

## Chapter 6. Clifton to Tangoio Coastal Hazards Strategy 2120, Hawke's Bay, New Zealand

*This chapter describes the process behind the Clifton to Tangoio Coastal Hazards Strategy 2120, a process led by a partnership of local communities. The case study illustrates how various stakeholders can work collaboratively to take long-term decisions on complex and uncertain challenges, how the dynamic adaptive planning pathways method can work in practice, and the importance of open conversations about accountability and responsibility.*

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*Technical support to the Council's and community were provided by Aramanu Ropiha, Infometrics, Maven Consulting Ltd, Mitchell Daysh Ltd and Tonkin & Taylor Ltd. Details of these assessments can be found at <https://hbcoast.co.nz/resources/>. Living at the Edge, a research collaboration funded by the NZ National Science Challenge acted as a "critical friend" to the process and provided independent advice and assistance.*

## 6.1. Overview

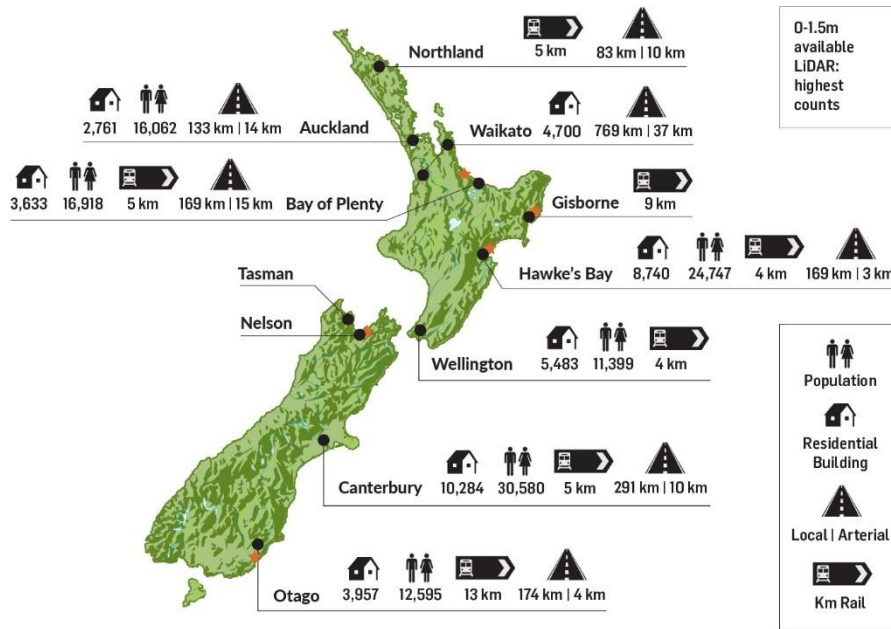
New Zealand has one of the longest coastlines in the OCED and one of the smallest populations. This, along with its varied landscape, makes developing adaptation responses challenging, particularly when considering how the costs of those responses will be met. As an island nation, New Zealand has strong social and cultural connection with its coastline, and it provides unique habitats for indigenous fauna and flora. It is also the focus of much economic activity. Today around 65% of the population and major infrastructure are located within 5 km of the coast.

Climate change poses an increasing risk to these important coastal areas, in particular because sea-level rise (SLR) increases exposure to coastal hazards. This exposure is exacerbated by ongoing coastal development and rising property values. Over the last 100 years, the sea level around New Zealand has risen at an average rate of 1.8 mm per year. As New Zealand is geologically active, rising sea levels are also exacerbated by tectonic effects of uplift and subsidence. Global projections estimate further rises by 0.2-0.4 m by 2060 and 0.3-1.0 m by 2100.

The levels of risk exposure in different regions in New Zealand are illustrated in Figure 6.2. Using a combination of population and infrastructure measures, the highest coastal risk exposure is in the Hawke's Bay and Canterbury regions.

Sea-level rise is, however, only part of the picture. Climate change is also expected to affect New Zealand's coastal areas through increased coastal erosion; more frequent and extensive coastal flooding; higher storm surges; saltwater intrusion into coastal aquifers and further inland in estuaries; and changes in surface water quality, groundwater characteristics and sedimentation. Risks to the coastline from a range of these impacts and the responses that are needed will be specific to each local area.

**Figure 6.1. Levels of coastal risk exposure in New Zealand determined by resident population, buildings, roads, railway, airport and jetties/wharves for land elevations less than 1.5 m**



<p><b>\$19B (2011)</b> Replacement cost of all buildings</p>	<p><b>43,680</b> Total number of residential buildings</p> <p><b>68,170</b> Total number of all buildings</p> <p><b>133,265 (Census 2013)</b> Total resident population</p>	<p><b>National Infrastructure</b></p> <p>382 critical-facility buildings</p> <p>5 airports ★</p> <p>1,547 jetties &amp; wharves</p> <p>2,121 km of roads (1,930 km local roads)</p> <p>46 km railway</p>
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*Note:* The boxes above show aggregated results from regional totals where LiDAR4 data were available. All dollars in NZD.

*Source:* Bell, R., R. Paulik and S. Wadwha (2015), National and regional risk exposure in low-lying coastal areas, Prepared for the Parliamentary Commissioner for the Environment, <https://www.pce.parliament.nz/media/1384/national-and-regional-risk-exposure-in-low-lying-coastal-areas-niwa-2015.pdf>

In New Zealand, the central government works at a national scale to improve resilience to the impacts of climate change. It does this by: providing the national-level legislative and policy framework; issuing information and guidance to support local government and businesses to take effective adaptation decisions; funding research and publishing information on climate change impacts; and preparing for and responding to major natural hazard events.

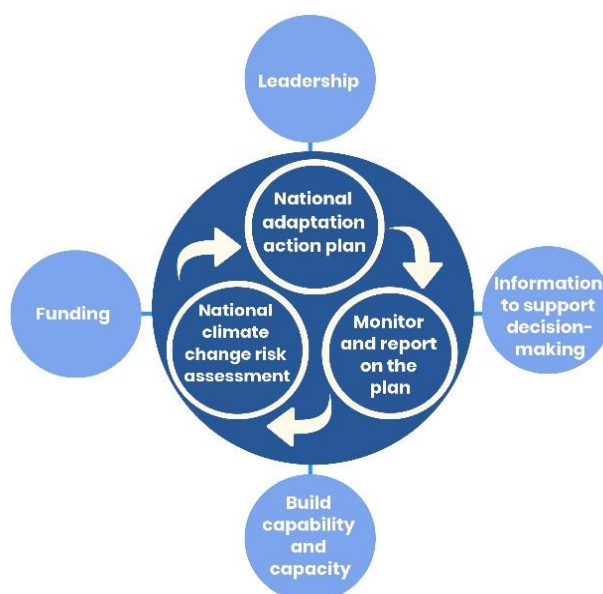
Local government has responsibilities to prepare communities for and manage the risks of climate change and are considered best-placed to understand what is appropriate for their region based on the local changes they can expect to experience. Local government is also required to consider the effects of a changing climate on communities and incorporate climate change into existing policy and regulatory frameworks, plans, projects and decision-making procedures, for example, when making choices about the use of land.

Māori are the indigenous people of New Zealand and *tangata whenua* rights and interests are represented in the Treaty of Waitangi, which is one of the founding documents of the country.

### 6.1.1. Current central government initiatives

In early 2018, a group of government-appointed technical experts provided recommendations on actions New Zealand needs to take to adapt to climate change. The group concluded that New Zealand is in the early stages of planning to adapt to the impacts of climate change and more needs to be done to reduce the risks and build resilience to the changing climate. The group's recommendations are summarised in Figure 6.2 and include core mechanisms needed (dark blue) and supporting functions (light blue).

**Figure 6.2. Climate Change Adaptation Technical Working Group's recommendations for effective adaptation in New Zealand**



At the time of writing, the government is progressing work to consider how the group's recommended actions can be implemented, including how to fund adaptation responses and how to support local communities to effectively respond to climate change in their local areas.

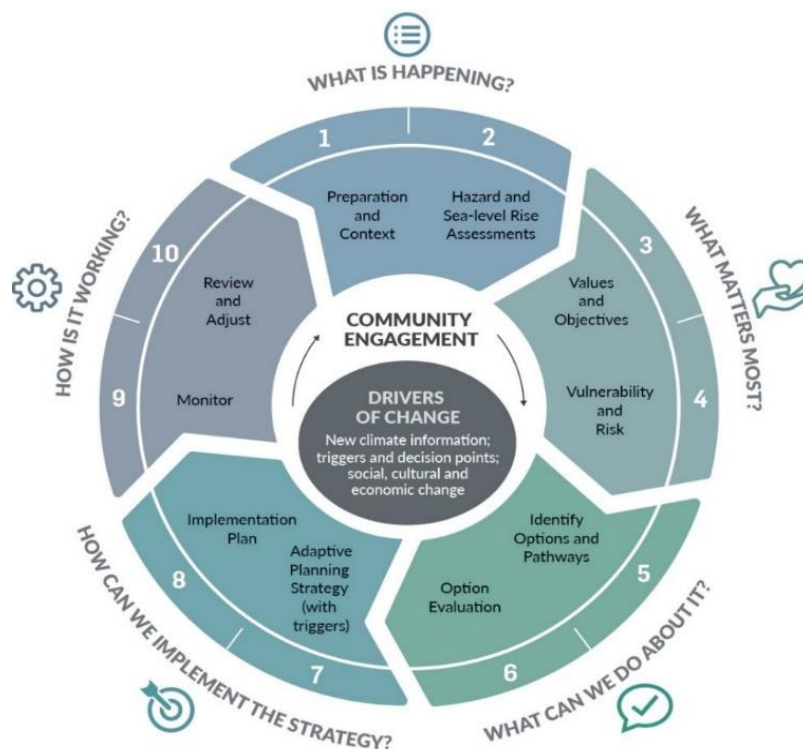
Proposals for a National Climate Change Risk Assessment and a National Adaptation Plan (the government's response to the National Climate Change Risk Assessment) are currently being considered as part of the its Zero Carbon Bill. This would include the establishment of a Climate Change Commission to provide advice on climate change adaptation and

monitor the implementation of the National Adaptation Plan. These proposals are expected to be legislated in 2019.

While central government continues to develop national-scale responses, New Zealand is taking action at a local level. At the coast this is informed by the Ministry for the Environment's publication "Coastal hazards and climate change: Guidance for local government" released in 2017 as an update to earlier guidance material. This guidance aims to support local government<sup>1</sup> to manage and adapt to the increased coastal hazard risks posed by climate change and sea-level rise. It:

- provides information on the potential effects of climate change on coastal hazards, incorporating the latest science and feedback from stakeholders
- recommends a new "adaptive pathways" approach to coastal hazards planning that is dynamic and flexible and that responds to the long-term uncertainty of climate change effects
- outlines collaborative approaches to engaging with communities and local government roles and responsibilities
- recommends a ten-step decision-making process that councils and communities can follow when planning for the effects of climate change on coastal hazards.

**Figure 6.3. Ten-step decision cycle: Coastal hazards and climate change: Guidance for local government**



## 6.2. Clifton to Tangoio Coastal Hazards Strategy 2120, Hawke's Bay, New Zealand

The Hawke's Bay region is located on the eastern coast of the North Island of New Zealand. The region's 353 km coastline supports a diverse range of habitats underpinned by the unique geological history of the area. The region is dominated by Hawke's Bay itself, which is 94 km across its widest point and includes the region's largest population centres of Napier and Hastings. The region has a population of 164 000 (June 2017) and is renowned for its horticulture, with large orchards and vineyards on the plains. In the hilly parts of the region, sheep and cattle farming are dominant along with forestry blocks.

Natural disasters, storms, coastal erosion and inundation along Hawke's Bay's coastline have, and continue to damage, property and threaten people's safety and well-being. In 1931, the region was devastated by a magnitude 7.8 earthquake, New Zealand's deadliest natural disaster. The earthquake resulted in significant loss of life, damage to property and infrastructure, and coastal areas around Napier were uplifted by around 2 metres by the quake, and around 40 km<sup>2</sup> of seabed became dry land. From a coastal processes perspective, the effects of this dramatic change are still being felt today, with coastal margins continuing to adjust to these altered physical conditions.

To plan and respond to the ongoing challenges and community concerns associated with coastal hazards, local government and *tangata whenua* in Hawke's Bay are developing a long-term strategy. The Clifton to Tangoio Coastal Hazards Strategy 2120 ("the strategy") takes a co-ordinated approach to identifying and responding to coastal hazards and the influence of SLR over the next 100 years. It is designed to create a platform for long-term planning and decision making in the Hawke's Bay region.

The first iteration of the strategy focuses on the most populated stretch of the coastline in Hawke's Bay; from Clifton in the south to Tangoio in the north. This area includes the city of Napier; coastal communities including Whirinaki, Te Awanga and Haumoana; and key infrastructure such as the Port of Napier and the Hastings Wastewater Treatment Plant.

The strategy is being developed through a Joint Committee formed by elected representatives from the local government: Hawke's Bay Regional Council, the Napier City Council and the Hastings District Council, and groups brought together for Treaty of Waitangi settlement processes including: He Toa Takitini, Mana Ahuriri Incorporated and the Maungaharuru-Tangitū Trust. The Joint Committee has been formally established under the Local Government Act (2002)<sup>2</sup> and therefore has legal standing and is subject to standard Council meeting procedure and protocol, including the requirement for meetings to be held publicly. Supporting the Joint Committee is a Technical Advisory Group formed by senior staff from each council and led by an independently appointed project manager. The strategy is being developed in four stages, as detailed in the following sections.

The strategy was originally developed to respond to issues raised in a technical report commissioned by the Hawke's Bay Regional Council and to ongoing community concern about the effects of coastal hazards. It also provided an opportunity for the councils to work together on a complex cross-boundary issue.

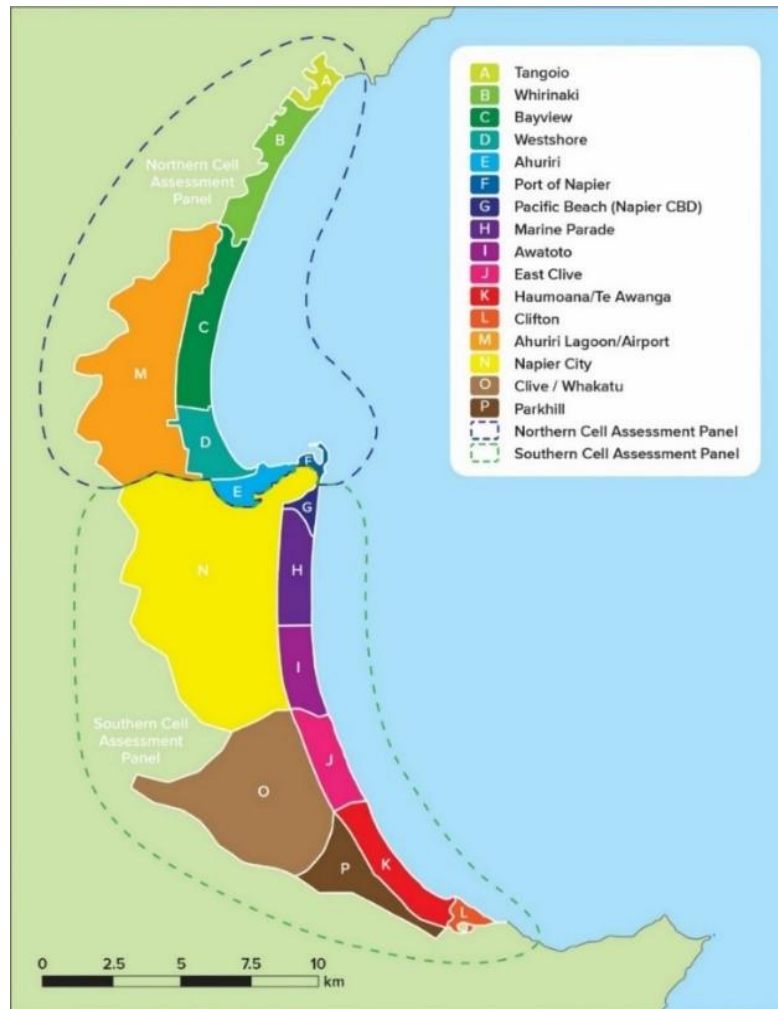
### 6.2.1. Stage 1: Defining the issue

The Hawke's Bay coastline has long history of coastal hazards impacts. To assess future risks, the focus area between Clifton and Tangoio was divided into 16 coastal "units". The units were based on a combination of communities of interest, coastal processes, land area units and topography (Figure 6.4).

Within each unit, the possible extent of coastal erosion and coastal inundation over the next 100 years was modelled and mapped, and risks associated with those hazard extents assessed. The process was broadly consistent with that defined in “Coastal hazards and climate change: Guidance for local government”. For coastal erosion, a range of potential SLR scenarios was modelled to develop probabilistic erosion lines (i.e. erosion lines mapped with probabilities of occurrence at different time periods). SLR scenarios of between 0.6 and 1.5 metres (with a mode of 1.0 metre) were used over the 100-year planning horizon. For coastal inundation, a building block approach was used where the inundation hazard extents were mapped based on a 1% AEP (or 1 in 100-year) storm surge event + wave set-up at the coast + 0.5 metre (at 2065) or 1.0 metre (at 2120) of SLR. It was acknowledged that these values may be reached sooner or later than the prescribed years; however, it provides a good indication of vulnerability based on current information. Tsunami risks were also identified at this early stage; however, due to the nature of tsunami risks, they have been considered a civil defence and planning issue rather than one that requires a long-term adaptive response.

The 100-year hazards assessment confirmed that in some units, immediate risks are high and in the longer term these become significant. The Joint Committee acknowledged that the issues faced were challenging, emotive and complex and any strategy to resolve them would require community involvement in a broadly agreed and technically sound response. For example, this coastline has a long history of coastal hazards effects and a wide range of strongly held opinions on what should be done, and who should be responsible for implementing such responses. In addition, there are historical, cultural, social, ecosystem and economic values attributable to this coastline that are under threat from the effects of climate change. Further, any response(s) made (e.g. defending with hard structures, retreating from the coast, etc.) to address risks from climate change could be as damaging or deleterious to these values as not responding at all.

Figure 6.4. Assessment cell evaluation panel areas and coastal units



Note: The landward units (M to P) incorporate areas that may be affected by coastal inundation.

### 6.2.2. Stage 2: Framework for decisions

The aim of this stage was to work with the community to design a decision-making framework that would result in well-considered and broadly supported long-term plans for responding to the risks and hazards identified in Stage 1. The resulting, agreed framework comprised of:

- two assessment panels to represent the interests of *tangata whenua*, communities and agencies exposed to coastal hazards risks
- facilitated workshops to work through a structured decision-making process to develop and evaluate potential options/pathways for responding to identified risks over time in priority coastal units
- the application of multi-criteria decision analysis (MCDA), dynamic adaptive planning pathways (DAPP) and real options analysis methodologies



- the development and delivery of assessment panel recommendations for preferred options/pathways back to each council for final decision making.

### ***6.2.3. Stage 3: Develop responses***

Stage 3 involved the formation of the assessment panels and the implementation of the decision-making framework developed in Stage 2. The panels completed their work through a series of 11 facilitated workshops and other supplementary work including site visits and public meetings that took just over 12 months to complete. The following sections outline this process in more detail.

#### *Panel structure*

The assessment panels were formed to consider the strategy in two distinct “cells”: 1) a Northern Panel to focus on the area from the Port of Napier north to Tangoio; and 2) a Southern Panel to focus on the area from the Port of Napier south to Clifton. The reasons for adopting this cell structure were that it:

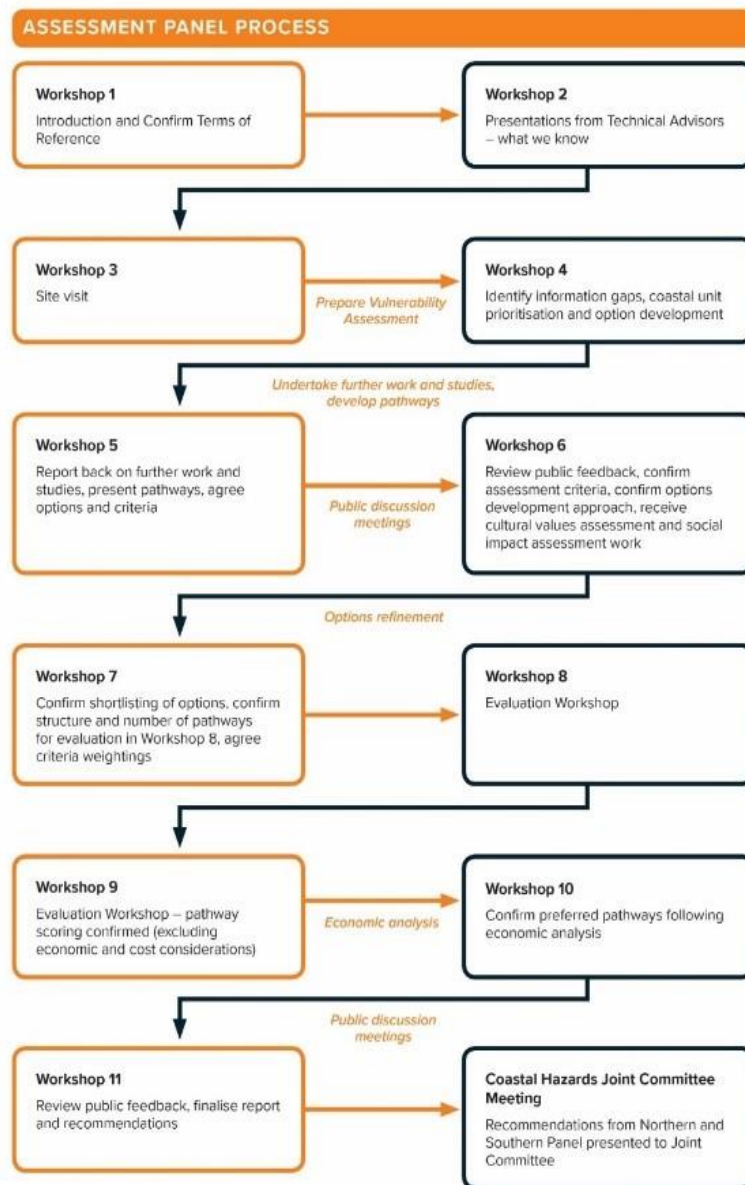
- grouped the 16 units with interrelated coastal processes into two manageable “cells”
- deliberately crossed jurisdictional boundaries to ensure that each Partner Council was functionally involved in both panel areas
- struck a good balance between administrative and process cost efficiency and community representation; too many panels would be difficult to operate, but with fewer panels the number of panel members required for appropriate representation purposes increases.

With a two-panel design, panel seats were pre-defined to provide a good cross-section of interested and affected parties. A series of public meetings was held within each coastal community and more broadly to call for volunteers for each of the available community positions. For organisation/agency members, nominations were sought from their respective agency.

#### *Panel process*

The assessment panels worked through a structured decision-making assessment process completed through a series of 11 workshops during 2017 (Figure 6.5).

Figure 6.5. Assessment panels and decision-making assessment process



### *Decision-making tools*

The assessment panels employed the decision-making framework that was developed in Stage 2 to arrive at their recommendations. The framework was designed to respond to complex technical information, long time frames, high levels of uncertainty, and multiple (and sometimes competing) values and interests. The framework included MCDA and DAPP. These were supported by:

- a coastal hazard assessment
- a coastal risk assessment

- a cultural values assessment
- a social impact assessment and valuation
- a real options analysis.

### *Multi-criteria decision analysis*

MCDA is an established technique for assessing multiple and sometimes complex options. Generally the process involves the “scoring” of multiple options against defined criteria (e.g. social, cultural, environmental, economic) to determine an overall preferred option that balances sometimes competing values. The criteria developed and adopted by the panels are outlined in Table 6.1.

The assessment panels determined that economic considerations were critical to whether a given pathway could be implemented. As economic considerations were a critical failure issue, rather than a measure of performance, separate economic analysis was undertaken and cost considerations were undertaken separately to the MCDA process.

**Table 6.1. The criteria developed and adopted by the panels**

	Criteria	Description
Technical assessment criteria	Manages the risks of storm surge inundation	<ul style="list-style-type: none"> <li>• Reduced exposure to risks from storm surge inundation</li> <li>• Meets objectives over long time frames</li> <li>• Proportionate to the scale and nature of risk</li> </ul>
	Manages the risks of coastal erosion	<ul style="list-style-type: none"> <li>• Reduced exposure to risks from coastal erosion</li> <li>• Meets objectives over long time frames</li> <li>• Proportionate to the scale and nature of risk</li> </ul>
	Ability to adapt to increasing risks	<ul style="list-style-type: none"> <li>• Readily responds to uncertain climate outcomes</li> <li>• Includes measures to support future adjustments</li> </ul>
	Risk transfer	<ul style="list-style-type: none"> <li>• Exacerbation of hazard risk in other areas</li> <li>• Transfer of risk to others, including future generations</li> </ul>
Impact assessment criteria	Socio-economic impacts	<ul style="list-style-type: none"> <li>• Social effects, for example:               <ul style="list-style-type: none"> <li>○ effects on community safety</li> <li>○ loss of amenity value</li> </ul> </li> <li>• Decline in recreational values, community facilities</li> <li>• Indirect economic/industry impacts (e.g. tourism, fishing)</li> </ul>
	Relationship of Māori and their culture and traditions with their ancestral lands, water, sites, <i>waahi tapu</i> and other <i>taonga</i>	<ul style="list-style-type: none"> <li>• Impacts on any cultural sites of significance</li> <li>• Maintains access to, and enables the carrying out of, customary activities</li> </ul>
	Natural environments impacts	<ul style="list-style-type: none"> <li>• Impacts on natural coastal ecosystems</li> <li>• Impacts on the natural character of the coastal environment</li> </ul>

### *Dynamic adaptive planning pathways*

DAPP has particular utility for taking decisions in the coastal context where ever-changing risk profiles are present, and there is increasing (with time) uncertainty around rates and magnitude of changes. Importantly, DAPP does not prescribe a single, final solution. Flexibility is retained, and future options are left open for future decision points.

This general approach was employed by the assessment panels in the development of “pathways” for each unit. In this strategy, the DAPP process was adapted, whereby pathways were formed for each unit as a combination of short-term (0-20 years),

medium-term (20-50 years) and long-term (50-100 years) hazard response actions. An example pathway is shown in Figure 6.6.

**Figure 6.6. Example pathway**

Short term 0-20 years	→	Medium term 20-50 years	→	Long term 50-100 years
Beach renourishment	→	Renourishment + groynes	→	Managed retreat

Six potential pathways were developed for each priority unit. The pathways were designed to represent the spectrum of possible responses, from low intervention to softer engineering (e.g. beach renourishment), hard engineering (e.g. sea walls) and retreat. The pathways were then assessed using MCDA to determine an order of preference in terms of each pathway's performance against the defined criteria.

#### *Cultural values assessment and hīkoi (tour of the area)*

A cultural values assessment provided an overview of the cultural values in the coastal area from Clifton to Tangoio to guide the decision making, and included:

- a brief history of the pre-settlement patterns of occupation
- *whakapapa* (genealogy) of the original occupants and how they are manifest in present *hapū* (sub-tribes)
- a compilation of *wāhi tapu* (places sacred to Māori) and sites of significance that are registered by public sector agencies
- *hapū* management plans with cultural values that are registered with local government
- agreements between *hapū* and the Crown related to the Treaty claimant process
- identification of gaps in the information reviewed with proposed remedies.

The report was supplemented with a cultural values *wānanga* (educational seminar) and *hīkoi* (site visit) for panel members, hosted by Matahiwi Marae (*marae* being a traditional meeting ground). Following a *powhiri* (formal welcome ceremony) at Matahiwi Marae, the *hīkoi* took members from both assessment panels on a bus tour of the entire strategy area, highlighting historical use and occupation, and places and sites of significance. This provided important contextual information for panel members as they embarked on the decision-making process.

#### *Social impact assessment and valuation*

The social impact of coastal hazards (inundation and erosion) on the communities in each unit was assessed by external consultants engaged by the councils to cover the northern and southern priority units. The purpose of the studies was to provide a clearer understanding of social issues and impacts from coastal hazards through meaningful engagement with community stakeholders. In addition, this assessment provided an analysis of social outcomes that would occur if there were no human intervention to address coastal hazards (beyond current interventions); and a valuation (estimated monetary value) of those outcomes using social impact measurement methodologies (social return on investment).

The studies were developed from interviews with residents and stakeholders and supported by other background information and reports.

The assessments assumed a *status quo* scenario, i.e. no change in interventions compared to those carried out at the present time. In effect, this provided a “baseline” social impact associated with doing nothing in response to coastal hazards. The projected social outcomes were valued using financial proxies and value mapping to estimate a social cost (in monetary terms) to each community. When asked to consider the effects of a do nothing response to coastal hazards, a common theme from those that were interviewed was the large proportion of social outcomes attributable to negative well-being among those residents whose properties are most at risk to the threat of coastal hazards. This negative well-being is a function of anxiety and concern caused by:

- their ability to take necessary action to protect their property from erosion and storm surges (what are the solutions, what will the government do?)
- current and future insurability of homes (excesses, exclusions, and eventual refusal to provide cover)
- ability to raise mortgage finance (which is directly related to insurability)
- future saleability of property as hazards increase
- physical damage caused by erosion or storm events
- perceived “oppression” by territorial authorities using regulatory powers to force retreat as the only option.

The studies provided useful insights and references for panel members to inform their decision making. Further application of this work has been in the development of a funding model in parallel to the work of the assessment panels, where the assessed social impact of coastal hazards has assisted a preliminary consideration of potential public-private apportionment of costs for implementing hazard-mitigation responses. This work is ongoing.

### *Real options analysis*

Real options analysis (ROA) was used as the primary means of applying economic analysis to the pathways. ROA is an expanded version of cost-benefit analysis that assesses whether there is value in waiting for more information before an expensive and possibly irreversible investment is undertaken, and whether an alternative investment might suffice in the meantime. The ROA provides a costing assessment that enables decision making that can be flexibly implemented over time as the climate changes and as impacts increase. This ensures that decisions taken today do not create further risks which are costly to reverse in the future, and that a range of options have been assessed for their ability to meet community objectives over time. Broadly, the results of the ROA demonstrated that a flexible investment strategy, enabling a change of course in the future, is more likely to deliver a lower cost outcome overall than pursuing a single option.

### *Community feedback sessions*

Two community feedback sessions were held for each panel (four sessions in total) as part of the decision-making process. Meetings were structured as “drop in” sessions, allowing members of the public to attend at any time during a two-hour window to meet panel members and council staff, receive information, and provide feedback. The feedback

sessions were held at important junctures in the process; the first sessions assisted panel members to confirm their approach and initial thinking; the second allowed panel members to test their preliminary outcomes before finalising their recommendations.

### 6.3. Outcomes achieved to date

The key outcomes achieved in the strategy to date include:

- Stage 1: production of a comprehensive hazard and risk assessment using probabilistic and other methodologies for 16 defined coastal units within the strategy area.
- Stage 2: development of a decision-making process to apply MCDA, DAPP and ROA methodologies through a community-led assessment process to develop responses to the hazard risks identified in Stage 1.
- Stage 3: establishment of two community-based assessment panels to apply the decision-making process developed in Stage 2. The panels produced a series of recommendations for the Joint Committee that were presented in a joint report. These included:
  - which of the 16 defined coastal units the partner councils should prioritise for response
  - a recommended 100-year adaptive pathway for each of the 9 priority units
  - a range of supplementary recommendations for the partner councils to consider in support of the recommended pathways.

The full package of recommended pathways represents a relatively high degree of intervention, where most locations are proposed for some form of coastal defence structures for the short and medium term. Managed retreat has only been recommended as a long-term response at this stage. While the adaptive nature of the pathways allows this to change over time if necessary to respond to changing hazard risks, overall this is perhaps an unsurprising result, and reflects a commonly expressed desire to protect and preserve coastal communities for as long as can be practicably achieved.

The panel's report and recommendations were adopted by the Joint Committee and recommended back to each partner council. Decisions have now been endorsed by each council for the commencement of Stage 4 to develop and test the panel's recommendations for implementation.

### 6.4. Lessons learnt

The process taken to develop the strategy is a first of its kind in New Zealand. Key lessons learnt include:

- **Take your time and plan carefully:** Coastal processes and climate change are complex subject areas. However, we do have time to develop considered and collaborative responses. Careful planning and investing time upfront to work openly with communities pays dividends later.
- **Collaboration with the community:** Bringing community members to the table to work alongside partner council officers on a challenging problem can change relationship dynamics by removing the people from the problem, and focusing on

the problem itself – but this does take time. Experience in this project showed that it took 4 or 5 workshops (out of an 11-workshop programme) to build trust and establish strong working relationships.

- **Facilitating knowledge exchange:** A process like this facilitates a significant amount of information exchange. Partner council officers learn far more about local issues and perspectives from this type of engagement than a more formal public meeting could ever provide. For community members, regular and ongoing interactions with subject area experts through an intensive programme of workshops increases knowledge, but also enables that knowledge to filter out into communities through incidental engagements and conversations with neighbours and friends. This assists to dispel misinformation; a common challenge in this area.
- **Blending political, technical and academic:** Success in this project can in large part be attributed to the effective blending of key inputs and working hard to keep those with interests in its outcomes strongly connected to the process and activity engaged throughout. Allowing either political debate, technical information or academic theory to dominate proceedings would likely have led to an unbalanced process; blending these inputs proved to be a successful approach.
- **Community led process, rather than a council-down process:** In a traditional council-led project, a concept is developed, perhaps with options, and then presented for community and stakeholder feedback. This process flipped the traditional approach on its head, with community members developing the concept and presenting it back to the partner council for consideration. This required a leap of faith from partner councils, but ultimately has produced a more robust outcome that has been developed by, rather than for, communities.
- **Pinch point – who pays:** Defending, retreating, accommodating or doing nothing at all; all carry significant financial burden, the question is how the costs should be shared, and by whom. The answers have not yet been developed in Hawke's Bay, and ultimately remain unresolved at a national scale. The government's response to the Climate Change Adaptation Technical Working Group's (refer to Section 6.1.2) recommendations also aims to address funding as a key issue.

## 6.5. Challenges ahead

The strategy is now moving into Stage 4, which will develop and test the detail of the pathways recommended by the assessment panels for implementation. Recognising that Stage 3 sought to develop multiple options for comparison purposes, and to recommend preferred options, Stage 4 is concerned with concept development and testing and securing broader community approval before moving into actual implementation. This last point is important; inevitably, partner councils will have to decide how to fund responses. Those living inland will likely be asked to contribute something, if not as much as those living on the coast. Securing broader buy-in will be important and critical to overall successful implementation.

This work has been scoped and planned to occur through three phases:

- Phase 1: Pathway Concept Development, Testing and Planning
- Phase 2: Wider Community Consultation and Approvals
- Phase 3: Pathway Implementation Projects.

This work presents a range of key challenges that must be resolved before any physical works can start under the guise of the strategy. Some of the key implementation challenges ahead include:

- Where the benefits of physical works programmes will be realised (i.e. the apportionment of public and private benefit) and where costs should fall as a result.
- Whether the pathways can be affordably implemented as a whole-of-coast package.
- Which partner council(s) should assume responsibility for implementing the physical works programmes and owning the new assets.
- Confirming priority and order of works, noting that some priority units will require more urgent action than others.
- Assessing the environmental effects of the physical works programme, including a consideration of cumulative effects, and any mitigation needed for permitting.
- Collaboratively developing signals and triggers to support each pathway. Signals and triggers will be used as forewarning and ultimate decision points for when to switch to the next action in a given pathway.

At the time of writing, with funding support from each of the partner councils, the Joint Committee is commencing work to develop responses to these challenges. The working relationship established between the councils in the development of this strategy is a notable example of cross-council collaboration, and the degree of co-operation has been highly successful at both the political and staff level. The process has also brought councils and communities closer together and has developed a more collaborative approach to problem solving. While it is essential that processes such as these are tailored to particular local circumstances, the approach developed in Hawke's Bay has many aspects that can be readily adapted for use by other jurisdictions.

## Notes

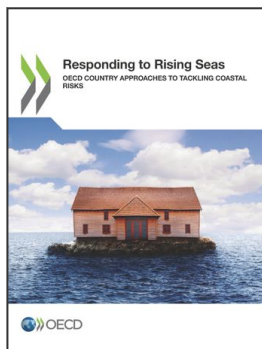
<sup>1</sup>. Local government in New Zealand consists of regional councils (regional focus on environment resource management and other regional functions) and territorial authorities (responsible for local service provision including roads, water, town planning and other functions). These are collectively referred to as "councils" within this case study

<sup>2</sup>. The Joint Committee has been formed under Clause 30(1)(b) of Schedule 7 of the Local Government Act 2002 and is deemed to be both a committee of the appointing local authority and a committee of each other local authority or public body that has appointed members to the committee.



## Reference

- Bell, R., R. Paulik and S. Wadwha (2015), *National and regional risk exposure in low-lying coastal areas*, Prepared for the Parliamentary Commissioner for the Environment, <https://www.pce.parliament.nz/media/1384/national-and-regional-risk-exposure-in-low-lying-coastal-areas-niwa-2015.pdf> (accessed on 29 August 2018). [1]



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