Project Manta

East Australian Current (EAC) Region Oceanographic conditions report

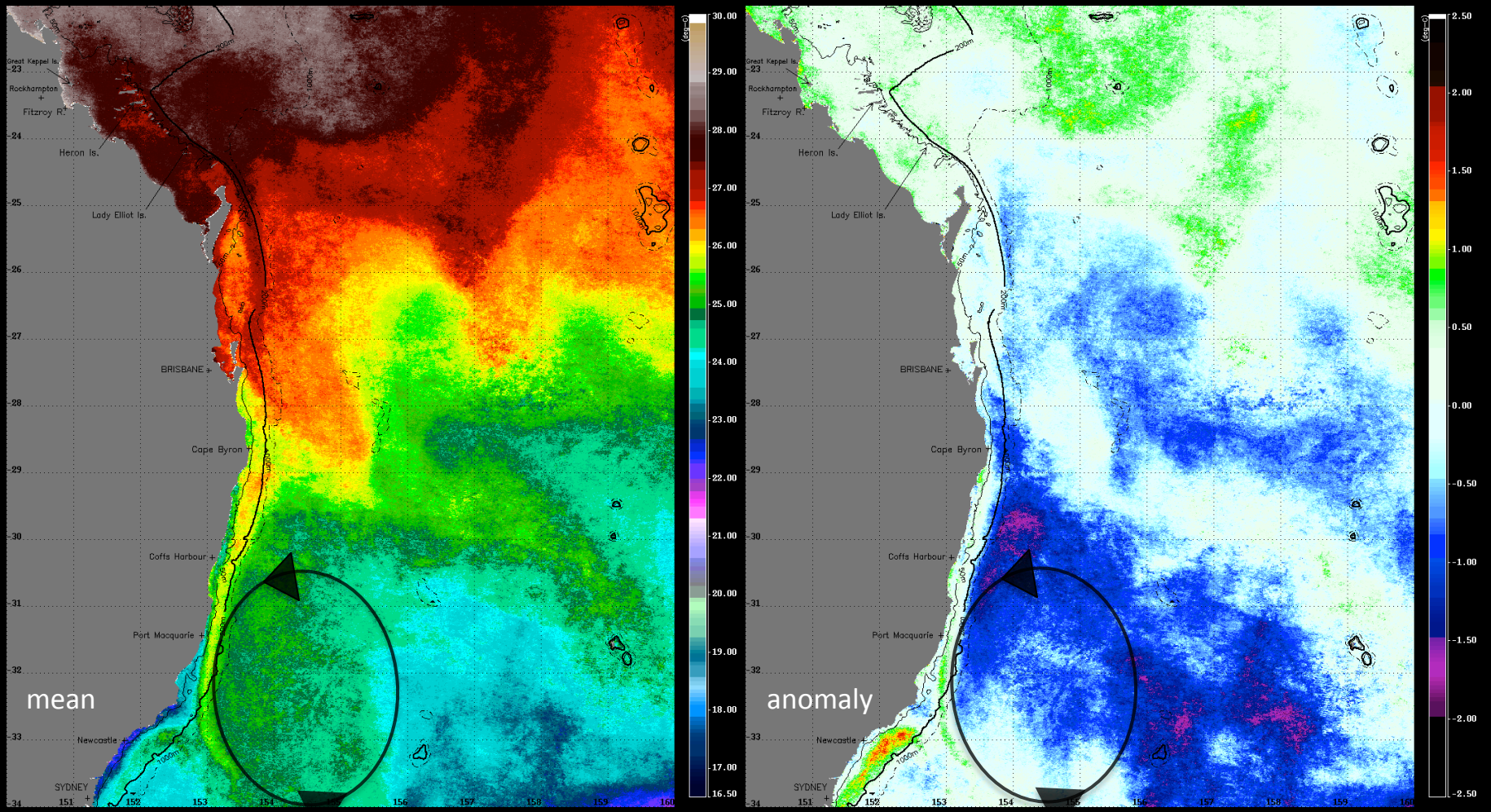
February 2012

Marites M. Magno-Canto
Fabrice Jaine
Ana Redondo-Rodriguez

Supervised by Scarla Weeks

UQ-GPEM Biophysical Oceanography Group

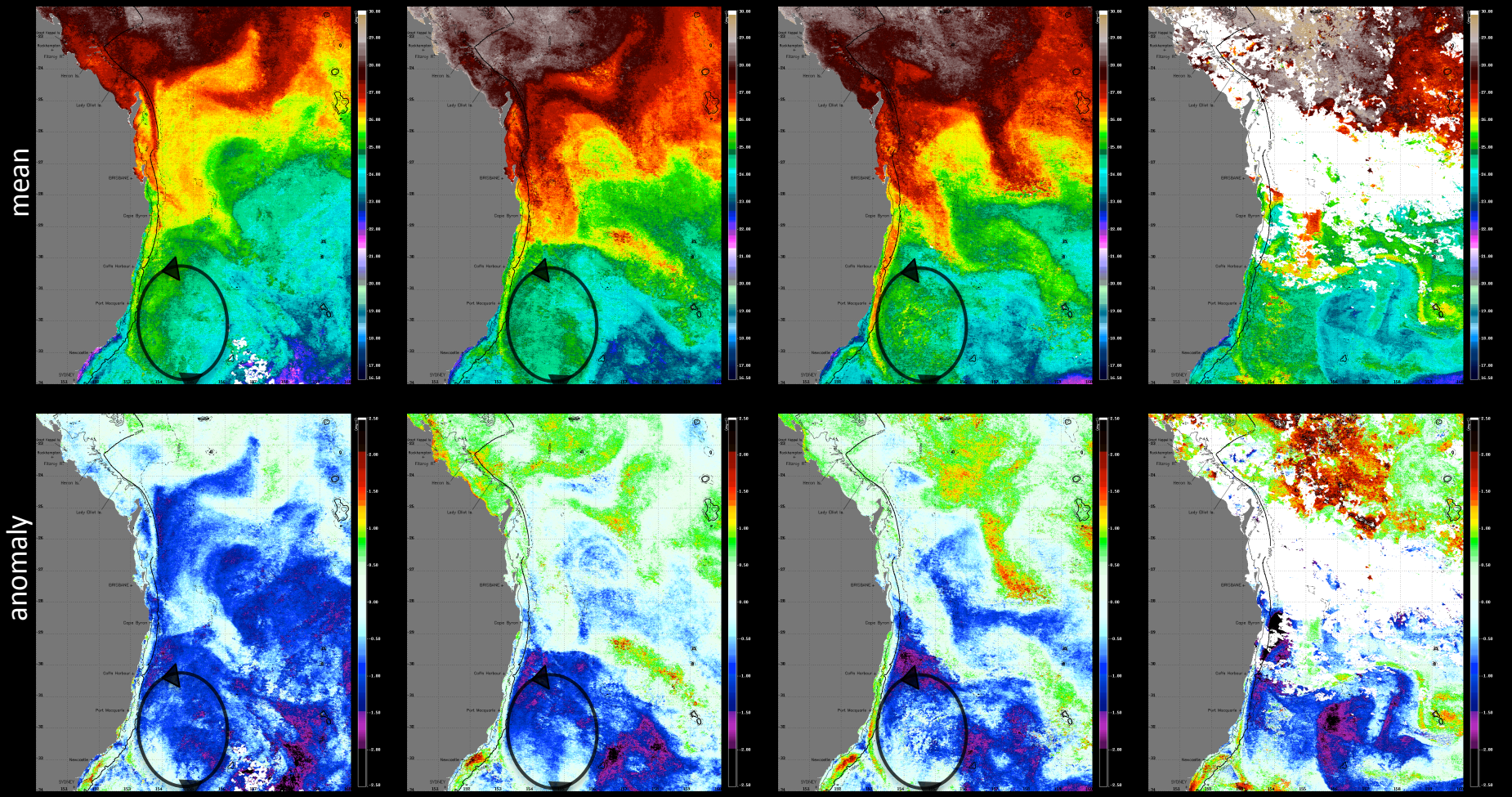
EAC Monthly MODIS SST (D+N): February 2012



- Unusual EAC flow with core right on the continental shelf south of Byron Bay
- Intense offshore negative SST anomalies in January have dissipated considerably
- Moderate negative SST anomalies also apparent on the shelf north of Cape Byron
- Relatively strong positive anomalies on the inner shelf south of Port Macquarie

UQ Biophysical Oceanography Group

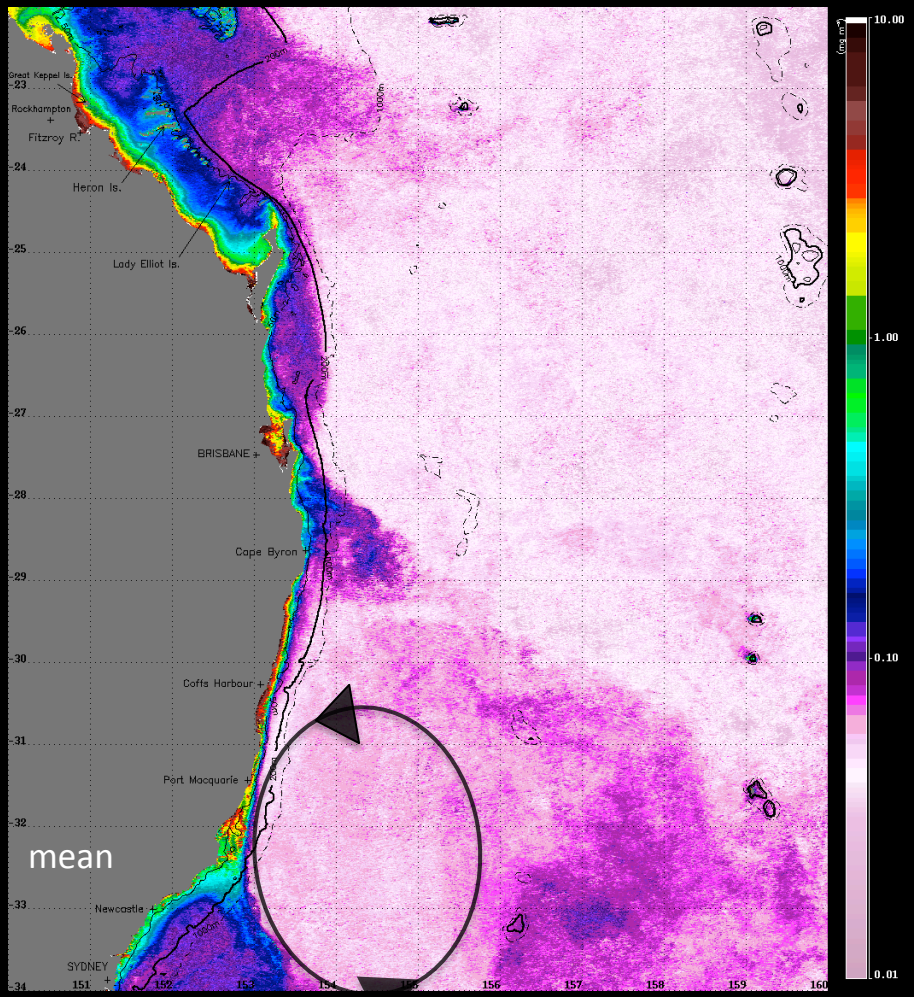
EAC Weekly MODIS SST (D+N): starting from 1-7 February 2012



- Progressively increasing offshore advection of a substantial component of the EAC eastward of the Byron region during February,
  - with resultant positive anomalies in the northern half of the greater region

- Simultaneous progressive encroachment of the southern EAC limb onto the continental shelf from Weeks 1-3,
  - associated with recirculation in a large anticyclonic eddy and negative anomalies due to the more limited EAC flow in the area

EAC Monthly MODIS Chlorophyll-*a*: February 2012

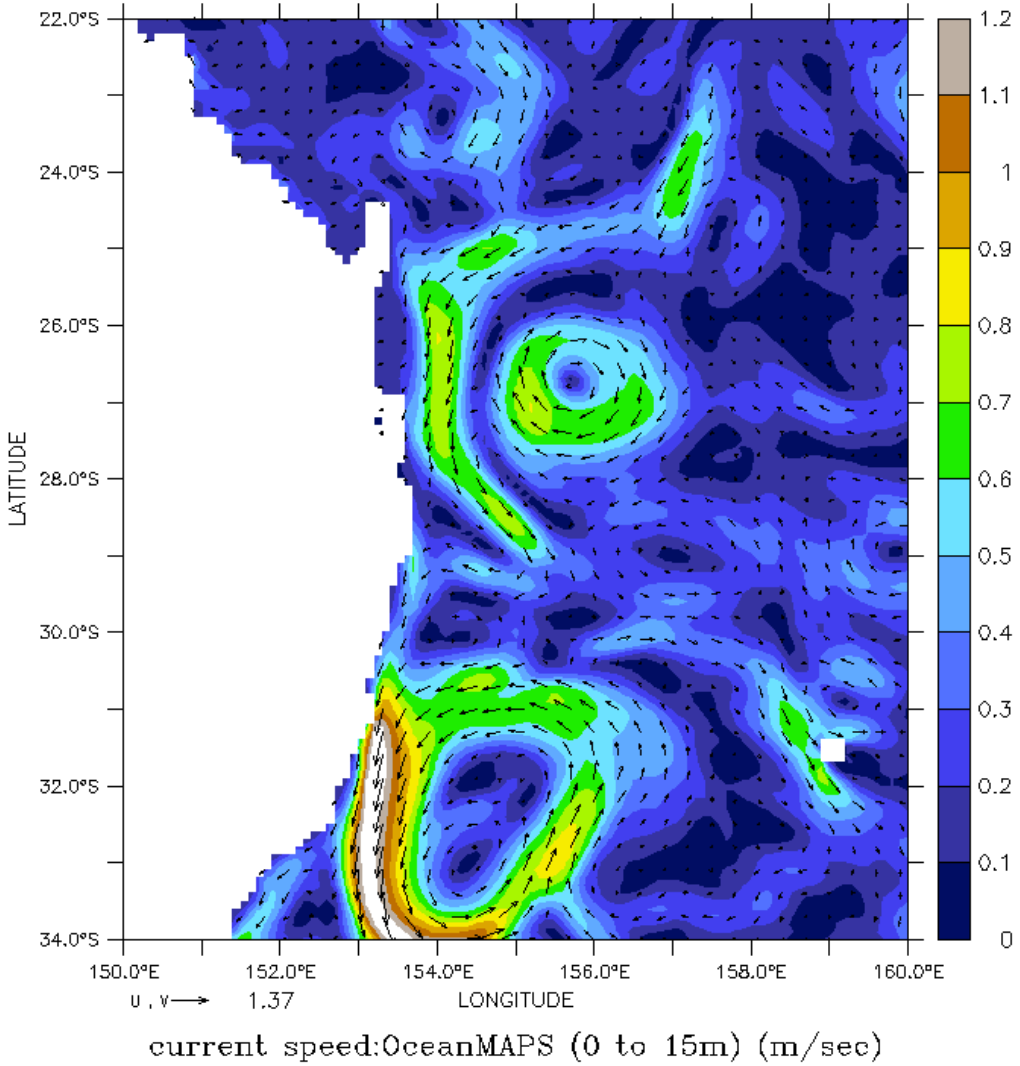


Animal sightings update:

- 22 February – whale shark sighted further south at Narooma, NSW (36.21 °S)
- Large number of mantas sighted at Byron Bay specifically during:
  - 5th Feb
  - 12th Feb
  - 22nd Feb
  - 24-25th Feb

- Encroachment of the southern EAC limb onto the continental shelf confined chlorophyll concentrations close inshore south of Byron, likely leading to the numerous mantas sighted in the area during this period
- Offshore entrainment of relatively high chlorophyll-*a* waters between 32-33°S associated with the offshore advection of the southern limb of the EAC eastward into the Tasman Sea

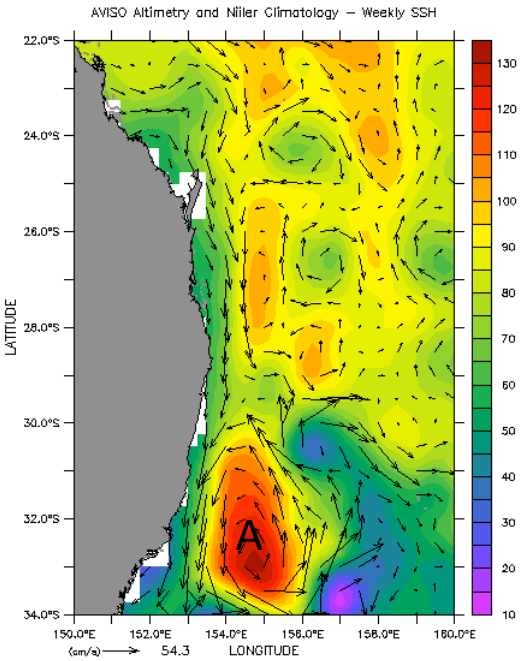
OceanMaps : February 2012 mean



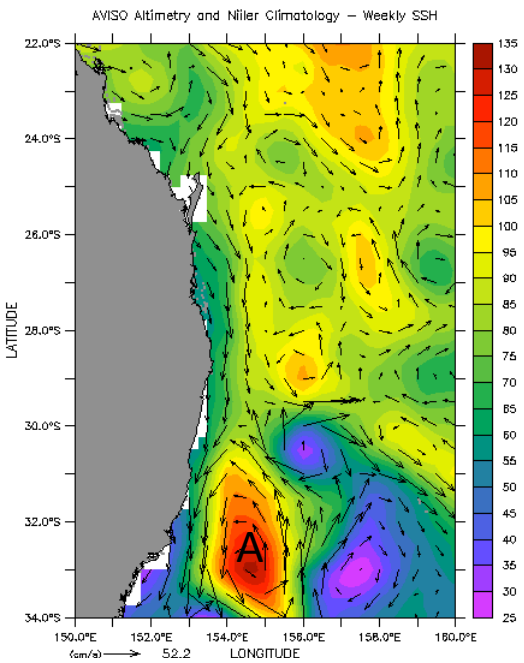
Depth integrated (0-15m) currents from OceanMaps reveal strong EAC flow along the shelf edge between Fraser Is & Cape Byron (from 25°S), with a cyclonic eddy located seaward of primary flow

Further south shows the intensified southern limits of the EAC southern flow as it advects eastward into the Tasman Sea, associated with recirculation in the large anticyclonic eddy

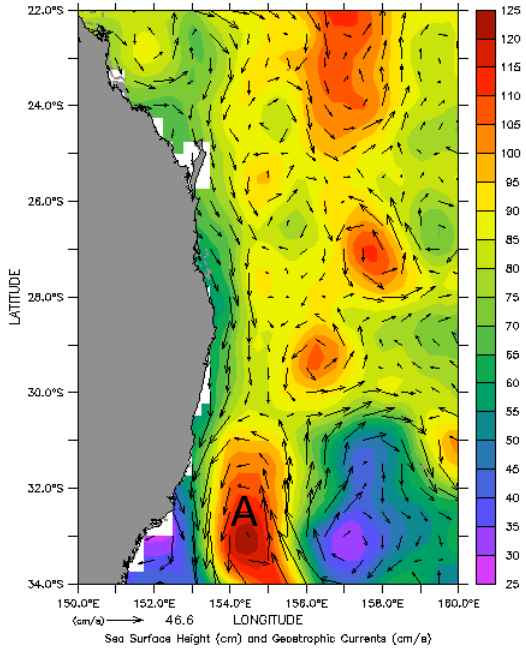
2-8 February 2012



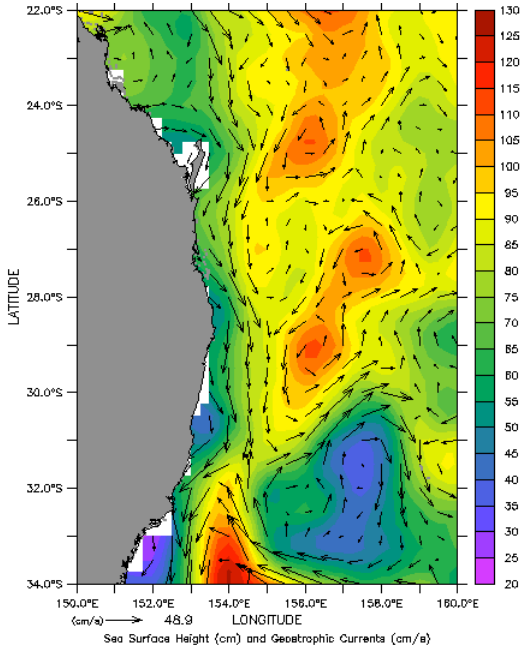
9-15 February 2012



2-8 February 2012



9-15 February 2012

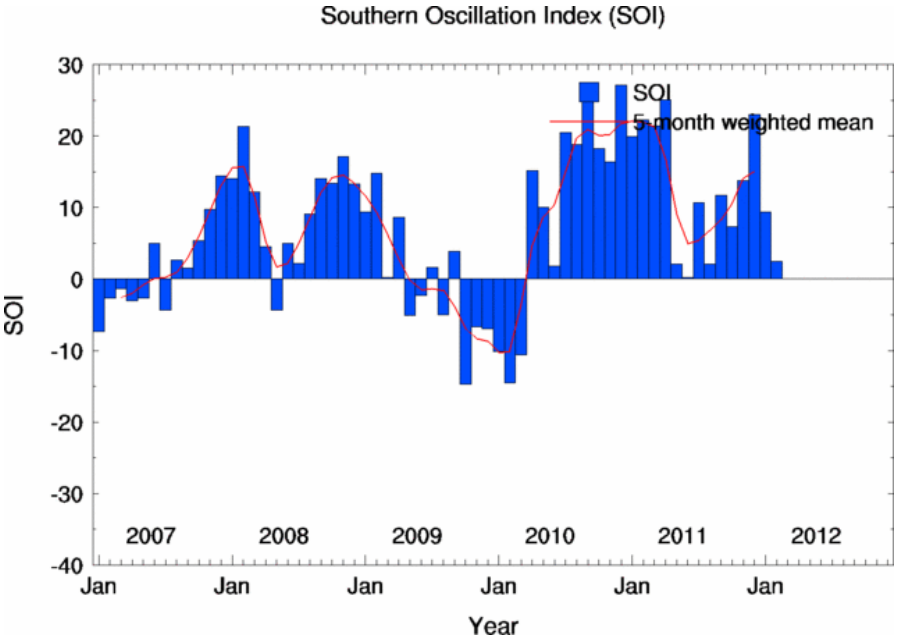


OceanWatch Central Pacific Weekly SSH

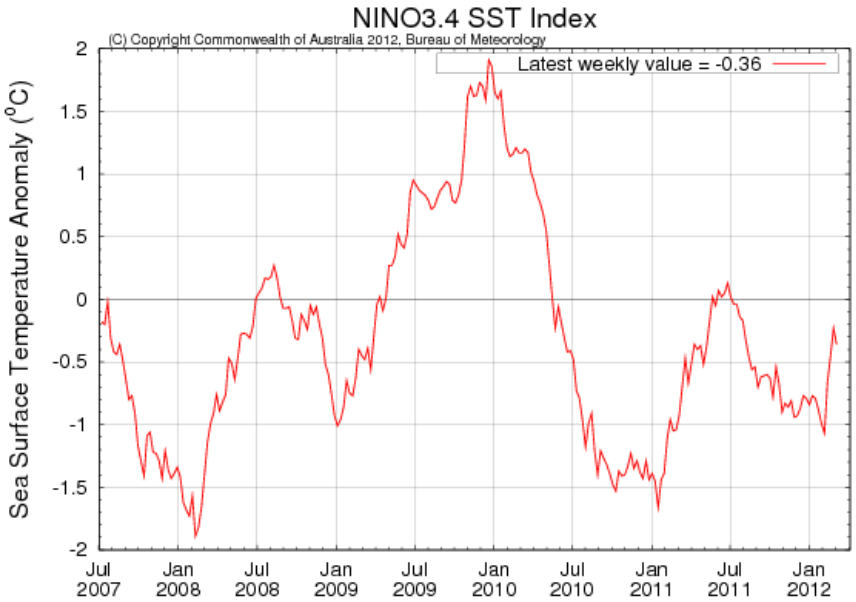
- Contours indicate the weekly averaged sea surface height (SSH) while arrows indicate the geostrophic velocities

- High SSH coincides nicely with the anticyclonic eddy feature (A) noted in MODIS SST and Chlorophyll

ENSO index



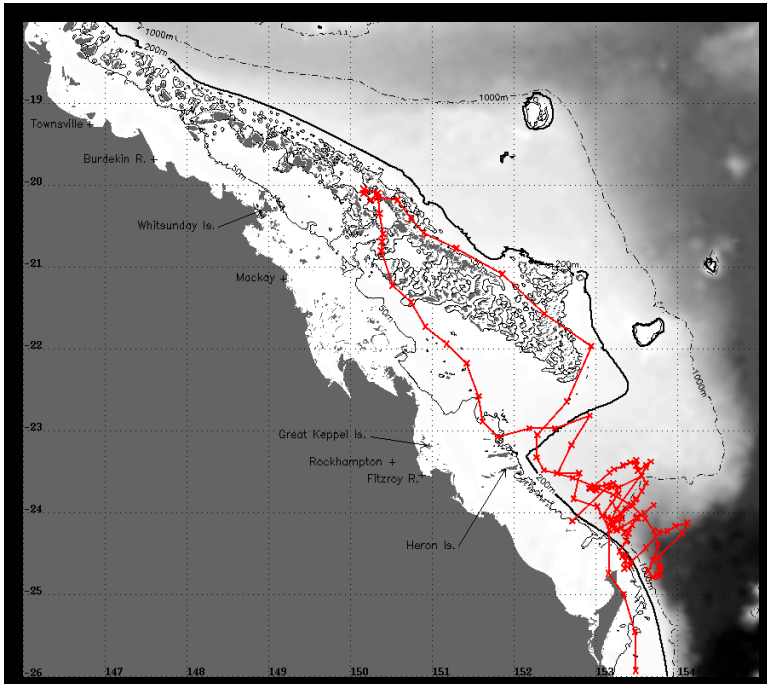
Positive SOI = La Niña



Negative Nino 3.4 index= La Niña

Note:

- Both, SST-based and SLP-based indices showed a shift towards neutral conditions over the month of February. La Niña is expected to change towards neutral conditions over the following months.

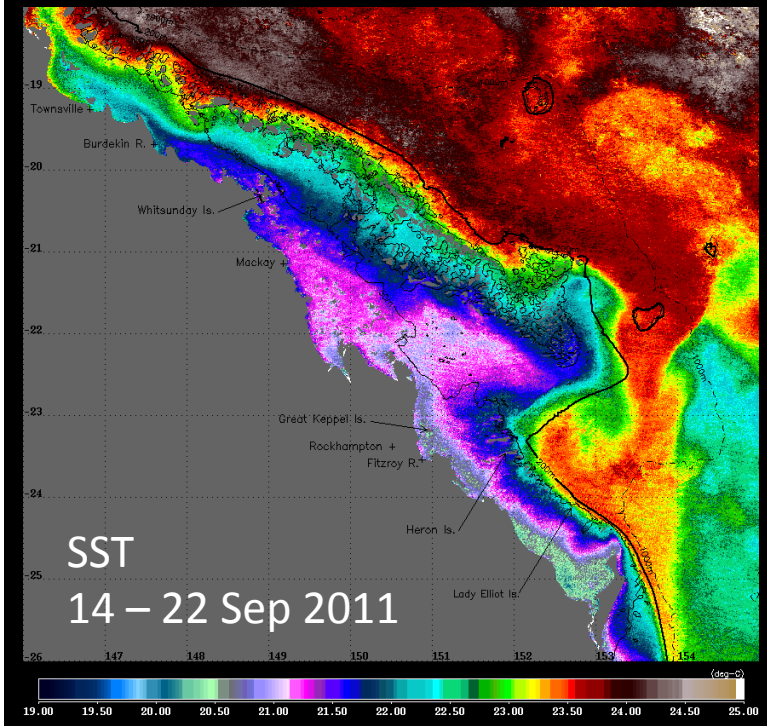


Tag updates

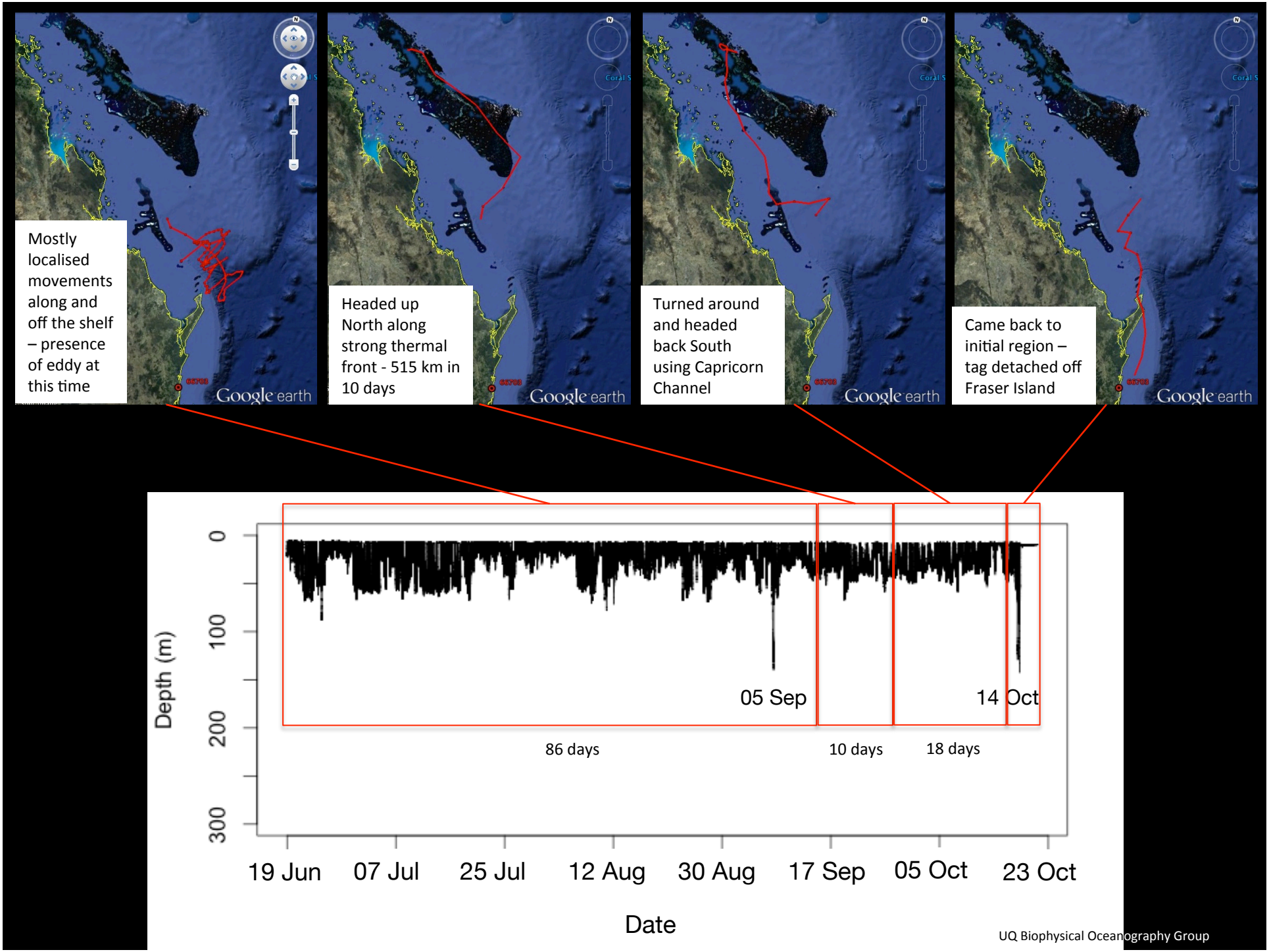
Track for tag deployed at LEI in June and recovered in Maroochydore on October 2011 (crosses indicate daily positions)

Tagged manta: Cinqua (#76), Female, sighted yearly at LEI around June (since 2008)

Total deployment: 120 days



Strong Capricorn Eddy signal with intense 21-23°C thermal front along continental shelf edge, likely influencing movements of the tracked manta


Mostly localised movements along and off the shelf – presence of eddy at this time
Headed up North along strong thermal front - 515 km in 10 days
Turned around and headed back South using Capricorn Channel
Came back to initial region – tag detached off Fraser Island
Google earth
Depth (m)
0
100
200
300
05 Sep
14 Oct
86 days
10 days
18 days
19 Jun
07 Jul
25 Jul
12 Aug
30 Aug
17 Sep
05 Oct
23 Oct
Date
UQ Biophysical Oceanography Group