

# The Climate Update



## **Frosty and sunny in October**

The coldest October since 1982. The month was drier than normal and extremely sunny, with low stream flows over much of the country ... *page 2*

## **Outlook**

El Niño increases the risk of dry east coast weather and cool conditions over southern regions ... *page 3*

## **Blowing the other way – for the moment**

Team NZ meteorologist comments on El Niño racing conditions ... *page 4*

# New Zealand climate in October 2002

## Air temperature and rainfall

### Coldest October since 1982

October received more than the usual number of cold snaps, keeping temperatures well below normal over most of New Zealand. The national average temperature was 1.1 °C below normal at 11 °C, the same temperature as that of September.

Overnight minimum temperatures were more than 2 °C below normal in many places. Ground frosts occurred with twice their normal frequency in inland parts of Bay of Plenty and Canterbury.

The cold October was a marked turn around from September, when temperatures were above normal over much of the country.

### Low rainfall

Apart from north of Gisborne, and coastal Southland, rainfall was below average. Many

North Island localities recorded less than 75% of normal, as did parts of the northern South Island and inland Otago. Rainfall was below average for the fourth consecutive month in central Marlborough, with 50% of normal. Similar rainfall departures were recorded in Bay of Plenty and the southern tip of the North Island.

### High sunshine hours

October was extremely sunny throughout New Zealand. Sunshine hours at Kaitaia, Auckland, New Plymouth, Paraparaumu, Wellington, and Christchurch were the highest October totals on record.

### Hailstorm

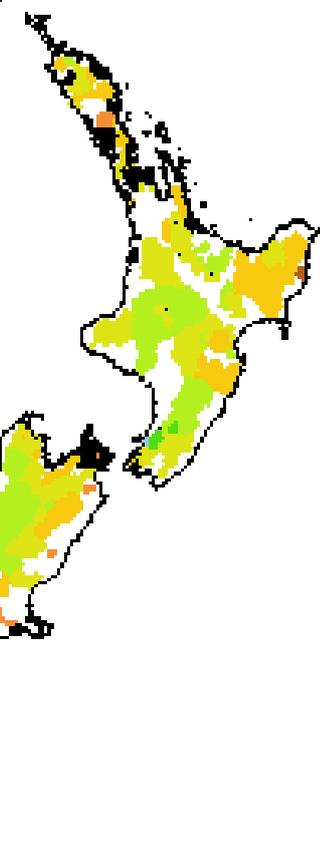
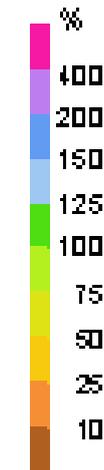
Hail the size of golf balls caused widespread damage in Hornby, near Christchurch, on 27 October.

## River and streamflows

### October streamflows mostly low

October flows were below normal in many areas, but near normal in the central North Island, the Tararua, and Buller. Flows were above normal in coastal Southland.

### River flows

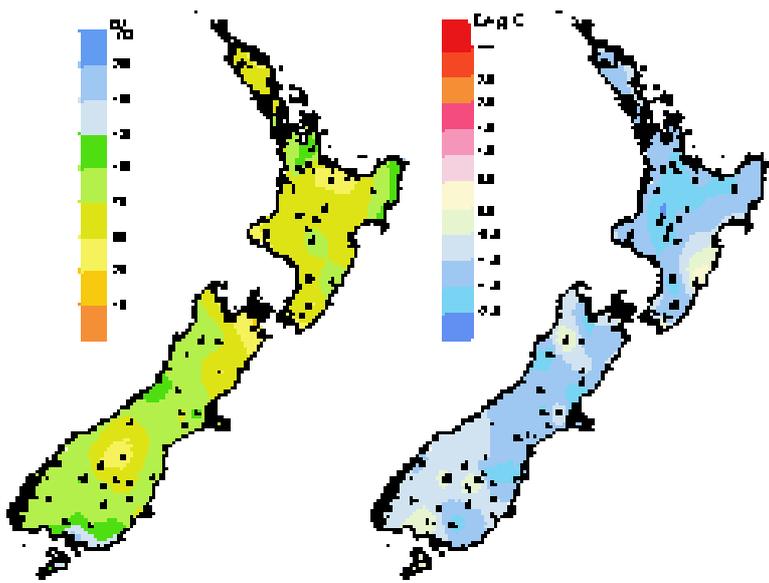
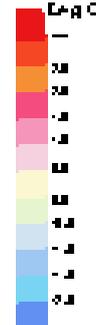


ABOVE: Percentage of average October streamflows for rivers monitored in national and regional networks. The contributing catchment area above each monitoring location is shaded. NIWA field teams, regional and district councils, and hydro-power companies are thanked for providing this information.

### Rainfall



### Mean air temperature



ABOVE: Percentage of average rainfall (left) and difference from the average air temperature in degrees Celsius (right). Dots indicate recording sites.

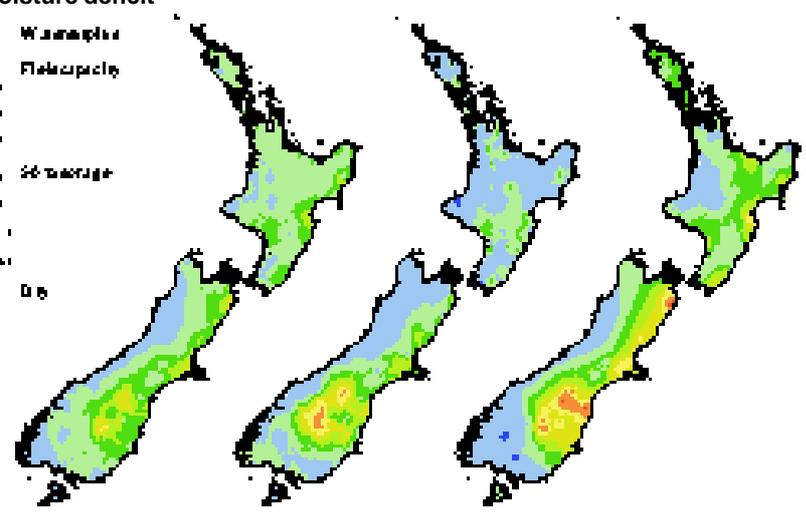
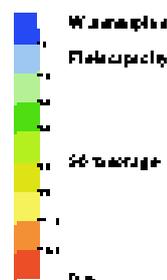
## Soil moisture

East coast soils were generally drier than normal by the end of October. Particularly dry for this time of year were Hawke's Bay, Marlborough, south Canterbury, and parts of coastal and inland Otago. Root zone soil moisture availability in Marlborough was at typical December levels.

North Taranaki and western Waikato soils were wetter than normal, and Southland soils also had high moisture content.

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

### Soil moisture deficit



Historical average deficit of 16 October    Deficit on 16 October 2001    Deficit on 16 October 2002

# Checkpoint

## August to October 2002

**Rainfall** was near normal, as expected, in parts of both main islands, but higher than predicted in the southwest of the South Island and lower than predicted in the north of the North Island, around Wellington, and in the east of the South Island.

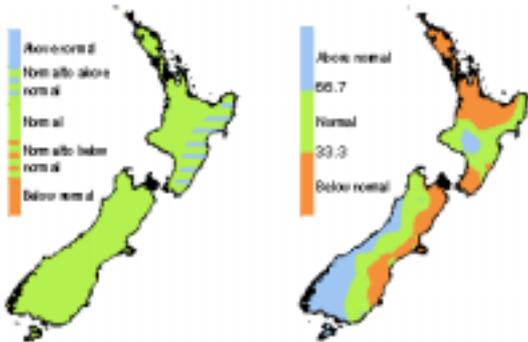
**Air temperatures** were lower than predicted over the North Island. Pockets of the east and south of the South Island were warmer than predicted.

**River flows** were lower than predicted in the north of the North Island and in the north and east coast of the South Island. Flows were near normal in many other places.

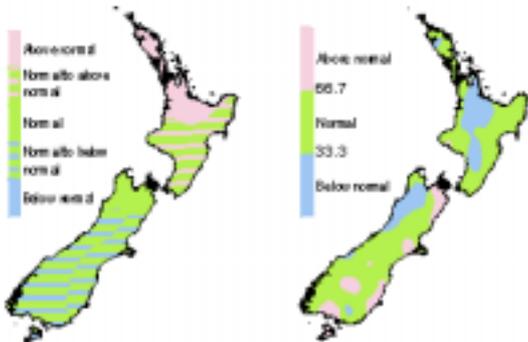
### Rainfall

**Outlook** What we said

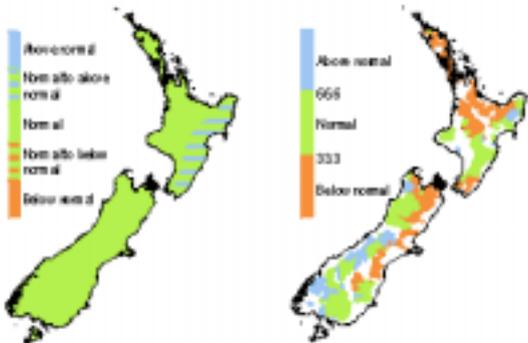
**Outcome** What actually happened



### Mean air temperature



### River and stream flows



The three outcome maps (right column) give the tercile rankings of the rainfall totals, mean temperatures, and river flows that eventuated for August to October 2002. Terciles were obtained by dividing ranked August to October data from the past 30 years into three groups of equal frequency (lower, middle, and upper one-third values) and assigning the data for the present year to the appropriate group. As an approximate guide, middle tercile rainfalls (33.3 to 66.7%) often range from 80 to 115% of the historical average. Middle tercile air temperatures typically occur in the range of the average plus or minus 0.5 °C. Note that in the maps above, the upper, middle, and lower tercile ranges are described by the terms *Above normal*, *Normal*, and *Below normal*, respectively.

# Outlook

## November 2002 to January 2003

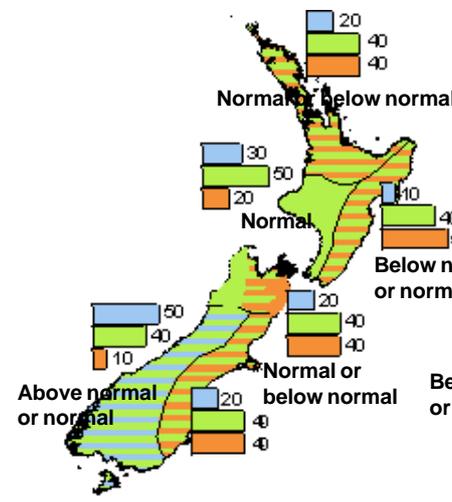
The moderate El Niño event in the tropical Pacific is expected to last through summer 2002–03, but is unlikely to be as strong as the 1997–98 event. Early summer climate in New Zealand is expected to be influenced by a continuation of lower than normal atmospheric pressures across southern New Zealand and episodes of stronger than normal westerly winds.

Temperatures are expected to be near average over the North Island and northern South Island, tending to below average over the rest of the South Island. Below normal or normal rainfall is expected in Marlborough, Canterbury, Otago, and the east and north of the North Island. Above normal rainfall is possible in the west and south of the South Island.

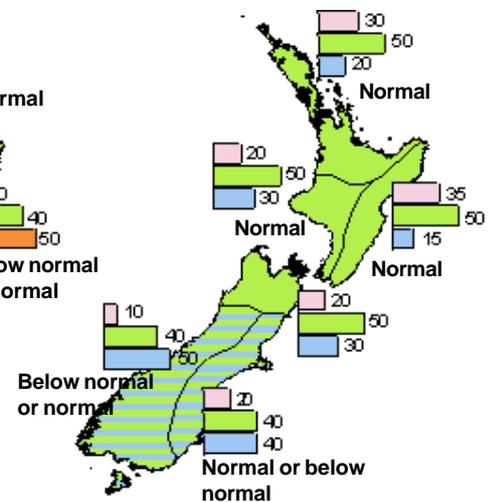
Soil moisture is expected to be below normal in Nelson and Marlborough, normal or below normal across eastern parts of both islands, and normal elsewhere. Below normal streamflows are predicted for all regions except for the west coasts of both islands and in Southland, where normal flows are predicted.

The presence of El Niño during the coming summer slightly reduces the tropical cyclone risk over New Zealand.

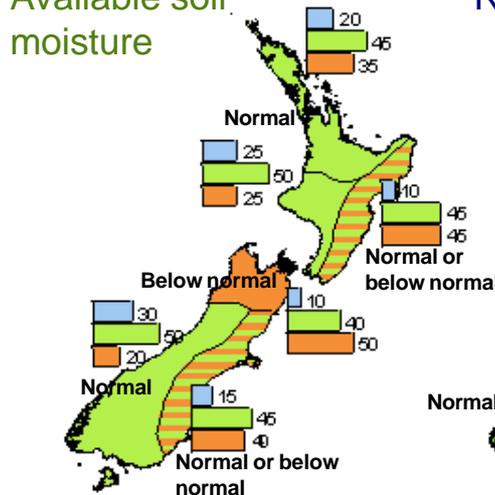
### Rainfall



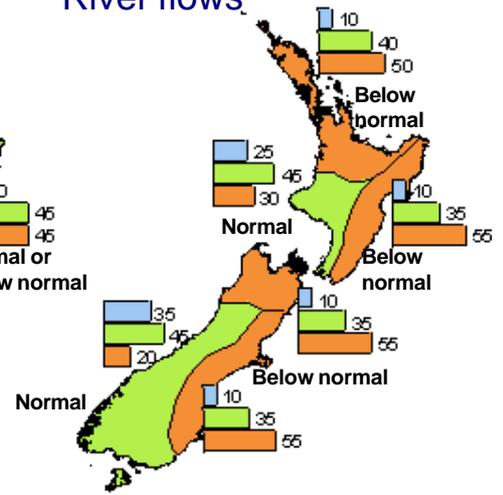
### Mean air temperature



### 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).

	No strong climate signal	Strong expectation of below normal
Above normal	33	10
Normal	33	30
Below normal	33	60

# Viewpoint

## Blowing the other way – for the moment

Roger Badham, Team New Zealand meteorologist

“We have been watching the developing El Niño conditions very closely, and now that El Niño is with us, the westerly winds on the Hauraki Gulf appear to be doing exactly what we thought they would do,” said Roger Badham, meteorologist for Team New Zealand.

“These El Niño conditions are certainly making this spring and early summer very different to anything experienced in the leadup to the last America’s Cup, when we had strong La Niña conditions and a high frequency of northeasterly winds.

“The Louis Vuitton series has suffered quite a number of lost days from strong westerly winds. We have had strong zonal flow across all New Zealand with active fronts and troughs crossing almost daily. As well, the Louis Vuitton race series committee lowered the wind speed for abandoning the starting of a race from 23 knots down to 19 knots. There is no doubt that the lower wind speed has reduced the damages that were witnessed last time. However, westerly winds come directly offshore, with only a few miles of fetch, and the associated seas are reasonably flat. As a consequence, the wind limit has been somewhat controversial. Certainly, the sea conditions with the same strength northeasterly winds were, on some occasions, much more dangerous, with one to two metre high waves.

“Even if the El Niño conditions continue through until March, we won’t be able to infer as much about the winds in the race area during the America’s Cup final as we were able to during the Louis Vuitton series. There is a strong correlation between a negative Southern Oscillation Index (El Niño) and strong westerly winds prior to the New Year from October to December.

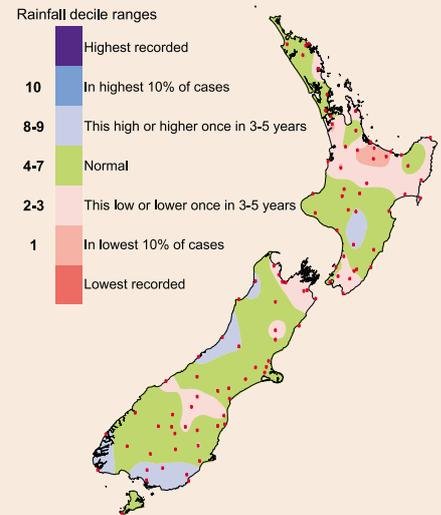
However, that correlation decreases rapidly during January with little signal in the late summer period. So the America’s Cup period in the second half of February may still be influenced by a couple of strong westerly fronts, but, in between, the winds will be lighter with both west coast and east coast sea breezes.”



ABOVE: The NIWA meteorological buoy deployed on the America’s Cup course in the Hauraki Gulf. Sensors record detailed information on key parameters such as wind and wave conditions. Photograph: Georgina Griffiths

## 2002 rainfall to date

Much of New Zealand has received near normal rainfall. Parts of Waikato, Bay of Plenty, south Wairarapa, Marlborough, Nelson, and North and inland Otago have been drier than average. Parts of Manawatu, Westland, Southland, and south Otago have been wetter than average.



ABOVE: Total rainfalls for 1 January to 31 October 2002, shown according to decile rankings of all rainfalls for this period from 1972. Dots indicate observation sites used in the analysis.

## Update on the SOI

The mean Southern Oscillation Index (SOI) for October was -0.9, with the three month average now at -1.2. The present moderate El Niño is expected to last through summer, and is likely to be weaker than the 1997–98 event. Further general information on El Niño is available on the World Meteorological Organization web site, [www.wmo.ch](http://www.wmo.ch)



ABOVE: The Southern Oscillation Index (SOI), a measure of changes in the atmospheric pressures across the Pacific, smoothed over three months. La Niña or El Niño typically have an observable effect on the New Zealand climate when there is a large departure of the SOI from zero.



**The Climate Update** is a monthly newsletter from NIWA’s National Climate Centre for Monitoring and Prediction, and is published by NIWA, Private Bag 14901, Wellington. It is also available via 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 Fax: 0-4-386 0341 Visit our website: [www.niwa.co.nz/ncc](http://www.niwa.co.nz/ncc)

**Cover picture:** Team New Zealand crew in action on the Hauraki Gulf in preparation for the America’s Cup series. Photograph supplied by Team New Zealand

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## Online climate graphics

Climate maps and line plots of climate site observations are updated each week on the [Climate Now](http://www.niwa.co.nz/ncc/climate) website at: [www.niwa.co.nz/ncc/climate](http://www.niwa.co.nz/ncc/climate)

