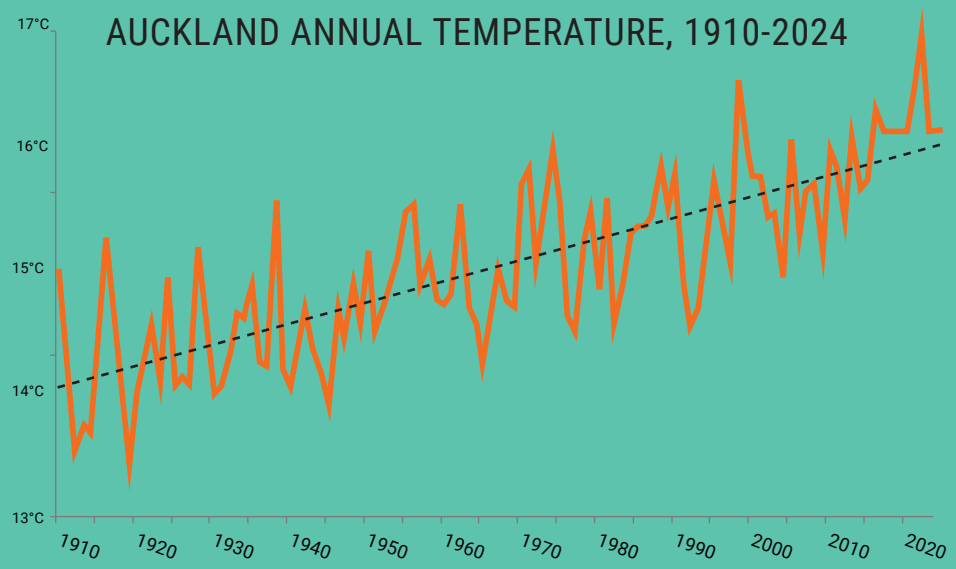
AUCKLAND'S FUTURE CLIMATE

As temperatures rise due to global warming, our wind, rainfall, and seasonal patterns will change. Sea levels will continue to rise and we will experience more floods, droughts and heatwaves.

Climate change is already happening, and Auckland's current average temperature is about 1.7 degrees higher than 100 years ago. As we head into the future it is critical to understand how our environment might change so we can prepare, find opportunities, adapt, and continue to prosper.



How our future climate will change depends strongly on greenhouse gas concentrations in the atmosphere. Shared Socio-economic Pathways (SSPs) are scenarios of greenhouse gas concentrations from 2015-2100. The following two scenarios represent a plausible range for investigating future global climate change:

MODERATE INTENSITY SCENARIO (SSP2-4.5)

SSP2-4.5 is an intermediate concentration scenario that could be a realistic outcome if moderate global action is taken towards reducing greenhouse gas emissions.

HIGH INTENSITY SCENARIO (SSP3-7.0)

SSP3-7.0 is an high concentration scenario where little global action is taken towards reducing greenhouse gas emissions.

In this summary report, annual climate change projections for two future time periods are shown: 2050 (data averaged over 2041-2060), and 2090 (2081-2099). Changes are relative to the historic average (data averaged over 1995-2014).

TEMPERATURE

Auckland's future climate

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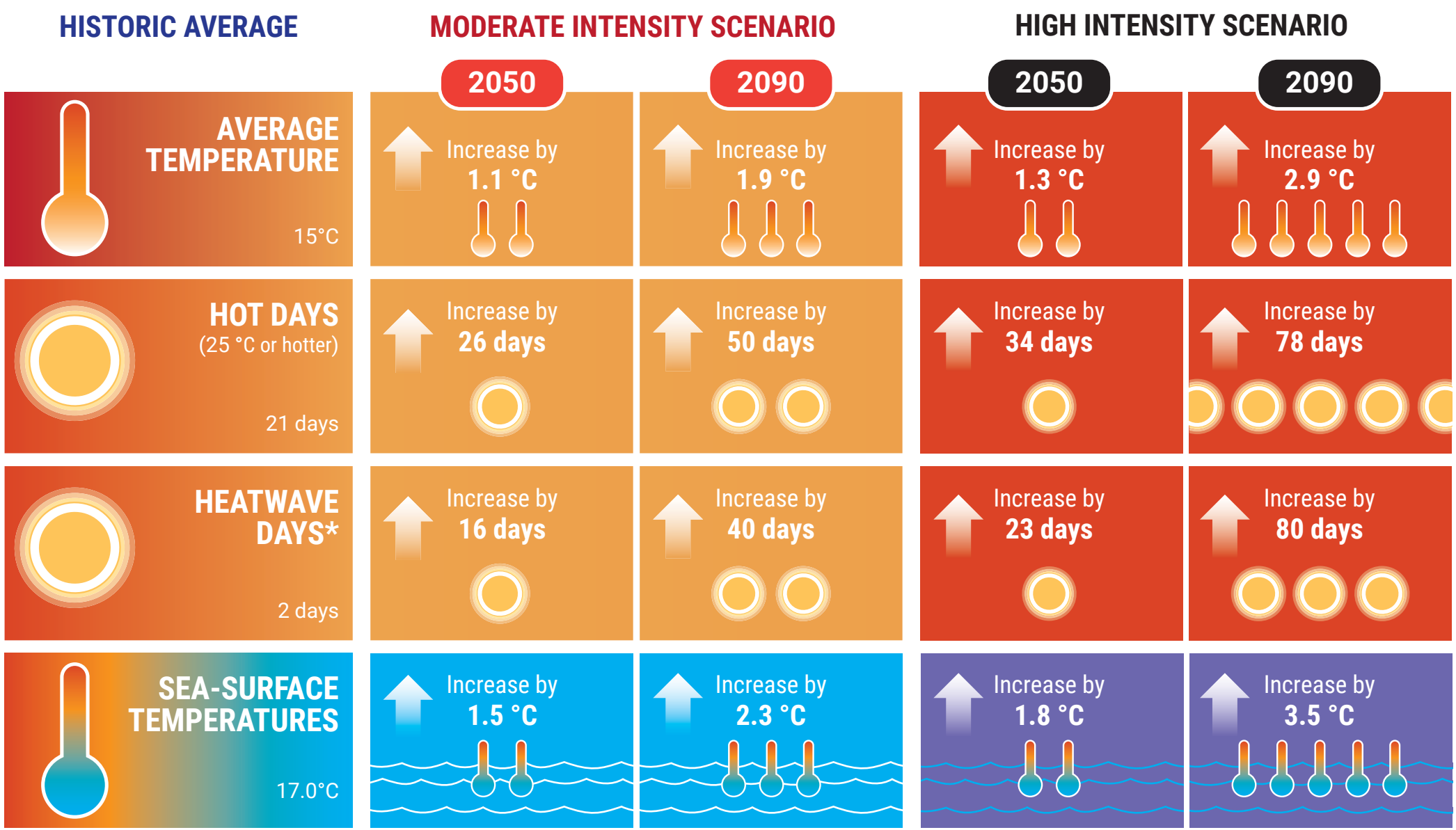

* at least 3 consecutive days that are exceptionally warm for the time of year.

RAINFALL

Auckland's future climate

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	HISTORIC AVERAGE	MODERATE INTENSITY SCENARIO		HIGH INTENSITY SCENARIO	
		2050	2090	2050	2090
TOTAL RAINFALL	1,332 mm	Decrease by 1%	Decrease by 3%	Decrease by 2%	Decrease by 9%
DRY DAYS (1 mm or less)	231 days	Decrease by 1 day	Increase by 2 days	Decrease by 1 day	Increase by 8 days
HEAVY RAINFALL AMOUNT	61 mm in a day	Increase by 11%	Increase by 13%	Increase by 12%	Increase by 19%
DROUGHT FREQUENCY*	66 days	Increase by 10 days	Increase by 25 days	Increase by 19 days	Increase by 53 days

* Drought is defined here by unusually low rainfall over a period of at least 3 consecutive months.

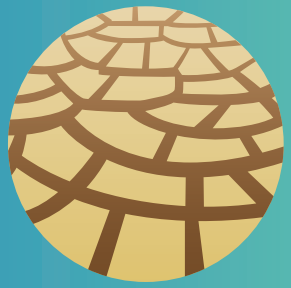
RAINFALL
further details
Auckland's future climate

Overall, Auckland can expect a small reduction in annual rainfall. However, changing rainfall patterns may be more noticeable at the seasonal scale. Spring and winter are expected to become drier, with wetter summers than present.

INCREASED INTENSITY OF EXTREME EVENTS

Heavy rainfalls

A warmer atmosphere can hold more moisture, and therefore more frequent and intense heavy rainfall events are expected in future. Historically, a heavy rainfall event in summer brings 69 mm of rain to Auckland. By the end of the century, under the high intensity scenario, this could increase to 90 mm.



Droughts

Higher temperatures increase the rate at which the land dries out. As a result, drought severity in expected to increase (i.e. more frequent and longer duration droughts). Historically, Auckland experiences 66 days of drought each year. By the end of the century, under the high intensity scenario, this could increase to 119 days.

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HOW WILL CHANGING RAINFALL AFFECT THE REGION?

Flooding will continue to be an issue in Auckland. More frequent and intense extreme rainfall events will worsen existing impacts associated with these events including urban flooding causing damage to properties and other assets, floodwaters blocking roads, and slips for hilly areas of the region. Insurance may increasingly become an issue for owners of flood-prone properties.

Increasing drought frequency and duration will have an impact on water sensitive activities and industries. The agricultural and horticultural sectors may be particularily affected, with reduced pasture and produce yields impacting farm and orchard incomes.

Water storage levels in Auckland's dams will be reduced during times of drought. This may lead ot impacts for Auckland residents through water use restrictions, intensifying the increased demand for irrigation during times of drought.

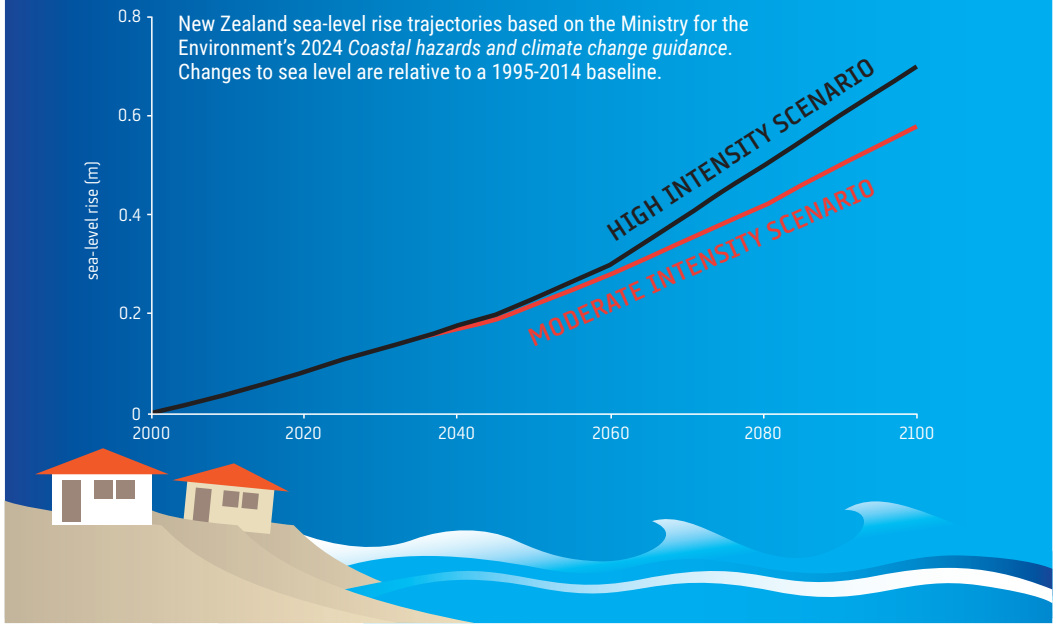
ADDITIONAL IMPACTS

Auckland's future climate

SEA-LEVEL RISE

Sea-level rise is triggered by melting of the polar ice caps, and the thermal expansion of ocean as water warms. In New Zealand, the sea may rise by up to a metre by the end of the century. Auckland has extensive coastlines, and sea-level rise will directly impact those who live and recreate in the coastal zone.

Slow incremental changes will occur alongside an increased frequency and magnitude of extreme sea-level events. Sea-level rise will amplify the coastal inundation and erosion impacts associated with severe storm events such as ex-tropical cyclones. Coastal erosion and flooding can damage homes, roads, and other infrastructure, and affect access to coastal areas. Extensive development near beaches, estuaries and marshes limits the natural adjustment of the coast, so rising seas will destroy large areas of habitat at the current coastal margin.



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IMPACTS FOR MĀORI

Climate change will impact the cultural, social, environmental, and economic wellbeing of Māori. Sea-level rise and flooding will increasingly compromise marae, Māori land holdings, urupā, wāhi tapu, and papakāinga. Indigenous species and ecosystems are vulnerable to a changing climate which is likely to disturb the relationships Māori have with these taonga, including impacts on mahinga kai. Ocean acidification and increasing sea-surface temperatures will impact marine ecosystems, and this may affect fisheries and access to kai moana.

NATURAL ENVIRONMENT IMPACTS

Auckland's forest and wetland ecosystems are vulnerable to changing rainfall patterns and increased drought intensity. Kauri dieback may be exacerbated. Mangrove habitats are at risk of inundation due to sea-level rise. Slips and soil erosion from extreme rainfalls will lead to increased sedimentation in waterways, as well as habitat loss.

Increasing temperatures bring a greater threat of invasive species and diseases becoming established in Auckland, as well as increasing the prominence of existing weeds. Endangered native bird species such as those on Auckland's sanctuary islands may be especially vulnerable to the impacts of climate change given the limited extent of their habitat. Higher sea temperatures will compromise aquatic biosecurity, as species not usually seen in New Zealand waters may arrive and become established.

Auckland climate change summary report prepared by Earth Sciences New Zealand for Auckland Council, July 2025

For further information, see Auckland Council technical report TR2025/9 on **Knowledge Auckland**.