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NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre

September – warm conditions; lower than average rain and stream flows in most places.

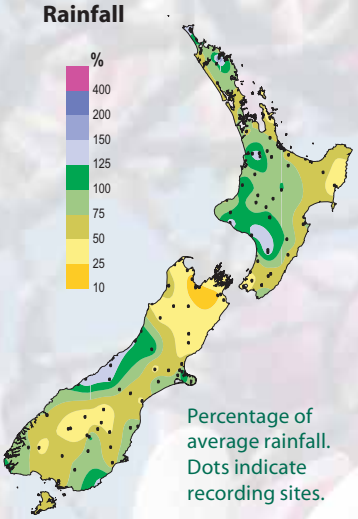
Outlook for October to December – above average temperatures across New Zealand. Normal or above normal rain in the North Island and north of the South Island.

New Zealand climate in September 2005

September temperatures were above average – the third consecutive month of warmer than normal conditions – in spite of a cold outbreak in the third week of the month. Rainfall was low in most places, but especially around Nelson, where the lowest rainfall for 70 years was recorded.

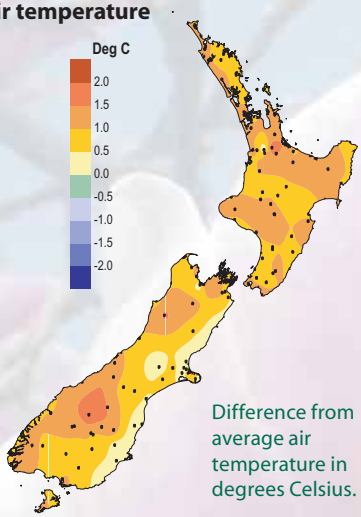
The warm, dry conditions were the result of frequent anticyclones to the east of the country which gave periods of northerlies over the North Island.

Rainfall



Percentage of average rainfall. Dots indicate recording sites.

Air temperature

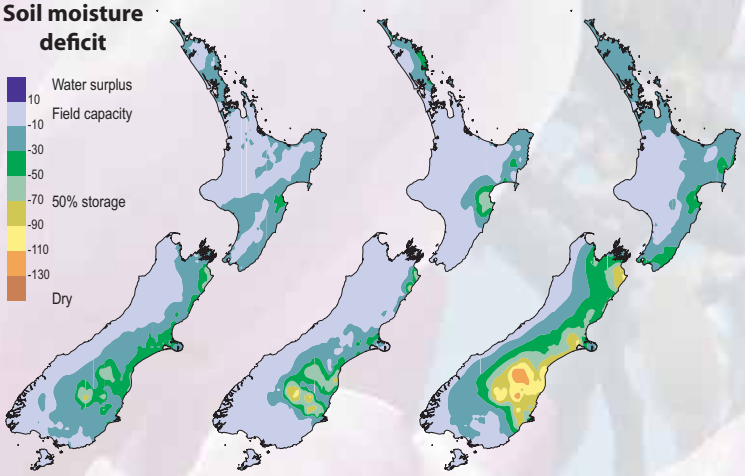


Difference from average air temperature in degrees Celsius.

Low soil moisture in the east of the south

Although less than normal, September rainfalls kept topsoils wet in most places. However, total moisture storage in east coast South Island soils was below average at the end of the month, particularly in coastal and south Canterbury, Otago, and parts of Marlborough.

Soil moisture deficit



Historical average deficit on 30 September | Deficit on 30 September 2004 | Deficit on 30 September 2005

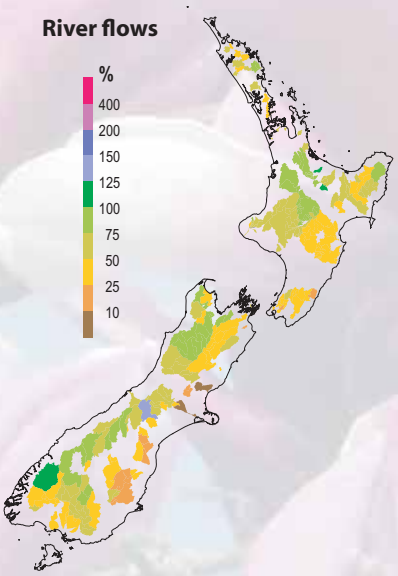
Water balance in the pasture root zone for an average soil type where the available water capacity is taken to be 150 mm.

For more information on the climate in September, visit the climate summaries page at www.niwa.co.nz/ncc/cs/mclimsum_05_09

Low river and stream flows

River flows were below average nearly everywhere.

River flows



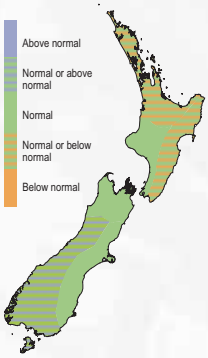
Percentage of average September river and stream flows at monitored catchments. NIWA field teams, regional and district councils, and hydro-power companies are thanked for providing data.

July to September: the climate we predicted and what happened

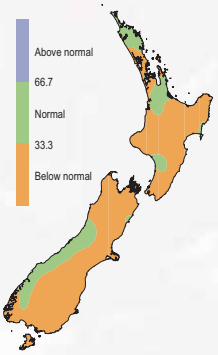
Rainfall

Lower than normal rainfall in the north and east of the North Island was in line with predictions. The South Island was drier than expected.

Outlook



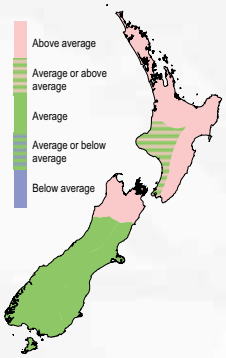
Outcome



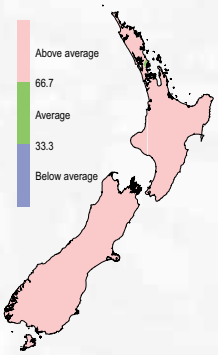
Air temperature

Air temperatures were above average in the North Island and north of the South Island as expected, but higher than predicted in the south of the country.

Outlook



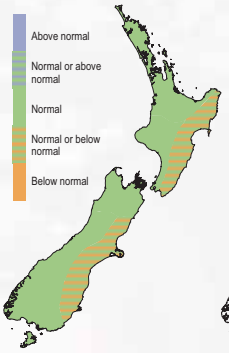
Outcome



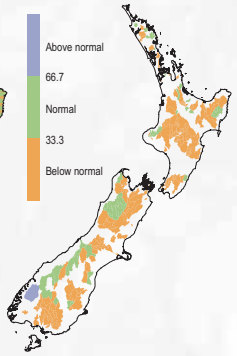
River flows

Streamflows were lower than normal in the east of the country, as was signalled in the forecast, but lower than expected elsewhere.

Outlook



Outcome



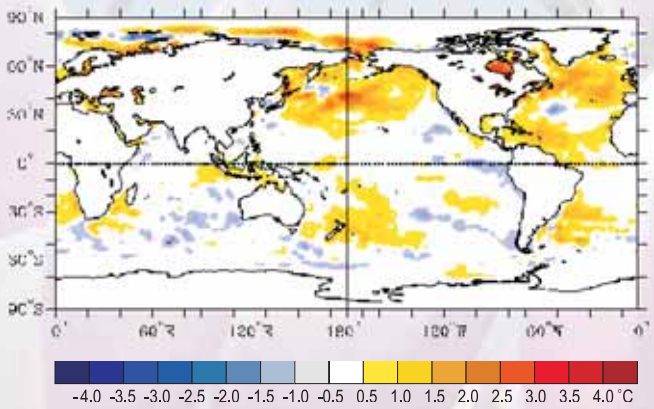
The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from July to September, in comparison with the forecast conditions.

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

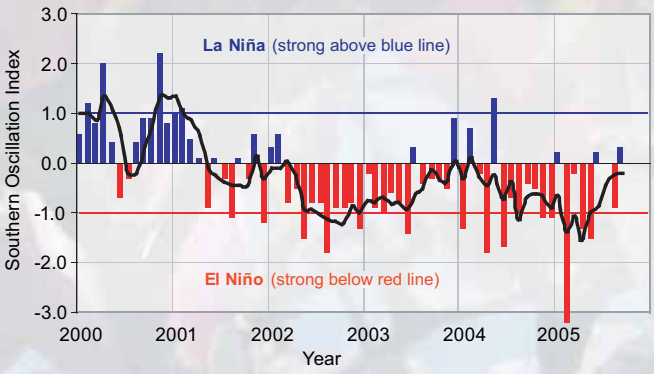
El Niño-Southern Oscillation remains neutral

The tropical Pacific is in a neutral state (no El Niño or La Niña), and is expected to remain so through the rest of 2005.



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

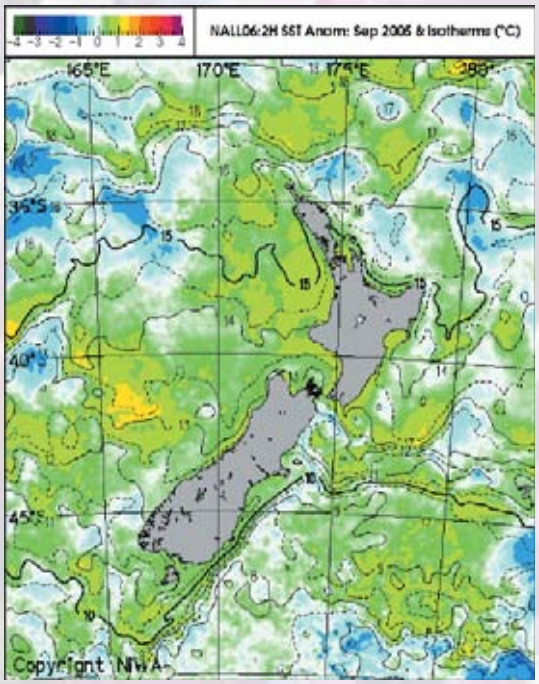
The SOI was slightly positive in September (+0.3), and the 3-month July to September mean remained near zero (–0.2).



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).

Sea surface temperatures (SST) around New Zealand

The New Zealand average SST anomaly was about +0.8 °C in September, a rise from August (+0.6 °C) and July (+0.5 °C). This increase was very likely to be due to the predominant anticyclonic conditions over New Zealand in the past three months. SST anomalies are positive over much of the Tasman Sea, and east of New Zealand as far as the central South Pacific. Sea surface temperatures around New Zealand are expected to remain above average until the end of the year.



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

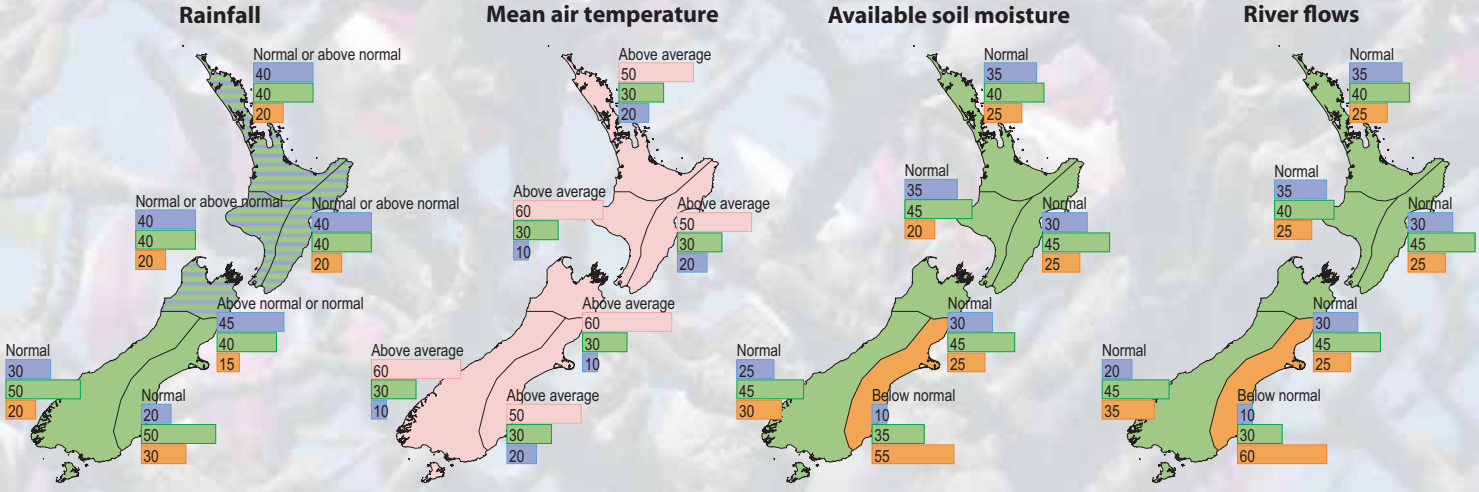
Outlook for October to December 2005

Local atmospheric circulation patterns are likely to favour more northerly quarter airflow than usual over the country for October–December.

Air temperatures are expected to be above average in all regions, with an upper tercile probability of 50% or more.

Rainfalls are likely to be normal or above normal in the North Island and in Nelson-Marlborough, and normal further south.

Normal soil moisture levels and streamflows are expected in most areas, apart from the South Island east coast where there is a high probability of dry soil conditions and lower than normal flows (55% and 60% respectively).



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).

Where can I grow grapes?

Searching for new land to grow your favourite crop typically means looking for localities with similar climate, soil, and topography to places where the crop is already grown successfully. This can be a time consuming and costly exercise.

New approaches to climate and soil modelling, funded by the Foundation for Research, Science & Technology, provide a desktop method to survey potentially suitable areas. The procedure doesn't eliminate the need to go out and investigate possible sites 'on the ground'. Its purpose is to rank the suitability of locations of interest, with high scores indicating where the most suitable areas are likely to be found, down to low scores where land has little suitability.

Grape growing localities

NIWA scientists examined the eight most extensive grape growing regions of New Zealand – Central Otago, Canterbury, Marlborough, Nelson, Wairarapa, Hawke's Bay, Gisborne, and Auckland – to find out what makes these regions good for grape production. In each region, 23 climate, soil, and topographical features were extracted for the vineyard sites. We graded the range of values for each feature, and assigned high scores for the most favourable conditions. A combination of these scores was used to create a Similarity Index for grapes in each region – a high index for locations with many favourable features, and a low index where there were few favourable features.

Limiting thresholds

This is not to say that all areas with a high Similarity Index are going to be spot on for grape growing. That's because each of the 23 variables is treated equally – i.e., there is no weighting of the scores based on the relative importance of the variable. It is quite possible that an area may have a high similarity score, but because the summer rainfall is too high (or some other feature crosses a limiting threshold) the area is completely unsuited to grape growing. The Similarity Index indicates areas which have similar climate, soil, and topography to some known grape-growing sites.

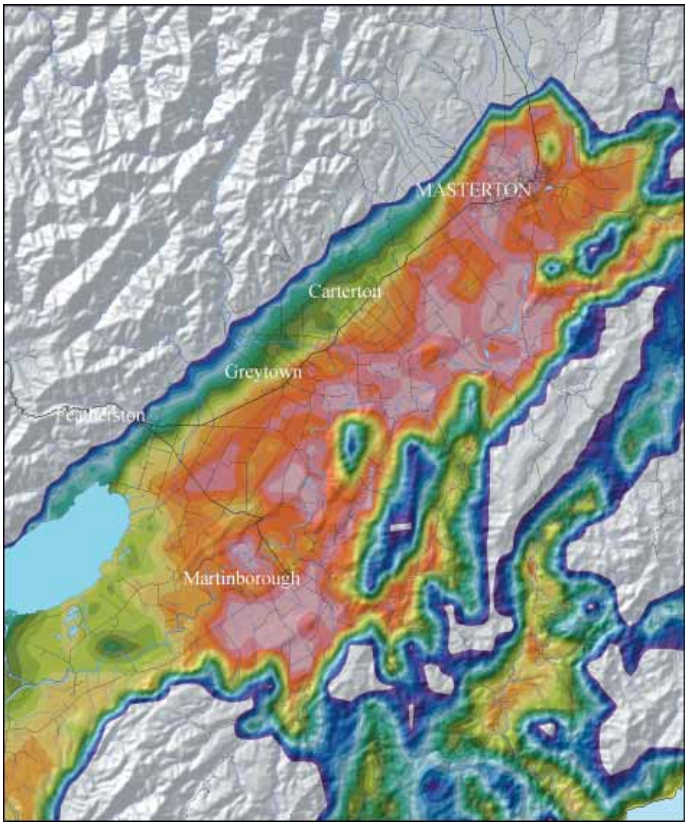
New locations

The Grape Similarity Index highlights areas near known vineyard locations that may be suitable for grapes, but can also be used to search for potentially suitable places further afield. For example, can grape varieties grown in Wairarapa also be grown in Manawatu?

Where can I grow grapes? is available on CD, including maps of the Suitability Index and a full explanation of how it is derived.

For more information, contact Andrew Tait on 0-4-386 0300, or email ncc@niwa.co.nz

Acknowledgments: Soil data were provided by LandCare Research; topography data were obtained Land Information New Zealand



Example of a Suitability Index map showing the most suitable (red to pink shading) grape growing locations in Wairarapa. Low suitability is shown in green to blue hues, and grey areas are entirely unsuitable.

Kereru takes a break from shredding a magnolia flower. Early blooming trees in Taranaki provide an opportunity for a feast.

Cover photo: *Wendy St George*

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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