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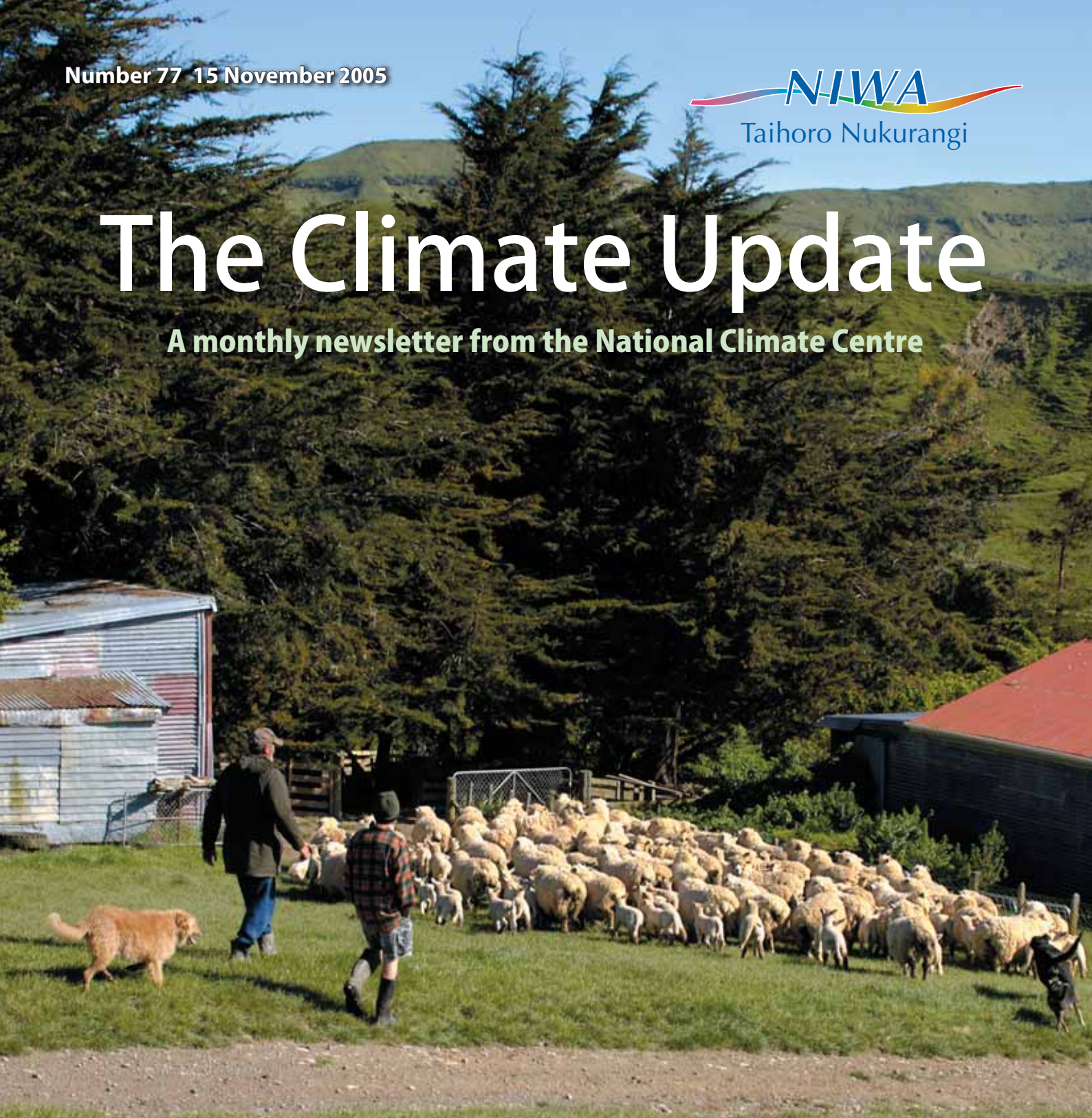
NIWA
Taihoro Nukurangi

The Climate Update

A monthly newsletter from the National Climate Centre



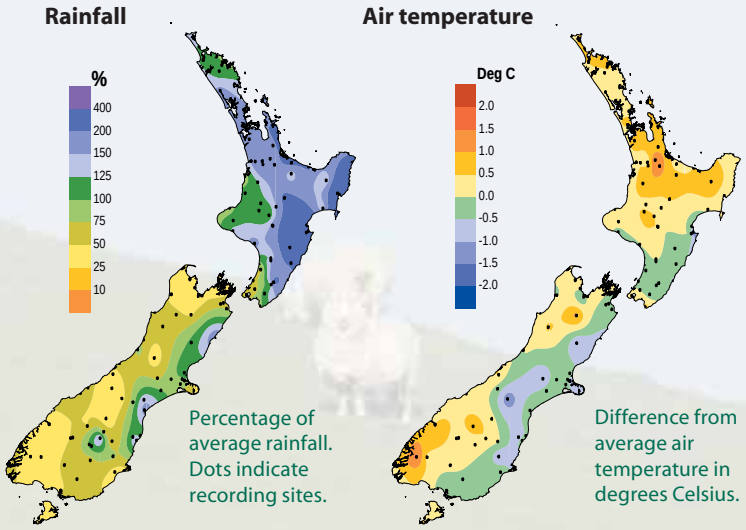
October – wet and warm in the north; very dry in parts of the South Island and cool in some areas.

Outlook for November to January – air temperatures are likely to be average to above average across New Zealand. Normal rainfall in most areas, but possibly drier than normal in the east of the North Island.

New Zealand climate in October 2005

Contrasting rainfall patterns between the North and South Islands were a feature of the October climate. Gisborne, Hawke's Bay, Auckland, and Waikato were extremely wet, while much of the South Island was very dry.

Air temperatures were above average in the northern half of the North Island, and below average in many other regions, especially parts of Marlborough and Canterbury. The national average temperature of 12.0 °C was 0.1 °C below normal.



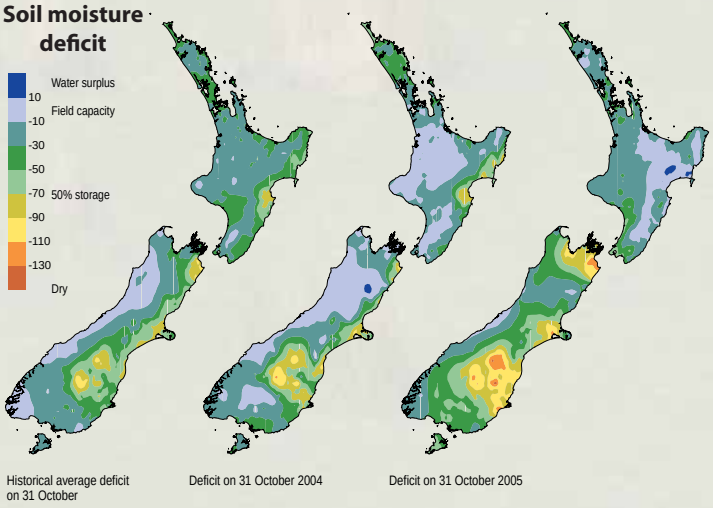
Percentage of average rainfall. Dots indicate recording sites.

Difference from average air temperature in degrees Celsius.

For more information on the climate in October, visit the climate summaries page at www.niwa.co.nz/ncc/cs/mclimsum_05_10

Large soil moisture deficits

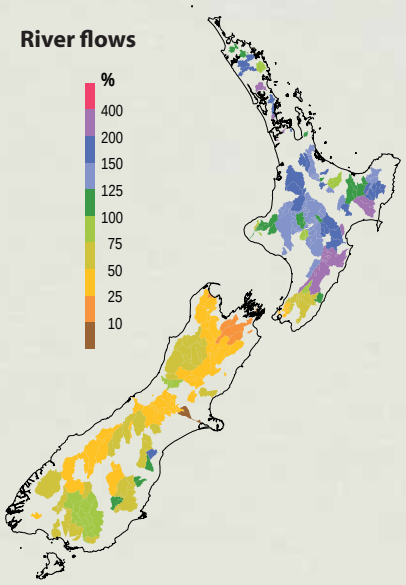
Soil moisture deficits in Marlborough, South Canterbury, and much of Otago remained larger than usual through to the end of October. In contrast, soils were wetter than average across much of the North Island.



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

Above normal flows in the north

River flows were above normal for much of the North Island, near normal for some South Island east coast and Southland rivers, and below normal elsewhere.

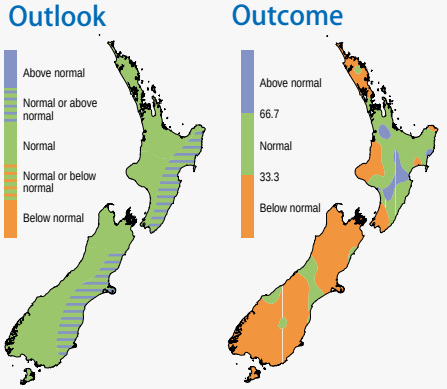


Percentage of average October river and stream flows at monitored catchments. NIWA field teams, regional and district councils, and hydro-power companies are thanked for providing data.

August to October: the climate we predicted and what happened

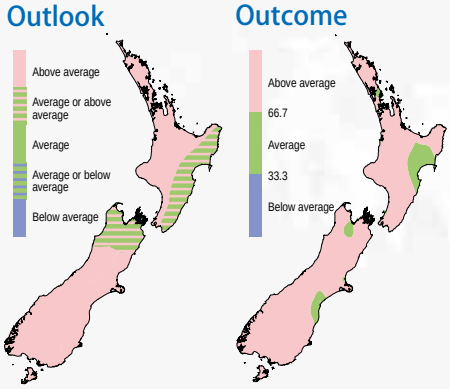
Rainfall

Rainfall was near normal over much of the North Island, consistent with predictions. The South Island was drier than expected.



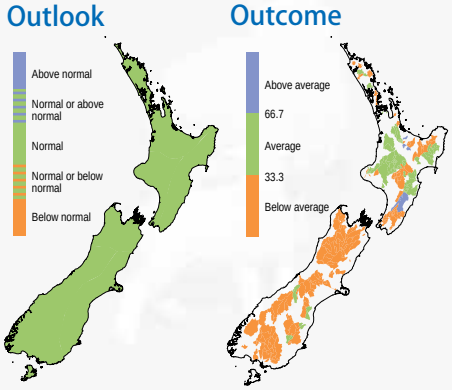
Air temperature

Air temperatures were above average in most districts as expected.



River flows

Streamflows were normal to below normal over most of the North Island, and below normal everywhere in the South Island.



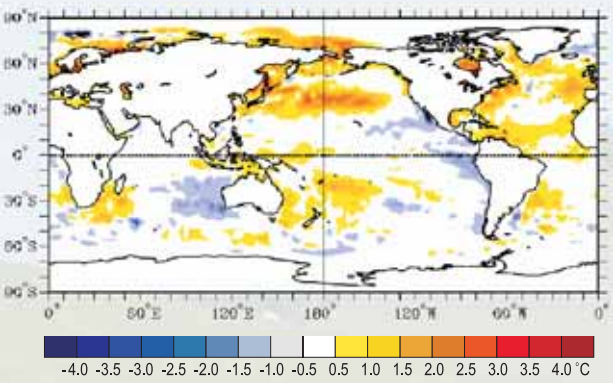
The three outcome maps give the tercile rankings of the rainfall totals, mean air temperatures, and mean river flows that eventuated from August to October, in comparison with the forecast conditions.

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 neutral at least until autumn

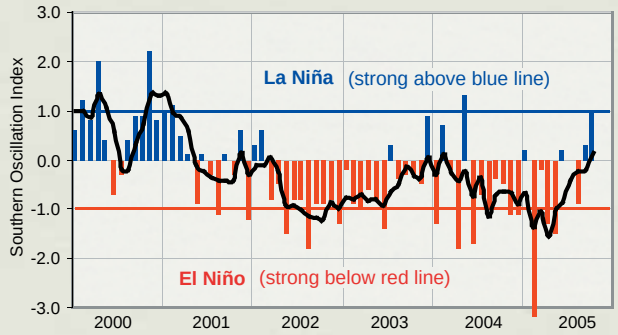
The tropical Pacific is in a neutral state (no El Niño or La Niña), although sea surface temperatures near the Date Line remain a little above average.



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

The SOI was positive in October (+1.0), but the 3-month August to October average was near zero (+0.1). Near neutral conditions are expected through to autumn 2006.

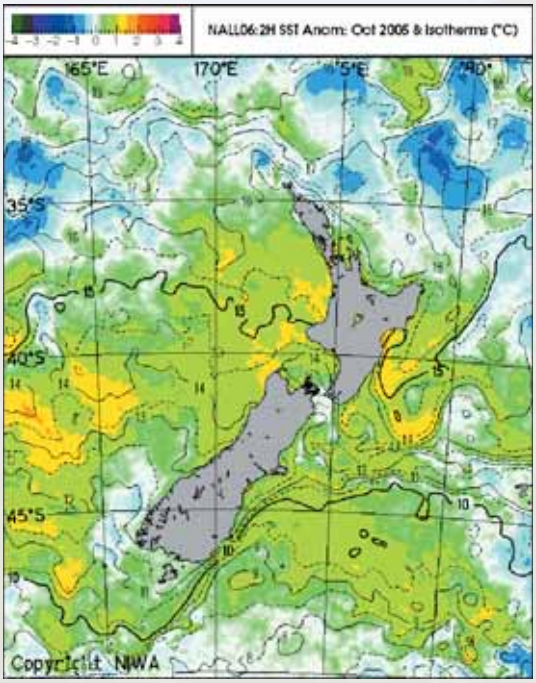
For the coming cyclone season (November-April), normal cyclone activity is expected. For New Zealand, this means a 2 in 3 chance of a cyclone passing near the country, with Northland and Gisborne being most at risk.



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 SST anomaly was lower in October than in September, as a result of more frequent southeasterly airflows across the New Zealand region. SSTs will remain above average over much of the Tasman Sea, and east of New Zealand as far as the central Pacific Ocean.



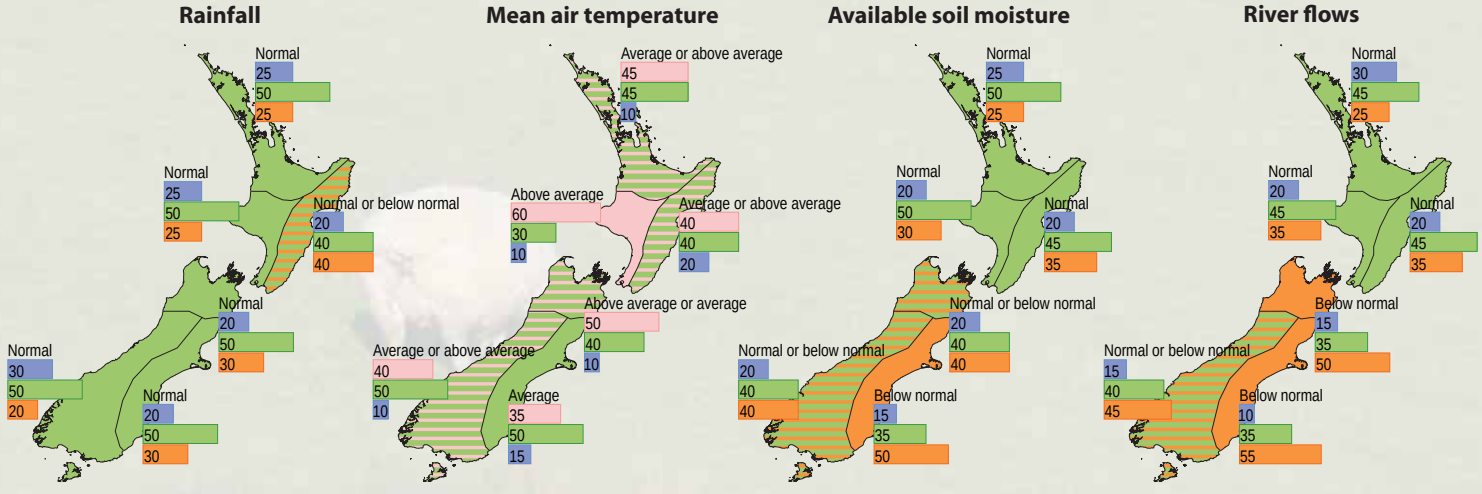
Difference from normal October surface temperatures in the seas around New Zealand.

Outlook for November 2005 to January 2006

Atmospheric circulation patterns over New Zealand during November–January are likely to be more anticyclonic than usual, with enhanced southwesterly airflows over the North Island, and more frequent southerly quarter airflows over the South Island.

Sea surface temperatures around New Zealand are expected to remain slightly above average to the end of January 2006. Air temperatures are expected to be average or above average in all regions of New Zealand.

Rainfalls are likely to be near normal in all regions, except for normal or below normal in the east of the North Island. Normal soil moisture levels and streamflows are expected in the North Island. Generally dry conditions are expected in the South Island.



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).

Livestock farmers cope with climate variability

The climate of the Gisborne district is highly variable and frequently poses severe risks to livestock farming. El Niño seasons are typically dry, and La Niña seasons are often wet. Global warming and the Interdecadal Pacific Oscillation add further dimensions to the variability.

The vulnerability of farmers to climate variability and season-changing weather events has led to the evolution of numerous coping strategies.

Survey

AgResearch and NIWA recently surveyed representative groups of farmers in the Gisborne district. Discussions focused on the climate extremes experienced since the early 1980s and farmers' coping strategies.

The two major extremes of the period were the drought of 1982–83, and Cyclone Bola in March 1988. There were eight dry seasons and three when floods occurred.

The farmers described the following coping strategies that they developed in response to these events.

- More flexible stocking strategies
- Earlier lambing, to allow for timely decisions on destocking
- Improved subdivision of paddocks, focusing on the most reliable water supplies
- Use of drought resistant pasture species
- Strategies that prevent paddock over-grazing
- More dams in paddocks, and water systems installed on flats
- Well planned animal health and production systems, and detailed monitoring of pests and diseases
- More regular use of climate forecasts

While climate forecasts did not predict the timing of floods and droughts, they were useful scene-setters that helped farmers to plan contingencies for both typical and unexpected weather conditions.

Dec 02–Feb 03	Very dry
Sept–Nov 02	Cold and very dry
Aug 02	Localised floods
Feb–June 02	Very dry – no autumn
Spring 99–01	Very dry
Summer 99	Good summer rains
Spring 98	Very dry and windy
Spring 97	Very wet
Autumn 92	Cold and very dry
Autumn 89	Bad drought
Spring 88	Very dry
Sept 88	Baby Bola
Mar 88	Cyclone Bola
87	Dry spells
85	Floods
83–85	Frequent dry spells
82–83	Worst drought ever

Strengthening resilience

The introduction of the above strategies in livestock management shows the determination of farmers to cope with climate extremes and trends. By developing a range of response options that have proven effective during the kinds of events that have occurred over the past two decades, stocking systems have become more flexible and durable. These coping strategies have strengthened farming resilience, and will reduce vulnerability to future climate variations.

For more information email the National Climate Centre at ncc@niwa.co.nz

Acknowledgment: This work was funded by the New Zealand Foundation for Research, Science & Technology.

Debris caused extensive damage to farm fences during a recent North Island east coast flood.

Mustering sheep in the Wairarapa hill country. Livestock farmers have developed improved strategies for dealing with climate variability.

Cover photo: *Alan Blacklock*

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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