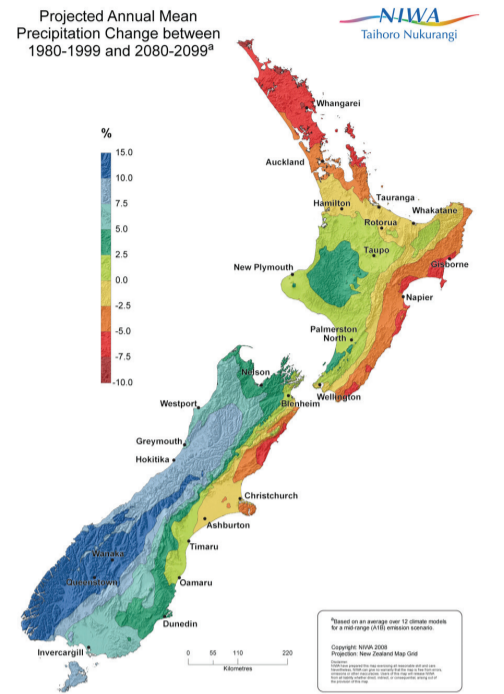
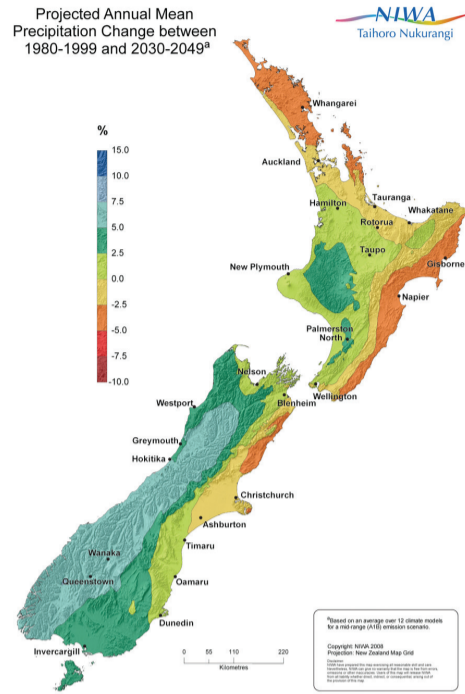
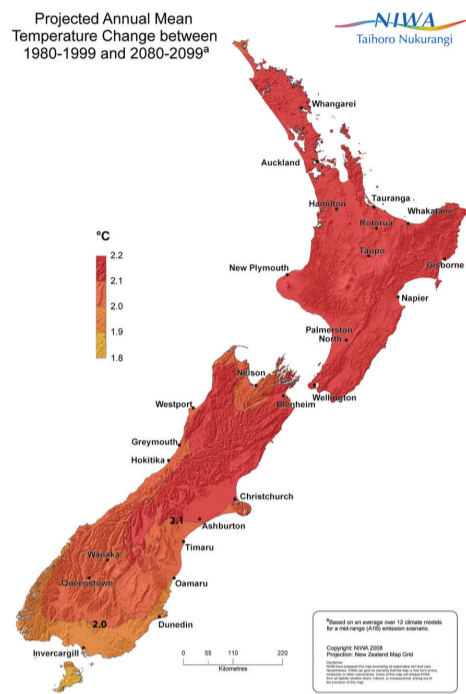
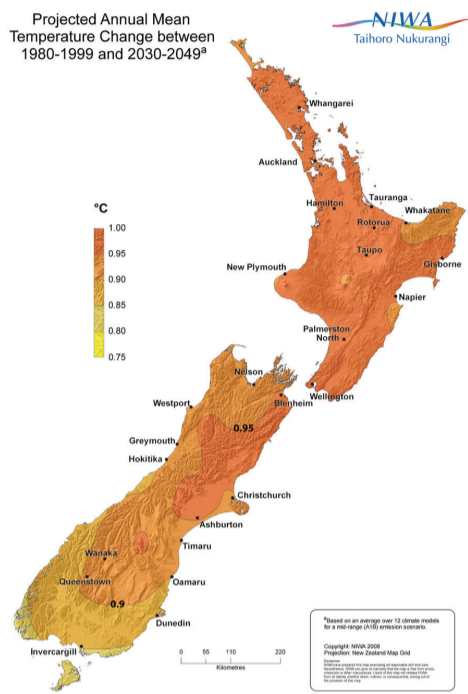


Climate variability will affect sheep, beef and arable farming in New Zealand

Projections of how climate will change:

Through the century, NIWA projects the following likely trends in New Zealand's future climate:
Warmer by about 2.0°C* - **Wetter in the west and drier in the east** - **More extreme weather events.**

- ✔ Some of these changes will create opportunities.
- ! Others will require higher levels of risk management.



* Mid-range projection

Extreme weather events – higher variability and uncertainty

The effects of extreme weather events are already being felt. Intense storms are difficult to predict and their impact on farmland and livestock can be huge.

More intense and frequent rain

Higher temperatures may result in more intense rainfall events.



- For farmers, this means:**
- ✔ Potential to divert high river flow to storage for irrigation
 - ! Higher risk of erosion
 - ! Higher risk of nutrient runoff and sediment
 - ! Greater risk of pugging and soil damage in winter
 - ! Increase in stock deaths
 - ! Increased crop losses

More wind

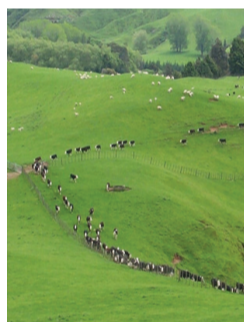
Frequency of westerly winds and strength of strong winds may increase by up to 10%.



- For farmers, this means:**
- ! Greater need for shelter for animals, pasture and crop productivity
 - ! Higher risk of wind erosion
 - ! Stock losses at lambing/calving
 - ! Increased water use and risk of crop damage
 - ! Increased risk of damage to buildings and shelter

Warmer temperatures, less frost

Fewer frost days in lower North and South Islands.



- For farmers, this means:**
- ✔ Changes in seasonal timing of pasture production
 - ✔ Improved lamb and calf survival
 - ✔ Changing opportunities for arable crops
 - ! More occasions when heat stress impacts on animal and pasture performance
 - ! Increased risk of heat stress on arable crops

Increased frequency of drought

Severe droughts may occur more frequently.



- For farmers, this means:**
- ! Increased consideration of water harvesting, storage and irrigation
 - ! Increased risk of drought-induced feed deficits
 - ! Reduced arable crop yields
 - ! Change in farm policy and management to cope with more dry seasons

Impacts on farm performance

Pasture and Crop Productivity

More variable pasture production between seasons, years and regions.



- ✔ Changed seasonality in pasture growth - earlier spring
- ✔ More rainfall and higher temperatures mean higher pasture growth rates
- ✔ Higher CO₂ concentrations increase plant growth & yield
- ! Increased variability in feed supply & arable crop yields
- ! More pasture weeds including spread of C4 grasses such as kikuyu
- ! Increased fertiliser use

Pests & Diseases

Rising temperatures may change pest and disease incidence.



- ✔ Some diseases may become less prevalent
- ✔ Opportunity to use alternative forages for improved persistence and performance
- ! Risk of new pest and disease emerging
- ! Pest populations may build to critical levels more quickly and frequently (e.g. grass grub and Porina)
- ! Risk of extension of zones at risk of facial eczema

Animal Performance

Extremes in heat and cold can affect animal production and welfare.



- ✔ Potential reduction in cold stress on stock
- ! Temperatures greater than 25°C may contribute to heat stress
- ! Higher temperatures and CO₂ reduce pasture palatability and digestibility
- ! Increased variability in pasture utilisation

Water Use

Pressure on water resources will continue and efficient use will become more important.



- ✔ Increasing use of deeper rooting species to improve available water use e.g. lucerne and chicory
- ! Increased consideration of water harvesting, storage and irrigation
- ! Investment required in irrigation and technology to improve efficiency of water use

Images kindly supplied by Horizons Regional Council, Landcare Research, Marie Casey and Alison Popay.

Summary

Planning reduces the impact of climate change on farms. Actions farmers can take include:

- adapting their farm system and lifting profitability in anticipation of these changes
- being prepared for weed and pest problems
- increasing shelter and shade
- using more appropriate pasture species
- capturing surplus water (water storage) and using available water efficiently

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