Climate and Oceanographic Summary, Great Australian Bight 2018 - 8

Kirsten Rough – 23rd January 2018

Summary:

The GAB continues to warm progressively at the sea surface and along the sea floor. Conditions are highly suited to SBT over a very wide area.

Longer-term forecasts indicate this situation will continue well into the start of March, with best conditions retracting in area from mid to late March. Cabbage patch and Rocky Island areas are likely to remain suitable at that time.

Upwelling continues to be a prominent feature on satellite images and is leading to marked differences between water temperatures at the sea surface and the sea floor, especially below Eyre Peninsula.

Chlorophyll levels remain ideal for SBT across a very wide area of the GAB with a bit of dirtier water west of Streaky Bay and in areas with upwelling.

There will be no seismic survey vessels operating in the GAB this fishing season. Consultations are ongoing to get a workable outcome for seismic operations in the eastern GAB through the 2019-fishing season.

Forecast Sea Surface Temperature (SST) and SBT Habitat:

Conditions continue to warm over a broad area; the current habitat distribution is shown in Figure 1, and updated **Longer-term forecasts** of conditions in the GAB Figure 2. As indicate areas holding fish now will continue to do so throughout February and early March. Forecasts are still indicating that the area below and west of Kangaroo Island will start cooling from late-March and into April, though the Cabbage Patch and Rocky Island areas look to remain highly suited to SBT. So pretty much a "historically normal" season, with the only notable difference being that the conditions are suited to a very wide range of fish sizes over the entire GAB. It is in seasons like this that habitat preferences for different size classes/age classes of SBT would be very helpful for maintaining and improving fishing efficiency. Figure 3 shows how the local situation compares with the global situation of long-term average sea temperatures (1980 to 2010). The eastern GAB and the Tasman Sea are quite a bit warmer than that 30-year average. Other areas of wider interest are the warm patches adjacent to California and Mexico; also the Southeastern Indian Ocean (winter foraging areas for SBT) remains warmer than years past.

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Figure 1: Sea Surface Temperature and SBT Habitat over the past week (CSIRO 2018 - GAB Forecasting Website)



Figure 2: Longer term forecasts of Sea Temperature and SBT habitat issued on 18th January for the 4-week period from late-February (top) and following 4-weeks starting from late-March (bottom) (CSIRO 2018 – GAB Forecasting Website).



Figure 3: Sea surface temperature anomaly across the globe over the past 7-days. This gives an indication of where areas are warmer or cooler than the long-term average (Bureau of Meteorology 2018)

GAB Sea Surface Temperature (SST):

The broader GAB area continues warming with the influence of local weather and warm currents continuing to feed in from the west. Cool water from the Bonney Upwelling remains a prominent feature in the east of the GAB and west coast of Eyre Peninsula (Figure 4). Actual SST along the 200m-depth contour now and for a similar point in time last season, is shown in Figure 5.



Figure 4: Sea Surface Temperature across southern Australia over the past week (CSIRO 2018 - GAB Forecasting Website)



Figure 5: SST satellite image between longitudes 128° to 140°E (left) and corresponding graph of SST along the shelf break (right). Top image is the situation at a comparable point in time last season; bottom image is now (CSIRO 2018 - GAB Forecasting Website)

Fine-scale Sea Surface Temperature and short-term forecasts are shown in Figure 6. These show suitable surface temperatures across a huge area, and that upwelling of cool is becoming very obvious to the west of Kangaroo Island and along inshore areas adjacent to western Eyre Peninsula.





Figure 6: Snapshots of now-cast (today, top) and short-term <u>forecasts of Sea Surface Temperature</u> for the 25th January (bottom). The 18 and 20°C temperature contours are marked by solid black lines, the direction and strength of the water currents are indicated by the black arrows (SARDI-BoM 2018 – eSA Marine website).

The **Sea Floor Temperature** remains cool over much of the GAB area, with upwelling having a significant influence to the west of Kangaroo Island and in the southeast (Figure 7).

Profile snapshots of the temperature situation down through the water column at four locations across the GAB; west to east: Outer Shelf area at longitude 133°54'E; South west of Rocky Island; near the Cabbage Patch and near Young Rocks are shown in Figure 8.



Figure 7: Snapshot of the <u>Sea Floor Temperature</u> at 7:30am today, the 23rd January 2018; the 18 and 20°C temperature contours are marked by solid black lines, the direction and strength of the water currents are indicated by the black arrows (SARDI-BoM 2018 – eSA Marine website).



Figure 8: Water temperature profile from sea surface (0) to sea floor (-xxx) for the previous (black) and future (red) 2days for the Outer Shelf area Central GAB 133°E (top); Rocky Island (second); Cabbage Patch (third); Young Rocks (fourth); and Sanders Banks (bottom) – Please note that the scale bars for depth and temperature vary between each of these images due to variations in the local conditions at each site. Note the stripe on the left is just indicating a recalibration of the temperature scale bar (SARDI-BoM 2018 – eSA Marine website).

SST Western Australia and East Coast:

The recent sea surface temperatures of regions adjacent to Western Australia and the East Coast of Australia are shown in Figure 9.



Chlorophyll / Productivity Levels:

The most recent clear images from this satellite over this past week are shown in Figure 10; once again 2 snapshots are included here to give a view of the entire area. These are showing conditions continue to be highly suited to SBT over much of the GAB, with some dirtier water to the west of Streaky Bay and productivity levels increased in regions experiencing upwelling.





Figure 10: Chlorophyll plots from the Great Australian Bight taken on 17th January 2018, the grey areas have no readings due to cloud cover.

Seismic Survey Update:

There will be NO seismic survey vessels operating through this fishing season. Consultations with the two companies are on going. The most recent developments on timing are that one company has now agreed to delay the starting date by 74 days, meaning the vessel will potentially be on-site in the eastern GAB (operating in deep and shelf waters between longitudes 133° and 136°E) from 15th March 2019.

Relevant Websites:

GAB SBT Habitat Forecasts: <u>http://www.cmar.csiro.au/gab-forecasts/env-observed.html</u> eSA Marine: <u>http://pir.sa.gov.au/research/esa_marine/sarom</u> IMOS ocean monitoring: <u>http://oceancurrent.imos.org.au/index.php</u> Bureau of Meteorology: <u>http://www.bom.gov.au</u>

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