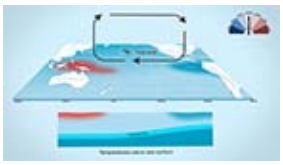
Australian Government
Bureau of Meteorology

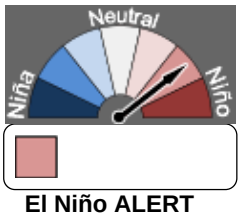
ENSO Wrap-Up

Current state of the Pacific and Indian Ocean

Tropical Pacific Ocean close to El Niño thresholds



View the video about ENSO



El Niño ALERT

ENSO Tracker

(or click graphic)

Issued on 16 December 2014 | Product Code IDCKGEWW00

The tropical Pacific remains close to El Niño thresholds, with a number of countries around the Pacific Ocean basin and further afield showing some El Niño-like impacts in recent months.

The equatorial Pacific Ocean remains warm, with surface temperatures exceeding El Niño thresholds for several weeks. Typically, after the ocean has exceeded thresholds for an extended period, an El Niño is considered to be underway. However some atmospheric indicators, such as the trade winds, cloudiness and tropical rainfall, have not shown sustained and widespread patterns consistent with El Niño. The Southern Oscillation Index, which has remained negative for several months, has recently eased back from El Niño thresholds; this is likely to be a weather related short-term fluctuation in the index.

The Bureau's ENSO Tracker status is currently at ALERT, indicating a greater than 70% chance that the atmosphere will start to reinforce the ocean in the coming months. Regardless of whether El Niño is declared, El Niño-like impacts are likely to continue, as shown by recent seasonal outlooks. For Australia, this means a drier and warmer summer is likely for many.

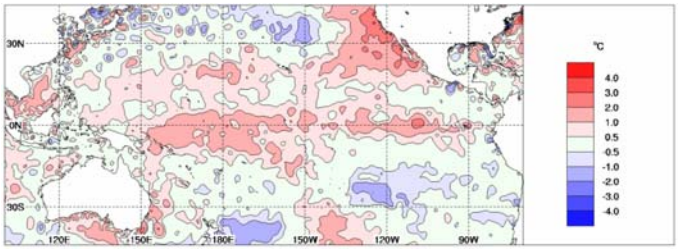
All climate models surveyed by the Bureau indicate little change is likely in the tropical Pacific Ocean in the coming weeks and months, with ocean temperatures forecast to either remain close to, or just above, El Niño thresholds. If the atmosphere does start to reinforce the ocean, models suggest the resulting El Niño would most likely be weak or moderate at most.

A new video explaining El Niño, La Niña and the link between the tropical ocean and atmosphere is available on the Bureau's YouTube channel.

Next update expected on 23 December 2014 | print version

Weekly sea surface temperatures

The pattern of sea surface temperature (SST) anomalies in the equatorial Pacific remains similar to two weeks ago, with warm anomalies along the entire equator (see SST anomaly map for the week ending 14 December). Warm anomalies have increased slightly in both the far tropical west and east. Warm anomalies are also present across most of the Indian Ocean, large parts of the northern Pacific Basin and the waters around the coastline of southern and eastern Australia.

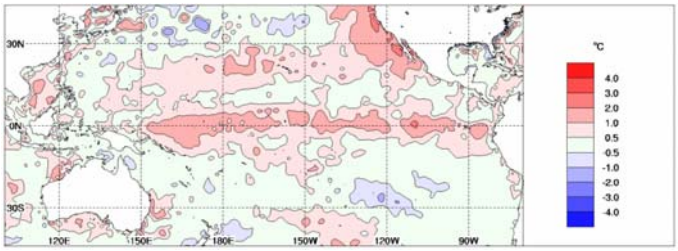


Index	Previous	Current	Temperature change (2 weeks)
NINO3	+0.8	+0.9	0.1 °C warmer
NINO3.4	+0.9	+0.9	no change
NINO4	+1.0	+1.1	0.1 °C warmer

Baseline period 1961–1990.

Monthly sea surface temperatures

The SST anomaly map for November shows warmer than average waters across the entire equatorial Pacific as well as across much of the northern Pacific Basin, around southern and northwestern Australia and across much of the Indian Ocean. This pattern was generally similar to the previous month, although SSTs along the equator have warmed again during November.



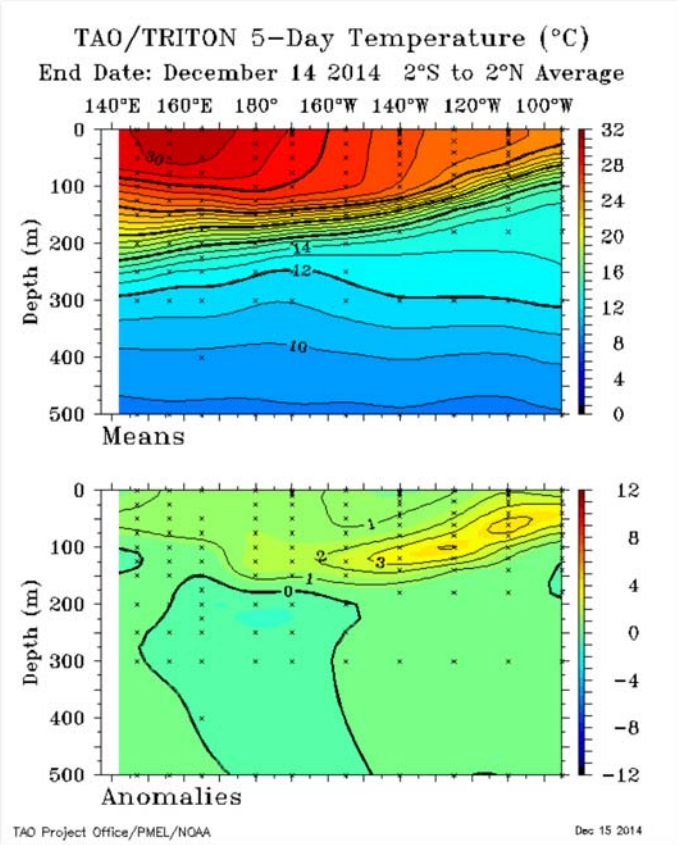
Index	October	November	Temperature change
NINO3	+0.7	+0.9	0.2 °C warmer
NINO3.4	+0.6	+0.9	0.3 °C warmer
NINO4	+0.8	+1.0	0.2 °C warmer

Baseline period 1961–1990.

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

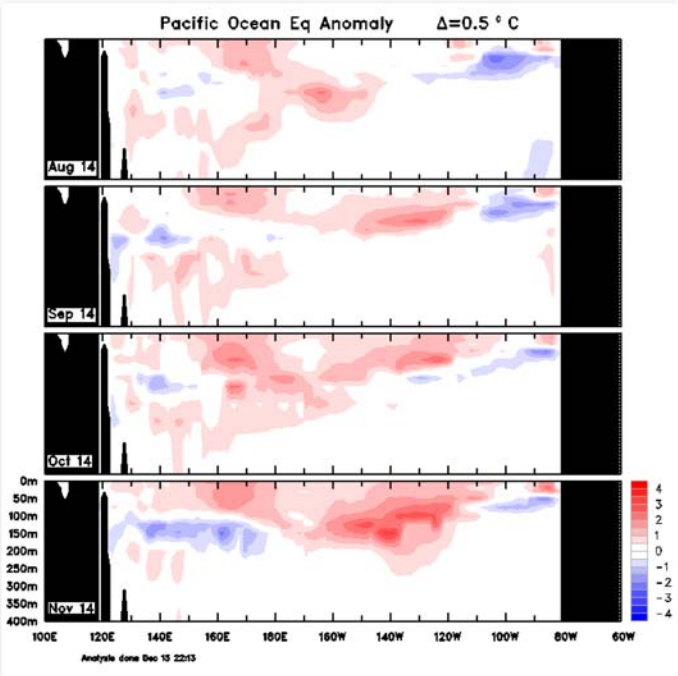
5-day sub-surface temperatures

The sub-surface temperature map for the 5 days ending 14 December shows temperatures are warmer than average in the sub-surface of the eastern equatorial Pacific. Sub-surface waters are more than 3 °C warmer than average in an area east of between 150°W at around 100 m to 50 m depth. This pool of warmer-than-average water has continued to move slowly eastward and rise closer to the surface over the past two weeks.



Monthly sub-surface temperatures

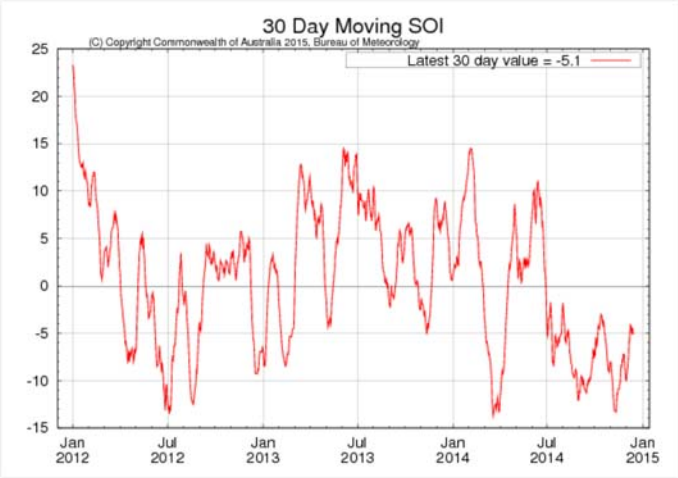
The four-month sequence of sub-surface temperature anomalies (to November) shows warm anomalies were present across most of top 200 m of the equatorial sub-surface profile, although there were areas of weak cool anomalies in both the far east and western equatorial Pacific. The area of cool anomalies in the western equatorial Pacific, at around 150 m depth, has expanded compared to October and now extends from 120°E to the Date Line.



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

Southern Oscillation Index

The Southern Oscillation Index (SOI) has risen over the past fortnight and has remained around −5 during the past week. The latest 30-day SOI value to 14 December is −5.1. This fluctuation into neutral values is likely to be a temporary result of lower pressure recorded at Darwin, associated with the passage of the Madden–Julian Oscillation (MJO) through Australian longitudes.



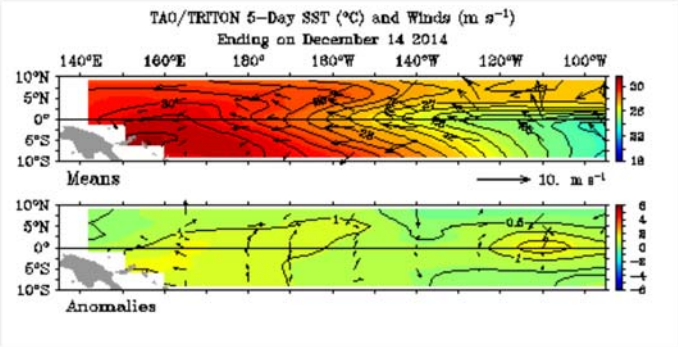
Sustained positive values of the SOI above +8 may indicate a La Niña event, while sustained negative values below −8 may indicate an El Niño event. Values of between about +8 and −8 generally indicate neutral conditions.

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

Trade winds

Trade winds were near-average over the majority of the tropical Pacific for the 5 days ending 14 December, but slightly stronger than average in the far west (see map).

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.

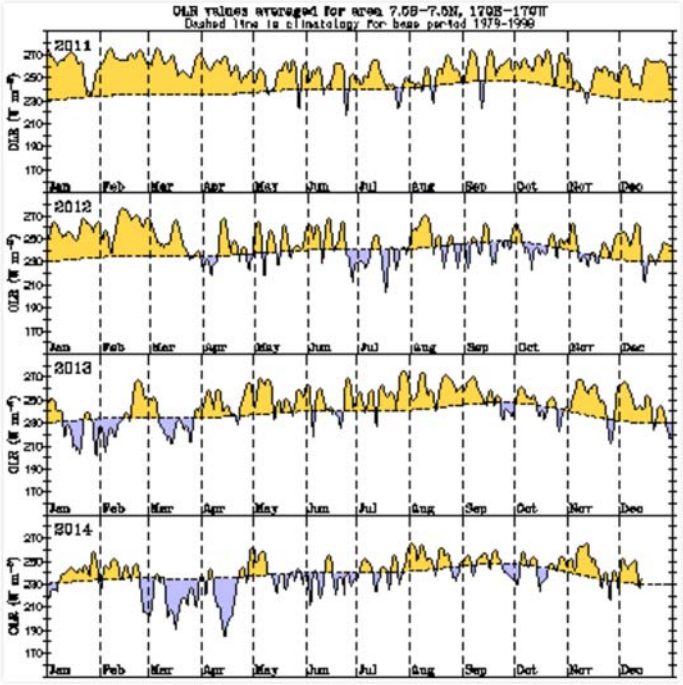


Data Source: TAO/TRITON data | Time-longitude wind anomalies

Cloudiness near the Date Line

Cloudiness near the Date Line was generally below average over the past two weeks, but has returned to near-average over the past few days.

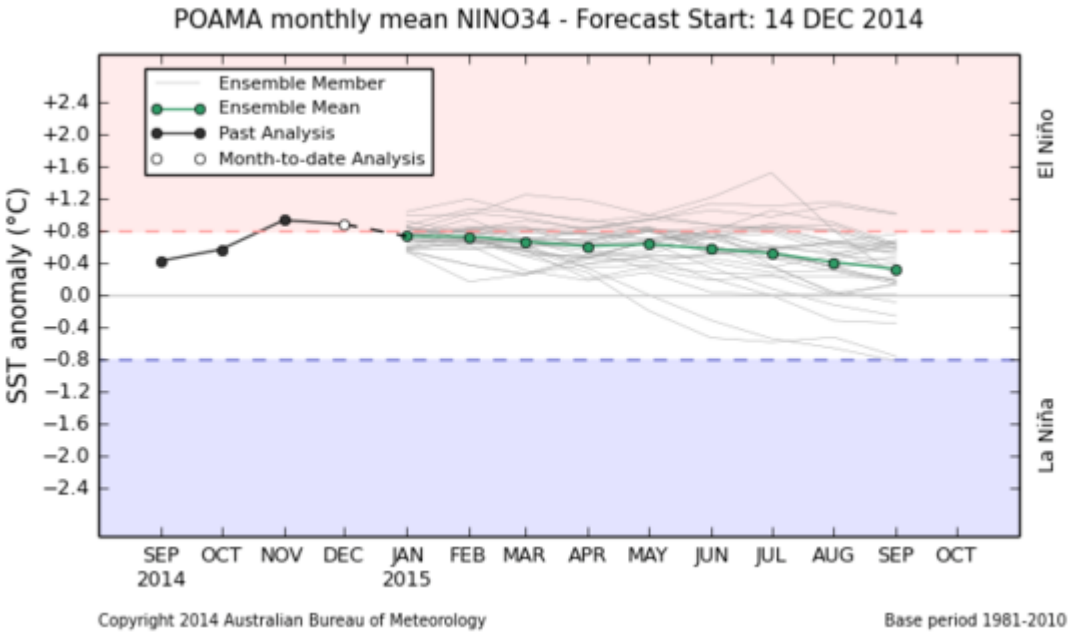
Cloudiness along the equator, near the Date Line, is an important indicator of ENSO conditions, as it typically increases (negative OLR anomalies) near and to the east of the Date Line during El Niño and decreases (positive OLR anomalies) during La Niña.



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

Model outlooks

Four of the eight surveyed international climate models predict that central Pacific Ocean SSTs will reach El Niño thresholds before autumn. Around half of the models predict SSTs will be above the threshold value during some or all of the austral autumn, while the others indicate warm but neutral conditions. On the whole, these outlooks continue to indicate that peak central equatorial Pacific SSTs are unlikely to rise far beyond the threshold value.

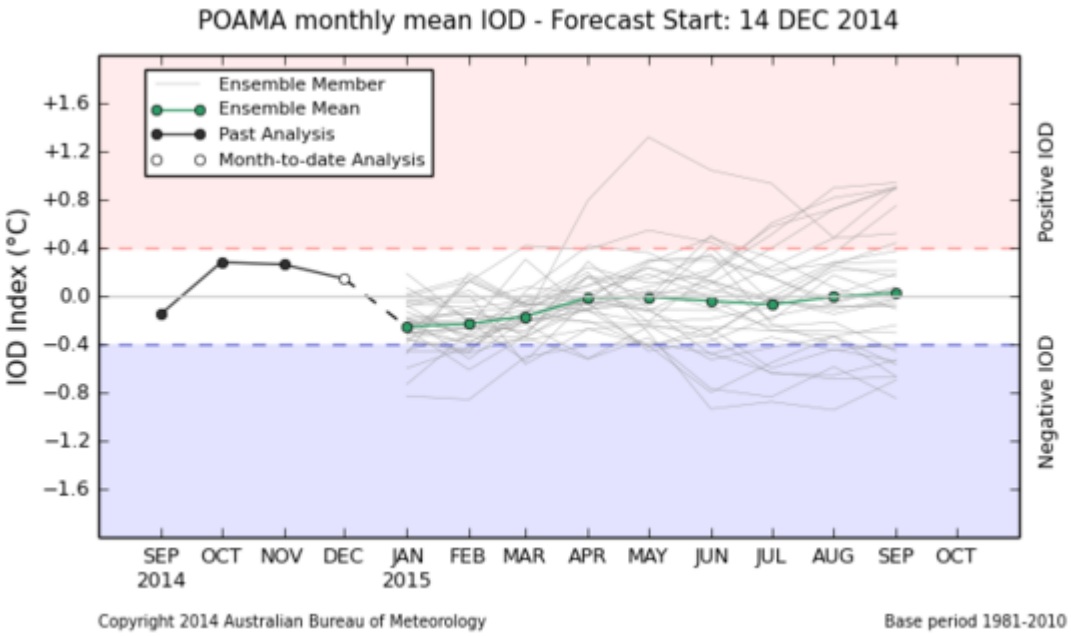


See also: Climate model summary | POAMA model | Map of NINO regions

Indian Ocean Dipole

The Indian Ocean Dipole (IOD) index remains neutral. The latest weekly index value to 14 December is 0.0 °C. Climate models surveyed in the model outlooks favour a continuation of neutral IOD values for the remainder of the year.

The IOD typically has little influence on the Australian climate from December to April.



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

Archive

- Previous ENSO Wrap-Ups

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