

Climate and oceanographic summary for the Great Australian Bight

Kirsten Rough - 21st October 2012

Following the “Review of Fishing, Weather and Oceanography in the Great Australian Bight (GAB) Presentation” to the Executive Committee (11th October 2012); updates of sea surface temperature, ocean currents, chlorophyll distribution and climate status will be provided weekly.

Summary:

A) Comparing a snapshot of the Sea Surface Temperatures (SST) of the 1st September 2011 and 2012 both show the Leeuwin Current (LC) rounding Cape Leeuwin, the southwest corner of WA (**Figure 1**).

Sept 2011 shows a strong Leeuwin Current (LC) rounding Cape Leeuwin, the southwest corner of WA progressing into the GAB; prevailing SST in GAB already warmer than previous years (by 2+ degrees), and there is a large pool of hot water west of WA.

Sept 2012 the LC energy appears to break-up in eddies south of WA and prevailing SST within GAB similar to many other years. Also no pool of hot water west of WA.

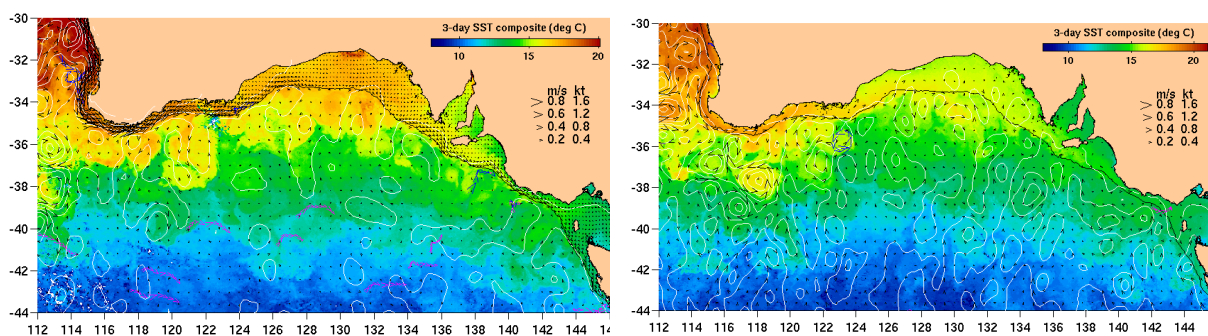


Figure 1: Sea surface temperature 1st September 2011 (on left) and 1st September 2012 (on right).

B) Through this past week SST on the fishing grounds continues to hover around 17-18°C.

C) Areas of productivity (chlorophyll a) are becoming obvious along the coastal fringe of the GAB and well south of the GAB, and also south of WA.

D) Climate Status globally – the Southern Oscillation Index (SOI) remains positive indicating that the warm water mass of the Pacific Ocean persists on the Australian side, but importantly not directly adjacent to Australia’s coast as was the case coming into the last fishing season. This coming fishing season will be in the neutral phase of this climate cycle (i.e. not El Niño and not La Niña).

Local Sea Temperature and Currents:

There are three terrific free websites for monitoring these. All three obtain information from the same satellite source, but each presents the data in different formats (eg. colour and scale). Also the ability to look at temperature at an actual position, and historically through time varies between these websites. Snapshots from each of these websites for the 20th to 22nd October appear below (Figure 2, Figure 3, Figure 4), with websites in the caption text (I can help with navigating and establishing web-link shortcuts). The Ocean Current (IMOS) images (Figure 4) will be the one routinely included in subsequent updates.

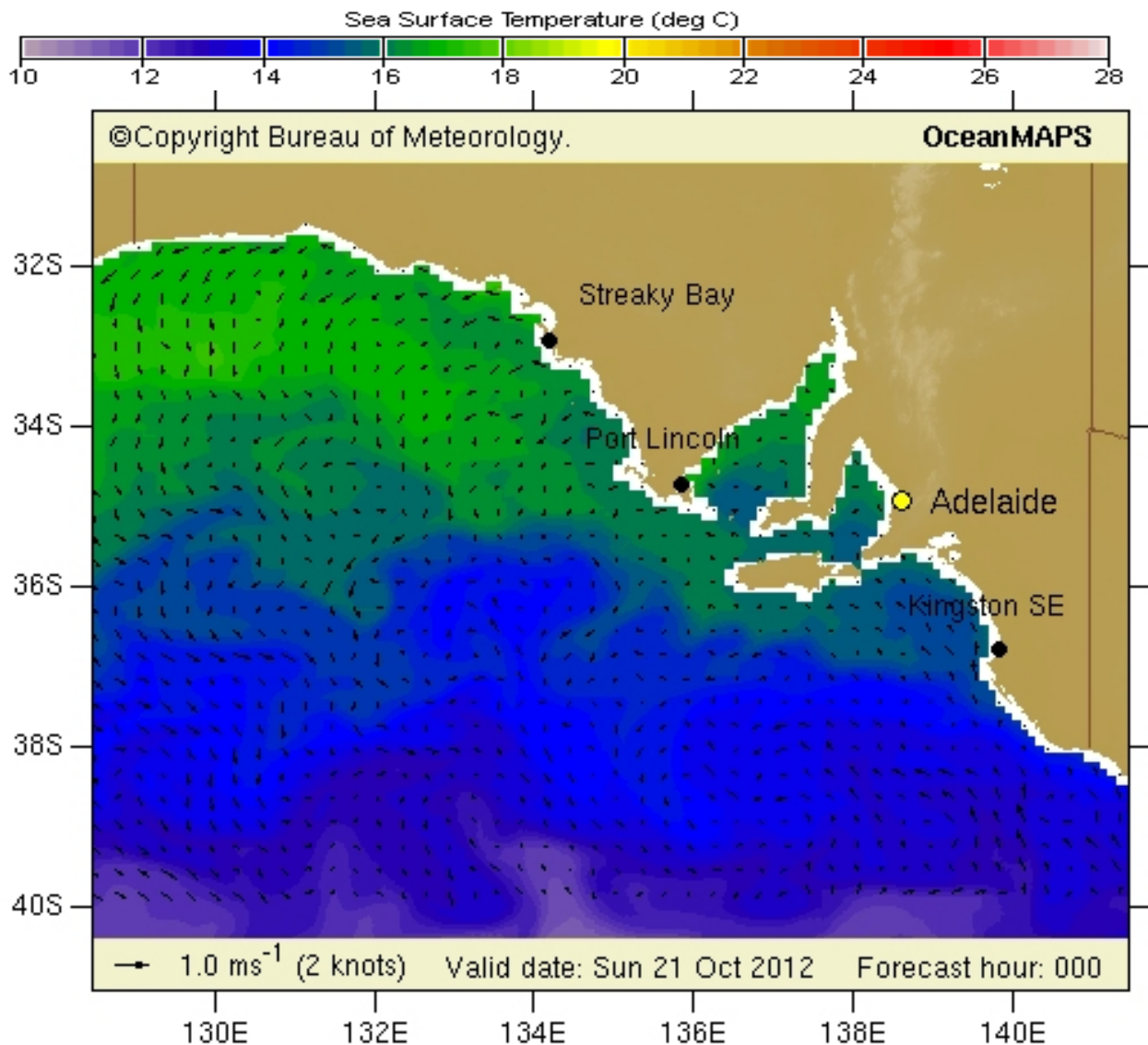
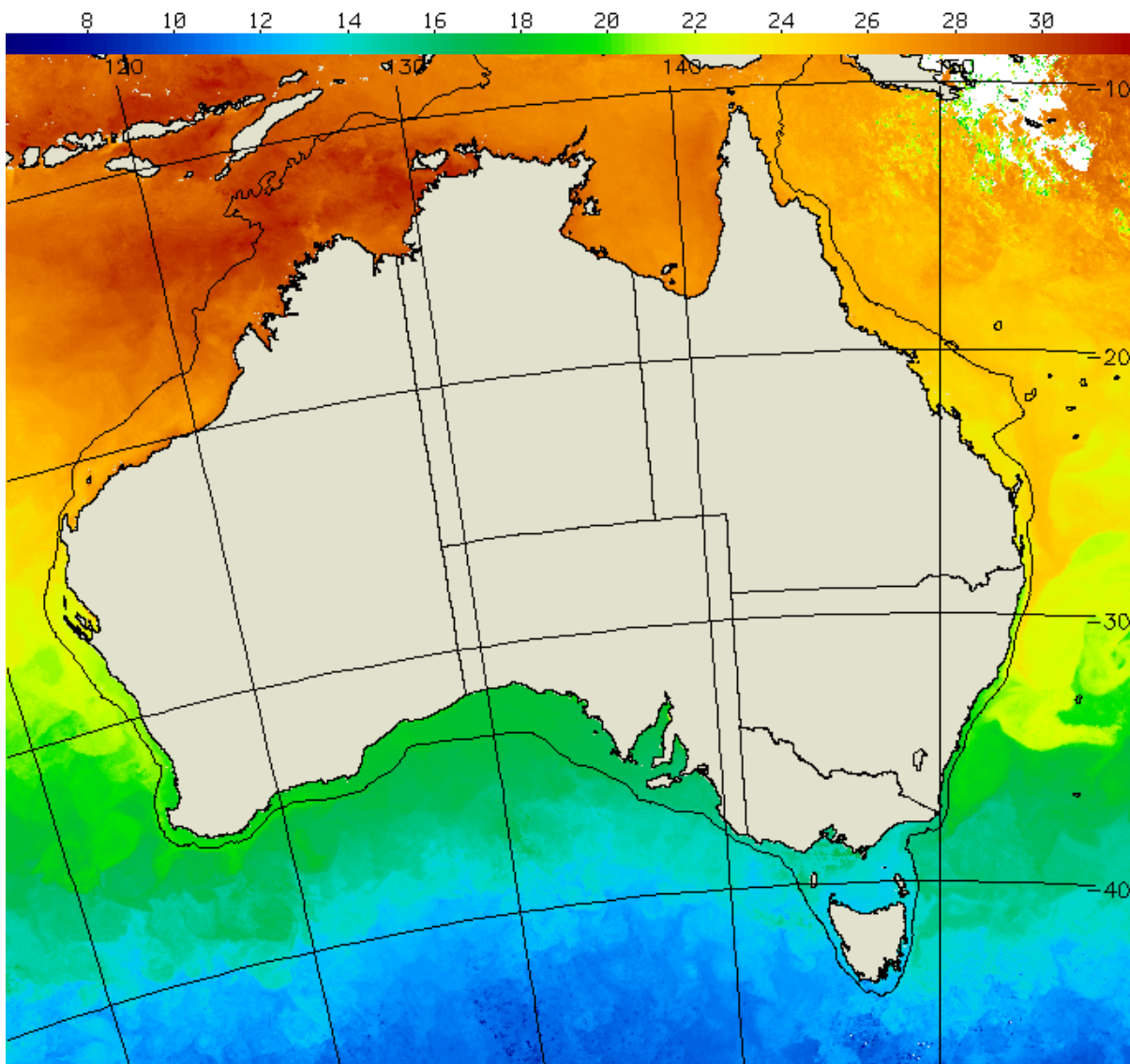


Figure 2: South Australian sea surface temperature from the Bureau of Meteorology website for the 3 days to 21st October 2012 (source: <http://www.bom.gov.au>).



Mean SST from 16/10/2012 to 21/10/2012
Copyright 2012, CSIRO MAR, Hobart

Figure 3: Sea surface temperature around Australia from the CSIRO website for the 6 days to 21st October 2012 (source: <http://www.csiro.au>)

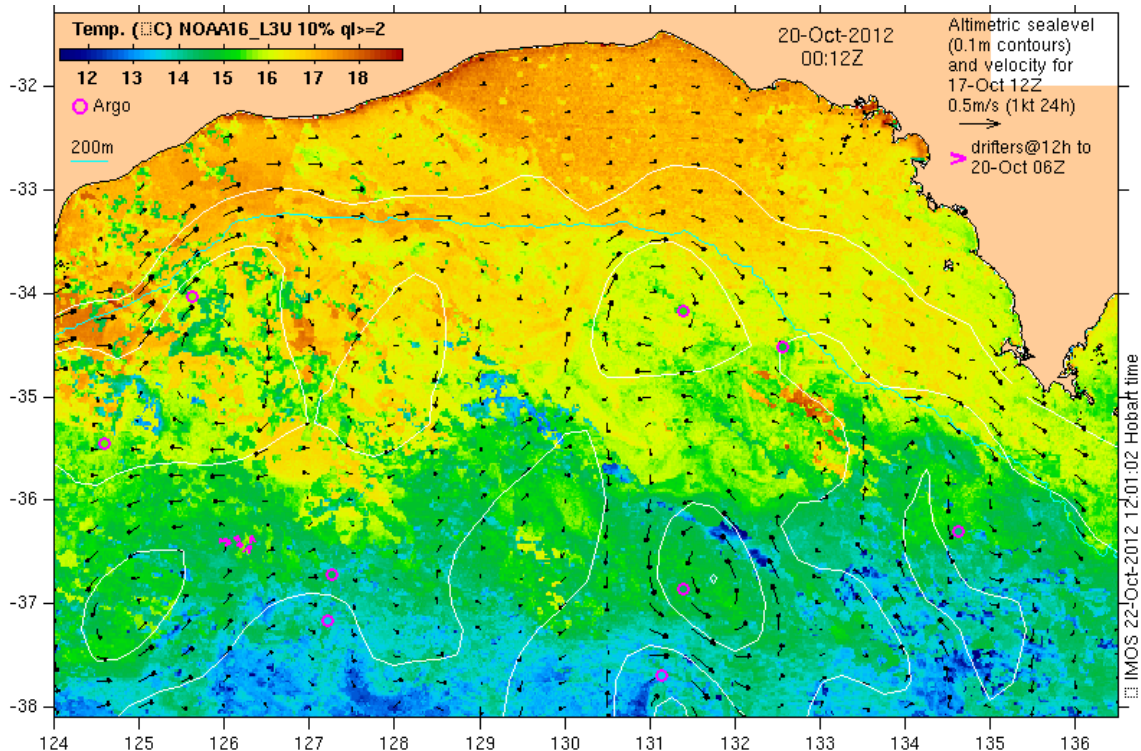


Figure 4: Sea surface temperature and currents from the IMOS ocean current website, this is updated several times per day and can be checked for images dating from 1993 (source: <http://www.oceancurrent.imos.org.au>)

Areas of Productivity:

Satellite images of the distribution of chlorophyll a give an indication of where food webs are enriched. These patches are often (but not always) associated with prey items that are desirable to SBT. Areas of increased productivity are becoming defined along the coastal fringe of the GAB, and well to the south of the GAB. Another patch is becoming apparent south of WA (Figure 5).

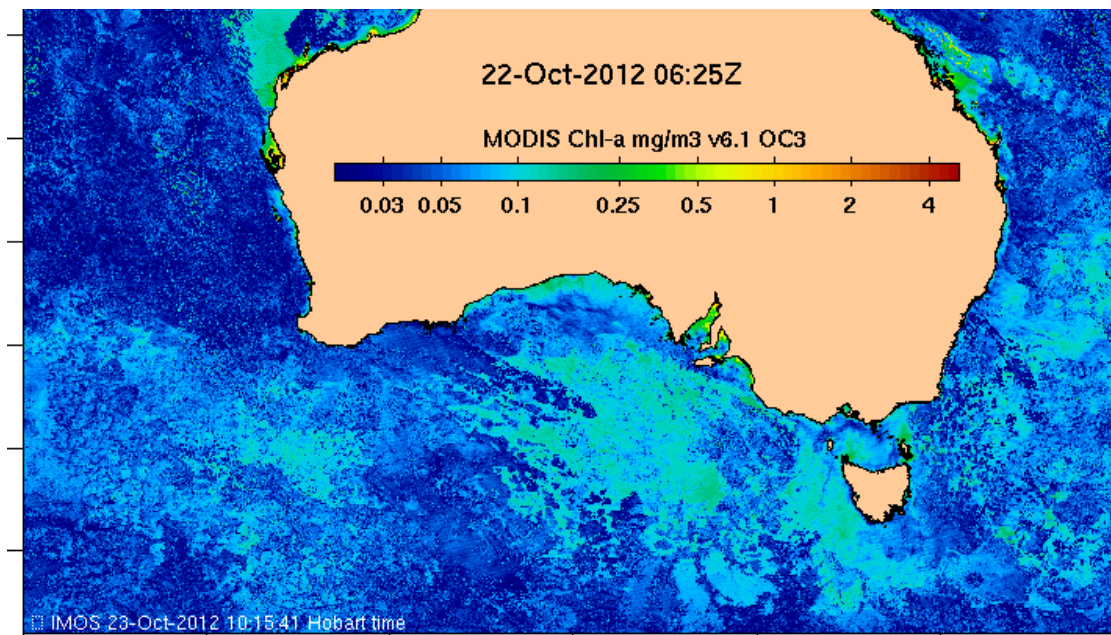


Figure 5: Image showing areas of productivity (chlorophyll a) on the 22nd October 2012 (source: <http://www.oceancurrent.imos.org.au>)

Global Sea Temperature:

A snapshot for September 2012 of the actual sea surface temperatures (SST) across all oceans of the world can be seen in Figure 6. Of particular relevance to us is the fact that the hot water masses of both the Indian and Pacific Oceans are well north of northern Australia. Anomalies (higher or lower than long term average) of SST of the Indian and Pacific Oceans through September can be seen in Figure 7. This shows that pools of warmer than usual water ($+1^{\circ}\text{C}$) are apparent to the west of Western Australia (in the eastern sector of the Indian Ocean), and to the northeast of Queensland (in the western sector of the Pacific Ocean). These anomalies are not located where the Leeuwin Current originates; and therefore unlikely to influence the 2013 season. However they do persist in the general vicinity of Australia and will require monitoring through 2013 to assess potential influence through the 2014 season.

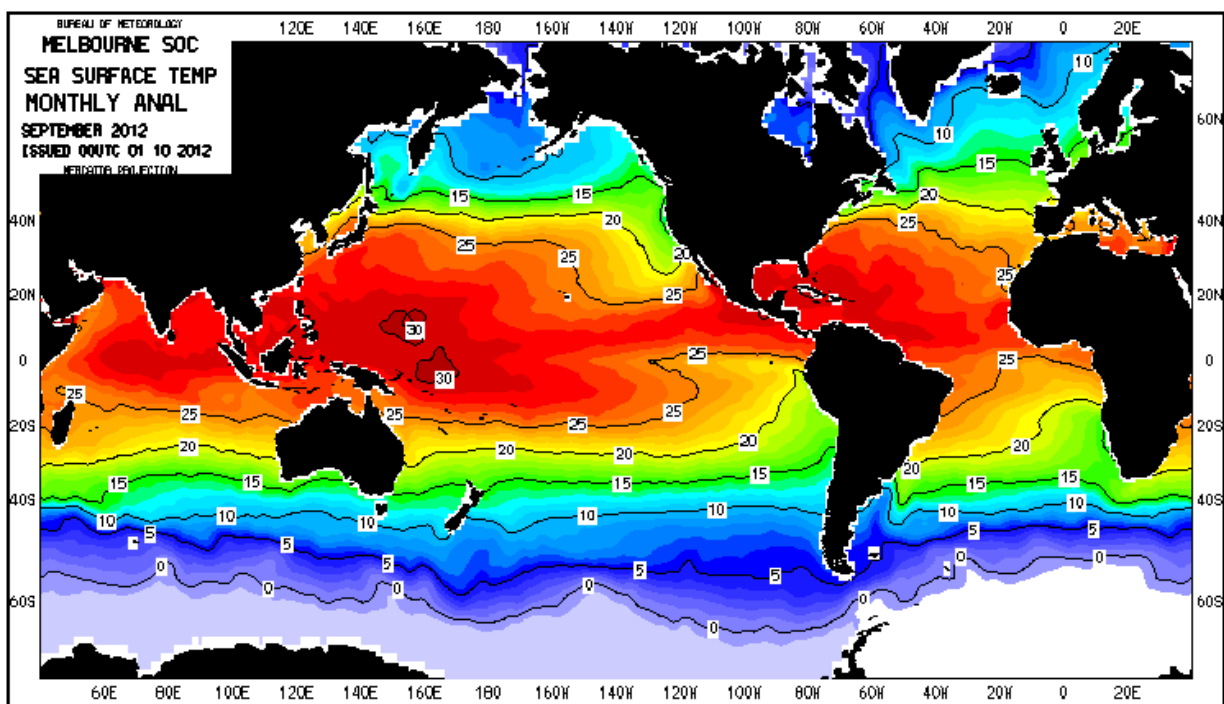


Figure 6: Global sea surface temperature September 2012 (source Bureau of Meteorology web site October 2012).

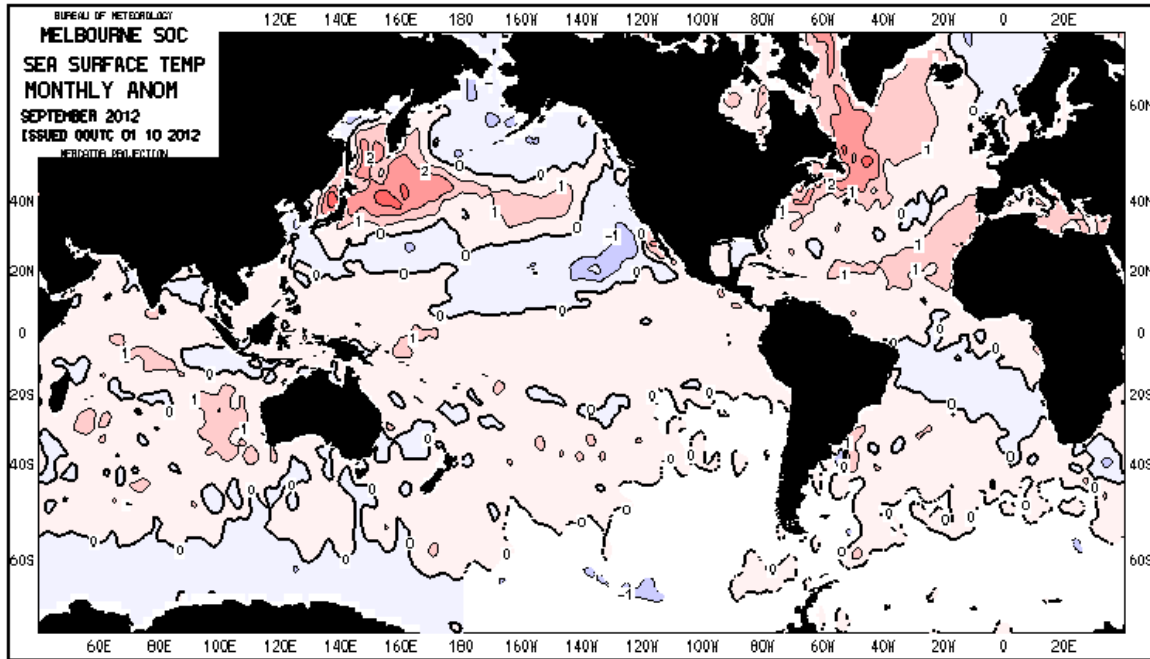


Figure 7: Global sea surface temperature anomaly September 2012 (source Bureau of Meteorology web site October 2012).

The Southern Oscillation Index (SOI) is a measure of the climate phases El Niño and La Niña calculated from SST at various locations across the Pacific Ocean. El Niño (the negative phase, lower than minus 8 for 5 consecutive months) influences the upwelling of cold water along the west coast of Eyre Peninsula (eastern GAB). La Niña (the positive phase, greater than +8 for 5 consecutive months) influences the strength and temperature of the Leeuwin Current. The SOI can be monitored on the Bureau of Meteorology website <http://www.bom.gov.au>; monthly values for 2011 and 2012 are shown in Table 1. The positive readings indicate the hot water is located towards the Australian side of the Pacific Ocean.

Table 1: Monthly values of the Southern Oscillation Index for 2011 and 2012 to date. Note that values need to exceed +8 for 5 consecutive months for this climate system to be declared a “La Niña”; and be lower than -8 for 5 consecutive months for this climate system to be declared an “El Niño”.

DATE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	+19.9	+22.3	+21.4	+25.1	+2.1	+0.2	+10.7	+2.1	+11.7	+7.3	+13.8	+23.0
2012	+9.4	+2.5	+2.9	-7.1	-2.7	-10.4	-1.7	-5.0	+2.7			

Note: the shift between plus and minus throughout autumn and winter of 2012 is typical of a “neutral phase”.

ASBTIA – Research Office

Unit 12 / 6 South Quay Boulevard

Port Lincoln SA 5606

Email: SBT_Research@bigpond.com

