

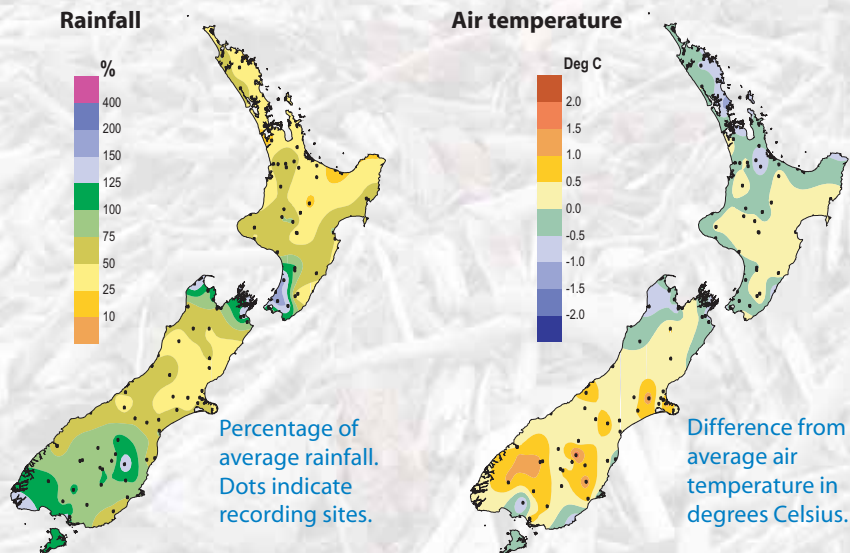
The Climate Update

A monthly newsletter from the National Climate Centre

Cold start to January followed by welcome change to summer temperatures. Generally low rainfalls across the country, but high streamflows persisted in many areas. High streamflows in the North Island and southern South Island followed end-of-year storms.

Outlook for February to April – average or below average air temperatures; rainfall likely to be near or below normal in most places.

New Zealand climate in January 2005



January

The first half of January was cool, but warm summer conditions dominated the last 10 days of the month. The mean temperature for January was about 3.5 °C higher than for December.

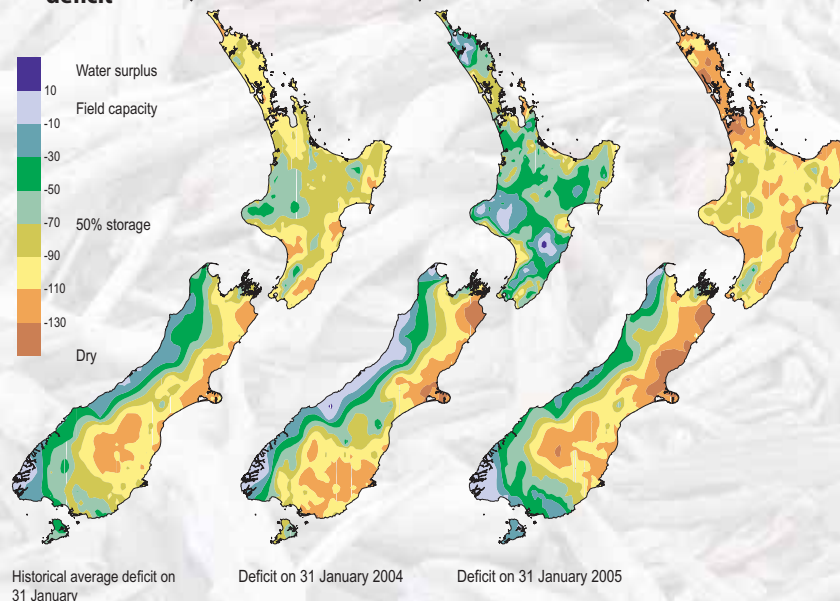
Rainfall was below average in many areas, especially eastern Bay of Plenty. The southern Wairarapa, Kapiti, and Upper Hutt districts experienced heavy rainfall on 5 January, with local flooding, road closures, and other damage.

For more information on the climate in January, visit the climate summaries page at www.niwa.co.nz/ncc/cs/mclimsum_05_01

Soils drying out in many areas

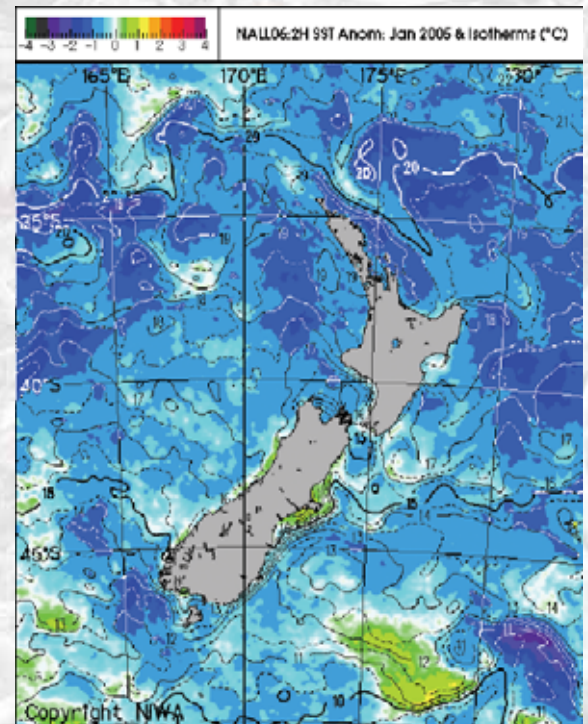
Soil moisture levels in much of the country dropped dramatically from mid January, with most soils at, or less than, 50% storage at the end of the month. Southland soils remained more moist than usual for the time of year.

Soil moisture deficit



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

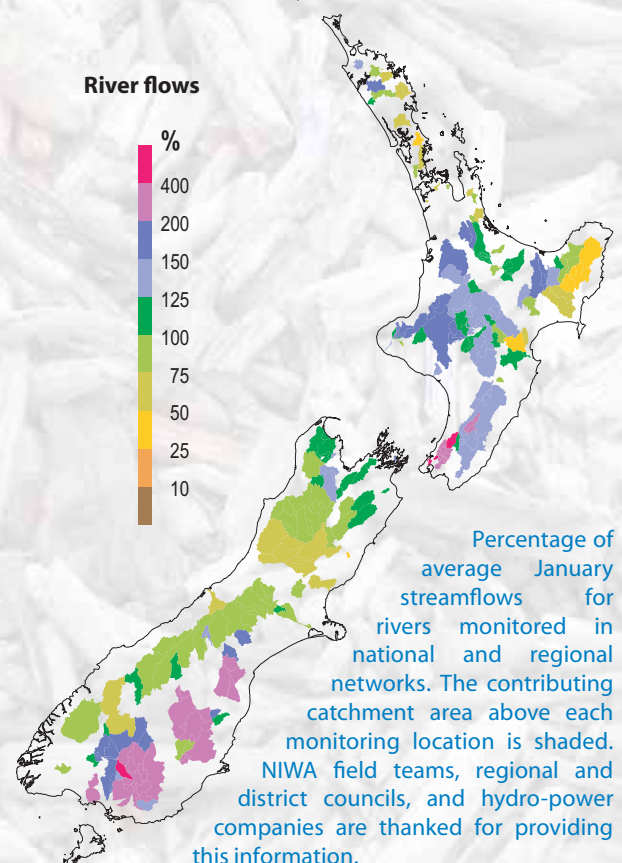
Sea surface temperatures



Difference from normal surface water temperatures in the seas around New Zealand. Although temperatures in seas adjacent to New Zealand were below average in January, they rose during the month.

High flows persisted

Streamflows were well above normal in most of the North Island apart from the Bay of Plenty, Hawke's Bay, and Gisborne regions, and in South Canterbury, Otago and Southland outside of alpine areas.



Checkpoint

November 2004 to January 2005

Rainfall predictions were correct for much of the North Island. There was more rain than predicted in the east of the South Island and southern Wairarapa. Parts of the South Island west coast were drier than expected.

Air temperatures were average as predicted in the southwest of the North Island, but lower than expected elsewhere. South Island temperatures were average or below average as predicted for most places.

Streamflows were higher than forecast in the south of the South Island and lower than expected in some western South Island catchments. Many North Island river levels were in line with forecast flows. Storms at the end of 2004, and December's high soil and ground water levels, contributed to the high flows.

Outlook

February to April 2005

Sea surface temperatures around the country are below average at present, but are expected to recover to near average for most of the period.

Air temperatures are expected to be average or below average in all regions.

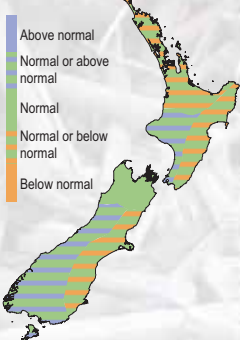
Relatively dry conditions are expected, with rainfalls likely to be normal or below normal in all districts. Soil moisture levels are expected to be below normal in the north of the North Island, normal or below in the east of both islands, and near normal elsewhere.

Stream flows are expected to be below normal in the north of the North Island and the east of the South Island, normal or below normal in the east of the North Island, and normal elsewhere.

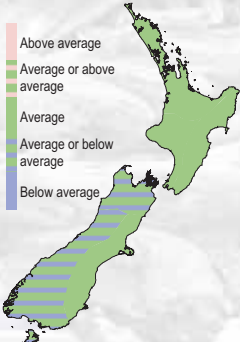
Weak El Niño conditions are very likely to continue in the tropical Pacific through to the end of March, after which neutral conditions are likely.

Outlook What we said

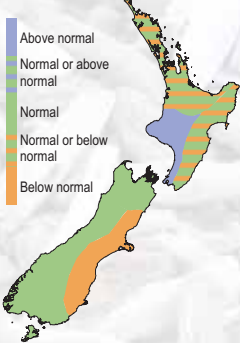
Rainfall



Mean air temperature



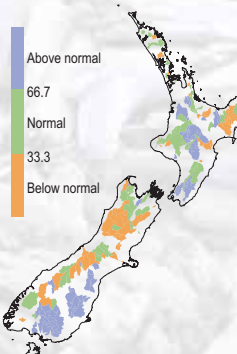
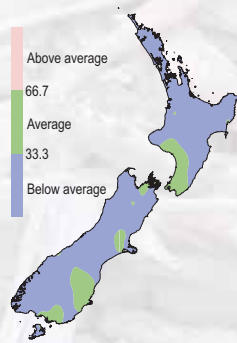
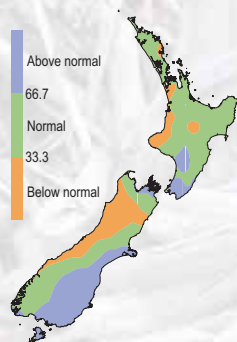
River flows



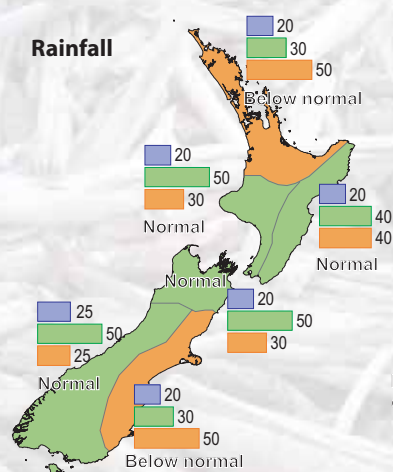
The three outcome maps (right column) give the tercile rankings of the rainfall totals, mean air temperatures, and river flows that eventuated from November to January, in comparison with the forecast conditions (left column).

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.

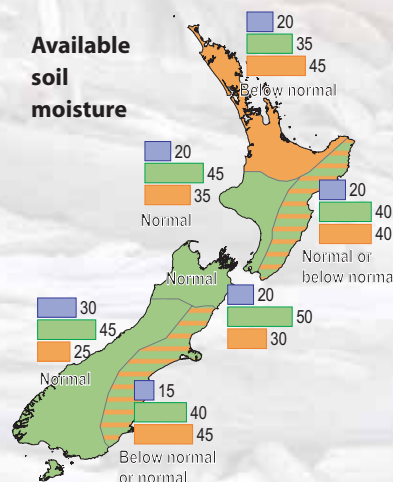
Outcome What actually happened



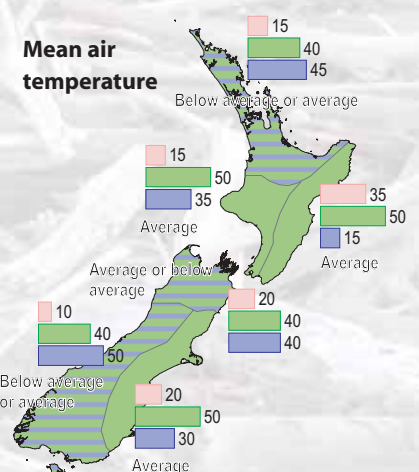
Rainfall



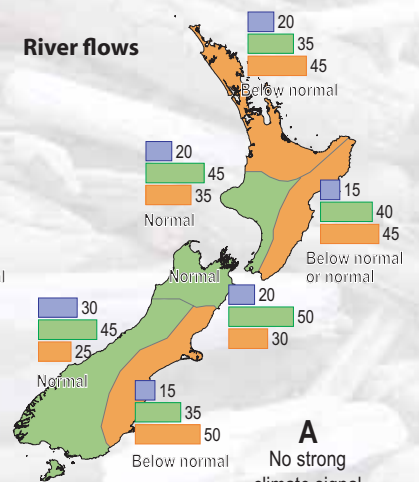
Available soil moisture



Mean air temperature

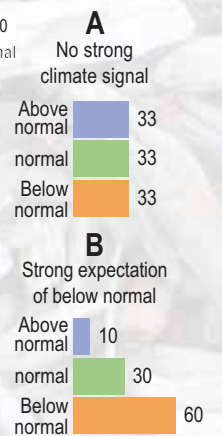


River flows



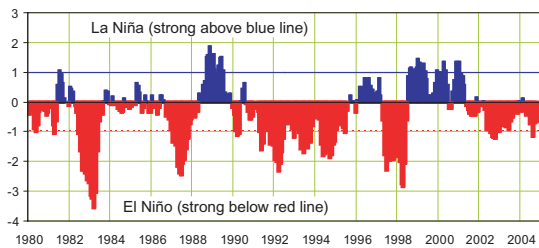
Key to maps (example interpretation)

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).



Global setting

Update on the SOI

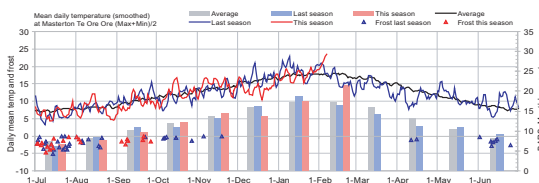


The Southern Oscillation Index (SOI), a measure of the changes in the atmospheric pressures across the Pacific, smoothed over three months. The present weak El Niño (negative SOI) is fading.

On-line climate graphics

Climate maps and line plots of observations are available by subscription from the NIWA Climate Now website

www.niwa.co.nz/ncc/climatenow



River debris along the beach at Queen Elizabeth II Park on the Kapiti Coast, flushed from southern North Island rivers following the heavy rainfall in early January.

Cover photo:
Alan Blacklock

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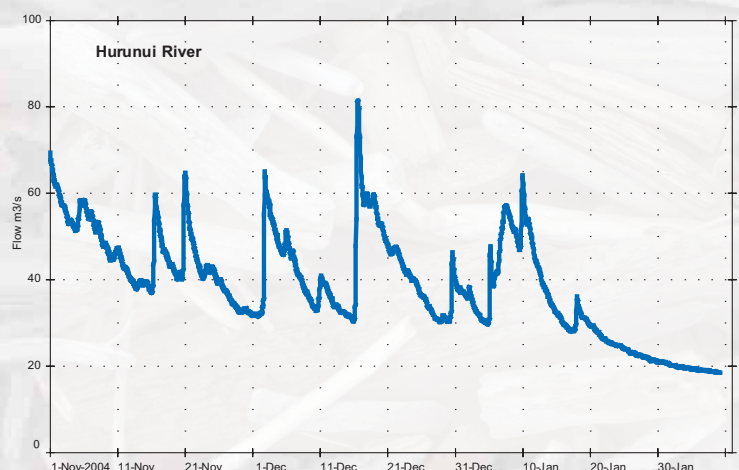
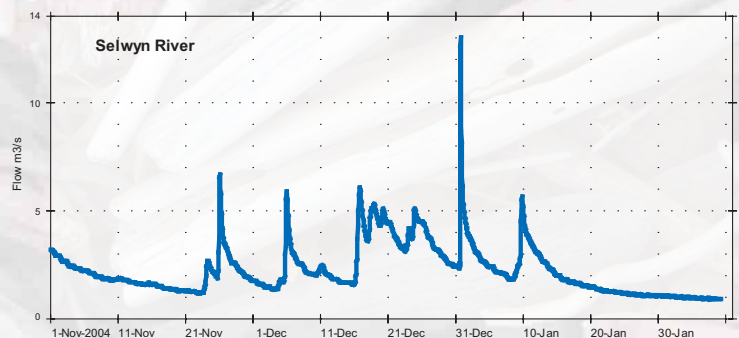
Backgrounder

Contrasting January rainfalls and streamflows

The maps of January rainfalls and streamflows reveal interesting contrasts. Exceptional December rainfalls over much of the country, apart from the North Island east coast and the South Island west coast, raised streamflows to high levels and elevated soil moisture conditions to well above normal. January commenced with many streams flowing at high levels and further rain early in the month sustained these flows. The lack of rain from about 12 January saw flows receding steadily to the end of the month. However, the average flows for January 2005 were in many cases well above the average for January, as shown by the map of river flows on Page 2.

The January rainfall map shows that relatively low rainfalls occurred over most of the North Island apart from the southwest, and over Canterbury and the west coast in the South Island. The lack of rainfall over the latter part of January, coupled with the high mid-summer evapotranspiration rates that accompanied the near-normal January temperatures, caused a steady depletion of soil moisture levels, leading to end-of-month soil moisture deficits that were greater than typical end-of-January values (see soil moisture map, Page 2).

In Canterbury, where agriculture is heavily dependent on irrigation, most streams followed the countrywide pattern with steadily reducing flows from about the middle of the month, as illustrated in the flow records for the Selwyn and Hurunui Rivers (below). By the end of the month, some Canterbury rivers were depleted to well below typical January flows, and irrigation restrictions were in force, notably for the Waiau, Hurunui, Ashley, Waimakariri, and Ashburton Rivers. Restrictions were also being imposed on smaller groundwater-fed streams in the region. Overall, however, much less irrigation than usual has been necessary over spring and early summer.



River flow records in cubic metres per second from 1 November to early February in the Selwyn and Hurunui Rivers, Canterbury.