

IMOS OceanCurrent

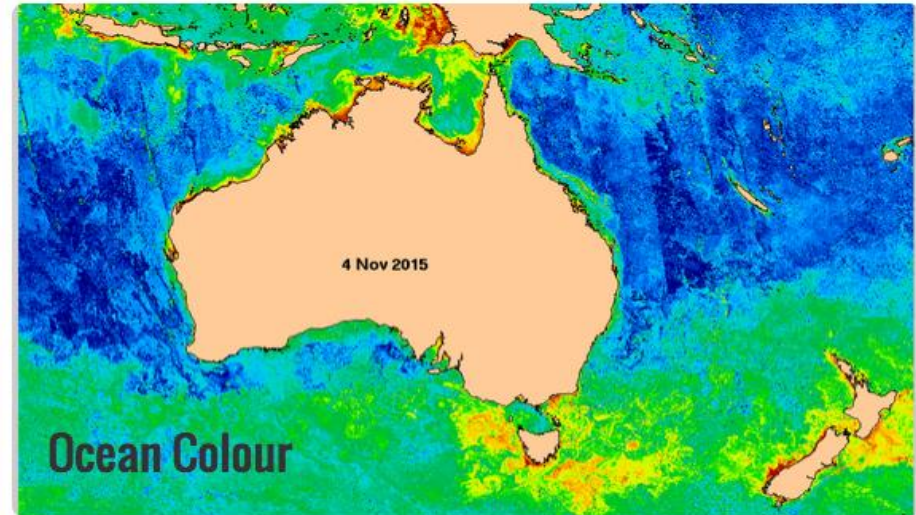
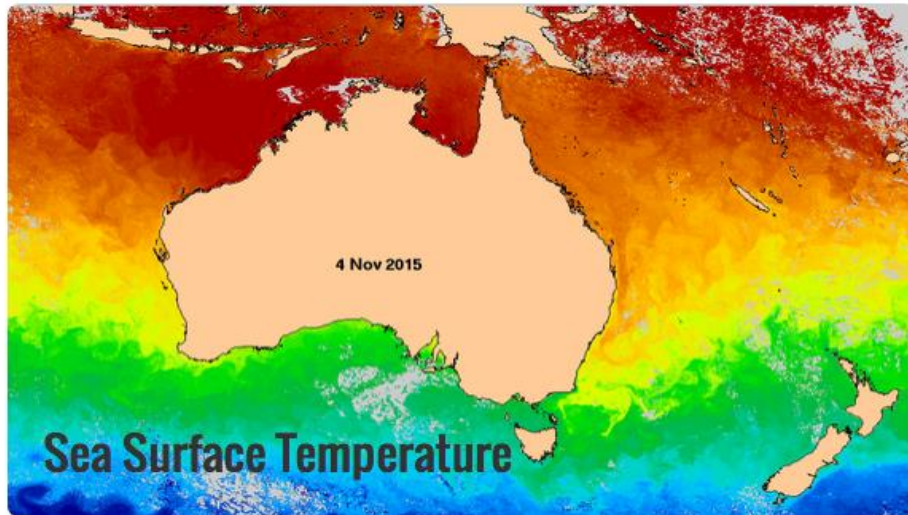
Surface Currents and Temperature

Up to date ocean information around Australia.

 IMOS
Integrated Marine
Observing System

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[IMOS](#) [IMOS Ocean Portal](#)



**Madeleine Cahill, David Griffin
and Roger Scott**

November 2018

OCEANS AND ATMOSPHERE
www.csiro.au



Daily images of IMOS data

Integrated Marine Observing System

I'm looking for ...

AODN
AODN Portal

IMOS OceanCurrent

Facilities

Latest News

Roger, over and out
31 October 2018
Dr Roger Proctor retires in December this year after a decade at the helm of the Australian Ocean Data Network (AODN).

Integration: the focus of the IMOS ocean modelling workshop at the Shine Dome
17 October 2018
The fourth biennial Australian Coastal and Oceans Modelling and Observations Workshop (ACOMO 2018) was held at the Shine Dome, Australian Academy of...

New Australian database reveals climate change impact on fish at larval stage
17 October 2018
One of the first of its kind in the world, a benchmark database of larval fish collected over the last three decades and analysed by UNSW researchers...

We present daily SST, Ocean Colour and surface velocities going back to 1993 and all data we can from the IMOS data centre: the AODN, Australian Ocean Data Network

In-water data:
Current meters, gliders, Argo floats, drifters, SealCTDs
Place the data in context, visualize & test-drive

AODN Open Access to Ocean Data
Data Network

AODN Portal
"The gateway to Australian marine and climate science data"

Get Ocean Data Now

IMOS
Integrated Marine Observing System

Originally developed for the East & West Coasts East Australian Current & Leeuwin Current

Satellite altimeter data:

In deep ocean (>200m)

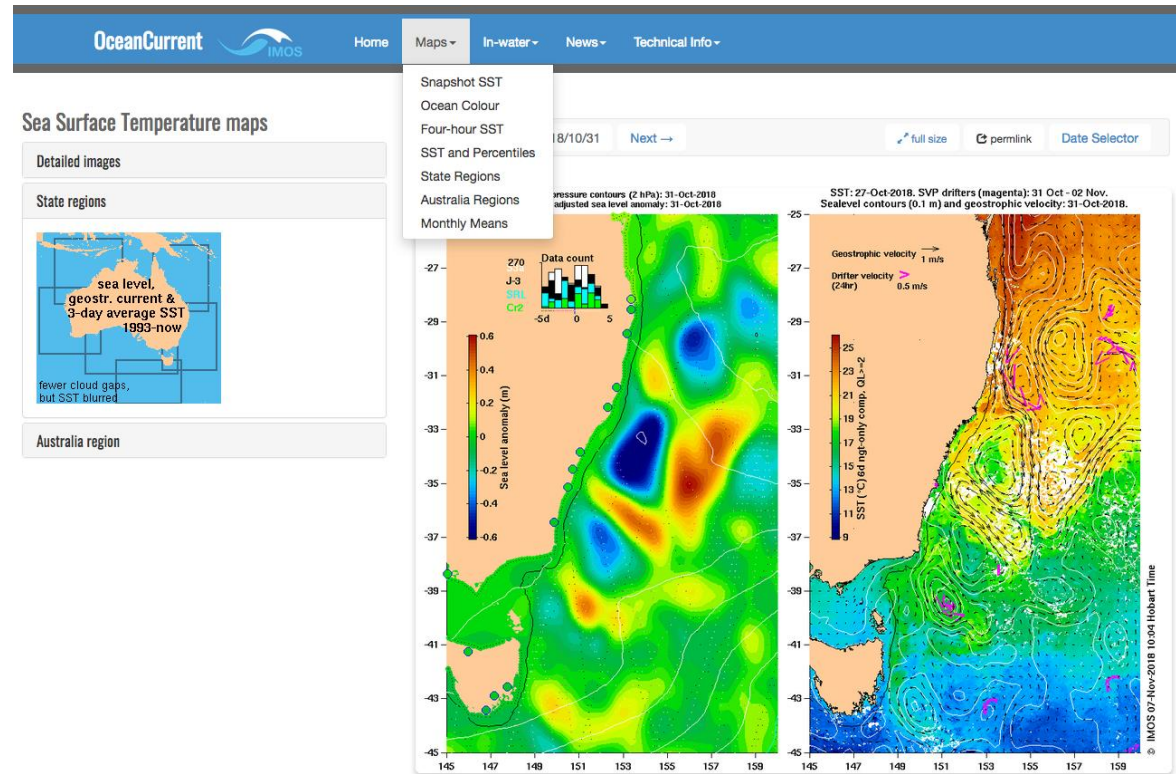
- identify eddies and
- surface geostrophic currents

Tides and wind-forcing make altimetry less useful in coastal waters

Tide gauges help but are not enough on wide shelves

SST & Chlorophyll-a

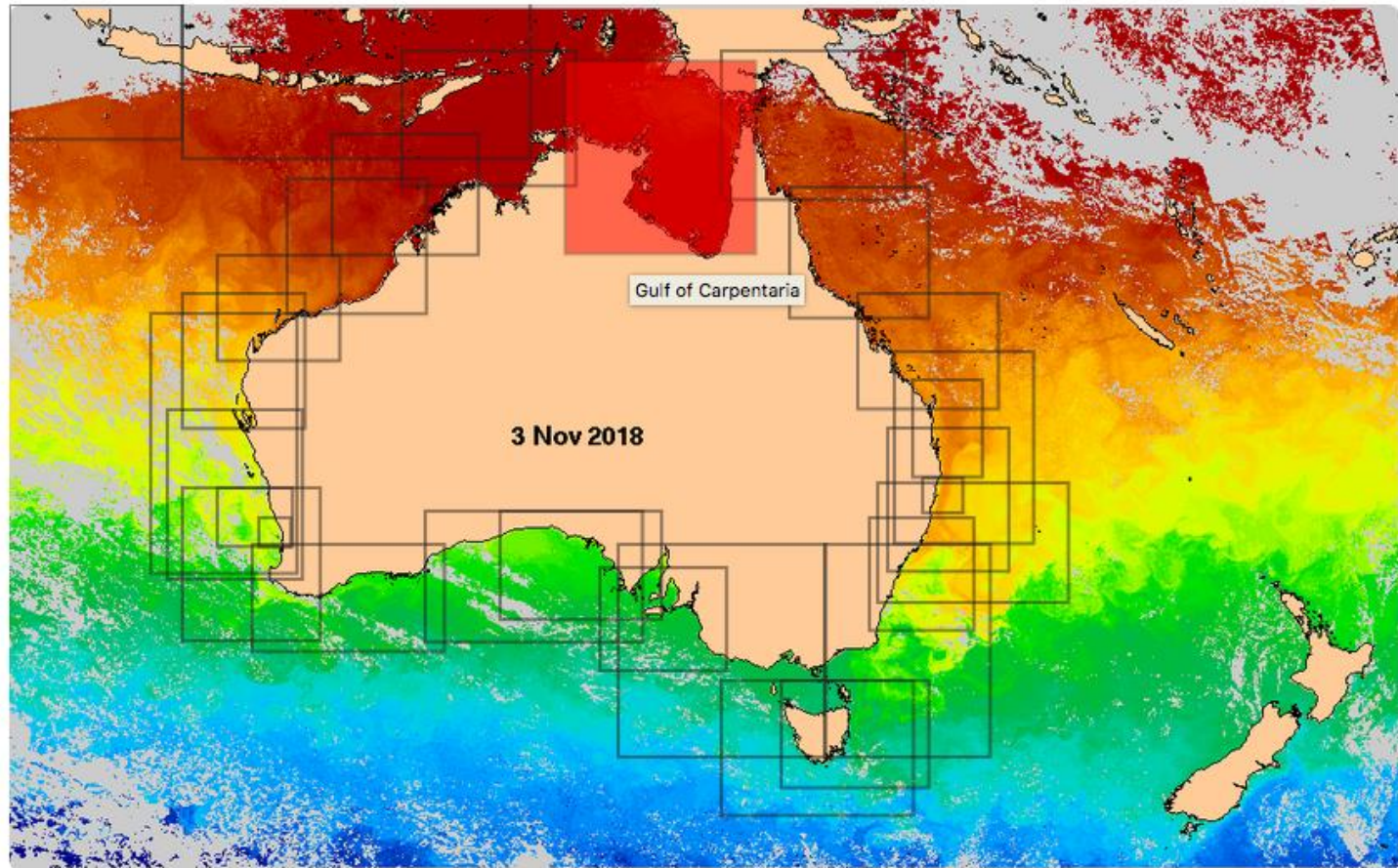
- Snapshot (often too cloudy)
- Four hour composites
- Daily (6d night only) composites and Percentiles



Detailed Regions

Select region

Detailed images

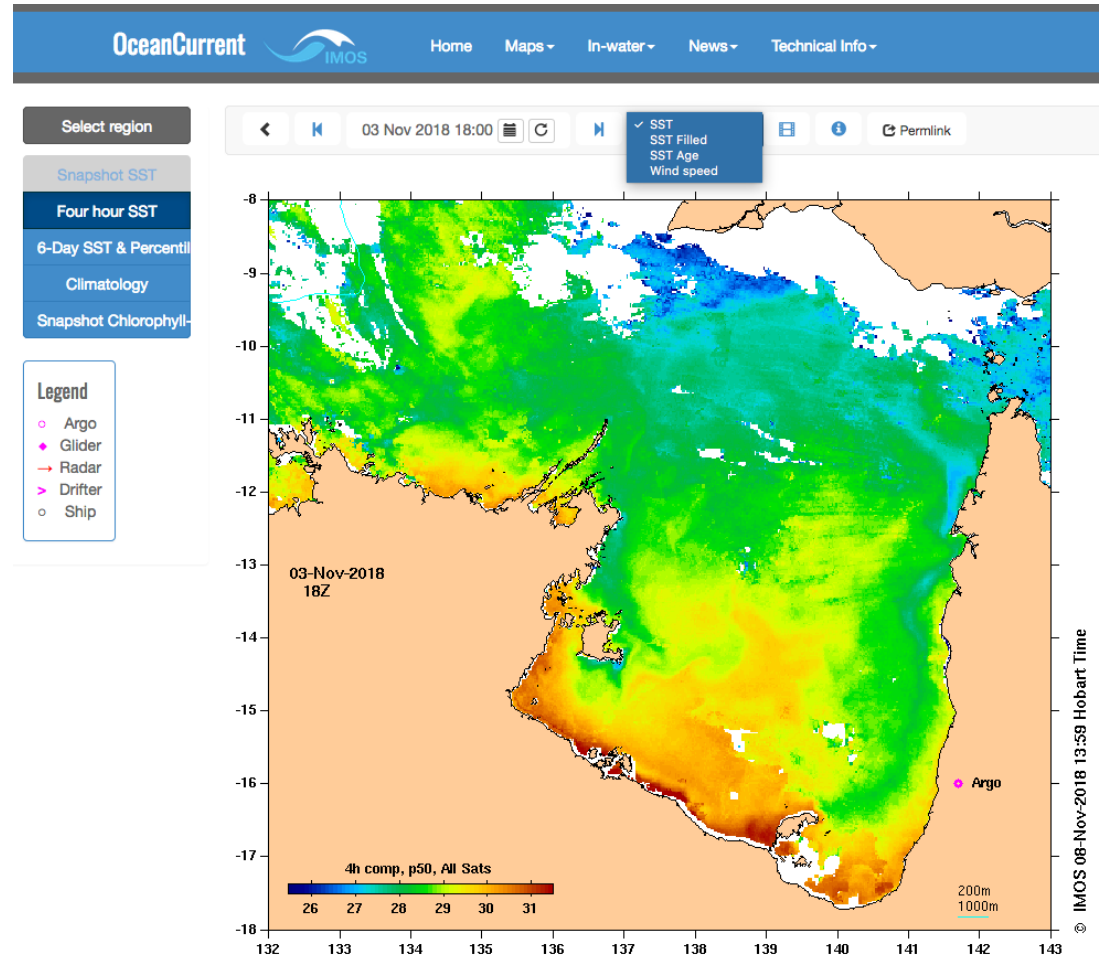


Four Hour SST - 3 Nov 2018 18:00

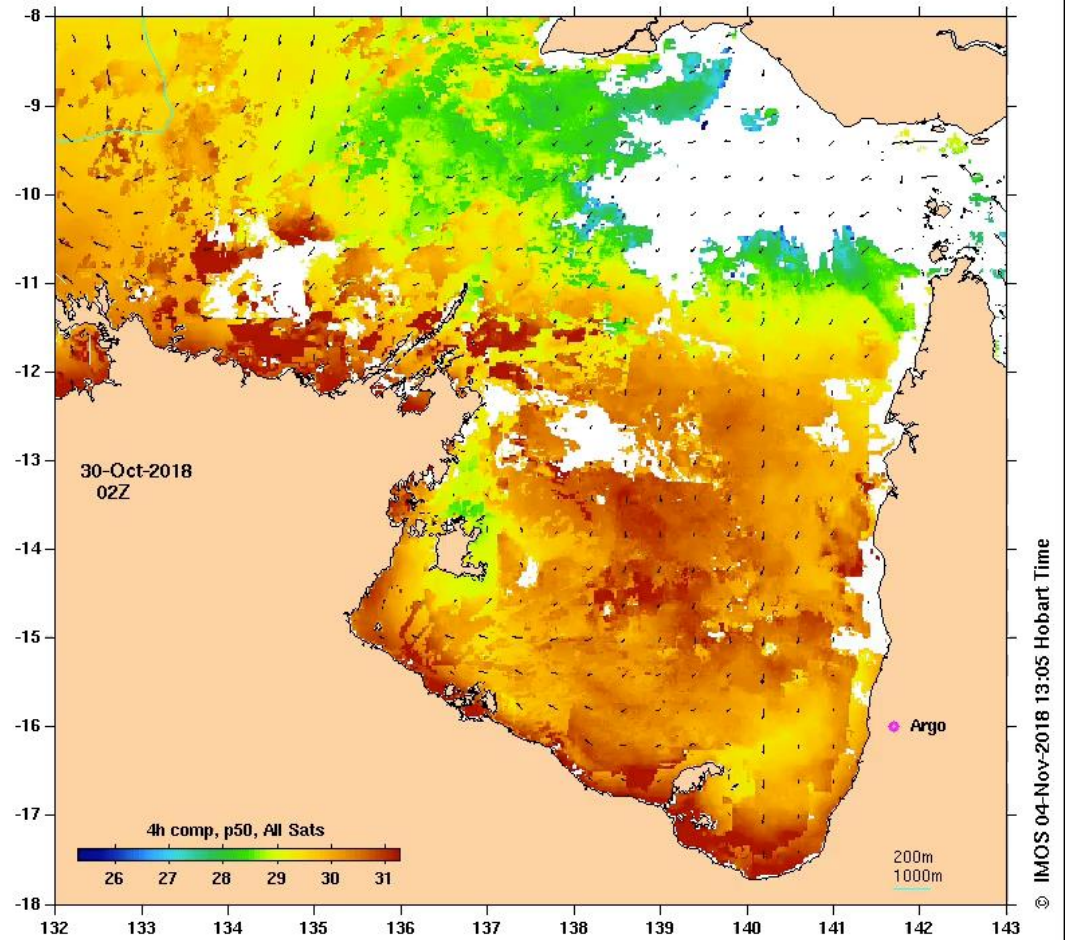
Using all satellite SST sensors

- Himawari-8 SST dominates with images every 10mins
- Four-hour composites (6/day)
- Diurnal heating is evident – maximum in the afternoon, a super-heated surface layer occurs when winds are light
- Shallow water regions warm faster

Note:
we don't know currents in Gulf



Four Hour SST movie Nov 2018

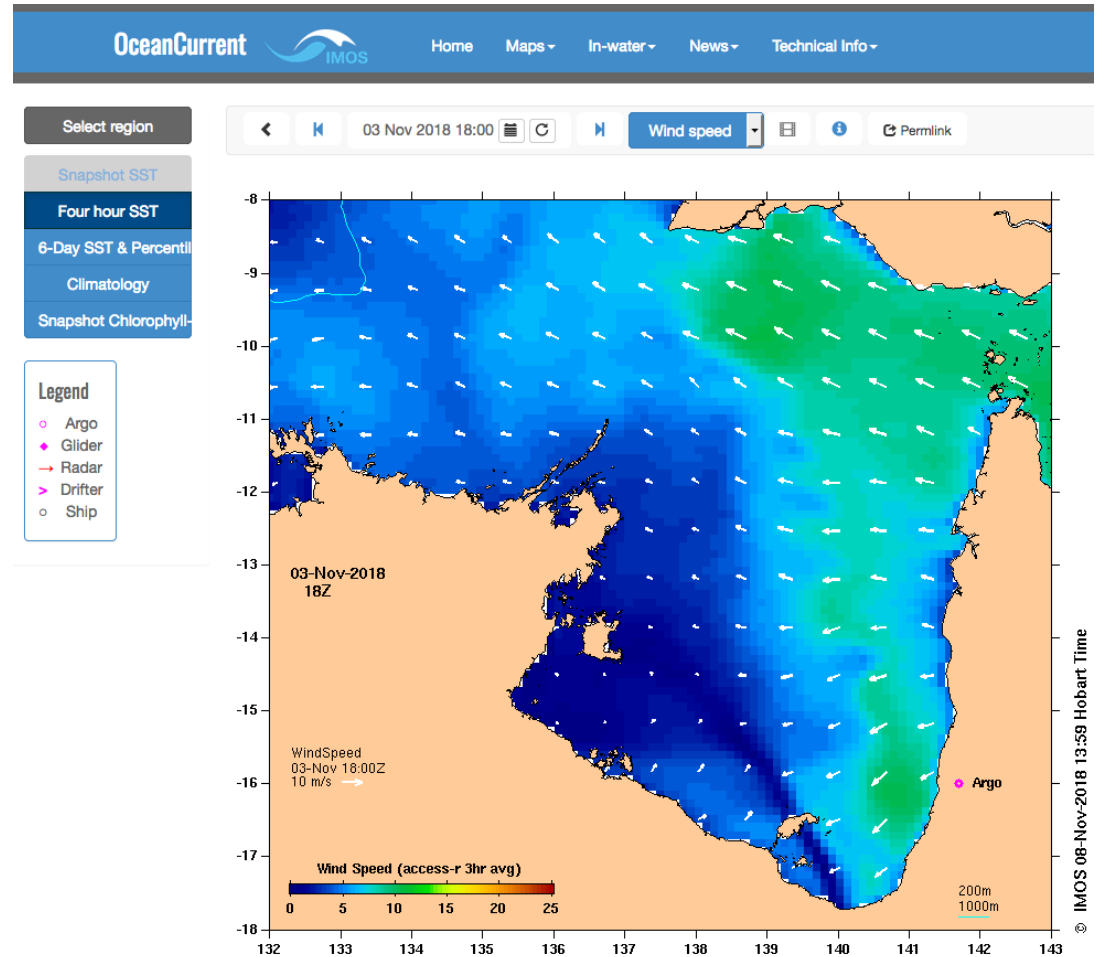


Four Hour SST – 3 Nov 2018 18:00

3hr avg wind speed – Bureau of Meteorology

Wind speed can indicate how deep the surface heating has penetrated

Blue = near zero winds



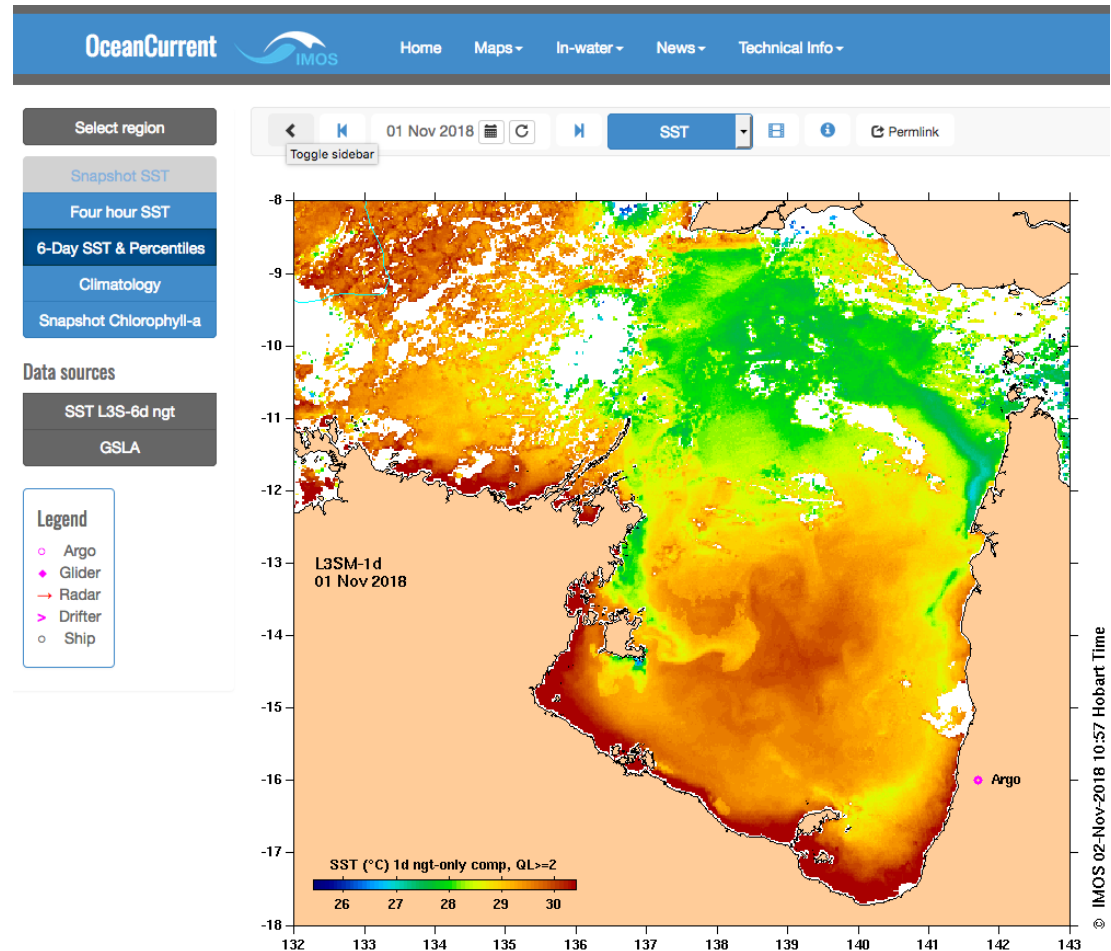
6-day SST and Percentiles

Night-only composite SST (1d composite in NRT)

Night-only SST is used in the composites to avoid including the diurnal heating

we use the 6-day composites to reduce cloud issues

Sometimes you get brilliant images with just one day



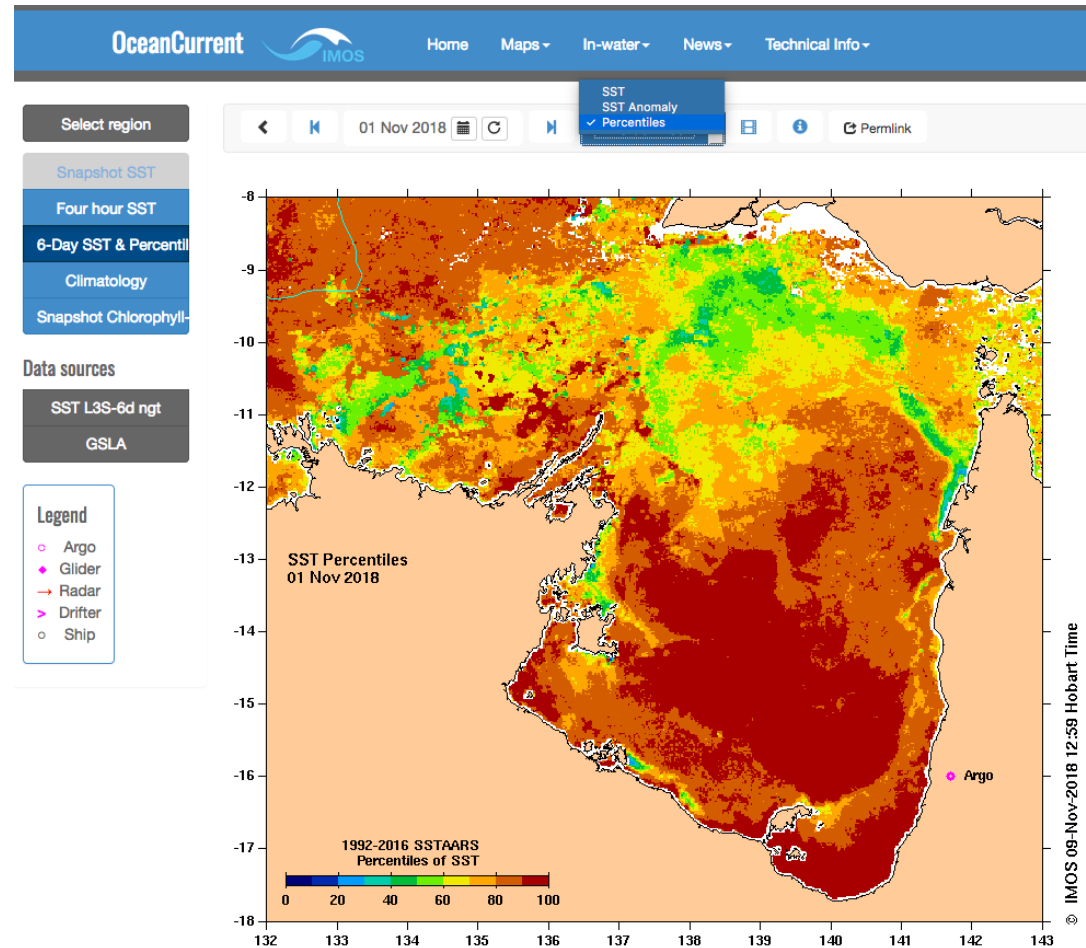
SST Percentiles based on SSTAARS

The percentiles rank the temperature according to 25 years of SST observations

Red = hottest 10% observed

Blue = coldest 10%

Green = average



SSTAARS Climatology – median SST based on SST data from 1992-2016

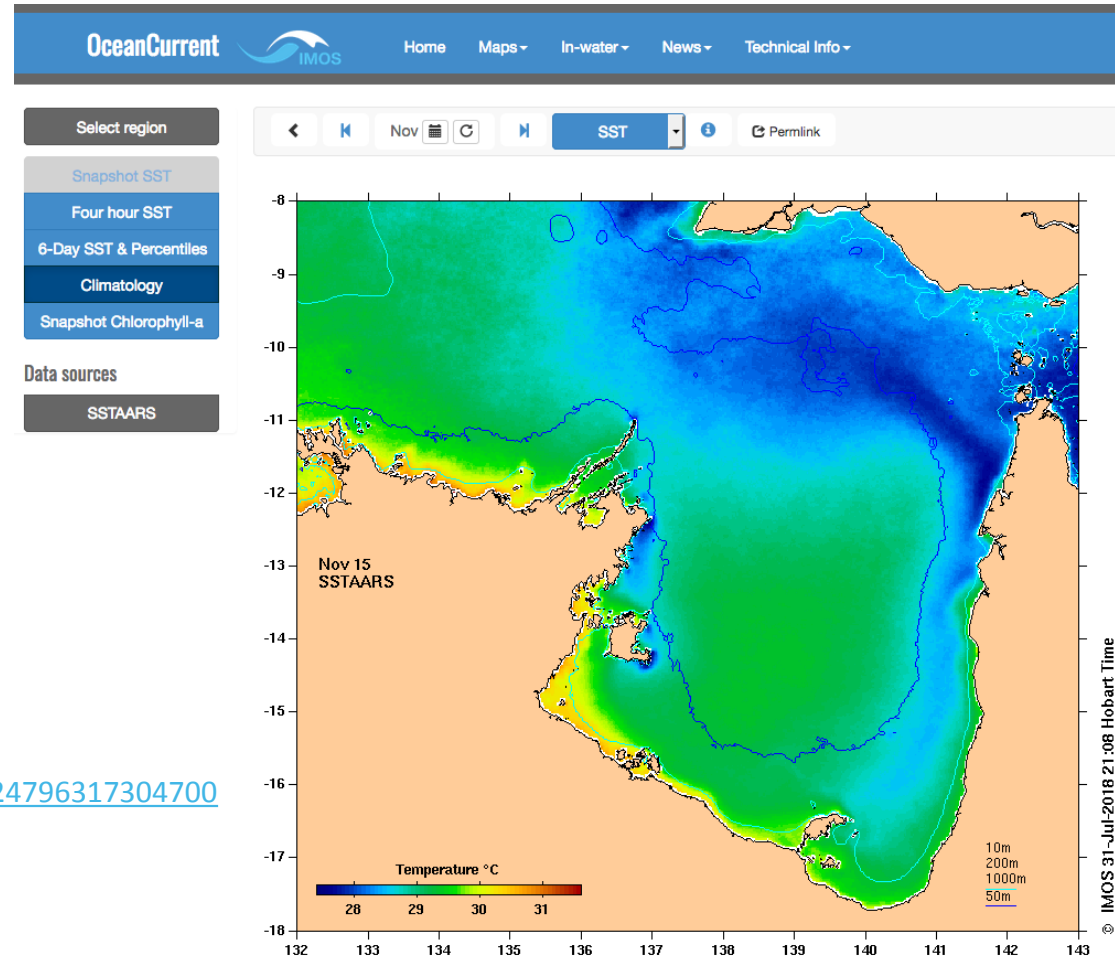
Nov 15

Spatial resolution (2km) showing high spatial variability

10m and 50m depth contours

Reference:

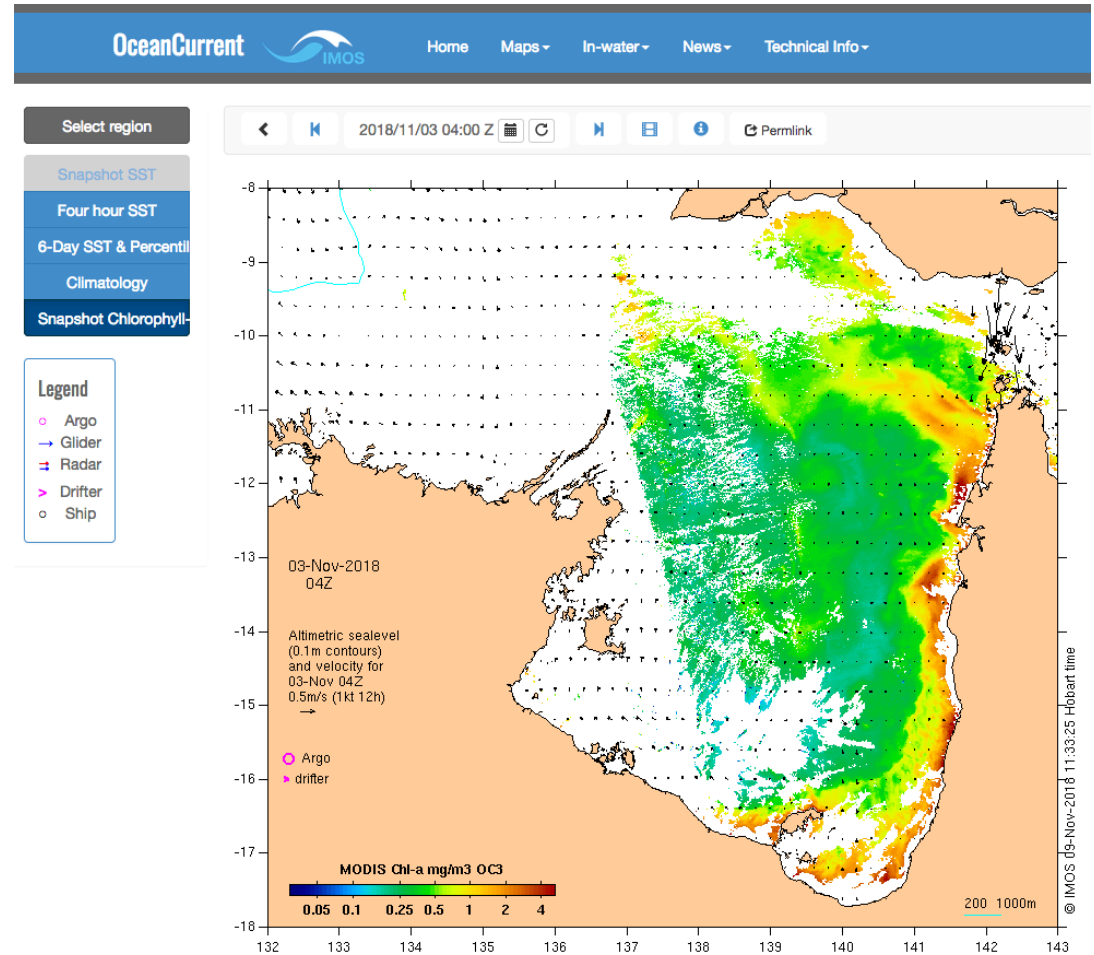
<https://www.sciencedirect.com/science/article/pii/S0924796317304700>



Ocean Colour – Chlorophyll-a

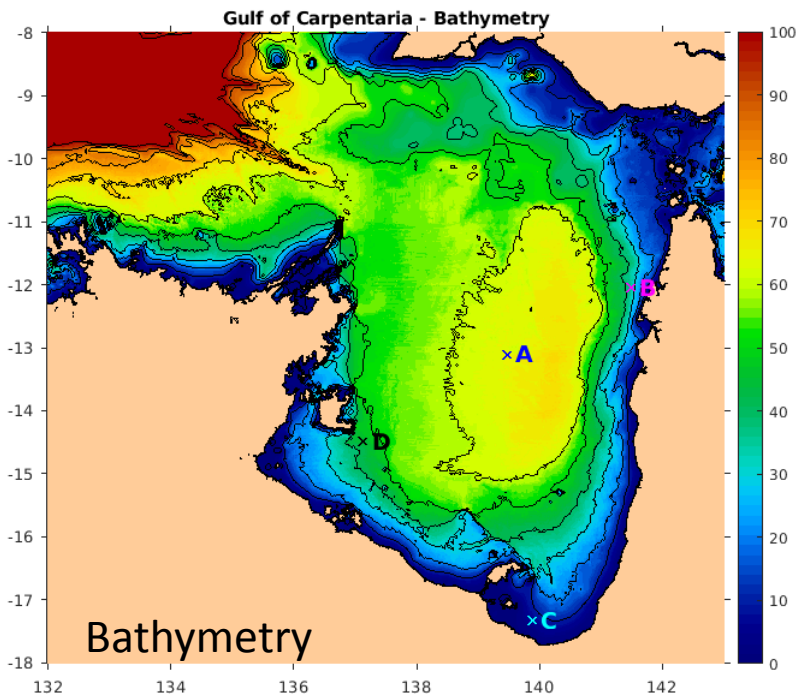
An indicator of productivity

- Single pass daily – Modis
- Cloud is more of an issue
- Conversion of colour to chlorophyll-a is only valid in the deep ocean:
 - Bottom reflectance
 - Vegetation

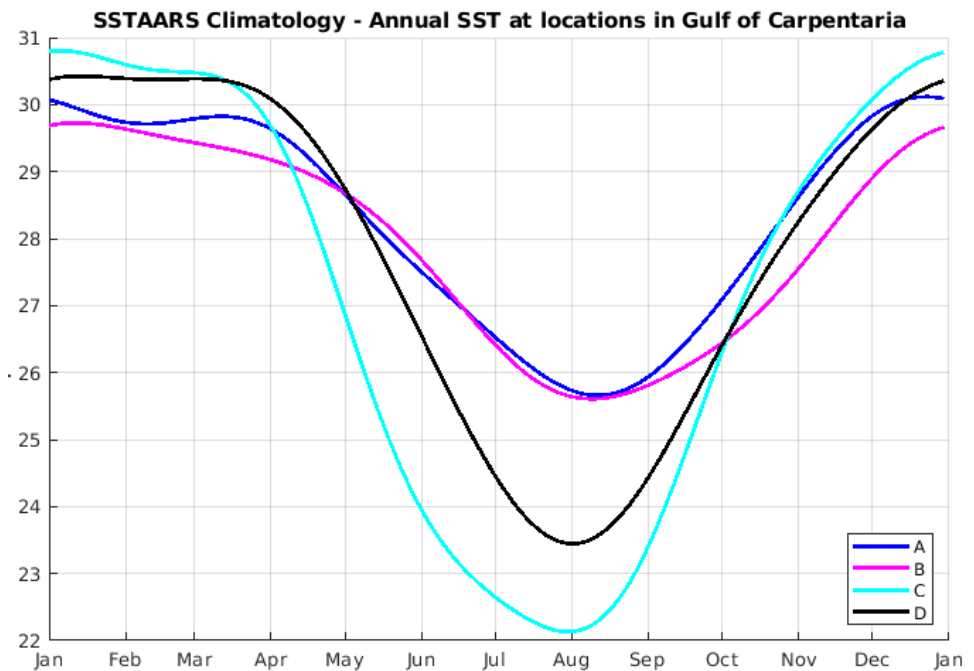


SSTAARS Median SST

Annual Cycle at different locations in Gulf

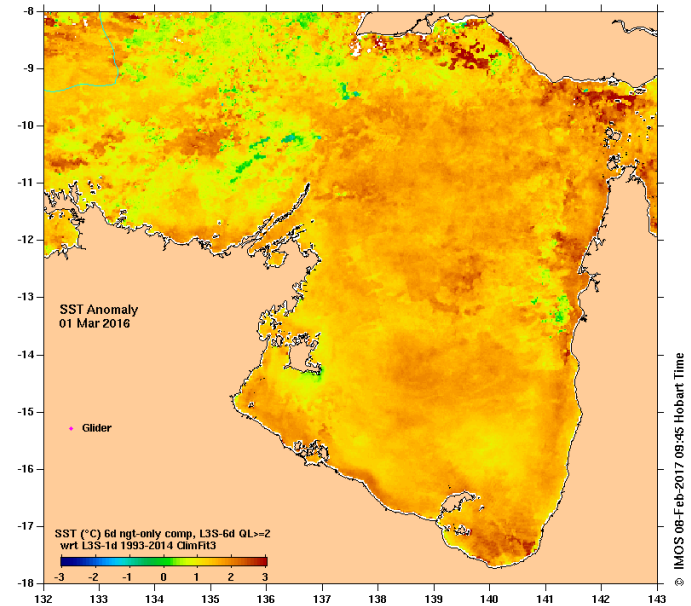
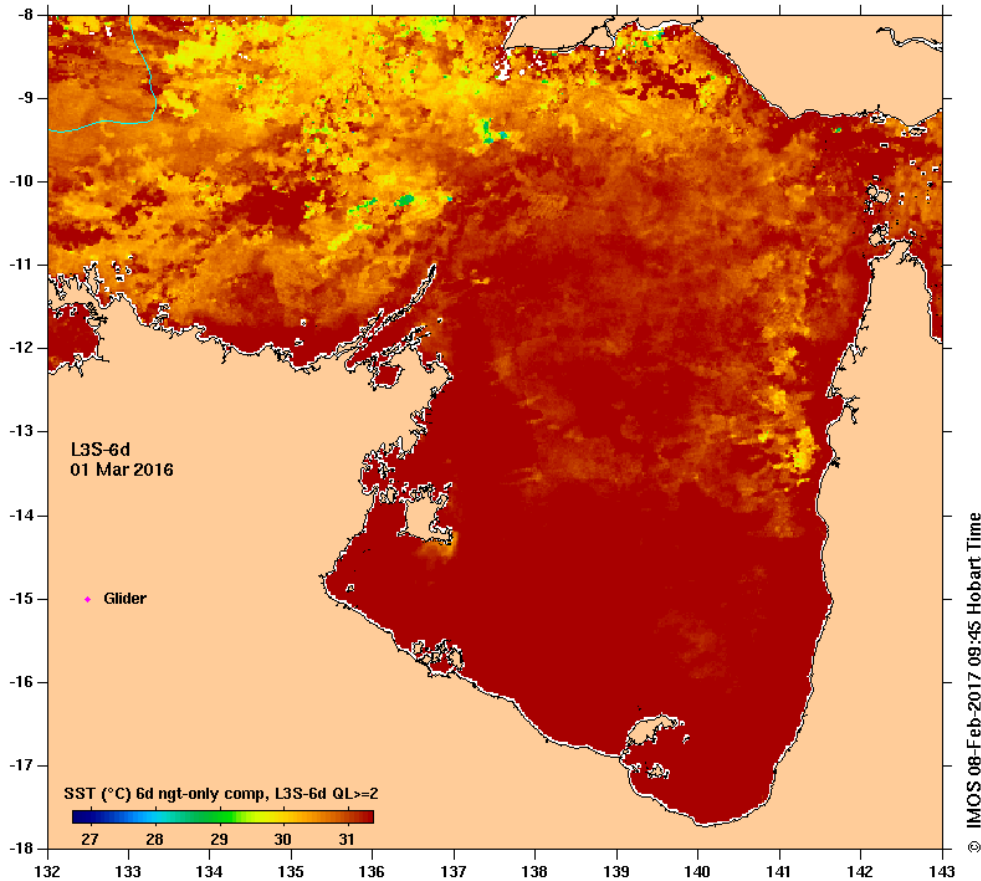


The annual temperature cycle is quite different in different parts of the Gulf
Hottest Jan-Mar



Gulf of Carpentaria – L3S-6d SST

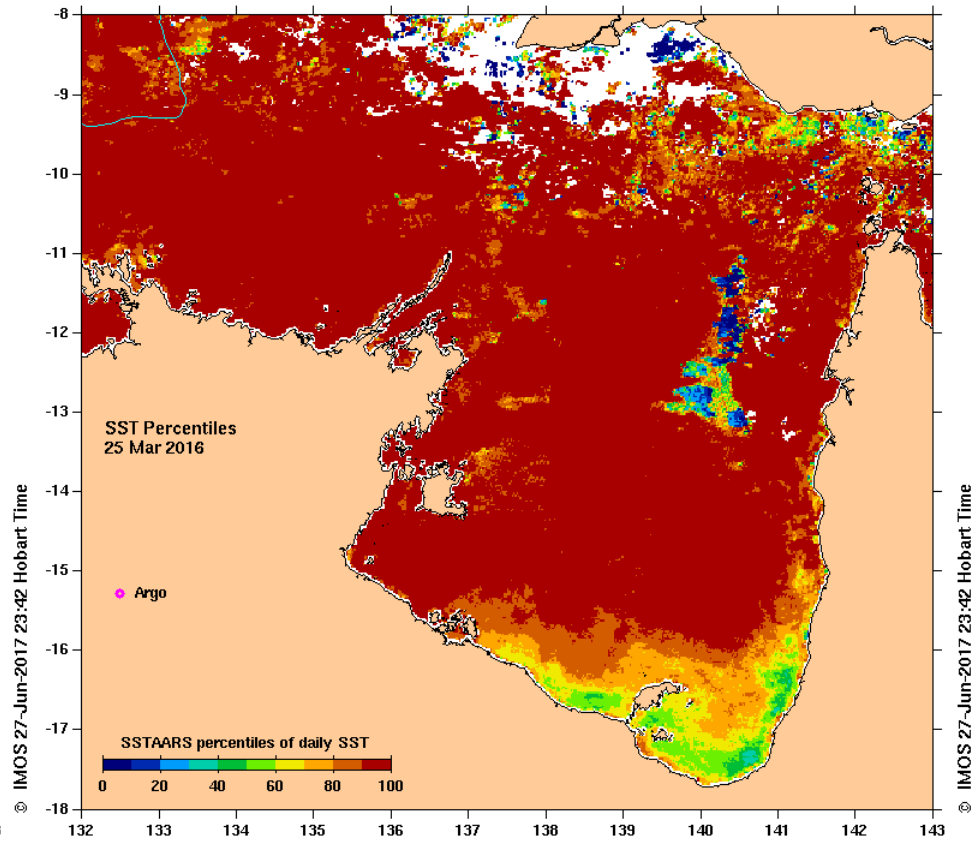
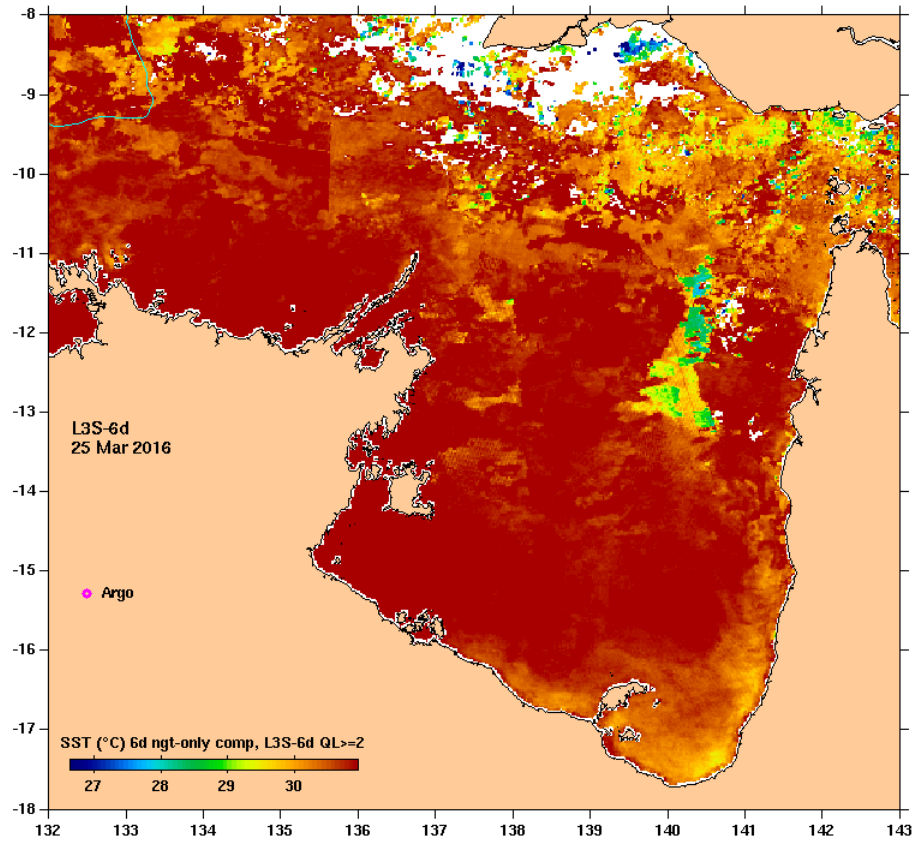
- In 2016 the Gulf of Carpentaria suffered it's worst marine heat wave
- Contributing to mangrove die-off
- Despite anomalies being only 1.5-2°C



Mar 25 2016

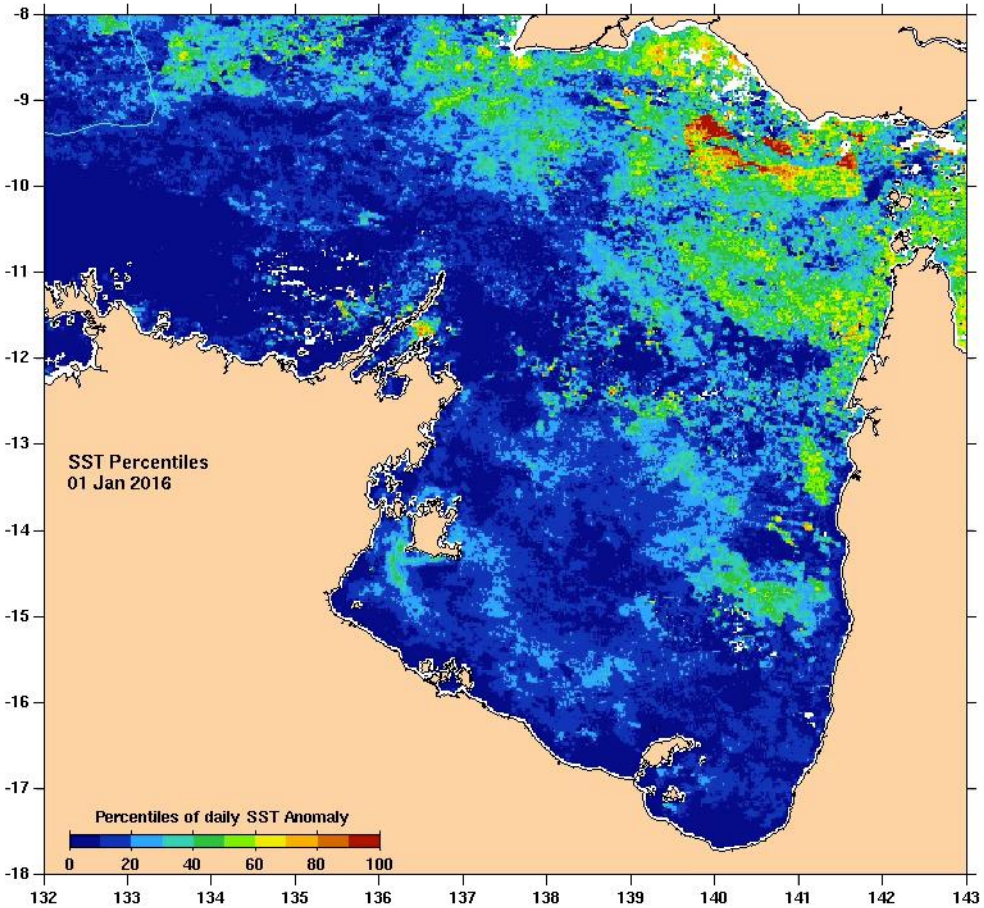
SST

Percentiles



SST Percentiles

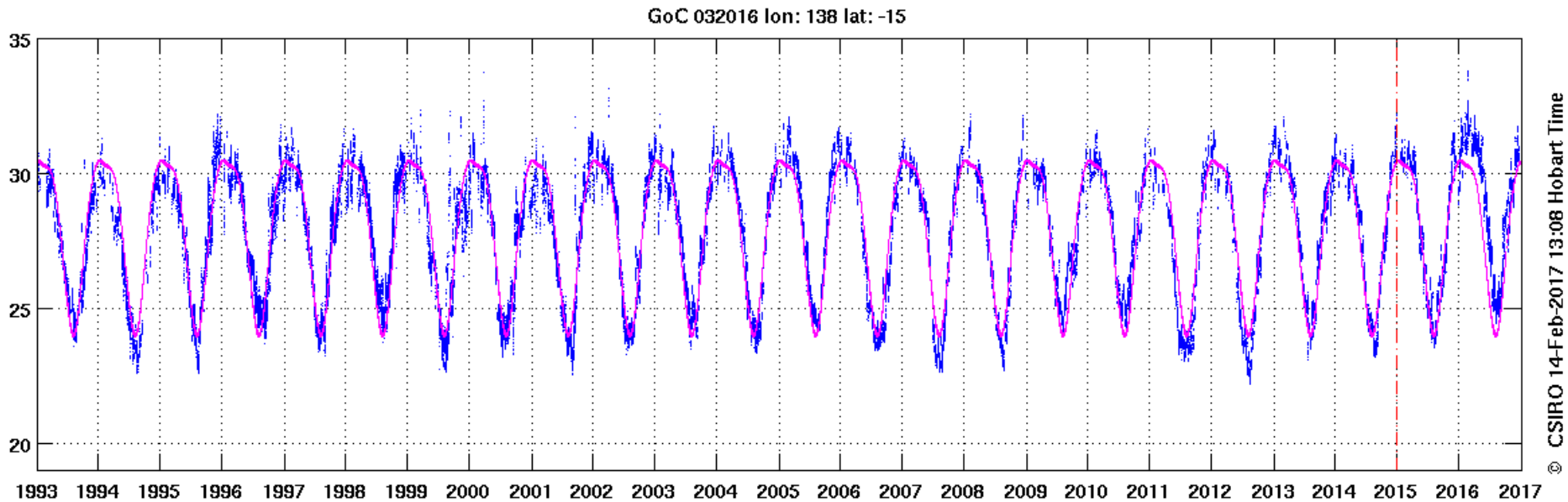
Jan-Mar 2016



Time series of SST in the Gulf of Carpentaria

Anomalously high temperatures Jan-Apr 2016

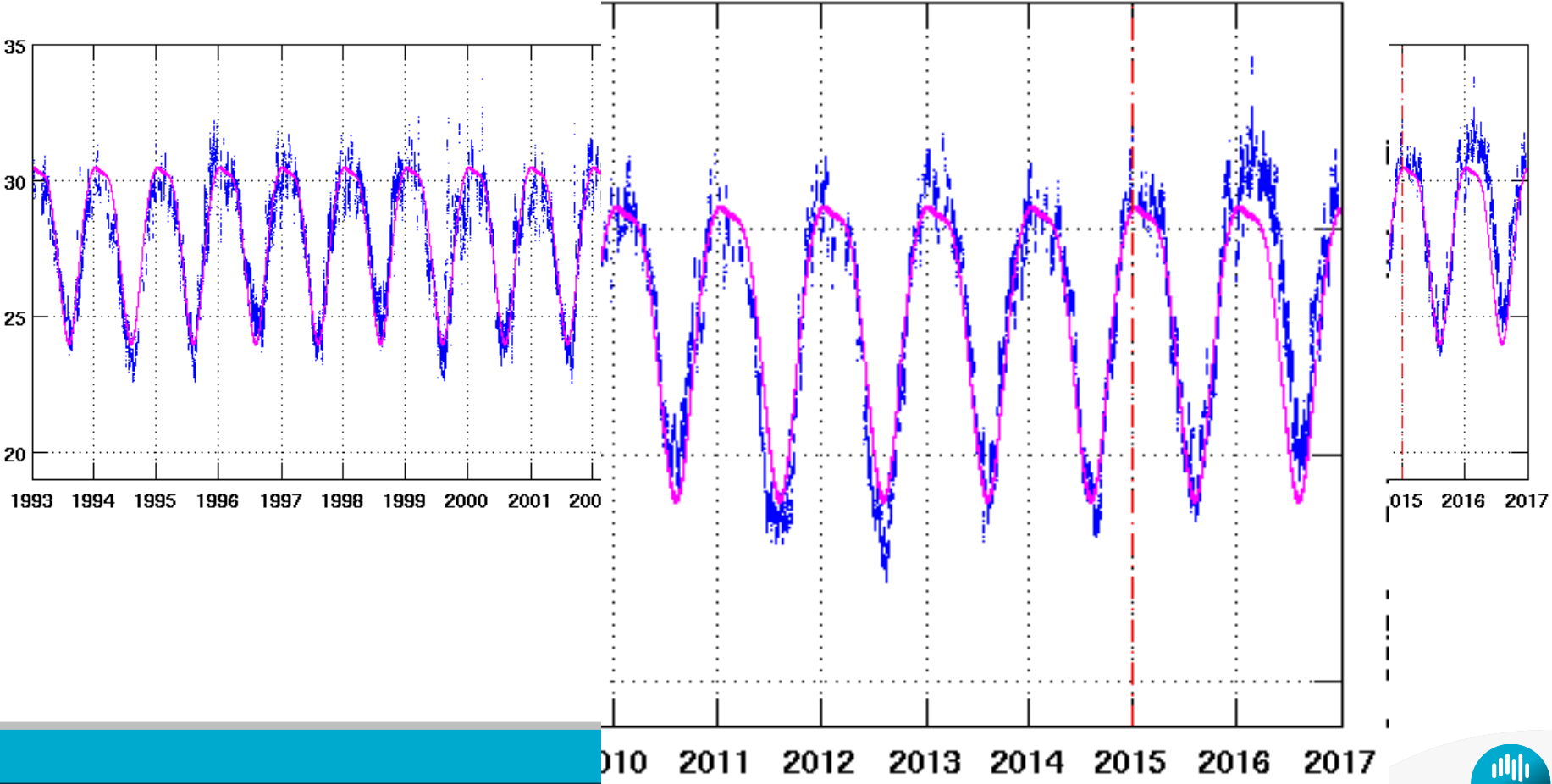
SSTAARS in pink



Time series of SST in the centre of the Gulf

Anomalously high temperatures Jan-Apr 2016

SSTAARS in pink

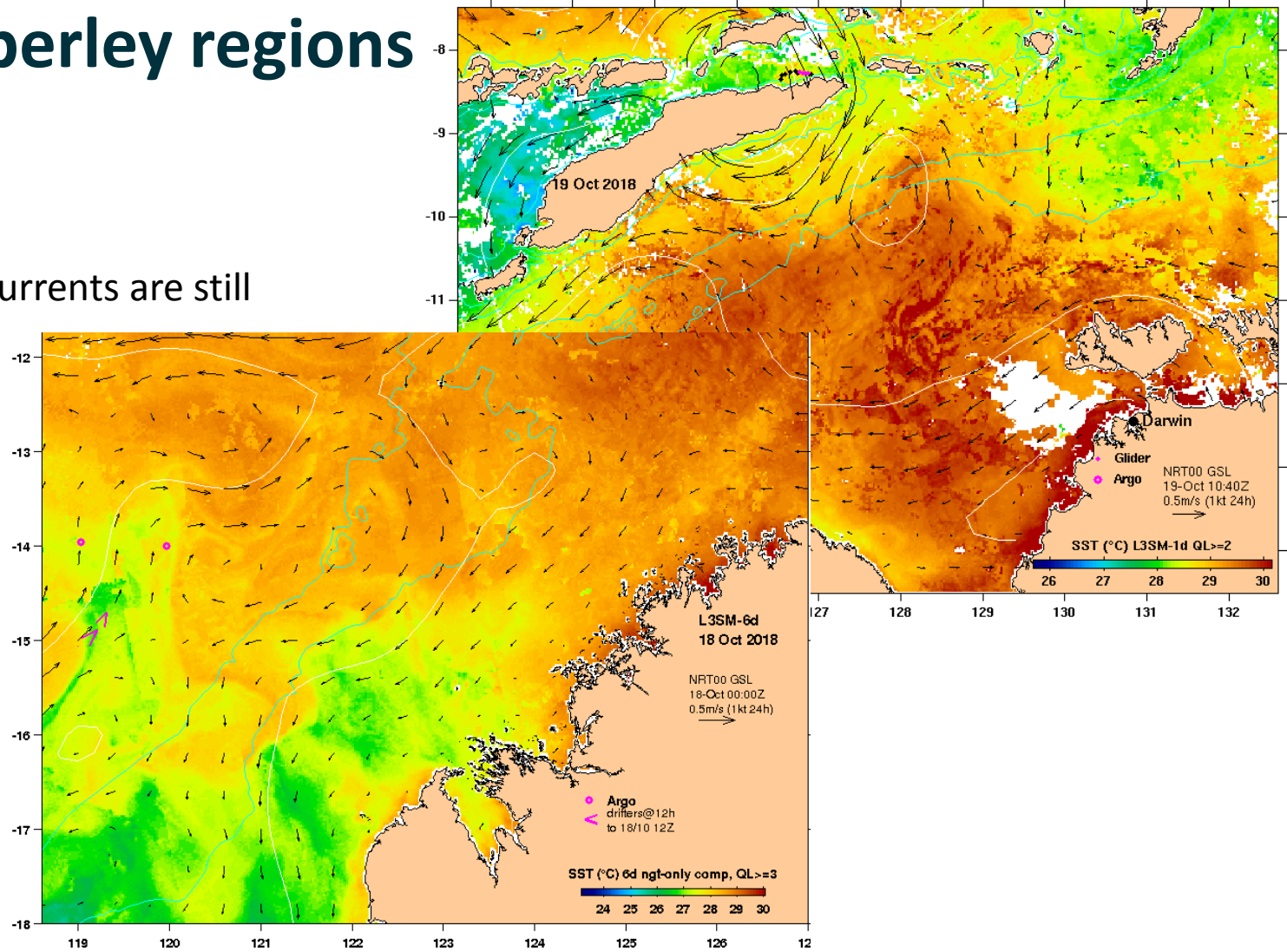


© CSIRO 14-Feb-2017 13:08 Hobart Time

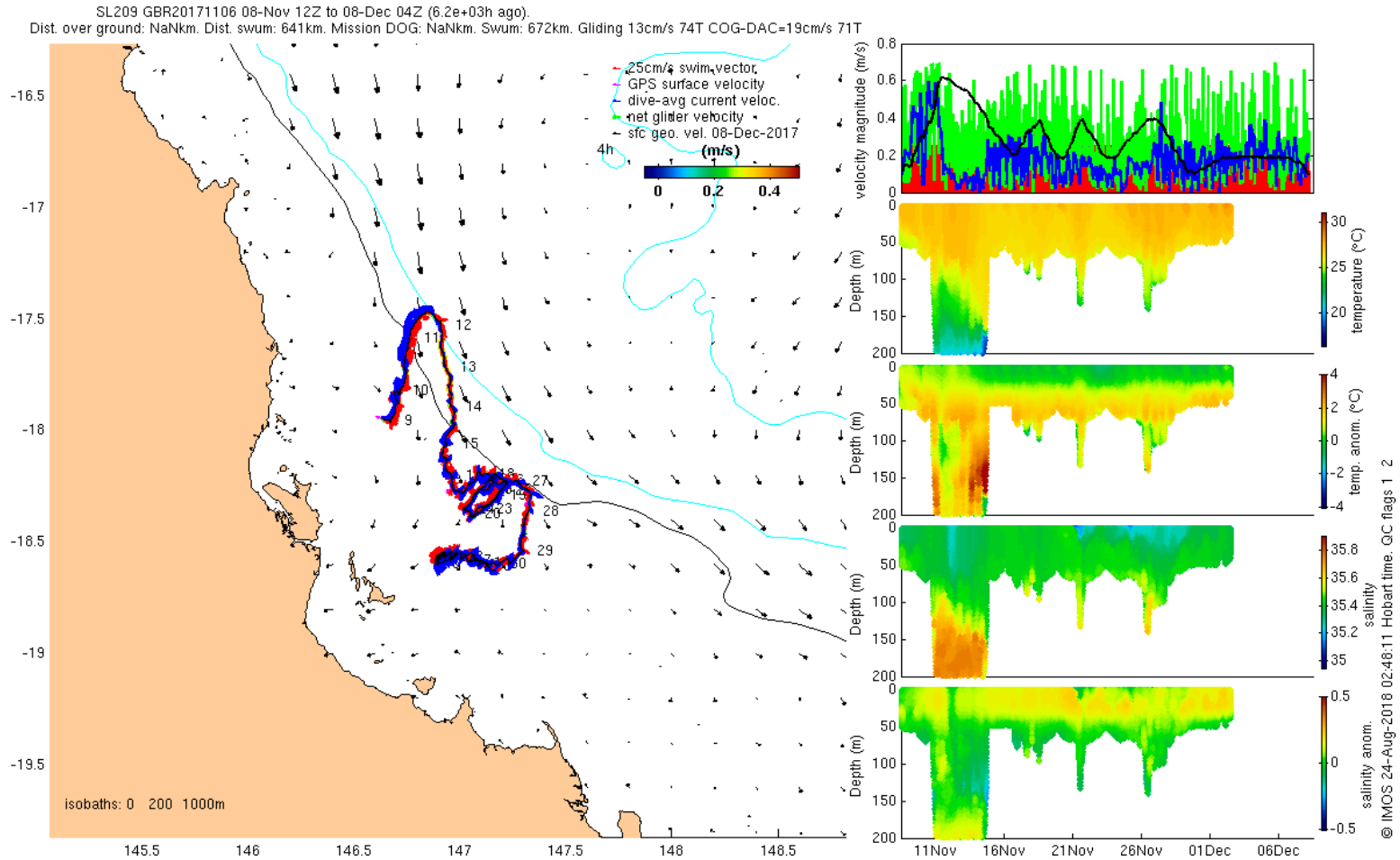


Also Darwin and Kimberley regions

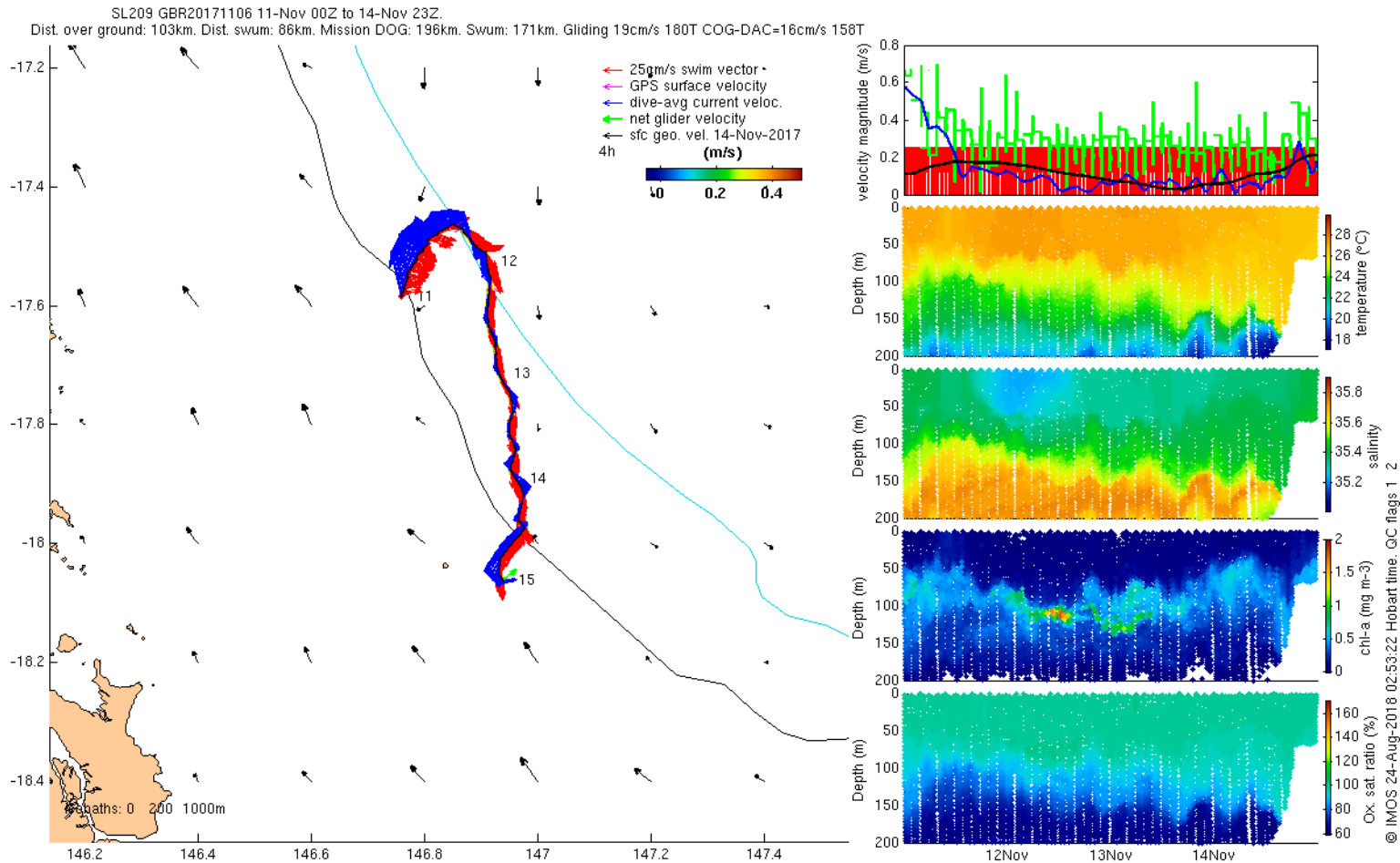
- Gliders
- Moorings
- Argo floats
- Geostrophic currents are still unreliable



Glider observations can be made in shallow water



Zoom in on 4 days of the same glider observations - showing chlorophyll-a and oxygen saturation



Why was IMOS established?

- Oceans matter to Australia as a 'blue economy'
 - national safety, sovereignty and security
 - energy security
 - food security
 - biodiversity conservation
 - coastal populations
 - climate change, variability, extremes
 - resource allocation
- Historically, Australia's marine observing was uncoordinated, had poor coverage, was fragmented, and not sustained
- **IMOS** was established in 2006-7 to address these problems



What is the Integrated Marine Observing System?

IMOS is a **national, collaborative, research infrastructure**, funded by the Australian Government.

1. National

- National Collaborative Research Infrastructure Strategy - Department of Education and Training

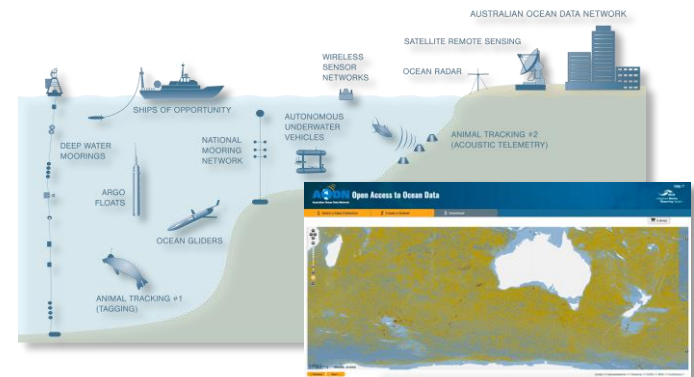


2. Collaborative

- University of Tasmania (lead agent)
- Australian Institute of Marine Science
- Bureau of Meteorology
- CSIRO
- South Australian Research and Development Institute
- University of WA
- Sydney Institute for Marine Science

3. Research Infrastructure

- systematic and sustained observing of the marine environment
- **open data** access for scientific research and other purposes



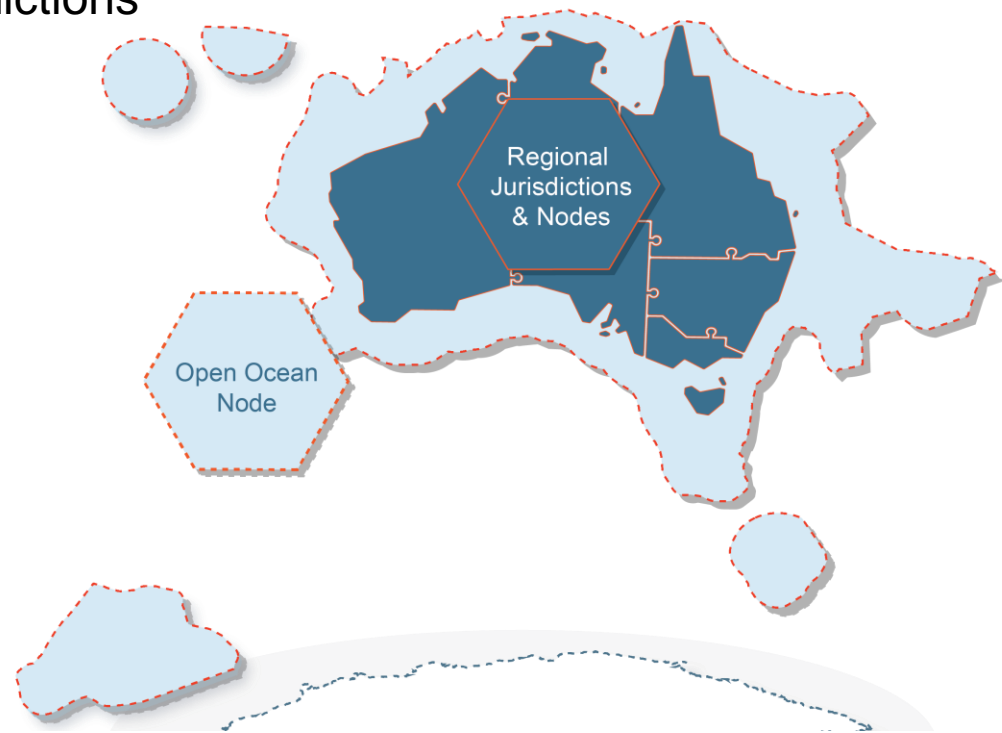
How does IMOS work?

IMOS is guided by community-driven science and implementation planning, organised through Nodes and Jurisdictions

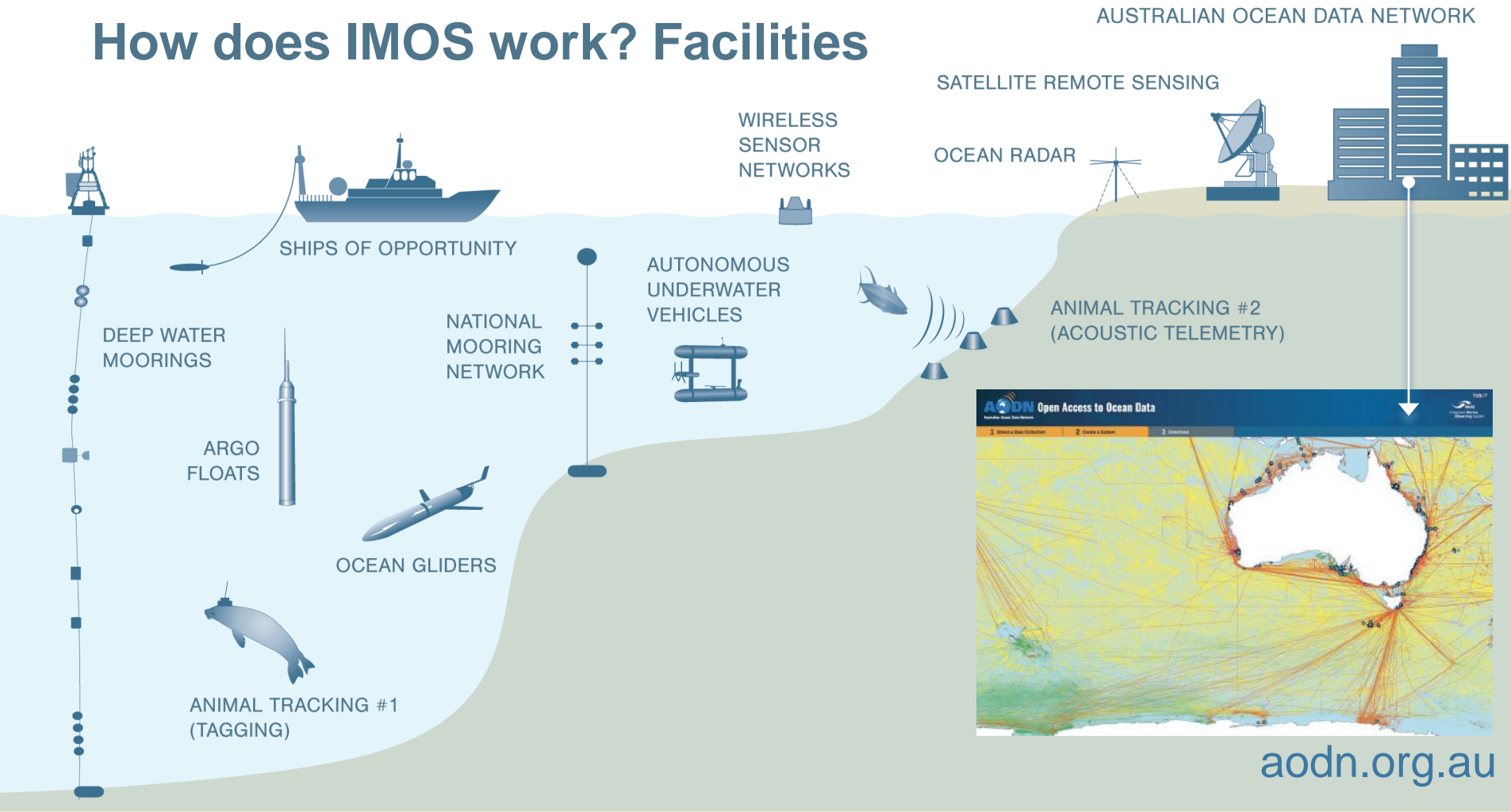
- an open ocean Node, and
- regional Nodes covering Australia's shelf and coastal oceans

This planning underpins the current context for ocean observing around Australia, and identifies the big science questions that determine

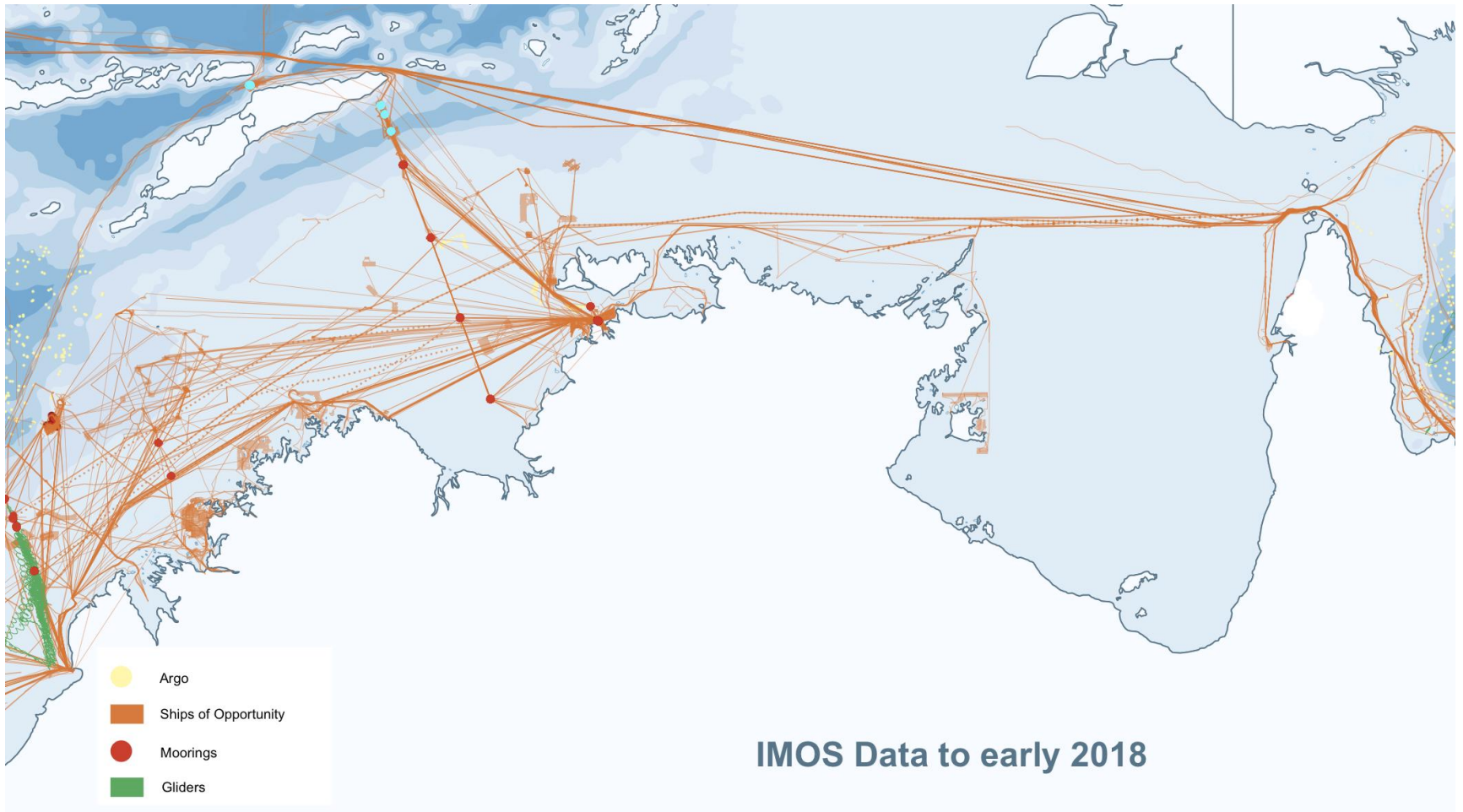
- **What we need to observe**
- **Where, when, and how**

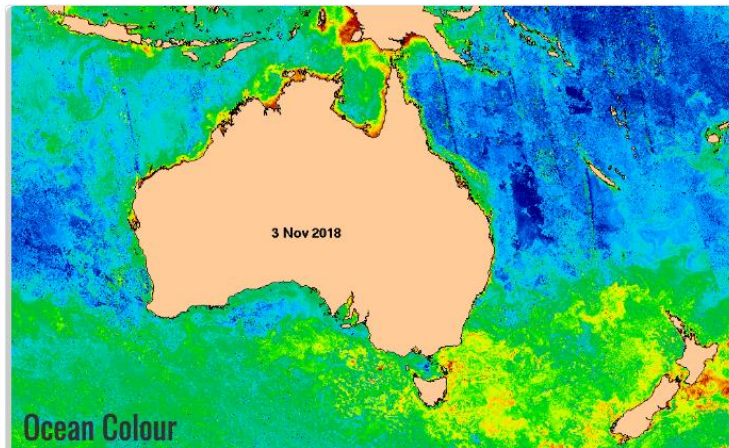
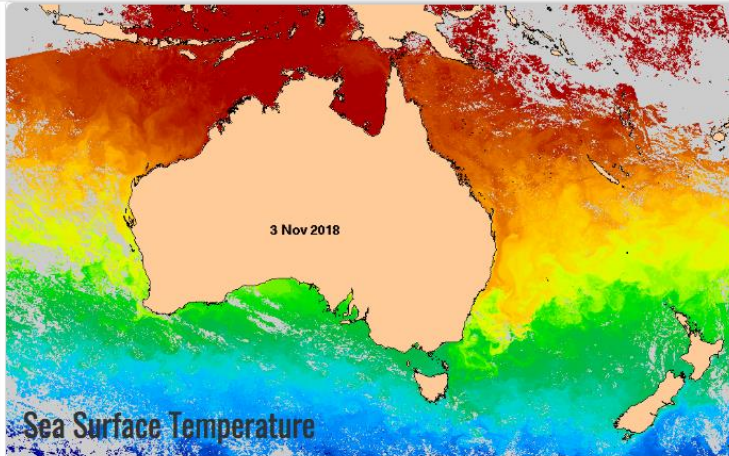


How does IMOS work? Facilities



IMOS Data from Northern Australia



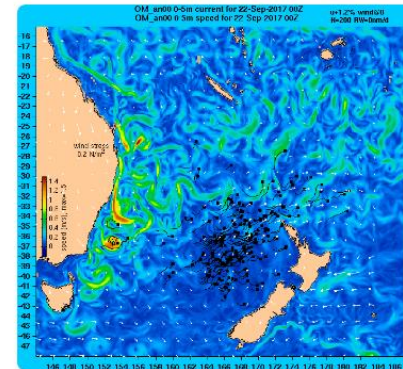


OceanCurrent News

How did Ella's message in a bottle get to Queensland from Tasmania?

David Griffin and Madeleine Cahill

23 October, 2018



Oceanographic wisdom is that waters off eastern Tasmania are either south-bound in the 'Tasman leakage' of East Australian Current waters into the Great Australian Bight, or east-bound in the 'west...

Sea Level: Rising Faster as the Ice Sheets Melt

Madeleine Cahill

12 October, 2018

Sea level has risen, on average, 8cm over the last 25 years of satellite altimetry (see figure). It doesn't seem that much - so what's the fuss? Firstly, sea level has been rising since the industrial...

Argo-Observed Bass Strait Water Off Central New South Wales

Peter Oke and Tatiana Rykova

6 September, 2018

An Argo float (WMO # 5902378: deployed in 2014) that drifted near

[SST and Percentiles](#)

[SeaCTD](#)

[Follow El Nino with SLA](#)

[Animations](#)

[Google Earth View](#)

[Argo](#)

[Current Meters](#)

[Gliders](#)

Thank you

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