



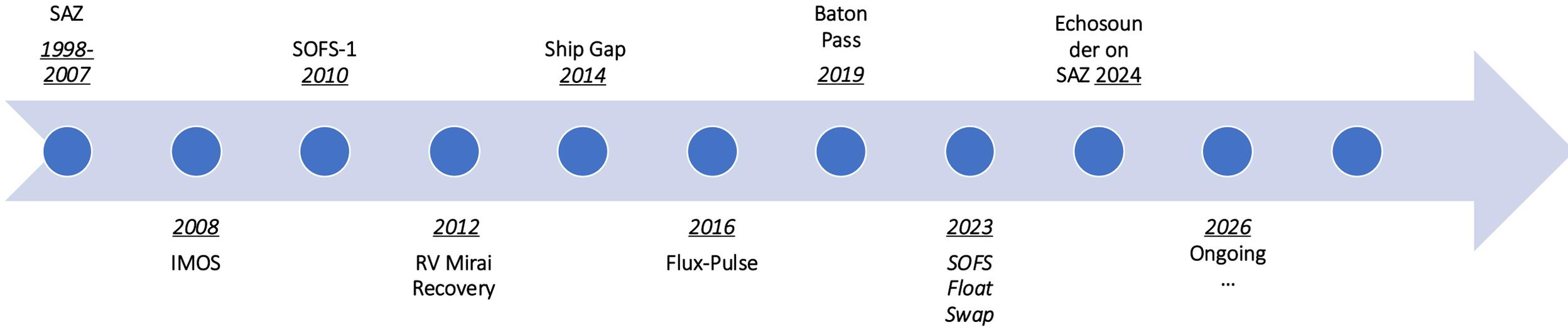
IMOS Facility 3: Southern Ocean Time Series

Eric Schulz, Elizabeth Shadwick & Haifeng Zhang



IMOS acknowledges the Traditional Custodians and Elders of the land and sea on which we work and observe, and recognise them as Australia's first marine scientists and carers of sea Country. We pay our respects to Aboriginal and Torres Strait Islander peoples past and present.

The Timeline (highlighting events for discussion in the following slides)



SAZ – 1998-2007

- Pre-IMOS, SAZ had already been monitoring the Southern Ocean for a decade (ACE CRC, AAPP).



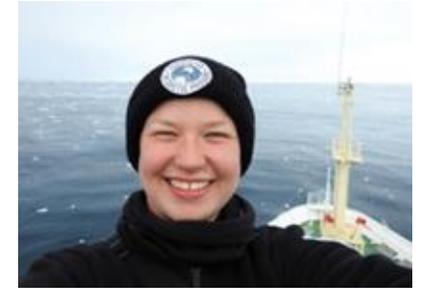
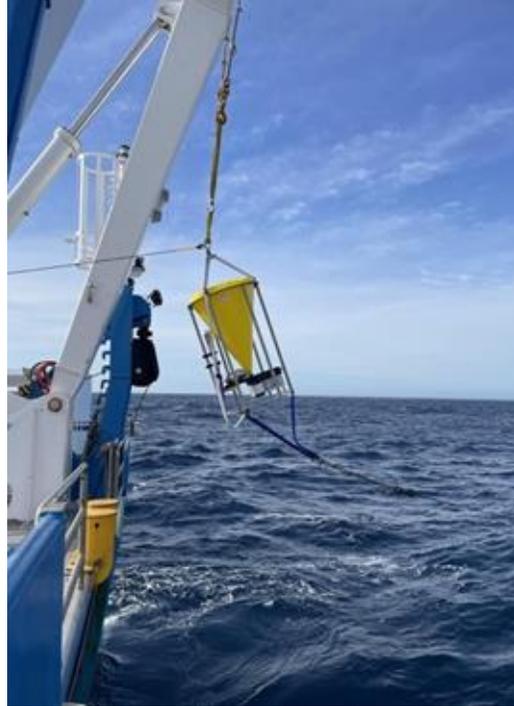
ANTARCTIC CLIMATE & ECOSYSTEMS
COOPERATIVE RESEARCH CENTRE



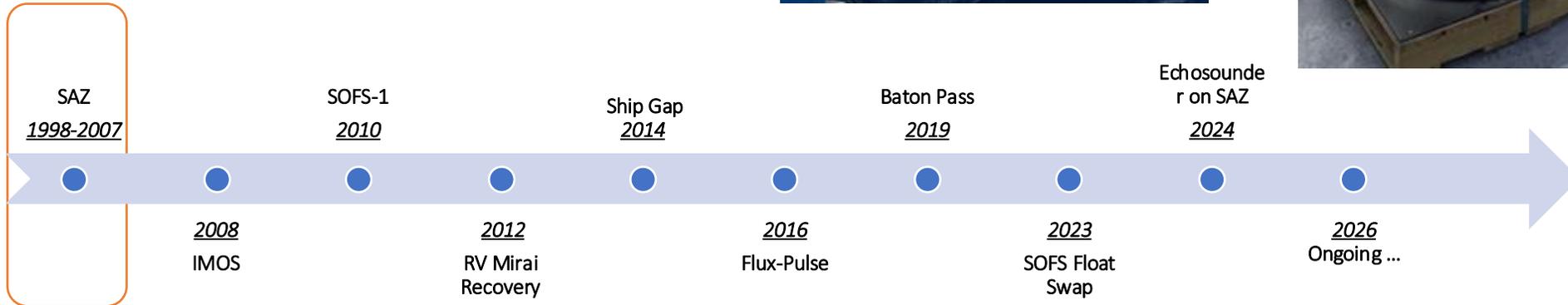
AAPP
Australian Antarctic
Program Partnership



New amphipod species identified at SOTS
(from a SAZ sample collected in 1998)

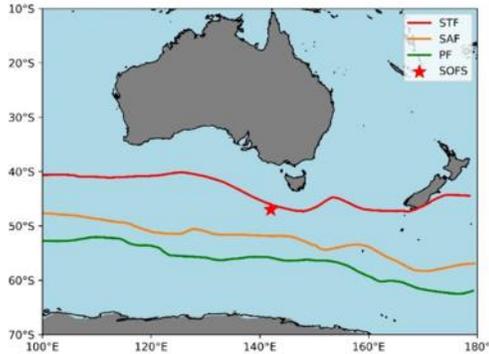


Svenja Halfter (UTAS, now ESNZ)



IMOS - 2008

- IMOS started funding SOTS facility since 2008, including Pulse, SAZ and SOFS moorings.

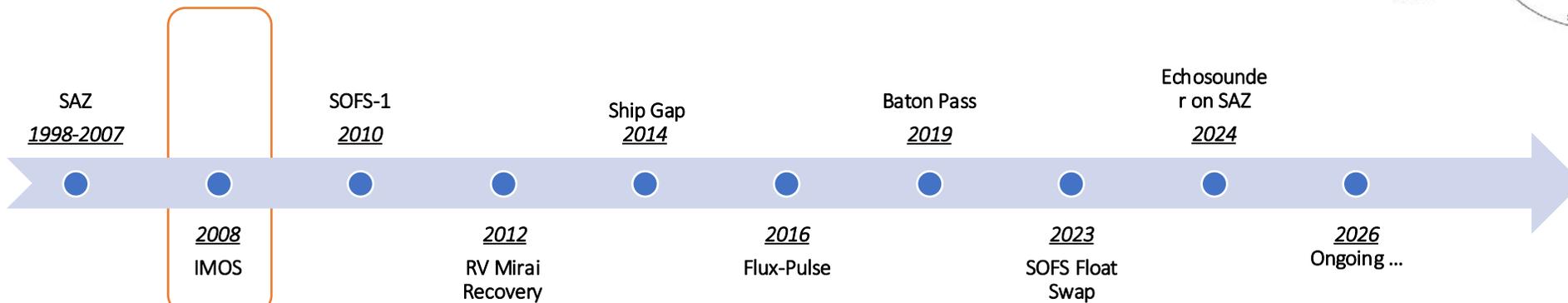
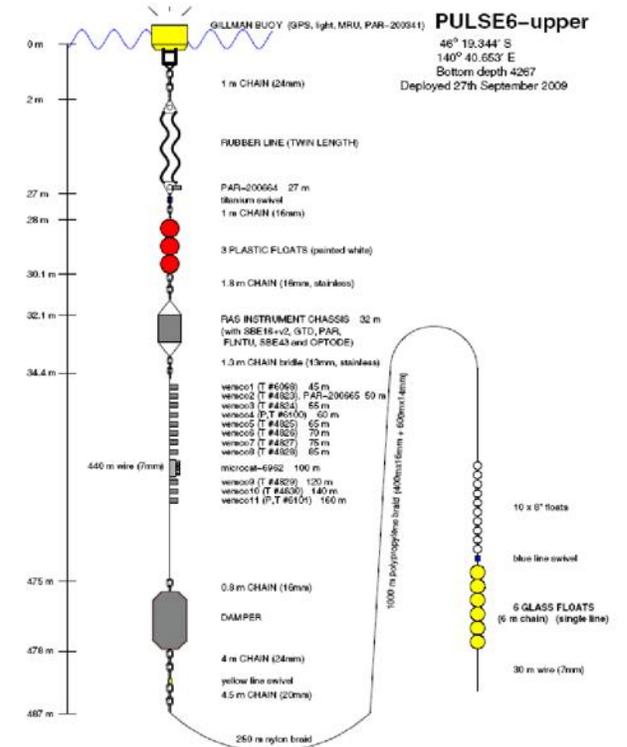


Home / Facilities / Deep Water Moorings / Southern Ocean Time Series Observatory

Southern Ocean Time Series Observatory

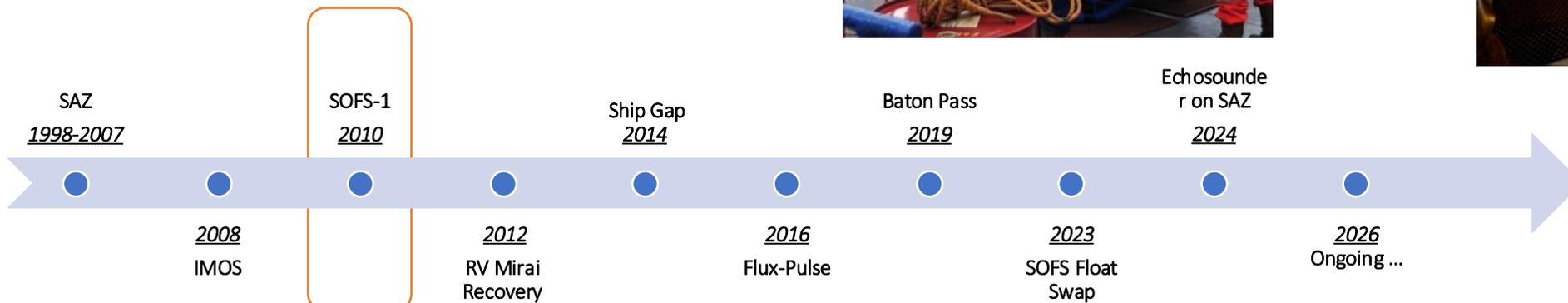
The Southern Ocean is an important part of the global climate system, absorbing carbon dioxide and heat to moderate the earth's atmosphere. The Southern Ocean Time Series Observatory uses a set of automated moorings to measure these processes under the extreme conditions in the Southern Ocean, where they are most intense and least studied. The processes occur on many timescales, from the day-night cycle up to ocean basin decadal oscillations, which requires high frequency observations sustained over many years.

[Access data](#)



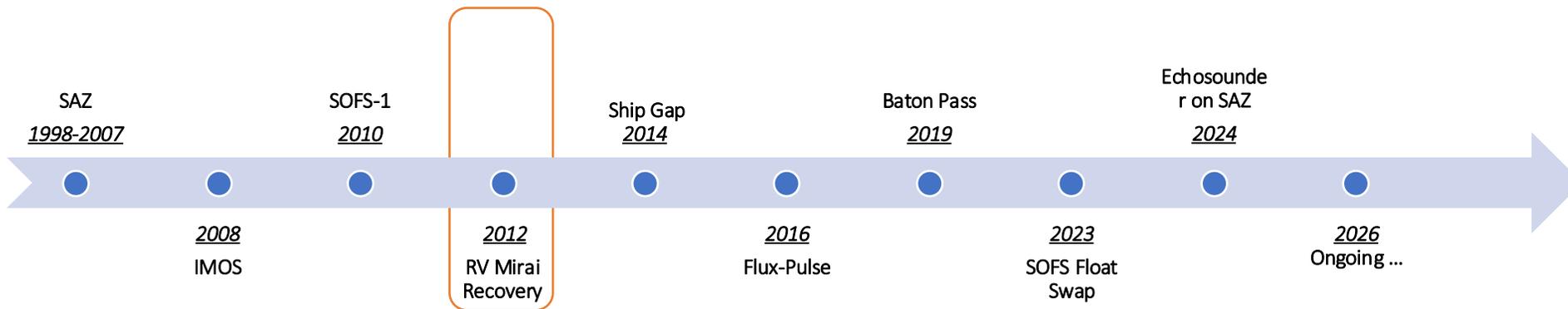
SOFS-1 2010

- SOFS-1 was the first air-sea flux mooring in the Southern Ocean.



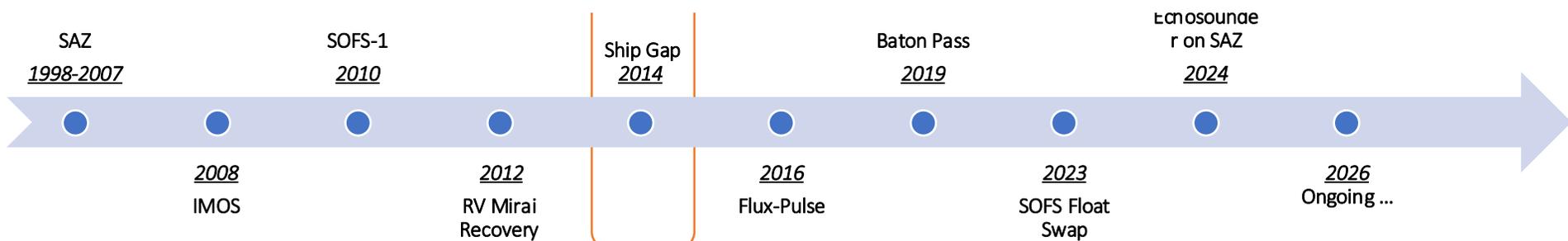
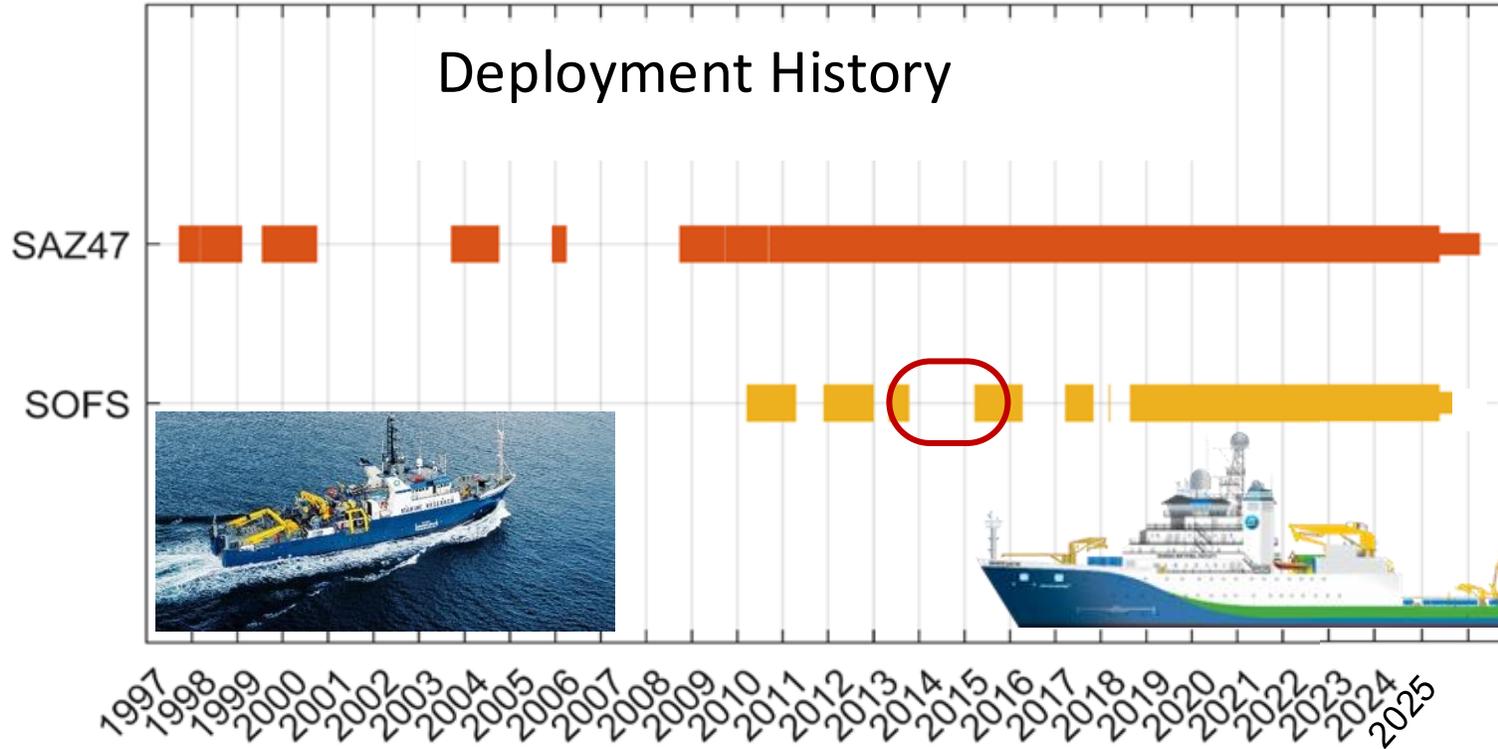
RV Mirai Recovery of SOFS-3

- Recovery of SOFS-3 (deployed: July 2012, started drifting in Sep, recovered: Jan 2013) was performed by Japanese RV Mirai.



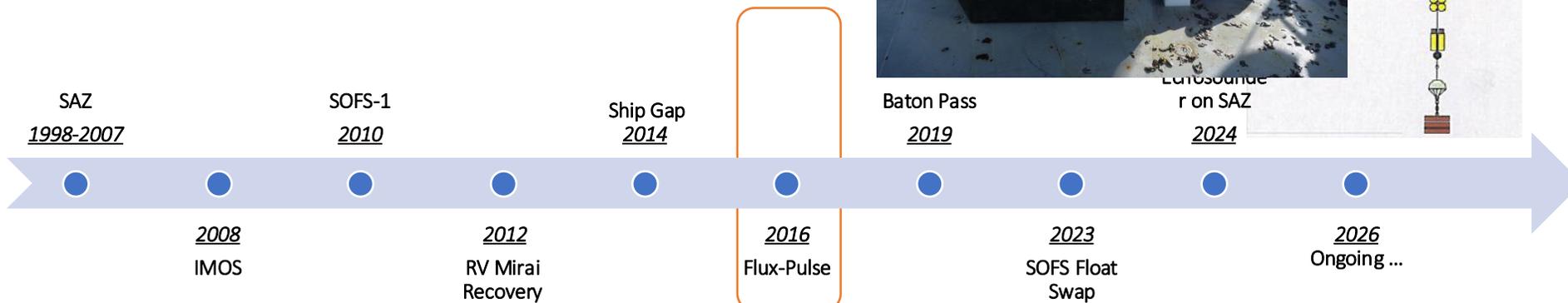
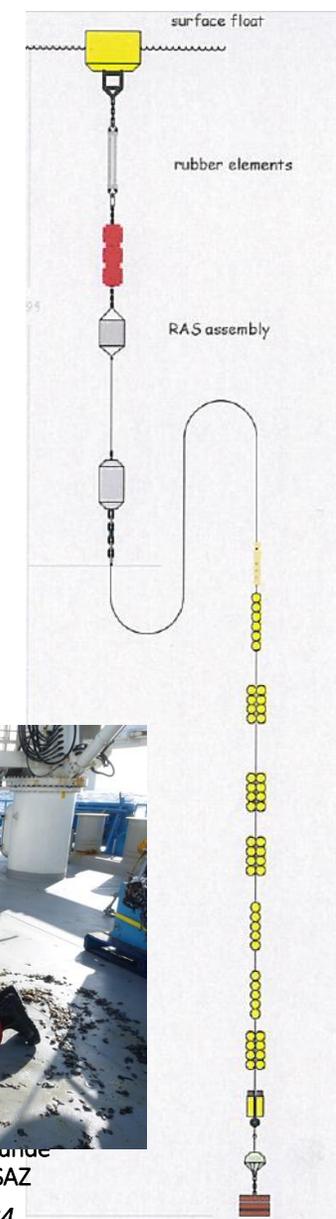
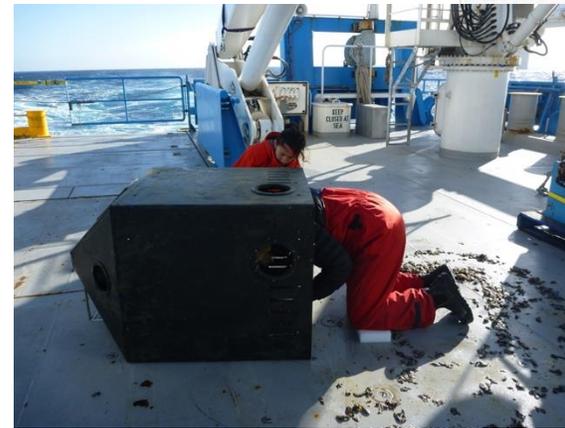
Data gaps

- MNF ship replacement (Southern Surveyor to Investigator), 18-month (2013-2015) gap in deployment and data collection.



Flux-Pulse recovery & SOFS-5 recovery

- Flux and Pulse was combined into one mooring.
- Flux-Pulse was recovered by the Pacific Crest.
- SOFS-5 recovery: rope propeller tangle and dive-boat visit

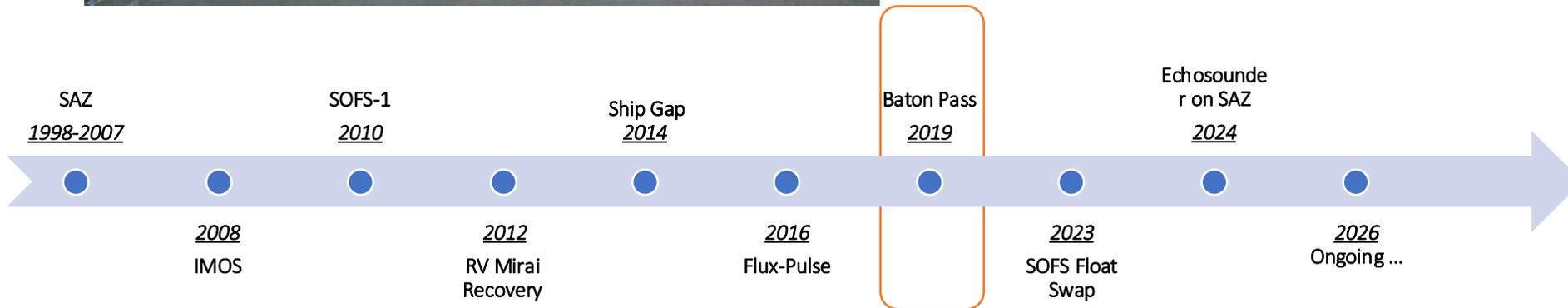


Batan pass

- Facility lead from Tom Trull to Elizabeth Shadwick in 2019.

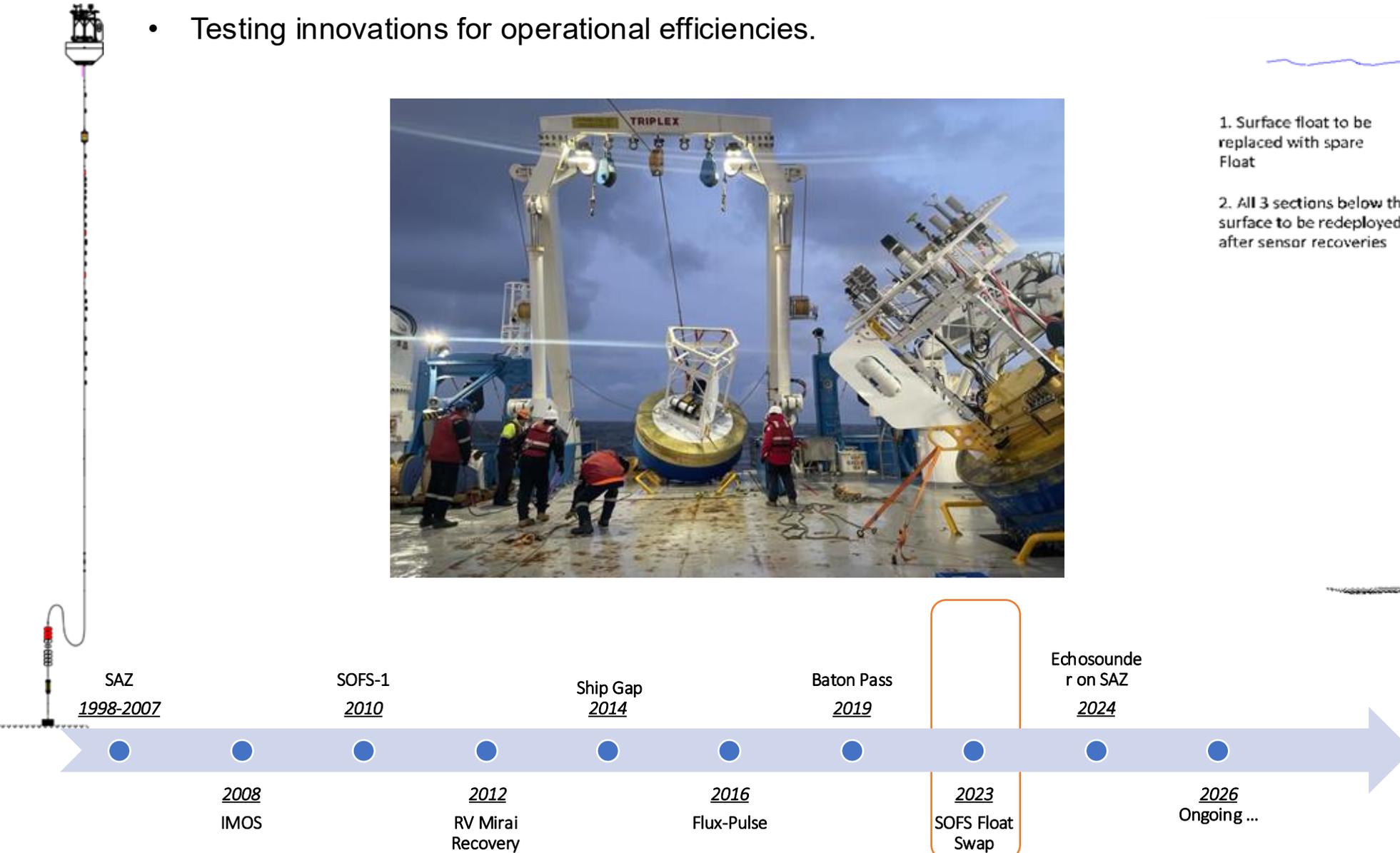
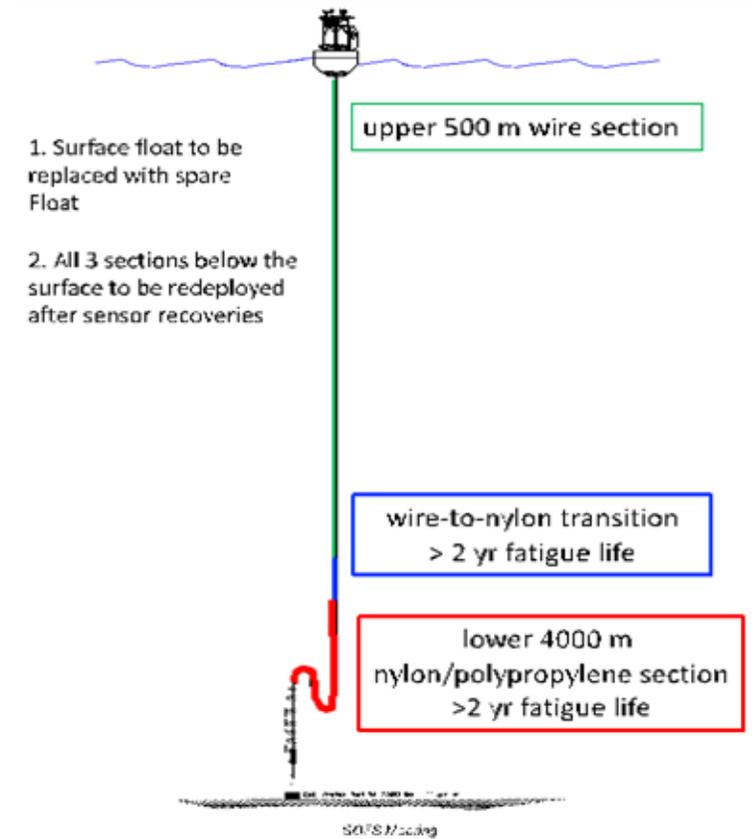


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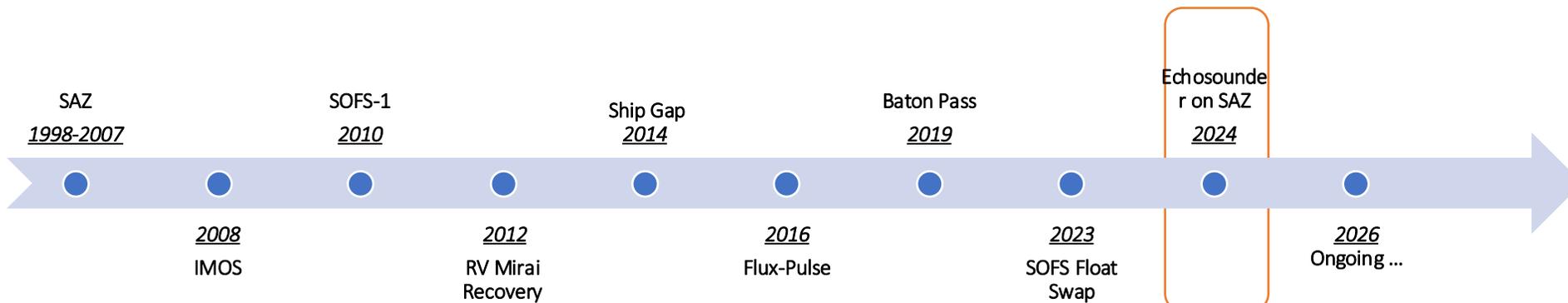
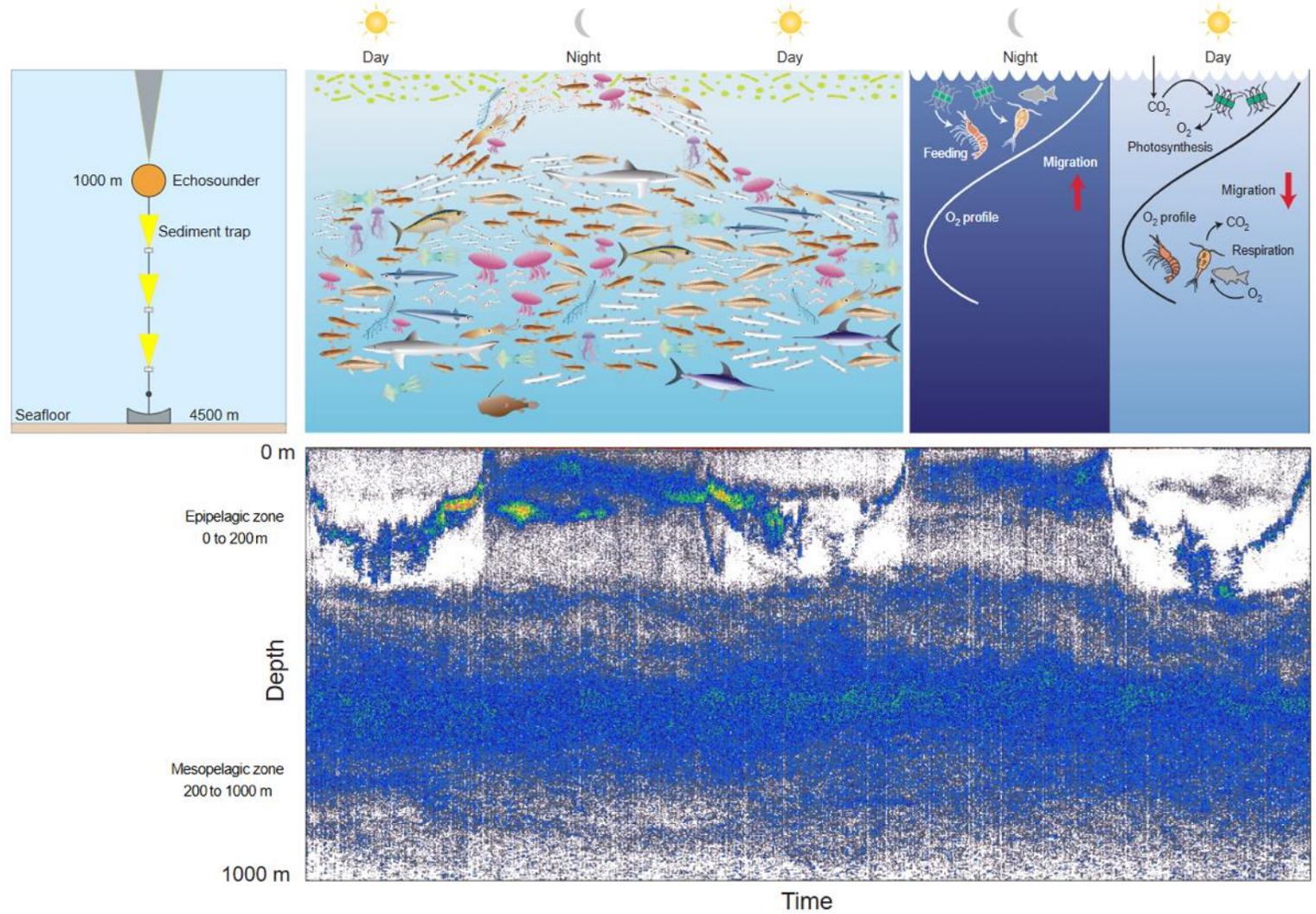
SOFS Surface Float Swap 2023

- Testing innovations for operational efficiencies.



Echosounder on SAZ 2024

- A collaboration between SOTS & BioAcoustics facility



Other Collaborations & Partnerships

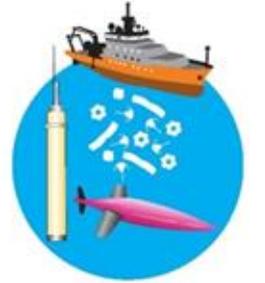
MNF Partnership (2021)

- Planning assurance



SOTS hosts SOLACE (2020)

- Linking to global efforts
- Exploiting single point time-series



Scientists capture detailed snapshot of Southern Ocean's role in carbon uptake

By AAPP | 15/01/2021

Australian researchers today returned from a six-week marine science voyage investigating the critical role of ocean life in capturing atmospheric carbon.



Gels reveal particle types exported to the Twilight Zone

By AAPP | 07/01/2021

Polyacrylamide gels are providing a sneak peek at who's responsible for exporting carbon to the ocean's interior.



SOLACE team arrives back in Hobart after a successful 6 week voyage

By AAPP | 15/01/2021

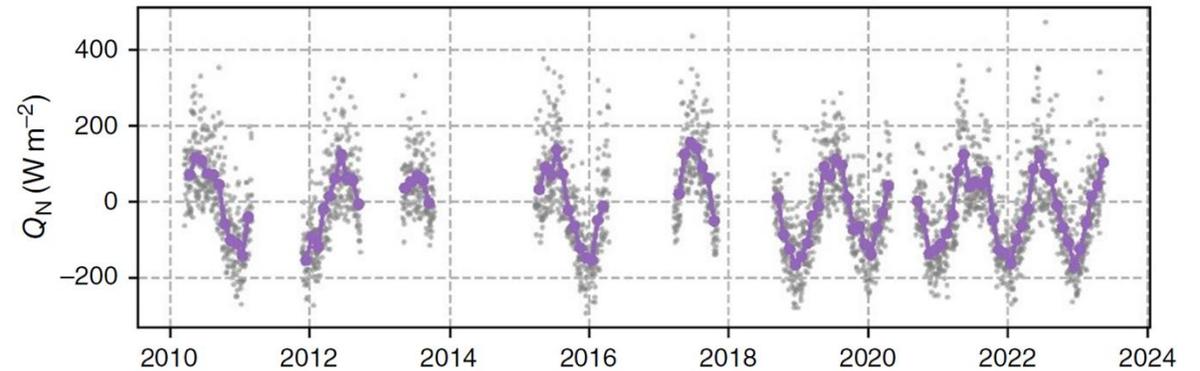
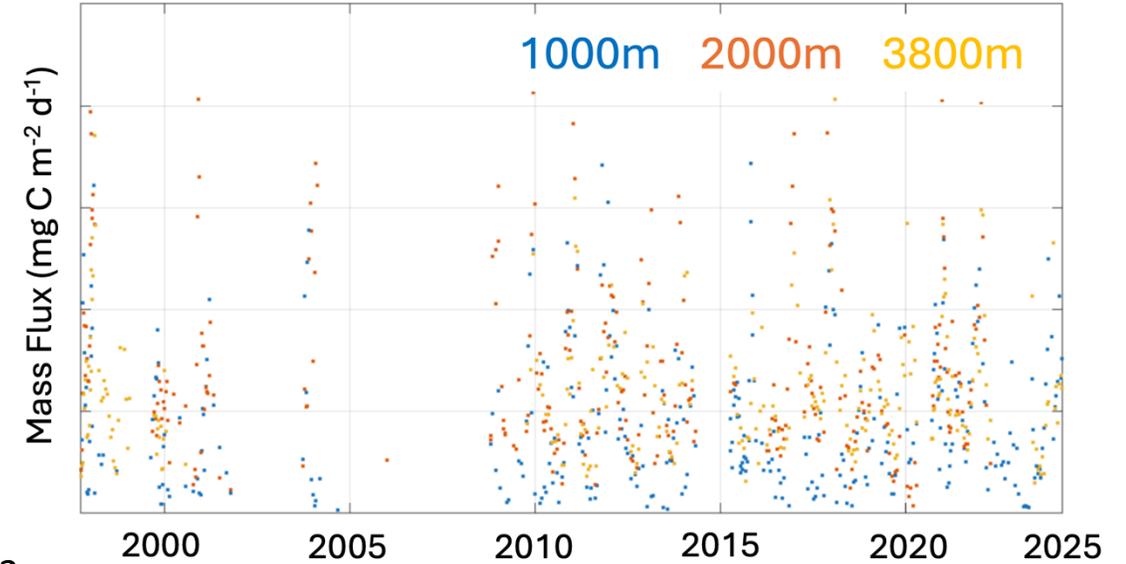
After a 1000 nautical mile steam from polar waters, the SOLACE voyage finishes today, as we dock in Hobart.



Integrated **Marine** Observing System

SOTS by the Numbers

- ☐ **5322** - measurement days at SOTS between 2009 and 2024
- ☐ **1638** - discrete POC/PIC/BSi samples
 - **> 1000** - in an archive available for further analyses
- ☐ **> 50M** - subsurface ocean observations
- ☐ **> 4.4M** - near-surface met-ocean 1-min observations 2010-2023
- ☐ **> 90%** - pass QC and flagged as good data



The Crew & behind the scenes



Tom Trull



Pete Jansen



Cathryn Wynn-Edwards



Ruth Eriksen



Di Edwards



Haifeng Zhang



Gemma Woodward





Australia's Integrated Marine Observing System is enabled by the National Collaborative Research Infrastructure Strategy (NCRIS). It is operated by a consortium of institutions as an unincorporated joint venture, with the University of Tasmania as Lead Agent.

PRINCIPAL PARTICIPANTS



SIMS is a partnership involving four universities

ASSOCIATE PARTICIPANTS



IMOS thanks the many other organisations who partner with IMOS, providing co-investment, funding and operational support, including investment from the Tasmanian and Western Australian Governments.

