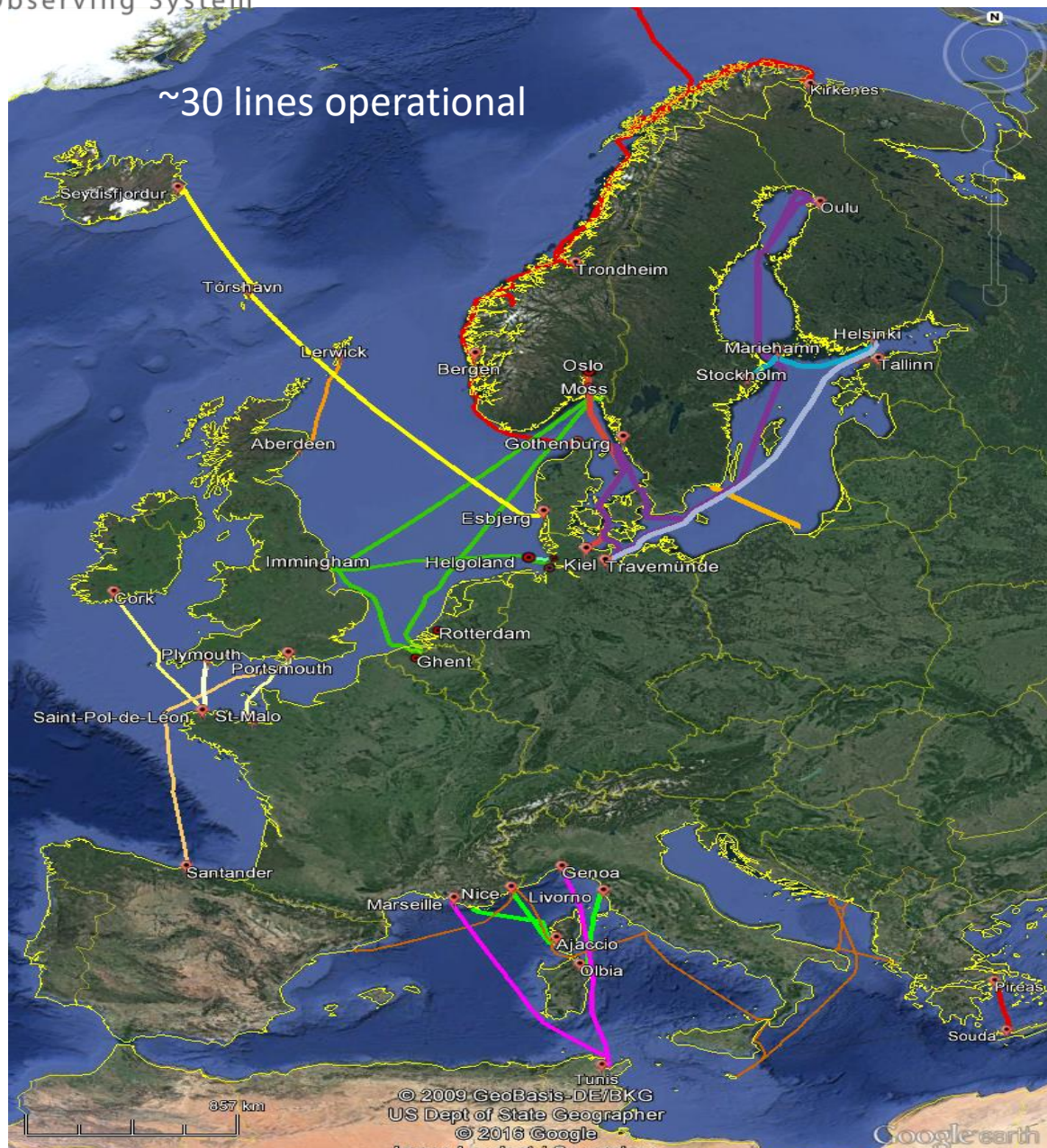


EuroGOOS FerryBox Task Team

FerryBox Workshop, Helsinki
1-2 October 2024

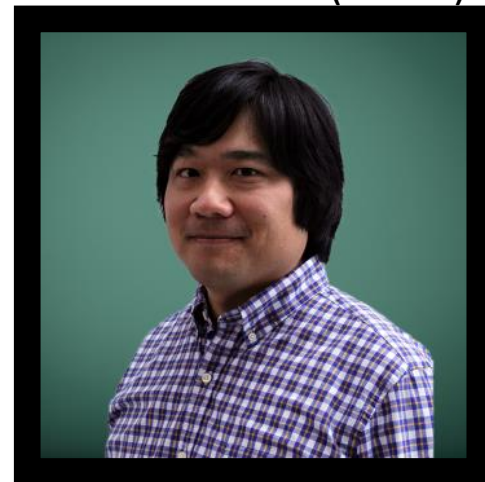
FerryBox Task Team update



Partners involved:

NIVA, IMR (Norway)
HZG (Germany)
EuroGOOS (Belgium)
SYKE (Finland)
SMHI, VOTO (Sweden)
TTU (Estonia)
HCMR (Greece)
IFREMER (France)
CEFAS (UK)
Deltares (Netherlands)
VLIZ (Belgium)
CNR-ISMAR (Italy)
PLOCAN, IEO (Spain)
IPMA (Portugal)

Chairs: Andrew King (NIVA)
& Anna Wranne (VOTO)



www.ferrybox.org

FB Task Team objectives



- To act as the European component of the global community using ships of opportunity
- Develop links with other TT, WG, ROOS, GOOS, OCEAN-OPS, ICOS (Integrated Carbon Observation System), and other complementary activities
- Ensure the integration of FerryBox networks in the European ocean observing efforts and contribute to the development of EOOS
- Operate and promote a common European FerryBox data portal
- Ensure and enable data availability via the EuroGOOS ROOS data portals including data quality procedures and links to CMEMS and EMODnet

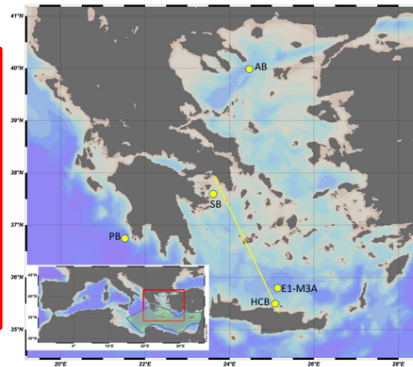
FB Task Team Highlights

HCMR (Costas Frangoulis):

- First CO₂ recordings in the Eastern Mediterranean using a FB; CO₂ data to be processed and submitted to the next SOCAT submission i.e. in 2025

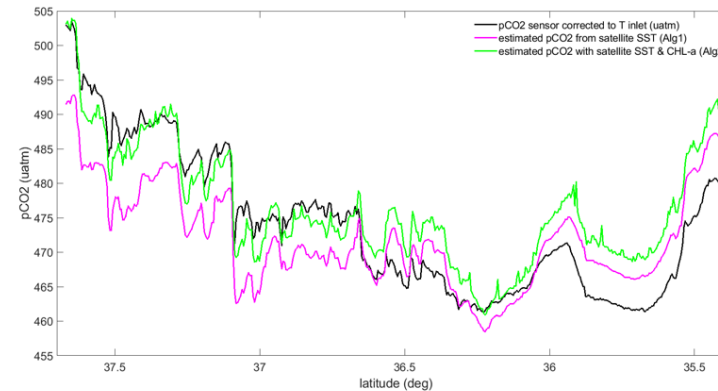


See the poster presented by Georgia Ktistaki in the poster session this evening, and presentation by Manolis Ntoumas tomorrow!



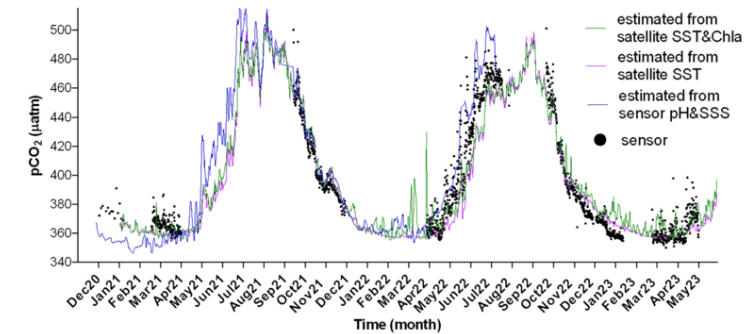
Map showing the FB route marked in yellow, which meets two Poseidon stations/buoys (E1-M3A, HCB), one of which (HCB) is equipped with sensors measuring pCO₂ and pH. Regular R/V missions are carried out at HCB for discrete sampling of pH, total dissolved inorganic carbon and total alkalinity.

First FerryBox based CO₂ measurements in the Eastern Mediterranean
Frangoulis C., Stamataki N., Ktistaki G., Pettas M., Michelinakis S., Petihakis G.
Institute of Oceanography, Hellenic Centre for Marine Research, Greece



Measured pCO₂ (black line) from FB (30-31/08/23), and estimated pCO₂ from FB temperature data (purple line) and from FB temperature & Chl-a data (green line). Estimation algorithms from Frangoulis et al. (2024). It appears that the SST & Chl-a algorithm is generally <7 ppm accurate, except for lower Chl-a values where further tuning is needed

This work was partially supported by the JERICO-S3 project. funded by the EC H2020 Framework Programme under grant agreement No. 871153.



Measured pCO₂ (black dots) from HCB, and estimated pCO₂ from pH and SSS data from HCB sensors (blue interrupted line), from SST satellite data (purple line) and from SST & Chl-a satellite data (green line). Figure from Frangoulis et al. (2024).

Frangoulis C, Stamataki N, Pettas M, Michelinakis S, King AL, Giannoudi L, Tsiaras K, Christodoulaki S, Seppälä J, Thyssen M, Borges AV and Krasakopoulou E (2024) Front. Mar. Sci. 11:1348161.

Hereon (Yoana Voynova)

- **M/S Magnolia Seaways** and **M/S FunnyGirl** (Büsum-Helgoland) are operating in the North Sea (**Hereon**)
- **Tesperhude Station** is now also providing nitrous oxide measurement (stationary, Elbe River, **Hereon**)
- Solar panels installed at **Cuxhaven** station 2022-2023
- FerryBox installation in planning on **RV Akademik** (IO-BAS) Black Sea, with support from SeaReCap project (IO-BAS - Hereon collaboration)
- **Cuxhaven Station** (stationary, Elbe Estuary, **Hereon**), pilot ICOS-D estuarine station since 2023, will add methane measurements in 2025



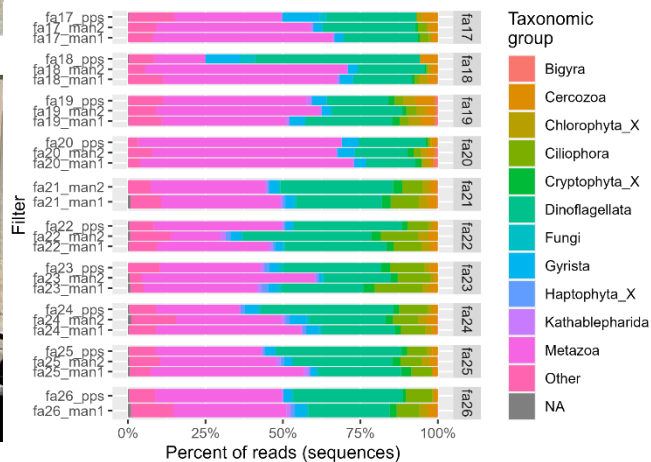
See the presentation by Yoana Voynova in this session about the impact of Storm Daniel on Black Sea biogeochemistry!

NIVA (Andrew King):

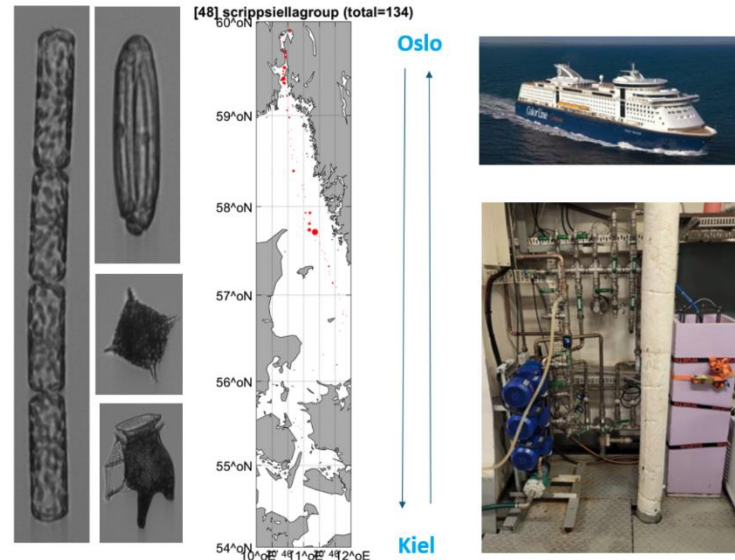
New FerryBox complete on coastal steamer MS Richard With, also with General Oceanics pCO₂ sensor for ICOS Norway, soon will apply for ICOS station labeling; eDNA and Imaging Flow Cytobot (IFCB) deployments on MS Color Fantasy as part of H2020 projects; nearly complete with re-establishing data links with EMODnet and beyond.



See the presentation tomorrow by Pierre Jaccard about FerryBox-based eDNA sampling!



See the poster this evening by Marit Norli about IFCB observations in the eastern N Sea!



Also see posters this evening by Liza Protsenko and Anfisa Berezina about NIVA's FB digital infrastructure and FB phytoplankton blooms in Oslofjord; also Kai Sørensen's presentation tomorrow on optical sensor calibrations!

SMHI (Bengt Karlson):

- SOOP line Tavastland is back in the Baltic Sea covering again the Bothnian Bay and the Baltic Proper.

Ferrybox R/V Svea

Monthly cruises
Baltic Proper
Kattegat-Skagerrak

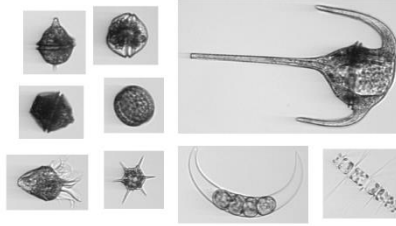
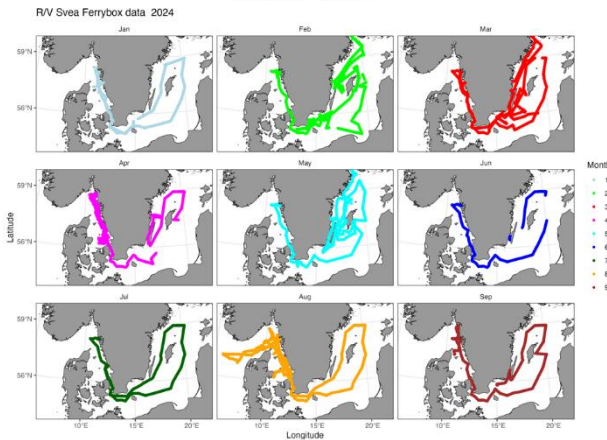
pH
pCO₂
fluorescence:

chl
phycyanin
phycoerythrin
CDOM

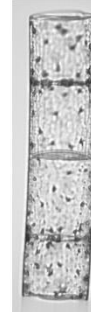
salinity
temperature
meteorology
PAR



Track in 2024



IFCB, automated plankton
sampling every ~25 minutes
AI-assisted analysis



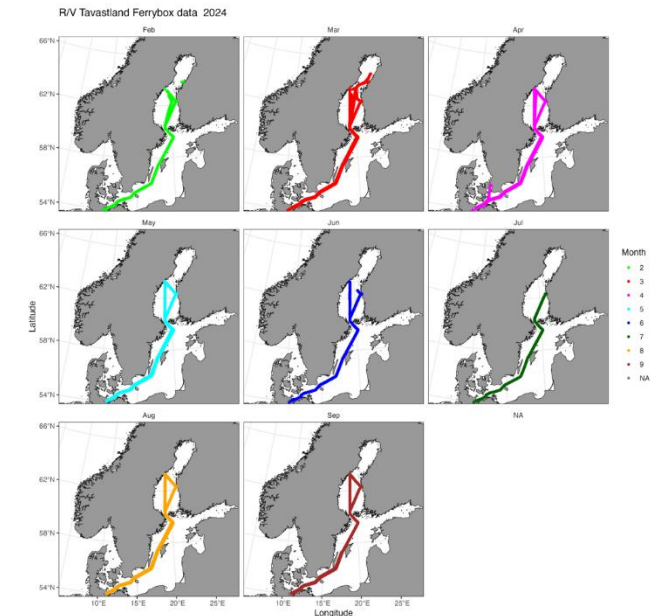
See the presentation tomorrow by Bengt Karlson about FerryBox plankton observations! Madeleine Nilsson presented earlier today!

Ferrybox Tavastland



pCO₂
fluorescence:
chl
phycyanin
CDOM
salinity
temperature

Track in 2024



SMHI

FB Task Team Highlights (cont'd)



SYKE (Jukka Seppala):

- celebrating 30 years of FerryBox measurements in Algaline “project”; demonstrated the operationality of plankton Imaging (IFCB, Cytosense) on SOOP line FINNMAID (Helsinki-Travemunde) for 5-month period; presentations earlier today by Jukka, Kaisa, and Lumi!

TalTech (Villu Kikas):

- upgraded FerryBox system installed onboard Victoria I (TallinnHelsinki/Stockholm); presentation earlier today by Urmas Lips!

FMI (Lauri Laakso):

- pCO₂ measurements onboard Silja Serenade (Helsinki-Stockholm) joining ICOS OTC; presentations earlier today by Lauri and Martti!

PLOCAN (Eric Delory):

- PLOCAN fixed platform FB (4H JENA) has been delivered to our offshore platform, plans to have the system commissioned by end of this year

Future direction and new initiatives

- Strengthen the collaboration between the related European RIs and other projects and initiatives (ongoing projects include JERICO-RI, ICOS-ERIC, NAUTILUS, AQUARIUS, MINKE, LandSeaLot, and others)
- Work towards an updated “white book/paper” about FerryBoxes for potential users/stakeholders
- 13th FerryBox Workshop in Spring 2026 hosted by ????