



Final Workshop
Instituto Superior Técnico, Lisboa, Portugal
1st June 2023

The PAAnoramic mission

1st European Atlantic Area International multi-platform ocean monitoring mission

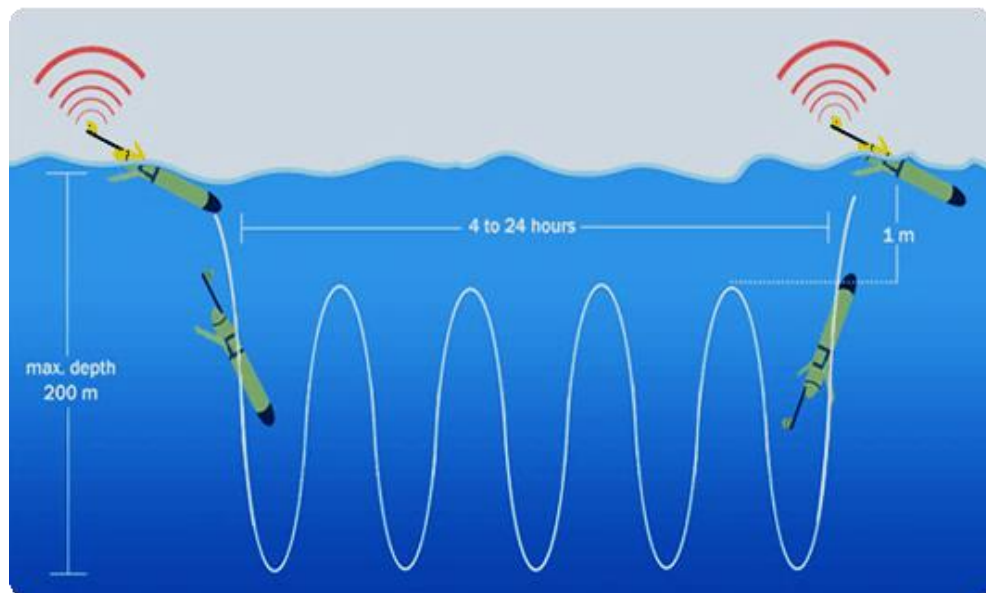
Filipa Carvalho (National Oceanography Centre)
Susan Hartman (NOC), Carlos Barrera (PLOCAN), Alan Berry (MI),
Dan Hayes (CYPRUS SUBSEA), Inês Martins (IH) and iFADO Partners



This project has received funding from the European Union's Interreg Atlantic Area programme under the grant EAPA_165/2016



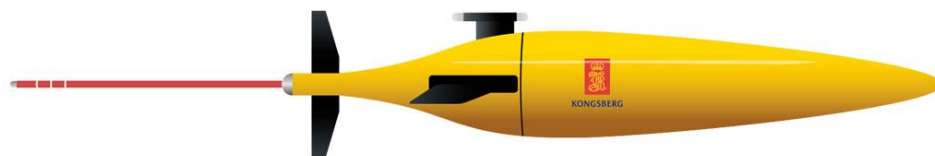
**National
Oceanography
Centre**



- Autonomous underwater vehicle (AUV)
- Usually rated to 1000m
- high-resolution profiling vehicles
- Buoyancy driven (saw-tooth pattern)
- Communicate via satellite Iridium



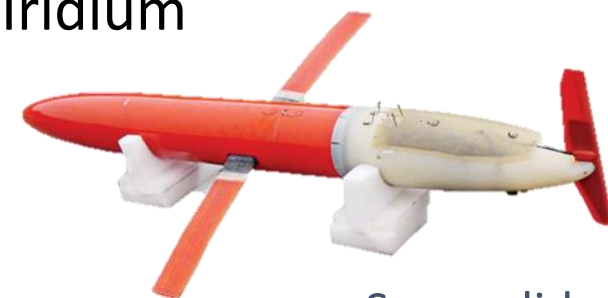
Slocum glider
(Teledyne Webb Research, USA)



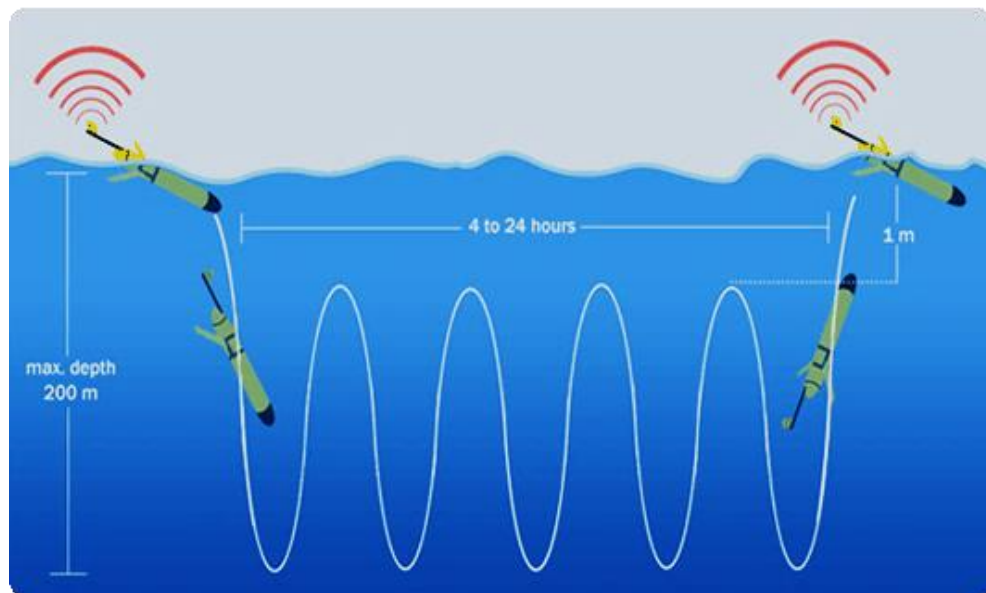
Seaglider
(Kongsberg/iRobot/U. Washington, USA)



Sea Explorer
(Alseamar, FR)



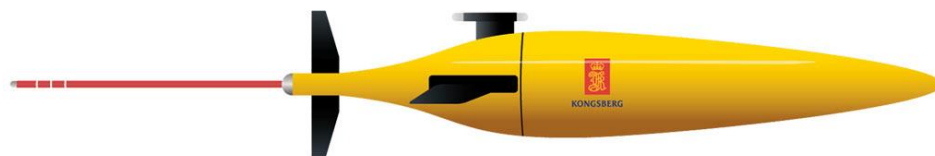
Spray glider
(Scripps Institution of Oceanography, USA)



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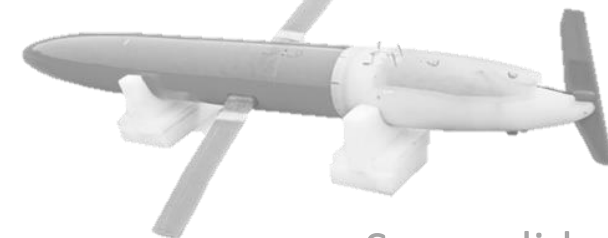
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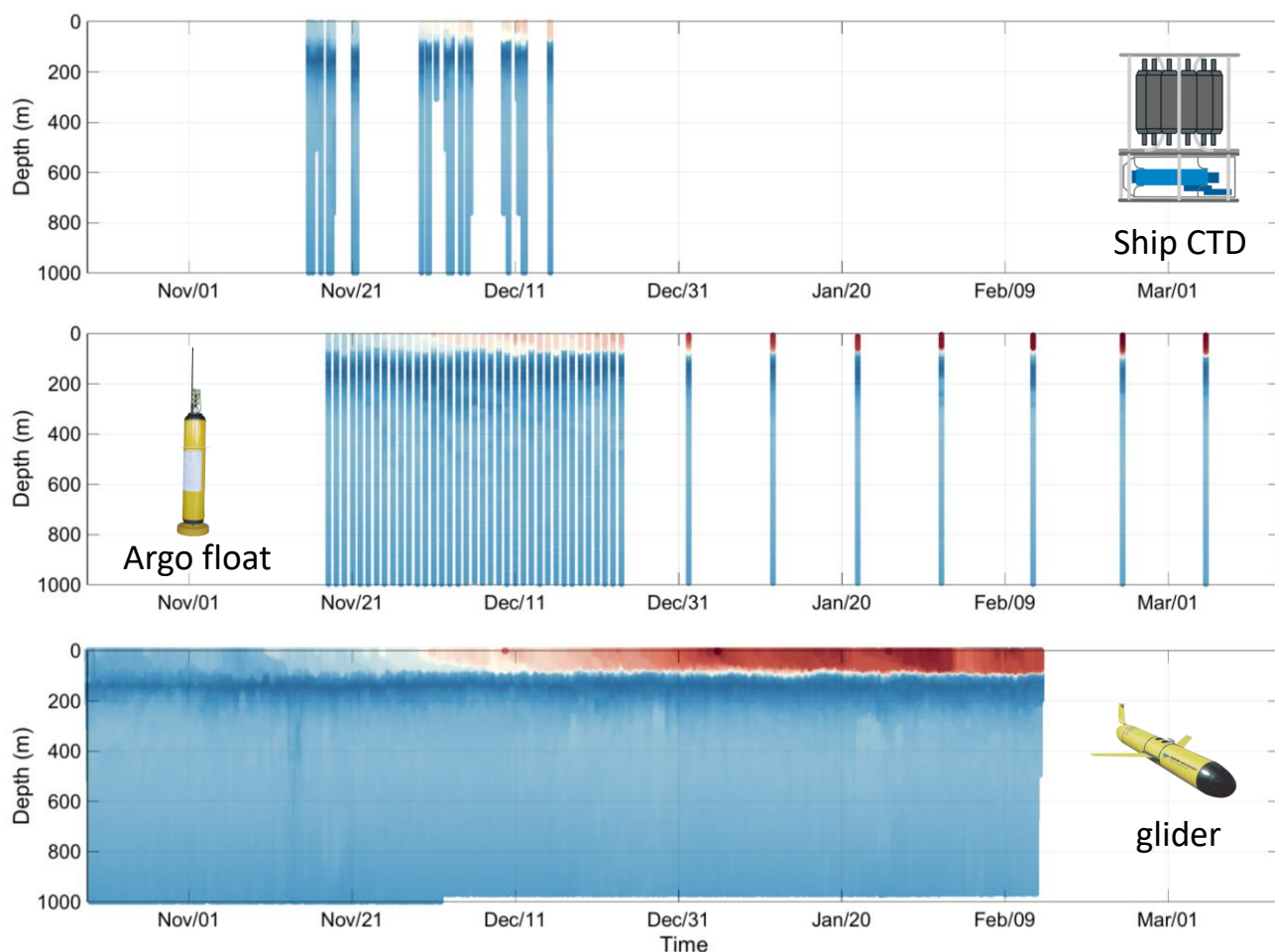
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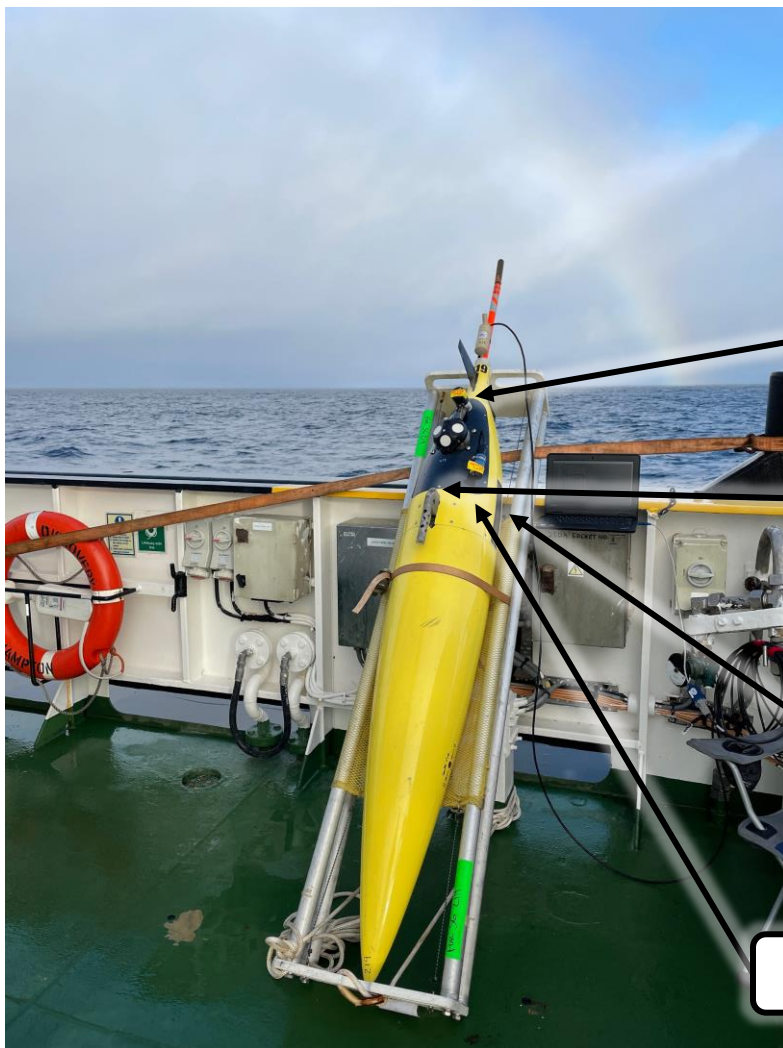


Spray glider
(Scripps Institution of Oceanography, USA)



Autonomous platforms such as gliders and BGC-Argo floats:

- Long endurance
- High-resolution sampling
- Carry relevant sensors, including biogeochemical
- Provide long term context
- See below the surface (beyond what satellites see)
- Extreme weather resistant



Standard
measurements
from gliders:

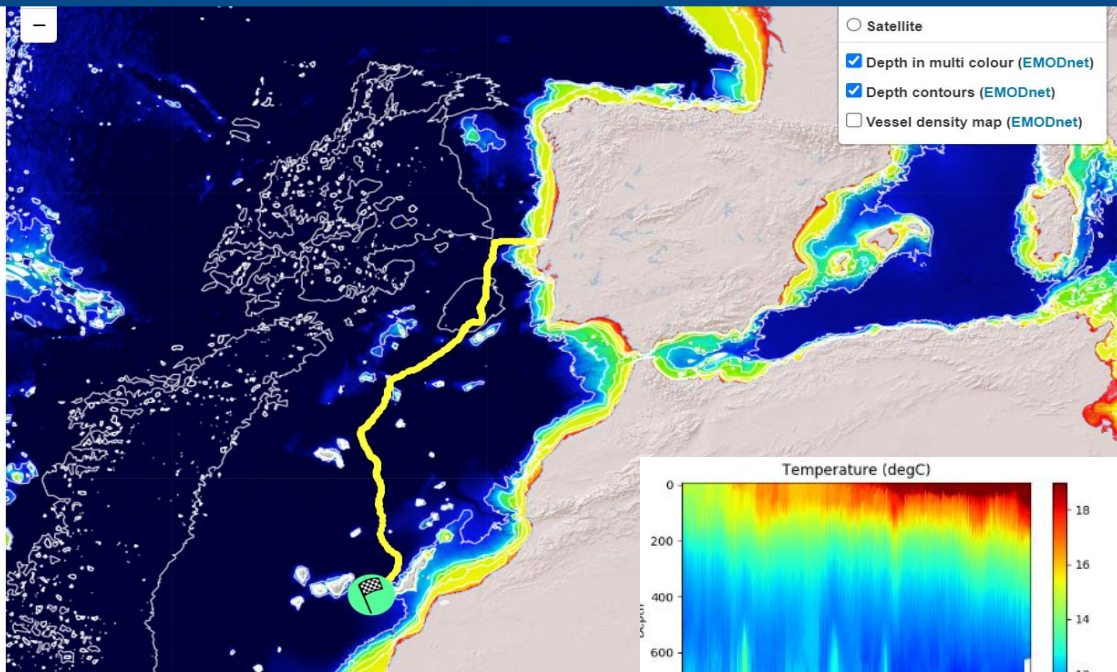
Light

Temperature,
conductivity,
pressure

chlorophyll
fluorescence,
optical
backscatter
(particles)

Dissolved oxygen





Completed

Glider: P302

Start Date: 2020-02-07 10:00 UTC

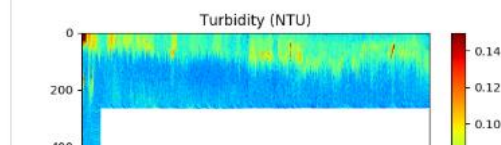
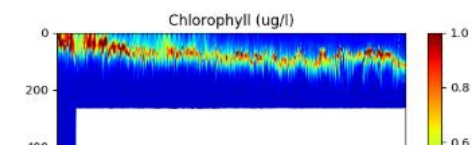
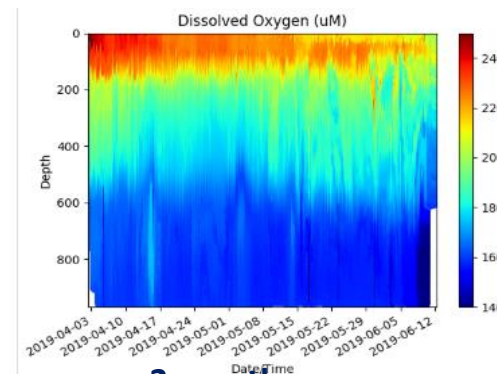
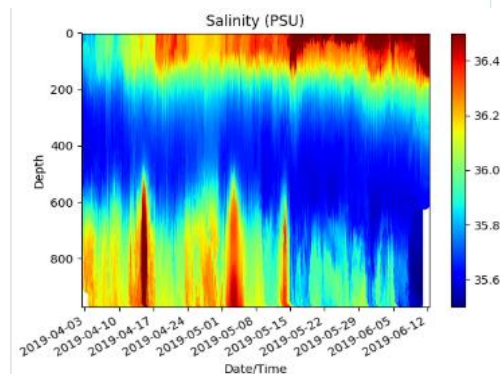
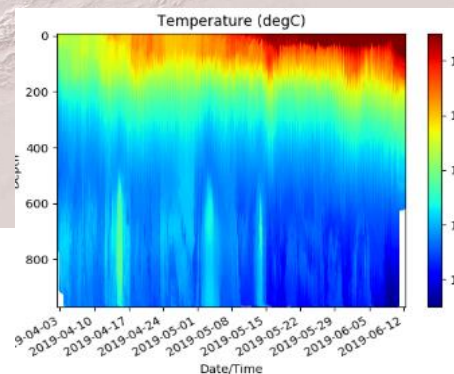
Last comm: 2020-05-05 13:15 UTC

Institutions involved: IH

Related projects: iFADO

Distance covered: 1793.2 km

Sensors: Fluorometer DO CTD



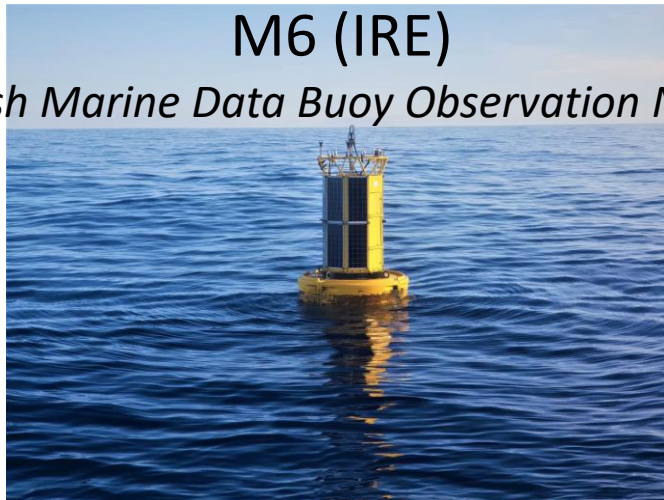
3 months
1800 km
517 dives (+ 1000 profiles)



Current timeseries sites in the NE Atlantic Arc

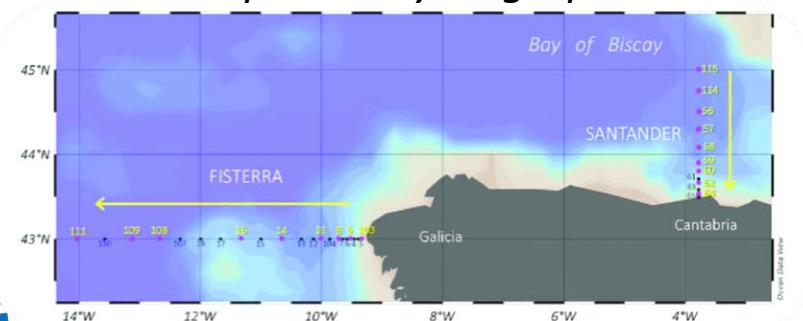
M6 (IRE)

The Irish Marine Data Buoy Observation Network



IEO (ES)

*Spanish Institute of Oceanography
Finisterre repeated hydrographic section*



PAP-SO (UK)

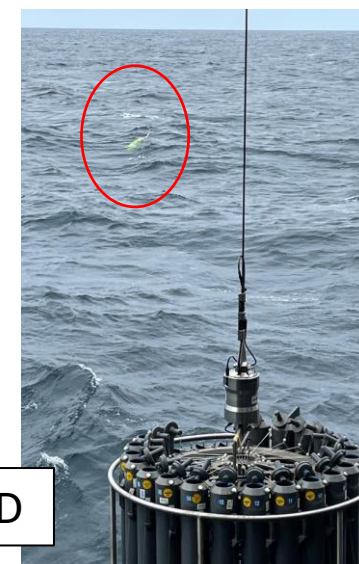
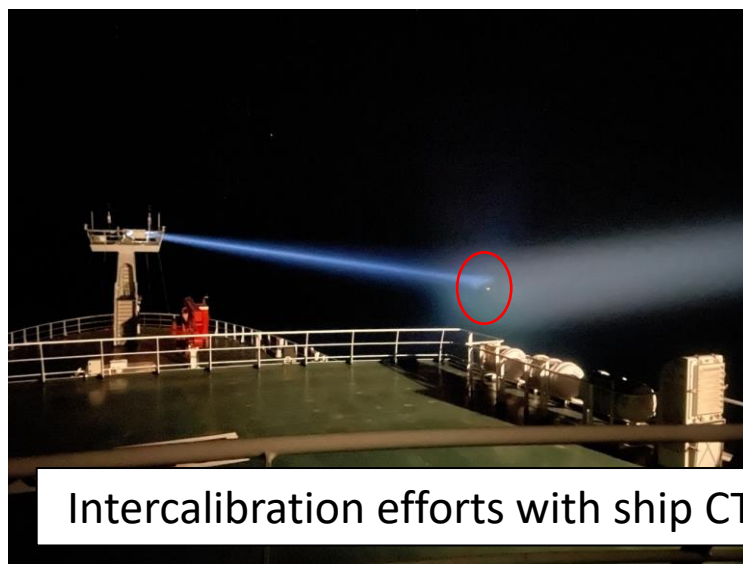
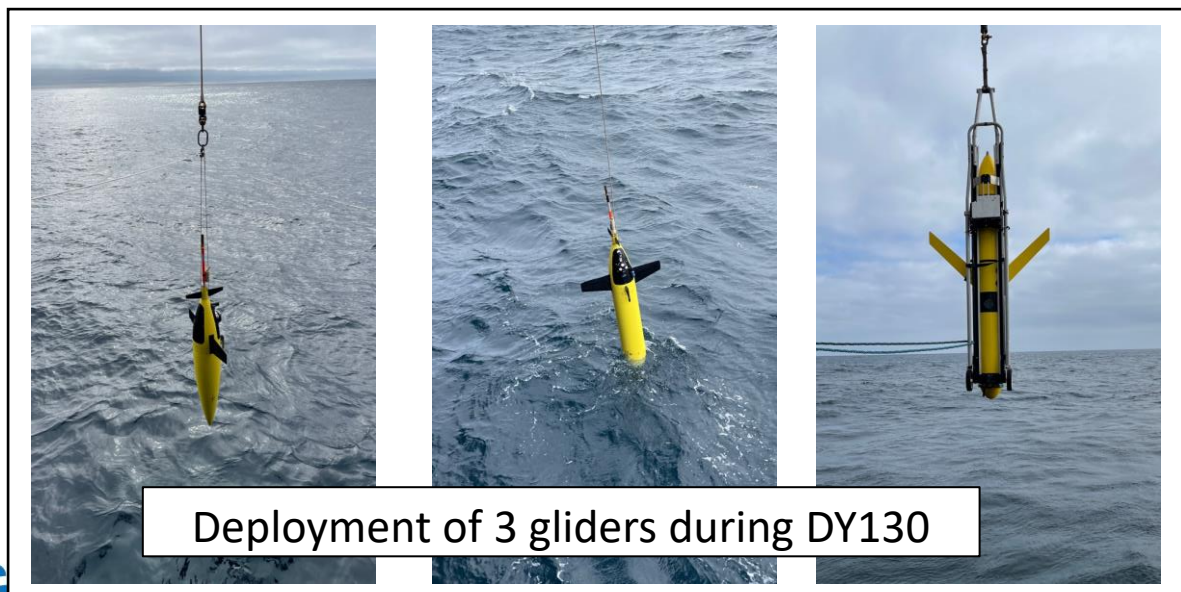
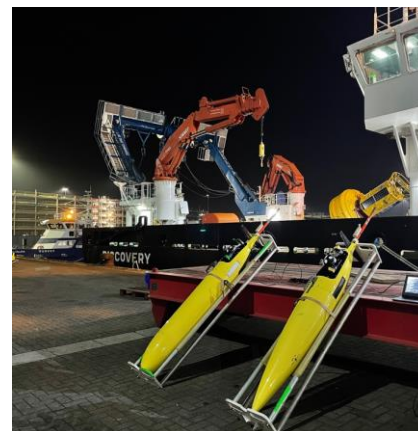
Porcupine Abyssal Plain Sustained Observatory



ESTOC (ES)

*European Station for Time series
in the Ocean at the Canary islands*





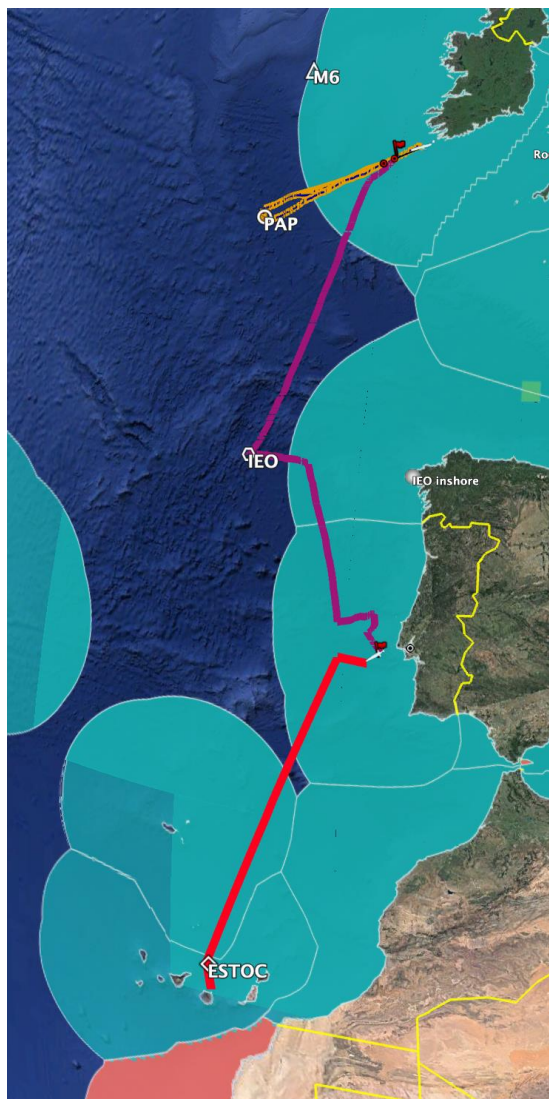


- **Enhance ocean observing capabilities** along the NE Atlantic Arc from Irish waters to Gran Canaria
- Leverage International collaborations and technologies from the **iFADO consortium** to coordinate deployment/recovery of gliders, **measuring** a subset of essential ocean variables (EOVs) from the timeseries sites – **transnational cooperation**



The concept: 3-glider relay mission

A truly transnational cooperative mission



Leg 1 (IRE): MI glider

Irish coast (IRE) – PAP-SO (UK) – Irish coast
Deployment & recovery from IRE vessel

COMPLETED



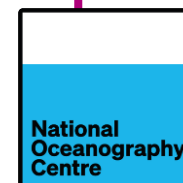
Marine Institute
Foras na Mara

Leg 2 (UK): 'NOC' glider from CSCS

Irish coast (IRE) – IEO offshore Finisterre Line, ES
Hydrographic Institute moorings, PT – Nazare, PT
Deployed from IRE vessel, recovered from PT vessel

COMPLETED

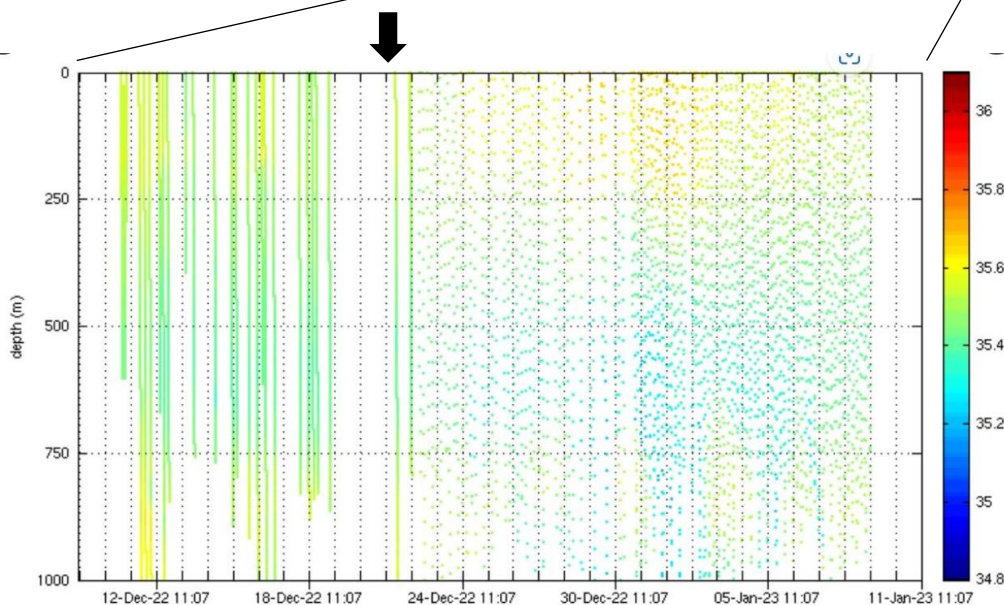
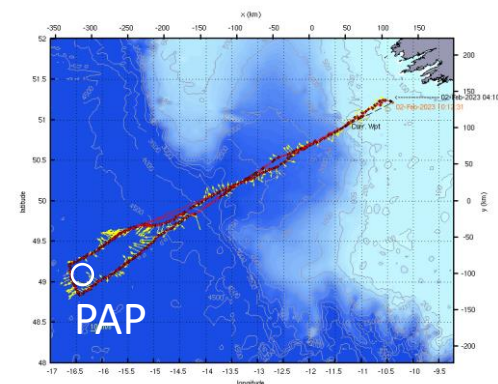
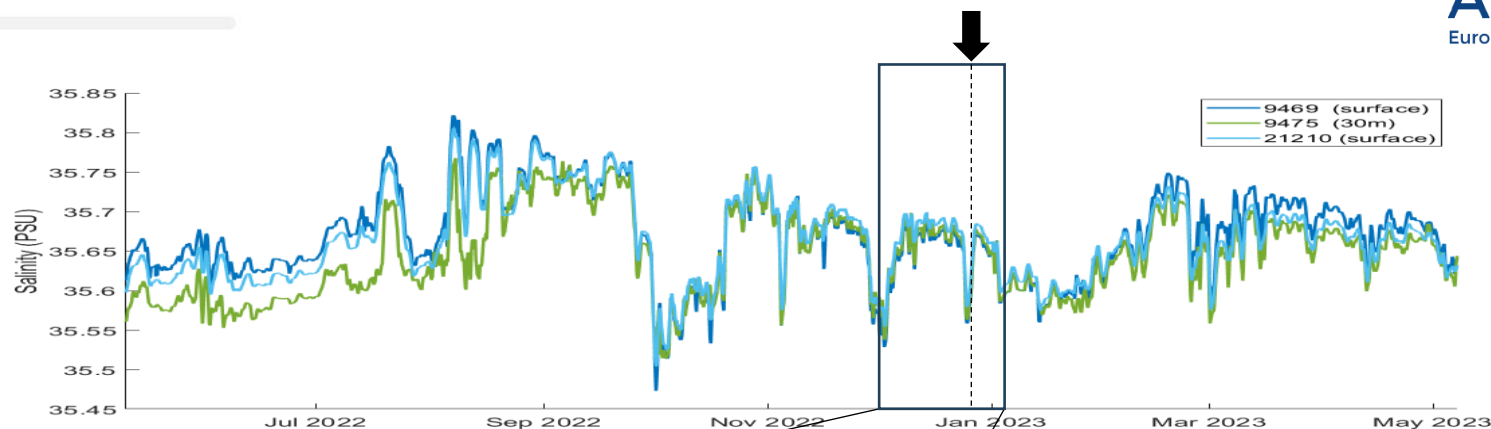
CYPRUSUBSEA
Consulting and Services C.S.C.S. Limited



Leg 3 (ES): PLOCAN glider

Nazare, PT – ESTOC, ES – Gran Canaria ES
Deployment: PT vessel; recovery: ES vessel

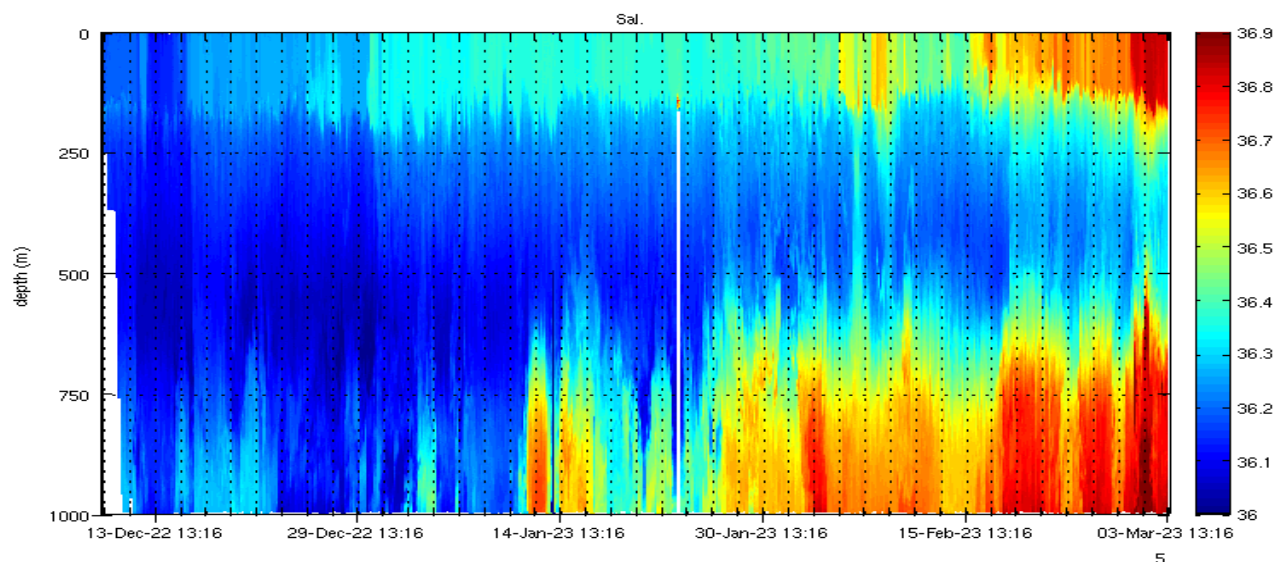
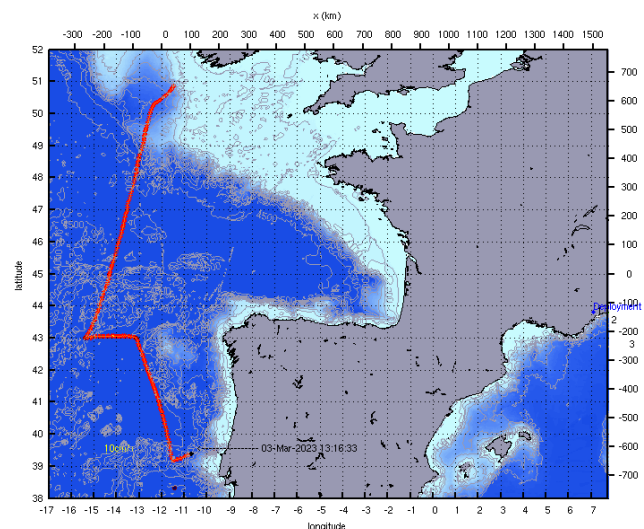
PLOCAN
Plataforma Oceánica
de Canarias



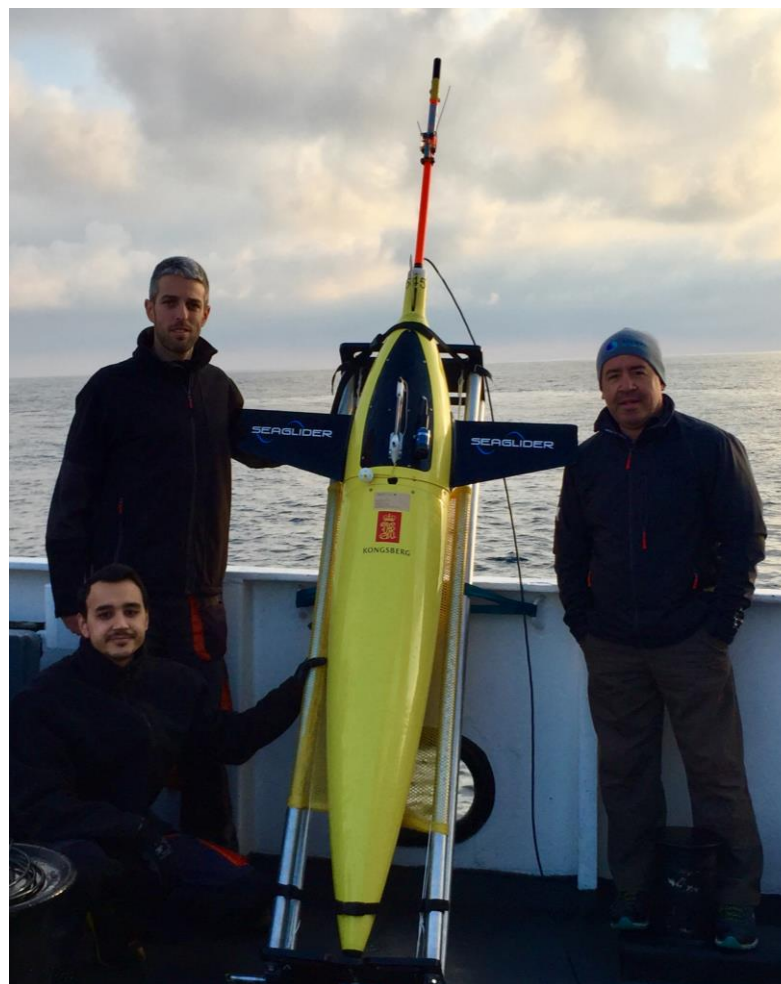
- Salinity data measured from the glider, covers the top 1000m of water. It spent several days at PAP-SO at the end of Dec 2022
- Salinity data from PAP-SO, 2022-2023 provides seasonal context (surface and 30m subsurface data)



The 'NOC' (CSCS) glider deployed in Dec 2022 by MI (IRE), visiting Spanish and Portuguese time series sites before recovery in March 2023



Glider captures Mediterranean Outflow Water (MOW)



3rd leg of PAA^NORAMIC mission

Spring 2023

Delayed until June 2023

In partnership with:



Whatsapp group set up to coordinate everything from name of the mission, shipment of equipment, to launch and recovery of the gliders



The [#PAAanoramic](#) mission has started! Last Friday (09/12/22) [@Eir_OOS](#) deployed 2 gliders for the [@AtlanticArea](#) [@AAiFADO](#) project in Irish waters. Video shows the [@NOCnews](#) seaglider from [@CyprusSubsea](#) deployment. Video courtesy [@spuddyyad](#) More information coming soon! Stay tuned!



IFADO project:
deployment of 3
gliders by 3
partners of
GROOM RI
project



PAP Observatory
[@PAP_observatory](#)

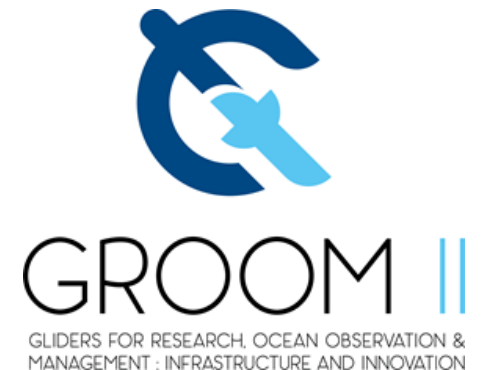
PAP-SO was part of the ambitious [#PAAanoramic](#) glider mission in recent weeks. The Aisling na mara glider from [@MarineInst](#) travelled to PAP-SO and back to Ireland [@AAifado](#) [@NOCnews](#)



- iFADO legacy: Establishing a coordinated endurance line between M6, PAP, IEO, ESTOC
- Link up with the timeseries sites for **validation** and **cross-calibration**
- Use as a tool for **offshore monitoring** of good environmental status (MSFD)
- Monitoring **changes in ocean circulation**, water mass dynamics
- Create **baseline** for long term variability studies
- Improve **forecast** by feeding NRT data into models
- **Habitat mapping** and link up with **fisheries**
- Fit **novel biogeochemical sensors** (nutrients, $p\text{CO}_2$, biology, particles, radiometry, etc)

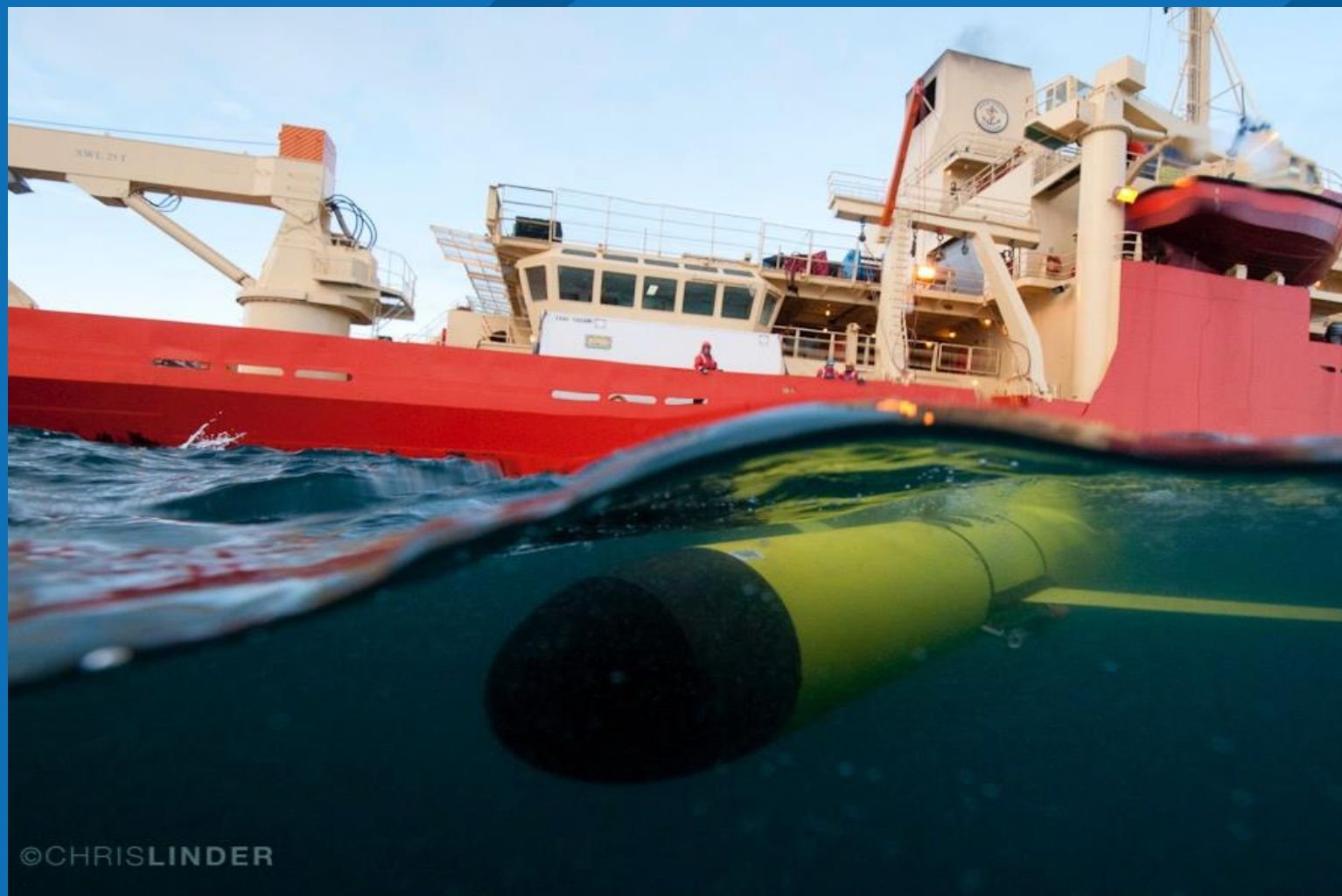


- PAAnoramic is an opportunity to show initiatives such as GROOM II that it is possible to have all data flowing through one place in NRT.
- EGO for both Slocum and Seaglider missions' data visualization as a reference point for tracking progress and collaborating on the results as they come in, with data flow to Coriolis in real time.
- GROOM-II could use this iFADO mission as an example of how a pan-European glider facility could develop (MI, NOC, PLOCAN and Cyprus Subsea are all GROOM-II partner national facilities)





THANK
YOU!



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