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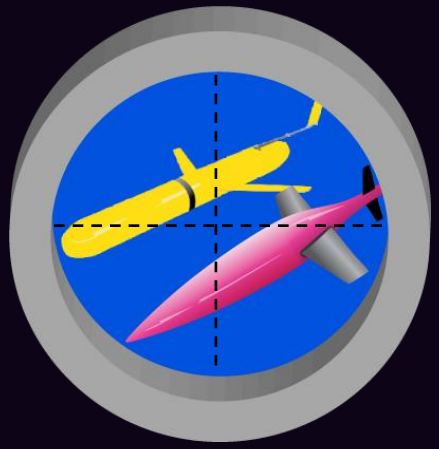

GLIDERSCOPE: Ocean glider data visualisation software

Christine Hanson, Mun Woo, Ben Hollings & Chari Pattiaratchi

Australian National Facility for Ocean Gliders (ANFOG),
School of Environmental Systems Engineering (SESE),
The University of Western Australia, Perth WA

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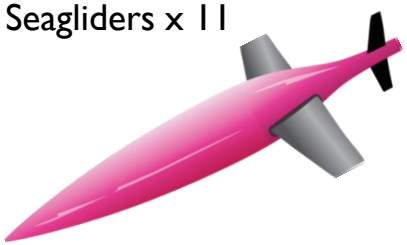
Australian National Facility for Ocean Gliders (ANFOG)

- ANFOG operational since mid-2008

Slocum gliders x 4

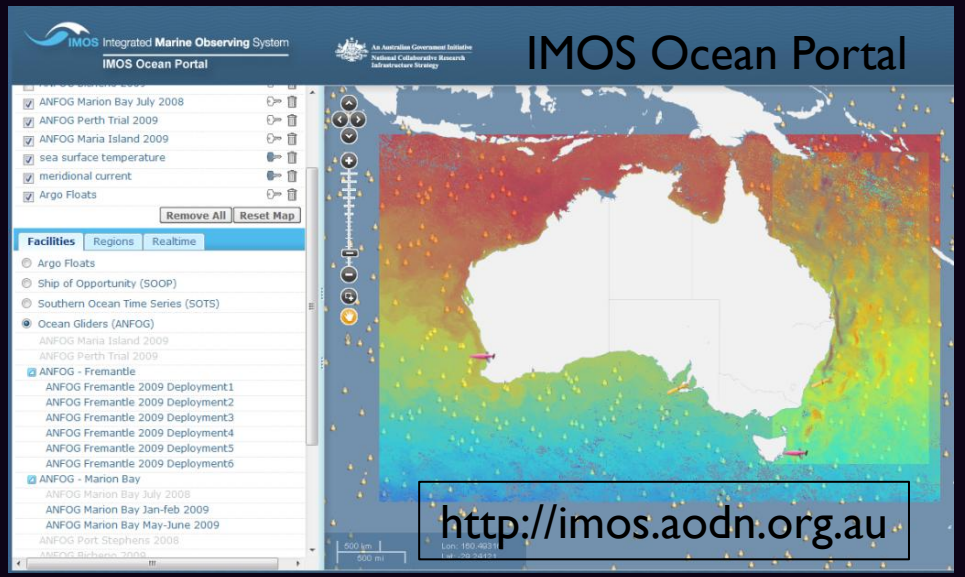
Seagliders x 11



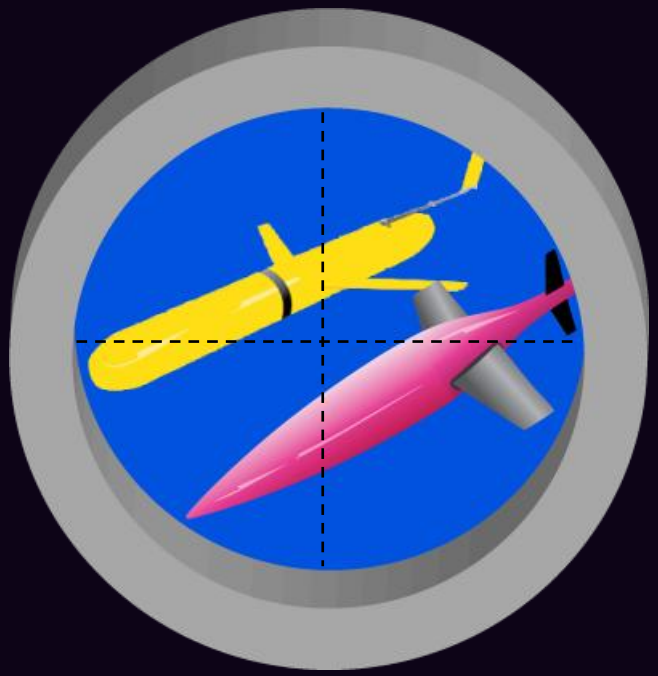
- Sustained observations off western, southern and eastern coasts of Australia to date

- As part of Australia's Integrated Marine Observing System (IMOS), all ANFOG data is freely available

- Files are NetCDF (Network Common Data Form)
- Wide range of users – led to development of glider visualisation software



ANFOG GLIDERSCOPE



- Software to visualise and extract ocean glider data
- Uses Matlab Component Runtime (MCR)
- GUI for easy access to NetCDF files
- Filters out bad data
- Visualise data using 2D & 3D plots of water properties, interpolated contours, vertical profiles, etc.
- Choose and extract segments of glider data for use within GLIDERSCOPE or export to other applications

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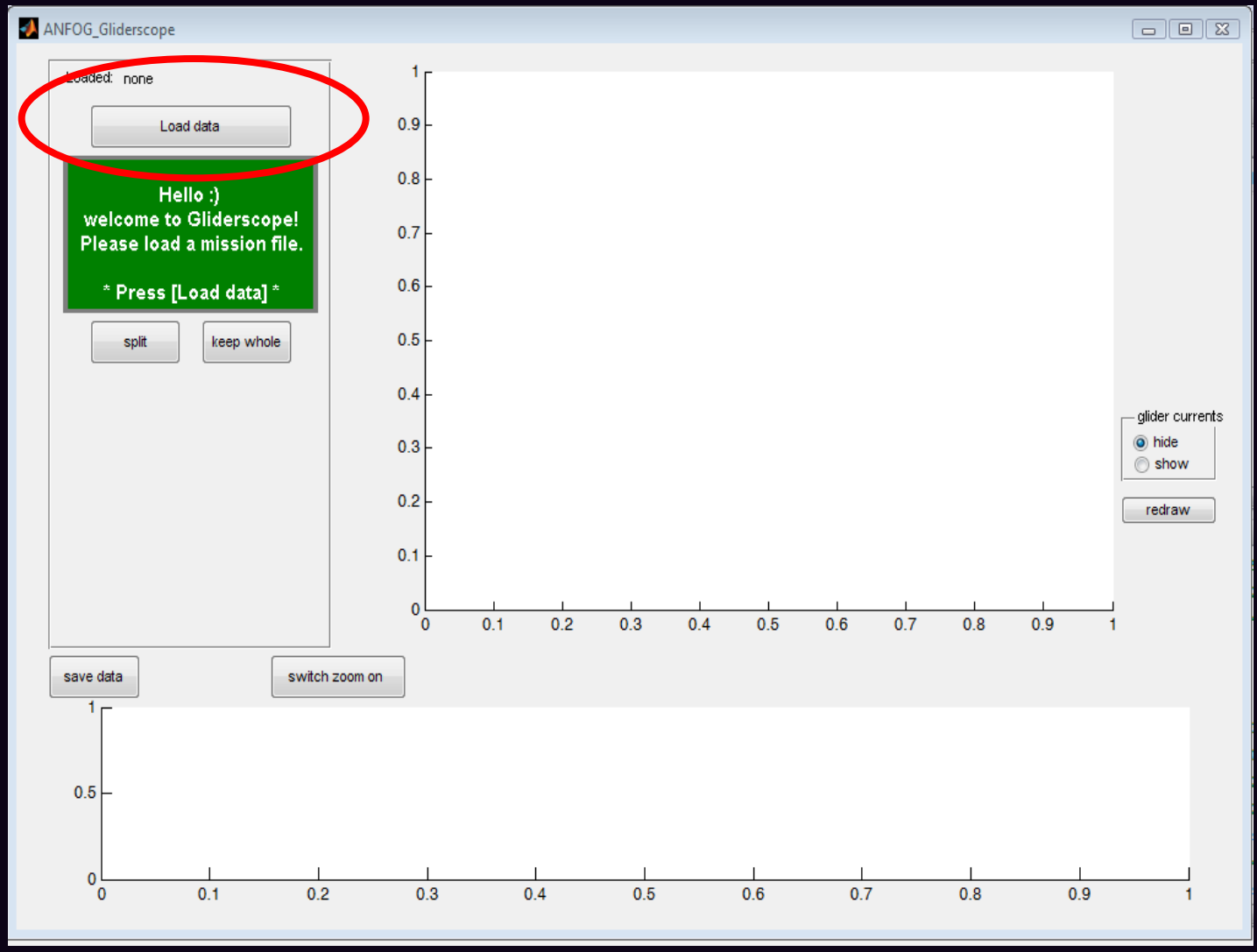
GLIDERSCOPE



GLIDERSCOPE's main dashboard with controls for loading and extracting data

Load data & examine glider path

ANFOG_Glider scope

Loaded: Seaglider data from NSW20091019

Load data

To select by mouse :
-pick right or bottom chart
-press [use mouse-clicks];
To select with keyboard :
-input in index range boxes

split | keep whole

Data segment
right plot / bottom plot | use mouse-clicks

Index range : 1 to 1004402 show

min depth 0.21 max depth 1001.68 m

Done

save data | switch zoom on

Flightpath on horizontal-plane

lat °N

lon °E

glider currents: hide / show | redraw

Glider trajectory through water

depth m

Data Index Numbers

GLIDERSCOPE's main dashboard with controls for loading and extracting data

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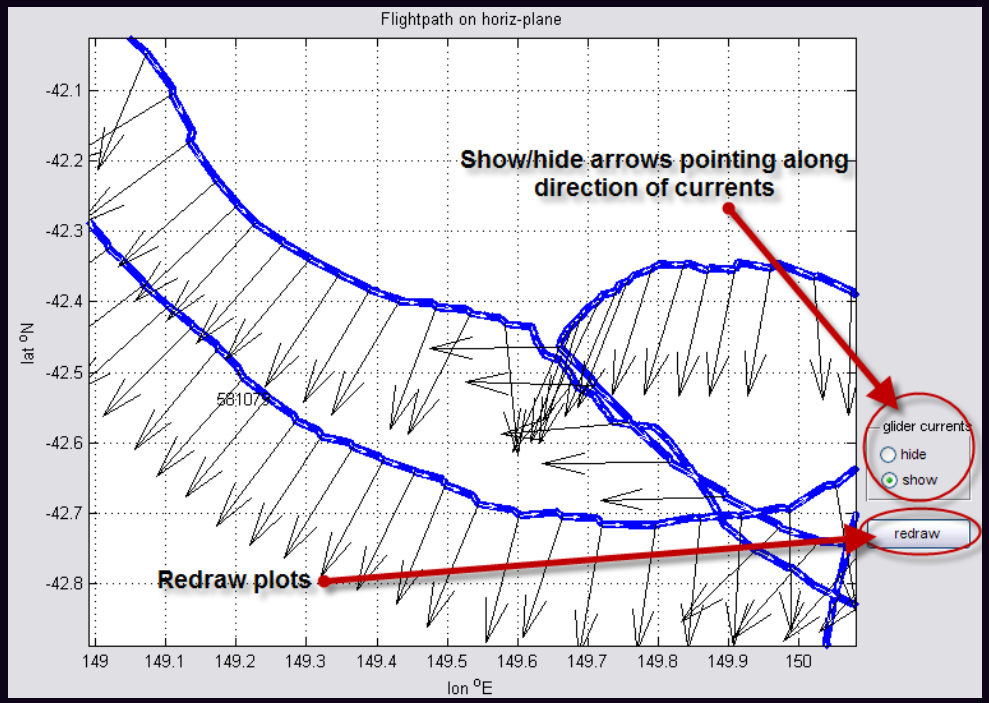
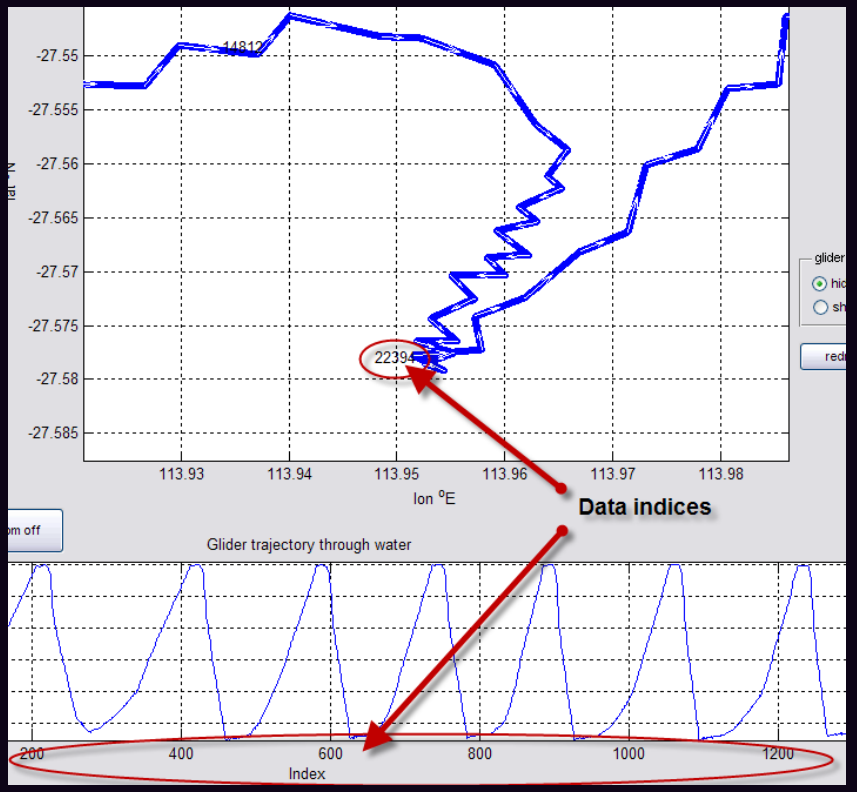
View current vectors & vertical path



Aerial view of the glider path can be supplemented with current vectors (depth-mean values) computed from GPS fixes and onboard engineering parameters



Glider vertical trajectory is displayed with data indices along the x-axis

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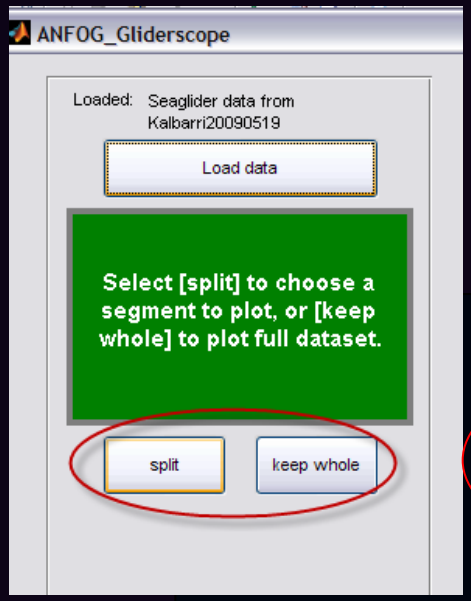
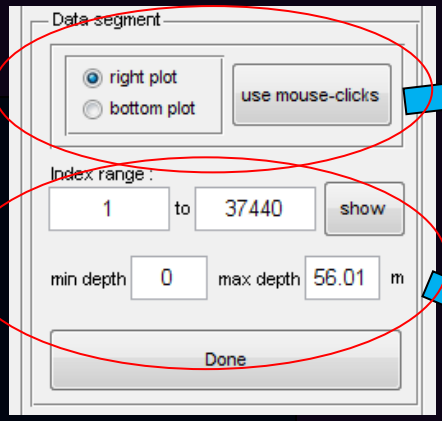
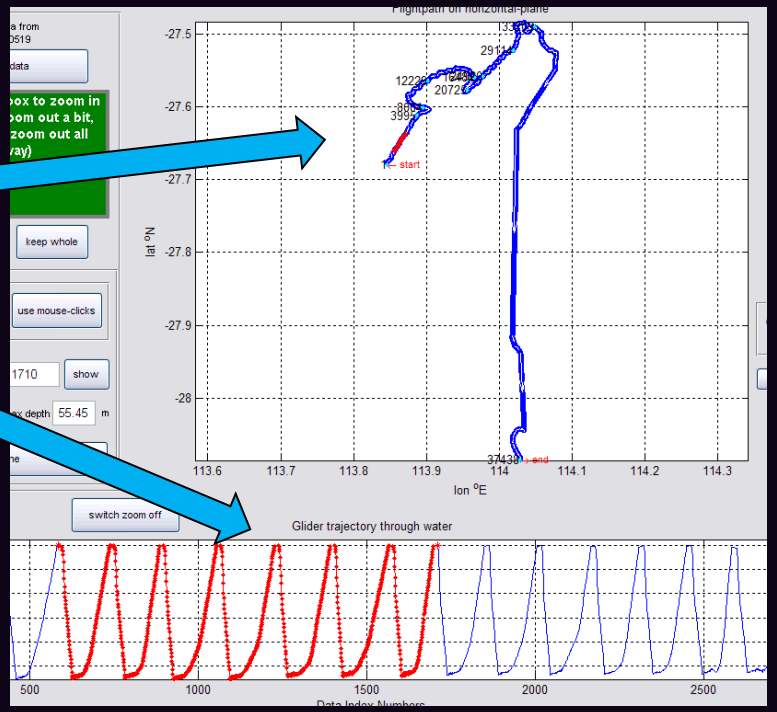
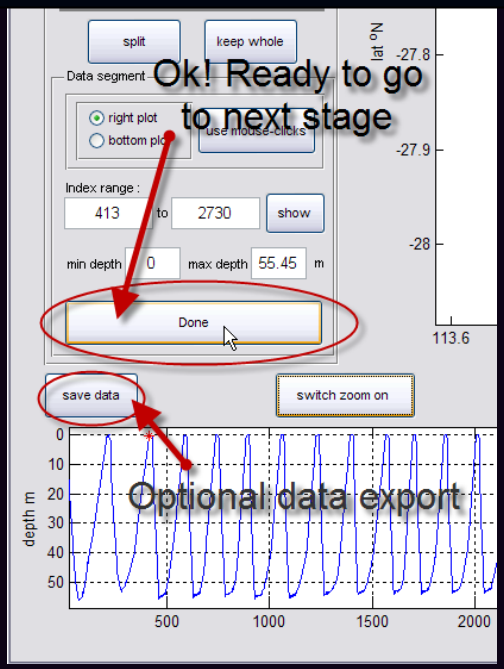
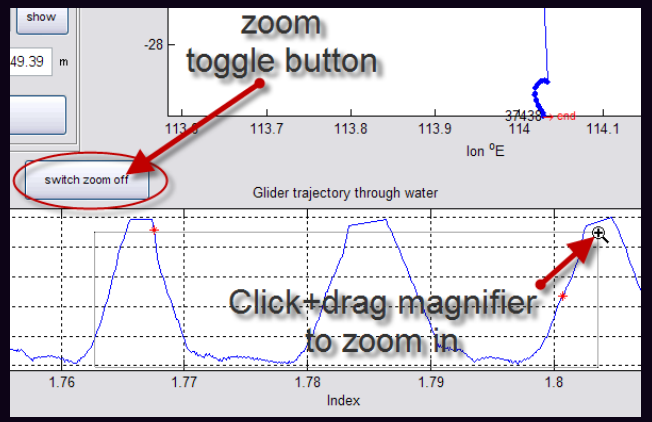
Extract data segments











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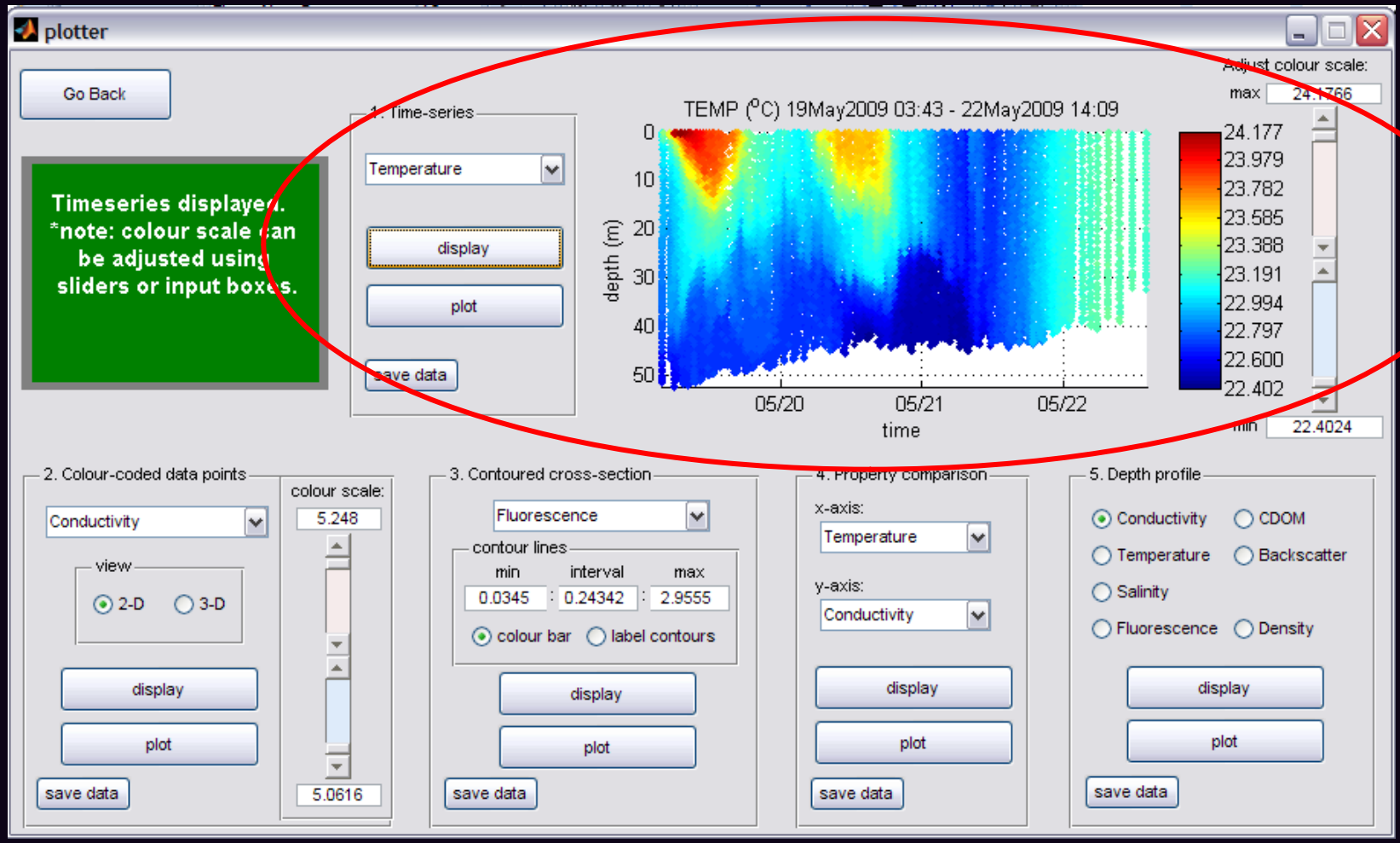
Data visualisation



GLIDERSCOPE's plotter dashboard

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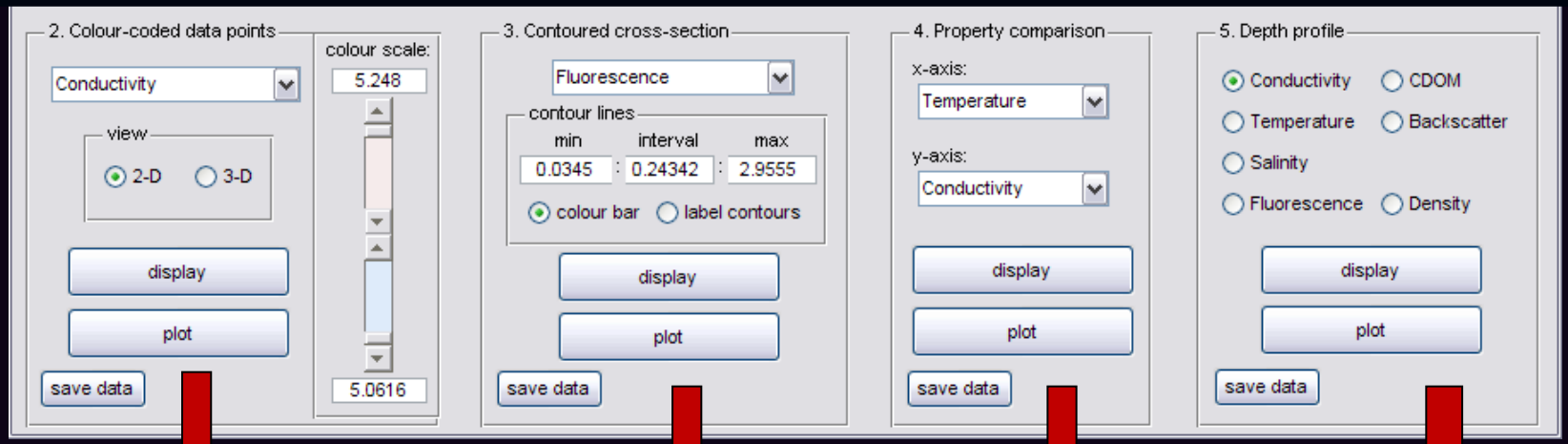
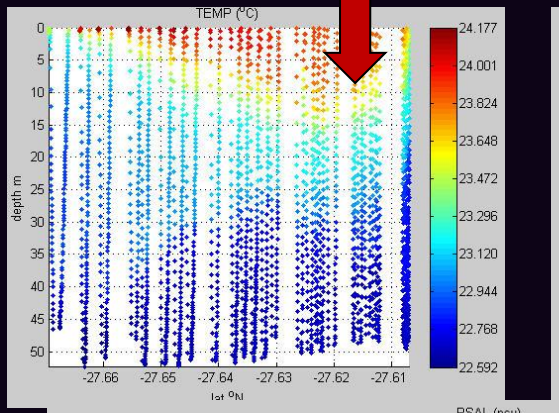
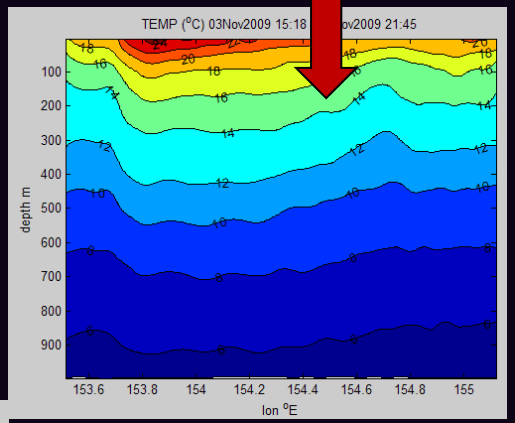
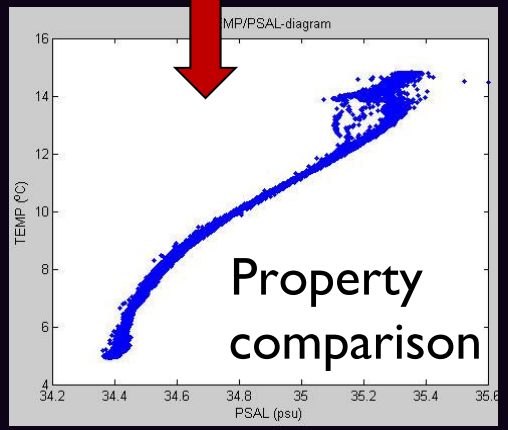
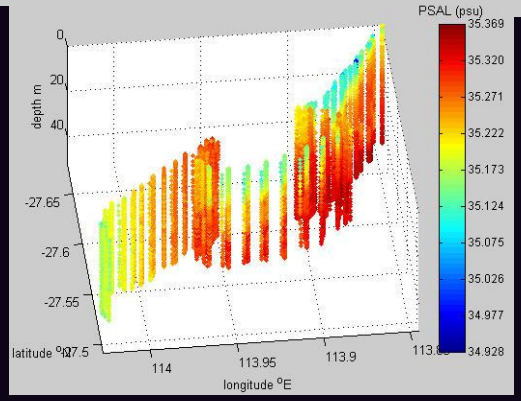




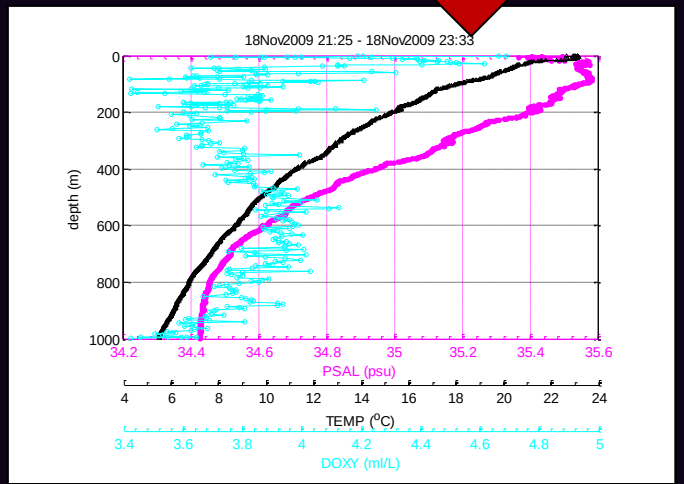


Contoured cross-section





Colour-coded data points



Depth profiles

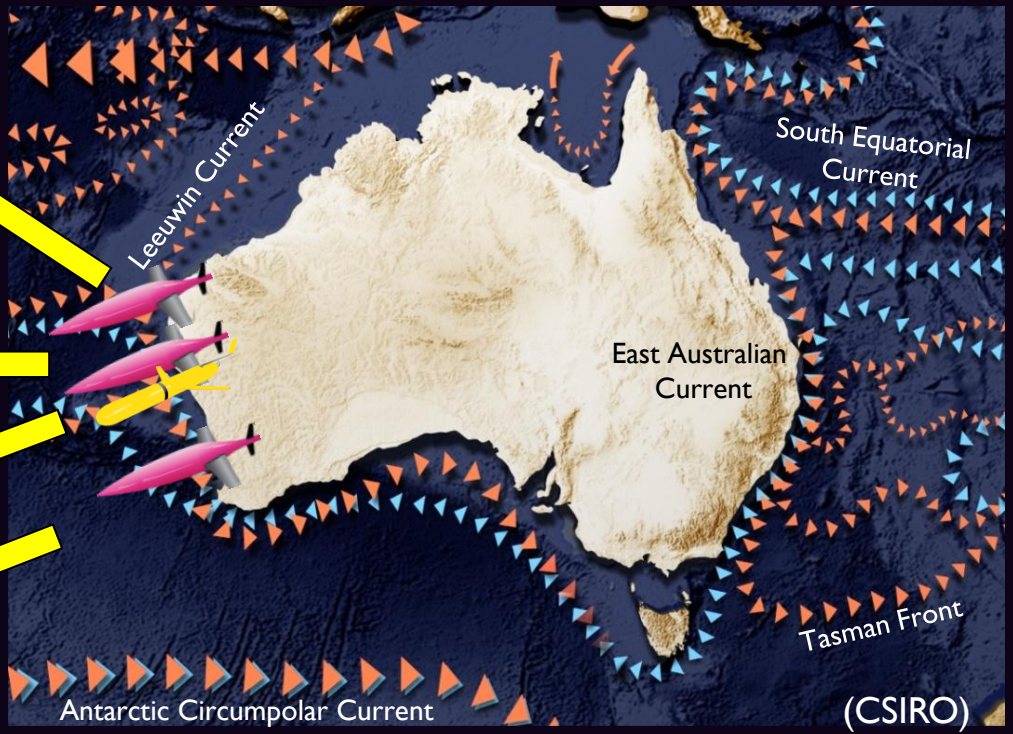
Example datasets/analyses from Western Australia

Sequence of transects to examine evolution of current structure

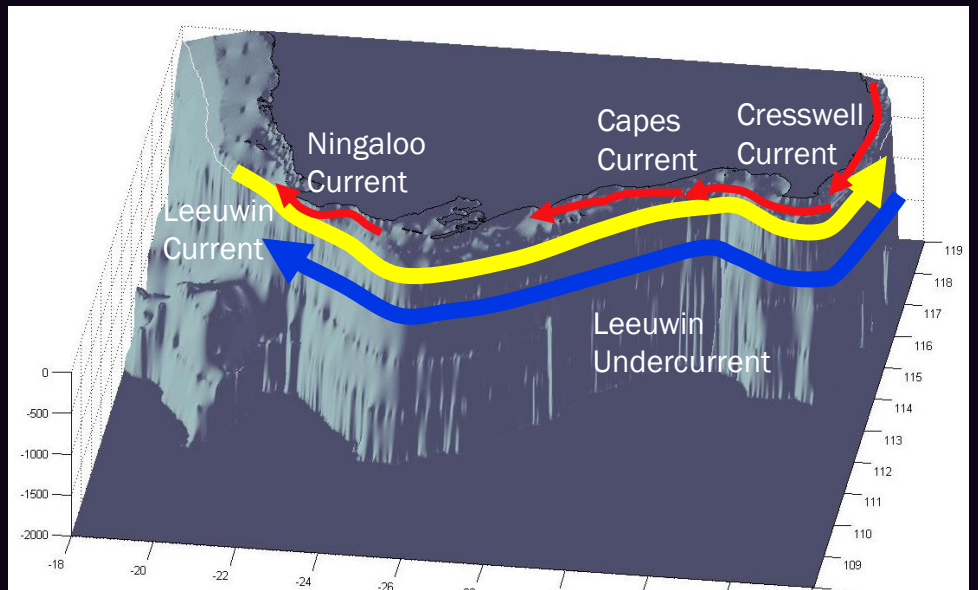
Temporal evolution of mesoscale eddy

Nearshore survey

Fixed location, geographically limited feature

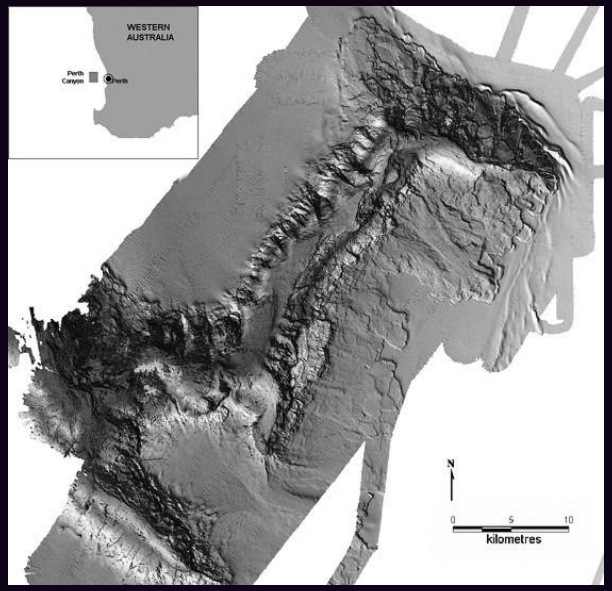


- Leeuwin Current system
  - southward-flowing, downwelling Leeuwin Current
  - northward-flowing Leeuwin Undercurrent
  - seasonal inshore, upwelling countercurrents

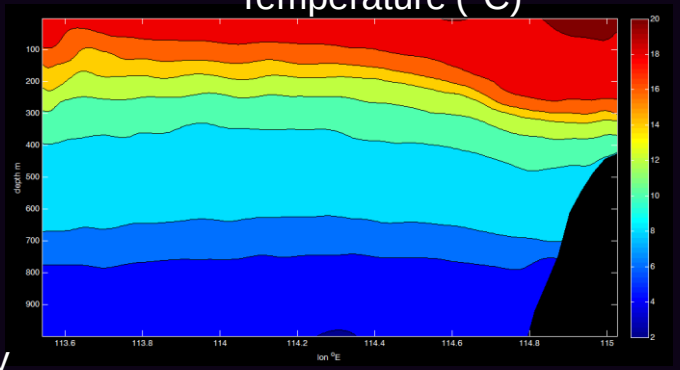


Examining processes related to geological features

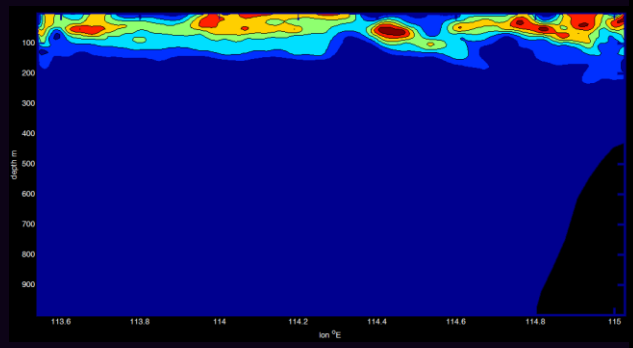
Perth Canyon deployment
May - Sept 2010



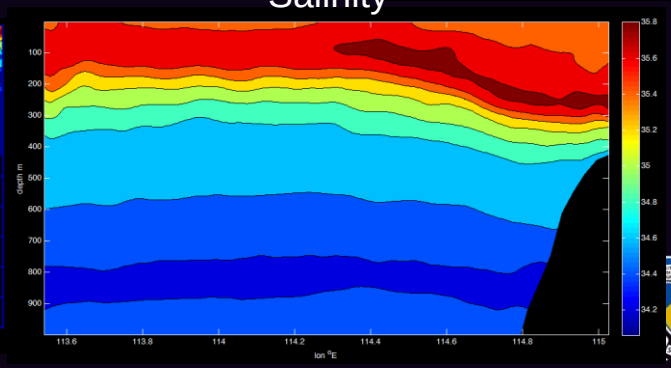
Temperature (°C)



Chlorophyll fluorescence



Salinity



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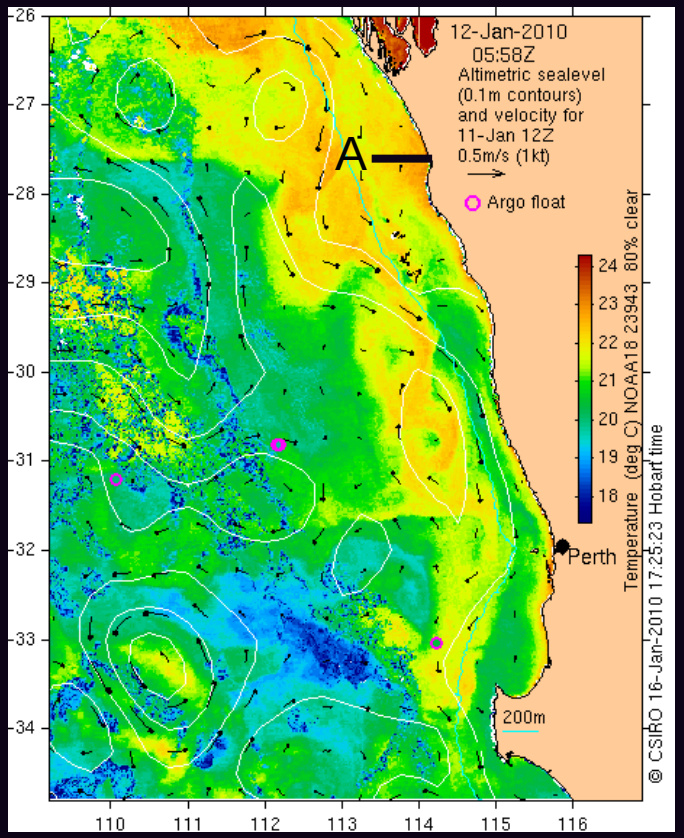
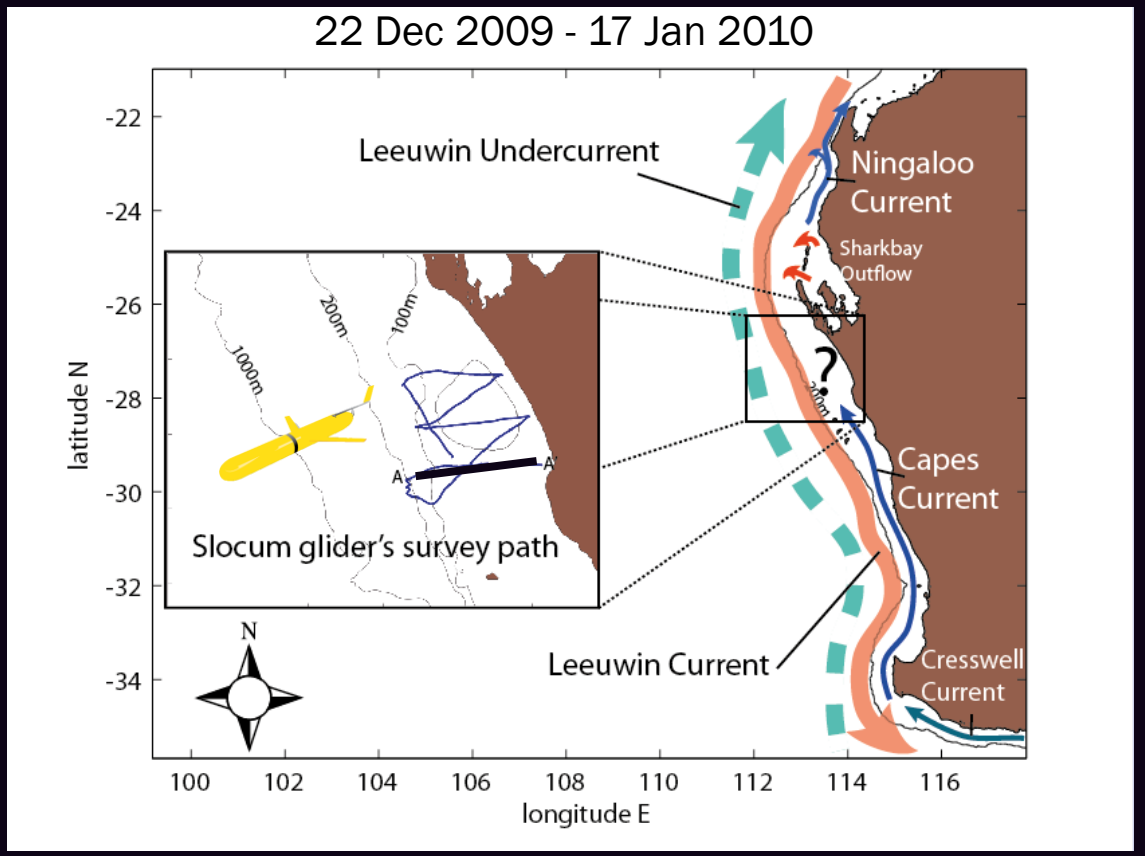
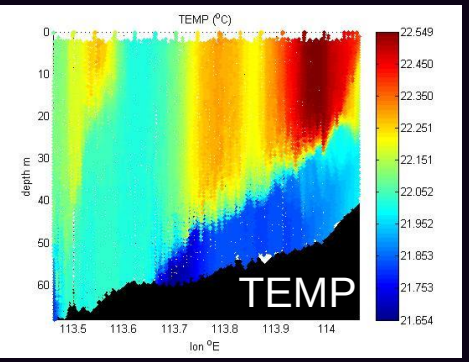
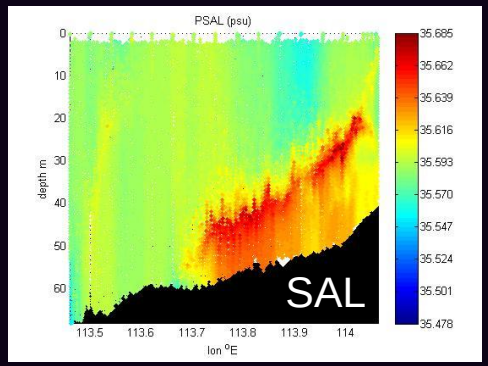
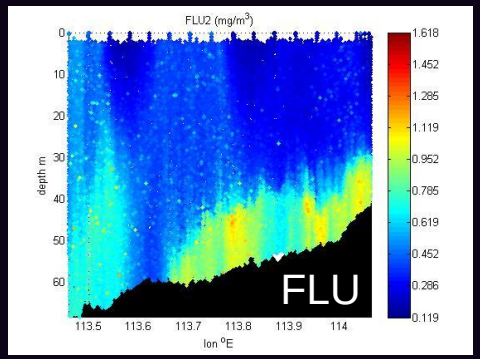
Nearshore survey – northern extent of the Capes Current

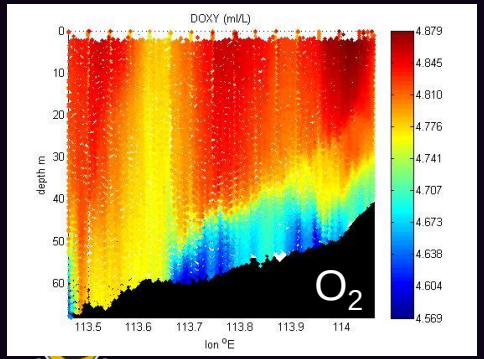




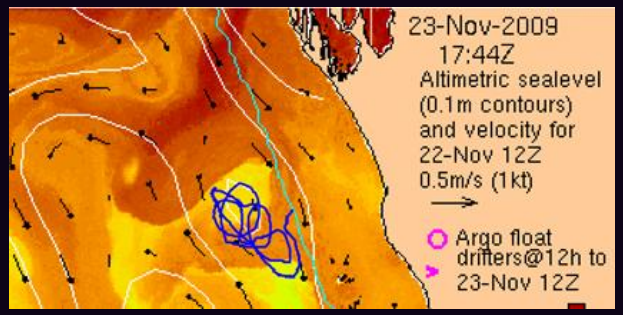




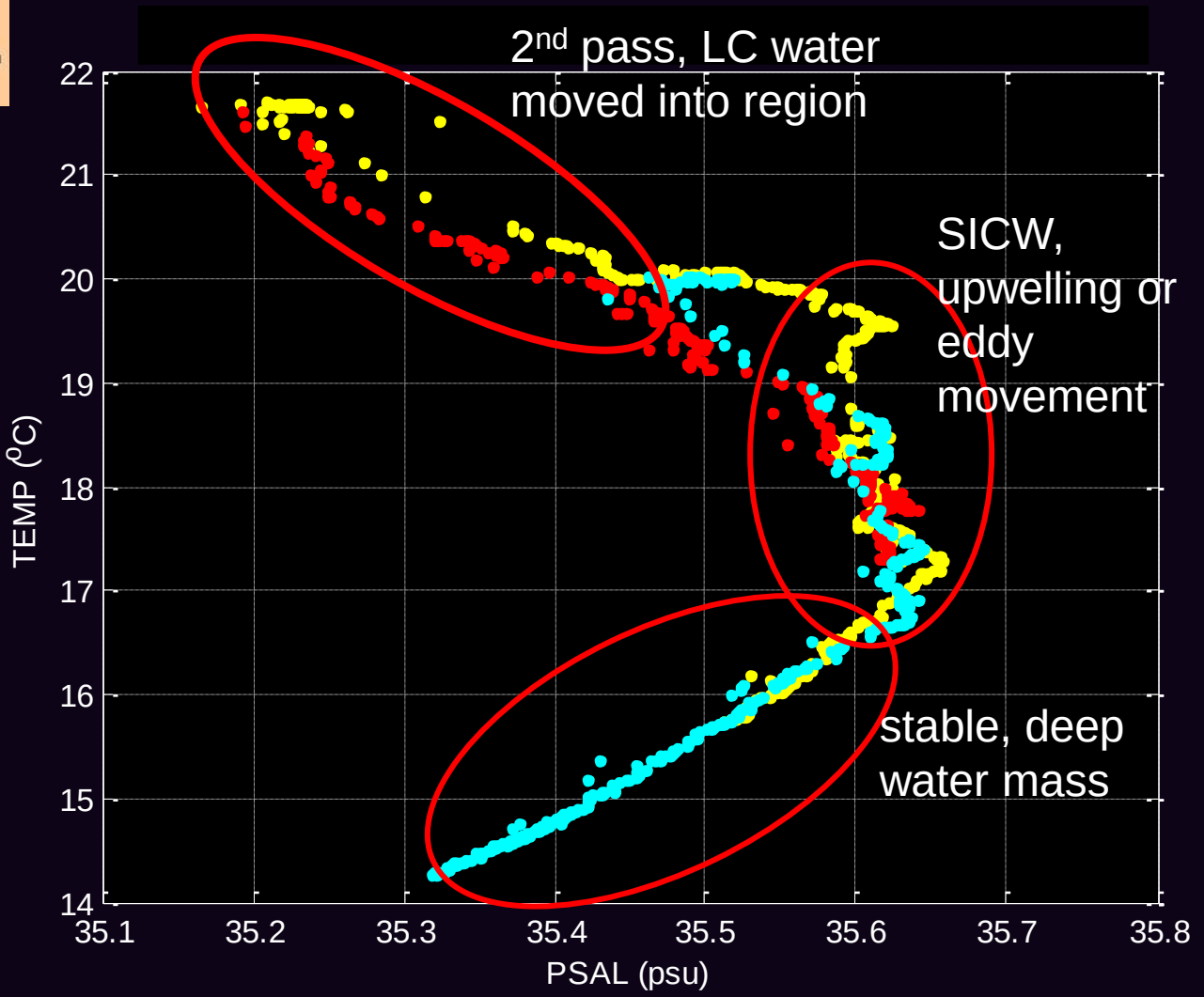




Examining multiple passes through a single point



18 Nov – blue
5 Dec – red
9 Dec – yellow



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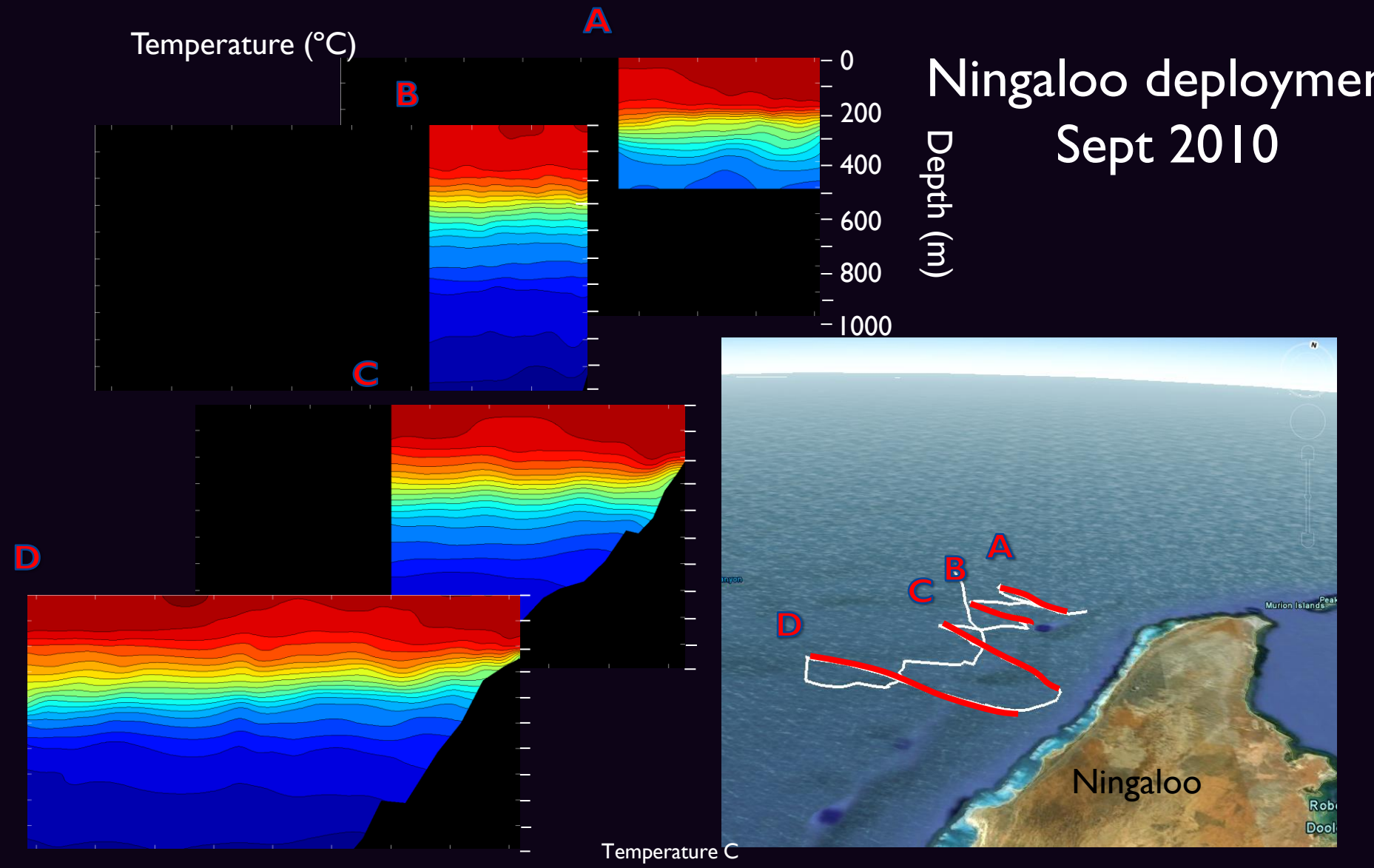
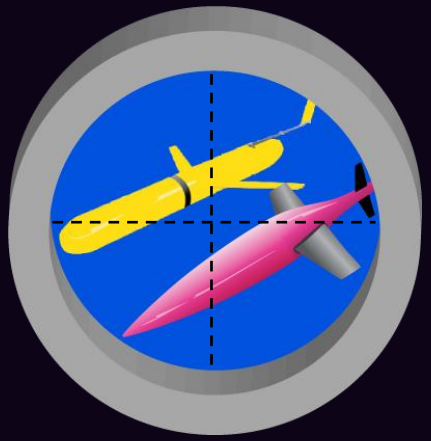
Examining a sequential series of transects



Summary



- ANFOG glider data provides new, high-resolution view of oceanographic processes around Australia
- GLIDERSCOPE is a useful and effective tool for extracting, viewing and analysing glider data
- Can be used for any NetCDF glider data that conforms to standardised variable names (OceanSITES template)

GLIDERSCOPE (program, manual, example dataset) is available for download at

http://imos.org.au/anfog.html

...or see me for a disk...

More ANFOG NetCDF data files

http://imos.aodn.org.au

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EGO 6 or 7 in Perth, Western Australia?

The Kimberley – northern tropics, monsoonal climate, macrotidal (10 – 12 m)

Ningaloo Reef – fringing reef, 260 km long, access from beach

Shark Bay World Heritage Area

Mediterranean climate, microtidal (0.7 m)

temperate Southern Ocean region

Image credits – Tourism WA & Wilderness Society (R. Costin)

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Perth & the Swan River

(G.Alcie)

Perth coastline & beaches

(Tourism WA)

Rottnest Island from the Air - Image courtesy Rottnest Island Authority

(RIA)

quokka

(RIA)

Rottnest Island (20 km off Perth)

David Budd © 2008

(Tourism WA)

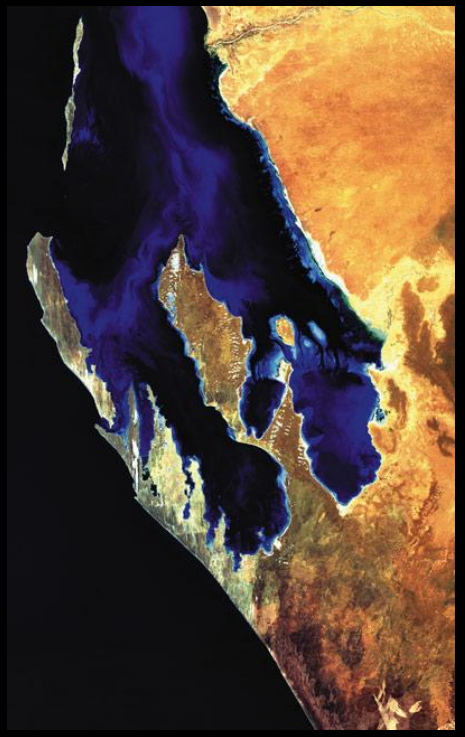
Margaret River

Photo credits: Tourism WA

Shark Bay World Heritage Area

living stromatolites

hypersaline lagoons



dugongs

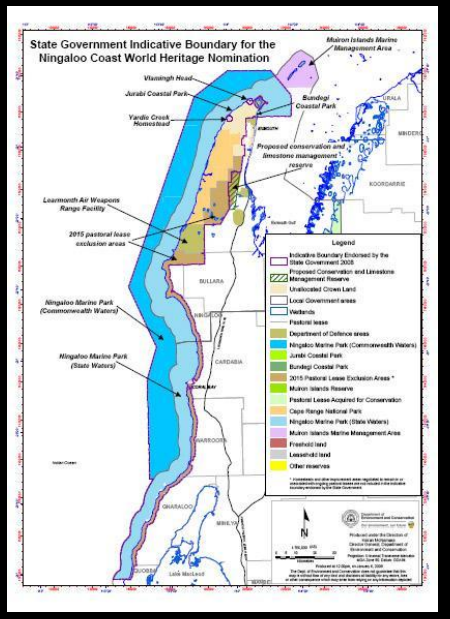
Bottlenose dolphins – interactive with humans

Tamala rose

Photo credits: Dept of Environment & Conservation

Ningaloo Reef

(Tourism WA)



(D. Litchfield)

(ABC)

(A. Edwards)

(Tourism WA)

(SESE)

(Steve Gibson, Ningaloo Blue Dive)

(S. Graham)

Whale sharks & manta rays at Ningaloo

(Tourism WA)

The Kimberley

Photo credits: Tourism WA

WA wildlife – feathery

galahs

rainbow lorikeet

red-tailed black cockatoos

splendid fairy wren

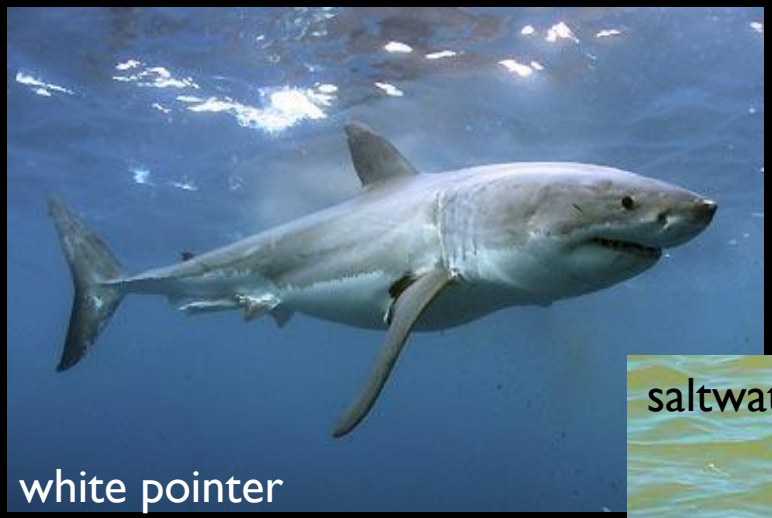
kookaburra

© OceanwideImages.com

WA wildlife – furry

WA wildlife – scaly

WA wildlife – kinda scary


white pointer

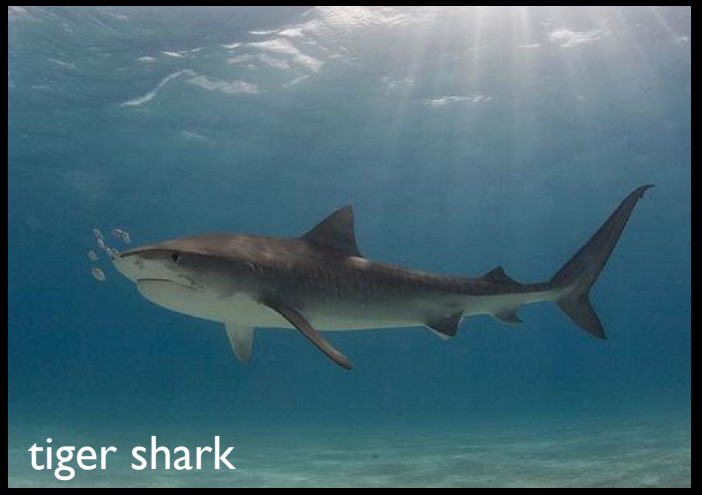
dugite

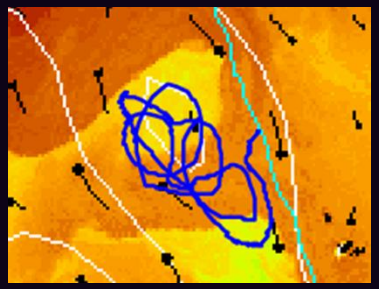
saltwater crocodile

stonefish

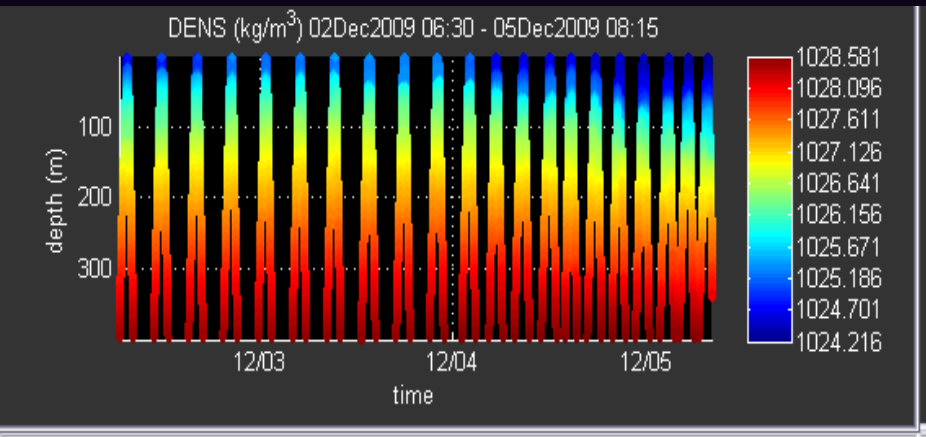
box jellyfish

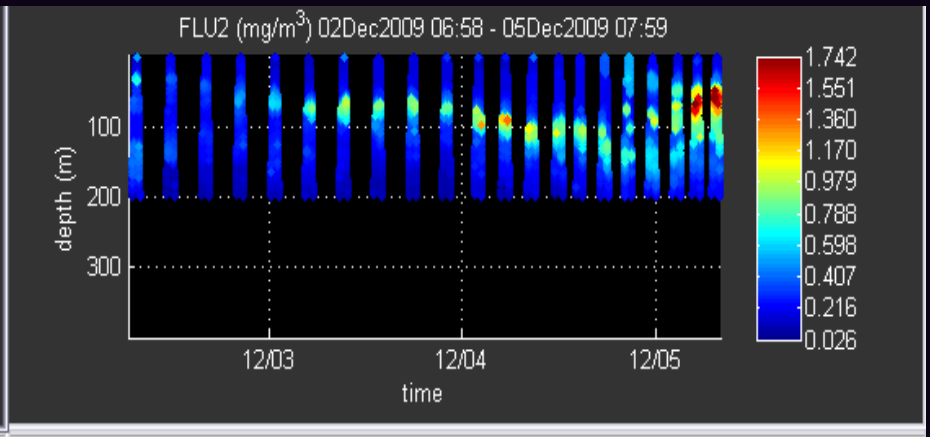
inland taipan

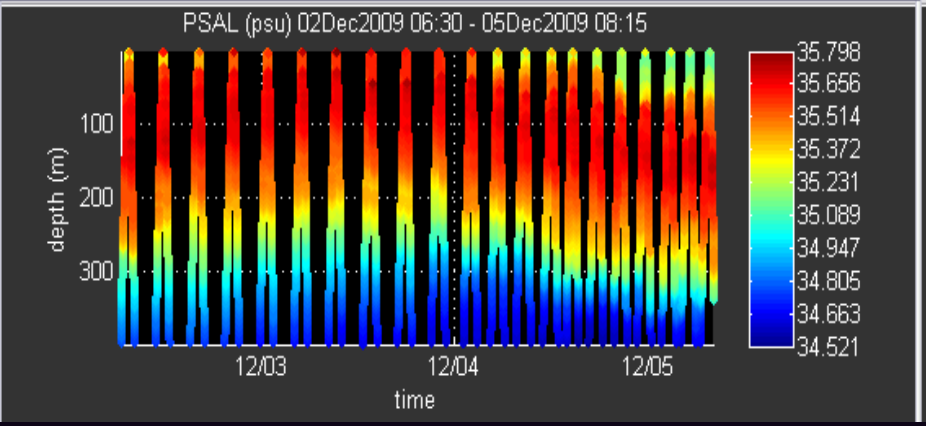

tiger shark

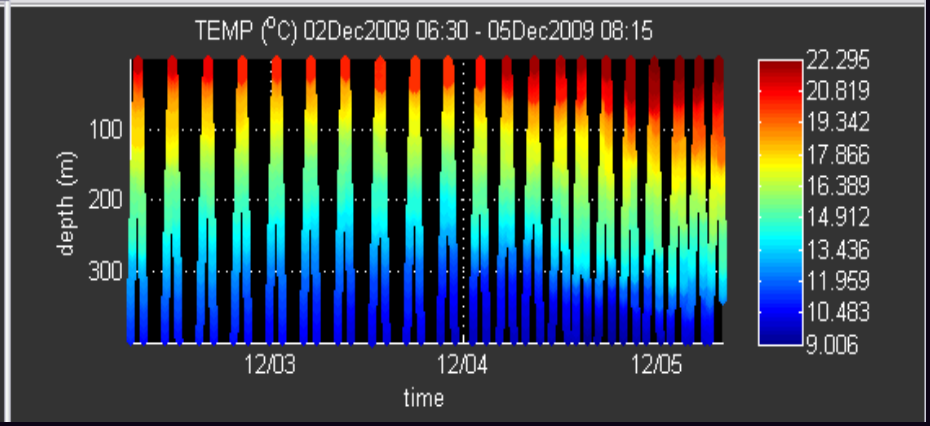


Kalbarri deployment
Nov - Dec 2009









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