



ENSO Wrap-Up

Current state of the Pacific and Indian Ocean

El Niño likely to develop in winter

Issued on Tuesday 8 April 2014 | [Product Code IDCKGEWOO](#)

It is now likely (estimated at a greater than 70% chance) that an El Niño event will develop during the southern hemisphere winter. Although the El Niño–Southern Oscillation (ENSO) is currently neutral, surface and sub-surface ocean temperatures have warmed considerably in recent weeks, consistent with a state of rapid transition. International climate models surveyed by the Bureau indicate continued warming of the central Pacific Ocean in coming months. Most models predict sea surface temperatures will reach El Niño thresholds during the coming winter season.

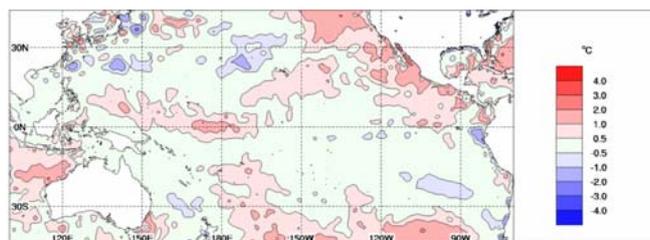
El Niño is often, but not always, associated with below normal rainfall across large parts of southern and inland eastern Australia during the second half of the year. The strength of an El Niño does not always indicate how much it will influence Australian rainfall. Historically there are examples where weak events have resulted in widespread drought across large parts of Australia, while at other times strong events have resulted in relatively modest impacts. It is too early to determine the strength of this potential El Niño. Daytime temperatures tend to be above normal over southern Australia during El Niño events.

The Indian Ocean Dipole (IOD) is currently in a neutral state. Model outlooks indicate the IOD will remain neutral through late autumn and early winter. The chance of a positive IOD event occurring will increase if an El Niño develops.

Next update expected on 22 April 2014 | [print version](#)

Monthly sea surface temperatures

Compared to February, the equatorial Pacific has warmed over the past month. The sea surface temperature (SST) anomaly map for March shows that much of this region is now near average to warmer than average, while in February cool anomalies dominated along the equator in the east.



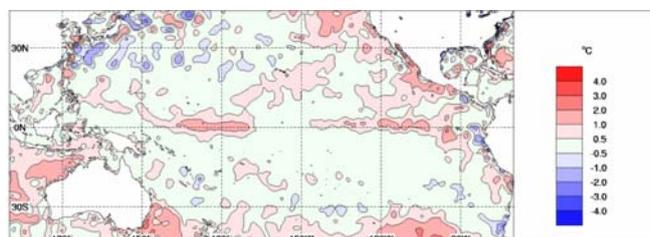
Index	February	March	Temperature change
NINO3	-0.5	+0.1	0.6 °C warmer
NINO3.4	-0.3	0.0	0.3 °C warmer
NINO4	+0.4	+0.6	0.2 °C warmer

Baseline period 1961–1990.

Weekly sea surface temperatures

The SST anomaly map for the week ending 6 April 2014 shows above-average SSTs have now emerged across most of the equatorial Pacific. The waters across the central to eastern Pacific have steadily warmed since February, with the current warming pattern consistent with an emerging El Niño.

Waters surrounding Australia are generally warmer than average, except for the northeast region.



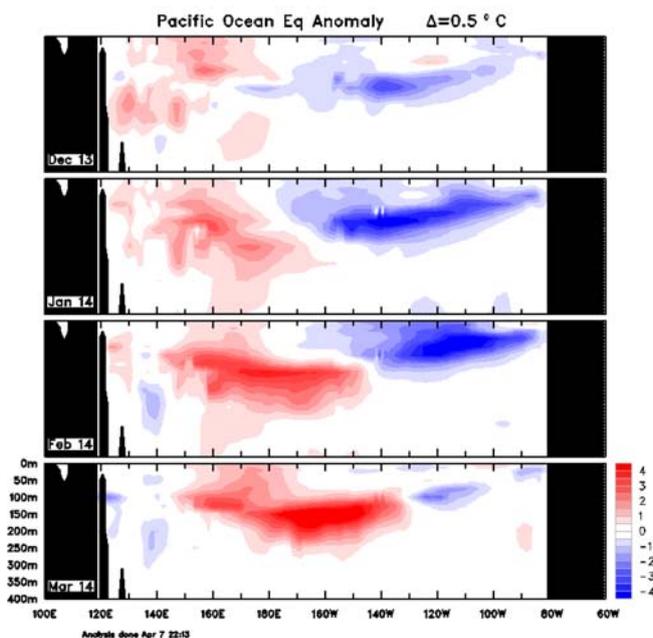
Index	Previous	Current	Temperature change (2 weeks)
NINO3	+0.2	+0.5	0.3 °C warmer
NINO3.4	+0.1	+0.3	0.2 °C warmer
NINO4	+0.5	+0.5	no change

Baseline period 1961–1990.

See also: [Animation of recent SST changes](#) [Weekly index values](#) [Map of NINO regions](#)

Monthly sub-surface temperatures

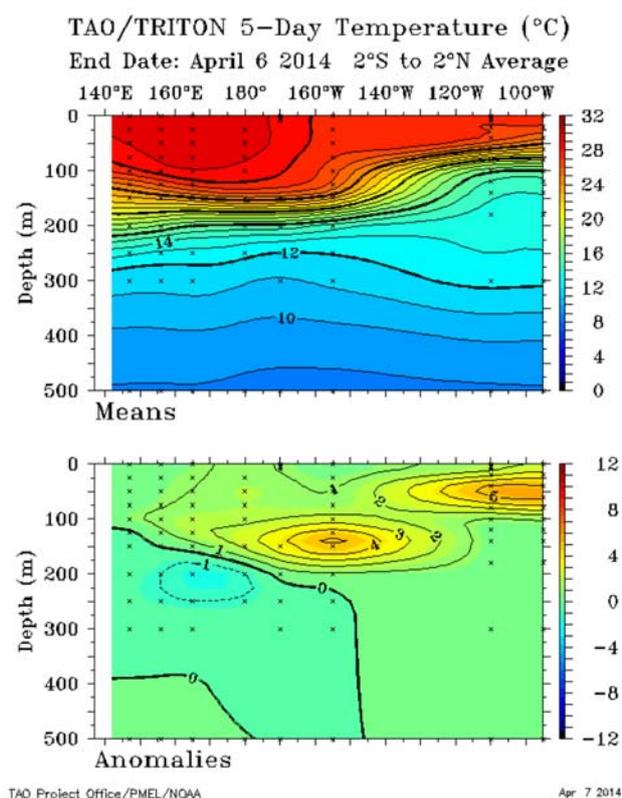
The plot to the right shows the sub-surface temperature anomalies for the four months ending March 2014. Since January, a large volume of warmer-than-average water (known as a downwelling Kelvin wave) has progressed from the western Pacific sub-surface to the central Pacific sub-surface and warmed, eroding the cooler waters in the east. A very small area of weak negative anomalies remains in the east. Water below the surface in the central Pacific is now more than 4 °C warmer than average in some places.



Weekly sub-surface temperatures

The sub-surface temperature map for the 5 days ending 6 April 2014 shows positive anomalies have now progressed to the central and eastern sub-surface of the tropical Pacific. Parts of these waters are more than 4 °C warmer than normal in the shallow eastern sub-surface (near 50m depth), and also in the central sub-surface (near 150m depth).

The [animation of sub-surface temperature changes](#) shows the progression of the warmer waters across the Pacific (which is, as previously mentioned, known as a Kelvin wave). Downwelling Kelvin wave events are driven by westerly winds over the western tropical Pacific. This pool of warmer-than-average sub-surface water is expected to cause a further warming at the surface of the tropical Pacific, which is now likely to contribute to the formation of an El Niño during winter.



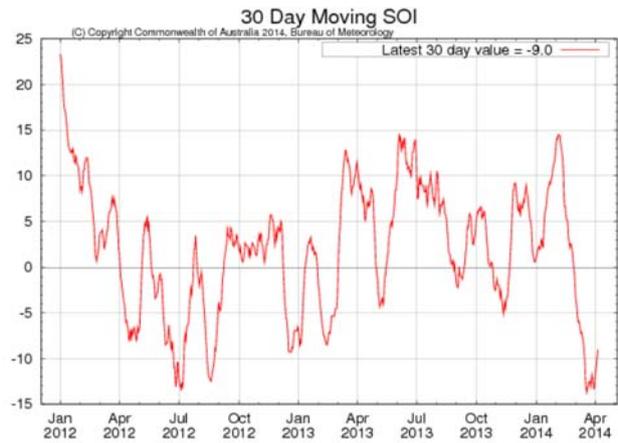
See also: [Animation of recent sub-surface temperature changes](#)

[Archive of sub-surface temperature charts](#)

Southern Oscillation Index

Following a fall of 29 points in about eight weeks, the Southern Oscillation Index (SOI) has stabilised, and remained roughly steady over the past week. The latest approximate 30-day SOI value to 6 April 2014 is -9.0.

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.

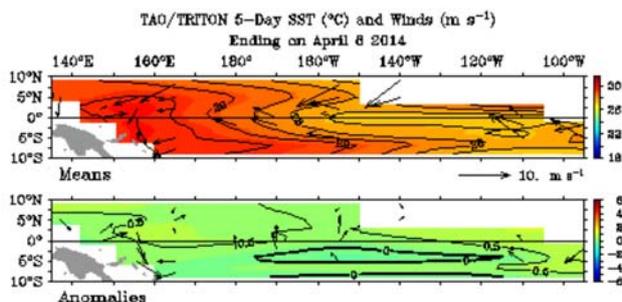


See also: [Monthly SOI graph](#) [Table of monthly SOI values](#) [30-day SOI values](#)

Trade winds

Trade winds have returned to near average along the equator this week, after a sequence of strong westerly wind bursts in the west Pacific during January and February (see anomaly map for the 5 days ending 6 April 2014). There is an indication a weak Madden-Julian Oscillation event will move into the west equatorial Pacific next week, which may enhance westerly winds in this region again.

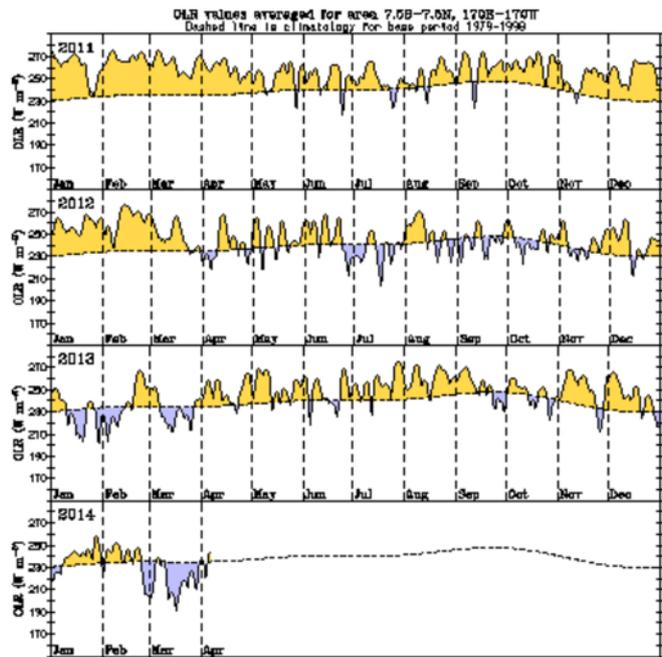
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



Cloudiness near the Date Line

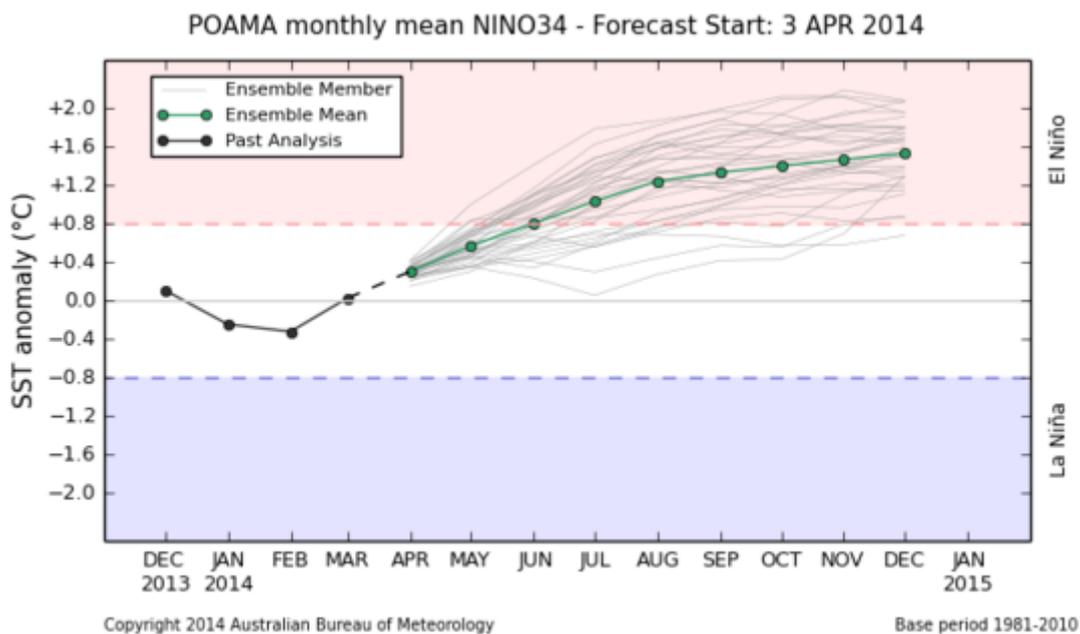
Cloudiness near the Date Line has generally been above average from late February.

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 an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



Models outlooks

All international [climate models](#) surveyed by the Bureau indicate that SSTs in the equatorial Pacific Ocean will continue to warm during autumn and winter. Almost all models indicate El Niño thresholds will be exceeded during the southern hemisphere winter.

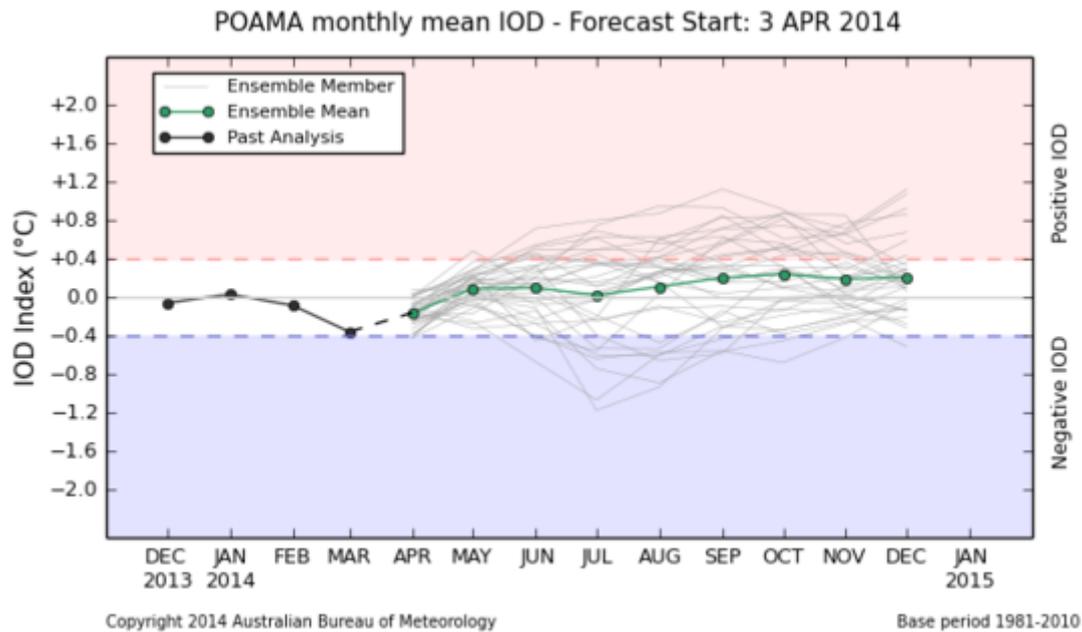


See also: [Climate model summary](#)

Indian Ocean Dipole

The Indian Ocean Dipole (IOD) remains neutral, with the latest weekly value (6 April) $-0.5\text{ }^{\circ}\text{C}$.

Climate models surveyed in the [model outlooks](#) favour neutral IOD values over the coming months. However, if an El Niño develops, the chance of a positive IOD event occurring will increase. Positive IOD events often coincide with El Niño and are typically associated with lower than normal winter and spring rainfall over parts of southern and central Australia.



See also: [POAMA model](#) [IOD time series](#) [Map of IOD regions](#) [IOD forecasts](#)

[Weekly IOD values](#)

Effects on rainfall

- Pacific Ocean: El Niño and La Niña (ENSO)
 - [Average rainfall patterns during El Niño](#)
 - [Average rainfall patterns during La Niña](#)
 - [Past El Niño events](#)
 - [Past La Niña events](#)
 - [About the 2010–11 and 2011–12 La Niña events](#)
- Indian Ocean: Indian Ocean Dipole (IOD)
 - [Average rainfall patterns during negative IOD years](#)
 - [Average rainfall patterns during positive IOD years](#)

About climate influences

- [Australian climate Influences](#)

Related information

- [Tropical \(MJO\) monitoring](#)
- [Sea temperature analysis](#)
- [Out-going longwave radiation maps](#)

International sites

- [TAO/TRITON data](#)
- [World Meteorological Organization El Niño/La Niña Update](#)

Archive

- [Previous ENSO Wrap-Ups](#)

This page was created at **14:53 on Tuesday 08 April 2014 (AEST)**

© [Copyright](#) Commonwealth of Australia 2014, Bureau of Meteorology (ABN 92 637 533 532) | [Disclaimer](#) | [Privacy](#) | [Accessibility](#)