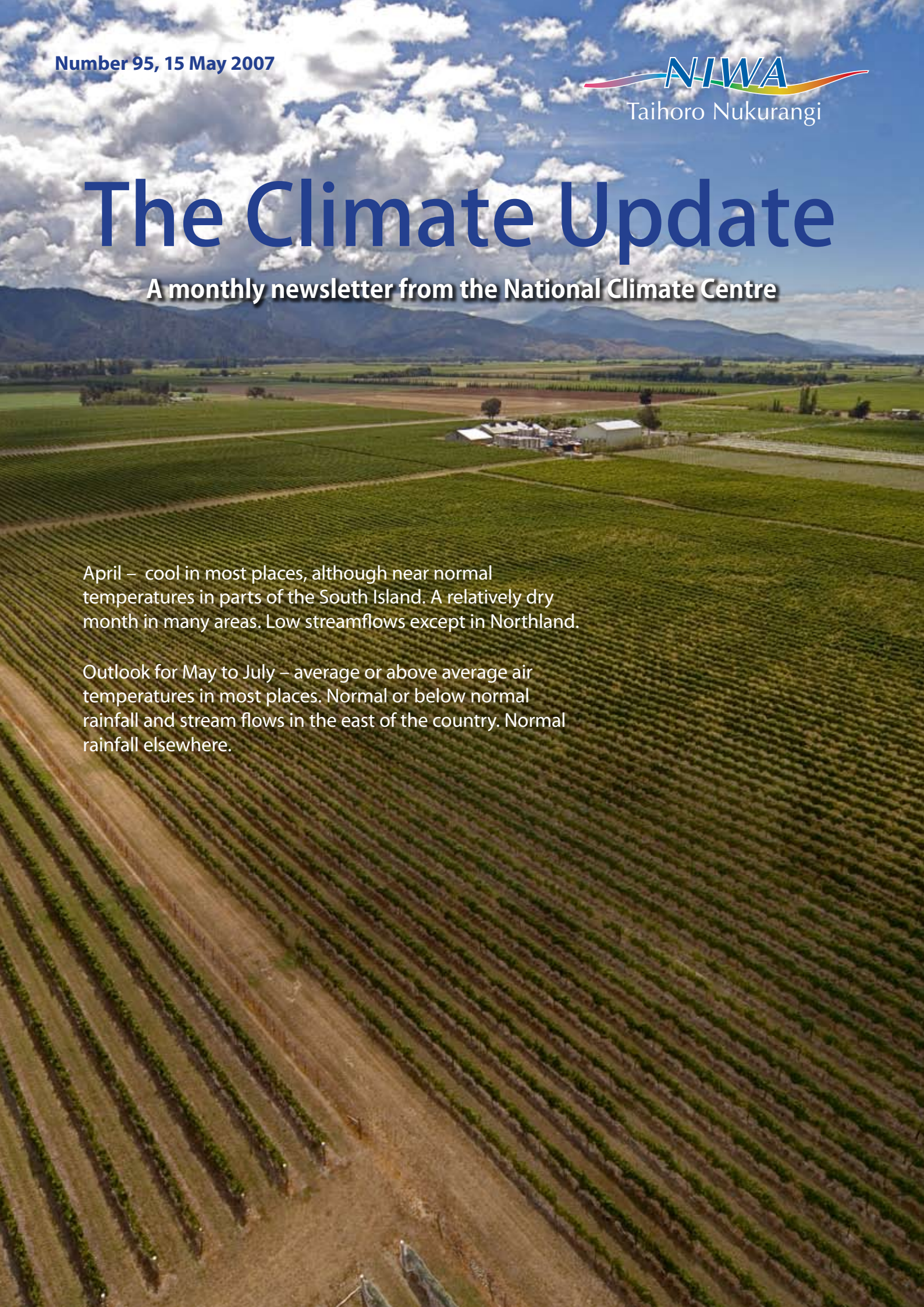
Number 95, 15 May 2007

NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre



April – cool in most places, although near normal temperatures in parts of the South Island. A relatively dry month in many areas. Low streamflows except in Northland.

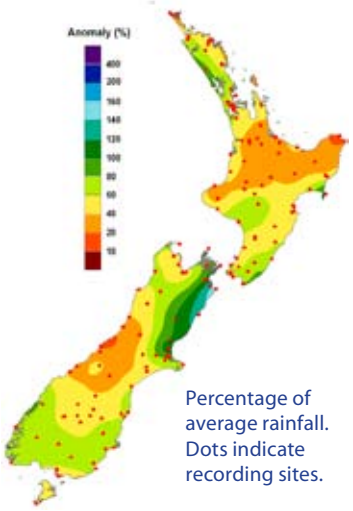
Outlook for May to July – average or above average air temperatures in most places. Normal or below normal rainfall and stream flows in the east of the country. Normal rainfall elsewhere.

New Zealand climate in April

April was a relatively dry month overall, especially over the North Island and the north and west of the South Island, with less than 50% of normal rainfall in many areas. The month was dominated by anticyclones to the west and winds from the southerly sector, which produced cooler than normal conditions for many.

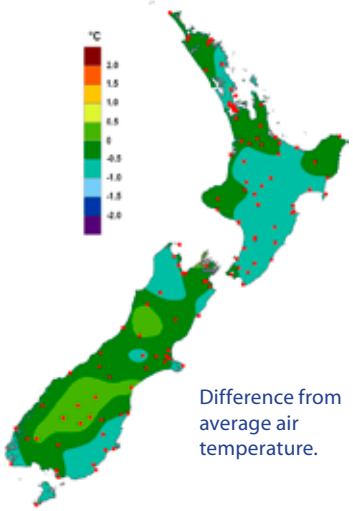
For more information on the climate in April 2007, visit the climate summaries page at www.niwascience.co.nz/ncc/cs/mclimsum_07_04

Rainfall



Percentage of average rainfall. Dots indicate recording sites.

Air temperature

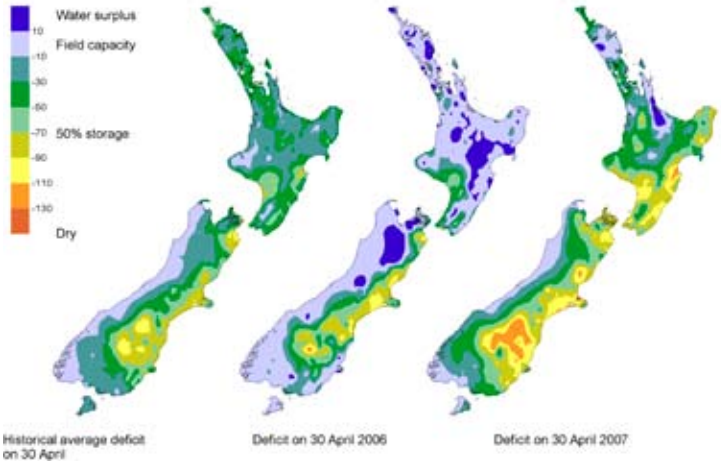


Difference from average air temperature.

End of month rainfall lifted soil moisture levels

Rainfall late in April brought some relief to dry soils in many areas, although soil moisture deficits of about 110 mm persisted in Hawke's Bay, central Marlborough and Central Otago.

Soil moisture deficit

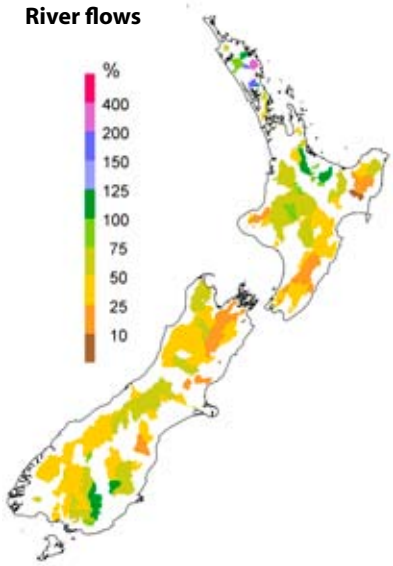


Water balance in the pasture root zone for an average soil type, where the available water capacity is taken to be 150 mm.

Mostly below normal catchment yields

April streamflows were normal in the far north, and generally below normal elsewhere.

River flows



Percentage of average April river and stream flows at monitored catchments. NIWA field teams, regional and district councils, and hydropower companies are thanked for providing data.

February to April – the climate we predicted and what happened

Rainfall

Rainfall was normal or below normal as predicted in the east and north of the North Island, apart from wetter than expected conditions in Northland. Elsewhere conditions were mostly drier than expected.

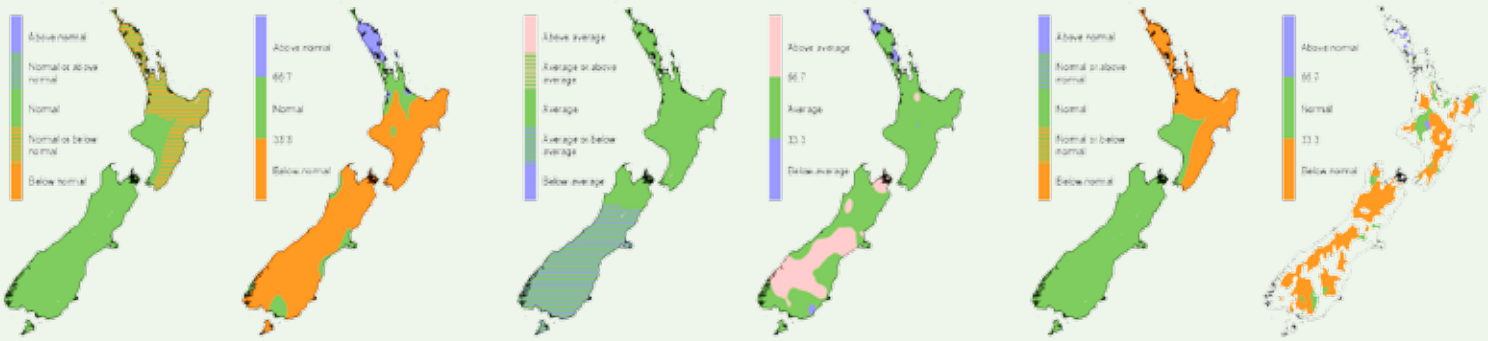
Air temperature

Air temperatures were higher than predicted in the south and west of the South Island, but near normal as expected elsewhere.

River flows

Streamflows were above normal in the far north and mostly below normal elsewhere. Catchment yields were generally lower than predicted in the South Island, and southwest North Island.

Outlook **Outcome** **Outlook** **Outcome** **Outlook** **Outcome**



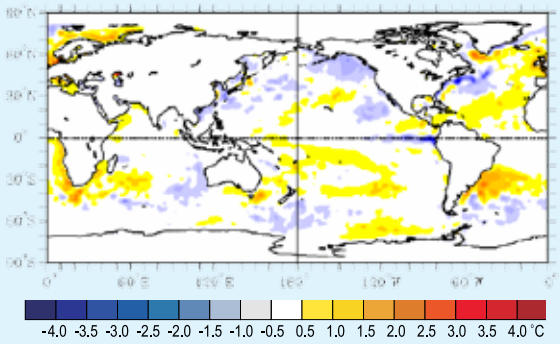
The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from February to April, in comparison with the forecast conditions.

As an approximate guide, middle tercile rainfalls typically range from 80% to 115% of the historical normal, and middle tercile temperatures range about the average by plus or minus 0.5 °C.

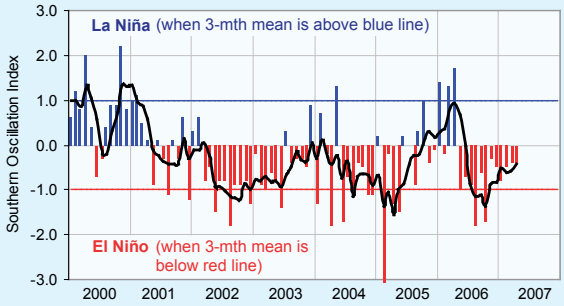
Global setting and climate outlook

50% chance of move to La Niña

Conditions are currently neutral in the tropical Pacific, but there is a relatively high (50%) chance of a transition to La Niña conditions during the next three months. The pattern of sea surface temperature anomalies is beginning to resemble La Niña conditions, with colder than average waters near the Equator in the far eastern Pacific (see map) and slightly warmer than average waters in the western Pacific. The SOI is still negative, although in the neutral range.



Difference from average global sea surface temperatures for April 2007. Map courtesy of NOAA Climate Diagnostics Centre.

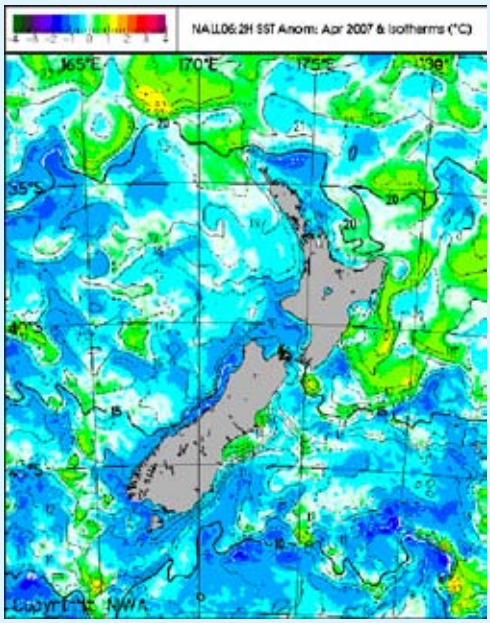


Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressures across the Pacific, and the three-month mean (black line).

SOI mean values:
April: -0.4
February to April: -0.4

Sea surface temperatures around New Zealand

Sea surface temperature anomalies in the New Zealand region continued to increase in April, rising to an anomaly of +0.4 °C. The area-wide average temperature anomaly has risen about 0.8 °C since the start of 2007. Surface waters to the southeast of the country remain cooler than normal, while the Tasman is slightly warmer than normal, especially to the west and east of the North Island.



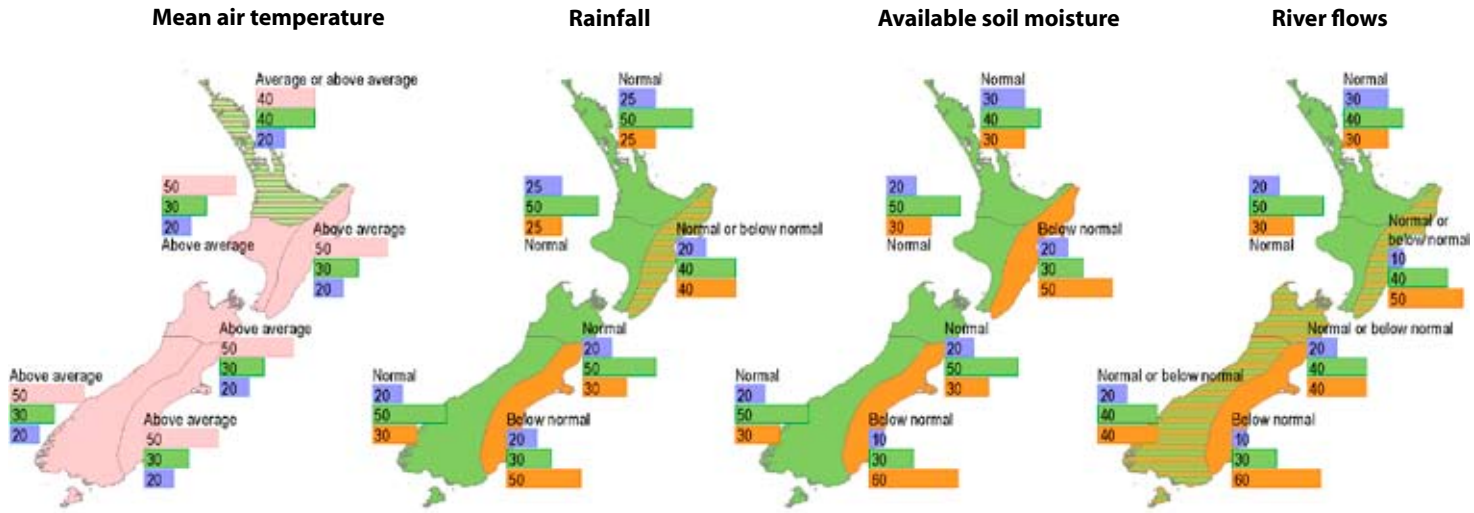
Differences from normal April surface temperatures in the seas around New Zealand.

Outlook for May to July 2007

Atmospheric mean sea level pressures are expected to be higher than average south of the South Island for the coming three months.

Air temperatures are expected to be above average in most regions and near or above average in the north of the North Island.

Normal or below normal rainfall is likely in the east of the both islands, with near normal rainfalls elsewhere. Below normal soil moisture and stream flows are very likely in the east of the South Island. Soil moisture and stream flows are expected to be normal or below normal in the east of the North Island, and the north, west and south of the South Island. Elsewhere, normal soil moisture and stream flows are likely.



How to interpret these maps

In the example here the climate models suggest that below normal conditions are likely (50% chance), but, given the variable nature of the climate, the chance of normal or above normal conditions is also shown (30% and 20% respectively).

Below normal
20 — 20% chance of above normal
30 — 30% chance of normal
50 — 50% chance of below normal

Adapting to climate changes

Dr Andrew Tait, National Climate Centre, NIWA

New Zealand's climate is highly variable. Growing seasons are rarely the same from one year to the next. Will there be an El Niño or a La Niña? Is the climate changing on a long-term basis, and what will it mean to me?

We will all adapt to future changes in the climate, eventually. Livelihoods depend on our ability to adapt. So the question is not whether we will adapt, but can we adapt with a minimum of disruption and cost?

For example, everyone adapts to changes in the weather. On Monday it was fine and 22 °C so you wore shorts and sandals to work. On Monday night, you watched the weather on the TV news and the forecast was for rain and a cold southerly. As a result, you adapted and wore long pants, socks and shoes, and a jersey to work on Tuesday, and took your raincoat. On both days you were comfortably attired – your adaptation to the change in weather was successful and resulted in minimal discomfort.

We need to adapt to climate changes in the same way as we do to changes in the weather. From the example above, the critical components for a successful adaptation strategy are prior knowledge, preparation, and appropriate action.

Prior knowledge

- Know the climate of your location.
- Know the limitations of your land – e.g., what is your carrying capacity in dry years?
- Get access to up-to-date information on the current conditions.

Preparation

- Build up a suite of plausible climate scenarios for the next two weeks, or season, or year, or 10 years.
- Develop climate contingency plans.
- Have the resources or procedures in place that can be called upon when needed.

Take action

- Use extended range forecasts, seasonal climate outlooks, and climate change scenarios.
- Seek additional guidance from your regional council, Crown Research Institutes, agricultural companies, neighbours.
- Be conservative if there is a chance of non-ideal conditions prevailing.
- If relevant, diversify some of your land.
- Make your decisions based on the best available information and guidance.

Climate change information and maps, including scenarios for the future, are available at www.niwascience.co.nz/ncc

Malborough vineyards, autumn 2006. Higher atmospheric CO_2 may increase the shading on fruit because of enhanced leaf growth.

Cover photo: *Alan Blacklock*

The Climate Update is a monthly newsletter from NIWA's National Climate Centre, and is published by NIWA, Private Bag 14901, Wellington. It is also available on the web. Comments and ideas are welcome. Please contact Alan Porteous, Editor
Email: ncc@niwa.co.nz
Phone: 0-4-386 0300.
Visit our webpage: www.niwa.co.nz

Hikurangi farmland in Northland after inundation from the heavy rainfall of 27–29 March 2007. Photo: *Graeme Smart*