

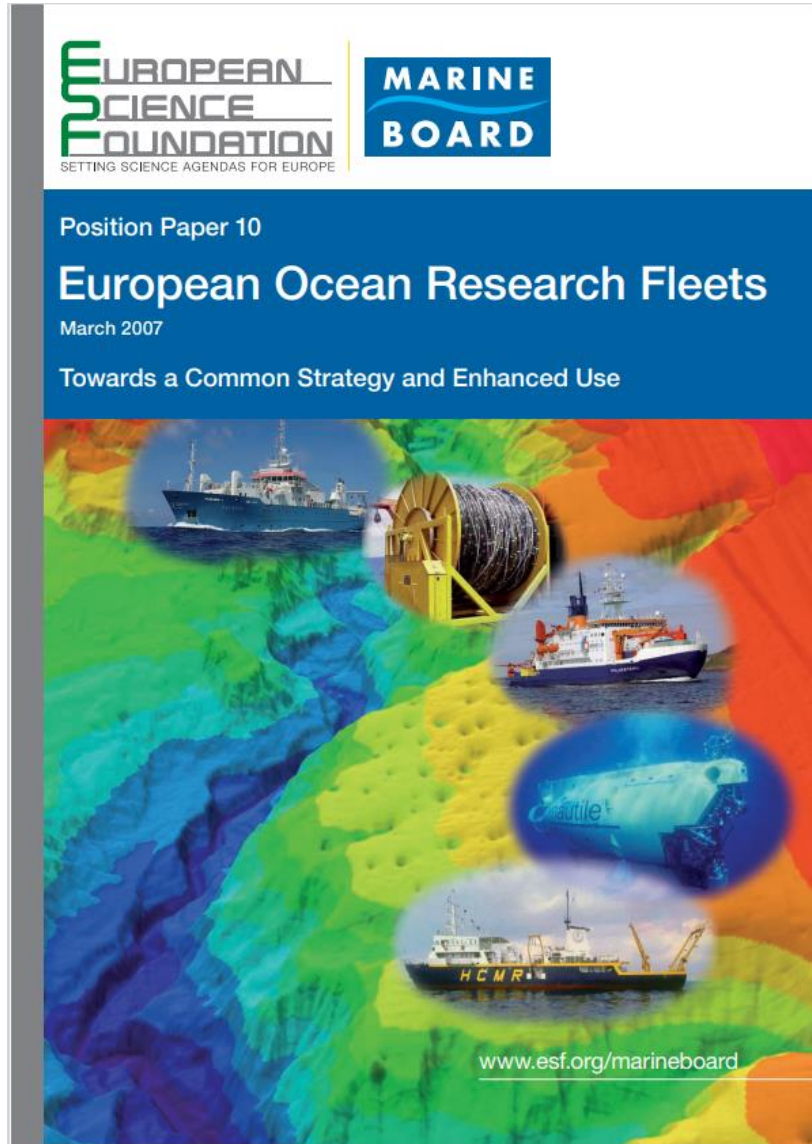
# European Marine Board Webinar on *New developments in research vessel capabilities and technology*

16 June 2022

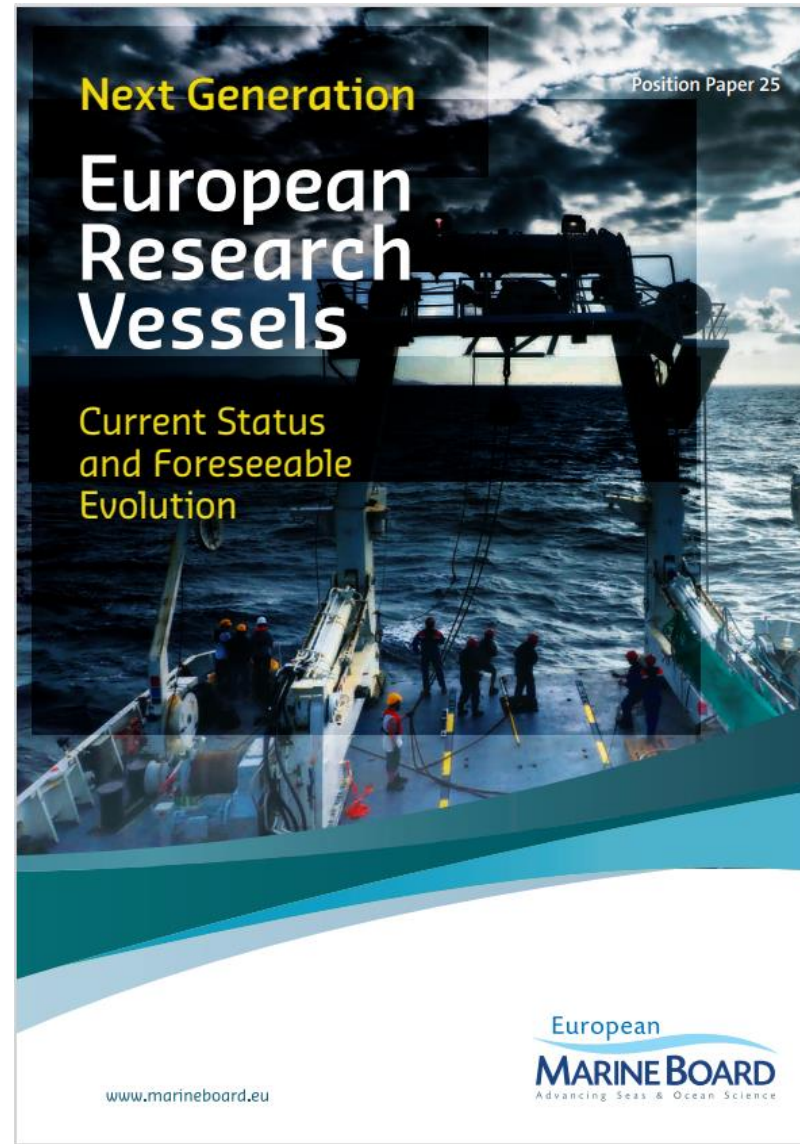


European  
**MARINE BOARD**  
Advancing Seas & Ocean Science

# EMB Position Papers on Research Vessels



EMB PP 10 (2007)



EMB PP 25 (2019)



# Background – Status pr 2019 (EMB PP 25)

## THE FLEET IN FIGURES

**99**  
VESSELS



Operated by 62 operators  
in 23 different European countries.  
6 countries own more  
than 5 vessels

  
**25**  
YEARS

Average age of the fleet is 25 years.  
The fleet is split equally into 1/3 Local  
and Coastal Class, Regional Class, and  
Ocean and Global Class

99 Research Vessels (RVs) operated by 62 operators in  
23 different European countries.

6 countries own more than 5 vessels

Average age of the fleet is 25 years.

The fleet is split equally into:

1/3 Local and Coastal Class

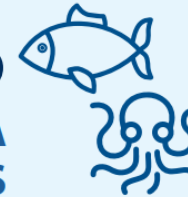
1/3 Regional Class

1/3 Ocean and Global Class

8 DEEP-SEA VESSELS that can deploy a full set of  
deep-sea equipment and a total of 16 vessels that  
can conduct some research in the deep sea

9 POLAR VESSELS with ice-breaking capability and  
a total of 24 vessels that have some ice-going capability

**8**  
DEEP-SEA  
VESSELS



that can deploy a full set of  
deep-sea equipment and  
a total of 16 vessels that can  
conduct some research  
in the deep sea



**9**  
POLAR  
VESSELS

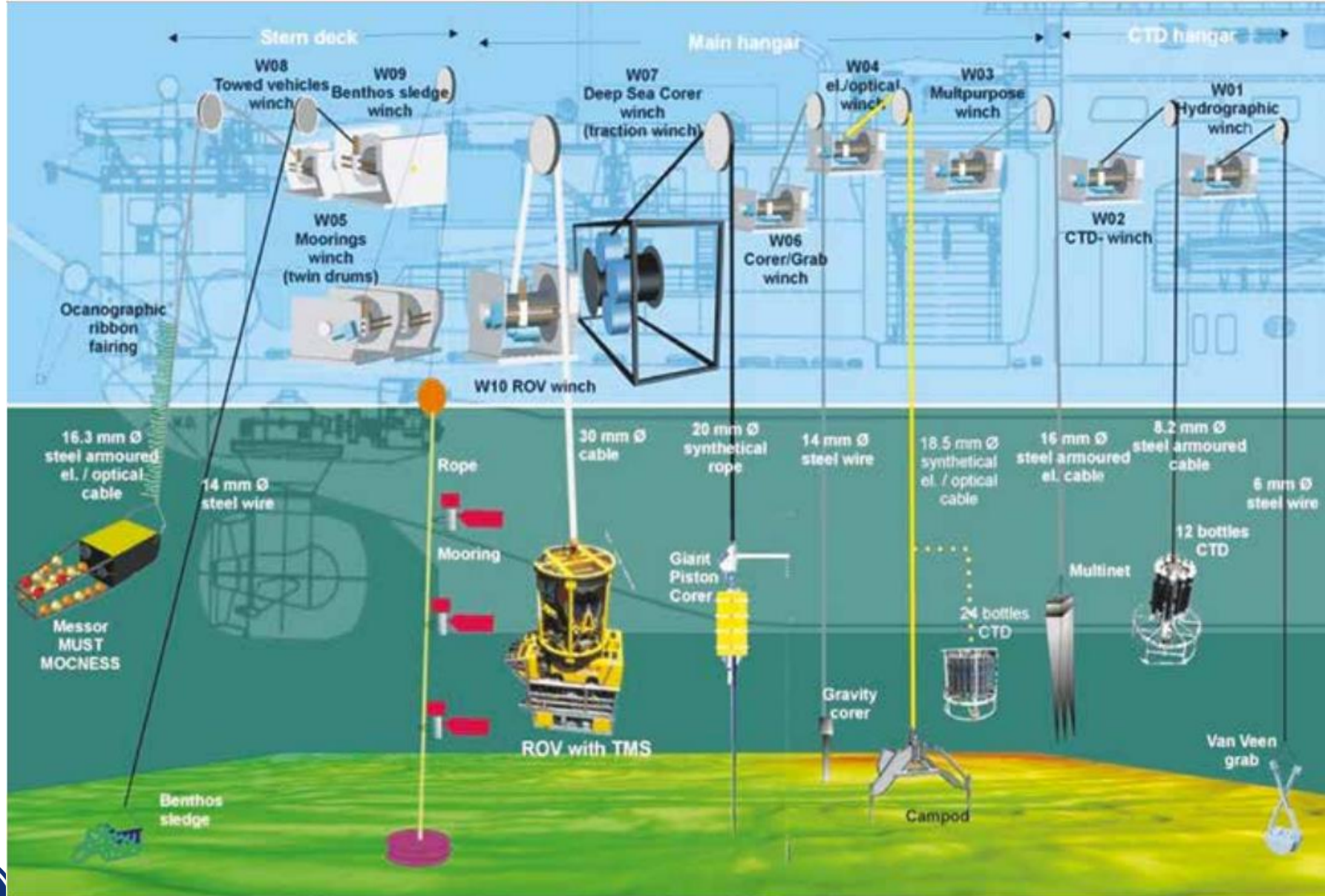
with ice-breaking capability  
and a total of 24 vessels that have  
some ice-going capability



# Main marine science areas using Research Vessels

- Oceanography (Physical and Chemical)
- Biology (Plankton, shellfish, benthos, fish, sea mammals, seabirds etc)
- Geology (Seafloor mapping, seabed geology)
- Fish stock assessment (Mapping and monitoring of fish stocks)
- Meteorology (Weather data collection)
- Platform for deployment, service and recovery of autonomous vehicles and stationary observation systems on the seafloor, in the water column and on the sea surface
- Logistical support to Antarctica Research Stations





Typical RV sampling tools

# Trends

- Several nations are modernizing and expanding their research vessel (RV) fleets.
- Increased use of autonomous vehicles and stationary observing platforms.
- Developments in Research Vessel designs.
- Use of satellite communication to deliver near real time data and video to shore.
- Opportunistic hydrographic mapping of international waters world wide.
- Transnational Access (TA) through the EU-funded projects Eurofleets and ARICE.
- Development of a legal entity called Eurofleets RI.



# RV Fleet developments 2019 - 2022

- Greenland – Tarajoq (61m)
- Faroes - Jákup Sverri (54m)
- Ireland – Tom Crean (52.8m)
- Belgium – Belgica II (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)



# RVs «in the pipeline»

- Iceland – Bjarni Sæmundsson replacement (2024).



- Germany – Meteor IV (2026).



- Netherlands – Pelagia replacement (2024/2025)



- Spain – New RV for IEO (2024)



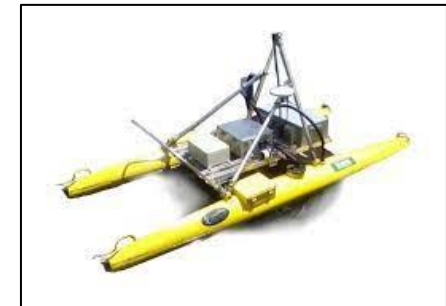
- Germany – Polarstern II (2027)



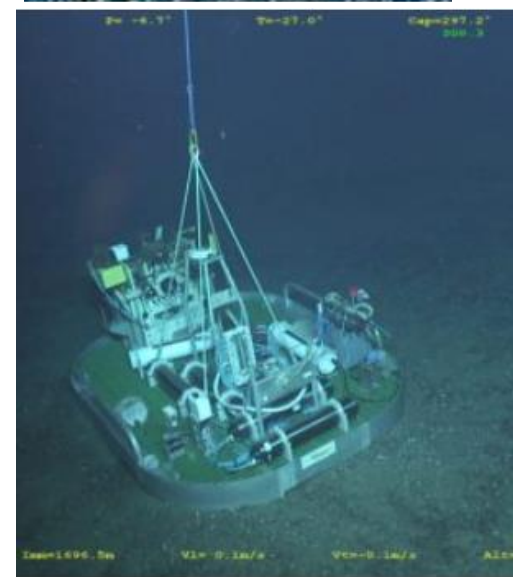
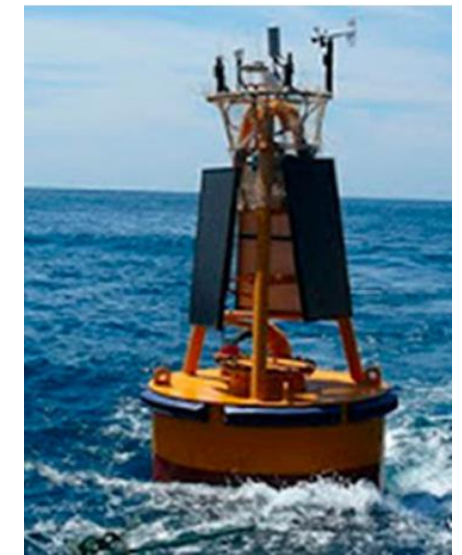
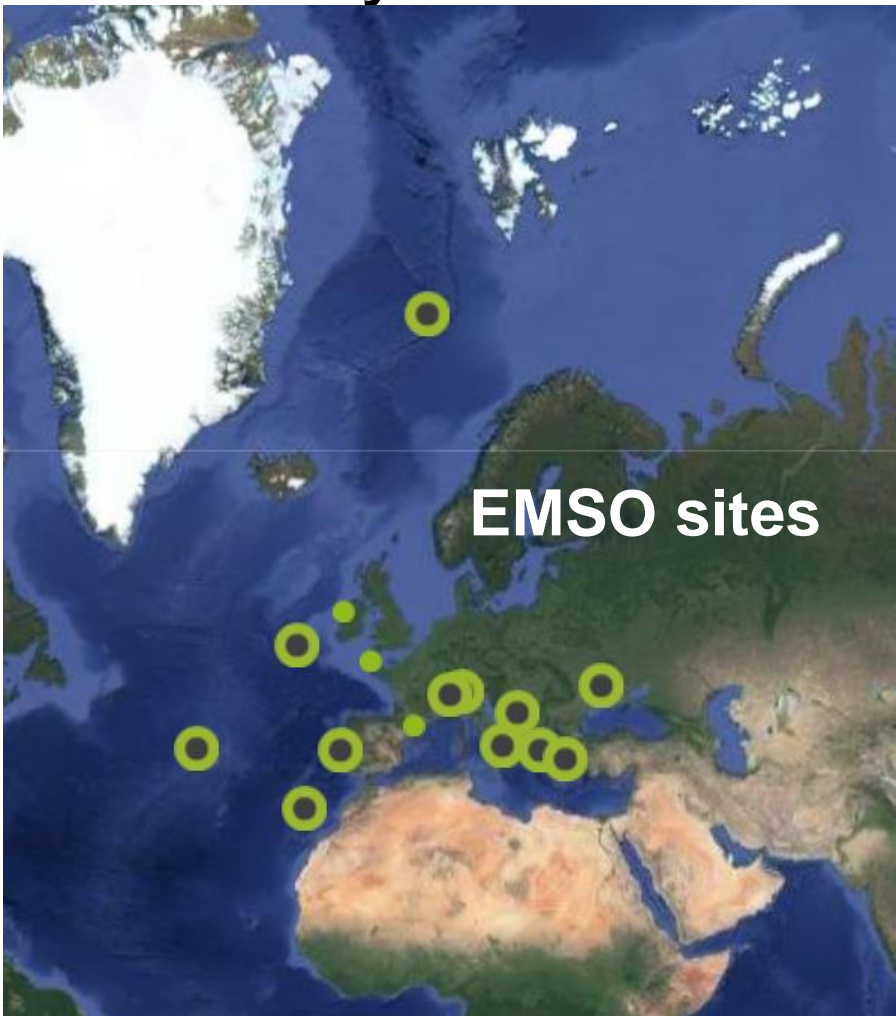


# Autonomous vehicles

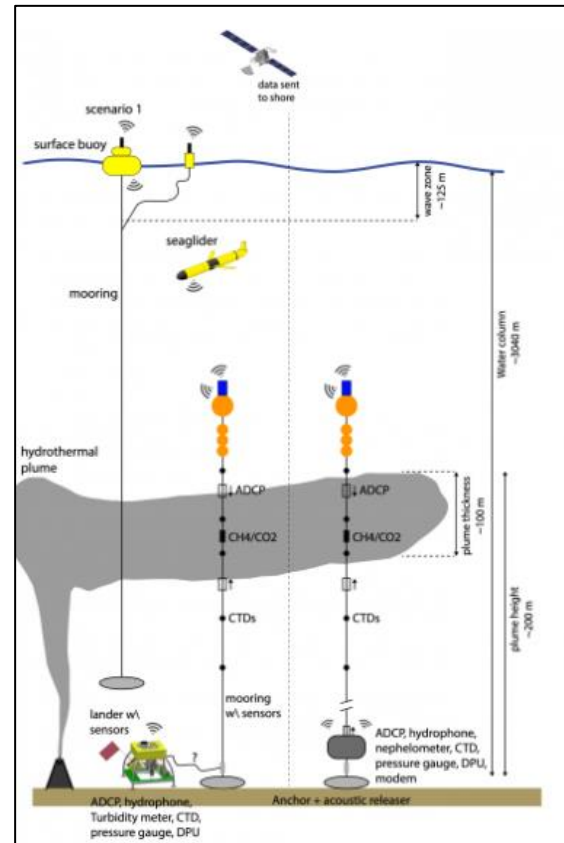
- Rapid growth in use of autonomous vehicles in the air (UAVs), on the sea surface (USVs) and in the water column (AUVs, gliders, floats).
- Many of these are working in cooperation with RVs (deployment, recovery, remote control, resupply, service etc).
- This creates new challenges for the RV crews and instrument technicians with regards to new skills and sufficient training, and for the RV operators regarding modifications to the RV infrastructure to find the necessary deck space, power supplies and to develop safe and efficient handling systems for such a diverse group of vehicles.



# Stationary observation systems



Require vessels to be deployed, serviced and recovered.



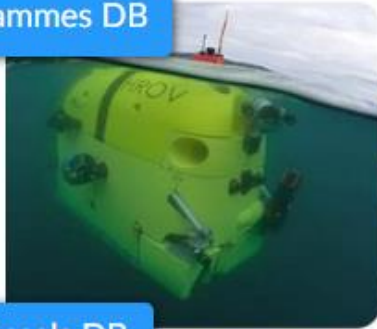
# Developments in Research Vessel designs

- Larger vessels with increasing number of cabins and laboratories, and large, open work deck for handling of observatories/landers/moorings, Autonomous Vehicles and other Large Exchangeable Instruments (LEXIs).
- Larger and more capable cranes, A-frames and winches to handle increasingly larger and heavier equipment and to reach larger water depths.
- Reduction in emissions to air with low emission diesel engines (Tier III) combined with use of LNG, biodiesel, fuel cells, battery packs etc. Not many (if any) «non-emission» RVs so far due to operational profile (long cruises far from shore), limited supply points for LNG, LPG, methanol, hydrogen etc and large storage volumes.
- EVIOR – European Virtual Infrastructure in Ocean Research.
- Increased use of satellite communication with growing bandwidth demands.



# European Virtual Infrastructure in Ocean Research (EVIOR)

Cruise Programmes DB



Cruise Summary Reports DB



European Research Vessels DB

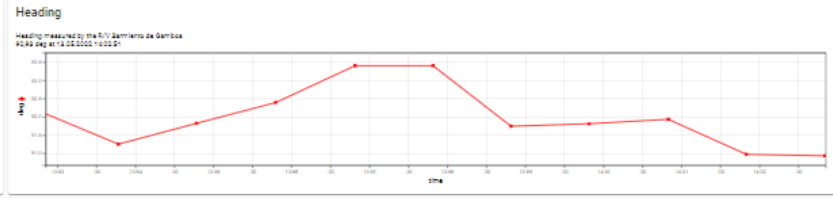
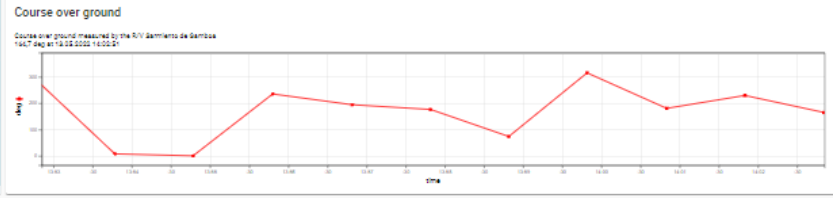
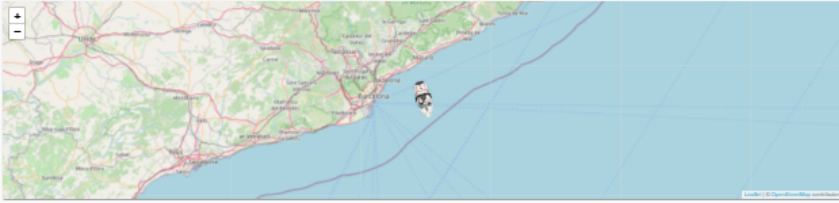


Dashboard for information from sailing research vessels



<https://evior.eurofleets.eu>





# Opportunistic hydrographic mapping of international waters



The banner features a background image of an underwater scene with coral and fish. At the top, there is a row of logos: The Nippon Foundation (with Japanese characters), GEBCO (General Bathymetric Chart of the Oceans), IHO (International Hydrographic Organization), and UNESCO (Intergovernmental Oceanographic Commission). To the right of these is the 2021-2030 United Nations Decade of Ocean Science for Sustainable Development logo. On the left side of the banner is the SEABED 2030 logo, which includes the text 'THE NIPPON FOUNDATION-GEBCO' and 'SEABED 2030' above a stylized blue wave graphic. The main title 'The Nippon Foundation-GEBCO Seabed 2030 Project' is written in large white text in the center. At the bottom center, the text '100% of the ocean floor mapped by 2030' is displayed.



Status pr 2021: 20.6%

<https://seabed2030.org>



# Transnational Access (TA)

- EU-funded TA suggested in EMB PP10 (p. 33) and has been the main activity in the EU-funded projects Eurofleets (2009-2013), Eurofleets2 (2013-2017), Eurofleets+ (2019-2023) and ARICE (2018-2022).
- Has resulted in access to well equipped RVs and Large Exchangeable Instruments for students, instrument technicians and scientists for training and/or science cruises.

TA activity	Eurofleets	Eurofleets2	<u>Eurofleets+</u> (Provisional)
Number of calls	3	5	4
Proposals submitted	54	50	56
N. of granted cruises	17	24	24
N. of days at sea (Vessel/Equipment)	190,5	221+24	231+63
N. of researchers and students	221	498	TBC

160 TA cruise proposals  
65 granted cruises  
642 cruise + 87 LEXI days  
719+TBC E+ person days

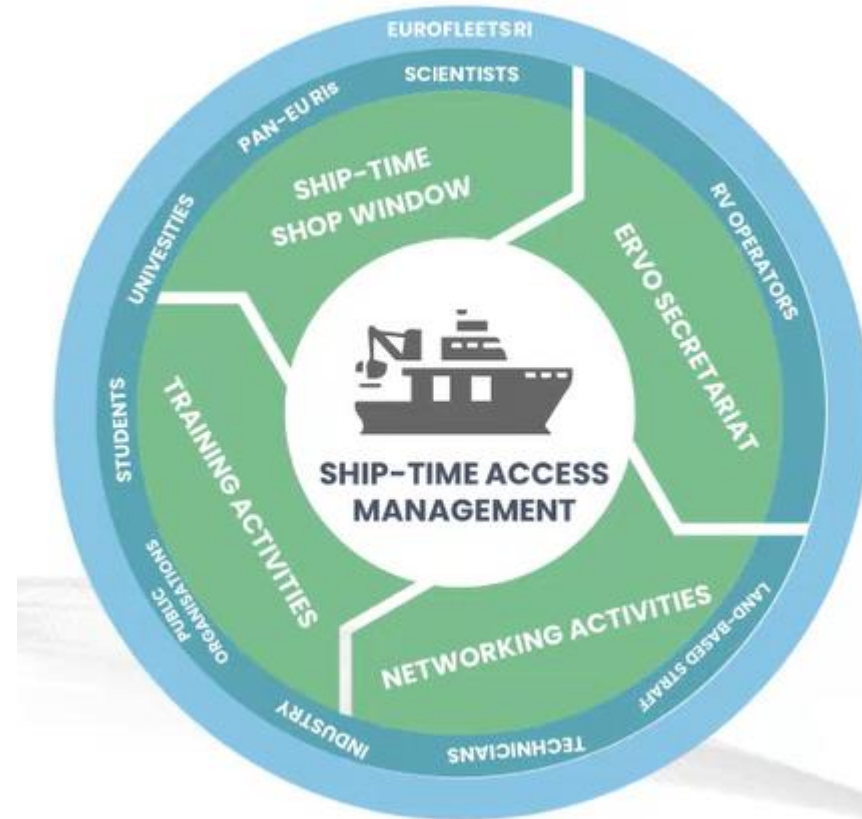


In addition comes the ARICE TA on polar vessels, see <https://arice-h2020.eu>



# Eurofleets RI

- The TA system may come to an end post-Eurofleets+ and ARICE, and the project is therefore working on a proposal for a legal entity called Eurofleets Research Infrastructure (RI) who could be the management office for TA and other RV-related activities in the future.



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







Thank you for your attention!  
Questions?

