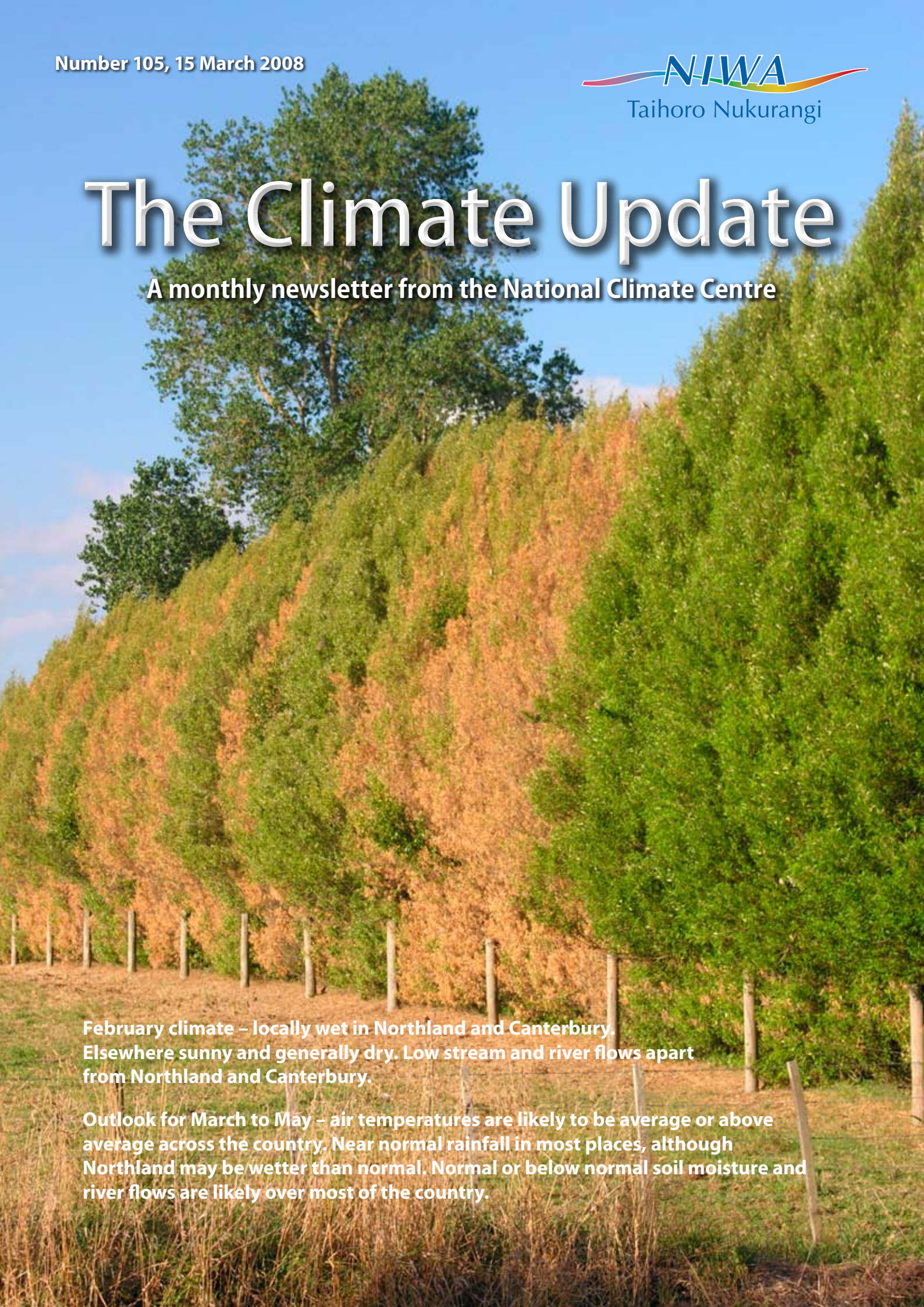
Number 105, 15 March 2008

NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre

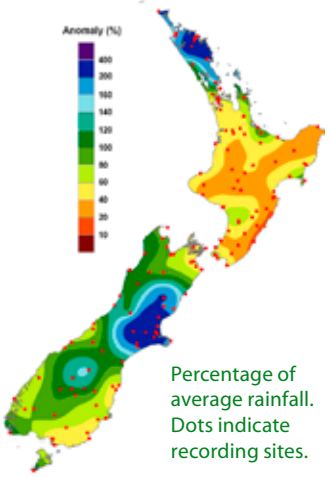


February climate – locally wet in Northland and Canterbury. Elsewhere sunny and generally dry. Low stream and river flows apart from Northland and Canterbury.

Outlook for March to May – air temperatures are likely to be average or above average across the country. Near normal rainfall in most places, although Northland may be wetter than normal. Normal or below normal soil moisture and river flows are likely over most of the country.

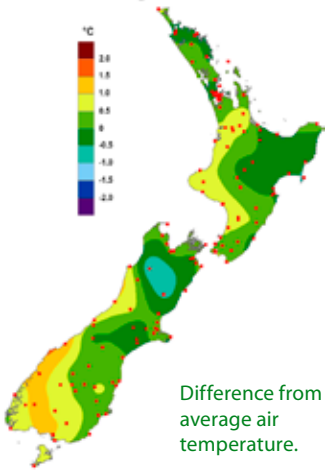
New Zealand climate in February

Rainfall



Percentage of average rainfall. Dots indicate recording sites.

Air temperature



Difference from average air temperature.

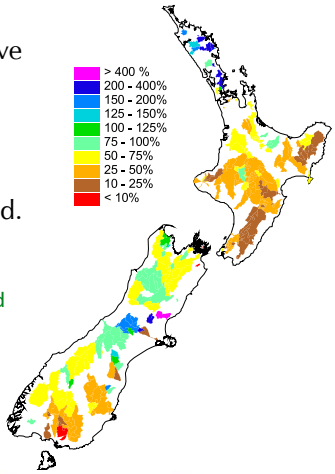
Rainfall was 50% or less of normal over much of the North Island from Manukau southwards, and in coastal Otago and parts of Southland. Twice normal rainfall was recorded in Northland, and parts of Canterbury.

February temperatures were above average in western areas, and near average over the north of the South Island and the northeast of the North Island. The national average temperature of 17.7 °C was 0.5 °C above normal. Otago and Southland basked in very sunny conditions.

For more information see www.niwascience.co.nz/ncc/cs/mclimsum_08_02

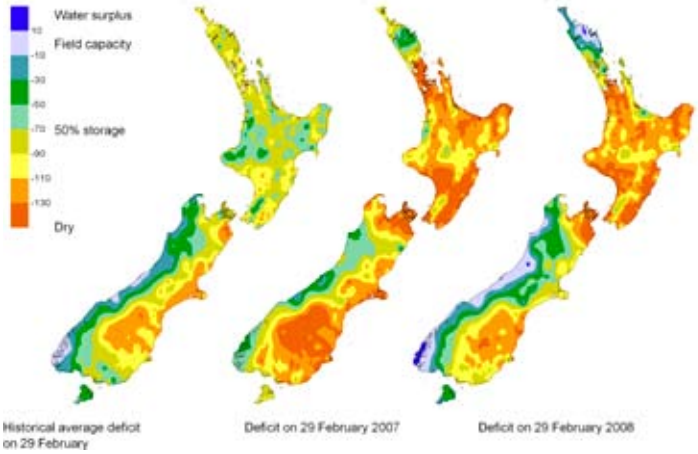
River flows

River and stream flows were above normal across Northland with some flooding, above normal in Canterbury, and below normal elsewhere, with extremely low flows for much of the North Island.



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

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.

At the end of February, significant moisture deficits remained in many North Island areas, as well as in Marlborough and Otago.

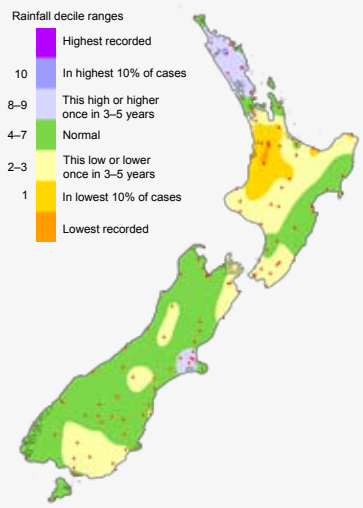
December to February – the climate we predicted and what happened

Rainfall

Predicted: Above normal in northern North Island, below normal in west of South Island, and near normal elsewhere.

Outcome: Above normal in Northland, and mid Canterbury, below normal in large parts of the North Island and some South Island districts, and near normal elsewhere.

December to February rainfall

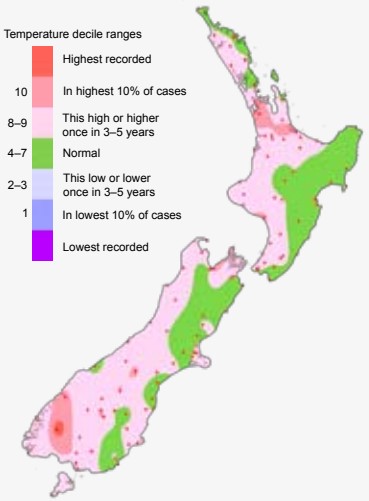


Air temperature

Predicted: Above average or average in all districts.

Outcome: Above average over much of New Zealand; near average in many east coast regions.

December to February temperature

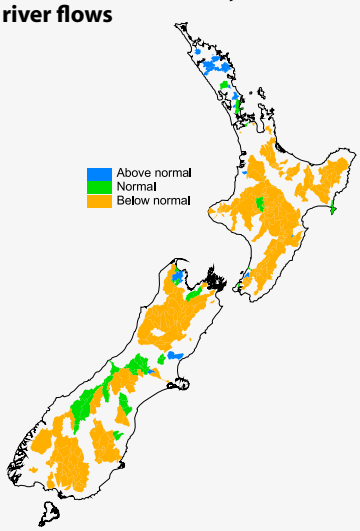


River flows

Predicted: A range from above normal in the northern North Island to below normal in the west, south, and east of the South Island.

Outcome: Stream flows were above normal in Northland and mostly below normal elsewhere.

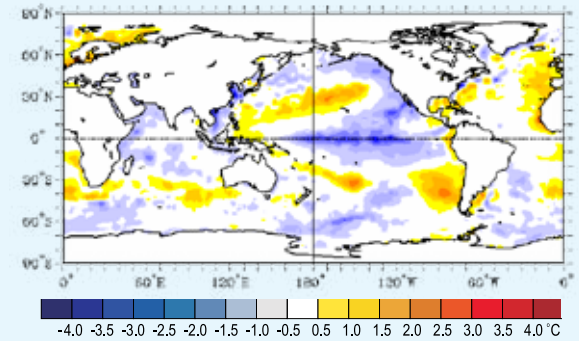
December to February river flows



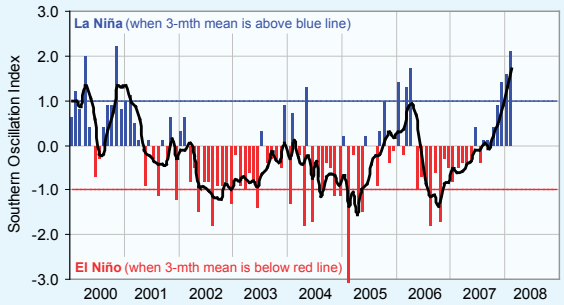
Global setting and climate outlook

La Niña likely to remain until autumn

A mature La Niña event continues in the tropical Pacific, and is very likely to persist through autumn 2008. Below normal sea surface temperatures (SSTs) extend across most of the equatorial Pacific, with anomalies of –2.0 °C or more over the central equatorial region (Date Line to 120° W, approximately). The warm 'horseshoe' SST pattern (see map) is in evidence in the extra-tropics of both hemispheres and is less patchy than in previous months.



Difference from average global sea surface temperatures for February 2008. Map courtesy of NOAA Climate Diagnostics Centre

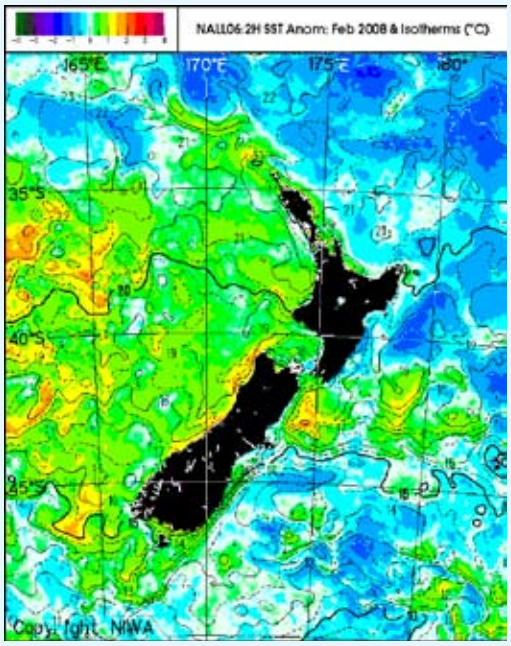


Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressures across the Pacific, and the three-month mean (black line).

SOI mean values:
February: +2.1
December to February: +1.7

Sea surface temperatures around New Zealand

Sea surface temperature anomalies (departures from normal) in the New Zealand region are positive, which is consistent with a La Niña event, although the largest anomalies remain to the west of the country. The February SST anomaly in the New Zealand box was about +0.4 °C. Sea surface temperatures around New Zealand are expected to remain above normal during autumn.



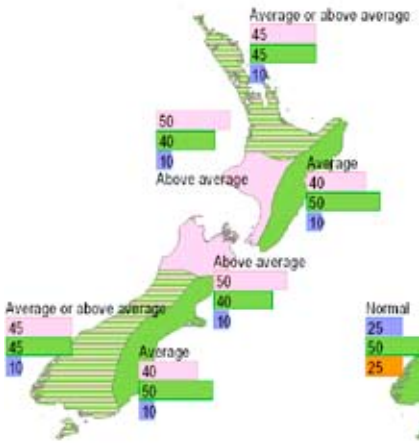
Differences from normal February surface temperatures in the seas around New Zealand.

Outlook for March to May 2008

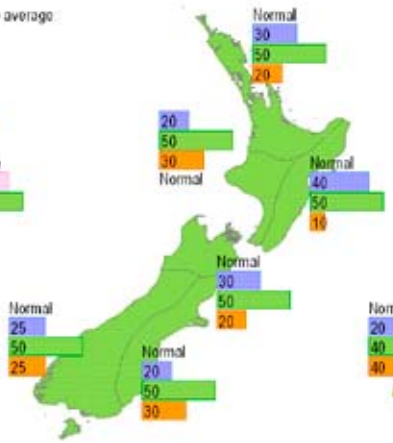
Autumn mean sea level pressures are expected to be higher than normal east of the South Island and lower than normal to the north of New Zealand, with weaker than normal westerlies over the country.

Air temperatures are likely to be average or above average across the country. Rainfall is expected to be near normal in most places, but may be above normal in Northland. Normal or below normal soil moisture and river flows are likely in the southwest North Island and the west, south, and east of the South Island. Elsewhere, normal conditions are expected. Two ex-tropical cyclones have passed close to New Zealand during the current tropical cyclone season. For the remainder of the season (through to May 2008), there is still a chance of at least one more ex-tropical cyclone passing close to the country. The regions most at risk are the north and northeast of the North Island.

Mean air temperature

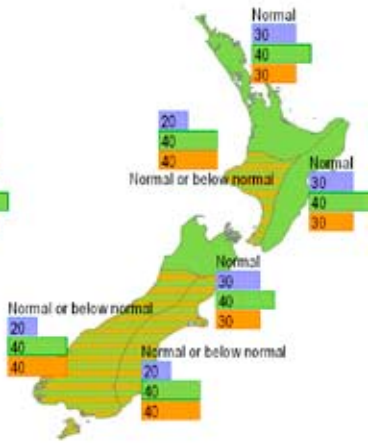


Rainfall



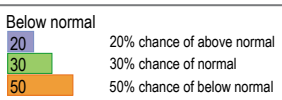
Available soil moisture

River flows



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).

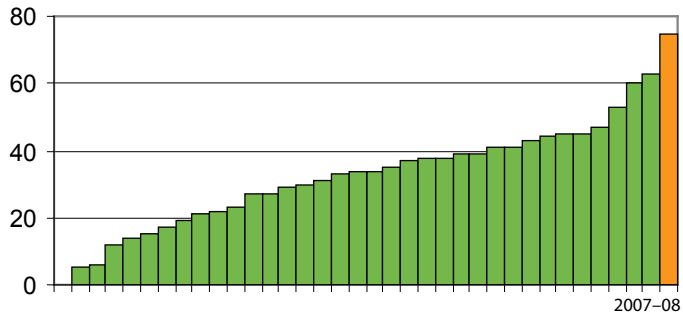


The 2007–08 drought: some comparisons of regional moisture deficits

Most regions of New Zealand apart from Northland and Westland have been coping with very dry soil conditions over the past few months. Below are some example comparisons of total days of soil moisture deficit (DSMD) for the four months November 2007 to February 2008, shaded orange, with the same period for all years since 1972–73. Ruakura recorded the driest 4-month period since 1972, and it was the third driest event for Kaikoura and Middlemarch. At Napier Airport, the conditions were comparatively less extreme.

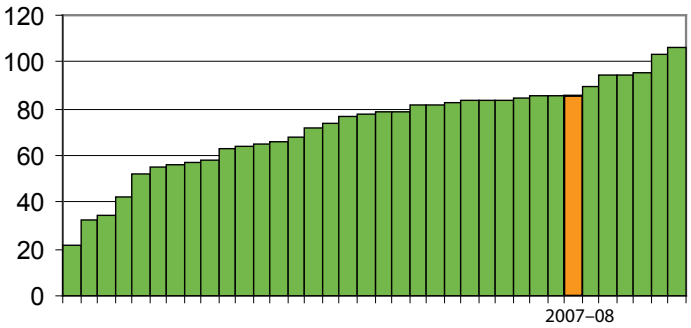
A day of soil moisture deficit is taken to be a day when more than half of the available moisture in the pasture root zone has been depleted, and hence pasture production is constrained by lack of available moisture.

RUAKURA



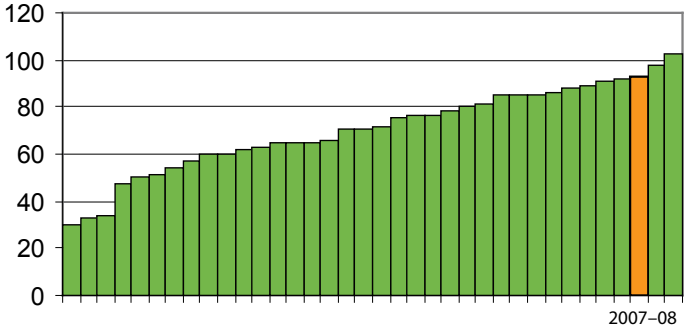
Summer soils in 2007–08 were the driest for many years at Ruakura climate station, following lower than normal rainfall since September. Total DSMD deficit for November to February was 75, the highest 4-month total since 1972.

NAPIER AERO



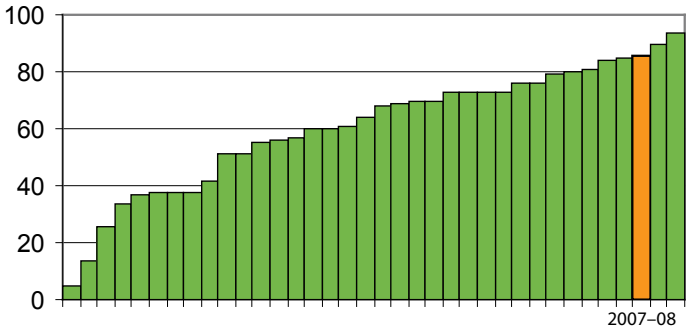
Napier was unusually dry by late October, although above average rainfall was recorded in December. During the four months of November 2007 to February 2008, 86 DSMD were recorded, similar to the totals of 1979–80 and 1981–82. Over 100 days of deficit were recorded in the El Niño years 1982–83 (106 days) and 1997–98 (103 days).

KAIKOURA



Kaikoura recorded 93 DSMD during November 2007 to February 2008. The El Niño years 1982–83 (98 days) and 1997–98 (103 days) were drier.

MIDDLEMARCH



Total November-February DSMD of 80 or above occurs about once every 5–6 years at Middlemarch. The total for the current season, 86 days, ranked third in the series shown. The highest DSMD total (94 days) was recorded in 1972–73.

Carbon Workshop 2008
Global Cycle to Regional Budget

14–15 April 2008
National Library Auditorium, Wellington

Carbon researchers from New Zealand and overseas will gather to review current understanding of the global carbon cycle and its biogeochemical interactions. We will look ahead to the research challenges associated with mitigation of fossil carbon emissions, and to the development of policies for carbon constraint.

Keynote speakers:

Dr Pep Canadell, Executive Director, Global Carbon Project
Prof Martin Manning, Victoria University of Wellington

Workshop sessions:

- The global carbon cycle
- New Zealand terrestrial carbon budget
- Mitigation and carbon policy
- Carbon research poster session

For more information, visit: www.confer.co.nz/carbon

We encourage poster submission through the web interface. If you are interested in presenting a paper, contact the conference organiser, Dr Mike Harvey, NIWA
m.harvey@niwa.co.nz

Satinwood (*Phebalium squameum*) hedge in Waikato showing signs of drought stress.
Cover photo: *Ron Ovenden*

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