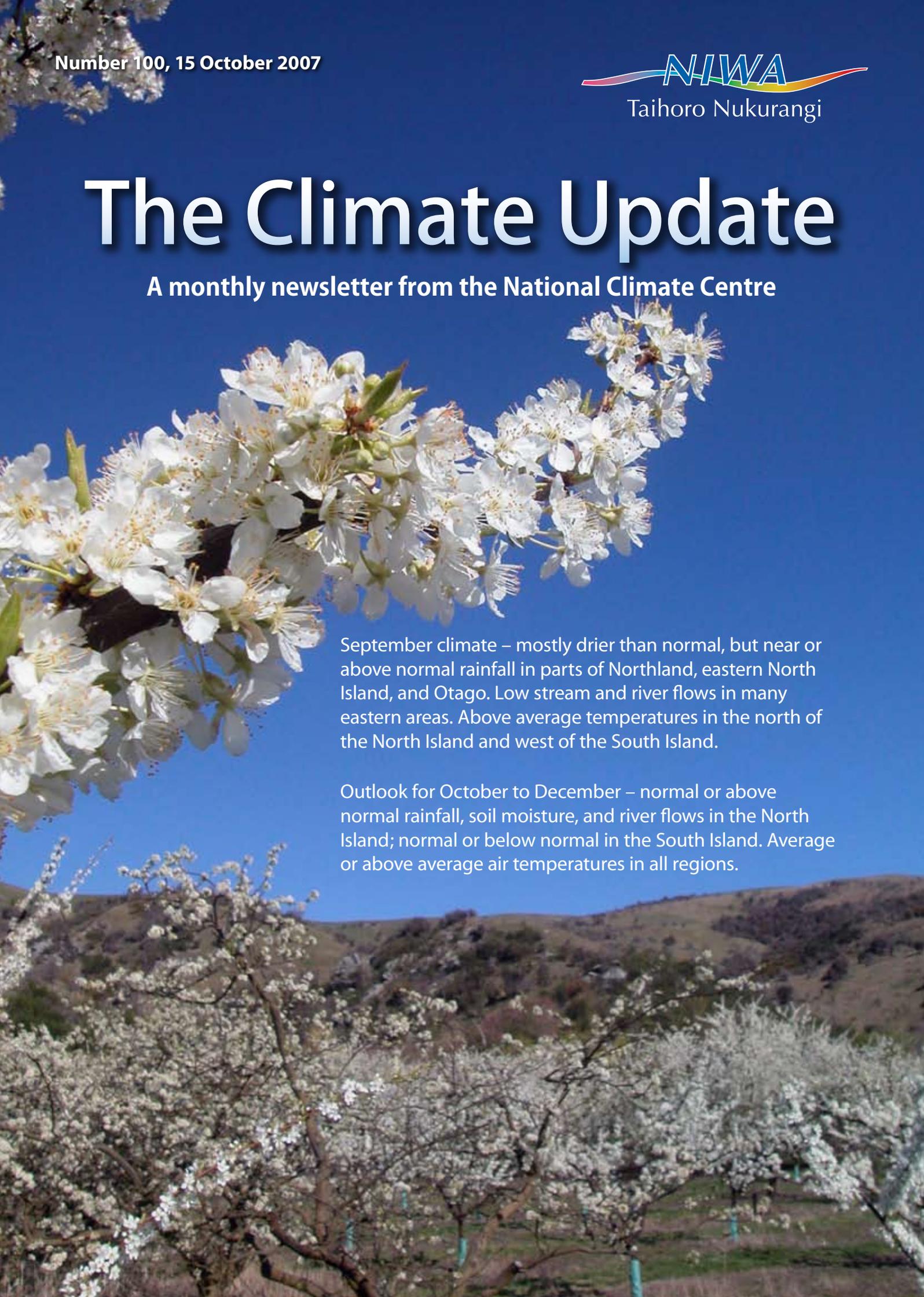


The Climate Update

A monthly newsletter from the National Climate Centre

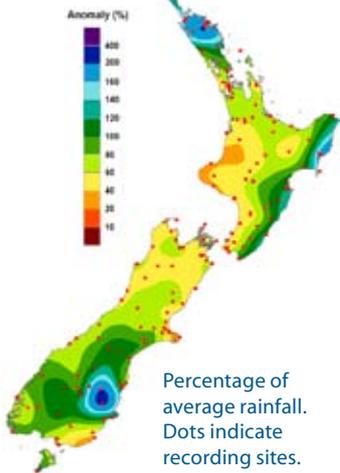


September climate – mostly drier than normal, but near or above normal rainfall in parts of Northland, eastern North Island, and Otago. Low stream and river flows in many eastern areas. Above average temperatures in the north of the North Island and west of the South Island.

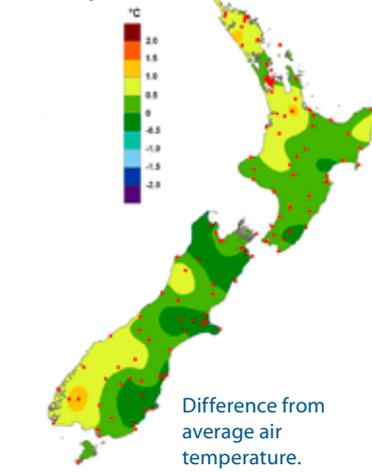
Outlook for October to December – normal or above normal rainfall, soil moisture, and river flows in the North Island; normal or below normal in the South Island. Average or above average air temperatures in all regions.

New Zealand climate in September

Rainfall



Air temperature

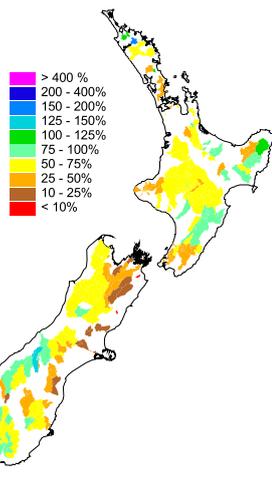


September was a relatively benign month with more anticyclones and less wind than normal, and less extremes. Rainfall was lower than normal in many areas, especially in the west of the North Island. Temperatures were above average in many North Island areas. The national average temperature of 10.5 °C was 0.1 °C above the historical normal.

For more information see www.niwascience.co.nz/ncc/cs/mclimsum_07_09

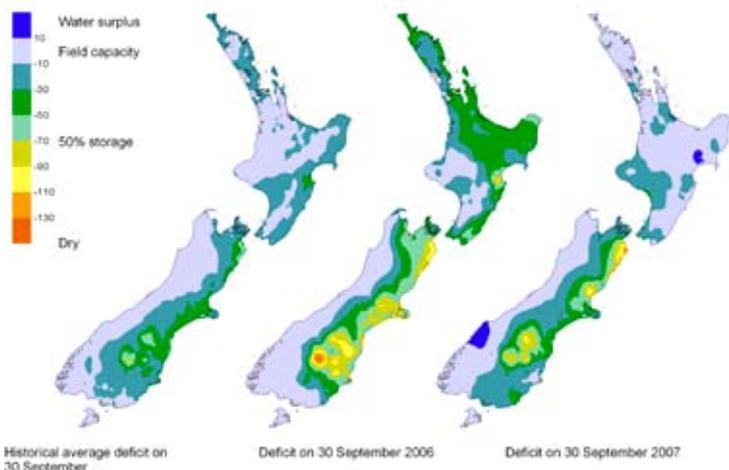
River flows

Stream flows were below normal in east coast regions, normal to above normal elsewhere in the North Island and near normal elsewhere in the South Island.



Percentage of average September 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 were drier than normal in eastern Marlborough and north Canterbury.

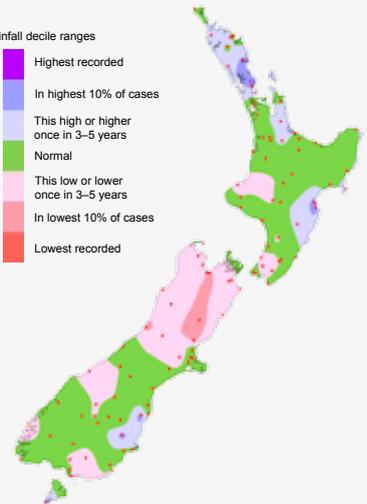
July to September – the climate we predicted and what happened

Rainfall

Predicted: Normal or above normal rainfall in the north and east of the North Island; normal elsewhere.

Outcome: Above normal in Northland and parts of Hawke's Bay. Below normal in the northern half of the South Island. Normal in many other areas.

July to September rainfall

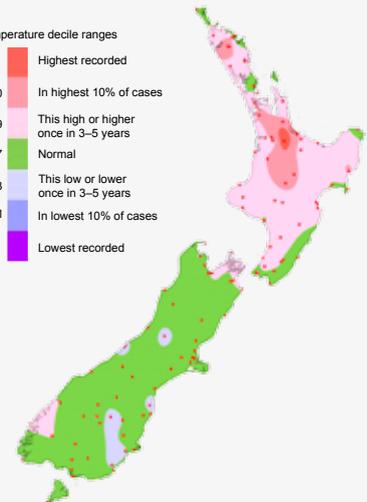
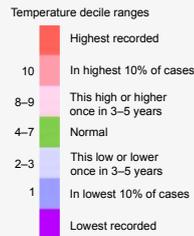


Air temperature

Predicted: Above average in the North Island and north of the South Island; average or above average in the west of the South Island, and average in Canterbury and East Otago.

Outcome: Average over the South Island, and mostly above average over the North Island.

July to September temperature

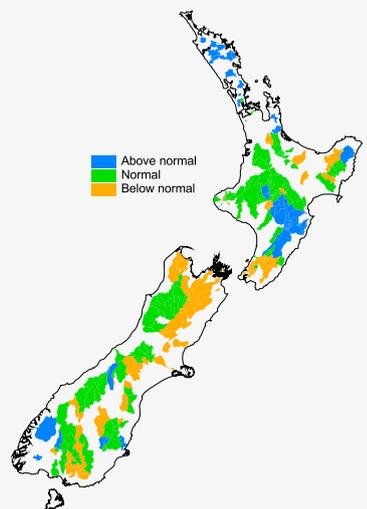


River flows

Predicted: Normal in most of the country, except for normal or below normal in the east of the South Island apart from Marlborough.

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

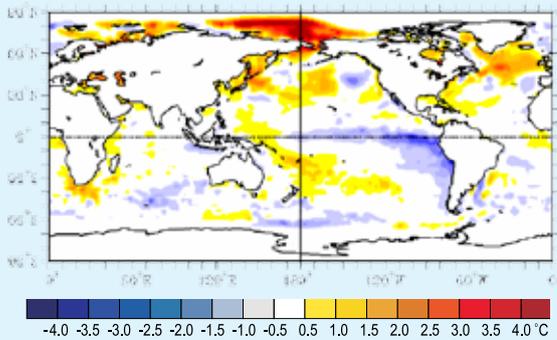
July to September river flows



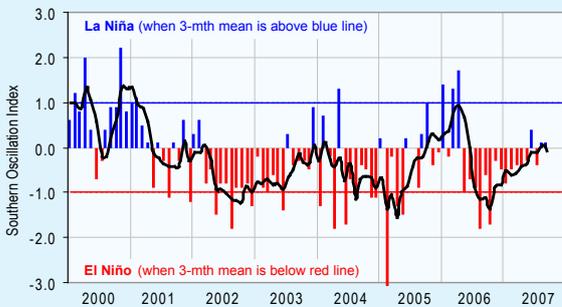
Global setting and climate outlook

La Niña conditions have developed

La Niña conditions have become more developed in the tropical Pacific over the last month. Sea surface temperatures in the equatorial Pacific have become more strongly negative during the month, especially in the east (see map below), and the area of cold anomaly has expanded westward to the Dateline. There is about a 50% chance of La Niña conditions persisting through to the end of summer 2007–08.



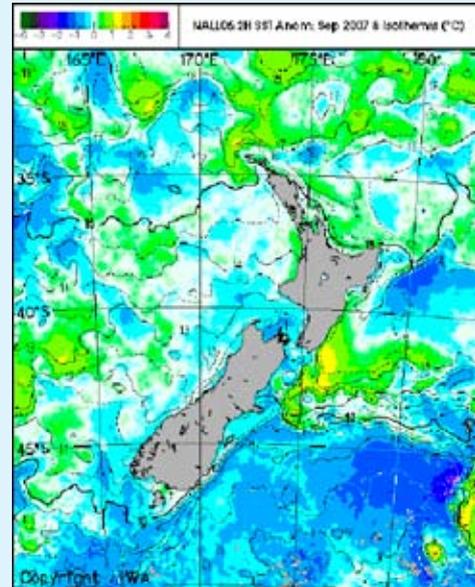
Difference from average global sea surface temperatures for September 2007. Map courtesy of NOAA Climate Diagnostics Centre.



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: September: +0.1 July to September: -0.1

Sea surface temperatures around New Zealand

Sea surface temperature (SST) anomalies in the New Zealand region continued to weaken in September to +0.2 °C, with the July–September average anomaly about +0.4 °C. SST anomalies are positive around the North Island coast and across to the central Pacific, but remain negative south of Chatham Rise and southeast of the South Island. Over the next three months, sea surface temperatures are expected to be above normal around the North Island and near normal east of the South Island.



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

Outlook for October to December 2007

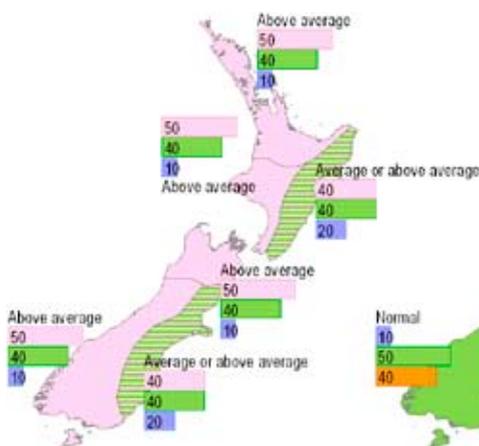
Over the coming late spring period, mean sea level pressures are expected to be higher than normal to the south and southeast of New Zealand and lower than normal to the north, with weaker than normal westerly winds, on average.

Air temperatures are likely to be average or above average over most of New Zealand. Rainfall is expected to be normal or above normal in the north and east of the North Island, normal or below

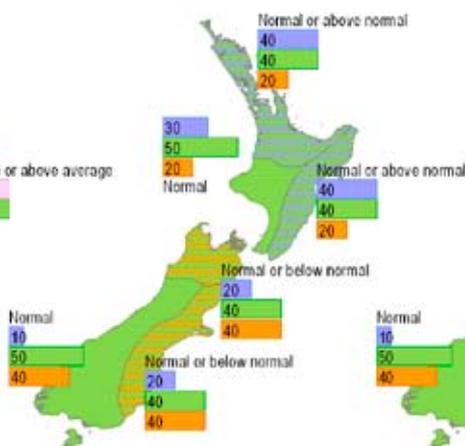
normal in the north and east of the South Island, and normal elsewhere. Soil moisture levels and stream flows are likely to be below normal in the north and east of the South Island, and normal or above normal elsewhere.

There is a slightly lower than normal chance of an ex-tropical cyclone passing within 500 km of New Zealand in the coming tropical cyclone season (November 2007–May 2008).

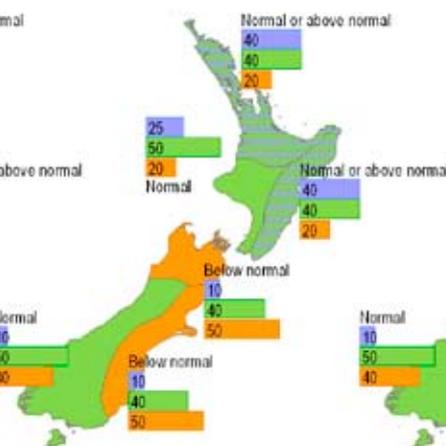
Mean air temperature



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).

Below normal	
20	20% chance of above normal
30	30% chance of normal
50	50% chance of below normal

Wind chill equivalent temperature

Loss of body heat from young animals soon after birth is a significant cause of lamb mortality on New Zealand farms each spring. Key drivers of heat loss are the ambient air temperature, wind, which increases convective heat loss, and skin wetness, which causes evaporative heat loss.

Weather models can provide estimates of wind chill risk on different time scales, and provide some warning of high risk periods. Farmers know that low air temperature, wet days, and windy conditions can be a fatal mix for new-born animals. Moving stock to sites that are sheltered from rain and wind, for example under trees, can considerably reduce exposure to wind chill.

The wind chill equivalent temperature is a term for the effective temperature to which animals are exposed, given adverse weather conditions. For example, an ambient air temperature in still conditions of 10 °C is a relatively comfortable situation for a dry, well-fed lamb. If the wind speed subsequently rose to 9 m/s (a 'fresh' breeze), the lamb would experience an apparent fall in temperature to 0 °C, i.e., a wind chill equivalent

temperature of 0 °C. A stronger breeze could depress the temperature by a further 3–4 °C, which could prove fatal, especially if the lamb was wet.

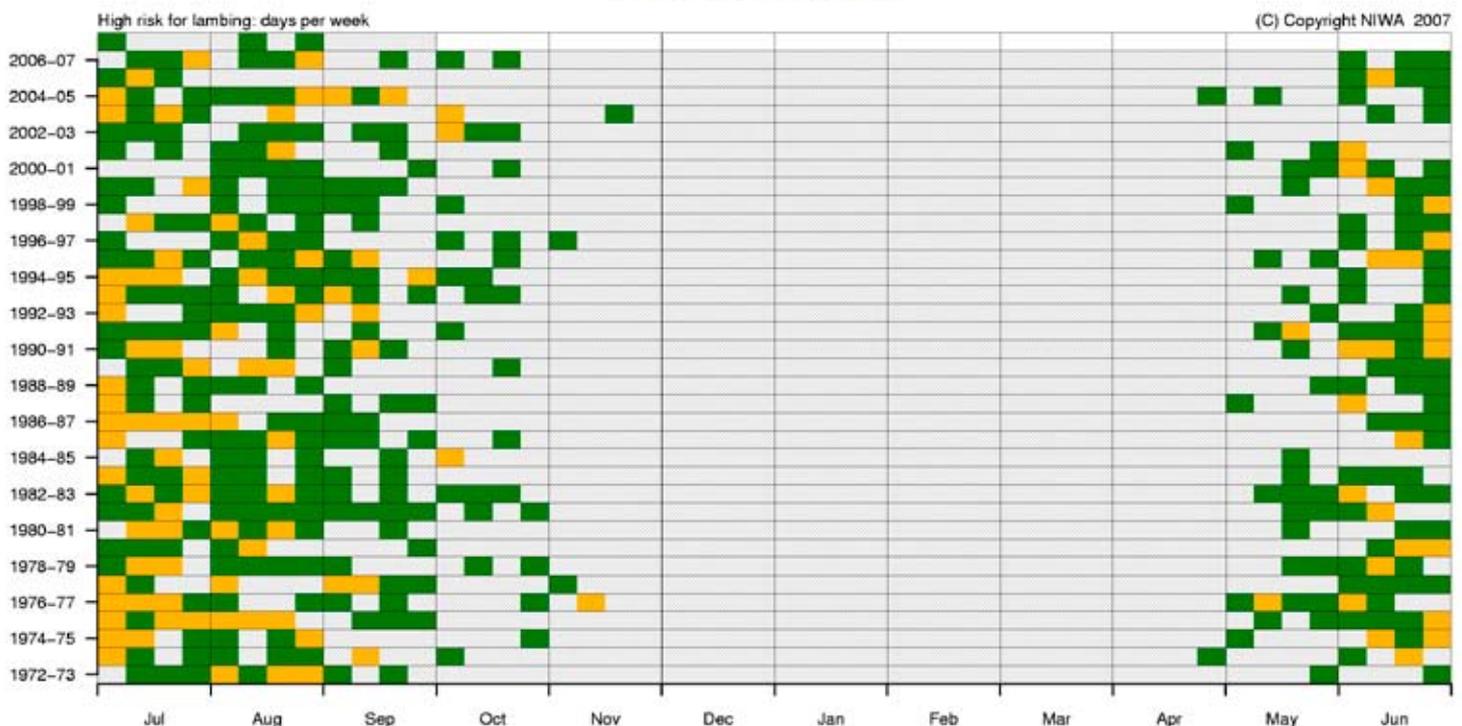
Wind chill risk at Napier

The figure below compares the number of days per week of high or extreme wind chill risk (see the legend below) for the years 1972–73 to 2007–08, at Napier. (For simplicity, a week here has been normalised to a quarter of a month). As is expected, the risk decreases as spring advances, with typically lower risk by October compared to July and August. Autumn, as a lambing option, is noticeably benign compared to spring.

The data in the figure suggest that the current season, 2007–08 (top line of the figure), has been less severe for lambing than usual, with just one week in July and two in August with 3–4 days of high or extreme risk (green segments). During September the number of risk days per week has been two or less (grey shading).

Note that methods of estimating wind chill vary – changing weather data criteria may yield different results.

D96484 NAPIER AERO AWS



HIGH or EXTR. RISK CONDITIONS:

- 0–2 days per week:
- 3–4 days per week:
- 5–7 days per week:

Extreme risk: Wind chill equivalent temperature less than –4 °C, wet or dry
 High risk: Wind chill equivalent temperature less than 0 °C, wet or dry



Spring blossom in Otago.
 Cover photo: Steve Le Gal

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