

Climate and Oceanographic Summary, Great Australian Bight 2014 - 25

Kirsten Rough – 24th March 2014

Summary:

The upwelling continues to influence water temperatures with conditions cooler along the inshore regions of the GAB with temperatures between 18 to 19°C. Along the shelf-break water temperatures remain suitable for SBT anywhere westwards of longitude 135°E, although these temperatures are probably on the cooler side of what the fish prefer.

Actual Sea Surface Temperature (SST) this past week:

- Western GAB at 130°E 33°30'S is 20.4°C
- Central GAB at 133°E 34°S is 20.1°C
- Eastern GAB at 135°E 35°S is 19.6°C

CSIRO Aerial Survey SBT sightings from 1st January 2014 to date (24th Mar) tonnage per longitude:

128°	129°	130°	131°	132°	133°	134°
156 tonnes	1365 tonnes	1316 tonnes	3015 tonnes	9839 tonnes	2670 tonnes	5217 tonnes

Climate projections for 2015 fishing season:

The Pacific Ocean system continues to intensify in a pattern increasing the likelihood of an El Niño phase into the next fishing season. If these climate projections continue to follow the forecasted predications, the 2015-fishing season is likely to be back towards the more traditional fishing area. Follow the long-term forecasts through the Bureau of Meteorology or specifically conditions in the Bight coming into the next fishing season on the SBT Habitat Forecasting website:

<http://www.cmar.csiro.au/gab-forecasts/index.html>

GAB Sea Surface Temperature (SST):

Sea temperatures around Australia and through the Great Australian Bight are shown in Figure 1 and Figure 2. The coastal fringe remains cool as upwelling continues to influence water temperatures. The cool water from upwelling continues to extend along the coast to longitude 133°48'E. Water temperatures remain suitable for SBT along the shelf break to longitude 135°E.

Table 1: Sea Surface Temperatures at specific locations along the shelf and shelf break of the Great Australian Bight on the 23rd March 2014, co-ordinates as degrees, minutes, seconds (CSIRO 2014).

130°E 33°30'S is 20.4°C	131°E 32°S is 20.4°C	131°E 33°S is 20.4°C	132°E 33°30'S is 20.6°C
133°E 34°S is 20.1°C	134°E 34°30'S is 20.1°C	135°E 35°S is 19.6°C	136°E 35°30'S is 19.3°C
136°30'E 36°30'S is 18.8°C	137°E 36°30'S is 18.8°C	138°E 37S is 18.4°C	139°E 37S is 18.0°C

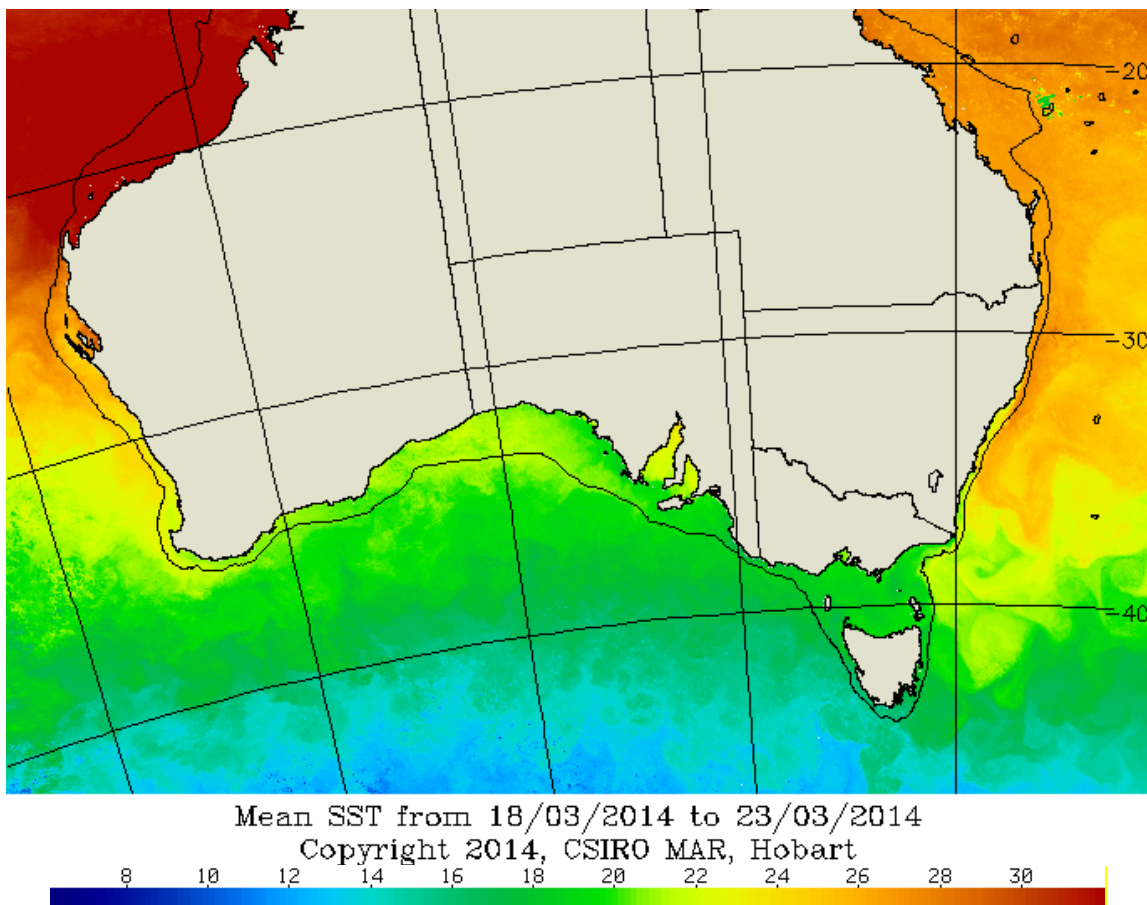


Figure 1: Sea Surface Temperature across southern Australia for the 5-days to the 23rd March 2014 (source: CSIRO 2014).

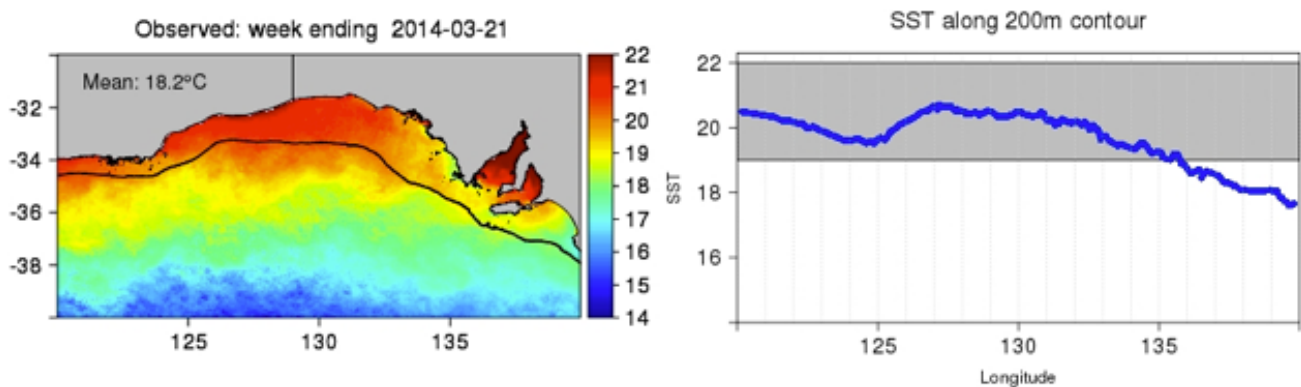


Figure 2: Snapshot of GAB water temperatures for the previous week (left) and corresponding graph of Sea Surface Temperature along the shelf break (right). Where the blue dotted line is within the gray band, conditions are within the range that archival tags suggest SBT prefer (source: CSIRO-ASBTIA TRF project web site 2014).

SA Water Currents and Tide Times:

Local tide times for the next week in the SBT ranching lease area are shown in table 2.

Table 2: Tide times for Port Lincoln for the next 2 weeks (local daylight savings time). Note that Taylors Landing and Reevesby Island tides are 20-28 minutes behind Lincoln tides, so minus this to make these more representative of the Tuna Lease Zone.

TUE 25 MAR		WED 26 MAR		THU 27 MAR		FRI 28 MAR		SAT 29 MAR		SUN 30 MAR		MON 31 MAR	
LOW	10:00 am 0.41 m	LOW	8:47 am 0.40 m	HIGH	1:02 am 1.16 m	HIGH	1:53 am 1.25 m	HIGH	2:28 am 1.29 m	HIGH	2:57 am 1.28 m	HIGH	3:22 am 1.24 m
HIGH	6:51 pm 1.06 m	HIGH	6:34 pm 0.87 m	LOW	8:28 am 0.36 m	LOW	8:37 am 0.32 m	LOW	8:53 am 0.30 m	LOW	9:08 am 0.28 m	LOW	9:22 am 0.27 m
LOW	8:37 pm 1.03 m	LOW	7:33 pm 0.87 m	HIGH	2:56 pm 0.90 m	HIGH	2:51 pm 1.02 m	HIGH	3:01 pm 1.15 m	HIGH	3:15 pm 1.28 m	HIGH	3:29 pm 1.40 m
HIGH	10:50 pm 1.06 m			LOW	7:59 pm 0.67 m	LOW	8:29 pm 0.51 m	LOW	8:56 pm 0.38 m	LOW	9:23 pm 0.29 m	LOW	9:49 pm 0.25 m

TUE 1 APR		WED 2 APR		THU 3 APR		FRI 4 APR		SAT 5 APR		SUN 6 APR		MON 7 APR	
HIGH	3:40 am 1.18 m	HIGH	3:54 am 1.12 m	HIGH	4:09 am 1.07 m	HIGH	4:27 am 1.03 m	HIGH	4:48 am 0.98 m	HIGH	4:07 am 0.92 m	HIGH	4:18 am 0.84 m
LOW	9:36 am 0.25 m	LOW	9:46 am 0.22 m	LOW	9:55 am 0.20 m	LOW	10:09 am 0.20 m	LOW	10:27 am 0.23 m	LOW	9:43 am 0.31 m	LOW	9:47 am 0.42 m
HIGH	3:43 pm 1.50 m	HIGH	4:00 pm 1.57 m	HIGH	4:22 pm 1.60 m	HIGH	4:47 pm 1.58 m	HIGH	5:13 pm 1.51 m	HIGH	4:39 pm 1.41 m	HIGH	5:03 pm 1.27 m
LOW	10:14 pm 0.26 m	LOW	10:37 pm 0.30 m	LOW	10:59 pm 0.36 m	LOW	11:21 pm 0.44 m	LOW	11:47 pm 0.52 m	LOW	11:17 pm 0.62 m	LOW	11:55 pm 0.73 m

Chlorophyll and Productivity:

The best image of the past week was taken on the 19th March (**Figure 3**), this was the clear day preceding the last flying day of the Aerial Survey. SBT sightings were abundant through the paler turquoise area. Chlorophyll levels are generally higher along the coastal fringe and particularly along the areas being fed by the recent upwelling.

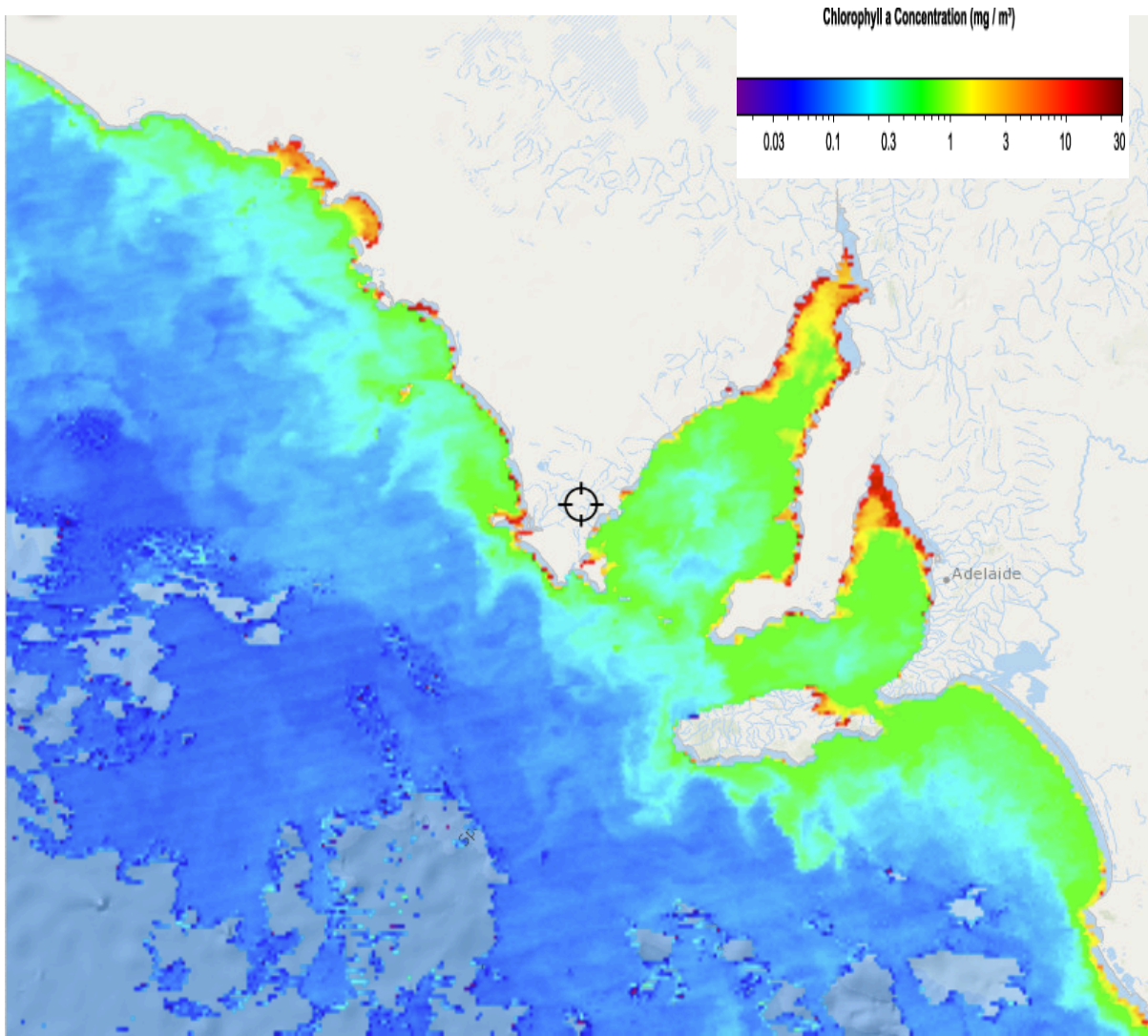


Figure 3: Areas of productivity around Eyre Peninsula on the 19th March 2014 - note gray areas denote cloud cover (Fish Track 2014).

Climate / Ocean Trends:

As mentioned in the last update - over the past few weeks a very large mass of warm water ($>5^{\circ}\text{C}$ higher than that of the surrounding water) has been consolidating at 100m-depth in the Pacific Ocean. If this warm water reaches the surface, 2015 will be either directly under the influence or off-the-back of a strong El Niño event.

The picture below shows this 'blob' of unusually warm water currently centred at around 150m-depth to the north east of Australia. Over the past few weeks this has increased in size and temperature and is moving further away from Australia.

The 2010-fishing season is the most recent that was under a moderate El Niño influence. For SBT in the GAB this is likely to mean a shift back to the more traditional fishing area historically (ie in the central GAB around longitudes 132-133).

I will continue to track this system through the winter, but please also note that this is a climate system that is written into the TRF habitat forecasting model and therefore the influence it will have on sea temperature distribution in the GAB can be seen on the website

<http://www.cmar.csiro.au/gab-forecasts/index.html>

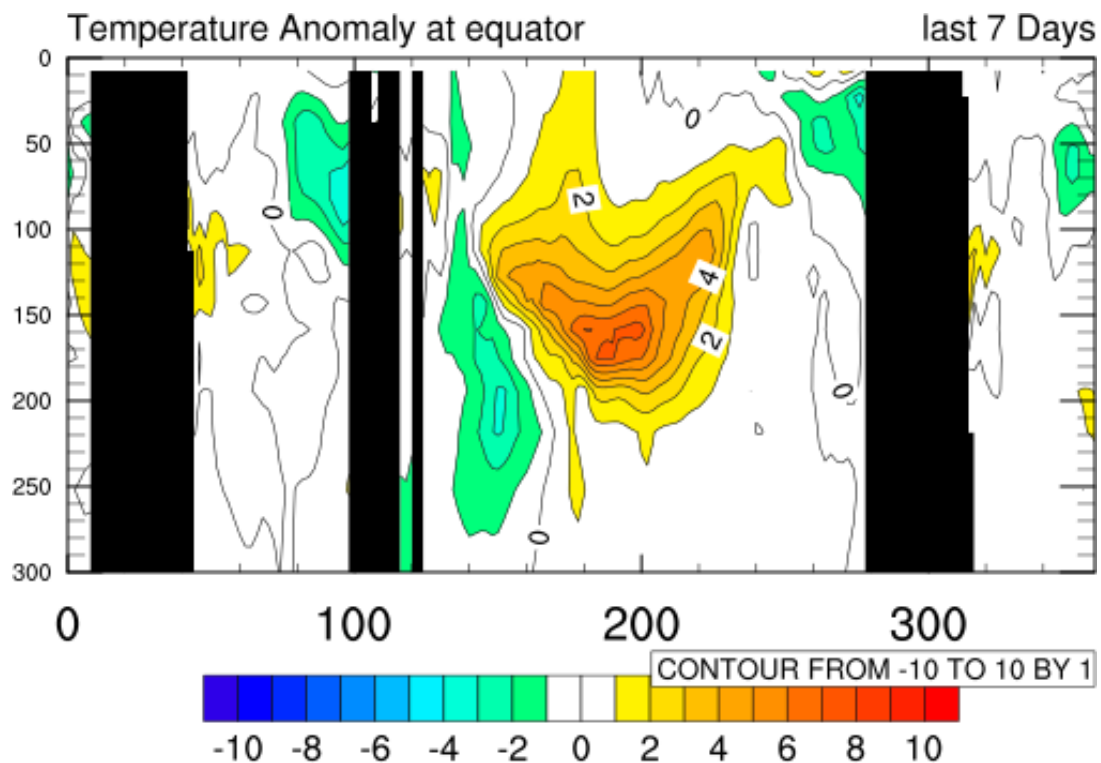


Figure 4: Water temperature anomaly at depth along the equator around the world. the yellow to orange coloured area featured is in the Pacific Ocean. The scale on the left is depth from the ocean surface; the scale on the bottom is longitude where zero is the start point in the Atlantic Ocean. Black areas are landmasses, on the left is Africa, the middle is above Australia, and the one on the right is America (source: Bureau of Meteorology 2014)

Useful Websites:

<http://www.bom.gov.au>
<http://www.csiro.au>
<http://www.fishtrack.com>
<http://imos.org.au>

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