

Briefing Paper: Climate Change Programme – Adaptation Update

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Ngā whāinga | Purpose

Due to cyclone Gabrielle we are aware there is pressure to answer questions on Council's response to Climate Change. The purpose of this briefing is to provide elected members with an overview of the plan and progress to establish climate change adaptation.

Horopaki | Context

The Joint Climate Change Adaptation Committee and Mayoral forum met on February 20th following the impacts of Cyclone Gabrielle. The Mayoral Forum has asked for lessons and recommendations post-Gabrielle from the emergency response teams across the region. The Joint Committee meanwhile has asked for clearer actions from the Climate Adaptation te Tai Tokerau working group. Both are being prioritised due to the public attention and may create opportunities for direct implementation and greater support for climate change planning.

The Climate Change Programme is working to deliver on FNDC's Climate Change Roadmap which has four focus areas. This briefing paper provides an update on two of the focus areas (Community Adaptation and Council Adaptation). A subsequent report will update members on developments in the remaining focus areas (Council Mitigation and Community Mitigation).

For the community adaptation focus development over the last few months can be summarised as focussing on:

- Quantifying adaptation pilot costs, timings, and resource requirements estimates to ensure a pilot decision is setup for success.
- Update to the council communications website and materials in preparation for wider engagement.
- Joint Climate Change Adaptation Committee reporting for new members, including a review of progress against priority actions.
- Climate Change Te Tai Tokerau working group scoping of shared resources arrangements.

For the council adaptation focus

- Preparation has begun to engage consultants to review potential council infrastructure impacts to support high-level infrastructure strategies and long-term planning. This requires alignment between infrastructure teams but will accelerate post restructure to align with LTP planning timelines.
 - For District Facilities and 3 Waters the accountabilities between planning and operations are being established through the restructure. Once completed this should progress quite quickly.
 - For Transport there are opportunities that NTA's current roading risks assessments cover medium-term projected climate variation. Longer-term considerations and alignment across council's approach is likely to be the focus.

Ngā kōrerorero | Discussion

What is involved in a climate change adaptation project?

The recommended process for adaptive pathway planning issued by Ministry for the Environment has ten distinct steps and has been used in Aotearoa for the last 10 years. Reviewing other such projects from Hawkes Bay, Thames-Coromandel and Kaipara, we should expect a pilot project to take between 12 and 24 months from formation of a community planning group.

Attachment 1 shows the recommended model with estimated timing at each step. This will be used to support better future planning of budgets, breakdown of resourcing and capability requirements for planning the forward programme for community adaptation projects.

An alternative process for delivery, Te Ao Māori Framework, is in draft stages by Climate Adaptation Te Tai Tokerau led by Whangarei District Council. It is hoped that this might be available for a pilot, but details are yet to be released on the framework.

Attachment 3 shows an example of an Adaptive Pathway Plan. The output is short despite the community engagement that was involved and shows how the plan is intended to adapt to different scenarios over time.

How soon can we make a pilot decision at Council?

The emerging options for Council based on high-level risks assessments and community discussions include:

- A) **Kororareka/Russell** – we have an indicative support from members of Resilience Russell. A wider community panel needs to be strategized but a pilot project is viable from a community engagement point of view.
- B) **Whangape/Pawarenga** – we are in the process of establishing contact, interrupted only by Cyclone Gabrielle this last two weeks.
- C) **Awanui** – we have reached out to community groups and Ngati Kahu, but meetings are yet to be held. This should indicate whether pilot project is viable and feed into the decisions report.
- D) **Waitangi/Paihia** – Conversations with Waitangi to confirm if an opportunity is available to partner with them on their existing climate change work.
- E) **Waipapa/Kerikeri** – An opportunity to integrate climate adaptation planning into spatial integrated planning processes. Climate change is already a factor in this discussion, so integration of the adaptive pathways planning approach is needed.

At this stage cost and timing estimates indicate we will not be able to progress all sites as pilots and may be limited to only one or two. The decision of how many and which ones will be put to Council in April.

How soon can we complete the entire coastline and then incorporate inland areas that will also be impacted?

Te Tai Tokerau Climate Change Adaptation Strategy directed resources to focus on coastal hazards as a priority in line with central government direction. The wider programme will focus attention on coastal communities before expanding, although this may change over time as priorities evolve.

Lessons emerging from other adaptation pathway planning indicate several potential issues that will be detailed more fully within the pilot decision paper and may be the first opportunity to adjust the longer-term programme. Those lessons include:

1. A lack of connectedness between adaptation plans and other planning instruments within Council organisations. A consideration for council adaptation and preparedness.
2. Unclear responsibilities between agencies and funding mechanism to adopt certain adaptation responses. A consideration for sector governance and council readiness.
3. Unresolved issues within communities may prevent commitment to the long-term view needed for adaptation pathways planning. A consideration for community readiness.

Overall the coastal programme may take between five and seven years based on current estimates and resourcing.

How does all this feed into corporate planning and the Long-Term Plan?

The pilots will not be advanced enough to appear in the upcoming LTP24-34 timeline. The adaptive pathway plans aim to identify options for investment (or divestment) across multiple agencies out to 100 years. The output from them will appear in part in LTPs as either recommended projects or options for consultation within the wider community.

The Council Adaptation focus area on the other hand should target alignment for the upcoming LTP. This will work internally with infrastructure planners and asset managers on climate change impacts for existing programmes and assets. That will be separate from adaptation community plans and does not involve community engagement.

Considering Cyclone Gabrielle's impact in the last two weeks, we expect that lessons and recommendations that emerge from this event will be put forward for the upcoming LTP.

How are we managing FNDC insurance risk through climate change adaptation?

We should expect insurance costs to increase in line with asset risk exposure, and for coverage to exclude over time hazards like sea-level rise, storm-surge and coastal erosion. This is becoming evident in Australia which has in the past been a good indicator of New Zealand insurance trends. As insurers reduce their liability exposure this will act as an adaptation incentive for communities and council. Overall, this is a financial planning consideration and is likely to require investment in staff capability to support better decision-making.

How will we make better decisions that account for the complex issues associated with climate change?

An effective climate response will arguably demand as much change in our perceptions and behaviours as it will have on our physical environment in the next few years. The change of mindset must also be the focus of our council adaptation work. Investment in better decision-making is needed and an internal policy to direct staff to consider climate change will be put to the Senior Leadership Team. A wholistic decision-making framework is identified as a critical gap needed to make clear methods to consider climate change impacts alongside other

decision-making criteria. Such a framework would support staff to better engage in investigation work at the outset, to gain appropriate insights from the right stakeholders, shape proposals and options, while also being transparent at all levels of decision-making.

What is the national policy direction on Climate Change and is it effected by cyclone Gabrielle?

Central government plans to release a draft Climate Adaptation Act in the later part of this year is likely to be accelerated based on commentary from the Minister for the Environment in the last week. As the third part of the RMA reform following the Natural and Built Environment Act and Spatial Planning Bill, the Climate Adaptation Act is likely to clarify roles between agencies and allow communities a practical pathway for managed retreat. There is no indication that the intent of the act will change as a result of the cyclone, and fast tracking is unlikely to enable solutions to cyclone Gabrielle recovery.

Recovery efforts by the government are likely to explore opportunities for rebuilding with greater resilience to this type of event. It is unclear whether that will create opportunities for Northland.

E whai ake nei | Next Steps

The below items are the key activities for the climate change programme:

- Community board workshop on climate change roadmap to be schedule.
- Community adaptation pilot decision paper for Council meeting of April 7th.
- Commence infrastructure risk assessment for climate change hazards.
- Adoption of an internal climate change policy, and subsequent development of a decision-making framework.

Ngā tāpiritanga | Attachments

Attachment 1 - Recommend Process for Adaptive Pathway Planning.

Attachment 2 - FNDC Coastal Risk Profile Scoring and Sensitivity.

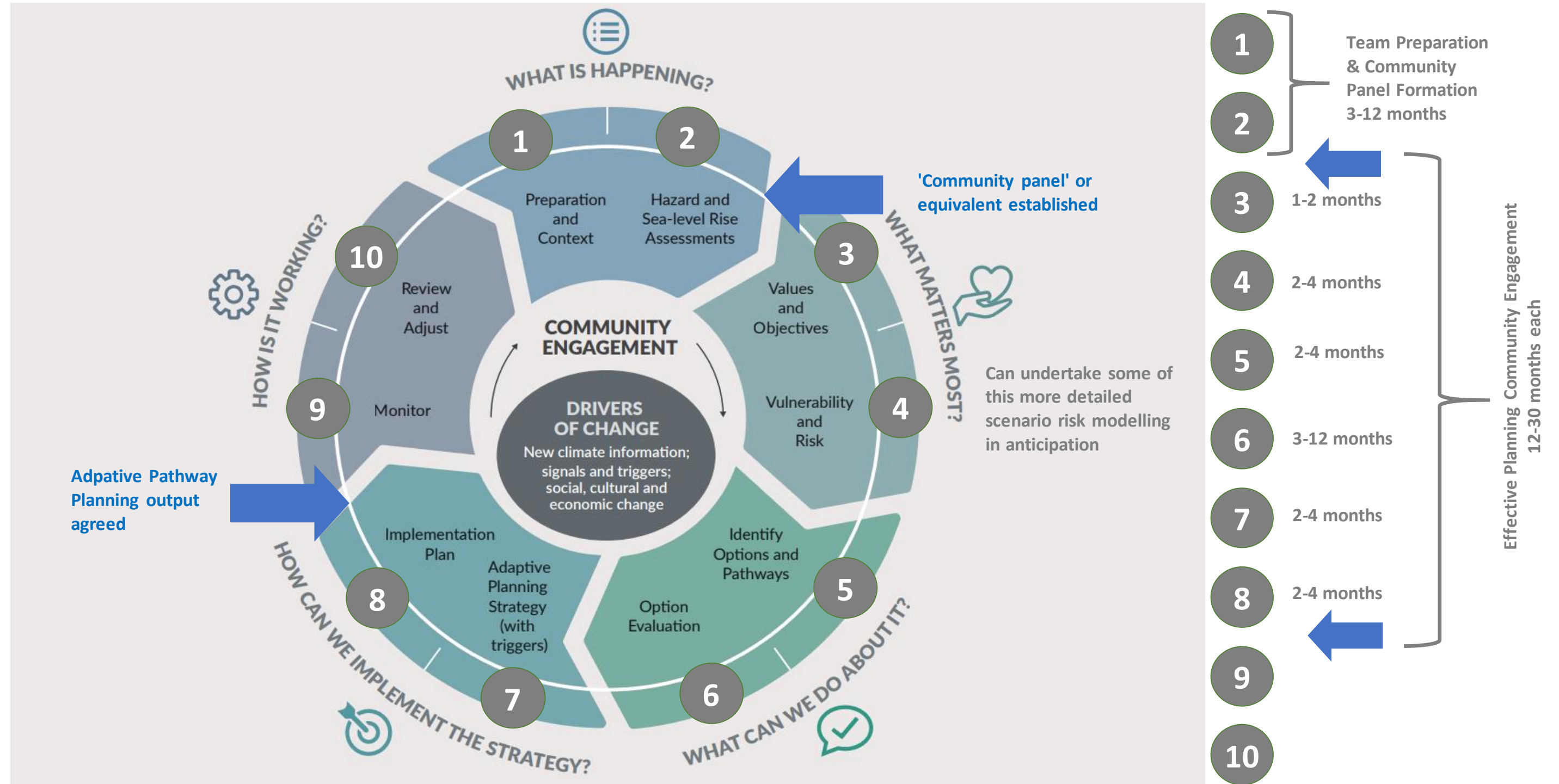
Attachment 3 - Thames-Coromandel District Council Buffalo Beach Reserve.

Attachment 1 Recommend Process for Adaptive Pathway Planning

The recommended framework for developing an adaptive pathway plan for a community is shown below with indicative timings based on effective community engagement.

Note:

- The process is not linear but interactive, and is highly dependent on effective engagement, capability resourcing at each stage and the provision of effective hazard information.
- This indicative timeline is based on initial estimated made by NRC and Kaipara and update from lessons being drawn from the Kaipara's Ruawai Drainage Pilot, as well as the timelines provided by Thames Coromandel.



Attachment 2 FNDC Coastal Risk Profile Scoring and Sensitivity

The below scores are based on the raw data from the Coastal Community Adaptation Profiles work undertaken by NRC. Here we give a basic summative scoring model to the factors that were evaluated. Included is a test of sensitivity for aspects that remained unscored. This does not factor for systemic inaccuracy of the data that are part of the limitations of the methodology. It is important to note that the profiles were intended to be a high-level direction.

Risk Assessment by location							
Long list of sites at risk	Periodic inundation		Permanent loss of land		Access	Ward	Score
	Coastal flooding	River flooding	Coastal erosion	Permanent tidal inundation	Road access outside community area visual assessment		
Paihia/Waitangi	high	high	high	high	high	Eastern	20
Russell/Long beach	high	high	high	moderate	high	Eastern	19
Tauranga Bay	high	high	minor	high	high	Eastern	18
Awanui	extreme	high	uncertain	extreme	high	Northern	18
Tokerau/ Whatuwhiwhi	extreme	high	extreme	minor	negligible	Northern	17
Owhata/Herekino	high	high	uncertain	high	high	Northern	16
Taipa bay	high	extreme	moderate	negligible	minor	Northern	15
Te Ngaere	high	high	high	minor	uncertain	Eastern	14
Whangape harbour	moderate	high	uncertain	moderate	high	Western	14
Panguru and harbour	high	extreme	uncertain	negligible	high	Western	14
Taupo Bay	moderate	high	high	negligible	negligible	Eastern	13
Hihi	moderate	moderate	high	minor	negligible	Northern	13
Ahipara	high	minor	extreme	negligible	negligible	Northern	13
Motukaraka	moderate	moderate	uncertain	moderate	high	Western	13
Kohukohu	moderate	moderate	uncertain	moderate	high	Western	13
Waitangi treaty grounds	high	minor	uncertain	minor	high	Eastern	12
Mitimiti	moderate	high	uncertain	negligible	high	Western	12
Horeke/Maraeroa	moderate	high	uncertain	minor	moderate	Western	12
Opononi/Omapere	negligible	negligible	extreme	negligible	high	Western	12
Coopers Beach/Cable Bay	negligible	minor	high	negligible	moderate	Northern	11
Kaimaumau	minor	minor	moderate	negligible	minor	Northern	10
Opu	moderate	negligible	uncertain	negligible	high	Eastern	9
Matauri bay	minor	minor	moderate	negligible	negligible	Eastern	9
Matangirau	negligible	high	negligible	negligible	negligible	Eastern	8
Rangiputa	moderate	negligible	moderate	negligible	moderate	Northern	11
Pakanae	negligible	high	uncertain	negligible	moderate	Western	9
Te Tii	moderate	negligible	uncertain	high	uncertain	Eastern	8
Totara North	minor	negligible	uncertain	negligible	high	Eastern	8
Taemaro	minor	moderate	uncertain	negligible	negligible	Northern	7
Rawene	minor	negligible	uncertain	minor	negligible	Western	6

Rating	Score
extreme	5
high	4
moderate	3
minor	2
negligible	1
uncertain	0

The below sensitivity test shows how the scores change when the rating is changed that to moderate (3) and uncertain score is given a zero on the overall score, and then can see how the two of the top ten scores fall away and the

overall scores bunch around 19. Awanui is clearly an area highly impacted regardless of sensitivity, as is Paihia and Russell.

Sensitivity Test					
Uncertainty Rated 0		Uncertainty Rated 3		Uncertainty Rated 5	
Location	Score	Location	Score	Location	Score
Paihia/Waitangi	20	Awanui	21	Awanui	23
Russell/Long beach	19	Paihia/Waitangi	20	Owhata/Herekino	21
Tauranga Bay	18	Russell/Long beach	19	Paihia/Waitangi	20
Awanui	18	Owhata/Herekino	19	Russell/Long beach	19
Tokerau/ Whatuwhiwhi	17	Tauranga Bay	18	Te Ngaere	19
Owhata/Herekino	16	Tokerau/ Whatuwhiwhi	17	Whangape harbour	19
Taipa bay	15	Te Ngaere	17	Panguru and harbour	19
Te Ngaere	14	Whangape harbour	17	Tauranga Bay	18
Whangape harbour	14	Panguru and harbour	17	Motukaraka	18
Panguru and harbour	14	Motukaraka	16	Kohukohu	18
Taupo Bay	13	Kohukohu	16	Te Tii	18
Hihi	13	Taipa bay	15	Tokerau/ Whatuwhiwhi	17
Ahipara	13	Waitangi treaty grounds	15	Waitangi treaty grounds	17
Motukaraka	13	Mitimiti	15	Mitimiti	17
Kohukohu	13	Horeke/Maraeroa	15	Horeke/Maraeroa	17
Waitangi treaty grounds	12	Te Tii	14	Taipa bay	15
Mitimiti	12	Taupo Bay	13	Opu	14
Horeke/Maraeroa	12	Hihi	13	Pakanae	14
Opononi/Omapere	12	Ahipara	13	Taupo Bay	13
Coopers Beach/Cable Bay	11	Opononi/Omapere	12	Hihi	13
Kaimaumau	10	Opu	12	Ahipara	13
Opu	9	Pakanae	12	Totara North	13
Matauri bay	9	Coopers Beach/Cable Bay	11	Opononi/Omapere	12
Matangirau	8	Rangiputa	11	Taemaro	12
Rangiputa	11	Totara North	11	Coopers Beach/Cable Bay	11
Pakanae	9	Kaimaumau	10	Rangiputa	11
Te Tii	8	Taemaro	10	Rawene	11
Totara North	8	Matauri bay	9	Kaimaumau	10
Taemaro	7	Matangirau	8	Matauri bay	9
Rawene	6	Rawene	9	Matangirau	8



Coastal Adaptation Pathway: Buffalo Beach Reserve

Policy Unit 99, Management Area F2

Introduction

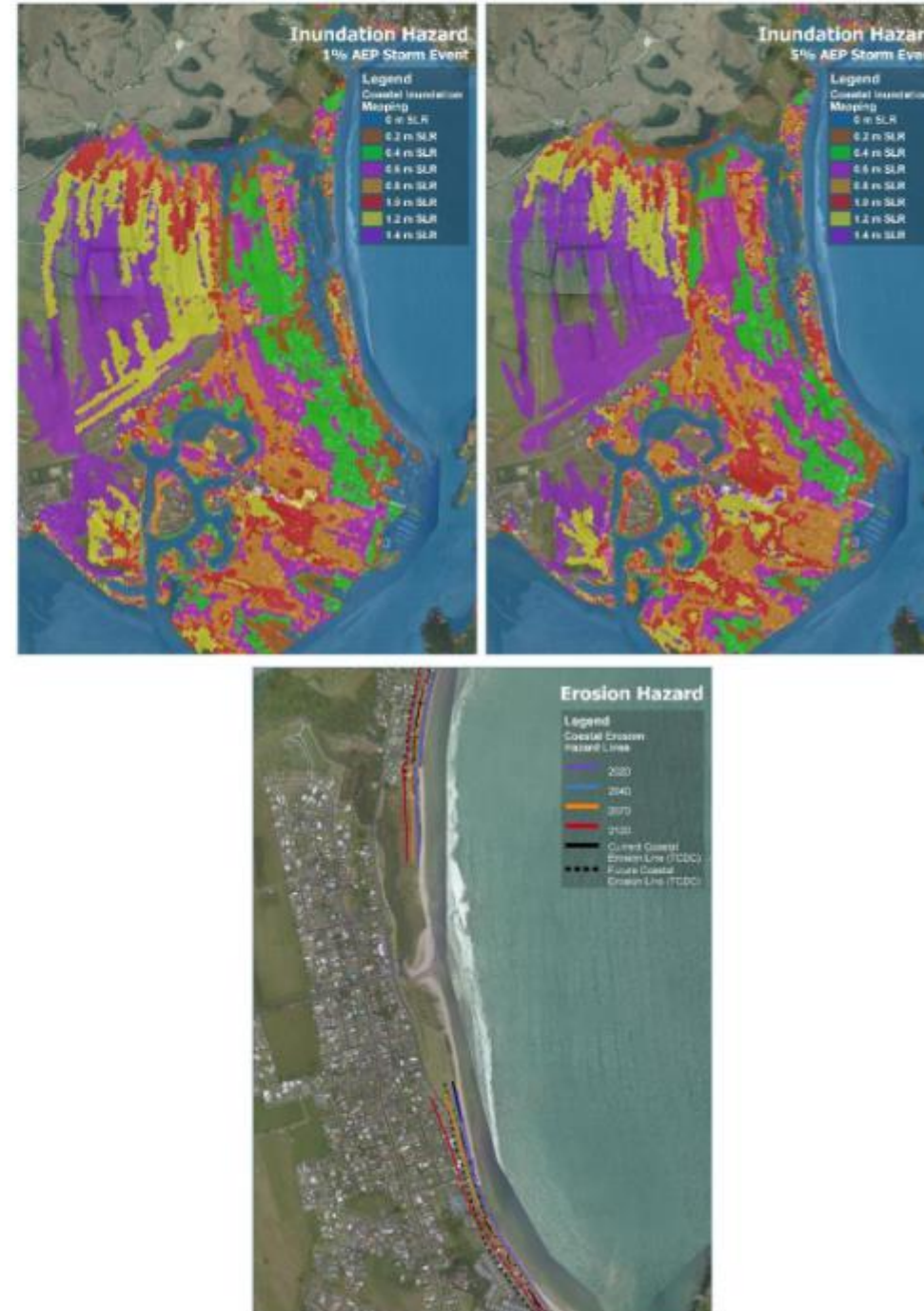
Buffalo Beach is a large and popular sandy beach in Whitianga on the Coromandel's east coast. This Policy Unit encompasses the length of Buffalo Beach between the southern end of the locally named 'Homeowners wall' and the northern end of the locally named 'NZTA seawall'; a rock revetment.

The beach is backed by wide dune system along most of the Policy Unit. Taputapuatea Stream flows south between SH25 and the dune system and outfalls roughly in the middle of the beach. Its banks are populated by wetland species. South of the stream mouth, the dune system has been heavily modified to create a grassed open space reserve between the beach and Buffalo Beach Road.

Residential development occupies a large area to the landward side of SH25 and Buffalo Beach Road.



The Hazards



The Risk

Type	Year/SLR	Storm	Exposure	Vulnerability	Consequence
Erosion	2020	1% AEP	Low	Moderate	Minor
Erosion	2040	1% AEP	Moderate	Low	Minor
Erosion	2070	1% AEP	High	Moderate	Moderate
Erosion	2120	1% AEP	Extreme	Extreme	Extreme
Inundation	0 m SLR	1% AEP	High	High	Major
Inundation	0.4 m SLR	1% AEP	Extreme	Extreme	Extreme
Inundation	0.8 m SLR	1% AEP	Extreme	Extreme	Extreme
Inundation	1.2 m SLR	1% AEP	Extreme	Extreme	Extreme
Inundation	0.4 m SLR	5% AEP	High	High	Major
Inundation	0.8 m SLR	5% AEP	Extreme	Extreme	Extreme
Inundation	1.2 m SLR	5% AEP	Extreme	Extreme	Extreme
Inundation	0.4 m SLR	King tide	Moderate	Moderate	Moderate
Inundation	0.8 m SLR	King tide	High	High	Major
Inundation	1.2 m SLR	King tide	Extreme	High	Major

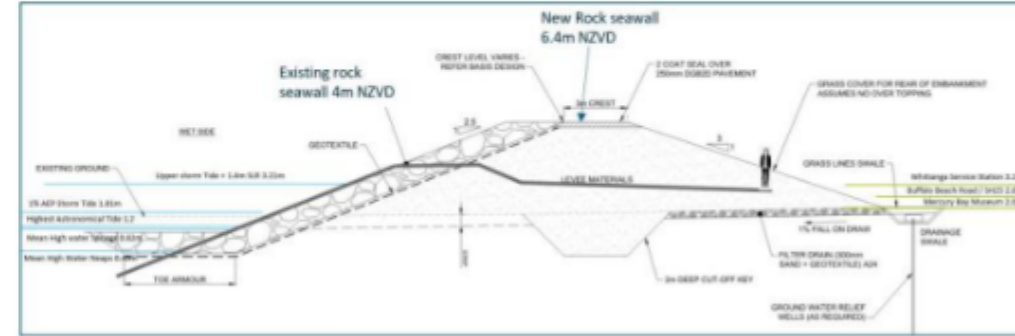
The Response

At the option assessment stage, the following adaptation options were considered:

Policy	Option
Be Prepared	Provide regular information to affected stakeholders on hazards, risks and management measures.
Be Prepared	Implement hazard warning systems and prepare emergency response plans.
Accommodate	Maintain natural defences through dune management; maintenance of sediment supply; maintaining foreshore vegetation and wetlands; and managing stock access to the foreshore.
Accommodate	Retrofit (including raising) buildings and infrastructure.
Protect	Enhance natural defences through relocating sand within a sediment compartment (sand back passing) or through adding material to the beach (beach nourishment).
Protect	Improve the resilience of existing coastal defence assets, including seawalls, revetments, stop banks, groynes and cliff stabilisation works.
Protect	Construct a new seawall or revetment.
Managed Retreat	Changing planning practices.
Managed Retreat	Relocate assets.
Managed Retreat	Provide accommodation space (e.g. space for habitats).

On further examination, the 'Protect' option relating to implementing 'soft-engineering' practices was also considered.

As for Policy Unit 98 (and 100), to provide context for the option assessment, the feasibility of protecting Whitianga, in its entirety, against a 1% AEP storm event and 1.2m of sea level rise was investigated.



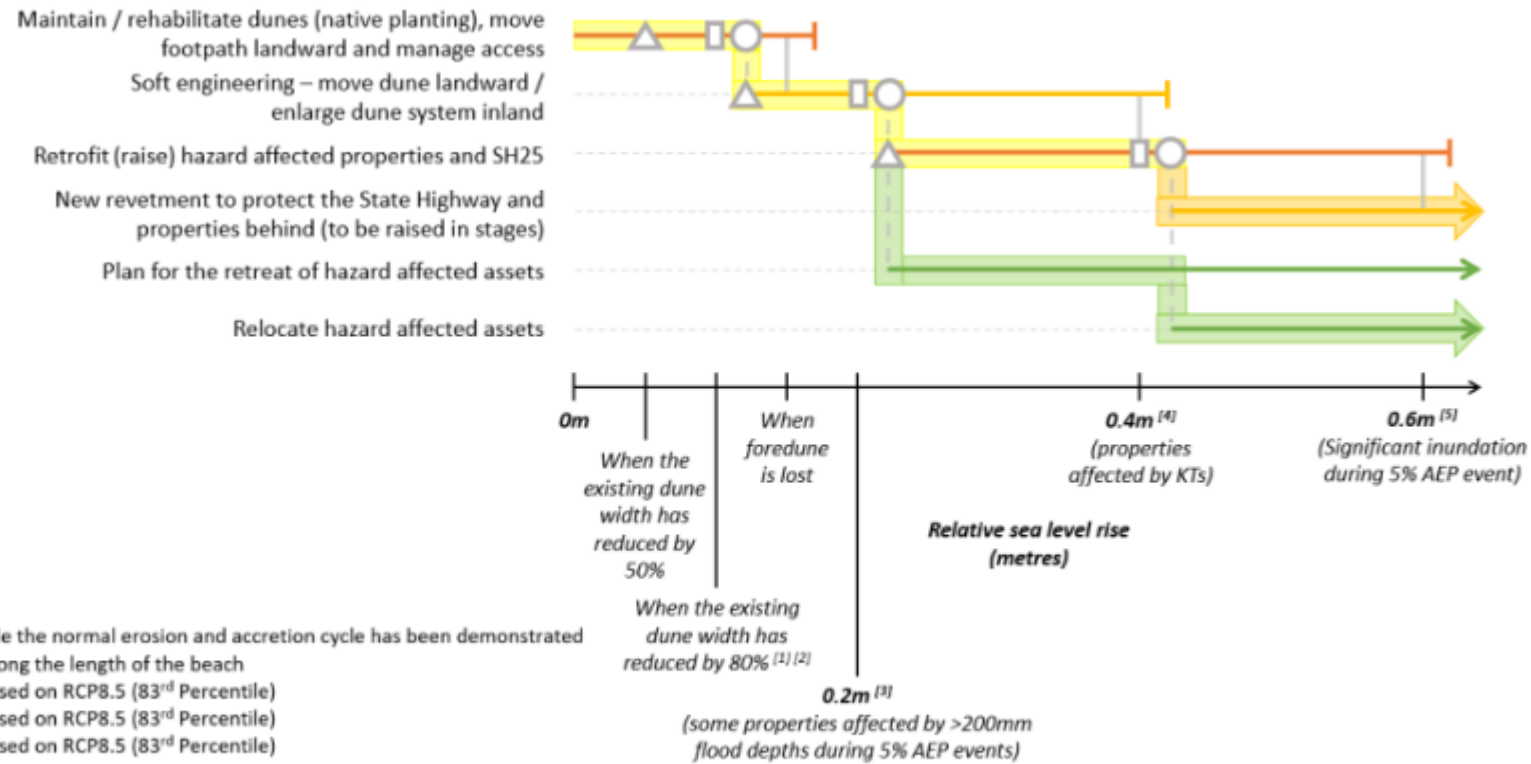
Strategy

The adaptation strategy advocated for Buffalo Beach Reserve in the short term is to rehabilitate the dunes through planting, moving the existing footpath landward and managing access. With climate change this is not expected to be sufficient to limit erosion on its own. Therefore, if 80% of the foredune is lost to erosion and maintenance is ineffective, soft engineering measures should be implemented; setting the dune back into the reserve and undertaking dune planting.

With 0.2m of sea level rise, it is predicted that some properties behind the Reserve will be affected by 5% AEP (and larger) storm events. At this point, hazard affected properties and SH25 in this location will need to be raised. With 0.4m of sea level rise, it is predicted that some properties will be affected by King Tides.

Prior to this, a decision needs to be taken by the residents of Whitianga and other stakeholders regarding whether to protect Whitianga into the future (and construct new defences, to be raised in phases over time) or to plan to retreat and retreat. If a 'Protect' policy is supported, in this location, there is an aspiration to maintain the beach for a long as possible. It is recommended that a spatial plan for the next 100 years is prepared for Whitianga.

Adaptation Pathway



¹ and a recessionary trend outside the normal erosion and accretion cycle has been demonstrated

² The width of the dune varies along the length of the beach

³ Approx. 24 years into future based on RCP8.5 (83rd Percentile)

⁴ Approx. 43 years into future based on RCP8.5 (83rd Percentile)

⁵ Approx. 57 years into future based on RCP8.5 (83rd Percentile)