NERP

Torres Strait / GBR environmental conditions report:

Recent status and predictions

12 December 2011

by Ana Redondo-Rodriguez, PhD candidate – a.rodriguez@uq.edu.au
work supervised by Dr. Scarla Weeks

UQ-GPEM Biophysical Oceanography Group

Outline

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

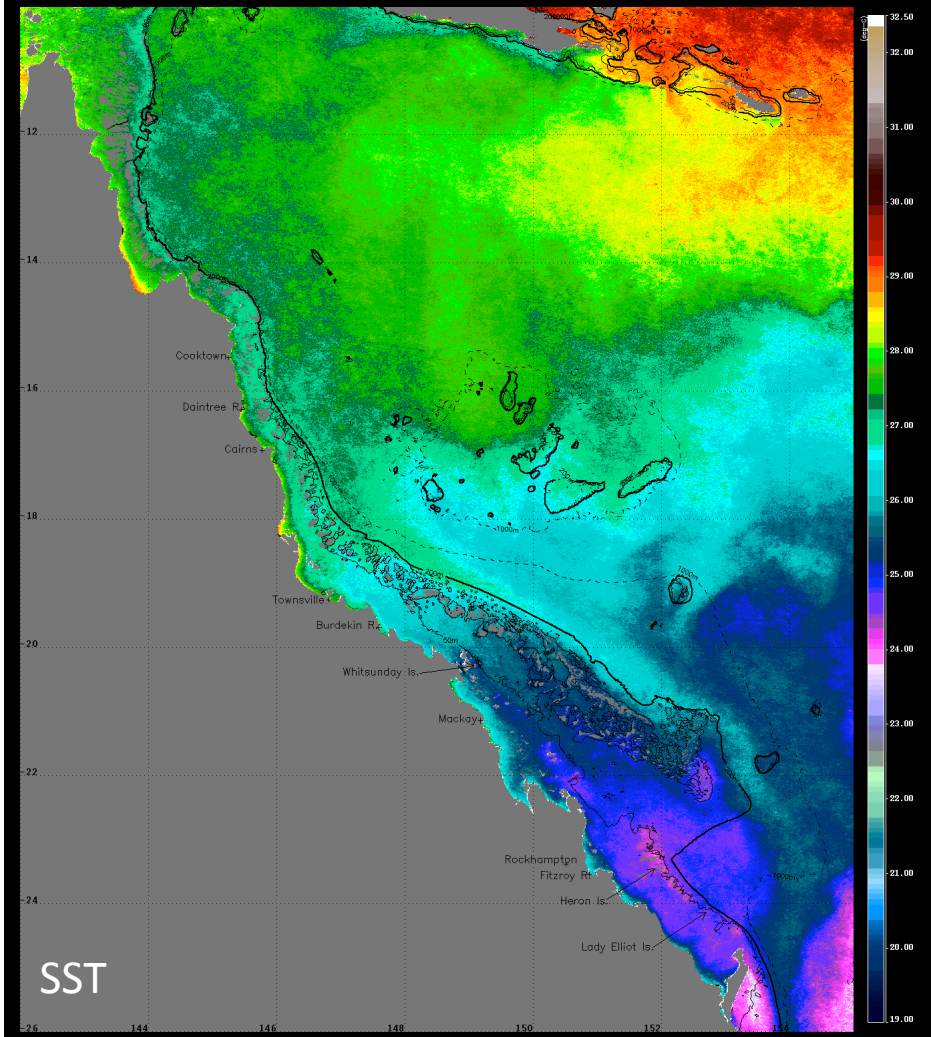
Overview

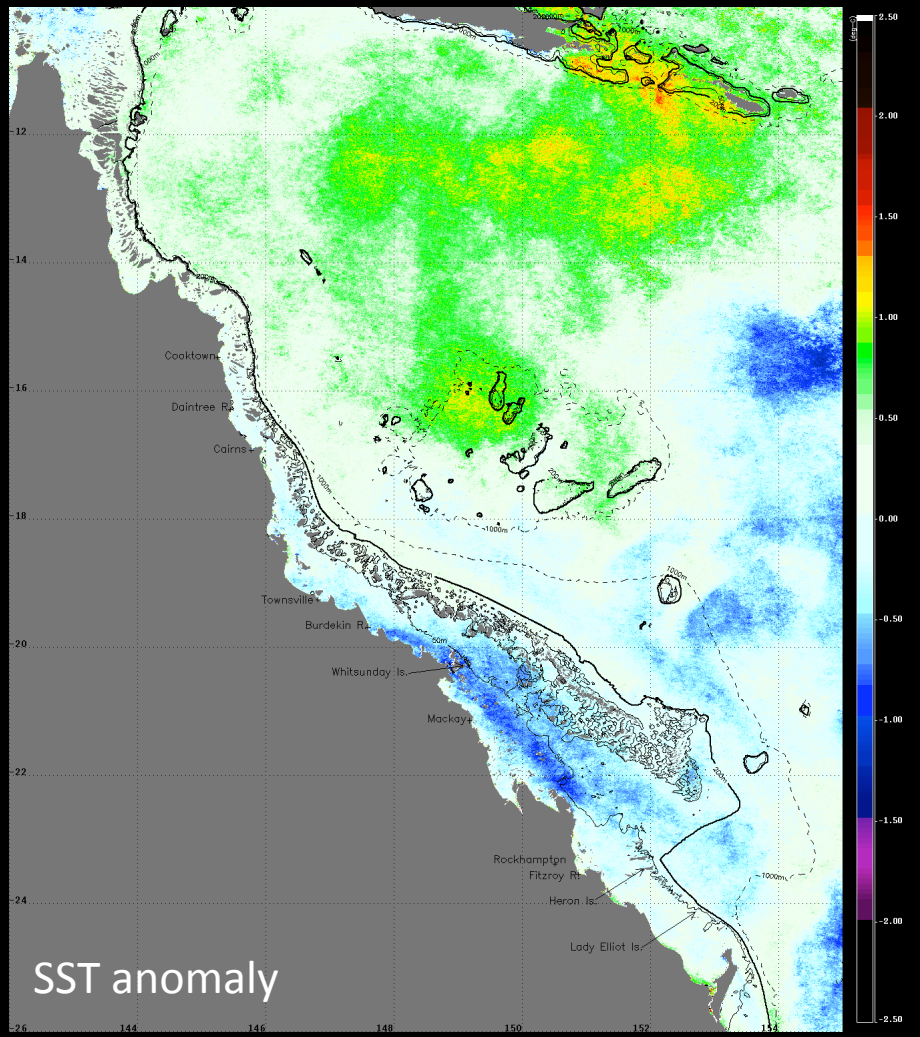
- Close to average SST for the Torres Strait / northern GBR area during November. The strong negative SST anomalies present last month have dissipated through November.

- Forecast of close to normal SST conditions in the upcoming months.

- La Niña conditions established in the Pacific and expected to peak in December/January (weak to moderate strength).

Modis SST (day+night): November 2011

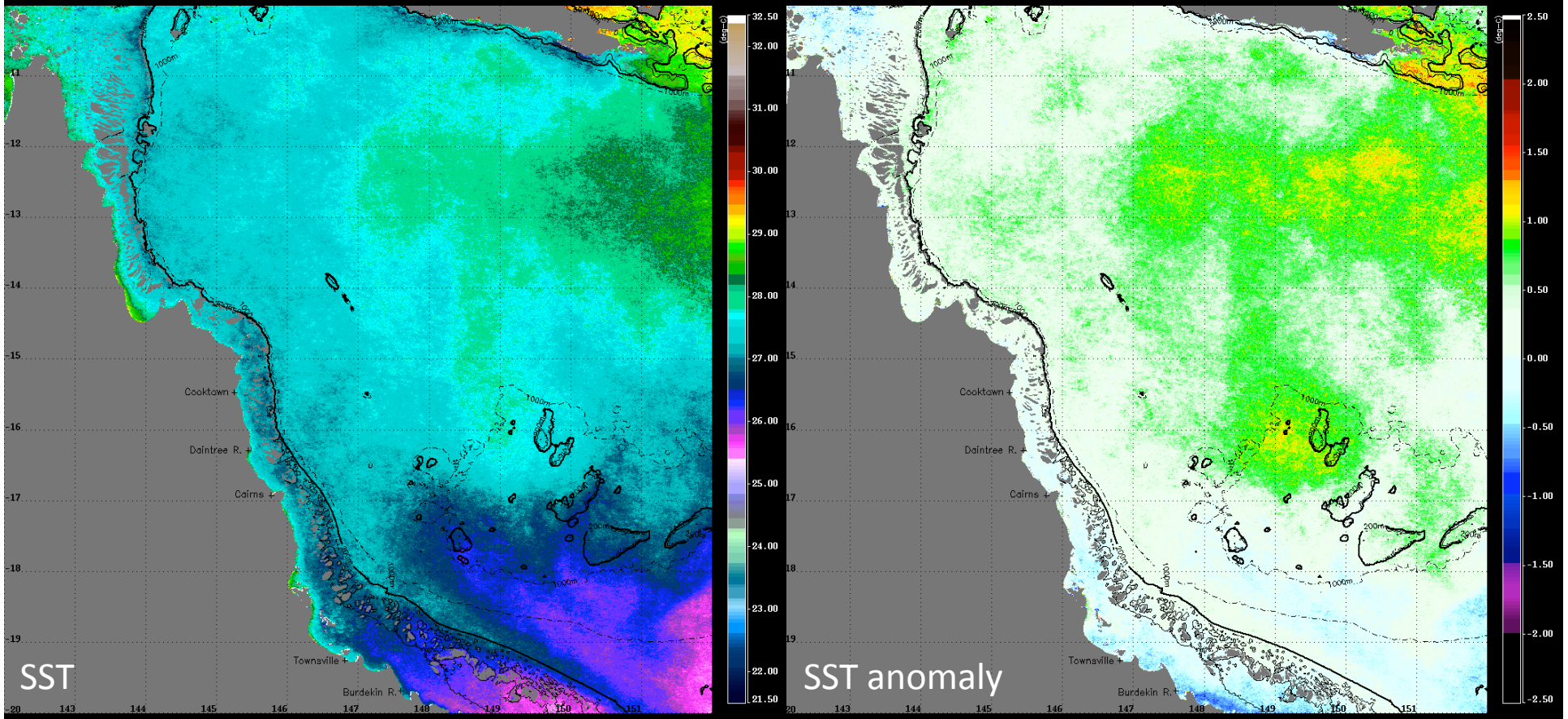




Note:

- Mostly average SST for the whole GBR and Torres Strait region, with the exception of the area south of ~20^{o} S
- Strongly intensified EAC southward-flow adjacent to the shelf during the month of November
- SST positive anomalies still persistent in the Coral Sea, but weaker than in October

Torres Strait / northern GBR MODIS SST: November 2011

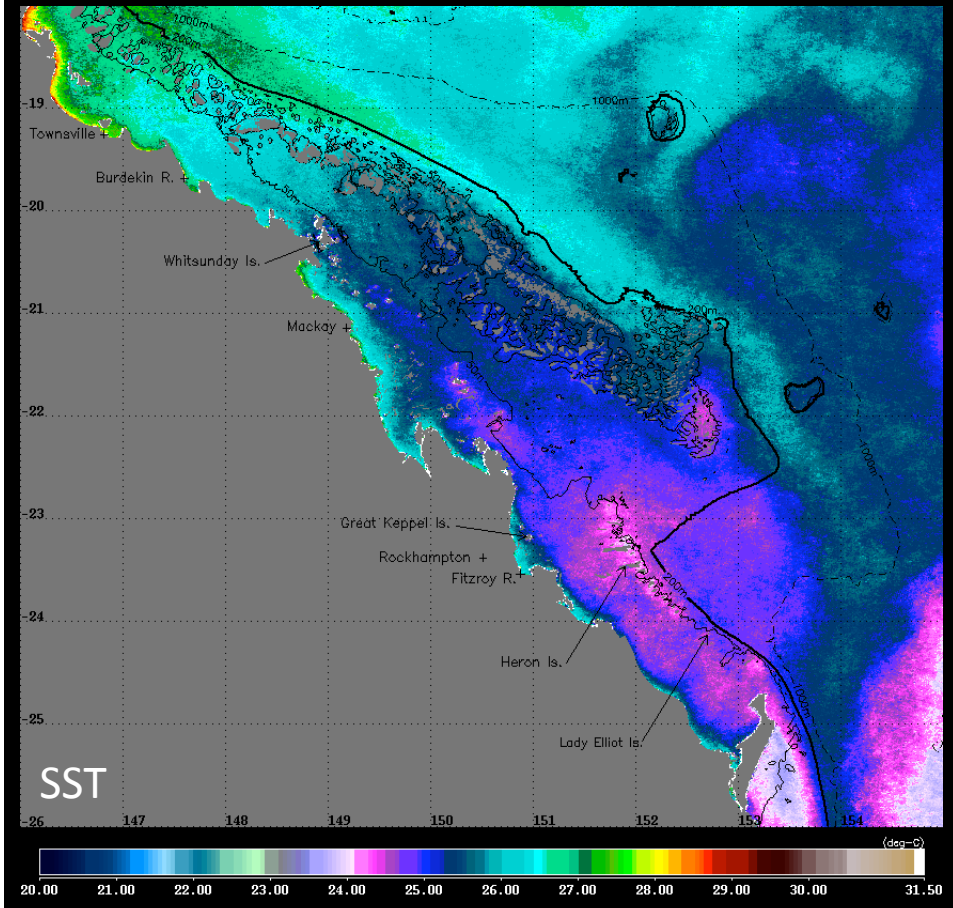


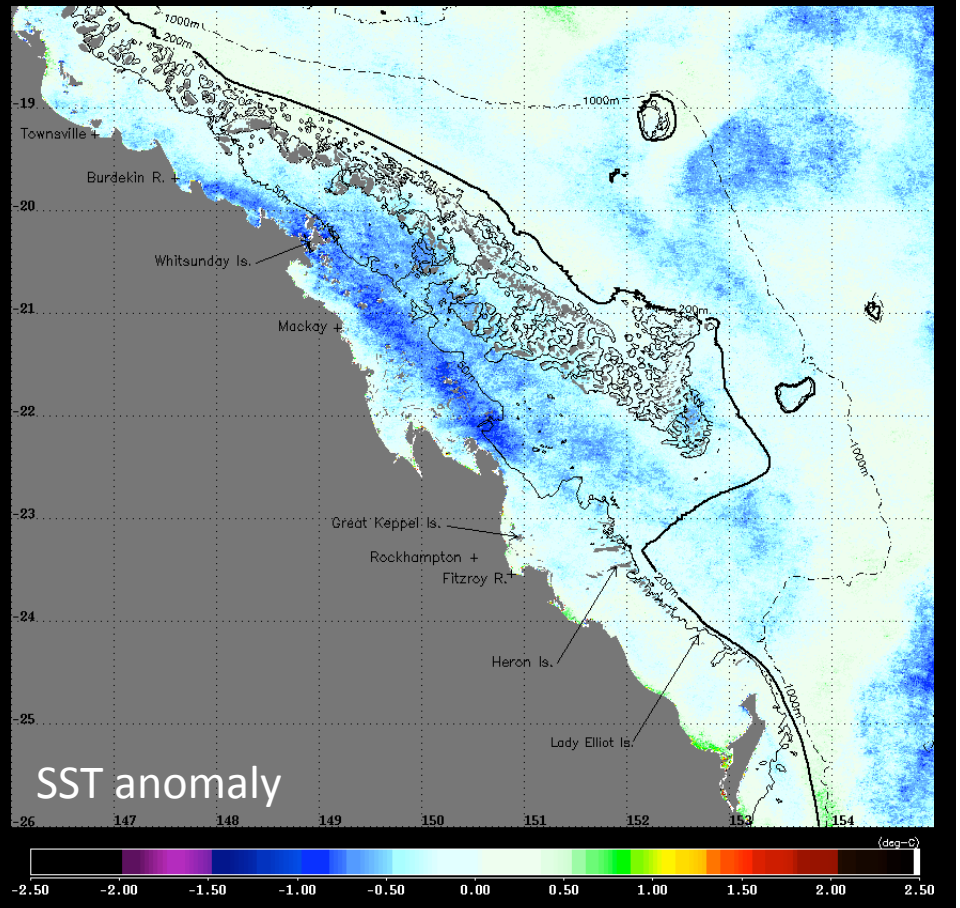
Note:

(SST scale adjusted for N-GBR)

- Mostly average conditions for the Torres Strait and N-GBR area
- Relaxation of the negative SST anomalies on the inner reefs south of ~17° S

Southern GBR MODIS SST: November 2011



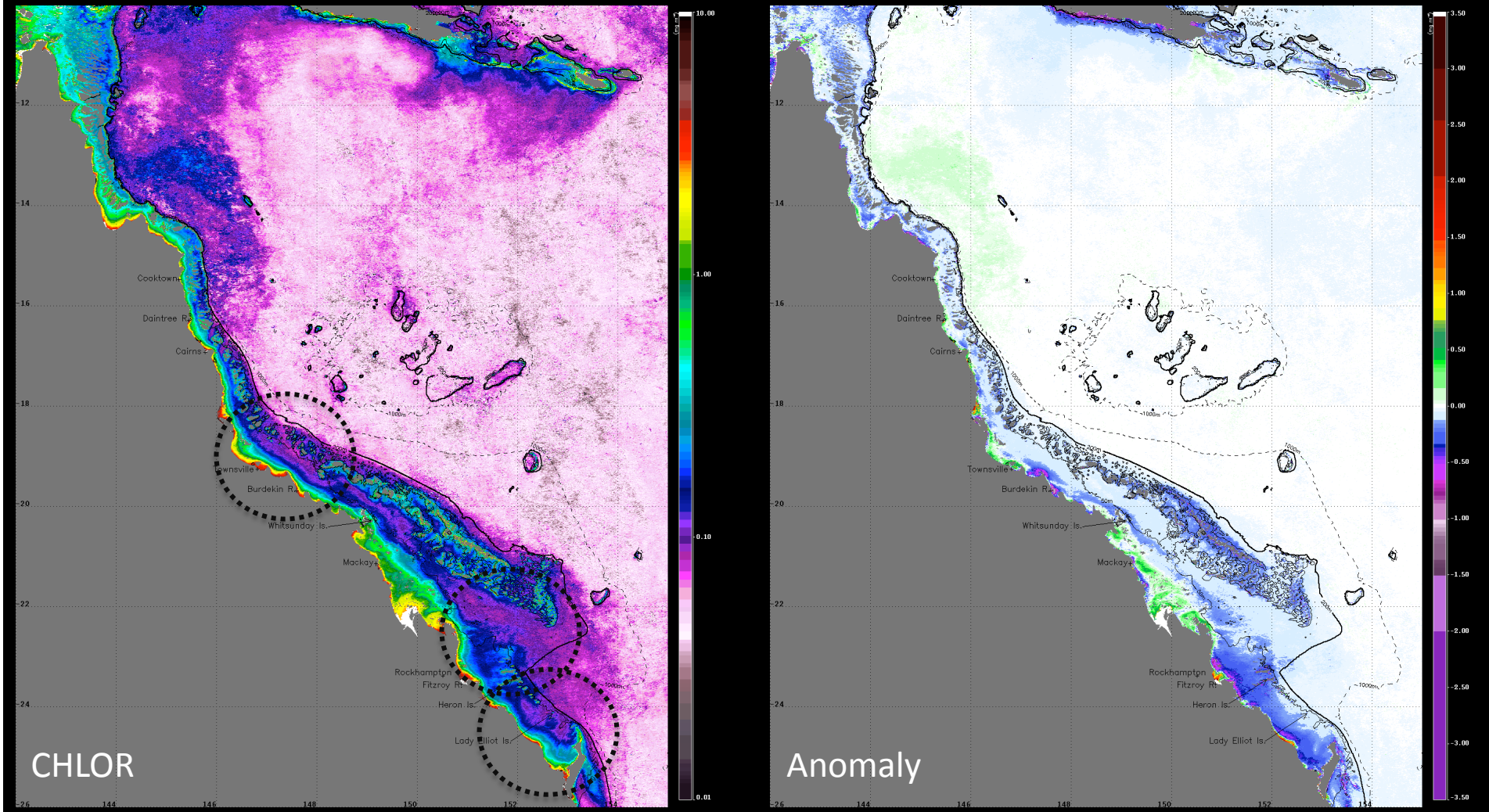


Note:

(SST scale adjusted for S-GBR)

- The strong negative SST anomalies present in October on the southern GBR dissipated during November
- Strongly-intensified EAC southward flow during November

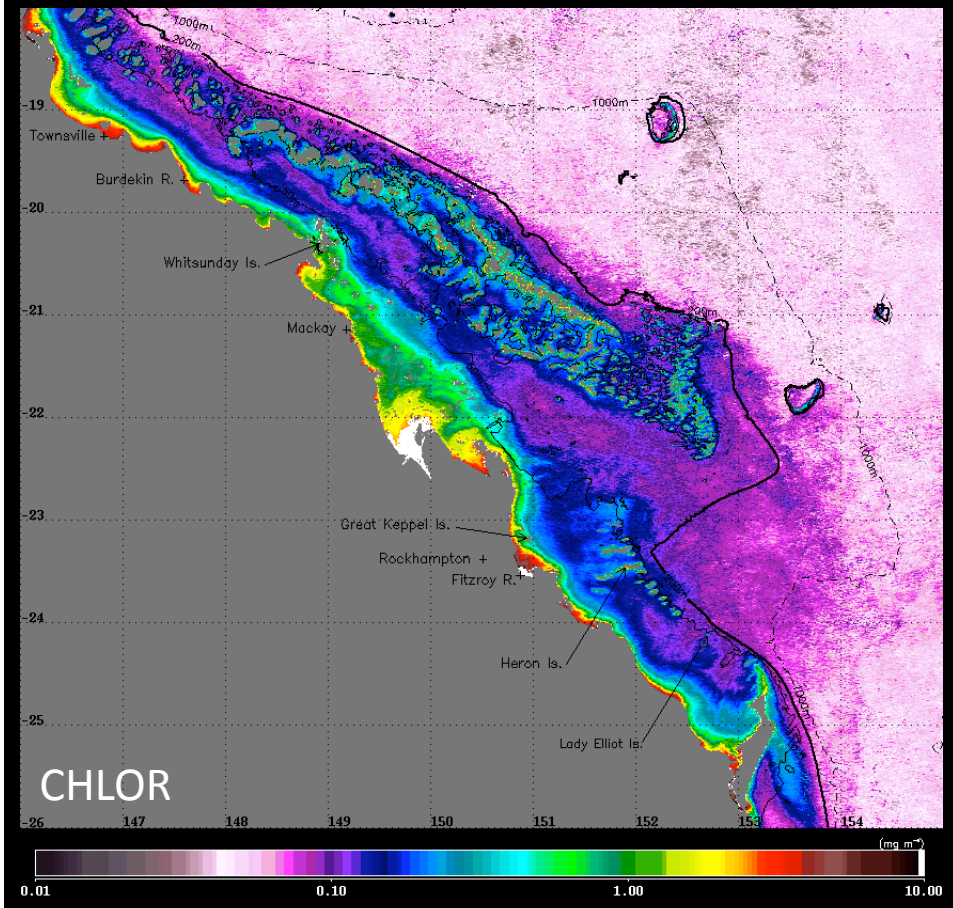
MODIS Chlorophyll-*a* concentration: November 2011

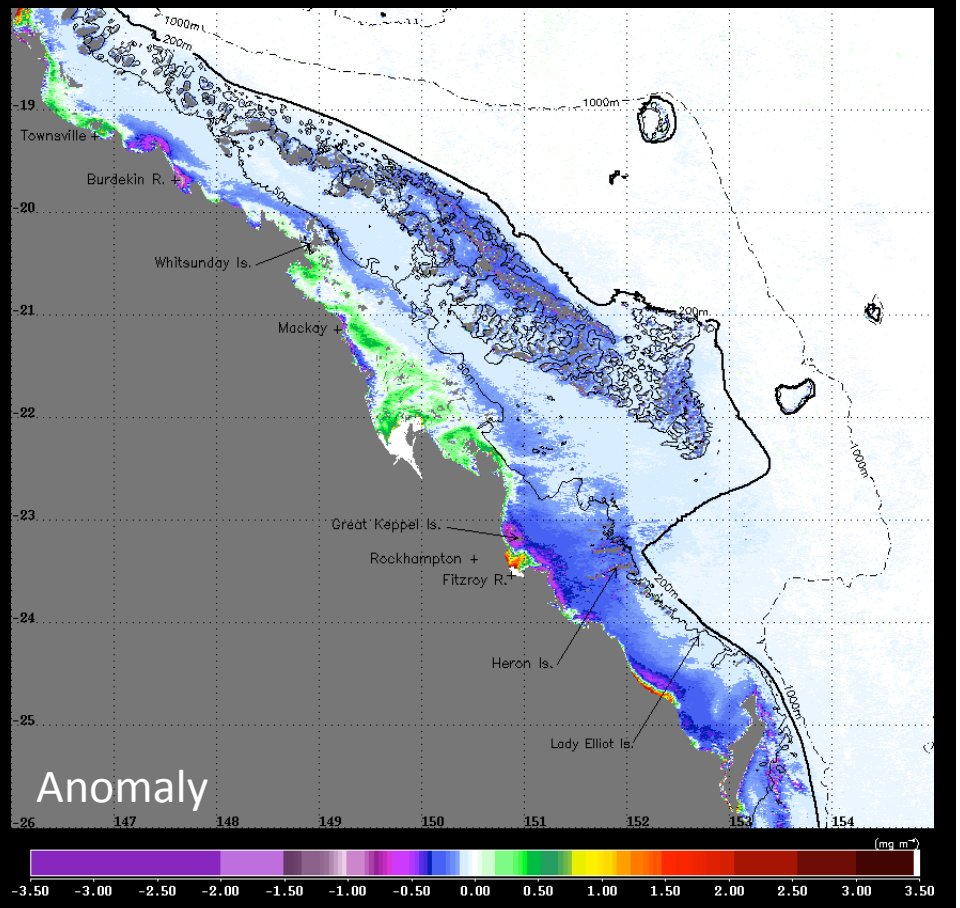


Note:

- Close to / below averaged chlorophyll concentration levels for November across the Torres Strait and along the length of the GBR
- Pronounced intrusions of low chlorophyll waters into the GBR lagoon due to intense EAC flow, leading to anomalously low anomalies particularly on the southern GBR

Southern GBR
MODIS Chlorophyll-*a* concentration
November 2011

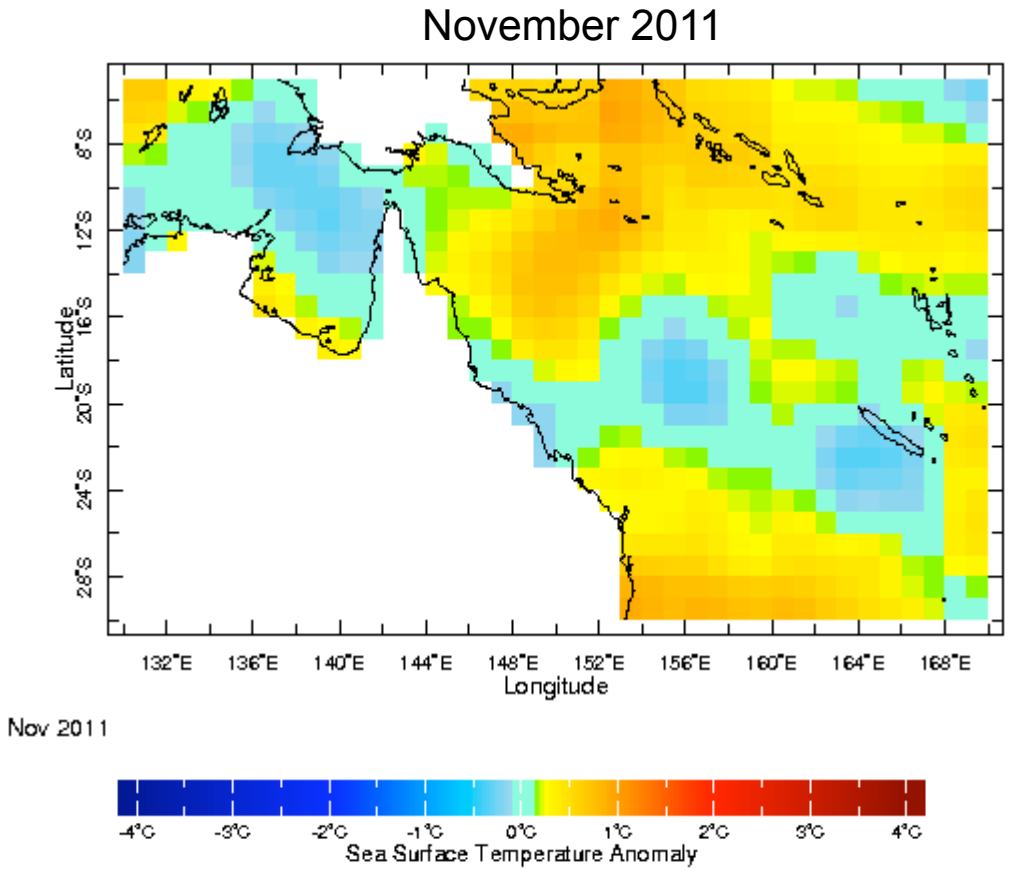




Note:

- Strong intrusions of low chlorophyll EAC waters into the GBR lagoon clearly apparent through the Myrmidon, Capricorn and Curtis channels

NOAA NCEP EMC CMB GLOBAL Reyn_SmithOIv2 monthly SSTA: Sea Surface Temperature Anomaly data



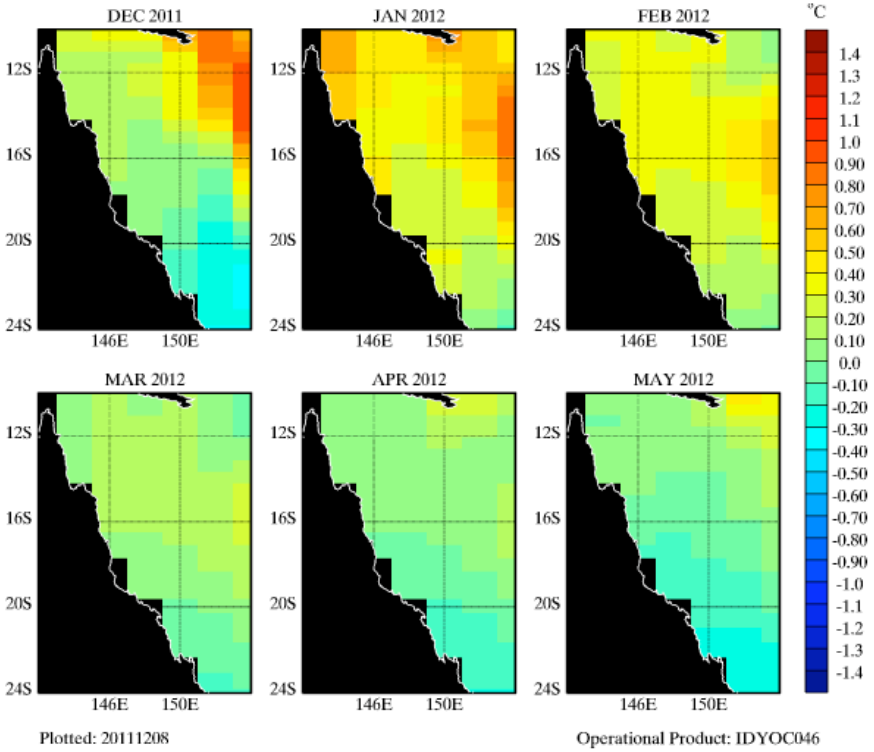
Note:

- Coincident with the MODIS SST data, Reynolds SST anomaly data shows mild SST anomalies along the GBR
- Close to average conditions for the Torres Strait area
- Positive SST anomalies in the Coral Sea in November

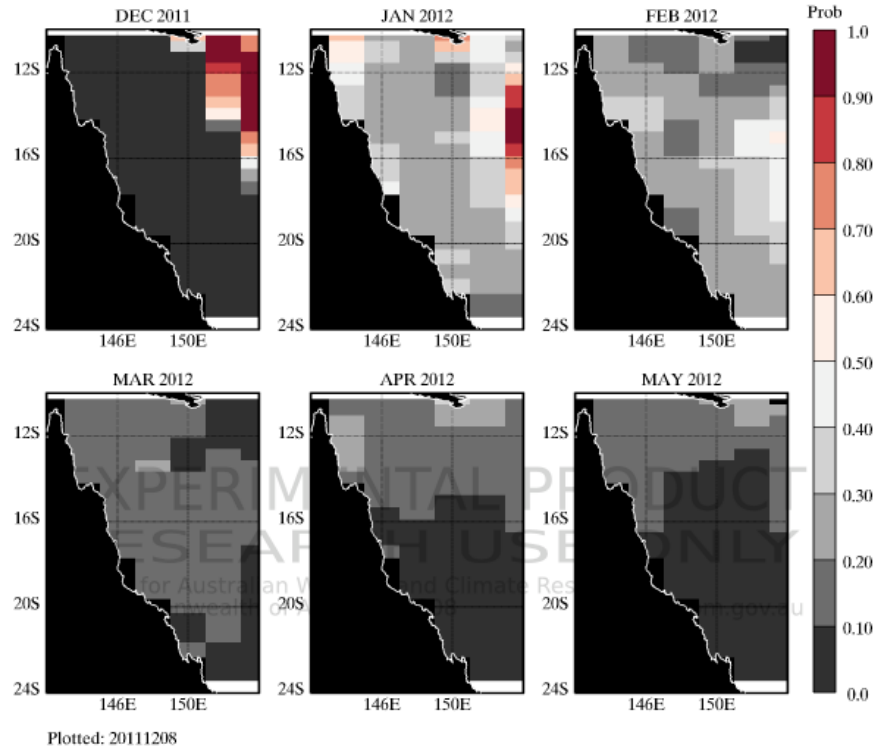
http://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.EMC/.CMB/.GLOBAL/.Reyn_SmithOIv2/

Great Barrier Reef SST Anomaly Forecast (POAMA-2)

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



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



Note:

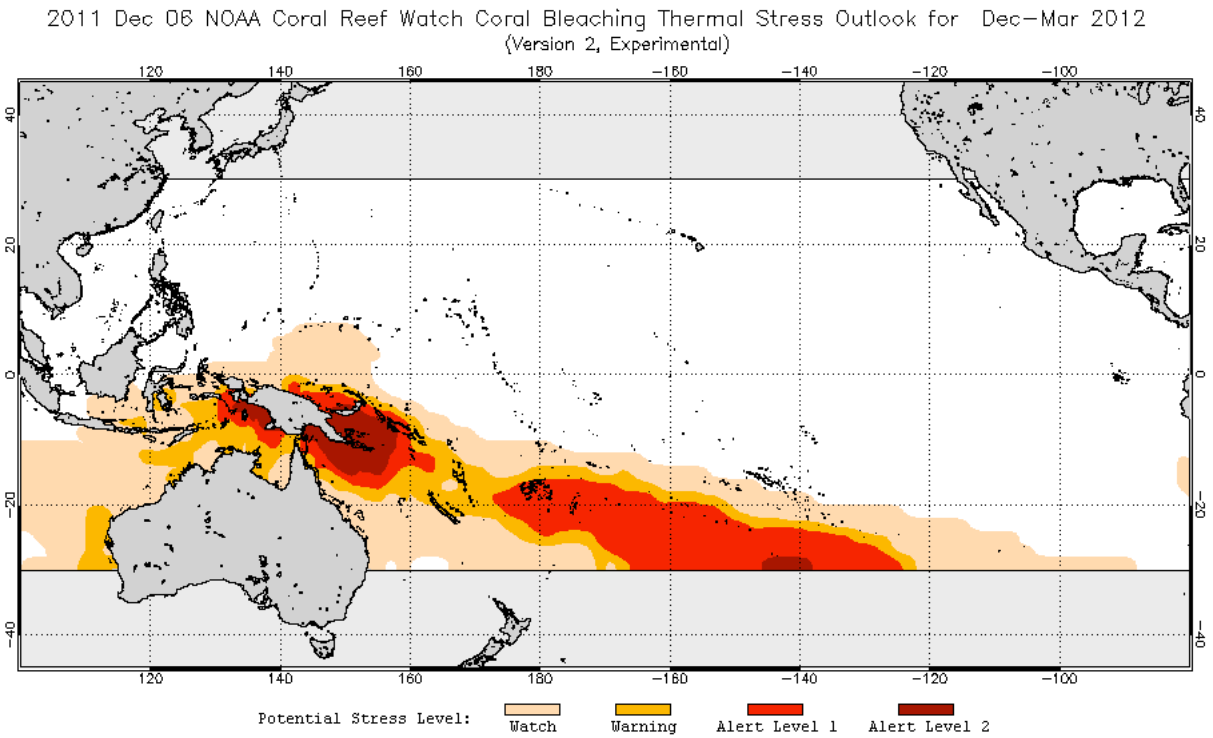
- From 3rd November 2011, the POAMA model has been upgraded to POAMA-2
- POAMA forecasts mostly averaged conditions for the following months, except for January, when slightly more positive anomalies are expected on the northern GBR.

NOAA Coral Reef Watch

Coral Bleaching Thermal Stress Outlook

(Version 2, experimental)

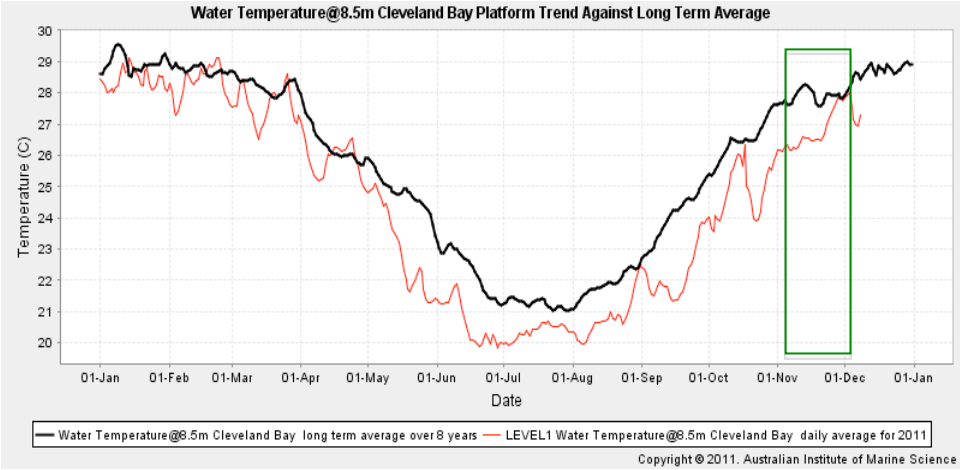
Outlook for December 2011 to March 2012

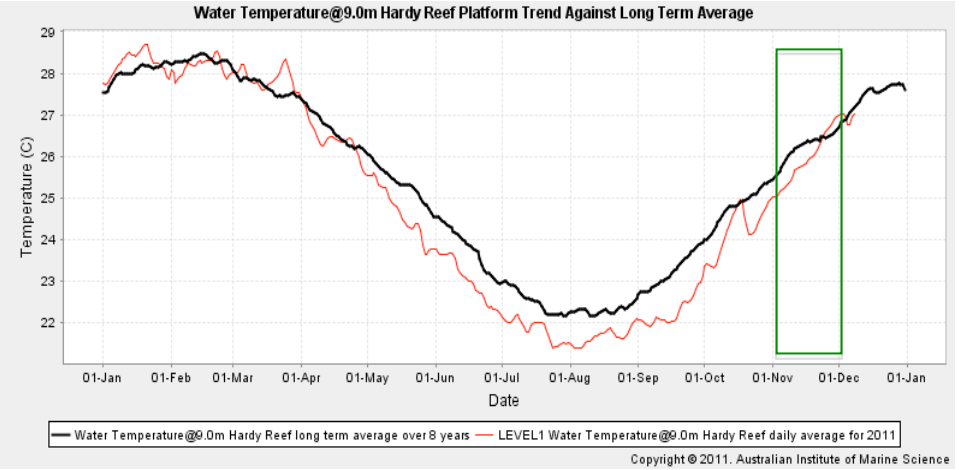


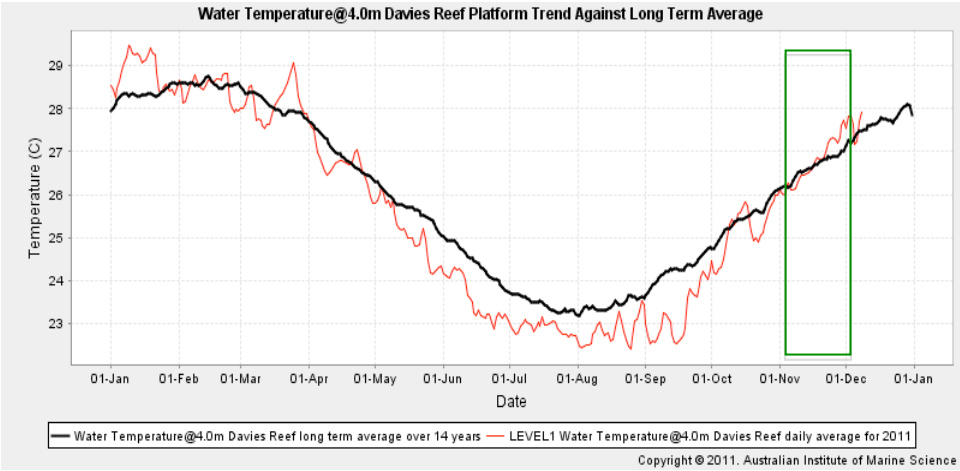
Note:

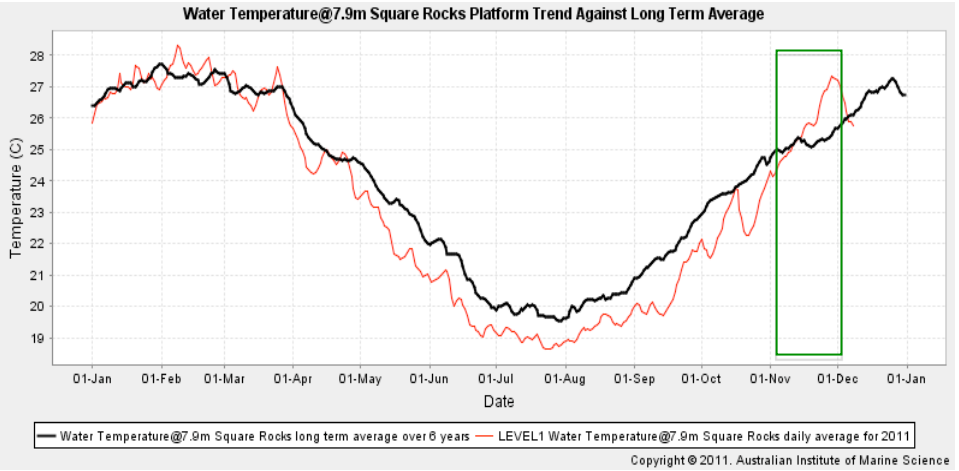
- NOAA thermal Stress Outlook suggests 'Watch' for potential thermal stress outlook till February 2012, with increasing alert levels around northern GBR and PNG reefs.

Weather Observing System: AIMS Data Centre



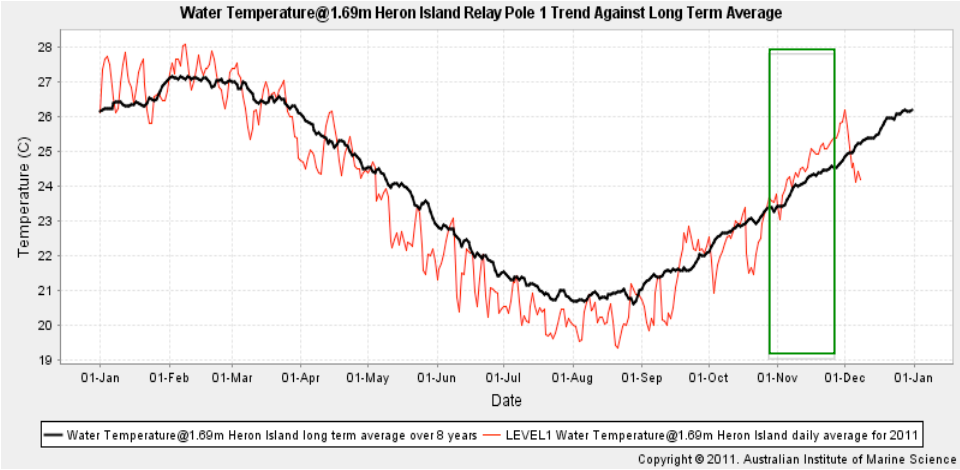


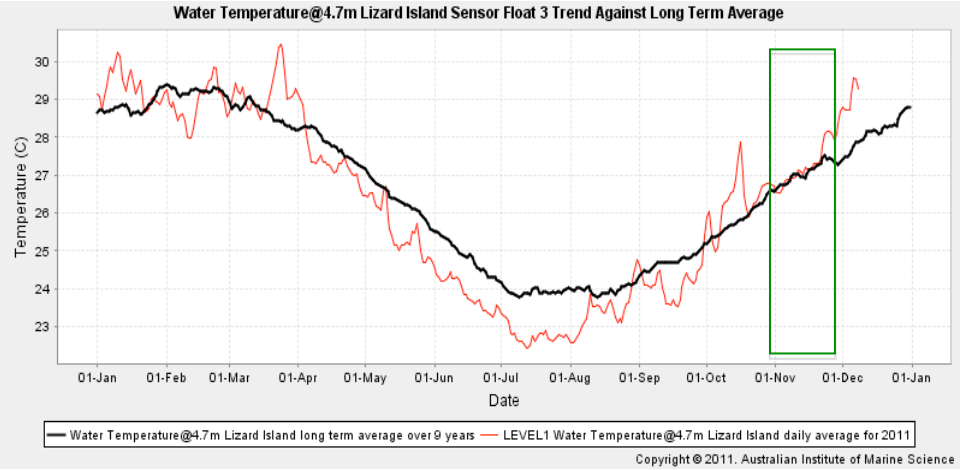




Copyright©2011 Australian Institute of Marine Science. URL: http://www.aims.gov.au

Weather Observing System: AIMS Data Centre





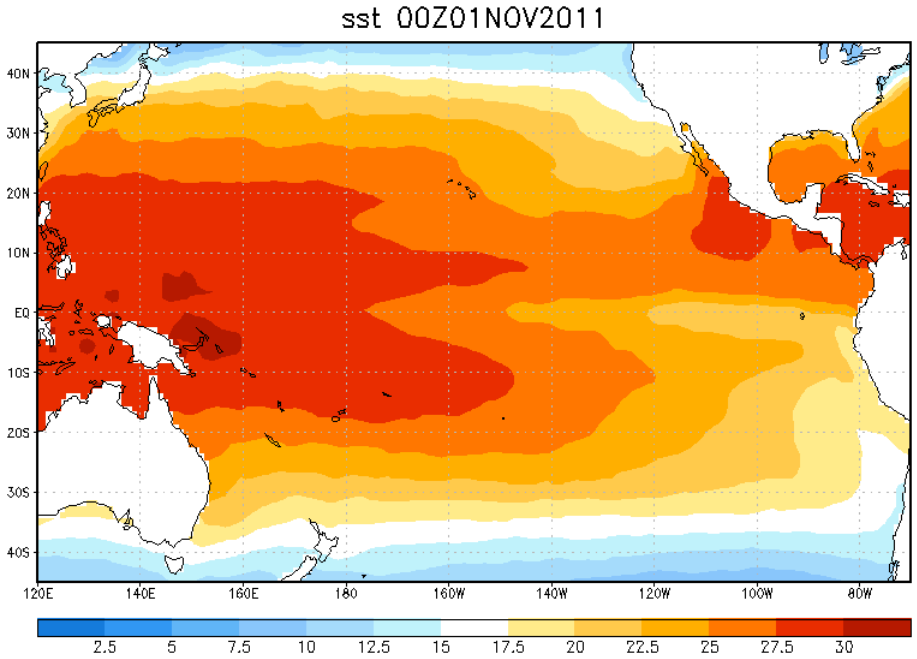
Note:

- Coincident with the SST data, in situ temperatures at all stations show a continued tendency towards increased temperatures, approaching or exceeding the long term-average.

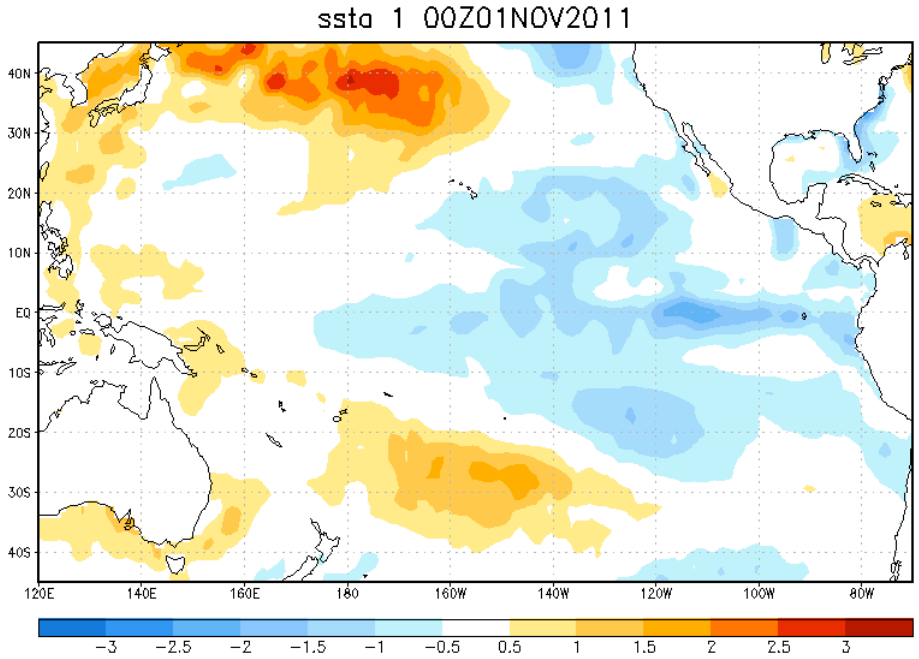
Copyright©2011 Australian Institute of Marine Science. URL: http://www.aims.gov.au

NOAA Optimum Interpolation Sea Surface Temperature Analysis:

OI SST: NOVEMBER 2011



OI SST ANOMALY: NOVEMBER 2011

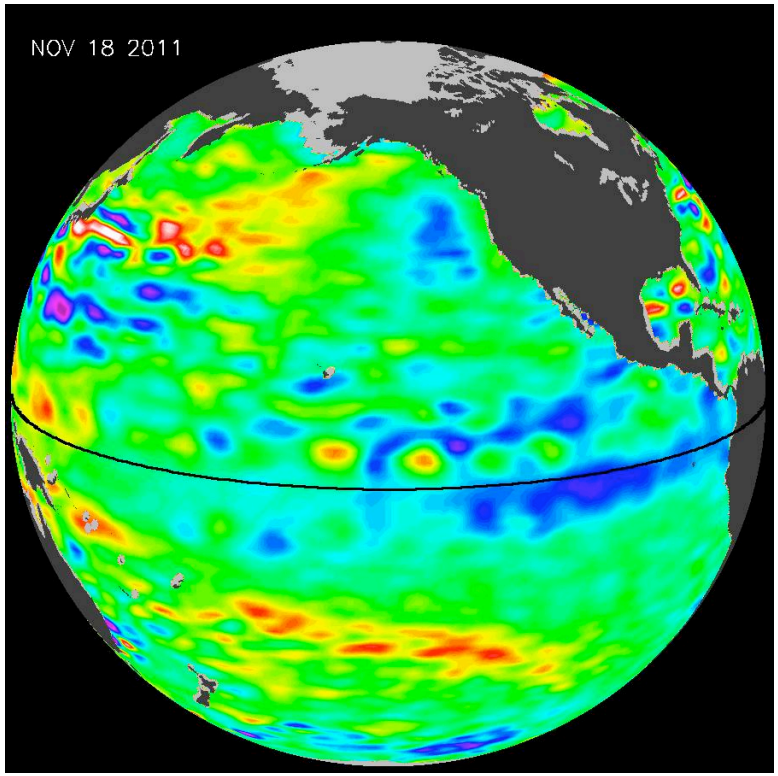


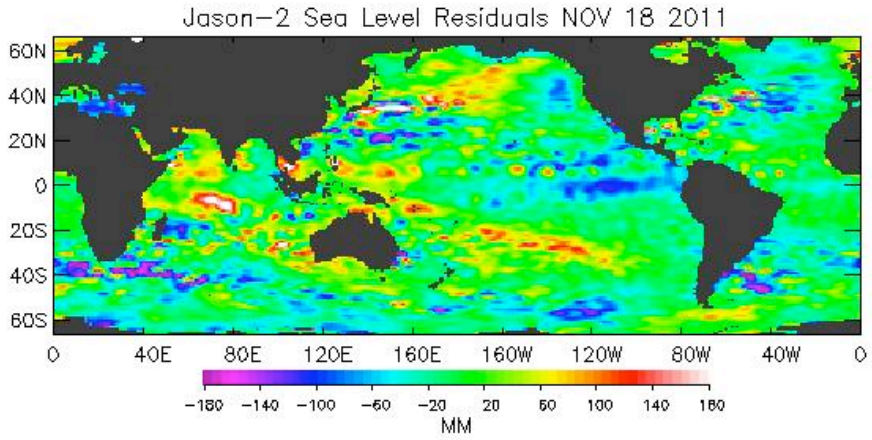
Note:

- Negative SST anomalies persisted across the eastern half of the equatorial Pacific during November, indicative of La Niña conditions

Sea surface height anomalies from Ocean Surface Topography: Jason-1 and Jason-22 (NASA/French)

10-day data cycle centered around 18 November, 2011.





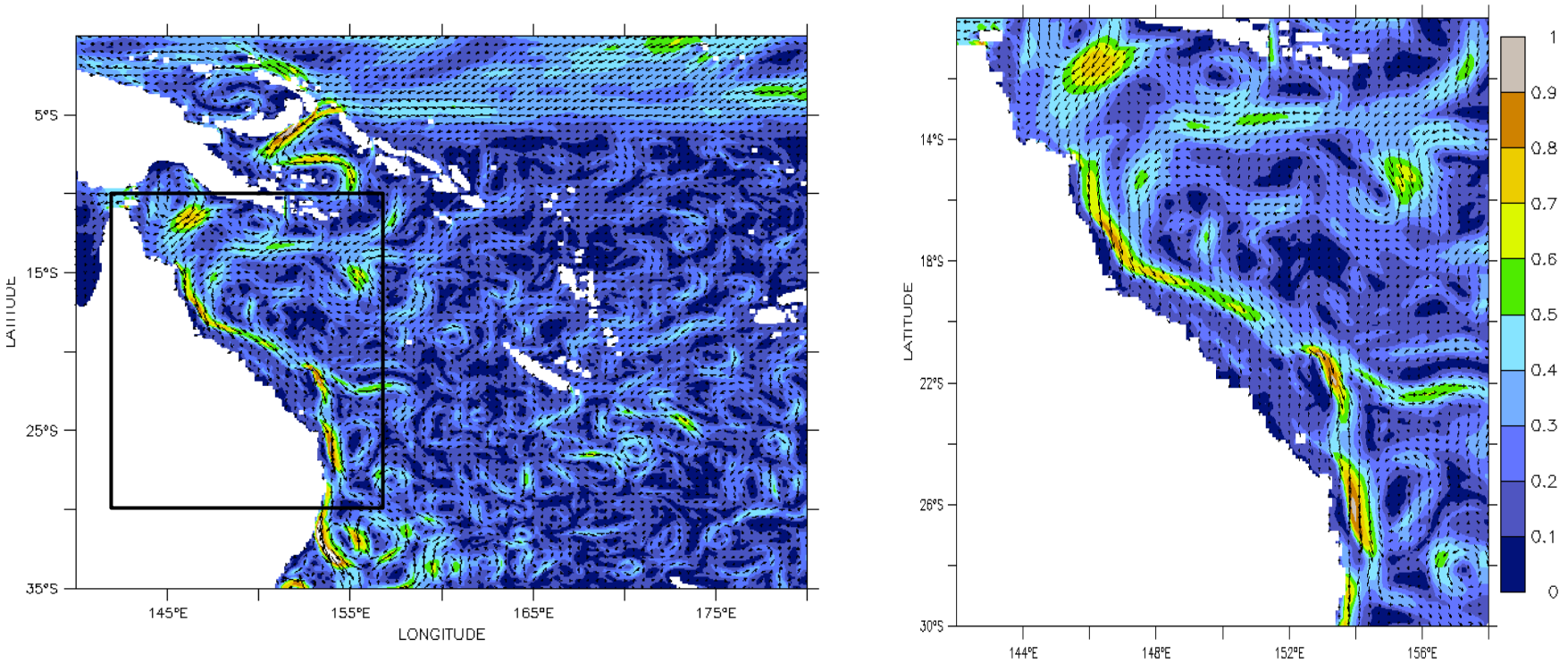
Note:

• Satellite SSH data shows negative SSH anomalies located in the eastern equatorial Pacific, related to La Nina which is characterized by lower SSH in the central and eastern equatorial Pacific and an increase in SSH over the Western Pacific Warm Pool.

OceanMAPS 15m Depth-Average Currents

November 2011

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.

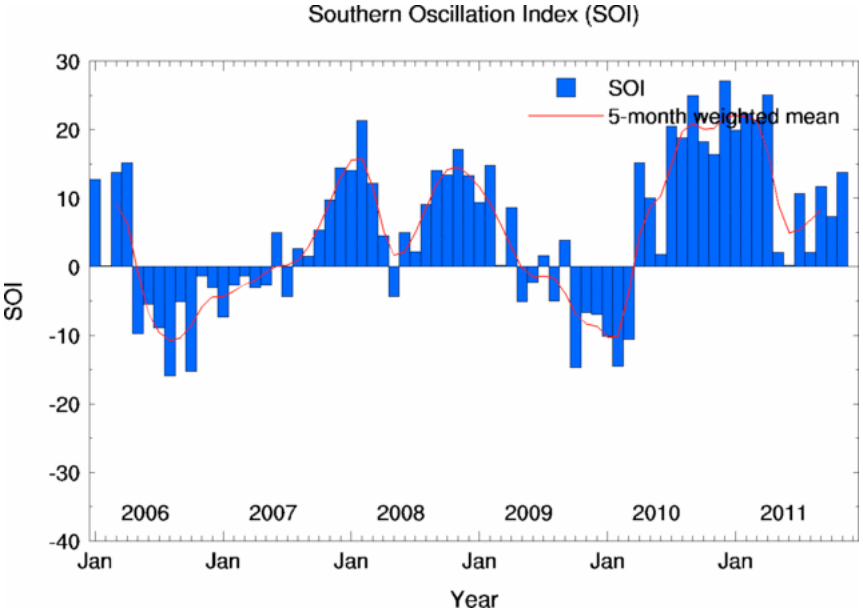


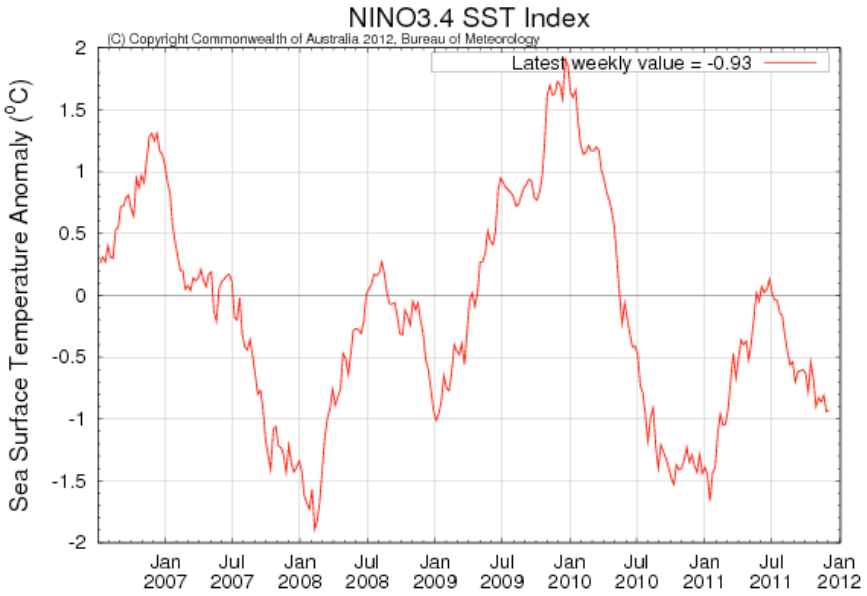
Behind Real Time analysis
15 m Depth-Averaged Currents (m/s).

Note:

- Intense southward EAC flow adjacent to the entire GBR shelf (resulting in the strong GBR intrusions noted in chlorophyll images)
- Strong recirculation within the PNG Gyre

ENSO index





Positive SOI = La Niña

Negative Nino 3.4 index= La Niña

Note:

- ENSO indices indicate La Niña conditions, which are expected to peak in December /January (weak to moderate La Niña).