

Project Manta

East Australian Current (EAC) Region: Oceanographic conditions report

May 2013

Marites M. Magno-Canto
Ana Redondo-Rodriguez

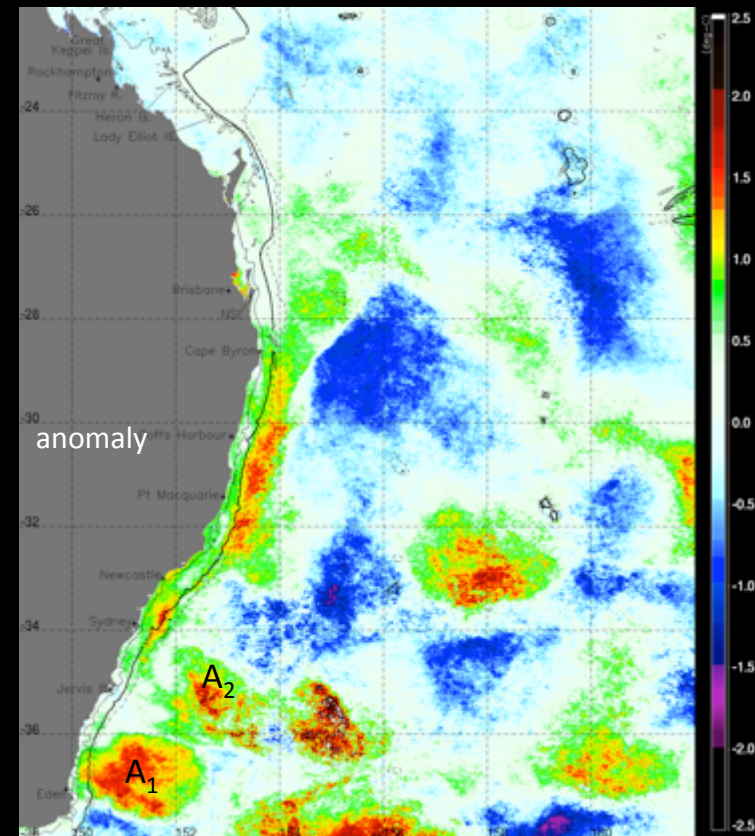
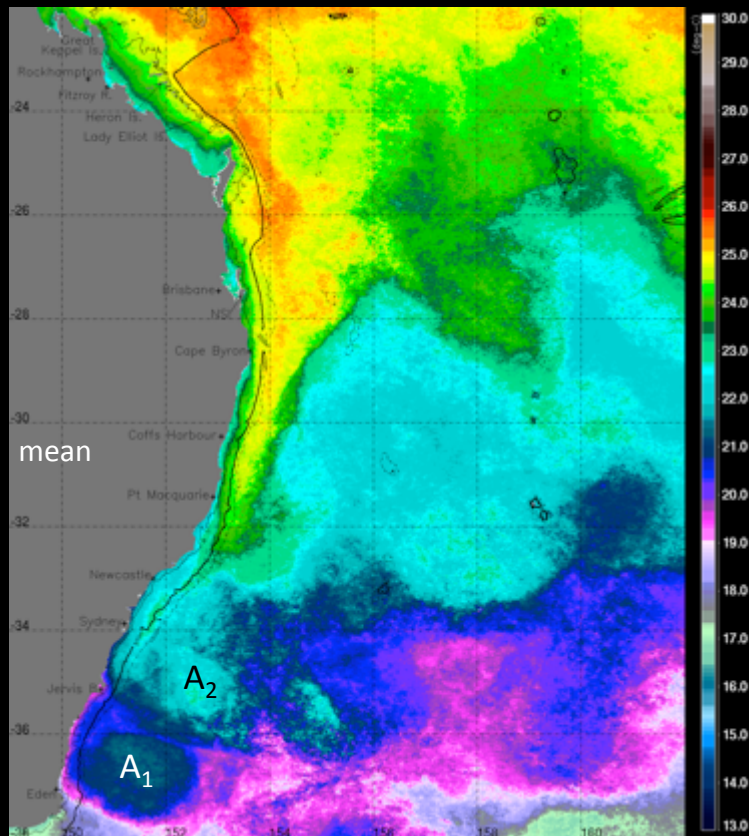
Supervised by Scarla Weeks

UQ-GPEM Biophysical Oceanography Group

Overview: May 2013

- Monthly and weekly MODIS SST means and anomalies highlight the shedding and merging of anticyclonic eddies from the primary EAC flow
- Monthly and weekly chlorophyll means and anomalies show patterns related to the dynamics and behaviour of the EAC and associated eddy activities
- Weekly maps of sea level anomalies from AVISO show the ocean topography related to the EAC and strong eddy activity in the region
- Monthly mean surface oceanic currents (OceanMAPS) show maximum current (1.25 m/s) coincident with the intense positive SST anomalies
- Summary of Manta sightings at LEI for May 2013

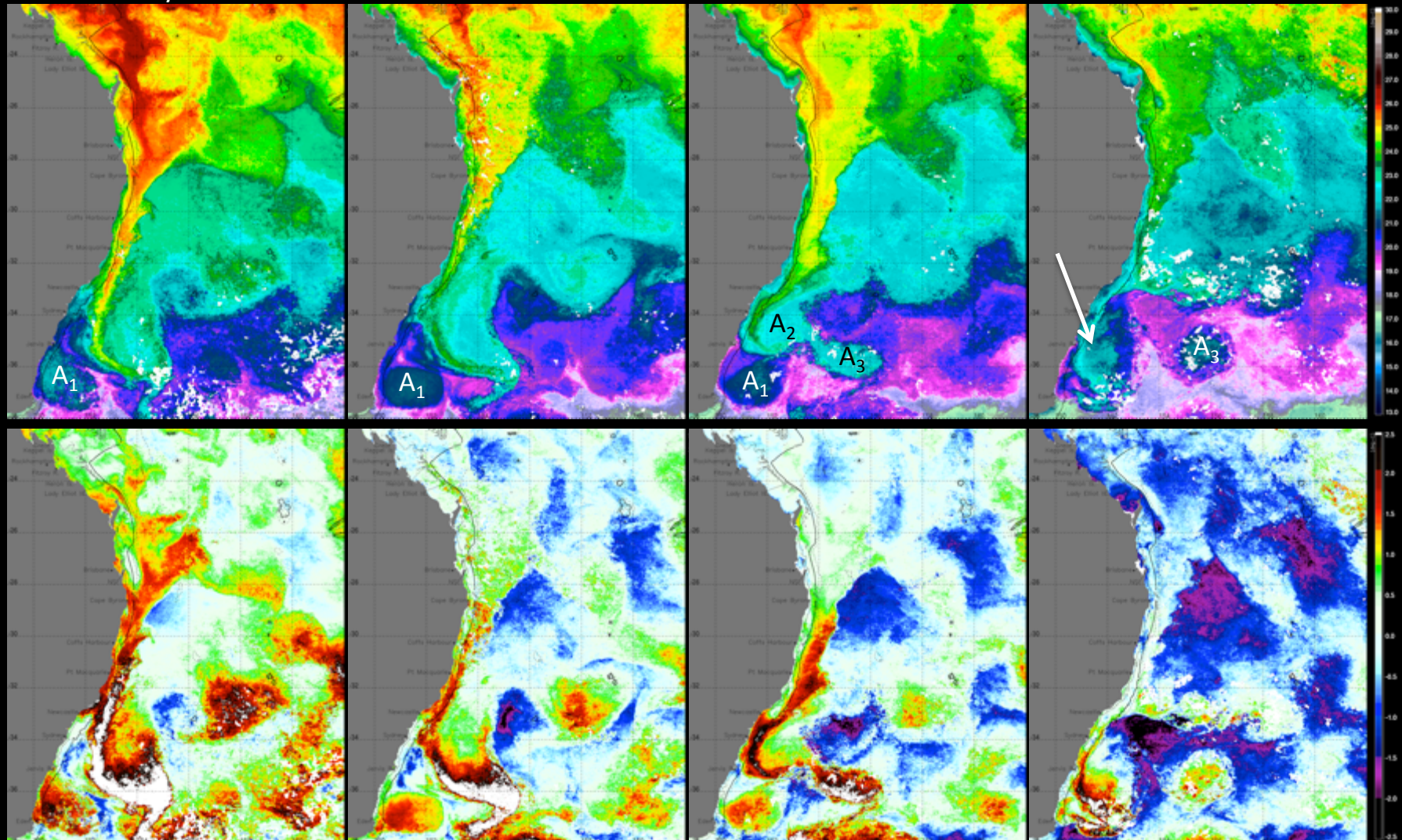
EAC monthly MODIS SST (D+N): May 2013



- Seasonal cooling of EAC with maximum SST $\sim 1.5^{\circ}\text{C}$ lower compared to April
- Moderate to strong positive SST anomalies associated with the core EAC and several anticyclonic eddies shed at the southern limit of the current
- Anticyclonic eddy (A₁) still persists in the same location as the previous month.
- Note another anticyclonic eddy (A₂) pinching off from the main EAC flow

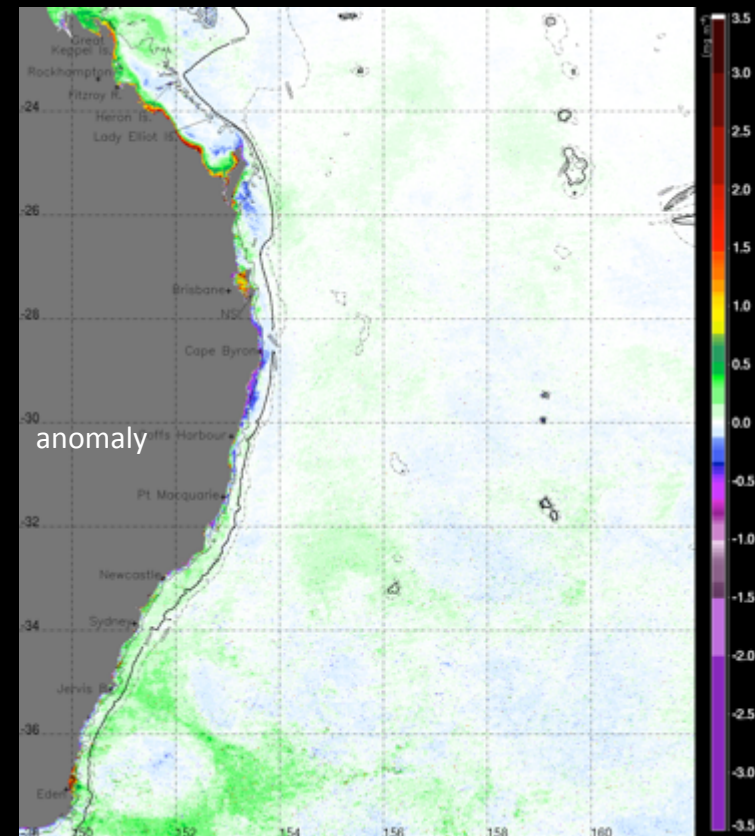
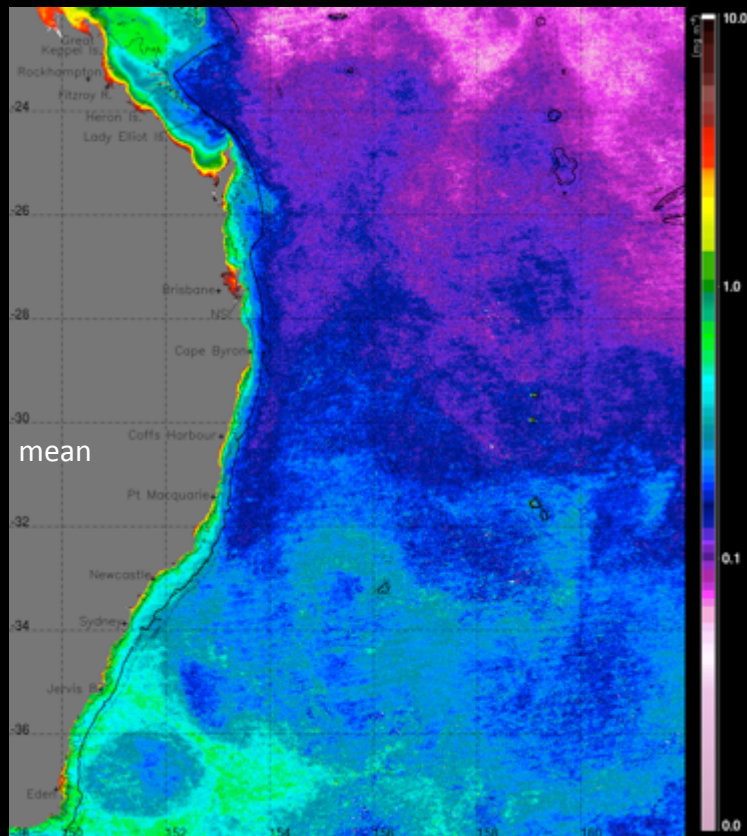
Weekly MODIS SST means (top panel) and anomalies (bottom panel)

From 1-7 May 2013



- Weekly means showing the EAC forming two more anticyclonic eddies (A_2 and A_3) in the south
 - associated with intense positive SST ($+4^\circ\text{C}$) anomalies
- Week four: merging of anticyclonic eddies A_1 and A_2 south of 34°S and complete separation of Eddy A_3 as it moves eastward to the Tasman Sea

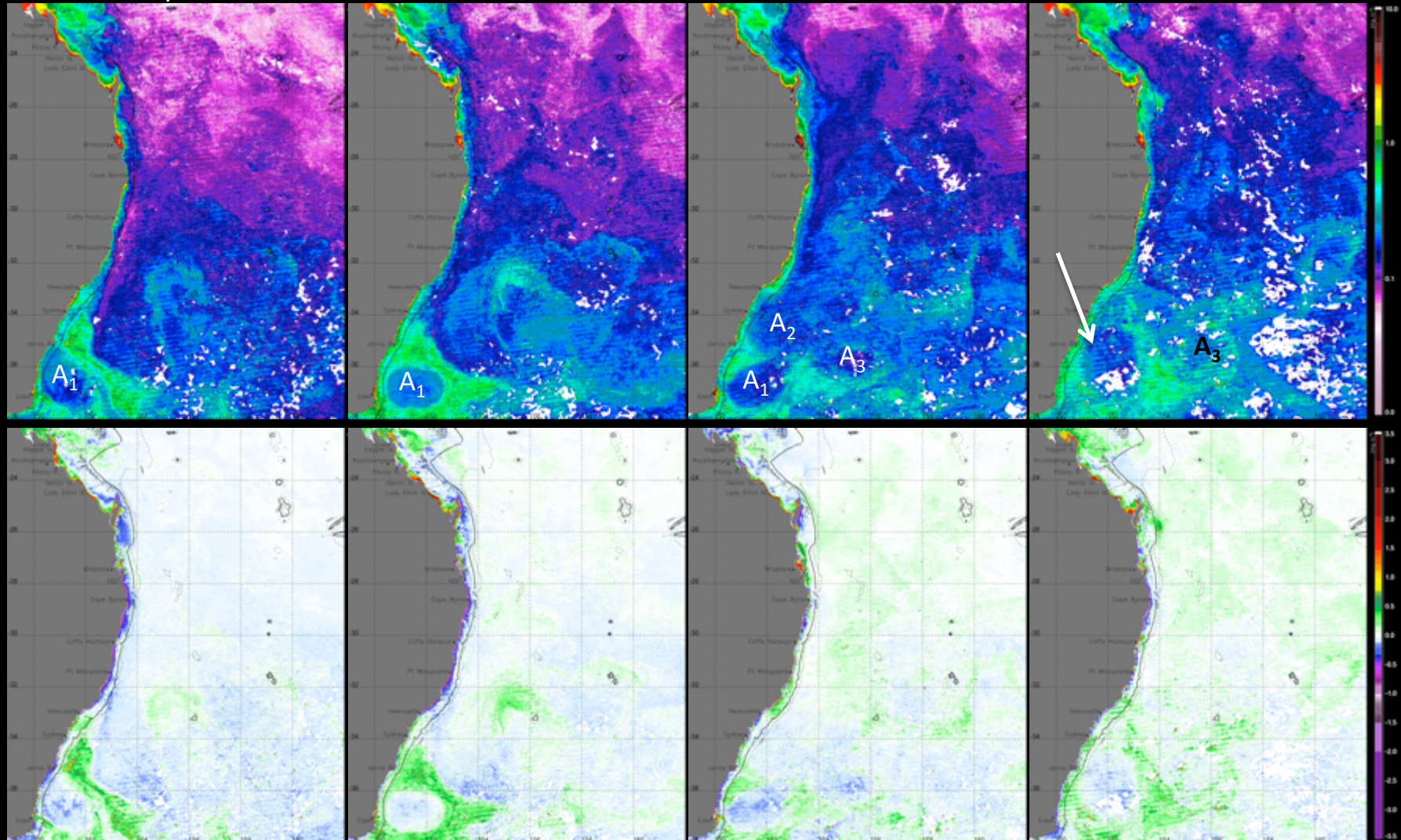
EAC Monthly MODIS Chlorophyll: May 2013



- Overall seasonal increase in chlorophyll concentration in the region south of 31°S
- Enhanced chlorophyll concentration most pronounced around the anticyclonic eddy off Eden and extending offshore to ~155°E

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

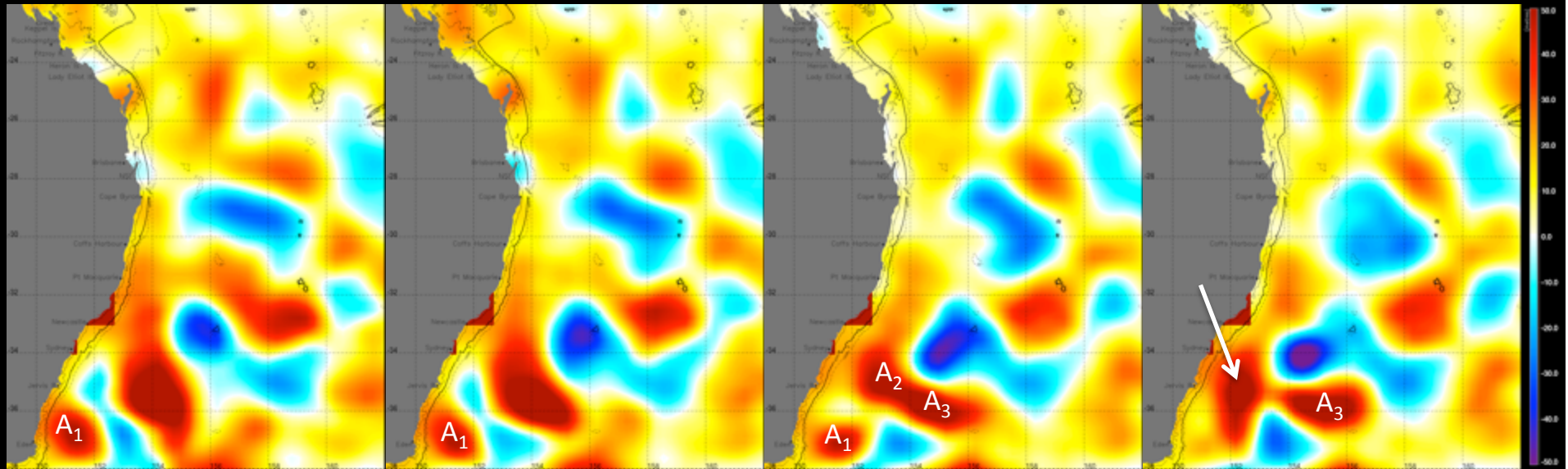
From 1-7 May 2013



- Weekly means showing associated changes in chlorophyll concentration where the EAC formed two more anticyclonic eddies as shown in the SST images
- Positive chlorophyll anomalies most intense during the second week, strongly concentrated around Eddy A_1 in the south

Weekly AVISO Maps of Sea Level Anomalies

From 1-7 May 2013



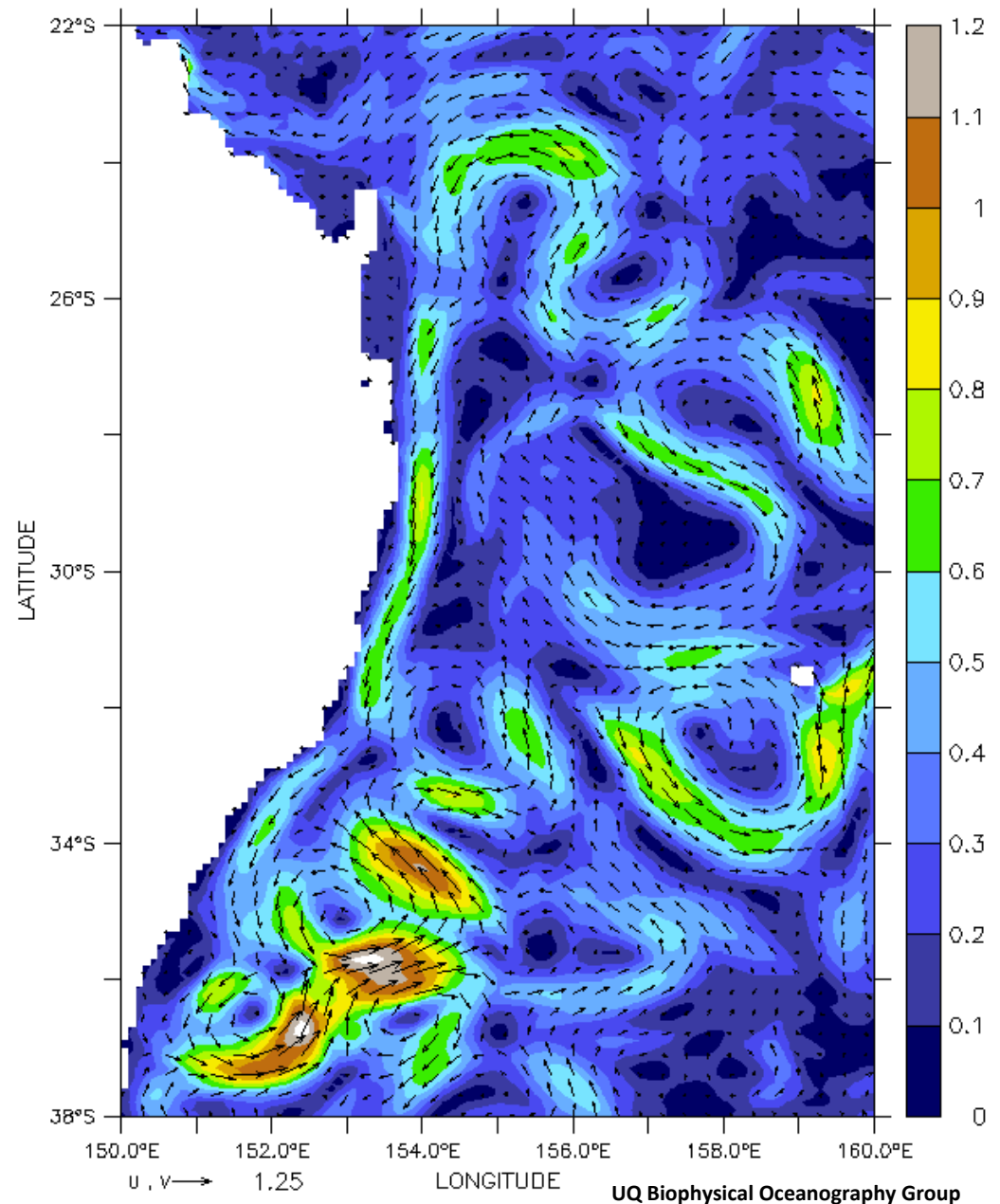
- Weekly sea surface height anomalies showing the:
 - persistent anticyclonic eddy A_1 off Eden
 - EAC meander forming the two further anticyclonic eddies, A_2 and A_3
 - Merging of anticyclonic eddies A_1 and A_2 in Week 4
 - Separation and movement of anticyclonic eddy A_3 eastward into the Tasman Sea

Note: yellow to red = positive sea level anomalies

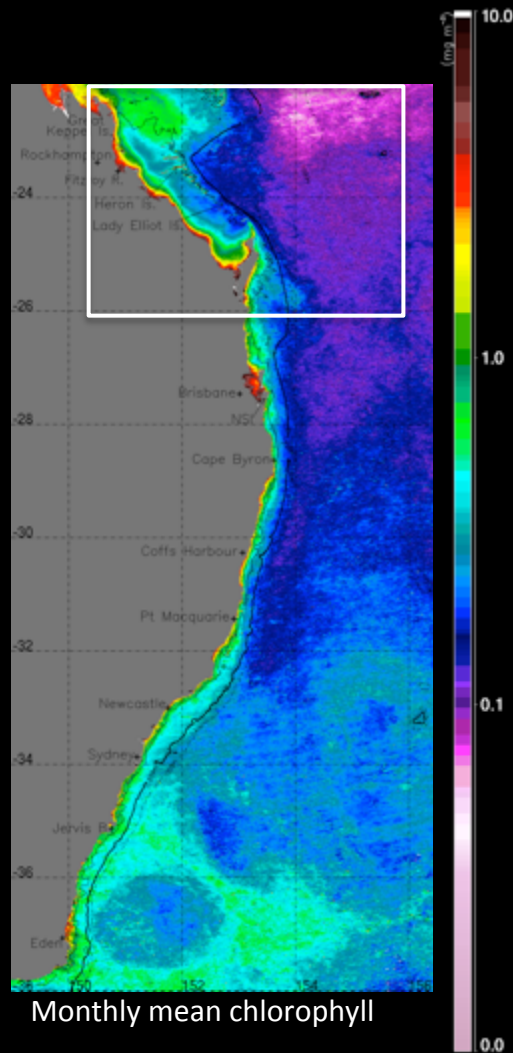
OceanMaps: May 2013 mean

Depth integrated (0-15m) currents from OceanMaps for May 2013 showing a narrow and weaker EAC flowing along the shelf edge

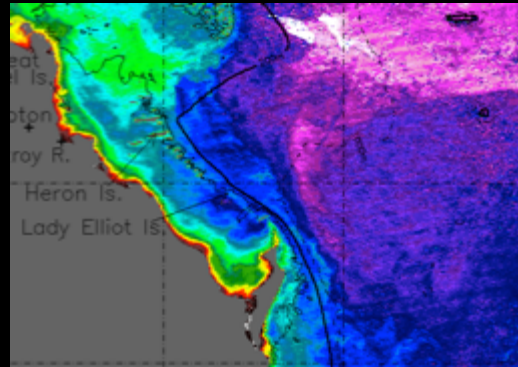
Further south, the current regime shows strong eddy activity as described in the monthly MODIS images with a maximum current of 1.25 m/s coincident with the intense positive SST anomalies



Manta sightings @ Lady Elliot Island in May 2013

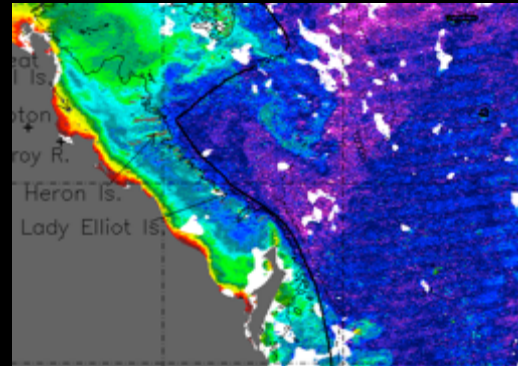


3D mean, 17-19 May 2013



High manta sightings (26) during this period coincident with intrusions onto the shelf around Lady Elliot Is.

3D mean, 28-30 May 2013



High manta sightings (33) during this period coincident with an active Capricorn Eddy

Day	Number of Manta sighted	Animal behaviour
1	4	Cruising/cleaning
2	1	Cruising/cleaning
3	2	Feeding @Lighthouse Bommie (LHB) @ 15h00, 24deg C, calm surface, southerly current
4	3	Feeding @Anchor Bommie @ 08h10, 25deg C, moderate surface, southerly current
5	3	Cruising/cleaning
6	7	Cruising/cleaning
7	2	(growth on one -tumour- on middle of belly)
8	1	Cruising/cleaning
9	3	Cruising/cleaning
13	1	Cruising/cleaning
14	4	Feeding @Second Reef @ 11h00, 24deg C, calm surface, northerly current
15	1	Cruising/cleaning
16	1	Feeding @LHB @ 14h00, 23deg C, choppy surface, northerly current
17	1	Cruising/cleaning
18	19	(one pregnant) – feeding@ LHB & Sunset Reef @ ~10h30, 24deg C, calm, southerly current
19	6	Cruising/cleaning
20	1	Cruising/cleaning
21	2	Cruising/cleaning
22	4	Cruising/cleaning
23	2	Cruising/cleaning
24	7	Cruising/cleaning
25	4	(full moon)
26	9	Cruising/cleaning
27	5	Cruising/cleaning
28	25	Cruising/cleaning
29	4	Cruising/cleaning
30	4	Cruising/cleaning
31	2	Cruising/cleaning