

Port Waikato Coastal Hazards

Prepared for the Waikato District Council

By

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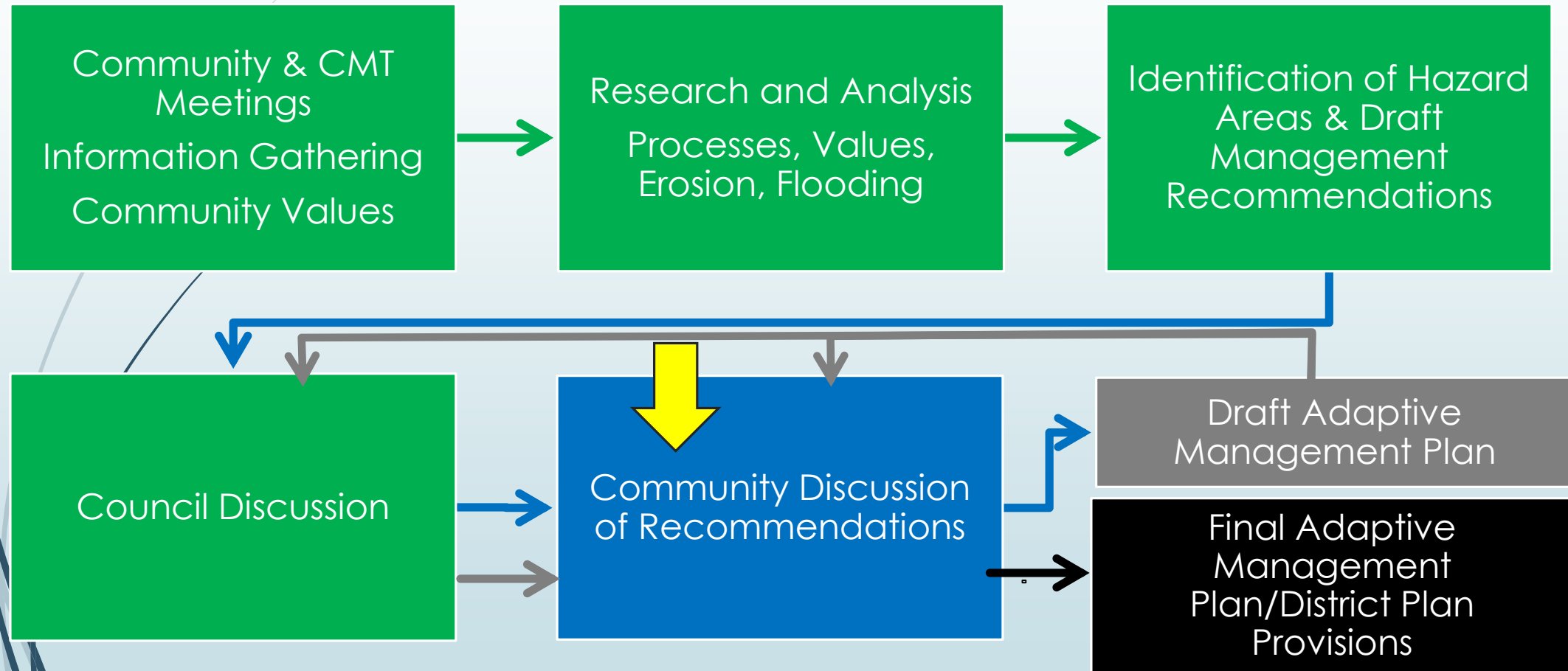
Objectives

Waikato District Plan review – natural hazards.

Work with local communities, landowners and Iwi to:

- Identify areas potentially at risk with existing sea level
 - Identify the additional areas that could be affected with projected future sea level rise
 - Develop adaptive management strategies that clearly identify how existing and potential future risk will be managed
-
- Focus on Raglan and Port Waikato

Methodology Overview





Purpose of this Meeting

- Second round of community meetings to:
 - Outline findings in regard to areas of existing and potential future risk (and associated uncertainties)
 - Outline and discuss options for the management of current and potential future hazard risk areas

Sea Level Rise

- National Policy:
 - must plan for 100-150 years
- Huge uncertainty, cannot simply extrapolate past trends
- Must use “plausible scenarios”
 - Intergovernmental Panel on Climate Change (“IPCC”) scenarios - relate to future emissions and management
 - National guidance from Ministry for the Environment from these studies – tells us what to use.

<http://www.mfe.govt.nz/climate-change/technical-guidance/guidance-local-government-preparing-climate-change>

Scenario	2070	2120
Lower bound “surprise”	0.32 m	0.55 m
Intermediate	0.36 m	0.67 m
High+ (85 th percentile)	0.61 m	1.36 m

Adaptive Planning – Decision Cycle

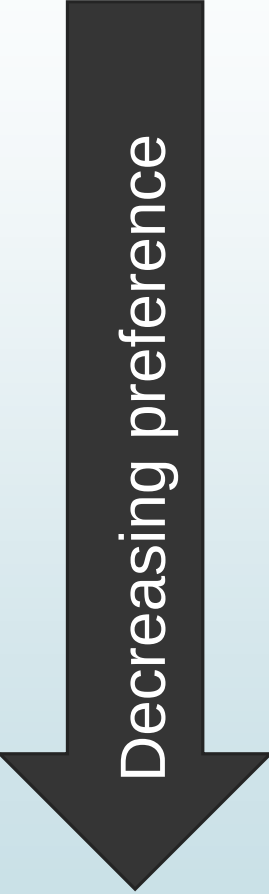
Much uncertainty so need a flexible and adaptable approach to planning

Five key stages:

1. Building a shared understanding (processes, hazards, community resilience)
2. Exploring the future and how communities are affected and identifying objectives
3. Building adaptive pathways
4. Implementing the strategy in practice
5. Monitoring the strategy using early signals and triggers (decision points) for adjusting between pathways.

This study is currently working with WDC, WRC and local communities and stakeholders on Items 1-3

Management Options and Philosophy: National and Regional Policy (NZCPS 2010, RPS)

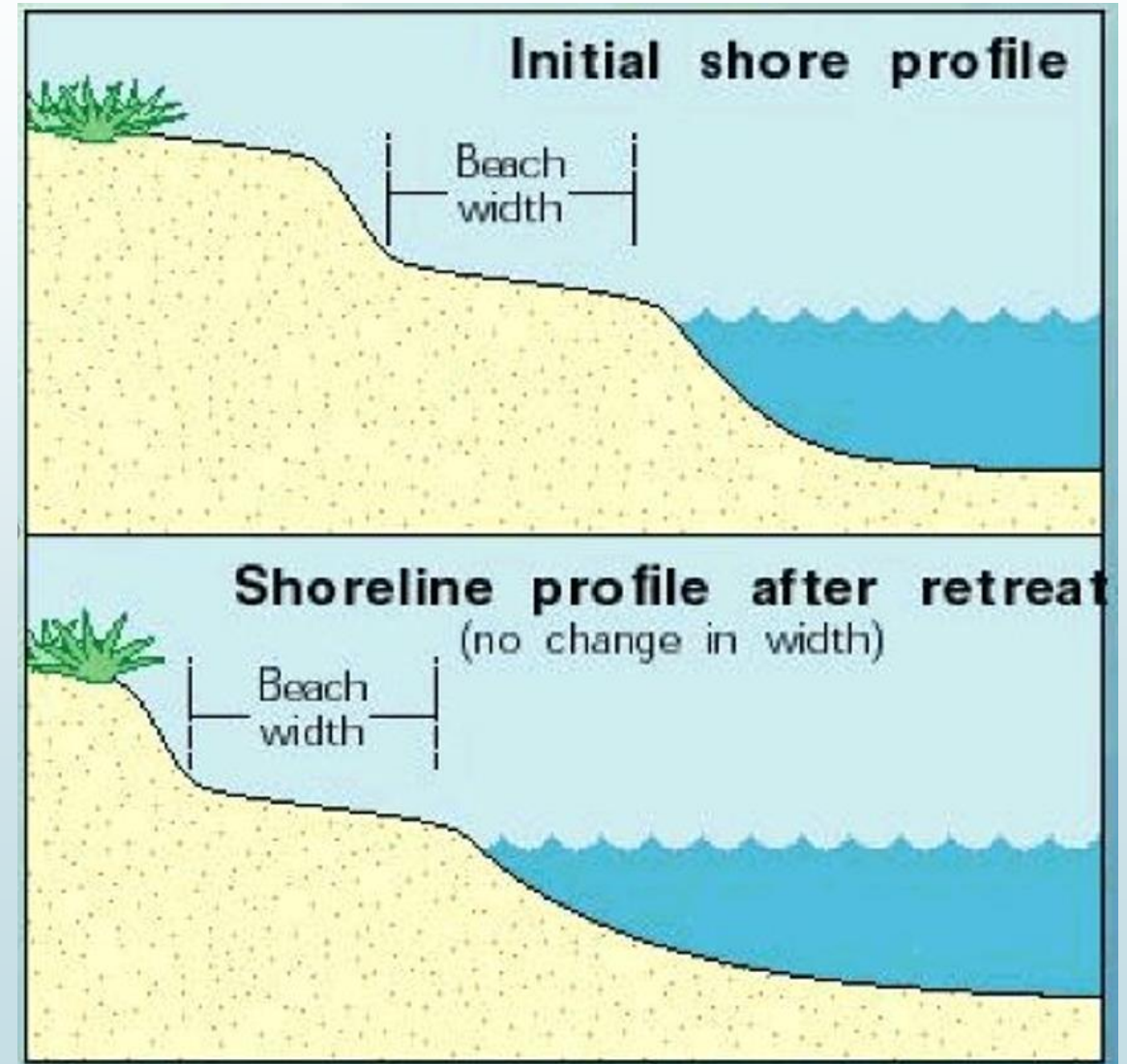


Decreasing preference

- **Risk avoidance** - Managing land use in hazard risk areas to avoid risk.
Landward relocation of assets to a safe location
- **Risk reduction** - Managing land use and development to reduce existing risk exposure over time
- **Living with erosion** – accepting erosion where appropriate
- **Mitigation of erosion** through protection and restoration of natural buffers (e.g. beaches, dunes, wetlands)
- **Soft engineering** measures which mitigate erosion **using** natural buffers (e.g. beach nourishment)
- **“Hard” engineering structures**, including new or existing sea walls or rock revetments. Traditional emphasis – now last resort for most areas. Significant challenge

Coastal Structures – why a last resort?

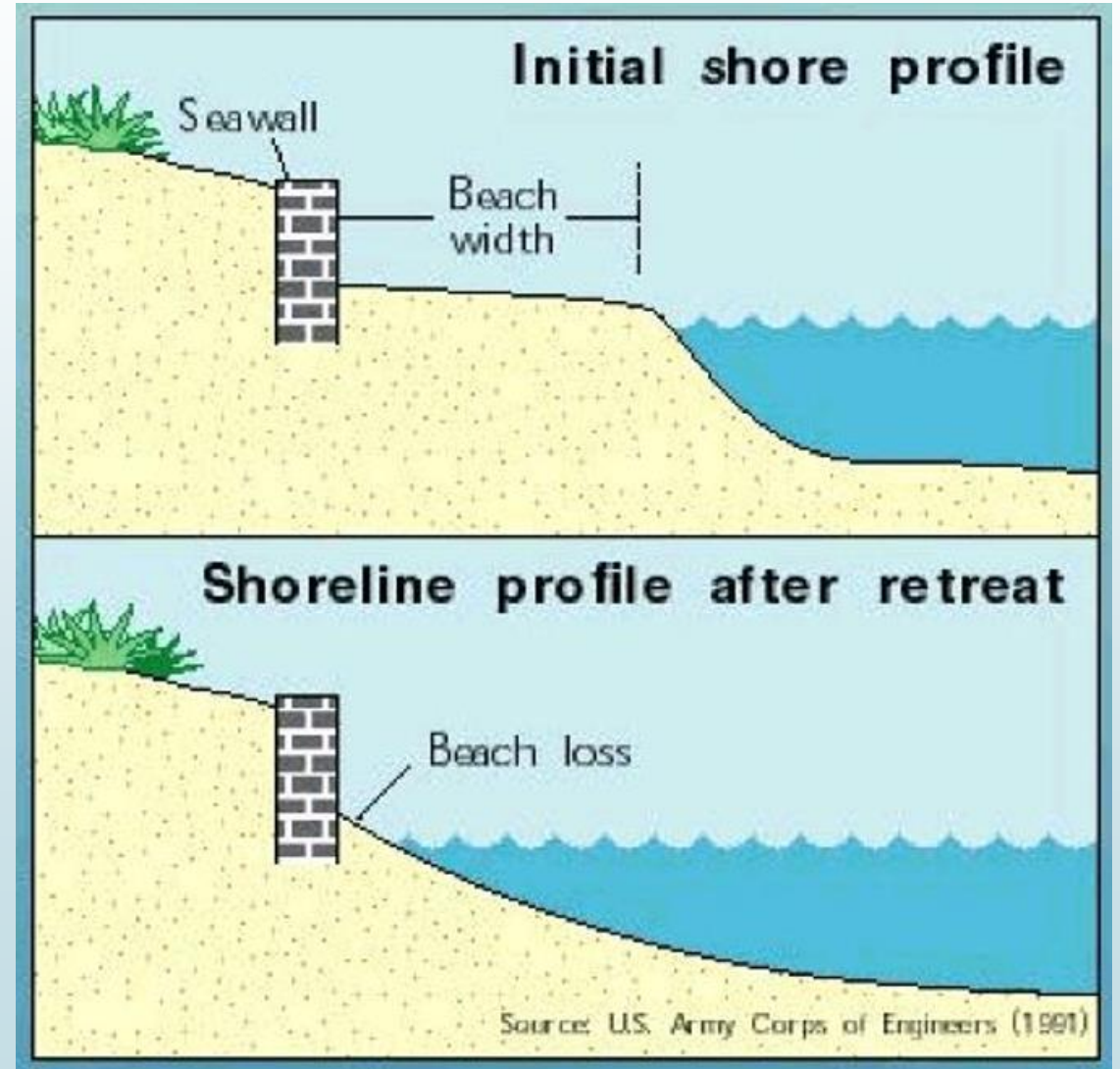
- When erosion occurs on a natural beach, the whole profile moves landward
- A wide high tide beach will re-establish after erosion
- Erosion does not destroy beaches as long as the erosion encounters sand



Coastal Structures – Effect on beaches

- Building an effective seawall protects the land behind the wall
- A seawall does not stop the processes driving erosion in front of the wall
- The beach continues to erode, and over time the beach disappears
- Recreational values are lost and public access alongshore also adversely affected

So, generally not an acceptable long-term solution on sandy shorelines.





Possible Management Approaches

At any given site there are a range of options for managing coastal hazards. Different methods will suit different sites.

- Development setbacks and associated controls – to avoid and reduce risk and to inform on existing and longer term risk
- Minimum floor levels to protect from flooding
- Controls/guidance on use of structures in the coastal margin
- Coastal restoration and soft approaches as relevant – e.g. restoration and enhancement of beaches, dunes and coastal wetlands, working with nature
- Adaptive management strategies and triggers will be required at some sites
- Coastal structures – limited, but may have a role in transition



Adaptive Management Approaches

In some places, there is development and infrastructures already at risk from coastal hazards and the issues and interests are complicated.

Need to work towards a solution that reflects public and private interests and reduces coastal hazard risk over time.

Requires a decision-making framework that is neither “business as usual” nor a radical (expensive, impractical, etc) “overnight” fix/change.

Aim is to ensure a transition to more sustainable management over time.

Will be very challenging and require time. May take decades to implement change.

May take more than one meeting to reach agreement among all stakeholders. Requires patience and open dialogue.

Open West Coast Beaches

- High energy wide sandy beaches
- Inter-connected beaches from Taranaki to Cape Reinga
- Dominant northerly longshore sediment transport over time
- “Slugs” of sediment moving into and through the system.
- Shorelines experience fluctuations over time scales up to centuries - complex
- Much uncertainty



Port Waikato 1940s

- Photograph taken early 1940s
- Spit much shorter than modern day
- Yellow line is digitised shoreline from this photograph

Port Waikato 1970s

- Yellow line is 1940s shoreline
- Significant erosion on northern shore of River entrance
- Spit has extended northwards



Port Waikato 1990s

- Spit continues to grow northwards and widen at the base
- Yellow line is digitised shoreline from 1940s photograph





Port Waikato Recent times



Summary of Port Waikato Change

- 1940s – 2002
 - Increased in length by approximately 1,200 m
 - Increased in width by approximately 300 m
 - Open coast beach accreted by 70 m at Township.
- 2002 – present
 - Very little change in length
 - Open coast shoreline eroded by ~50 m at Township
 - River shoreline eroded by ~60 m

Recent (Dec 2017) View of Erosion



Recent (Dec 2017) Views of Erosion





Township Foreshore

Looking backwards ... Looking forward...

► Looking backwards (shoreline changes near surf club 1940s to present):

- 1940s to 2002 – advanced by 70-80 m
- Since 2002 – eroded by about 50 m
 - 1997 – 2002 = relatively stable/minor changes
 - 2000 – 2012 = eroded at 1-2 m/yr
 - 2012 – present = eroded at 5-7 m/yr
 - Average rate of erosion since 2000 = 2.5-3.0 m/yr, but very variable.



Township Foreshore

Looking backwards ... Looking forward...

► **Looking forwards - Possible future change:**

► **Very uncertain**

- Shoreline may just be fluctuating on multi-decadal cycle, not yet back to 1940s position
- However, could be more complicated than that - so erosion might also just continue
- Erosion likely to be aggravated by future sea-level rise

► **IF erosion continues :**

- Private properties could be directly affected within 1-3 years if current high rate of erosion continues.
- Even at slower rate (i.e. average rate of 1-2 m/yr 2000-2012, entire front row of properties and Surf Club could be severely eroded within 50 years.

Cannot reasonably predict – need to be precautionary



Looking forward...

- Sea level rise effect likely to aggravate erosion
- Much uncertainty:
 - Don't know if erosion will continue to accelerate.
 - Sediment supply may increase and erosion may slow or stop. Possible that current erosion trend will cease
 - Uncertainty around longer term potential for spit breaching

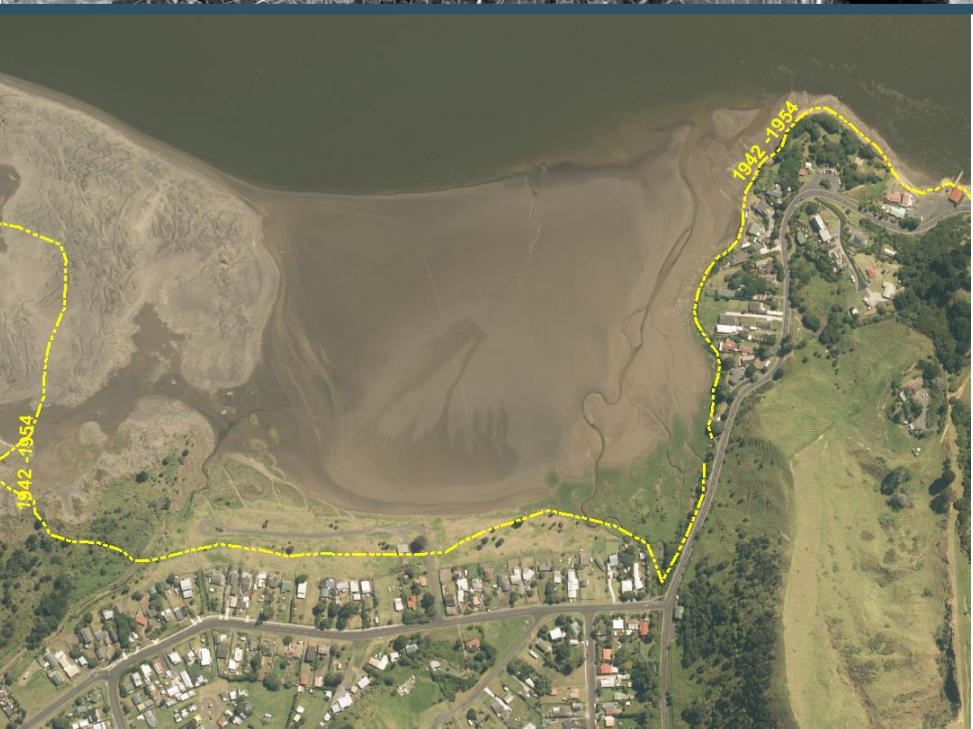
Sunset Beach: Coastal Erosion Management

- Living with erosion: no cost-effective and appropriate options to hold the shoreline with present technology
- Deep beachfront sections provide opportunity to retain use for a period by landward relocation of dwellings on site
- Trigger for relocation to be determined with owners
- Surf club buildings and other amenity infrastructure needs to be designed to be readily relocatable
- Beachcare dune restoration work useful to assist natural dune building and repair
- Access difficulties (e.g. surf club rescue) during erosion periods can be readily managed and integrated with dune restoration work



Maraetai Bay

- Small shoreline changes
- Overall trend for accretion since 1940s
- Sea level rise may exacerbate erosion



Red line – 2012 shoreline

Yellow line – 1940s shoreline

Water Level RL(MVD-53): 3.2 m

Maraetai Bay

- ▶ Low lying - potentially vulnerable to increased inundation with sea level rise
- ▶ Minimum floor levels likely to be the main requirement

Figures show:

Top: approximate current extreme storm level

Bottom: extreme storm level with 0.5 m sea level rise

Source: Waikato Regional Council inundation tool

<http://coastalinundation.waikatoregion.govt.nz/>

Cobourne Reserve Area



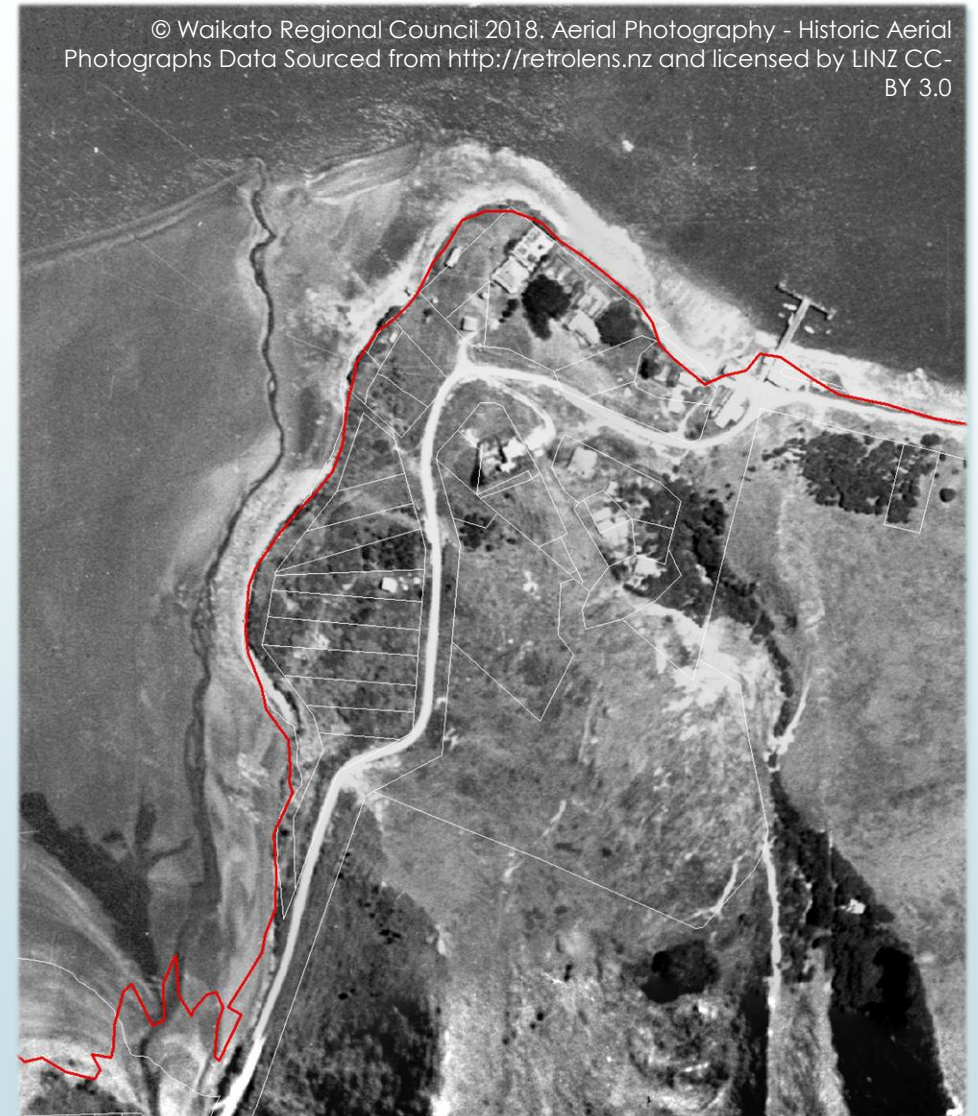
Cobourne Reserve Area



Cobourne Reserve Area

- Relatively stable shorelines, eroding only very slowly on eastern side
- Sea level rise may aggravate erosion
- Some low-lying areas (3-5 m RL)
- Reserves along entire foreshore
- Various private benefit works on public land

Red line – 2012 shoreline

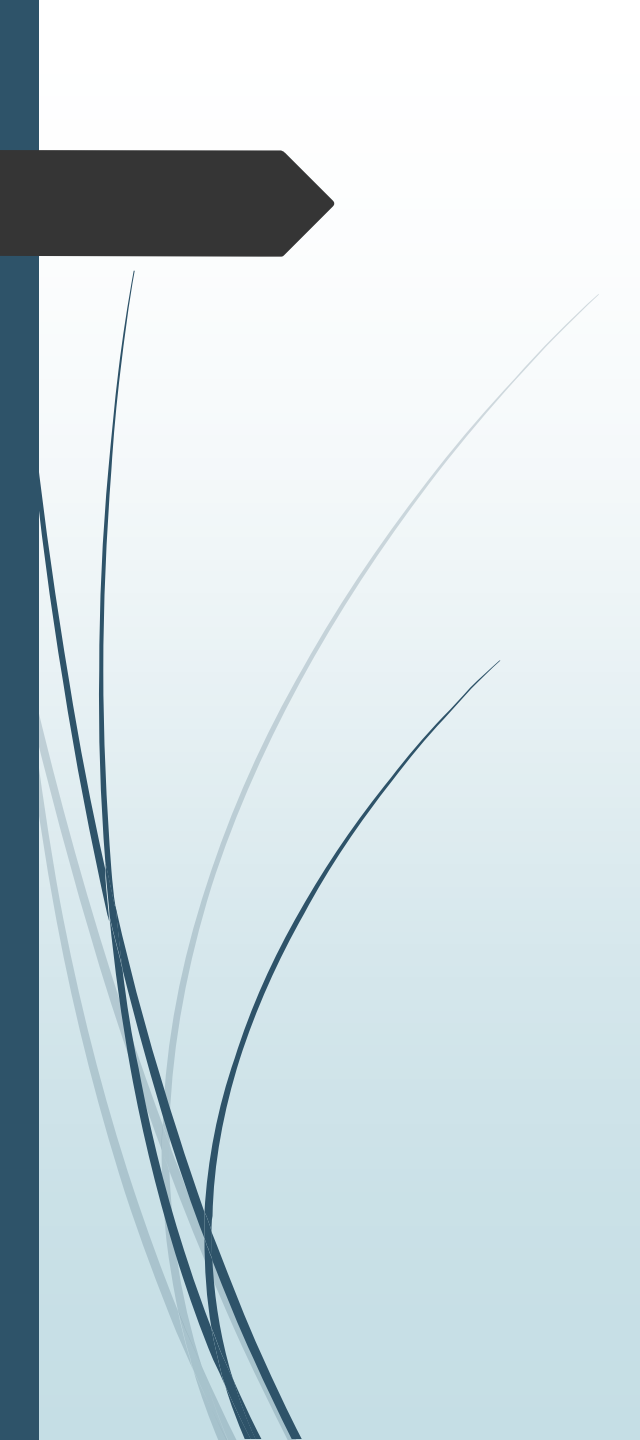


Cobourne Reserve Area

- Generally deep private properties with considerable resilience
- Could live with erosion using setbacks and development controls

Yellow line – 1940s shoreline





Discussion