

A world map on a blue background showing the global distribution of Argo floats. The floats are represented by small dots, with a higher concentration of yellow dots in the European region and a more sparse distribution of grey dots elsewhere. The map is centered on the Atlantic Ocean.

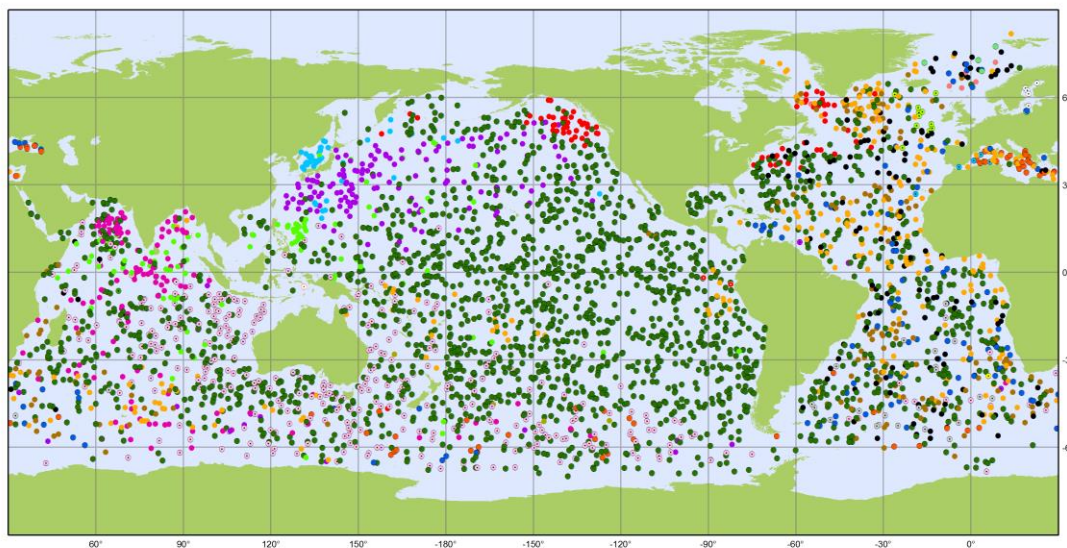
Euro-Argo: The European contribution to the global Argo ocean observations network



Argo: a global in-situ observing system



- About 3800 autonomous profiling floats are measuring ocean temperature and salinity up to 2000 m depth, all over the globe
- The Argo network delivers essential data both for climate change research and for ocean analysis and forecasting systems



Argo

National contributions - 3825 Operational Floats

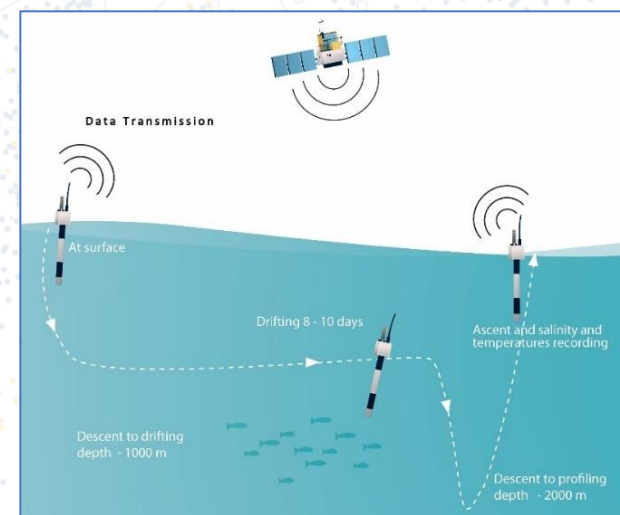
April 2018

Latest location of operational floats (data distributed within the last 30 days)

- | | | | | | |
|-------------------|----------------|-----------------|---------------|--------------------|---------------------------|
| • ARGENTINA (1) | • CHINA (98) | • GERMANY (141) | • ITALY (64) | • NETHERLANDS (26) | • POLAND (5) |
| • AUSTRALIA (359) | • EUROPE (108) | • INDIA (138) | • JAPAN (151) | • NEW ZEALAND (6) | • KOREA, REPUBLIC OF (48) |
| • BRAZIL (3) | • FINLAND (5) | • INDONESIA (1) | • KENYA (1) | • NORWAY (7) | • SPAIN (5) |
| • CANADA (80) | • FRANCE (276) | • IRELAND (11) | • MEXICO (1) | • PERU (3) | • UK (160) |
| | | | | | • USA (2127) |



Generated by www.jcommops.org, 09/05/2018

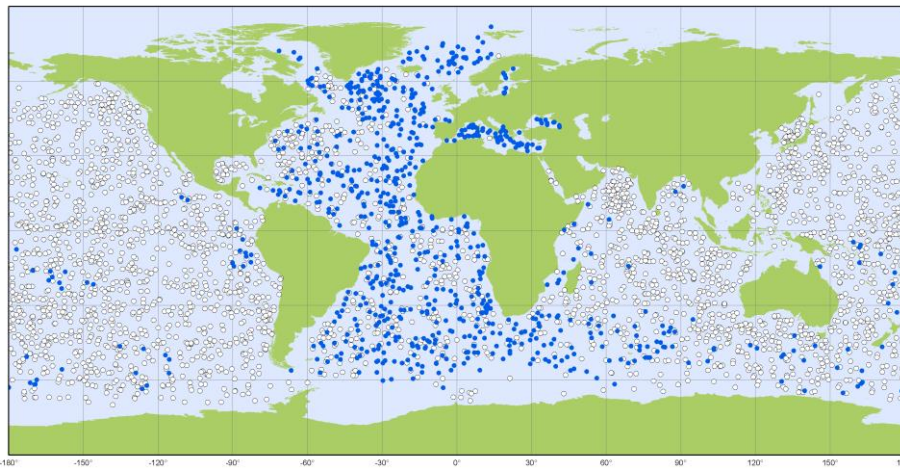
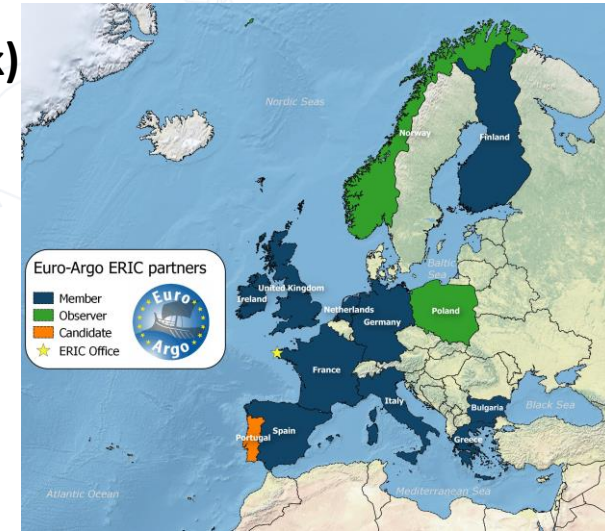


The Euro-Argo Research Infrastructure



Objective : To coordinate and sustain the 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

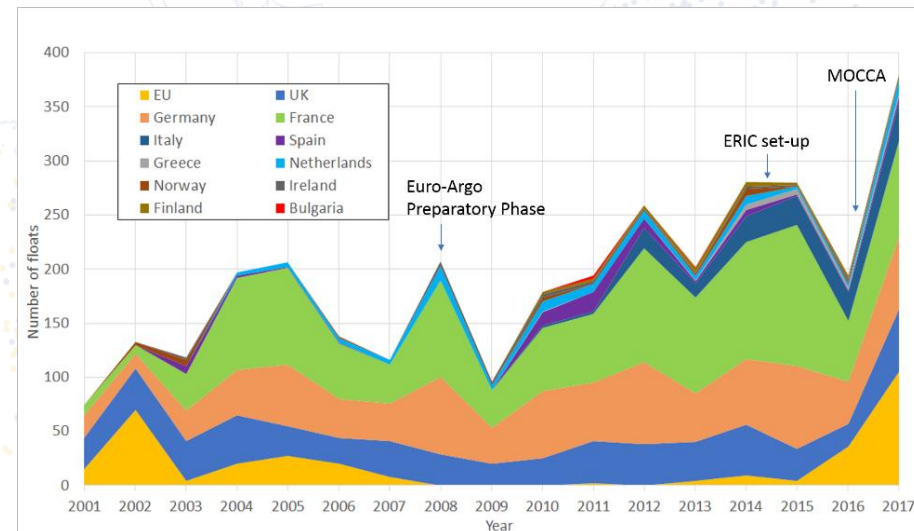


Argo **EuroArgo** April 2018
European contribution to the Argo program via EuroArgo Research Infrastructure
Latest locations of operational profiling floats (data distributed within the last 30 days)

• Argo EU (808) ○ Argo non EU (3016)

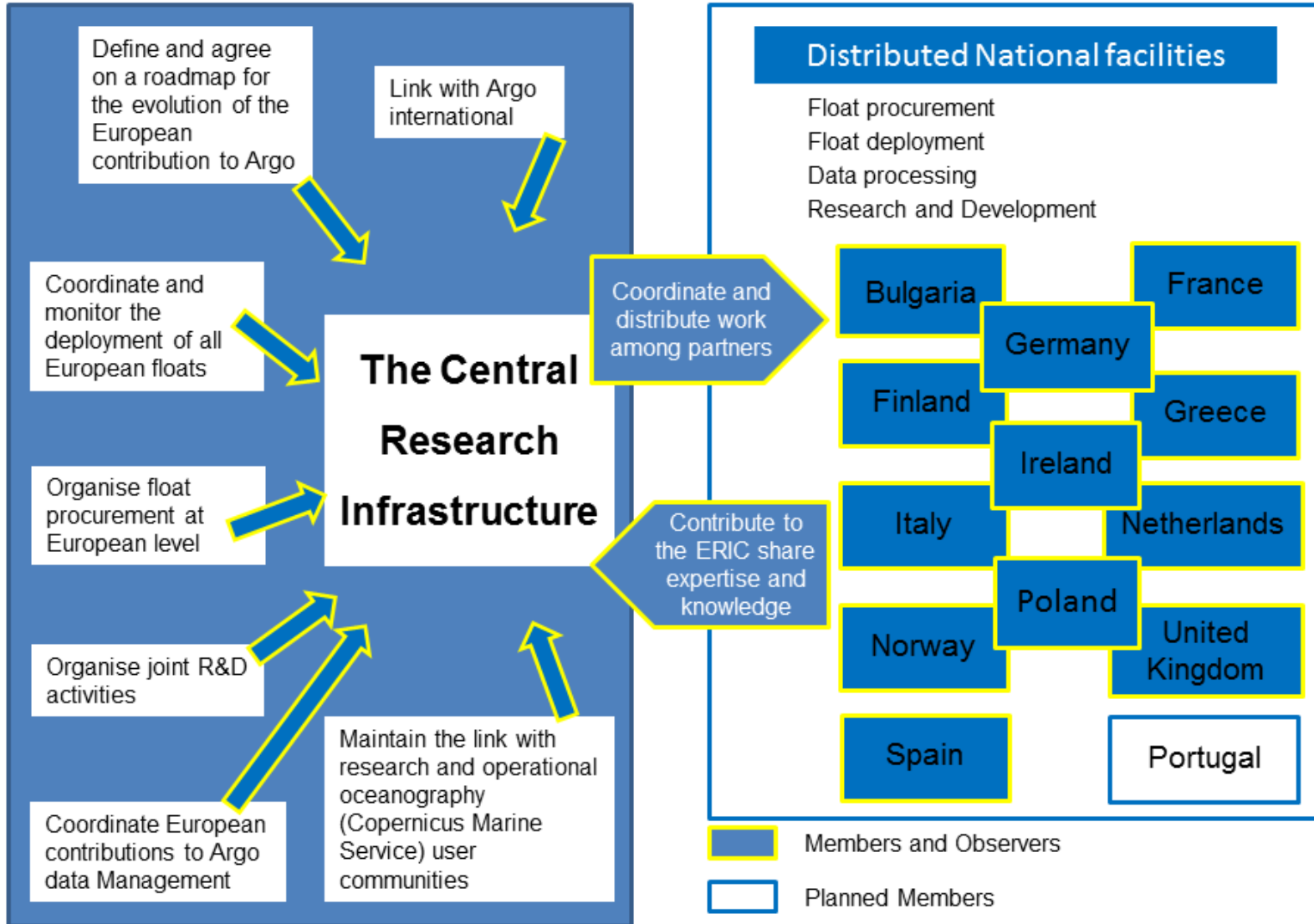


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Increase of the European contribution to the international network

Organisation of the Euro-Argo ERIC



The Central facility (ERIC Office) team



Sylvie Pouliquen - Programme Manager



Francine Loubrieu - Administrative Assistant



Grigor Obolensky - Technical Coordinator



Romain Cancouët - Operational Engineer



Claire Gourcuff - Science Officer

Euro-Argo contribution to EU Projects



- 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 Research Infrastructures for Environmental and Earth System sciences, built around the ESFRI roadmap and associating leading e-infrastructures and Integrating Activities together with technical specialist partners.
 - Euro-Argo is involved in Themes 1 – *Technological Innovation*, 2 – *Data for Science* and 6 – *Communication and Dissemination*.
- MOCCA: *Monitoring the Oceans and Climate Change with Argo*
5 years project started in 2015 funded through a EASME grant (DG-MARE):
 - Procurement of 150 T/S Argo floats (Core and Iridium) during 2015-2016 (20% co-funded by Euro-Argo partners)
 - Arrangement for their deployment in 2016-2017, including at-sea monitoring,
 - Collected data processing in real-time and delayed-mode, during the period 2015-2019.
- *E-AIMS (ended in 2015): Euro-Argo Improvements for the Copernicus Marine Service*

AtlantOS

plus
ENVRI

MOCCA

Argo in Europe for 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

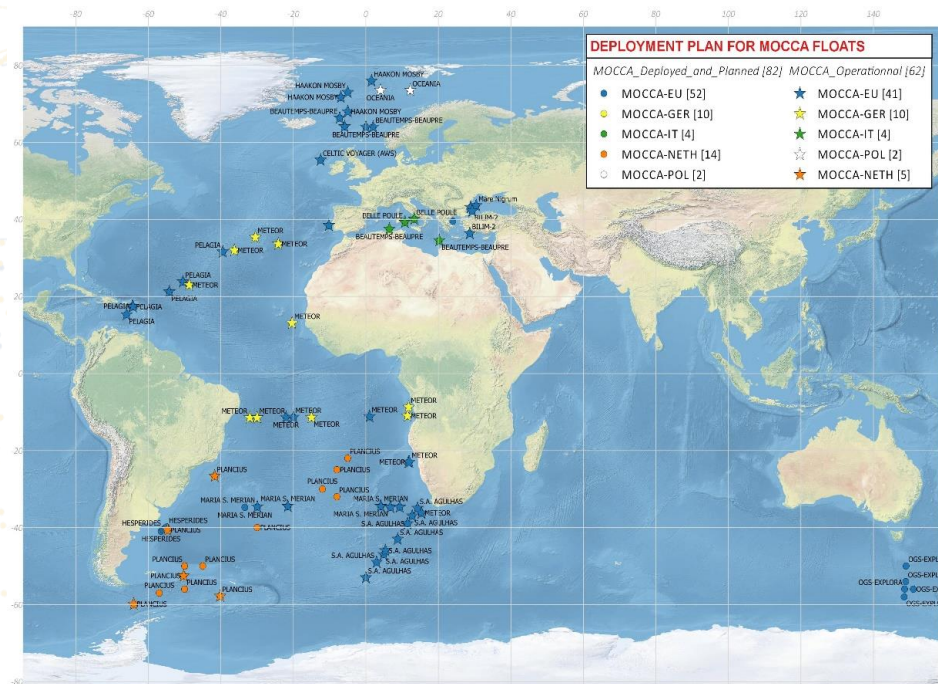
- Euro-Argo plans to contribute to **¼ of the global network** and is now starting to implement the new phase of Argo

- Reference document: **“Strategy for evolution of Argo in Europe” (Euro-Argo ERIC, 2017)**
DOI: 10.13155/48526

Core T/S Argo mission & marginal seas



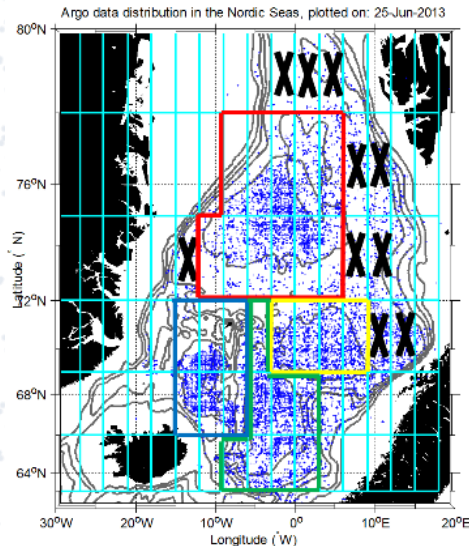
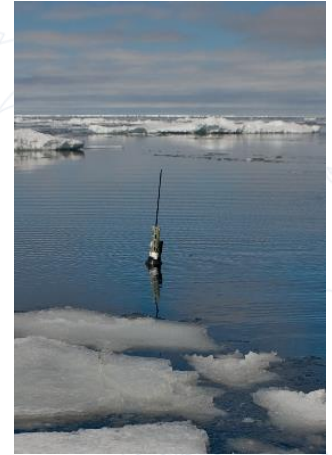
- Both national & EU (MOCCA project) contributions
- Euro-Argo will ensure that the European deployments fulfil both the international Argo programme requirements and the European scientific and operational oceanography community's needs:
 - The **Atlantic Ocean** is a region of great interest for the European research community, and float deployments will be continued in this ocean with a specific attention on keeping the appropriate sampling in **equatorial and boundaries regions (twice the classical sampling)**.
 - The aim is to **double** the classical Argo sampling in the **Mediterranean and Black Seas**, with 60 active floats at all time in the Mediterranean Sea and at least 10 active floats in the Black Sea
 - The recommendation for the **Baltic Sea** is to keep **7 active floats** at all time, with a precise repartition within the several basins



High Latitudes



- Argo is a complementary technology to other platforms, like Ice Tethered Platforms (ITP) in the Arctic, sea mammals, vessels and mooring in Arctic and Antarctic areas.
- Technology has been proven in Weddell Sea with floats able to stay for a long period under ice located with acoustic sources and is under definition/testing for the Arctic (tests occurring in Baffin Bay - NAOS project)
 - Collaboration opportunities within INTAROS project (acoustic sources)
- European Argo strategy in the Nordic Seas:

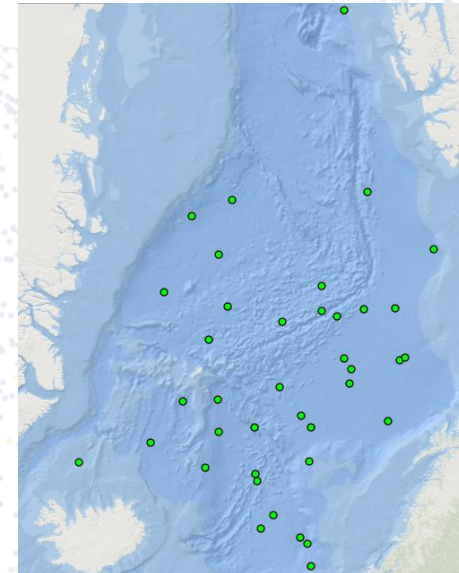


Target:

10 floats in boundary currents

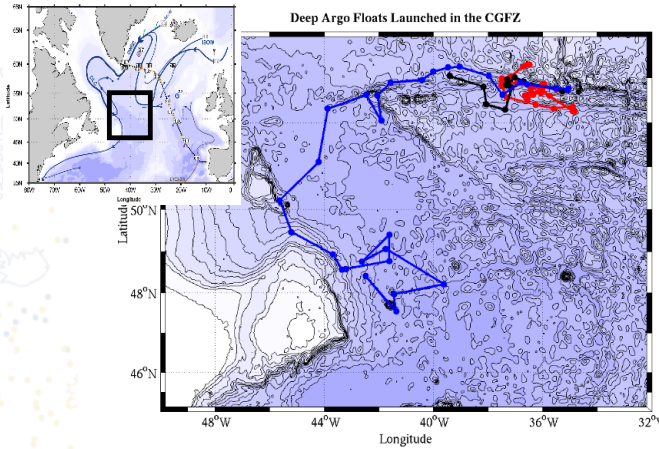
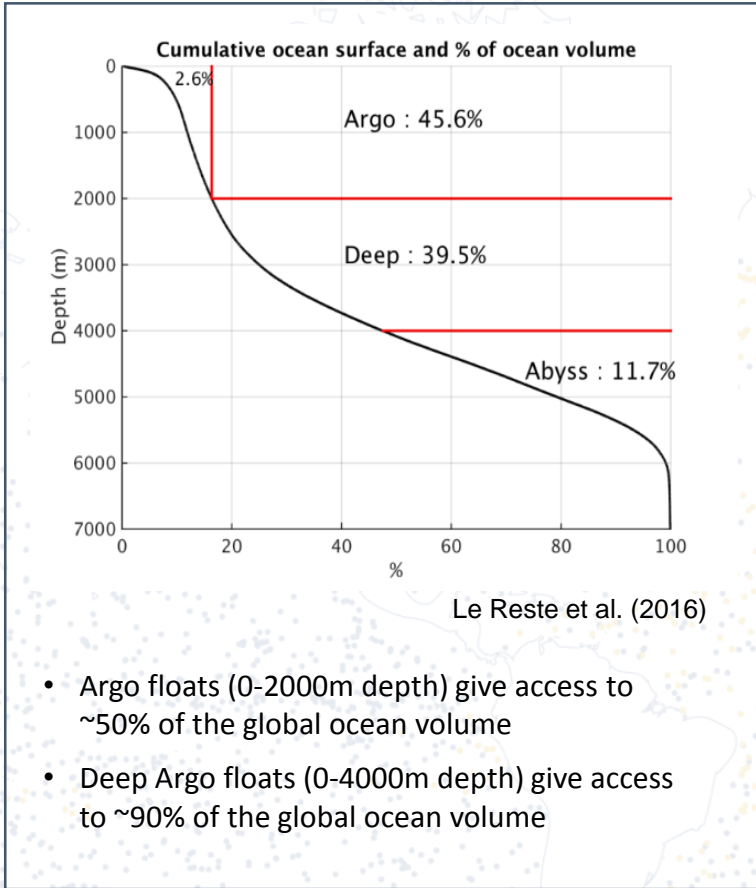
29 floats in deep basins:

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

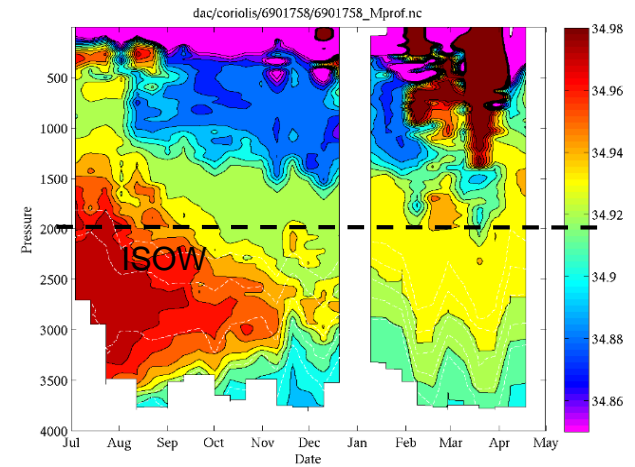


10 August 2017: 46 active floats
including 7 BGC floats

Argo extension to depth



Courtesy of G.Maze & V.Thierry



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

<http://biogeochemical-argo.org/>



An extension of the Argo program
to include biogeochemical observations

SCIENCE & IMPLEMENTATION PLAN

ABOUT US

PROGRAM LIFE

SCIENTIFIC QUESTIONS

MEASURED VARIABLES

KEY AREAS & PROJECTS

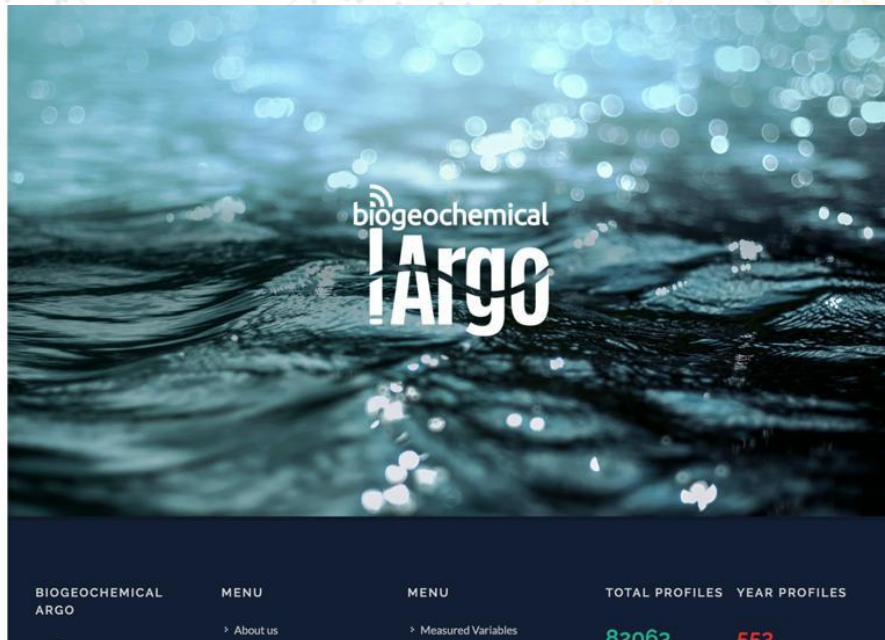
DATA

LIBRARY

DISSEMINATION

FLOAT MAP & STATISTICS

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Conclusions & perspectives



- The importance of Argo for the Copernicus Marine service was proven through E-AIMS H2020 project and new OSE-OSSE are underway in the AtlanOS project
- Recent R&D studies conducted at European level have shown that Biogeochemical Argo technology is mature
- The Deep technology pilot development phase is still ongoing to reach the accuracy needed for climate applications
- Work is ongoing regarding sea-ice technology that will enable Euro-Argo to extend its capacity to high latitudes
- Euro-Argo has successfully started to organize procurement, deployment and processing of new floats at European level
 - Coordination of national activities
 - European floats (MOCCA project)
- Euro-Argo has started to implement the new phase of Argo, following the “*Strategy for evolution of Argo in Europe*” (Euro-Argo ERIC, 2016)