



Adapting to the impacts of climate change

This information sheet covers how we can adapt to the physical impacts of climate change. Adapting to climate change can help minimise the risks we face as well as maximise the opportunities arising from our changing climate.

NEW ZEALAND'S CHANGING CLIMATE

New Zealand's climate is 'virtually certain' to be warmer in the 21st century, with noticeable changes in extreme events, according to the report of the Intergovernmental Panel on Climate Change (IPCC) released in April 2007. Average temperatures are expected to increase by around 1°C by 2040 and by around 2°C by 2090.

Models project future sea-level rises of 18–59cm by 2100. There could be an extra 10–20cm on the upper range if there is an increase in the rate of melting of the major ice sheets.

Heatwaves and fire risk are virtually certain to increase in intensity and frequency.

Floods, landslides, droughts and storm surges are very likely to become more frequent and intense; and snow and frost are likely to become less frequent. Large areas of eastern New Zealand are likely to have less soil moisture, although western New Zealand is likely to receive more rain.

A map with an indication of the potential impacts of climate change on New Zealand is shown on the back of this information sheet. Further information on climate change impacts is available from www.mfe.govt.nz/issues/climate/resources/impact-map/index.html

RISKS AND OPPORTUNITIES

Our natural ecosystems, water availability and coastal communities are particularly vulnerable to climate change.

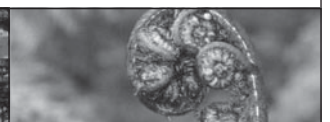
As a result of reduced precipitation and increased evaporation, water security problems are projected to intensify by 2030 in Northland and some eastern regions. Heavy rainfall is likely to put pressure on drainage and stormwater systems. Erosion and landslips from more frequent and intense rainfall as well as floods may increase road maintenance costs. Sites at risk of loss of biodiversity include fragmented habitats, the alpine areas and sub-Antarctic Islands.

Ongoing coastal development and population growth in areas such as Northland and Bay of Plenty are projected to exacerbate risks from sea-level rise and increases in the severity and frequency of storms and coastal flooding by 2050.

Production from agriculture and forestry is projected to decline by 2030 over parts of eastern New Zealand due to increased drought and fire.

Plants, animals and humans are likely to be at greater risk from some existing and new pests and diseases in a warmer climate.

However, there may also be opportunities arising from a changing climate. We can expect enhanced growing conditions, longer growing seasons and reduced winter energy demand. In addition, effective planning can bring about benefits such as improved water quality and better management of scarce resources.



Up to 2050, benefits are projected for agriculture, horticulture and forestry in western and southern areas and close to major rivers due to longer growing seasons, less frost, and increased rainfall. A change in climate may also lead to the production of new commercial crops. In the 21st century, conditions in the Nelson, Marlborough and Hawke's Bay regions could provide new economic opportunities for kiwifruit production.

Warmer winters could reduce demands for electricity and communities may enjoy the health benefits of warmer winters and lower heating costs.

Some tourist destinations may benefit from drier and warmer conditions, for example providing more opportunities for beach activities, camping, climbing or wine tasting.

THE IMPORTANCE OF ACTION

The IPCC report noted that the potential impacts of climate change are likely to be substantial if we do not take measures to adapt.

Much of New Zealand's urban development has occurred in areas vulnerable to the actions of the sea and in recent years, as coastline development has intensified, the potential impacts of sea-level rise, storm surge and waves have increased. Changes in the severity and frequency of extreme weather events will continue to provide a major risk of short-term impacts on key sectors such as agriculture and urban infrastructure.

Forward planning is more effective and less costly than reacting to events when they occur. For example, the impacts of climate change should be factored into the planning, replacement and upgrade of long-lived infrastructure networks such as roads, sewerage, electricity transmission, water reticulation, and telecommunications.

Acting now will help ensure our economy remains strong and that we are less vulnerable to the costs and adverse impacts of a changing climate.

WHAT CAN YOU DO?

People have already adapted to climate-related risks. Flood management systems, for example, are designed to reduce flood risk, and buildings are constructed to cope with extremes in temperature and storms.

Think about how the future climate will be in your region. Plan for and minimise any risks relevant to you and your family. For example, if you are buying or building a house, think about how climate change may affect your home. Is flooding an issue? How is it expected to change in the future? Is the site stable? Is erosion a concern? Could you install a rainwater tank if water shortages are an issue? You can design and manage your garden for drier or wetter conditions and similarly, appropriate house design, maintenance and landscaping can help to minimise your vulnerability to climate risks.

Farmers may need to modify farming practices to reduce the potential impacts arising from climate change. For example, they could change land-use, introduce flexible stock management policies, and provide catchment protection to strengthen the resilience of their farms. More information is available at: www.earthlimited.org

WHAT CAN YOUR COMMUNITY DO?

Each region, district and community has its own climate-related vulnerabilities and priorities. Development of region-wide resilience requires partnerships between communities, industry groups, utilities and local government.

Councils now factor climate change into long-term emergency and hazard management planning, land-use planning, and whenever council is considering new infrastructure and assets with a lifetime of more than 30 years. Of particular importance are:

- stormwater system capacity and design
- water permits and irrigation scheme placement and design
- development decisions relating to areas prone to river and coastal flooding
- decisions relating to housing and infrastructure in areas prone to coastal erosion
- land-use decisions, including those affecting management options for native ecosystems.



Important short-term benefits can also be gained from adaptation measures. For example, planning for future reductions in water availability can help increase the resilience of your community to drought right now. In many parts of the country communities are already making a difference through coastal restoration and care projects. For example, Coast Care Bay of Plenty volunteers have planted nearly 300,000 native dune plants on local beaches to restore and stabilise the dunes, reducing the impact of strong winds, storms, and erosion.

WHAT IS THE GOVERNMENT DOING?

The Government supports and encourages organisations and communities in vulnerable sectors and regions to engage in early planning. It is building partnerships with local government, engineers, the insurance industry and the agriculture sector to ensure we work together to adapt to climate change. The immediate focus is on water and coastal issues, infrastructure and utilities, primary industry, biosecurity and biodiversity.

The Ministry for the Environment provides information, tools and guidance to help councils assess the risks of climate change, including a risk-based decision-making framework, case studies, practical checklists, technical reports and guidance manuals.

Understanding the regional impacts for New Zealand is a priority. The Government supports a range of research programmes aimed at gaining a better understanding of projected climate changes and their impact on specific sectors, infrastructure and native ecosystems. The government has recently significantly increased its support for this research. A range of regional assessments of vulnerabilities, impacts and adaptation options have also been carried out, often initiated by or in response to requests from local government.





 **Urban**

- Warmer winters
-> less illnesses
- Warmer summers
-> increased heat stress
- Decreased electricity use in winter (less heating)
- Increased electricity use in summer (more air-conditioning)

 **Snowlines and glaciers**

- Changes in length and area of glaciers
- Rise in snowline
- Possible increase in snowfall
- Possible increase in avalanches

 **Wetter**

- Increased precipitation
- Increased intensity in weather events
- Increased flooding for already flood-prone areas
- Increased slips
- Increased soil erosion

 **Ex-tropical cyclones***

- Increased intensity
-> increased wind, waves, storm surge and rainfall
- * Tropical cyclones, in travelling to NZ change their character, becoming slightly less intense but causing damage over a much wider area

 **Drier**

- Less rainfall
- Decreased run-off to rivers
- Increased evaporation
- Increased drought for already drought-prone areas
- Increased irrigation demand

 **Commercial forests**

- Increased growth rates
- Increased geographic range
- Increased winds
-> increased damage to forests
- Increased temperatures
-> increased pests

 **Natural areas**

- Species distribution changes
- Changes to/loss of habitat
- Increased pressure from pests, animals and plants

 **Coastal**

- Sea level rise
- Increased storm surge
- Coastal inundation
- Increased coastal erosion

 **Wind**

- Increased westerly winds

MORE INFORMATION

Contact the Ministry for the Environment by phoning (04) 439 7400 or emailing e-waste@mfe.govt.nz or check out our website: www.mfe.govt.nz