

Project Manta

East Australian Current (EAC) Region: Oceanographic conditions report

November 2012

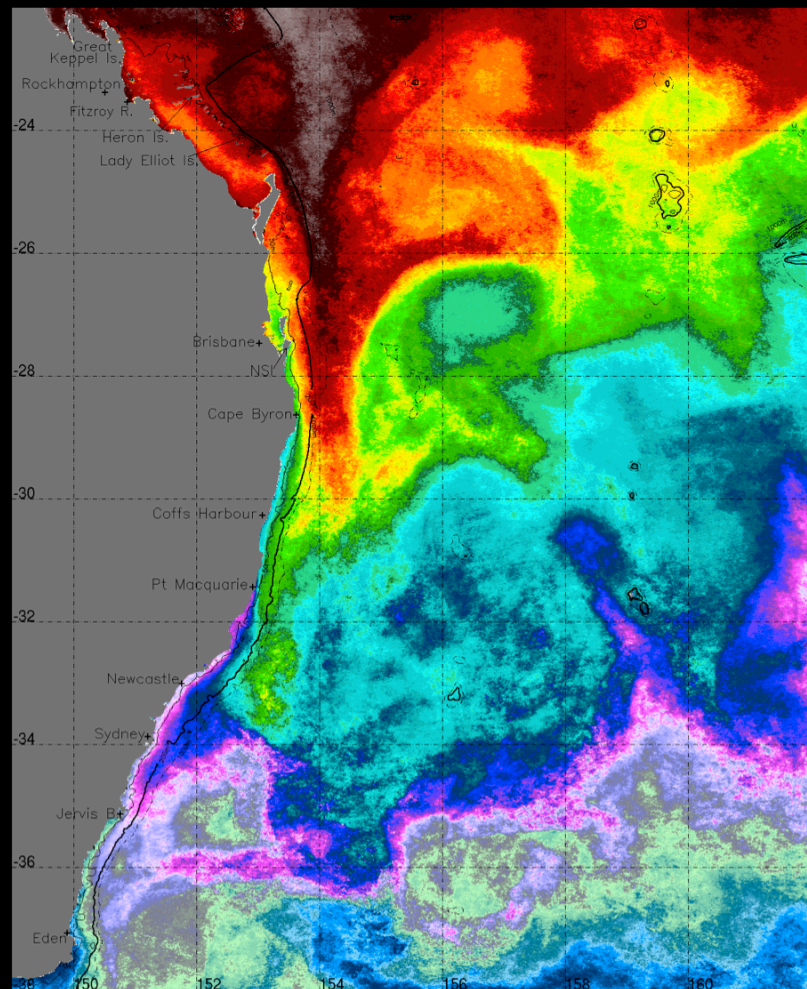
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Supervised by Scarla Weeks

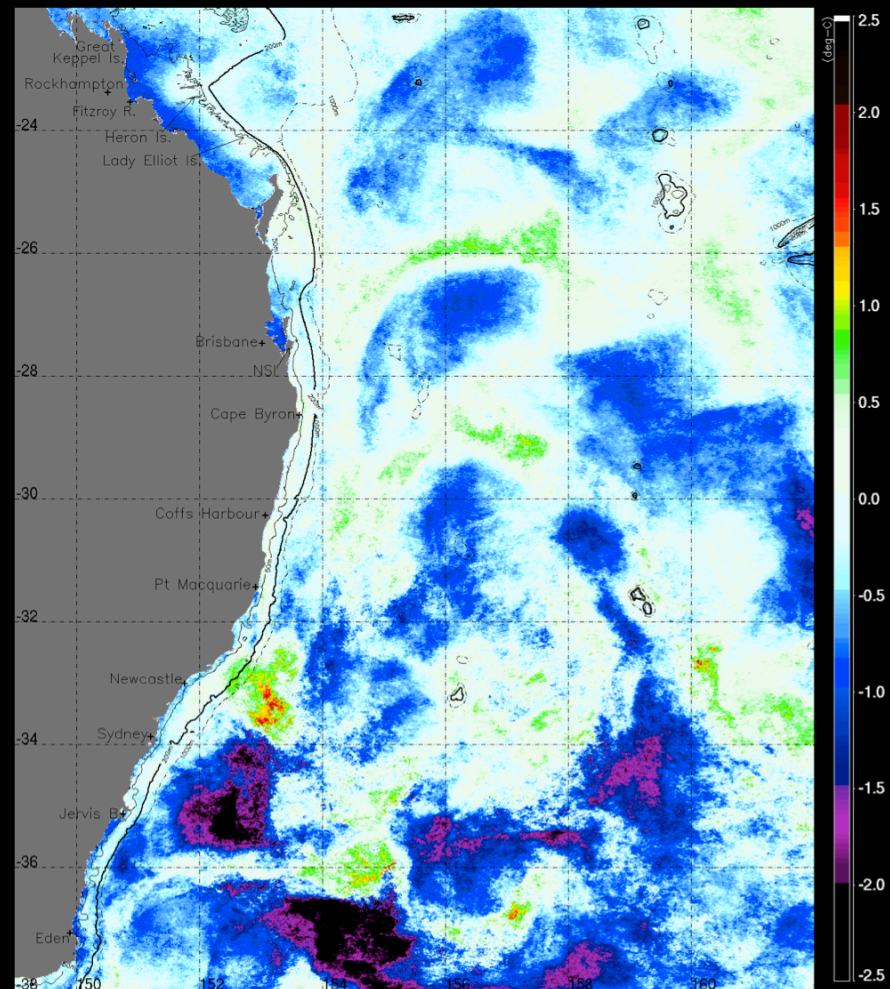
UQ-GPEM Biophysical Oceanography Group

EAC Monthly MODIS SST (D+N): November 2012

- The EAC is apparent as a tongue of warm water along the 200m isobath extending further south (compared to previous month) until ~30°S. South of this latitude, the EAC gradually loses heat as it flows southward and interacts with the temperate waters of the Tasman Sea, hence, lower EAC signature.
- Moderate negative SST anomalies are apparent in the northern portion of the region while intense negative anomalies characterise most of the southern portion.
- November 2012 mean compared to a 10-yr mean shows average/neutral SST conditions along the EAC
- Surface signature of the Capricorn Eddy is also discernable with a corresponding slight negative SST anomalies within its centre



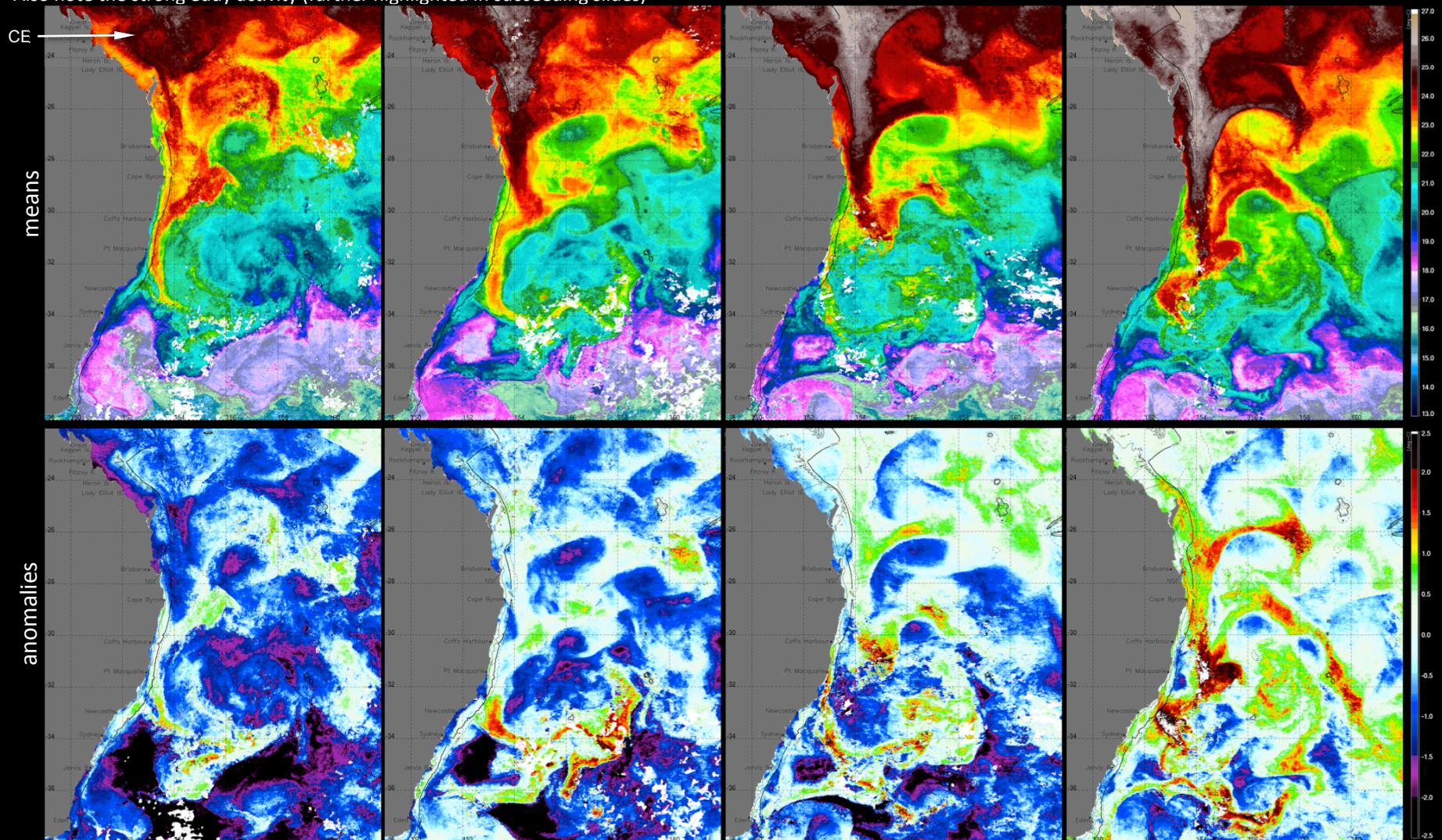
mean



anomaly

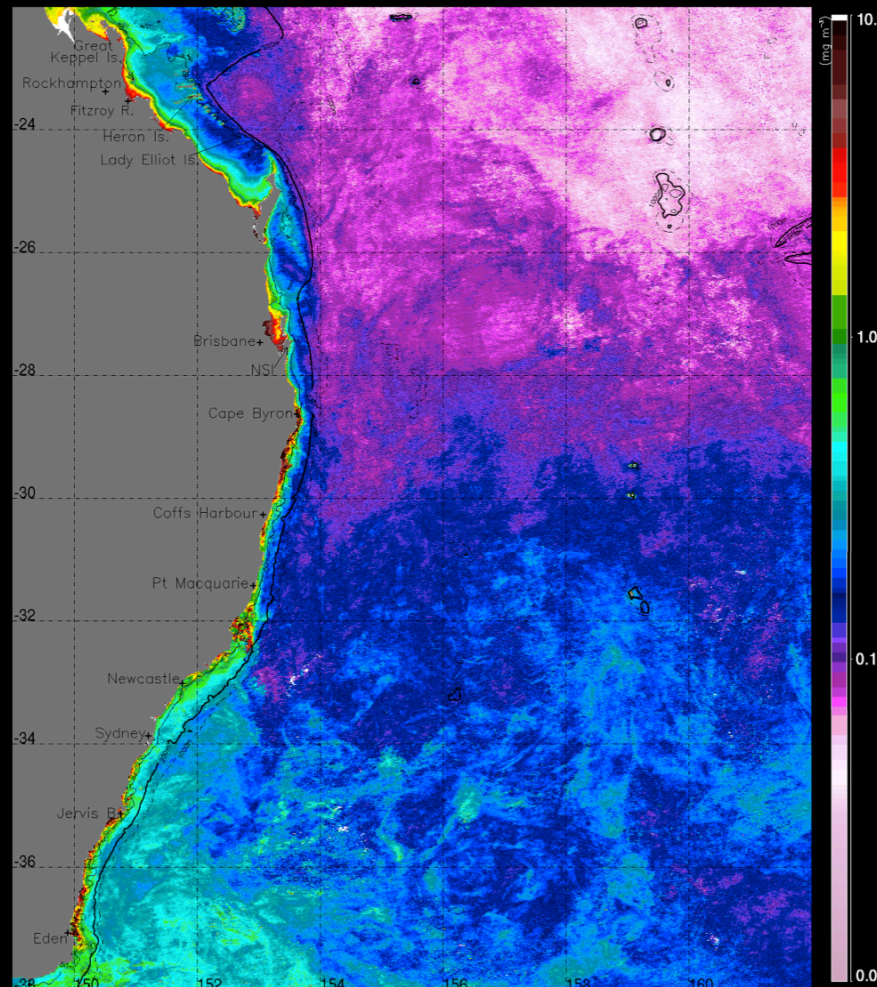
EAC weekly dynamics: starting from 1-7 November 2012

- Weekly images highlight the strength and variability of the EAC. Surface signature of the Capricorn Eddy (CE) is discernable in the SST mean particularly during the 1st two weeks
- Intense negative SST anomalies almost throughout the area except where EAC flowed strongly, resulting to neutral/slightly positive conditions during the 1st week. Negative SST anomalies gradually dissipated and replaced by positive SST anomalies towards the end of the month. Note the strong positive SST anomalies during the last week corresponding to the intensified EAC
- Also note the strong eddy activity (further highlighted in succeeding slides)



Colour scale ranges: Means (13 to 27 °C), Anomalies (-2.5 to 2.5 °C)

EAC Monthly MODIS Chlorophyll: November 2012



Low-chlorophyll offshore waters due to warm oligotrophic EAC and typical of subtropical warmer waters

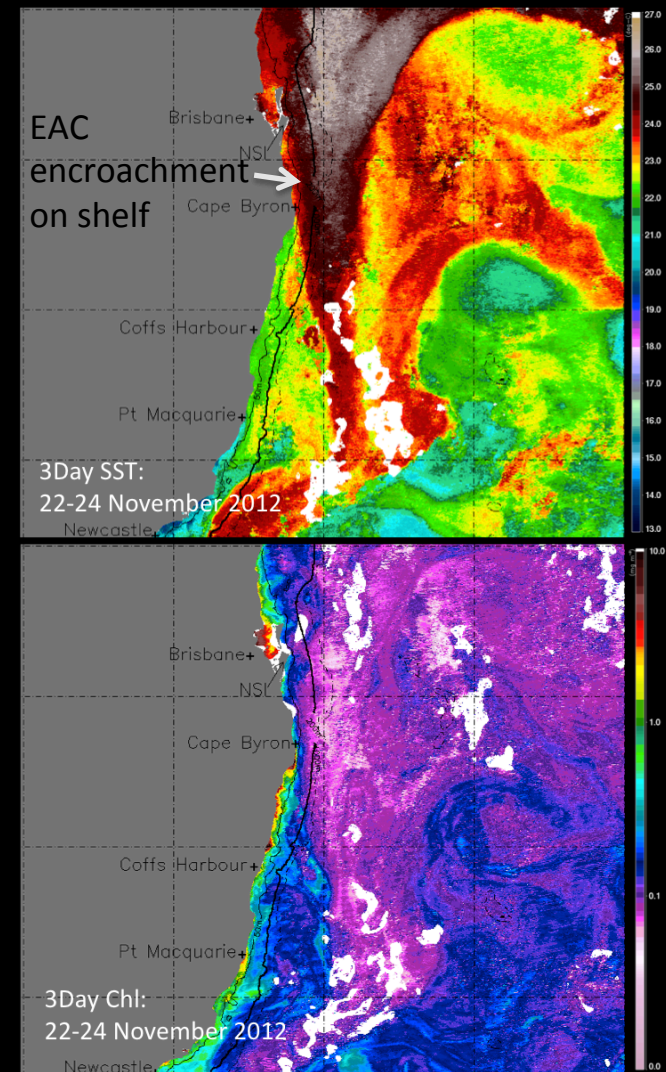
Higher chlorophyll offshore waters resulting from mixing interactions between 'retroflected' EAC and Tasman Sea waters. Higher chlorophyll concentrations are typical of temperate waters.

Manta sightings report

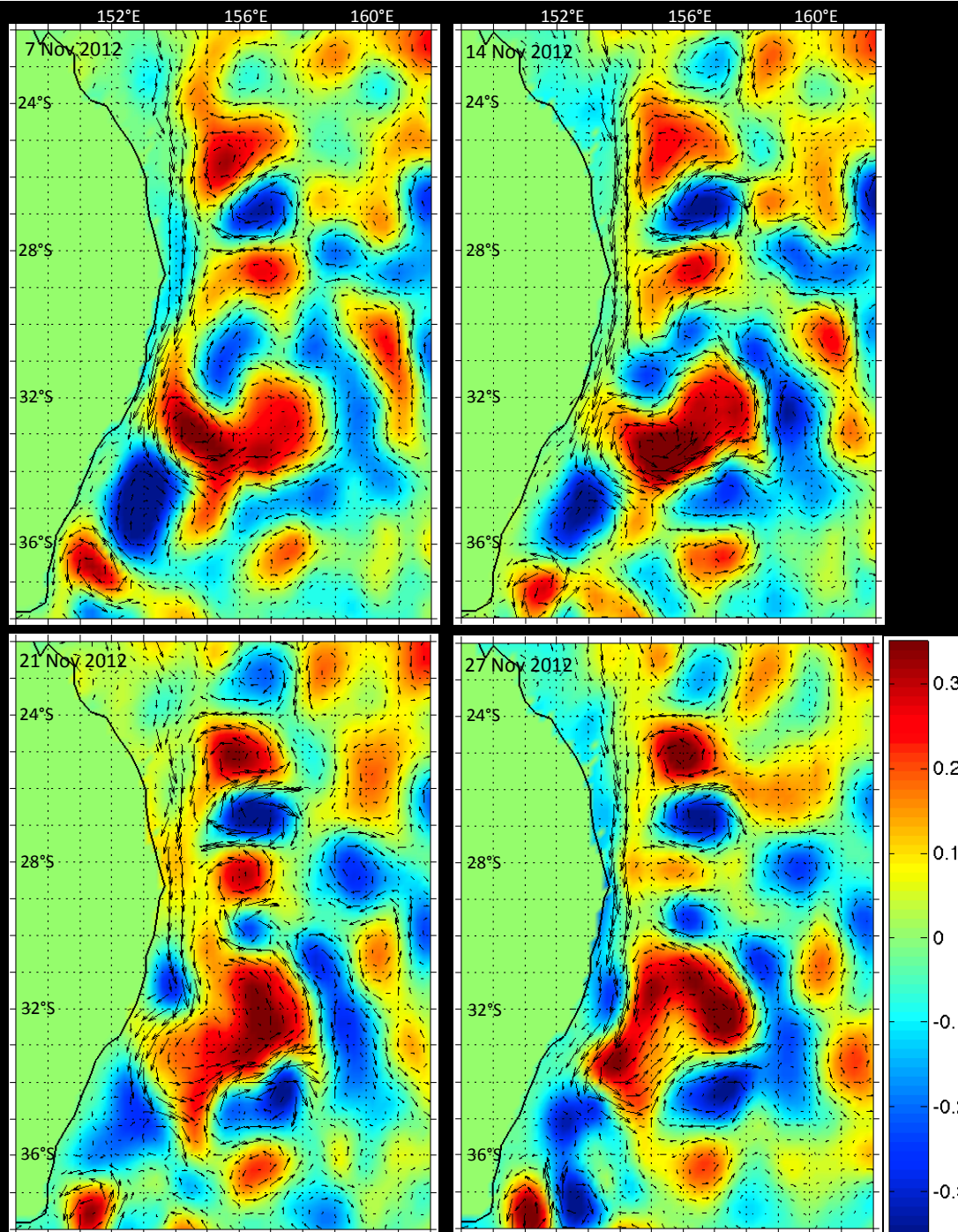
23 November 2012:

Five Mantas sighted at Byron Bay**

- 3Day SST mean shows the EAC encroaching onto the shelf resulting to sharp SST front between the relatively cooler shelf waters and warm EAC slope waters
- Corresponding 3Day chlorophyll image shows high chlorophyll concentration along Cape Byron coinciding with the location of the front



** Source: Lydie Couturier, Project Manta



IMOS Gridded Sea Level Anomalies and Geostrophic currents

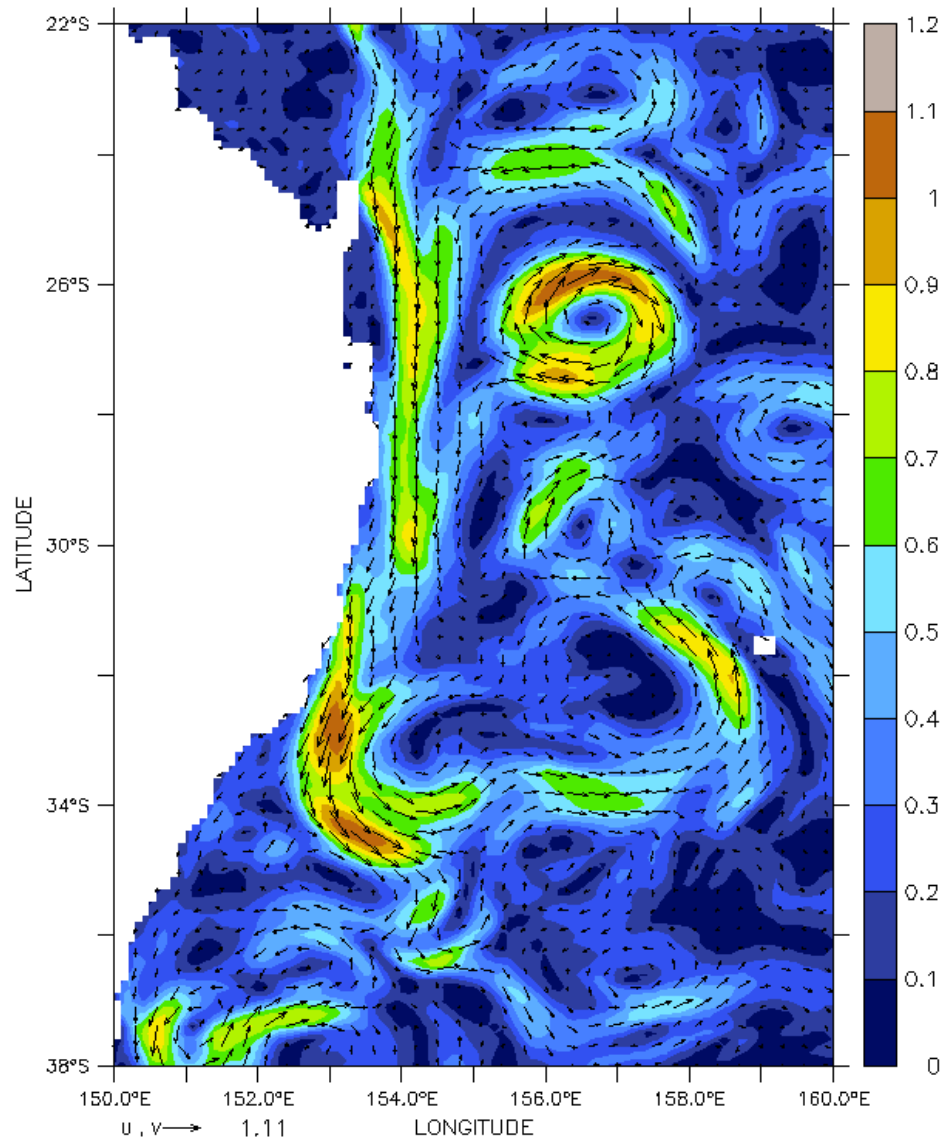
- Sea level anomalies highlighting the high eddy-activity in the region corresponding well with the MODIS images

- Strong EAC flowing southward very close to the coast (black arrows)

Image legends:

- Red (positive anomalies) = anticyclonic eddies (warm core)
- Blue (negative anomalies) = cyclonic eddies (cold core, upwelling of nutrient laden waters from deeper depths)

OceanMaps : November 2012 mean



http://godae.bom.gov.au/oceanmaps_analysis/ocean_diag_brt/ocean_diag.shtml

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

- An intensified EAC continuing southward until $\sim 31^\circ\text{S}$ with an almost consistent strength
- An intensified EAC southern limb separating eastward from NSW coast at $\sim 33^\circ\text{S}$ to become part of the Tasman Front
- Similar to previous month, very high eddy activity in the region corresponding to the dynamics shown in the preceding MODIS SST and Chlorophyll images