

# Climate and Oceanographic Summary, Great Australian Bight 2019 - 5

Kirsten Rough – 30<sup>th</sup> December 2018

Please find below the latest update for recent and expected conditions for the 2019-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. The recent period of hot weather has led to the warming of the surface water layers particularly in the central Bight area.

The upwelling continues to be a significant feature of sea temperature images with regular large pulses of cold water that are particularly obvious in the sea floor regions of lower and western Eyre Peninsula. There are now large temperature differences of 3-5°C between the sea surface and the sea floor at most historic and recent fishing locations.

The upwelling and ocean circulation so far this season is leading to a number of productive areas that should be highly suited to SBT.

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

The situation across the broader area of the GAB over the past week is shown in Figure 1. The strength and persistence of the upwelling in the east remains a significant feature, and the Leeuwin Current continues to have minimal input of warmth from the west. Recent weather conditions have been highly favourable for heating the surface layers through the central GAB area. The SST situation along the shelf-break has improved from last week, now temperatures are at or exceed 18°C to longitude 137°E (Figure 2). There are large differences in temperature between the sea surface and the sea floor and importantly now there is distinct layering down through the water column.

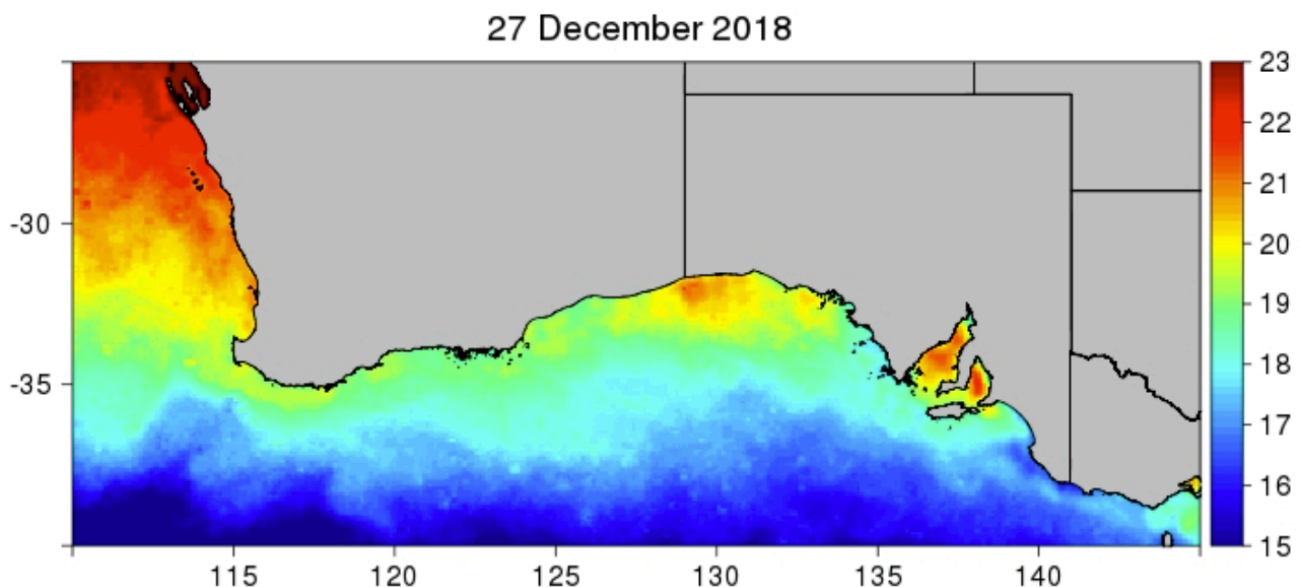


Figure 1: GAB Sea Surface Temperatures for the 3-day period centered around the 27<sup>th</sup> December 2018; the upwelling and minimal influence of the Leeuwin Current are the most significant features. In these images aqua to orange are highly suited to SBT (CSIRO 2018).

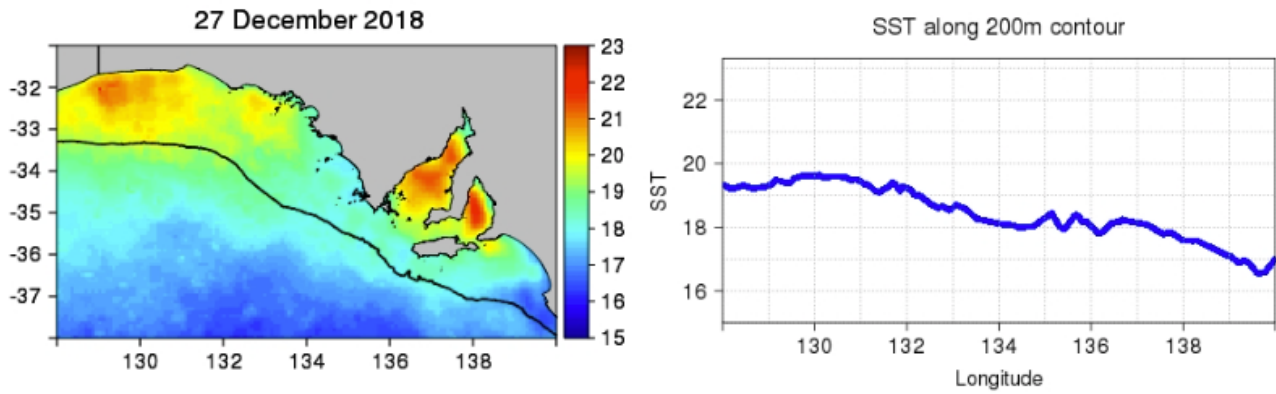


Figure 2: The most recent SST satellite image between longitudes 128° to 140°E (left) and corresponding graph of SST along the shelf break (right) (CSIRO 2018 - GAB Forecasting Website).

### **GAB Sea Surface and Sea Floor Temperatures – NOW-cast & short-term FORECAST:**

The most recent fine-scale Sea Surface and Sea Floor Temperatures are shown by the images in Figure 3 and Figure 4. In each of these figures the top image is the situation for today (30<sup>th</sup> December 2018) and the bottom image is the short-term forecast modeled for conditions on the 1<sup>st</sup> January 2019.

These images are clearly showing that the cold upwelling is continuing to have a major influence on water temperatures over a broad area. The short-term forecasts indicate that fish aggregating areas this week will continue in similar locations into the New Year.

Another point of interest is the warm patch on the sea surface out from Port MacDonnell, likely within range of the recreational sector.

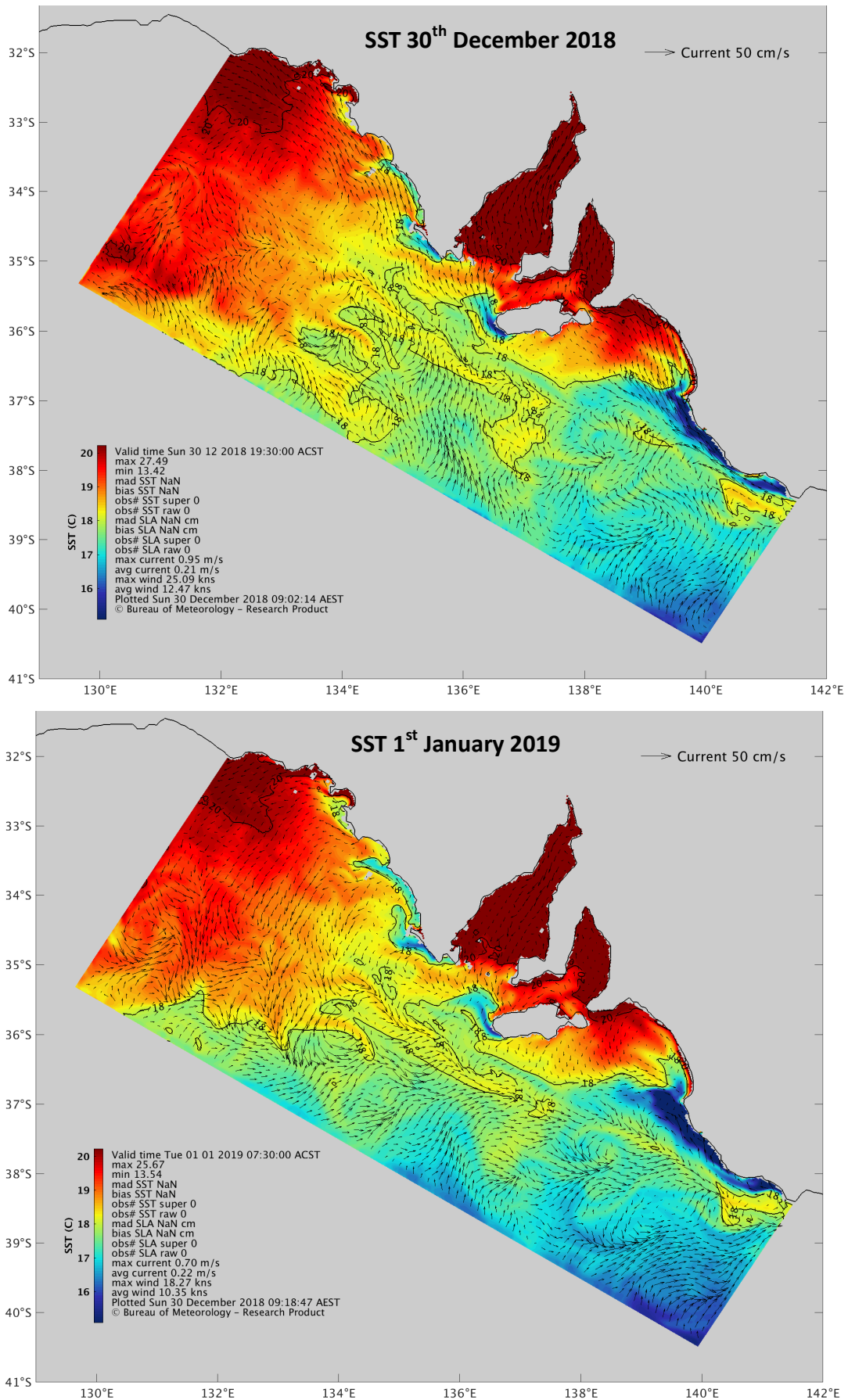


Figure 3: Fine scale SEA SURFACE Temperature and local currents on the 30<sup>th</sup> December 2018 (top) and 1<sup>st</sup> January 2019 (bottom). The 18°C and the 20°C temperature contours are marked; please check the colour scale on each image for the ACTUAL temperatures that various colours represent (SARDI-BoM 2018)

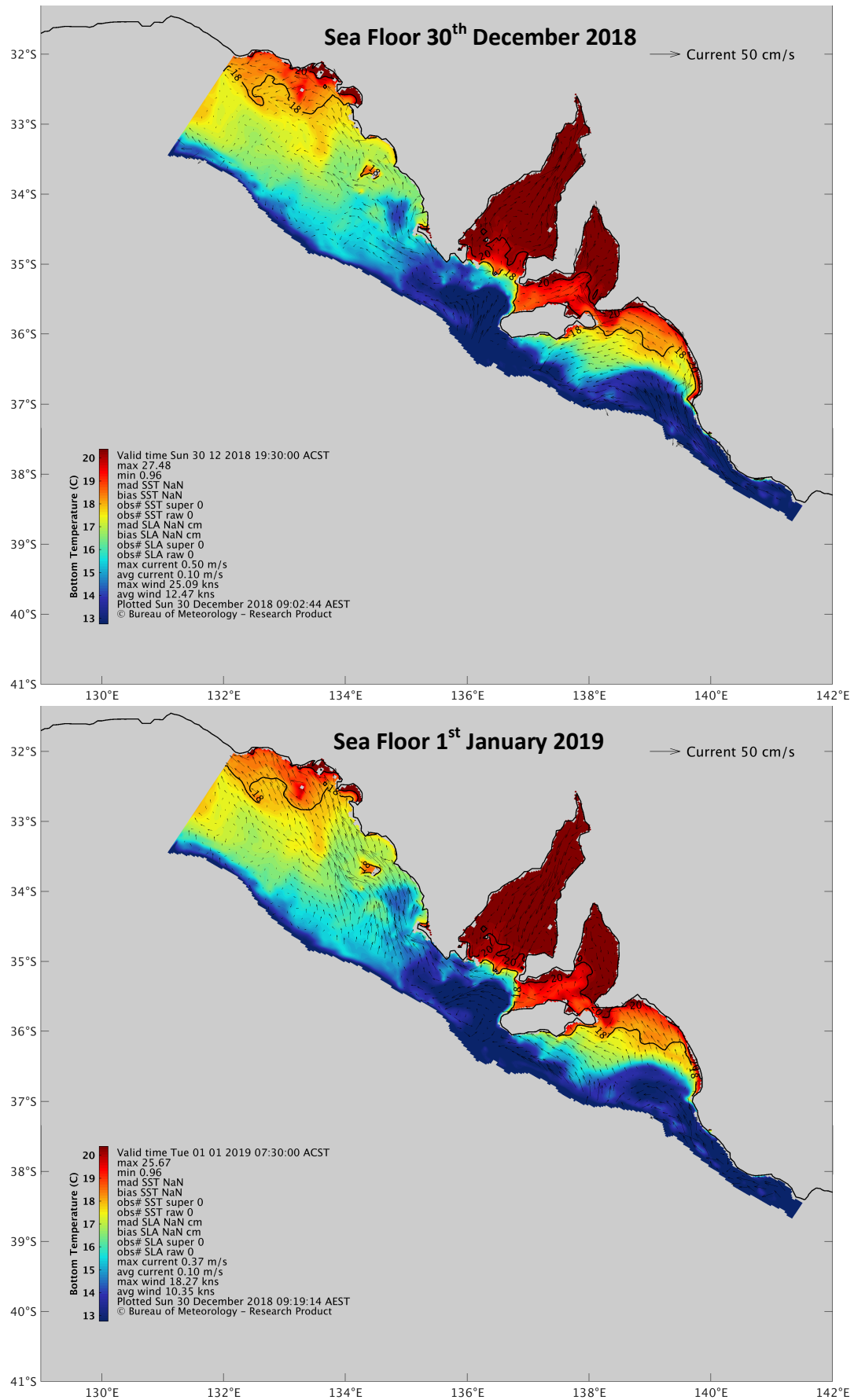


Figure 4: Fine scale SEA FLOOR Temperature and local currents on the 30<sup>th</sup> December 2018 (top) and 1<sup>st</sup> January 2019 (bottom). The 18°C and the 20°C temperature contours are marked; please check the colour scale on each image for the ACTUAL temperatures that various colours represent (SARDI-BoM 2018)

Water temperature profile snapshots of the situation down through the water column (sea surface to sea floor) are now showing strong layering of the water column with differences of 3-5°C between surface layers and the bottom. These thermoclines are particularly noticeable at the deeper locations (Figure 5). The four locations shown here; west to east are: Outer Shelf area at longitude approximating 132°E; 134°E south west of Rocky Island; 135°E near the Cabbage Patch and 138°E in the vicinity of Sanders Banks. These images show the previous 2-day period with dates in black text and the forecast of the next 2-day period with dates in red text. Several locations are showing 2 depth-stratifications – for example the Cabbage Patch area has a hot surface layer that extends to 20-30m depth and another distinct change at approximately 80m depth which would most likely be associated with the ‘deep scattering layer’ that shows as that speckled stripe above the sea-floor on the sounder. I’d be very keen to have screen-shots or hear comments or any observations on this.

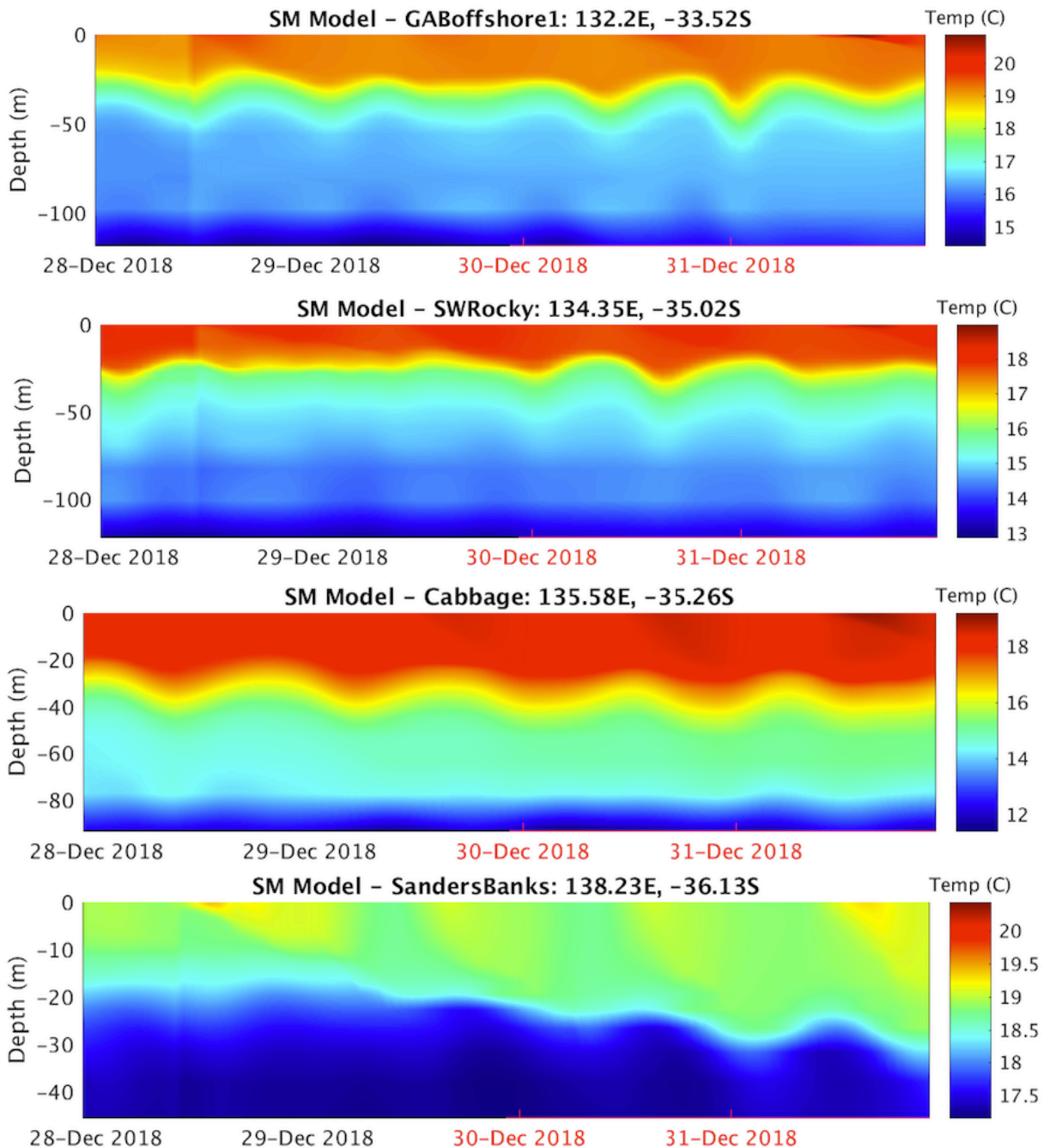


Figure 5: Sea temperatures down through the water column (from sea surface to sea floor) at 4 historic and recent fishing locations; from top to bottom - near shelf edge central GAB, Southwest of Rocky Island, near the Cabbage Patch and near Sanders Banks. Please note colours represent different temperatures for each image – look at the scale on the right hand side for each location (SARDI-BoM 2018).



### Chlorophyll/ Productivity levels:

Clearer skies over the Christmas period meant better satellite images of water quality across the GAB Figure 6. There are a number of areas of very reasonable water developing across the GAB. Specifically a long frontal band from south of Ceduna to well beyond the shelf break (approx. 133°20'E); discrete areas in very deep water to the southwest of Rocky Island (cursor in Figure 6); in deep waters to the south and south-southwest of the Cabbage Patch and also several more areas south of Kangaroo Island.

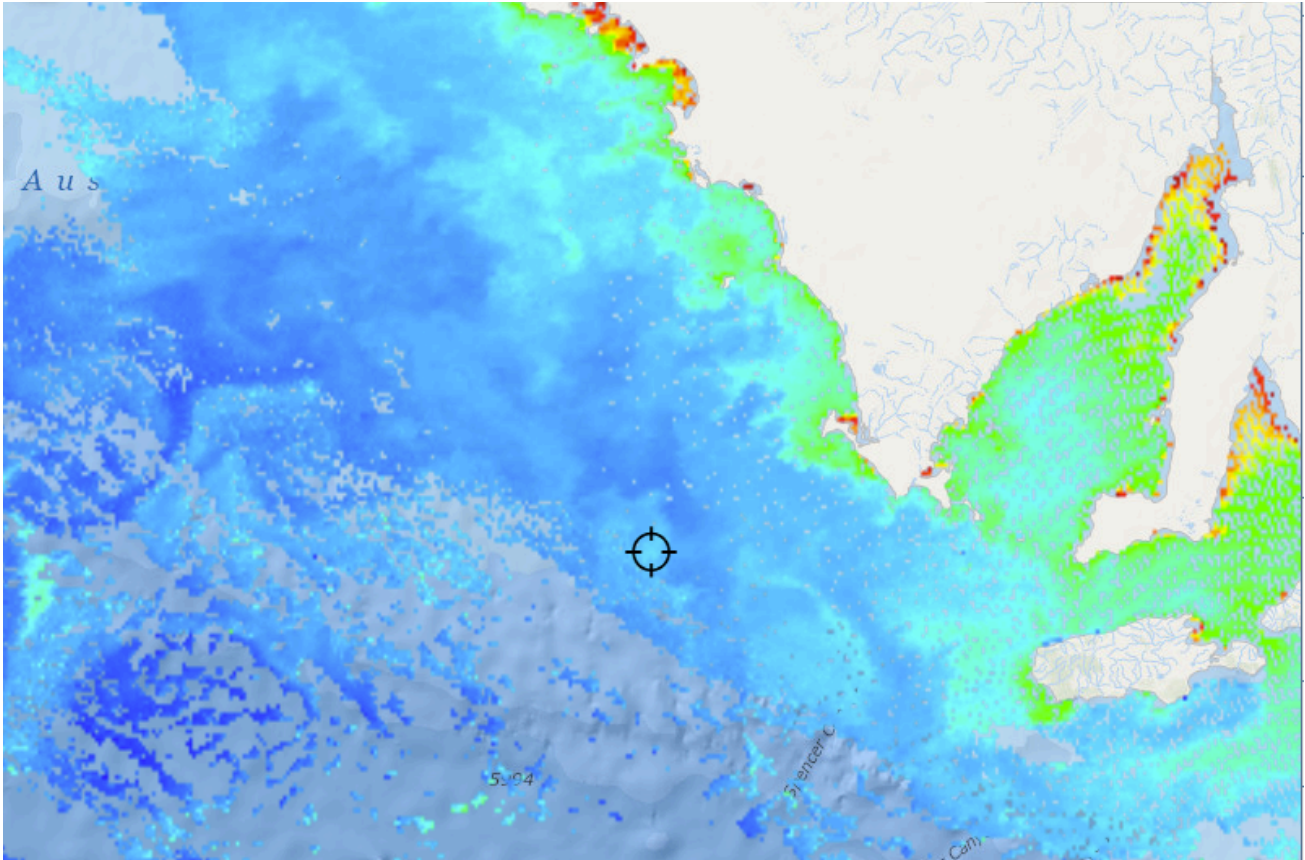


Figure 6: Chlorophyll image 25<sup>th</sup> of December 2018 – cursor is located at 35°13'S 133°58'E on a patch of water suitably productive for SBT. There are other large areas South and South-southwest of the Cabbage Patch and a good frontal band at longitude 133°20'E, this extends from shallow areas inshore to well beyond the shelf break around 34°56'S. Several more of these productive areas are located south of Kangaroo Island (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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