

NERP

Torres Strait / GBR environmental conditions report:

Recent status and predictions

10 January 2012

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

UQ-GPEM Biophysical Oceanography Group

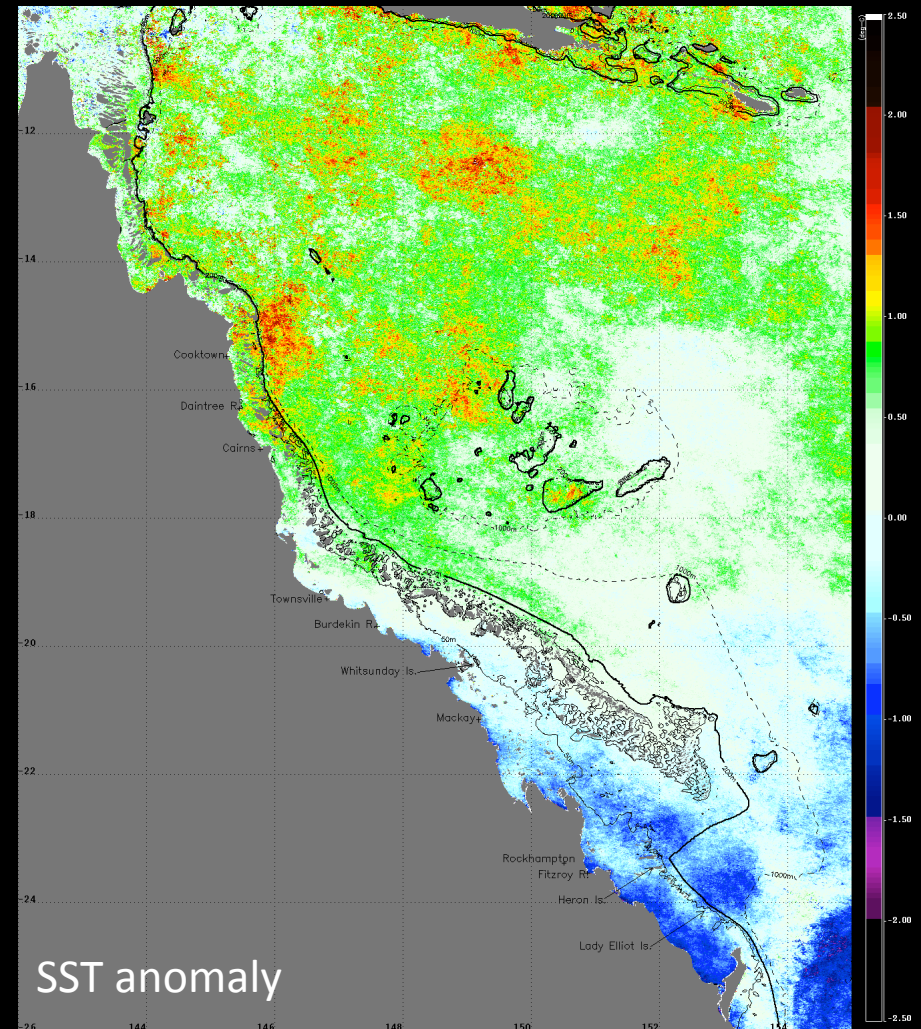
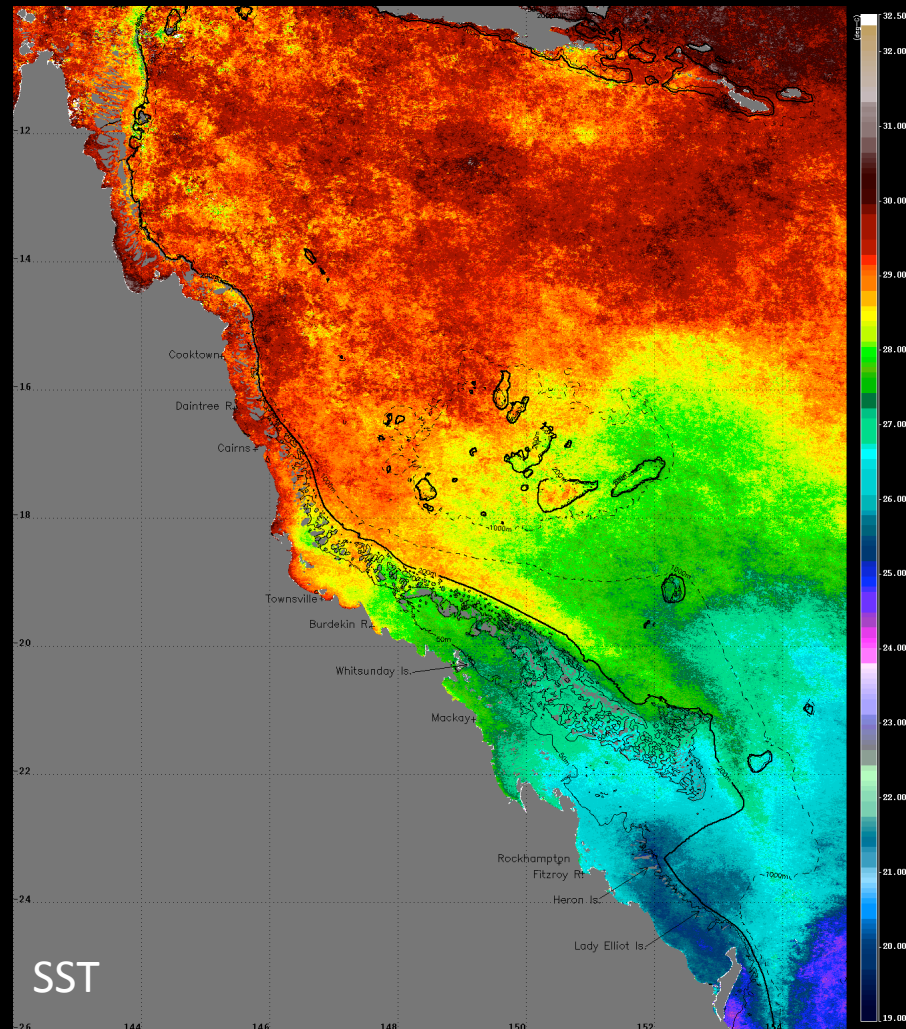
Outline

- 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

- Positive SST for the Torres Strait / northern GBR area during December in contrast with negative anomalies present on the southern GBR.
- Forecast of close to normal SST conditions in the upcoming months. Bleaching alert around the PNG reefs.
- La Niña conditions continue in the Pacific and expected to continue into the following months.

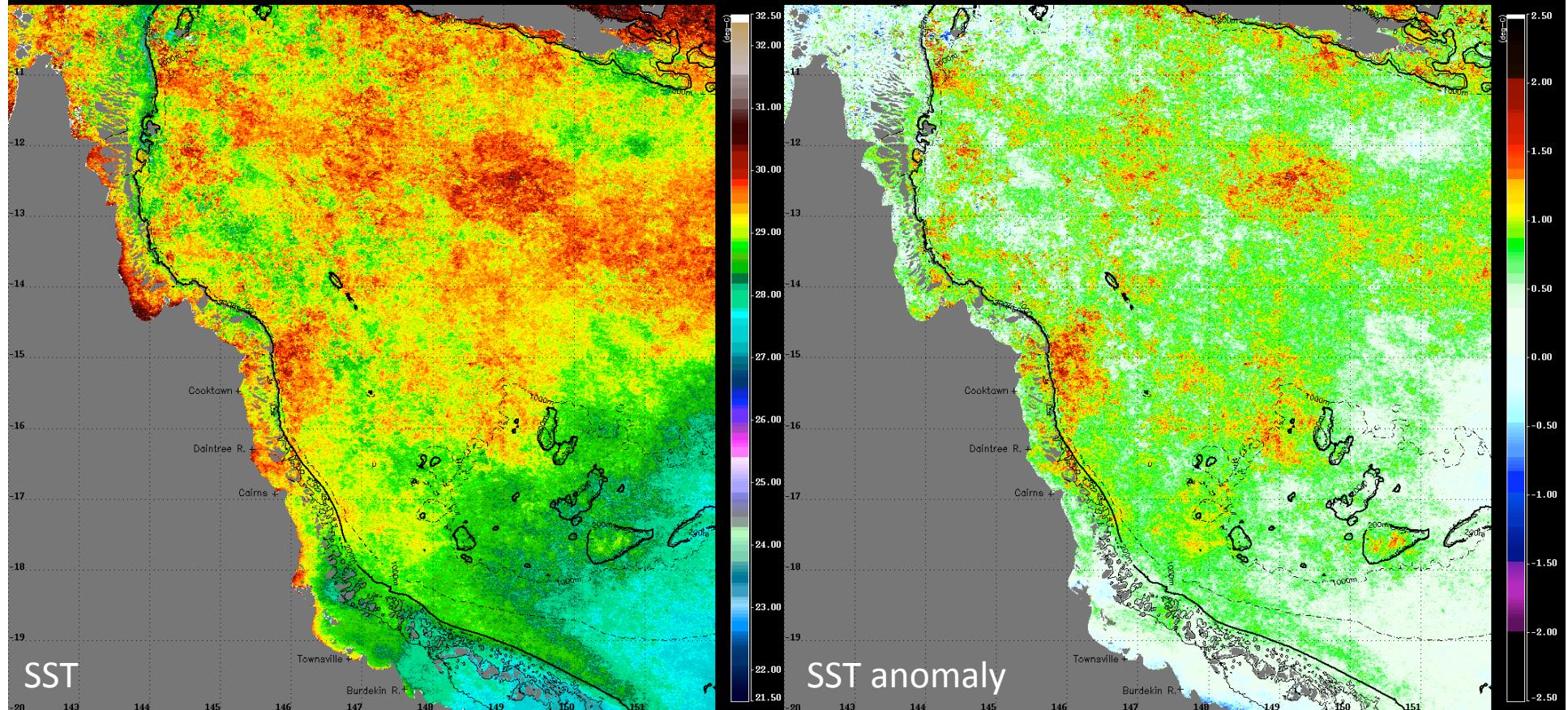
Modis SST (day+night): December 2011



Note:

- Positive SST anomalies were present on the northern GBR during December
- Negative anomalies still present in parts of the southern GBR.

Torres Strait / northern GBR MODIS SST: December 2011

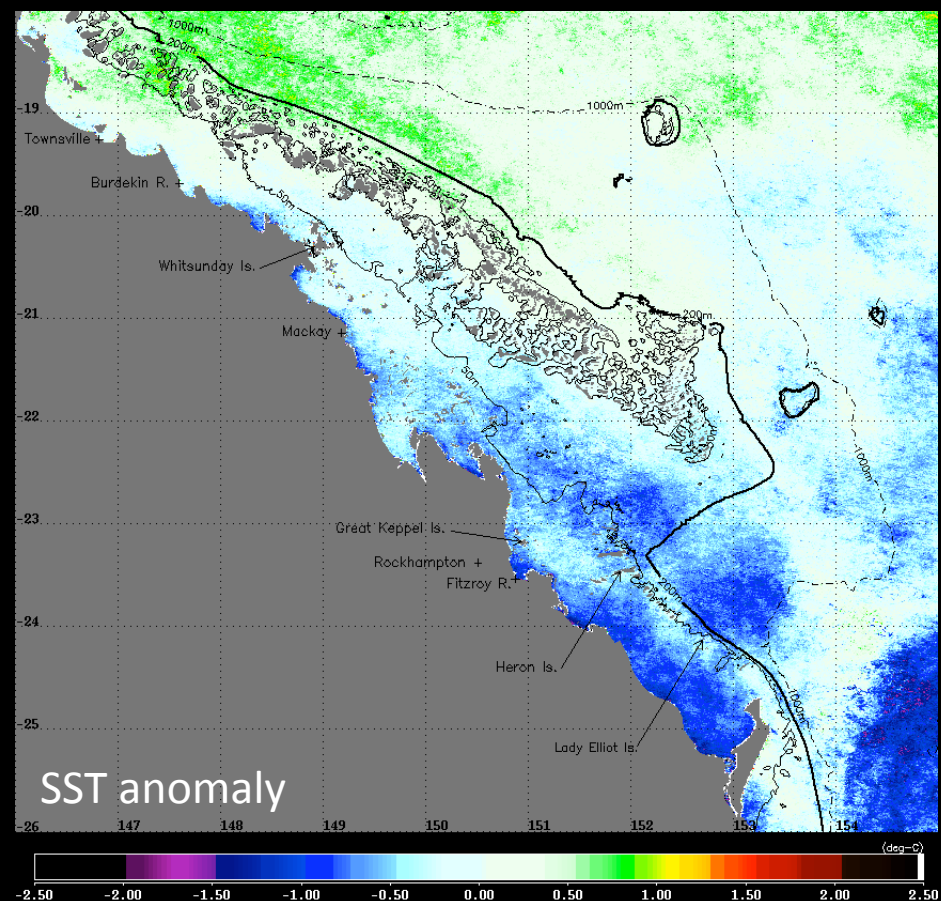
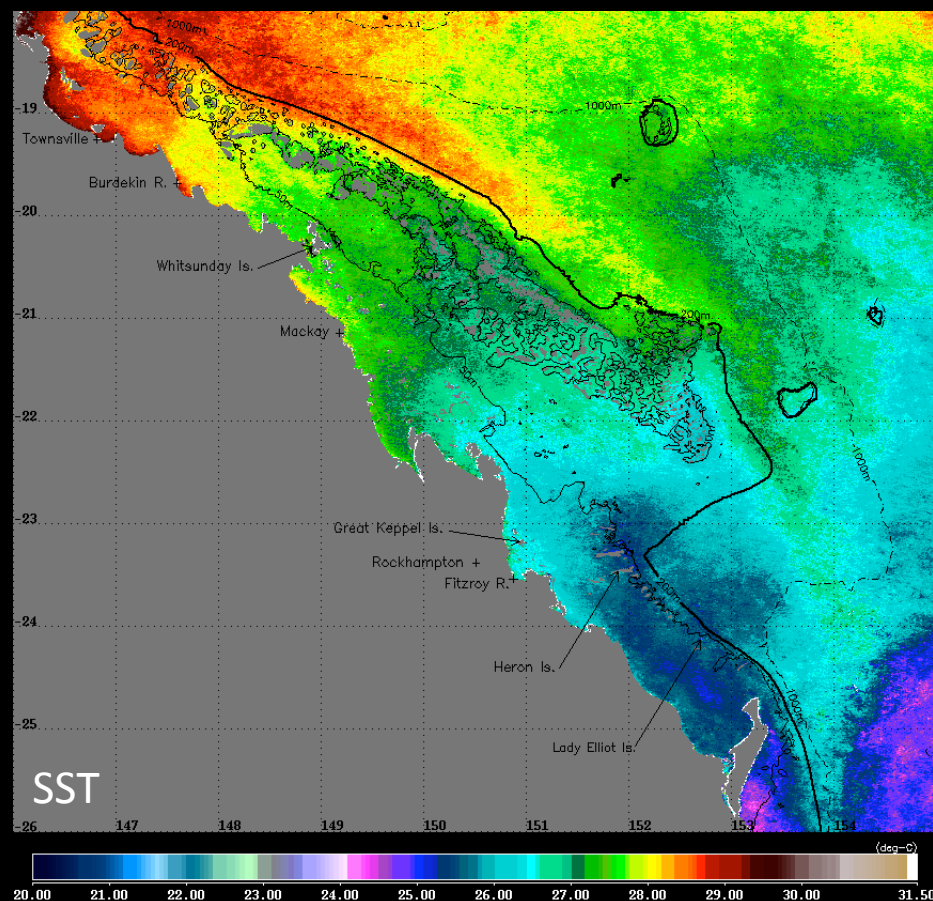


Note:

(SST scale adjusted for N-GBR)

- SSTs have increased considerably with positive anomalies now present on the northern GBR

Southern GBR MODIS SST: December 2011

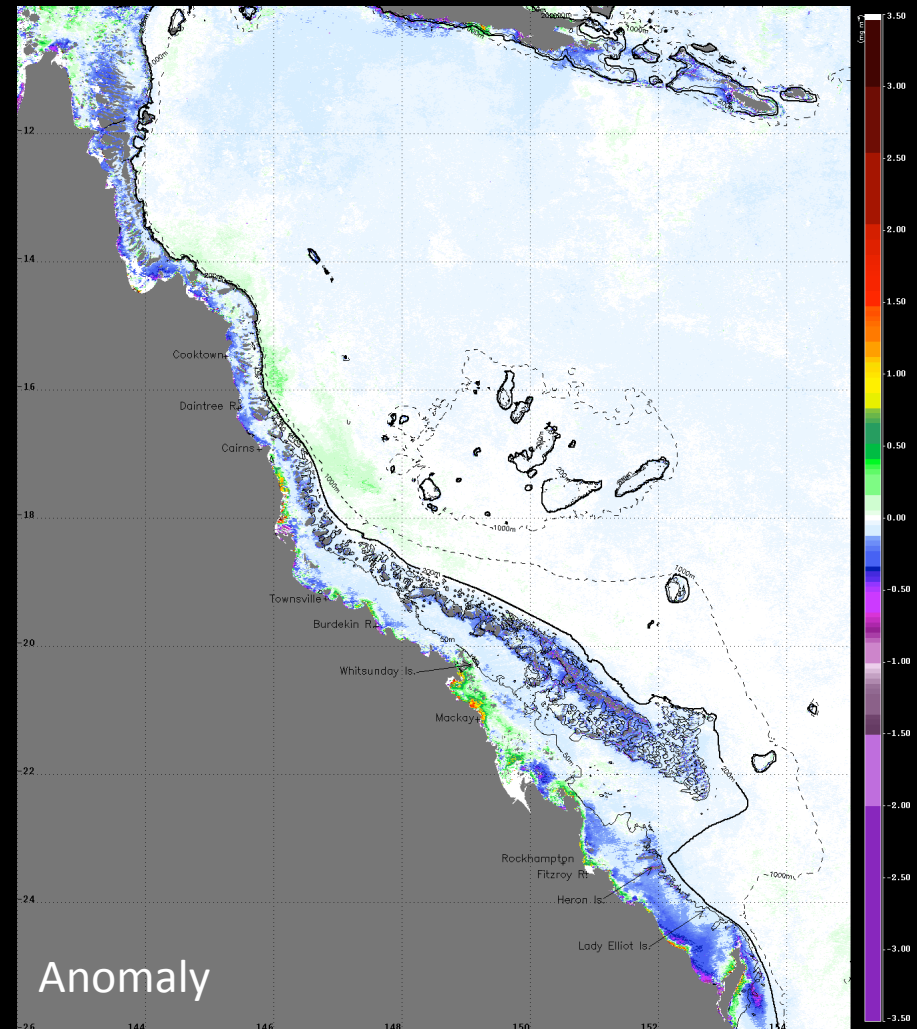
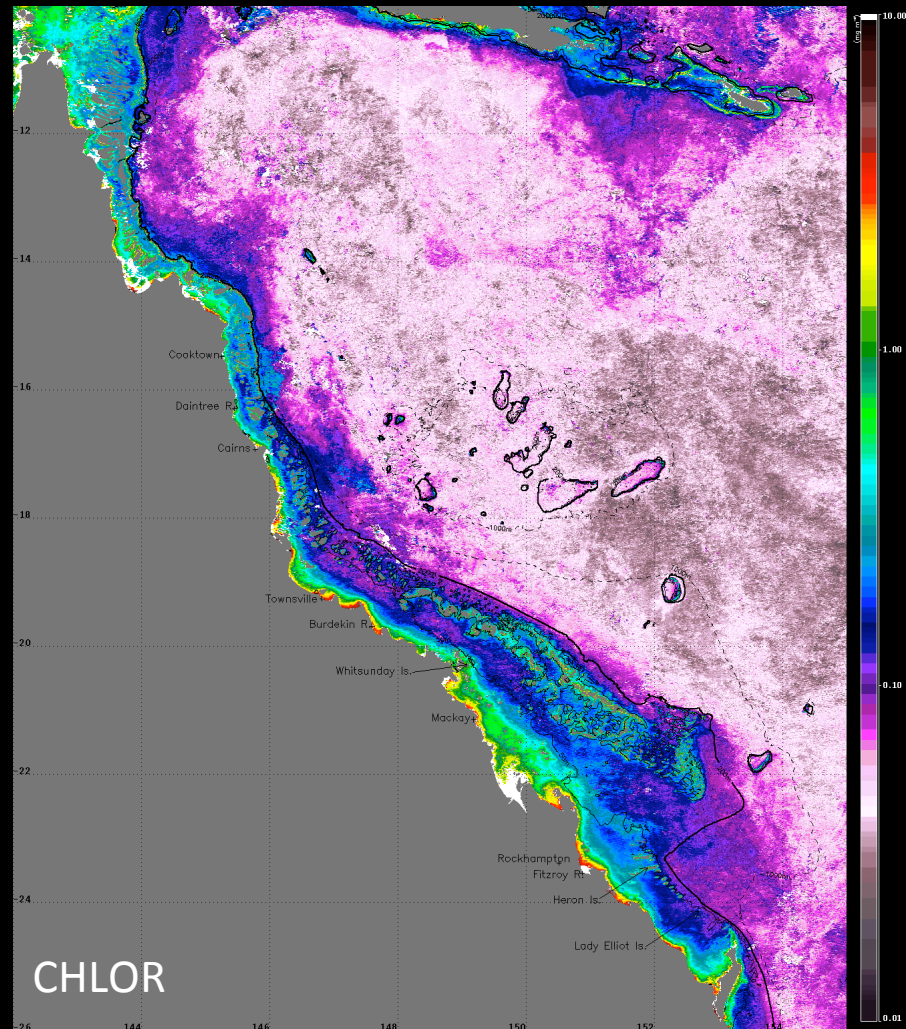


Note:

(SST scale adjusted for S-GBR)

- Mostly average conditions on the outer reefs of the S-GBR in December
- Negative SST anomalies on the inner reefs & the Capricorn group
- Intensified EAC southward flow still apparent along the shelf-edge

MODIS Chlorophyll-*a* concentration: December 2011

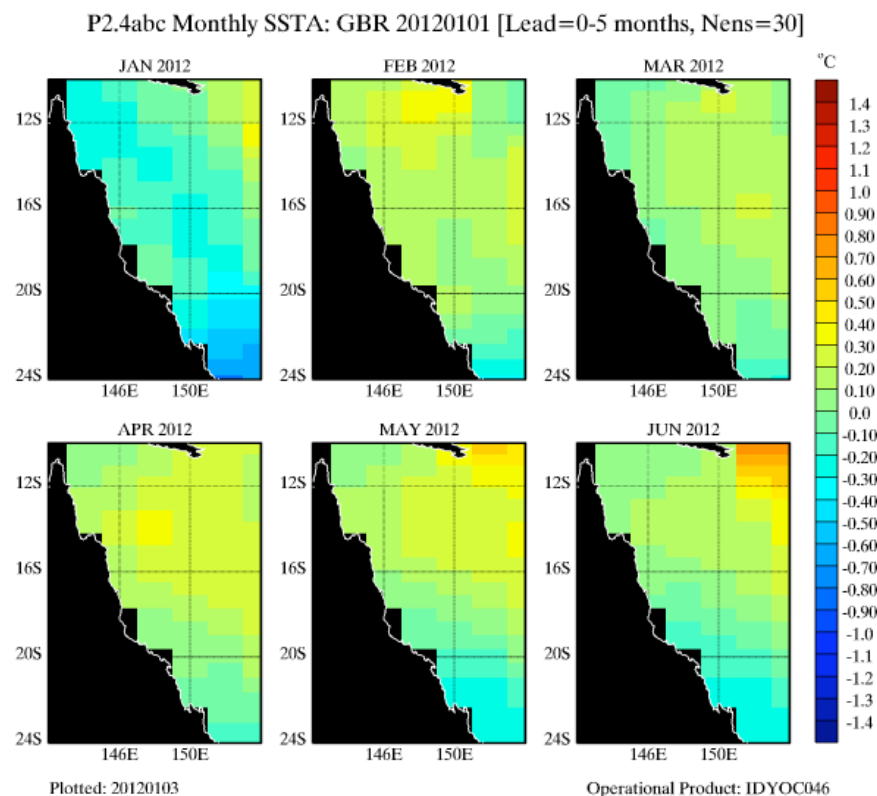


Note:

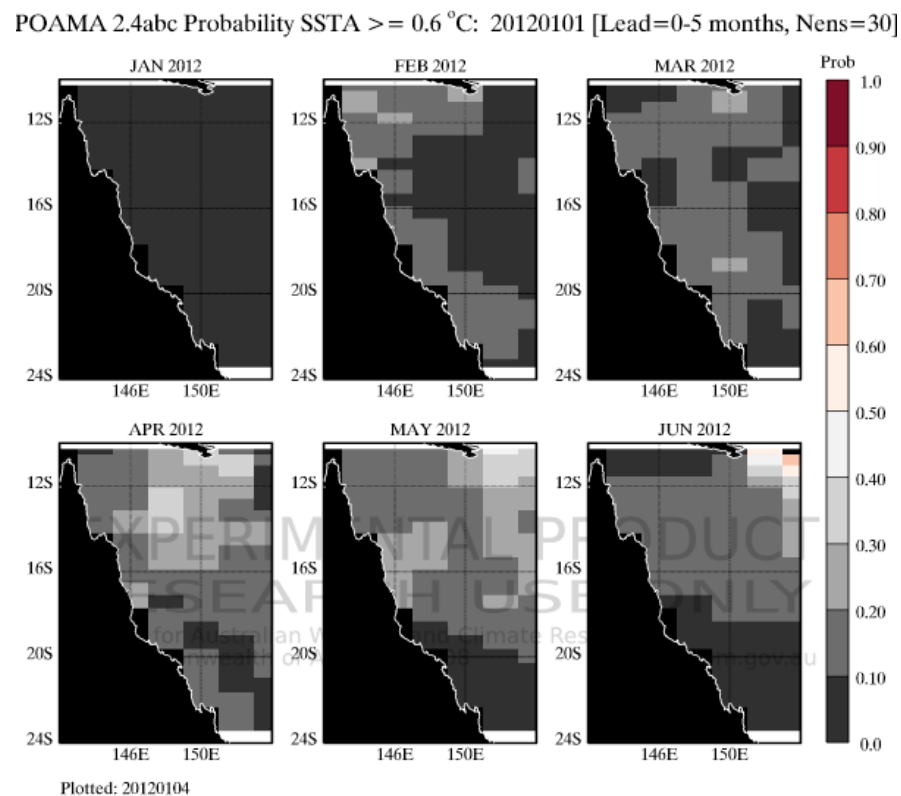
- Close to / below average chlorophyll concentration levels for December across the Torres Strait and along the length of the GBR

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:

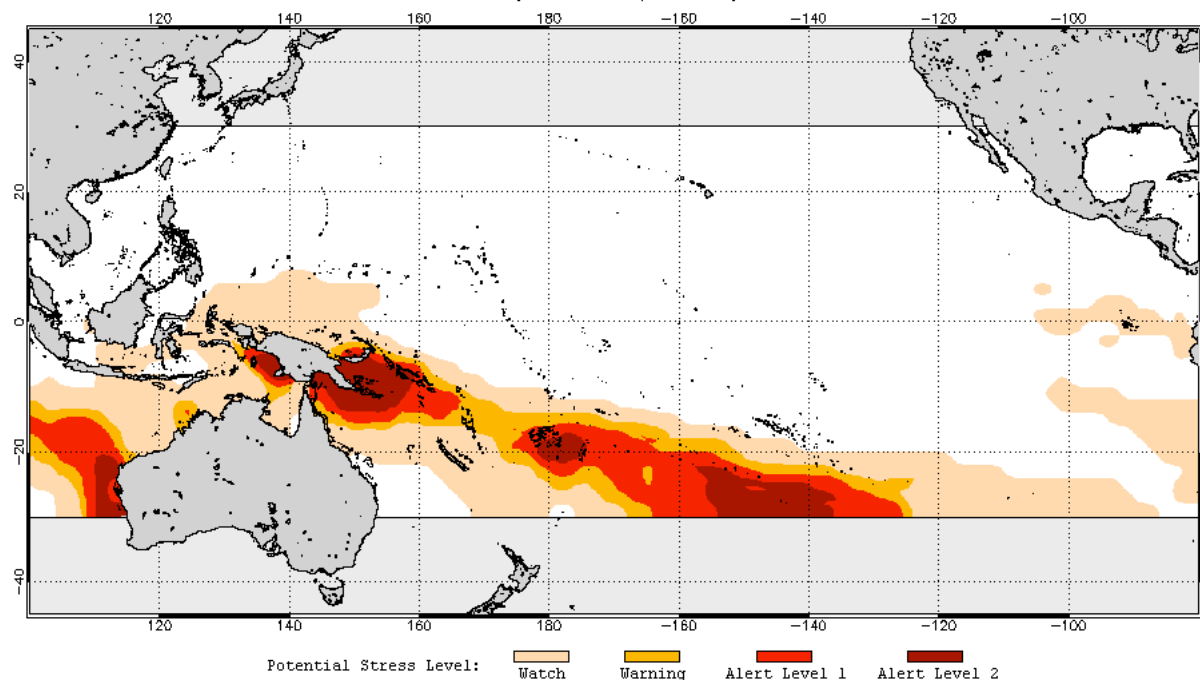
- POAMA forecasts mostly average conditions for the following months,.

NOAA Coral Reef Watch

Coral Bleaching Thermal Stress Outlook (Version 2, experimental)

Outlook for January 2012 to April 2012

2012 Jan 03 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Jan–Apr 2012
(Version 2, Experimental)

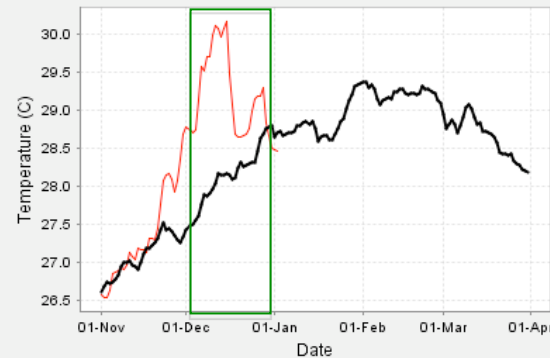


Note:

- NOAA thermal Stress Outlook suggests 'Watch' for potential thermal stress outlook till April 2012.
- Alert levels continue around northern GBR and PNG reefs.

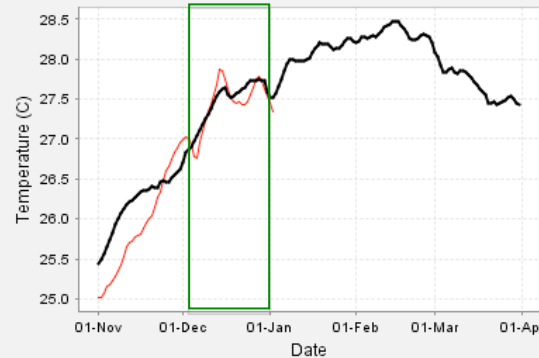
Weather Observing System: AIMS Data Centre

Water Temperature@4.7m Lizard Island Sensor Float 3 Trend Against Long Term Average



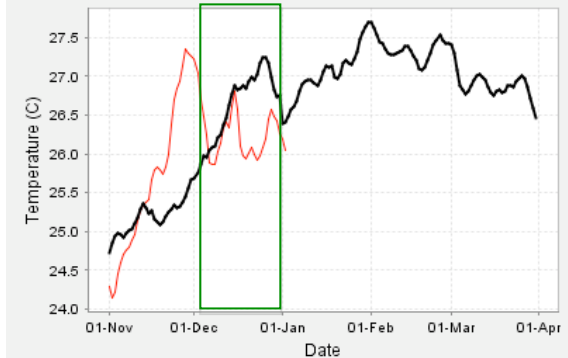
— Water Temperature@4.7m Lizard Island long term average over 9 years
— LEVEL1 Water Temperature@4.7m Lizard Island daily average for 2011 - 2012
Copyright © 2012, Australian Institute of Marine Science

Water Temperature@9.0m Hardy Reef Platform Trend Against Long Term Average



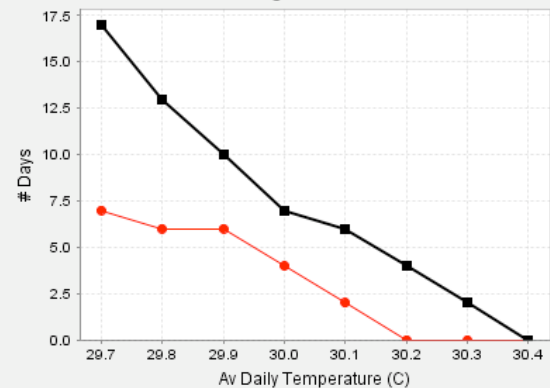
— Water Temperature@9.0m Hardy Reef long term average over 8 years
— LEVEL1 Water Temperature@9.0m Hardy Reef daily average for 2011 - 2012 su
Copyright © 2012, Australian Institute of Marine Science

Water Temperature@7.9m Square Rocks Platform Trend Against Long Term Average



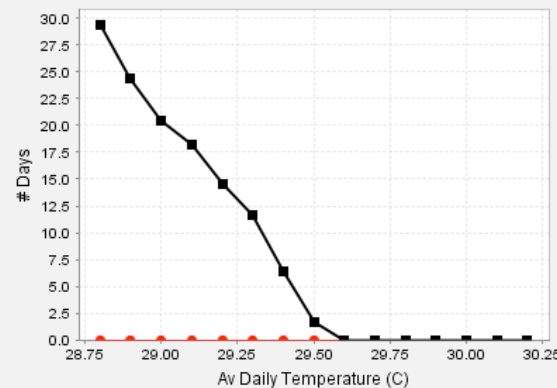
— Water Temperature@7.9m Square Rocks long term average over 6 years
— LEVEL1 Water Temperature@7.9m Square Rocks daily average for 2011 - 2012
Copyright © 2012, Australian Institute of Marine Science

Water Temperature@4.7m Lizard Island Sensor Float 3 Coral Bleaching Indicator



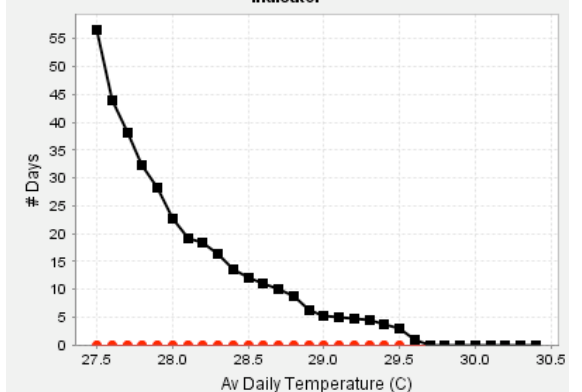
■ Lizard Island Bleach Threshold — Number of days for 2011 - 2012 summer
Copyright © 2012, Australian Institute of Marine Science

Water Temperature@9.0m Hardy Reef Platform Coral Bleaching Indicator



■ Hardy Reef Bleach Threshold — Number of days for 2011 - 2012 summer
Copyright © 2012, Australian Institute of Marine Science

Water Temperature@7.9m Square Rocks Platform Coral Bleaching Indicator



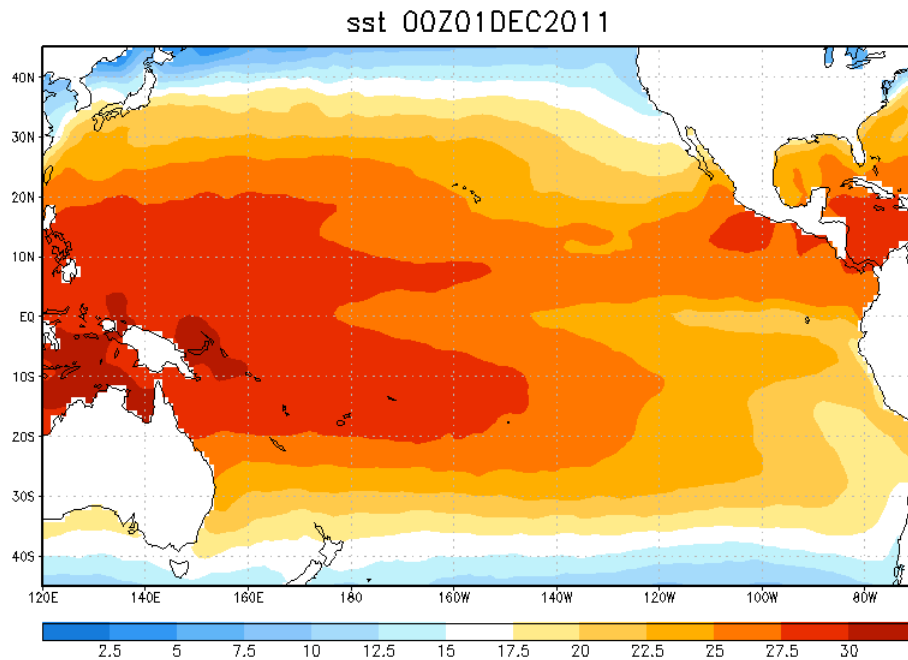
■ Square Rocks Bleach Threshold — Number of days for 2011 - 2012 summer
Copyright © 2012, Australian Institute of Marine Science

Note:

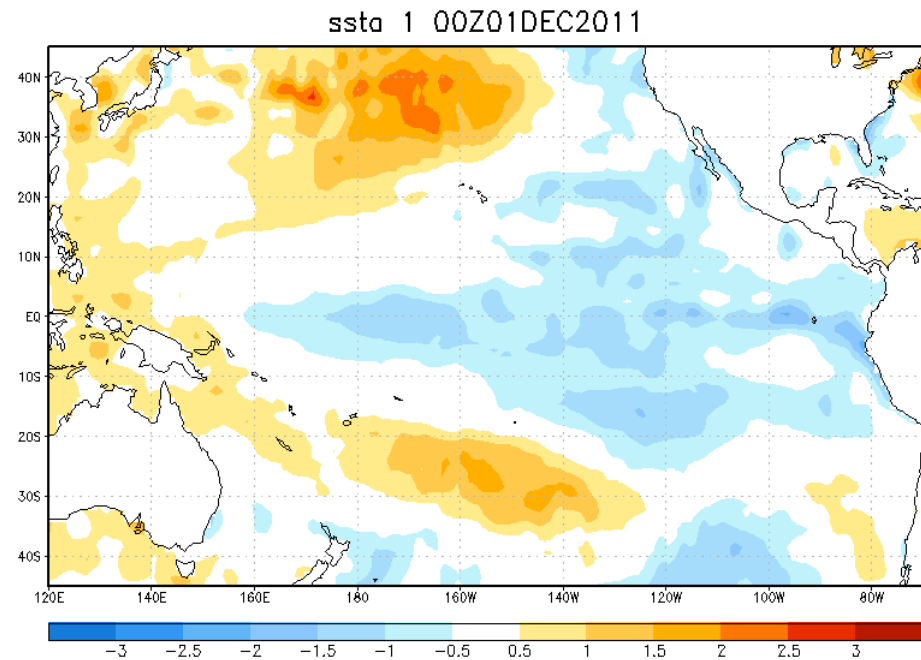
- In situ temperatures at most stations show close to normal temperature during December, except Lizard Island (located at a more northerly position) shows higher than average temperatures, and Square Rocks (located at a more southerly position) shows lower than average temperatures, which coincident with the MODIS SST anomalies.

NOAA Optimum Interpolation Sea Surface Temperature Analysis:

OI SST: DECEMBER 2011



OI SST ANOMALY: DECEMBER 2011

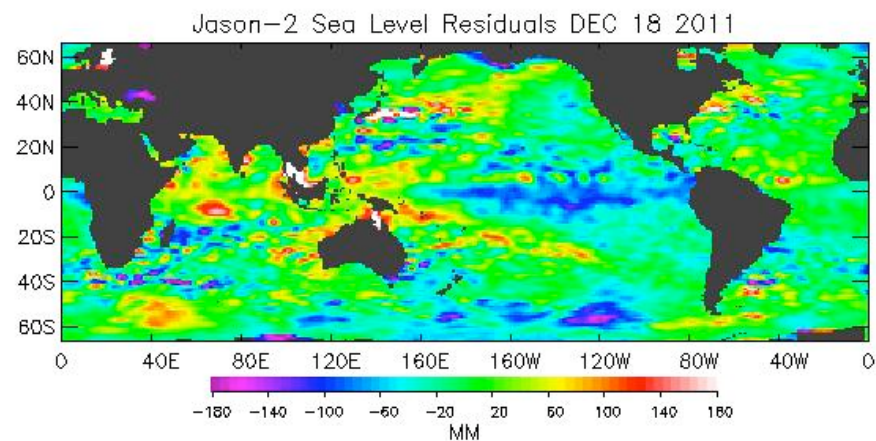
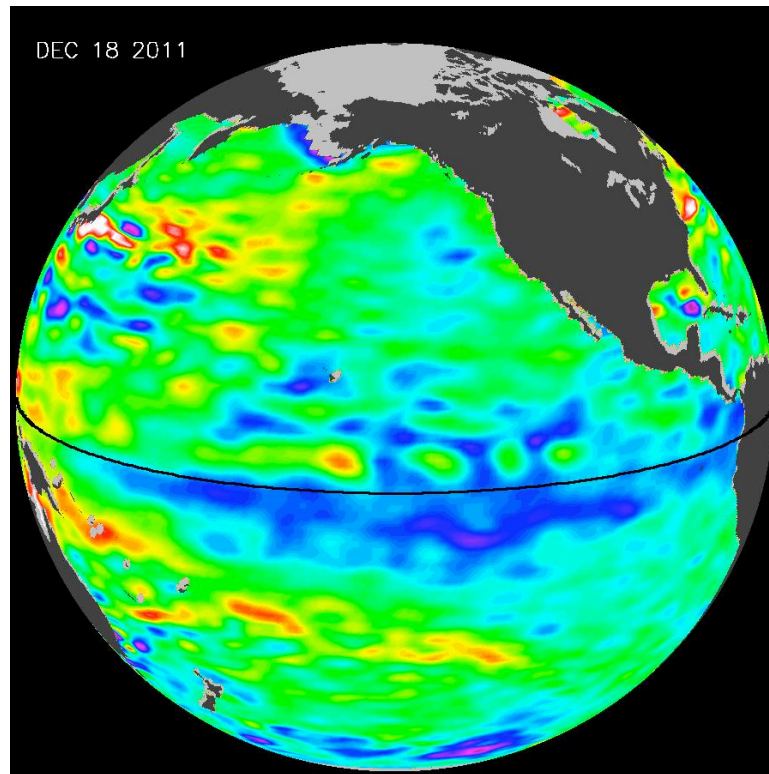


Note:

- Negative SST anomalies associated with La Niña continued across the central and eastern equatorial Pacific during December.

Sea surface height anomalies from Ocean Surface Topography: Jason-1 and Jason-2 (NASA/French)

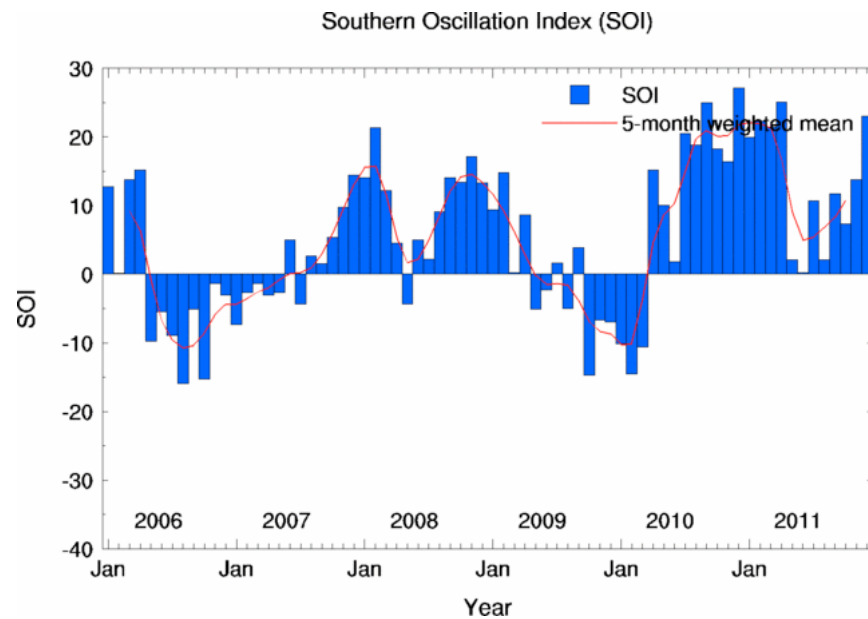
10-day data cycle centered around 18 December, 2011.



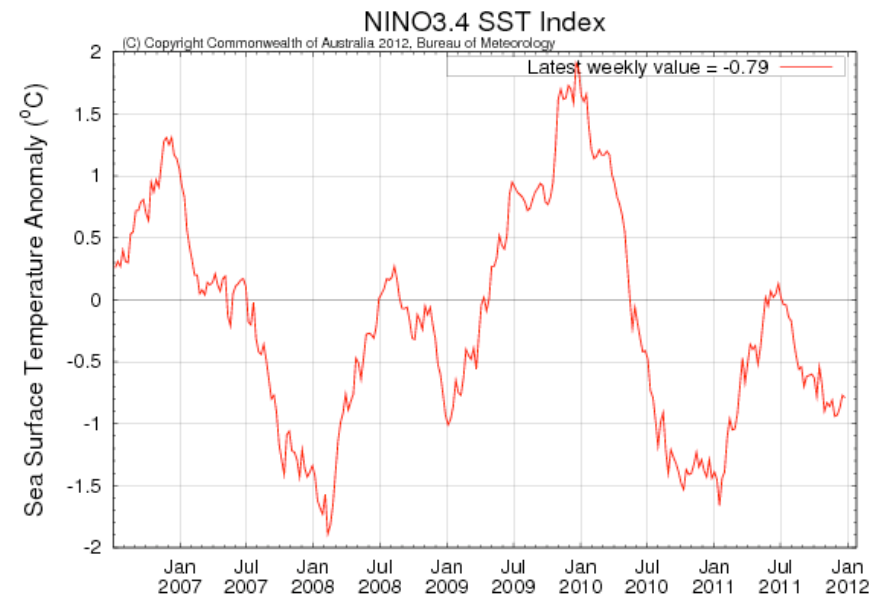
Note:

- Negative SSH anomalies associated with La Niña expanded across the central and eastern equatorial Pacific during December.

ENSO index



Positive SOI = La Niña



Negative Nino 3.4 index= La Niña

Note:

- La Niña conditions continue during December and are expected to continue into the following months. (peak expected Dec to February)