

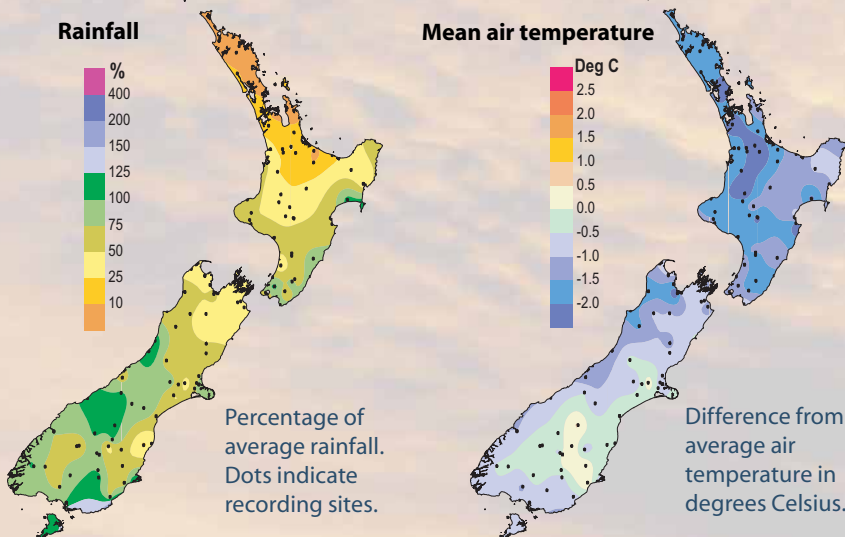
# The Climate Update

**A monthly newsletter from the National Climate Centre**

**March – record low rainfall in parts of the north;  
temperatures well below average.  
High March streamflows in the North Island caused  
by February storms.**

**Outlook for April to June –  
cool and at times frosty conditions expected.  
Near normal rainfall in most places, but possibly below  
normal in the north and southeast of the country.**

# New Zealand climate in March 2004



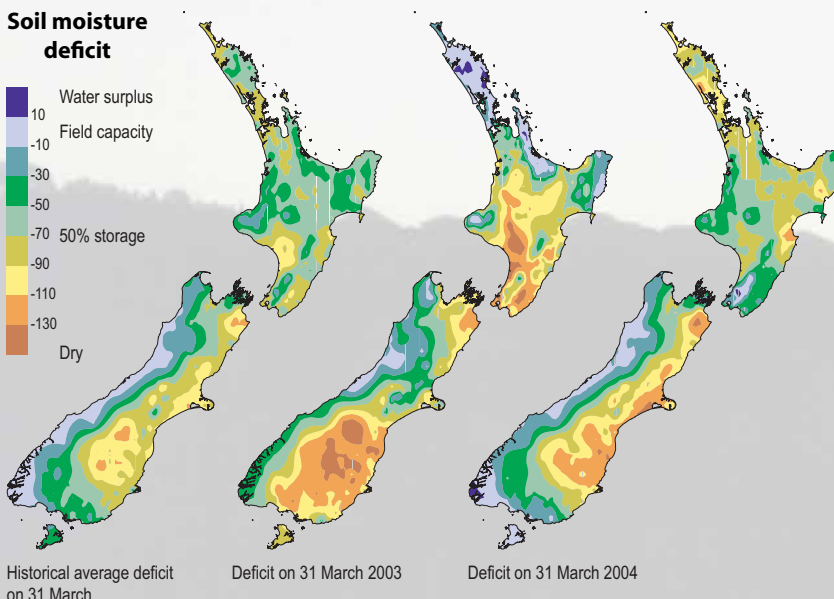
## Low rainfalls, low temperatures

March rainfall, in a dramatic contrast to the extremely wet February, was well below normal throughout much of the North Island and northern South Island, with many locations recording less than 50% of average totals. Record low rainfall, less than 10 mm in many areas, occurred throughout much of Northland, Auckland, Coromandel, and Bay of Plenty.

Mean temperatures were 1.0 to 2.5 °C below normal throughout much of the North Island, especially in Northland, Auckland, Coromandel, Waikato, and Taranaki, and also below normal in the north and west of the South Island. Lower than normal sea surface temperatures in March contributed to the low air temperatures over New Zealand.

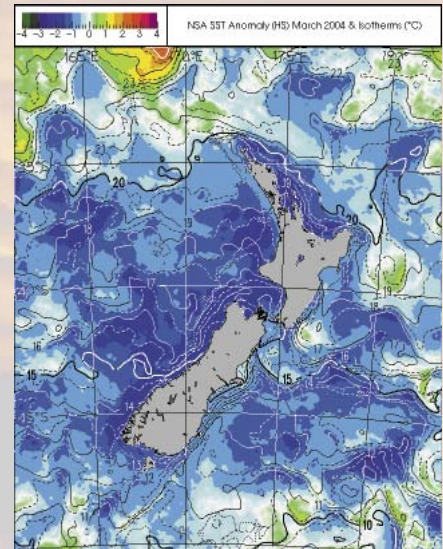
## Moisture levels drop due to low rainfall

Unusually low rainfall in the north of the country resulted in low soil moisture levels by the end of March. Northland, Auckland, Waikato, Bay of Plenty, and Hawke's Bay soils were drier than average, while Manawatu soils also had little moisture replenishment during the month. Soils on much of the South Island's east coast were drier than normal.



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

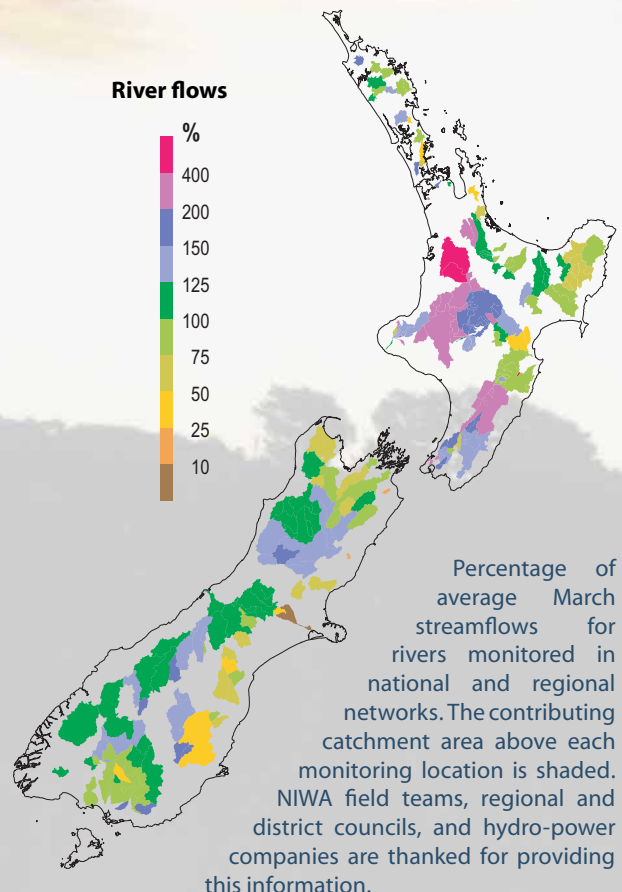


Difference from normal surface water temperatures in the seas around New Zealand. Mean temperatures for March were below normal all around the country.

For more information on the climate in March, visit the climate summaries page at [www.niwa.co.nz](http://www.niwa.co.nz).

## February rainfalls lift March flows

High March streamflows over much of the North Island were a consequence of the severe storms in mid and late February. Streamflows in the west and south of the South Island were normal or above normal. Streamflows in the north and east of the South Island tended to be below normal.



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 2004

Rainfall was as forecast for parts of Northland and the southern South Island. In other districts, while January and March rainfalls were generally in line with predictions, rainfall totals for the three months were dominated by the February storms, especially over the southwest North Island and northwest South Island, where totals were well above normal.

Air temperatures were lower than predicted in most districts, although the east was warmer than the west, as signalled by the forecasts.

A sequence of severe February floods gave exceptionally high streamflows for most of the North Island apart from the Bay of Plenty, East Cape, and northern Hawke's Bay regions where normal or above normal flows occurred. In the South Island, river flows were normal to above normal in the west, normal in the north, and below normal in the east and south.

# Outlook

## April to June 2004

A tendency towards more south or southwesterly winds is likely. Sea surface temperatures close to New Zealand are expected to remain lower than normal.

Air temperatures are expected to be below average in the South Island and average or below average in the North Island. More frosty nights than usual are expected, especially in the first half of the period.

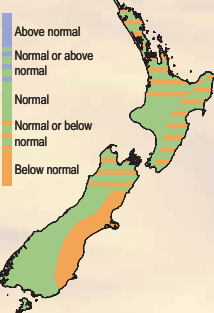
Rainfalls are expected to be near normal in many regions, but below normal in the northern North Island, and normal or below normal in the eastern South Island.

Soil moisture levels are expected to be below normal in the northern North Island, below normal or normal in the north and east of the South Island, and near normal elsewhere. River flows are expected to be normal in most regions, but below normal in the northern North Island and below normal or normal in the eastern South Island.

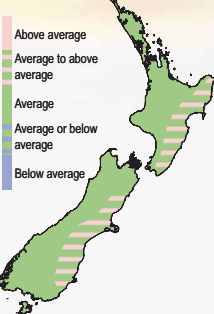
The Equatorial Pacific is in a neutral state, and no El Niño or La Niña is expected through the middle of 2004. There is only a small risk of an ex-tropical cyclone affecting New Zealand during April.

### Outlook What we said

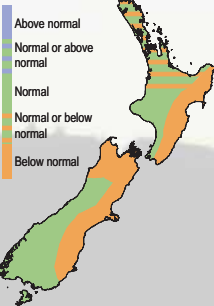
#### Rainfall



#### Mean air temperature



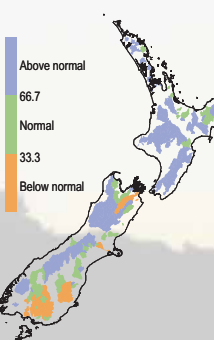
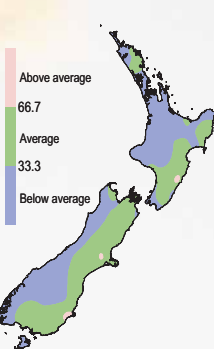
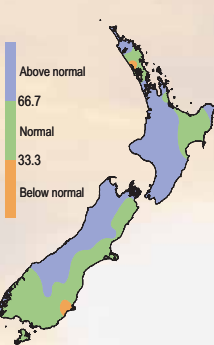
#### River flows



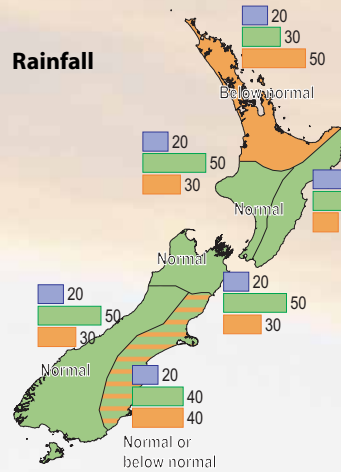
The three outcome maps (right column) give the tercile rankings of the rainfall totals, mean air temperatures, and river flows that eventuated from January to March, in comparison with the forecast conditions (left column).

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

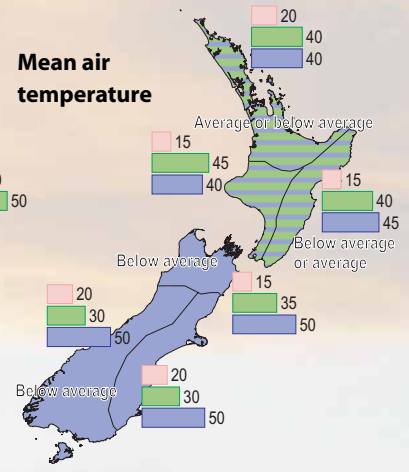
### Outcome What actually happened



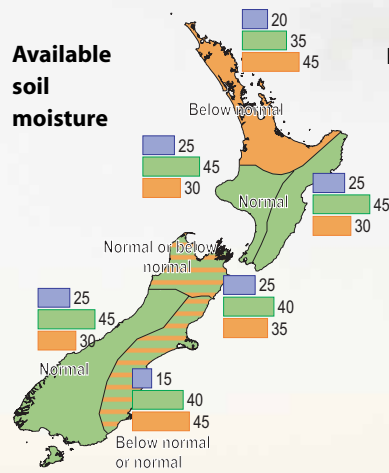
#### Rainfall



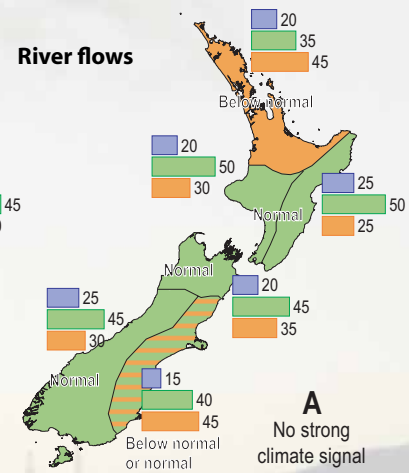
#### Mean air temperature



#### Available soil moisture

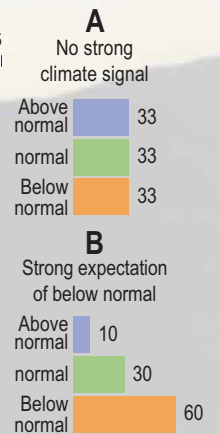


#### River flows



### 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).



# Backgrounder

## UV forecast adding more science to sport

**Richard McKenzie, NIWA, Lauder**

Sports enthusiasts in New Zealand are increasingly conscious of the need to protect themselves from excessive exposure to UV radiation. NIWA forecasts of daily UV risk were on display at a recent major South Island sporting event.

The 3-day, 475 km Goldrush multi-sport event, based in Alexandra and encompassing wide tracts of backcountry Central Otago, has become an annual icon event in the New Zealand multi-sport calendar. This year the competition, now in its eighth year, attracted a record 500 entries over Otago Anniversary Weekend (20–22 March).



The NIWA UV-risk portable display at the Goldrush staging posts.

NIWA helped to raise the awareness of UV risk to contestants by providing a UV forecast as part of the pre-race briefing, and by making a real-time display of daily UV forecasts available at key staging posts of the event. Contestants showed a lot of interest in the display and its highlighting of UV health issues. Subsequent observations found the forecasts to be accurate.

The prototype UV display had been constructed at the NIWA research campus in Lauder, Central Otago, and tested over the summer.

Daily updated forecasts and monitoring of UV and ozone over New Zealand are available on the NIWA web site (see box). Also on this web page are daily updates of graphs showing predicted and measured UV index at Leigh, Paraparaumu, Christchurch, Lauder, Invercargill, and Rarotonga.

### What is the UV (ultraviolet radiation) index?

The UV index is a standard measurement of erythemal (sunburn-causing) UV intensity that gives a more objective measure than the old “time to burn” (which cannot account for skin tone).

The UV index scale is open ended, but the larger the number, the more intense the UV. A UV index of greater than 10 is extreme and a UV index of less than 1 is low.

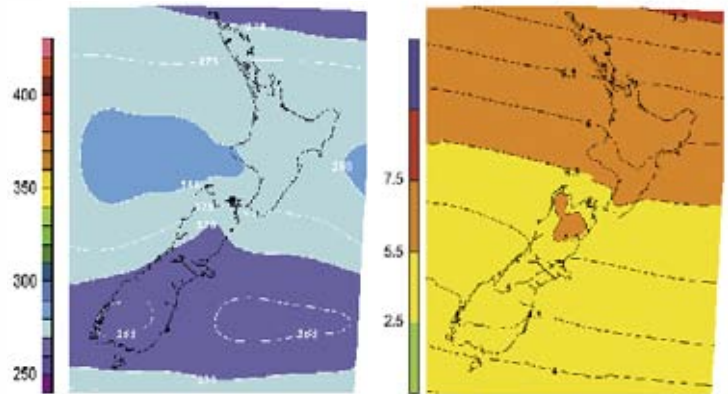
In New Zealand, its maximum summer value is generally about 12, but it can exceed 13 in the far north. In winter, it reaches peak values of 1 in the south or 2 in the north.

For most of us, a UV index of 4 or above means that protection from the sun is important, especially for long periods of exposure between 11 am and 3 pm during summer. For UV and ozone information, see [www.niwa.co.nz/services/uvozone](http://www.niwa.co.nz/services/uvozone)

### Global UV index link

The UV index used in New Zealand is part of the World Health Organization’s Global UV Project, known as *Intersun*.

Intersun has introduced an internationally agreed communication concept to harmonise reporting of the UVI worldwide and to improve its use as an educational tool. See [www.who.int/uv/publications/en/UVIGuide.pdf](http://www.who.int/uv/publications/en/UVIGuide.pdf)



Examples of the forecasts of ozone thickness (left) and UV index (right) for New Zealand that are published daily on the NIWA web site. Part of the UV spectrum is absorbed by the ozone layer in the atmosphere. NIWA monitors ozone thickness to help determine UV risk.



Sunset over Wellington.

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](mailto:ncc@niwa.co.nz) Phone: 0-4-386 0300 Visit our webpage: [www.niwa.co.nz](http://www.niwa.co.nz)

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