NERP

Torres Strait / GBR environmental conditions report:

Recent status and predictions

13 June 2012

By Ana Redondo-Rodriguez (PhD candidate) & Marites Canto
work supervised by Dr. Scarla Weeks
Contact: a.rodriguez@uq.edu.au

UQ-GPEM Biophysical Oceanography Group

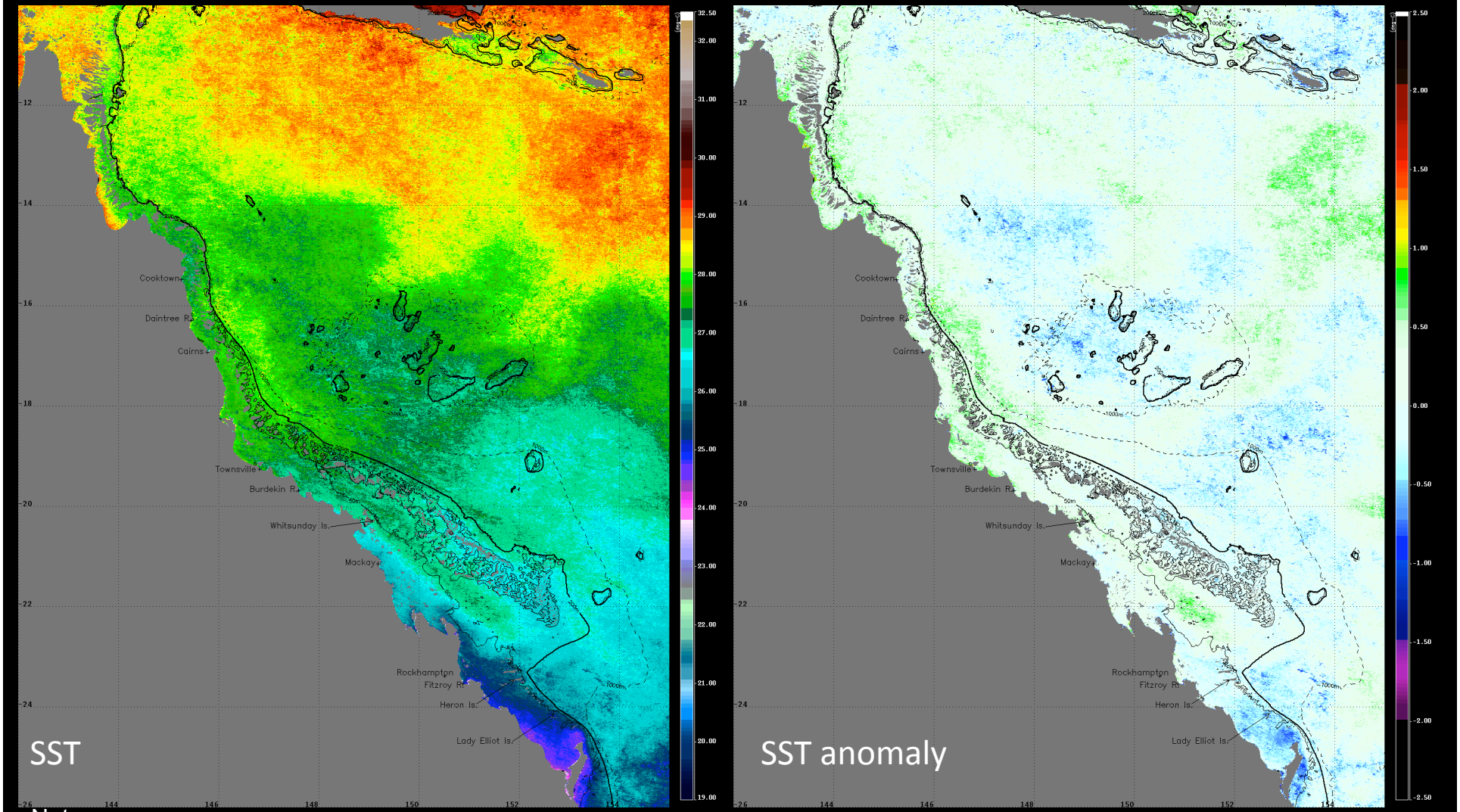
Outline

- 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

- Mostly average SST in Torres Strait and along the length of the GBR for both April and May.
- Forecast of close to neutral SST anomalies along the GBR and Torres Strait areas for the upcoming months.
- No bleaching alert for GBR and Torres Strait as we head into winter.
- ENSO-neutral conditions prevalent in the Pacific.

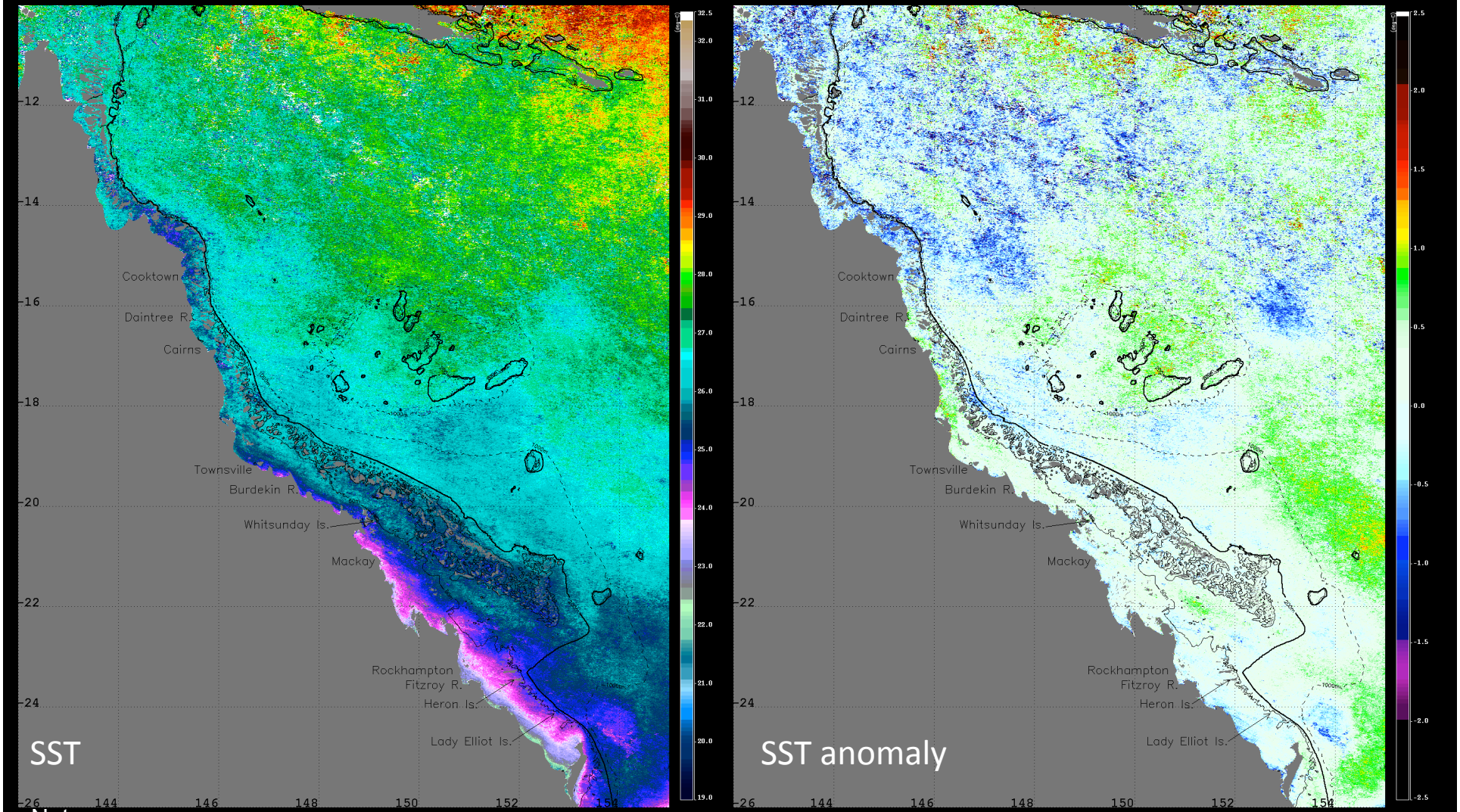
Modis SST (day+night): April 2012



Note:

- The positive anomalies observed at the end of the summer have dissipated, with close to average conditions present throughout the GBR and Torres Strait areas for April.

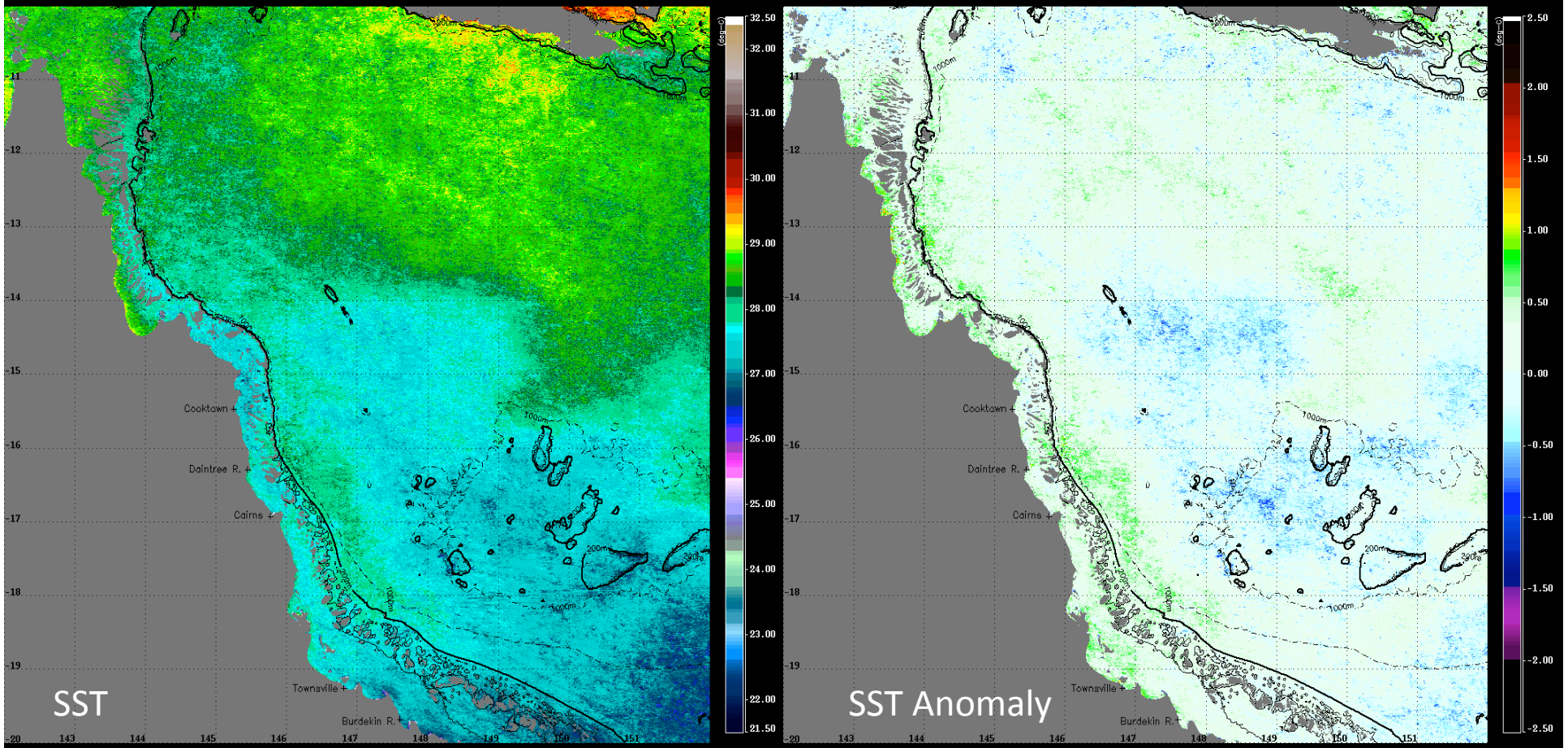
Modis SST (day+night): May 2012



Note:

- Mostly average conditions present over the GBR/Torres Strait throughout during May
- The negative SST anomalies observed over Torres Strait and the northern GBR may not be indicative of the actual conditions, as considerable cloud cover persisted through the month of May, limiting the accuracy of the anomalies.

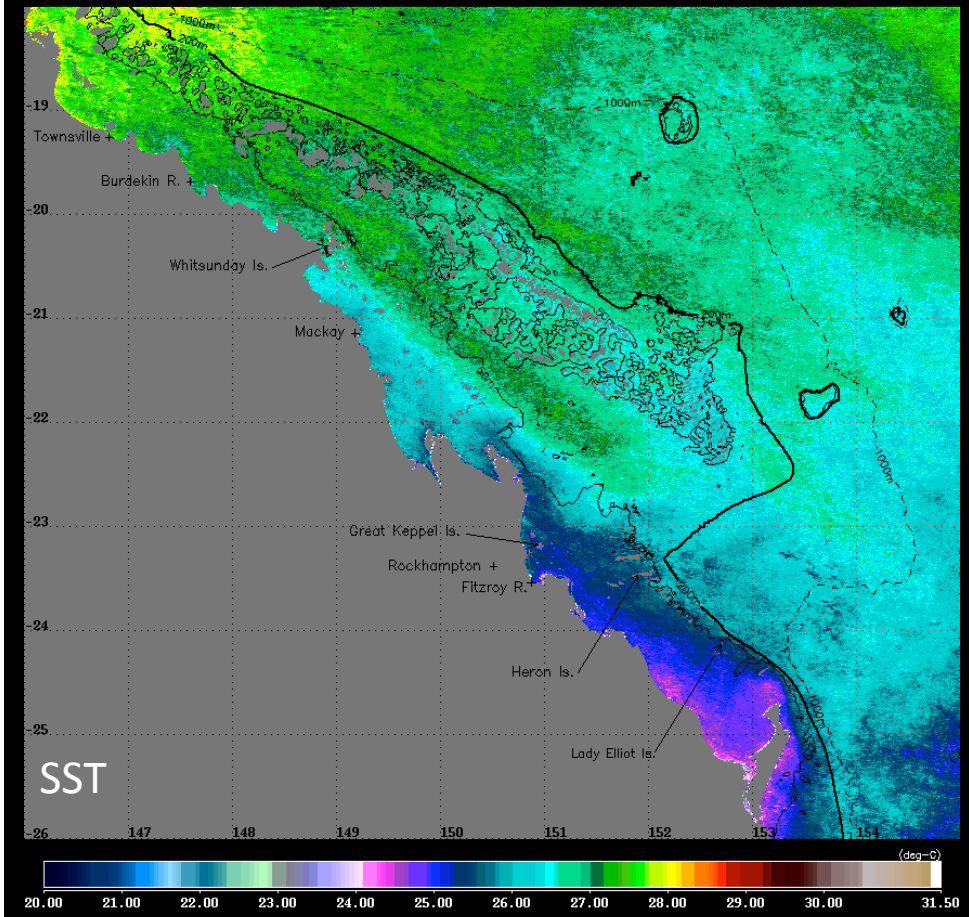
Torres Strait / northern GBR MODIS SST: April 2012

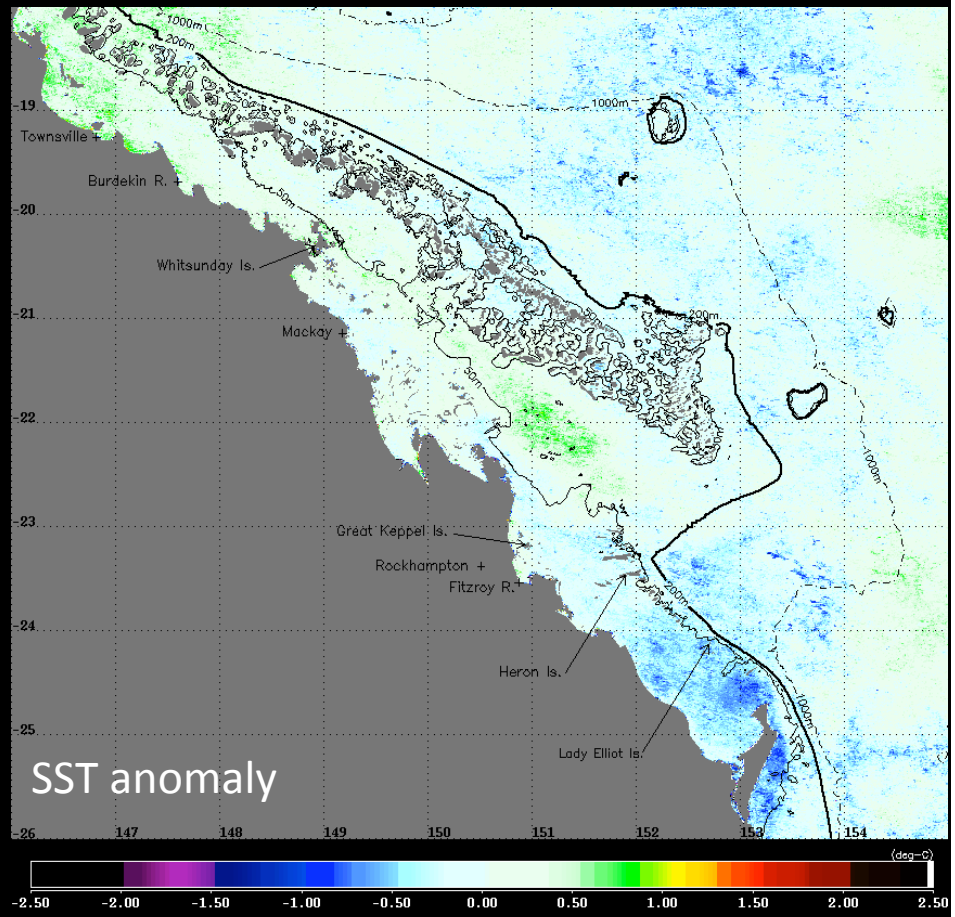


Note:

- Close to average conditions present throughout the GBR and Torres Strait areas for April.
- GBR and Torres Strait images for May not included due to considerable cloud contamination

Southern GBR MODIS SST: April 2012

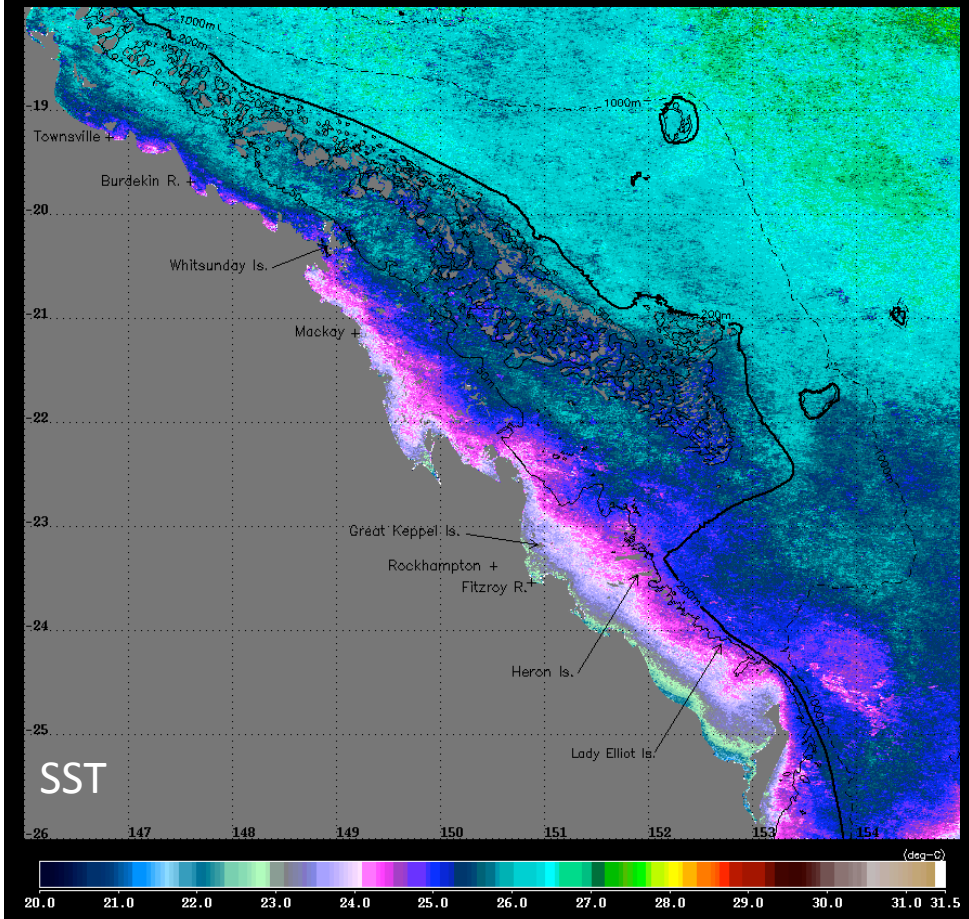


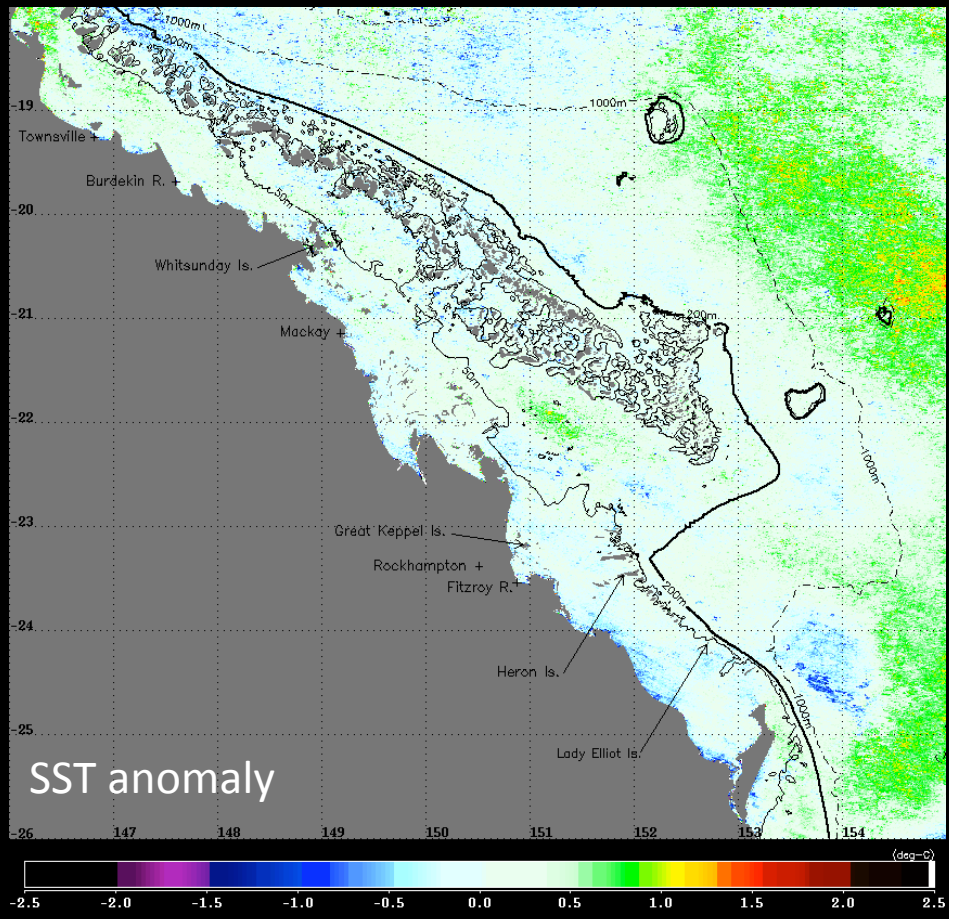


Note:

- Southward flow of warmer waters through the lagoon channel clearly evident
- Close to average conditions present in the southern GBR for April, with negative anomalies in the Capricorn Bunker / Fraser Is area.

Southern GBR MODIS SST: May 2012

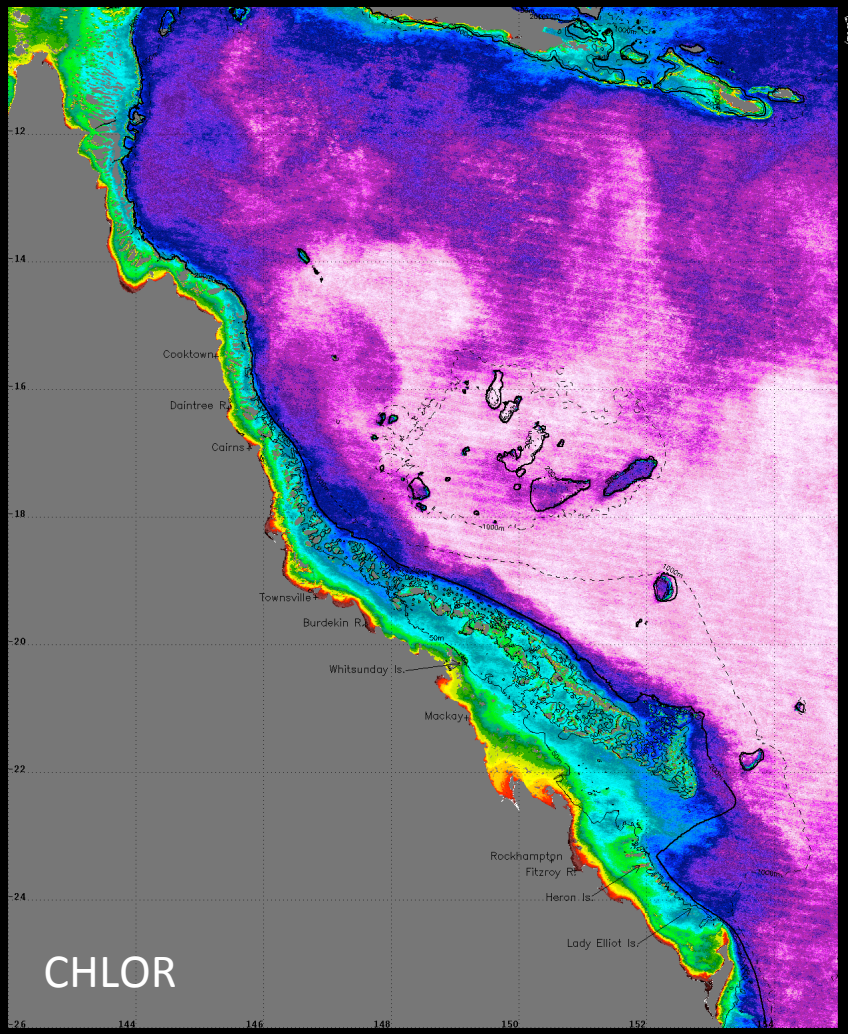


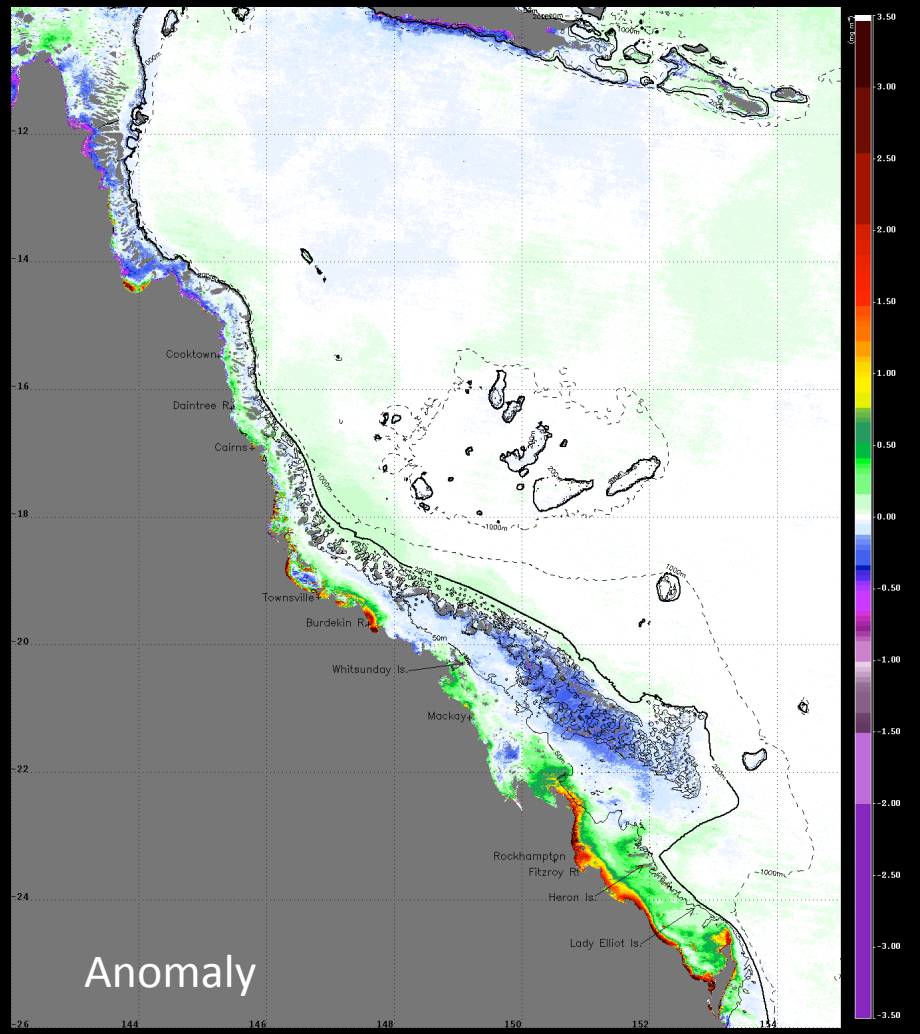


Note:

- Pronounced seasonal cooling of waters
- Moderate positive anomalies offshore

MODIS Chlorophyll-*a* concentration: April 2012



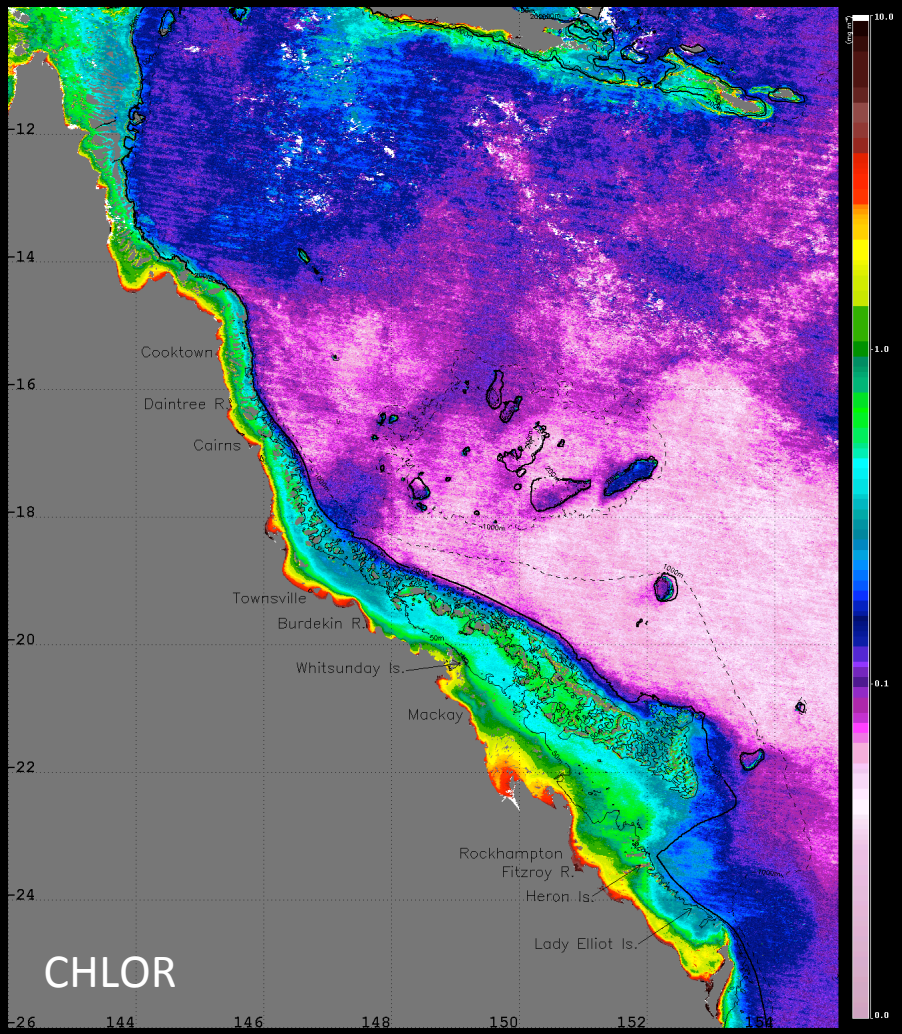


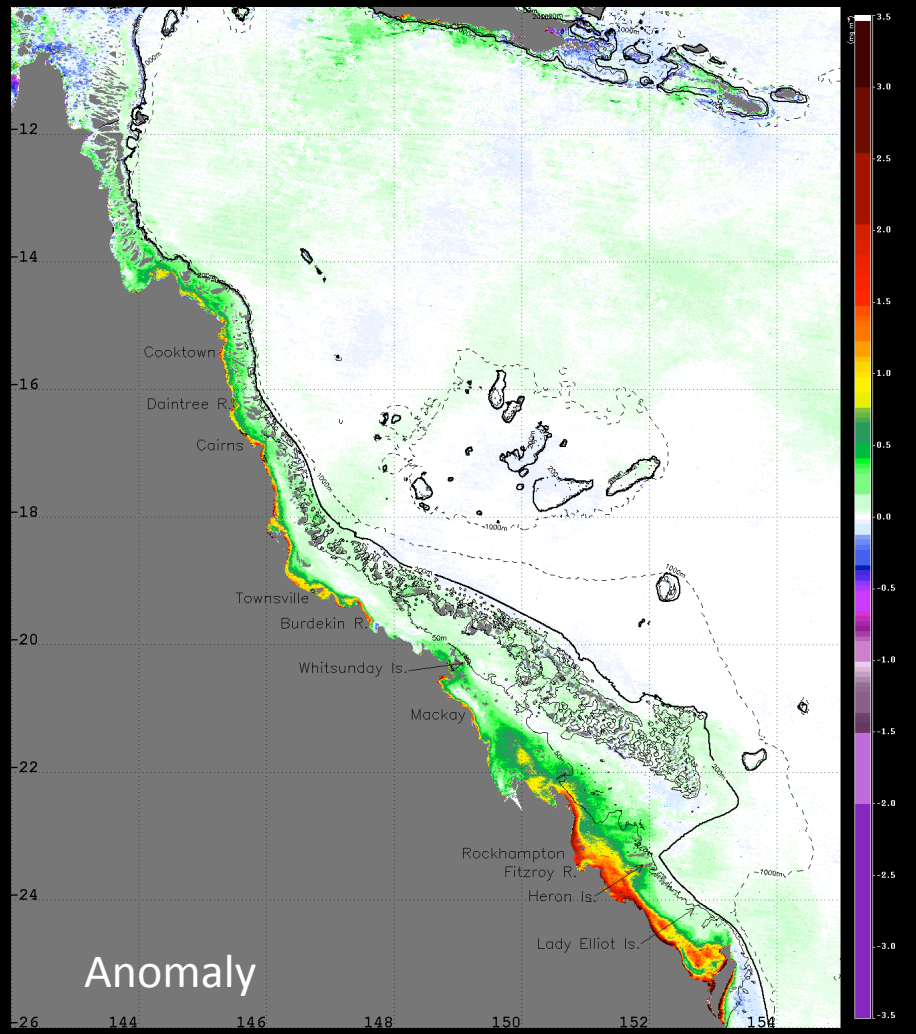
Note:

- Chlorophyll data shows strong positive anomalies over inshore reefs in the central GBR due to the Burdekin River outflow, and especially in the S_GBR due to high Fitzroy River outflow
- Negative chlorophyll anomalies over outer S-GBR reefs

UQ Biophysical Oceanography Group

MODIS Chlorophyll-*a* concentration: May 2012

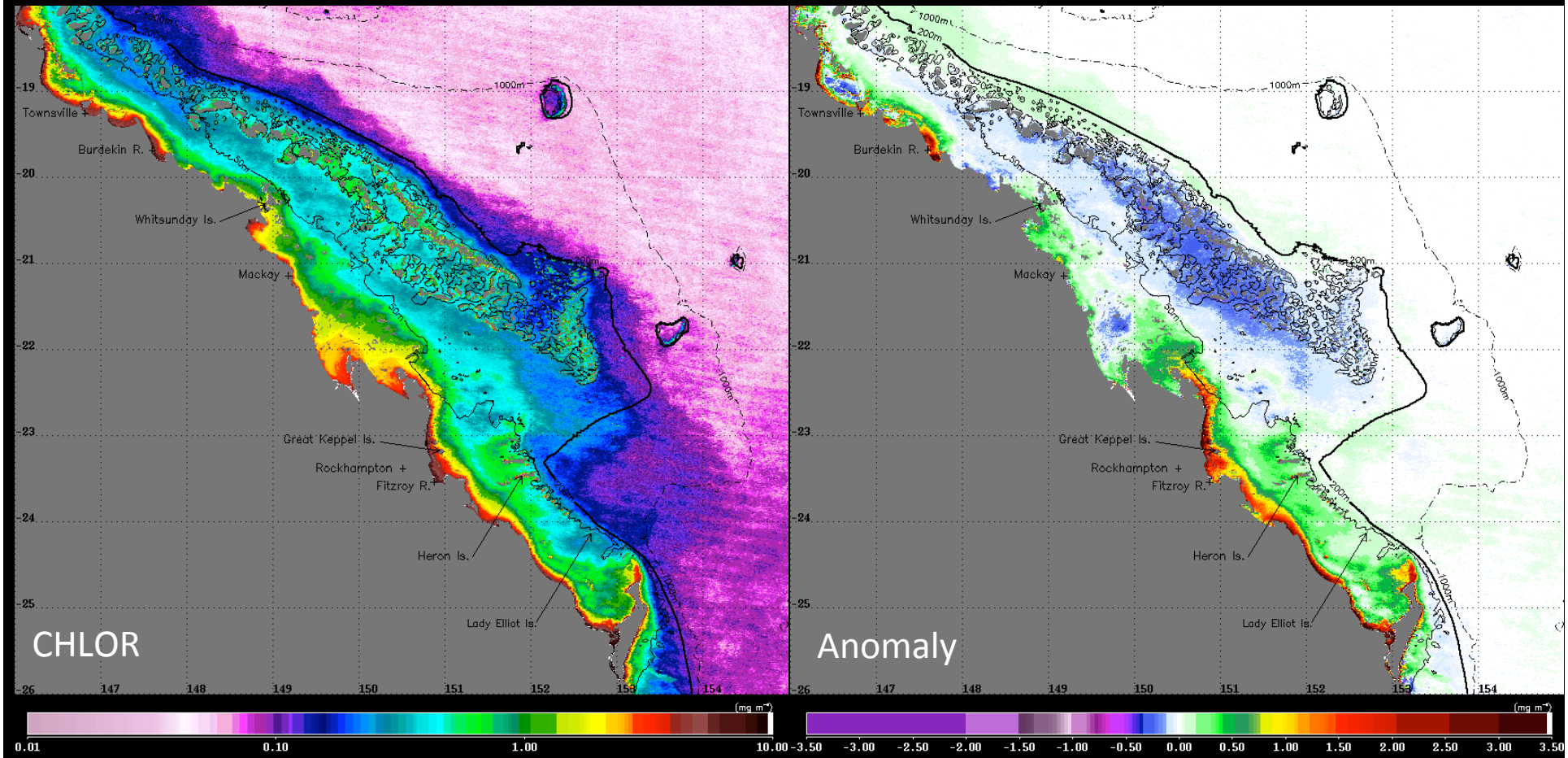




Note:

•Strong positive chlorophyll anomalies over inshore reefs along the length of the GBR in May due to the Daintree, Burdekin & Fitzroy River outflows

Southern GBR
MODIS Chlorophyll-*a* concentration
April 2012

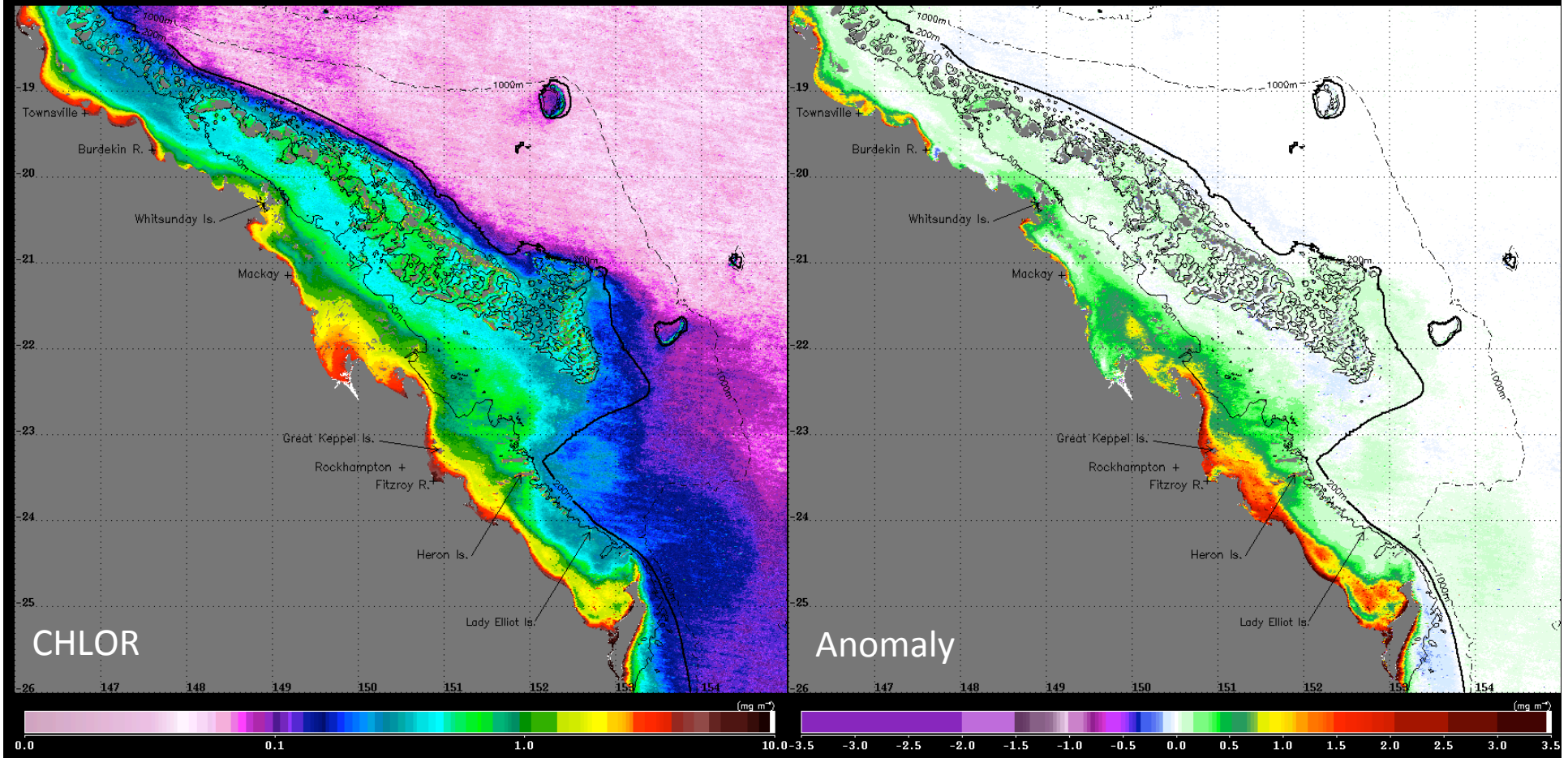


Note:

- Detail showing the strong positive anomalies over inshore reefs in the central GBR due to the Burdekin River outflow, and especially in the S-GBR due to high Fitzroy River outflow and,
- Negative chlorophyll anomalies over outer S-GBR reefs

UQ Biophysical Oceanography Group

Southern GBR
MODIS Chlorophyll-*a* concentration
May 2012



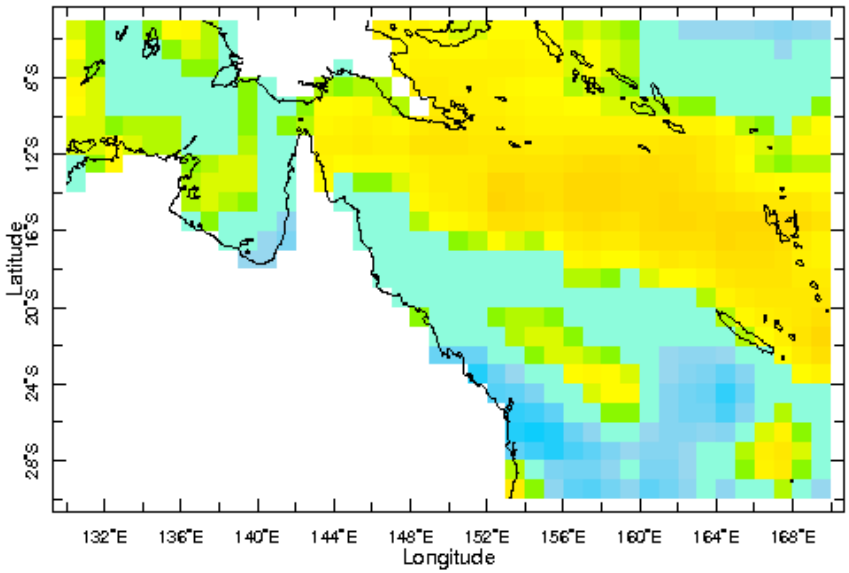
Note:

- Intense positive chlorophyll anomalies over inshore reefs, especially in in May due to the Daintree, Burdekin & Fitzroy River outflows
- Inshore retention likely due to strong SST frontal boundary

UQ Biophysical Oceanography Group

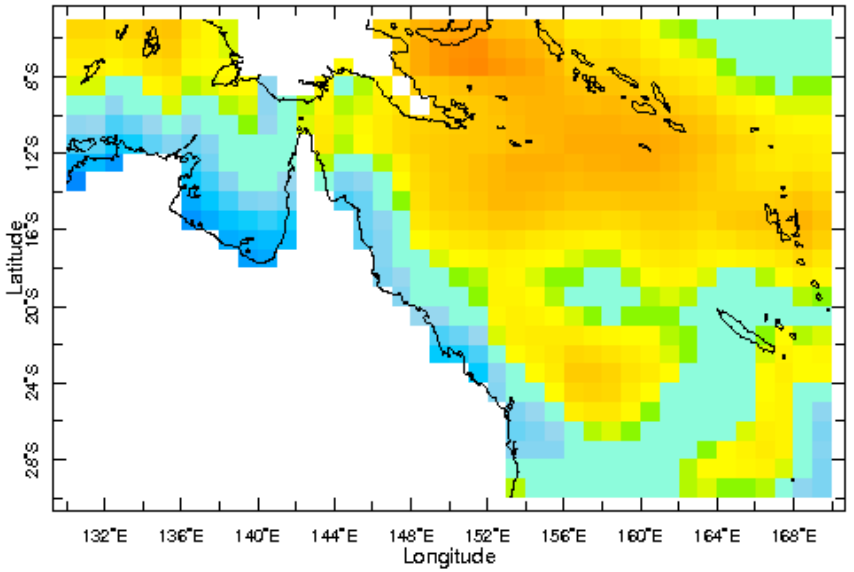
NOAA NCEP EMC CMB GLOBAL Reyn_SmithOIv2 monthly SSTA: Sea Surface Temperature Anomaly data

April 2012

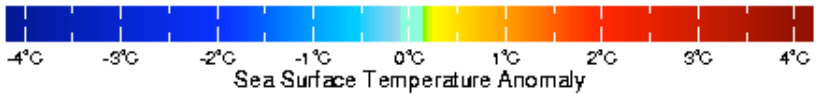


Apr 2012

May 2012



May 2012



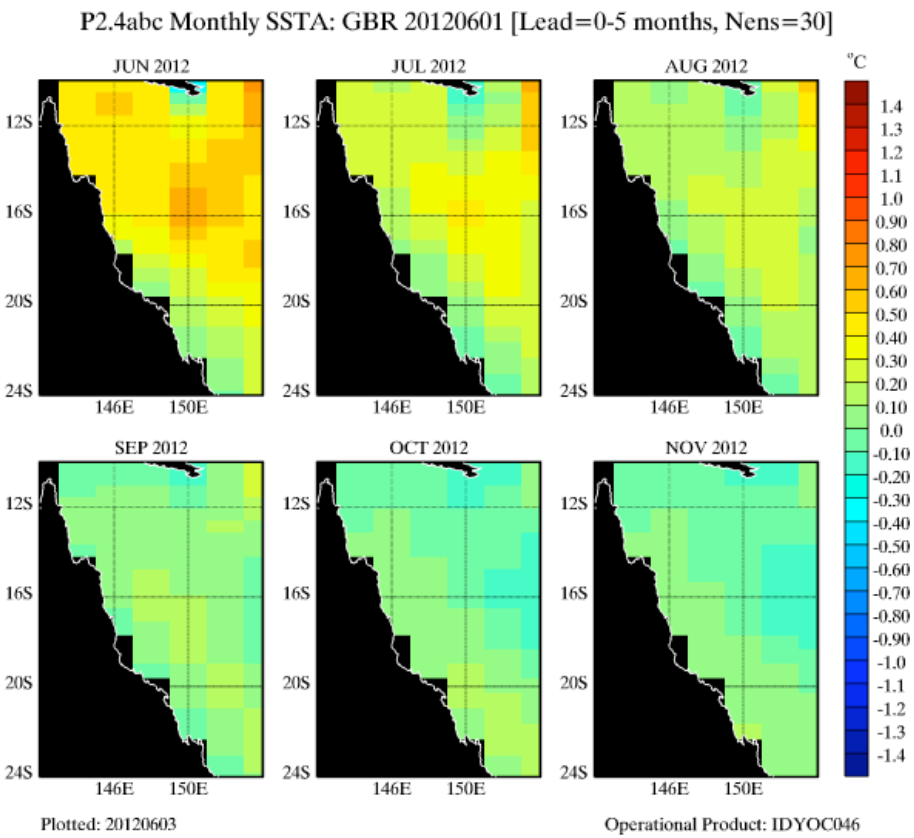
Note:

• During April, and coincident with the MODIS data, Reynolds SST anomalies showed average conditions for most of the GBR. An area of very weak positive anomalies however, is seen on the N-GBR/Torres Strait areas. Similarly, for May the data depicts close to average SST with the exception of the far N-GBR (where SST anomalies slightly positive opposite to the MODIS data)

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)



Note:

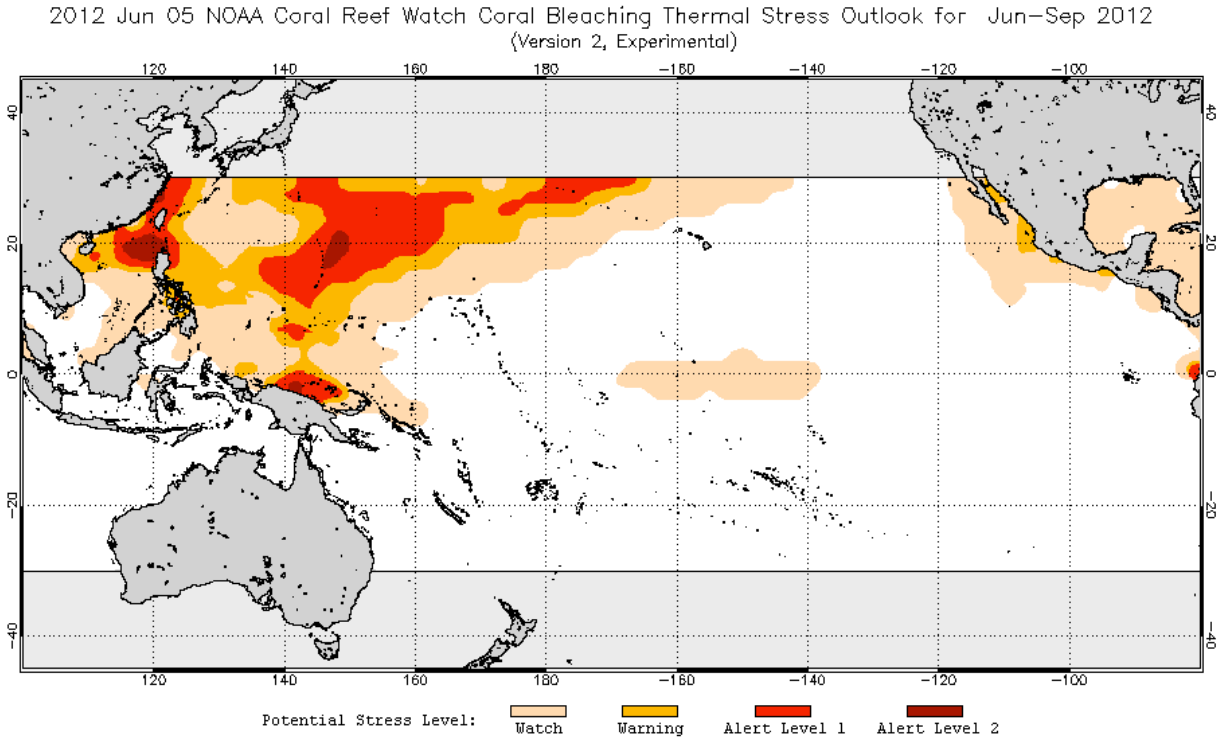
- POAMA forecast show low positive SST anomalies for June that will dissipate towards neutral conditions in the subsequent months.

NOAA Coral Reef Watch

Coral Bleaching Thermal Stress Outlook

(Version 2, experimental)

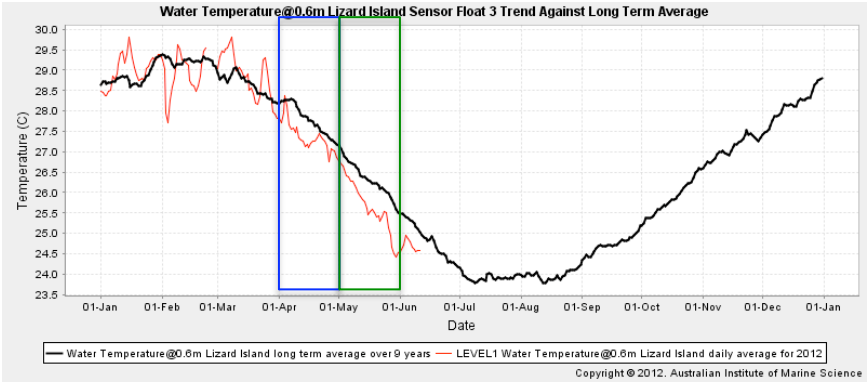
Outlook for June 2012 to September 2012

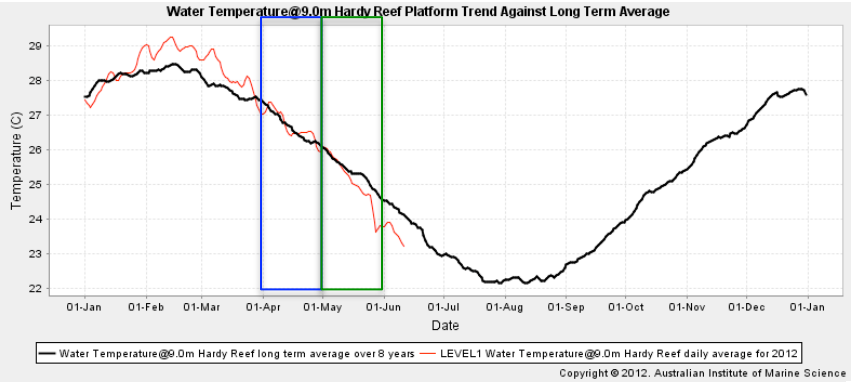


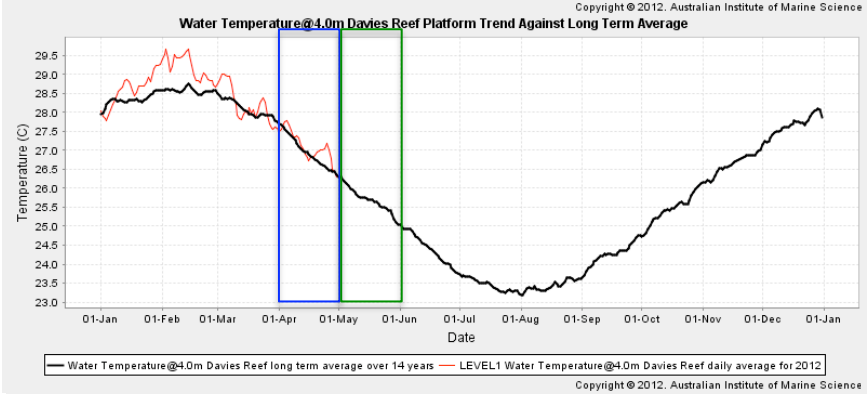
Note:

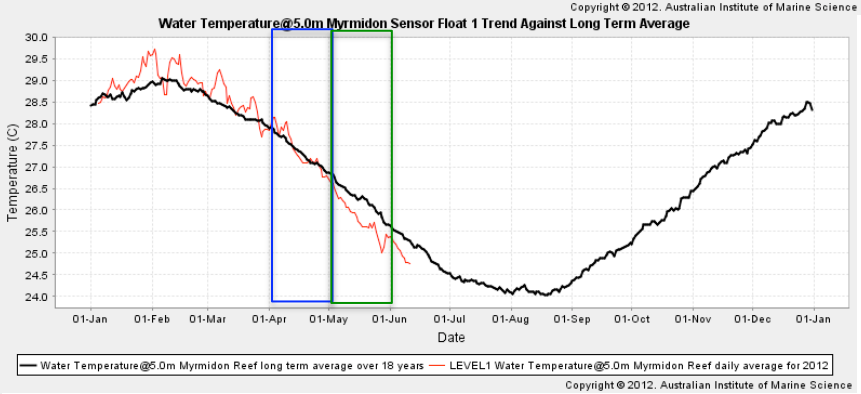
- No bleaching alerts for the southern Pacific (as expected for the austral winter season)

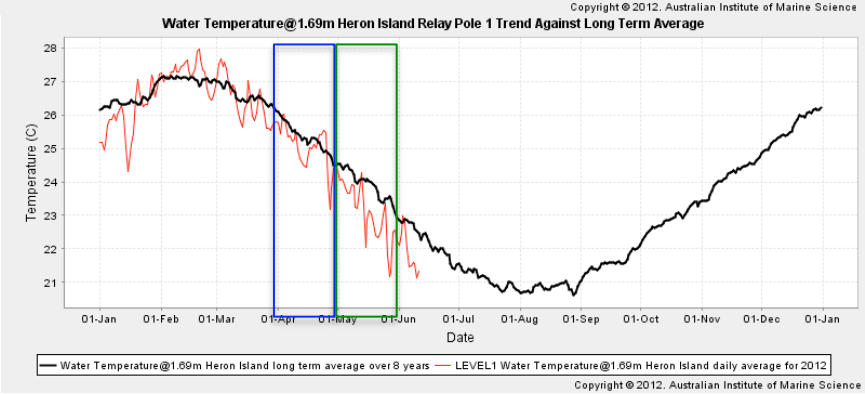
Weather Observing System: AIMS Data Centre









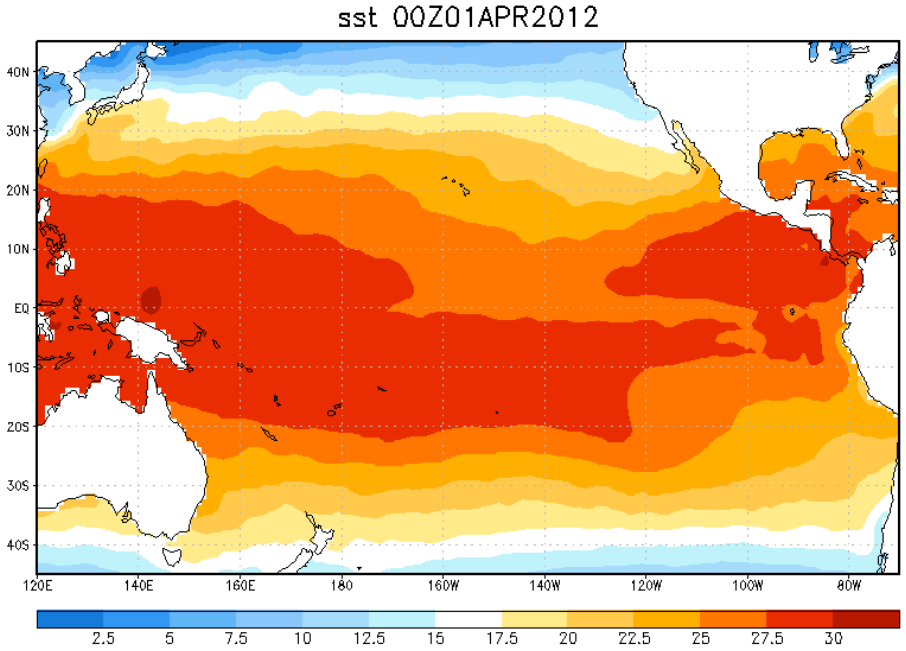


Note:

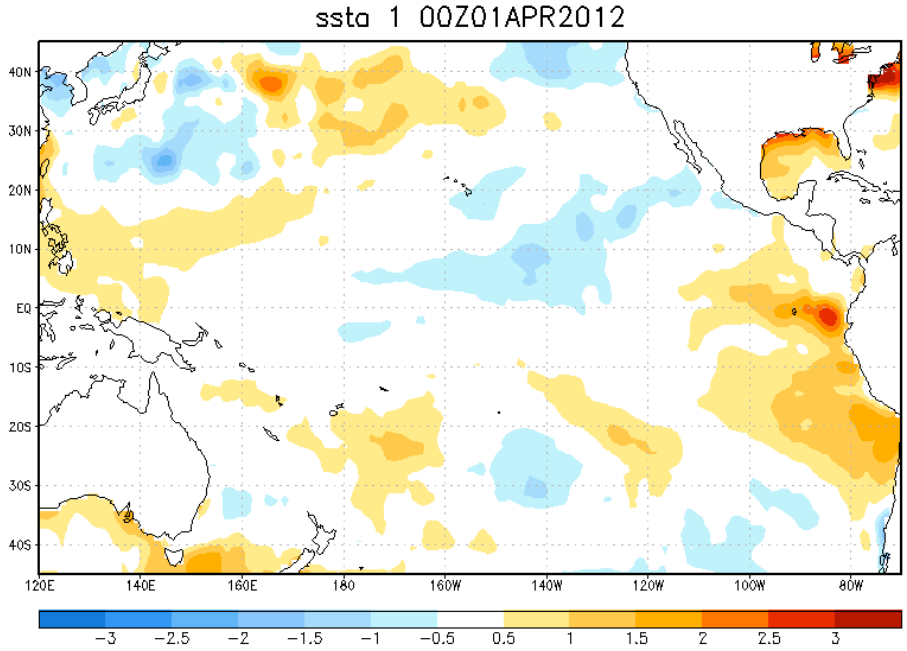
- All the AIMS weather stations show average temperatures for April and slightly below average for May.

NOAA Optimum Interpolation Sea Surface Temperature Analysis:

OI SST: APRIL 2012



OI SST ANOMALY: APRIL 2012

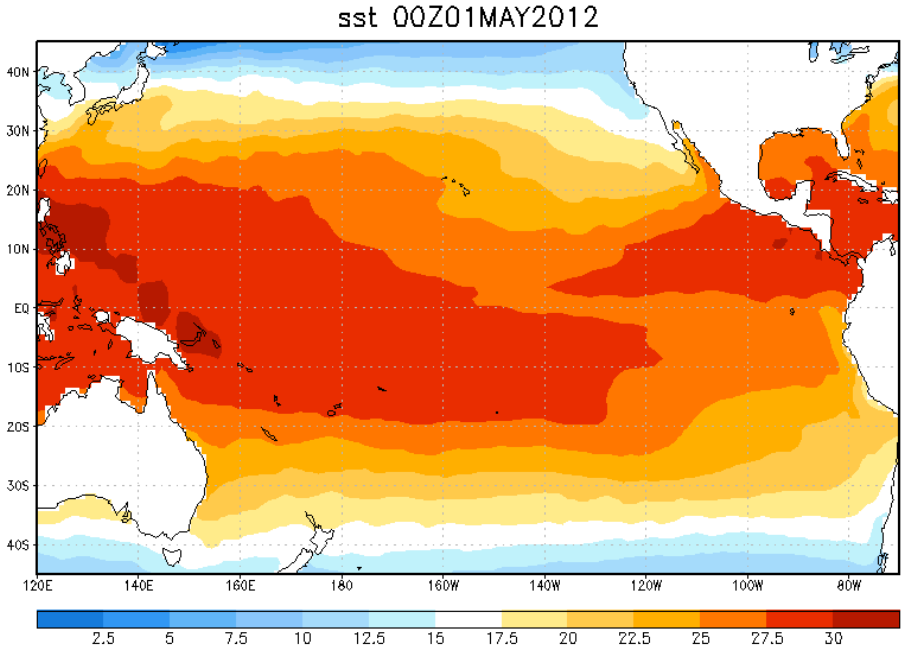


Note:

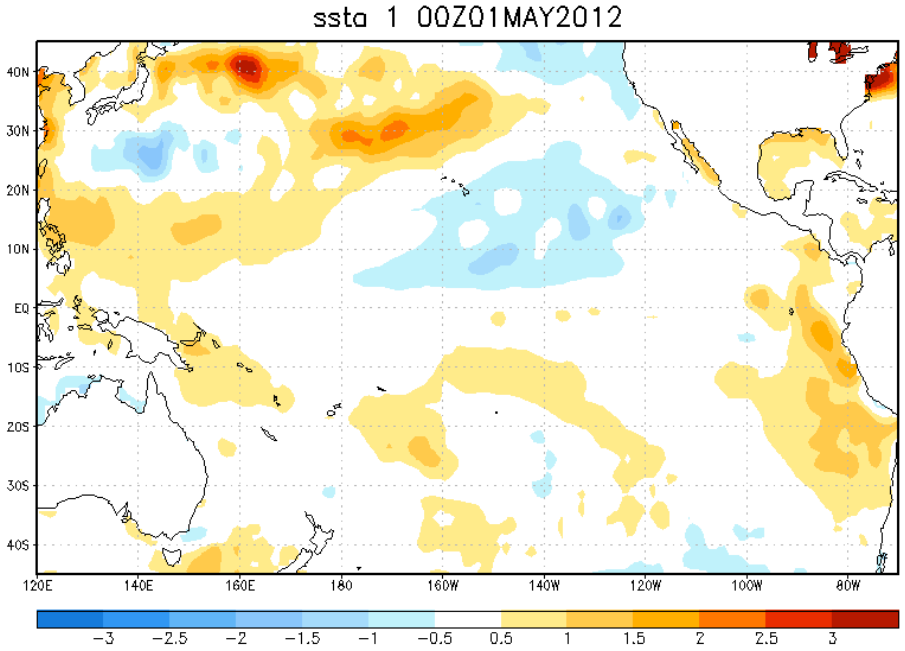
Coincident with a neutral ENSO state, SST anomalies in the Pacific are mostly average, however an area of positive anomalies is developing to the west of South America.

NOAA Optimum Interpolation Sea Surface Temperature Analysis:

OI SST: MAY 2012



OI SST ANOMALY: MAY 2012

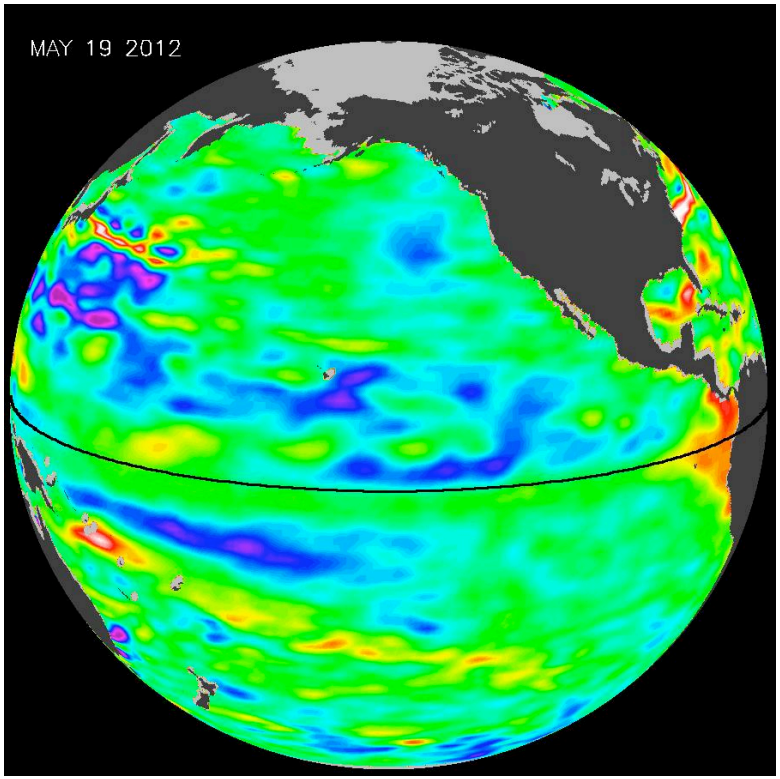


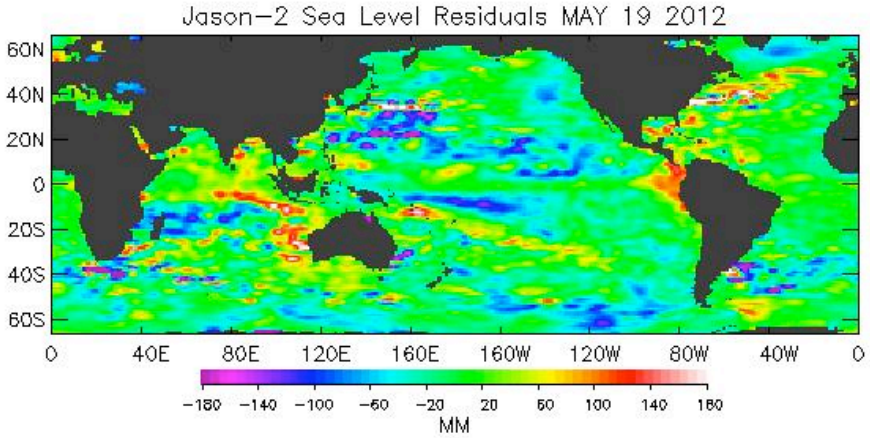
Note:

Coincident with a neutral ENSO state, SST anomalies in the Pacific remain mostly average. The area of positive anomalies to the west of South America a little weaker.

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

10-day data cycle centered around 19 May, 2012.



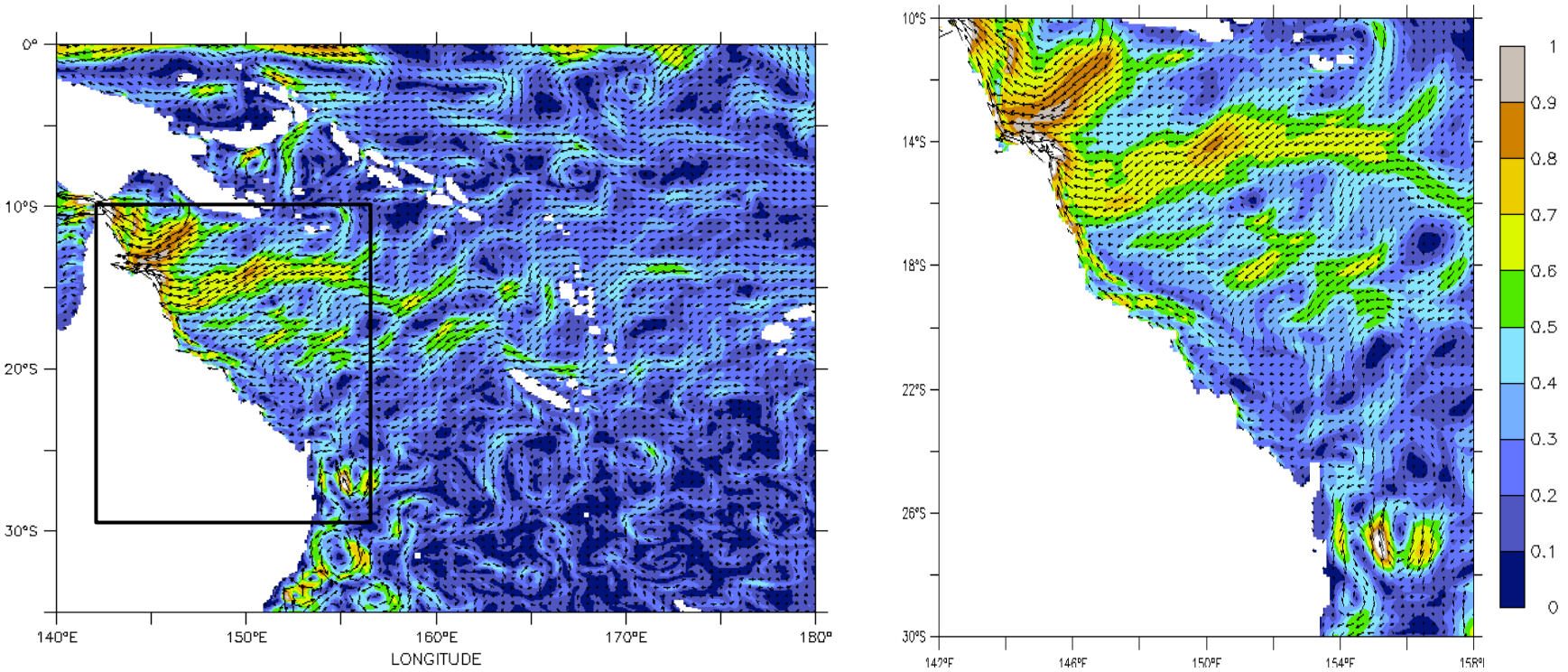


Note:
- Largely average conditions across the equatorial Pacific, with positive SSH anomaly developing off Peru.

OceanMAPS 15m Depth-Average Currents

May 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.

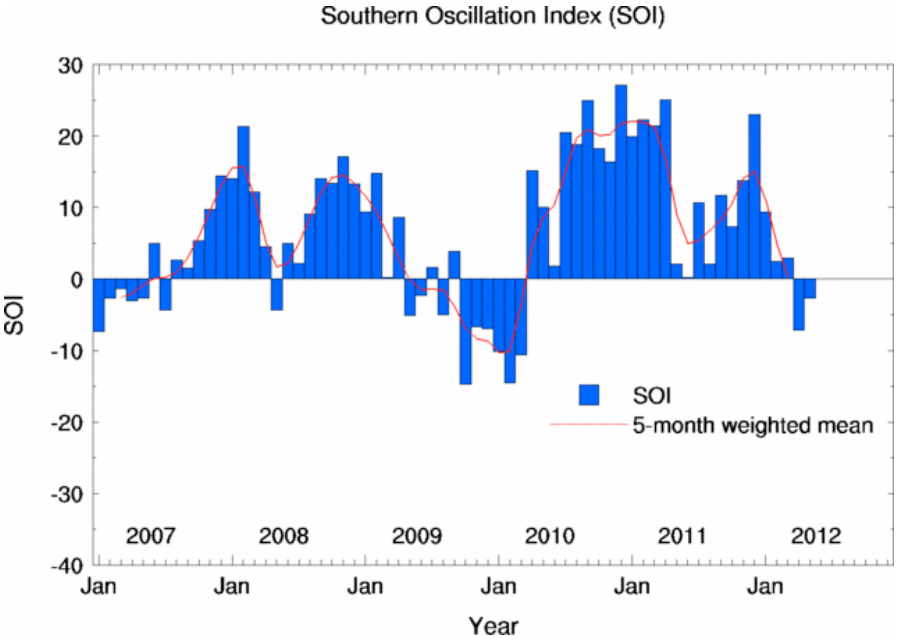


Behind Real Time analysis
15 m Depth-Averaged Currents (m/s).

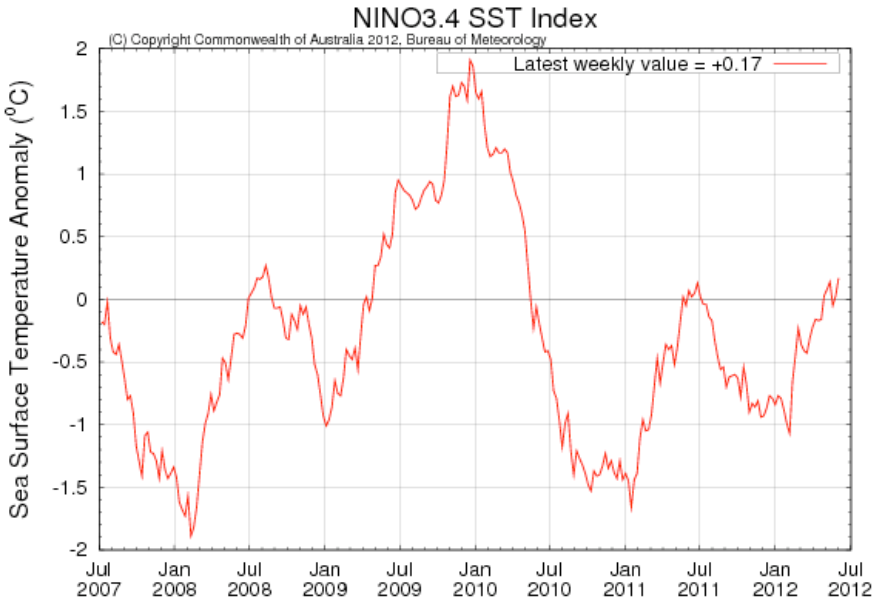
Note:

- Strong westward inflow into the GBR centered at around 16°S turning northwards to join the North Queensland Current.
- As expected for winter, the East Australian Current is relatively weak as the South Equatorial Current bifurcates further south.

ENSO index



Positive SOI = La Niña



Negative Nino 3.4 index= La Niña

Note:

- Both indices showing neutral ENSO conditions.
- According to NOAA ENSO diagnosis discussion (http://www.cpc.ncep.noaa.gov/prodcuts/analysis_monitoring/enso_advisory) there is a 50% chance of El Niño conditions developing towards the end of the year (dynamical models predict El Niño whereas statistical models predict a continuation of neutral conditions).