

Climate and Oceanographic Summary, Great Australian Bight 2018 - 5

Kirsten Rough – 3rd January 2018

Summary:

The GAB continues to warm progressively at the sea surface.

Longer-term forecasts are indicating a fishing season where conditions will be suitable for SBT over a very wide area.

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 are ideal for SBT across a very wide area of the GAB; and responding to nutrient input from the upwelling.

Forecast Sea Surface Temperature (SST) and SBT Habitat:

This year conditions continue to warm over a broader area at an earlier point in time compared to what has occurred coming into the last season; comparisons of SST and SBT habitat for similar point in time in 2016, 2017 and now-2018 are shown in Figure 1; and a snapshot comparison of 2013 (the warmest season in recent history) and now are shown in Figure 2.

Updated **Longer-term forecasts** of conditions in the GAB are shown in Figure 3, and continue to indicate that the sea conditions this season will be warmer over a much broader area than they were last season (and most previous seasons other than 2013).

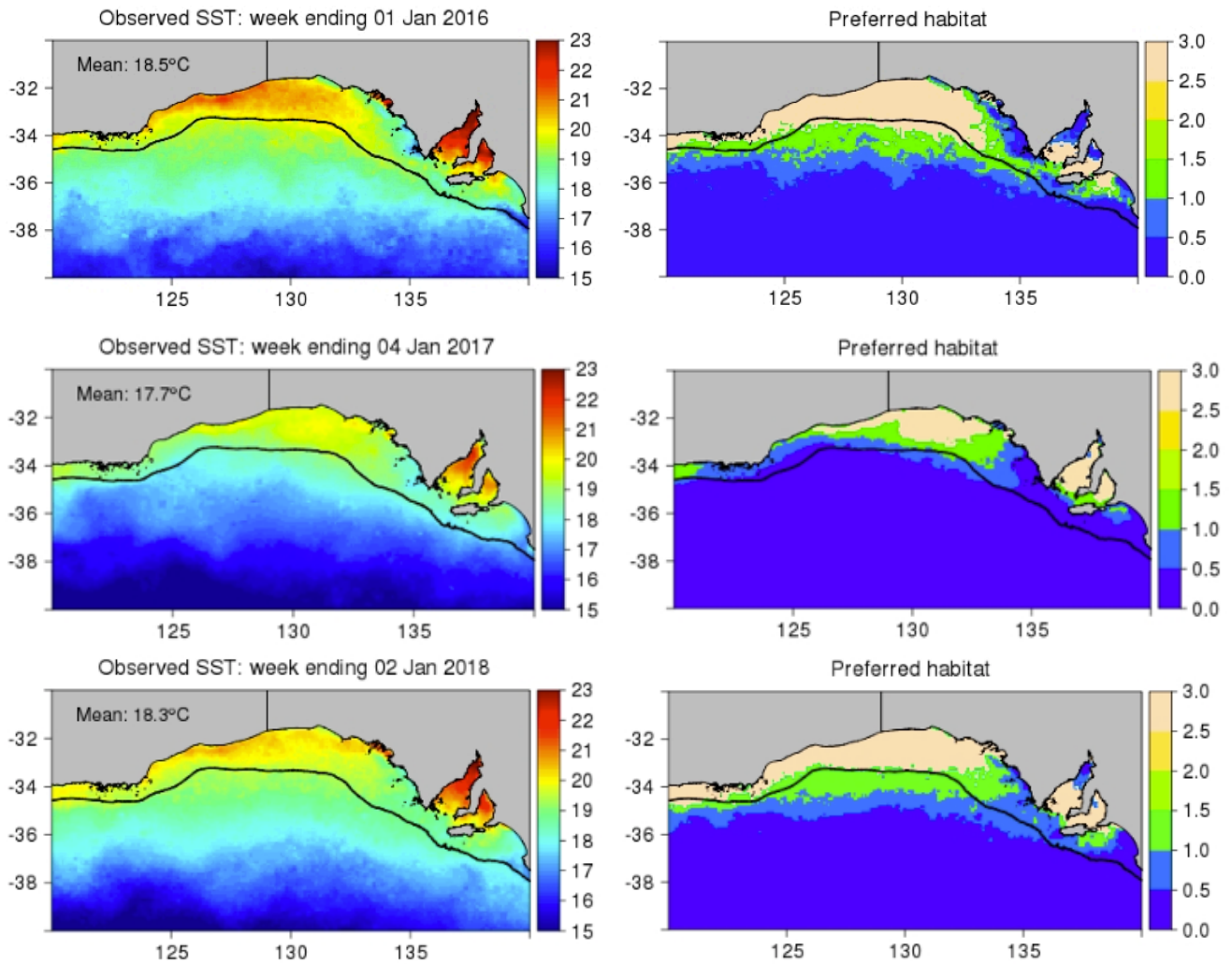


Figure 1: Comparison of Sea Surface Temperature and SBT Habitat for early January 2016 (top); 2017 (middle) and NOW-2018 (bottom) (CSIRO 2018 - GAB Forecasting Website)

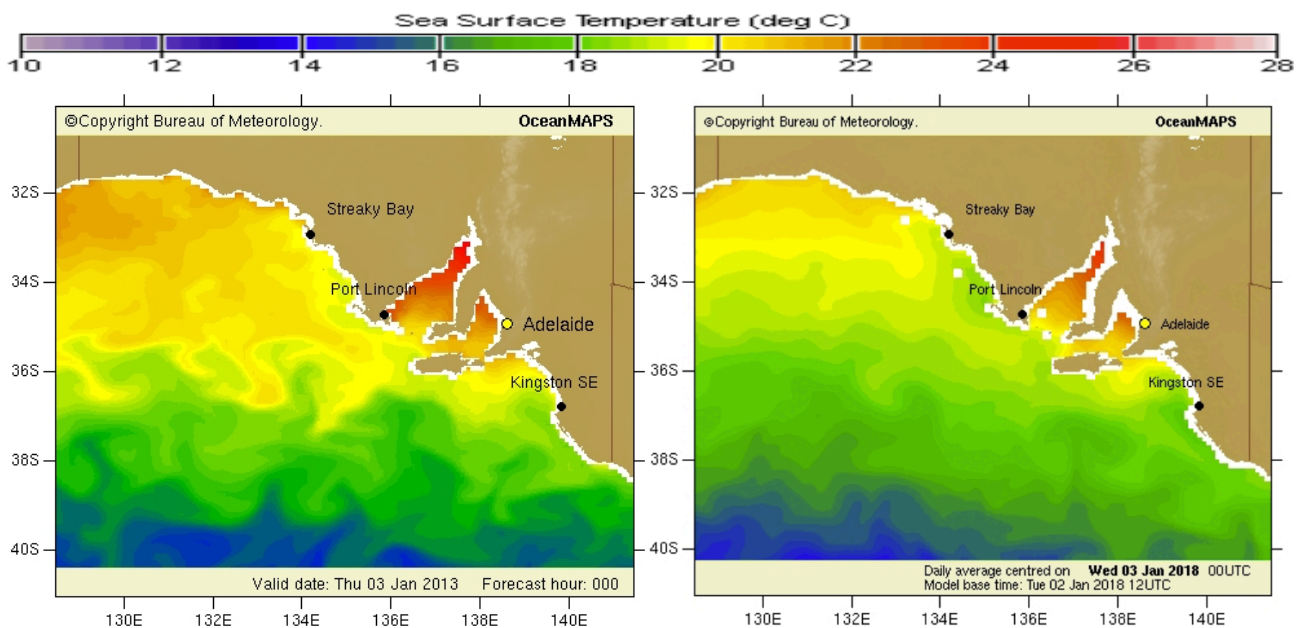


Figure 2: Snapshot of Sea Surface Temperature for 3rd January 2013 (left) and now, 3rd January 2018 (right) (source: Bureau of Meteorology 2018)

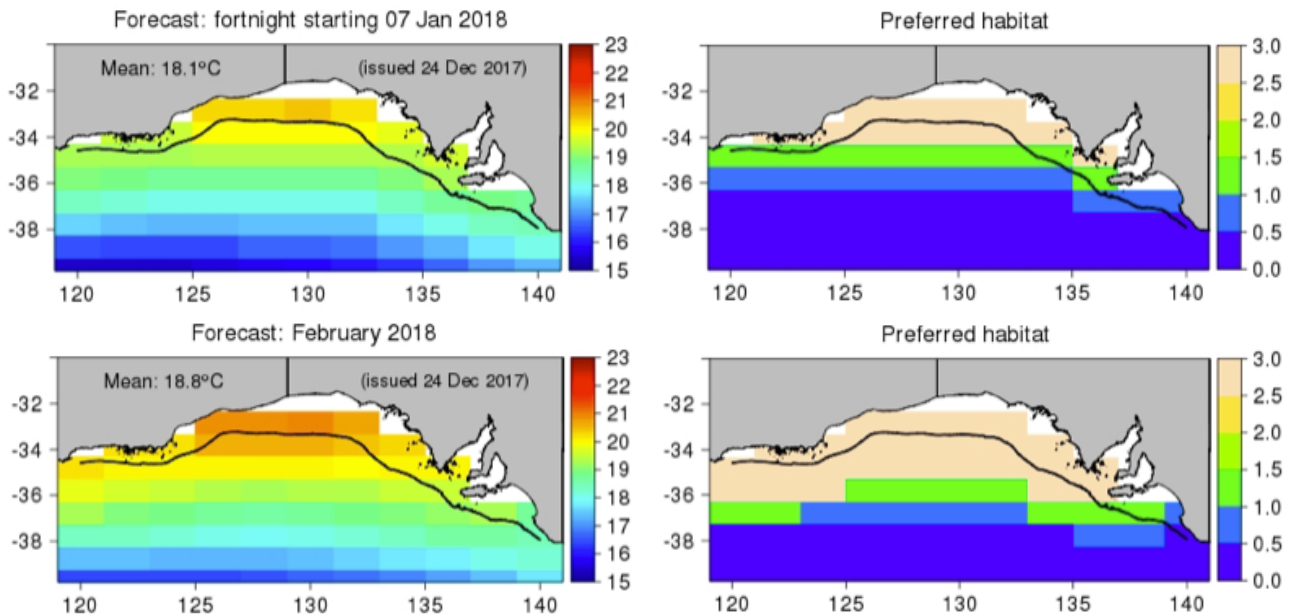


Figure 3: Forecasts of Sea Temperature and SBT habitat issued on 24th December for the first fortnight of January and for the start of February 2018 (CSIRO 2018 – GAB Forecasting Website).

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. A comparison of broader conditions now and for a similar point in time last season is shown in Figure 4. Cool water from the Bonney Upwelling remains a prominent feature in the east of the GAB. Actual SST along the 200m-depth contour is shown in Figure 5. This year (now), SST along the shelf-break is at or exceeds 18°C from longitude 120 to 139°E.

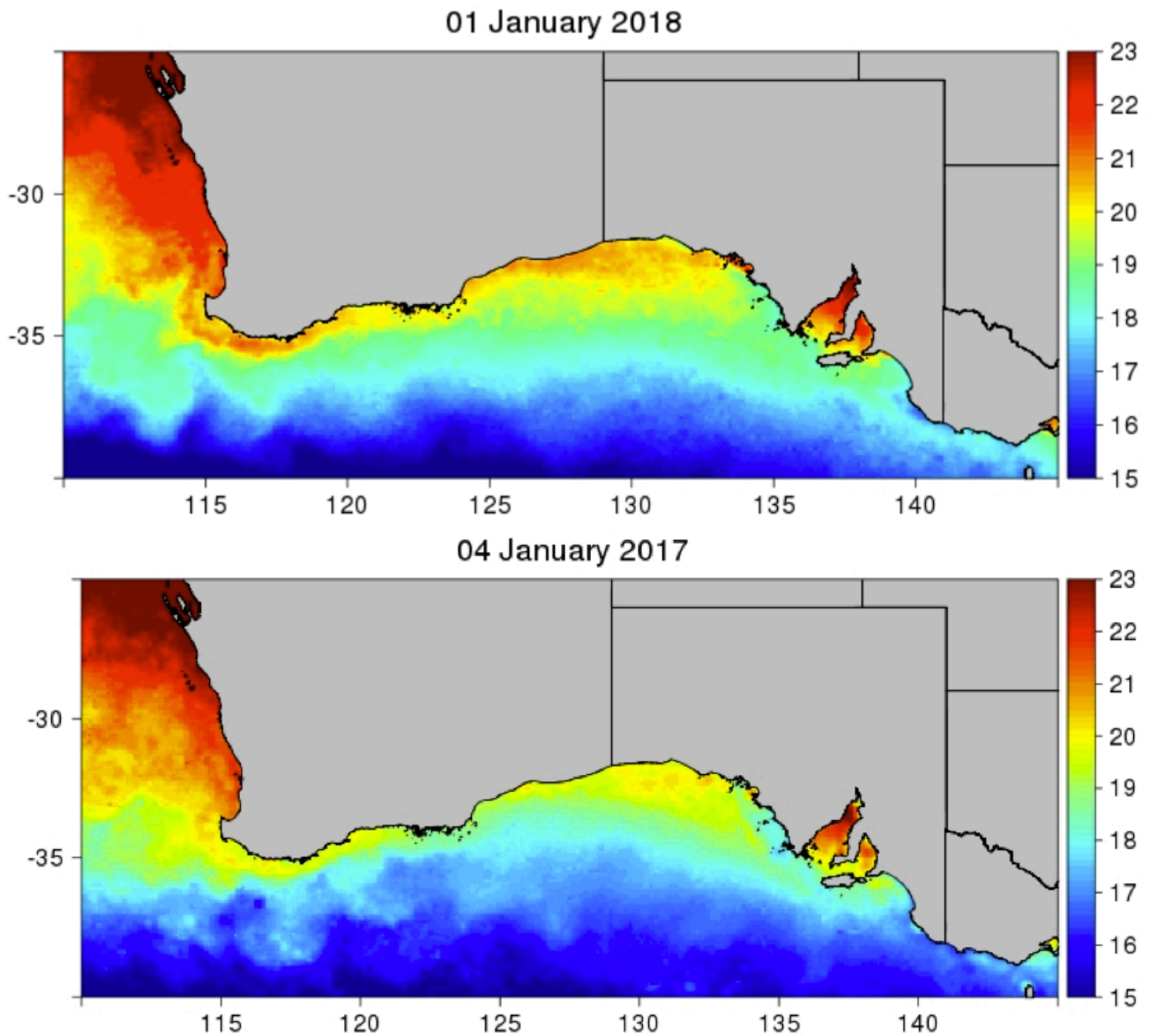


Figure 4: Sea Surface Temperature across southern Australia over the past week for NOW (top) and similar time LAST SEASON (bottom) (CSIRO 2018 - GAB Forecasting Website)

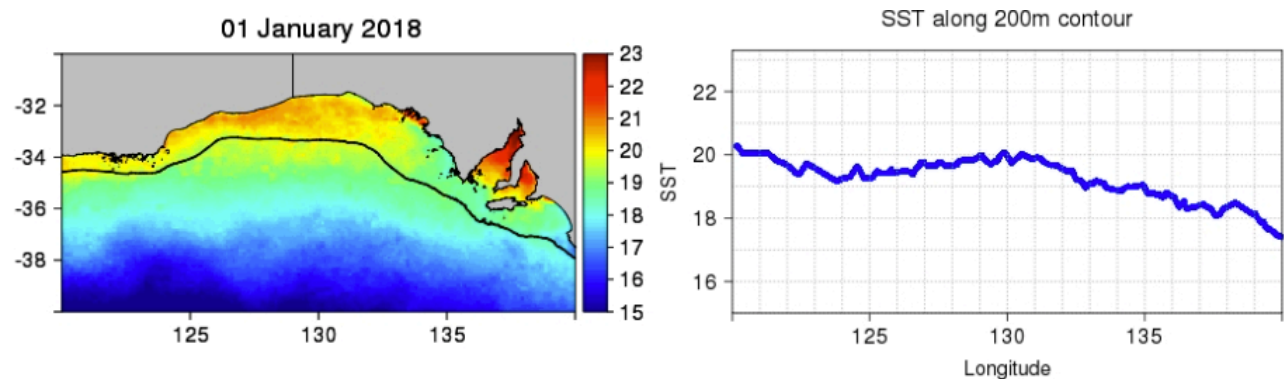


Figure 5: Most recent SST satellite image between longitudes 120° to 140°E (left) and corresponding graph of SST along the shelf break (right) (CSIRO 2018 - GAB Forecasting Website)

The most recent **fine-scale Sea Surface and Sea Floor Temperatures** are shown in Figure 6 and Figure 7. The plot of surface temperature is indicating the Gulf areas are continuing to warm and that surface waters are suitable for SBT across the majority of the Bight. The sea floor temperatures remain cool in areas most influenced by the upwelling, from longitude 134°E through to Kangaroo Island and in the south East of SA.

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 8. Full details on salinity profiles, wind and water current speed and direction can be found on the e-SA Marine website link listed at the end of this document.

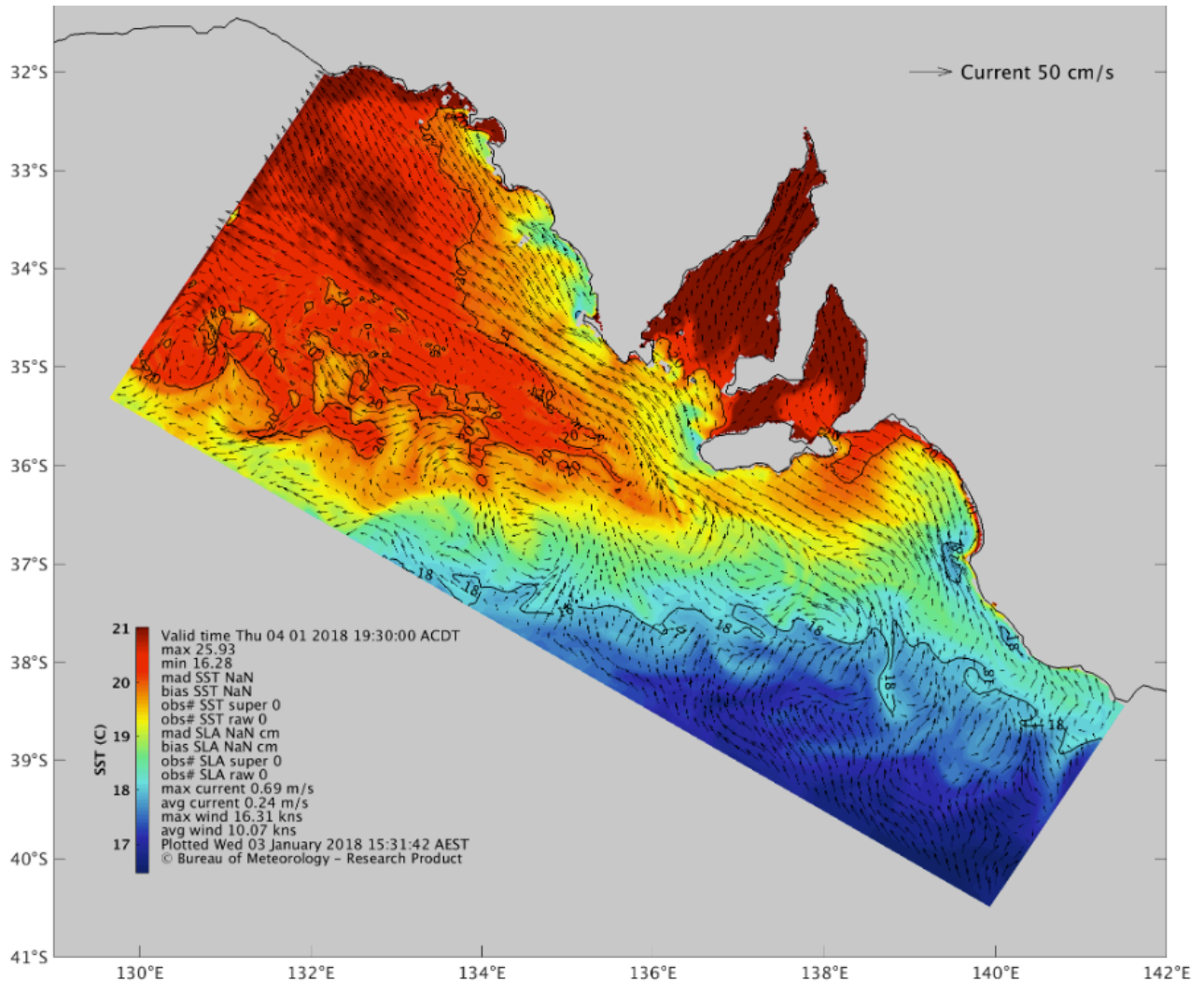


Figure 6: Snapshot of the forecast Sea Surface Temperature for the 4th January 2018, the 18 and 20°C temperature contours are marked by solid black lines, the direction and strength of the water currents are indicated by the black arrows (SARDI-BoM 2017 – eSA Marine website).

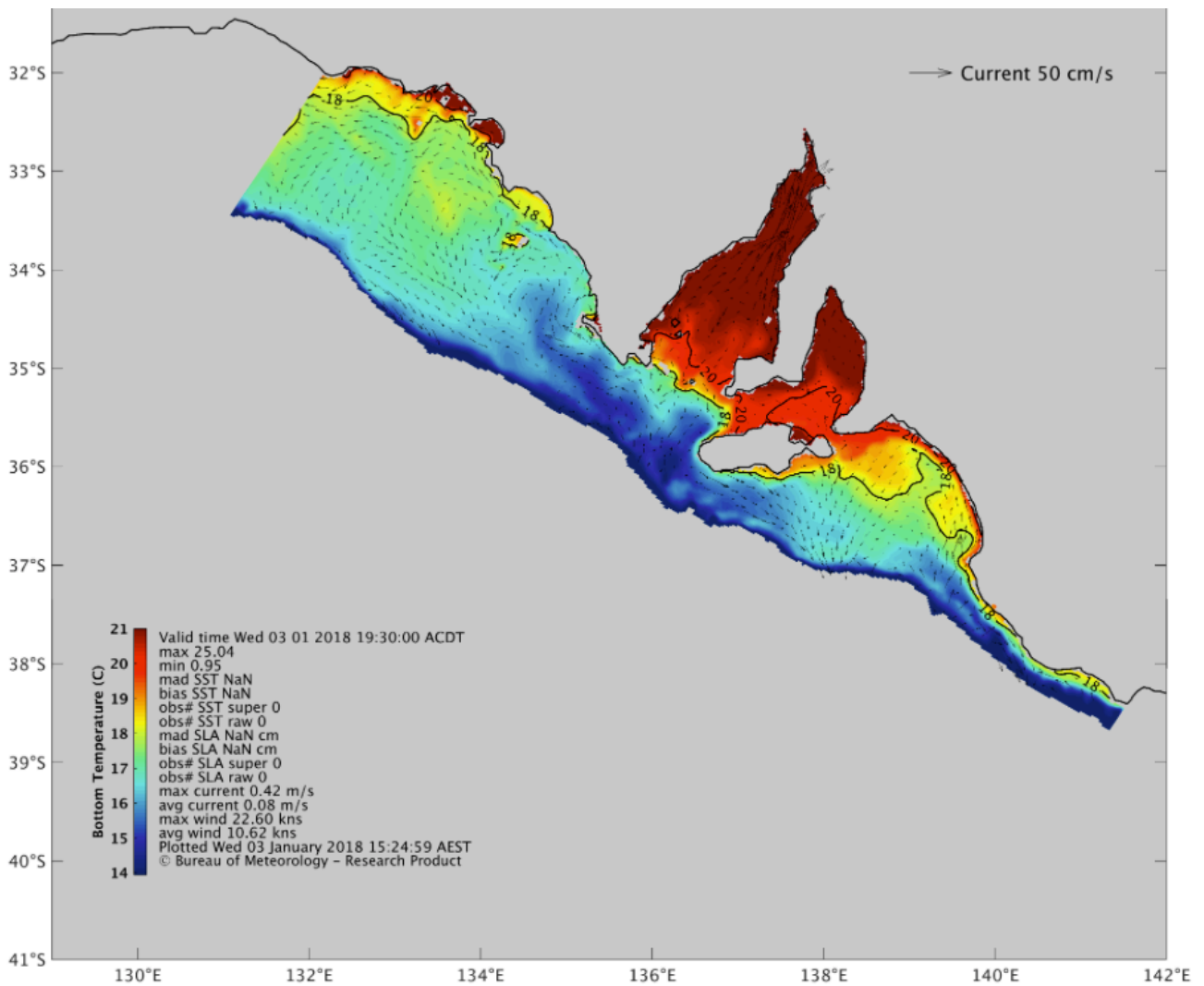
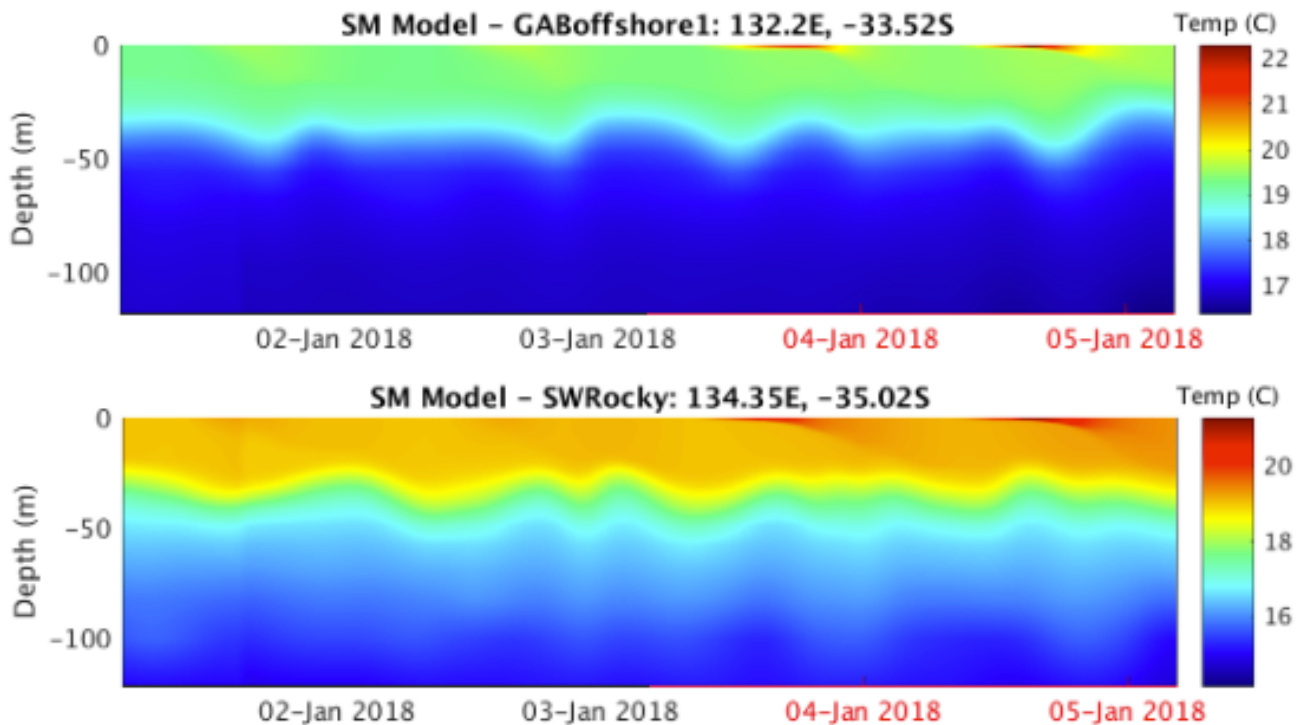


Figure 7: Snapshot of the actual Sea Floor Temperature on the 3rd January 2018; the 18 and 20°C temperature contours are marked by solid black lines, the direction and strength of the water currents are indicated by the black arrows (SARDI-BoM 2017 – eSA Marine website).



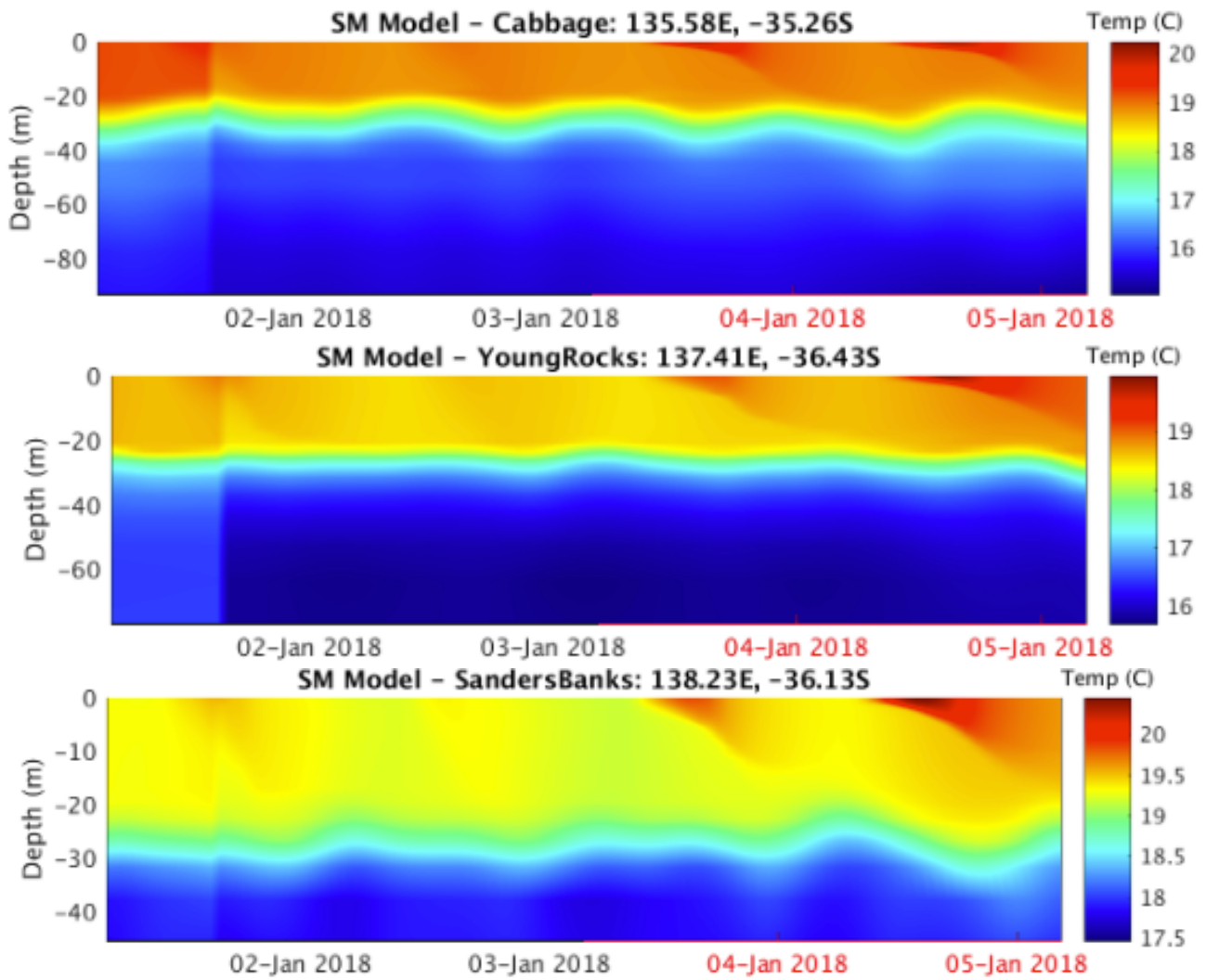


Figure 8: Water temperature profile from sea surface (0m) to sea floor (-**m) for the previous (black) and future (red) 2-days for the Outer Shelf area Central GAB 132°E (top); Rocky Island (second); Cabbage Patch (third); Young Rocks (fourth) and Sanders Banks (bottom) – Please note that the scale bars for depth and temperature vary between each of these images due to variations at each location

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 Figure 9.

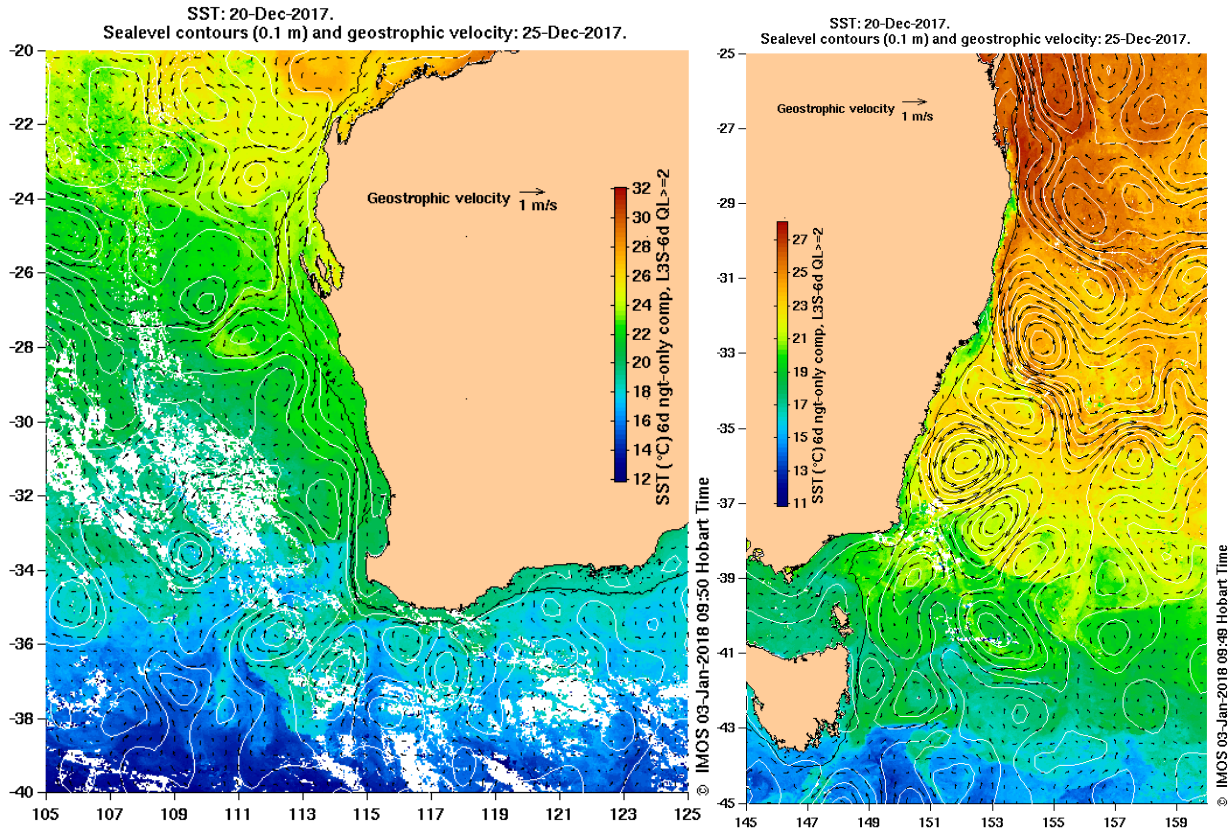


Figure 9: The most recent images of Sea Surface Temperature and water current speed and direction for the West (left) and East (right) Coast areas of Australia; please note that the temperature scales are different for each of these plots (IMOS 2018).

Chlorophyll / Productivity Levels:

A single snapshot from an individual satellite pass is shown in Figure 10; this is showing conditions continue to be highly suited to SBT over much of the GAB.

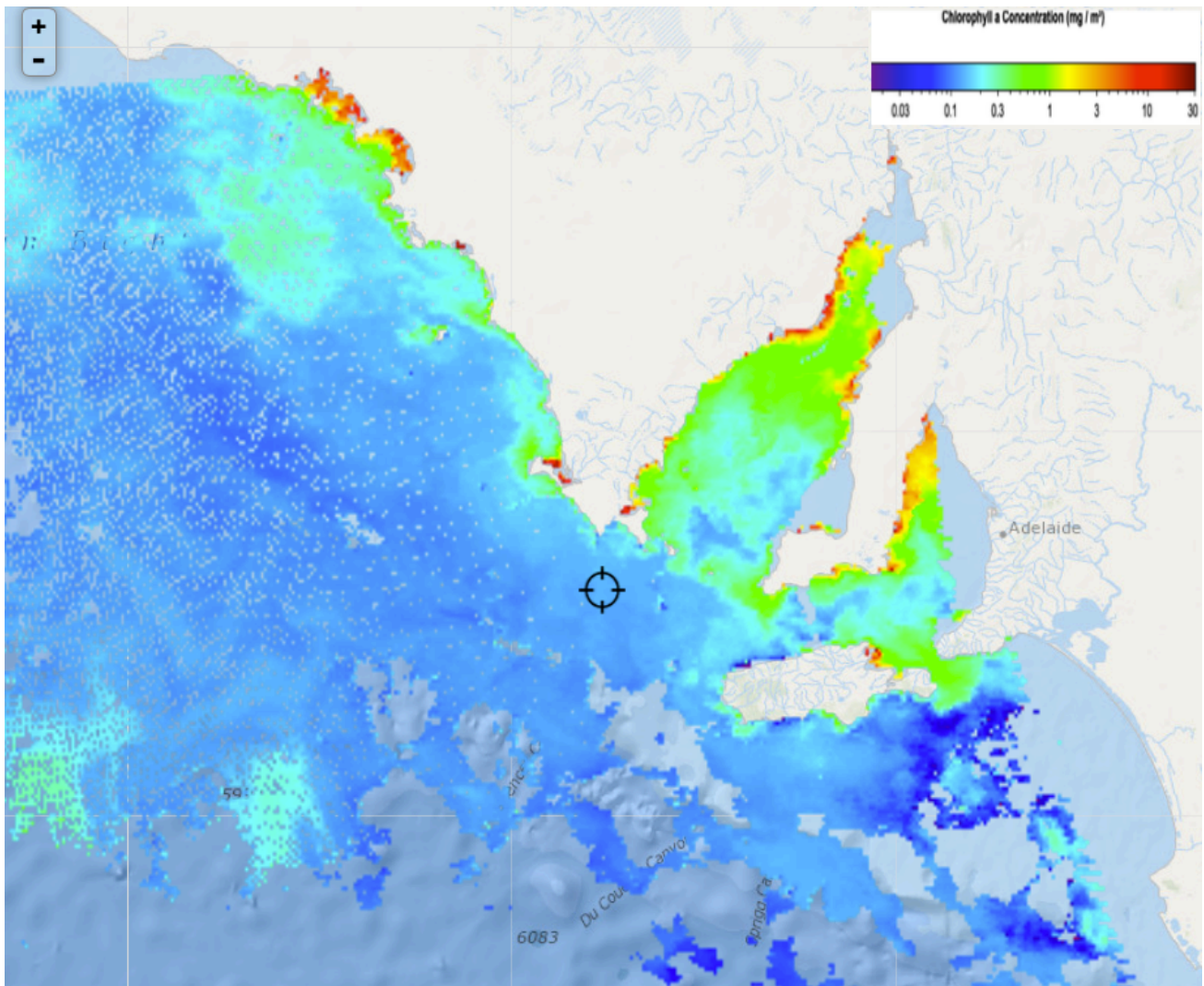


Figure 10: Chlorophyll plot from the Head of the Bight to the SA/Vic border taken on 3rd January 2018, the grey areas have no readings due to cloud cover.

Relevant Websites:

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

eSA Marine: http://pir.sa.gov.au/research/esa_marine/sarom

IMOS ocean monitoring: <http://oceancurrent.imos.org.au/index.php>

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

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