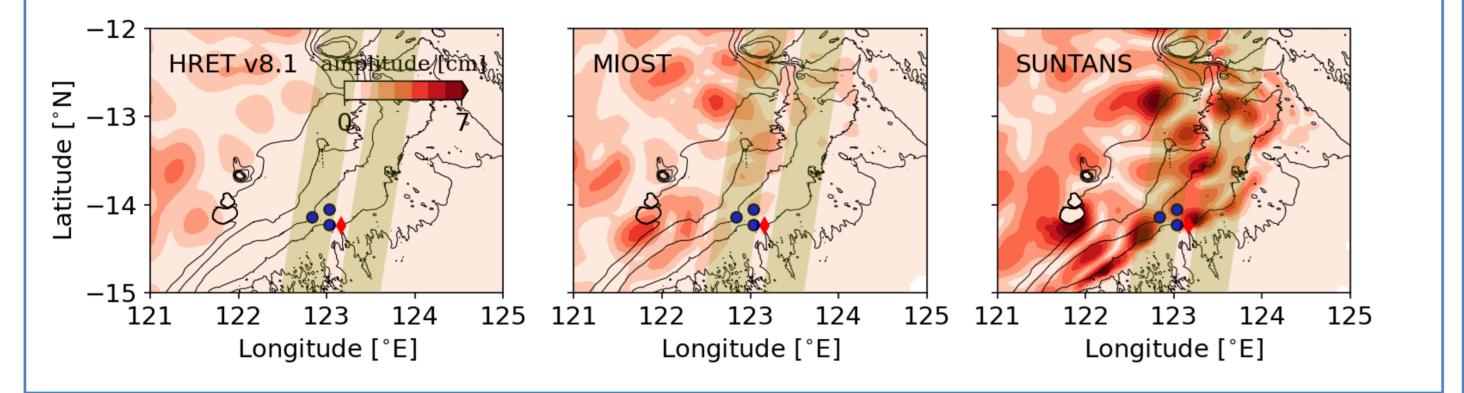
North West Australian Shelf Topographic Internal Tide and **Eddy Measurement Program**

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Introduction

In situ data collected during SWOT rapid phase in region with:

- Large-amplitude internal tides
- Topographically-generated eddies
- Non-linear and breaking internal waves 3.



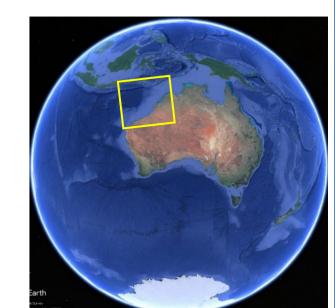
SWOT campaign on the Australian Northwest shelf

Dates:

- Leg 1: 18 April 5 May
- Leg 2: 30 May 6 June
- 3 Moorings Deployed (22 April 1 June 2023)

Objectives:

- Measure hydrography, bottom pressure and velocity during SWOT rapid sampling phase (...as much as possible!)
- Collect spatial and temporal data sets for stochastic model development
- Strong focus on near-surface velocity data collection





Turbulent observations (near-surface and near-seabed) for heat and momentum flux estimates

Moored Data Overview

3x through-water-column moorings

- Long-range ADCPs (5 m, 60 s)
- T @ 2 Hz every 10 m
- S, P (knockdown)
- Surface ADCP (0.1 m, 3 s)
- Bottom pressure (16 Hz)
- 1x turbulent flux pack

1x bottom lander

- 3x ADV (BBL turbulence)
- 1x 1000 kHz ADCP

5					- omm Amsteel	[1.0 m sect.]
ő	[296.8 m ASB 0.4 m AE]	#126989 - Sercel			- Sercel+frame	[296.4 to 296.9 m
5	[294.5 m ASB 3.8 m AE]	#6523 - SBE39 ext. TP		—	- 30in	[295.4 to 296.4 m
Ject.	[292.6 m ASB 1.9 m AE]	Zn Anode	→ "	-	- 3/8 wire rope	[4.5 m sect.]
	[290.1 m ASB 0.9 m AE]	#100244 - Signature 1000	→ '	₽	- 100 cm Signature Frame	[289.2 to 290.5 m
Section C	[282.5 m ASB 81.6 m AE]	#9276 - SBE37 SMP plastic CTP)		- 3/8 wire rope	
	[270.2 m ASB 69.3 m AE]	#7402 - SBE56 T	-			
	[257.7 m ASB 56.8 m AE]	#7401 - SBE56 T	→ 1			
	[245.2 m ASB 44.3 m AE]	#7400 - SBE56 T				
	[232.5 m ASB 31.6 m AE]	#12739 - SBE37 SMP plastic CTP	→			[88.0 m sect.]
	[220.2 m ASB 19.3 m AE]	#7399 - SBE56 T	→			
	[207.7 m ASB 6.8 m AE]	#7378 - SBE56 T	→			
L	[203.2 m ASB 2.3 m AE]	Zn Anode				
_				—	- 30in	[199.9 to 200.9 m
Section B Section B	[195.1 m ASB 162.4 m AE]	#8222 - SBE39 plus TP	I		- 3/8 wire rope - 75kHz+40in+Ti300kHz	
	[182.6 m ASB 149.9 m AE]	#7377 - SBE56 T	→			
	[170.0 m ASB 137.3 m AE]	#12738 - SBE37 SMP plastic CTP	→			
	[157.6 m ASB 124.9 m AE]	#7376 - SBE56 T				
	[145.1 m ASB 112.4 m AE]	#7375 - SBE56 T	>			
	[132.6 m ASB 99.9 m AE]	#7374 - SBE56 T	>			
	[120.1 m ASB 87.4 m AE]	#12319 - SBE56 T	→			
	[107.6 m ASB 74.9 m AE]	#7371 - SBE56 T				[167.0 m sect.]
	[95.0 m ASB 62.3 m AE]	#11063 - SBE37 SMP titanium CTP				
	[82.6 m ASB 49.9 m AE]	#7370 - SBE56 T	-			
	[70.1 m ASB 37.4 m AE]	#7369 - SBE56 T				
	[57.6 m ASB 24.9 m AE]	#7347 - SBE56 T				
	[45.1 m ASB 12.4 m AE]	#7346 - SBE56 T				
	[37.2 m ASB 4.5 m AE]	Zn Anode				
	[33.1 m ASB 0.4 m AE]	#7345 - SBE56 T	>			
	[32.0 m ASB 1.4 m AE]	#20089 - Sentinel	\neg			
	[31.0 m ASB 0.4 m AE] [24.9 m ASB 20.5 m AE]	#16870 - Longranger #4456 - SBE39 sync. T				
	[19.9 m ASB 15.5 m AE]	#7344 - SBE56 T				[30.6 to 32.4 m AS
	[19.4 m ASB 15.0 m AE] [14.9 m ASB 10.5 m AE]	#1835 - FLNTUSB #3799 - SBE39 ext. T				
	[9.9 m ASB 5.5 m AE]	#3799 - 36239 ext. 1 #7343 - SBE56 T			2/9 with 1000	
	[9.4 m ASB 5.0 m AE]	#3194 - FLNTUSB				[26.0 m sect.]
	[7.5 m ASB 3.1 m AE] [5.1 m ASB 0.7 m AE]	Zn Anode #3975 - SBE39 T			- 3/8 wire rope	[20.0 III Sect.]

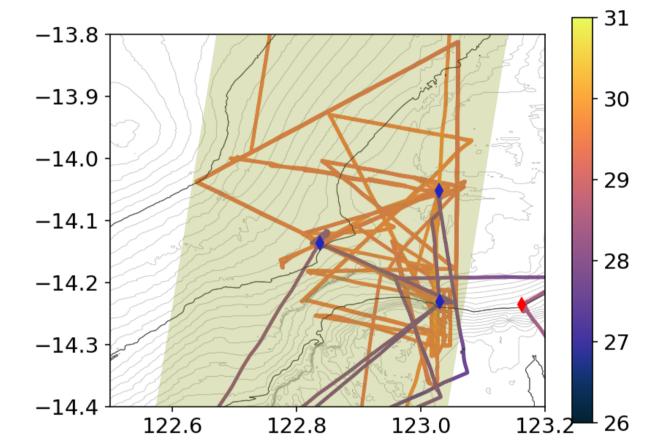
Ship and Lagrangian Data Overview

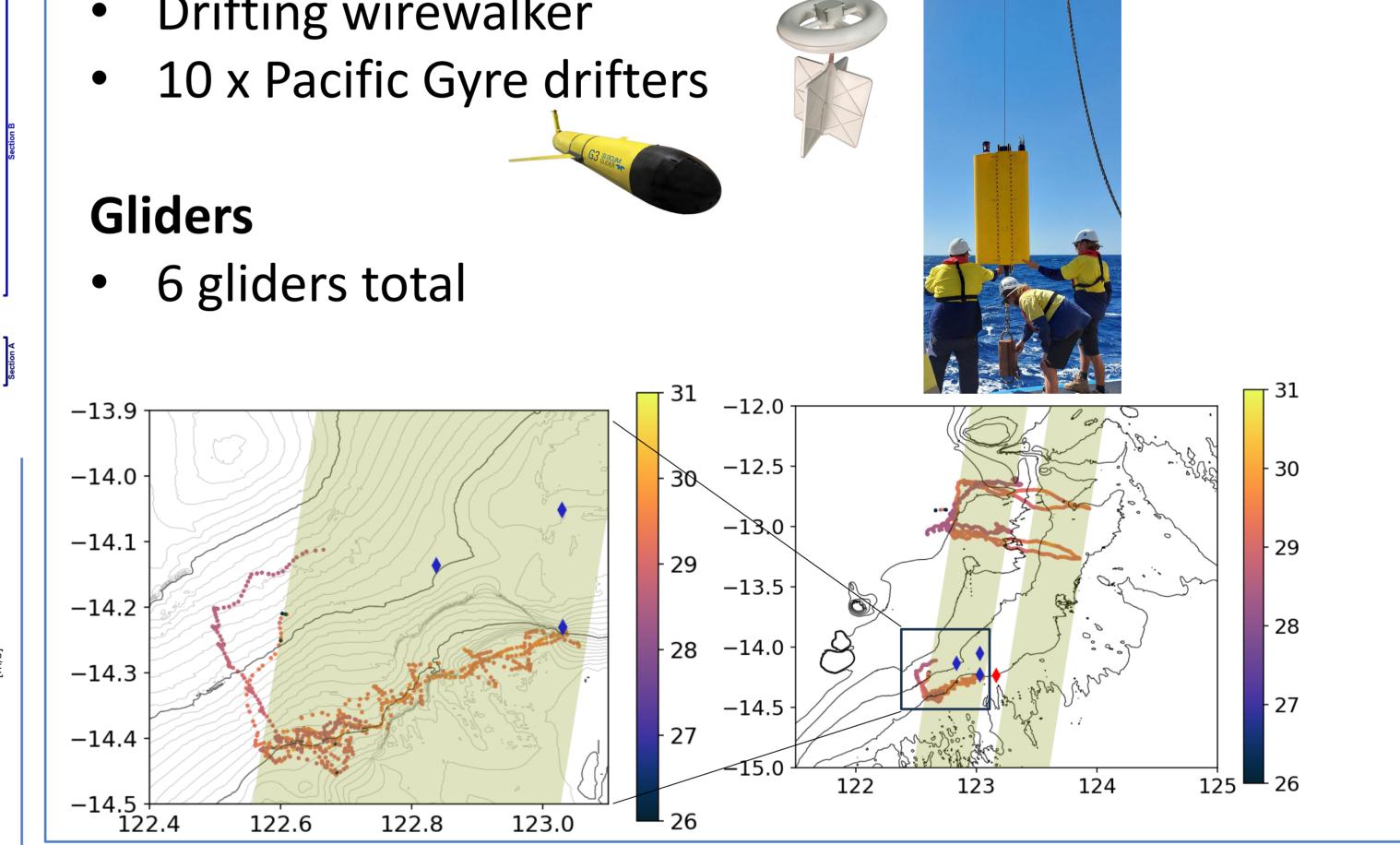
Vessel-based sampling

- TSG and ADCP (right)
- CTD and VMP transects
- Met variables

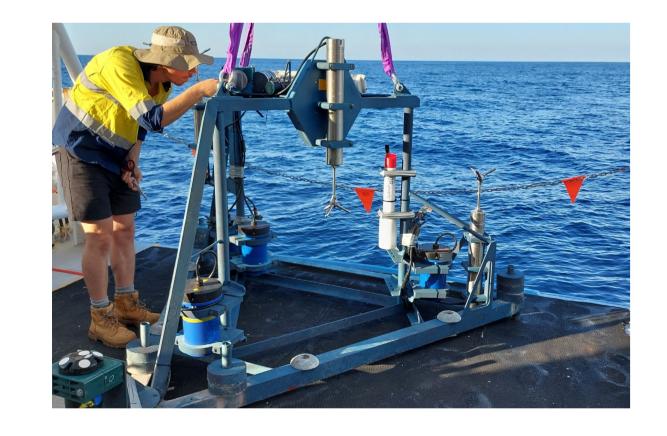
Wirewalker and drifters

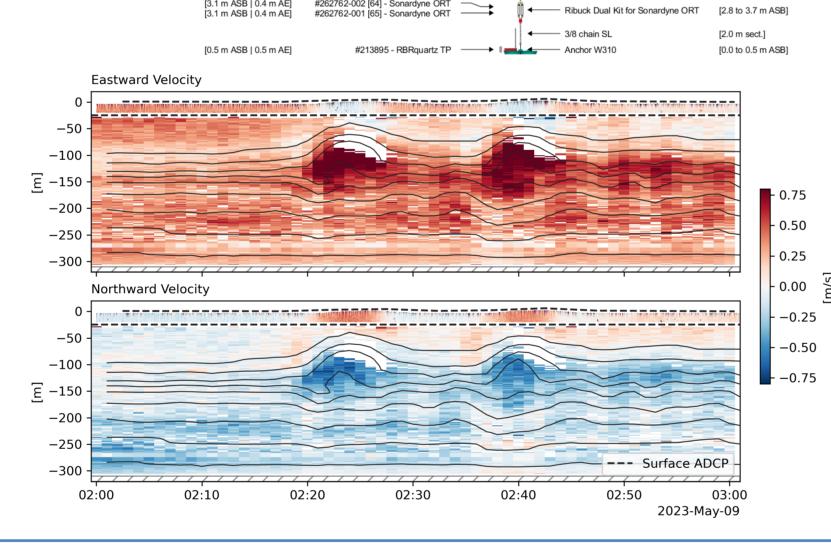
- Drifting wirewalker
- 10 x Pacific Gyre drifters



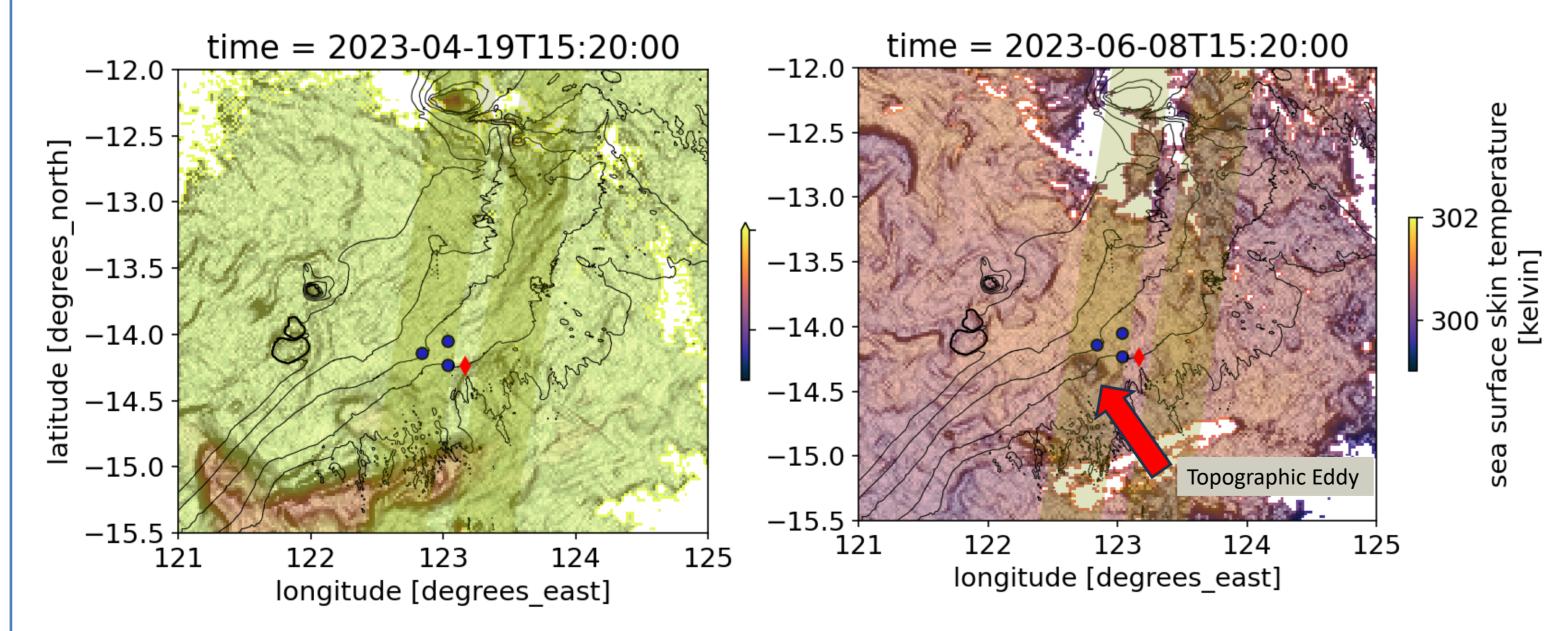


Bottom pressure



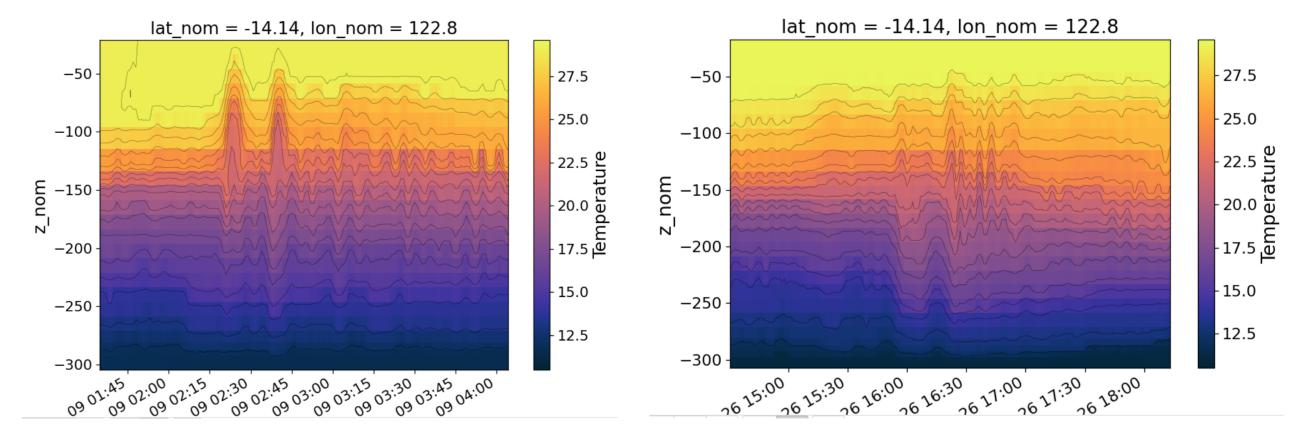


Overview of conditions during field campaign GHRSST L3 1 km Sea Surface Temperature

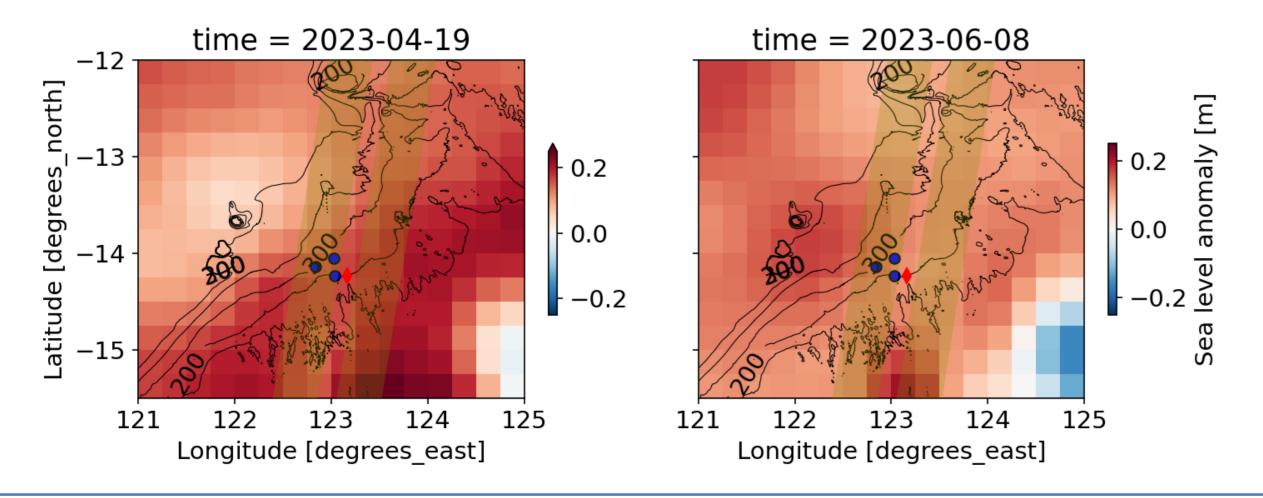


Early findings

- Topographic eddies formed near the end of the mooring deployment (early June).
- Low-frequency SSH fluctuations ~O(1) cm
- Internal tides and mode-2 non-linear internal waves caused similar magnitude steric height fluctuations



SSALTO-DUACS L4 Sea Surface Height



See our ECR poster by Jen-Ping Peng

Acknowledgements

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