

Project Manta

East Australian Current (EAC) Region: Oceanographic conditions report

August 2012

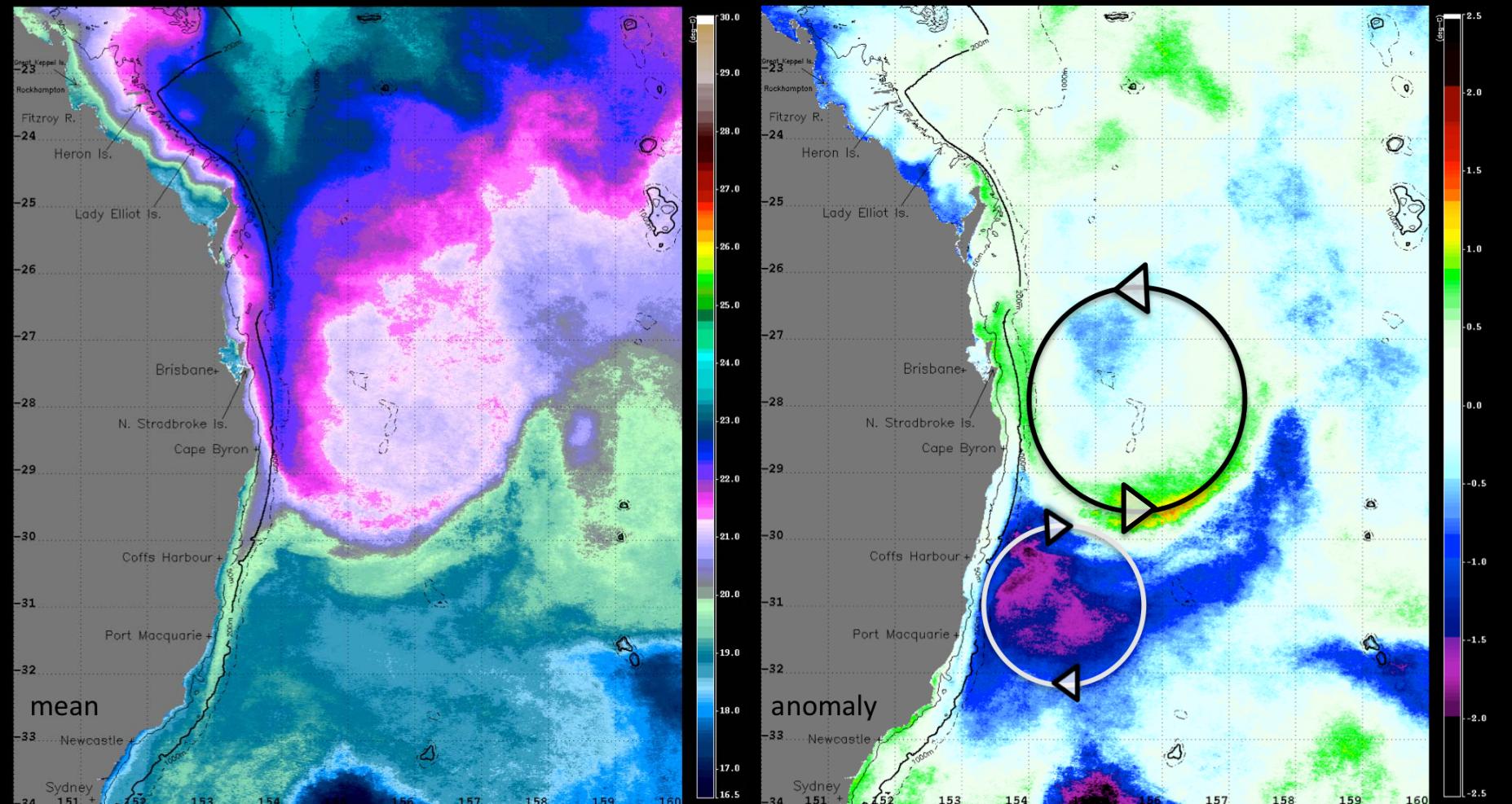
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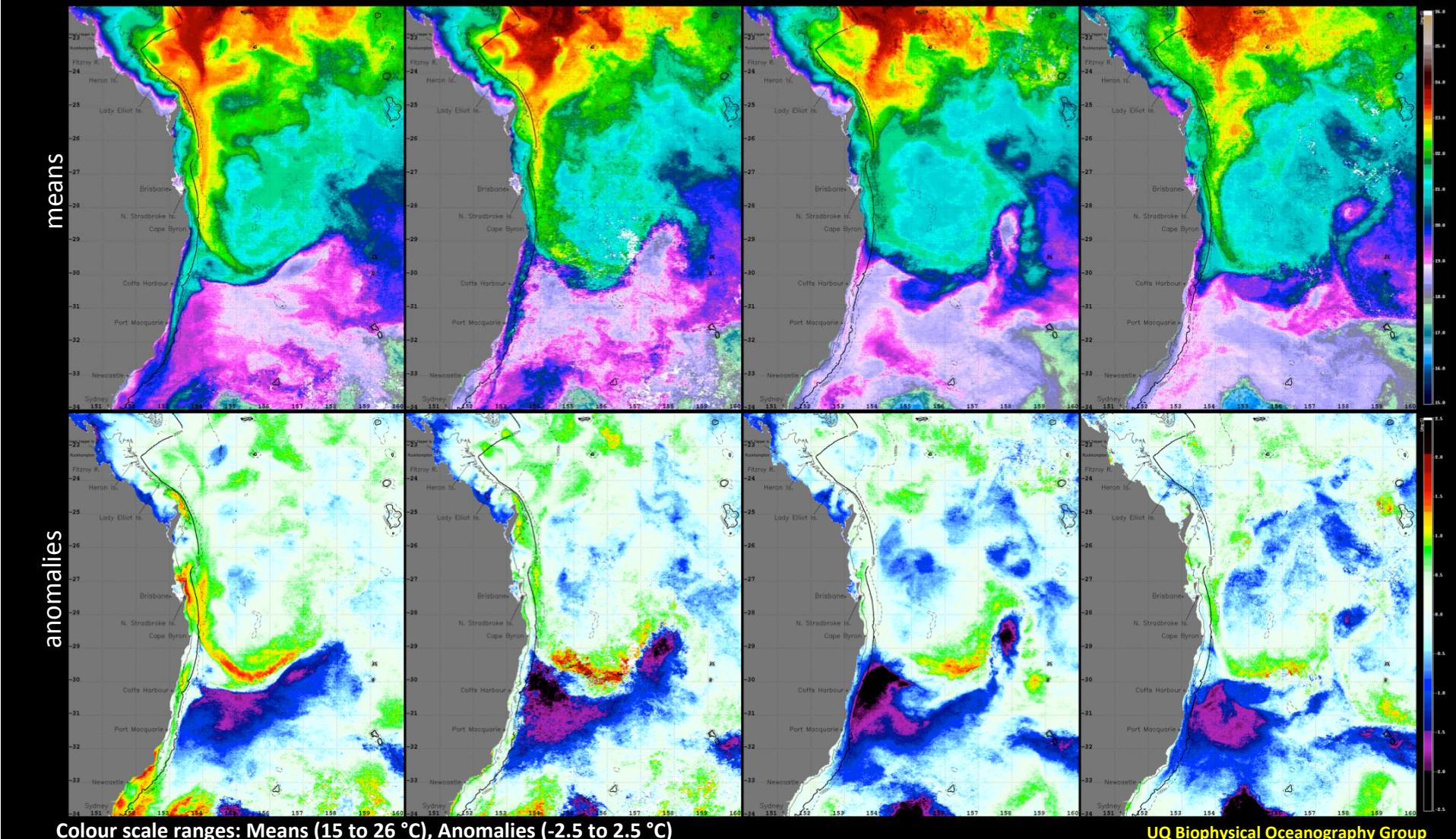
EAC Monthly MODIS SST (D+N): August 2012

- Intense negative anomalies along the continental shelf edge centered between Coffs Harbour and Port Macquarie corresponding to a strong cyclonic (cold core) eddy -see white circle and arrows
- “Normal” southward progression of the EAC disrupted by this cold-core eddy blocking and forcing the main current to flow eastward, separating from the shelf edge at $\sim 29^{\circ}\text{S}$, forming a huge anticyclonic eddy off Cape Byron (black circle and arrow)

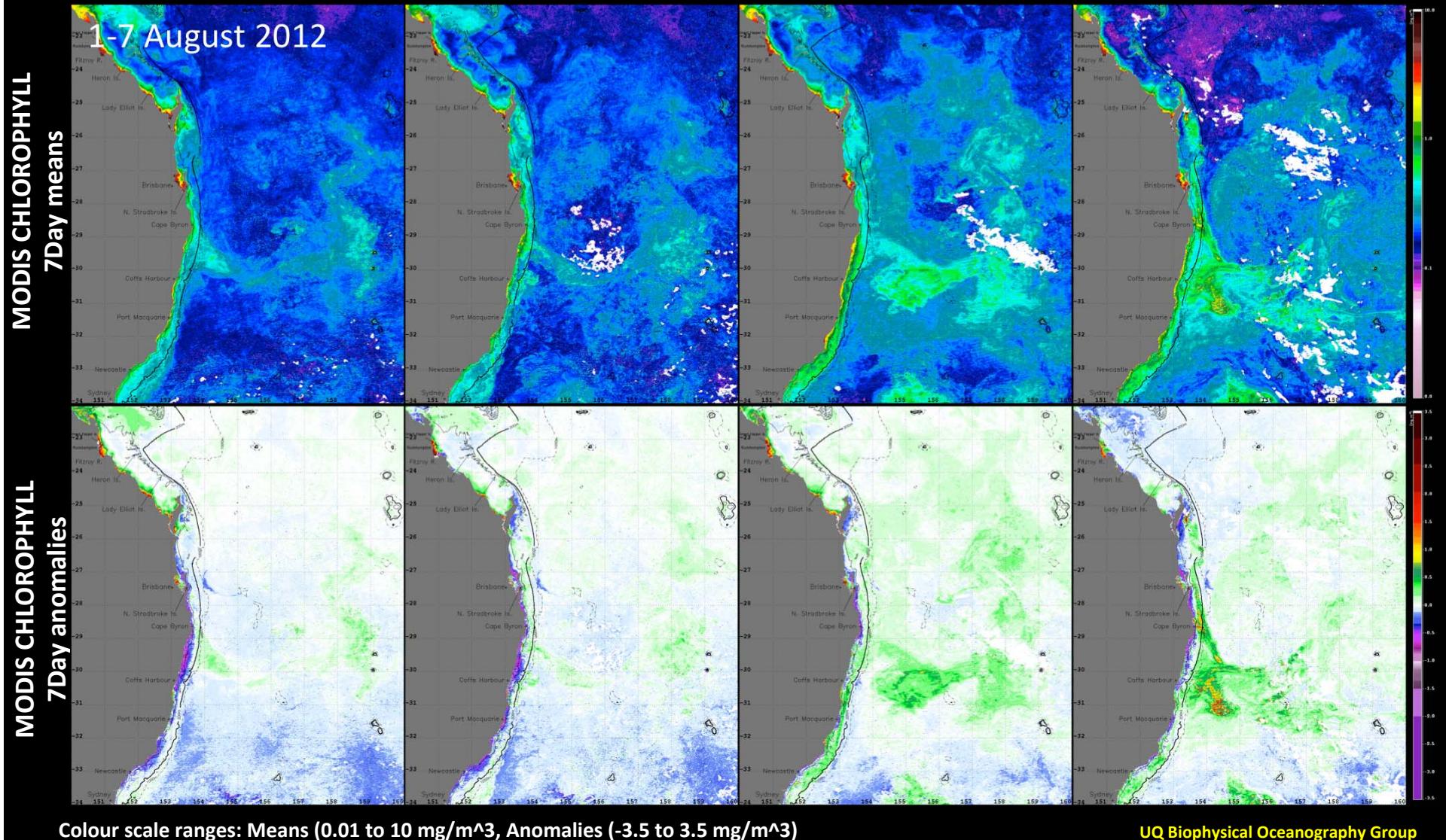


EAC weekly dynamics: starting from 1-7 August 2012

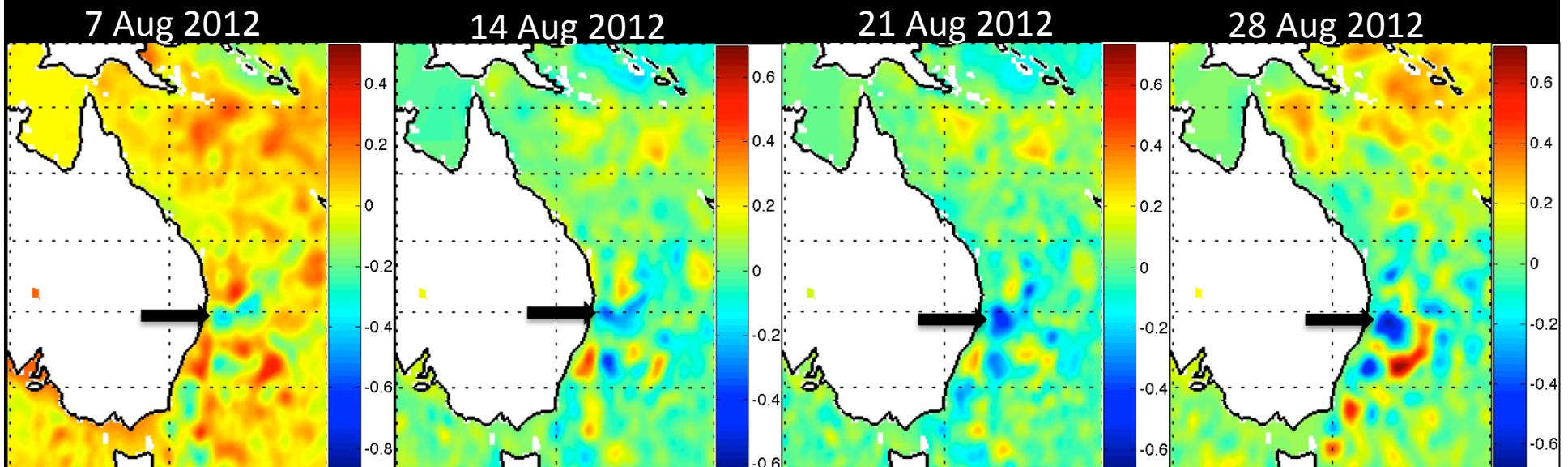
- Strong positive anomalies along the shelf from 26.5°S corresponding to the EAC southern limb, weakening gradually towards the end of the month, & similarly offshore, related to offshore entrainment around anticyclonic eddy.
- Intense negative anomalies corresponding to the cold-core eddy progressively encroaching onto the shelf. Note (i) that the southern limb of the EAC is entirely impeded from the second week onwards, as the cold-core eddy intensified & encroached onto the shelf, and (ii) the strong frontal boundary between the eddy dipole pair.



- Elevated chlorophyll concentration along the length of the shelf, especially during the last two weeks
- High chlorophyll concentration entrained offshore coincident with the sharp frontal boundaries between the two eddies, peaking during the fourth week
- Reported aggregation of devil rays (*Mobula japonica*) off Sydney with hundreds of animals during 3rd & 4th weeks - on 18th and 26th August (source: *Lydie Couturier*) - coincident with elevated biomass on the shelf in that area

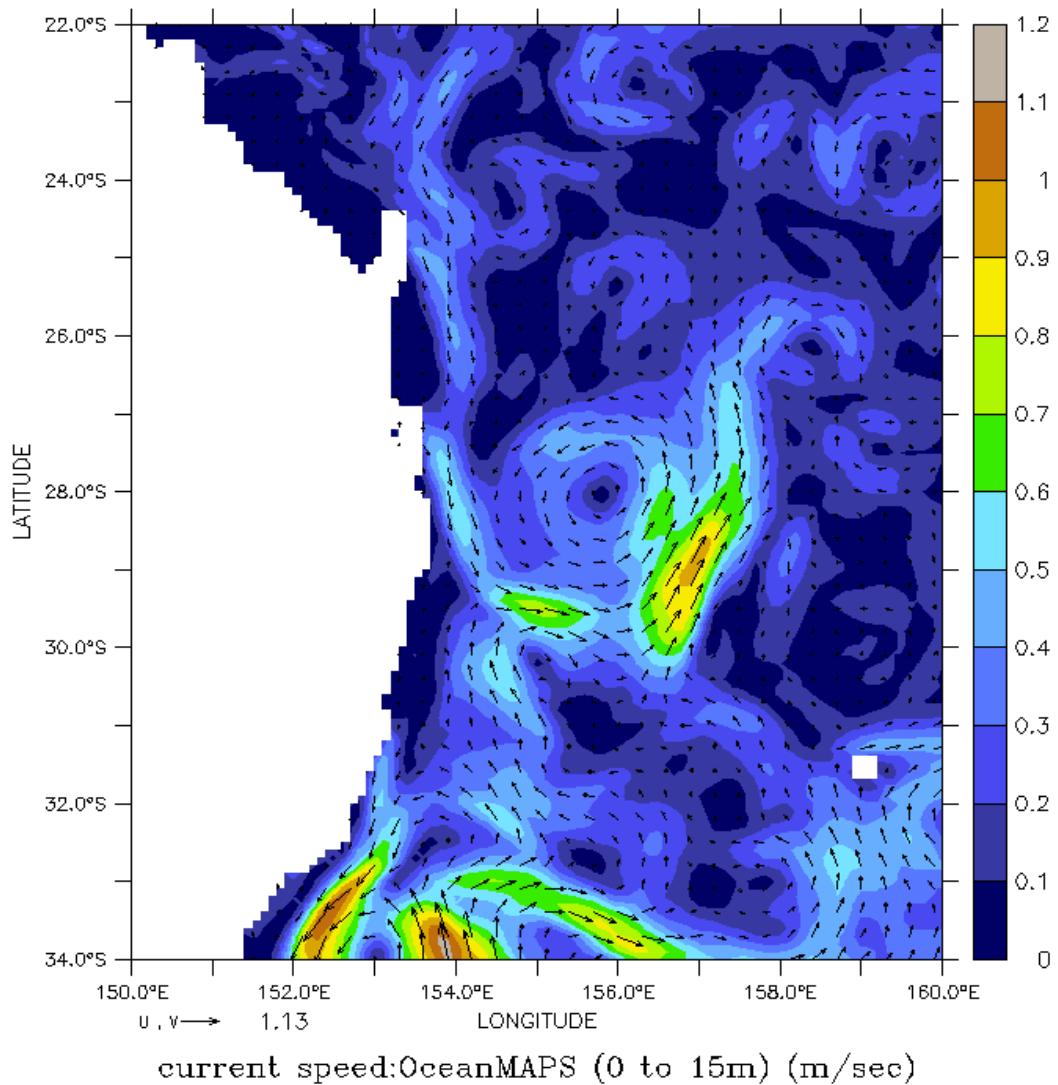


IMOS Sea Level Anomalies



Sea level anomalies highlighting the cyclonic (cold-core) eddy that impeded the southward flow of the EAC (Note: SLA scale not consistent)

OceanMaps : August 2012 mean



Depth integrated (0-15m) currents from OceanMaps reveal the huge anticyclonic eddy east of Cape Byron formed as the EAC southern limb turned eastward rather than continuing southward, entirely impeded by the cyclonic eddy (see MODIS SST images) centered at $\sim 31^{\circ}\text{S}$, 155°E