

Adaptation pathways

Adaptation pathways identify options for managing natural hazard risks while acknowledging uncertainty and enabling responses to changing risks over long planning timeframes.

An important principle of pathways is adaptiveness; the timeframe for shifting between actions, and the specifics of future actions, can be adjusted in response to changing hazards risks.

In this way, each pathway is designed to remain 'adaptive' to a highly uncertain future.

To identify the preferred pathway for each priority unit, six potential pathways were developed for each unit, representing the spectrum of possible responses from no or low intervention to soft engineering (e.g. beach renourishment), hard engineering (e.g. sea walls), and managed retreat. Part of this work looked at construction and maintenance costs for each pathway.

A wide range of options were carefully considered by Community Panels, taking account of the uniqueness of Hawke's Bay's coast and what has been done around the world. The Panel's were supported by advice from independent science and engineering experts, before confirming a recommended pathway for each priority unit.

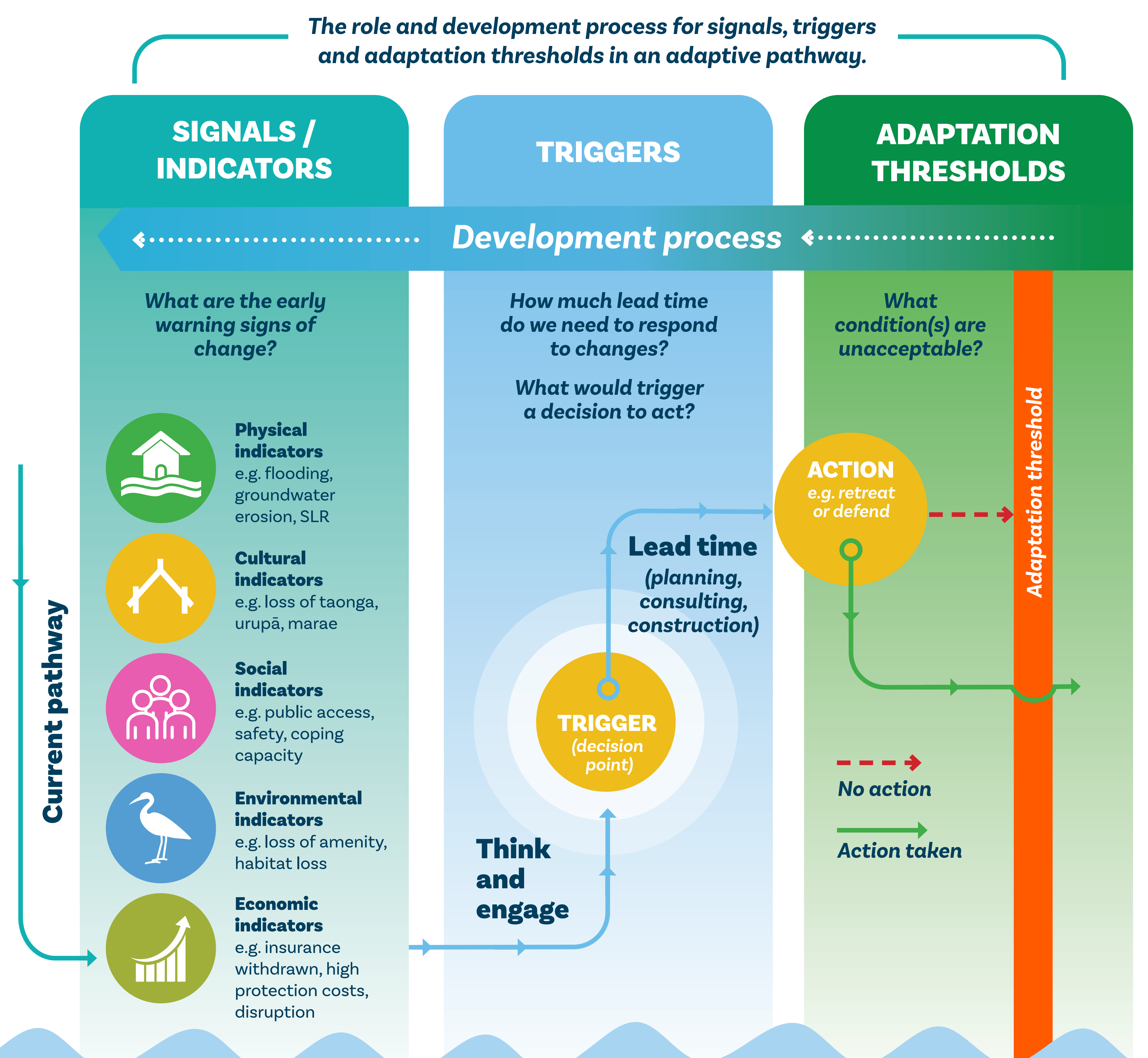
| Cell | Unit | Short term (0 - 20 years) | Medium term (20 - 50 years) | Long term (50 - 100 years) |
|---------------|--------------------|----------------------------|------------------------------------|------------------------------------|
| Southern Cell | Clifton | Status quo | Sea wall | Managed Retreat |
| | Te Awanga | Renourishment + Groynes | Renourishment + Groynes | Renourishment + Groynes |
| | Haumoana | Renourishment + Groynes | Renourishment + Groynes | Managed Retreat |
| | Clive / East Clive | Status quo | Renourishment + Groynes | Retreat the Line / Managed Retreat |
| Northern Cell | Ahuriri | Status quo | Sea wall | Sea wall |
| | Pandora | Status quo | Storm surge barrier | Storm surge barrier |
| | Westshore | Renourishment | Renourishment + Control Structures | Renourishment + Control Structures |
| | Bay View | Status Quo / Renourishment | Renourishment + Control Structures | Renourishment + Control Structures |
| | Whirinaki | Status Quo / Renourishment | Renourishment + Control Structures | Sea wall |

These pathways are not yet truly 'adaptive'. To be adaptive, tools are needed to measure when the next step in the pathway is implemented.

These tools are known as signals, triggers and adaptation thresholds

- **Signals are an early warning of change**
They might take the form of sea level reaching a certain height, or erosion reaching a defined location.
- **Triggers are a decision point**
They are designed to be set to allow sufficient time to take an action, before an adaptation threshold is reached. At this point, a decision is needed about whether action needs to be taken.
- **Adaptation thresholds describe a situation where performance measures are no longer being met or start to fail**

Adaptation thresholds describe a situation that people/communities don't want to see happen.



Adaptation thresholds

Adaptation thresholds describe a situation or scenario that results in unacceptable outcomes for the community.

Below are proposed adaptation thresholds for the coast between Clifton and Tangoio. We are interested in your feedback. Do we have these about right? Are they describing an outcome that is truly intolerable and must be avoided?

We want to avoid these Adaptation Thresholds being reached and will use the actions specified in the pathway for each unit to do this.

Proposed Adaptation Thresholds were developed through a series of community and council asset manager workshops.

Through understanding the consequences of coastal hazards and the effects on the community of these consequences, we identified thresholds based on the following factors:



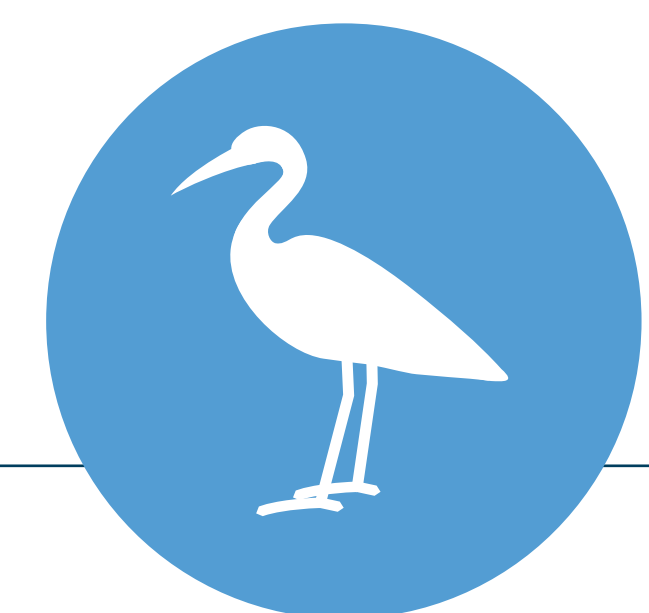
Social



Cultural



Economic



Environmental

| Threshold + Threshold Measure | |
|---|--|
| Whole Coast | Coastal inundation causing the loss of one or more essential services affecting the majority of the community. How long: At least 48 hours How often: More often than once every 5 years. |
| | Community-wide coastal inundation causing damage to multiple build-ings/service. How long: Any duration How often: More often than once every 5 years. |
| | Any serious injuries and/or fatalities that occur as a result of a coastal erosion or coastal inundation event. |
| | Civil Defence emergency is declared in response to coastal inundation or coastal erosion. How often: More often than once every 10 years. |
| | 50% of an affected coastal community consider that a permanent loss of amenity has occurred as a result of coastal erosion or coastal inundation im-pacts |
| | 50% of the community report actual or perceived property purgatory effects i.e. actual or foreseeable damage to their properties from coastal erosion or coastal inundation and uncertainty about being able to recover their losses |
| | 50% of properties are unable to secure building insurance for losses from coastal hazards. |
| Access to and use of the beach, coastal reserves and/or recreational facilities is prevented as a result of coastal inundation. How long: At least 7 days How of-ten: More often than once every 5 years. | |
| Whirinaki | Coastal erosion in Whirinaki affecting Whirinaki Road and/or North Shore Road, causing loss of road access for the majority of the community. |
| | Buildings in Whirinaki are deemed uninhabitable as a result of coastal hazards (e.g. loss of septic tanks, building structural integrity etc). |
| Bay View | Coastal erosion in Bay View affecting Le Quesne Road, causing loss of road access for majority of the community. |
| Westshore | No unit specific thresholds - only Whole Coast Thresholds apply |
| Ahuriri | No unit specific thresholds - only Whole Coast Thresholds apply |
| Pandora | Coastal inundation in Pandora affecting Thames Street and Severn Street causing loss of road access for the majority of the community. How long: At least 48 hours How often: More often than once every 5 years. |
| East Clive | Buildings in East Clive are deemed uninhabitable as a result of coastal hazards (e.g. loss of septic tanks, building structural integrity etc). |
| Haumoana | Coastal inundation in Haumoana affecting Haumoana and/or Beach Road causing loss of road access for the majority of the community. How long: At least 48 hours How often: More often than once every 5 years. |
| | Buildings in Haumoana are deemed uninhabitable as a result of coastal hazards (e.g. loss of septic tanks, building structural integrity etc). |
| Te Awanga | Coastal inundation in Te Awanga affecting Clifton Road causing loss of road access for the majority of the community. How long: At least 48 hours How often: More often than once every 5 years. |
| | Coastal erosion in Te Awanga affecting Clifton Road causing loss of road access affecting the majority of the community. |
| | Buildings in Te Awanga are deemed uninhabitable as a result of coastal hazards (e.g. loss of septic tanks, building structural integrity etc). |
| Clifton | Coastal inundation in Clifton affecting Clifton Road causing loss of road access for the majority of the community. How long: At least 48 hours How often: More often than once every 5 years. |
| | Coastal erosion in Clifton affecting Clifton Road causing loss of road access affecting the majority of the community. |
| | Buildings in Clifton are deemed uninhabitable as a result of coastal hazards (e.g. loss of septic tanks, building structural integrity etc). |