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NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre

August – drier, warmer, and sunnier than usual for most of the country.

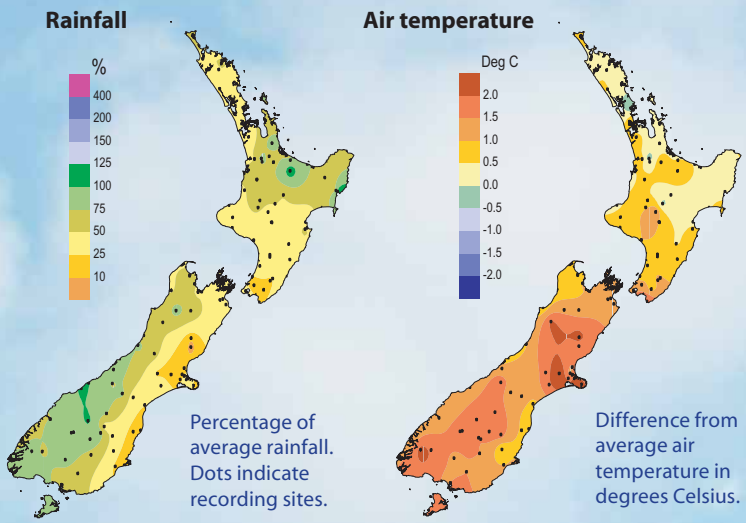
Outlook for September to November – above average temperatures in the North Island, average or above in the South Island. Mostly near normal rain. Soil moisture and river flows below average in the east of the South Island.

New Zealand climate in August 2005

August was much drier, warmer, and sunnier than normal over most of New Zealand. Many northern and eastern regions of the country recorded less than 50 percent of normal rainfall.

Air temperatures were higher than usual, with the national average temperature of 9.8 °C being 1.1 °C above normal. This was the fourth highest August mean temperature since reliable records began in the mid 1860s.

For more information on the climate in August, visit the climate summaries page at www.niwa.co.nz/ncc/cs/mclimsum_05_08

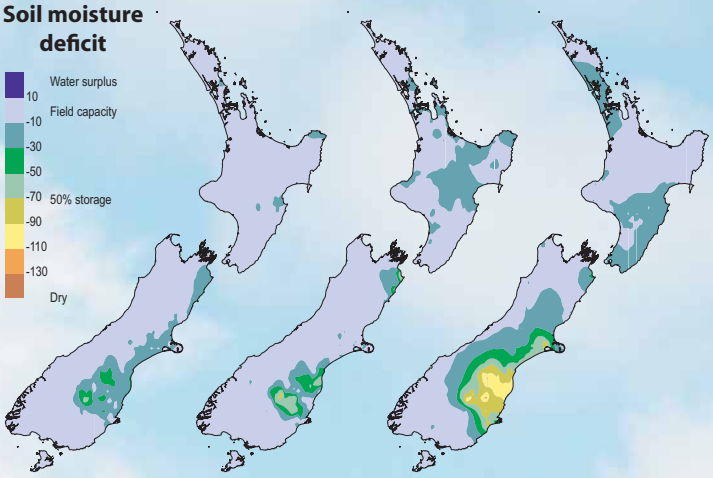


Percentage of average rainfall. Dots indicate recording sites.

Difference from average air temperature in degrees Celsius.

Continuing low soil moisture

Soils in much of Otago and parts of coastal Canterbury continued to be drier than normal in August. In some areas, soil moisture deficits developed that were 50–60 mm below the average for the end of August.



Historical average deficit on 31 August

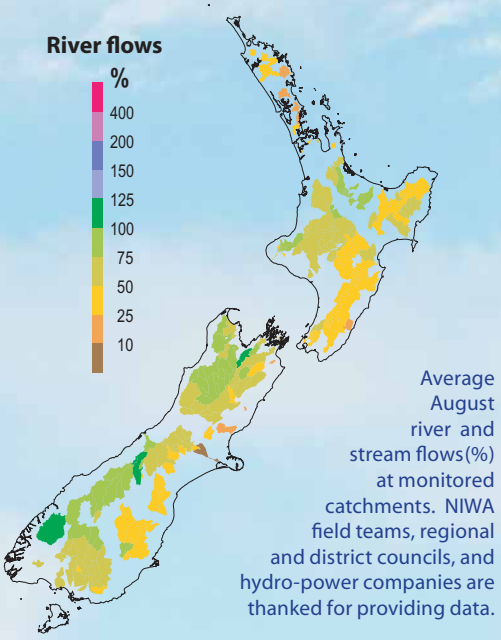
Deficit on 31 August 2004

Deficit on 31 August 2005

Water balance in the pasture root zone for an average soil type where the available water capacity is taken to be 150 mm.

Mostly low river and stream flows

River flows were below normal nearly everywhere, apart from the Buller and Fiordland regions, where they were near normal.

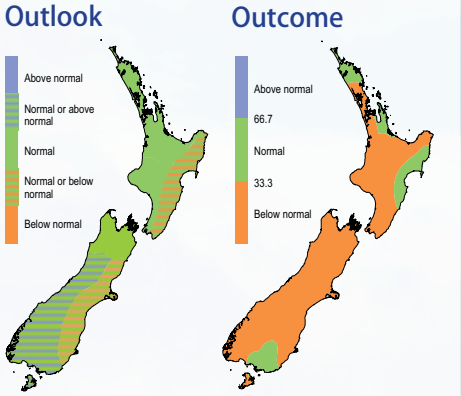


Average August river and stream flows(%) at monitored catchments. NIWA field teams, regional and district councils, and hydro-power companies are thanked for providing data.

June to August: the climate we predicted and what happened

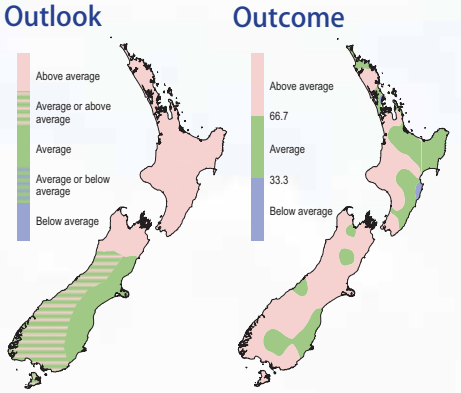
Rainfall

Rainfall was near normal, as predicted, in parts of Northland, Waikato, and the east of the North Island, but below normal over much of the rest of the country.



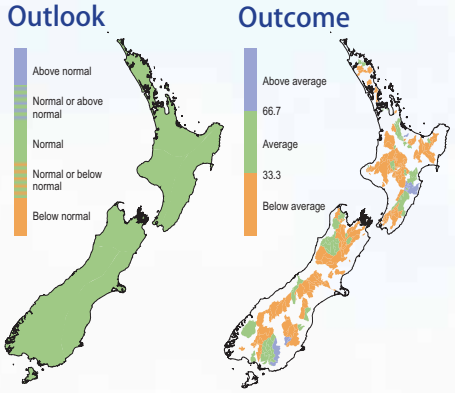
Air temperature

Air temperatures were above average in many places as was predicted, but lower than expected in parts of the east and north of the North Island.



River flows

Streamflows were near normal, as was predicted, in the south and southwest of the South Island, and below normal elsewhere.



The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from June to August, in comparison with the forecast conditions.

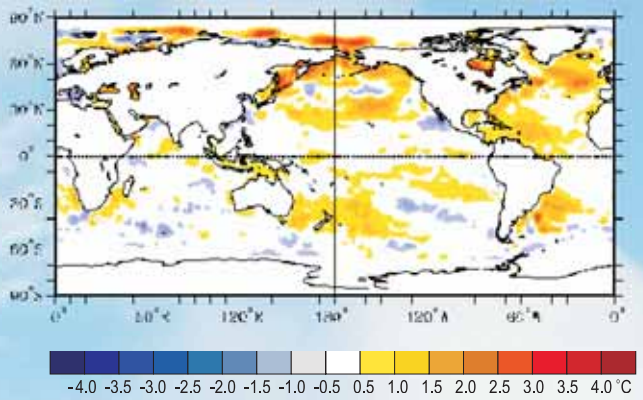
As an approximate guide, middle tercile rainfalls typically range from 80 to 115% of the historical normal, and middle tercile temperatures range about the average by plus or minus 0.5 °C.

Global setting and climate outlook

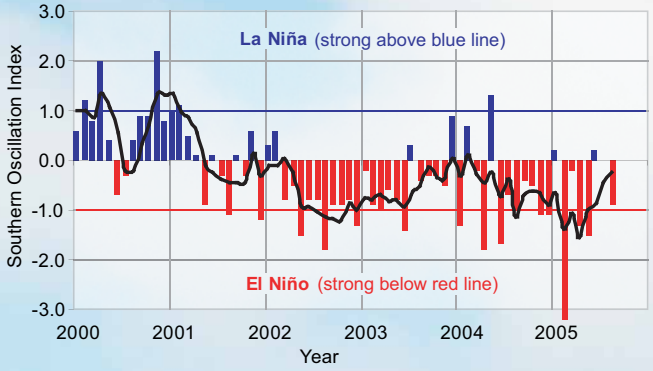
El Niño-Southern Oscillation remains neutral

The tropical Pacific Ocean is in a neutral state (no El Niño or La Niña), although equatorial Pacific sea surface temperatures (SST) are still above average. Tropical Pacific conditions should continue to be in a neutral state over the next 3–6 months.

The Southern Oscillation Index (SOI) was negative in August (-0.9), due mainly to higher pressures at Darwin, but the 3-month July to August mean was near zero (–0.2).



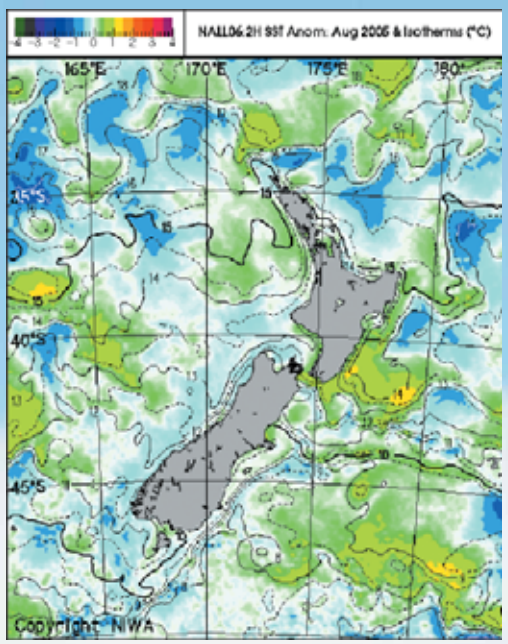
Difference from average global sea surface temperatures for August 2005. Map courtesy of NOAA/Climate Diagnostics Center.



Monthly values of the Southern Oscillation Index (SOI), a measure of the changes in atmospheric pressure across the Pacific, and the 3-month mean (black line). Current values: August -0.9; JJA 3-month mean -0.2.

Sea surface temperatures around New Zealand

The New Zealand average SST anomaly was about +0.6 °C in August, with the 3-month mean anomaly for June to August at about +0.5 °C. SST anomalies are positive over much of the Tasman Sea, and in the Pacific to the east of New Zealand.



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

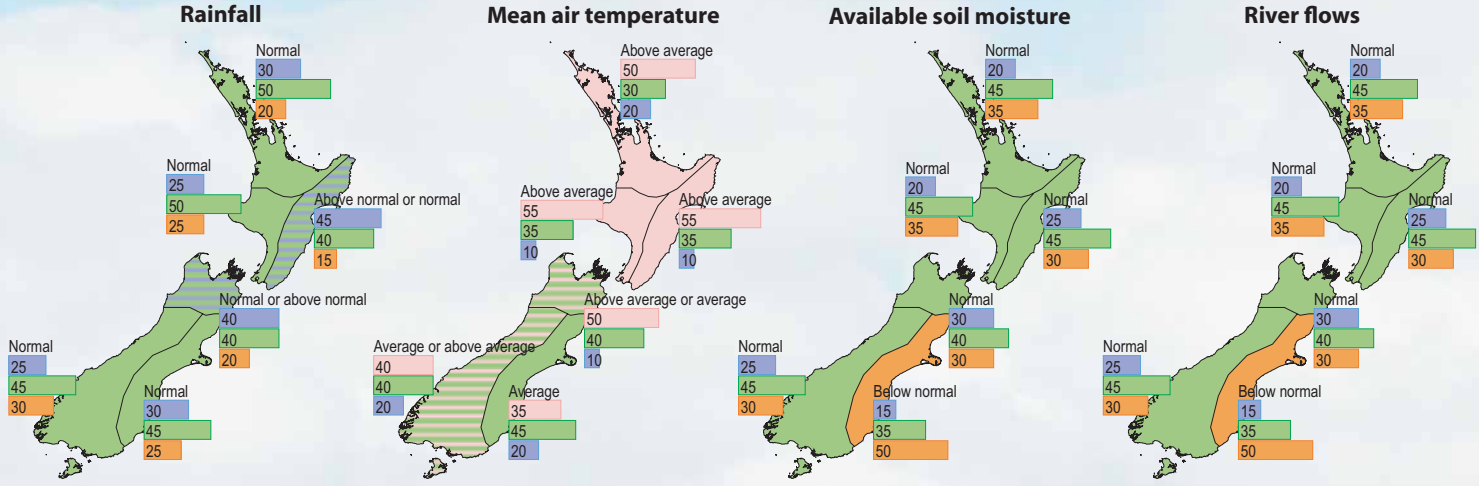
Outlook for September to November 2005

Local atmospheric circulation patterns are expected to result in more anticyclonic conditions than usual to the east of the South Island, and weaker westerly wind flows, over New Zealand.

Sea surface temperatures around New Zealand are likely to be near or above average until November 2005.

Air temperatures (see maps below) are expected to be above average in the North Island, and average or above average in the South Island.

Rainfalls are likely to be normal or above normal in the east of the North Island and north of the South Island, and near normal elsewhere. Below normal soil moisture levels and river flows are expected on the east coast of the South Island. Elsewhere, normal soil moisture levels and stream flows are expected.



	Below normal
Upper tercile: 20% chance of above normal	20
Middle tercile: 30% chance of normal	30
Lower tercile: 50% chance of below normal	50

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

Climate science meets virtual reality

"It was a balmy 18 degrees in Masterton today..." When the TV weather presenter reports on the temperatures around the country, do you add a couple of degrees because you know that the climate of your location is typically warmer than Masterton?

This handy logic, called spatial interpolation, is probably something most of us use more often than we might realise.

If would be useful to have climate stations with long records of data everywhere they were needed. For obvious reasons this is impossible. However, using spatial interpolation techniques we can create "virtual" climate stations at almost any location on land in New Zealand. A systematic grid of these virtual stations across the country provides a base network of climate information to assist our understanding of climate related problems.

Data interpolation

The virtual station data are estimated from actual data values recorded at about 300 climate stations throughout the country. The interpolation scheme takes into account the distance from the nearest recording sites and the topographic differences between the recording sites and the virtual station sites, for example, differences in elevation, aspect, slope, and distance from the sea.

The adjacent map shows the grid-pattern location of NIWA's virtual climate stations (shown as red dots) in the Wairarapa. The grid points are about 5 km apart (actual spacing is 0.05° of latitude and longitude), and cover the entire country. Daily climate data have been calculated back to 1972 for most variables (rainfall goes back to 1960), and are updated every month (i.e., the data currently go up to the end of August 2005).

Maps and data derived from the virtual climate network for all New Zealand are available from NIWA.

So the next time the TV weather presenter says, "... with winds gusting to 100 km/h in Tapanui", you could know more accurately what that might mean for where you live.

For more information on New Zealand's virtual climate information, contact Andrew Tait on 0-4-386 0300, or email a.tait@niwa.co.nz, or ncc@niwa.co.nz

Virtual climate station network (red dots) in the southern North Island. Estimates of daily rainfall, air temperature, evapotranspiration, soil temperature, and wind speed have been made at each site, and can be interpolated between sites.

Otago vineyard approaching harvest maturity. Temperature data interpolated from long-term climate sites to new orchard locations can provide estimates of historical variability in crop harvest dates.

Cover photo: *Steve LeGal*

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
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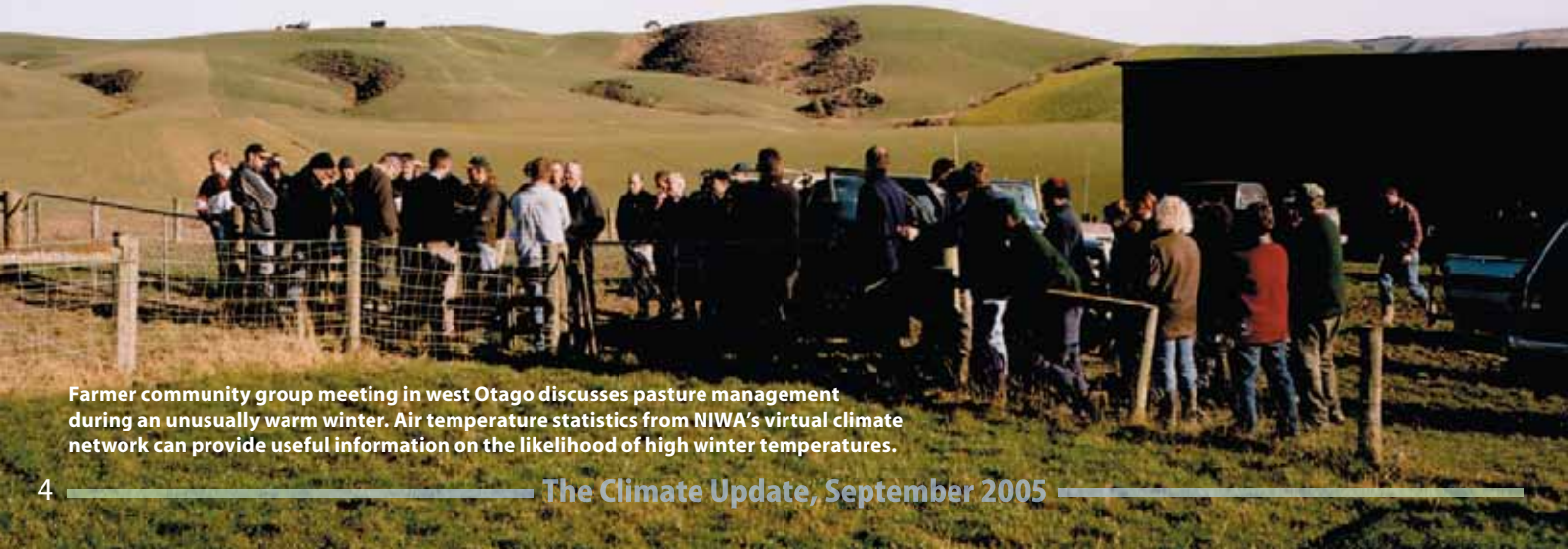
Visit our webpage: www.niwa.co.nz



Farmer community group meeting in west Otago discusses pasture management during an unusually warm winter. Air temperature statistics from NIWA's virtual climate network can provide useful information on the likelihood of high winter temperatures.