

NERP

Torres Strait / GBR environmental conditions report:

Recent status and predictions

11 December 2012

By Ana Redondo-Rodriguez & Marites Magno-Canto
work supervised by Dr. Scarla Weeks

Contact: a.rodriquez@uq.edu.au

UQ-GPEM Biophysical Oceanography Group

Outline

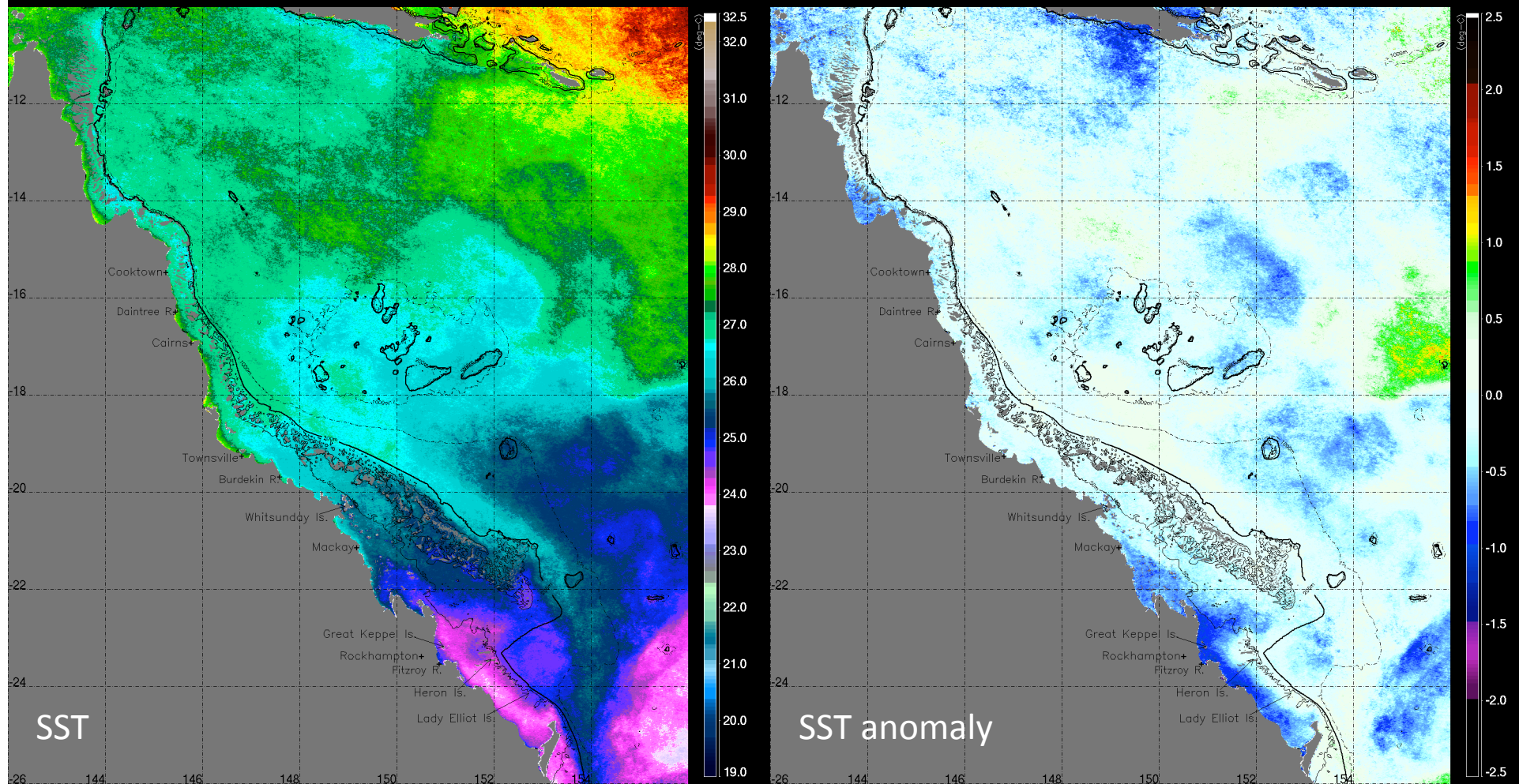
- Overview
- Recent SST and in situ Temperature evolution
- GBR SST forecast (POAMA)
- Coral Bleaching Outlook (NOAA:CRW)
- Surface conditions in the tropical Pacific
- ENSO evolution and predictions

Overview

Note: Torres Strait / far northern GBR region extended north- and westward to cover full Torres Strait area

- Negative SST conditions along the inshore reefs south of $\sim 21^{\circ}\text{S}$ in November and weak negative anomalies for Torres Strait. Neutral SST conditions elsewhere.
- Forecast of close to average SST along the GBR and Torres Strait for the upcoming months.
- The NOAA Coral Reef Watch forecast suggests 'Warning' for the Torres Strait and N-GBR regions.
- ENSO-neutral conditions observed in the Pacific during November, and expected to continue in the upcoming months.

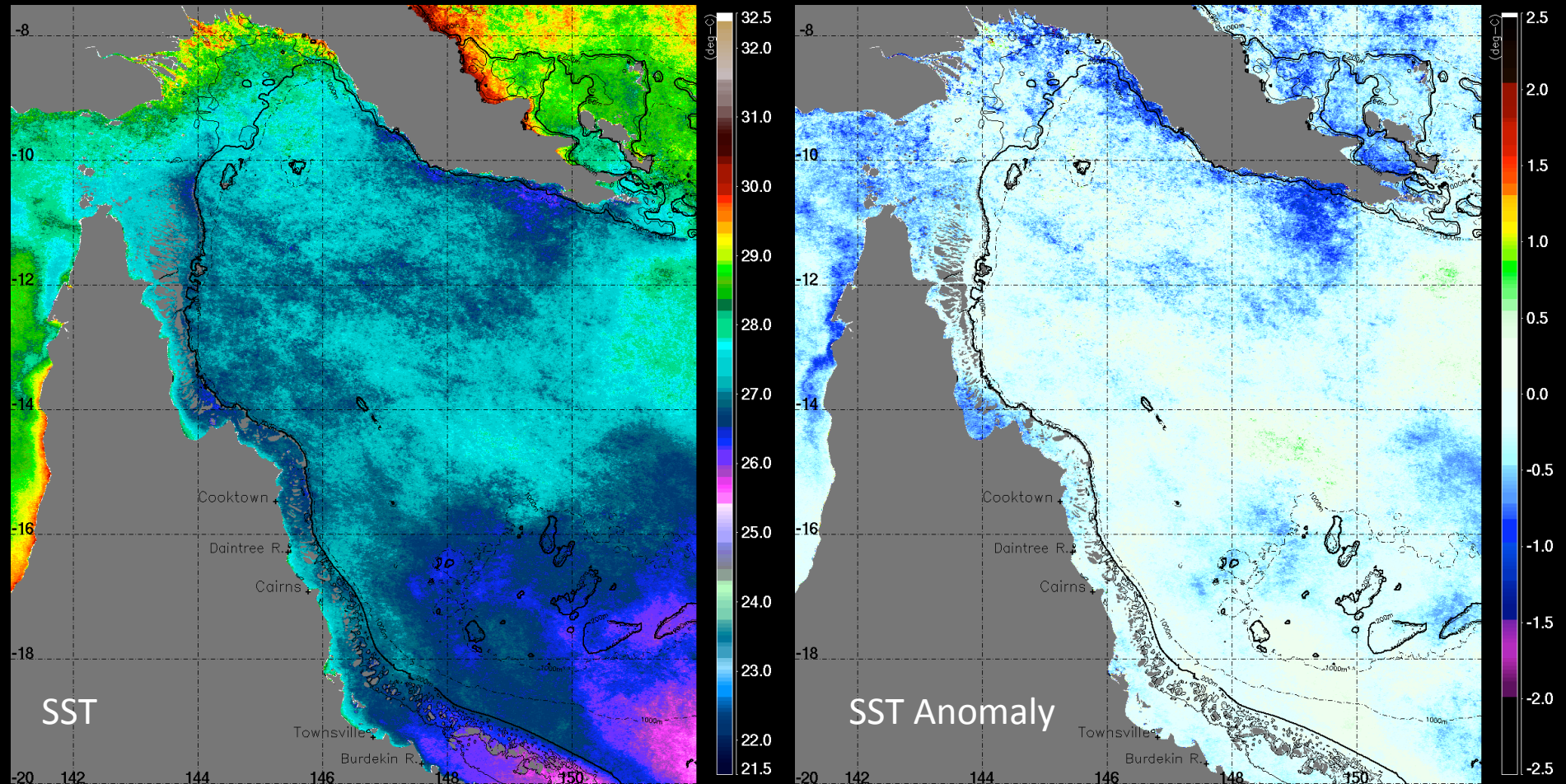
Modis SST (day+night): November 2012



Note:

- Negative SST anomalies persisted for most of the inshore reefs south of $\sim 21^{\circ}\text{S}$ during November.
- Small negative anomalies for the Torres Strait and N-GBR regions.

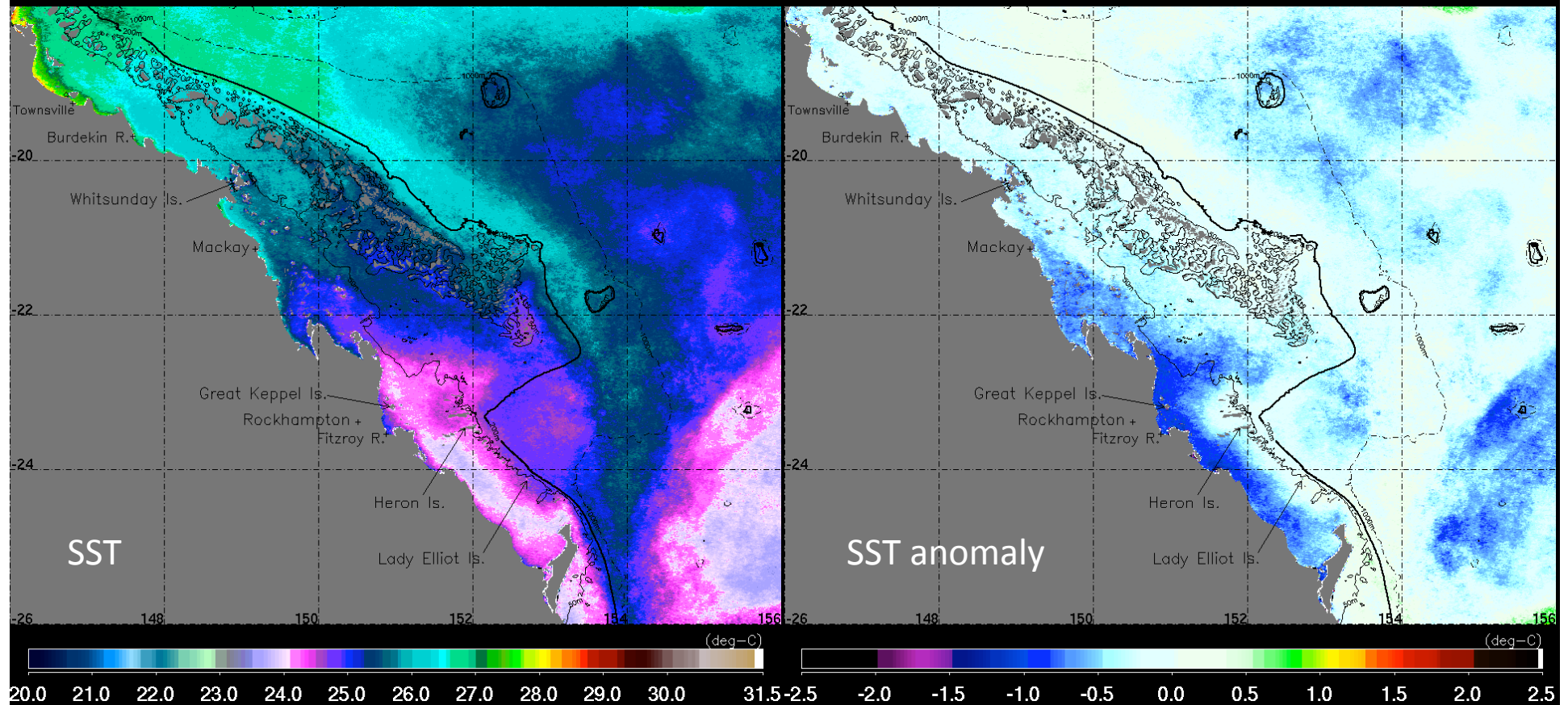
Torres Strait / far northern GBR MODIS SST: November 2012



Note:

- Moderate negative SST anomalies during November for the Torres Strait and far N-GBR areas.
- The negative anomalies present on the inshore reefs from south of ~14°S dissipated during November.

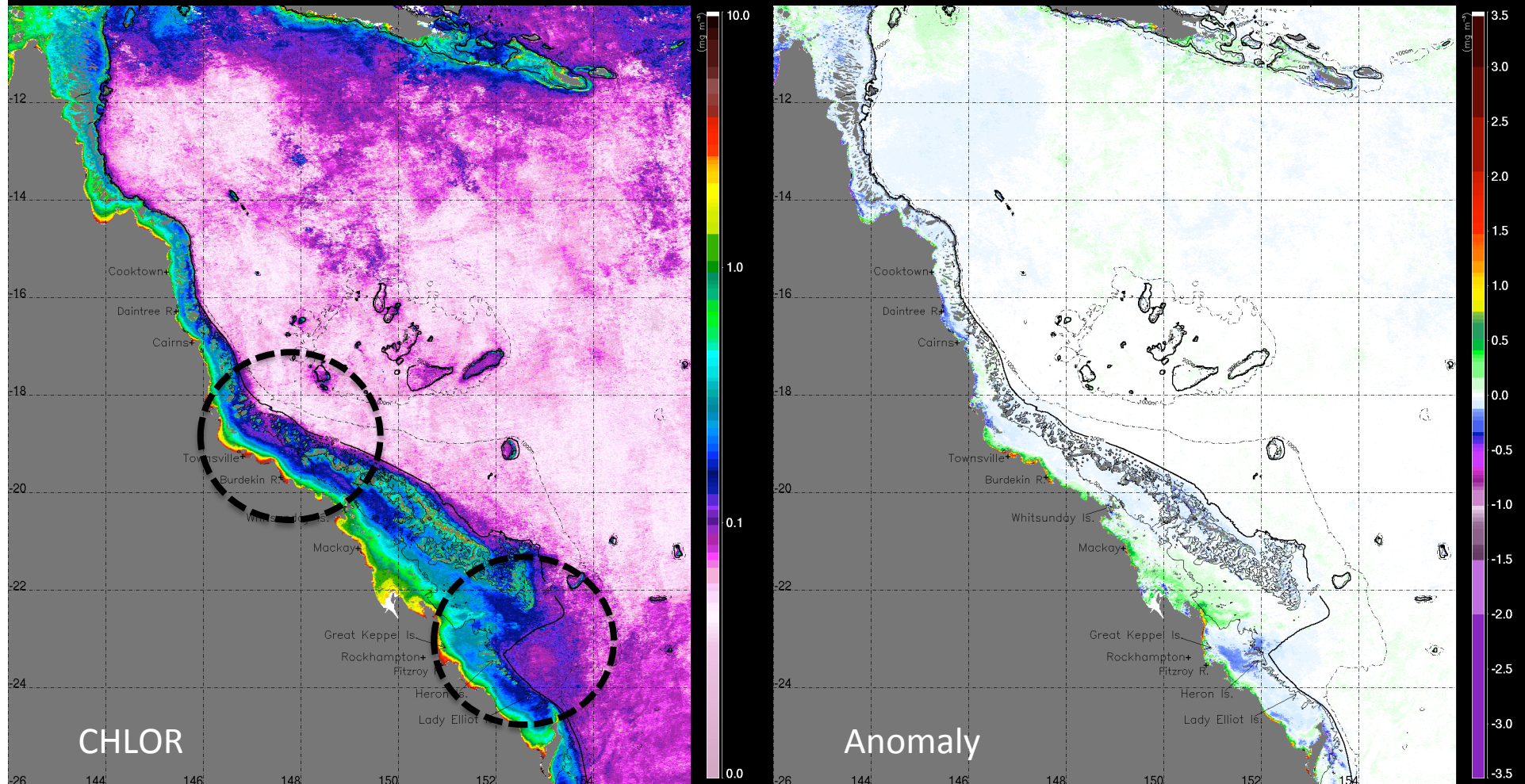
Southern GBR MODIS SST: November 2012



Note:

- Negative anomalies strengthened on the inner reefs south of $\sim 21^{\circ}\text{S}$ during November.
- Clearly defined EAC flowing southward along the GBR shelf, leading to neutral conditions for the outer reefs of the S-GBR.

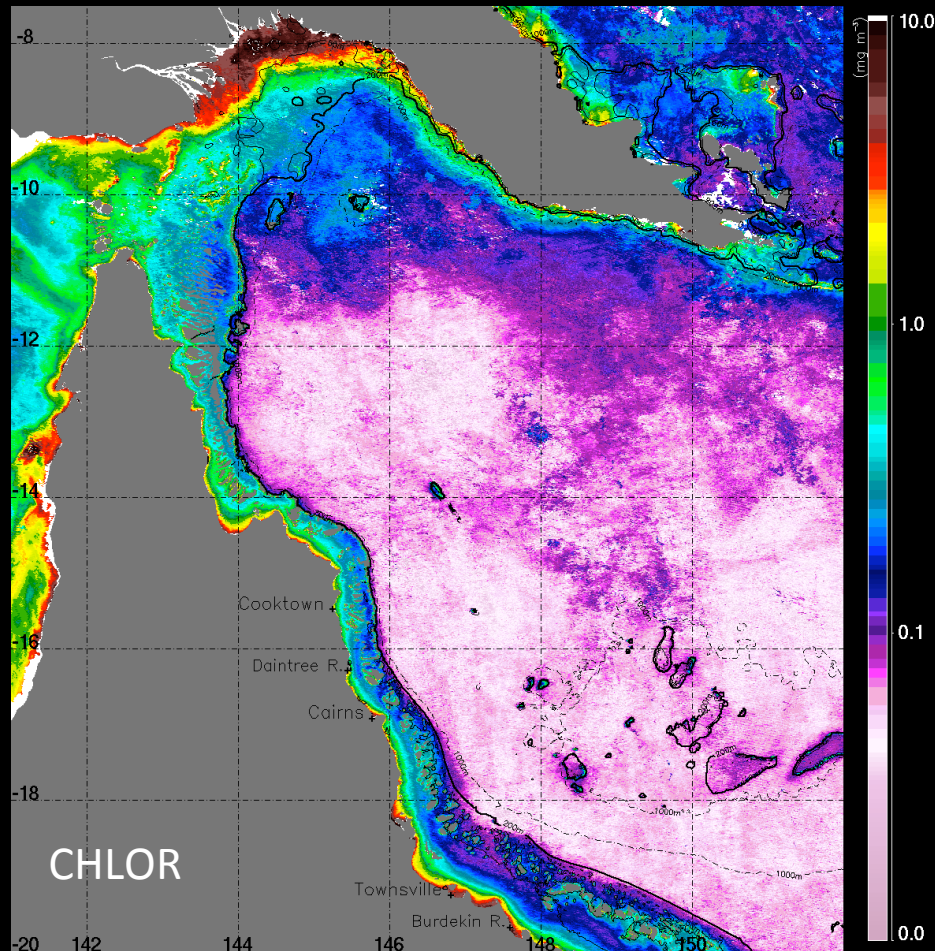
MODIS Chlorophyll-*a* concentration: November 2012



Note:

- Slight positive anomalies present on the inshore reefs south of $\sim 19^\circ\text{S}$.
- Mostly average conditions for the Torres Strait area.
- Intrusions of low chlorophyll EAC waters into the central GBR, and the Capricorn & Curtis Channels more apparent than in previous month.

Torres Strait / far northern GBR Chlorophyll-*a* concentration November 2012



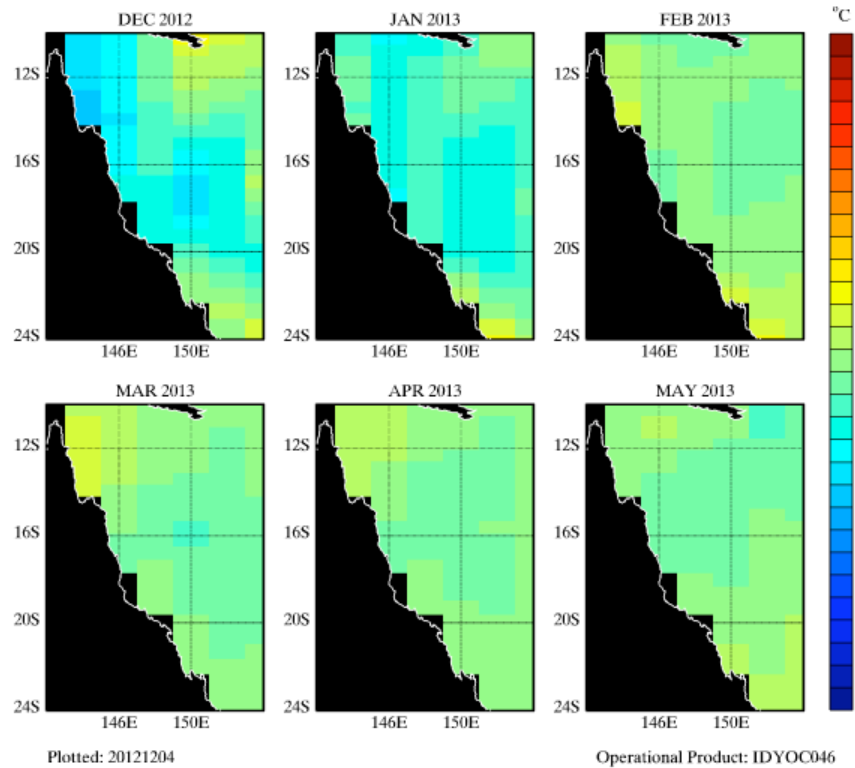
Note:

- Similar to previous month, high chlorophyll signal in the Fly River, Papua New Guinea, likely due primarily to sediment outflow
- Chlorophyll data severely impacted by cloud contamination on the N-GBR and Torres Strait areas during November, masking the values of accurate anomalies. Hence, anomaly image not included as not a true representative of the month.

Great Barrier Reef SST Anomaly Forecast (POAMA-2)

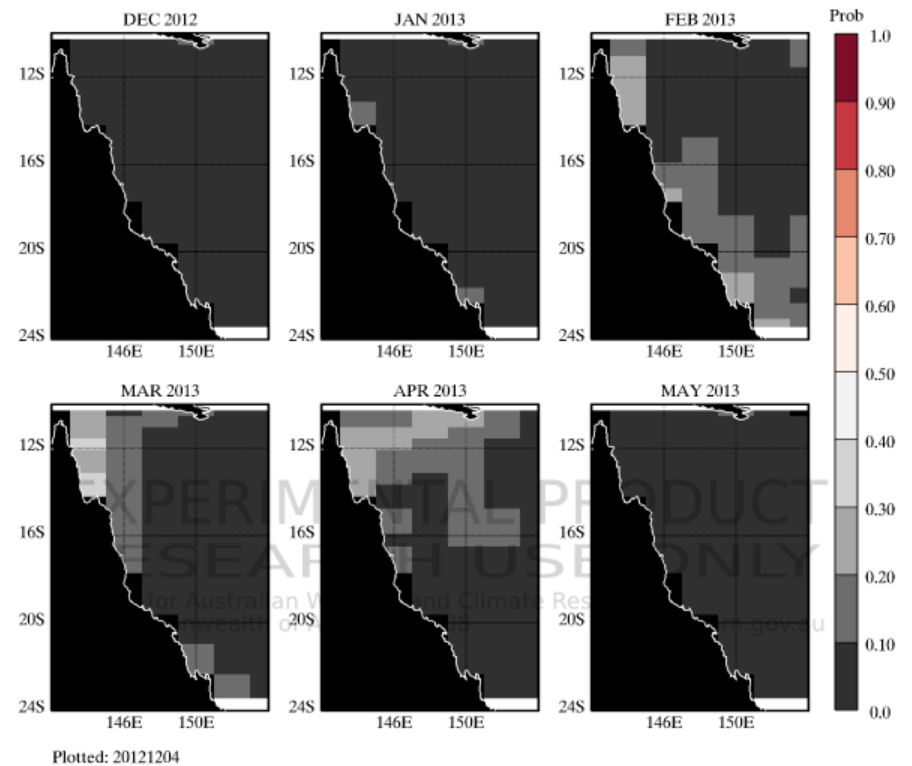
POAMA SST anomaly forecast for the next 6 months
(Operational)

P2.4abc Monthly SSTA: GBR 20121201 [Lead=0-5 months, Nens=30]



Probabilities of SST anomalies greater than 0.6°C for the
next 6 months (Experimental)

POAMA 2.4abc Probability SSTA $\geq 0.6^\circ\text{C}$: 20121201 [Lead=0-5 months, Nens=30]



Note:

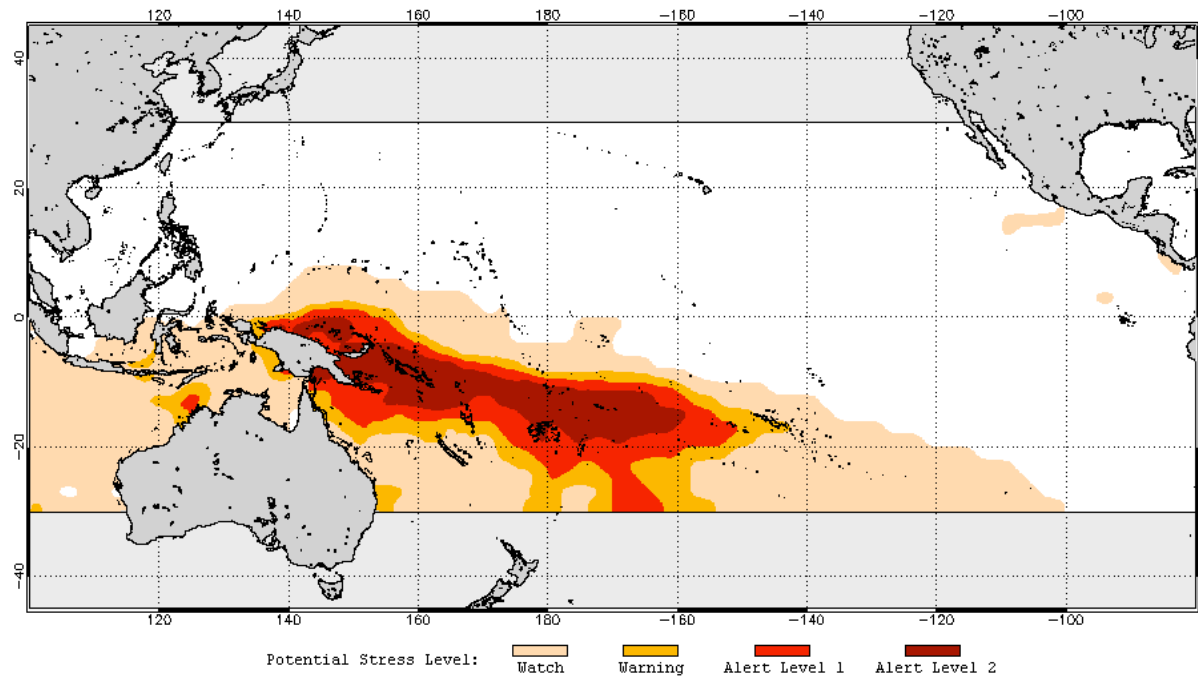
- POAMA is currently forecasting mostly average conditions until May 2013, with a forecast of slightly higher temperatures for December to April compared to previous months.

NOAA Coral Reef Watch

Coral Bleaching Thermal Stress Outlook (Version 2, experimental)

Outlook for December 2012 to March 2013

2012 Dec 04 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Dec-Mar 2013
(Version 2, Experimental)

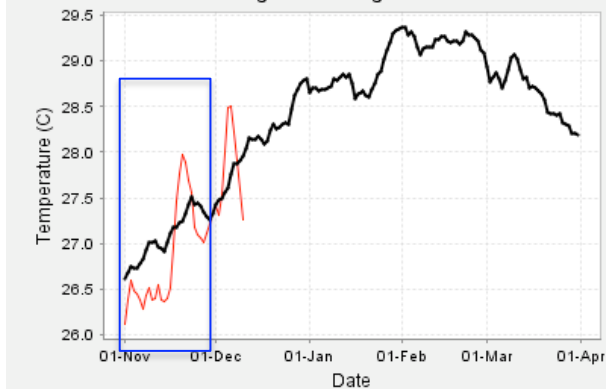


Note:

- The NOAA Coral Reef Watch forecast now suggests 'Alert level 1' south of PNG, and 'Warning' for the Torres Strait and N-GBR regions, while it continues suggesting 'Watch' for the rest of the GBR area.

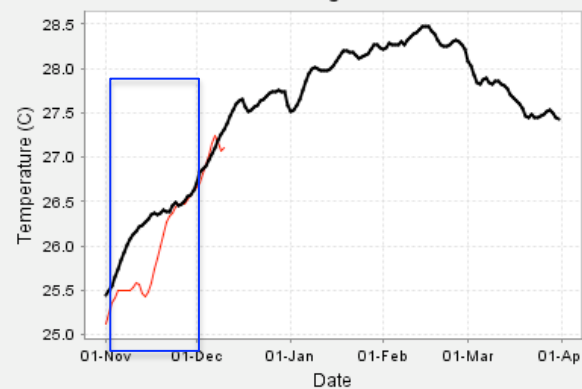
Weather Observing System: AIMS Data Centre

Water Temperature@0.6m Lizard Island Sensor Float 3Trend Against Long Term Average



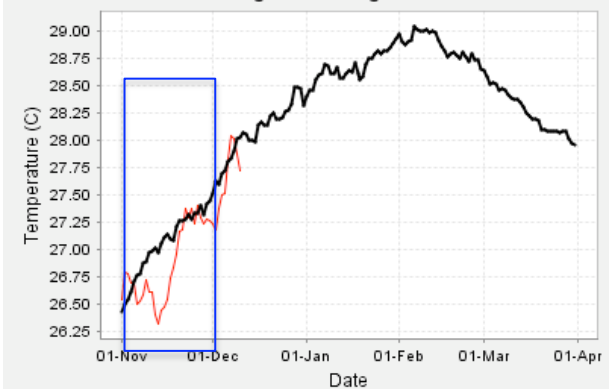
— Water Temperature@0.6m Lizard Island long term average over 9 years
 — LEVEL1 Water Temperature@0.6m Lizard Island daily average for 2012 - 2013
 Copyright © 2012. Australian Institute of Marine Science

Water Temperature@9.0m Hardy Reef PlatformTrend Against Long Term Average



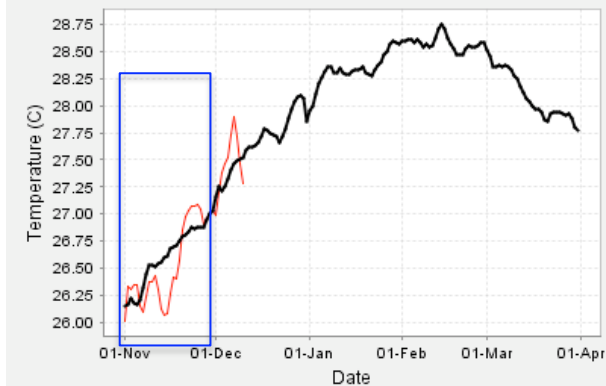
— Water Temperature@9.0m Hardy Reef long term average over 8 years
 — LEVEL1 Water Temperature@9.0m Hardy Reef daily average for 2012 - 2013
 Copyright © 2012. Australian Institute of Marine Science

Water Temperature@5.0m Myrmidon Sensor Float 1Trend Against Long Term Average



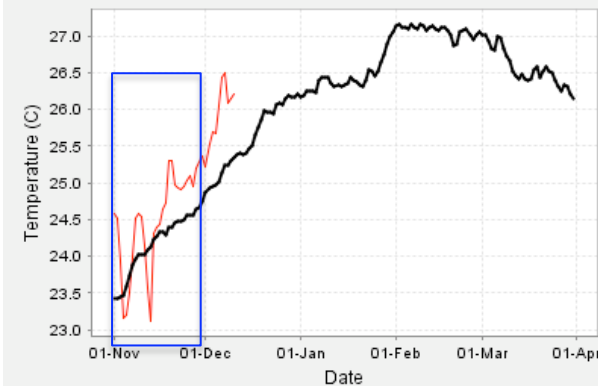
— Water Temperature@5.0m Myrmidon Reef long term average over 18 years
 — LEVEL1 Water Temperature@5.0m Myrmidon Reef daily average for 2012 - 2013
 Copyright © 2012. Australian Institute of Marine Science

Water Temperature@4.0m Davies Reef PlatformTrend Against Long Term Average



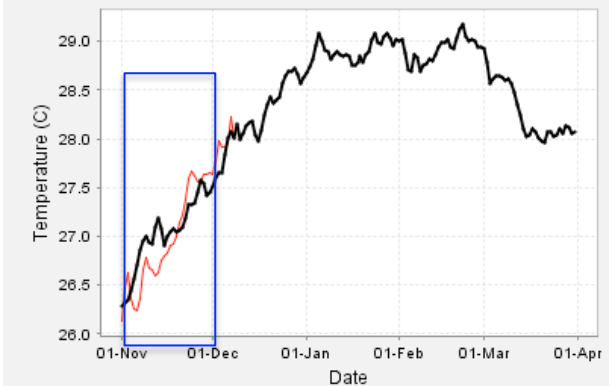
— Water Temperature@4.0m Davies Reef long term average over 14 years
 — LEVEL1 Water Temperature@4.0m Davies Reef daily average for 2012 - 2013
 Copyright © 2012. Australian Institute of Marine Science

Water Temperature@1.7m Heron Island Relay Pole 1Trend Against Long Term Average



— Water Temperature@1.7m Heron Island long term average over 8 years
 — LEVEL1 Water Temperature@1.7m Heron Island daily average for 2012 - 2013
 Copyright © 2012. Australian Institute of Marine Science

Water Temperature@8.6m Orpheus Island Sensor Float 2Trend Against Long Term Average

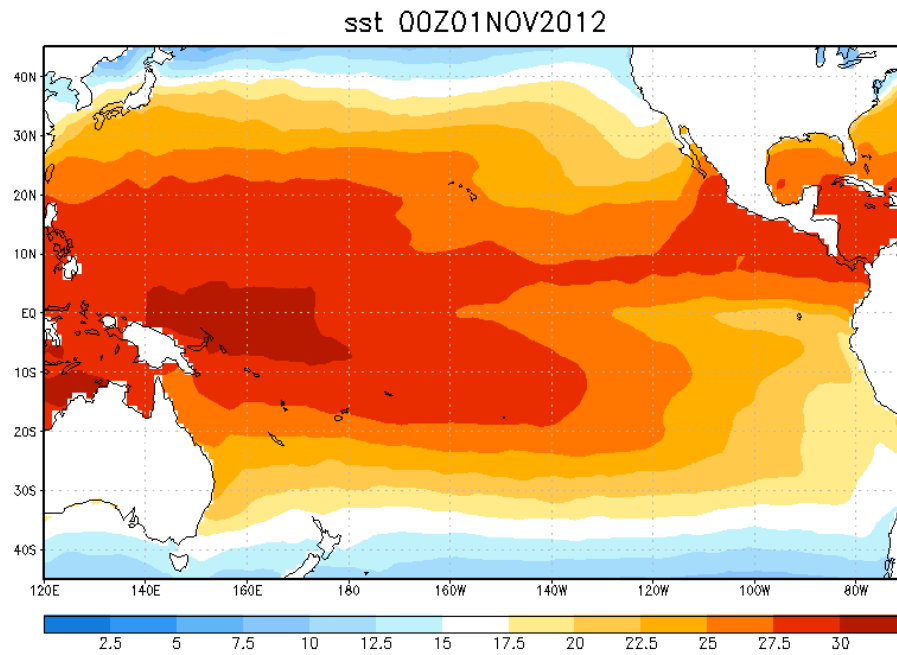


— Water Temperature@8.6m Orpheus Island long term average over 6 years
 — LEVEL1 Water Temperature@8.6m Orpheus Island daily average for 2012 - 2013
 Copyright © 2012. Australian Institute of Marine Science

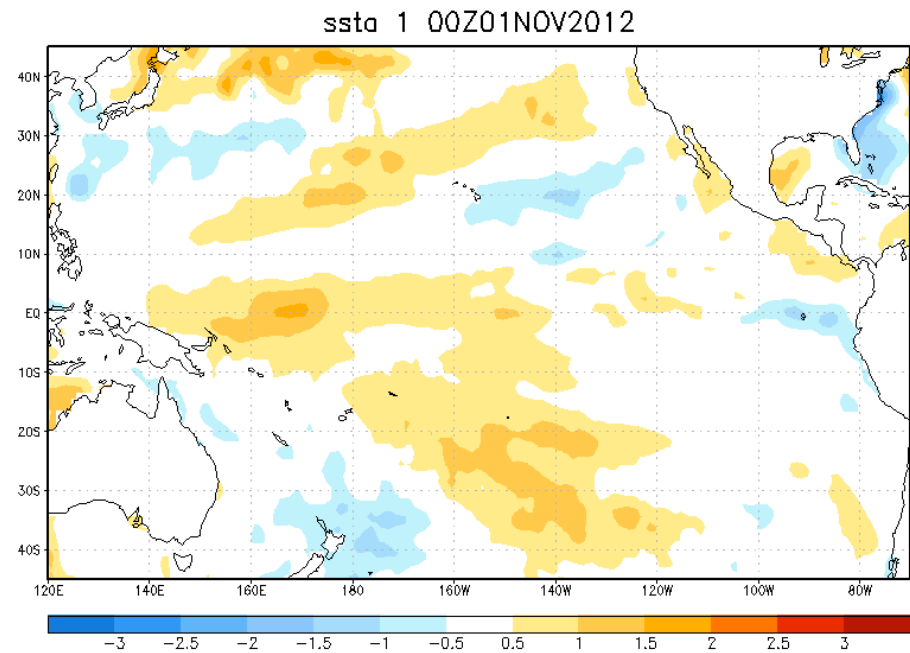
- Most of the AIMS weather stations show below average temperatures for the first half of November that changed to average or positive anomalies towards the end of the month.

NOAA Optimum Interpolation Sea Surface Temperature Analysis:

OI SST: NOVEMBER 2012



OI SST ANOMALY: NOVEMBER 2012



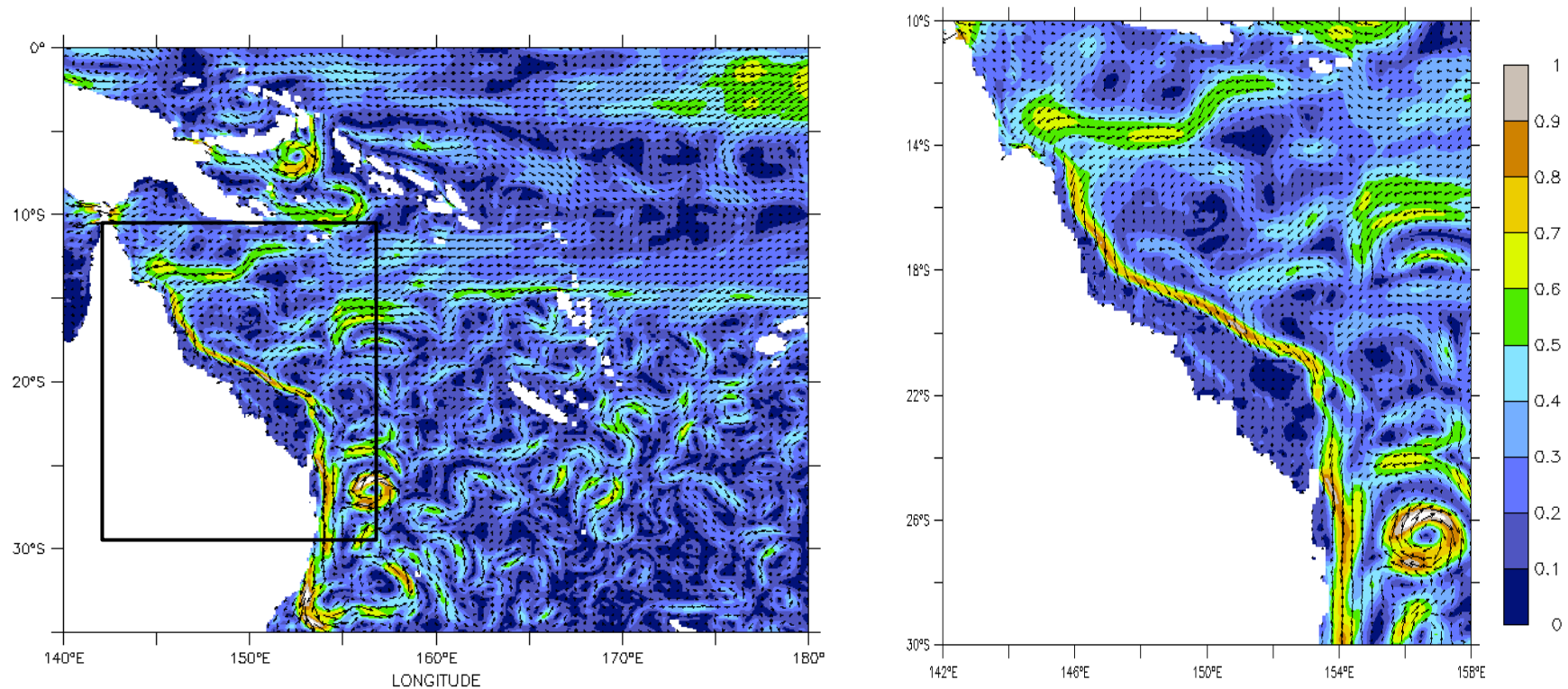
Note:

- Relatively weak positive SST anomalies continued along the equatorial Pacific during November, with the exception of the eastern most areas of the equatorial Pacific.

OceanMAPS 15m Depth-Average Currents

November 2012

OceanMAPS Ocean Modeling, Analysis and Prediction System was developed at CSIRO Marine and Atmospheric Research and the Bureau of Meteorology and it is part of the **Bluelink** project.

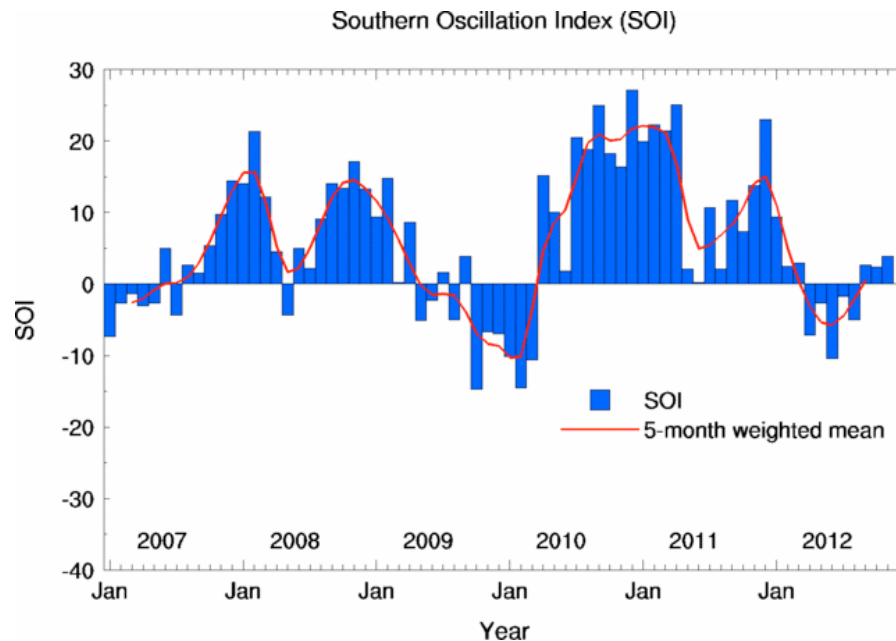


Behind Real Time analysis
15 m Depth-Averaged Currents (m/s).

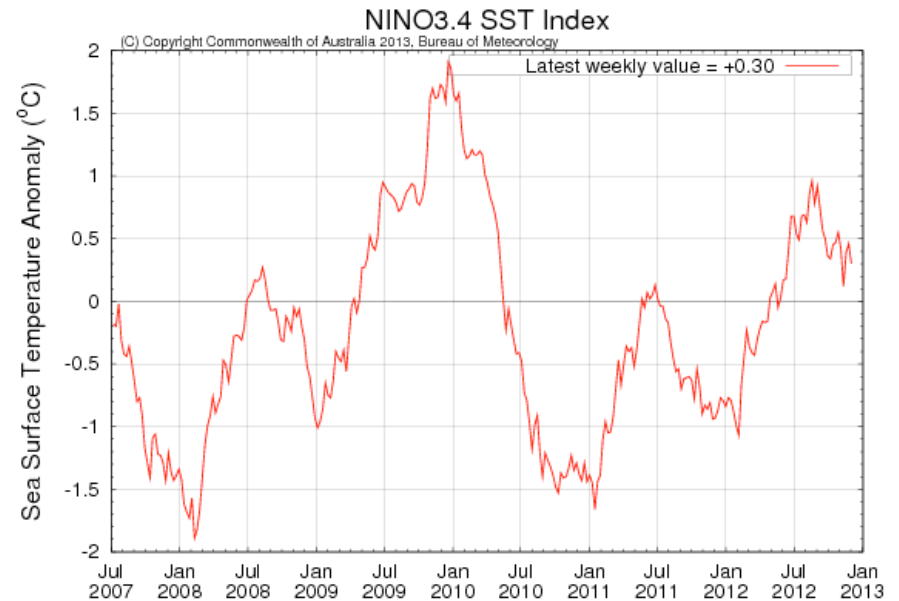
Note:

- Strong and well defined EAC clearly apparent along the GBR shelf-edge south of ~14°S
- Strong eddy activity off SE Queensland

ENSO index



Negative SOI = El Niño



Positive Nino 3.4 index= El Niño

Note:

- ENSO-neutral conditions observed during November, with the weak positive SST anomalies for the equatorial Pacific reflected in the slightly positive Niño 3.4 SST index.
- ENSO-neutral conditions are expected to continue for the upcoming months (<http://iri.columbia.edu/climate/ENSO/currentinfo/figure1.html>)