East Australian Current Region
Oceanographic conditions report

September 2013

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Overview: September 2013

- MODIS sea surface temperature (SST) means & anomalies showing an intensified and relatively wide East Australian Current (EAC) and strong eddy activity in the region. The EAC is linked with intense positive SST anomalies (+4.0 degrees).

- Weekly MODIS chlorophyll means highlights the intensification of the southern EAC limb towards the end of the month.

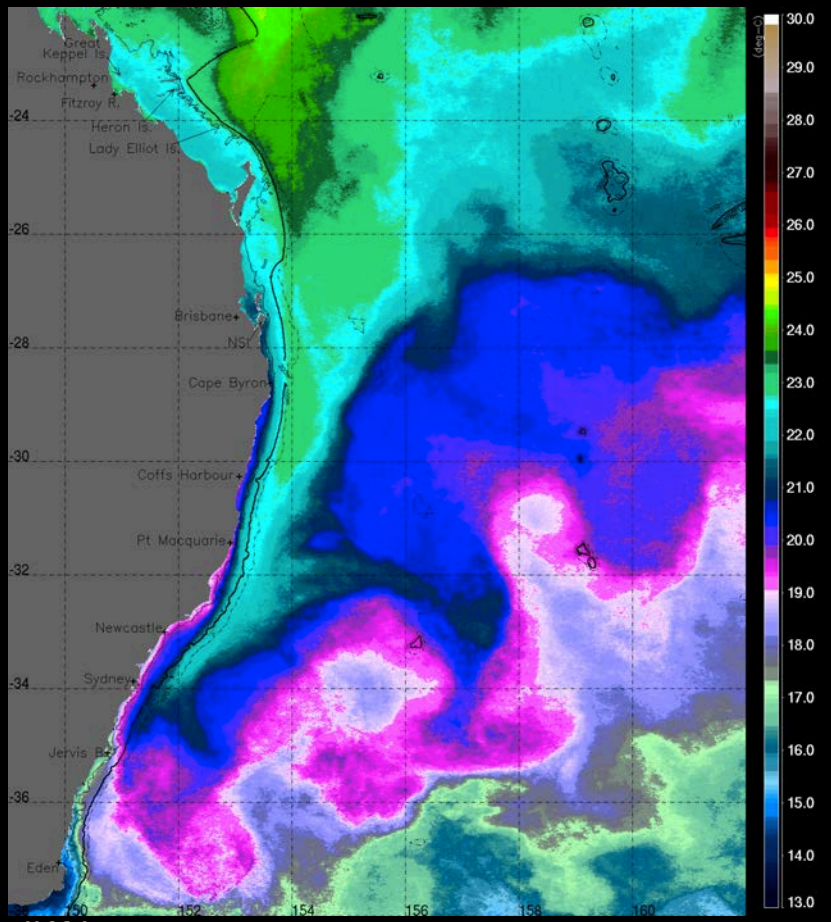
- Weekly maps of sea level anomalies showing the ocean topography related to the EAC and eddy activity in the region.

- Monthly mean surface oceanic currents (OceanMAPS) show maximum current (1.69m/s) coincident with the intense positive anomalies.

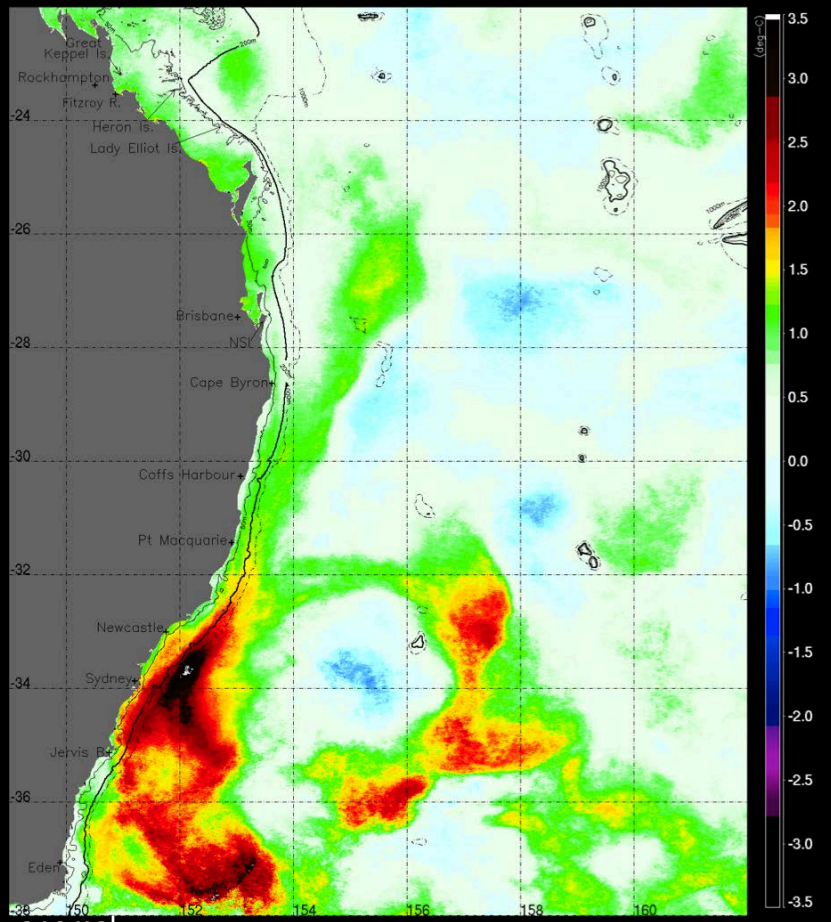
- Oceanographic conditions around lady Elliot island (LEI) and summary of selected manta sightings at LEI for September 2013.

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

- Strong but relatively wider EAC associated with strong positive SST anomalies as the current approaches Port Macquarie. From this point poleward, the EAC southern limb exposed to the Tasman Sea waters is associated with intense positive SST anomalies (+4.0 degrees warmer). These warm waters encroaching closer inshore between Newcastle and Jervis Bay.



mean

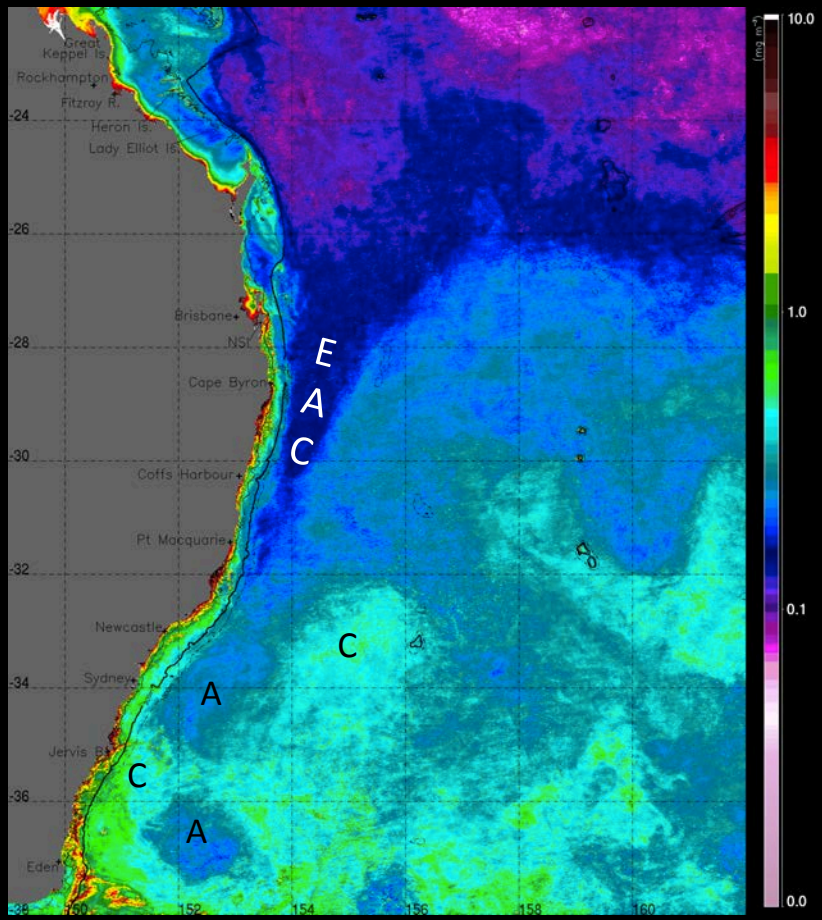


anomaly

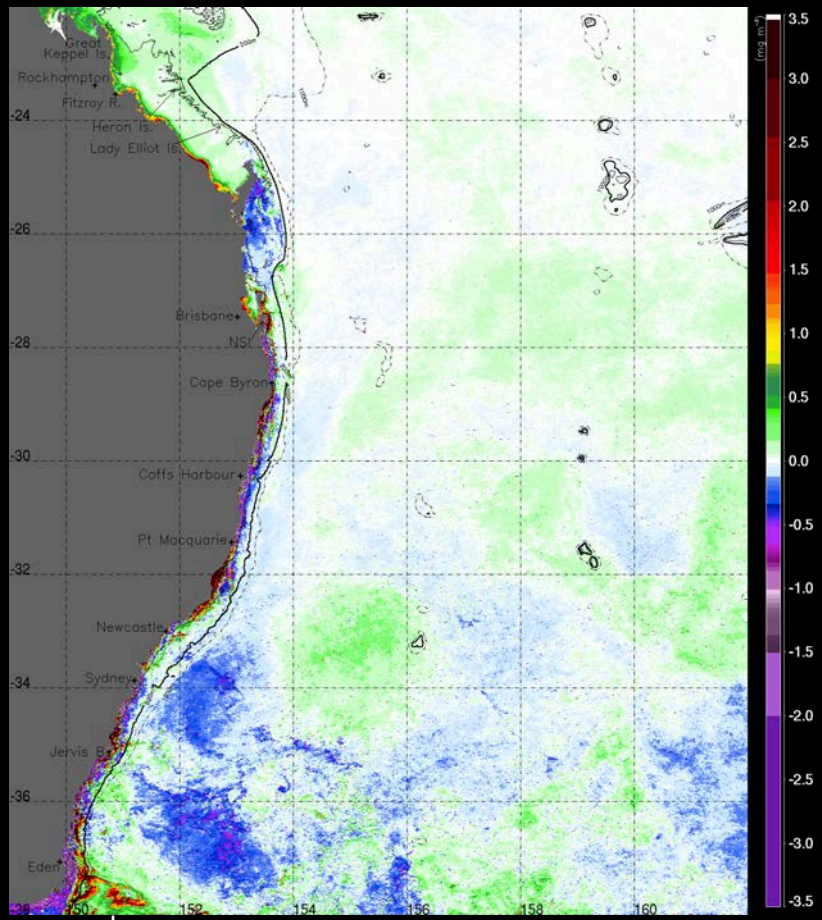
EAC monthly MODIS Chlorophyll-*a*: September 2013

- Seasonal latitudinal gradient in chlorophyll starts to re-appear: low chlorophyll waters characterize Coral Sea waters in the north while high chlorophyll waters of the Tasman Sea dominates south of the region. EAC evidently tracking the shelf poleward as bluish waters.

- Note highly elevated chlorophyll concentration along the frontal boundaries between eddies shed by the EAC. Negative chlorophyll anomalies along 34.25°S and 37°S indicate the centre of the anticyclones



mean

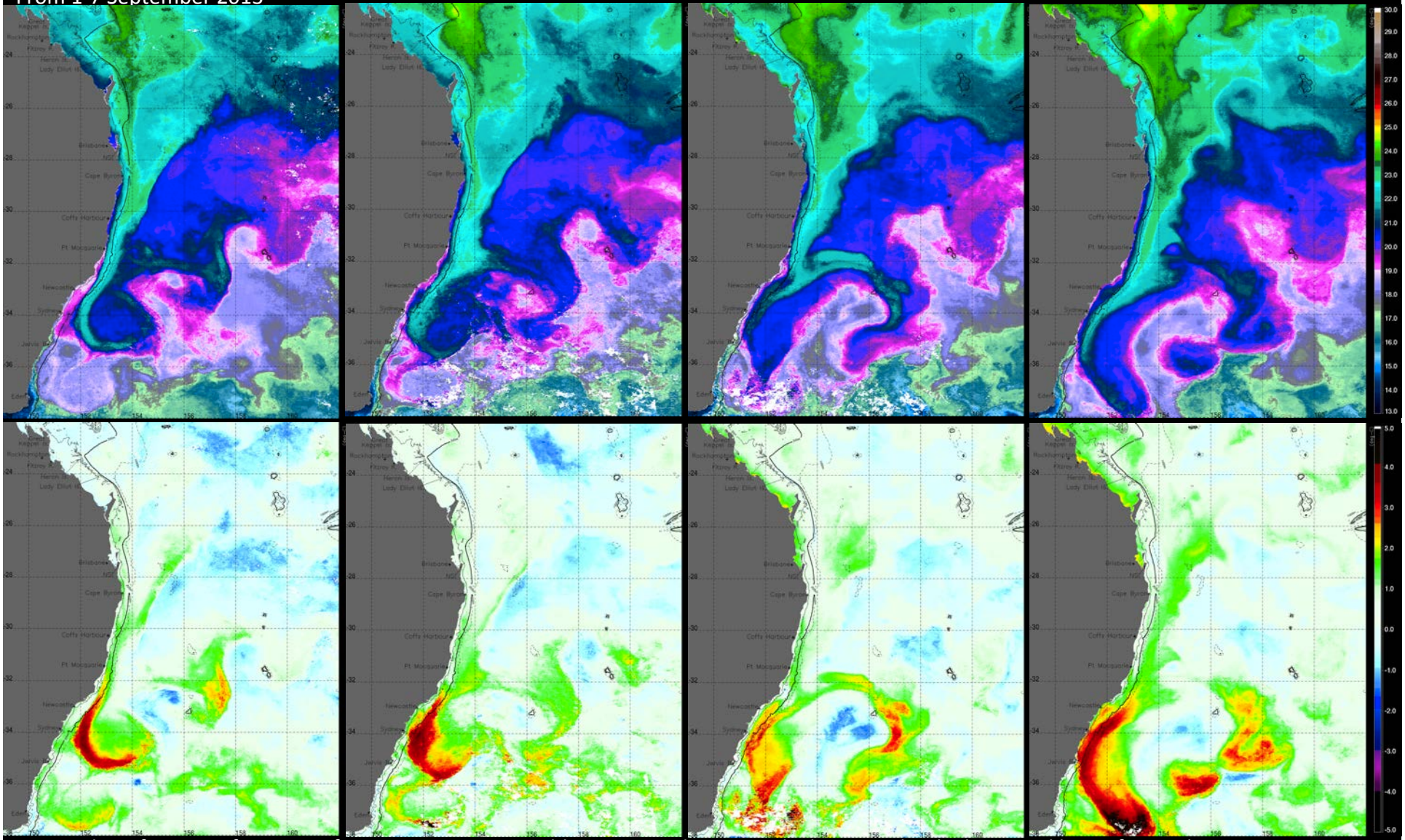


anomaly

A: anticyclonic eddy; C = cyclonic eddy

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

From 1-7 September 2013



- Rough surface manifestation of an active Capricorn Eddy apparent during week1 but completely dissipated henceforward
- Defined EAC structure encroaching on the shelf as it flows poleward, associated with intense positive SST anomalies
- Southern limit of the EAC becomes more strengthened towards week 4 associated with positive SST anomalies exceeding 4°C. These warm waters have also evidently moved closer inshore between 33-35°S during week 4. Strong temperature gradient offshore Eden also apparent as EAC intensified at this latitude

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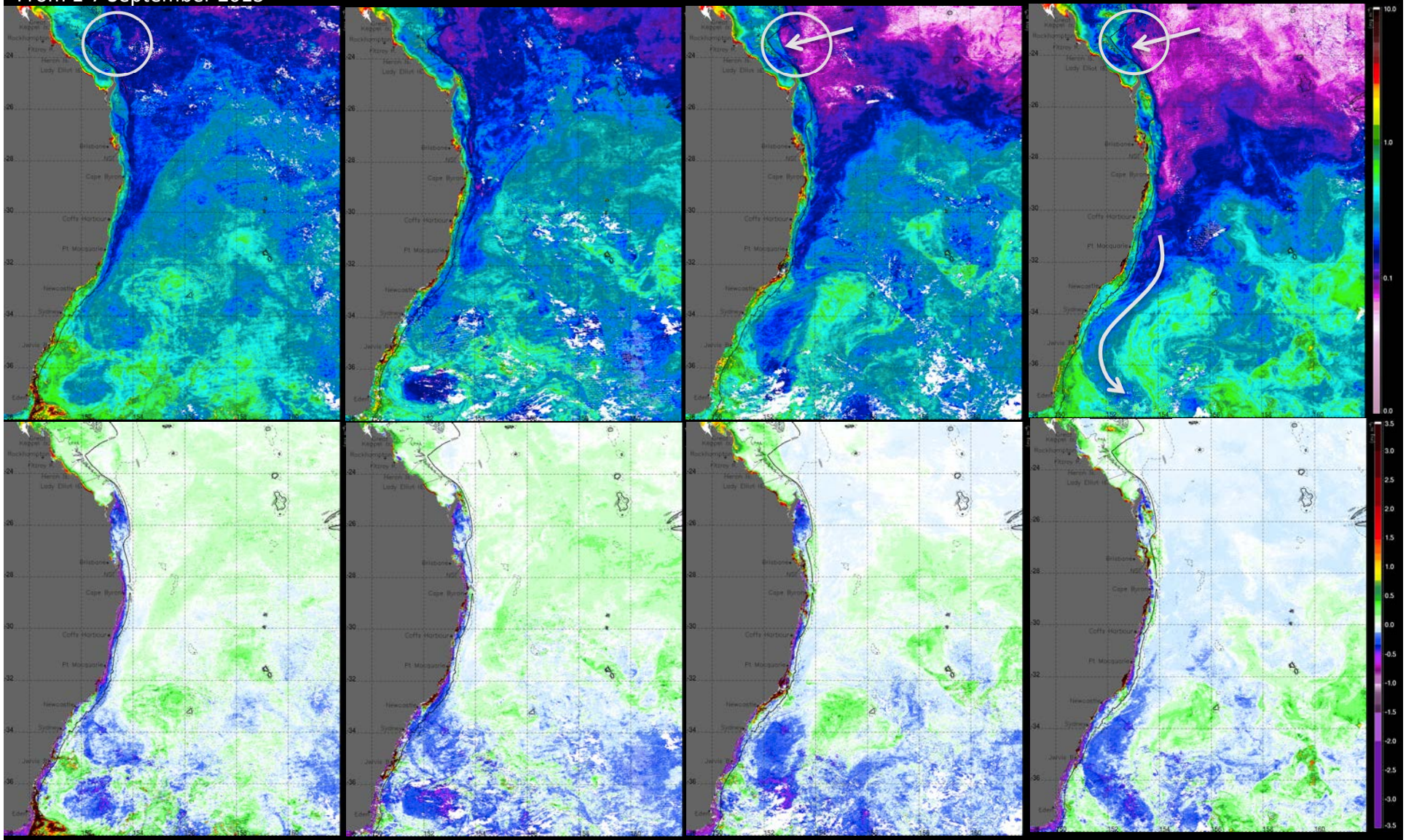
Weekly MODIS CHLOR means (top panel) and anomalies (bottom panel)

From 1-7 September 2013



- Active Capricorn Eddy during the first week but surface signal dissipated from the second week onwards.
- Frontal gradient between offshore and near shelf waters intensifies toward weeks 3&4, resulting to enhance primary production in the area associated with moderate positive chlorophyll anomalies
- Distribution pattern of low chlorophyll waters further highlights the intensification of the southern EAC limb towards week 4

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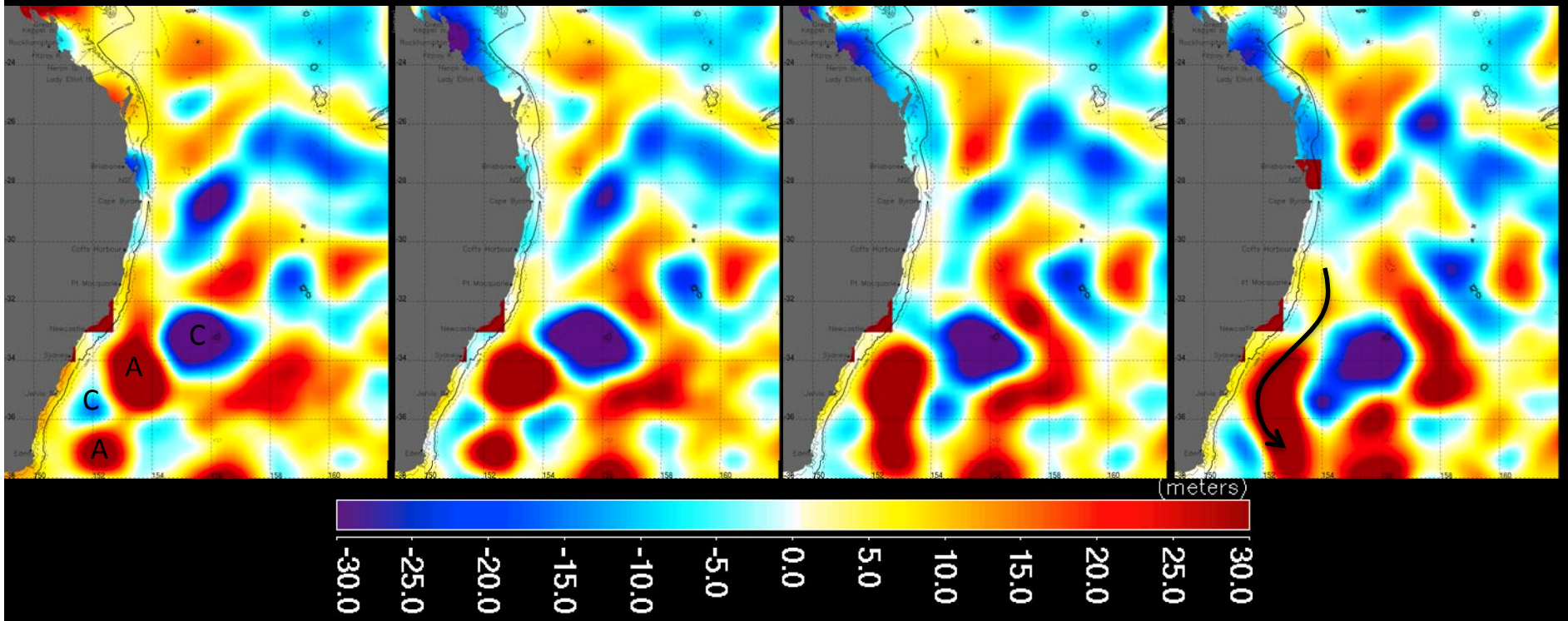
Weekly AVISO Maps of Sea Level Anomalies

From 1-7 September 2013



- Sea level anomalies from AVISO highlighting the topographic structure of the region with the relative locations of 'highs' and 'lows' associated with the anticyclonic and cyclonic eddies shed by the EAC in agreement with the MODIS data

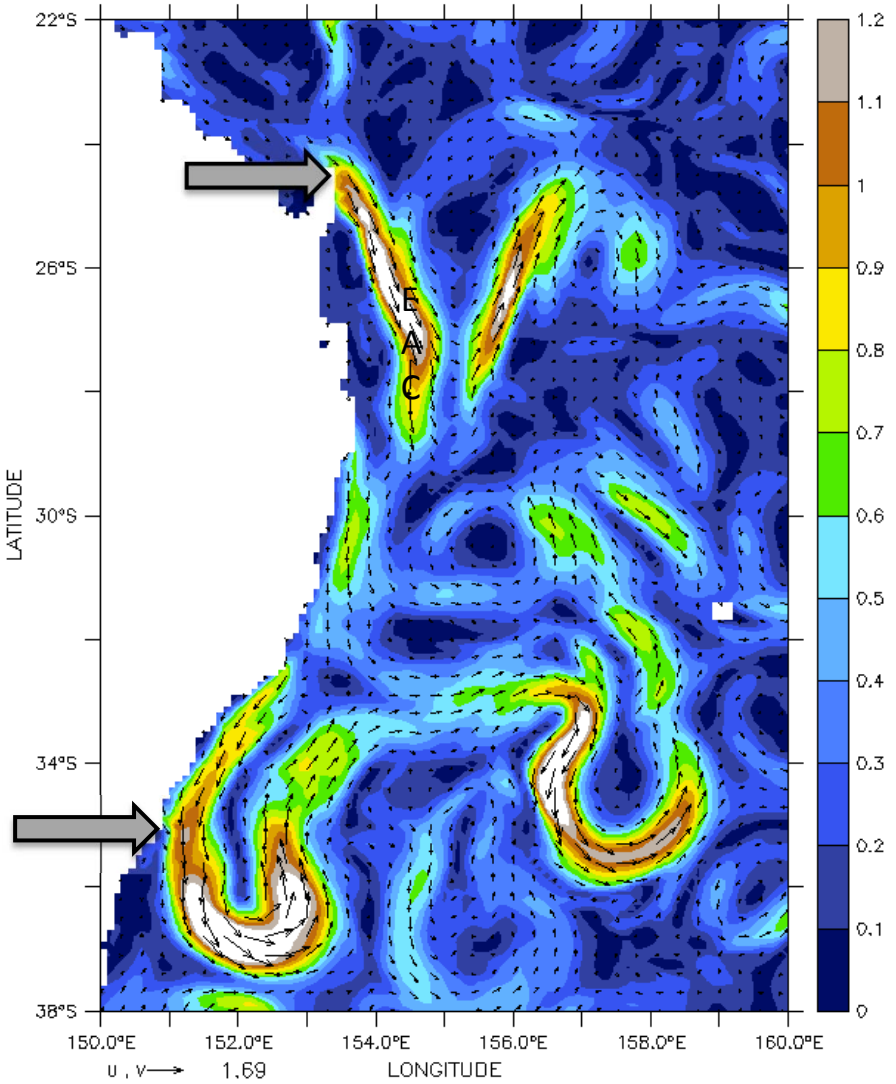
A: anticyclonic eddy; C = cyclonic eddy

OceanMaps 15m Depth Integrated Currents
September 2013

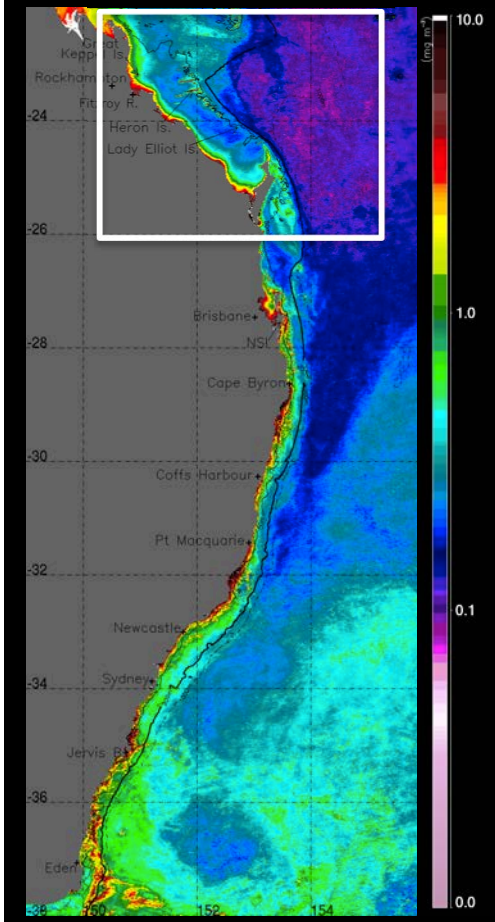
Depth integrated (0-15m) currents from OceanMaps reveal

Top arrow: EAC reattaching to the shelf break along Fraser coast and continue as a very strong poleward current

Bottom arrow: EAC southern limb separating from the coast into the Tasman Sea as even more intensified western boundary current

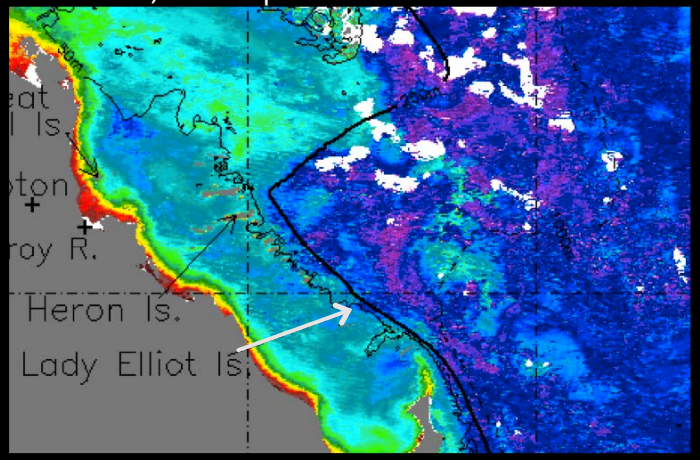


Manta sightings @ Lady Elliot Island in September 2013



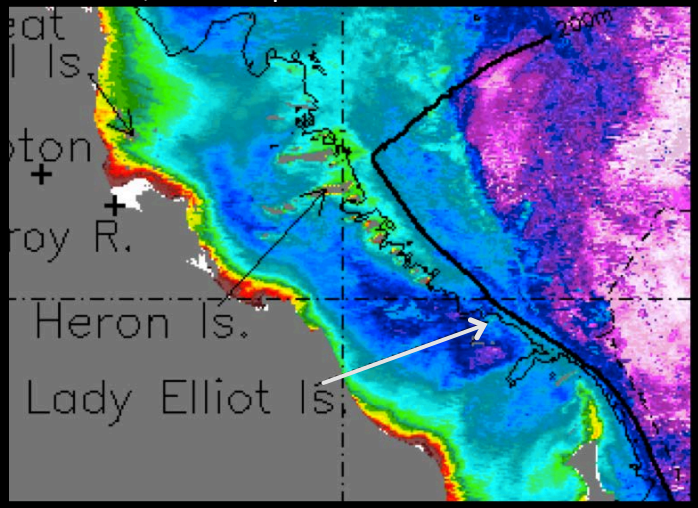
Monthly mean chlorophyll (September 2013)

5D mean, 6-10 September 2013



Highest manta sightings (48) during this period coincident with an active Capricorn Eddy

5D mean, 17-21 September 2013



High manta sightings (37) during this period coincident with high chlorophyll concentration due to a *Trichodesmium* bloom

Day	Number of Manta Sighted	Animal Behaviour
2-Sep	1	cleaning
6-Sep	8	courting/feeding
8-Sep	6	feeding
9-Sep	10	feeding
10-Sep	24	cleaning/feeding/cruising
11-Sep	1	cruising
14-Sep	7	clurting
15-Sep	10	clurting/cleaning
16-Sep	3	cruising
17-Sep	7	cruising/feeding
18-Sep	5	cruising/feeding
19-Sep	8	cleaning/cruising
20-Sep	3	cruising
21-Sep	13	feeding/courting/cleaning/ cruising
22-Sep	1	(pregnant) - cruising
23-Sep	1	cruising/feeding
24-Sep	7	maiting
25-Sep	1	feeding
26-Oct	3	cruising
28-Sep	4	feeding
29-Sep	10	feeding/courting