

The Swedish Research Vessel Infrastructure for Marine Research

An overview of the new National Infrastructure

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Swedish Research Vessel
Infrastructure for Marine Research

Research vessels in Sweden

Sweden is a maritime nation. With most of its borders being coastline, the ocean is central to the history and identity of Sweden

Sweden has many small, coastal vessels used for research and education, as well as 6 larger / advanced vessels used for research, education, monitoring and mapping. Each vessel is operated independently, with (until recently) little collaboration or integration.

In 2021, representatives from each of the large vessel operators/owners formed the Swedish Ship Operators Network (SON), with the aim to increase collaboration and share knowledge.

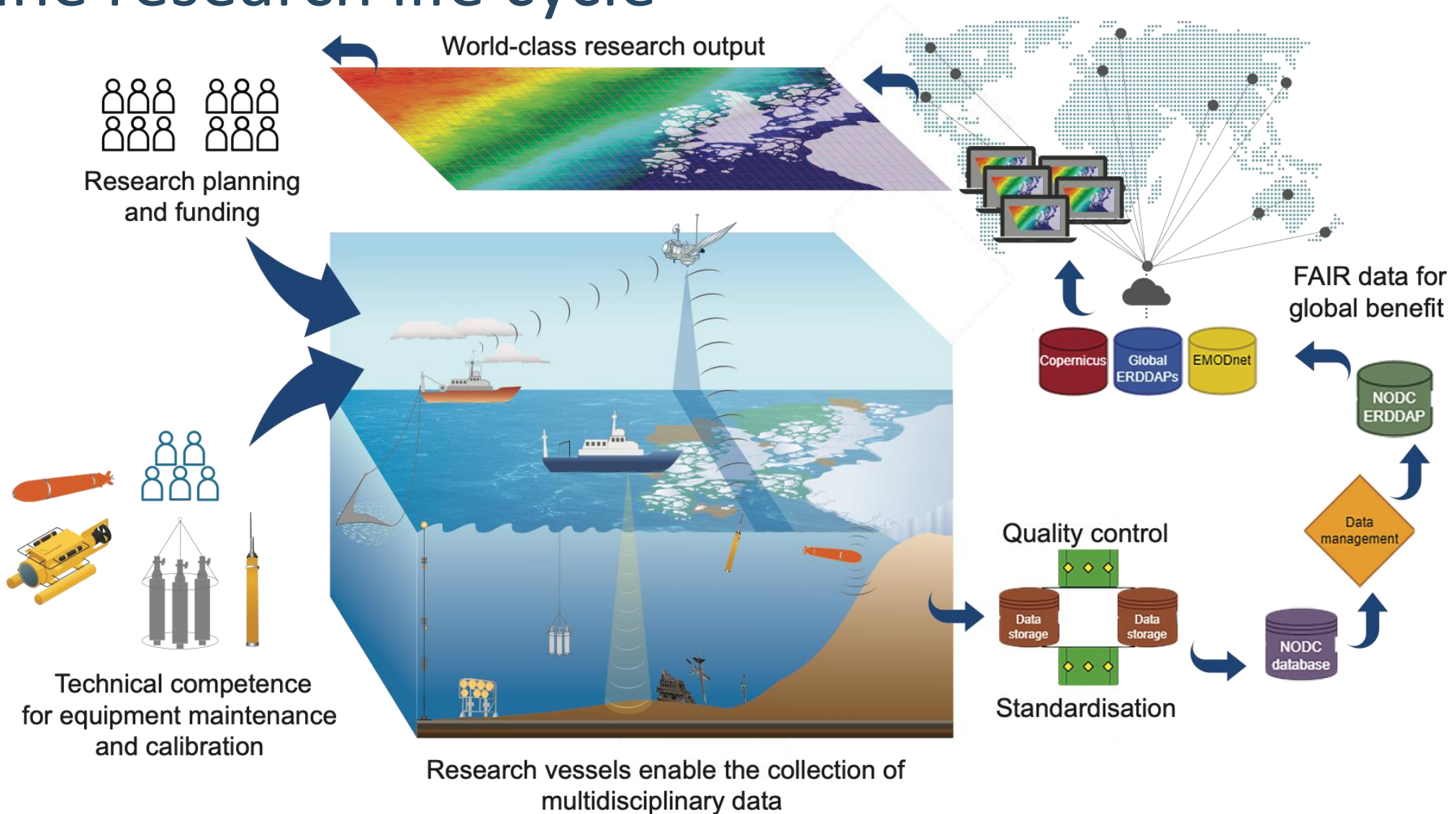
e.g. SON started a national network of technicians and ran online meetings and some workshops



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Ideal marine research life cycle

Each step requires infrastructure and funding at a level beyond the ability of a single organisation to provide; it must be delivered at a national level



What are the gaps in this cycle in Sweden?

1) Researchers do not have access to vessel infrastructure that they require. This is due to:

- A lack of funding for ship time
- Knowledge of vessel availability and access
- Ability to determine voyage specifics required for their science
- A lack of access to the required scientific equipment
- A lack of collaborative partners with the required expertise

2) Vessels are advanced multidisciplinary platforms that need to cater to a very broad range of users. This means:

- It difficult to maintain world-class equipment and the technical expertise required to support it
- It is difficult for operators to connect with all potential users, nationally and internationally
- The data collected is large and diverse, making it difficult (expensive) to ensure it is FAIR

...Reduces breadth of Swedish marine science, and our researchers ability to contribute to international programs

SWERVE: Swedish Research Vessel Infrastructure for Marine Research

VR-funded National Research Infrastructure 2024 - 2026

Aim: To align vessel and data infrastructures to enhance access to vessels, equipment and technical expertise – ensuring greater scientific and societal impact from research investment

We do this by bringing together:



UNIVERSITY OF
GOTHENBURG



Stockholm
University



POLARFORSKNINGS
SEKRETARIATET
SWEDISH POLAR RESEARCH SECRETARIAT

SGU Sveriges
geologiska
undersökning



SWERVE Infrastructure:



SGU Sveriges geologiska undersökning




Stockholm University



 **POLARFORSKNINGS SEKRETARIATET**
SWEDISH POLAR RESEARCH SECRETARIAT



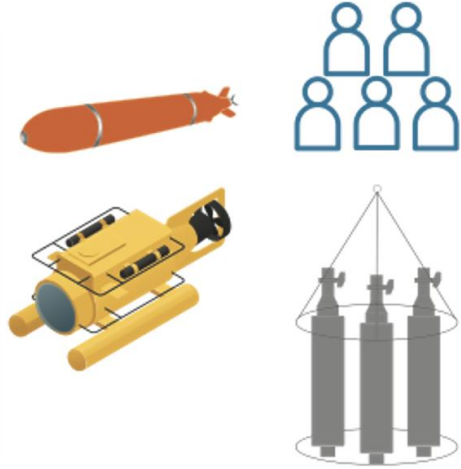

UNIVERSITY OF GOTHENBURG




SLU




UMEÅ UNIVERSITET



SWERVE Module 1: Coordination, Management and communication



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Module 1: Coordination, Management, and Communication

A) Coordination and Management

- Efficient processes
- Reporting + Finances
- Governance – led by a Steering Committee

B) Communication

- Development of a national network of ship users
 - 90 subscribers from 18 organisations

- Website: Vessel capabilities, schedules, technical information and support, available berths, inventory of nationally available equipment
 - www.swerve.se
- Newsletter to announce open opportunities, calls for collaborations, shared voyages
 - First SWERVE Newsletter June 2025
- Presentations, networking, meetings with users
 - Kick-off, scientific meetings, stakeholder meetings, vessel operator meetings, VR

[Addresses the gaps related to information sharing amongst and between vessel operators, ship users, technicians, and data managers]



SWERVE Module 2: Technical capabilities, sensor harmonisation and FAIR data



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Module 2A: Technical Capabilities

- National Marine Technicians Network
77 members, 19 organisations
- Training courses and workshops
4 workshops in 2 years (CTD, Multibeam, Ferrybox, SeaBird)
- Experts contact list for sharing knowledge and providing support for onboard sensor packages **Ongoing**
- National sensor package inventory
Currently being developed
- Onboard at-sea training and career development opportunities **Ongoing**



Module 2B: Harmonisation of sensors and delivery of FAIR data

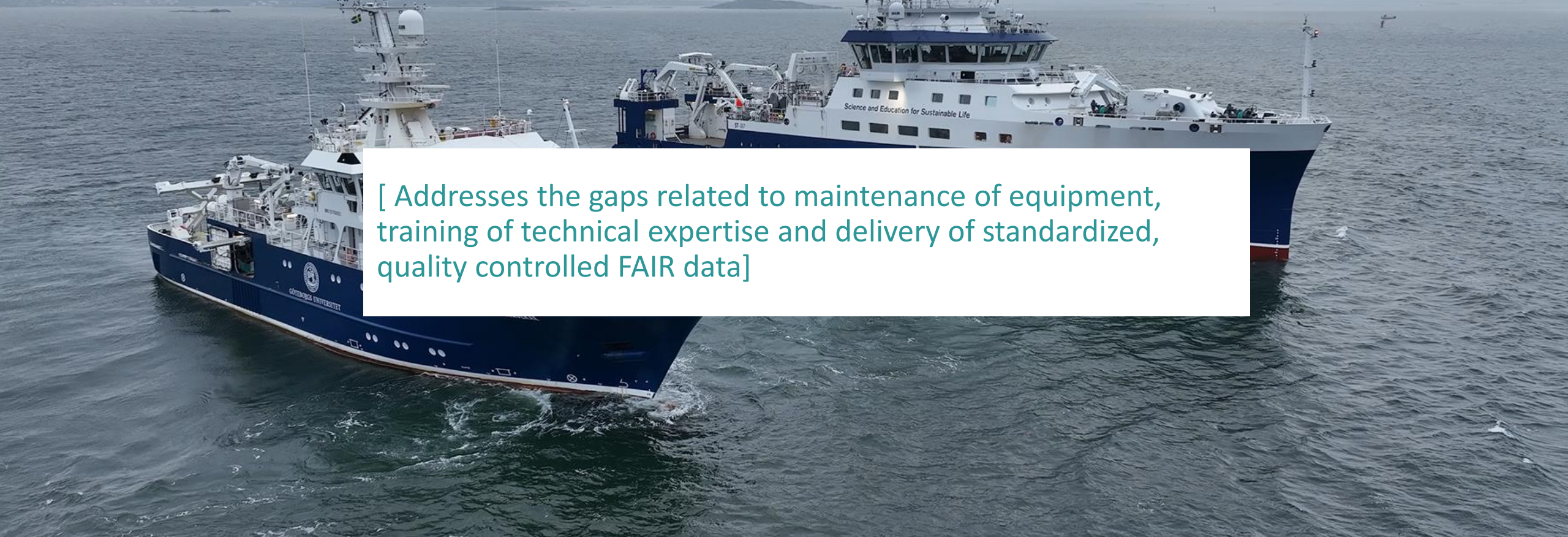
- Harmonise the onboard data systems (i.e. ferrybox, weather stations, CTDs) to ensure high standard of data collection
- Quality control and standardisation of data being collected
- Delivery of data to the NODC
- Delivery of data to international repositories

Ferrybox sensors							
Vessel	Temperature	Salinity	Fluorescence (phyco)	Fluorescence (Chl-a)	Oxygen	pH	pCO2
Oden	2	2	2	2	2	2	2
Svea	5	5	5	5	5	3	3
Skagerak	3	3	3	3	3	1	1
KBV 181	2	2	0	2	0	2	2
Ocean Surveyor	0	0	0	0	0	0	0
Electra	3	3	0	0	0	0	3

Weather Station Sensors							
Vessel	Wind speed/ Direction	Air Pressure	Temperature/ Humidity	Surface Earths Radiation Budget (ERB) shortwave (i.e. Photosynthetically active radiation)	Surface ERB longwave	Precipitation	Aerosol properties
Oden	5	5	5	5	1	5	0
Svea	4	4	4	4	0	4	0
Skagerak	3	3	3	3	3	1	0
KBV 181	3	3	3	3	0	0	0
Ocean Surveyor	1	1	1	0	0	0	0
Electra	3	3	3	0	0	3	2

CTD Sensors							
Vessel	Temperature	Salinity	Oxygen	Fluorescence	Turbidity	pCO2	pH
Oden	5	5	5	5	5	0	0
Svea	5	5	5	5	5	0	0
Skagerak	3	3	3	3	3	0	0
KBV 181	5	5	5	1	1	0	0
Ocean Surveyor	4	4	4	0	0	0	0
Electra	3	3	3	3	3	0	0

Readiness level	
0	Non-existent and not planned
1	Base Platform exists but sensors needed
2	Sensor exists but not calibrated or delivering quality data
3	Calibration systems needed, data stored locally and not visible
4	Calibration systems working, data delivered individually
5	Calibration systems in place, coordinated delivery of data in place



[Addresses the gaps related to maintenance of equipment, training of technical expertise and delivery of standardized, quality controlled FAIR data]

- Harmonise the onboard data systems (i.e. ferrybox, weather stations, CTDs) to ensure high standard of data collection **Cross-calibration exercises (Svea & Skagerak)**
- Quality control and standardisation of data being collected **Work in progress**
- Delivery of data to the NODC **Zenodo repository initiated; raw data flow now possible**
- Delivery of data to international repositories **Ongoing**

SWERVE Module 3: Enhancing access to vessels for research



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Module 3: Enhancing access to ships for research



- Providing ship-time funding through an open, competitive application process
- Access is based on scientific merit and feasibility

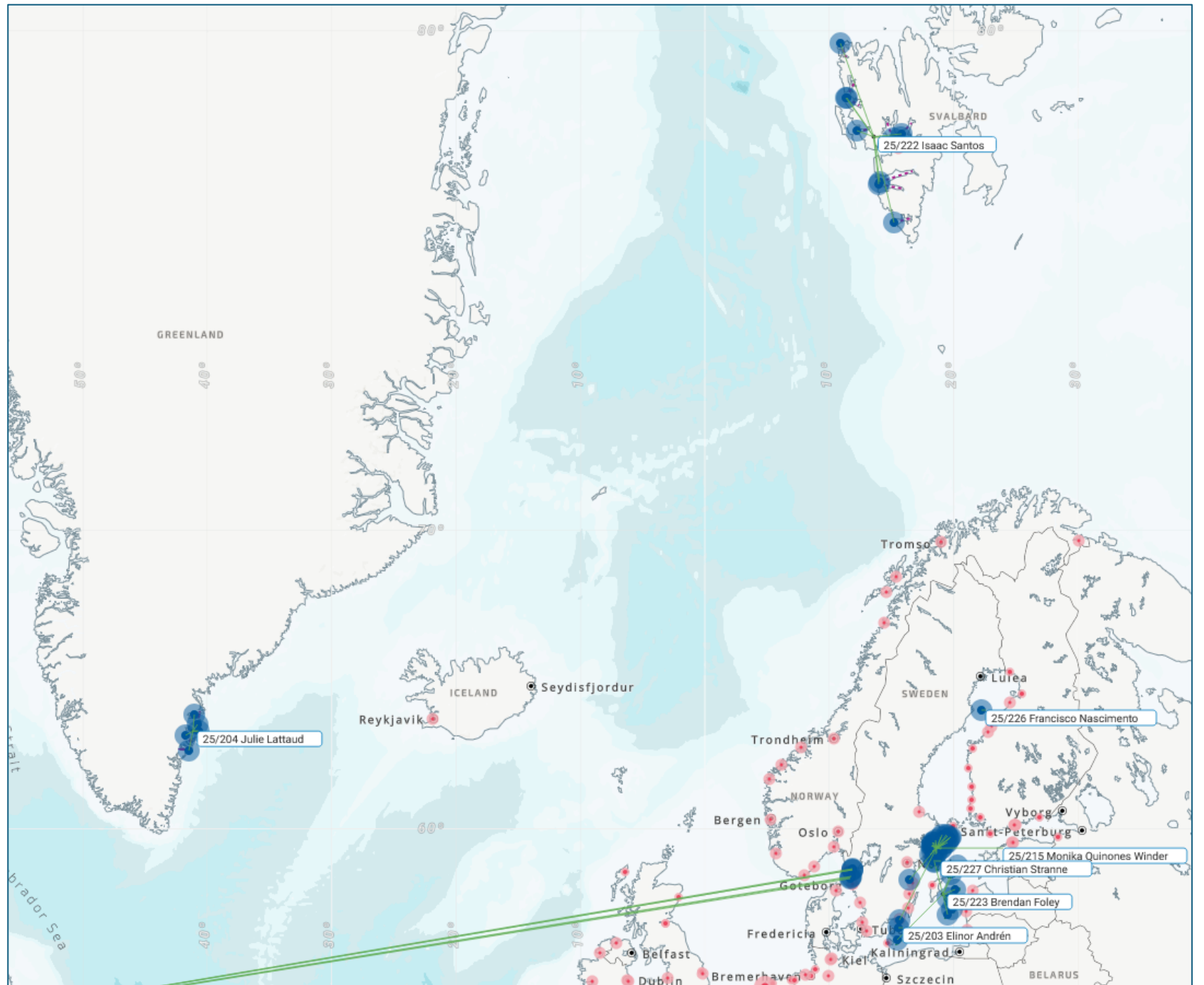
[Addresses the gap related to the cost of ship time]



Received 18 applications for 2025 ship time; with 6 voyages funded, resulting in 45 days of research at sea, from Bay of Bothnia to Iceland. Additionally, support for 7 ECR's onboard Oden voyage to the Arctic.



2026 ship-time applications



SWERVE2 (if funded) will include:

- 1) Enhanced access to RVs and equipment
- 2) National Marine Technicians Network
- 3) Sensor Harmonisation and National Sensor Pool
- 4) FAIR Vessel and Research Data
- 5) Management and Communications

SWERVE2: 2027 - 2031

