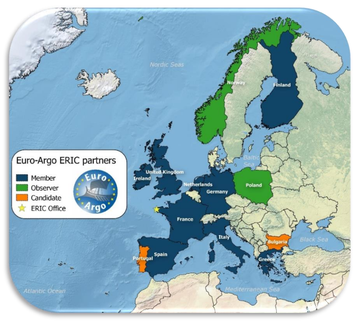
Euro-Argo ERIC - European Research Infrastructure

EURO-ARGO.EU
euroargo@ifremer.fr
@EuroArgoERIC

MOCCA (2015-2020)
Monitoring the Oceans and Climate Change with Argo

CONTEXT

Euro-Argo: a European Research Infrastructure Consortium for Observing the Oceans (11 countries)



Objectives of Euro-Argo in monitoring the oceans:

- Deploy about **250 floats per year** to contribute to the Argo **core mission** including regional enhancements and maintain an array of 1000 floats active at any time (**1/4 of the global array**)
- Prepare and contribute to the **extensions of Argo** (e.g. marginal seas, biogeochemistry, deep ocean, polar regions)
- Ensure that **all data are processed** and delivered to users in real time

Users and applications:

- Ocean and climate research
- Operational oceanography (Copernicus Marine Service)

BUT: European funds are needed to complement national funds

Analysis of the evolution of the number of floats deployed by EU countries in the past 15 years showed that based on national funds only, the European contribution has reached a plateau.

2 EU projects are on-going: DG-Research H2020 AtlantOS and DG-MARE MOCCA

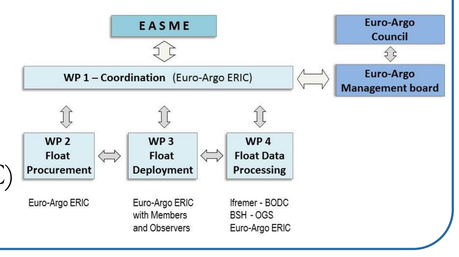
MOCCA

In 2015 the Executive Agency for Small and Medium-sized Enterprises (**EASME**) funded the MOCCA project (Grant Agreement EASME/EMFF/2015/1.2.1.1/SI2.709624) for **5 years**. With **5 M€** (20% co-funded by Euro-Argo members) this allows Euro-Argo to buy 150 new T/S floats in 2016-2017, to ensure their deployments and to organise the real-time and delayed-mod processing of the data.

MOCCA floats description:
150 T/S Core Argo floats, NKE Instrumentation ARVOR (130 iridium and 20 Argos) including 30 floats co-financed by partners (Germany, Italy, Netherlands, Poland)

Current status:

- All floats purchased and tested in Ifremer test tank
- 87 deployed in 2016-2017
- 63 to be deployed in 2017-2018
- RT processing started in 2016-2017 (Ifremer & BODC)
- DMQC processing will start in 2018

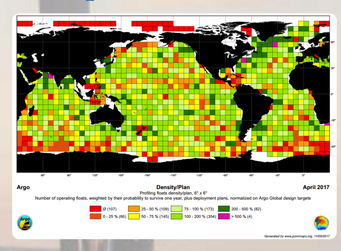


COORDINATION OF DEPLOYMENT PLAN

Euro-Argo ERIC Office is working with its Management Board to update annually the European deployment plan within the international coordination.

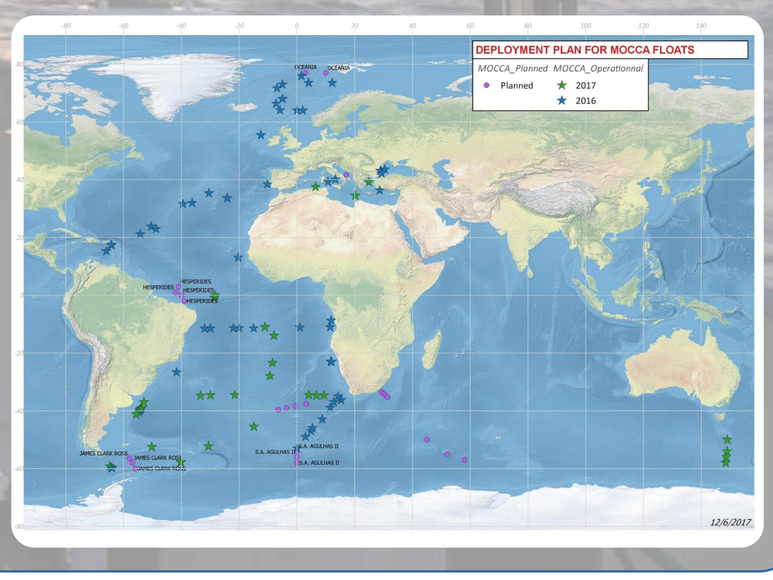
Elaboration of deployment is plan based on:

- Recommendations from the **'Strategy for evolution of Argo in Europe'** document
- National plans / scientific campaigns
- Other international country deployment plans
- Argo array density/age maps (JCOMMOPS)
- Cruises of opportunities from partners and others



MOCCA target deployment areas:

- Southern Ocean: poor density in Argo network
- Marginal Seas enhancement (Nordic, Black, Baltic and Mediterranean Seas)
- Gaps in Argo array from target densities



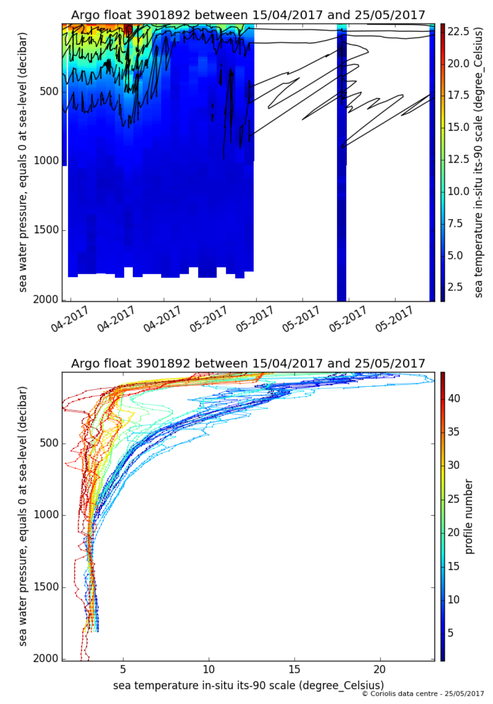
Deployment locations of MOCCA floats launched in 2016, 2017 and planned for 2018

NEW OBSERVING STRATEGIES

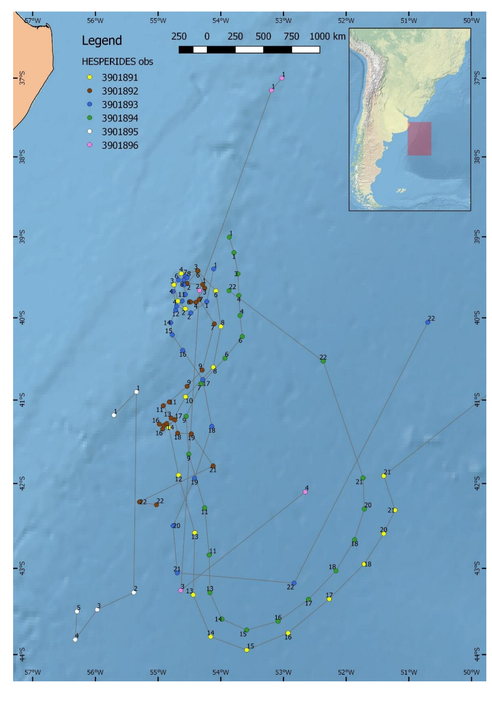
MOCCA floats benefit from new technological functionalities such as iridium bi-directional satellite link and enhanced software that allows:

- **Higher vertical sampling resolution** (up to 1000 CTD points in one cast!)
- Shorter surface time to transmit the data, reducing wind drift and risk of collision
- **Reprogramming of float mission parameters** while at sea, in order to change the float cycle behaviour or meet specific scientific interests

Example of new Argo measuring strategies during RETRO-BMC cruise (R/V Hespérides) in April 2017:



CTD temperature profiles of MOCCA float WMO 3901892. For the first 20 days the float had a 24-hour cycle, measuring data during descent and ascent. Then the float switched to standard Argo programming with a cycle period of 10 days.



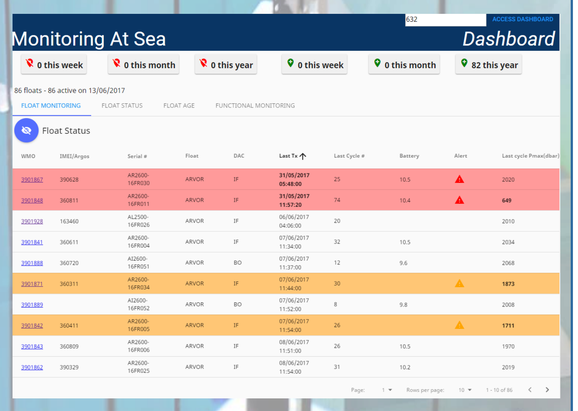
Argo CTD observations of the 4 floats deployed simultaneously with the research cruise. ***In total 160 CTD profiles acquired by the 4 floats within 20 days****, in the area of interest!*

MONITORING THE EUROPEAN FLEET

Acceptance tests:
MOCCA floats were tested in the Ifremer pool before their shipment to deployment locations. Main float components (satellite data transmission, hydraulic behaviour, intercomparison between CTD measurements) were checked and some problems were detected (e.g. Kistler pressure sensor), preventing faulty floats to be deployed.

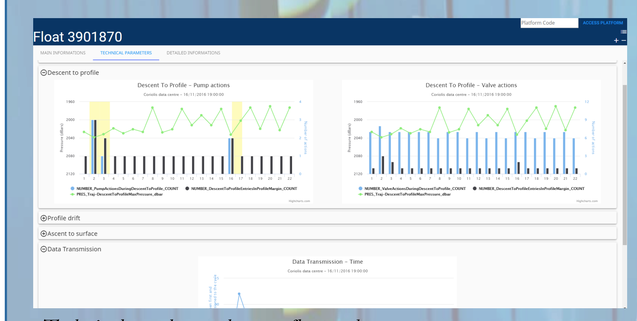
At-sea monitoring tools:
In the frame of MOCCA the Coriolis website for technical monitoring has been enhanced. **This will benefit all the European fleet.**

Key parameters (defined by Euro-Argo technical experts) are monitored through a dashboard for a whole fleet: maximum drift and profile pressure, float hydraulic repositioning, quality of data transmission & GPS positioning, battery voltage etc.

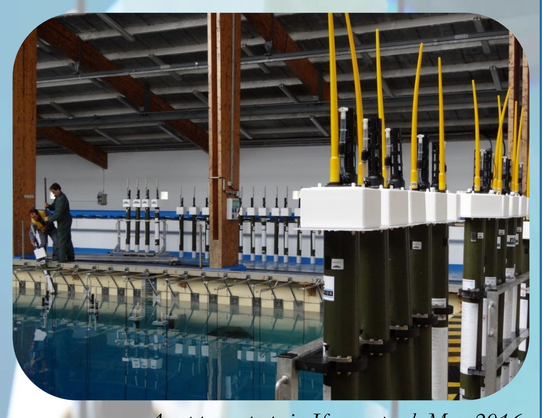


New at-sea monitoring website:
http://www.ifremer.fr/argoMonitoring

Alerts and **technical graphs** enable the day-to-day float monitoring, the detection of major problems and facilitate diagnostic and technical reporting on a fleet.



Technical graphs on the new float webpage



Acceptance tests in Ifremer pool, May 2016

CONCLUSIONS

- **Euro-Argo is ready to manage the European contribution to Argo**
- Within MOCCA the Euro-Argo ERIC demonstrates its operational capabilities
- The Euro-Argo RI will continue to work with EC to sustain such funding to complement the national contributions and allow the development of the extensions of Argo to BGC and deep ocean monitoring