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Summary

- Phase 1 • **WHAT IS HAPPENING?**
- Phase 2 • **WHAT MATTERS MOST?**
- Phase 3 • **WHAT CAN WE DO ABOUT IT?**
- Phase 4 • **HOW CAN WE IMPLEMENT THE STRATEGY?**

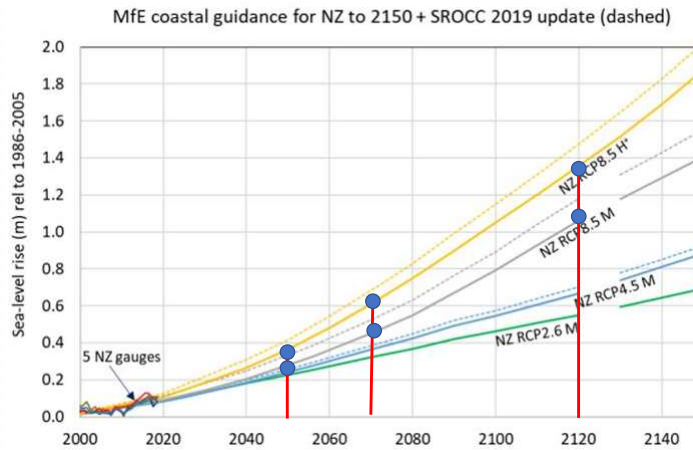
 **HURUNUI**
District Council

COASTAL CONVERSATIONS
The environment is changing, how will you?

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**Phase one:
What is happening?**

Sea level rise projections (MfE, 2017)

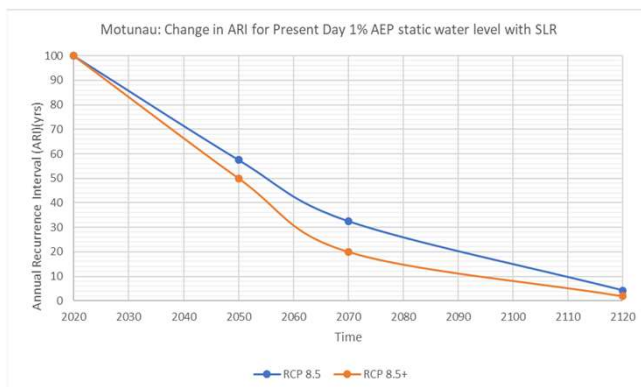


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**Phase one:
What is happening?**

Increase in Frequency of 1 in 100 Year Events with SLR



1 in 100 year event could occur every:

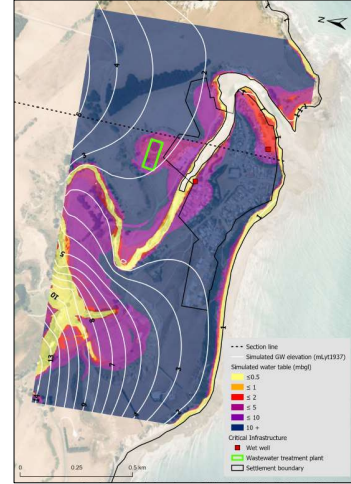
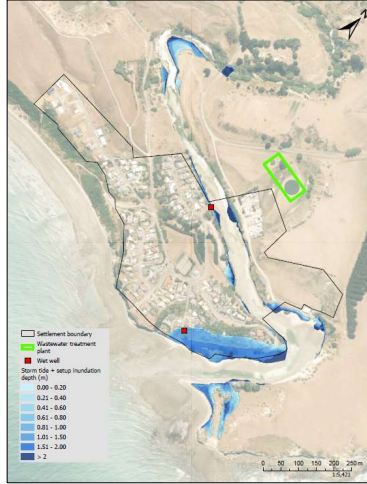
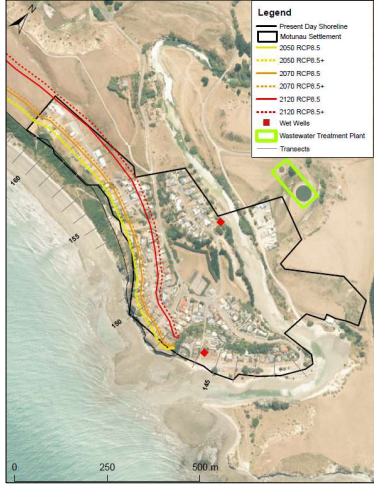
- 50-60 Years by 2050
- 20-30 Years by 2070
- 1-5 Years by 2120



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The environment is changing, how will you?

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Phase one: What is happening?



COASTAL CONVERSATIONS The environment is changing, how will you?

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Phase one: What is happening?



COASTAL CONVERSATIONS The environment is changing, how will you?

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**Phase one:
What is happening?**

Next steps – it's up to you

1. Continue to share stories / photographs or any other information?
2. Citizen science projects?

**Citizen Science Options for the
Hurunui District**

Derek Todd (Jacobs)

Agenda

1. What is Citizen Science?
2. What makes a good Citizen Science project?
3. An overview of different citizen science methods
4. What options would work in Motunau?



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What is Citizen Science?

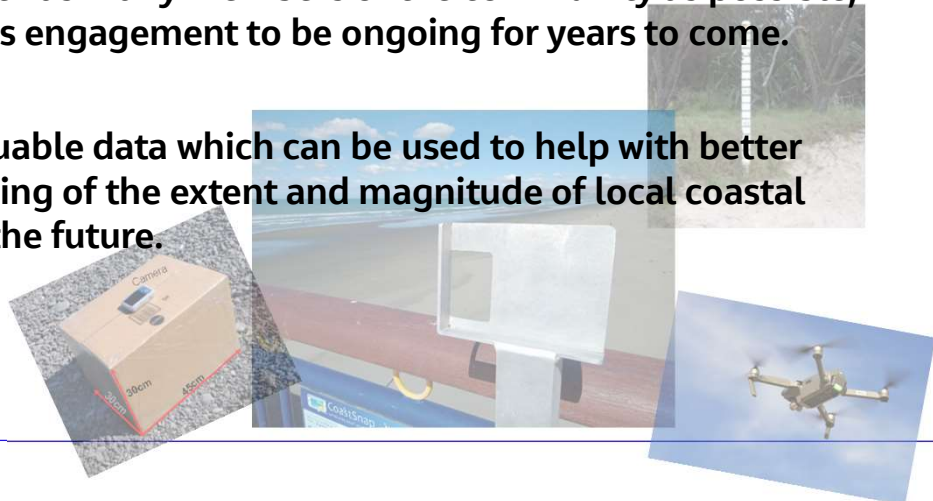
- Members of the public collect information and data for scientific research and monitoring.
- It creates an opportunity for communities to become experts of their own environment, and assist with data collection in their local setting.
- It provides an opportunity to record more regular data and observations than able to be collected by regulatory authorities, especially changes in the environments due to large natural events.



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What makes a good Citizen Science Project?

1. Engage with as many members of the community as possible, and for this engagement to be ongoing for years to come.
2. Collect valuable data which can be used to help with better understanding of the extent and magnitude of local coastal hazards in the future.



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What makes a good Citizen Science Project?

Community Engagement (Number of people engaged)

3	<ul style="list-style-type: none"> Engages with a wide range of people non-exclusive to the community. Anybody visiting the site will be able to be involved. No training is required.
2	<ul style="list-style-type: none"> Engages with the whole community. Easy execution of method for all ages. Some awareness of the project and methods is required to take part. Small amount of training required.
1	<ul style="list-style-type: none"> Small group of dedicated volunteers. Training and equipment required Data collected requires external quality control and processing. Higher level of technical ability required.

Technical

3	Produces high quality data that can be used in future assessments and to inform broader research.
2	Produces some quantitative data which could be used in future assessments
1	Produces some qualitative data which could be used in future assessments

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Examples of different Citizen Science Methods

Physical Beach Parameters

- Physical Measurements (e.g. Measuring Rod)
- Photographs (e.g. CoastSnap)
- Sediment Sampling
- Drone Surveys



Basic Ocean Parameters

- Measuring wind and waves
- Storm observations

Pre and Post Storm Monitoring

- Recording changes to beach health following storms

Recording water-levels during large events

- Photographs
- Water level gauges



Tension Cracks and Cliff Failure

- Measuring tension crack width
- Recording failure events

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Data Collection	Method	Engagement	Technical	'Score'	Motunau
Physical beach health parameter	Measuring Pole and physical measurements	2	2	4	Sandy Bay ²
	Photographs (CoastSnap)	3	2	6	✓
	Sediment Sampling	1	3	3	Sandy Bay ²
	Drone Survey	1	3	3	✓
Basic Ocean Parameters	Physical Measurements	2	1	2	✓
Vegetation Cover	Ecological Surveys - Quadrant	2	1	2	✗
	Dune profiles (CRT Guidelines)	1	3	3	✗
Cliff Failure and Tension Cracks	Physical Measurements and estimates	1	2	2	✓
Pre and Post Storm Change	Notification of Incoming Storm	Potentially 2 ¹	Potentially 3 ¹	Potentially 6	✓
Water levels in extreme events	Water Gauge (with warning notification)	2	2	4	✓
	Photographs (with warning notification)	2	1	2	✓
Structures	Survey with Photographs	2	1	2	✗

¹This method is used in addition to another method (e.g. physical beach measurements), therefore most of its success is based on what method is employed for measuring/recording beach health or water levels.

²This method is appropriate along the Sandy Bay (beach) environment, but not the cliff environment at Motunau.

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Photographs (CoastSnap)

Engagement

3

Technical

2

- CoastSnap uses images from a single reference point to measure shoreline changes over time.
- Photos taken using a smartphone in the 'CoastSnap' App.
- Relatively low cost
- Information could be used for shoreline tracking, time lapse videos, useful information following storms.
- Currently being used at other places on the Canterbury Coast
- Equipment
 - Private Smartphone
 - Cradle installation



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CoastSnap Example



Sourced from Youtube

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Measuring Pole and Physical Measurements

Engagement

Technical

2

2

- Recording the beach elevation on a permanent, surveyed measuring pole which has been installed at the back of the beach.
- Gives information about the dynamic and changing volume of the beach
- Information could be recorded in a notebook or via an online survey form
- Relatively low cost
- Could be installed in line with Environment Canterbury beach profile monitoring sites, so that the information could add value to the longer term (20-30 year) record.
- Equipment
 - Installation of permanent measuring pole (by surveyors)
 - Measuring tools (beach profile equipment – measuring rods, tape measure, inclinometer)



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Pre and Post Event Monitoring

Engagement

Technical

Potentially 2

Potentially 3

- Additional '**warning system**' which could alert the community when a storm may be coming so that can capture pre and post storm data (via other methods e.g. CoastSnap, measuring pole)
- Notification would be digital (e.g. text or email)
- This would give us a record of when large events happen, and what the effect of them was.



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Water level Gauge Readings

Engagement

Technical

2

2

- The installation of a water gauge which members of the public could read and record in flood events.
- A record of actual water level in lagoons/river mouths near settlement would be useful to verify flood modelling.
- Relatively low cost.
- Information could be recorded manually (notebook) or digitally.
- Equipment
 - Installed Water Gauge
 - Notebook/survey form



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Cliff Failure and Tension Crack Monitoring

Engagement

Technical

1

2

- Create a record of the development of tension cracks in cliff environments, and the eventual cliff failure.
- Records tension crack width - Installing a peg on either side of the tension crack and tying a piece of string between them. The tension crack would be remeasured when the string snapped and had to be re-tied.
- Record cliff failure events and estimates of cliff retreat following failure
- Likely to be a smaller group of volunteers who would be trained up and normally reside at Motunau
- Recorded either in a notebook or online database.



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**Phase one:
What is happening?**

Next steps – it's up to you

1. Continue to share stories / photographs or any other information?
2. Citizen science projects?



COASTAL CONVERSATIONS
The environment is changing, how will you?

**Phase two:
What matters most?**

What I value most

1 – the most important to you.
2 – the nice to have's but not essential to you.
X – the things that aren't that important.

Visual appearance of my settlement
 Cultural or historical significance
 Feeling of being on holiday
 No flooding on access roads
 Family connection with the area
 Existing trees and vegetation
 Recreation trails
 Fishing opportunities
 No flood water in my house
 No flood water on my property
 Ability to get insurance for my house
 I also value...

Who I live next to
 Smell or sound of the ocean
 Birdlife
 Drinking water security
 Community feel
 Physical access to beach
 Uninhibited vehicle access to my property
 Easy walking distance to beach
 Ability to dispose of wastewater
 Space on beach to play and enjoy

COASTAL CONVERSATIONS
The environment is changing, how will you?

HURUNUI
District Council

Example objectives:

Maintain safe, aesthetically pleasing, public greenspaces (including picnic and playground facilities) along (or close to) the foreshore and distributed throughout the community.

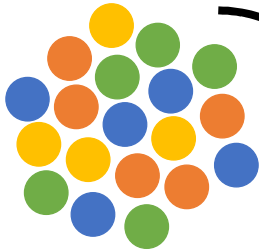
Ensure a functioning coastal ecosystem that supports rare and mahinga kai species.



COASTAL CONVERSATIONS
The environment is changing, how will you?

**Phase three:
What can we do about it?**

Long list of options



Short list of options



Proposed adaptive plan



**Phase three:
What can we do about it?**

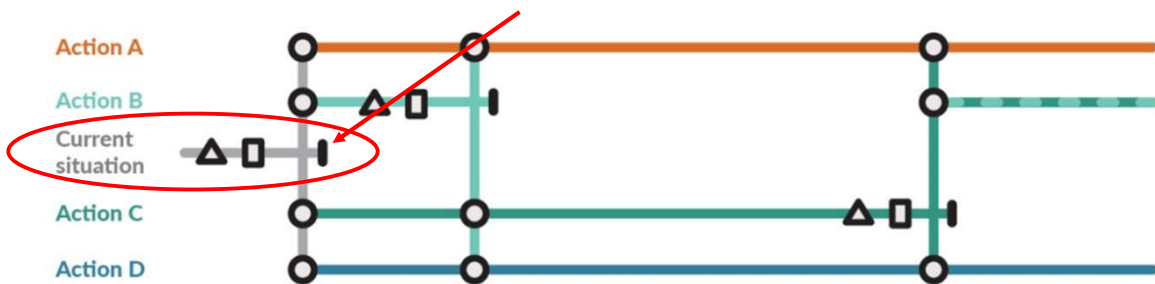
Action A

Action B

Current situation

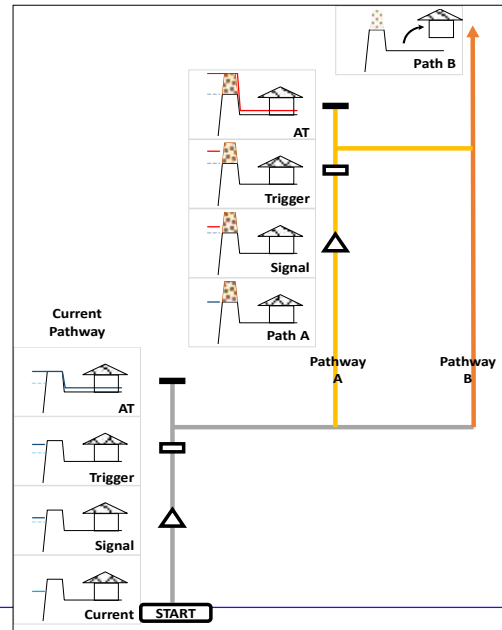
Action C

Action D



- Transfer point to new action and pathway
- Trigger (decision point)
- Adaptation threshold for policy action and pathway (no longer meets objectives)
- △ Adaptation signals
- Policy action and pathway effective

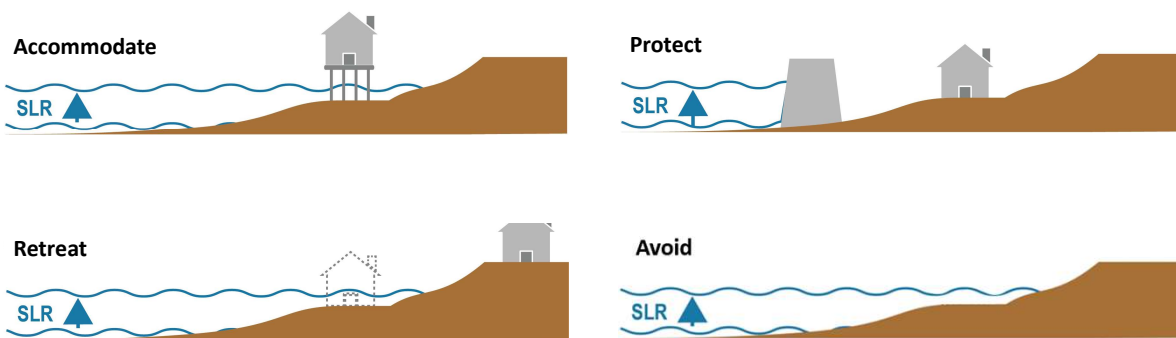
An example adaptation pathway



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Phase three: What can we do about it?

Types of options



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**Phase three:
What can we do about it?**

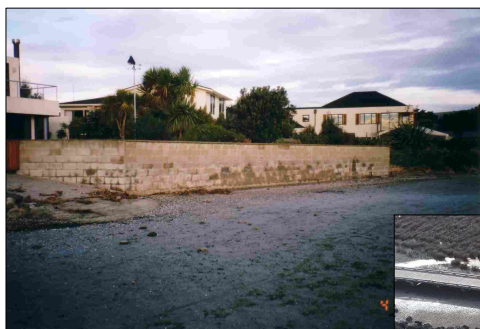


Accommodate



- Raise floor levels for new builds
- Accept some surface flooding
- Identify new access points

**Phase three:
What can we do about it?**



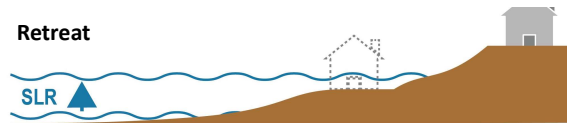
Protect



Phase three: What can we do about it?



Retreat



- Retreat after an event
- Managed retreat
- Require new development to be relocatable or prevent new development entirely

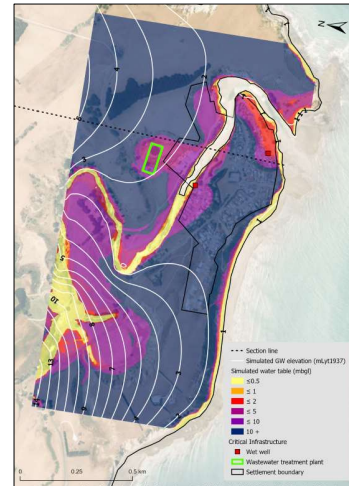
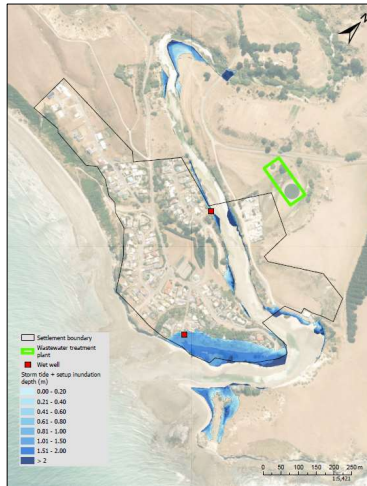
Phase three: What can we do about it?

Avoid

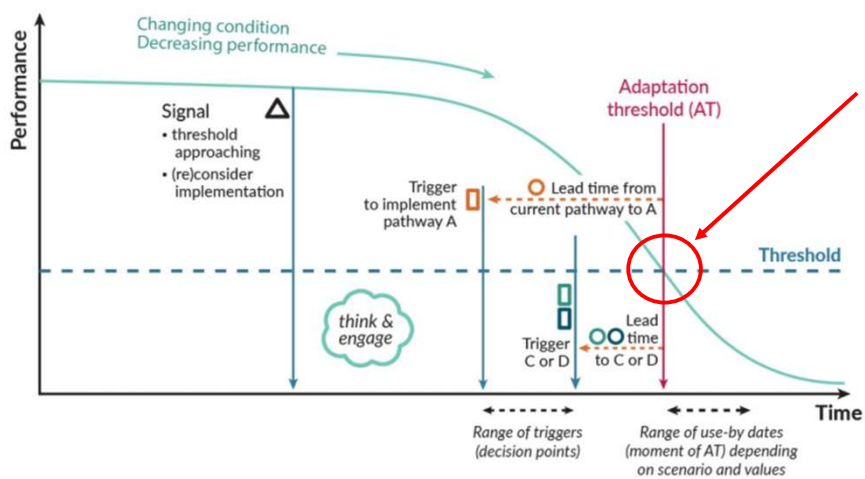


- Prevent new development in areas of risk
- Stop intensifying development in existing areas subject to risk

Phase one: What is happening?



Phase four: How can we implement the strategy?



Thank you