

A world map with a blue background. The map shows the outlines of continents in a lighter blue. Numerous small dots are scattered across the oceans, representing Argo floats. A higher density of yellow dots is visible in the North Atlantic and around Europe, indicating the Euro-Argo network. Other dots are grey.

Euro-Argo: The European contribution to the global Argo ocean observations network

Research Infrastructures and the Paris Agreement on climate

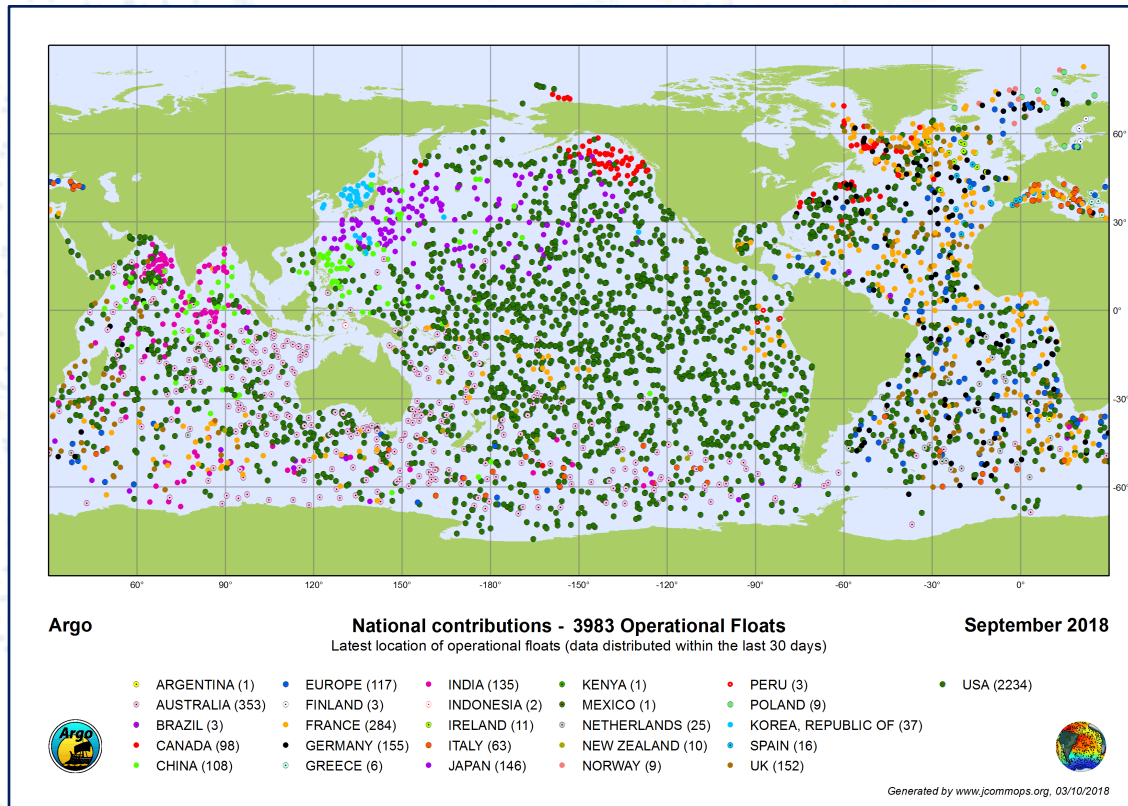
Diarmuid Ó Conchubhair
Marine Institute (Ireland)



Argo: A global in-situ observing system



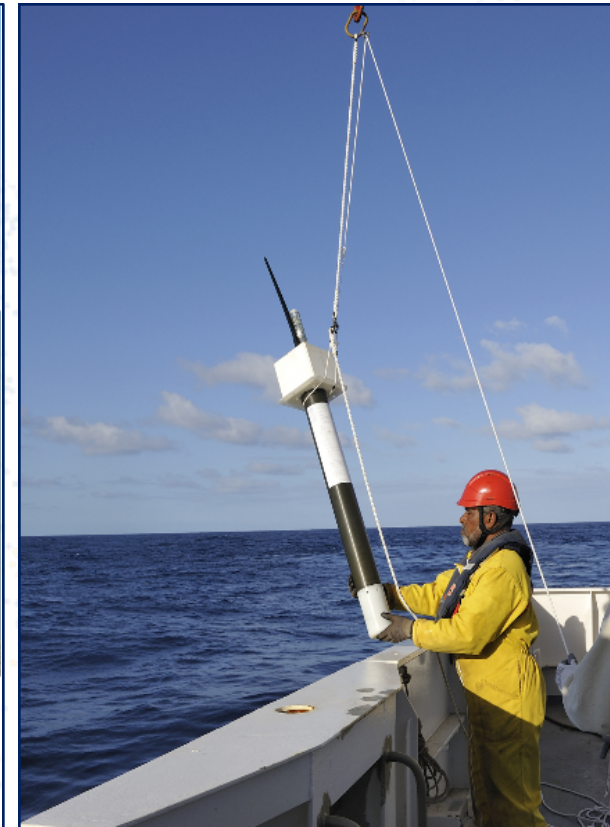
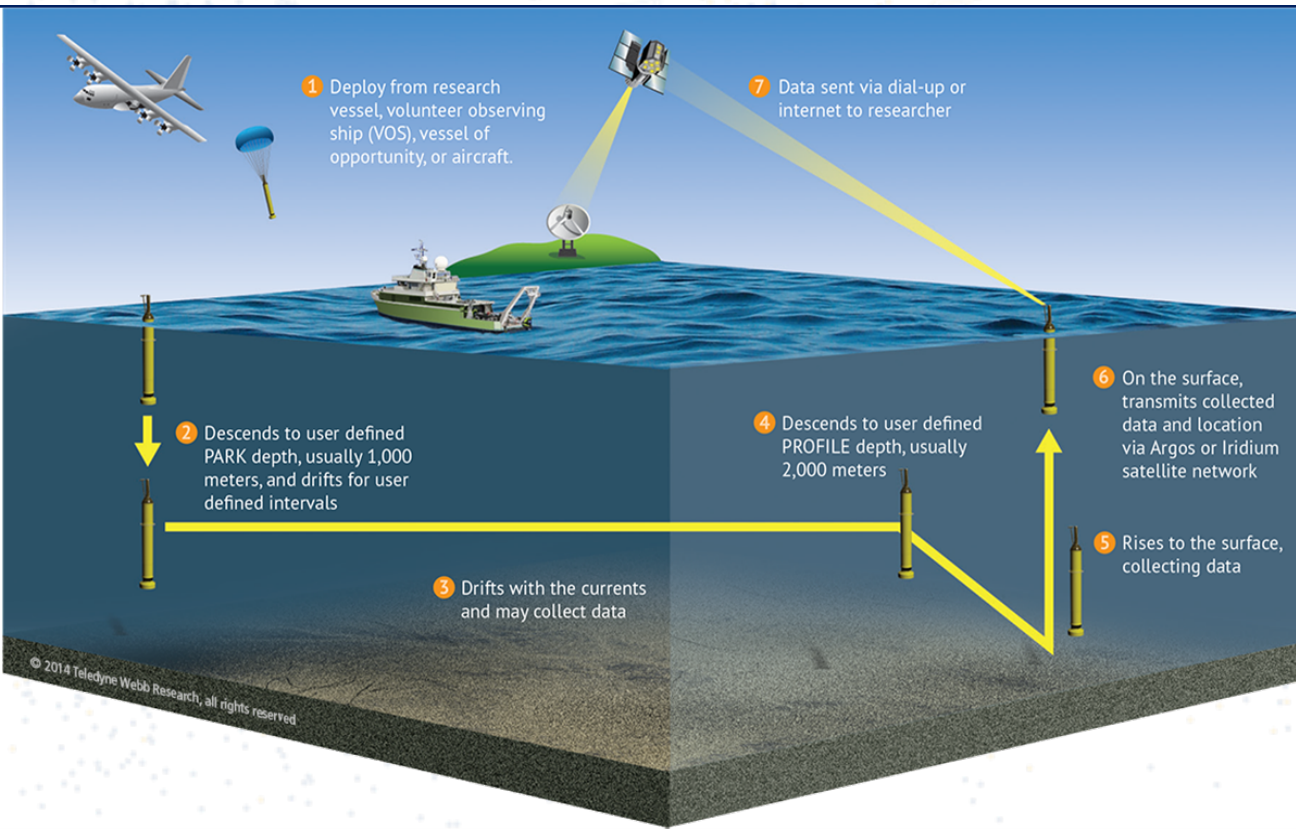
- ✓ ~4,000 autonomous profiling floats measuring:
 - Ocean temperature and salinity in the upper 2,000m water column
- ✓ The Argo network delivers essential data both for climate change research, ocean analysis and forecasting systems



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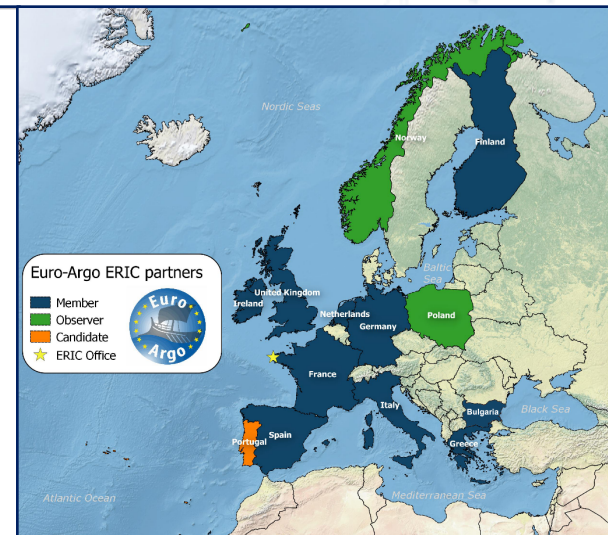
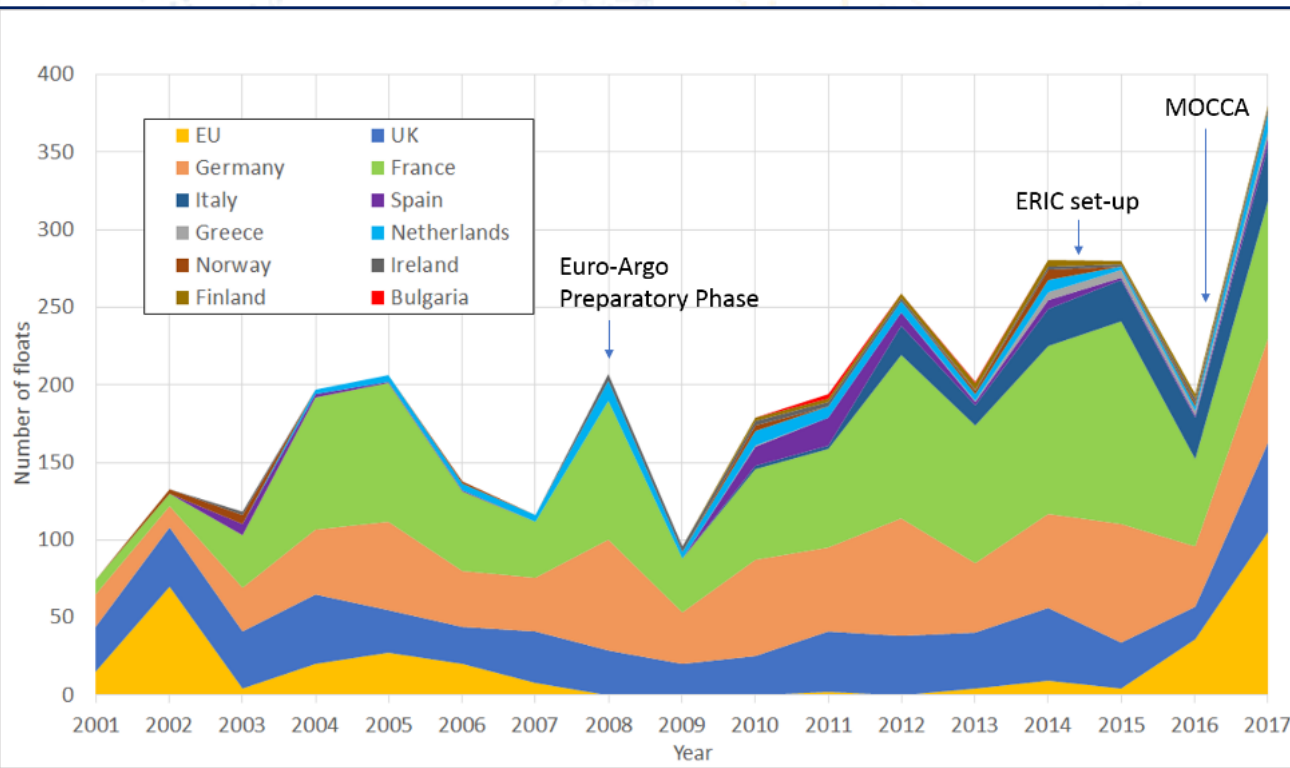


The Euro-Argo Research Infrastructure



Objective : To coordinate and sustain European contribution to the global Argo network (1/4 of the network)

- Euro-Argo was part of the 2006 ESFRI Roadmap
- The **Euro-Argo ERIC** (European Research Infrastructure Consortium) **was created in May 2014** and has increased from 9 funding members to 12 members in 2018.
- Euro-Argo is a Landmark in the ESFRI 2016 roadmap



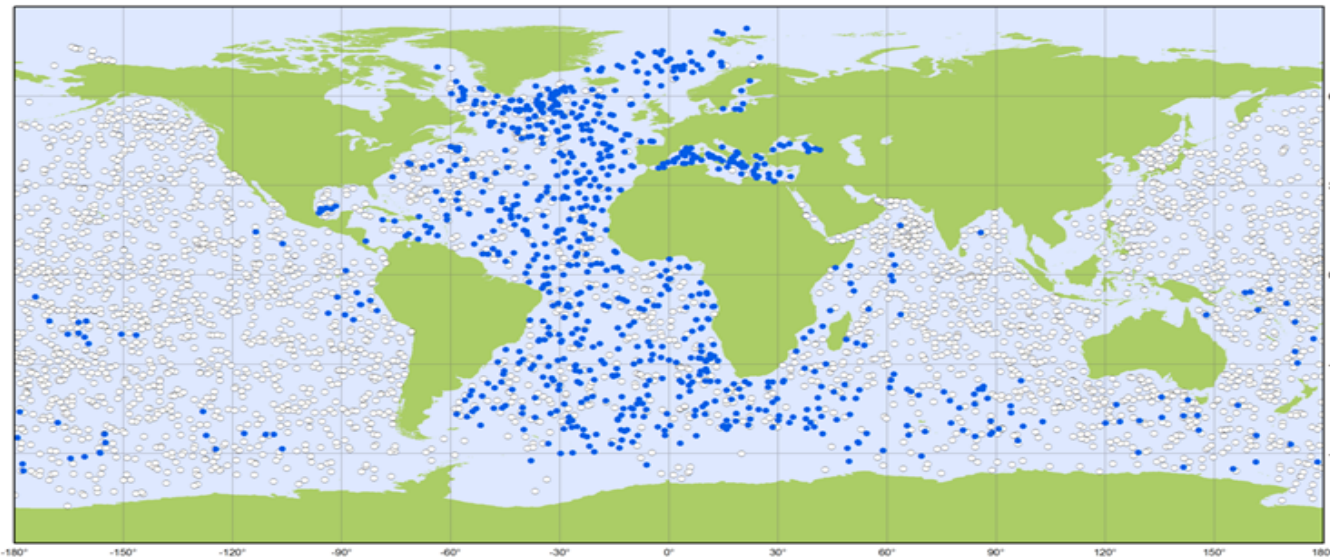
Increase of the European contribution to the international network

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Argo

EuroArgo

September 2018

European contribution to the Argo program via EuroArgo Research Infrastructure
Latest locations of operational profiling floats (data distributed within the last 30 days)

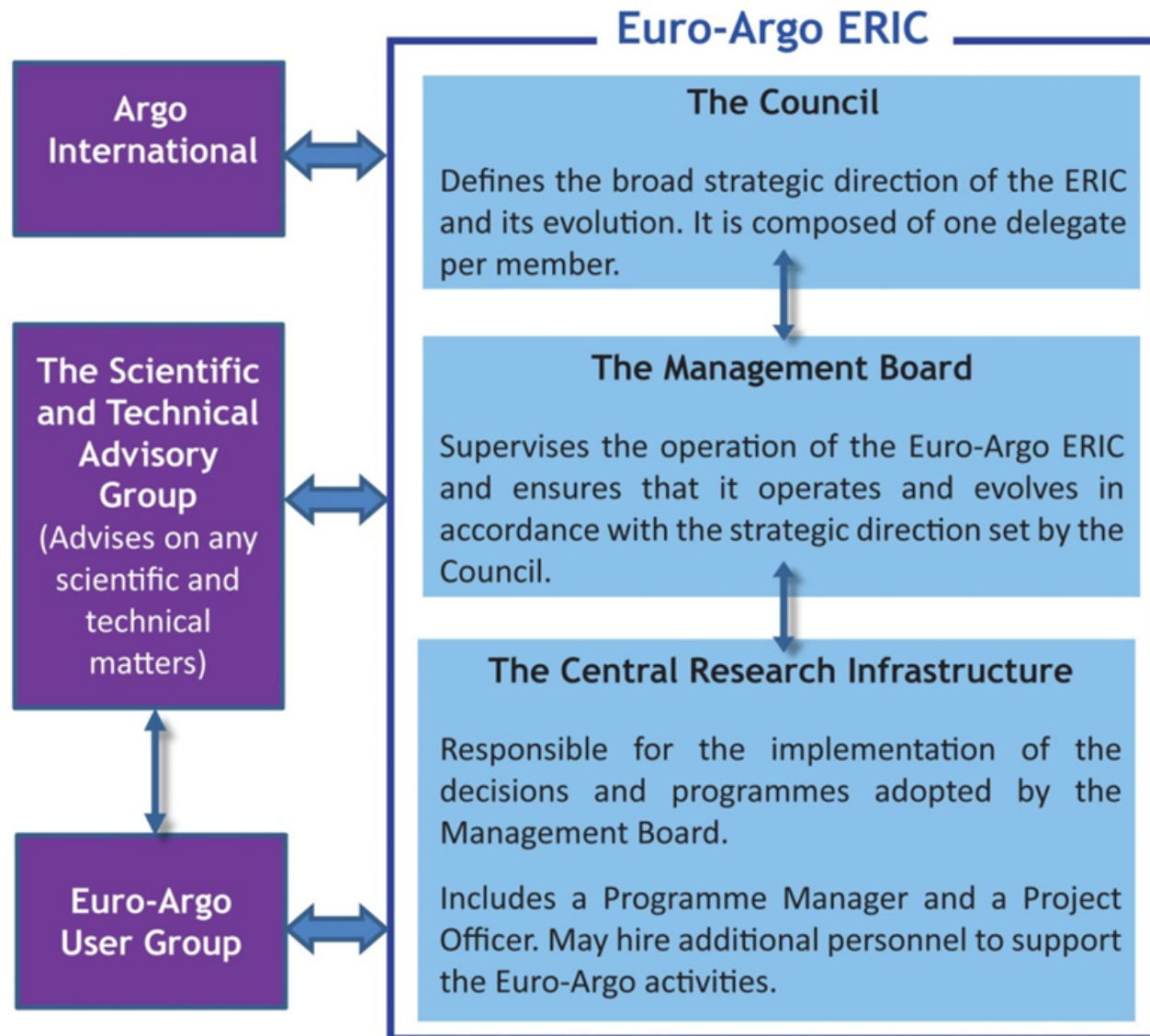
• Argo EU (850) ○ Argo non EU (3132)



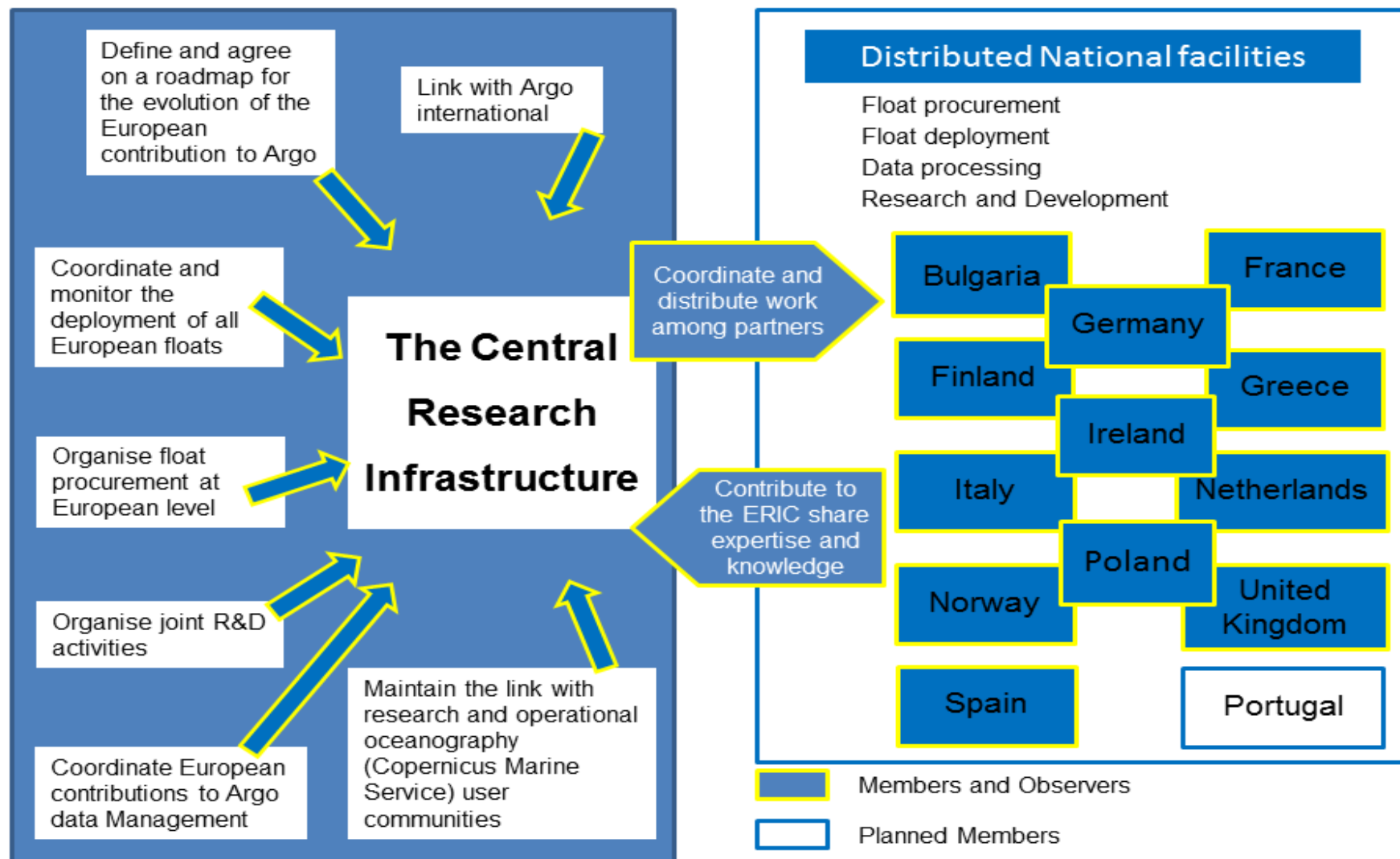
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European contribution to the
global Argo programme

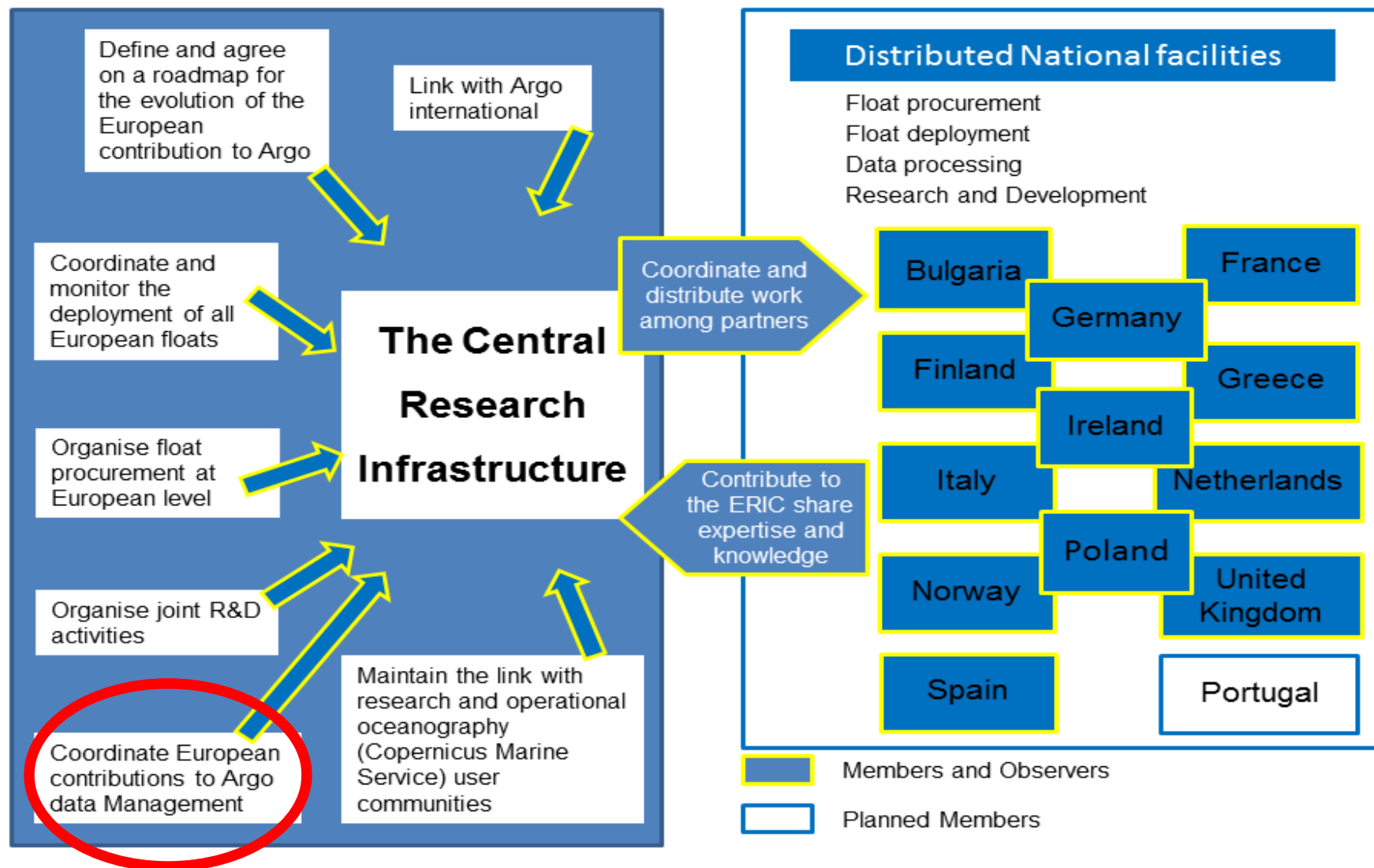
Organisation of the Euro-Argo ERIC



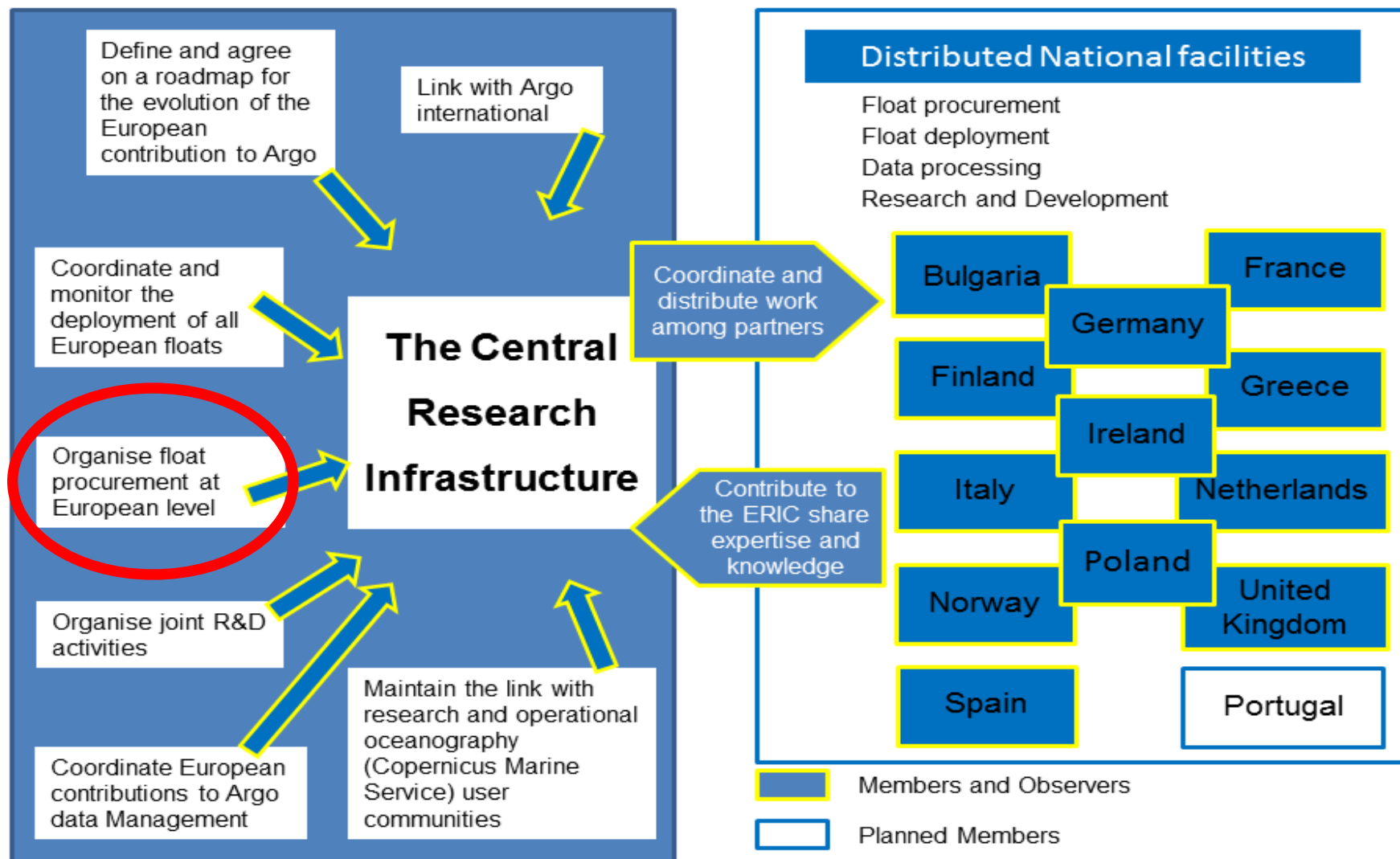
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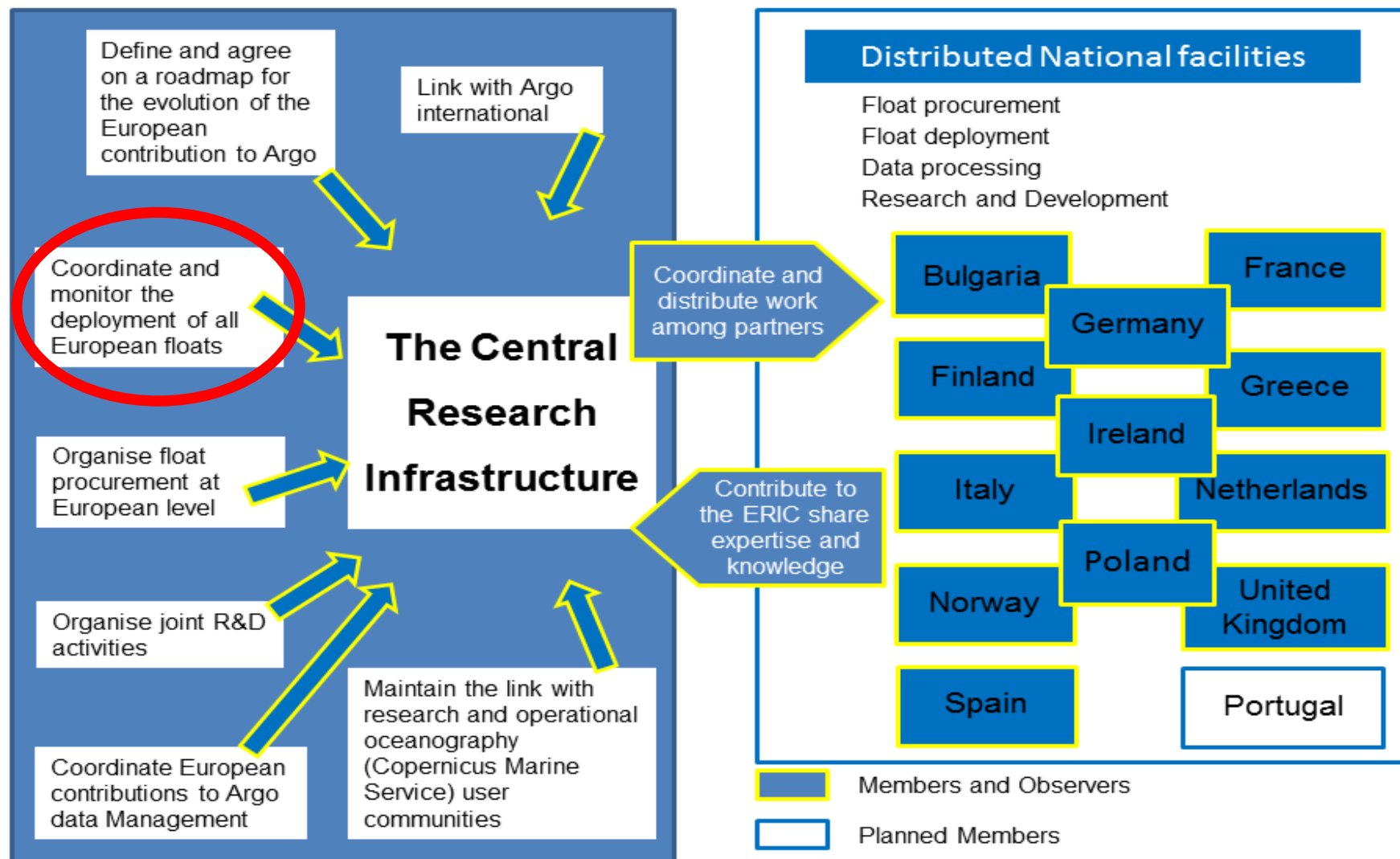
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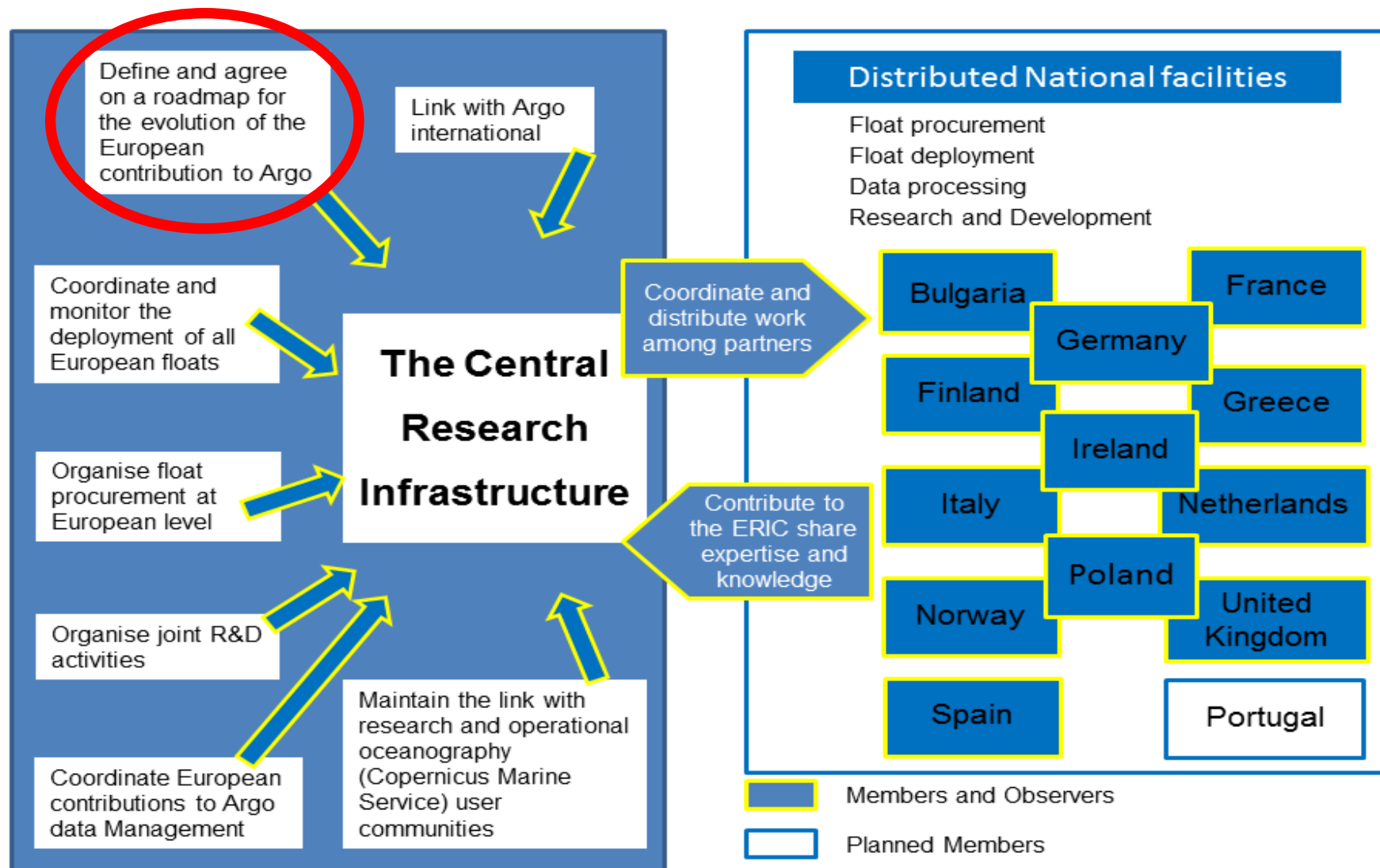
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Euro-Argo success in EU projects



AtlantOS

✓ AtlantOS [2015 – 2019]

- The Euro-Argo ERIC coordinates operations at sea and associated logistics to allow deployment of 7 deep-oxygen and 7 BGC Argo floats.
- OSE-OSSE are underway to help improving the design of ocean observing systems - including Argo - in the Atlantic Ocean (WP1).

✓ ENVRIplus [2015 – 2019]

- A cluster of RIs for environmental and Earth System sciences, built around the ESFRI roadmap and associating leading e-infrastructure
- Euro-Argo is involved in themes; 1) Technological Innovation, 2) Data for Science and 6) Communication and Dissemination

MOCCA

✓ MOCCA [2015 – 2020]

- Procurement of 150 T/S Argo floats (Core and Iridium) during 2015-2016 (20% co-funded by Euro-Argo partners)
- deployment in 2016-2017, including; at-sea monitoring and data processing (real-time and delayed-mode)

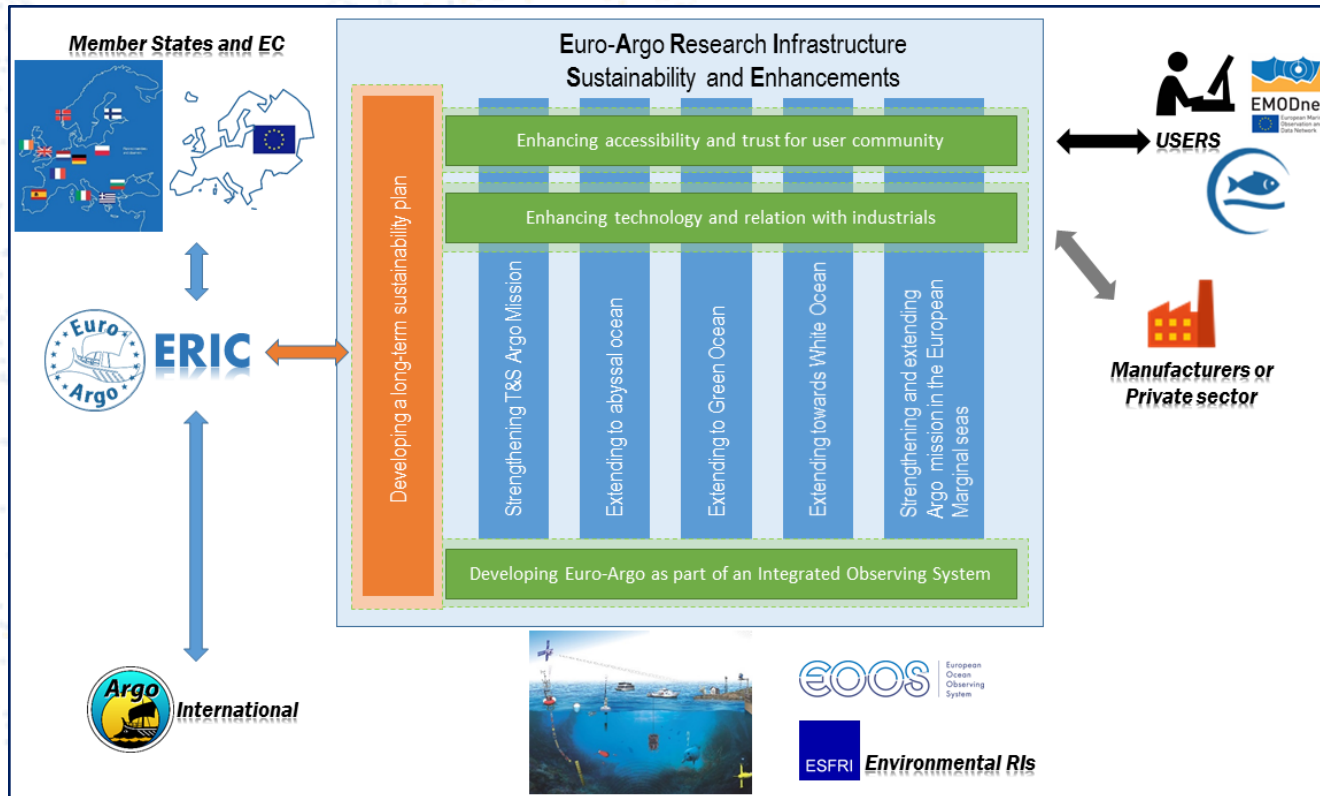
✓ Euro-Argo RISE [2019 - 2023]

Euro-Argo success in EU projects



Euro-Argo-Rise (Coordinated by the Euro-Argo ERIC)

- Enhance and extend the capabilities of the Argo network to provide essential ocean observations to answer new societal and scientific challenges and support
- 1) ocean and climate change research, 2) climate change monitoring , 3) seasonal and climate change forecasting, 4) ocean analysis and forecasting

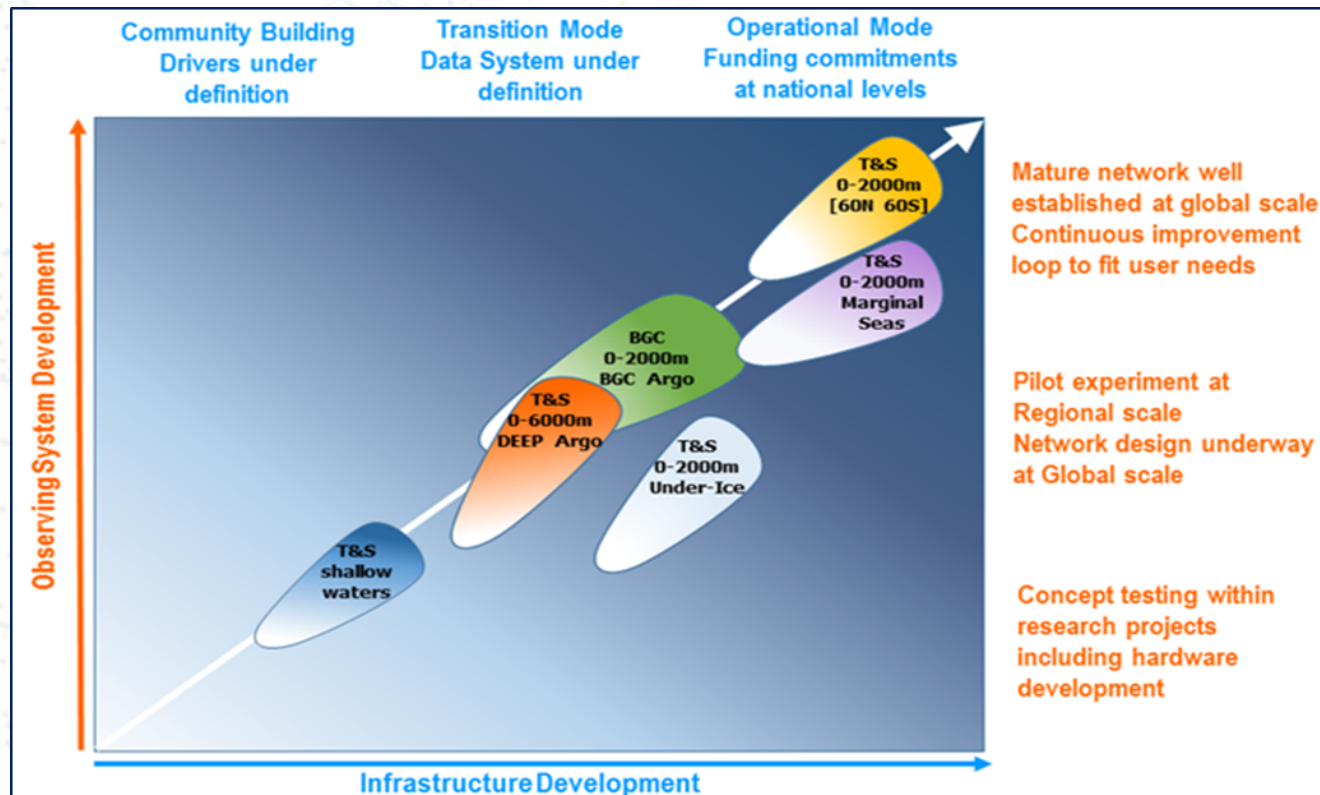


Euro-Argo success in EU projects



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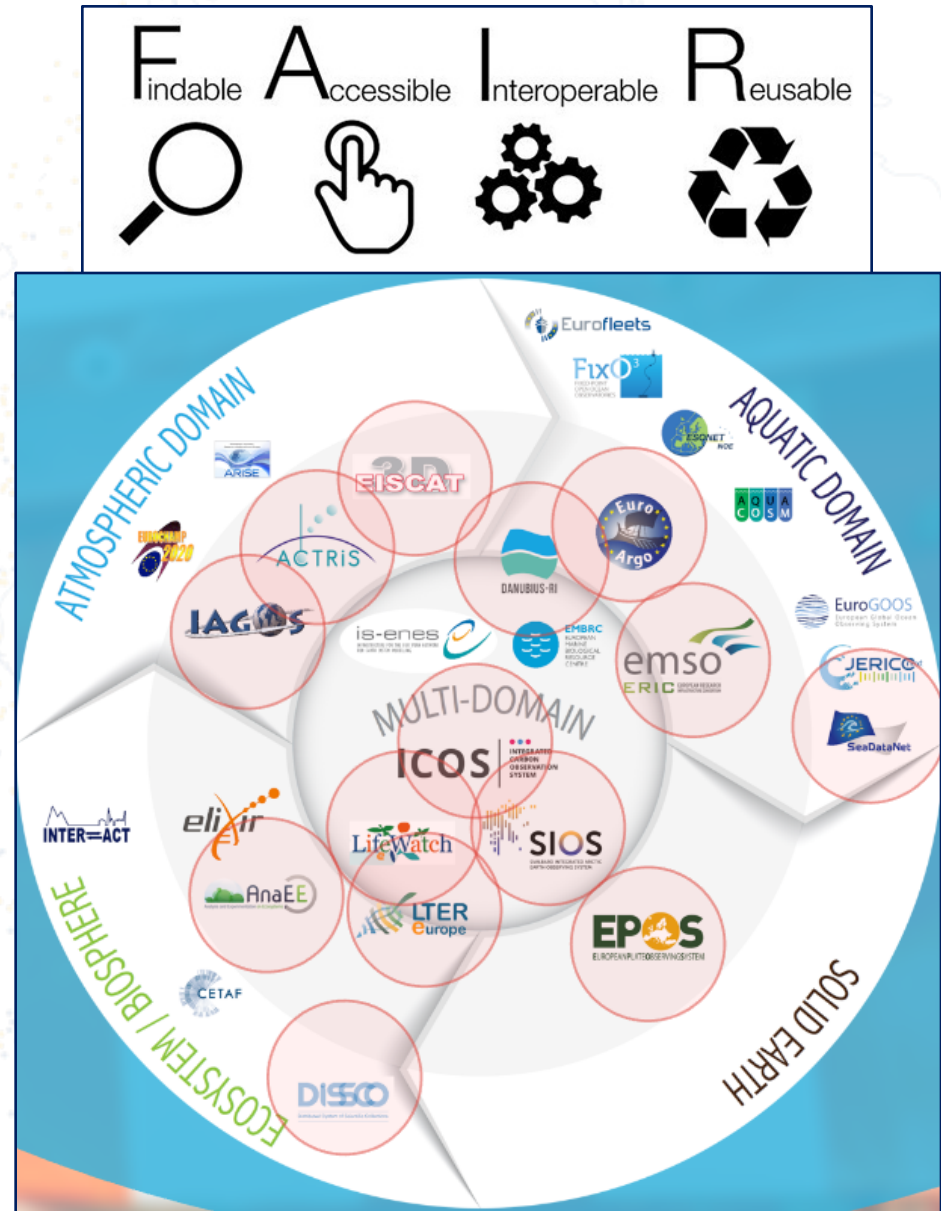


Euro-Argo success in EU projects



ENVRIFAIR [2019 – 2022]

- The goal of ENVRIFAIR is to implement the FAIR principles in the ENVR cluster of Research Infrastructures for Environmental and Earth System sciences community and connect it to the European Open Science Cloud (EOSC).
- Euro-Argo is coordinating with EMSO the Marine Domain activities work package



Main achievements over the last 4 years



- Set-up a Euro-Argo ERIC team and office which support the European contribution to Argo
- Extended ERIC membership from 9 to 12 countries
- Developed a European community in Argo with the European contribution more visible and acknowledged at international level
- Extended the European contribution from less than 20% to nearly 25% of the global network
 - Next challenge is sustainability of network and extension to new missions
- Built a stronger European user Community:
 - Newsletter, enhanced website, social media, scientific user workshops and training workshops
- Developed services for the members (centralised float procurement and at-sea monitoring)
- Recognised input at ESFRI, ICRI and EU organised conferences in link with other environmental and marine Research Infrastructures
- Capacity to develop European proposals

Argo in Europe...the next decade



- Main Challenges:

- ☐ **Maintain** the Research Infrastructure
- ☐ **Extend** its capacity to abyssal ocean (4000 to 6000m), partially ice covered areas and biogeochemistry

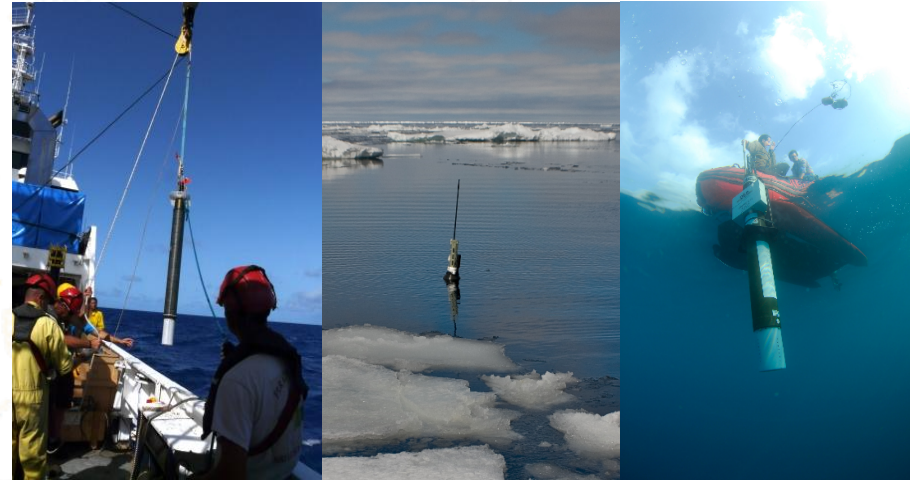
Euro-Argo is developing the European strategy in coherence with Argo international:

- ☐ Sustain the core T&S mission, with an emphasis in Western Boundary regions
- ☐ Monitor European marginal seas (Baltic, Mediterranean & Black seas)
- ☐ Monitor high latitudes
- ☐ Monitor the abyssal oceans
- ☐ Monitor ecosystem parameters

Euro-Argo plans to contribute **to ¼ of the global network** and is now starting to implement the new phase of Argo

Reference document: ***“Strategy for evolution of Argo in Europe”*** (Euro-Argo ERIC, 2017)

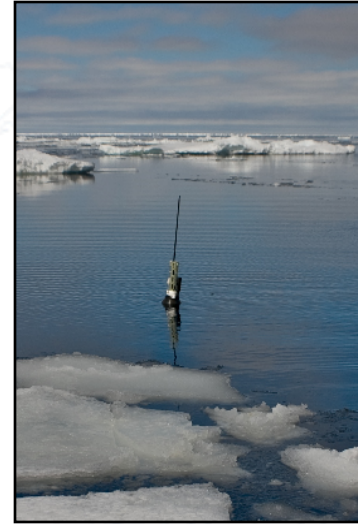
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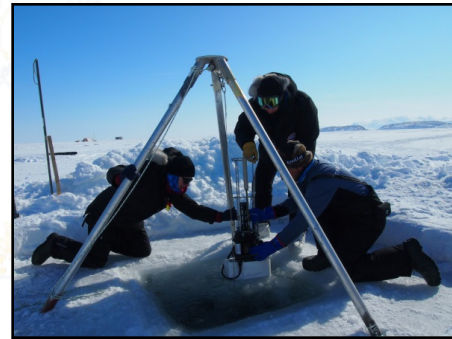
High Latitudes



- Argo is a complementary technology to other platforms such as; Ice Tethered Platforms (ITP) in the Arctic, sea mammals, vessels and moorings in Arctic and Antarctic areas.
- Technology has been proven in Weddell Sea with floats able to stay under ice for a sustained period of time



- European Argo strategy in the Nordic Seas:



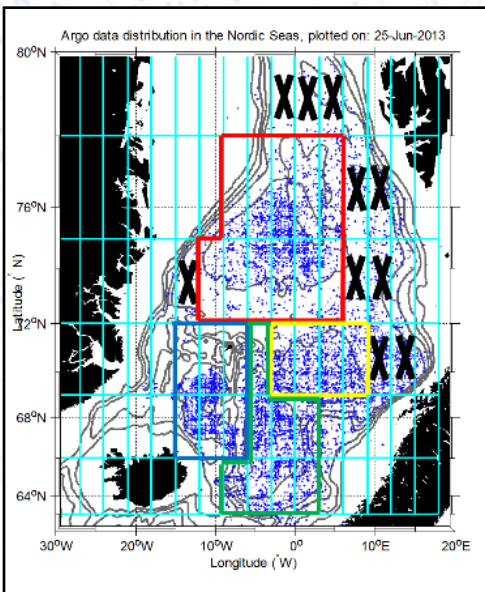
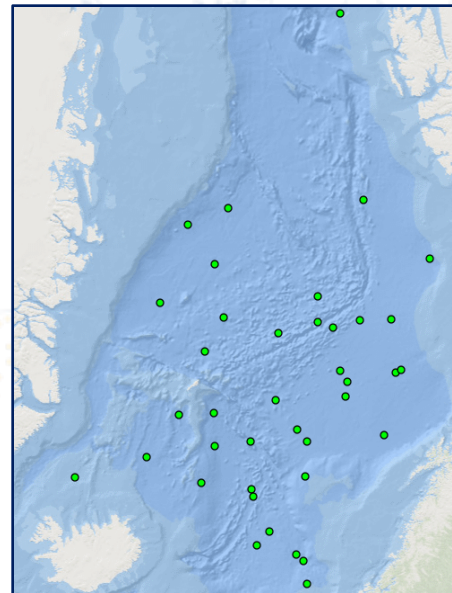
10 August 2017: **46 active floats**
including **7 BGC floats**

Target:

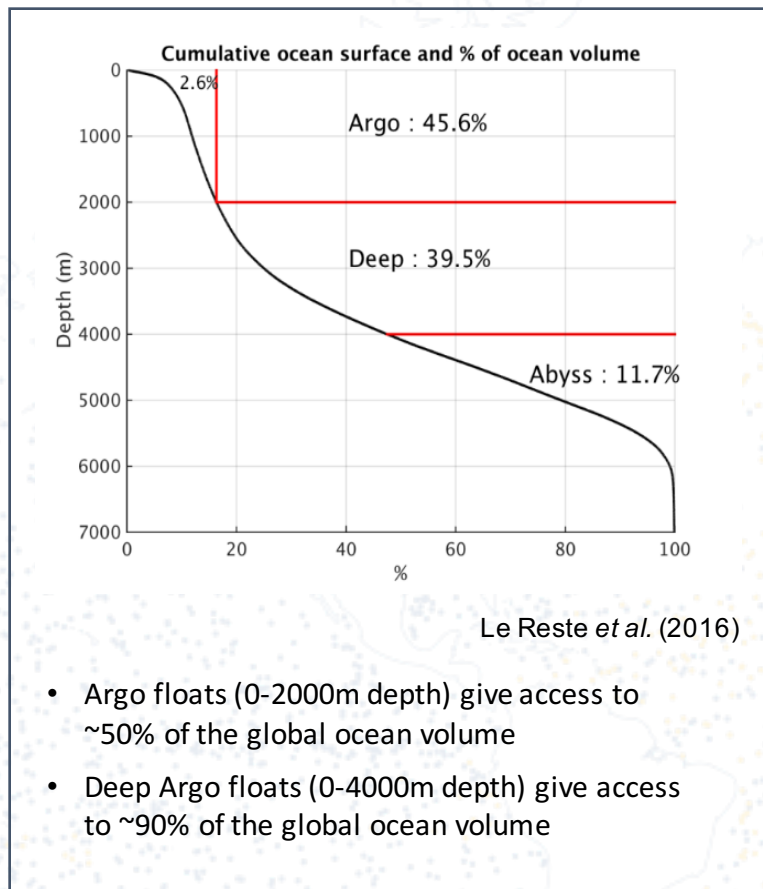
10 floats in boundary currents

29 floats in deep basins:

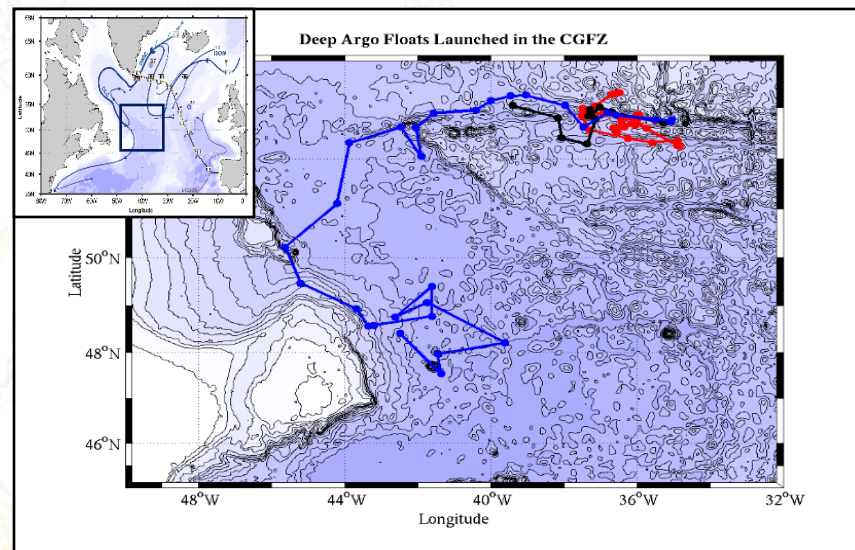
- red** – Greenland Sea,
- blue** – Icelandic Plateau
- yellow** – Lofoten Basin
- green** – Norwegian Basin.



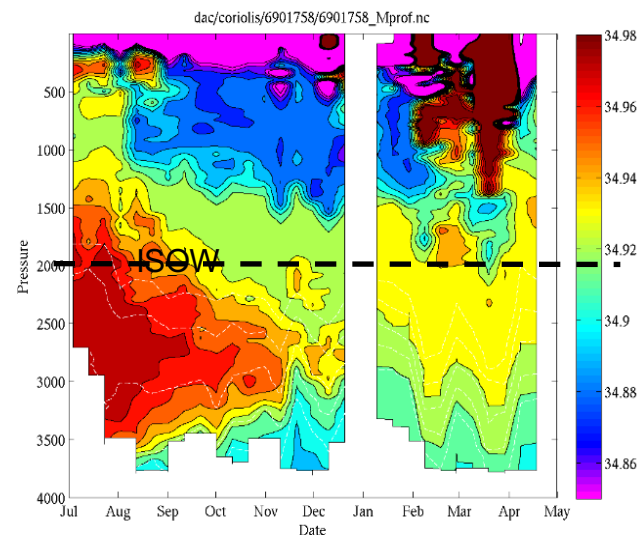
Argo extension to depth



Right: Courtesy of G. Maze & V. Thierry



Above Right: Southward trajectory of the deep Argo float 6901758 (blue) between deployment (July 2015) and May 2016



Above: One year time series [2015-2016] of salinity measured by the deep Argo float 6901758

Strategy for Deep Argo: Focus on areas where large deep signals are located, that is where deep-water masses are formed, namely the North-Atlantic Ocean and the Southern Ocean

Target: 250 active deep floats (4000-6000m)

Biogeochemical Argo



- Biogeochemical-Argo *Scientific and Implementation plan* was finalized in 2016
- Target for the global array: 1000 fully equipped BGC-Argo active floats with a uniform distribution
- Euro-Argo aims at contributing to $\frac{1}{4}$ of the global effort, which represents **250 active BGC floats**
- Additional effort put on equipping **additional floats with oxygen sensors** (target under definition).





Questions?

Thank you for listening...

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