

La Niña continues to weaken in the tropical Pacific

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The La Niña event in the Pacific Ocean continues to weaken after reaching peak intensity in early January. Pacific Ocean temperatures along the equator, particularly those below the surface, have warmed over the past month. This warming has markedly reduced the strength and volume of the cool water that has been present during the previous nine months. Current observations in the Pacific Ocean are consistent with the breakdown phase of La Niña events. In some contrast, atmospheric indicators of the La Niña, including trade winds, cloudiness and the Southern Oscillation Index (SOI) remain strong, with the February value of the SOI being highest on record for that month. These atmospheric indicators may be expected to weaken over the coming month as the ocean surface warms.

All available climate models suggest further weakening of the La Niña is likely through the southern hemisphere autumn, with a return to neutral conditions by winter 2011. The risk that the event may reform after autumn has reduced.

During La Niña events, tropical cyclone numbers are typically higher than normal during the November to April period, with February and March the peak. The influence of La Niña on Australian rainfall and temperature typically peaks during winter to mid-summer, and then weakens during the following autumn.

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 March 2011 | [print version](#)

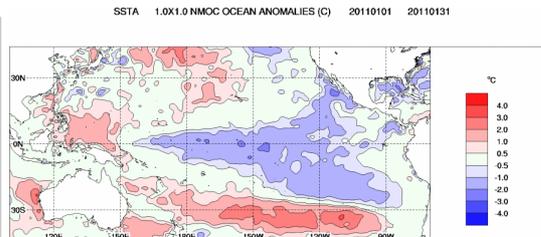
Further Details

Sea Surface Temperatures

Monthly sea surface temperatures:

Cool anomalies in the central and eastern tropical Pacific Ocean generally remained constant during January, with only a slight warming in the far east. The sea surface temperature (SST) anomaly map for January 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 January, warm anomalies in the southern Maritime Continent region continued to cool.

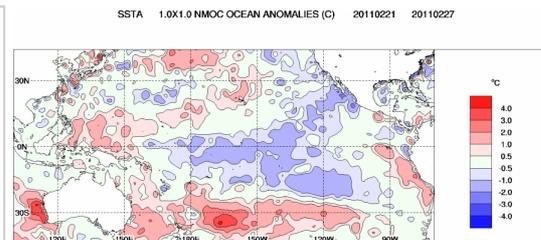
Index	Dec	Jan	Temperature change
NINO3	-1.2	-1.1	0.1 °C warmer
NINO3.4	-1.4	-1.5	0.1 °C cooler
NINO4	-1.2	-1.3	0.1 °C cooler



Weekly sea surface temperatures:

Sea surface temperatures in the equatorial Pacific Ocean have continued to warm slightly over the past two weeks. The weekly SST anomaly map for the week ending 27 February shows cool anomalies extending along the equator east of 160°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 in the western equatorial Pacific and increased slightly in the central equatorial Pacific.

Index	Previous	Current	Temperature change (2 weeks)
NINO3	-0.4	-0.5	0.1 °C cooler
NINO3.4	-1.0	-1.0	no change
NINO4	-1.0	-0.9	0.1 °C warmer

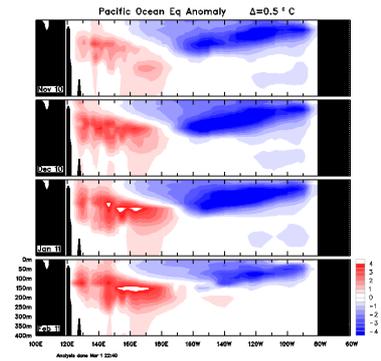


[An animation of recent SST changes](#) | [Weekly data graph](#)

Pacific ocean sub-surface temperatures

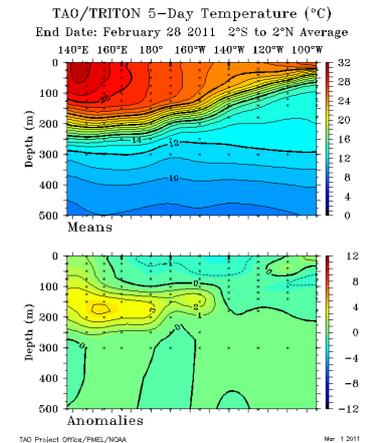
Monthly sub-surface:

The four-month sequence of sub-surface Pacific Ocean equatorial temperature anomalies, to 28 February, 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 decreased in size over the past month. While sub-surface water in the central and eastern Pacific remained cooler than usual during February, it has warmed when compared with previous months, with only a very small area of 4 °C cooler than usual water remaining centred 120°W. Positive anomalies in excess of 4 °C remain evident in the western Pacific, and the area of warmer than usual anomalies has continued to slowly propagate eastward at depth over the last month.



Weekly sub-surface:

The map for the 5 days ending 28 February shows slightly cooler than normal water in the shallow sub-surface of the central and eastern tropical Pacific Ocean; this has decreased in depth over the preceding fortnight. This map also shows the volume of warmer than usual water present below the surface of the western tropical Pacific where anomalies more than 4 °C warmer than usual for this time of the year, on a weekly scale, have been present during February. When compared with two weeks ago, there has been a further decrease in the intensity and extent of the cool sub-surface water in the eastern Pacific, whilst warm anomalies in the west have propagated eastwards, extending under the cool anomalies in the central Pacific.

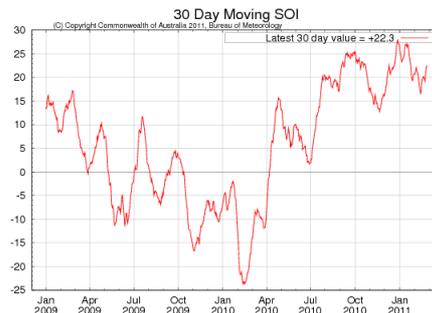


[Animation of recent sub-surface changes](#) | [Archive of sub-surface temperature charts](#)

Southern Oscillation Index:

The Southern Oscillation Index (SOI) increased slightly then remained relatively stable over the past two weeks. The latest (28 February) 30-day SOI value, +22, remains strongly positive. The monthly SOI value for February was +22.3, a new record for the month (the previous record was +21.3, recorded in 2008). 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.

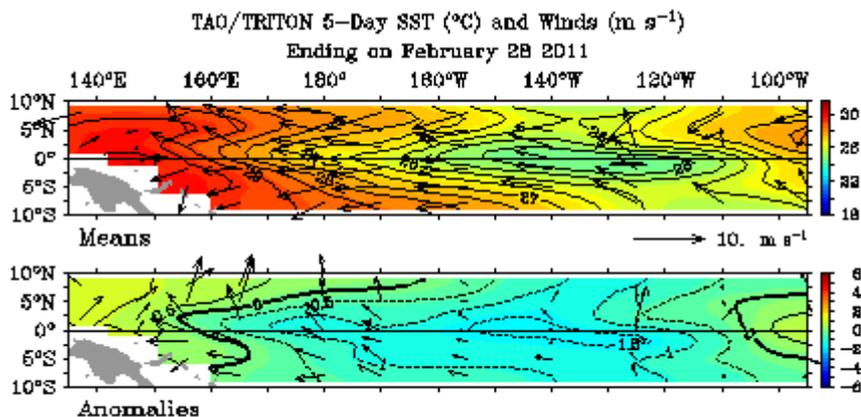


[Monthly graph](#) | [SOI table](#) | [SOI text](#)

Trade winds:

Trade winds are stronger than normal across the western and central equatorial Pacific. Over the past two weeks trade winds have strengthened, most noticeably over the central Pacific. The latest wind anomaly map for the 5 days ending 28 February is shown below.

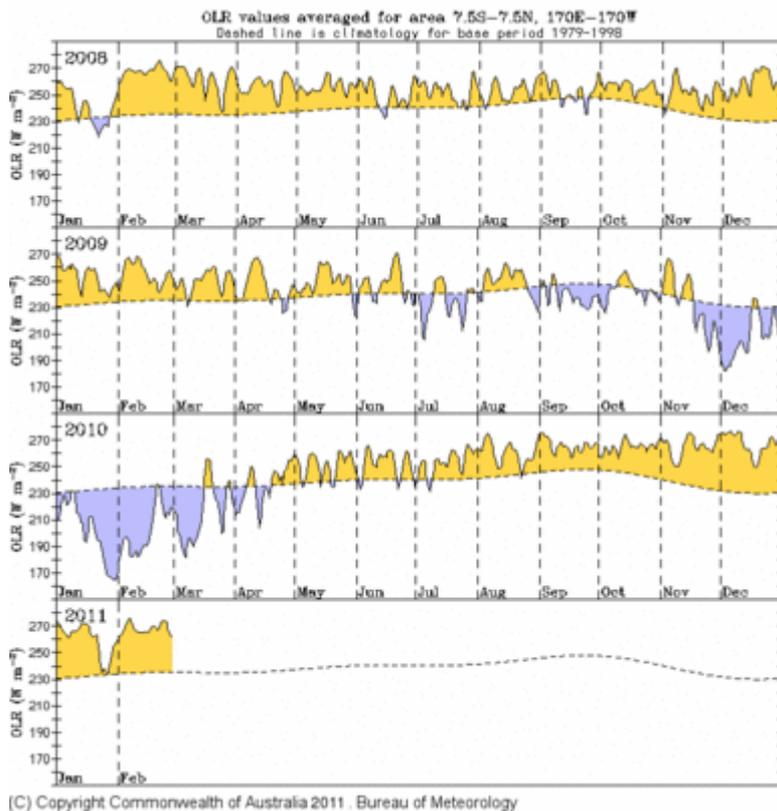
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



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.

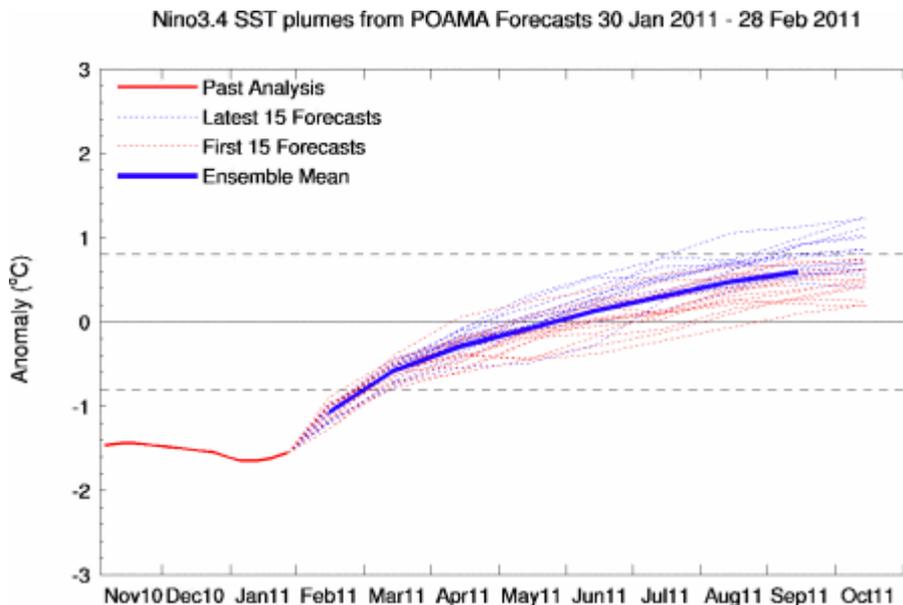
Cloudiness along the equator, near the date-line, is an important indicator of ENSO conditions, as it typically increases (negative OLR anomalies) near and to the east of the dateline during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



Computer Models:

All leading international [climate models](#) surveyed by the Bureau predict the La Niña event will continue to decay during the southern hemisphere autumn, with surface temperatures in the tropical Pacific Ocean approaching neutral conditions by mid 2011. The majority of models indicate neutral conditions can be expected to persist through the southern hemisphere winter.

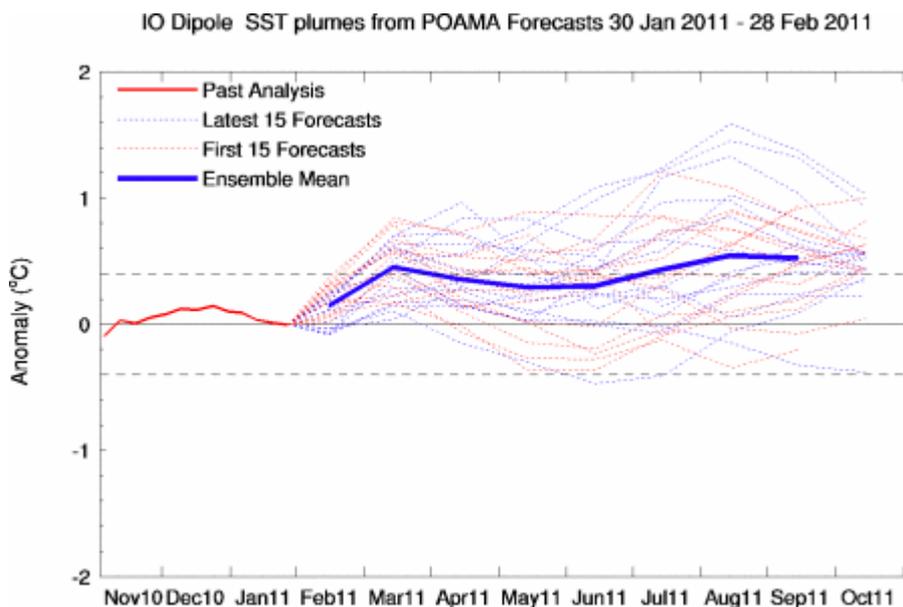
Recent forecasts from the [POAMA model](#), run daily at the Bureau of Meteorology, predict a gradual weakening of La Niña conditions, consistent with previous Niña episodes.



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 27 February 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 the southern spring.



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

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