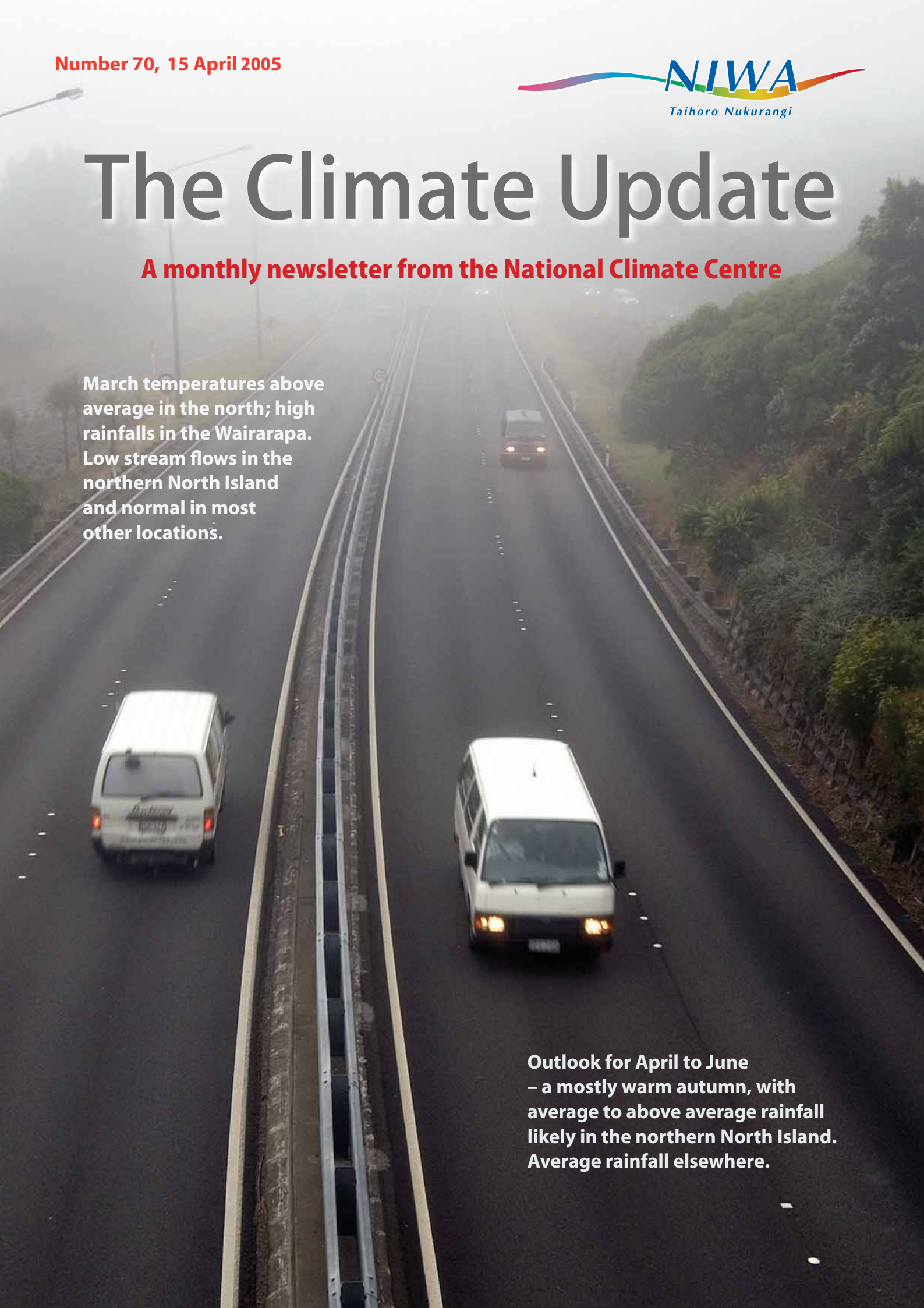
Number 70, 15 April 2005

NIWA
Taihoro Nukurangi

The Climate Update

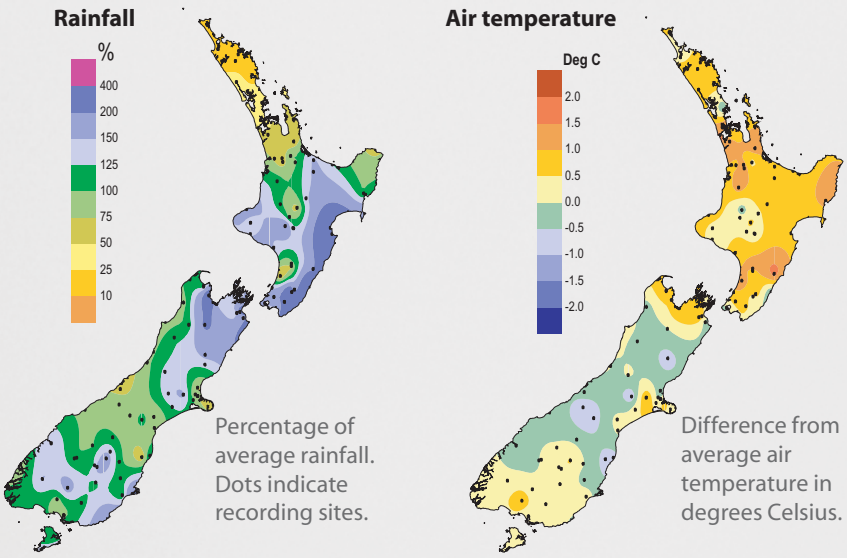
A monthly newsletter from the National Climate Centre



March temperatures above average in the north; high rainfalls in the Wairarapa. Low stream flows in the northern North Island and normal in most other locations.

Outlook for April to June – a mostly warm autumn, with average to above average rainfall likely in the northern North Island. Average rainfall elsewhere.

New Zealand climate in March 2005



Percentage of average rainfall. Dots indicate recording sites.

Difference from average air temperature in degrees Celsius.

New Zealand climate in March 2005

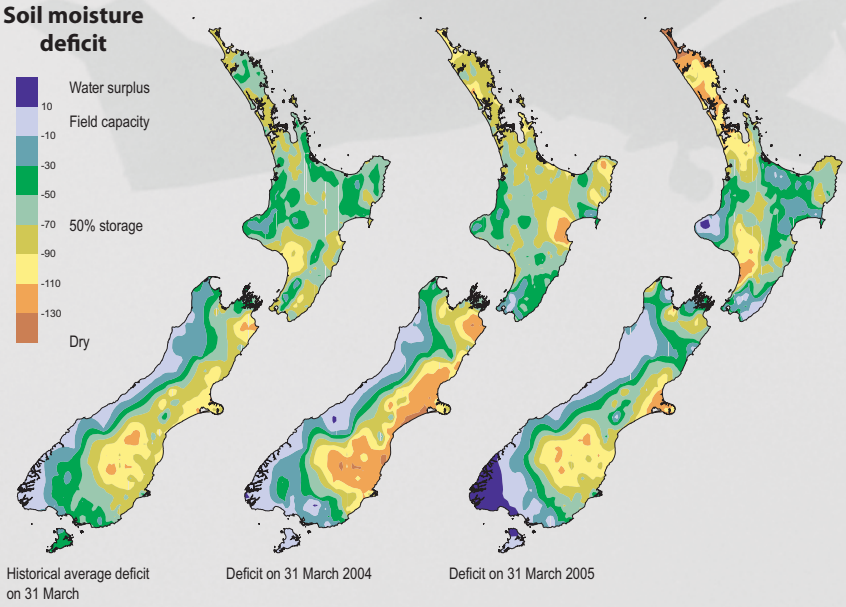
March was unsettled, with above average rainfall over much of the North Island, especially Wairarapa. However, drier and sunnier than average conditions occurred in Northland, Auckland, Waikato, and Coromandel.

It was warmer than normal in the North Island and in Nelson, while temperatures were mostly near average elsewhere. The warmer than normal conditions resulted from an average northeasterly air flow over the country during the month.

For more information on the climate in March, visit the climate summaries page at www.niwa.co.nz/ncc/cs/mclimsum_05_03

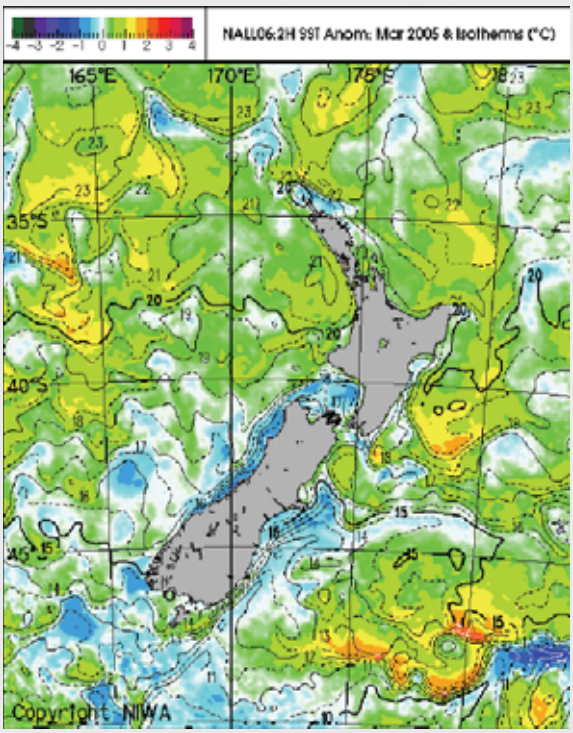
Soil moisture levels recover in many areas

During March, soil moisture levels in central and eastern parts of the North Island, in the north and east of the South Island, and in much of Otago recovered to normal or above normal conditions. Most recovery occurred late in the month. Northland soils remained relatively dry during the month.



Soil moisture deficit in the pasture root zone at the end of March (right) compared with the deficit at the same time last year (centre) and the long-term end of March average (left). The water balance is for an average soil type where the available water capacity is taken to be 150 mm.

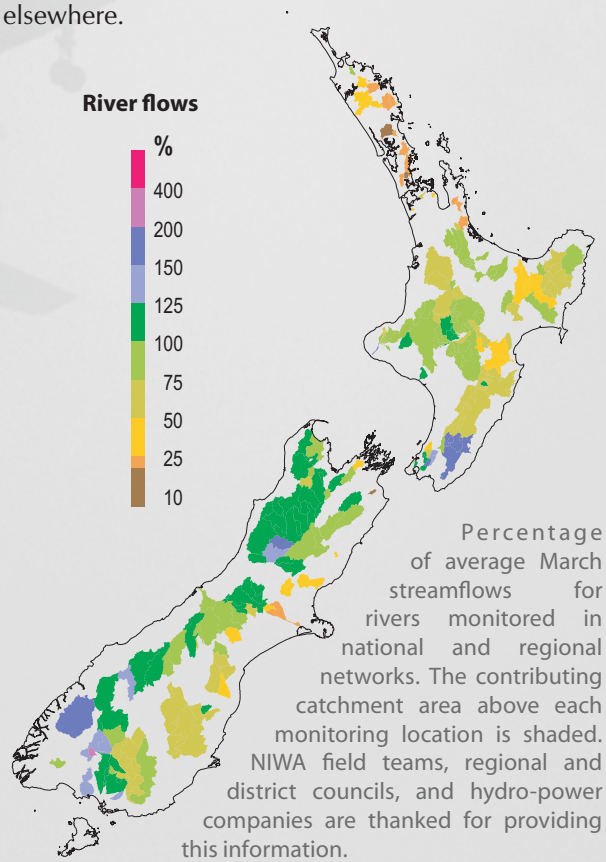
Sea surface temperatures



Difference from normal surface water temperatures in the seas around New Zealand. The New Zealand average surface temperature anomaly was about +0.7 °C in March, similar to the value for February. The 3-month mean anomaly for January to March was about +0.2 °C.

Low flows in northern New Zealand

Stream flows were below normal in the northern North Island and above normal in the southern North Island, the northern South Island, and the southwest of the South Island. Near normal flows occurred elsewhere.



Percentage of average March streamflows for rivers monitored in national and regional networks. The contributing catchment area above each monitoring location is shaded. NIWA field teams, regional and district councils, and hydro-power companies are thanked for providing this information.

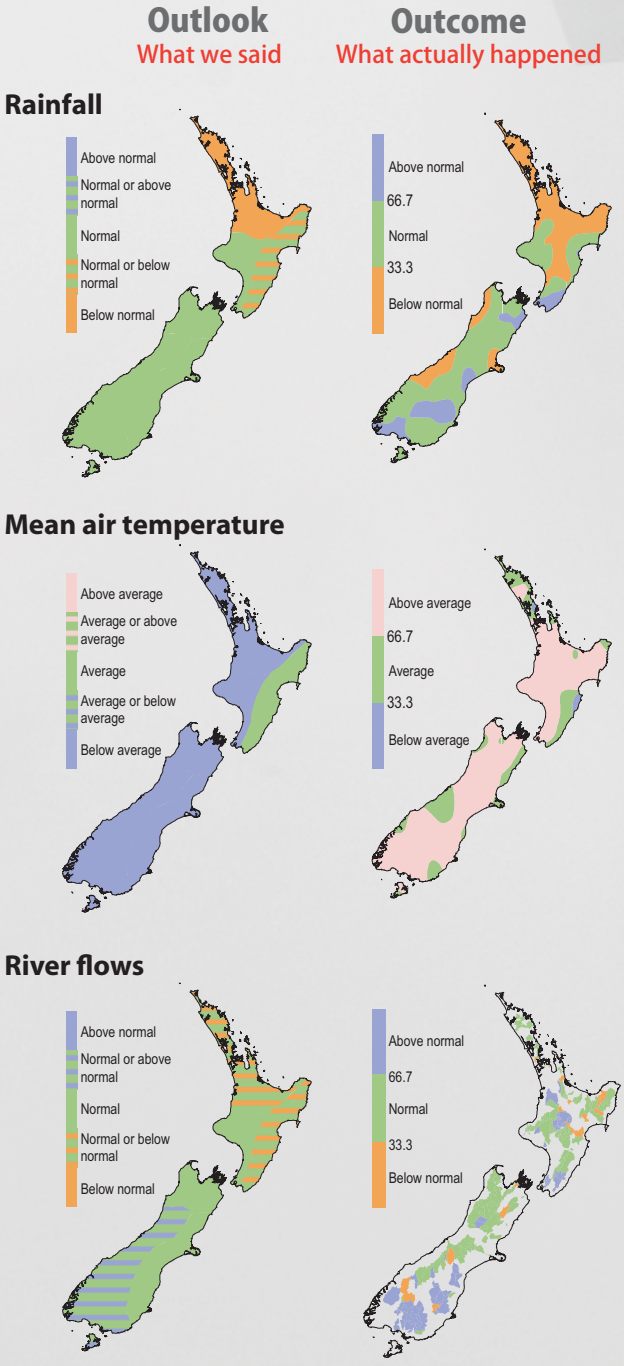
Checkpoint

January to March 2005

Rainfall was below normal as forecast in the north of the North Island. Normal or below normal rain fell, as forecast, in most other places, apart from a few wet spots in the south and east of both islands.

Air temperatures were mostly higher than predicted, apart from parts of the eastern North Island.

Stream flows were above normal in South Canterbury, most of Otago, and Southland. Elsewhere, stream flows were near normal in most locations.



The three outcome maps (right column) give the tercile rankings of the rainfall totals, mean air temperatures, and river flows that eventuated from January to March, in comparison with the forecast conditions (left column).

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.

Outlook

April to June 2005

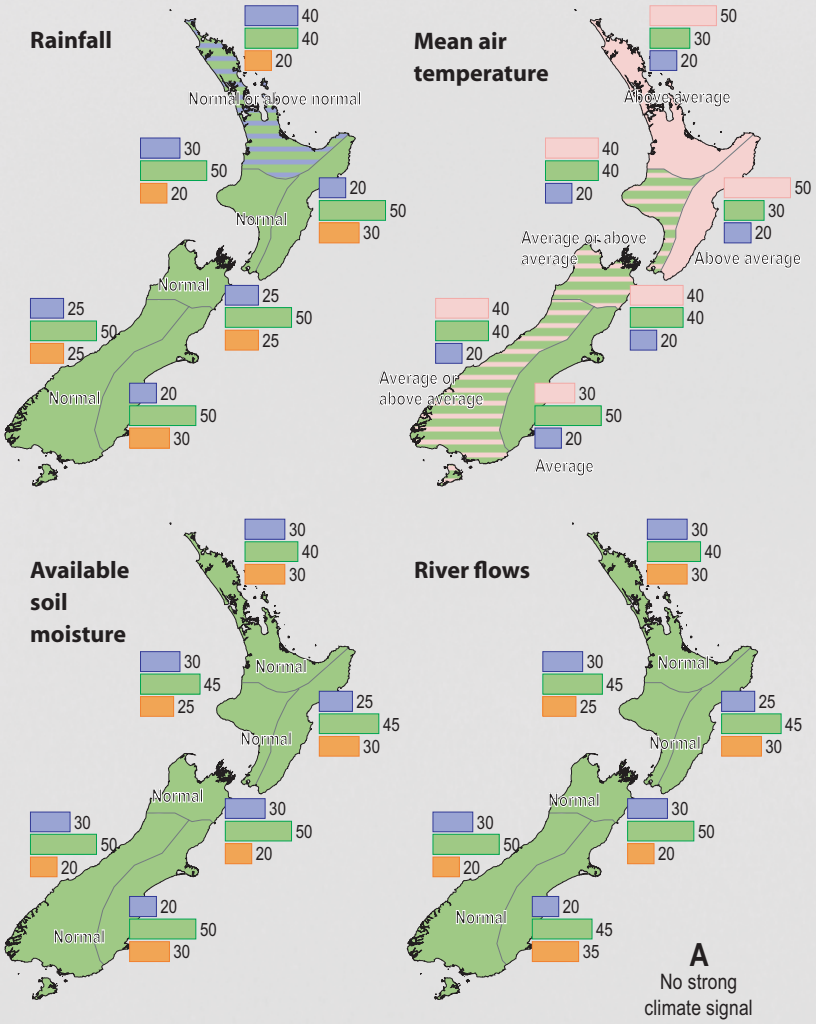
Over the next three months, atmospheric pressures at mean sea level are expected to be lower than their historical average to the west of New Zealand, with more northerly flows than usual over the country. Sea surface temperatures around New Zealand are expected to be near or above average.

Mean three-month air temperatures are expected to be near or above historical averages in all districts.

Mean rainfalls are likely to be near normal in all districts, but may be above normal in the northern North Island. Normal soil moisture levels and stream flows are expected in all regions.

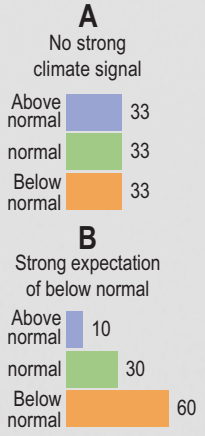
The tropical Pacific should be in a neutral state (no El Niño or La Niña) for most of the period, ending the present weak El Niño event.

There is still a chance of an ex-tropical cyclone affecting New Zealand during April, but typically the cyclone season has ended by late April.



Key to maps (example interpretation)

In example A, climate models give no strong signals about how the climate will evolve, so we assume that there is an equal chance (33%) of the climate occurring in the range of the upper, middle, or lower third (tercile) of all previously observed conditions. In example B there is a relatively strong indication by the models (60% chance of occurrence) that conditions will be below normal, but, given the variable nature of climate, the chance of normal or above-normal conditions is also shown (30% and 10% respectively).



Backgrounder

More fog than usual in Wellington

Major disruptions to the operation of Wellington Airport occurred in February and March. Although fog is not unusual at this time of year, there was more fog around this year than normal.

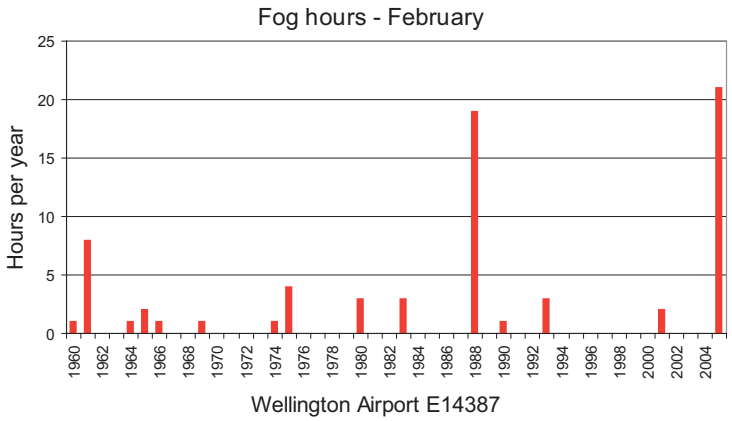
Fog typically forms when moist air comes into contact with a cool surface. The air cools and condenses into visible water droplets. Fogs form after radiative cooling, when the ground loses heat rapidly at night in still conditions, and through advection, when moist air intrudes over a cold surface.

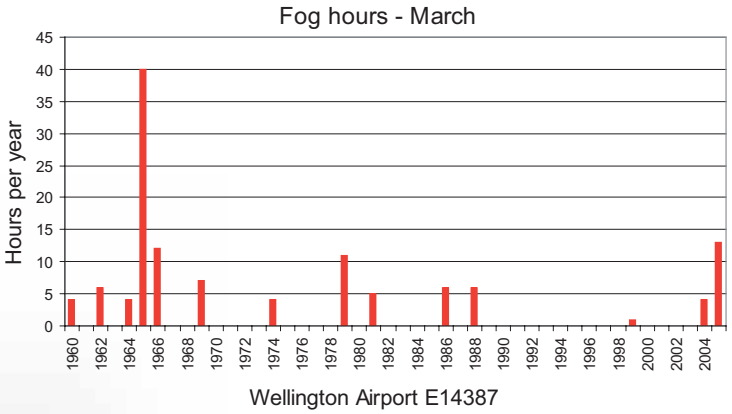
While radiation fogs generally lift after daylight as the sun heats the moist air, advection fogs typically clear after a change in wind direction, with the arrival of a drier air mass.

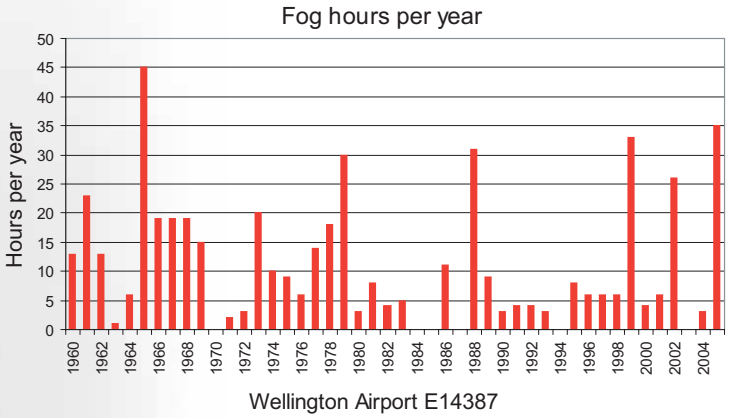
Recent fogs in Wellington were typical of advection fogs, the result of weak southerly flows bringing low stratus cloud and fog along the east coast of the South Island, and into Cook Strait and then into Wellington Harbour.

Persistent fog resulted in the closure of Wellington Airport and disruption of about 250 flights affecting thousands of travellers in early February. The airport was closed over 17–18 and 20–22 March, with more than 500 flights and tens of thousands of travellers affected.

Fog frequency data for Wellington Airport are shown in the adjacent figures. The data show that February 2005 was the foggiest February since records began in 1960 (top figure); March 2005 was the second foggiest March (middle figure); total fog hours for 2005 so far is the second highest annual total in the same record (bottom figure).







Low visibility on State Highway 1 out of Wellington. Fog blanketed Wellington for five days during March.

Cover photo: *Alan Blacklock*

A typical view from the ground on 18 March of an aircraft unable to land.

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
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