

# Eurofleets+ Project

Overview of Project Activities

Final Conference, 13<sup>th</sup> September, 2023

Aodhán Fitzgerald, Project Coordinator



**Eurofleets+**

An alliance of European marine research infrastructure  
to meet the evolving needs of the research and industrial communities



**2021**  
**2030** United Nations Decade  
of Ocean Science  
for Sustainable Development

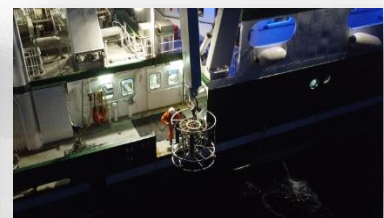
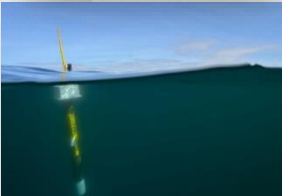
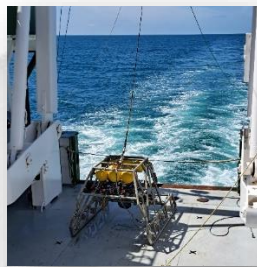
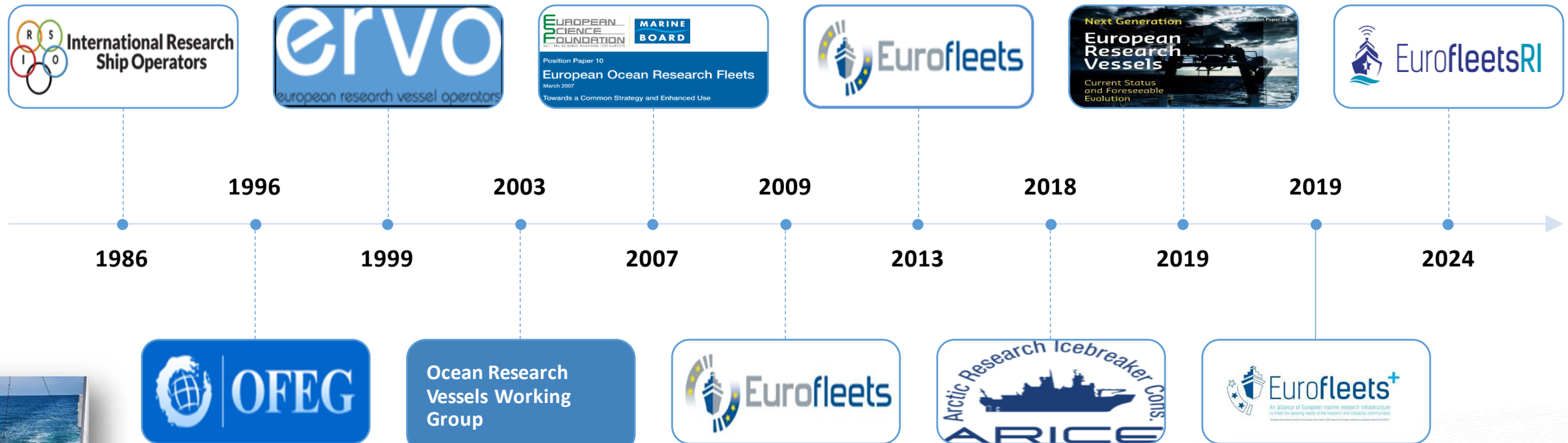


*Foras na Mara*  
*Marine Institute*



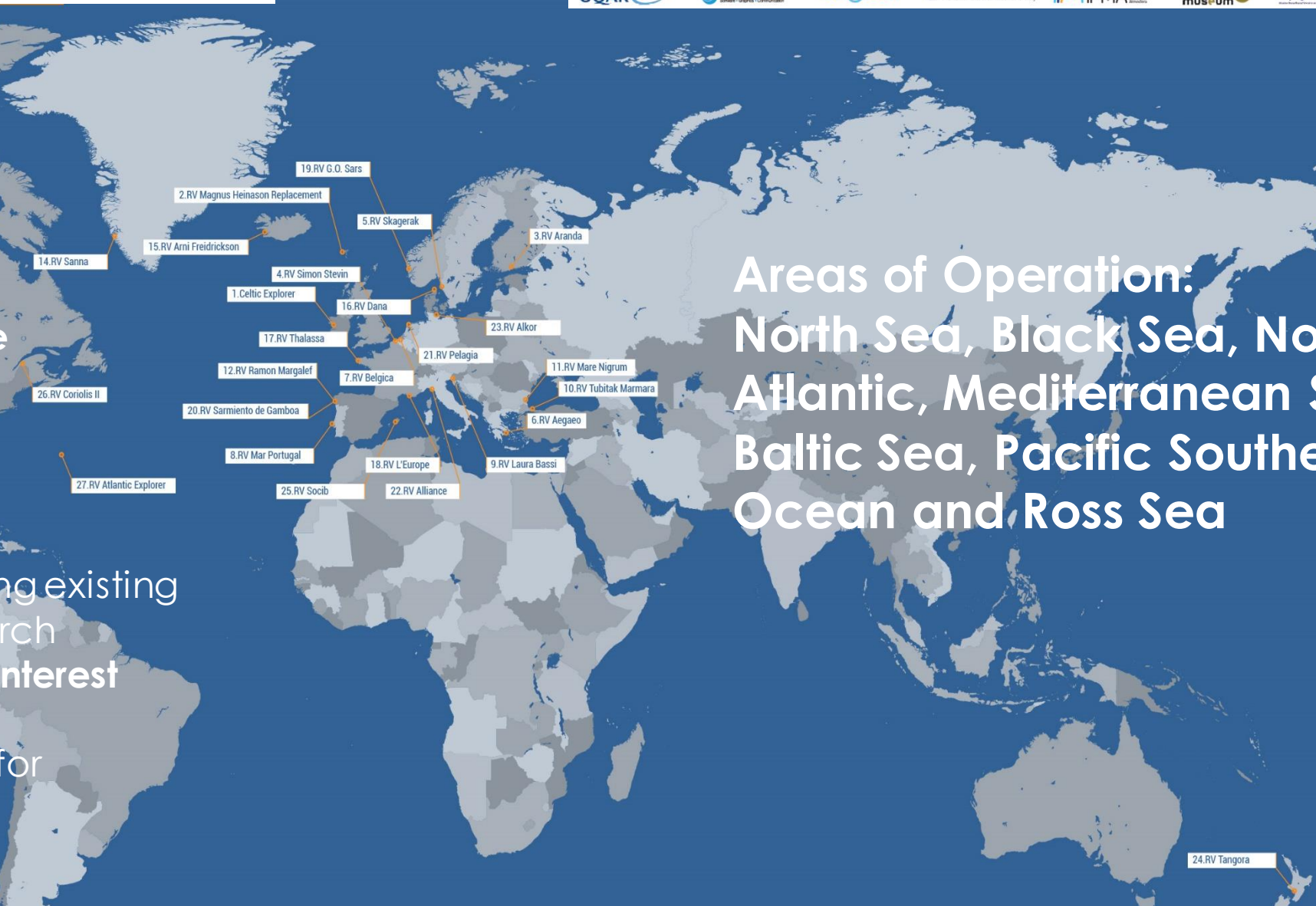


# EUROPEAN RESEARCH VESSEL FLEET COOPERATION, DEVELOPMENT AND ACTIVITIES 1986 - 2023



- 41 Partners
- Budget of 9.9m €
- Access to:
- 27 Research Vessels,
- 7 ROV's &
- 5 AUV's

Coordinator: Marine Institute  
 Start Date: 01 February 2019  
 End Date: 31 October 2023



Areas of Operation:  
 North Sea, Black Sea, North Atlantic, Mediterranean Sea, Baltic Sea, Pacific Southern Ocean and Ross Sea

**Call:** Integrating and opening existing national and regional research infrastructures of European interest  
**(INFRAIA Call H2020 2018)**

**Topic:** Integrating Activities for Advanced Communities

1

## Research Vessel Access

- Provide single point access to new more advanced research infrastructures ✓
- Transnational Access inc. e-access ✓
- Open Access to data ✓



2

## Education and Training

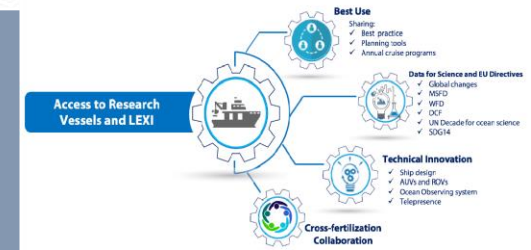
- Education of the next generation of researchers ✓
- Transfer of knowledge and technology through exchange of staff ✓
- Promote Ocean Literacy ✓



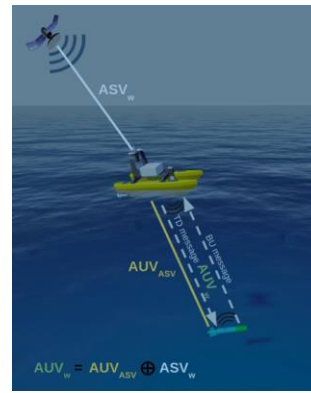
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## Better coordination of European Research Vessel Fleets

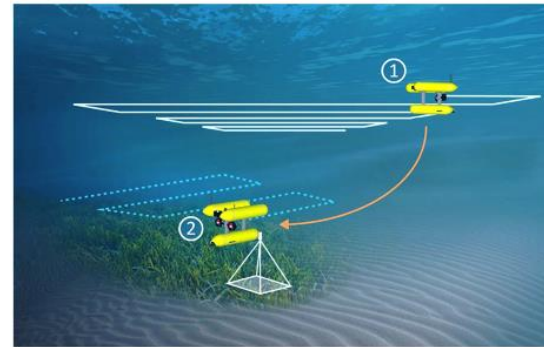
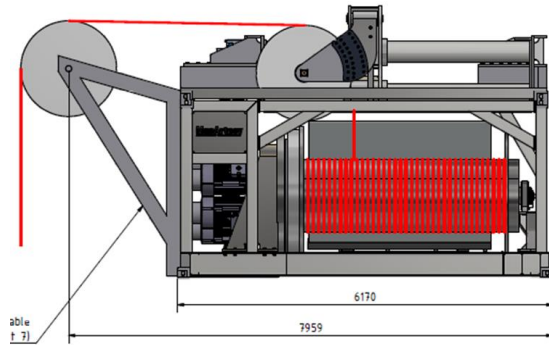
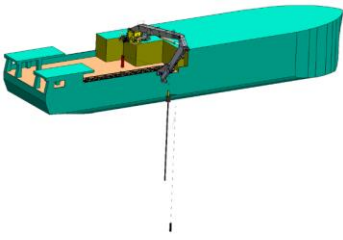
- Development of synergies and complimentary capabilities ✓
- Promoting greener and sustainable research vessel ✓
- Fostered innovation through reinforced partnerships with industry and stakeholders ✓







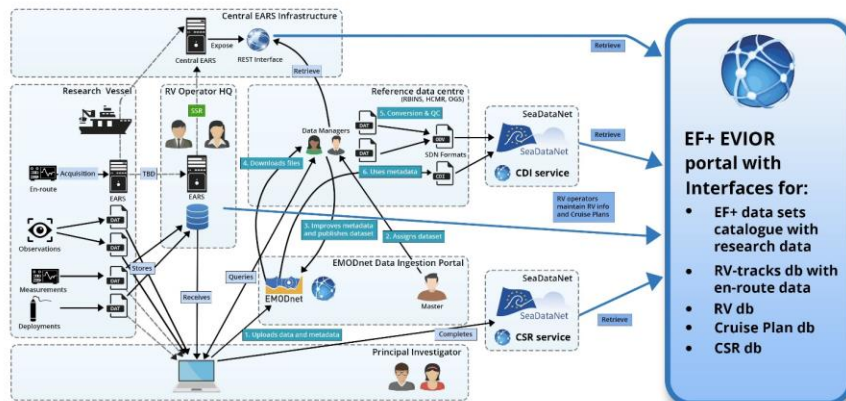
# EUROFLEETS JOINT RESEARCH ACTIVITIES



## EUROFLEETS+:

- Advancing shipboard data management and data access (EARS) TRL 6-7
- Equipment innovations for deep sea operations from vessels
- Intelligent robot exploration

Cruise ID	Research Vessel	Date Start	Date End	More Details
IRAE	Odisea	2020-05-28	2020-06-02	✓
Bermevan	CSG Siles	2020-06-05	2020-06-10	✓
PODOL-ROSA	Sesimbra	2020-06-30	2020-07-06	✓
GRANDPAP	SOLAS	2020-07-14	2020-07-20	✓
GRANDPAP	Odisea	2020-07-23	2020-08-12	✓
HYDROLAB	Odisea	2020-08-30	2020-09-04	✓
PROVISA	Galapagos Research	2020-09-13	2020-09-17	✓
PODOL-CAP	Galapagos	2020-09-20	2020-09-30	✓
CALYPSO	Odisea	2020-10-20	2020-01-12	✓
CRISTE	Odisea	2020-04-04	2020-04-07	✓



**ICRI 2022 Side Event**  
**Long-term sustainability of small & mid-scale distributed Research Infrastructure projects**

Organisers:

Date: 19 October 2022 | Time: 9:00am-12:00pm | Type of event: Hybrid

Registration: Mandatory for on-site and online attendance on <https://icri2022.gpm.me/registration/3-registration-to-attend-the-side-events-of-icri-2022>

Place: Bco Western Premier Hotel International, Brno, Slovakia

Session 1: Presentations of sustainability approaches from 12 RI projects

Session 2: Co-creation & mutual learning exercise on sustainability, visibility & impact of RI

Session 3: Roundtable discussion on the outcomes of the co-creation session & way forward

ICRI2022.CZ

The aforementioned RIBRA projects have received funding from the European Union's Horizon 2020 Research & Innovation Programme



# WP5. Eurofleets+ Stakeholder Engagement

- 2 Stakeholder International workshops
  - 1st workshop (virtual on April 13, 2021) Combining fixed and mobile ocean observing systems and their link with satellite observations
  - 2nd workshop (virtual on September 26, 2022) Synergies with the Atlantic Mapping program linking with AORA, EMODNET bathymetry and Belém statement
- Stakeholder Engagement Questionnaire
- Stakeholder Engagement face to face interviews
- Strategic MOU and partnerships developed with other projects; GROOMII, RITrainPlus, ARICE, CATRIS...

- Research and education:** Research institutions, academia, European Research Infrastructures, High education institutions
- Industry:** Technology developers, Innovators, Marine Engineering Companies
- Government:** Regional and local governments, National and EU policy-maker
- Civil society:** NGOs, Journalists, documentarists, General public

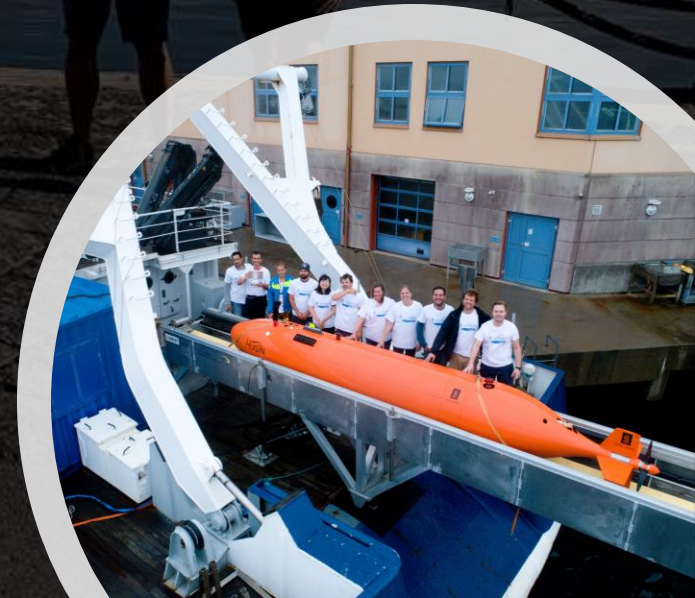


# Education Training



# OGS

- 5 Floating Universities
- 8 Marine Internships
- 2 Autonomous Underwater Vehicle Labs
- 2 ROV Labs at University of Bremen
- 2 Seismic Labs at
- Ocean Classroom with over 83 resources
- Research Infrastructure Management Workshop
- Ship to Shore educational Broadcasts
- Partnerships with Partnership for Observation of the Global Ocean (POGO) and All-Atlantic Floating University Network





**GOAL**  
Develop capabilities on IQUA vehicles to operate cooperatively

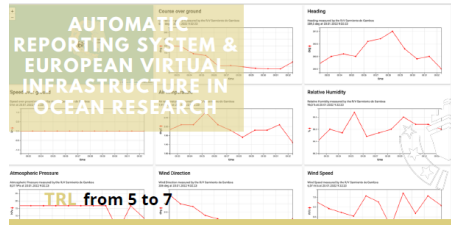
**MOTIVATION**  
Cost reduction on AUV operations using an ASV for monitoring

**OUTCOME**  
Algorithms to enable 2 different cooperative modes: 1) ASV follows AUV and 2) AUV is guided by ASV. This involves advances in the IQUA-ASV's software architecture with regards to acoustic communication protocols, mission re-planning, path planning and saliency detectors over multibeam data.

**VALUE**  
ASV follows AUV mode guarantee acoustic coverage and provide position updates AUV is guided by ASV mode mapping the seafloor from the surface and command the AUV to respect detected targets

**NEXT STEPS**  
Improve the technology to integrate it in the AUV's architecture as a potential add-on for customers requesting cooperation between vehicles.

**TALK TO US**  
IQUA Robotics  
Joana Rocha - [info@iquarobotics.com](mailto:info@iquarobotics.com)



**GOAL**  
Installed on a Research Vessel, EARS is instrumental for gathering partly automatically and partly manually. The full set of metadata and data that is acquired during the operations of a cruise by sensors and sampling. It is equipped for near real-time transfer of these data to a His inshore and to feed a dynamic dashboard at the online EVIOR platform.

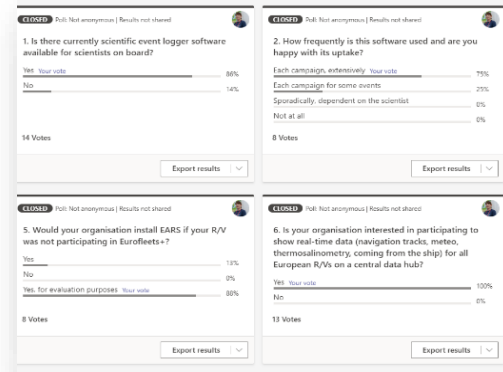
**MOTIVATION**  
This web, the sailing and underway data and events information from equipped Research Vessels can be retrieved and displayed. While afterwards, the EARS log data can be used for generating a Cruise Summary Report and contributing to Data Management follow-up.

**OUTCOME**  
The EARS software package including documentation for installation, configuration, and use. It can be installed by VM and as Docker instance.

**VALUE**  
As we see a world moving toward autonomous vessel operation, undertaking scientific cruises is expensive and it is of utmost importance that the collected data and samples are well stored and documented for optimal and wider use.

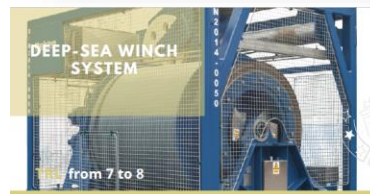
**NEXT STEPS**  
Considering to achievements and future potential, the development team strives for arranging an Intellectual Property Rights between involved partners and to make arrangements for a licensing agreement towards future users.

**TALK TO US**  
MUSEUM, CSIC, Ifremer, Spanish, MARIS  
Daria K. Simey - [dsimey@museum.es](mailto:dsimey@museum.es)



# WP7. INNOVATION MANAGEMENT AND EXPLOITATION

- Exploitation strategy developed
- Developed guidelines and support to user groups and researchers on innovation management and exploitation, for funded transnational Access
- Industry platform within the Eurofleets+ Innovation Committee
- Exploitation roadmap to ensure that commercial and non-commercial results of the project.



**GOAL**  
To provide a standardized winch system with high flexibility for user-base scenarios.

**MOTIVATION**  
Introduce a new sensor to be used by AUV, ROV, boats.

**OUTCOME**  
MacArtney has used a novel technology, with Electrical Winches, designed a winch meeting the requirement for versatile operations on research vessel. All parts of the winch system have been built in delivered systems, and tested in container operation since 2016.

**VALUE**  
As we see a world moving toward autonomous vessel operation, the system adding value with a fully electrical, coordinate winch system with a high level of self-diagnostic and remote autonomous operation.

**NEXT STEPS**  
Continue product development to keep abreast with technology.



**GOAL**  
Make an efficient and flexible system for handling of current and future scientific equipment both over side and through moonpool.

**MOTIVATION**  
Making handling of science equipment safer, more efficient and flexible.

**OUTCOME**  
A customised system ready to use from small instruments to the largest identified in the project. In addition the system is prepared for use in small to large vessels.

**VALUE**  
The system offers improved operational efficiency and flexibility.



**GOAL**  
Introduce a new underwater sensor with deep learning capabilities.

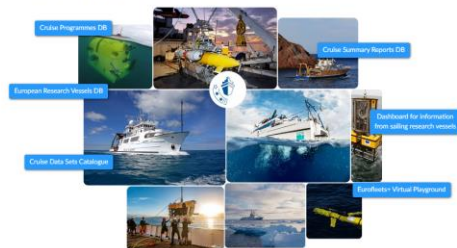
**MOTIVATION**  
Introduce a new sensor to be used by AUV, ROV, boats.

**OUTCOME**  
A new Corionis Online Underwater System with 4 cameras able to work in 360-degree app. The system includes an embedded AI with deep learning capabilities, where algorithms for target recognition can be deployed.

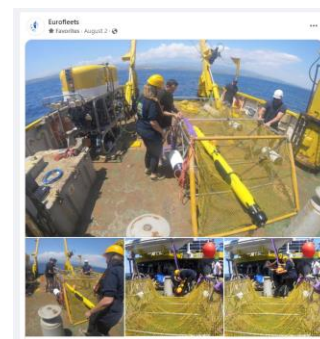
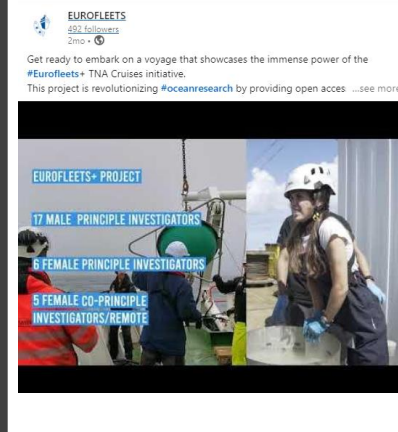
**VALUE**  
Using underwater omnidirectional systems allows the inspection of the seafloor in all directions at the same time. It also allows experts to have an immersive 360° view of it.

**NEXT STEPS**  
The system offers improved operational efficiency and flexibility as a potential add-on for customers requiring this kind of underwater sensors.

### European Virtual Infrastructure in Ocean Research (EVIOR)

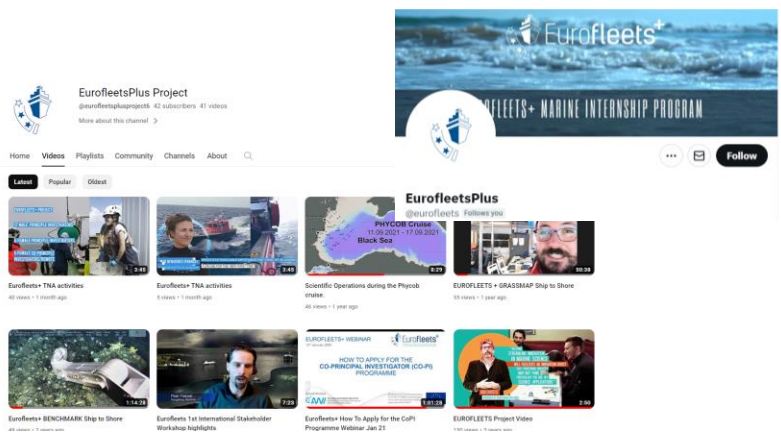


Sharing information on planned, current and completed cruises and on details of European research vessels and specialized equipment. Giving e-access to underway events, information, sailing tracks and current position of European research vessels.



# Dissemination Activities

- Website and social media accounts
- Promotion of project activity
- Promotion of scientific data
- Dissemination of funded cruise activity
- Engagement of extended stakeholder groups
- Supporting capacity-building and ocean literacy





# TOWARD A LEGAL FRAMEWORK EUROFLEETS RI



**EUROFLEETS RI** aims at uniting world-class RVs and associated equipment among European partners to **facilitate access to unique marine infrastructure for a wide user community, enabling excellent research, increased cooperation** in technical development and **sharing of knowledge in RV operations & management.**

**EUROFLEETS RI** will play a **central role in delivering the European Union Missions by the provision of access to our Seas and Oceans through facilitation of multidisciplinary science teams** tackling changing climate, supporting bio medical research, ocean monitoring, sustainable fisheries and advancing the European Green Deal.

Collaboration in **EUROFLEETS RI** will help to **optimise integration, develop a European approach to address common challenges** through the provision of **single point transnational access to our Seas and Oceans.**





# Research Vessel Fleet Development 2019-2022

- Greenland - Tarajoq (61m)
- Faroes - Jákup Sverri (54m)
- Ireland - Tom Crean (52.8m)
- Belgium - Belgica (71m)
- Sweden - Svea (69.5m) & Skagerak (49m)
- Italy - Laura Bassi (80m) (ex Ernest Shackleton) & Gaia Blu (82.9m) (Ex Falkor)
- Norway - Prinsesse Ingrid Alexandra (35m), Geologen (23m) & Beret Paulsdatter (24.6m)
- UK Sir David Attenborough (125m)





# Research Vessel Fleet Development 2023 -2030

- Iceland –Bjarni Sæmundsson replacement (70m) 2024.
- Germany –Meteor IV (125M) 2026.
- Netherlands – RV Wim Wolff (36m) 2023 & RV Anna Weber-van Bosse (80M) 2025
- Denmark – RV DANA V (68m)
- Spain –Odon de Buen (84m) 2024
- Germany –Polarstern II (145m) 2027
- France – Regional Vessel (40m) 2025



THANK YOU

[www.eurofleets.eu](http://www.eurofleets.eu)

Email: [eurofleetsplus@marine.ie](mailto:eurofleetsplus@marine.ie)



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