East Australian Current Region
Oceanographic conditions report

October 2013

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Overview: October 2013

- MODIS monthly sea surface temperature (SST) means & anomalies showing an intensified East Australian Current (EAC) and strong eddy activity in the region.

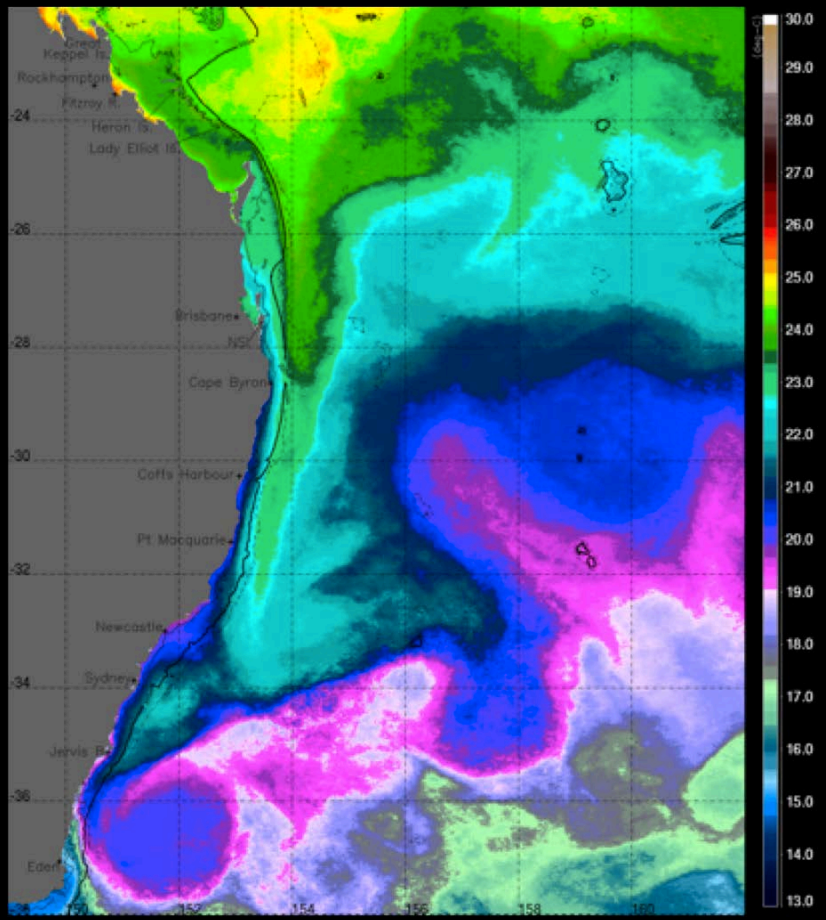
- Weekly MODIS SST means show persistent intense positive anomalies from 34°S with warmest waters exceeding 3°C observed from inshore of Jervis Bay.

- Weekly maps of sea level anomalies showing the ocean topography related to the EAC and eddy activity in the region consistent with MODIS images.

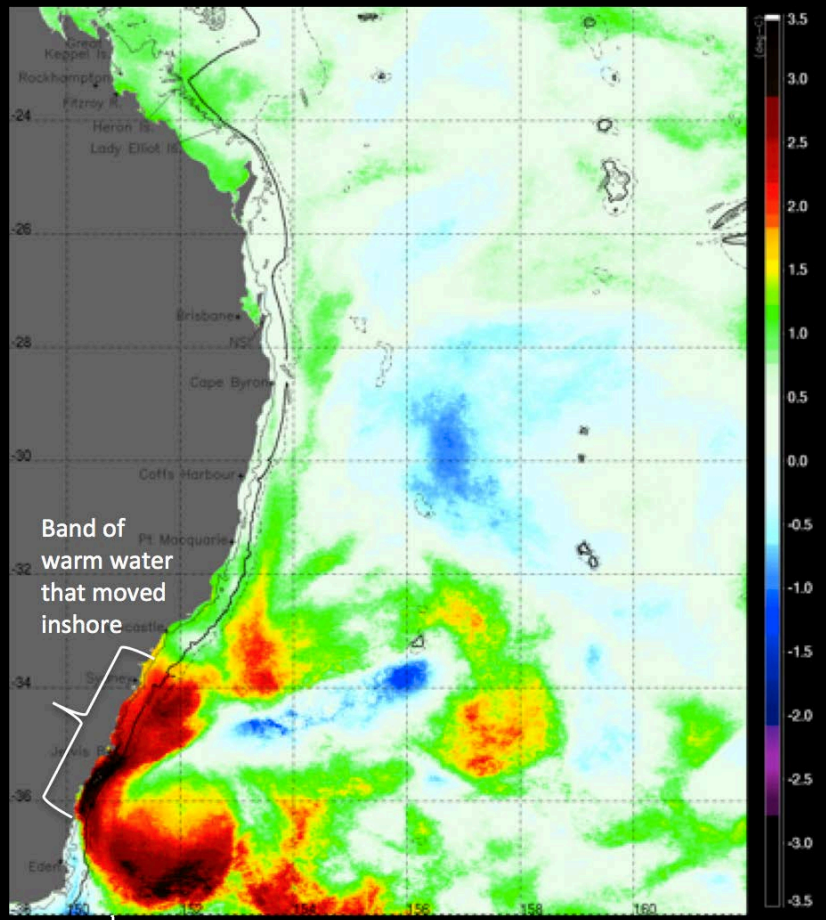
- Monthly mean surface oceanic currents (OceanMAPS) show maximum current (1.5m/s) coincident with the intense positive SST anomalies and anticyclonic eddy.

EAC monthly MODIS SST (D+N): October 2013

- Stronger EAC compared to September – overall seasonal increase in temperature of the Current
- Strong to intense positive SST anomalies south of 32°S but mostly average to moderate conditions elsewhere
- Relative to September, intense positive SST anomalies associated with the EAC eddies and southern limb progressed southwestward. Shelf waters between 33.75 to 36.3°S with anomalies exceeding 2.5°C



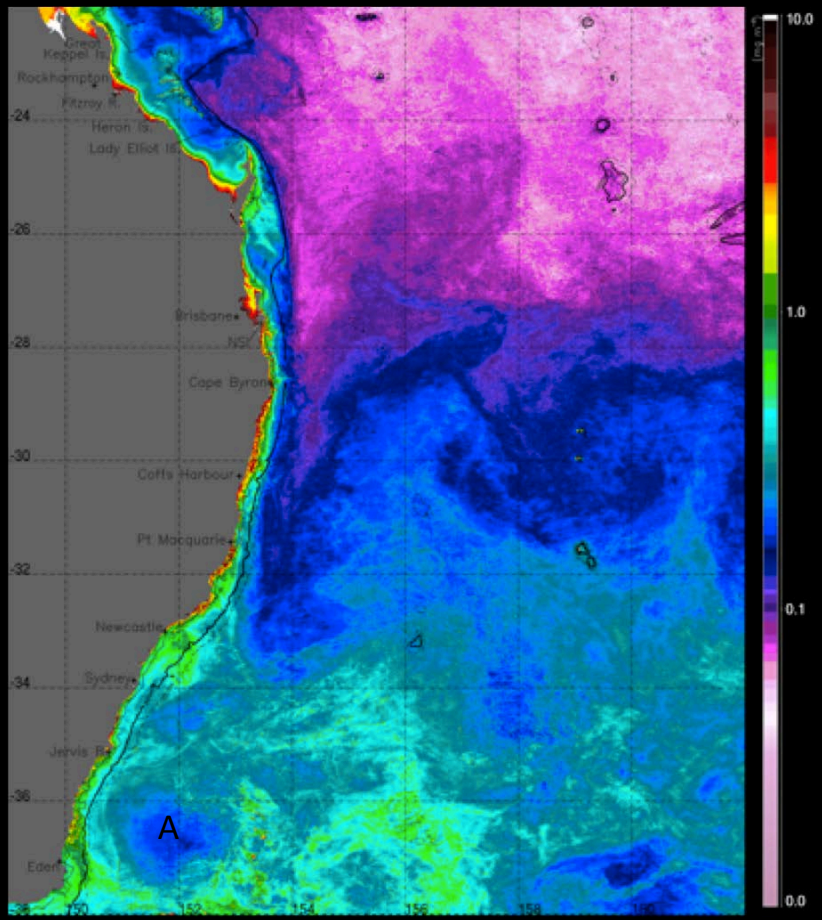
mean



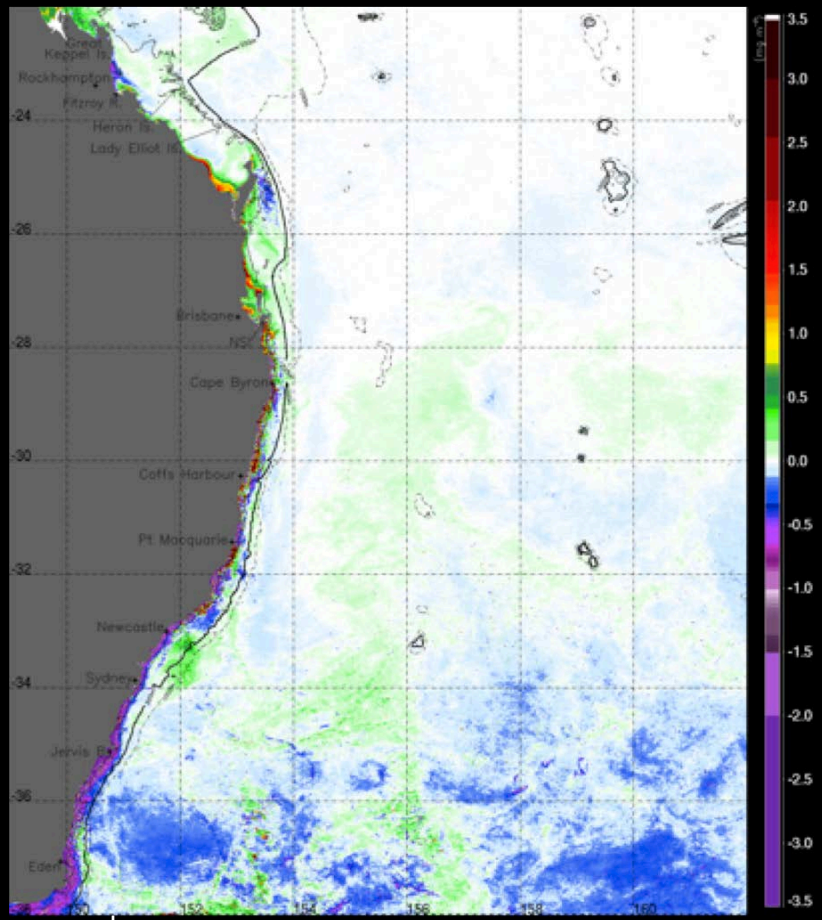
anomaly

EAC monthly MODIS Chlorophyll-*a*: October 2013

- Extent of warm oligotrophic Coral Sea waters even wider compared to September
- Elevated chlorophyll concentration in the temperate waters of the Tasman Sea particularly along the frontal boundaries of the EAC eddies (southwest corner of the region). Note, however, drop in chlorophyll concentration relative to September in the coastal waters along Jervis Bay and Eden as the huge anticyclonic eddy moved closer inshore bringing in oligotrophic EAC waters



mean

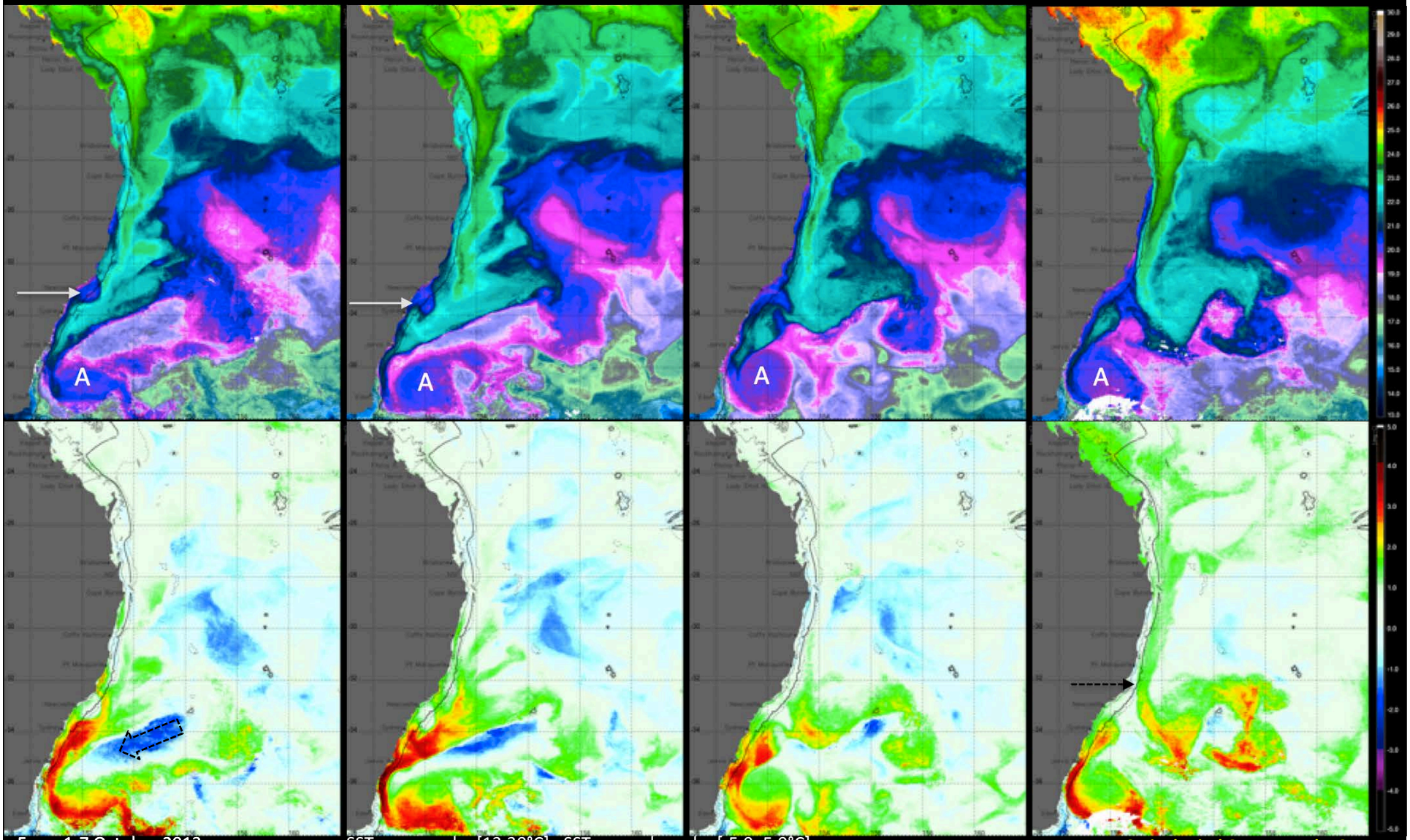


anomaly

A: anticyclonic eddy

October 2013 Weekly MODIS SST means (top panel) and anomalies (bottom panel)

- Intensified EAC continue poleward during week 1&2 driving a small cyclonic eddy (white arrow) off Newcastle and feeding a huge anticyclonic eddy (A) off 37°S
- During week 3, but more pronounced during week 4, EAC separates from the coast between ~32-32.5°S driving an anticyclonic eddy as it meanders eastward into the Tasman Sea
- Persistent intense positive SST anomalies associated with the EAC southern limb and anticyclonic eddy. Warmest waters evident along the shelf during week2 exceeding 3°C being "pushed" by an elongated cyclonic eddy associated with an intense negative SST anomalies



From 1-7 October 2013

SST mean scale: [13,30°C] ; SST anomaly scale: [-5.0, 5.0°C]

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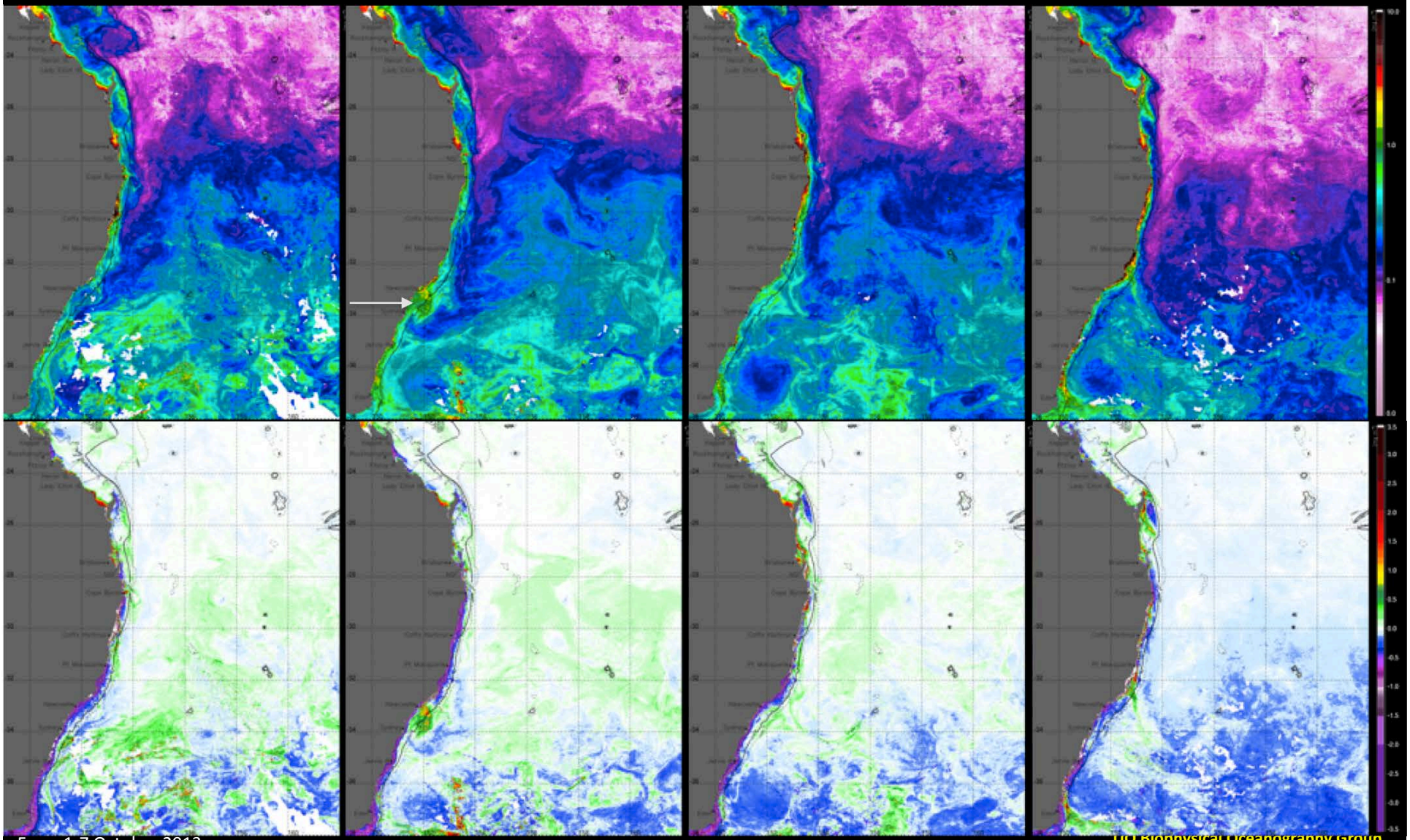
October 2013 Weekly MODIS CHLOR means (top panel) and anomalies (bottom panel)

- Surface manifestation of an active Capricorn Eddy during weeks 1 and 2
- Extent of warm oligotrophic EAC/Coral Sea waters much wider compared to September
- Apparent increase in chlorophyll levels in coastal waters off Newcastle corresponding to the presence of a cyclonic eddy noted in SST images. Signal more pronounced in week 2 (white arrow)
- High chlorophyll waters still persist at the southern region influenced by the dynamics of the eddies shed and driven by the EAC.



From 1-7 October 2013

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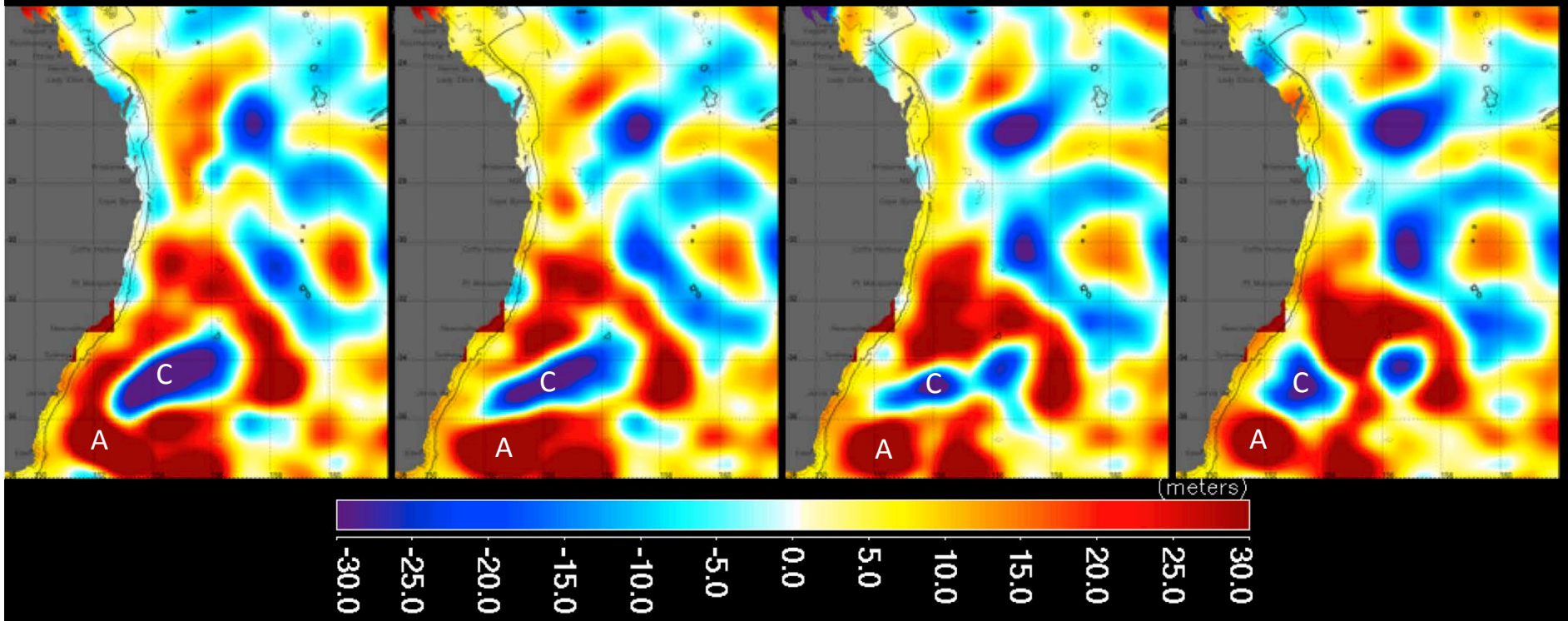
Weekly AVISO Maps of Sea Level Anomalies

From 1-7 October 2013



- Corresponding maps of sea level anomalies from AVISO shows how a horizontally elongated cyclonic eddy "pushed" the warm EAC southern limb and eddy closer to the coast, most evident during week1, consistent with MODIS images

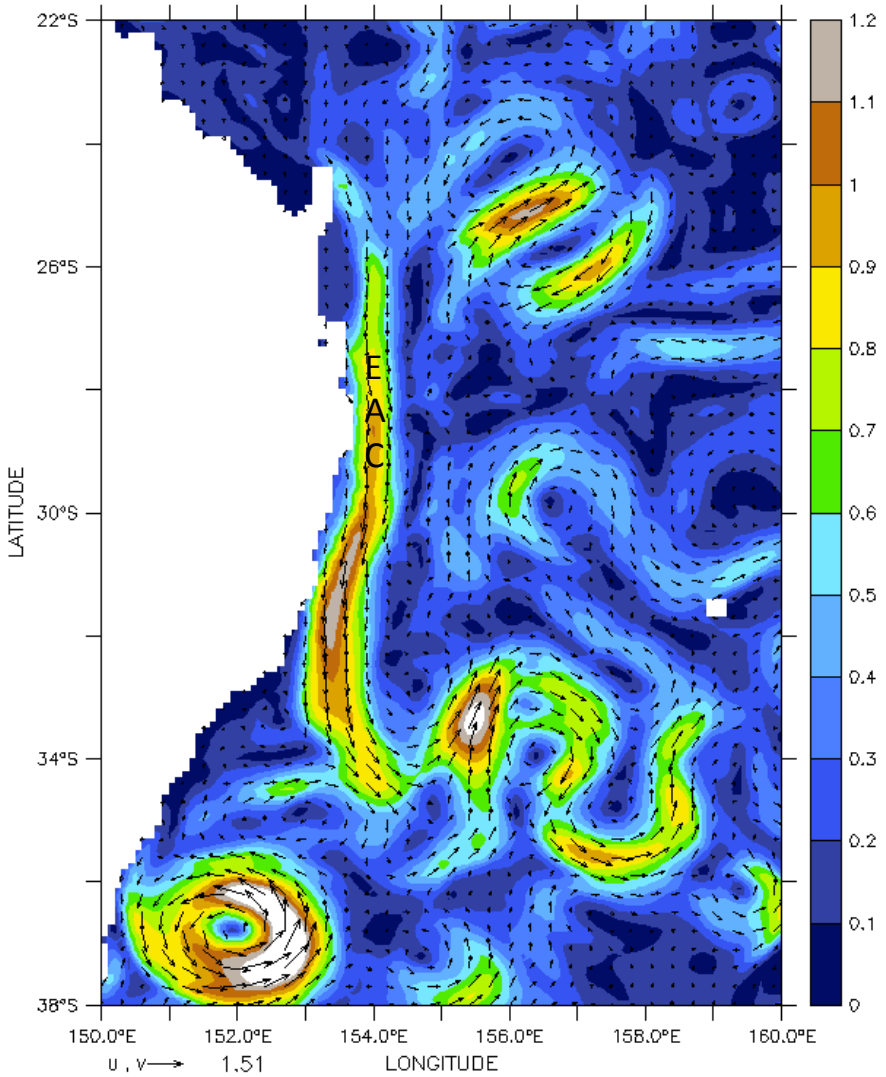
A: anticyclonic eddy; C = cyclonic eddy

OceanMaps 15m Depth Integrated Currents
October 2013

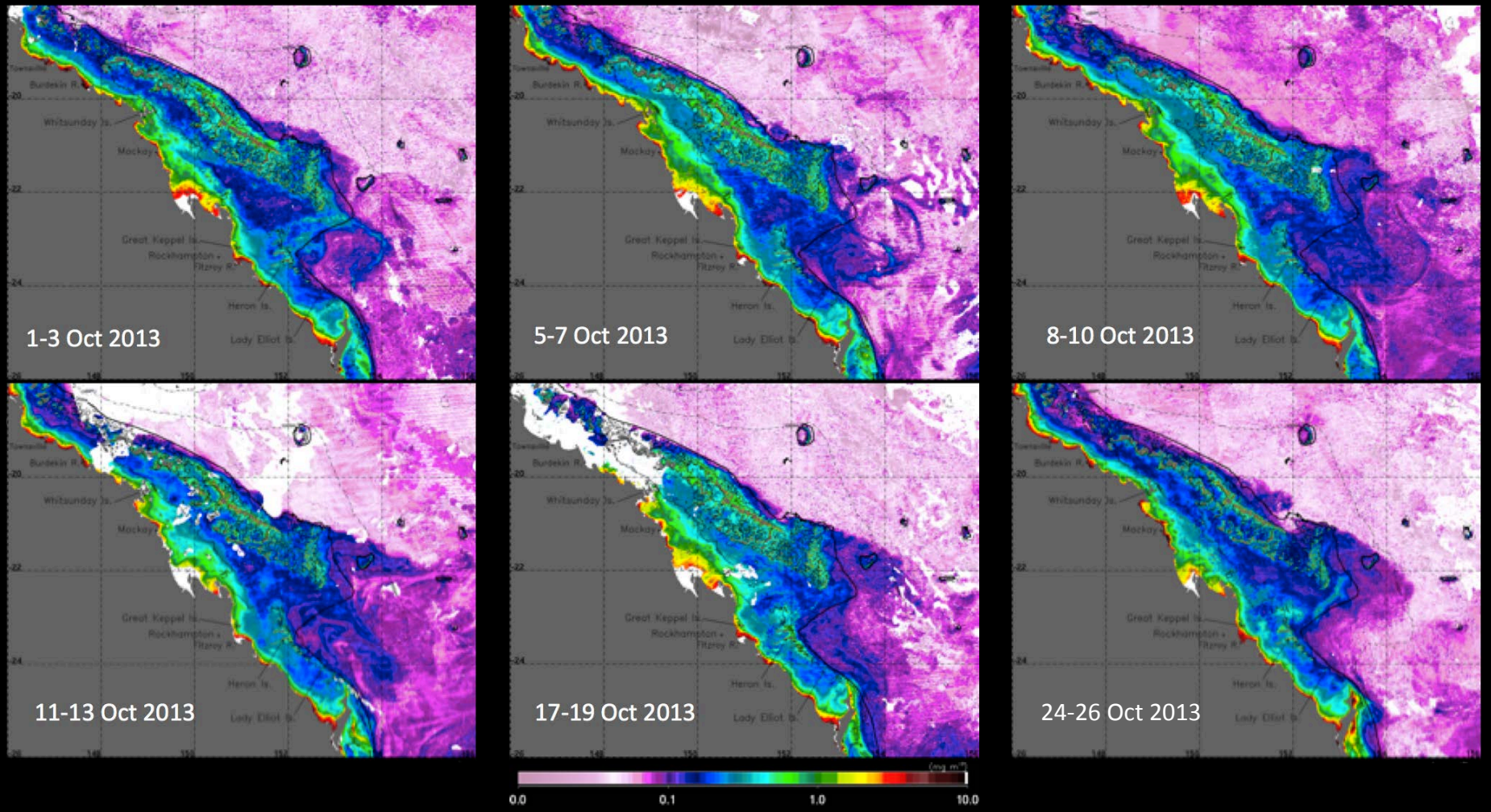
Depth integrated (0-15m) currents from OceanMaps reveal:

- A very strong EAC continuing poleward from south of Fraser shelf, intensifying further from 30°S with maximum velocity of 1.2 ms^{-1}. The EAC separates from the coast (eastward) at ~31°S, meandering and feeding the Tasman front

- Huge anticyclonic eddy centered at 37°S and 152°E with maximum current velocity of 1.5ms^{-1}



MODIS 3D Chlorophyll-*a* images: Capricorn Eddy in focus



Snapshots showing the evolution of the Capricorn Eddy

- pronounced cyclonic surface flow feature in early October
- Entrainment of high chlorophyll waters within the eddy boundaries
- Intrusions of oceanic waters into the inner reefs as the eddy weakens
- Enhanced primary production at the frontal boundaries between oceanic and shelf waters

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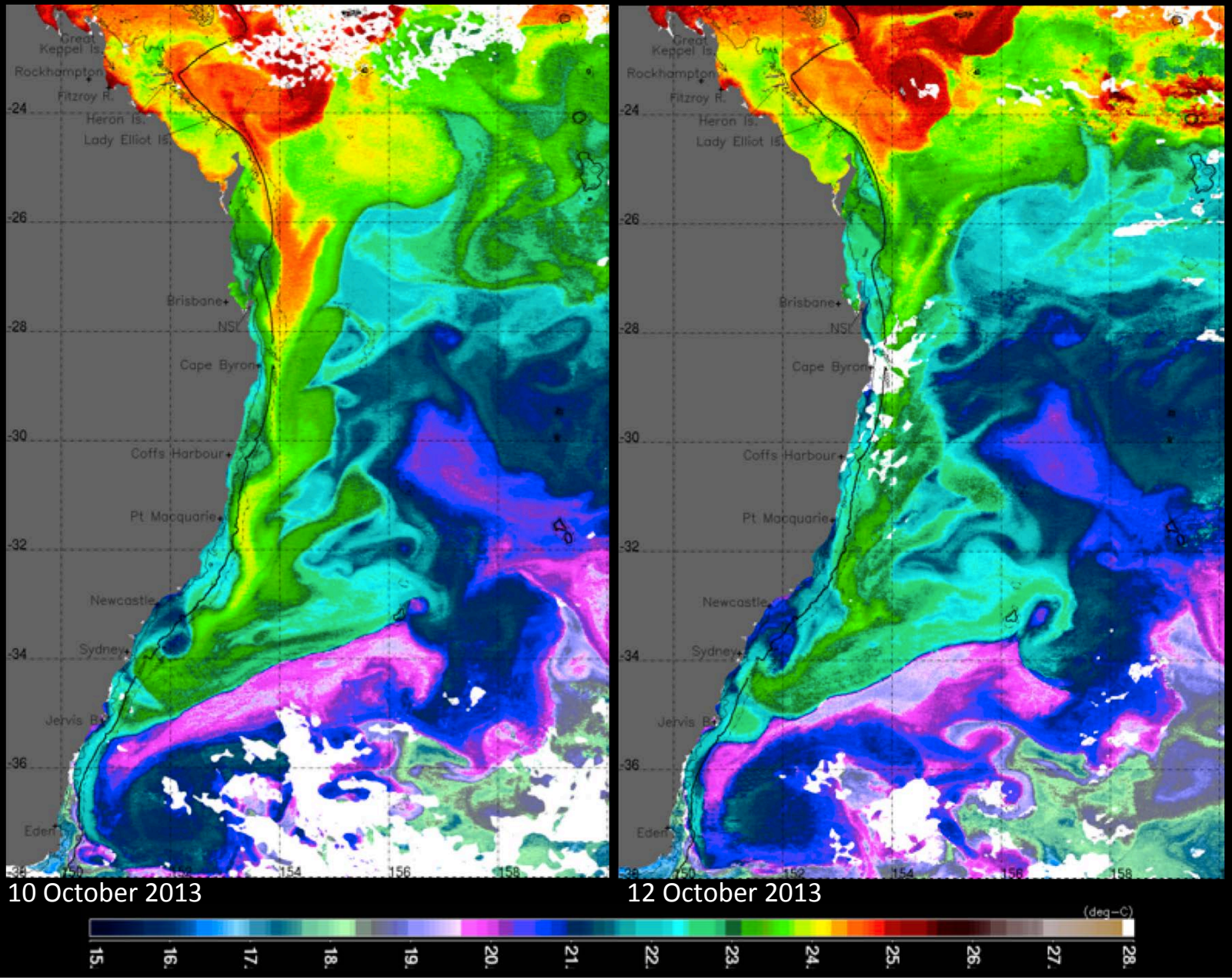
MODIS SST images depicting the dynamical nature of the EAC on a daily basis



10 October 2013

12 October 2013