

The Climate Update

A monthly newsletter from the National Climate Centre



April – Above average rainfall over much of New Zealand, with severe flooding in Otago and Coromandel. The warmest April since 1981.

Outlook for May to July – more northeasterly air flows than usual over New Zealand with warm conditions in the north and west of the North Island. Wet in the north and east of the country.

New Zealand climate in April

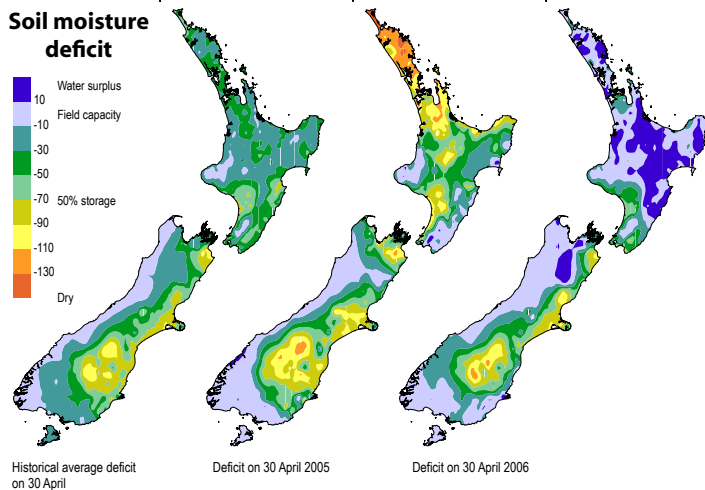
Rainfall was more than 300% of normal in parts of North and east Otago, and 200–250% of normal in many other places. Southern parts of Wairarapa, the Kaikoura coast, and coastal Southland were drier than usual.

Mean temperatures were about 1.5 °C above average throughout much of the North Island, with particularly warm conditions in parts of Auckland and Coromandel. Most South Island temperatures were 1 °C or more above average. The national average temperature of 14.6 °C (higher than March) was 1.2 °C above the 1971–2000 average.

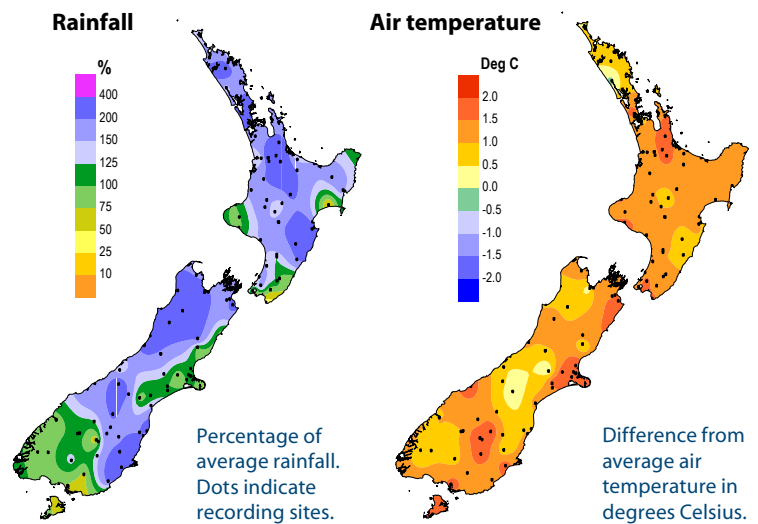
For more information on the climate in April 2006, visit the climate summaries page at www.niwascience.co.nz/ncc/cs/mclimsum_06_04

Soil moisture: persisting deficits

The widespread rainfall of April lifted soil moisture levels almost everywhere. Many North Island soils were at saturation at the end of the month, apart from drier spots in Hawke's Bay and southern Wairarapa. Significant end of March deficits in drier parts of the South Island were eliminated during April.



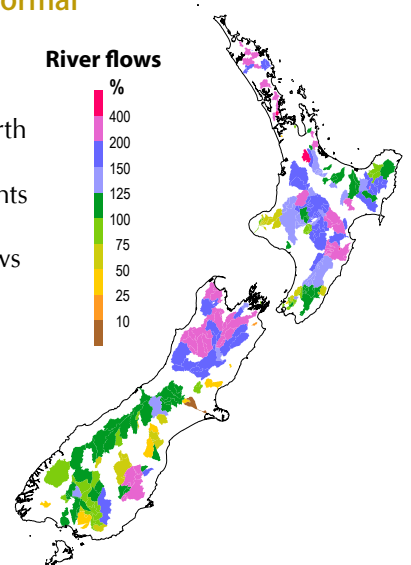
Water balance in the pasture root zone for an average soil type where the available water capacity is taken to be 150 mm.



Many river flows above normal

River and stream flows were well above normal in many northern and central North Island districts, and in the north and southeast of the South Island. A number of catchments delivered flows in excess of 200% of normal. Normal flows occurred in the South Island hydro catchments.

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



February to April: the climate we predicted and what happened

Rainfall

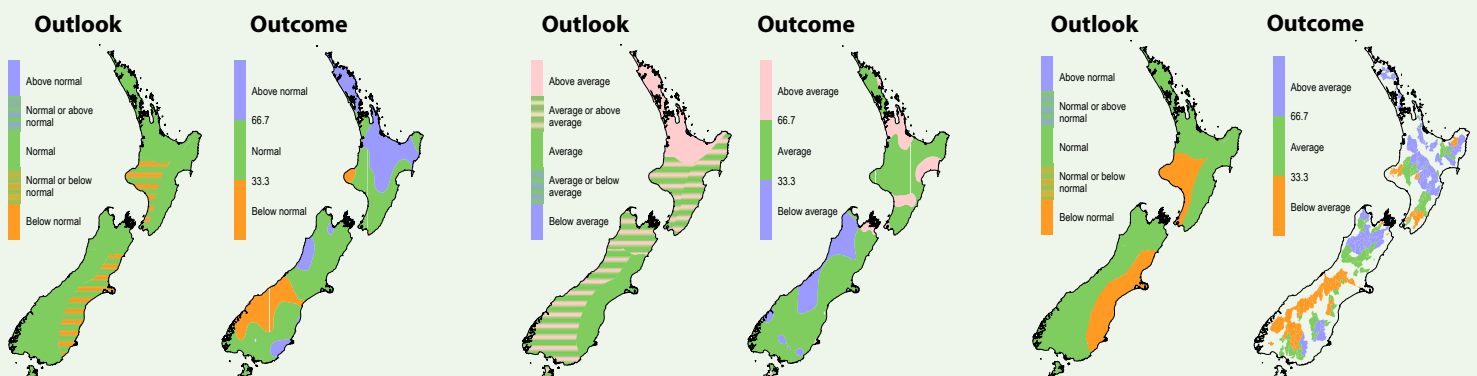
Rainfall was higher than predicted in the north of the North Island, and lower than predicted in the southwest of the country.

Air temperature

Air temperatures were average or above average as predicted in many areas, but lower than expected in parts of the west and south of the South Island.

River flows

Stream flows were above normal in many northern and central North Island catchments, and in the north and southeast of the South Island. Western South Island flows were lower than normal.



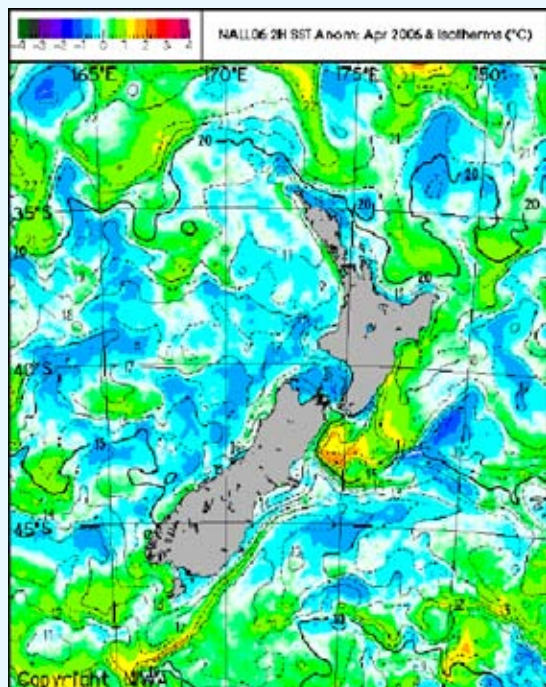
The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from February to April, in comparison with the forecast conditions.

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

Sea surface temperatures (SSTs) around New Zealand

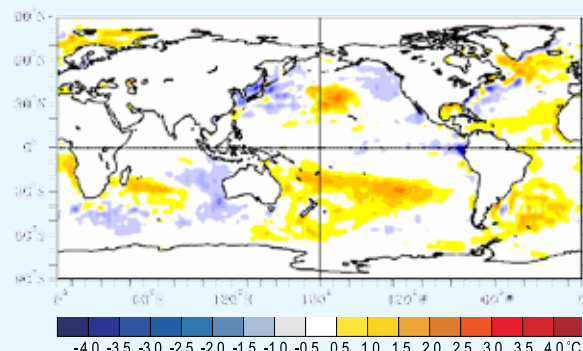
Sea surface temperature anomalies in the New Zealand region increased slightly in April to +0.4 °C (after a warm February of about +1.0 °C, and a near-average March of +0.1 °C). The three month February to April average was about +0.5 °C. SSTs in the New Zealand region are expected to remain near or above average until July.



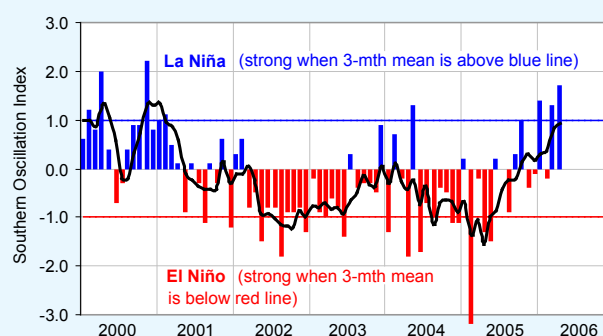
Average difference from normal April surface temperatures in the seas around New Zealand.

La Niña dissipating

The tropical Pacific should remain in a neutral state over the next 3 months, with the remaining La Niña features expected to dissipate over winter.



Difference from average global sea surface temperatures for April 2006. Map courtesy of NOAA Climate Diagnostics Center.



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). The SOI increased to +1.7 in April, with the three month February to April average at +0.9.

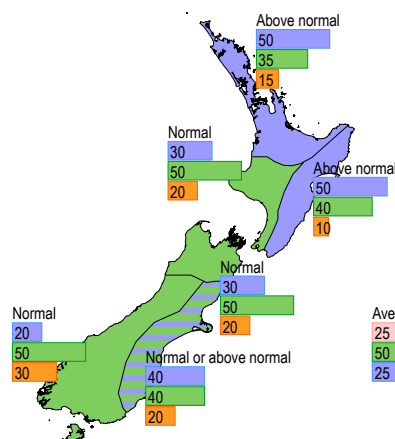
Outlook for May to July 2006

Atmospheric pressures are expected to be lower than normal over and to the north of the North Island, and higher than normal south of the South Island, with a tendency for more northeasterly air flows than usual over New Zealand.

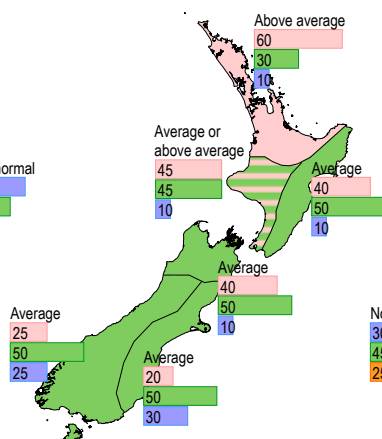
Air temperatures are likely to be average in the South Island and east of the North Island, and very likely to be above average or average in the north and west of the North Island.

Rainfalls are likely to be above normal in the north and east of the North Island, normal or above in the east of the South Island, and near normal elsewhere. Above normal soil moisture and flows are very likely in the north and east of the North Island. Normal soil moisture and flows are likely in the southwest of the North Island and the west and south of the South Island. Normal or above normal soil moisture and flows are likely in the north and east of the South Island.

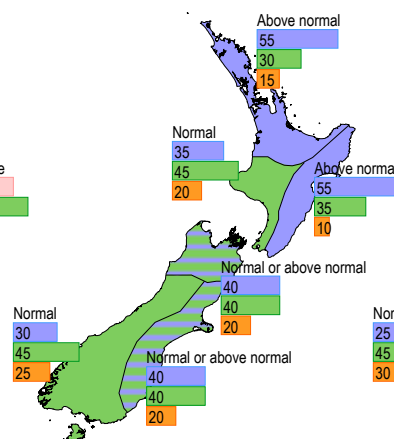
Rainfall



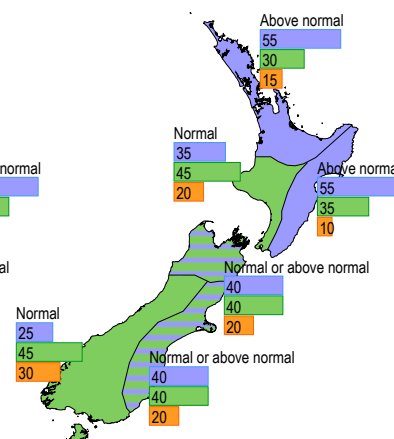
Mean air temperature



Available soil moisture

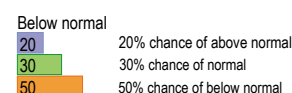


River flows



How to interpret these maps

In the example here the climate models suggest that below average 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).



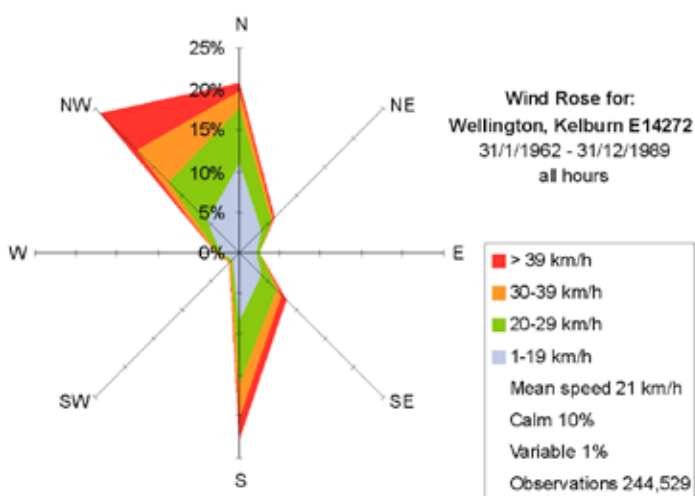
Climate Explorer <http://climate-explorer.niwa.co.nz>

Wind roses and forecasts of mean wind speed

Wind roses

If you want to find out the background wind conditions at a climate station near you, Climate Explorer can provide these data from over 60 sites around New Zealand. Choose the 'Climate Station' selection level on the Climate Explorer web page and follow the instructions to zoom to the nearest climate station on the map.

Historical wind patterns are represented in wind rose diagrams, like the example below from Kelburn, Wellington.



The wind rose diagram shows the percentage frequency of occurrence of winds of various strengths for the eight compass points, in a 'footprint' pattern. The extent of the footprint along each axis gives the overall frequency from that particular direction. The width of each colour band along the axes gives the frequency of winds within the strength range represented by those colours.

In the above example for Kelburn, a little over 21% of wind samples show wind from the north. This is made up of 11% of speeds ranging from 1-19 km/h (light blue band), about 6.5% in the 20-29 km/h (green) range, about 2% of 30-39 km/h, and about 2% exceeding 39 km/h.

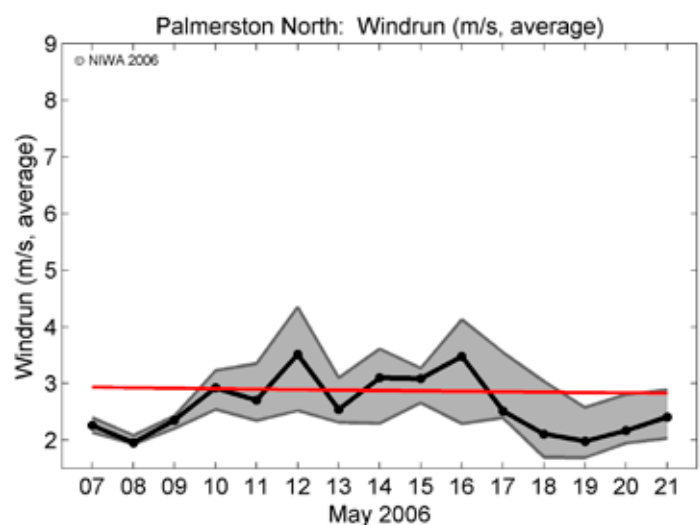
The total compliment of wind occurrences (100%) is made up (approximately) of N, 21; NE, 6.5; E, 2.5; SE, 7.5; S, 23; SW, 2; W, 2.5; NW, 24, calm conditions, 10; and finally variable conditions, 1.

Note that the north, east, south, and west directions cover 50 degree sectors (e.g., east: 070° to 110°), while northeast, southeast, southwest, and northwest directions cover 40 degrees (e.g., southwest: 210° to 240°).

Wind forecasts

Climate Explorer provides wind speed forecasts out to two weeks, as shown in the example below. This forecast for Palmerston North was issued on 7 May, and shows expected average daily wind speeds out to 21 May. The horizontal red line shows the historical average daily wind speed for May.

The forecast suggests that wind speeds during the period are not likely to be particularly strong. The highest wind speeds are predicted to reach about 3.5 m/s, or 12.6 km/h, within the light blue range in a wind rose diagram.



Note that 1 m/s = 3.6 km/h.

For more information, and to obtain an annual subscription for unlimited access to all regularly updated products, please contact explorerhelp@niwa.co.nz.

Annual subscriptions:

Individual \$185+gst, Corporate \$370+gst.



Hot air over Levin on Good Friday. Prevailing wind patterns and probabilistic forecasts of wind speeds are provided on Climate Explorer.

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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