NERP

Torres Strait / GBR environmental conditions report:

Recent status and predictions

10 April 2013

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UQ-GPEM Biophysical Oceanography Group

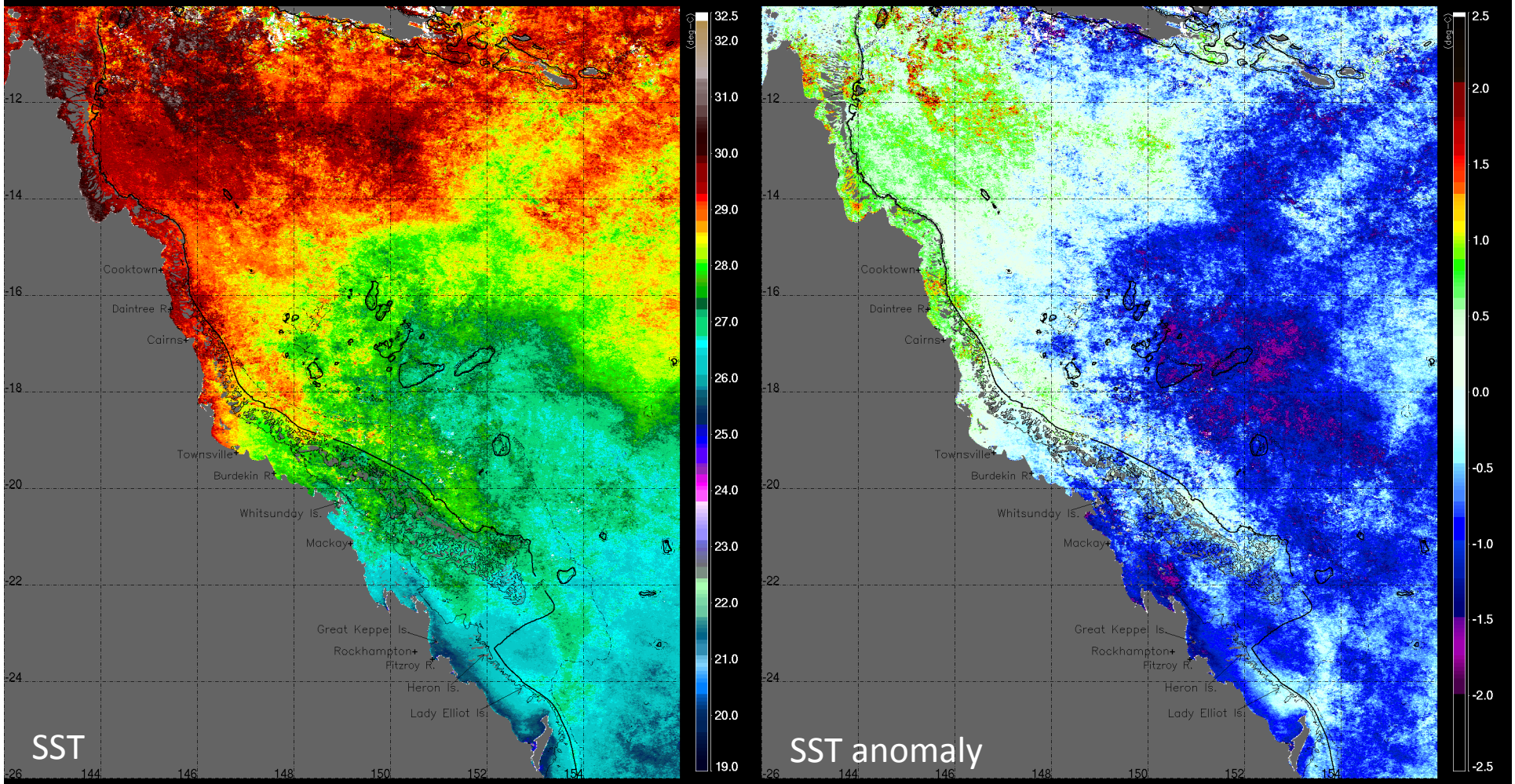
Outline

- 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

- Negative SST anomalies prevalent over the southern GBR during March while neutral and/or above mean temperatures were experienced in the Torres Strait and N-GBR areas.
- Forecast of close to average SST along the GBR and Torres Strait for the upcoming months.
- The NOAA Coral Reef Watch shows no bleaching alerts for the GBR and Torres Strait as we head into winter.
- ENSO-neutral conditions continued in the Pacific during March, and are expected to persist in the upcoming months.

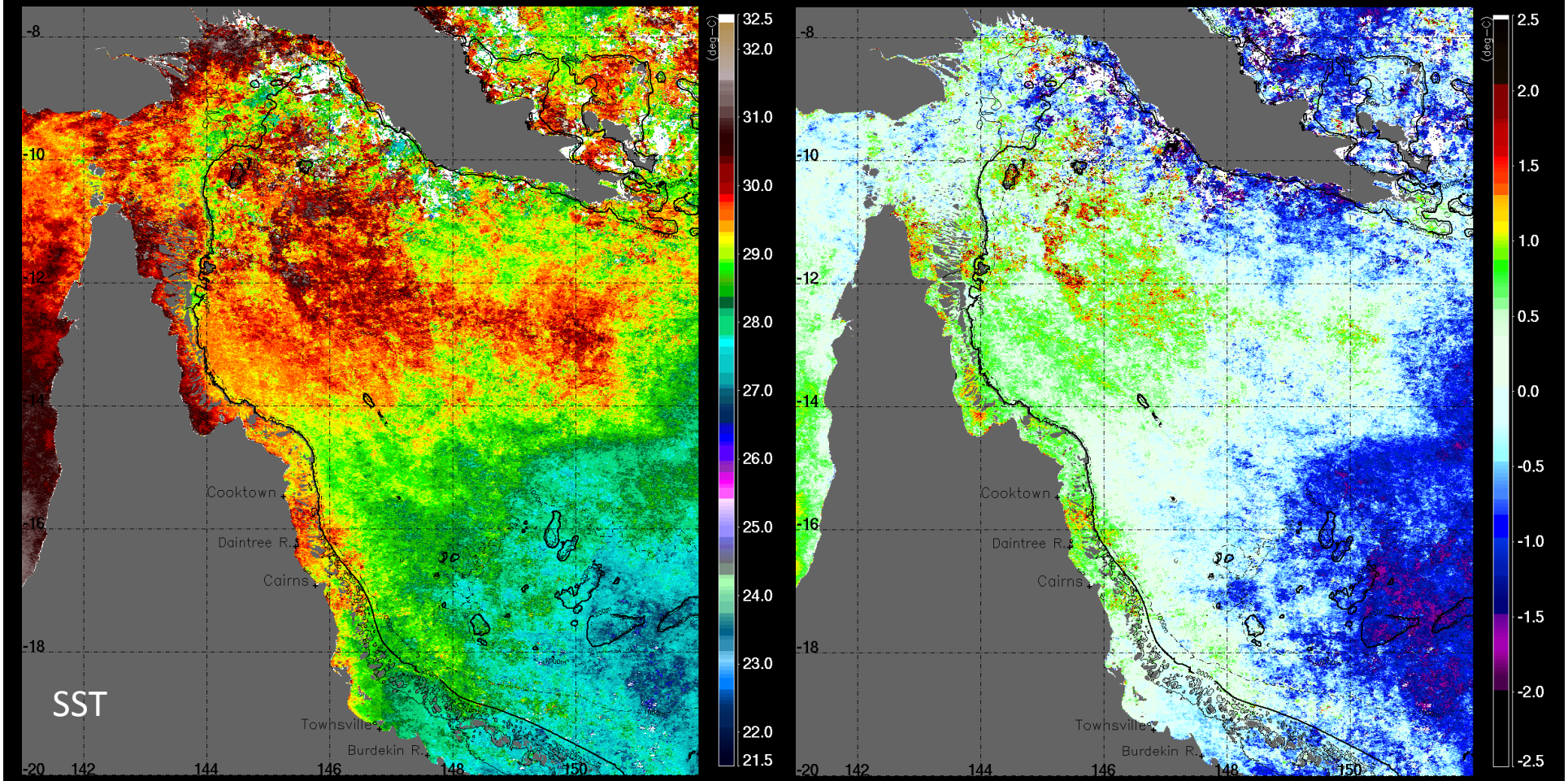
Modis SST (day+night): March 2013



Note:

- MODIS SST data show positive SST anomalies on the N-GBR and strong negative anomalies south of ~20S, especially marked on the inner reefs.
- SST data north of Townsville was impacted by extensive cloud contamination during March, hence caution should be applied in interpreting the March SST anomalies for that region of the GBR

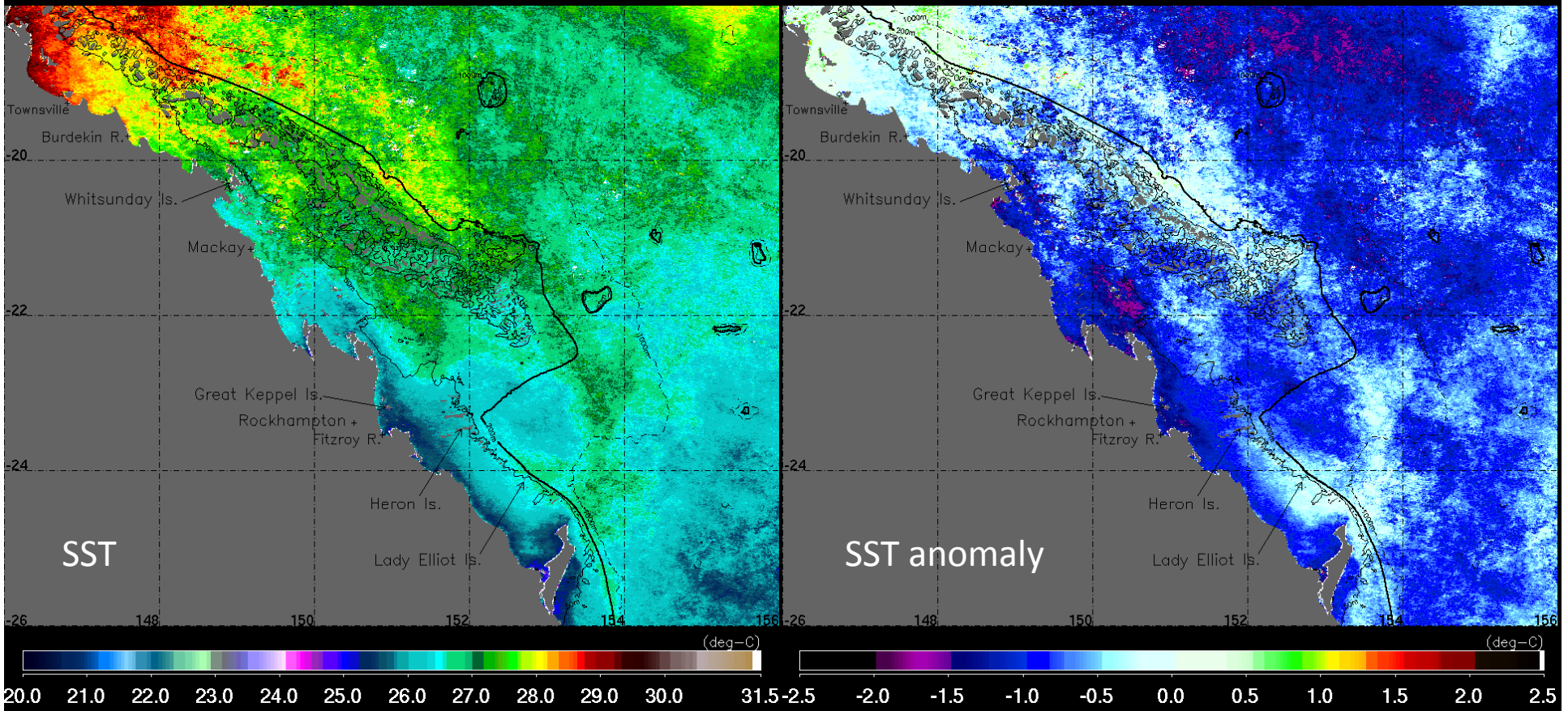
Torres Strait / far northern GBR MODIS SST: March 2013



Note:

- Mostly neutral SST conditions for the Torres Strait and positive SST anomalies on the N-GBR during March.
- SST data in Torres Strait / N-GBR impacted by cloud contamination, hence the SST anomalies not representative of the mean monthly conditions

Southern GBR MODIS SST: March 2013



Note:

- Strong negative anomalies for the southern GBR, especially marked on the inner reefs and offshore
- Noticeable on the MODIS SST anomaly data is the warm EAC signal that led to more neutral SST conditions on the outer reefs.

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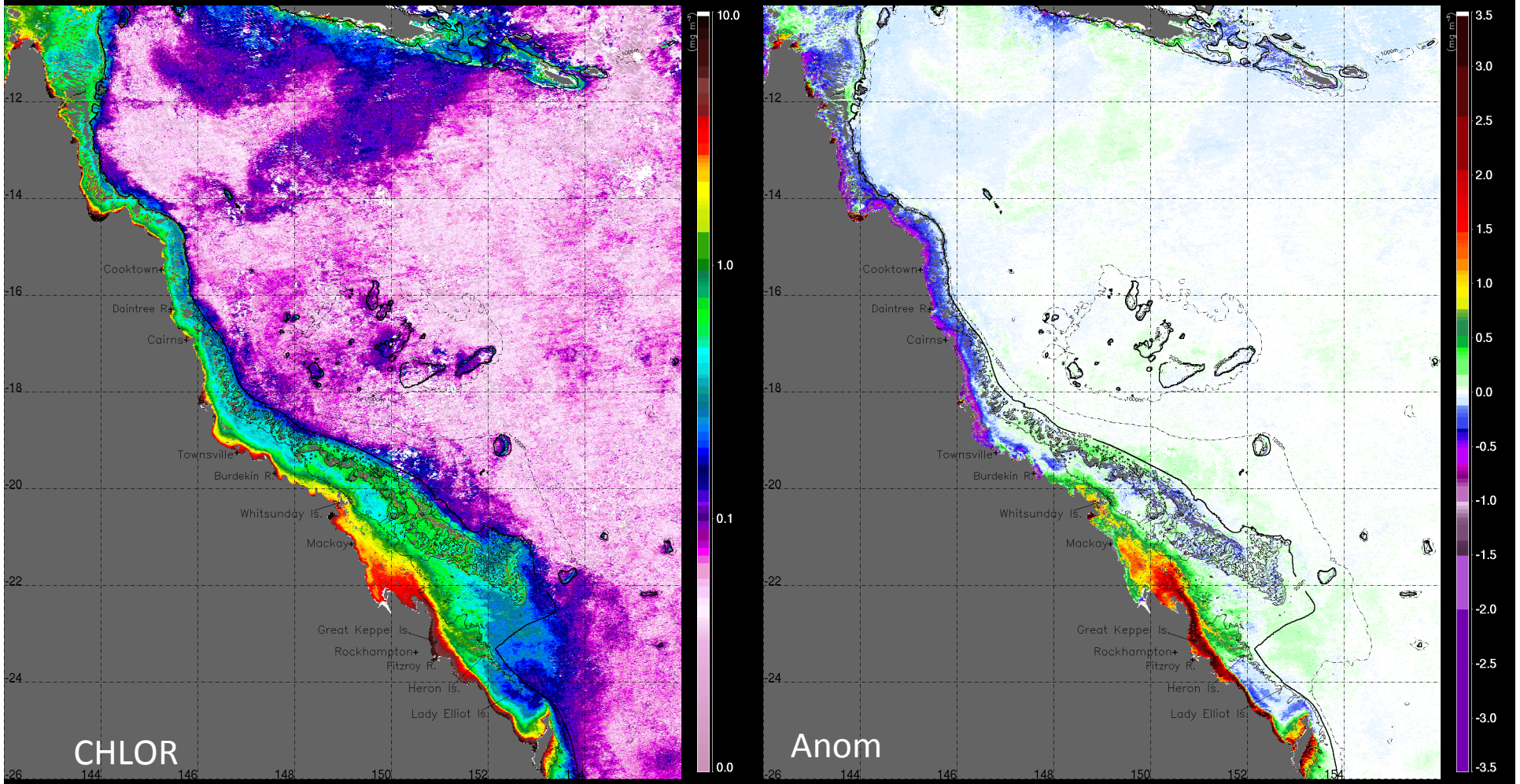
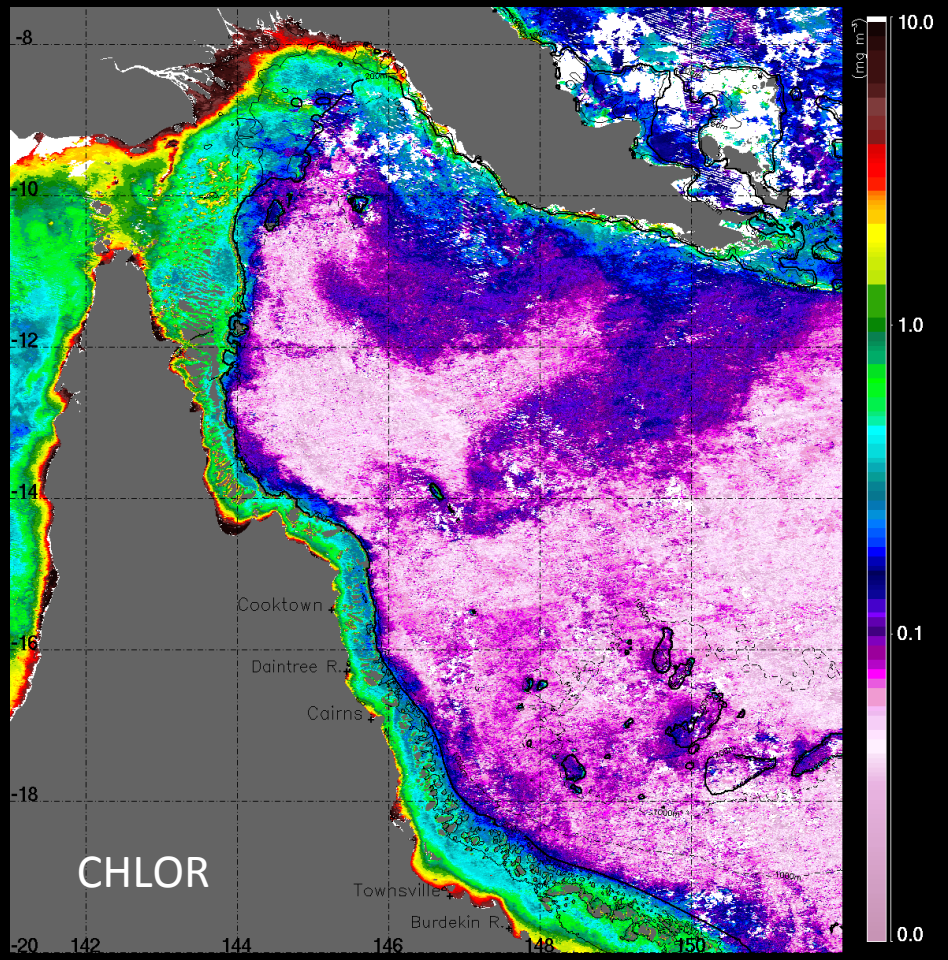
MODIS Chlorophyll-*a* concentration: March 2013



Note:

- High Chlorophyll-a signal on the inner south of ~20°S, most likely due to intense river discharge and vertical mixing.
- In contrast, negative anomalies were present north of Townsville – that data was however severely impacted by cloud contamination and caution should be applied in interpreting those anomalies

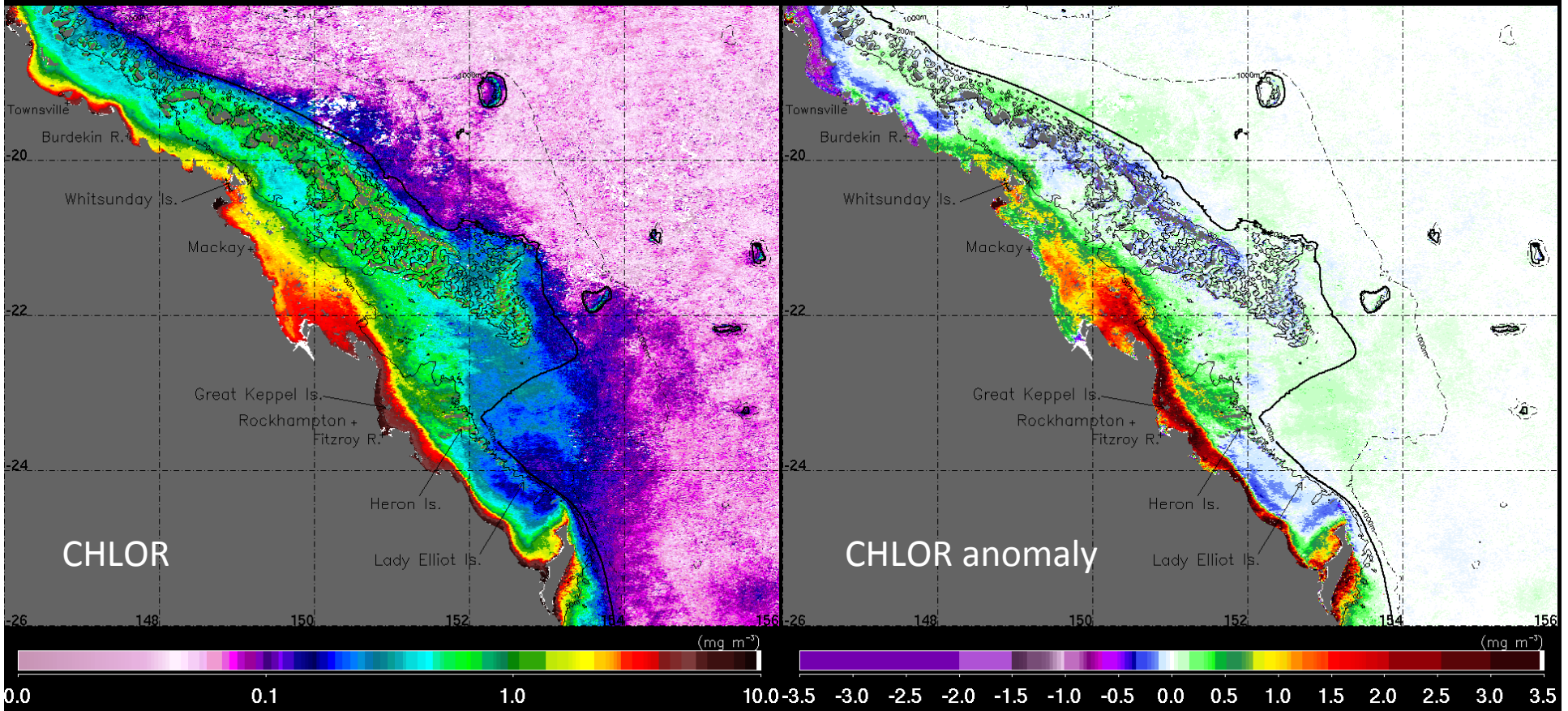
Torres Strait / far northern GBR Chlorophyll-*a* concentration March 2013



Note:

- Chlorophyll image for the Torres Strait / far-northern GBR represents only a limited number of days in March due to the extreme cloud contamination, hence the anomaly image for March is not included.

Southern GBR Chlorophyll-*a* concentration: March 2013



Note:

- High chlorophyll-a concentrations inshore, especially around the Fitzroy River leading to strong positive anomalies likely due to intense river discharge.

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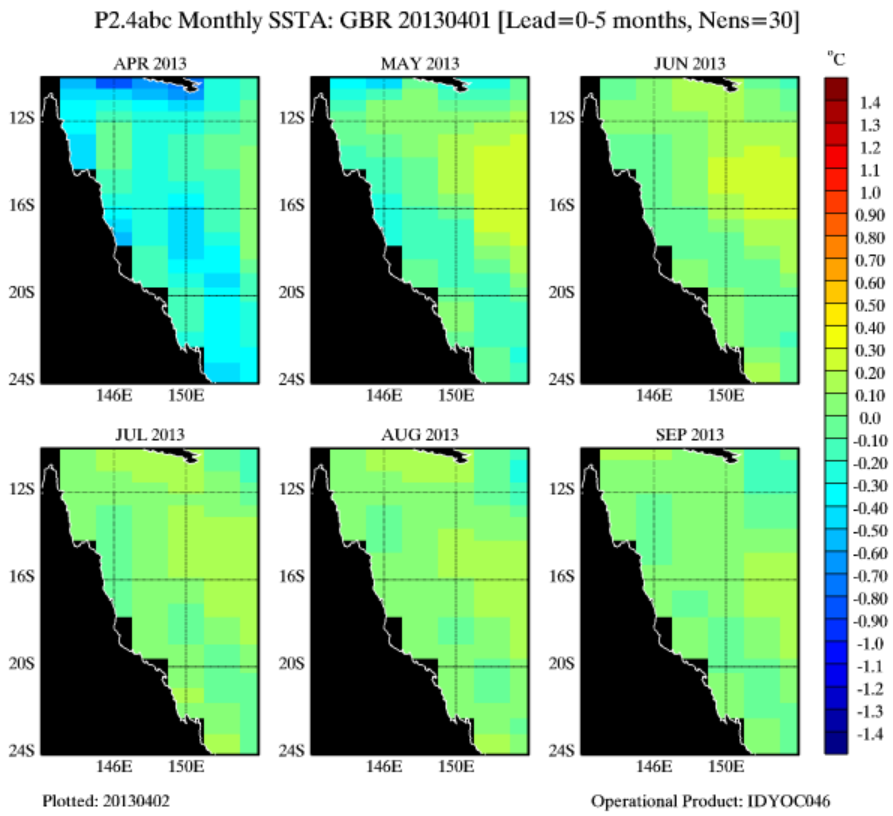
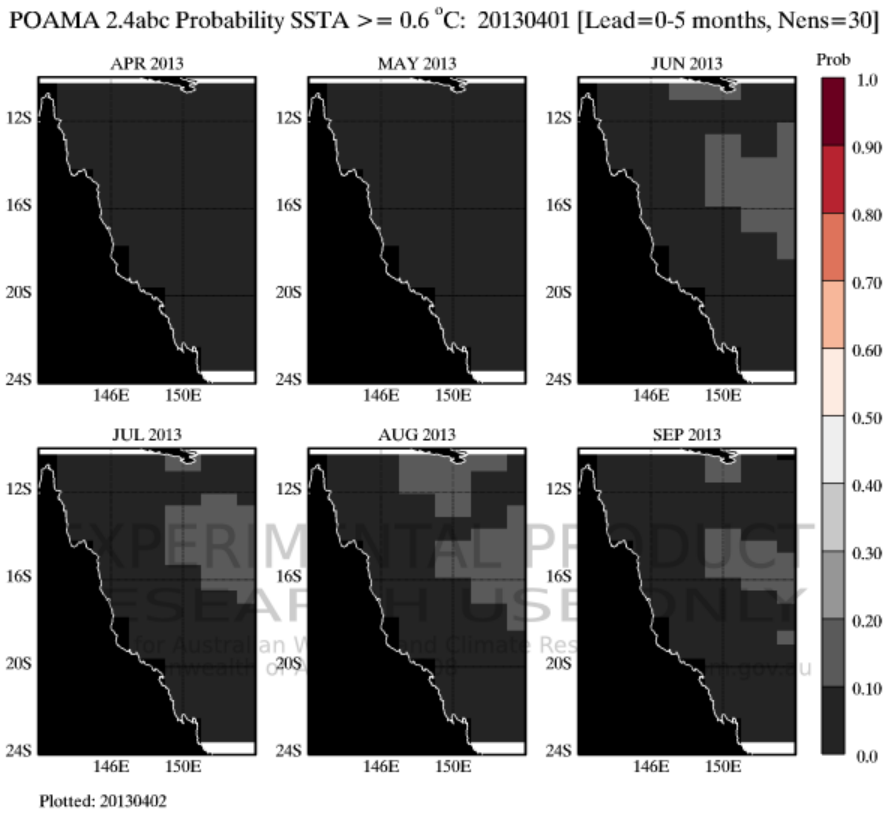
Great Barrier Reef SST Anomaly Forecast (POAMA-2)

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)



EXPERIMENTAL PRODUCT
RESEARCH USE ONLY

Note:

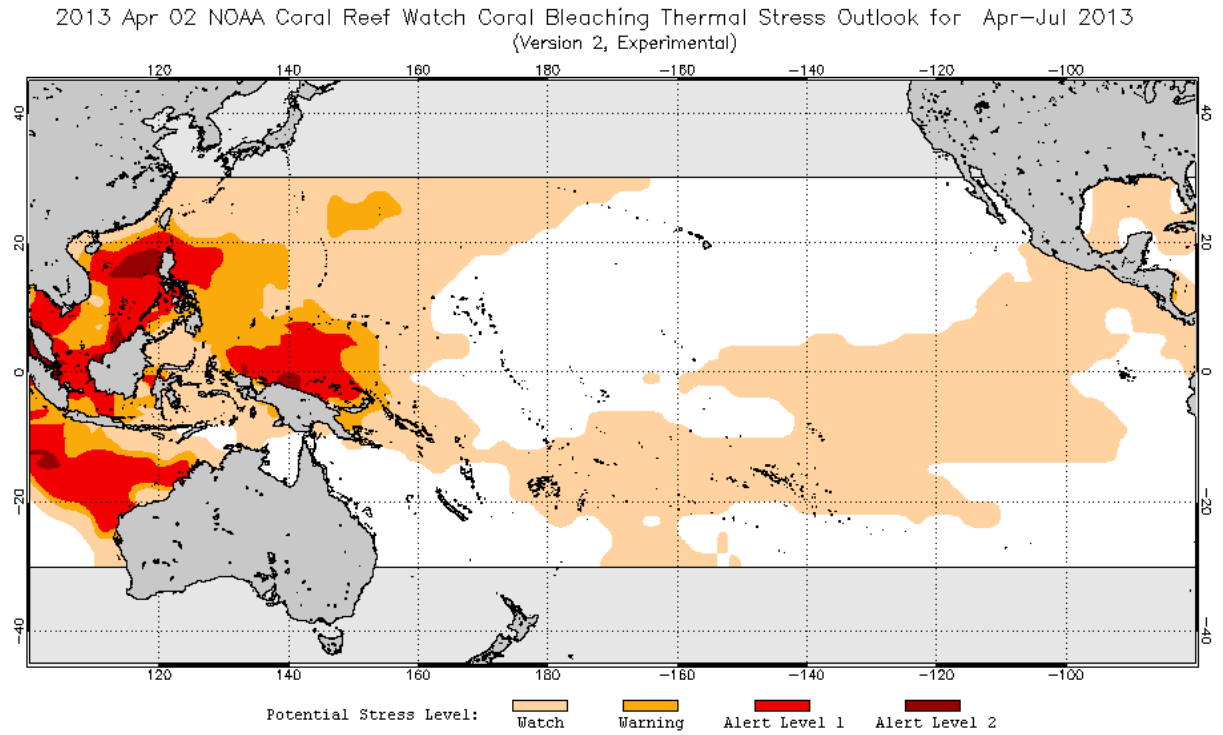
- POAMA is currently forecasting temperatures close to or below average for the upcoming months, with very low probabilities of temperature anomalies exceeding 0.6°C.

NOAA Coral Reef Watch

Seasonal Coral Bleaching Thermal Stress Outlook (LIM-based)

(Version 2, experimental, weekly, 2x2 degree spatial resolution)

Outlook for April to July 2013



Note:

- NOAA CRW bleaching thermal stress outlook shows no bleaching alerts as we head into winter.
- This outlook is based on SST prediction from CRW's experimental statistical Linear Inverse Model (LIM)

NEW!

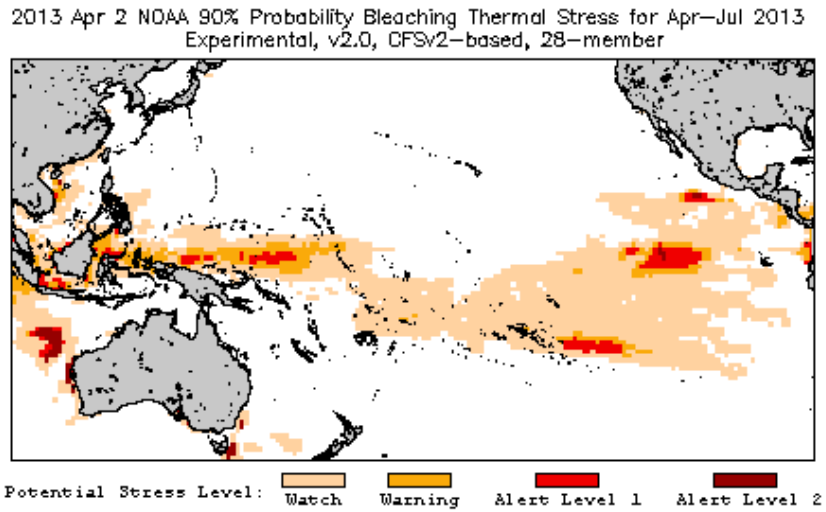
NOAA Coral Reef Watch

Seasonal Coral Bleaching Thermal Stress Outlook (CFS-based)

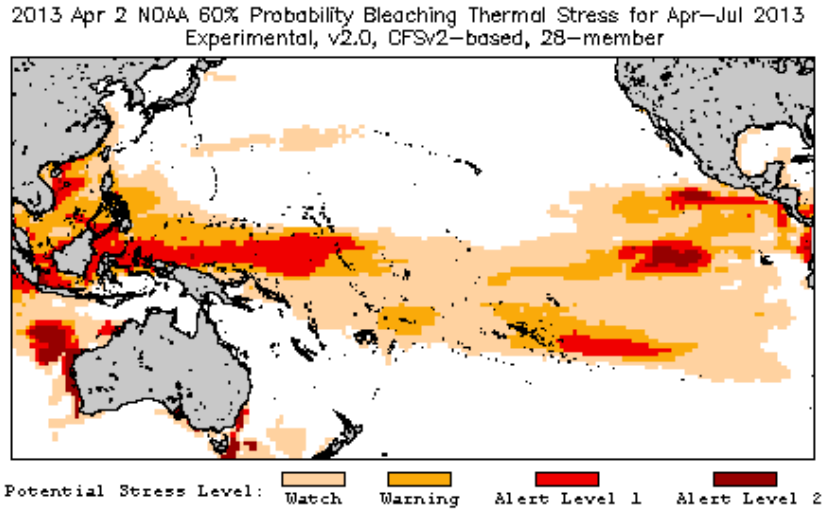
(Version 2.0, experimental, weekly, 1x1 degree spatial resolution)

Probability of bleaching thermal stress for Apr-Jul 2013:

90%



60%



Note:

- NOAA CRW has developed a new seasonal outlook system based on NOAA's operational climate forecast system (CFS) that predicts the probability of thermal stress events causing large-scale, mass coral bleaching, using a weekly 28-member ensemble of SST forecast.
- The second version of the CFS-based Thermal Stress Outlook was released in December 2012.

This CFS-based system predicts no probability of thermal stress events likely in the upcoming months

http://coralreefwatch.noaa.gov/satellite/bleachingoutlook_cfs/outlook_cfs.html

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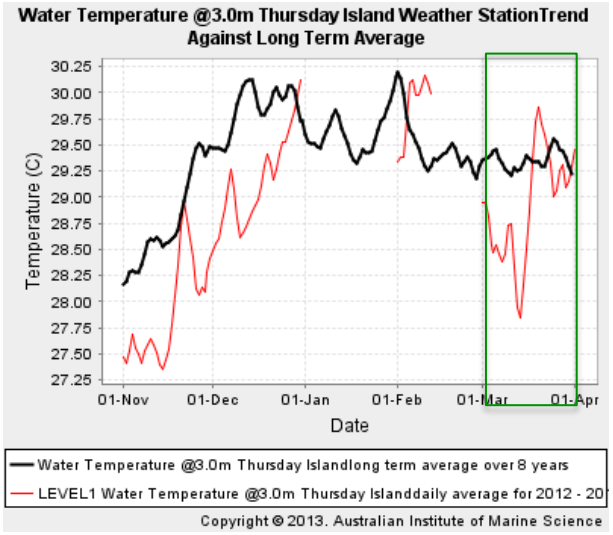
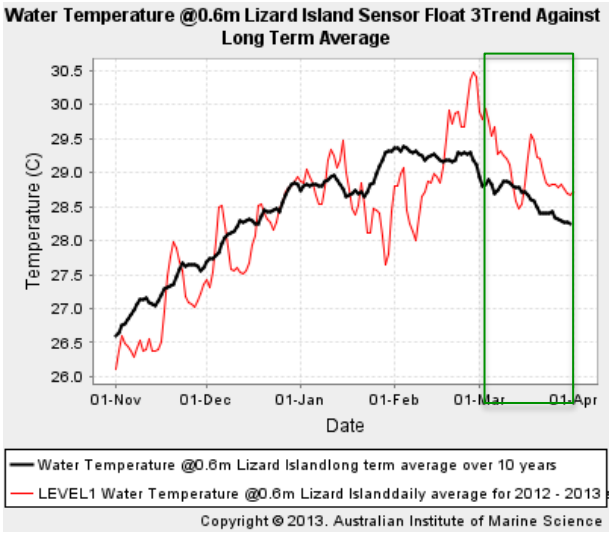
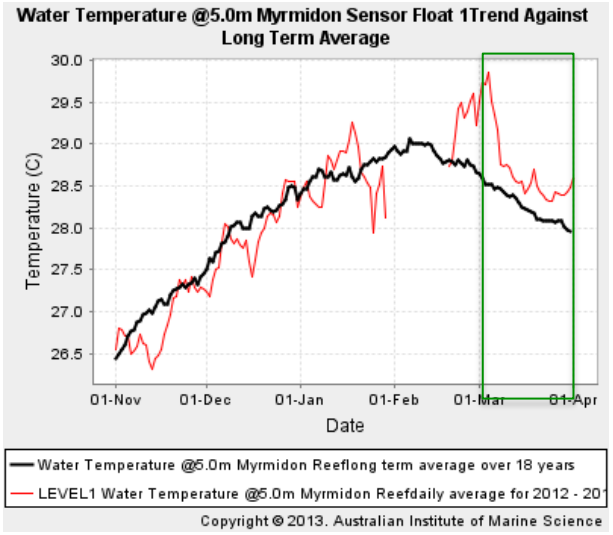
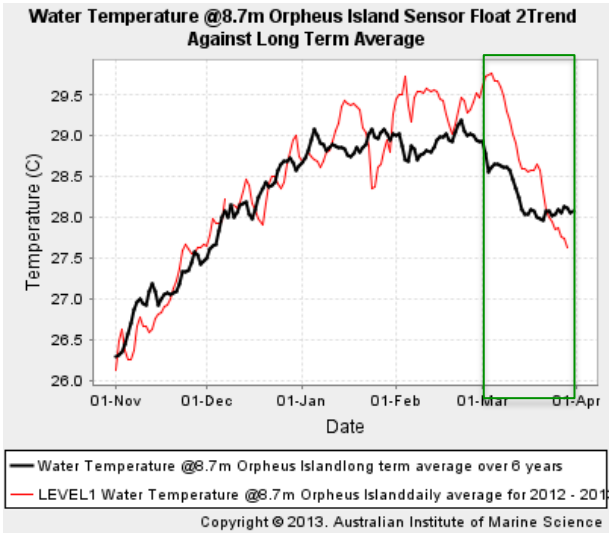
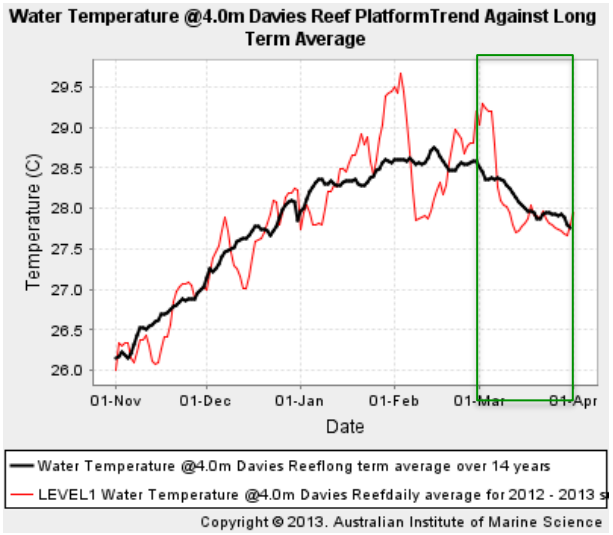
Weather Observing System: AIMS Data Centre

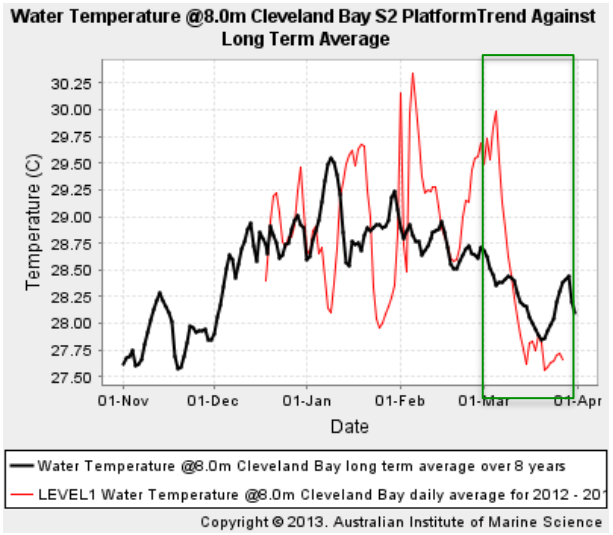












- AIMS weather stations show that ocean temperatures on Thursday Island (in the Torres Strait) were well below the longterm mean during first half of March, increasing to oscillate around he long-term average for the latter part of the month.
- Lizard Island, Myrmidon and Orpheus Island presented temperatures above the longterm mean for most of the month.

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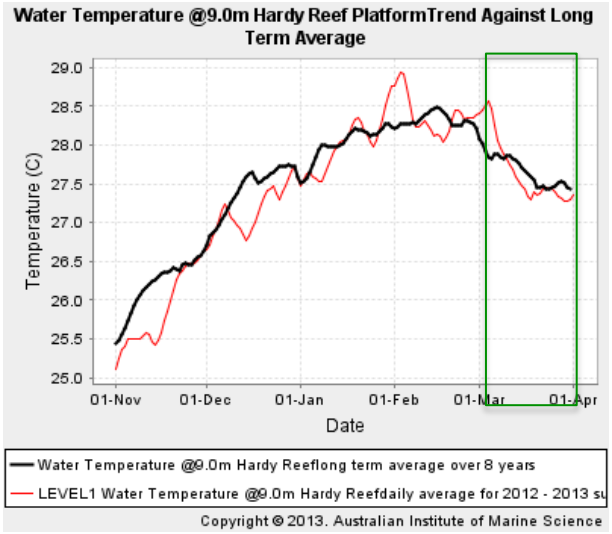
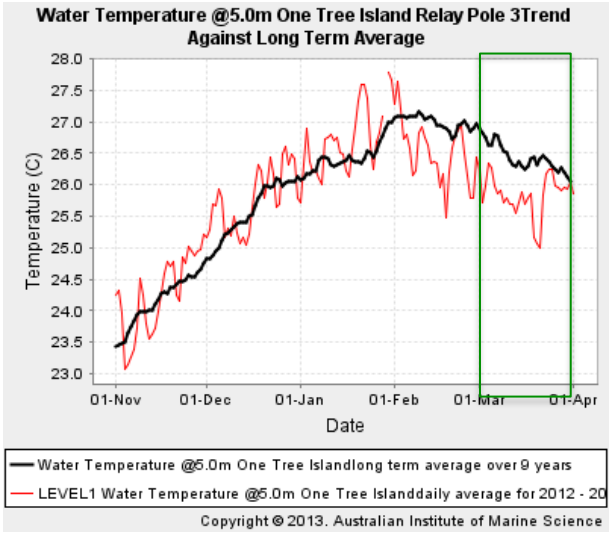
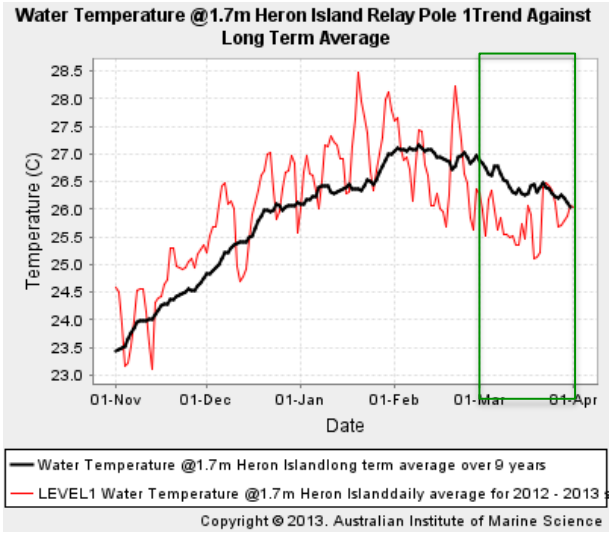
Weather Observing System: AIMS Data Centre







- The AIMS weather stations located on the southern GBR showed temperatures close to or below the longterm mean during March, coincident with the MODIS data.

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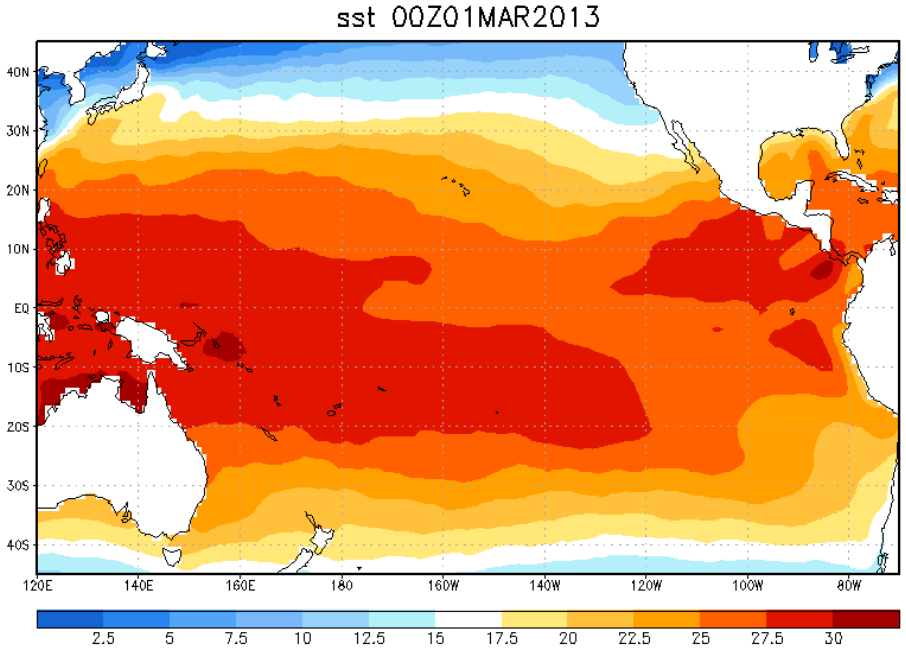
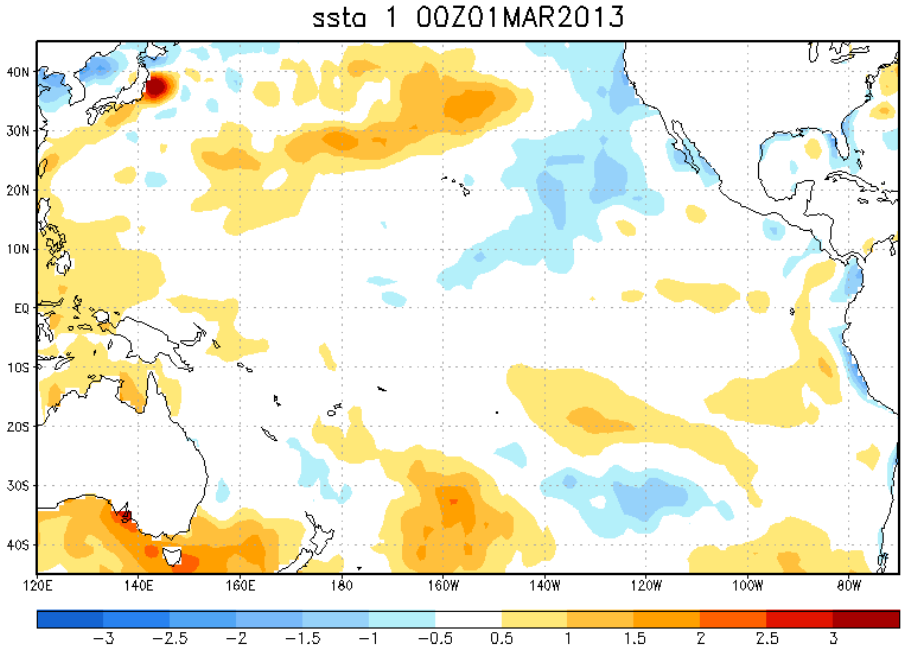
NOAA Optimum Interpolation Sea Surface Temperature Analysis:

OI SST: MARCH 2013



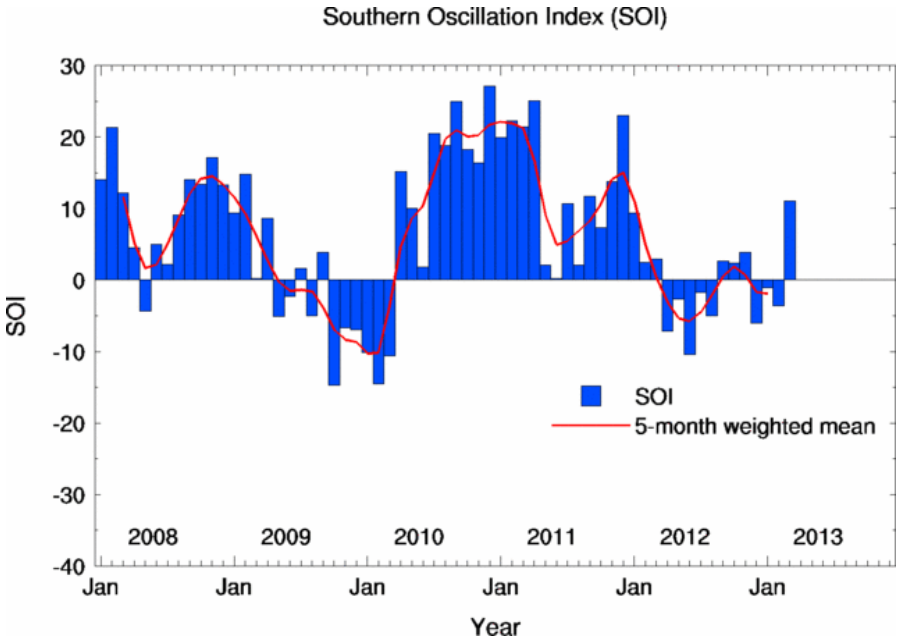
OI SST ANOMALY: MARCH 2013



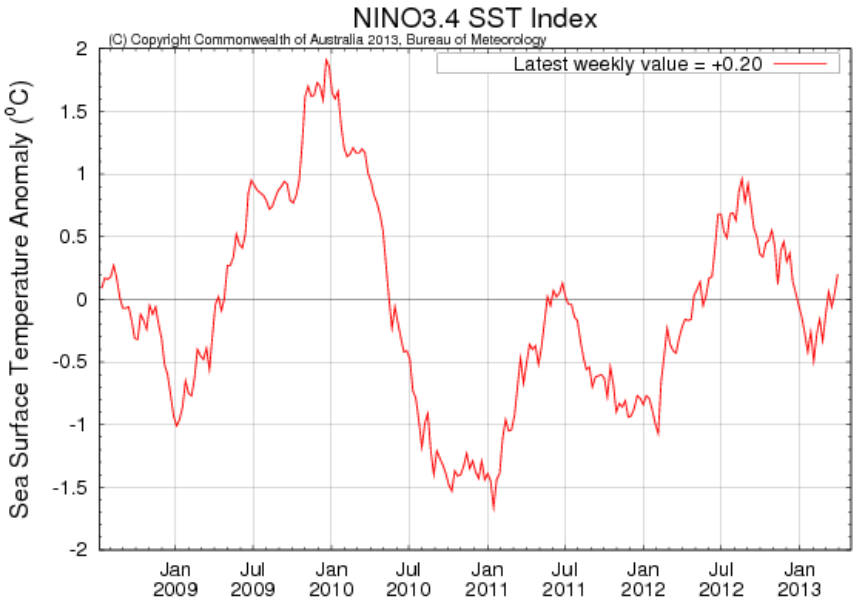
Note:

- Mostly average temperatures for the equatorial Pacific continued during March, corresponding with the neutral phase of ENSO.

ENSO index



Negative SOI = El Niño



Positive Nino 3.4 index= El Niño

Note:

- ENSO-neutral conditions continued during March and are expected to persist for the upcoming months.