answers about what life is going to look like in the future, but we know there are some important decisions we can all be making now to make sure we're better prepared.

You can help us all get ahead of the impacts of sea-level rise in Te Wharau Charteris Bay and the wider Whakaraupō Lyttelton Harbour to Koukourarata Port Levy area by being a part of this kōrero.

Kōrero mai | Let's talk

Head online to letstalk.ccc.govt.nz to find out more about this and other draft adaptation pathways and provide your feedback. Alongside Te Wharau Charteris Bay, we're also wanting feedback on draft adaptation pathways for Koukourarata Port Levy, Allandale, Teddington, Purau and Rāpaki.

You can pick up a consultation booklet for any of the other areas at Lyttelton and Diamond Harbour libraries, or get in touch with us and we'll send them out to you.

You need to give us your feedback by 10 December 2023.

Phone us on 03 941 8096 or email letstalk@ccc.govt.nz

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Te Hapū o Ngāti Wheke Inc is the Papatipu Rūnanga legal entity that represents Ngāti Wheke, the hapū with manawhenua status over the Whakaraupō basin and surrounding areas as outlined in the Port Cooper Deed. This entire area is culturally significant to Ngāti Wheke and sustains the hapū. Te Hapū o Ngāti Wheke has a strategic plan, a key part of which is the protection and enhancement of the whenua, moana and awa. Ngāti Wheke hopes to be a part of the leadership in climate action for future generations.

**Mō tātou, ā, mō kā uri ā muri ake nei.
For us and our children after us.**

Christchurch City Council recognises the rangatiratanga of Ngāti Wheke over its whenua and is working in partnership to plan for impacts on public assets and places of value.

Timeline

2021

You provided feedback on the Coastal Adaptation Framework and Catalogue of Coastal Hazard Adaptation Options. Members of the community expressed interest in joining the Whakaraupō Lyttelton Harbour – Koukourarata Port Levy Coastal Panel.

2022

The Coastal Adaptation Framework was adopted by the Council. The Coastal Panel was established.

2022-2023

You told us what you value most about living in the area. The Coastal Panel turned this information into community objectives that were shared with the public.

The Coastal Panel identified six Priority Adaptation Locations to focus on in this round of planning based on the level of exposure to coastal hazards. These locations were shared with the public.

Each adaptation option was considered for alignment with the community objectives by the Coastal Panel. The options were also scored for effectiveness, feasibility, and environmental impact by the Specialist and Technical Advisory Group, alignment with mana whenua values by rūnanga, and the Council's guiding principles by Council staff.

Private property owners at risk from coastal hazards in the short term have been contacted directly with more information about their individual risk.

Here now

Based on this information and input, the Coastal Panel has drafted adaptation pathways for each Priority Adaptation Location and is seeking your feedback.

2023-2024

Preferred pathways will be identified and shaped up with greater detail. These will be shared with the public for input.

Preferred pathways will be presented to the Council for a decision to either accept, amend or reject the recommendation.

Our conversation to date

This isn't the first conversation we've had with you about coastal hazards, and it won't be the last.

Guided by your feedback to date, the Coastal Panel has drafted adaptation pathways that outline different ways we could address the risks from coastal hazards in the southern end of Te Wharau Charteris Bay over time. The process to come up with these draft pathways has been supported by the Specialist and Technical Advisory Group.

Before we go any further with this work, we'd like to know what you think about these pathways, to make sure we're on the right track.

On the left is a reminder of the work to date and what's yet to come.

The Coastal Panel is a diverse group of 13 community members and rūnanga representatives from the Whakaraupō Lyttelton Harbour and Koukourarata Port Levy area, alongside a couple of city-wide representatives. The Coastal Panel will present adaptation pathways for each Priority Adaptation Location to the Council, who will make the final decision on whether to accept, amend or reject the pathways.

The Specialist and Technical Advisory Group is made up of various experts from across a range of fields and organisations. It supports the Coastal Panel's decision-making by providing information, advice and guidance.



What we've heard from you so far

Last time we touched base, you told us what you value about living in Te Wharau Charteris Bay and the wider Whakaraupō Lyttelton Harbour to Koukourarata Port Levy area, and the things you'd like to see in the future. The Coastal Panel turned this important feedback into community objectives (see below), which were shared in early 2023. The panel has since used these objectives to help come up with adaptation options and to guide the development of adaptation pathways.



In your feedback to us it was clear that some of the things you value most about southern Te Wharau Charteris Bay are:

The “tranquillity, views over the harbour and birdsong in the morning” that make this such a “peaceful environment”.

“We enjoy so much here – the walking, swimming, watersports, biking, exploring, tennis, Orton Bradley Park, the view and the community.”

You also have a clear vision about what you do and don't want to see in the future.

You do want to see:

Enhancement of the natural environment, with “improved native biodiversity” and “native bush-clad coastal tracks with thriving native wildlife”.

“Roads and walkways made resilient to climate change, to make sure there is driveable access from Lyttelton around the bottom of the bays.”

An integrated approach to adaptation. “For example, if [the Council is] lifting a road, also widen it and allow for bikes and pedestrians. Allow for stormwater control so that discharges into the harbour are properly controlled and don't contribute to the erosion.”

You don't want to see:

A loss of “access to our beaches” and “connection to the water”.

“Planning of housing developments and sewage and water systems [in places] that are vulnerable.”

These are all things the Coastal Panel has kept in mind when thinking about how to address coastal hazards in southern Te Wharau Charteris Bay.



Community objectives

Community resilience

Foster the preparedness of communities (current and future) to determine how best to support themselves through times of disaster and disruption.

Community and culture

Retain a sense of community, social connectivity and sense of place by recognising the importance of heritage, identity, community spaces, places (such as parks and marae) and neighbourhoods.

Infrastructure

Ensure infrastructure, such as roads, jetties, waste, communications, electricity and water networks, are sufficiently resilient to support the health, safety and wellbeing of communities now and in the future.

Access to natural areas

Protect and enhance access to the land and the sea for mahinga kai, cultural activities, recreation, leisure and enjoyment for current and future generations.

Environment and landscapes

Protect landscape amenity and protect the natural environment for mahinga kai, natural resources and native biodiversity.

Important features in Te Wharau Charteris Bay

Roads

Low-lying coastal sections of Charteris Bay Road and Marine Drive are at risk from coastal hazards. These roads provide key access to Charteris Bay and through to Diamond Harbour, Purau and Koukourarata Port Levy, and are used by around 2,000 vehicles per day. They are part of a wider network of roads that connect communities across the Whakaraupō Lyttleton Harbour and Koukourarata Port Levy with each other and with the city. Some sections of these roads are protected with a rock wall, others are not. Water supply and wastewater pipes sit underneath the at-risk sections of these roads.

Boat ramp

The Charteris Bay boat ramp is accessible from Marine Drive, where car parking and public toilet facilities are also available. Because of the relatively shallow water depth here, the boat ramp is mainly used during medium to high tides by recreational boats.

Natural environment

At the head of Te Wharau Charteris Bay you can find tidal mudflats and inter-tidal zones that support a range of native salt-tolerant plant species. You can also find shellfish such as cockles, which are significant for their mahinga kai value. In some parts of the bay, the mudflats merge into a diverse saltmarsh ecosystem as the land rises. These ecosystems are nationally rare and threatened because humans have changed many of the natural environments they exist in. Together with the shingle fans that form around stream outlets across the bay, the saltmarsh provides important habitat for the estuarine birds and seabirds that feed and roost in the area.

There are small strips of beach throughout the bay that are well used by locals and visitors for swimming and seasonal recreation.



Marine Drive in Charteris Bay.



Looking down on the boat ramp in Charteris Bay.



Looking out across the mudflats in Charteris Bay.

Southern Te Wharau Charteris Bay will be increasingly impacted by coastal hazards

Coastal flooding, coastal erosion and rising groundwater all pose a risk to the southern end of Te Wharau Charteris Bay. The images below show that as sea levels rise, the area will experience deeper flood events and the public assets in the area will become more and more at risk. The floodwater will also stay around for longer as groundwater levels rise and it gets harder for surface water to drain away into the soil. Areas at risk of erosion are likely to lose land at a faster rate as sea levels rise.

It's important to note that while we have a good understanding of how coastal hazards will impact us, it's hard to predict the rate at which sea levels will rise further in the future. The rate of change will depend on global greenhouse gas emissions and what impact this has on our climate. If different tipping points are reached, it's possible we'll see sea levels rise much more quickly. That's why it's important to have a plan in place for the future of our coastal communities.

Current sea level



40cm sea-level rise



1m sea-level rise



2m sea-level rise



Vulnerability of the road	
■	High
■	Medium
■	Low
■	Potentially prone to erosion

Depth of flooding*	
■	0–20cm
■	20–50cm
■	50–100cm
■	>100cm

*In many places, the areas at risk from flooding are also at risk from rising groundwater.

These images show how this area will be affected by coastal hazards as sea levels rise, during a 1-in-100-year-storm event. Over this time, the roads will become more and more at-risk.

Important things to know

- While we're planning for communities as a whole, the Council will focus its public funds towards public infrastructure. In Te Wharau Charteris Bay this means the focus of adaptation planning will be the public road, water and waste pipes and the boat ramp, some of which are more critical than others.
- While the Council is focusing its planning on public assets, we're aware that privately owned assets are also at risk, and some property owners will feel anxious and uncertain about their future. We've prepared a factsheet for property owners, which you can find on our website at ccc.govt.nz/coastal hazardsinfo
- It's also important to note that some adaptation options and pathways will, if progressed, have an impact on private property owners. For example, if privately owned land needs to be purchased to allow for things like building a new road, or if Council-owned assets are moved away from their current location, this may affect nearby properties. You might want to follow the Council's work over time so that you'll be aware if it affects you directly.
- Some adaptation options for the Whakaraupō Lyttelton Harbour to Koukourarata Port Levy area would need significant investment from residents and ratepayers, yet may only benefit relatively small numbers of people. The Council and residents have limited resources and need to balance the considerable investments needed for climate adaptation with other investments needed across the district. It's also important to remember that any major works will take time to happen. These factors mean we'll all need to learn to live with some of the impacts of rising seas and a changing climate.
- Given these challenges, there's no guarantee that existing Council assets will be maintained and available into the future. The closure, removal, or retreat of different assets are options that may be considered for any asset in response to changing conditions and needs across the district.
- We don't yet have all the information about what these options might look like if put in place, but we think it's important to get your thoughts on them now, before we invest time and money drawing up plans that might not align with the community's views for the area.



What can we do about coastal hazards in southern Te Wharau Charteris Bay?

Charteris Bay Road, Marine Drive, the underlying wastewater and water supply pipes, and the boat ramp are all at risk from coastal hazards. If nothing is done, rising sea levels will cause more and more road interruptions and closures, making it harder to travel to and through the area. Erosion of these roads will also have an impact on the water and wastewater pipes beneath them that service local households. Rising sea levels will result in increased coastal flooding and erosion of the local boat ramp.

The Coastal Panel has considered the workable options that would address the risks to each of these assets. These options are set out in the section titled 'Adaptation pathways'.

Sometimes the way we decide to manage one asset will have an impact on how the other assets could be affected by coastal hazards and the options we have available to manage those risks. In Te Wharau Charteris Bay, the decision to protect the roads in their current location or to move them out of the hazard zone will have an impact on other assets.

The Coastal Panel has identified two approaches that help to show how different adaptation options might fit together. These are outlined on the opposite page.



1. Hold the line

We could flood-proof and protect the at-risk sections of the road in their current location for several decades. This option could be used to buy a bit more time or a lot more time, depending on how much is invested. A decision could then be made to switch to a 'work with nature' approach and move away from coastal hazards.

Over the long term, holding the line would likely involve improving and extending the rock armouring along Marine Drive, widening and raising the at-risk sections of road above future flood levels, and improving the ability for stormwater to drain away. The protection of the road would also provide protection for the underlying pipes. However, over time, the beaches and inter-tidal mudflats would be lost as sea levels rise to meet this hard edge.

Protecting Marine Drive in its current location would also protect the existing access to the boat ramp, parking area and public toilet facilities. This area could be armoured to stop the land being lost to erosion over time. The boat ramp itself may need to be raised at some point in the future to ensure it's useable.

2. Work with nature

In time, it may be better to move at-risk sections of both Charteris Bay Road and/or Marine Drive away from the shorefront and out of the hazard zone, creating a new way to access Te Wharau Charteris Bay and connect with the surrounding communities. This option could be used when it becomes too hard and expensive to maintain the existing road, or when actions to protect it ('hold the line') become less effective.

Moving the road wouldn't necessarily mean moving the underlying pipes at the same time, although this is an option. They could be left in place until the risk of erosion becomes too great.

Moving these sections of road would provide some space for the mudflats, beach and existing foreshore to move inland as sea levels rise, meaning they'd continue to provide recreational and ecological benefits.

Access to the boat ramp may change or be lost if at-risk sections of Marine Drive were moved away from the coastal hazard zone. Because the boat ramp itself is also at risk, at some point in time we'd need to consider closing and removing it.

Both of these approaches come with their own opportunities, risks and costs, and they may need to be used at different times or could be more appropriate for some assets than others. Regardless of what we do, it's going to get harder, more expensive and environmentally disruptive to keep public assets in this area, particularly near the shorefront where coastal erosion, flooding and groundwater all pose a risk.

Adaptation pathways

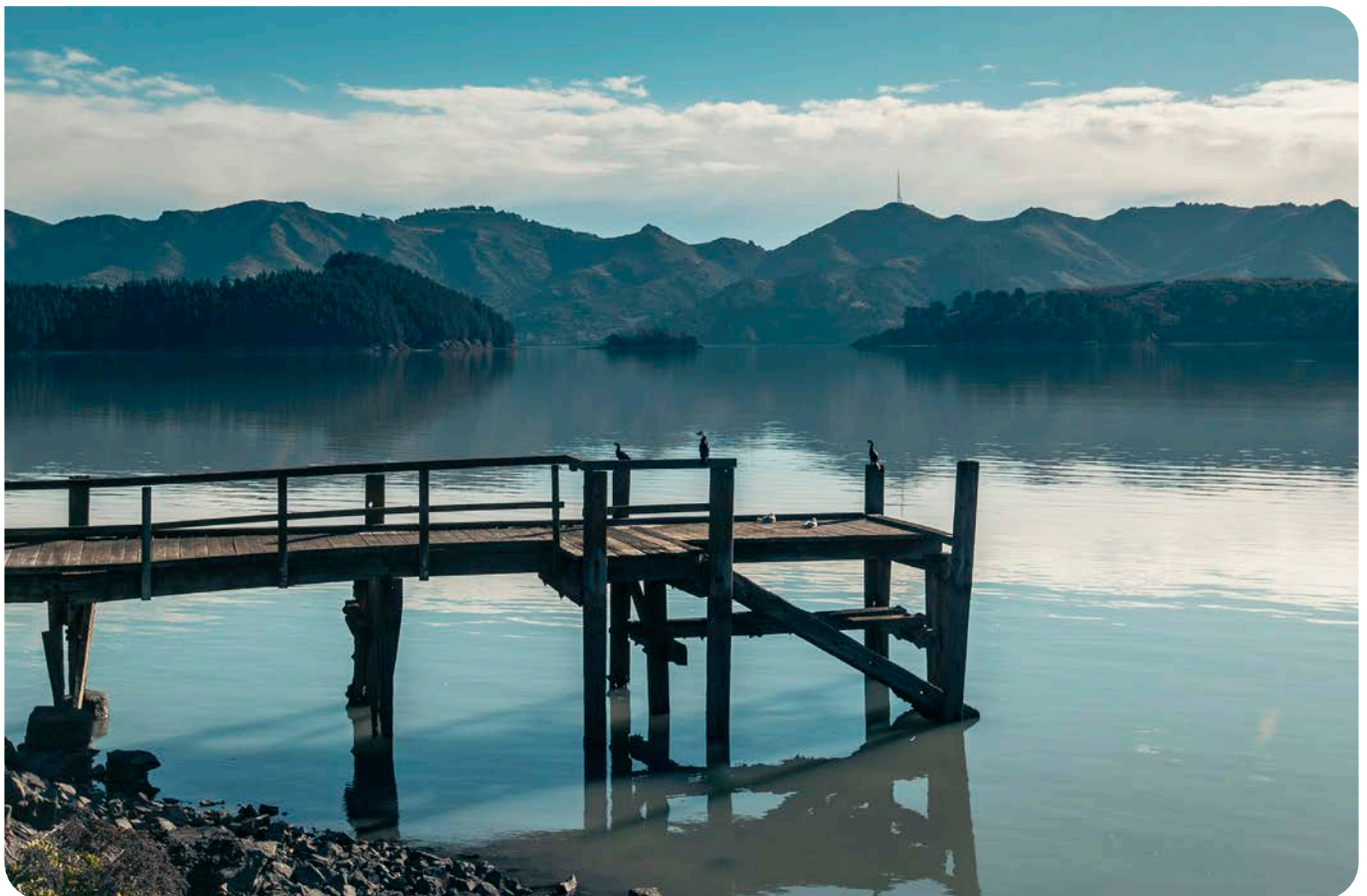
The adaptation pathway maps on the following pages help to show which options could be used to address the risks of coastal hazards for each asset. How we use or combine these options over time is something we want your feedback on.

Acting at the right time is an important part of a pathway. For example, it's hard to predict when it will become too costly and disruptive to keep repairing the road, and it's likely some parts will have issues before others. To get around this uncertainty, we'll make the decision to move from one option to another based on signals and triggers. In other words, we'll act when we start to see changes in conditions. The Coastal Panel will be thinking about what these signals and triggers might look like in more detail.

Some key terms explained

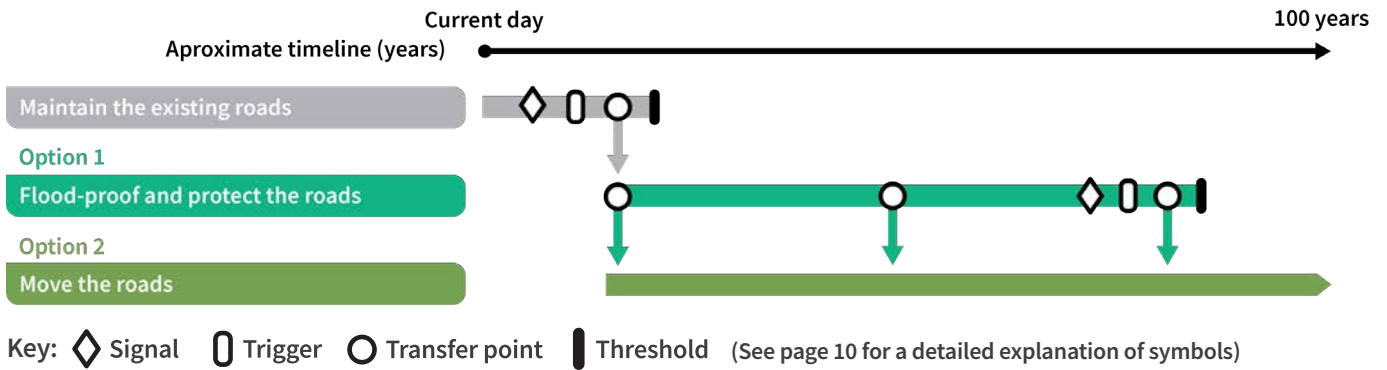
- ◆ **Signals** are early warnings that the current option isn't working and that a different one will be needed soon. Signals may be environmental, such as sea-level rise, or other indicators such as increasing maintenance costs.
- **Triggers** happen after signals and tell us it's time to act and change options. Making changes to infrastructure, like roads, can take a long time, so it's important that triggers take these lead-in times into account, before a threshold is met.

- **Transfer points** indicate switching from one option to another.
- ▮ **Thresholds** are conditions we want to avoid or a level of risk that's unacceptable. Identifying thresholds helps us to understand when we need to put a new option in place. In some cases, a threshold might reflect the community's tolerance for something (such as road closures) and can be shaped by community input.



Roads

Maintaining the at-risk sections of Charteris Bay Road and Marine Drive is expected to become harder and more expensive over time. The adaptation pathway map below shows that at a certain point – likely around 5 to 20 years from now – changing conditions will mean a new approach is needed to avoid increasing costs and disruption. As we near this point, we could look to flood-proof and protect the roads to different levels to buy us a bit more time or a lot more time. Alternatively, we could move the roads straight away or wait until a point in time when flood-proofing and protection isn't working as well, and then move them. Some sections of the roads are likely to need work sooner than others.

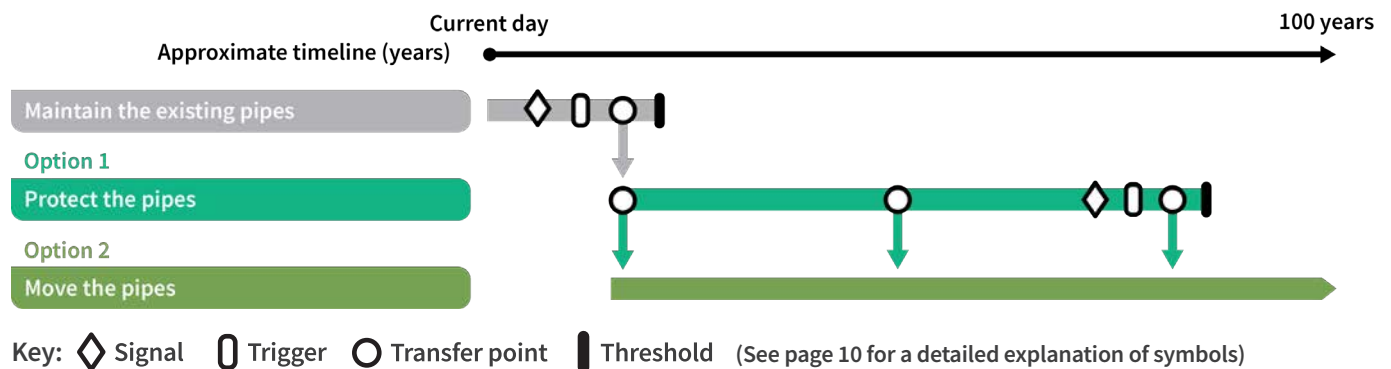


Options	Opportunities	Risks
Flood-proof and protect the roads ('Hold the line' approach)	It'd allow the roads to be used for longer in the same location.	The work would impact the environment and may be hard to consent.
	The short-term costs would be lower than moving the road.	The road would be more resilient for a time but still in a risky area.
	Flood-proofing and protection can be done in many ways for different lengths of time, making it a flexible option.	
Estimated cost: Our best estimate right now is about \$22 million to \$32 million to protect and raise at-risk sections of Marine Drive by one metre. This could involve as much as 1.3 kilometres of rock armouring.*		
Move the roads ('Work with nature' approach)	It'd completely avoid the risk of coastal hazards, providing long-term access.	Would likely require the purchase of private property at some point in the future, which the Coastal Panel and the Council acknowledge could be a difficult process for the landowners.
	It'd reduce future maintenance costs.	Property owners may need new access routes to and from their homes.
	The mudflats, beach and foreshore could move inland in response to rising sea levels, protecting ecological and recreational values.	
Estimated cost: Our best estimate right now is about \$32 million to \$48 million to relocate at-risk sections of Marine Drive away from coastal hazards and rising seas.*		

*We don't yet have enough information to understand exactly what the cost of this option would be.

Wastewater and water supply pipes

The wastewater and water supply pipes are resilient to groundwater and flooding impacts because of the materials they're made of, but they're at risk from coastal erosion. The adaptation pathway map below shows that at a certain point – likely around 10 to 25 years from now – increasing erosion will mean action is needed to avoid damaging these pipes. The pipes are underneath the road, so a decision to protect the road would also mean the pipes were protected. If the road was moved, the pipes could be moved at the same time or left in place until the risk of erosion became too great.

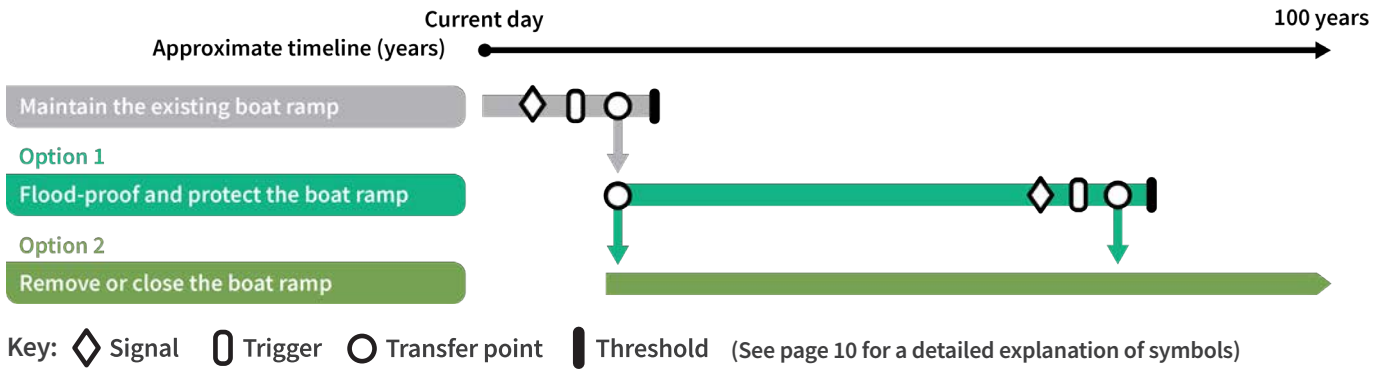


Options	Opportunities	Risks
Protect the wastewater and water supply pipes	It'd allow the pipes to be used for longer in the same location, supporting the resilience of local wastewater and water supply networks.	The work would have an impact on the environment and may be hard to consent.
	The short-term costs would likely be cheaper than moving the pipes.	The pipes would be more resilient for a time but still in a risky area.
		They'd be increasingly expensive to maintain.
Estimated cost: Our best estimate right now is about \$6.5 million to \$9.8 million to protect the pipes with rock armouring and reduce erosion. Importantly, if a decision is made to protect at-risk sections of Marine Drive, the underlying pipes would also be protected. This means there would be no additional cost to protect the pipes in these locations.*		
Move the wastewater and water supply pipes	It'd completely avoid the risk of coastal hazards, providing long-term access.	It'd likely mean the purchase of private property at some point in the future, which the Coastal Panel and the Council acknowledge could be a difficult process for the landowners.
	It'd reduce future maintenance costs.	
	If the road was also removed, the mudflats, beaches and foreshore could move inland in response to rising sea levels, protecting ecological and recreational values.	Building new pipes and removing the old ones would have an impact on the environment.
Estimated cost: Our best estimate right now is about \$22 million to \$33 million to move the wastewater and water supply pipes inland, away from coastal hazards. The cost is high, partly because pipes would need to be reconnected to private properties.*		

*We don't yet have enough information to understand exactly what the cost of this option would be.

Boat ramp

The adaptation pathway map below shows that at a certain point in time – likely around 10 to 25 years from now – sea-level rise will mean the boat ramp is no longer useable. Over this timeframe, decisions about managing the risk to the road will likely also affect how the boat ramp, parking area and public toilet can be accessed. If there’s long-term access to the area, the boat ramp can be flood-proofed by raising it above future sea and flood levels, and the surrounding land protected against erosion. Closing and potentially removing the boat ramp would need to be considered if there was no long-term access to the area, or at a point in time when flood-proofing and protection became less effective.



Options	Opportunities	Risks
Flood-proof and protect the boat ramp	It'd allow the boat ramp and parking area to be used for longer in the same location.	It'd become increasingly expensive to keep the asset in this location.
	The boat ramp could be used in the event of an emergency as a lifeline access route when roads are closed.	The boat ramp and parking area would be more resilient for a time but still in a risky area.
Estimated cost: Our best estimate right now is about \$660,000 to \$980,000 to make the boat ramp more resilient and protect the surrounding land and access.*		
Remove or close the boat ramp	It'd completely avoid the risk of coastal hazards, providing long-term services.	It'd likely mean the purchase of private property at some point in the future, which the Coastal Panel and the Council acknowledge could be a difficult process for the landowners.
	It'd reduce future maintenance costs.	The work would have an impact on the environment and may be hard to consent. It'd reduce the network of boat launching/receiving facilities in the harbour.
Estimated cost: Closure would be relatively cheap, but removing the boat ramp and landscaping the site could cost a few hundred thousand dollars.*		

*We don't yet have enough information to understand exactly what the cost of this option would be.

Moving around the harbour in the future

The main road here and in other communities around the harbour is at risk from coastal hazards, placing the whole network under threat. Over time, it may be realistic and necessary to live with more frequent road disruptions and inconveniences as storms and king tides cause damage. There are also other hazards, such as landslips, that will impact the roads more in the future. Better communication about road closures and detours, such as timely updates to a website or to people's phones, could help road users plan their trips or plan to work from home when it's a better option.

Similarly, jetties, wharves and boat ramps could provide alternative access during or after extreme weather events. In the long term, water access may even provide an alternative to roads, but this would depend on things like the size of the populations that would benefit from it and the cost and alternatives.



Help us plan for Te Wharau Charteris Bay's future

Let us know what you think by 10 December 2023.

Your feedback will help the Coastal Panel work out which combination of options to put forward to Christchurch City Council as the preferred pathway for Te Wharau Charteris Bay, once the options have been developed in greater detail. If approved by the Council, this pathway will guide the management of the public assets in this area over the coming decades – so it's important we get as much feedback from communities as possible.

Spread the word and make sure your friends and whānau living in the area also have a chance to shape their futures.



Online (preferred): letstalk.ccc.govt.nz



Email: letstalk@ccc.govt.nz



Deliver to:

Attention: Krystle Anderson, Engagement Advisor
Te Hononga Civic Offices
at 53 Hereford Street

by 10 December 2023



Post to: Freepost 178 (no stamp required)
Adapting to sea-level rise
Attn: Krystle Anderson, Engagement Advisor
Christchurch City Council
PO Box 73016
Christchurch 8154



Webinars

We're holding online webinars to talk about the options and to answer questions.

Rāpaki and Allandale

Wednesday 8 November, 6–7.30pm

Teddington and Charteris Bay

Wednesday 15 November, 6–7.30pm

Purau and Koukourarata

Tuesday 21 November, 6–7.30pm

If you're unable to attend, the webinars will be recorded and uploaded to our webpage and can be watched anytime.

Please register online at letstalk.ccc.govt.nz



Community meetings

If there's a community meeting you'd like us to attend, please let us know. You can also phone to speak to us.

Krystle Anderson, Engagement Advisor
03 941 8096

letstalk@ccc.govt.nz

Let's find a way

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Help us all get ahead of the impacts of sea-level rise in the wider Whakaraupō Lyttelton Harbour to Koukourarata Port Levy area by being a part of this kōrero.



Find out more about the draft adaptation pathways and provide your feedback.

letstalk.ccc.govt.nz

You need to give us your feedback by 10 December 2023.

