



Climate change
and you

MODULE 2

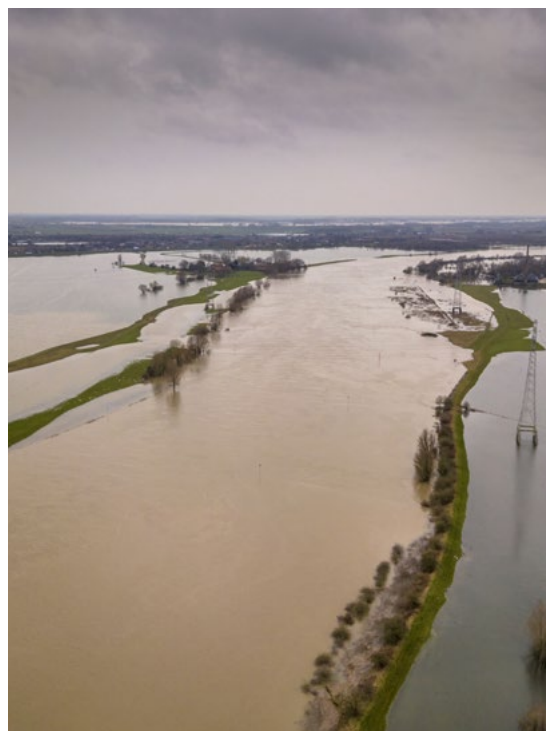
CLIMATE CHANGE ESSENTIALS

Understanding climate change is crucial to effectively prepare for the future. This module provides an overview of how the climate is changing in Aotearoa New Zealand, with a focus on regional impacts that will help you understand the scale and significance of these changes.

What is climate change?

Climate change refers to long-term shifts in temperatures and weather patterns. Human activities, such as burning fossil fuels (i.e., coal, oil, gas) and deforestation, are the primary drivers of these changes. These activities increase the levels of greenhouse gases in the atmosphere, such as carbon dioxide and methane, which trap heat from the sun. This creates a 'greenhouse effect' that warms the Earth.

As the planet warms, we are witnessing fundamental changes to Earth's systems. For instance, glaciers and ice caps are melting at an accelerated rate, contributing to rising sea levels. The warming atmosphere is leading to more frequent and intense extreme weather events, such as floods and droughts. These changes also affect seasonal patterns, altering the timing of natural events like flowering and migration.





Climate hazards

Understanding how the climate has changed to date, and will continue to change, is a critical aspect of your adaptation planning. Projections are available globally and locally that project the changes in our climate.

Climate hazards are a core part of projections and describe the change in either a size, persistence and frequency of an acute event (such as a storm or flood) or a slow onset event (such as sea level rise or increasing temperatures).

Throughout the assessment of climate-related risks and opportunities for your business, you should consider both acute and slow onset climate hazards including heatwaves, wildfires, flooding, coastal inundation, storms and landslides (acute) and sea level rise (slow onset).

The Ministry for Environment has worked with National Institute of Water and Atmospheric Research (NIWA) to provide localised projections for across the motu. For the latest information, visit the [Ministry for Environment](#).

Climate change in Tāmaki Makaurau Auckland

Over the last century, Tāmaki Makaurau Auckland has experienced significant changes in the climate. If greenhouse gas emissions continue at their current rate, these changes will become even more pronounced.

Within Tāmaki Makaurau, recent discussions about climate change have focused on the impacts of extreme weather events such as the Auckland Anniversary Weekend floods in January 2023 and Cyclone Gabrielle in February 2023. According to NIWA, this period was the wettest since records began with Central Auckland rainfall series recording a total of 539 mm of rain in Albert Park, smashing the earlier record of 420mm from February 1869.¹

Looking ahead, Tāmaki Makaurau Auckland could experience:



- **Increased number of hot days:** Currently, we experience around 20 days each year with temperatures above 25°C. By the end of the century, this could increase to over 70 days if emissions stay at current levels, and over 100 days under a high emissions scenario.



- **Increased extreme rainfall:** A warmer atmosphere holds more moisture, which can lead to heavier, short-duration rainfall events. These rare, intense storms are projected to increase by 14 per cent for every degree of warming.

Understanding these projections helps you anticipate the challenges and opportunities your business might face, allowing you to plan accordingly. However, it is not critical to understand these projections in detail to begin your adaptation planning. If you are based outside of Tāmaki Makaurau Auckland, the [Ministry for the Environment's climate projections](#) are a great place to start.

¹ NIWA (2023). Auckland suffers wettest month in history: <https://niwa.co.nz/news/auckland-suffers-wettest-month-history>

Climate change essentials



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Climate projections for Tāmaki Makaurau Auckland (under high emissions scenarios)

Climate hazard	Baseline period ²	2040 ³	2090
 Heatwaves (hot days)	19.7 hot days. ⁴	47 hot days (>25°C)	100 hot days (>25°C)
 Wildfires⁵	N/A	10-30% increase in Seasonal Severity Rating (SSR)⁶ - Very high and extreme forest fire danger increases by 40-50%	10-30% increase in SSR - Very high and extreme forest fire danger increases by 50-100% for the Auckland region north of the isthmus and by 40-50% south of the isthmus
 Flooding and extreme rainfall	100-year ARI, 24-hour storm depth, 176mm	100-year ARI, 24-hour storm depth, 189mm	100-year ARI, 24-hour storm depth, 215mm
 Sea level rise (worsening coastal inundation)	N/A	Increase by 0.3 metres	Increase by 1.2 metres
 Storms	9 cyclones every 10 years	Increased intensity and reduced frequency of ex-tropical cyclones.	Increased intensity and reduced frequency of ex-tropical cyclones
 Drought	- Potential evaporation transportation (PED) is 225 mm-375 mm per year 237⁷ dry days per year	60-100 mm increase in PED 3-9 more dry days per year - Annual relative humidity increases by 1%	100-140 mm increase in PED 12-21 dry days per year - Annual relative humidity decreases by up to 2% for most of the region
 Landslides	N/A	Increased intensity of heavy rainfall events will increase the frequency and severity of landslides	Increased intensity of heavy rainfall events will increase the frequency and severity of landslides

Note: Projection data retrieved from the Tāmaki Makaurau Economic Climate Change Risk Assessment⁸ and SeaRise⁹

² The baseline period is an average, depending on the climate variable, based on past data usually from 1995

³ Projections are the average of the 20-year period 2031-2050

⁴ Days where the temperature exceeds 25°C

⁵ Projections for wildfire are in relation to a 1980-1999 baseline and are for the 20-year periods centred on 2050 and 2080

⁶ Seasonal Severity Rating (SSR) is a seasonal average of the Daily Severity Rating (DSR), which captures the effects of both wind and fuel dryness on potential fire intensity, and therefore control difficulty and the amount of work required to suppress a fire

⁷ Days of less than 1mm of rainfall

⁸ The Economic Climate Change Risk Assessment (ECCRA) for Auckland builds upon the preliminary CCRA undertaken in 2020. This CCRA adds to the knowledge of climate change risks already identified by Auckland Council. It considers both risks and opportunities arising from physical climate change hazards as well as those arising from the transition to a low carbon economy. Key physical risks across the food and beverage, construction, screen and visitor economy sector have been included

⁹ SeaRise (n.d.). Sea level rise projection maps: searise.nz/maps-2



Why climate change is important to you

Understanding why climate change is important to you, your whānau and your business is crucial for effective planning and adaptation.

Climate change impacts various aspects of our lives, from an individual and community level to the environment we live in and the businesses we run.

Choosing which climate-related risks to address depends on what you value and prioritise as a business. Reviewing your business strategy or values statement can be a starting point in helping understand what is driving you to adapt to climate change, and where your ways of working may already support your resilience.



Health and wellbeing

Climate change affects individuals and their whānau by impacting their living conditions, mobility, sense of safety, health and wellbeing, and experience with the natural environment. Extreme weather events, such as floods and cyclones, can damage homes and infrastructure, displacing families and compromising their safety.

A changing climate also impacts individual and whānau health. Health issues related to heat-related illnesses and vector-borne diseases are becoming more prevalent due to climate change. Individual and whānau health will also be indirectly affected by drought and heavy rainfall events affecting water availability and quality.

Aside from physical health, the psychological toll of experiencing climate-related disasters and being displaced from familiar environments can have long-lasting effects on the mental health and resilience of whānau. Moreover, the loss of biodiversity and natural habitats affects recreational activities and cultural practices that are integral to people's identities.¹⁰

¹⁰ Ministry for Environment (2021). National Climate Change Risk Assessment environment.govt.nz/publications/national-climate-change-risk-assessment-for-new-zealand-main-report



Business implications of climate change

For businesses, climate change presents both challenges and opportunities across various sectors. Changes in weather patterns and natural disasters can disrupt supply chains, increase operational costs and affect customer demand. An increasing incidence of extreme weather will affect all SMEs. These impacts range from damage to key infrastructure through to an increase in insurance premiums.¹¹

Businesses that rely on natural resources, such as agriculture, forestry and tourism are particularly vulnerable to climate-related risks. For example, changes in weather patterns can disrupt agricultural production, leading to food insecurity and economic instability for SMEs that operate in the primary production sphere.¹²

However, a changing climate can also create new market opportunities and enhance competitiveness. Developing sustainable business practices, such as strengthening assets, developing off grid energy storage and adopting climate-resilient technologies can reduce climate risks and have the added benefit of attracting environmentally conscious consumers.

Collaboration and community resilience

Addressing the challenges of climate change requires collaboration and collective action at local, national and global levels.

Community-based initiatives, such as disaster preparedness programmes and climate education campaigns can empower individuals, whānau and businesses to build resilience and adapt to changing conditions.

What's more, industry collaboration is crucial when considering adaptation actions to address large-scale risks such as risks to supply chains.

At the community level, businesses can play a broader role in driving climate action by engaging with stakeholders and advocating for policy changes that support climate resilience. Businesses can also play a critical role in driving climate action by integrating sustainability into their operations, engaging with stakeholders, and advocating for policy changes that support climate resilience.

By working together, individuals, whānau and businesses can create a more sustainable and resilient future for themselves and future generations.



^{11,12} Tataki Auckland Unlimited (2021). Tāmaki Makaurau Economic Climate Change Risk Assessment knowledgeauckland.org.nz/publications/tamaki-makaurau-economic-climate-change-risk-assessment



Take a moment

Considering these points will help you better understand the content in this module.

- How have you been impacted by climate-related events?
- How has your business and whānau been affected?
- Can you think of some examples where your community has collaborated to overcome a challenge? This could either be a disaster event or related to COVID-19. How did you work together to overcome this challenge? How could some of these learnings be applied when thinking about developing community resilience to climate events?

It might be useful to talk these points through with your management team or teammates. That's because you'll likely have experienced past impacts differently, given your different roles within your business. (Use your answers here to help complete the climate-related risk and opportunity identification tool in Module 5.)

Find out more

I want more information on ...	Resource	Pages
How the climate is changing across New Zealand	National Climate Change Risk Assessment¹³	37
	Projected regional climate change hazards	N/A
How the climate is changing in Auckland	Tāmaki Makaurau Economic Climate Change Risk Assessment	8
	Auckland region climate change projections and impacts¹⁴	All
How climate change is impacting Māori	He huringa ā huarangi he huringa ao: a changing climate, a changing world	All
New Zealand's 10 most significant climate change risks	National climate change risk assessment	9
Auckland's economic climate change risks	Tāmaki Makaurau Economic Climate Change Risk Assessment	Executive summary

¹³ This report presents the findings of New Zealand's first National Climate Change Risk Assessment (NCCRA). The risk assessment gives a national picture of how New Zealand may be affected by climate-related hazards

¹⁴ Auckland Council and Council-controlled organisations commissioned NIWA to analyse projected climate changes for the Auckland region and potential impacts of climate change on some of Auckland's environments and sectors. This report addresses expected changes for 21 different climate variables out to 2120 and draws heavily on climate model simulations from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. Potential climate change impacts on important environments and sectors in the Auckland region are discussed

References

The Intergovernmental Panel on Climate Change (IPCC) (2021). Summary for Policymakers:
https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

Manaaki Whenua (2021). He huringa ā huarangi he huringa ao: a changing climate, a changing world:
[landcareresearch.co.nz/assets/researchpubs/He-huringa-ahuarangi-he-huringa-ao-a-changing-climate-a-changing-world.pdf](https://www.landcareresearch.co.nz/assets/researchpubs/He-huringa-ahuarangi-he-huringa-ao-a-changing-climate-a-changing-world.pdf)

Ministry for Environment (2021). National Climate Change Risk Assessment:
<https://www.landcareresearch.co.nz/assets/researchpubs/He-huringa-ahuarangi-he-huringa-ao-a-changing-climate-a-changing-world.pdf>

NIWA (2020). Auckland region climate change projections and impacts:
knowledgeauckland.org.nz/publications/auckland-region-climate-change-projections-and-impacts-revised-september-2020

Tātaki Auckland Unlimited (2021). Tāmaki Makaurau Economic Climate Change Risk Assessment:
<https://knowledgeauckland.org.nz/publications/auckland-region-climate-change-projections-and-impacts-revised-september-2020>

Ministry for Environment (2021). A Guide to Local Climate Change Risk Assessments:
environment.govt.nz/publications/a-guide-to-local-climate-change-risk-assessments

Ministry for the Environment (2022). Climate action for Māori: The national adaptation plan:
environment.govt.nz/publications/climate-action-for-maori-the-national-adaptation-plan

NIWA (2020). Climate change and possible impacts for New Zealand:
niwa.co.nz/climate-change-information-climate-solvers/climate-change-and-possible-impacts-new-zealand

Tātaki Auckland Unlimited (2021). Tāmaki Makaurau Economic Climate Change Risk Assessment:
knowledgeauckland.org.nz/publications/tamaki-makaurau-economic-climate-change-risk-assessment