

Northern Adaptation Area Risk Assessment

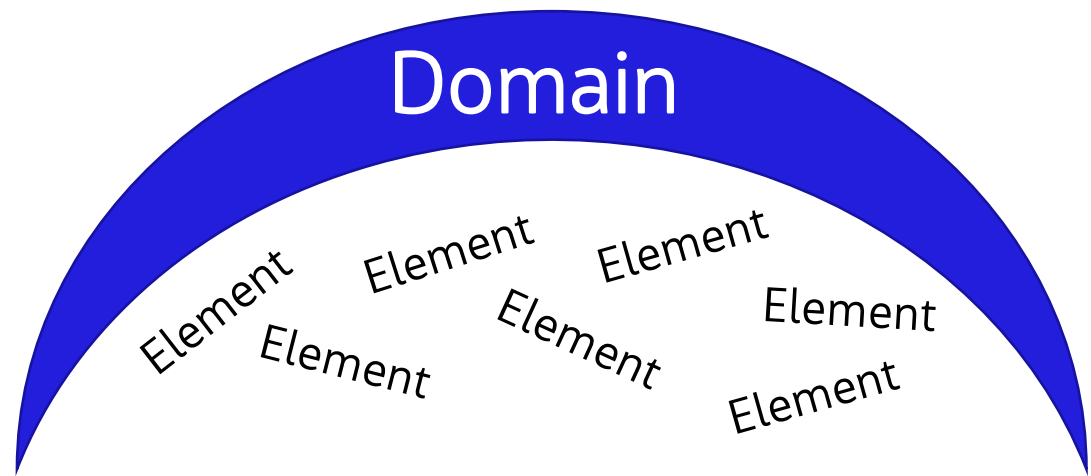
CAP Workshop 29 March 2023

(Updated May 2024)

Agenda

- Risk Assessment: Purpose and process
- Risk Assessment Results – By Domain
 - Built Environment
 - Natural Character
 - Cultural
 - Ecological
 - Human

Terminology

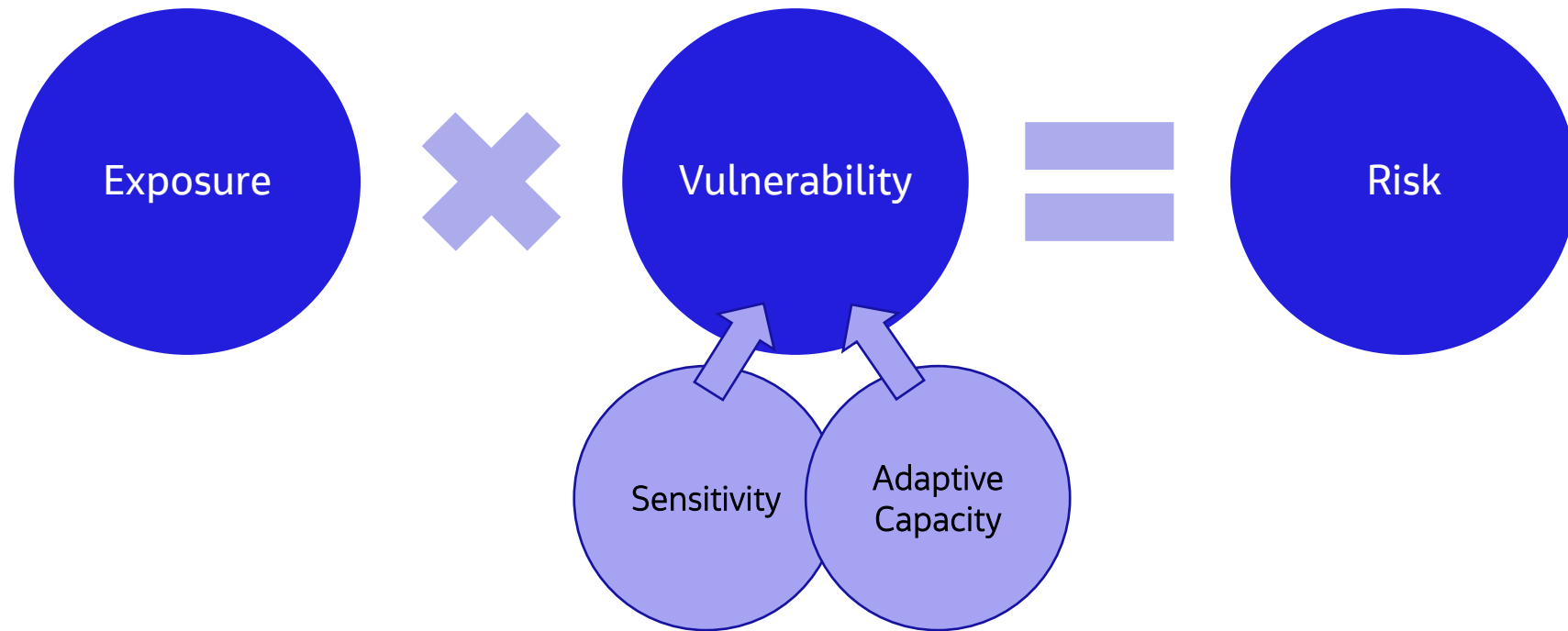


Domain	Element
Built Environment	e.g. Roads, Property, Water Supply
Ecological	e.g. Wetlands, dunes, bird habitat
Natural Character	e.g. Areas of high natural character
Human	e.g. Human physical health
Cultural	e.g. Ancestral landscapes, Mahinga kai

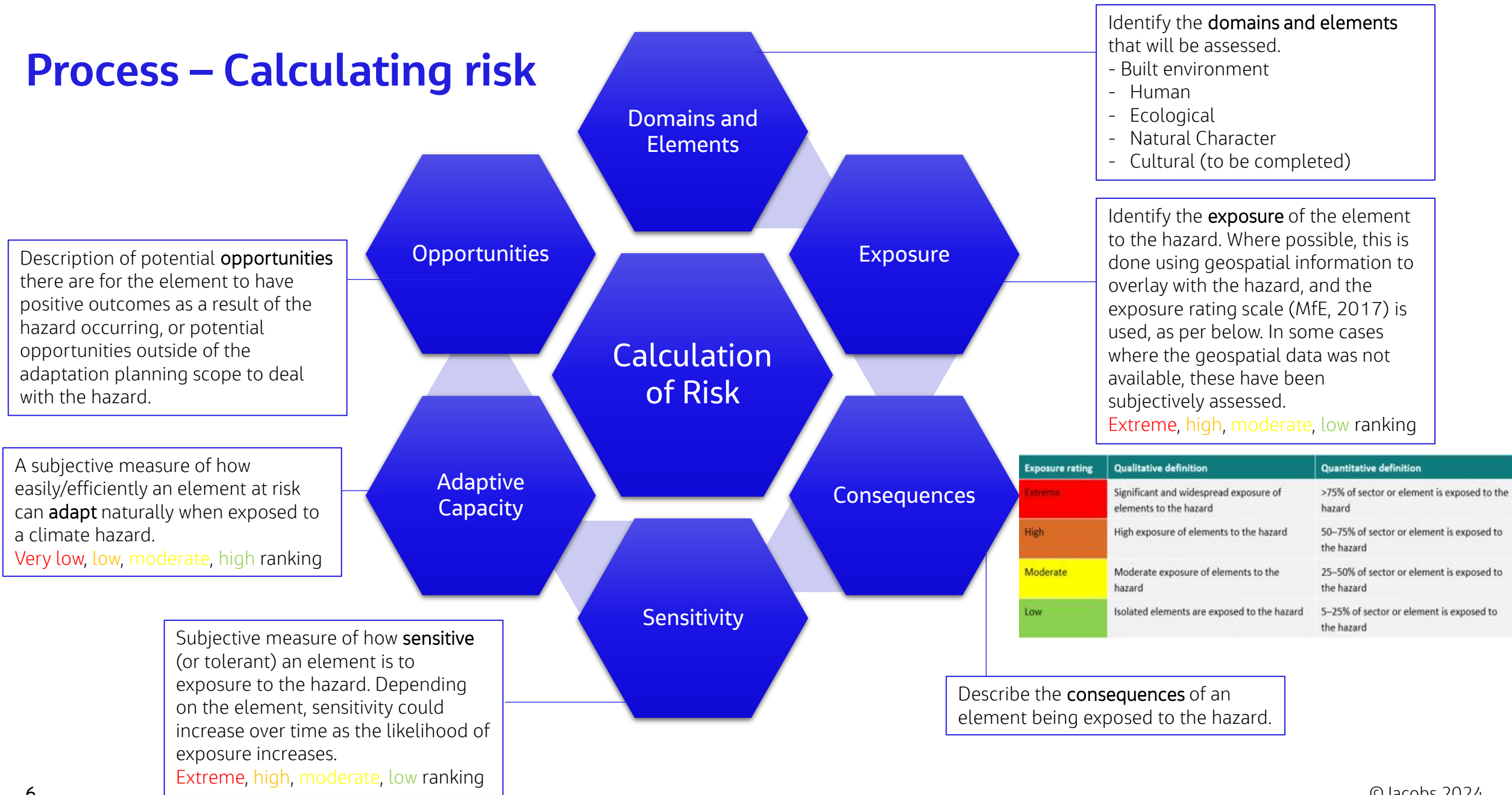
Purpose

What is a risk assessment?	Why do we need one?	What is it not?
<p>A systematic way to assess the potential risks that may impact a person, activity, or asset from a hazard over time.</p> <p>It considers:</p> <ul style="list-style-type: none"> - How exposed is an element to the hazard? - What are the consequences of the element being exposed? - And therefore, how sensitive is the element to being exposed? - Can the element naturally adapt with the hazard? <p>It is a snapshot of what a 'do nothing' scenario may look like in the future. It looks at the NAA as a whole unit.</p> <p>It provides a 'baseline' that throughout the TK process we can use to assess our pathways against – e.g. do our pathways achieve what we need?</p> <p>It is based on the data we have available now, and can be built on in the future.</p>	<ul style="list-style-type: none"> • To understand what is in the Northern Adaptation Area (NAA), and what is at risk to coastal erosion and inundation - now and in the future with SLR. • To understand when elements may become at risk. • To help us determine where we should focus our efforts to reduce risks in the future. • To help inform our objectives (what are we trying to achieve). 	<ul style="list-style-type: none"> • Domains aren't prioritised – That is for the CAP to decide in your objectives. • It does not include economics or governance Domains– it is based on the information we have available to date. • It is not a broad climate change risk assessment, it only deals with coastal erosion and coastal inundation information available at this stage (e.g does not include AWA fluvial/pluvial-groundwater flooding). • This is not an extensive risk assessment – does not include every single council asset. It recognises the key infrastructure and values of the district and uses available data to assess the risk. • It is not going to solve all our problems today! – This will show us what is at risk. In our next few workshops we will be determining how best to reduce the risks in the future.

Process – Calculating Risk



Process – Calculating risk

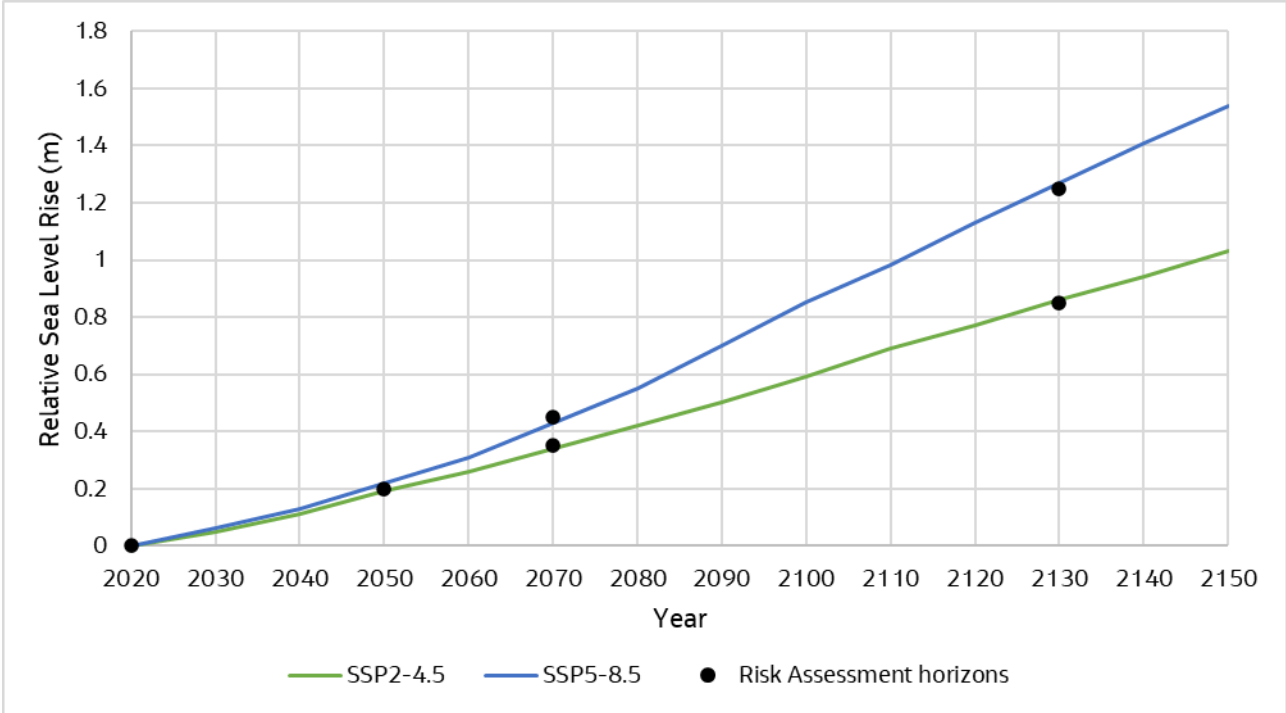


Process - Risk Ranking

		Exposure			
		Low (L)	Moderate (M)	High (H)	Extreme (E)
Vulnerability	Extreme (4)	Moderate	High	Extreme	Extreme
	High (3)	Low	Moderate	High	Extreme
	Moderate (2)	Low	Moderate	Moderate	High
	Low (1)	Low	Low	Moderate	High

From: Ministry for the Environment. 2021. *He kupu ārahi mō te aromatawai tūraru huringa āhuarangi ā-rohe / A guide to local climate change risk assessments*. Wellington: Ministry for the Environment.

Process – Likelihoods and Scenarios



Updated Scenarios to account for:

- NZSeaRise Data (1 mm/yr VLM)
- National Adaptation Plan, 2022

Timeframe	Sea level rise scenario	Erosion Hazard Probability Used	Inundation Hazard Probability Used
Present Day	0m RSLR	10% Probability of shoreline exceeding landward limit of mapped extent (e.g. P10)	1% Annual Exceedance Probability storm event
2050 (30 years)	0.2 m RSLR (SSP2-4.5 & SSP5-8.5)		
2070 (50 years)	0.35 m RSLR (SSP2-4.5) 0.45 m RSLR (SSP5-8.5)		
2130 (110 years)	0.85 m RSLR (SSP2-4.5) 1.25 m RSLR (SSP5-8.5)		

Northern Adaptation Area Risk Assessment Results

Built Environment Domain

The built environment encompasses assets, infrastructure and property that provide a service or critical function to the livelihood of the community.

Elements assessed:

- Private property
- Roads and bridges
- Wastewater services (pump stations, pipes)
- Water supply services (pipes, bores, treatment plants, pump stations)
- Stormwater services (pipes, outfalls, pump stations)
- Electrical supply and transmission (overhead and underground transmission lines)
- Natural gas supply



Built Environment Domain - Risk

	Coastal Erosion							Coastal Inundation					
Climate Change Scenario	Both		SSP2-4.5		SSP5-8.5			Both		SSP2-4.5		SSP5-8.5	
Element	Present	2050	2070 0	2130 0	2070	2130		Present	2050	2070	2130	2070	2130
Built Environment													
Properties - Whole Adaptation Area	L	L	L	L	L	L	L	L	M	M	M	E	
Properties - Ōtaki Beach*	L	M	M	M	M	H	L	L	L	H	M	E	
Properties - Te Horo Beach*	L	M	M	M	M	H	L	L	M	M	M	M	
Properties - Peka Peka*	L	L	L	L	L	M	L	L	L	M	L	M	
Water Supply Infrastructure	L	M	M	M	M	H	L	L	L	L	L	L	
Wastewater Infrastructure	L	M	M	M	M	H	L	L	L	L	L	H	
Stormwater Infrastructure	L	L	M	M	M	H	L	L	L	M	L	H	
Roads and Bridges	L	L	L	L	L	M	L	L	L	H	L	E	
Electrical Transmission and supply infrastructure	L	L	L	M	L	H	L	L	L	L	L	M	
Natural gas supply mains	No Exposure						L	L	L	L	L	M	

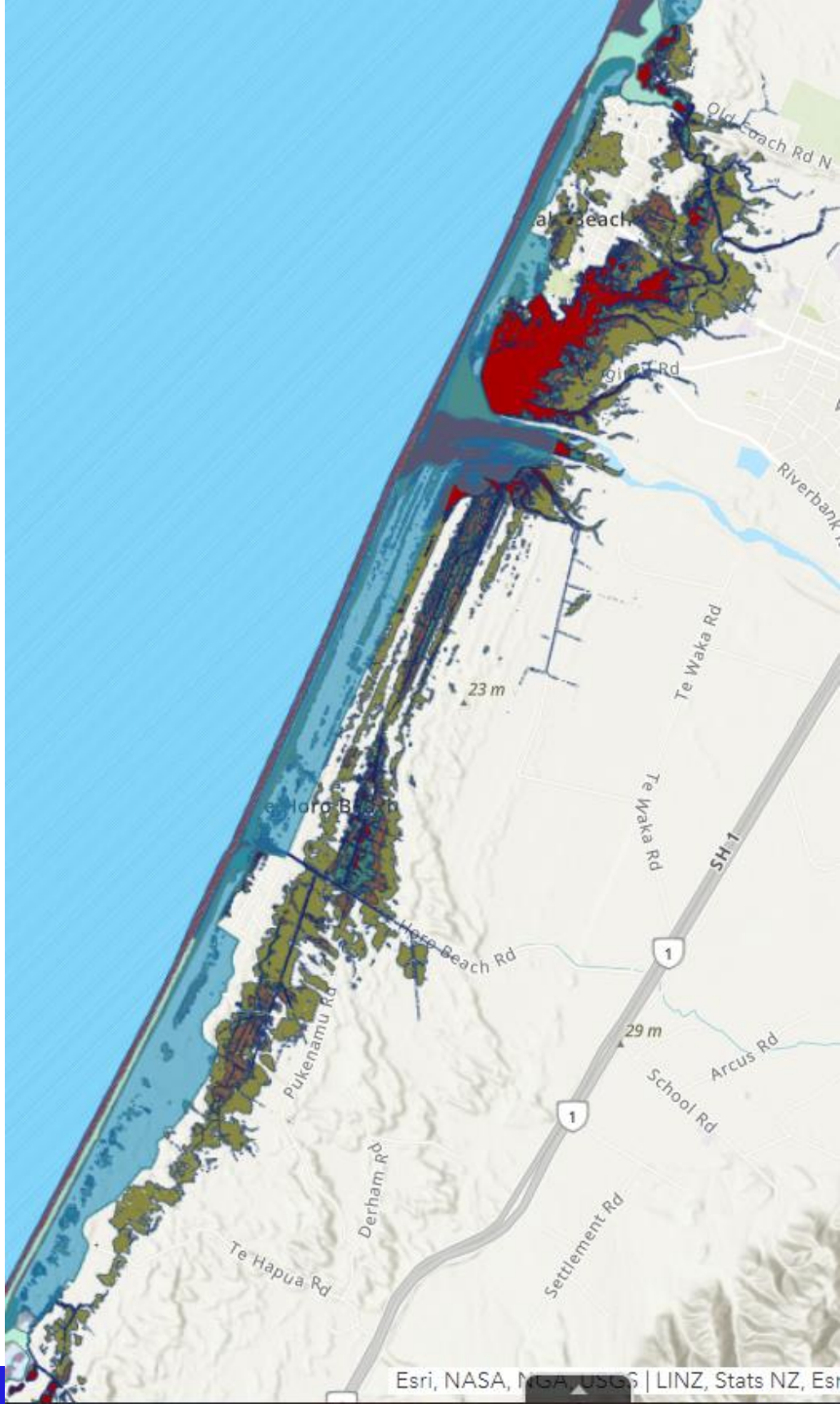
*For coastal erosion this is based on the number of beachfront properties impacted; For coastal inundation this is based on a broader settlement footprint.

Natural Character Domain

Natural character is the 'naturalness' or degree or modification of an area, as well as an areas distinct combination of natural characteristics and qualities.

Elements assessed:

- Ōtaki: Coastal Terrestrial Area
 - Ōtaki Dunes (High Natural Character)
 - Te Horo Dunes (High Natural Character)
- Part of: Waikanae and Paraparaumu: Coastal Terrestrial Area (CTA2)
 - Peka Peka Dunes (High Natural Character)



Natural Character Domain

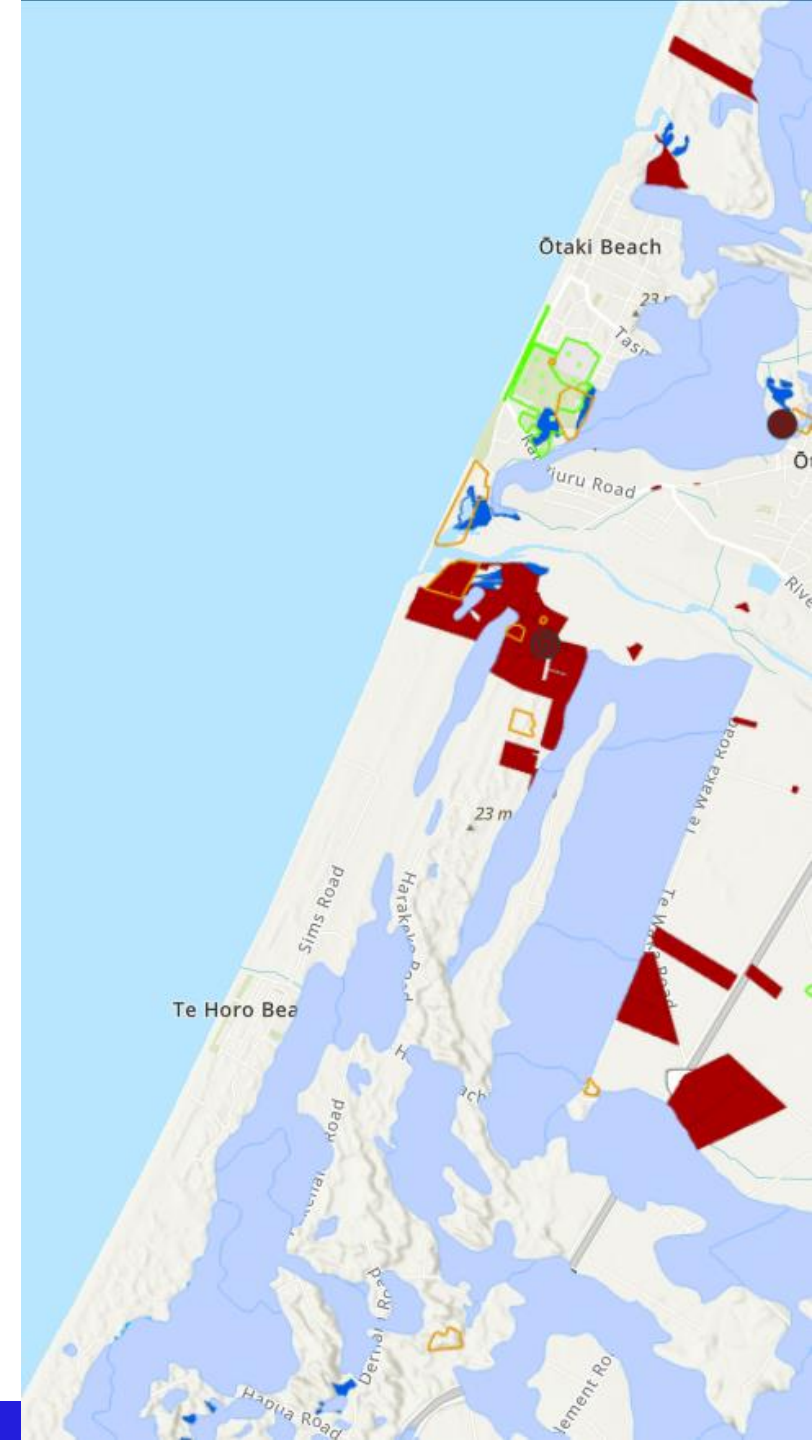
SLR Scenario	Coastal Erosion						Coastal Inundation					
	Both		SSP2-4.5		SSP5-8.5		Both		SSP2-4.5		SSP5-8.5	
	Present	2050	2070	2130	2070	2130	Present	2050	2070	2130	2070	2130
Element												
CTA1: Ōtaki (Coastal Terrestrial Area)	L	L	L	M	M	M	M	M	M	M	M	M
Ōtaki Dunes (High Natural Character)	M	M	M	M	M	M	M	M	M	M	M	M
Te Horo Dunes (High Natural Character)	L	L	L	L	L	M	L	L	L	L	L	L
Part of CTA2: Waikanae and Paraparaumu (Coastal Terrestrial Area)	M	M	M	M	M	H	M	M	M	M	M	H
Peka Peka Dunes (High Natural Character)	M	M	M	M	M	H	M	M	M	M	M	M

Cultural Domain

The Cultural Domain considers the risks to Mana Whenua values from coastal hazards.

Elements assessed:

- Ancestral Landscapes
- Marae
- Mahinga Kai
- Whānau/hapū/iwi whare and whenua



Cultural Domain

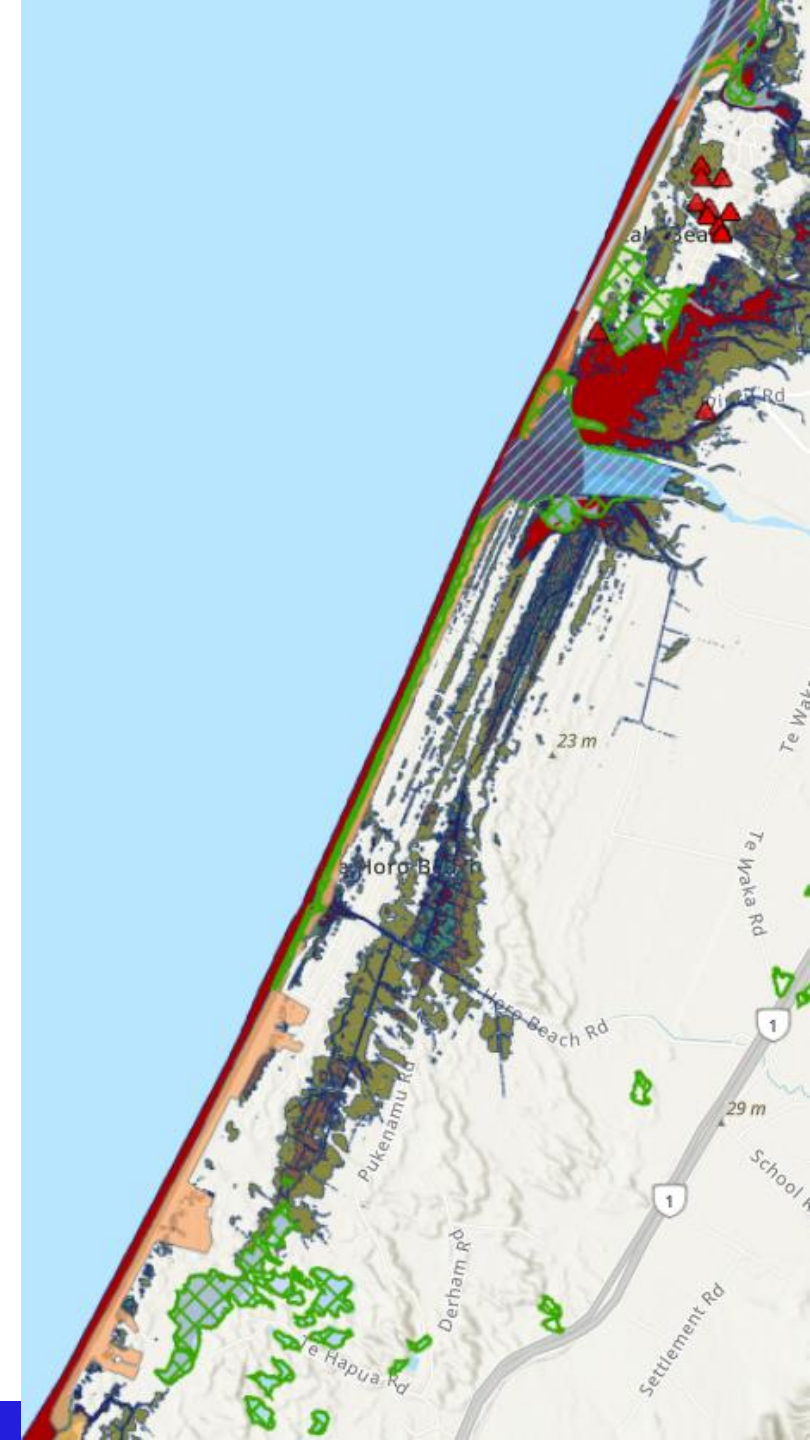
	Coastal Erosion						Coastal Inundation					
SLR Scenario	Both		SSP2-4.5		SSP5-8.5		Both		SSP2-4.5		SSP5-8.5	
Element	Present	2050	2070	2130	2070	2130	Present	2050	2070	2130	2070	2130
Ancestral Landscape	L	L	L	M	L	M	L	L	L	L	L	L
Marae	L	L	L	L	L	L	L	L	L	M	L	M
Mahinga Kai	L	L	L	L	L	L	L	L	L	L	L	L
Whānau/hapū/iwi whare and whenua	L	L	L	M	L	M	L	L	L	L	L	M

Ecological Domain

The ecological domain encompasses the natural flora and fauna of the district.

Elements assessed:

- Coastal Dunes
- Wetlands
- Mapped ecological sites
- Indigenous trees
- Rare and Threatened Species
- Bird Habitat
- Fish Habitat
- Indigenous Biodiversity Coastal



Ecological Domain

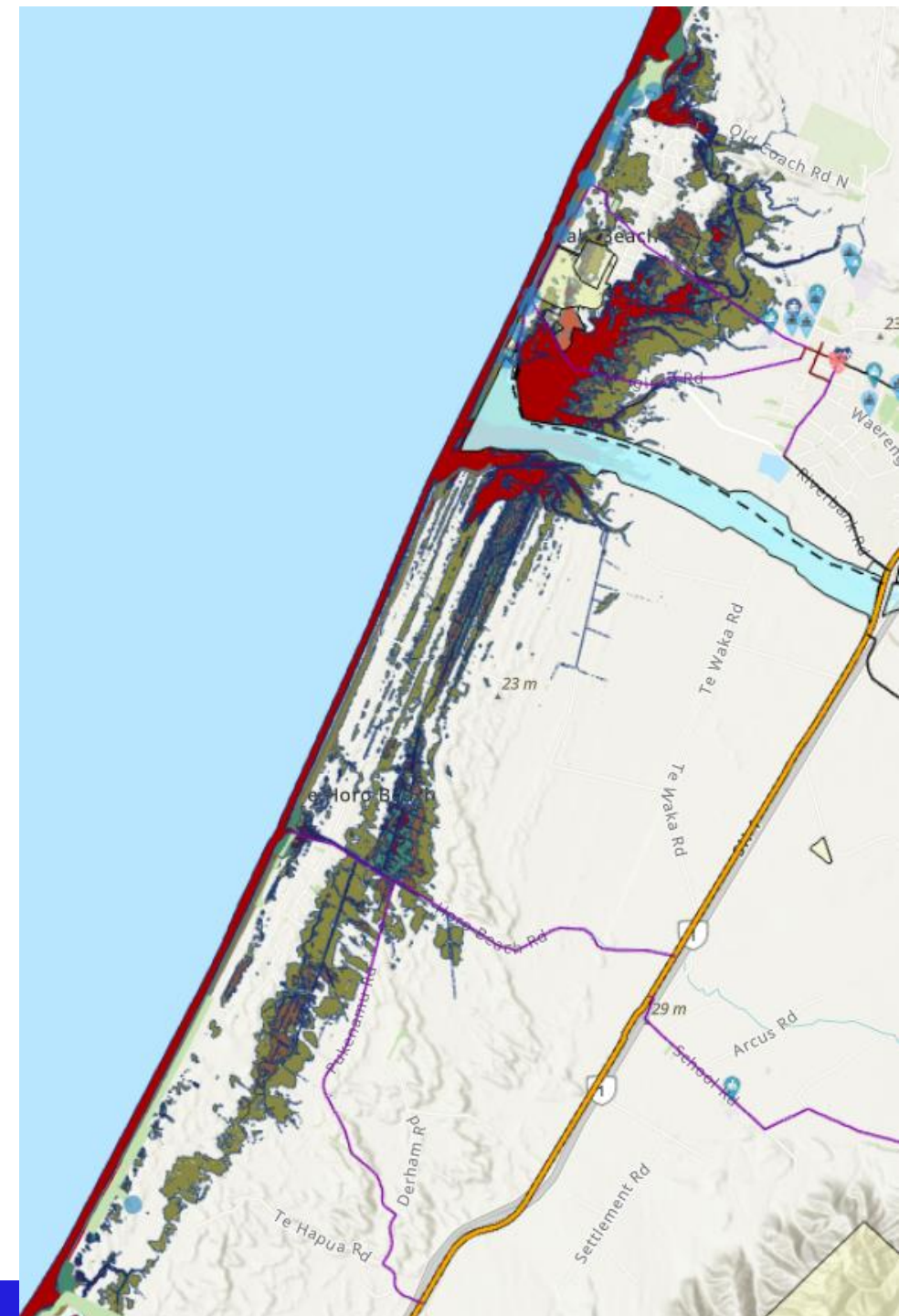
	Coastal Erosion						Coastal Inundation					
SLR Scenario	Both		SSP2-4.5		SSP5-8.5		Both		SSP2-4.5		SSP5-8.5	
Element	Present	2050	2070	2130	2070	2130	Present	2050	2070	2130	2070	2130
Coastal dunes	M	M	H	H	H	E	L	L	M	M	M	M
Wetlands	L	M	M	H	M	H	M	M	M	M	M	H
Ecological sites	M	M	H	E	H	E	M	H	H	E	H	E
Indigenous trees	No Exposure						L	L	L	M	L	H
Rare and threatened species	M	M	H	E	H	E	M	H	H	E	H	E
Bird habitat	M	M	H	E	H	E	H	H	E	E	E	E
Fish habitat	L	M	M	M	M	M	M	M	M	H	H	H
Indigenous biodiversity (coastal)	M	E	E	E	E	E	M	M	M	E	M	E

Human Domain

The human domain encompasses individual and community health and wellbeing, and disruptions to everyday life.

Elements assessed:

- Physical health
- Mental health and wellbeing
- Social infrastructure and amenity
- Exacerbating inequities
- Community cohesion and social wellbeing
- Conflict, disruption and loss of trust in government



Human Domain

Climate Change Scenario	Coastal Erosion						Coastal Inundation					
	Both		SSP2-4.5		SSP5-8.5		Both		SSP2-4.5		SSP5-8.5	
	Present	2050	2070	2130	2070	2130	Present	2050	2070	2130	2070	2130
Element	Human											
Physical health	L	L	L	L	L	L	M	M	M	H	M	H
Mental health and wellbeing	L	L	L	M	M	M	M	M	M	H	M	H
Social infrastructure and amenity	L	L	L	L	L	M	L	M	M	M	M	H
Exacerbating inequities	L	L	M	M	M	M	M	H	H	E	H	E
Social cohesion and community wellbeing	L	L	M	M	M	M	M	M	M	M	M	H
Conflict, disruption and loss of trust in government	M	M	M	M	H	E	M	M	M	H	M	E

Summary Matrices

	Coastal Erosion							Coastal Inundation						
Climate Change Scenario	Both		SSP2-4.5		SSP5-8.5			Both		SSP2-4.5		SSP5-8.5		
Element	Present	2050	2070	2130	2070	2130		Present	2050	2070	2130	2070	2130	
Built Environment														
Properties - Whole Adaptation Area	L	L	L	L	L	L		L	L	M	M	M	E	
Properties - Ōtaki Beach*	L	M	M	M	M	H		L	L	L	H	M	E	
Properties - Te Horo Beach*	L	M	M	M	M	H		L	L	M	M	M	M	
Properties - Peka Peka*	L	L	L	L	L	M		L	L	L	M	L	M	
Water Supply Infrastructure	L	M	M	M	M	H		L	L	L	L	L	L	
Wastewater Infrastructure	L	M	M	M	M	H		L	L	L	L	L	H	
Stormwater Infrastructure	L	L	M	M	M	H		L	L	L	M	L	H	
Roads and Bridges	L	L	L	L	L	M		L	L	L	H	L	E	
Electrical Transmission and supply infrastructure	L	L	L	M	L	H		L	L	L	L	L	M	
Natural gas supply mains	No Exposure							L	L	L	L	L	M	
Human														
Physical Health	L	L	L	M	L	M		M	M	M	H	M	H	
Mental Health and Wellbeing	L	L	L	M	M	M		M	M	M	H	M	H	
Conflict, Disruption, and Loss of Trust in Government	M	M	M	M	H	E		M	M	M	H	M	E	
Exacerbating Inequities	L	L	M	M	M	M		M	H	H	E	H	E	
Social Cohesion and Community Wellbeing	L	L	M	M	M	M		M	M	M	M	M	H	
Social Infrastructure and Amenity	L	L	L	L	L	M		L	M	M	M	M	H	
Ecological														
Coastal dunes	M	M	H	H	H	E		L	L	M	M	M	M	
Wetlands	L	M	M	H	M	H		M	M	M	M	M	H	
Ecological sites	M	M	H	E	H	E		M	H	H	E	H	E	
Indigenous trees	No Exposure								L	L	L	M	L	H
Rare and threatened species	M	M	H	E	H	E		M	H	H	E	H	E	
Bird habitat	M	M	H	E	H	E		H	H	E	E	E	E	
Fish habitat	L	M	M	M	M	M		M	M	M	H	H	H	
Indigenous biodiversity (coastal)	M	E	E	E	E	E		M	M	M	E	M	E	
Natural Character														
CTA1: Ōtaki (Coastal Terrestrial Area)	L	L	L	M	M	M		M	M	M	M	M	M	
Ōtaki Dunes (High Natural Character)	M	M	M	M	M	M		M	M	M	M	M	M	
Te Horo Dunes (High Natural Character)	L	L	L	L	L	M		L	L	L	L	L	L	
Part of CTA2: Waikanae and Paraparaumu (Coastal Terrestrial Area)	M	M	M	M	M	H		M	M	M	H	M	H	
Peka Peka Dunes (High Natural Character)	M	M	M	M	M	H		M	M	M	M	M	M	
Cultural														
Ancestral landscape	L	L	L	M	L	M		L	L	L	L	L	L	
Marae	L	L	L	L	L	L		L	L	L	M	L	M	
Mahinga Kai	L	L	L	L	L	L		L	L	L	L	L	L	
Whanau/hapu/iwi whare and whenua	L	L	L	M	L	M		L	L	L	L	L	M	
*Beachfront only' properties are considered for assessment of erosion risk; for coastal flooding all properties within the defined sub-area are assessed.														

Copyright notice

Important

The material in this presentation has been prepared by Jacobs®.

All rights reserved. This presentation is protected by U.S. and International copyright laws. Reproduction and redistribution without written permission is prohibited. Jacobs, the Jacobs logo, and all other Jacobs trademarks are the property of Jacobs Engineering Group Inc.

Jacobs is a trademark of Jacobs Engineering Group Inc.

