

# Climate and Oceanographic Summary, Great Australian Bight 2019 - 3

Kirsten Rough – 15<sup>th</sup> December 2018

Please find below the latest update for recent and expected conditions for the 2018-fishing season. Please don't hesitate to call or email if there are any questions, contact details and links to the various websites used are listed at the end.

## **Summary:**

The situation continues to look like an-historically typical season, with nothing to indicate an early or a late start, nor fish leaving or moving through the area at an unusually rapid rate.

The broader climate systems continue to indicate a season with an abundance of strong winds. Unfortunately the ocean and air components of these systems have not linked together (as forecast through November) – this means the period of calm between the wind events is likely to remain short. The Bureau of Meteorology updates these forecasts fortnightly, the next one is due on the 18<sup>th</sup> Dec so will be included in the next GAB update.

Upwelling began mid October, and continues to have regular strong pulses of cold water particularly obvious in the sea floor regions of lower and western Eyre Peninsula.

The seismic survey application lodged for the area covering Rocky Island and the Cabbage Patch (in the Duntroon Basin adjacent to Eyre Peninsula) is being assessed over a longer time frame and is now scheduled for a decision by NOPSEMA in early January.

All Commonwealth Marine Parks in the GAB and Kangaroo Island area are now active. This means there are restrictions on where activities can be done - and NO FISHING OR TOWING in Green Zones. A package of maps and class approvals was distributed to all companies through November; please call or email if there are any questions. IES Marine Electronics (Ian Smith) has the data package that loads these maps directly into the GPS.

## **Forecast Sea Surface Temperature and SBT Habitat:**

This year conditions are warming over the broader area at a slower rate compared to what occurred coming into the previous (2018) fishing season but faster than the one before that (Figure 1). In these images the plot on the left shows forecasted sea surface temperature and the plot on the right shows the areas that have conditions suitable for juvenile Southern Bluefin Tuna. Preferred habitat includes areas with a value of one or more (i.e. green to bone colour). Note that the shallow water and low resolution of the current satellite and modeling system mean that these forecasts cannot be displayed for the Sanders and Young Rocks regions.

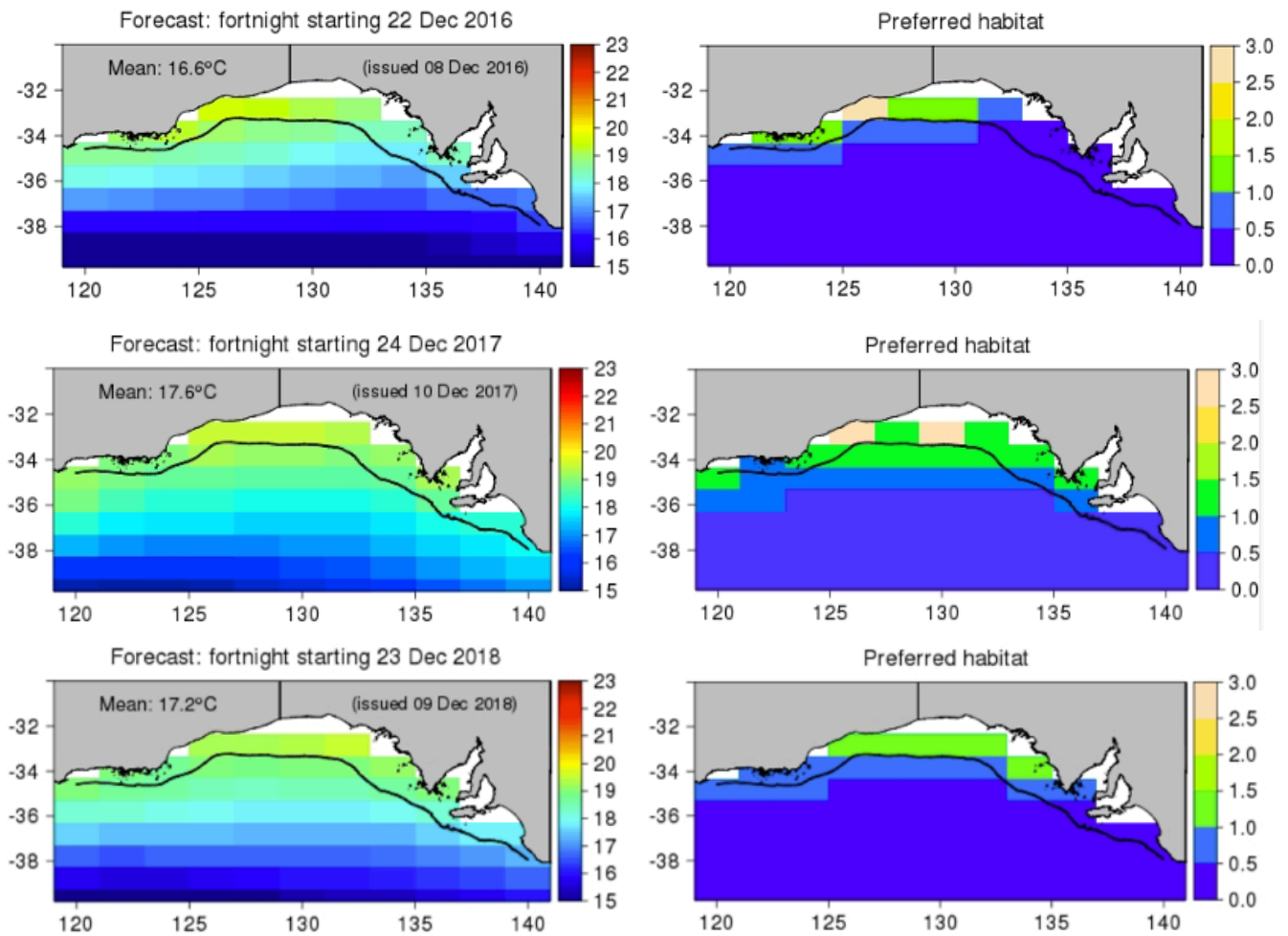


Figure 1: Sea Temperature and SBT Habitat forecasts issued mid December 2016 (top) mid December 2017 (middle) and now 2018 (bottom) (CSIRO 2018 – GAB Forecasting Website).

**Longer-term forecasts** of sea temperature conditions in the GAB through the 2019-fishing season are shown in Figure 2. These are indicating that the sea temperatures this season will be best in those more traditional fishing areas in the central GAB. However, the past 6 seasons have also had sea temperatures highly suited to SBT through historic fishing areas and SBT have not aggregated there. Please continue to do an occasional check of the historic areas – it is important to know how long it takes for an area to recover from the multiple large-scale seismic surveys carried out from 2012 to 2015.

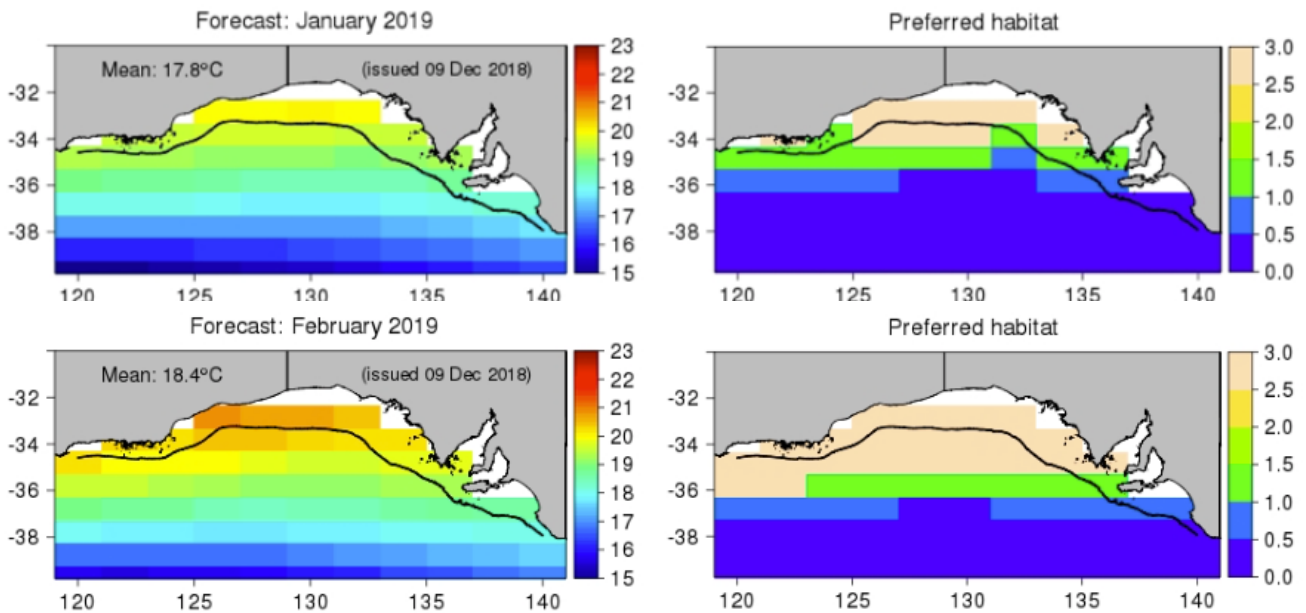


Figure 2: Sea Temperature and SBT habitat forecasts issued mid December for the months of January and February 2019) (CSIRO 2018 – GAB Forecasting Website).

**GAB Sea Surface Temperature (SST):**

The situation across the GAB for the month of November 2018 and the previous 5 years is shown in Figure 3. Through November, the broader region the GAB this year was slightly cooler than most of the recent seasons (except November 2016, coming into the 2017-fishing season).

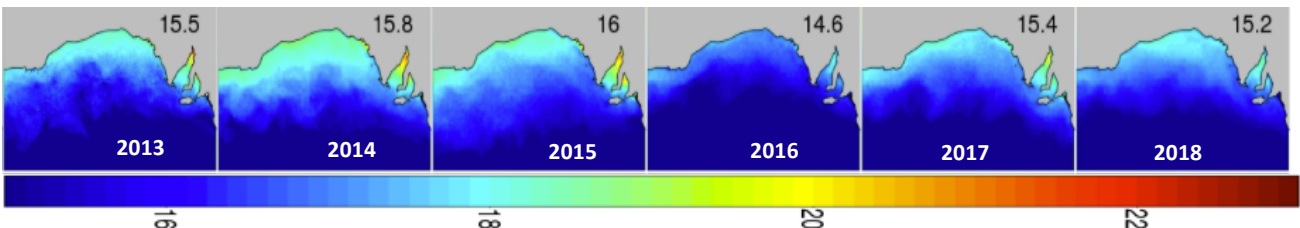


Figure 3: GAB sea surface temperatures for the area from longitude 120 to 140°E, through the month of November for 2018 and the previous 5 years; in these images aqua can contain early entry SBT (CSIRO 2018).

The situation across the broader area of the GAB over the past week is shown in Figure 4, including for the same point in time coming into the 2018-fishing season. The slightly cooler conditions now are probably due to the strength and persistence of the upwelling in the east and the reduced influence of the Leeuwin Current from the west. This year (now), SST along the shelf-break is at or exceeds 18°C from longitude 120 to 133°E (Figure 5). At this time last year the SST along the shelf-break was at or exceeded 18°C from longitude 120 to 138°E.

How the SST conditions of December appeared over the past 6 seasons is shown in Figure 6

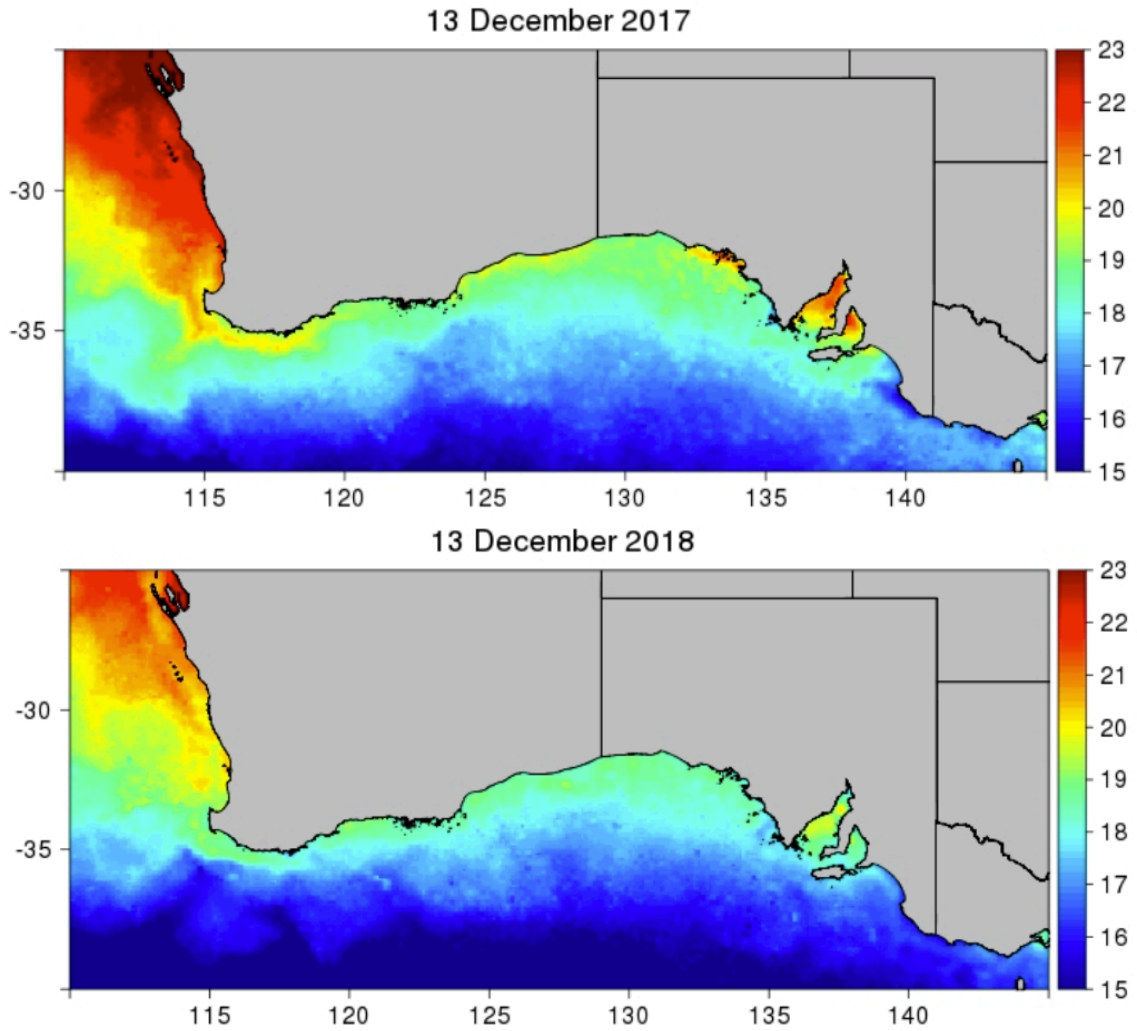


Figure 4: GAB Sea Surface Temperatures mid December 2017 (top) and 2018 (bottom); in these images aqua can contain early entry SBT (CSIRO 2018).

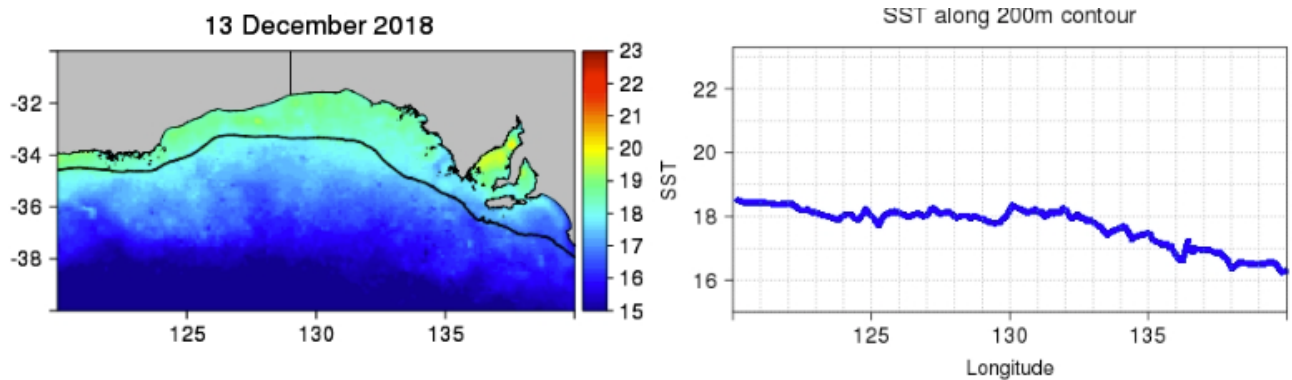


Figure 5: The most recent SST satellite image between longitudes 120° to 140°E (left) and corresponding graph of SST along the shelf break (right) (CSIRO 2018 - GAB Forecasting Website).

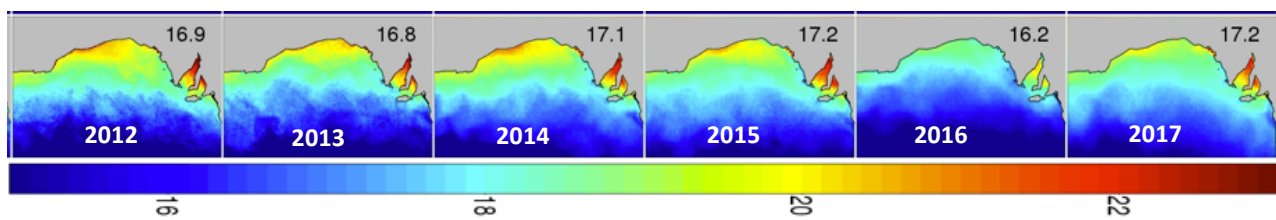


Figure 6: December Sea Surface Temperatures of the GAB area (between longitudes 120 and 140°E) for the previous 6 years (CSIRO 2018 - GAB Forecasting Website).

The most recent fine-scale Sea Surface and Sea Floor Temperatures are shown in Figure 7 and Figure 8; these are clearly showing the influence and extent of the cold upwelling. Water temperature profile snapshots of the situation down through the water column at five locations across the GAB; west to east: Outer Shelf area at longitude approximating 132°E; 134°E south west of Rocky Island; 135°E near the Cabbage Patch, 137°E near Young Rocks and 138°E in the vicinity of Sanders Banks are shown in Figure 9.

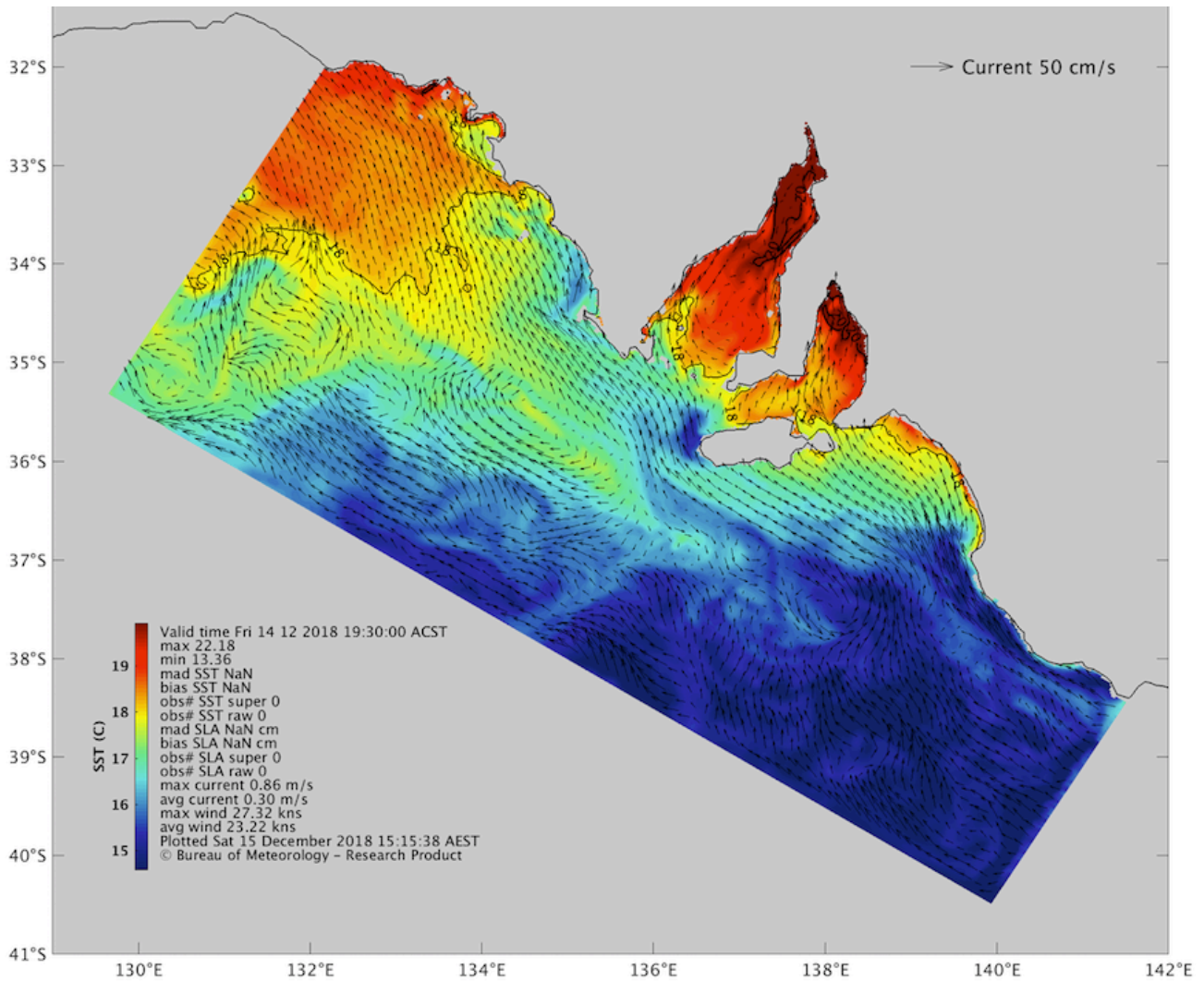


Figure 7: Fine scale SEA SURFACE Temperature and local currents on the 14<sup>th</sup> December 2018 with the 18°C temperature contour marked; please check the colour scale for ACTUAL temperatures (SARDI-BoM 2018)



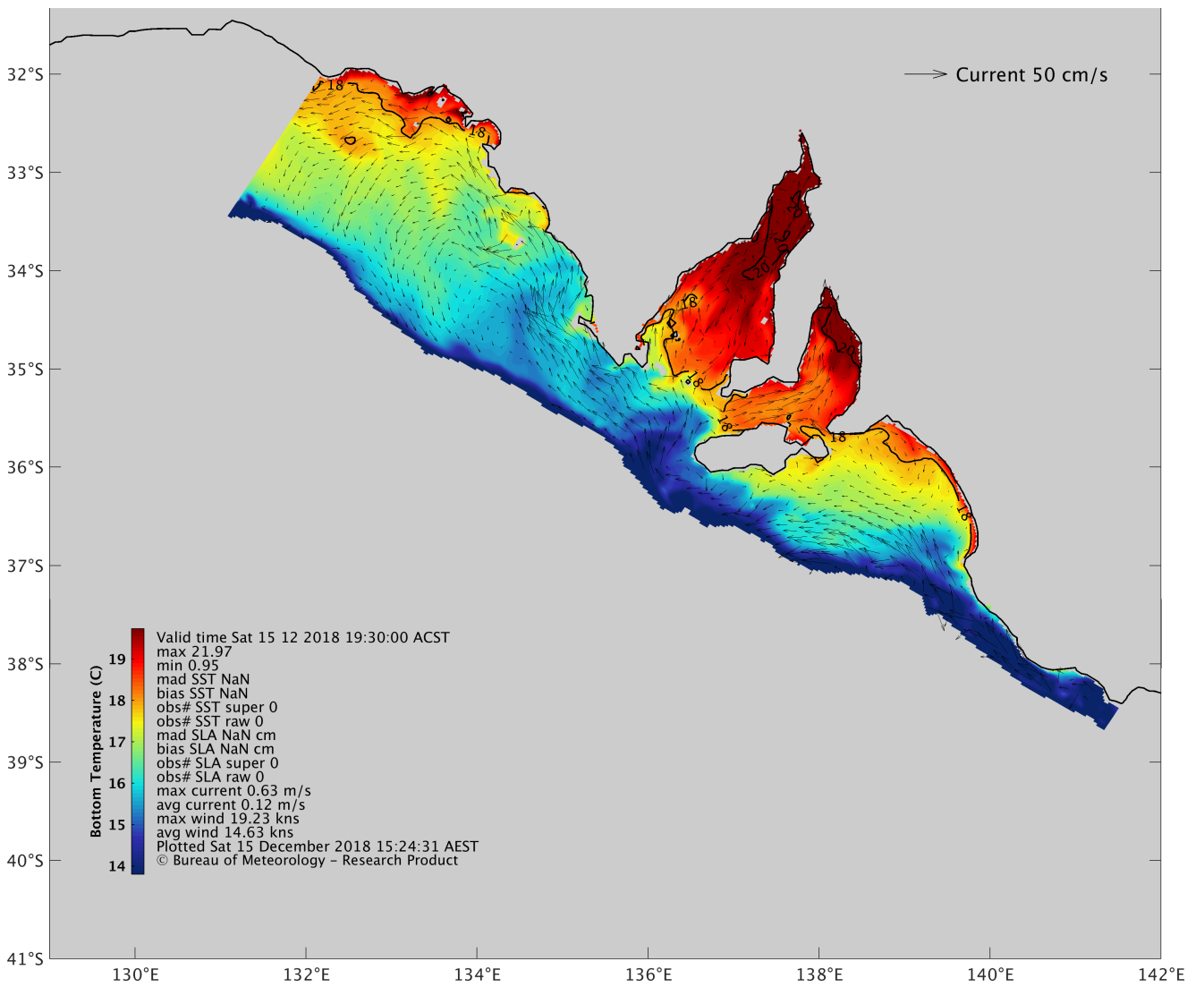
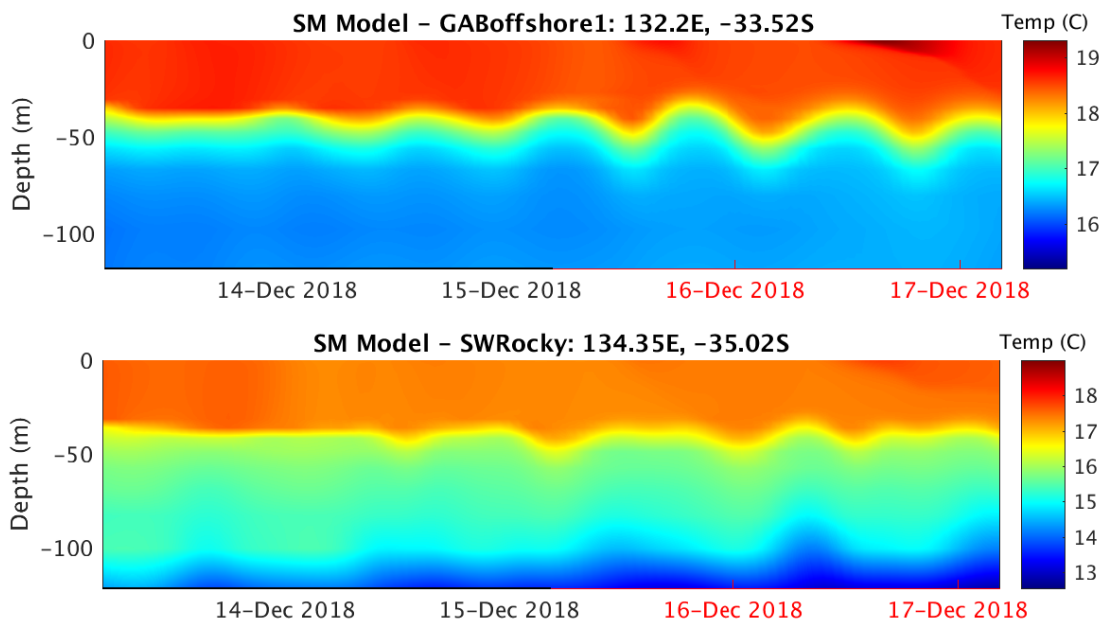


Figure 8: Fine scale SEA FLOOR Temperature and local currents on the 15<sup>th</sup> December 2018 with the 18°C temperature contour marked; please check the colour scale for ACTUAL temperatures (SARDI-BoM 2018)



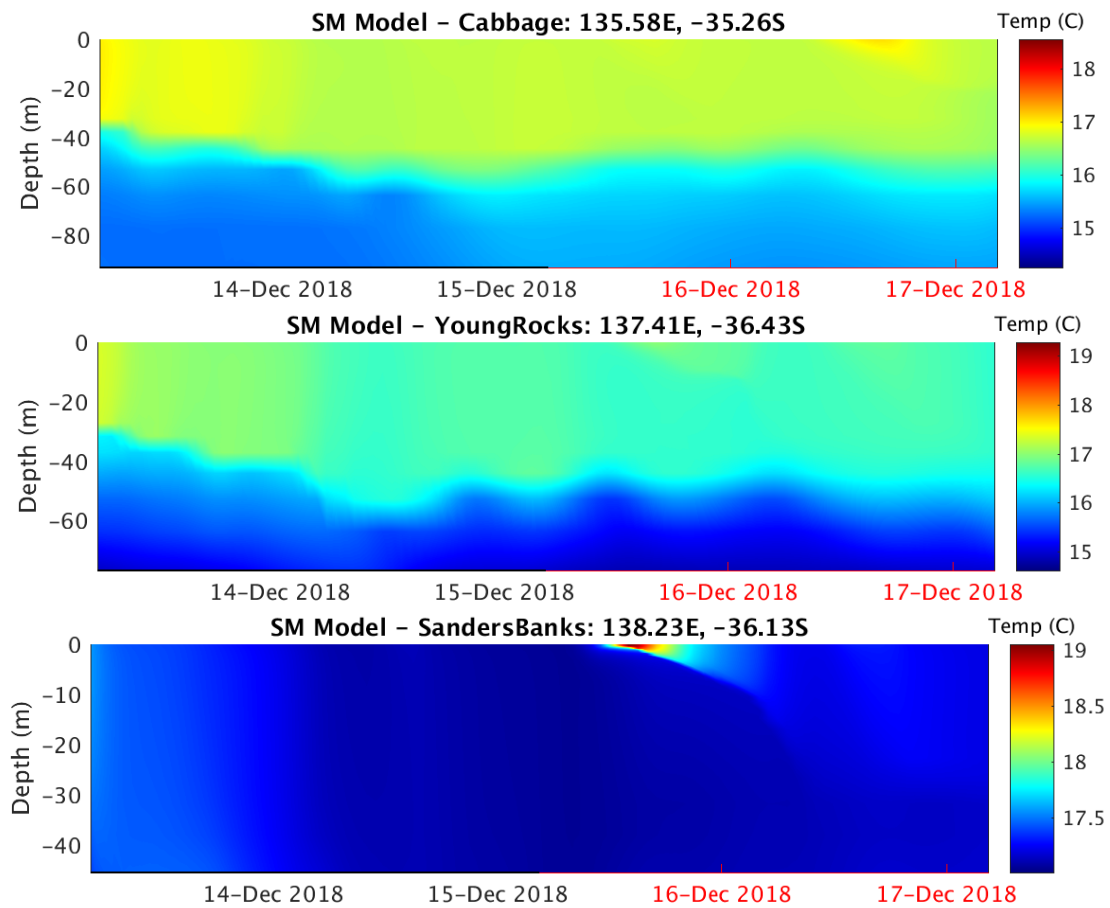


Figure 9: Sea temperature through the water profile from sea surface to sea floor at 5 historic and recent fishing locations; from top to bottom - near shelf edge central GAB, Southwest of Rocky Island, near the Cabbage Patch, near Young Rocks and near Sanders Banks (SARDI-BoM 2018).

### Chlorophyll/ Productivity levels:

A single snapshot from an individual satellite pass on the 9<sup>th</sup> of December is shown in Figure 10; cloud cover has unfortunately obscured most of the shelf area and southeast. From what is visible, the larger band of 'dirty' water that was close to the shelf break through November has shifted further southwards over the past few weeks, and left several eddies and productive fronts to the south of the shelf break and along the slope region.

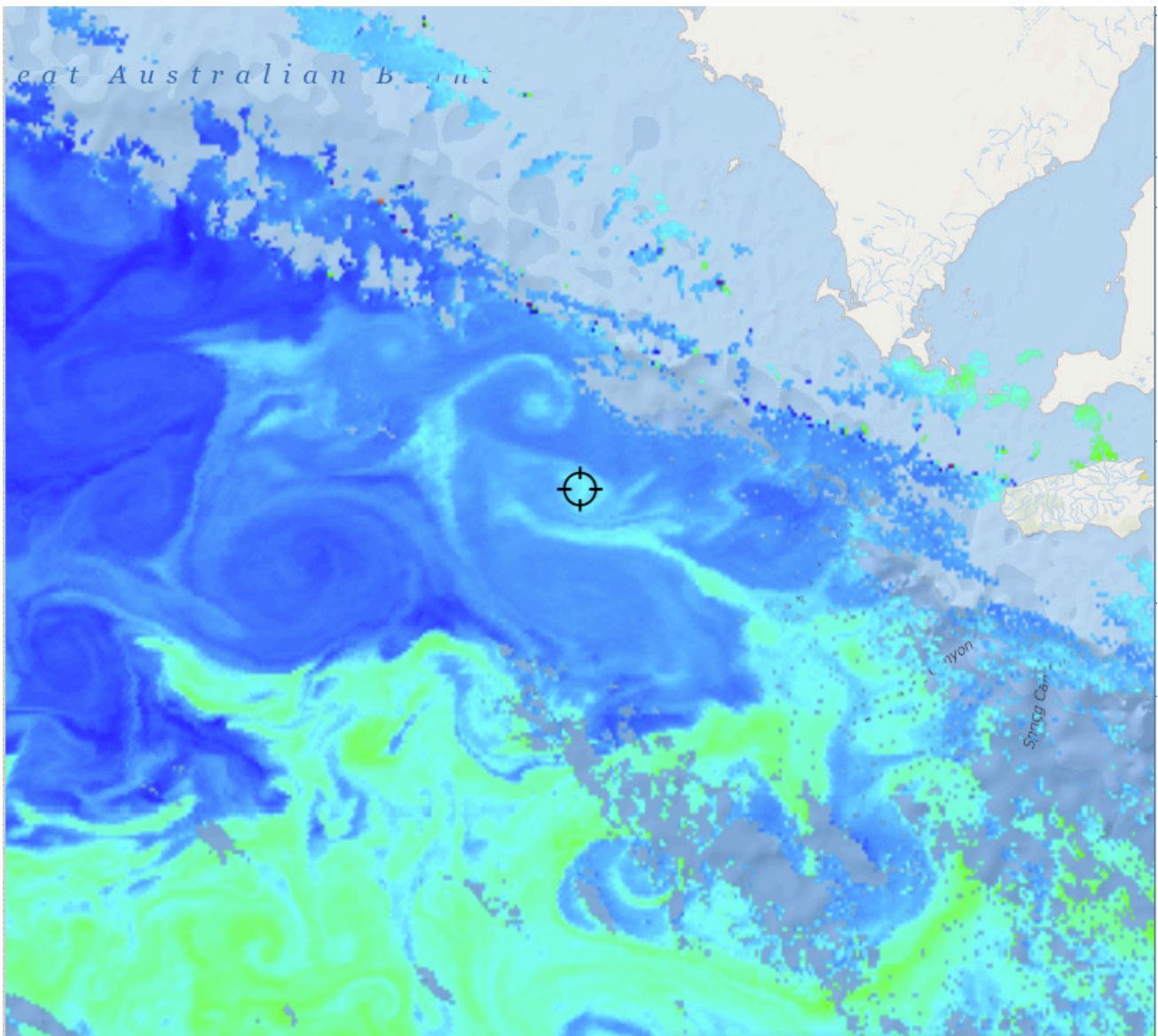


Figure 10: Chlorophyll image 9<sup>th</sup> of December 2018, gray areas are blocked by cloud cover (FishTrack 2018)

Any questions on any items in this update – please don't hesitate to call or email; contact details and links to relevant websites are listed here:

GAB SBT Habitat Forecasts (CSIRO): <http://www.cmar.csiro.au/gab-forecasts/env-observed.html>

eSA Marine (SARDI BoM): [http://pir.sa.gov.au/research/esa\\_marine/sarom](http://pir.sa.gov.au/research/esa_marine/sarom)

Bureau of Meteorology: <http://www.bom.gov.au>

NOPSEMA: <https://www.nopsema.gov.au>

Commonwealth Marine Parks: <https://parksaustralia.gov.au/marine/parks/>

State Marine Parks: <https://www.environment.sa.gov.au/marineparks/maps-and-coordinates>

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