

Possible impacts of climate change

WHAT IS THE IPCC

THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

A scientific intergovernmental body set up in 1988 by the World Meteorological Organization and by the United Nations Environment Programme. In 2007, it was awarded the Nobel Peace Prize for "efforts to build up and disseminate greater knowledge about man-made climate change and to lay the foundations for the measures that are needed to counteract such change".

It provides information on climate change through reports based on the continually growing body of scientific evidence. The comprehensiveness of the content is achieved through the contributions of thousands of experts across all relevant disciplines and in all regions of the world including New Zealand.

FUTURE NEW ZEALAND

As the 21st century advances, New Zealand's climate is likely to become more sub-tropical in the north, wetter and windier in the west and drier in the east with a milder, more temperate, climate developing in cooler and southern regions of the country. This will provide a combination of threats and opportunities for New Zealand's primary sectors.

Regional summaries are also provided as part of this series.

POSSIBLE IMPACTS AND OPPORTUNITIES

DROUGHT AND WATER RESOURCES

The frequency and severity of drought could increase in regions that are presently drought-prone. Regions most likely to be affected are eastern Northland, the Hauraki Plains, eastern Bay of Plenty, and eastern New Zealand from Gisborne to Otago. There could be increased pressure on water resources in these drought-prone areas.

Increased incidence of drought and possible increasing frequency of westerly winds will heighten the risk of fires in rural areas, particularly in areas prone to strong north-westerly conditions such as Canterbury.

INTENSE RAINFALL

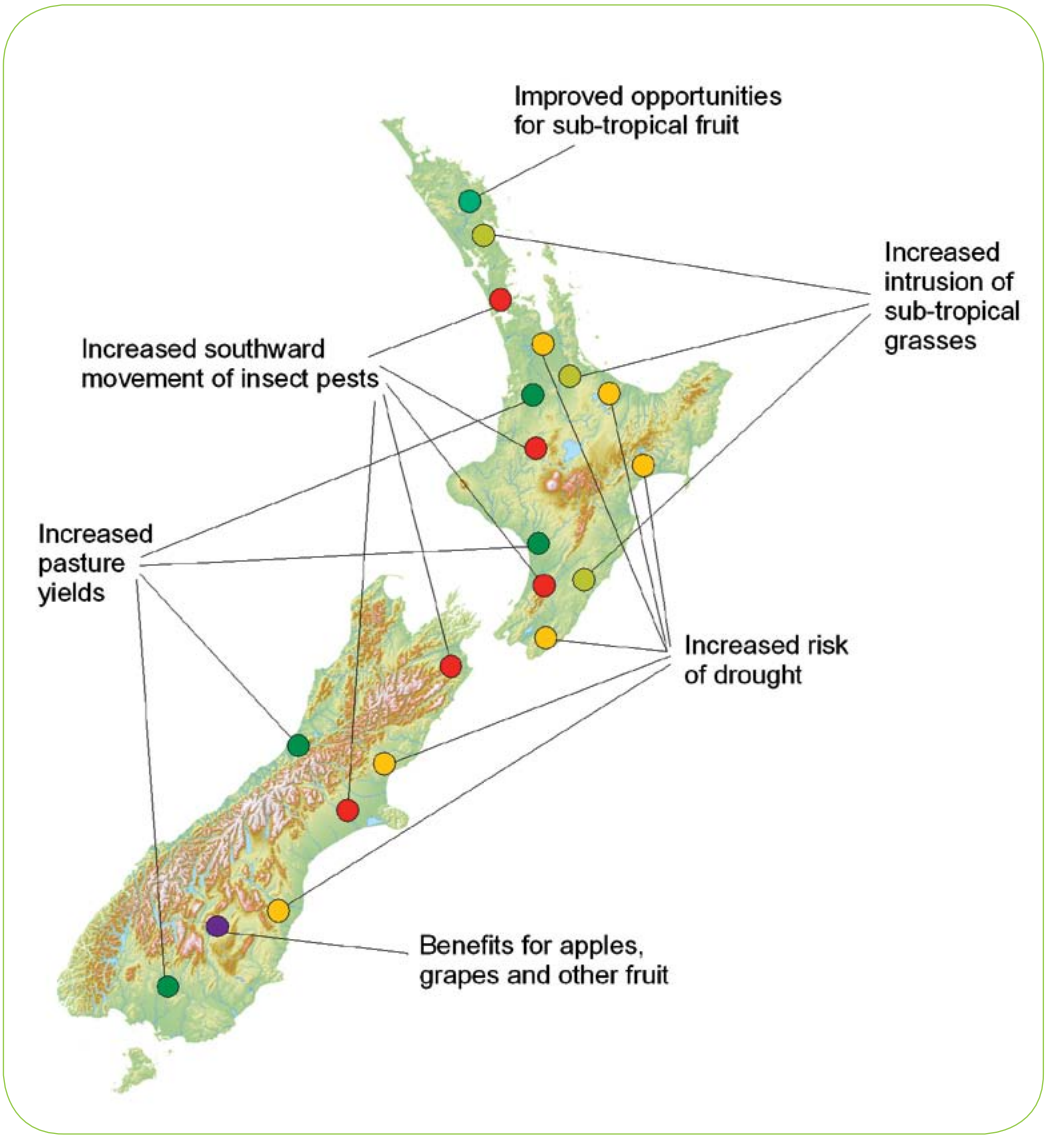
It is likely that heavy rainfall events will occur more frequently over the coming century, although New Zealand's mountainous nature and starkly contrasting rainfall climates make it difficult to predict whether this will be universally true across the whole country. Low-lying coastal land will be more prone to storm surges and flooding.

Changes could have consequences for farm infrastructure in all regions. This includes land drainage, flood protection, community water schemes, culverts and bridges, erosion control, farm dams, water reticulation and irrigation.

INSECT AND PLANT PESTS

Increased problems with insect pests are likely. Recent experiences in Northland with tropical grass webworm and guava moth, and crickets in Hawke's Bay, are indicative of what could occur more often with climate change. The spread of insect pests, such as the clover weevil and clover flea, could be accelerated with warmer average conditions.

Higher temperatures are likely to increase the number of pest plants in the north and encourage the southward spread of some species. In some cases, this is already occurring, which could be due in part to natural acclimatisation although higher temperatures could increasingly become an influence.



TEMPERATE PASTURE

Temperate pasture responses are likely to vary throughout New Zealand. Warmer and wetter average conditions could lead to yield increases in western regions of the lower North Island, in the West Coast, and parts of Otago and Southland. There may be a positive yield response in northern regions, but higher temperatures could become increasingly limiting along with increased predominance of sub-tropical grasses.

SUB-TROPICAL GRASSES

Sub-tropical grasses such as kikuyu and paspalum are already widespread in the North Island, and will become more so. They may become significant invaders of the South Island over time. This would have a greater negative impact on dairy producers than sheep and beef producers, because of the high dependency of dairying on maximising pasture utilization.

ANIMAL HEALTH

Animal health effects, particularly in northern and eastern New Zealand, could include increased heat stress on animals. Most of the North Island could experience increased incidence of diseases such as facial eczema, which could also become a problem in warmer regions of the South Island. A warmer wetter climate in western parts of New Zealand will increase problems with internal parasites. In cooler and southern regions of the country, stock will benefit from warmer winters with less stress on stock and better reproduction rates.

FRUIT

Hayward kiwifruit production may become uneconomic in the north over the next 50 years, due to less winter chill. Alternatively, opportunities may increase for production in the southern North Island and warmer locations of the South Island.

Current evidence suggests that apple production won't be greatly affected by warmer average temperatures in present apple growing regions. Although not certain, current knowledge suggests that an increased incidence of warmer winters will not have a major impact on flowering and fruit set in Hawke's Bay. A greater occurrence of hot dry summers could result in greater problems with water-core and sunburn. Higher average temperatures and reduced frost risk will benefit apple production in southern regions such as Central Otago.

New Zealand's climate is likely to become more sub-tropical in the north, wetter and windier in the west and drier in the east with a milder, more temperate, climate developing in cooler and southern regions of the country.

Wine grapes will benefit overall from warmer, drier conditions particularly in eastern and southern regions. However, there will likely be changes to phenology, regional spread of varieties and wine quality. Increased pressures on scarce water supplies will also become a greater issue, if drier conditions are realised.

Sub-tropical crops such as avocados and citrus will benefit from a trend towards warmer conditions in northern New Zealand. There will likely be a shift in southern production margins over time, with water the main limitation in the east and wind an ongoing limitation in western North Island.

Some tropical fruit crops can presently be grown only in localised micro-climates in Northland, but in a warming climate there may be increased niche opportunities to grow these crops in commercial quantities.

CROPS

In general, conditions will become increasingly suitable for maize production in the North Island, with greater opportunities in Canterbury over time. Various crops that have been limited by temperature in the past, such as chickpeas, will become increasingly viable. There could be yield and quality benefits to some of the temperate grains in the South Island with hotter, drier conditions. Wetter conditions could increase disease problems in some northern regions and in the west. In eastern regions, crop production may be constrained by limitations on the availability of water.

REGIONAL IMPACTS

More detailed information can be found in the accompanying regional summaries to this series of fact sheets. Further information may also be available from your local and/or regional council.

THIS FACT SHEET IS ONE IN A SERIES CALLED
INTRODUCTION TO CLIMATE CHANGE

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KEY REFERENCES

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FOR MORE INFORMATION

- For general information on climate change for land-based sectors visit the Ministry of Agriculture and Forestry website **www.maf.govt.nz**
- For more information on climate change in New Zealand visit **www.climatechange.govt.nz** or the Ministry for the Environment's website **www.mfe.govt.nz**
- For information on animal health and insect and plant pests and diseases visit **www.biosecurity.govt.nz**
- For a popular guide to the IPCC reports, visit the website of the United Nations Environment Programme **www.grida.no**
- Your local council may also have information on climate change. Visit **www.localcouncils.govt.nz** for a list of council websites.

The following websites provide a range of resources and publications related to climate change adaptation.

INDUSTRY

- Dairy NZ **www.dairynz.co.nz**
- Fert Research **www.fertresearch.org.nz**
- Foundation for Arable Research **www.far.org.nz**
- Horticulture NZ **www.hortnz.co.nz**
- Beef + Lamb New Zealand **www.meatnz.co.nz**
- NZ Kiwifruitgrowers Inc. **www.nzkgi.org.nz**
- NZ Forest Owners Association **www.nzfoa.org.nz**
- Organics Aotearoa NZ **www.oanz.org.nz**
- Sustainable Winegrowing New Zealand **www.nzwine.com**

CROWN RESEARCH INSTITUTES

- AgResearch **www.agresearch.co.nz**
- GNS **www.gns.cri.nz**
- Landcare Research **www.landcareresearch.co.nz**
- NIWA **www.niwa.co.nz**