



Australian Government
Bureau of Meteorology

Warming continues in Pacific Ocean

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The La Niña event continues to decline in the Pacific Ocean. All available climate models suggest further weakening of the La Niña over the coming months, with a return to neutral conditions by the southern hemisphere winter.

The tropical Pacific Ocean warmed further over the past fortnight, with temperatures continuing to approach their normal values for this time of year. Sea surface temperatures in parts of the eastern Pacific have become (marginally) warmer than normal for the first time since early May 2010. The recent warming in the Pacific Ocean is consistent with the life cycle of past Niña events, which tend to decline during the southern hemisphere's autumn.

Contrasting the warming in the Pacific Ocean, the atmospheric indicators of ENSO remain consistent with a well developed La Niña event. The Southern Oscillation Index (SOI) recorded its highest March value on record, and has remained consistently high throughout the event. Cloudiness near the date-line remains below normal while trade winds continue to be stronger than normal. These atmospheric indicators are expected to return to neutral over the coming months in response to the changes in the ocean.

The influence of the Indian Ocean Dipole (IOD) on Australian rainfall is limited during the months from December through to April.

Next update expected by 27 April 2011 | [print version](#)

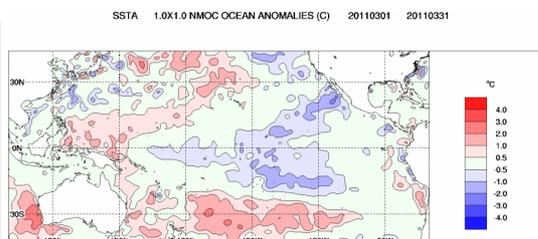
Further Details

Sea Surface Temperatures

Monthly sea surface temperatures:

When compared with the previous month, sea surface temperature (SST) anomalies for March have continued to show a strong warming at the surface of the central and eastern tropical Pacific Ocean. The sea surface temperature (SST) anomaly map for March shows that anomalies more than 1 °C cooler than normal are almost absent along the equator. Warm anomalies persist in the northern Maritime Continent region, but have cooled compared to the previous month.

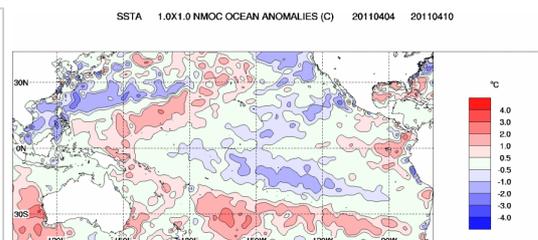
Index	Feb	Mar	Temperature change
NINO3	-0.5	-0.4	0.1 °C warmer
NINO3.4	-1.0	-0.6	0.4 °C warmer
NINO4	-0.9	-0.5	0.4 °C warmer



Weekly sea surface temperatures:

Sea surface temperatures in the equatorial Pacific Ocean have continued to slowly warm over the past two weeks. The weekly SST anomaly map for the week ending 10 April shows weak cool anomalies along the equator have continued to decay. Few areas of SST anomalies more than 1 °C cooler than normal for this time of the year now remain.

Index	Previous	Current	Temperature change (2 weeks)
NINO3	-0.3	+0.1	0.4 °C warmer
NINO3.4	-0.7	-0.4	0.3 °C warmer
NINO4	-0.5	-0.4	0.1 °C warmer

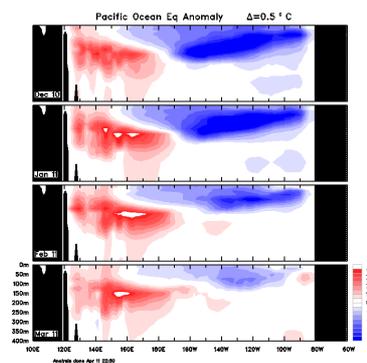


[An animation of recent SST changes](#) | [Weekly data graph](#)

Pacific ocean sub-surface temperatures

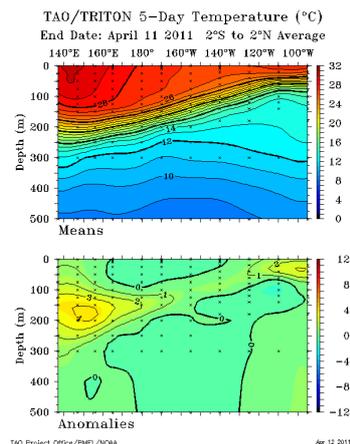
Monthly sub-surface:

The four-month sequence of sub-surface Pacific Ocean equatorial temperature anomalies, to March, shows the volume of cooler than normal water below the surface of the central and eastern equatorial Pacific, which has been evident for many months, has significantly decreased in size and warmed when compared with previous months. A small region with anomalies up to 2 °C cooler than normal remains in the eastern equatorial Pacific. Positive anomalies in excess of 4 °C are evident in the western Pacific, and the area of warmer than usual water has continued to slowly propagate eastward over the last month.



Weekly sub-surface:

The map for the 5 days ending 11 April shows cooler than normal water in the sub-surface of the eastern tropical Pacific Ocean; anomalies in this area have warmed when compared with the preceding fortnight. The volume of warmer than usual water below the surface of the central and western tropical Pacific has warmed slightly over the past two weeks, with anomalies in the west more than 4 °C warmer than usual for this time of the year, on a weekly scale.



[Animation of recent sub-surface changes](#) | [Archive of sub-surface temperature charts](#)

Southern Oscillation Index:

The Southern Oscillation Index (SOI) has fluctuated over the past two weeks, but remains strongly positive. The latest (11 April) 30-day SOI value is +25. The SOI has been consistently positive since early April 2010.

Sustained positive values of the SOI above +8 may indicate a La Niña event, while sustained negative values below -8 may indicate an El Niño event. Values of between about +8 and -8 generally indicate neutral conditions.

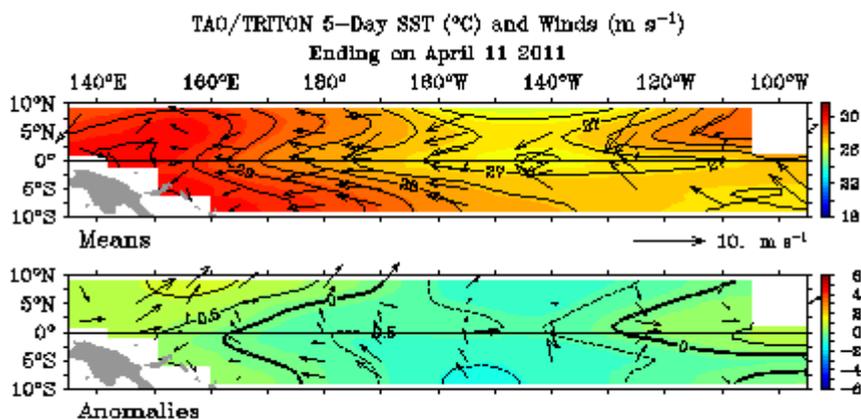


[Monthly graph](#) | [SOI table](#) | [SOI text](#)

Trade winds:

Trade winds are stronger than normal across most of the western equatorial Pacific. Trade wind strength has weakened across the equatorial Pacific over the last fortnight, associated with a westerly wind burst. The latest wind anomaly map for the 5 days ending 11 April is shown below.

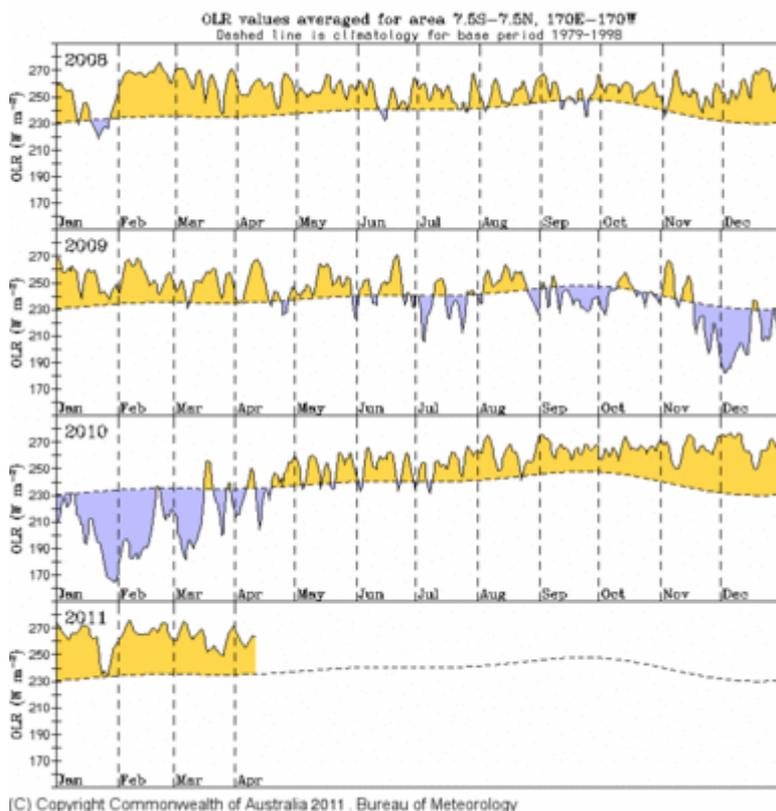
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



Cloudiness near the date-line:

Cloudiness near the date-line has been below average over the last two weeks (suppressed). Cloudiness has generally been suppressed near the date-line since April 2010.

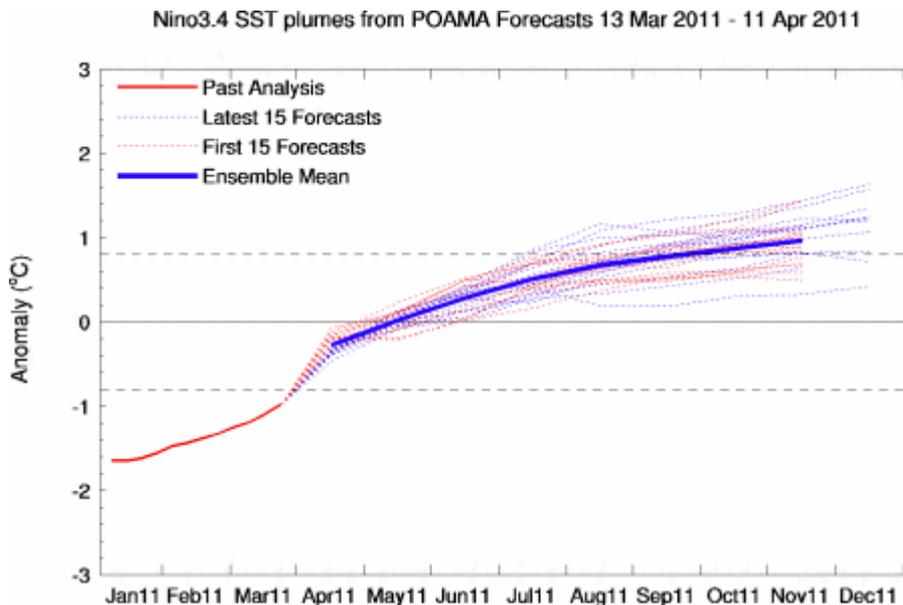
Cloudiness along the equator, near the date-line, is an important indicator of ENSO conditions, as it typically increases (negative OLR anomalies) near and to the east of the dateline during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



Computer Models:

All leading international [climate models](#) surveyed by the Bureau predict ENSO conditions within the neutral range over the southern hemisphere winter. The majority of models indicate neutral conditions can be expected to persist into the southern hemisphere spring.

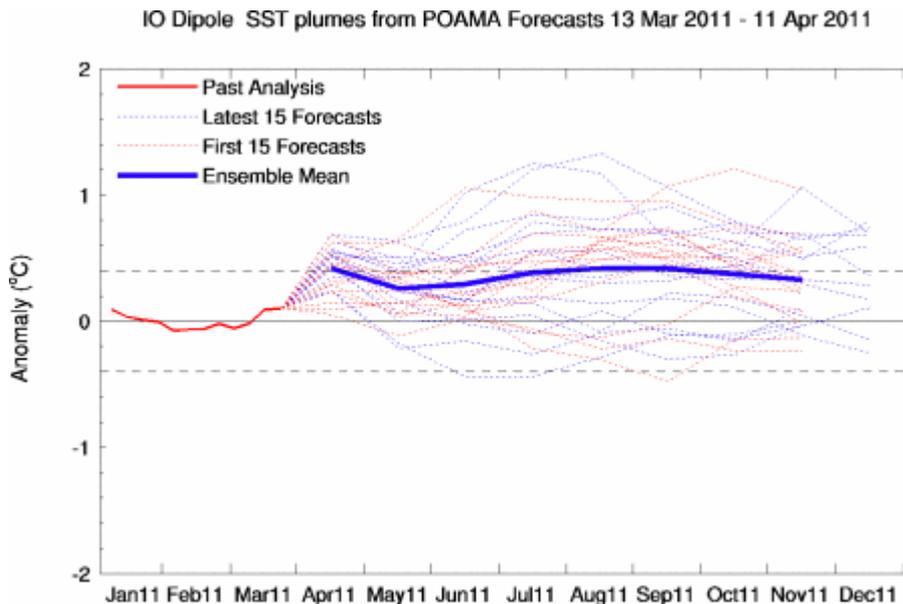
Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict that neutral conditions can be expected to persist into the southern hemisphere spring.



Indian Ocean Dipole:

The Indian Ocean Dipole (IOD) index has fluctuated around neutral over the past two weeks, which is typical for this time of year; the value for the week ending 10 April was +0.1.

Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict that the IOD index will remain in neutral territory into the southern hemisphere spring.



[IOD time series](#) [IOD map](#) [IOD forecasts](#) [DMI values](#)

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