Australian Government
Bureau of Meteorology

ENSO Wrap-Up

Current state of the Pacific and Indian Ocean

Renewed warming in the tropical Pacific Ocean

Issued on 3 March 2015 | Product Code IDCKGEWW00

The Bureau's ENSO Tracker has been upgraded to El Niño WATCH. This is due to a combination of warmer-than-average temperatures in the tropical Pacific Ocean and models showing that further warming is likely in coming months. El Niño WATCH indicates about a 50% chance of El Niño forming in 2015.

The central to western regions of the tropical Pacific Ocean have warmed by 0.2 °C to 0.3 °C over the past fortnight, while monthly sub-surface temperatures were more than 2 °C above average over a large area for February. This is largely the result of weakened trade winds and tropical surface currents in recent weeks. Weakened trade winds are forecast to continue, and this may induce further warming.

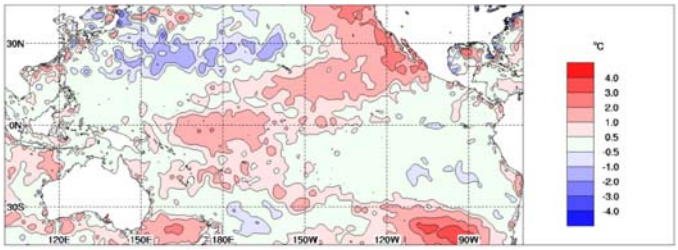
All international models surveyed by the Bureau indicate that central tropical Pacific sea surface temperatures (SSTs) are likely to remain warmer than average, but within the neutral range, until at least May. By mid-year, six of the eight models indicate SSTs will exceed El Niño thresholds. However, accuracy of forecasts made at this time are lower than those at other times of the year, and hence some caution should be exercised.

El Niño is often associated with below-average winter–spring rainfall over eastern Australia and above-average daytime temperatures over the southern half of Australia.

Next update expected on 17 March 2015 |

Weekly sea surface temperatures

Warm sea surface temperature (SST) anomalies have increased in the central and western equatorial Pacific over the past two weeks. The SST anomaly map for the week ending 1 March shows warm anomalies in the tropical Pacific between about 160°E and 120°W. Temperatures are broadly near average for this time of the year in most of the equatorial Pacific east of this point.



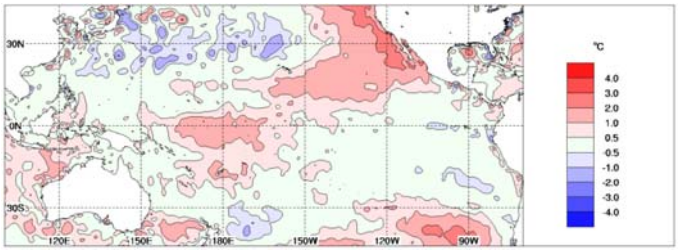
Index	Previous	Current	Temperature change (2 weeks)
NINO3	+0.1	+0.3	0.2 °C warmer
NINO3.4	+0.4	+0.7	0.3 °C warmer
NINO4	+0.9	+1.1	0.2 °C warmer

Baseline period 1961–1990.

Warm anomalies remain across a large part of the northeast of the Pacific Basin. Waters are also warmer than average in the Tasman Sea between southeastern Australia and New Zealand, with areas of weak warm anomalies also in parts of the Coral Sea and to Australia's northwest and large parts of the eastern half of the Indian Ocean.

Monthly sea surface temperatures

The SST anomaly map for February shows warmer than average waters over large areas of the Pacific. These areas include the tropical Pacific west of about 160°W, much of the northeast of the Pacific Basin, and the Tasman Sea. Warmer waters also persist across large parts of the Indian Ocean.



Index	January	February	Temperature change
NINO3	+0.3	+0.2	0.1 °C cooler
NINO3.4	+0.5	+0.5	no change
NINO4	+0.9	+1.0	0.1 °C warmer

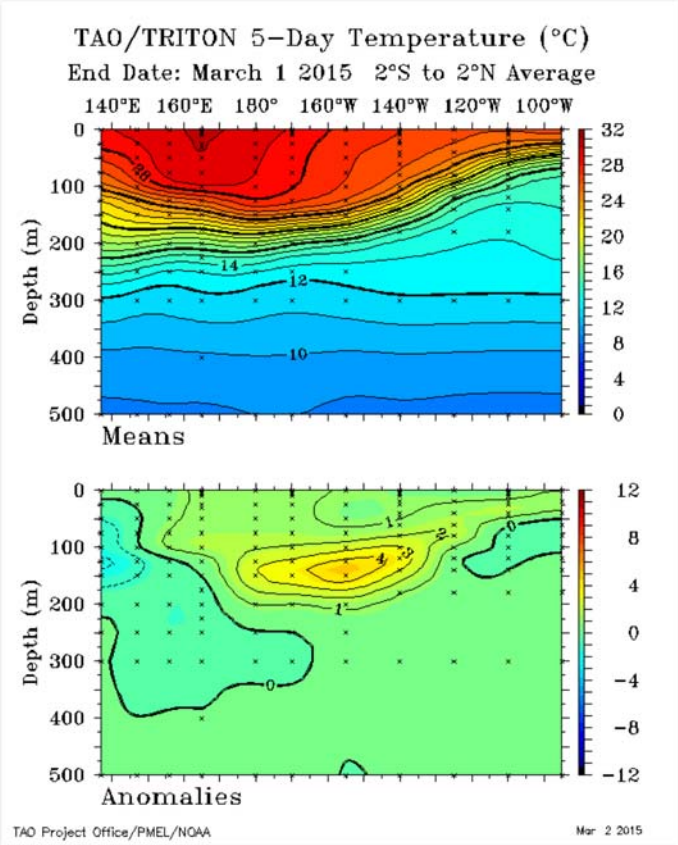
Baseline period 1961–1990.

Compared to January, positive anomalies had decreased slightly in the eastern equatorial Pacific and increased slightly in the western equatorial Pacific.

See also: Animation of recent SST changes | Weekly index values | Sea temperature analyses | Map of NINO regions

5-day sub-surface temperatures

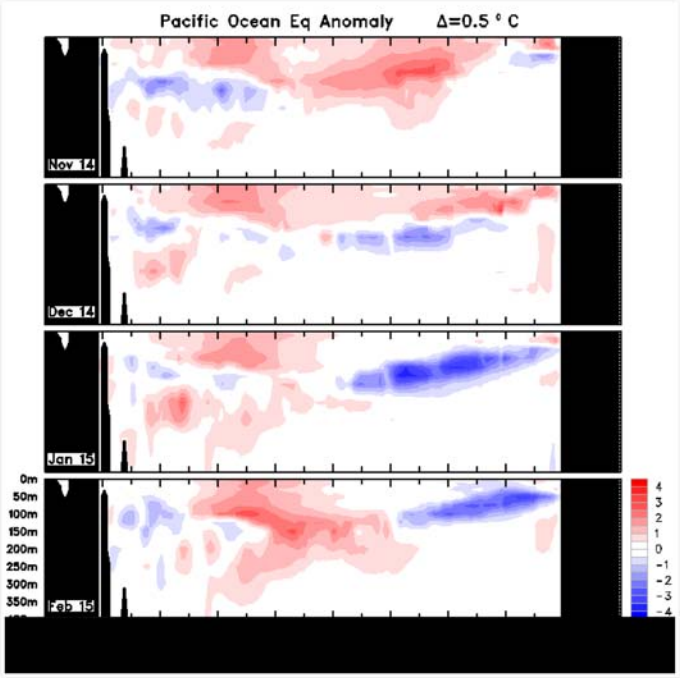
The sub-surface temperature map for the 5 days ending 1 March shows temperatures are near average across most of the sub-surface of the equatorial Pacific, with an area of warm anomalies present to the east of the Date Line at around 150 m depth. This pool of warmer-than-average water has progressed eastward (this is known as a downwelling Kelvin wave) and become more anomalously warm over the past fortnight. Anomalies in the centre of this region exceeded +4 °C.



Monthly sub-surface temperatures

The four-month sequence of sub-surface temperature anomalies (to February) shows cool anomalies have decreased in the sub-surface of the eastern equatorial Pacific, compared to last month, while warm anomalies have increased in the western and central equatorial Pacific sub-surface. Overall, the pattern of warm and cool anomalies has shifted slightly eastward compared to January.

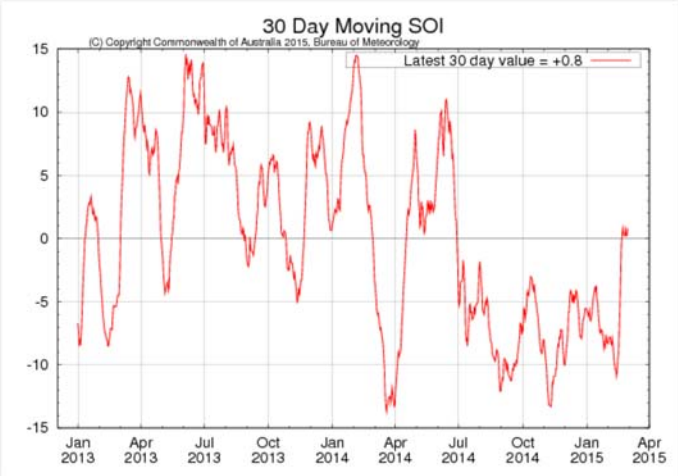
For February, warm anomalies were present in the top 200 m of the equatorial Pacific sub-surface between about 150°E and 140°W. Anomalies in western parts of this region reached more than +2.5 °C. Cool anomalies were present in much of the top 150 m of the equatorial Pacific sub-surface east of 140°W, with anomalies reaching more than −2.5 °C in the far eastern part of this area.



See also: Animation of recent sub-surface temperature changes | Archive of sub-surface temperature charts

Southern Oscillation Index

The Southern Oscillation Index (SOI) has remained relatively stable over the past week, hovering just above zero. The latest 30-day SOI value to 1 March is +0.8. The SOI has recovered from a dip into negative values which was primarily caused by transient weather systems in the vicinity of Tahiti. It is common for tropical weather systems to cause the SOI to fluctuate during the first quarter of the year, especially if a tropical low or cyclone was to pass near either Darwin or Tahiti.

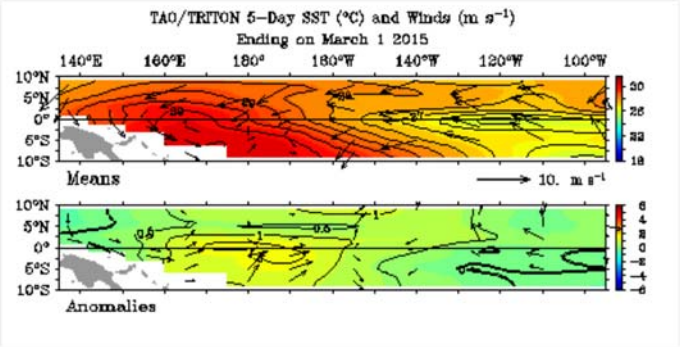


Sustained positive values of the SOI above +8 may indicate La Niña, while sustained negative values below −8 may indicate El Niño. Values of between about +8 and −8 generally indicate neutral conditions.

See also: Monthly SOI graph | Table of monthly SOI values | 30-day SOI values

Trade winds

Trade winds were weaker than average over the western half of the tropical Pacific for the 5 days ending 1 March (see map). A reversal of wind direction was seen in the far western tropical Pacific; westerly winds have been observed in parts of this area for about three weeks now. However, it is worth noting that westerly wind anomalies in parts of the western tropical Pacific sometimes occur during as a normal part of the breakdown of an El Niño.



Trade winds over the eastern half of the tropical Pacific were near average strength.

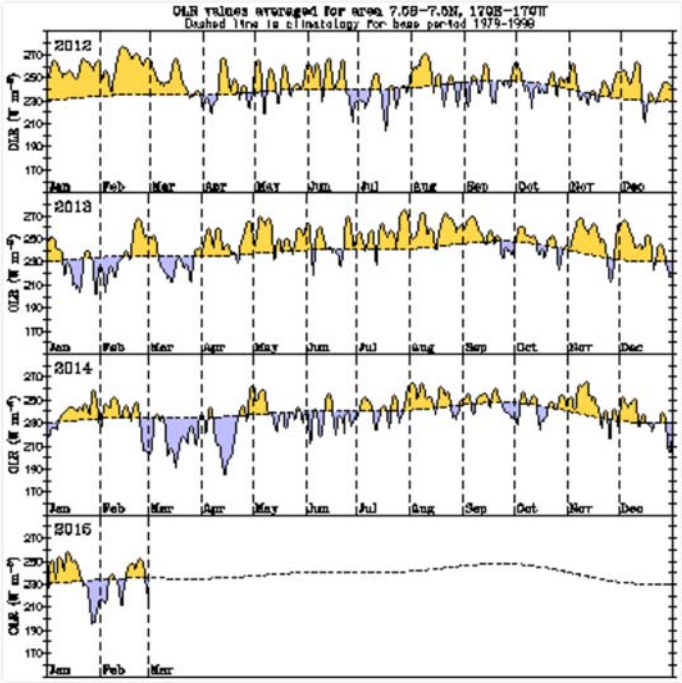
During La Niña there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño there is a sustained weakening of the trade winds.

Data Source: TAO/TRITON data | Time-longitude wind anomalies

Cloudiness near the Date Line

Cloudiness near the Date Line has fluctuated between below and above average during the past two weeks.

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 Date Line during El Niño and decreases (positive OLR anomalies) during La Niña.

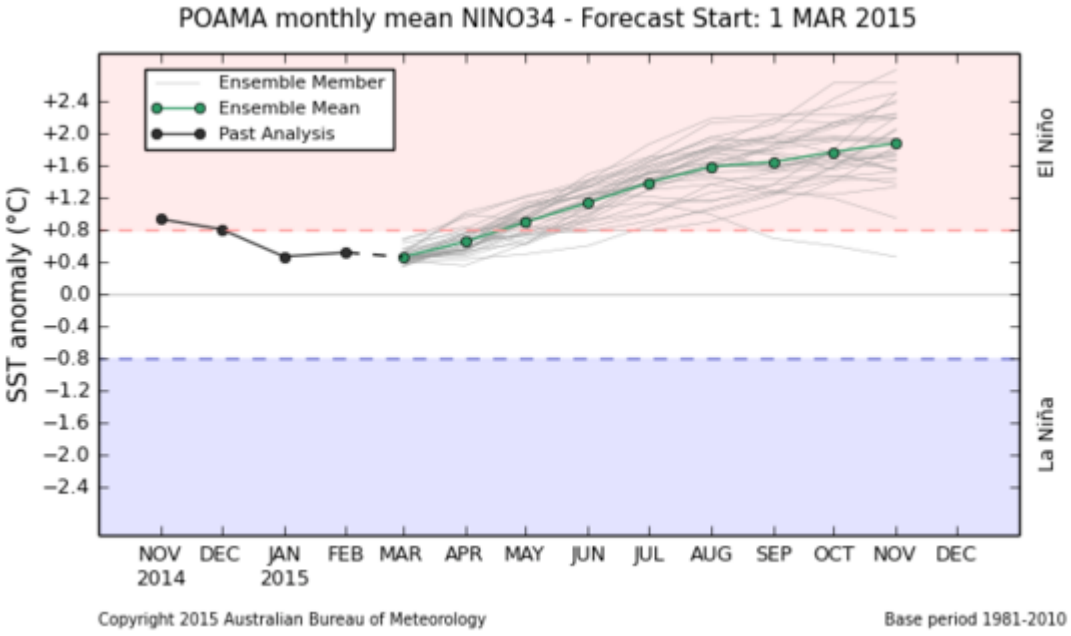


Spatial cloudiness | Regional cloudiness | Out-going longwave radiation maps

Model outlooks

Six of the eight surveyed international climate models favour warming of central Pacific Ocean SSTs over the coming months. About half the surveyed models suggest NINO3.4 will reach El Niño threshold levels during autumn (March–May), with six models indicating this warming will be sustained or increased over the winter months (June–August).

Model outlooks spanning February to May (the traditional ENSO transition period) have lower confidence than forecasts made at other times of year. Model outlooks for predictions through autumn should therefore be treated with caution.

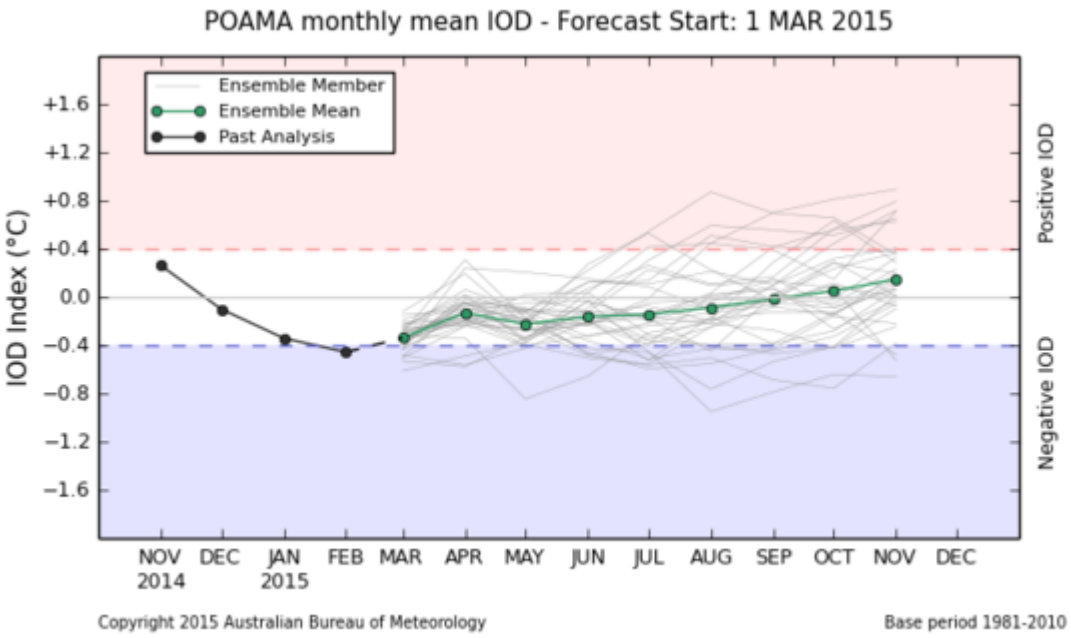


See also: Climate model summary | POAMA model | Map of NINO regions

Indian Ocean Dipole

The Indian Ocean Dipole (IOD) is currently neutral. Climate models surveyed in the model outlooks favour a continuation of a neutral phase of the IOD until at least early in the austral winter.

The IOD typically has little influence on Australian climate from December to April. During this time of year, establishment of negative or positive IOD patterns is largely inhibited by the development and position of the monsoon trough in the southern hemisphere.



See also: POAMA model | IOD time series | Map of IOD regions | IOD forecasts | Weekly IOD values

Archive

This page was created at **15:14 on Tuesday 03 March 2015 (AEDT)**

© Copyright Commonwealth of Australia 2015, Bureau of Meteorology (ABN 92 637 533 532) | Disclaimer | Privacy | Accessibility