



**AMBERLEY BEACH**  
**COASTAL ADAPTATION PLAN**

**JUNE 2023**

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# 1 INTRODUCTION

We live on a long narrow island with an abundant coastline. Coastal hazards are part of our reality. The Amberley Beach community have developed this Coastal Adaptation Plan to take control of their future. It sets out how they will adapt to the changing risk over the next 100 years.

It records the outputs of two and half years of engagement including nine community meetings, two drop in sessions, seven resident meetings and three formal rounds of engagement.

## 1.1 Purpose

This Coastal Adaptation Plan seeks to develop a planned response to coastal hazard risk at Amberley Beach out to the year 2120. In doing so it responds to the following hazards:

- Coastal erosion
- Coastal inundation
- Rising groundwater
- Fluvial flooding
- Pluvial flooding.

The community have agreed on an approach for managing this risk. This document outlines the information that informed this discussion, including why particular decisions were reached and how the Plan is to be implemented.

## 1.2 Background

In 2020 Hurunui District Council (HDC) started a project assessing the current coastal hazards that affect the Amberley Beach community and how these hazards might change over a 30-, 50- and 100- year period.

The project was based off the Ministry for the Environment's Coastal Hazards and Climate Change Guidance 2017 (the MfE Guidance)[1] but was scaled down to an appropriate size for Amberley Beach. The project had four phases:

- What is happening?
- What matters most?
- What can we do about it?
- How can we implement the strategy?

This project is now complete, and the focus moves to implementing the plan.

## 1.3 Developing an adaptive plan

The MfE guidance recommends the use of dynamic adaptive pathway planning. An adaptive plan allows us to prepare for the future despite the future being uncertain. It works by preparing multiple pathways that are designed to be dynamic or flexible. This allows the decisions to be revisited as new and improved information becomes available.

The plan is trigger-based, not time-based. These triggers are agreed points where we will revisit our approach or change course. A trigger-based approach means that we don't

act until we need to, but we are well prepared to act when we do. The plan sets agreed signals and triggers so we can monitor the change that is occurring and can respond appropriately.

A preferred course of action can be identified now to help guide future investment decisions, but the aim is to leave as many options open as possible. Care needs to be taken when implementing options now that might prevent an alternative option being adopted in future.

## 1.4 Changing information

The maps and information in this plan are derived from the information available in 2020. Since then, there has been regular updates to the scientific information and national policy guidance. This information has been reviewed throughout the project and does not significantly change the projected hazards.

Doing nothing until we have certainty is not a viable option. By the time we have certainty it will be too late to adapt. An adaptive plan is designed to be agile and accommodate new information as it arises. The information and guidance will continue to be updated. This will be periodically reviewed, and the plan will be amended as required.

[1] (Ministry for the Environment, 2017)



# 2 WHAT IS HAPPENING?

Amberley Beach is currently at risk of coastal erosion and multiple sources of flooding. These hazards and the risk they pose are summarised below. If you want more detail on any of the hazards, the methodology or the risk the following reports are available:

- Hurunui District Coastline Hazard and Risk Assessment[2]
- Hurunui District Multi Hazards: Coastal Inundation Modelling[3].

## 2.1 Uncertainty

We need to plan for an uncertain future. The rate of sea level rise is uncertain. The MfE (2017) Guidance identified four sea level rise scenarios, shown in Figure 1. These are:

- RCP2.6 – low/reduced emission
- RCP4.5 – moderate then declining emissions

- RCP8.5 – continuing status quo high emissions
- RCP8.5+ – continuing status quo high emissions and possible instabilities in the polar ice sheets.

The Hazard and Risk Assessment considered how the hazards might change over a 30-, 50- and 100- year period under the RCP 8.5 and RCP 8.5+ emission scenarios. As time increases the uncertainty in sea level rise increases. We can be fairly certain about the rate of sea level rise over the next 30 and 50 years; there is only a small difference between the highest and lowest sea level rise scenarios. There is much greater uncertainty when looking out 100 years or further.

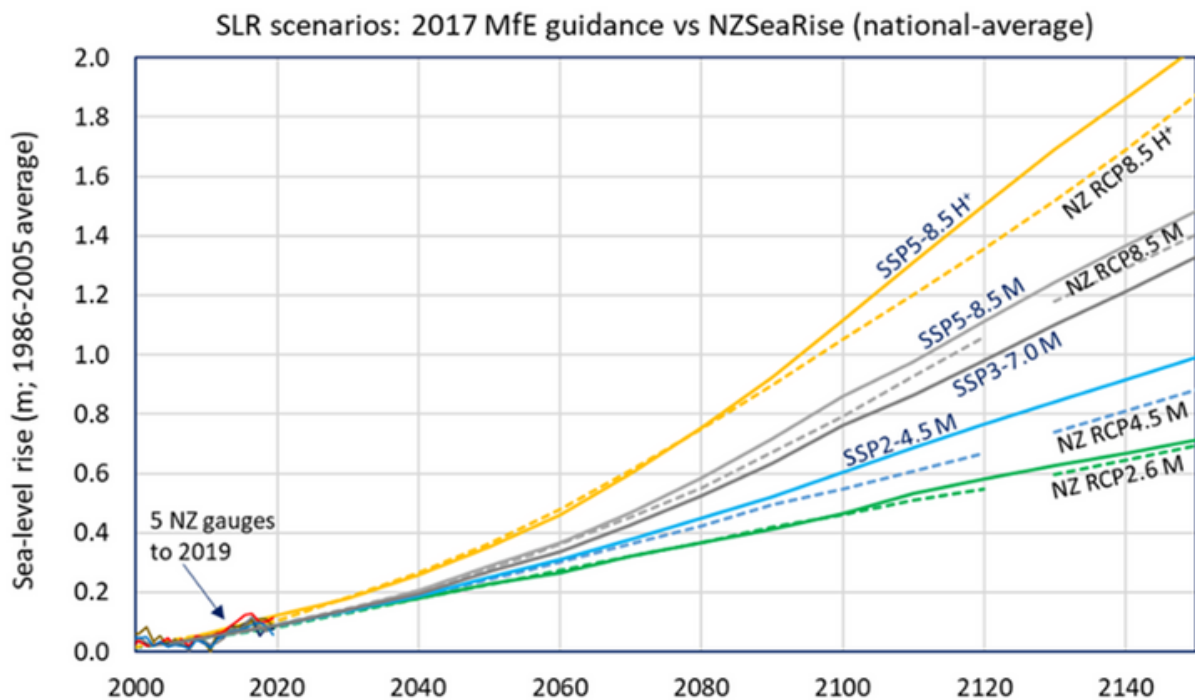


Figure 1: Sea Level Rise scenarios (Ministry for the Environment, 2022)

[2] (Jacobs, 2020)

[3] (Jacobs, 2022)

## 2.2 Coastal erosion

The coastal erosion assessment considered where the shoreline might be in 2050, 2070 and 2120. The assessment considered the historical shoreline trend, the effects of accelerated sea level rise, and the short-term erosion rate.

It is anticipated that the existing bund will be completely eroded and ineffective as inundation protection by 2050. For the bund to be effective there needs to be sufficient space for some of the wave energy to dissipate across the beach before reaching the bund. This helps reduce the rate of the bund erosion and therefore maintenance. It

also helps reduce the height waves travel up the bund reducing the risk of waves overtopping the bund.

Without maintenance it is anticipated that the bund could be completely eroded by 2030-2035 with the current rates of shoreline erosion. Properties along the eastern side of South Crescent and Chamberlain Avenue will be directly affected by this erosion. By 2120 over one third of the settlement could be lost to the sea. As the coast erodes, the coastal inundation risk to the remaining settlement increases.

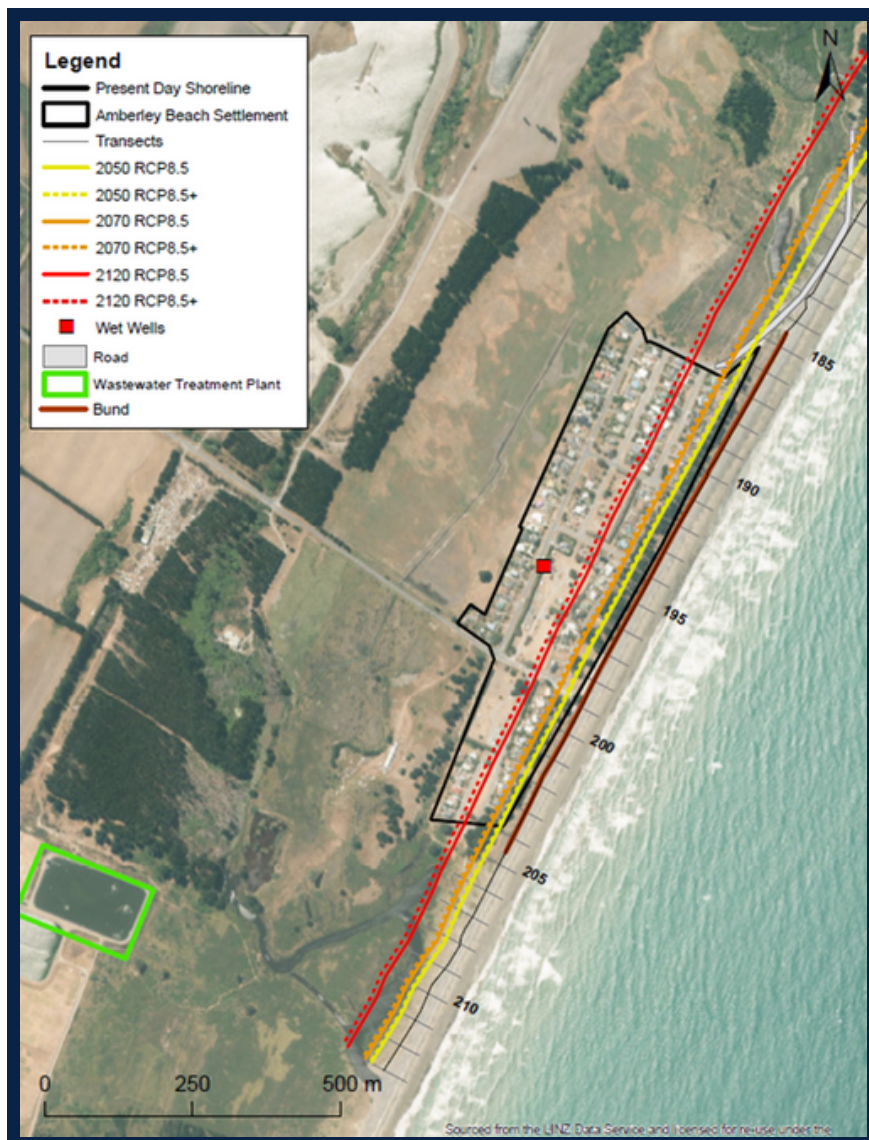


Figure 2: Projected Shoreline Positions in 2050, 2070 and 2120



## 2.3 Coastal inundation (or coastal flooding)

At Amberley Beach coastal inundation occurs when water overtops the manmade bund along the front of the settlement. Water can also enter the lagoons to the north and south of the settlement and flood the settlement from behind. The coastal inundation assessment considered a 1% AEP (annual exceedance probability) coastal flood. A 1% AEP event means there is a 1% chance of that event happening in any year (also referred to as a 1 in 100-year event).

The first map shows the current hazard footprint. This is where we would expect to find water if we had a

significant event today. Approximately 20% of the settlement would be inundated but the depths are generally shallow, generally in the range of 0.1-0.2 m. By 2050, approximately 80% of the settlement is potentially affected however the depths of water remain low.

By 2070 almost the entire settlement will be inundated. Most of the settlement will experience between 0.3 and 0.5 m of flooding but some properties will experience around 1 m of flooding. By 2120 flooding depths could increase to 0.8 to 1.2 m.





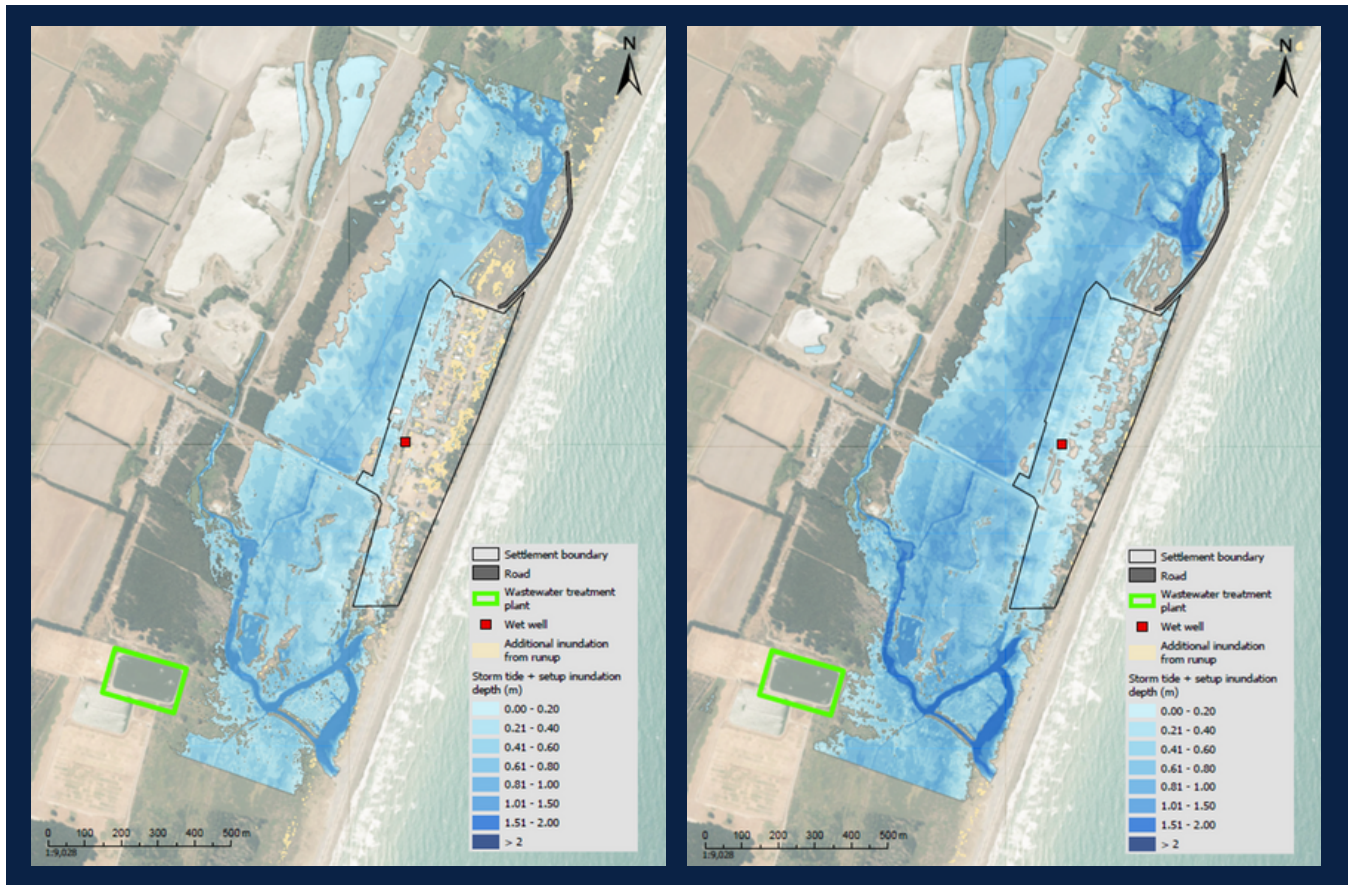


Figure 3a and b: Coastal Inundation in 1 in 100-year event under RCP 8.5 in 2020 and 2050

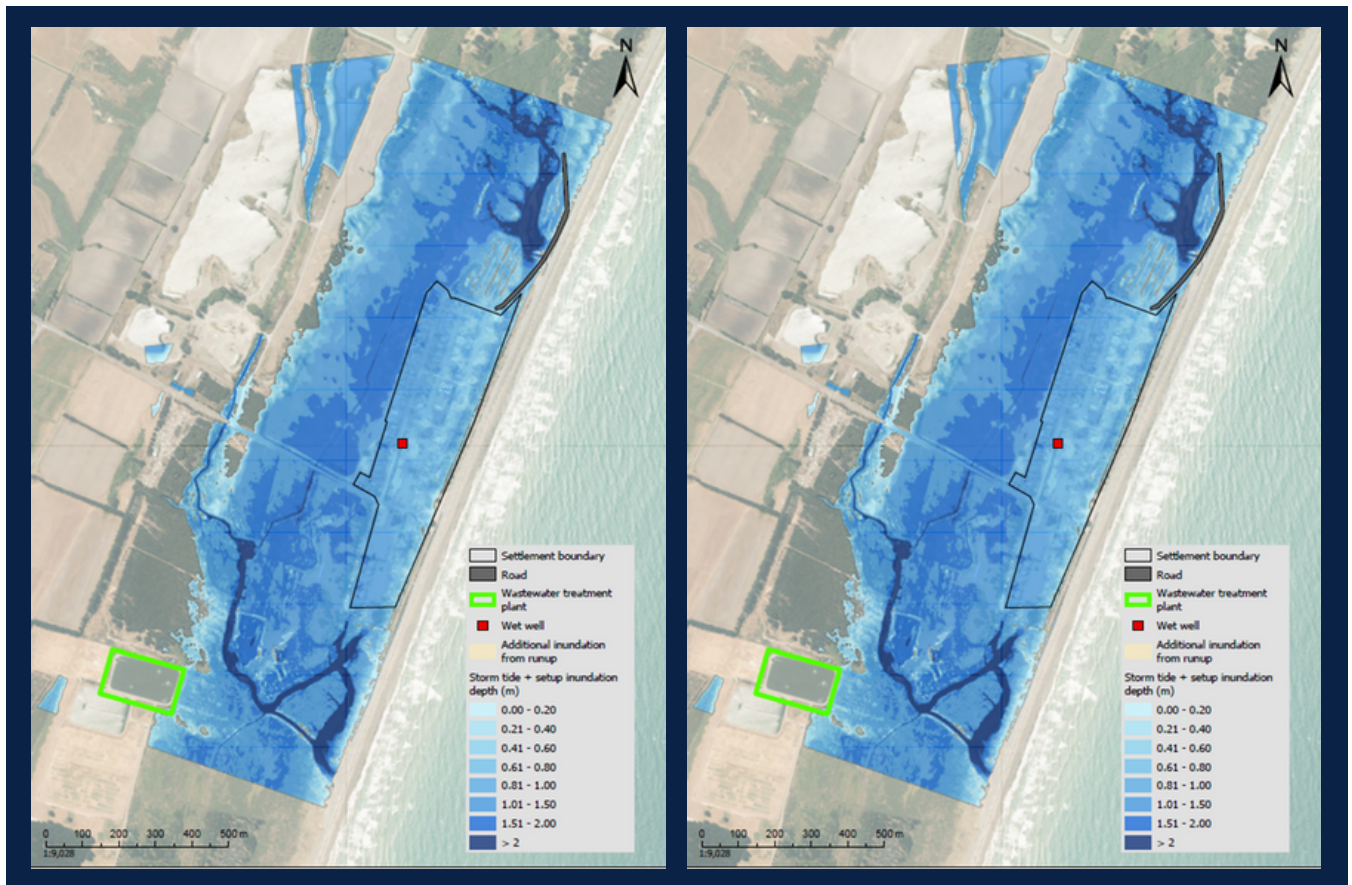


Figure 3c and d: Coastal Inundation in 1 in 100-year event under RCP 8.5 in 2070 and 2120



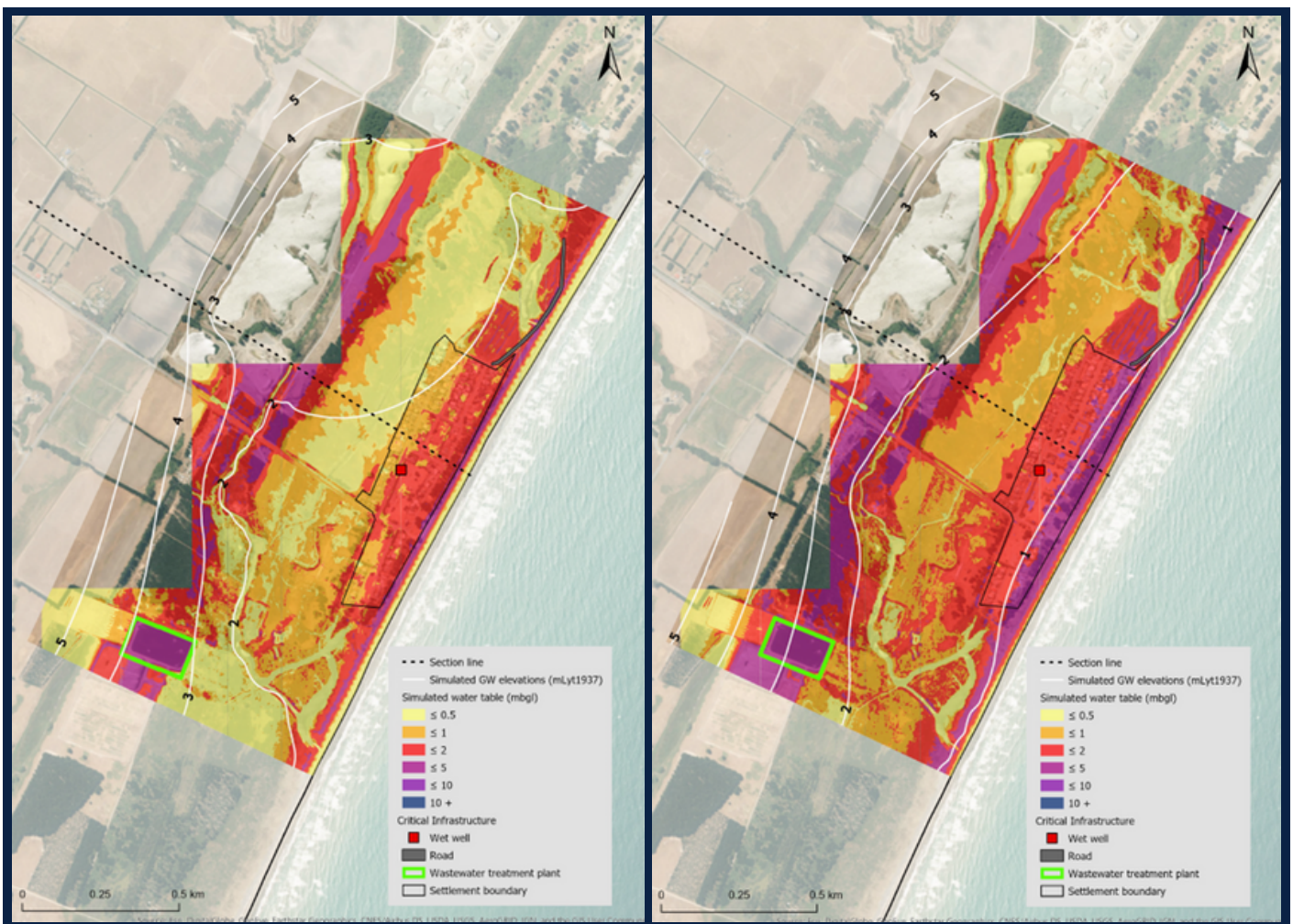


ROAD  
CLOSED

## 2.4 Rising groundwater

Shallow groundwater has the potential to affect house foundations and infrastructure. By 2120 60% of the settlement will be subject to average groundwater shallower than 1 m Below Ground Level (BGL) compared to 8% in the current day.

A high groundwater table also limits the ability for the water to drain away following large rainfall and flood events.



## 2.5 Fluvial (river) and pluvial (rainwater) flooding

Amberley Beach is subject to flooding from the Waipara River, Kowai River, and runoff from the local catchment via the adjoining paddocks. In large rainfall events water can also pond with limited drainage ability.

A multi-hazards assessment[5] was completed to investigate the impact of large rainfall events when they coincide with coastal storms. It was considered unlikely that an extreme coastal storm would coincide with an extreme rainfall event. The report therefore looked at

one smaller event coinciding with one larger event.

It found that flooding would be deepest with fluvial events for the next approximately 50 years. After this time coastal flooding will have a greater impact because of sea level rise. Ten scenarios are assessed in the report. The map below shows a 1 in 50-year coastal event combined with a 1 in 5-year rain event, with 0.5 m of sea level rise.

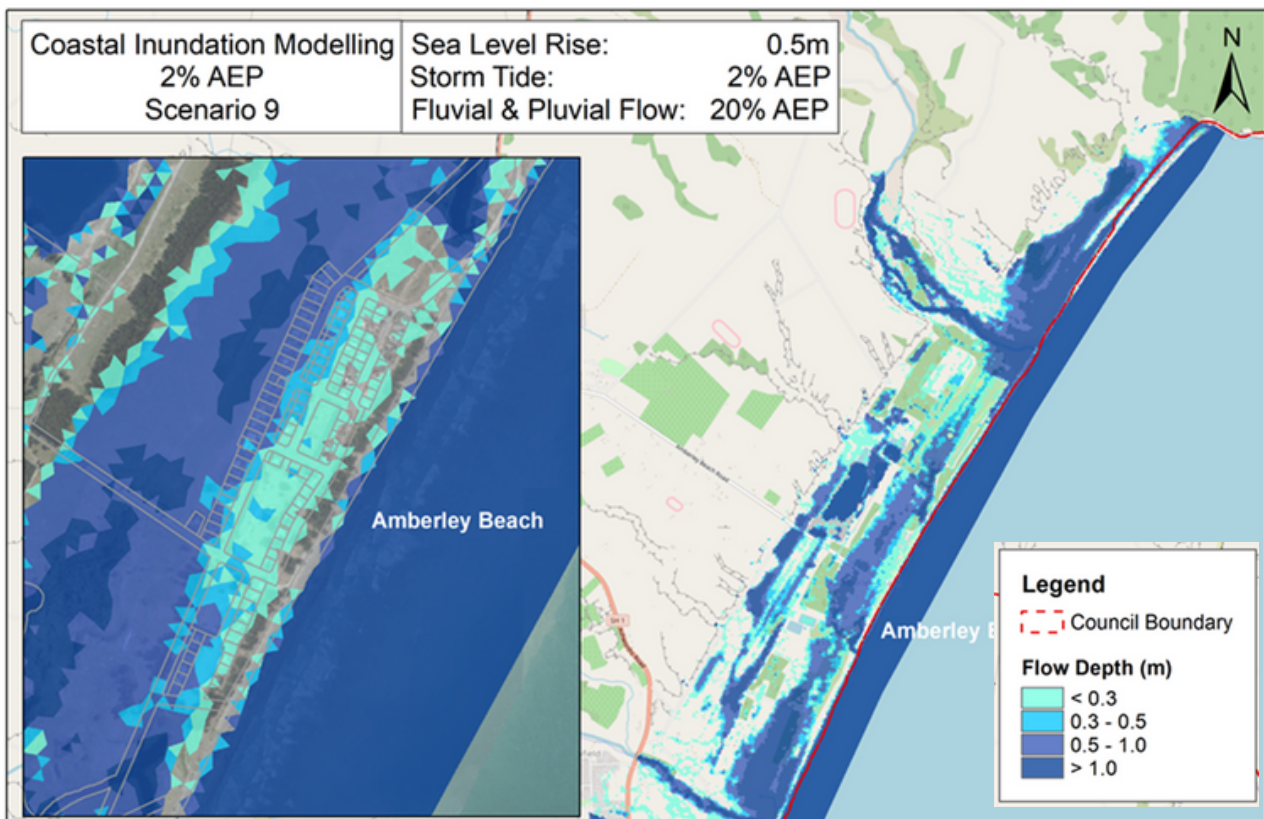


Figure 5: 1 in 50 year coastal event combined with 1 in 5 year rain event after 0.5m of sea level rise

[5](Jacobs, 2022)



## 2.6 Changing risk profile

This risk also changes over time. We know that we are expecting 1 in 100-year events to occur more frequently as sea level rises. What we consider a 1 in 100-year event today could occur every 15-30 years by 2050, every 6-12 years by 2070 and annually by 2120.

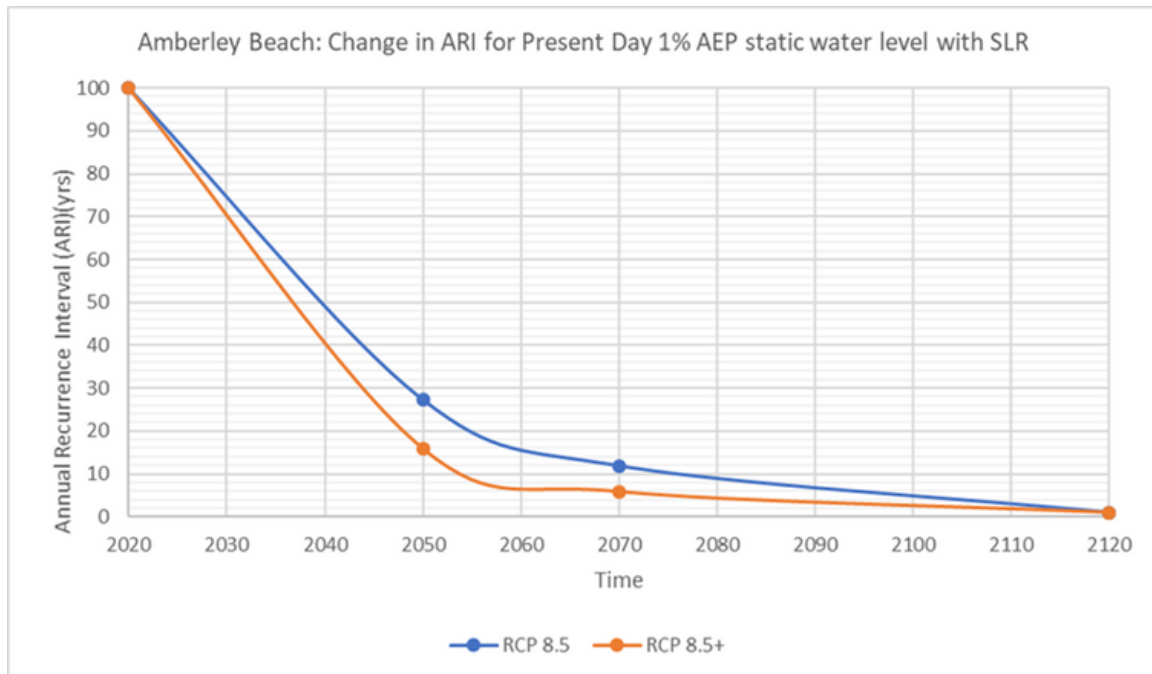


Figure 6: Graph showing the change in frequency of large events

### Box 1: History of the Bund

A manmade bund was first constructed in 1993 in response to coastal flooding in 1992 and extended the full length of the settlement in 2003. The bund requires maintenance every 3-5 years and has been very successful at preventing coastal inundation and has helped to reduce coastal erosion.



Figure 7: Amberley Beach Carpark February 2002 (left) and post 2003 bund renourishment (right)[4]

[4] (DTec, 2009)



## 3 WHAT MATTERS MOST?

Amberley Beach is important to everyone for different reasons. Once we understand what these values are, we can use them to build a decision-making framework – effectively those values become the lens in which we look through when assessing various options. They help ensure that what is important to the community remains the priority.

To understand what matters most to the community Council undertook a survey asking residents to identify what they valued most.

The following objectives were developed from the feedback received:

- Ensure houses are kept free from water and remain insurable and serviceable.
- Retain the small-town community feel whereby residents can feel safe and close to the natural environment.
- Secure and safe access is provided to and from Amberley Beach 24/7.





## 4 WHAT CAN WE DO ABOUT IT?

A long list of possible options was developed which was then narrowed down to a short list of feasible adaptation options that would be suitable to address the hazards at Amberley Beach. The feasibility assessment included how effective, affordable, and consentable options are. The following reports are available:

- Hurunui District Coastal Adaptation Short Listed Options[6]
- Planning Options for Coastal Communities[7]
- Exploring Options for Retreat[8].

The short-listed options were included in the Coastal Adaptation Explorer which we used in a community workshop in September 2022, see Box 2 for more information. From the workshop the following options have been included as part of the possible adaptation pathways.

[6] (Jacobs, 2022)

[7] (Hurunui District Council, 2022)

[8] (Hurunui District Council, 2022b)

## 4.1 The options

### Coastal bund

The coastal bund in its current form is no longer an option. The bund is currently located too close to the sea and does not provide sufficient space for wave energy to dissipate across the beach before it reaches the bund. This causes greater attack on the bund causing higher maintenance requirements. The resource consent for this activity expired in February 2023 and a new resource consent was granted to progressively relocate the bund.



Figure 8: Amberley Beach bund 12 July 2022

### Progressive relocation of the coastal bund

The coastal bund has been effective at preventing coastal inundation and reducing the rate of coastal erosion. The coastal bund could continue to be effective by progressively relocating the bund inland to maintain the width of the foreshore and provide greater space for wave energy to dissipate before it reaches the bund.

The relocation of the bund is proposed to happen progressively with new renourishment material being placed on the landward face of the bund with each renourishment and the front slope regraded to maintain a consistent slope.

As part of this project, it was agreed to apply for a resource consent to progressively relocate the bund up to 25 metres inland. There is also provision to raise the crest of the bund 0.5 metres to offer additional protection from inundation events responding to future sea level rise.



Figure 9: Bund is to be relocated inland with each future renourishment



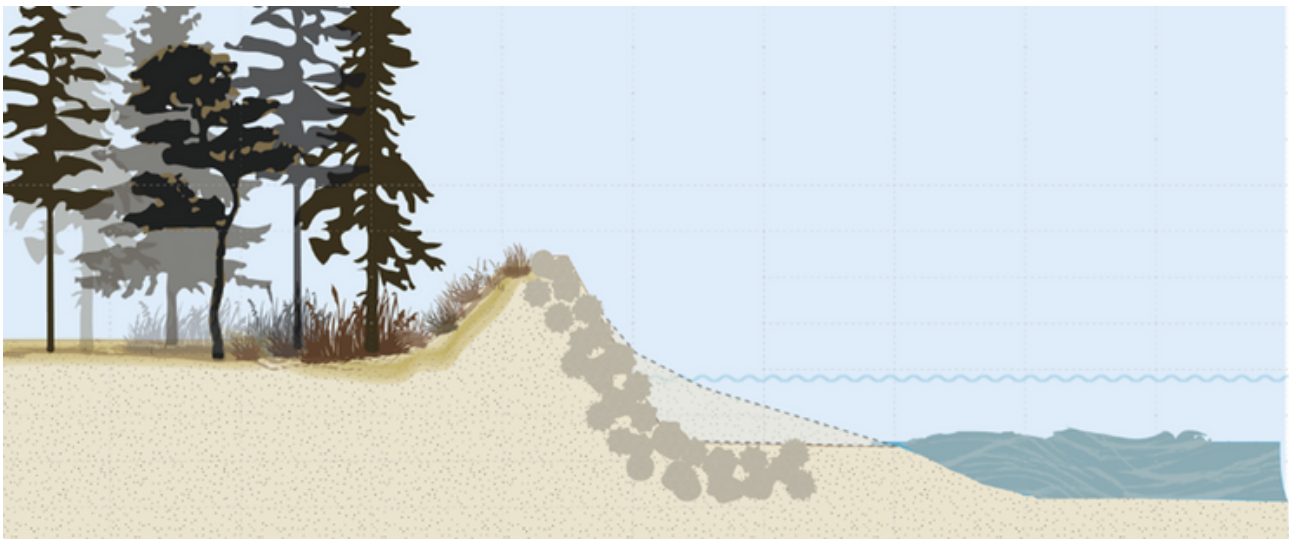
## Rock revetment

An armoured sloping rock revetment could be placed along the length of the existing bund. This would involve an underlayer of filter rock and geotextile topped with large rocks with a diameter of around one metre each. Existing excavated material would be returned to the structure to provide additional protection.

The voids between the armour rocks and the irregular front face dissipate the wave energy helping to reduce

wave runup. This means the wall looks more natural and does not need to be as high as a vertical wall to achieve the same goal.

Rock revetment was the community's preferred hard protection option as it looked more natural than a concrete structure. However, rock revetment could be replaced with any other hard protection option in the pathways outlined in Section 4.2 below.



*Figure 10: Indicative design of rock revetment for Amberley Beach*



## Inundation bund and pump station

An inundation bund could be constructed around the settlement to prevent floodwaters entering the settlement from behind. It is anticipated that the bund would need to be approximately 1.2 metres high and could be grassed over to look more natural. The bund would be connected to the existing coastal bund.

The installation of an inundation bund around the settlement would have the adverse effect of trapping water inside the settlement. This water may be the result of water overtopping the bund, rainfall within the settlement or groundwater ponding. Once water was inside the settlement a pump/s would be required to remove this water as there would be no natural drainage to the sea.

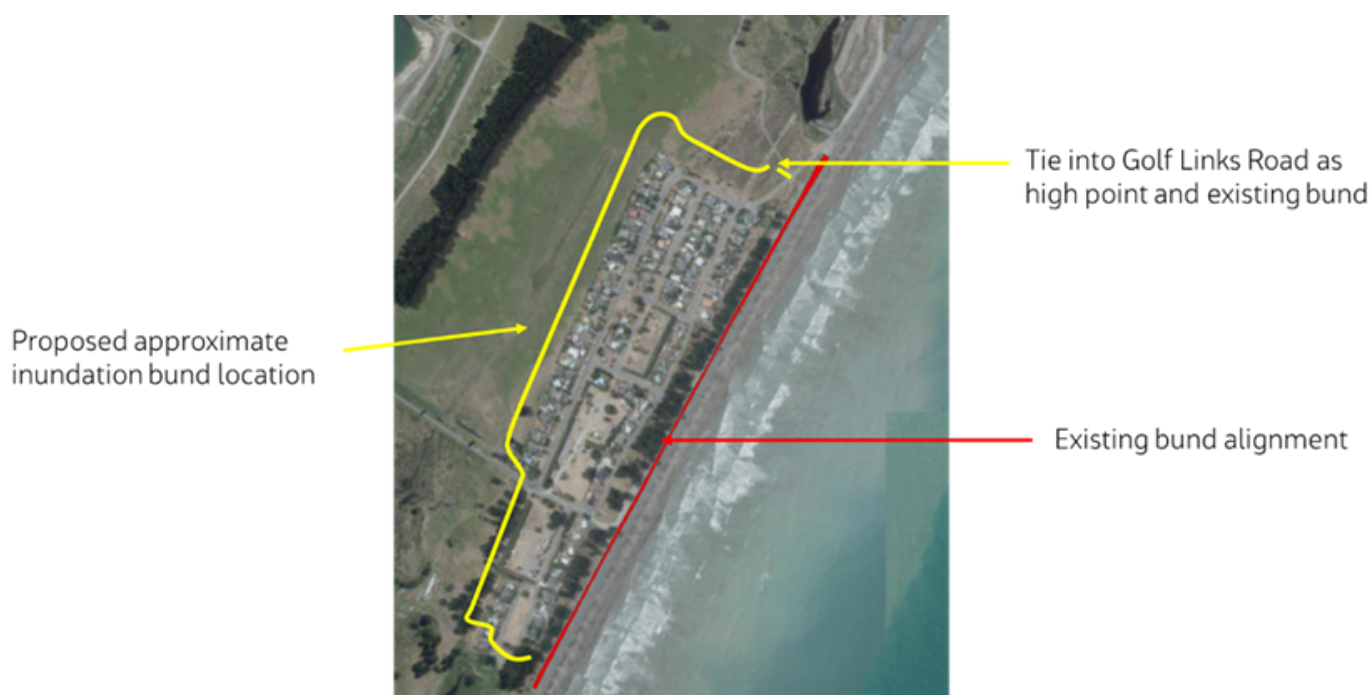


Figure 11: Map showing location of proposed inundation bund





## Managed retreat

Managed retreat is an approach to reduce or eliminate exposure to intolerable risk. It enables people to relocate assets, activities, and sites of cultural significance, away from areas at risk from climate change and natural hazards proactively.

There have been detailed conversations about the possibility of land banking and a potential land swap as an option to help facilitate managed retreat when, and if, required. A proposal for land banking is attached to this Draft Plan for further feedback.

Managed retreat and land banking can work independently of each other. Managed retreat can happen without land banking and land banking does not lock in retreat as the future option. It helps to secure land should retreat be required and provides an opportunity to raise funds to support future adaptation.

This proposal is to be considered further as part of the implementation phase.

## Combination of options

These options do not need to be undertaken in isolation and there are opportunities to combine options to achieve the desired level of protection. Planning options were also considered as part of the Coastal Adaptation Explorer however it was determined that these were best used to support the delivery of other options. Civil Defence Emergency Management can also help provide a backstop should protection works fail.



## Box 2: The Coastal Adaptation Explorer

The Coastal Adaptation Explorer allowed those in the workshop to turn on various options and get real time feedback on the costs, benefits, and effectiveness of an option, or combination of options.

The Explorer works by turning on different options on the lefthand side. Options could be turned on now, in 2050, 2070, or 2120. Multiple options could be turned on concurrently or as one option was no longer effective a different option could be turned on at a later timeframe to provide an additional level of protection.

The graphs at the bottom of Figure 12 show the effectiveness of the option compared to the do-nothing option. For Amberley Beach this looked at the ability to protect private property from

erosion and flooding, and the ability to protect critical roads.

The box in the centre-top shows the financial costs or benefits of an option. The box on the top-right is based on a multicriteria analysis that considers whether the option, or combination of options, would have a positive effect on a series of criteria relative to the do-nothing option. The criteria were based on some of the values the community had provided as part of Phase 2 of the project. It also considers some more practical issues such as whether an option would be able to be consented and whether an option could be adapted in future.

From the workshop we developed a Draft Dynamic Adaptive Planning Pathway which we sought feedback on.

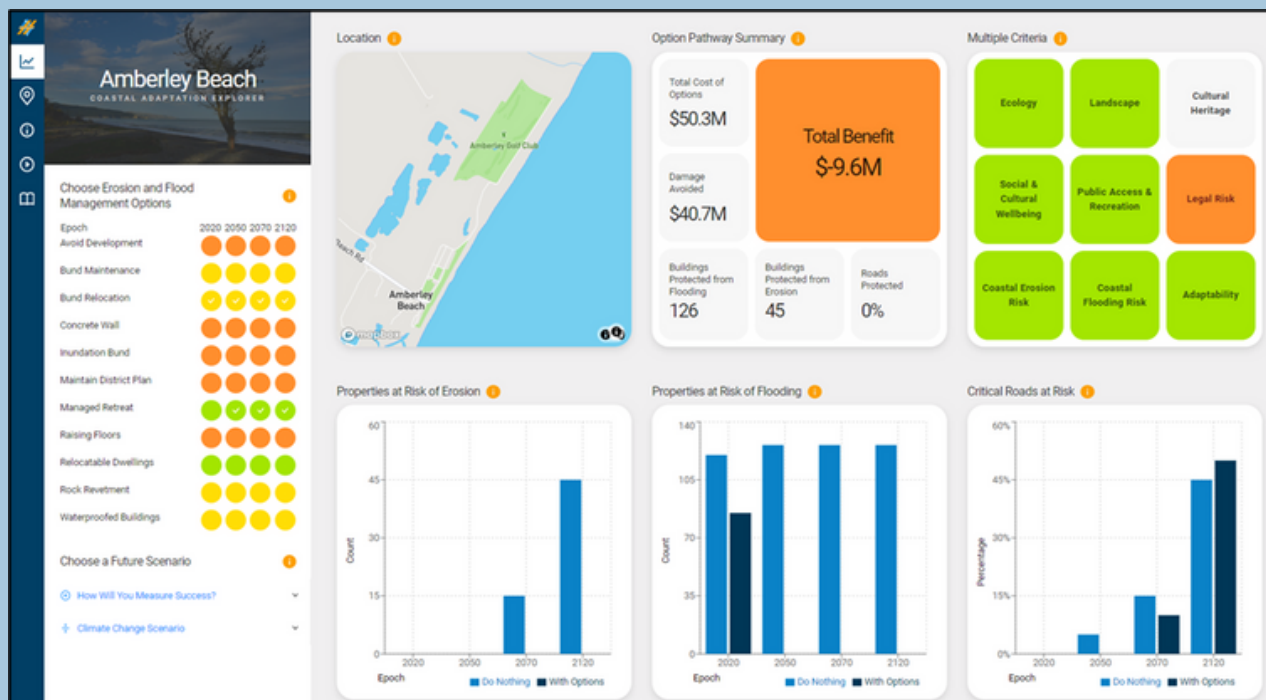


Figure 12: Snapshot of the Options Explorer used to discuss the viability of options with the community



## 4.2 The pathways

Figure 11 shows the pathways that have been identified using the options set out in Section 4.1 above.

A coastal bund currently separates the settlement from the sea. This bund has been successful at preventing coastal inundation and has helped limit the rate of coastal erosion. The original resource consent expired in February 2023 and a new consent was granted in March 2023. This was an agreed action from 2021.

The bund is anticipated to be effective for another 20-30 years. Prior to the bund losing effectiveness a new approach is required. At this point there are two feasible options:

- Hard protection (with the potential for an inundation bund); and
- Managed retreat.

There is the opportunity to install hard protection to extend the lifetime of the settlement prior to undertaking managed retreat. The ability to do so may be limited by the financial burden on the community of trying to simultaneously fund hard protection and managed retreat.

A cost benefit analysis will be required prior to the installation of hard protection to ensure the structure is worth the additional time bought.

## 4.3 Supporting options

Planning provisions and emergency management response were determined to be actions to support the above pathways as opposed to a pathway on their own. An action is proposed in Section 6 to update the Regional Coastal Environment Plan and the Hurunui District Plan to better support the delivery of adaptive planning.

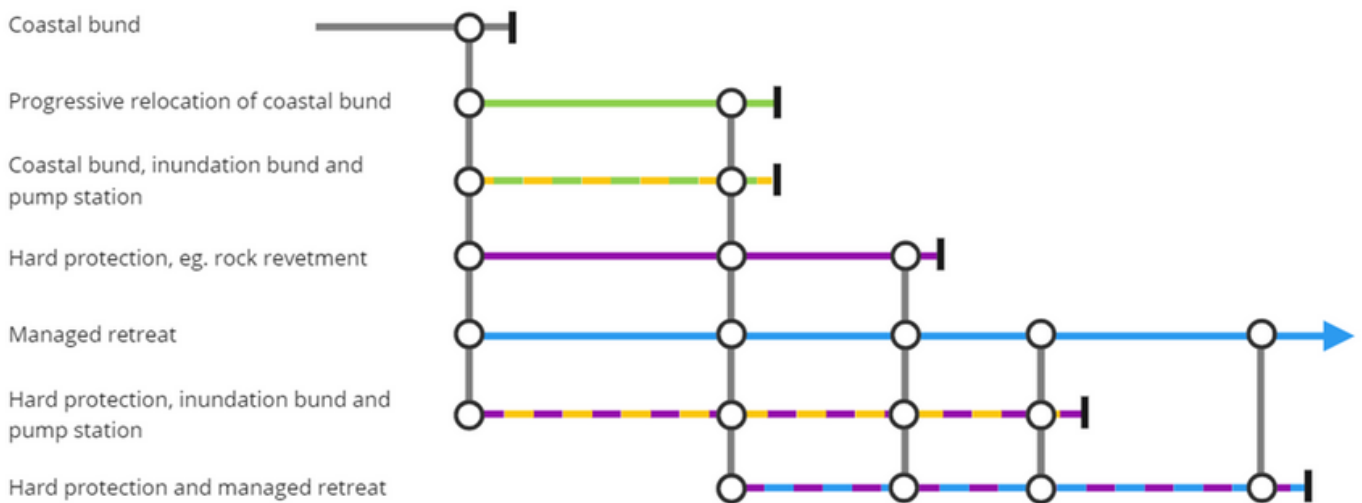


Figure 13: Pathways map for Amberley Beach

# 5 HOW CAN WE IMPLEMENT THE PLAN?

The community has established an adaptation threshold through the development of their community objectives. This is the point where the status quo is no longer tolerable, and change is required before we reach this point.

To determine when we need to act trigger points have been developed. These are based on the lead time to implement various options. The lead time to implement managed retreat via a land swap is estimated to be about 10 years. The trigger needs to be activated before then to ensure we have time to adapt prior to the threshold being reached.

Once two triggers are reached a final decision on the next steps needs to be made. If managed retreat is to proceed work on the subdivision needs to start, including preparing the Plan Change to rezone the land, preparing the subdivision consent and constructing the required infrastructure.

Property owners will also need to start thinking about when and how they may move. If the subdivision is not to proceed design work on hard protection will be required.

## 5.1 Triggers for change

Amberley Beach is at risk of several different hazards. Seven triggers are proposed to capture the various elements of the risk profile and ensure the robustness of the decision-making process. When the first of the seven trigger points is reached Council will initiate a conversation about the next steps. No action may be required at this point, or there might be small actions that can be taken to help reduce the interim risk. When two triggers are reached a formal decision on next steps will be made, if not already required by trigger one. The triggers are designed to provide a 10-year lead in time for the implementation of the next action.

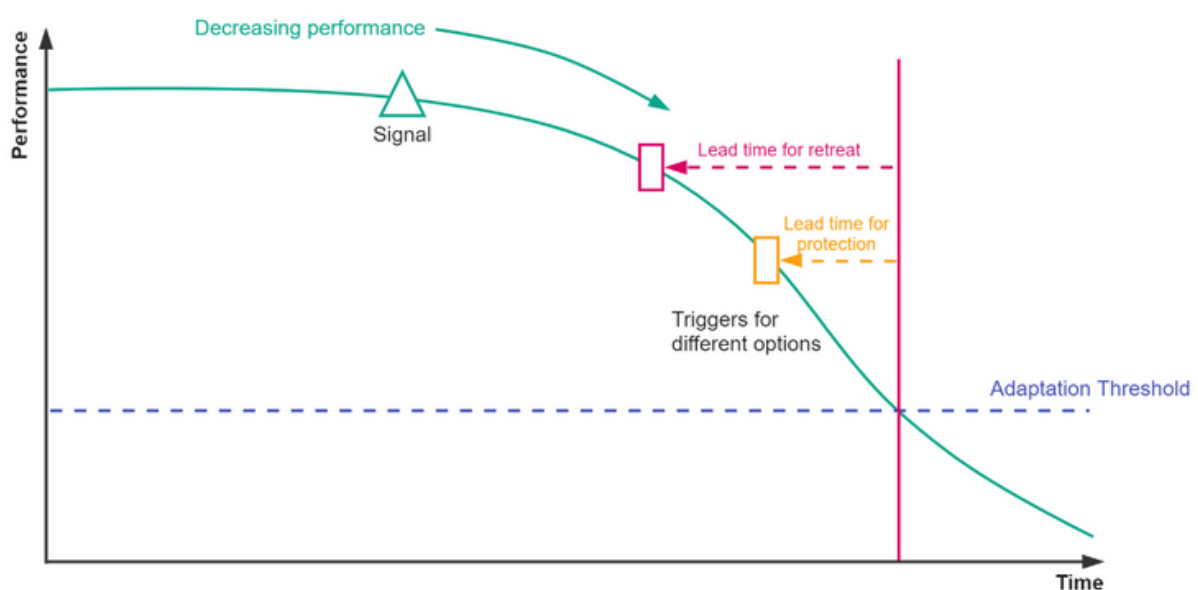


Figure 14: Graph showing the lead time for options relative to the decreasing performance of options. Adapted from (Ministry for the Environment, 2017)



## Trigger: Toe of backslope of the bund is within 5 metres of the nearest property boundary

To remain effective and affordable the bund needs to retreat over time. There is currently approximately 22 metres between the toe of the backslope of the bund and the nearest property boundary. The bund is nearest to properties at the following points:

- Southeast corner of 1 South Crescent,
- Intersection of Chamberlain Avenue and Seaward Drive,
- Southeast corner of 31 Chamberlain Avenue.

After each renourishment measurements will be taken from the backslope of the bund and the nearest points. The trigger point is reached when the bund needs to be located at or about 5 metres from the property boundary.

## Trigger: First dwelling loses flood insurance

Insurance companies manage the risk they are willing to take on across their portfolio. They can choose not to renew a policy or to increase premiums and excesses to manage the increased risk. Insurance retreat is likely to occur gradually. This is likely to involve premiums and excesses increasing in advance of full withdrawal.

Insurance is important to property owners for financial security, but in many cases is a condition of the mortgage on the property. A trigger is reached with the first dwelling is unable to obtain flood insurance. There are instances in the Hurunui District where sheds and garages are unable to obtain insurance already. The loss of insurance to sheds and garages, and the increase in premiums or excesses can be treated as signals of eventual insurance withdrawal.

## Trigger: Cost of bund renourishment rate increases from \$238.60 to \$750 per year (inflation adjusted)

The bund is funded by the community through a Beach Erosion Protection Rate. In the 2022/2023 financial year this was currently \$238.60 per property. Progressively relocating the bund inland helps to reduce the amount of maintenance required. Holding the bund in a static footprint requires more frequent renourishments of new material and therefore increases the cost. The community work with ReadyMix who provide them favourable rates for renourishment. If this arrangement is no longer available, the cost of renourishment could increase significantly.

Regular drone footage can measure the annual volume loss of bund material. This information can be used to help forecast the money required for renourishment. When the Beach Erosion Protection Rate is required to increase to \$750 per year (inflation adjusted), the trigger point is reached.

## Trigger: Two flood events occur with water depths of more the 0.15 m in any 12-month period

Water may pond within the settlement from a variety of sources. These events may occur individually, or they may occur together. For example, one massive rainfall event could cause ponding. Alternatively, an average rainfall event could cause similar flooding due to the high groundwater table at the time of the rain.

Most of the dwellings within the settlement have a finished floor height of around 0.3 m although there is some variation to this. If two floods of 0.15 m occur within 12 months, they have a return period of around 1 in 6 months. At this point a flood of 0.3 m has a return period of around 1 in 3 years. This would mean we would expect dwellings to be inundated every 3 years in normal conditions.

A static post will be installed at the following locations to record the depth of flooding at these locations:

- Southwest corner of the Southern campground
- Intersection of Grierson Avenue and Holton Road.
- Intersection of Grierson Avenue and Laverys Drive.

## Trigger: 0.05 m or more of water ponds at the recording posts for a continuous period of more than 20 days

Persistent shallow ponding can cause health and nuisance issues. The continuous duration of standing water is considered to be a greater issue than the number of days an area is wet in any given year.

The 20 continuous day requirement would mean that the area could experience 0.05 m of water for 15 days, 0.02 m of water for a few days and then another long period of standing water. The clock resets each time the water recedes even if the ground does not dry out.

A static post will be installed at the following locations to record the duration of flooding at these locations:

- Southwest corner of the Southern campground
- Intersection of Grierson Avenue and Holton Road.
- Intersection of Grierson Avenue and Laverys Drive.



### Trigger: A major event requires over 30 dwellings to rebuild

Should a significant hazard event require over 30 dwellings to rebuild a trigger point is reached. This may be the result of any hazard including, but not limited to, wildfire, earthquake, flood, or tsunami. At this point careful consideration needs to be given to the cause of the disaster, and where and how the dwellings are rebuilt.

There is never going to be a cheaper time to adapt than after an event with the assistance of insurance money. If dwellings are to be rebuilt in the same position, adapting might involve building relocatable dwellings.

## 5.2 Supporting information

The following additional triggers have been identified. They are not proposed as triggers due to the lack of current information or the annual variation in the data. This information is considered valuable to assist decision makers in confirming that a new action should be taken.

### Rising groundwater trends

There is limited groundwater monitoring data available. If continuous or regular groundwater level monitoring was undertaken there is the opportunity to monitor the changing trend or lack thereof. The major limitation of this is it would take some time to establish the existing state and determine a trend. No groundwater trigger is proposed but there is an opportunity to consider any information alongside the trigger points in a decision-making process.

### Trigger: Significant capital works are required

It is not anticipated that any infrastructure in Amberley Beach will require significant capital works in the next 30 years. Current infrastructure will continue to be maintained until it is no longer required. If significant capital works are required a trigger point is reached. At this point the community and Council will need to decide if investing in the works is a good investment for the community.

This trigger applies to three waters, roading and other Council infrastructure including reserves.

“Significant” includes any construction or placement of any new long term assets or works above and beyond maintenance or minor improvements.

For the avoidance of doubt the ongoing maintenance of the bund is not considered significant capital works for the purpose of this trigger.



### Sea level rise rises 0.11 m (from 2020)

Sea level varies from year to year; a midpoint is used to average out the variations. We can continue to follow the rate of sea level rise to help determine which sea level rise scenario we should be using for decision making. Due to the year-to-year fluctuation, as well as uncertainties in beach response, it is not considered a suitable trigger on its own.

### Civil Defence Emergency Response Capacity Impacted

Civil Defence Emergency Management have several roles but most visibly they are the lead agency when disaster strikes. Their work helps minimise the risk to the community through helping with evacuations if required and supporting recovery. If proactive evacuations are occurring regularly or their capacity to respond and assist in a disaster is limited, the risk profile to the community changes. This may trigger a discussion about the need to do things different or earlier.

### Lagoon mouths are unable to be opened

There is a health and safety risk to having a contractor open the lagoon mouths. This risk is likely to increase over time. There may come a point when Council is no longer able to offer this service as the risk is too great, the cost is prohibitive, or Council is unable to obtain the necessary consent. If this point is reached some consideration will need to be given to how the flooding risk is mitigated.

### Half of property owners request action sooner than planned

The triggers aim to capture the various elements of risk to ensure we all agree on when change is required. As the risk increases there may come a time when the community is no longer comfortable with the level of risk. If the community are no longer comfortable with the risk, they may choose to write to Council requesting that this Plan be implemented sooner.

It is difficult to determine what the right number of property owners is. Absentee owners may be more ignorant of the increasing risk or there may be property owners that will never engage in a process. A request from the community may trigger a review of the Plan.



# 6 REQUIRED ACTIONS

## 6.1 Maintaining the status quo

### Action: Development of a Bund Management Plan

Lessons have been learned over the previous 30 years of bund renourishments. The works rely heavily on a few individuals within the community who have a good understanding of what is involved. It is important that this information is documented to ensure that the knowledge does not leave the settlement and that decisions can be made swiftly when required. There is also an opportunity to document funding arrangements and consent requirements.

**WHO:** Hurunui District Council and Amberley Beach Residents and Ratepayers Association Subcommittee  
**FUNDED BY:** Hurunui District Council and individuals  
**STATUS:** Subcommittee appointed

### Action: Managing existing stormwater

Hurunui District Council hold a Global Stormwater Discharge Consent and associated consents to enable works to improve stormwater management in the Amberley catchment.

Opportunities for improvements will continue to be identified through the Stormwater Management Plan.

**WHO:** Hurunui District Council  
**FUNDED BY:** Hurunui District Council  
**STATUS:** Ongoing

### Action: Maintain existing Levels of Service

No capital works are proposed within the settlement. Council will however continue to maintain the existing infrastructure to the agreed Levels of Service. Levels of Service are set in the Long-Term Plan which is reviewed every three years. The community can submit on the Long-Term Plan if a higher Level of Service is required. Submitting on the Long-Term Plan is free but there may be a cost to the community if the Level of Service is to be increased.

When a trigger has been reached the Levels of Service may be adjusted to reflect the proposed action.

**WHO:** Hurunui District Council  
**FUNDED BY:** Hurunui District Council and Amberley Beach settlement  
**STATUS:** Ongoing



## 6.2 Monitoring actions

### Action: Shoreline monitoring

Environment Canterbury currently undertake annual State of the Environment monitoring. This currently includes annual shoreline profiles. There is an opportunity to compliment this with a topographical drone survey of the Amberley Beach bund and the coast north to, and including, the Waipara River Mouth.

This survey is to be undertaken every six months, to capture changes over the winter period, and the recovery of the beach during the summer period.

**WHO:** Environment Canterbury

**FUNDED BY:** Environment Canterbury

**STATUS:** Committed to

### Action: Investigating changes in sediment supply

Ki utu ki tai refers to the interconnected between the mountains and the sea. Amberley Beach is assumed to have been historically replenished with gravels from the Waipara River. However, in recent decades this process seems to have ceased or has significantly reduced, contributing to accelerated coastal erosion rates along the frontage of the Amberley Beach Settlement.

A brief for a student project has been lodged with the University of Canterbury to understand whether sediment supply and transport from the Waipara River has been reducing, and if so, to identify the changes, to understand if these changes can be reversed, and to get a better understanding of what we can expect in future.

**WHO:** University of Canterbury

**FUNDED BY:** University of Canterbury

**STATUS:** Proposed but awaiting a suitable student

### Action: CoastSnap monitoring

CoastSnap is a community monitoring program where people can use their mobile device to take a photo of the beach state from a fixed point. The observations can be used to track changes in the shoreline. A stand was installed at the northern end of the Amberley Beach carpark in November 2022.

To use the CoastSnap stands anyone can place their phone sideways in the cradle and take a photo. These can be uploaded on the CoastSnap app, shared via social media with the hashtag #CoastSnapAmberley or emailed to coastal@hurunui.govt.nz.

Photos gathered will be compiled to form a time lapse where we can view the change over time.

**WHO:** Hurunui District Council

**FUNDED BY:** Hurunui District Council

**STATUS:** Installed

### Action: Review new information and update this Coastal Adaptation Plan

The future is uncertain. This Plan has been developed using the best information available at the time of preparing the Plan. The information this Plan relies on is constantly being refined and updated. It is appropriate that the content of this Plan is periodically reviewed to ensure it remains fit for purpose. This may include:

- Considering updated sea level rise predictions and their impact on coastal hazards and the need to adapt.
- Updating possible options if new technologies or legislation emerge.

**WHO:** Environment Canterbury (science) and Hurunui District Council (policy and engagement)

**FUNDED BY:** Environment Canterbury (science) and Hurunui District Council (policy and engagement)

**STATUS:** Committed to





### 6.3 Preparing for change

**Action: Bund consent renewal**

Works within the Coastal Hazard Zone require a resource consent from Environment Canterbury. A new consent was granted in 2023 for a 30-year duration. Renewal of the bund consent will continue to be sought until the triggers within this Plan are reached or Environment Canterbury advise they will not grant a renewal.

**WHO:** Hurunui District Council  
**FUNDED BY:** Hurunui District Council  
**STATUS:** 2023 Application Granted

**Action: Proposal to land bank**

Land banking has been proposed as a mechanism for enabling managed retreat. Council will prepare an engagement document if there is sufficient support from the community to proceed with the proposal.

**WHO:** Hurunui District Council  
**FUNDED BY:** Hurunui District Council and Amberley Beach Community  
**STATUS:** Pending further engagement



## 6.4 Conditional actions

The following actions are dependent on the options adopted by the community.

### Conditional Action: Purchase of land

If land banking receives sufficient support Council will purchase a suitable parcel of land and arrange for a legal agreement to be drawn up with landowners.

**WHO:** Hurunui District Council

**FUNDED BY:** Hurunui District Council and repaid by the Amberley Beach Community

**STATUS:** Proposed

### Conditional Action: Plan Change to the Regional Coastal Environment Plan and Hurunui District Plan

The existing Coastal Plan rules are not fit for purpose and require changes to allow for adaptive planning and continued enjoyment. There are opportunities to streamline the consenting process for property owners. If managed retreat is to be undertaken there are additional planning changes required to implement this.

**PREPARED BY:** Hurunui District Council

**FUNDED BY:** Hurunui District Council

**STATUS:** Awaiting completion of adaptation planning and the Climate Adaptation Bill

### Conditional Action: Changes to the Long-Term Plan

Funding for adaptation actions needs to be included in the Long-Term Plan. This will be notified in May/June 2024.

**PREPARED BY:** Hurunui District Council

**FUNDED BY:** Hurunui District Council

**STATUS:** Awaiting completion of adaptation planning





# 7 REFERENCES AND ADDITIONAL INFORMATION

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