

Āhuarangi hurihuri Climate change



Climate change is one of the most pressing issues facing the region. The importance of building resilience to the impacts of climate change and natural hazards is reflected in its inclusion as one of Council's four strategic priorities and its six community outcomes (see *Te anga rautaki | Strategic framework*, page 4).

The disruptive effects of climate change on our environment and our communities is becoming increasingly obvious. Extreme weather events are now occurring at a frequency and intensity that is having significant environmental, economic and social impact.

Horizons has used the most up to date information available on climate change and its impacts for the Long-term Plan. Most of the information we have on regional climate projections was released in the mid-2010s. NIWA is currently leading work to "downscale" the latest (2022) global climate projections to understand regional impacts across New Zealand. Those will not be available until mid-2024, too late to inform this Long-term Plan, however Horizons will continue to assess the impact of climate change as new information is available.

CHANGES IN RAINFALL

NIWA predicts a change in precipitation across the region – not only in terms of how much rain falls but also when and where it falls³. Rainfall is likely to

increase across most of the region west of the Ruahine and Tararua ranges in winter and spring while decreasing in autumn and in summer. Eastern areas are projected to have decreased rainfall throughout the year. This means it is likely that floods will increase in both frequency and magnitude for both the Rangitikei and Whanganui catchments, with implications for Horizons in terms of levels of service, scheme operations and maintenance activities.

The impact on the Manawatū catchment, which falls on both sides of the ranges, is less certain. It may give rise to more frequent small to medium-scale flood events, with more limited impact of large flood events caused by catchment-wide rainfall. Higher rainfall events are likely to have a similar effect on operating costs for the land drainage schemes that cover the lower Manawatū floodplain.

INCREASING TEMPERATURES AND RISING SEA LEVELS

Eight of Aotearoa New Zealand's ten warmest years on record occurred in the last decade. An increase in hot days has implications for agricultural practice, health of waterways, biodiversity, animal and human welfare, and psychosocial health.

The NZ Searise data suggests that, under a high emissions scenario, it is likely we will see a 0.28m – 0.43m rise in sea levels for the region by 2050, and a 0.87 – 1.21m rise by 2100⁴. This will impact the protection and drainage

³ Regional Climate Change Risk Assessment 'NIWA. (2016). Climate Change and Variability—Horizons Region. National Institute of Water and Atmospheric Research.'

⁴ NZ Searise takes into account AR6 modelling and incorporates vertical land movement to produce their modelling.



He whanaungatanga whai mana
Our region's relationship with iwi and hapū are respectful and mana-enhancing



He whatunga waka mauritau
Our region has effective transport networks



He hapori manawaroa
Our region's communities are resilient to the impact of natural hazards and climate change

requirements for our coastal communities. Rising sea levels will raise water tables for coastal areas that can make them more prone to flooding.

Increasing temperatures, greater fluctuations in weather patterns and rising sea levels will have an effect on the ecosystems in our region. The exact impact is difficult to forecast however there is a high likelihood that climate change will impact on biodiversity and change the nature of biosecurity threats to the region.

LAND AND FRESHWATER SYSTEMS

Climate change will also have impacts on our land and freshwater systems. Modelling undertaken for Horizons by Manaaki Whenua Landcare Research shows that sediment loads in rivers are predicted to increase by between 40% and 180% by 2090. The modelling predicts that Horizons' Sustainable Land Use Initiative programme, at its current rate of on-farm works, may be insufficient to overcome the impacts of climate change at the most extreme scenarios.

EXTREME WEATHER EVENTS

The factors mentioned above contribute to the occurrence, and impact, of extreme weather events. The Regional Climate Change Risk Assessment (2021) identifies flooding as being one of the most significant risks to our built environments. This has been borne out in the significant floods of 2004, 2015 and most recently in February 2023 with Cyclone Gabrielle. Farms were impacted through slips, flooding and wind damage, communities were cut off, forestry slash and other debris littered east coast beaches. The extent of damage caused by Cyclone Gabrielle to roads and infrastructure was extensive. In the Tararua District, the roads suffered 513 high and medium complexity faults, including bridges being washed out. Experts attribute the intensity of the rainfall during the cyclone to climate change.

OPERATIONAL IMPACTS

Severe weather events require an emergency management response, resulting in the activation of Horizons' Emergency Operations Centre (EOC) and the Manawatu-Whanganui Civil Defence Emergency Management

Group's Emergency Coordination Centre (ECC), both of which are operated by trained Horizons staff who have other "business as usual" roles across the organisation. More frequent activation of the EOC and the ECC means that staff will be drawn away more often from their business as usual mahi, impacting on their ability to manage their day-to-day work loads.

The recovery phase of a weather event has financial and operational impacts on Horizons as well. Repair works or rebuilding damaged infrastructure can cause delays to planned work programmes and can impact levels of service in unexpected ways.

Changes in rainfall patterns can impact on the effectiveness of flood protection schemes, the cost of drainage, and the availability of water during the drier months.

IMPACTS ON PEOPLE

Climate change will impact different people differently. Rural and coastal communities may suffer from the impacts of accelerated erosion on property, utility networks, and critical transport links. Increasingly frequent and severe storms and droughts are likely, over time, to affect livelihoods in those same rural communities. Studies also show that climate change tends to exacerbate existing vulnerabilities and social inequalities. The elderly and disabled people may be more vulnerable to extreme weather (e.g. heat waves, evacuation). Māori, as well as lower-income groups in the community, are likely to be disproportionately affected.

OUR RESPONSE

Horizons has used the high-range emissions scenarios for its planning (RCP 8.5), which is based on 2011 data provided by the Ministry for the Environment. This is the most current data available until the release of NIWA's regional data based on the IPCC6 report, expected in mid-2024.

Overall, we know we need to better understand local and regional impacts. We need to investigate and address climate change impact on biodiversity and biosecurity, freshwater habitats, regional food security, flooding, droughts and other hazards. Climate change will be one of the factors we need to consider as we review the performance of our flood-protection

Ngā putanga ā-hapori Our community outcomes



He whakamana hapori, he hapori kori
Our region's communities are vibrant and empowered



He pūnaha hauropi ora
Our region's ecosystems are healthy



He rohe piki te ōhanga, piki te taiao
Our region's economy is thriving and environmentally sustainable

network, move toward integrated catchment management, and embark upon regional spatial planning. In the coming years, we will need to strengthen mechanisms for analysis and reporting of climate-related risks to our operations and assets. For example, as a part of the Infrastructure Strategy, a regional flood vulnerability assessment will be completed to assess the relative risk in the towns within the region. This study will help us better understand where we need to focus our efforts on building resilience. Information on climate impacts will also assist communities in their planning to adapt to the impacts of Climate change.

In 2020 Horizons established the Climate Action Joint Committee which provides a coordinated response from local government across the region, and includes working in partnership with territorial authorities and tangata whenua representatives.

The Joint Committee oversaw the development of regional Climate Action Plan which was adopted in March 2023. Horizons' own action plan dovetails with this coordinated framework, setting out actions which will address some of the knowledge gaps listed above, and build environmental and community resilience to climate change and/or reduce greenhouse gas emissions. Some projects in the Action Plan are joint initiatives with other parties, while some are Horizons' own projects. More information can be found in section 15 of the Climate Action Plan at horizons.govt.nz.



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