



Strong La Niña event persists in the Pacific

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Australia continues to feel the effects of one of the strongest La Niña's on record. During La Niña events, tropical cyclone numbers are typically higher than normal during the November to April period, while summer daytime temperatures are often below average, particularly in areas experiencing excess rainfall.

Climate indicators of ENSO continue to indicate a strong, mature La Niña, although there are clear signs the event has passed its peak. Pacific Ocean temperatures have increased, especially below the surface, while atmospheric indicators such as the Southern Oscillation Index (SOI), trade winds and cloud patterns have eased from their peaks reached about a month ago.

These observations are consistent with long-range forecast models surveyed by the Bureau which show the Pacific gradually warming during the southern autumn. Given that March to June is the ENSO transition period, there is a spread among the model predictions for the middle of 2011. The most likely outcome is for a return to neutral conditions, but there is a chance of La Niña persisting for the rest of the year.

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 16 February 2011 | [print version](#)

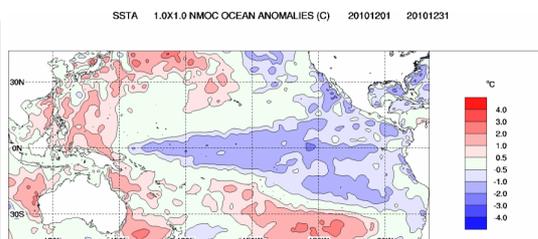
Further Details

Sea Surface Temperatures

Monthly sea surface temperatures:

Cool anomalies in the central and eastern tropical Pacific Ocean increased slightly during December. The sea surface temperature (SST) anomaly map for December shows anomalies more than 1 °C cooler than normal extending along the equator east of 160°E. The map shows a few small areas of the central and eastern Pacific where water was more than 2 °C cooler than normal. During December, warm anomalies in the southern Maritime Continent region cooled.

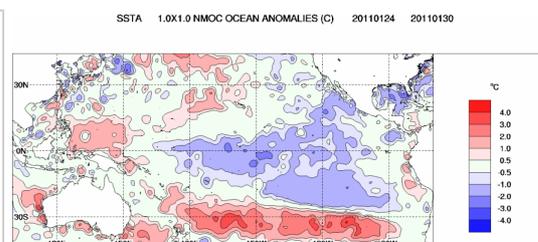
Index	Nov	Dec	Temperature change
NINO3	-1.3	-1.2	0.1 °C warmer
NINO3.4	-1.3	-1.4	0.1 °C cooler
NINO4	-1.1	-1.2	0.1 °C cooler



Weekly sea surface temperatures:

Sea surface temperatures in the equatorial Pacific Ocean have warmed slightly over the past two weeks. The weekly SST anomaly map for the week ending 31 January shows cool anomalies extending along the equator east of 170°E. Over the past two weeks, the area of SST anomalies more than 1 °C cooler than normal for this time of the year has decreased and all three key NINO indices have warmed. A few small areas of SSTs more than 2 °C cooler than normal are still present in the central Pacific.

Index	Previous	Current	Temperature change (2 weeks)
NINO3	-1.3	-1.0	0.3 °C warmer
NINO3.4	-1.7	-1.4	0.3 °C warmer
NINO4	-1.5	-1.1	0.4 °C warmer

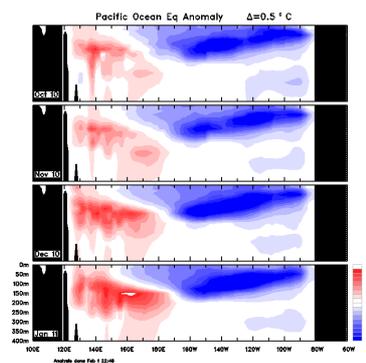


[An animation of recent SST changes](#) | [Weekly data graph](#)

Pacific ocean sub-surface temperatures

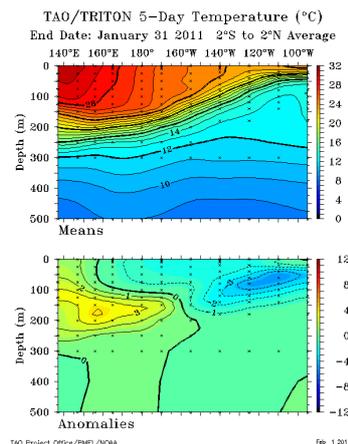
Monthly sub-surface:

The four-month sequence of sub-surface Pacific Ocean equatorial temperature anomalies, to 31 January, shows that a large volume of cooler than normal water has been evident below the surface of the tropical Pacific for many months. Sub-surface water in the central and eastern Pacific remained cooler than usual during January, with central areas more than 4 °C cooler than usual. Contrasting this, positive anomalies in excess of 4 °C are now evident in parts of the western Pacific, with some eastward propagation of this warm water over the last month.



Weekly sub-surface:

The map for the 5 days ending 31 January shows a large volume of cooler than normal water below the surface of the eastern tropical Pacific Ocean and warm anomalies in the west. When compared with two weeks ago, there has been a cooling and eastward shift of the cooler than usual sub-surface water in the eastern Pacific. This area shows anomalies more than 4 °C cooler than normal for this time of the year, on a weekly scale.

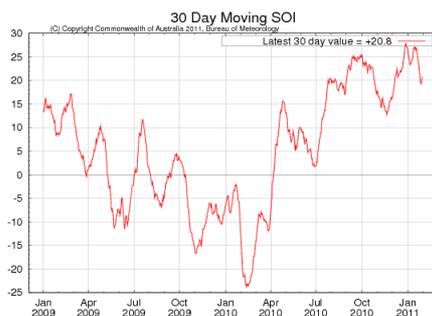


[Animation of recent sub-surface changes](#) | [Archive of sub-surface temperature charts](#)

Southern Oscillation Index:

The Southern Oscillation Index (SOI) has declined slightly over the past two weeks, yet remains strongly positive. The latest (31 January) 30-day SOI value is +21, comparable to the highest January monthly SOI value on record (20.8), recorded in both 1974 and 1890. The SOI has been consistently positive since early April.

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.

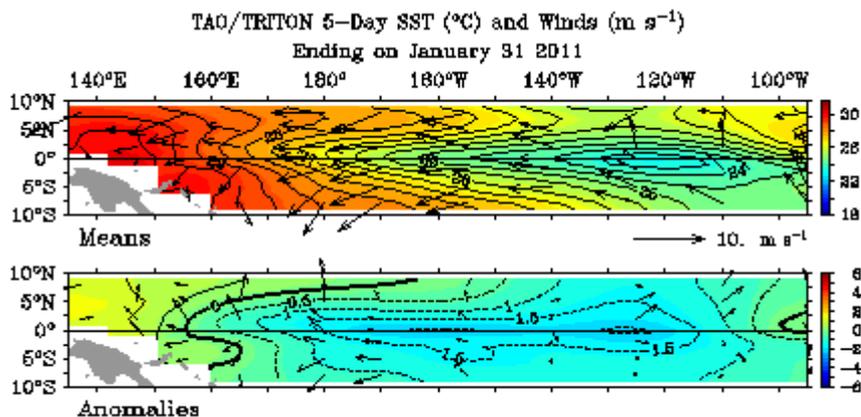


[Monthly graph](#) | [SOI table](#) | [SOI text](#)

Trade winds:

Trade winds are stronger than normal across the western and central equatorial Pacific. Trade winds over the western and central tropical Pacific have weakened over the past two weeks. The latest wind anomaly map for the 5 days ending 31 January is shown below.

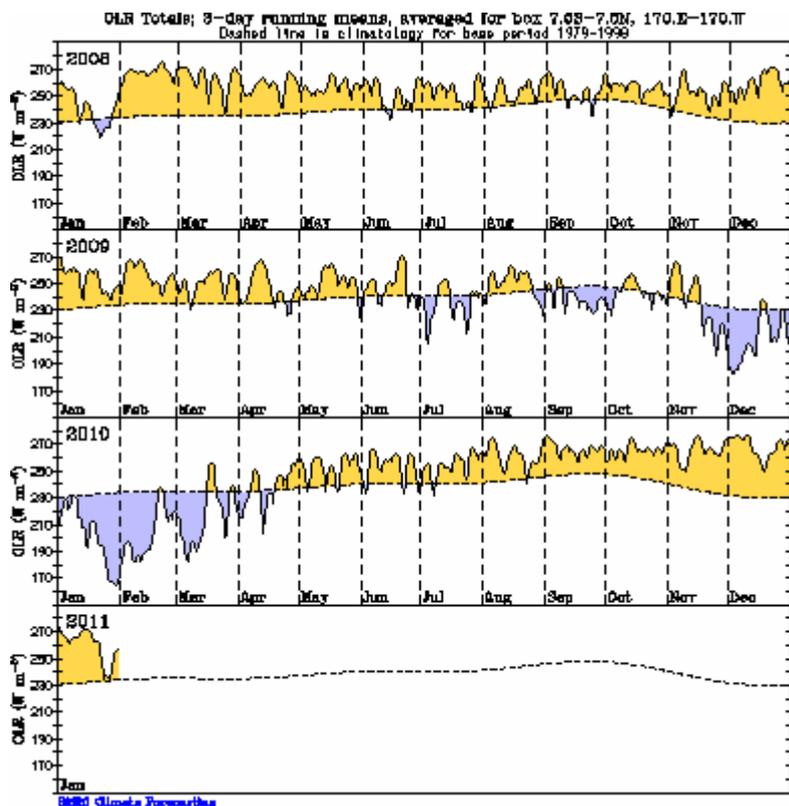
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



Cloudiness near the date-line:

Cloudiness near the date-line has continued to be strongly suppressed (below average) over the last two weeks. Cloudiness has generally been suppressed near the date-line since late April.

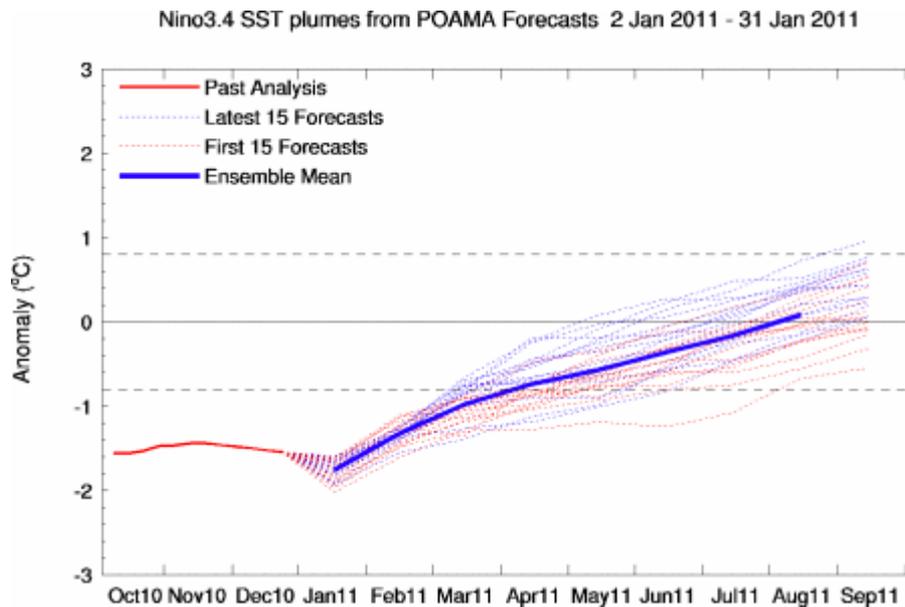
Cloudiness along the equator, near the date-line, is an important indicator of ENSO conditions, as it typically increases (negative OLR anomalies) near and to the east of the dateline during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



Computer Models:

All leading international [climate models](#) surveyed by the Bureau predict surface temperatures in the tropical Pacific Ocean will remain at levels typical of a La Niña into the southern hemisphere autumn. The majority of models indicate a gradual decay of the event, approaching neutral conditions by mid 2011.

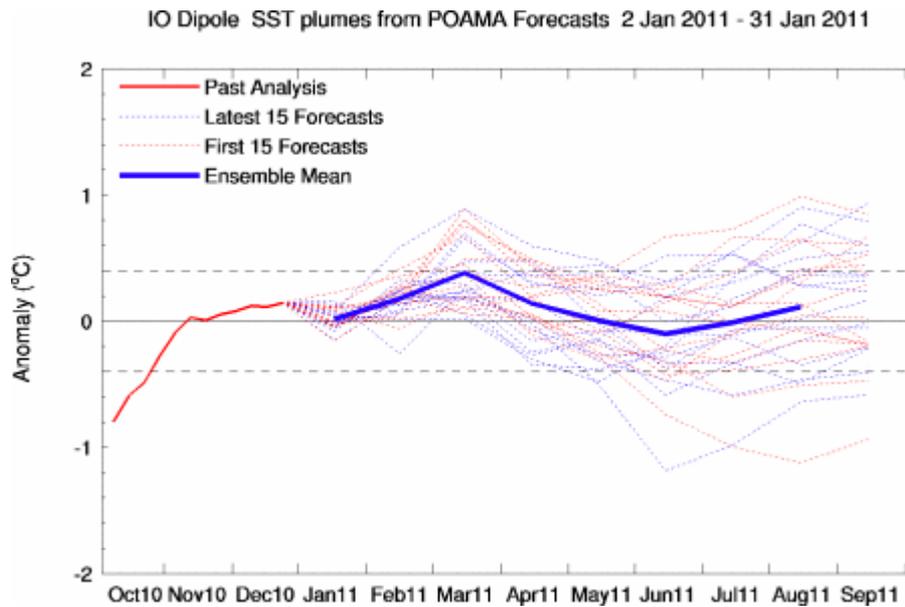
Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict a gradual weakening of La Niña conditions although the event will persist into the southern hemisphere autumn. A gradual weakening of the event through autumn would be consistent with previous Niña episodes.



Indian Ocean Dipole:

The Indian Ocean Dipole (IOD) index has remained close to neutral over the past two weeks, which is typical for this time of year; the value for the week ending 30 January was near zero.

Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict that the IOD index will remain in neutral territory at least until mid 2011.



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

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