



Pacific Ocean expected to warm

Issued on Tuesday 25 February 2014 | Product Code IDCKGEW00

The El Niño–Southern Oscillation (ENSO) remains neutral – neither El Niño nor La Niña. However, warming of the tropical Pacific Ocean is likely in the coming months, with international climate models surveyed by the Bureau showing Pacific Ocean temperatures approaching or exceeding El Niño thresholds in the austral winter. Model outlooks that span autumn tend to have lower skill than outlooks made at other times of the year, and hence should be used cautiously in isolation.

Recent observations add weight to the model outlooks. The tropical Pacific Ocean subsurface has warmed substantially in recent weeks, which is likely to result in a warming of the ocean surface in the coming months. A strong burst of westerly wind occurring now over the far western tropical Pacific, may cause further warming of the subsurface in the coming weeks.

The Indian Ocean Dipole (IOD) typically has little influence on the Australian climate from December to April. Current model outlooks suggest neutral IOD conditions for late autumn into early winter. The risk of a positive IOD event occurring is elevated during El Niño events.

Next update expected on Tuesday 11 March 2014 | [print version](#)

Further Details

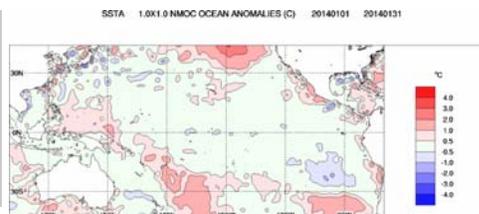
Sea Surface Temperatures

Monthly sea surface temperatures:

The sea surface temperature (SST) anomaly map for January shows SSTs are near average along most of the equatorial Pacific. Weak cool anomalies remain in the far eastern Pacific south of the equator between around 10°S and 30°S, while weak warm anomalies persist across the South Pacific Convergence Zone (SPCZ) in the southwest of the Pacific Ocean. Waters surrounding Australia were generally close to average temperature in the north and east and warmer than average in the south and west during January.

Index	December	January	Temperature change
NINO3	+0.1	-0.2	0.3 °C cooler
NINO3.4	+0.1	-0.3	0.4 °C cooler
NINO4	+0.3	0.0	0.3 °C cooler

Baseline period 1961–1990.

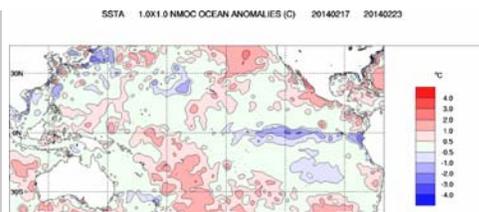


Weekly sea surface temperatures:

SST anomalies in the eastern tropical Pacific have cooled compared to two weeks ago. The anomaly map for the week ending 23 February shows cooler than average water along the equator east of 150°W while weak warm anomalies remain over much of the tropical Pacific west of the Date Line and north of the Maritime Continent. The warm anomalies around the SPCZ have strengthened slightly over the past fortnight. Around southern and eastern Australia surface waters remain warmer than average, as has been the case for several months.

Index	Previous	Current	Temperature change (2 weeks)
NINO3	-0.5	-0.6	0.1 °C cooler
NINO3.4	-0.4	-0.4	no change
NINO4	+0.3	+0.4	0.1 °C warmer

Baseline period 1961–1990.

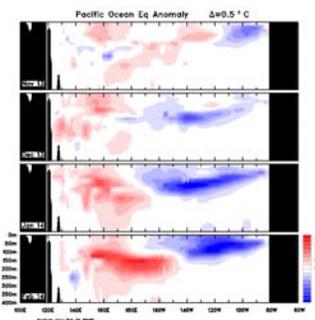


[An animation of recent SST changes](#) | [Weekly data graph](#) | [Map of NINO regions](#)

Pacific ocean sub-surface temperatures

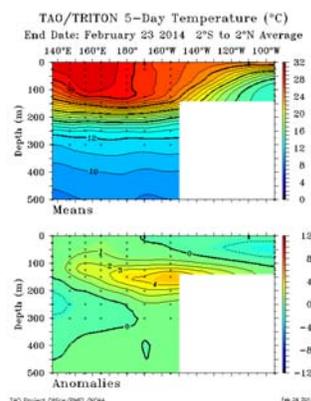
Monthly sub-surface:

The four-month sequence of sub-surface temperature anomalies (to 24 February) shows a recent warming of the sub-surface of the ocean in the western and central Pacific with cooling in the eastern sub-surface. This pattern of cool anomalies in the east and warm anomalies in the west has been generally similar for many months, but has strengthened significantly over the past three months. Water in an area of the eastern equatorial Pacific Ocean sub-surface between 120°W and 100°W at around 100 m depth is more than 4 °C cooler than average; warm anomalies in the western Pacific are weaker, reaching 3 °C at around 150 m depth around the Date Line.



Weekly sub-surface:

The sub-surface map for the 5 days ending 24 February shows a large area of warmer than average water in the sub-surface of the equatorial Pacific, reaching more than 4 °C above than average at around 150 m depth in the central Pacific. The [animation of sub-surface temperatures over recent weeks](#) shows the development and progression of this pool of warmer-than-average water across the Pacific. This warming of the sub-surface has occurred as a result of strong westerly wind anomalies over the western tropical Pacific in recent weeks.



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

Southern Oscillation Index:

The Southern Oscillation Index (SOI) has continued to drop over the past two weeks as was expected. The latest approximate 30-day SOI value to 23 February is +2.6, well within the neutral range.

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.

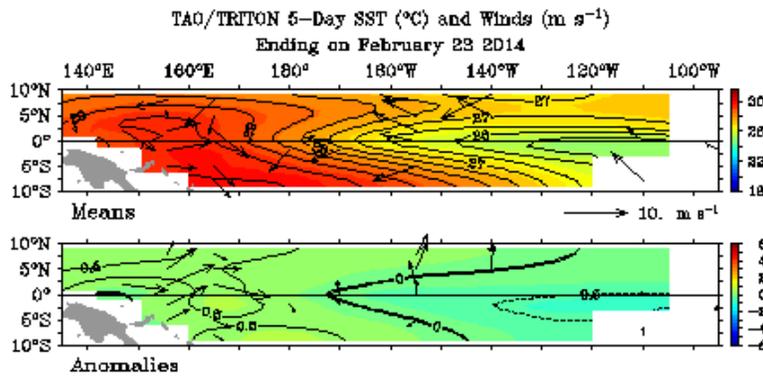


[Monthly graph](#) | [SOI table](#) | [SOI text](#)

Trade winds:

Strong westerly wind anomalies are present in the tropical Pacific west of the Date Line while trade winds are near-average along in the eastern half of the tropical Pacific (see anomaly map for the 5 days ending 23 February). This is the second strong westerly wind burst this year, with the first occurring between 19 and 30 January.

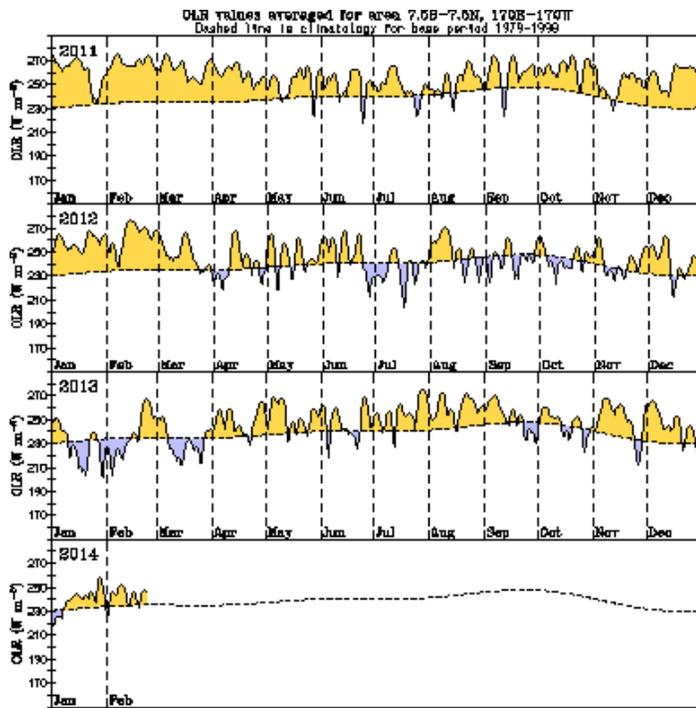
During La Niña events, there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño events there is a sustained weakening of the trade winds.



Cloudiness near the Date Line:

Cloudiness near the Date Line has generally been slightly below average since early January and remained so over the past two weeks.

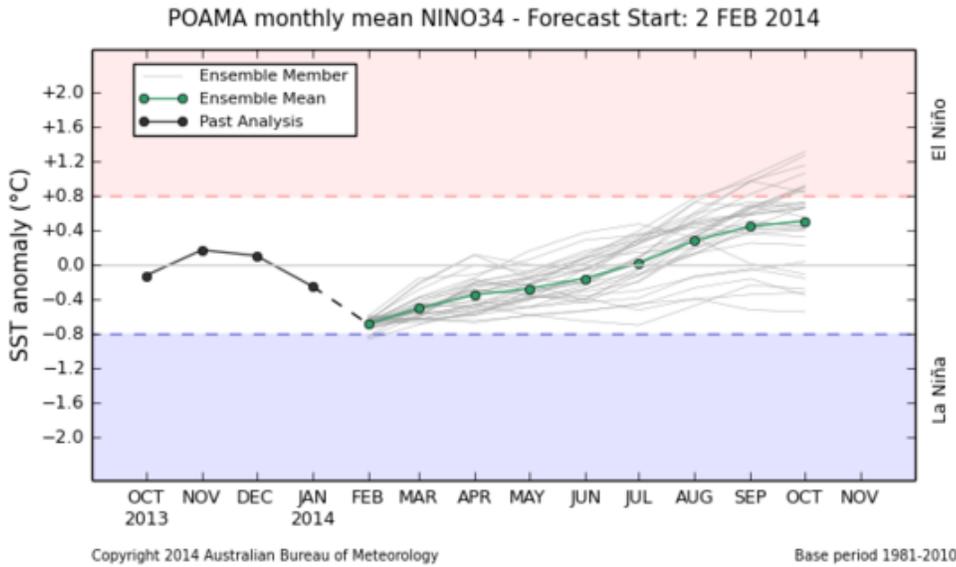
Cloudiness along the equator, near the Date Line, is an important indicator of ENSO conditions, as it typically increases (negative Outgoing Long-wave Radiation (OLR) anomalies) near and to the east of the Date Line during an El Niño event and decreases (positive OLR anomalies) during a La Niña event.



Climate Models:

The majority of international [climate models](#) surveyed by the Bureau indicate that SSTs in the equatorial Pacific Ocean are likely to slowly warm, although remaining in the ENSO-neutral range until at least the end of autumn. Some models suggest this warming may approach or exceed El Niño thresholds during winter.

The predictability of El Niño or La Niña conditions for the period extending through and beyond autumn is lower than for forecasts made at other times of the year (known as “the autumn predictability barrier”). Long-range model outlooks should be used cautiously at this time.

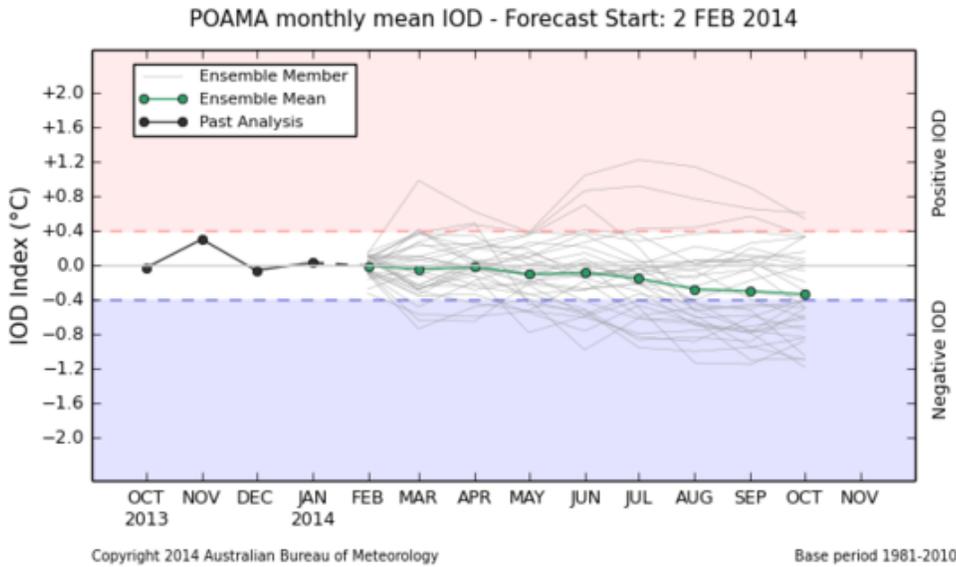


[NINO3.4 timeseries](#) [NINO3.4 values](#) [Map of NINO regions](#) [NINO3.4 forecasts \(POAMA\)](#)

Indian Ocean Dipole:

The Indian Ocean Dipole (IOD) remains neutral, with the latest weekly index value (23 February) -0.1 °C.

The IOD is typically not an active influence on Australian climate during summer and early autumn. 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.



[IOD timeseries](#) [DMI values](#) [Map of IOD regions](#) [IOD forecasts \(POAMA\)](#)

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