Number 99, 15 September 2007

NIWA
Taihoro Nukurangi

The Climate Update

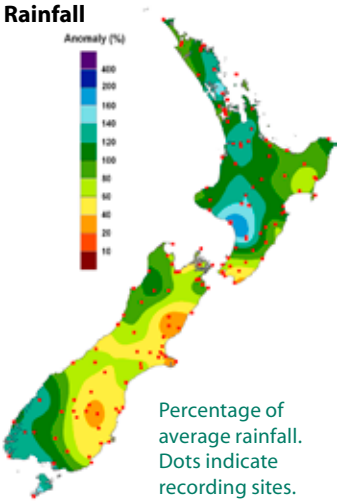
A monthly newsletter from the National Climate Centre

August – below normal rainfall in the north and east of the South Island; near or above normal rainfall in regions exposed to the west. Above average temperatures in the North Island; cold in the south. River and stream flows low in eastern regions and normal to above normal elsewhere.

Outlook for September to November – normal rainfall in the east of the North Island; normal or below normal rainfall elsewhere. Air temperatures are likely to be average or above in all regions.

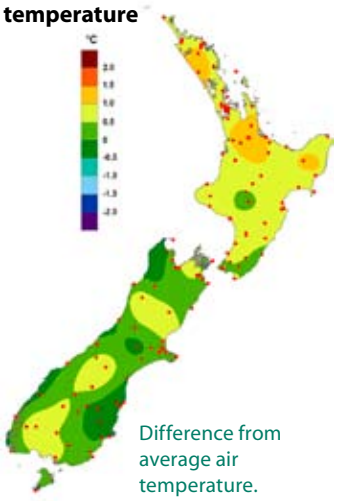
New Zealand climate in August

Rainfall



Percentage of average rainfall. Dots indicate recording sites.

Air temperature



Difference from average air temperature.

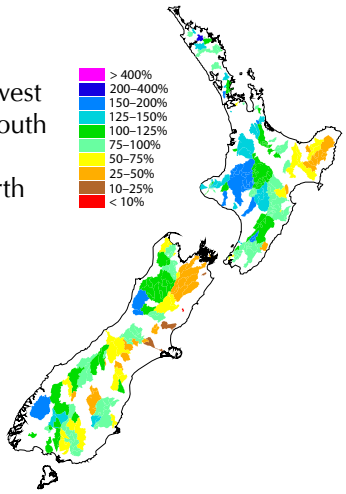
August was windy at times with frequent disturbed southwesterlies, especially to the east, resulting in low rainfall in sheltered northern and eastern South Island regions, and normal or above normal rainfall in several other regions.

Temperatures were above normal over much of the North Island and near average over much of the South Island. The national average temperature of 9.1 °C was 0.4 °C above normal.

For more information see www.niwascience.co.nz/ncc/cs/mclimsum_07_08

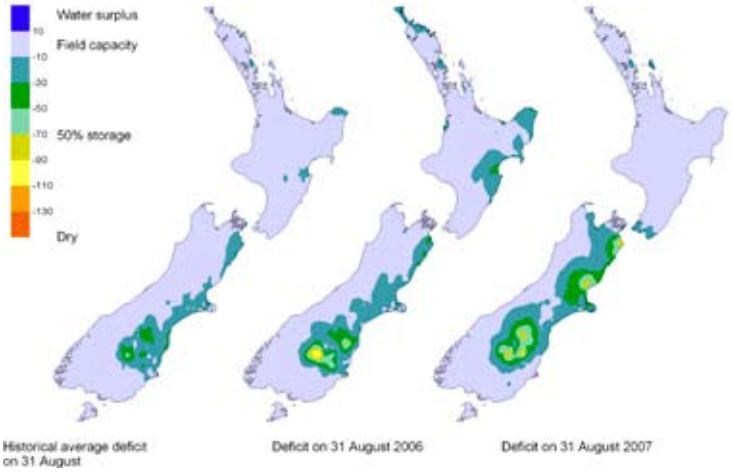
River flows

North Island stream flows were above normal in the north and west and below normal in the east. South Island stream flows were below normal in Marlborough and North Canterbury and mainly normal elsewhere.



Percentage of average August 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.

Soils in Marlborough and North Canterbury, on Banks Peninsula, and in inland parts of Otago were below normal at the end of August.

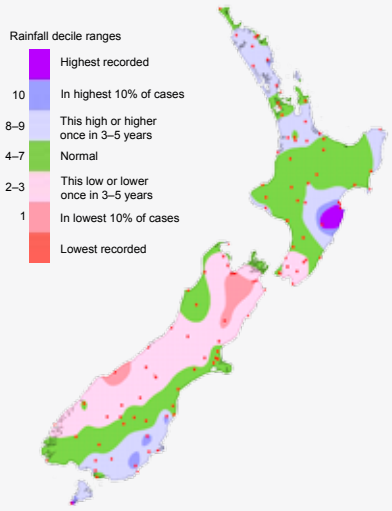
June to August – the climate we predicted and what happened

Rainfall

Predicted: Normal or above normal in the north and east of the North Island, normal or below normal in the east of the South Island, and normal elsewhere.

Outcome: Above normal in the north and east of the North Island, and southeast of the South Island. Dry areas in Wellington and from the northeast to the southwest of the South Island. Normal elsewhere.

June to August rainfall

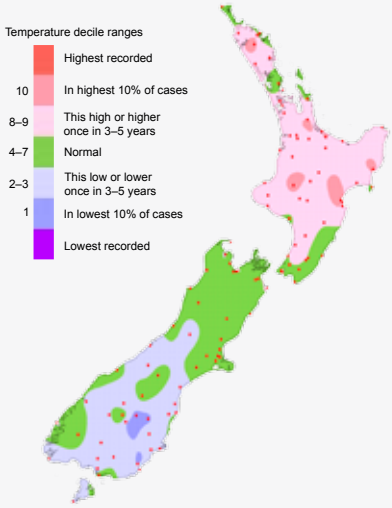


Air temperature

Predicted: Above average in all regions, except for average or above average in the east of the South Island. Cold outbreaks typical of winter from time to time.

Outcome: Above average over most of the North Island, average in central New Zealand, and below average in the south.

June to August temperature

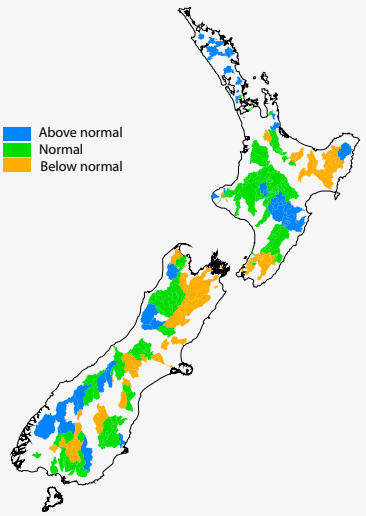


River flows

Predicted: Stream flows were expected to be below normal in the east of the South Island and in the normal range elsewhere.

Outcome: Stream flows were below normal in East Cape, Marlborough, and the South Island east coast, and mainly normal elsewhere.

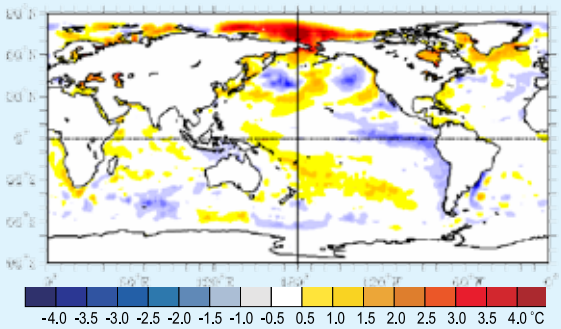
June to August river flows



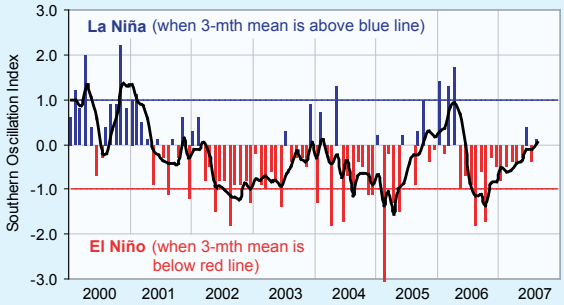
Global setting and climate outlook

La Niña indicators strengthen

Conditions in the tropical Pacific are in a borderline La Niña state, with some strengthening of this phase of the El Niño-Southern Oscillation over the past month. There is a 60% chance of La Niña conditions developing in the equatorial Pacific during the spring (September–November) forecast period, with less than a 10% chance of El Niño conditions developing. However the Southern Oscillation Index remains near zero.



Difference from average global sea surface temperatures for August 2007. Map courtesy of NOAA Climate Diagnostics Centre.

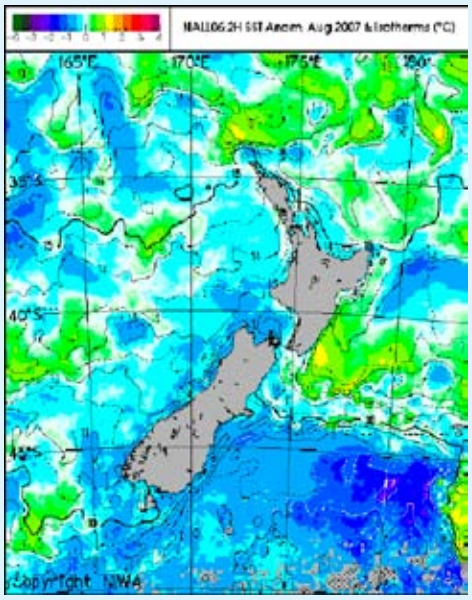


Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressures across the Pacific, and the three-month mean (black line).

SOI mean values:
August: +0.1
June to August: 0

Sea surface temperatures (SST) around New Zealand

Sea surface temperature (SST) anomalies in the New Zealand region continued to weaken in August to +0.4 °C, with the June–August average anomaly about +0.6 °C. SST anomalies are positive around the North Island east coast and across to the central Pacific, but remain negative south of Chatham Rise and southeast of the South Island. SSTs are expected to remain above normal around the North Island, but are likely to be near normal around the South Island.



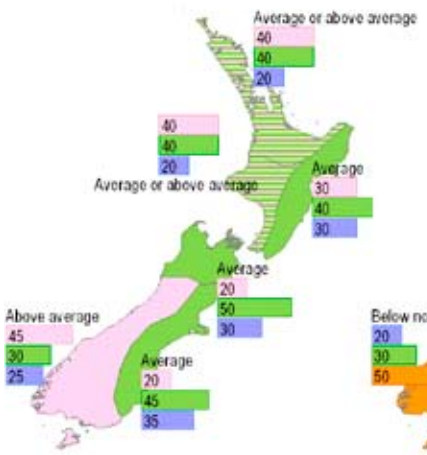
Differences from normal August surface temperatures in the seas around New Zealand.

Outlook for September to November 2007

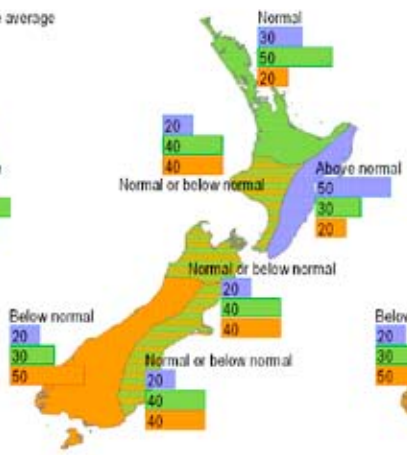
During spring, mean sea level pressures are expected to be higher to the southwest of New Zealand and lower than normal to the north, with weaker than normal westerly winds (more easterly anomalies) across the country. Air temperatures are likely to be average or above average in all regions.

Above normal rainfall is expected in the east of the North Island, with normal or below normal rainfalls likely elsewhere. Soil moisture levels and stream flows are likely to be normal or below normal in the South Island and west of the North Island. Normal or above normal conditions are likely in the east of the North Island, and normal conditions are likely in the north of the North Island.

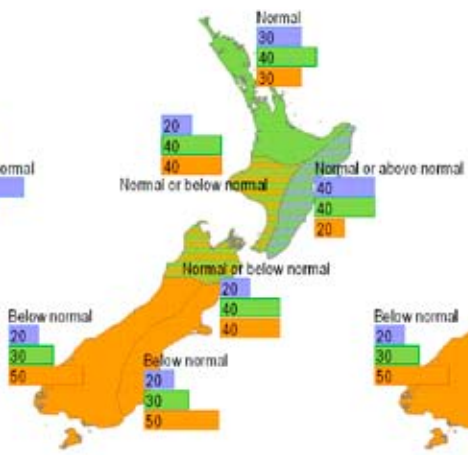
Mean air temperature



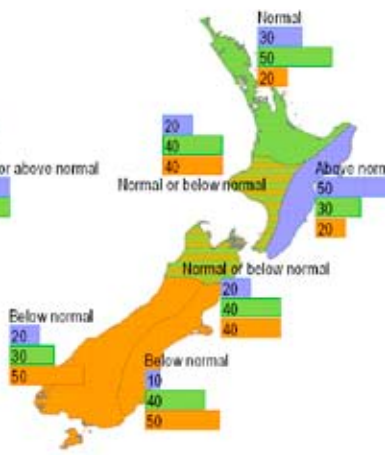
Rainfall



Available soil moisture

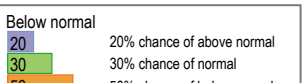


River flows



How to interpret these maps

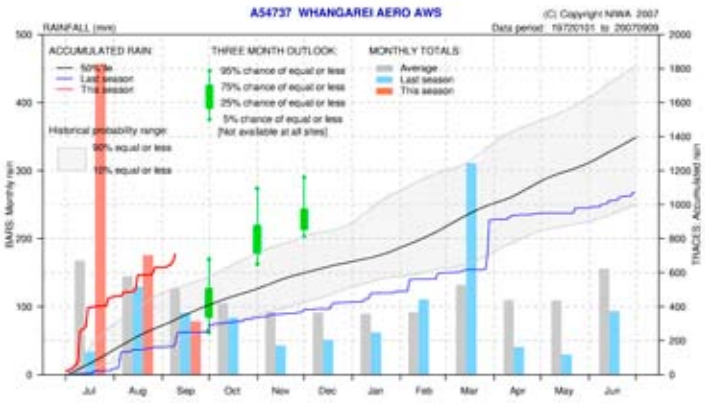
In the example here the climate models suggest that below normal conditions are likely (50% chance), but, given the variable nature of the climate, the chance of normal or above normal conditions is also shown (30% and 20% respectively).



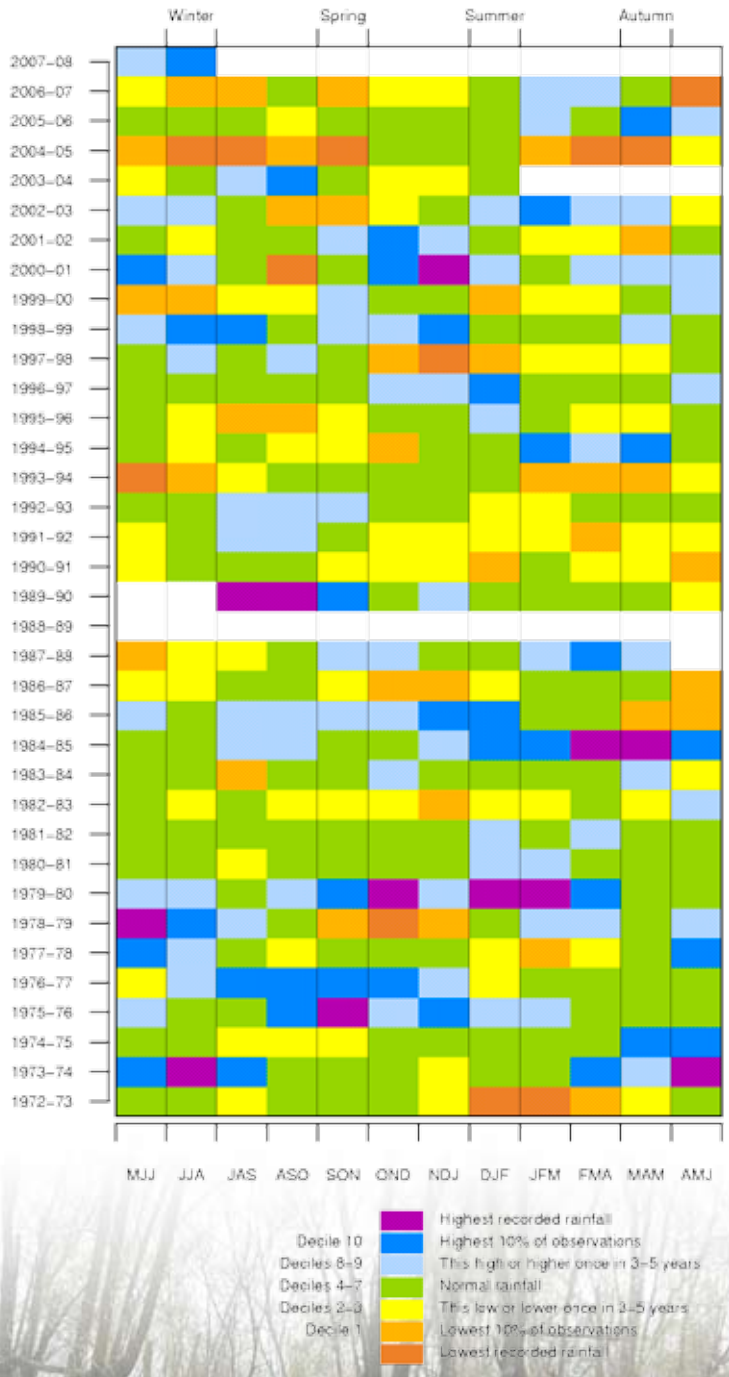
Winter rainfall at Whangarei Airport

Winter temperatures were higher than normal as expected over much of the North Island, but unexpectedly low in the south of New Zealand. The outlook for normal to above normal rainfall in the north of the country also proved accurate (see the outcome map on page 2).

This year Whangarei Airport recorded its highest winter (June–August, JJA) rainfall (724 mm) since 1973, when 743 mm was measured. The average winter rainfall at Whangarei is 456 mm. The figure below highlights the exceptionally high rainfall in July 2007 that contributed most to the winter total, after a relatively dry period in the preceding months.



The figure to the right compares 3–month rainfall totals for Whangarei Airport, arranged in rows by July to June year and in columns, from 1972–73 to the present. The columns are arranged from left to right as total rain for May–July (MJJ) to April–June (AMJ). The colour coding categorises the decile ranges of the observed 3–month rainfalls in each column respectively.



The magenta segment in the JJA column marks the 1973 winter rainfall total noted above. The current winter rainfall (dark blue segment) occurs in the top decile for JJA. The driest winter in the record was 2004, shown in brown. April to June rainfall for 2007, also noted above, was the lowest rainfall for that period in the record.

For more information contact explorerhelp@niwa.co.nz

Note: The data displayed here are from a composite of stations and should not be taken as final. White segments in the right hand figure indicate missing or as yet unrecorded data.

After the drought in southern Hawkes' Bay. Rainfall restored the colour but pasture covers were low during winter.

Cover photo: *Alan Porteous*

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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