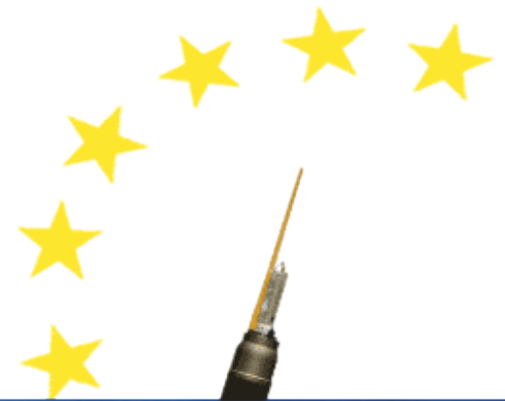




The MOCCA project

S. Pouliquen and Euro-Argo partners

Brest 28th April, 2016

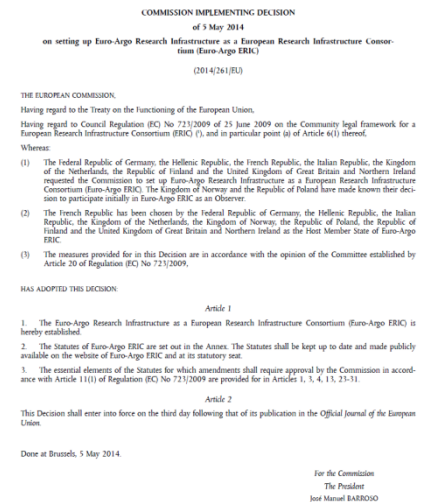




History of the Euro-Argo Research Infrastructure development

- Discussion/preparation Euro-Argo proposal for the ESFRI roadmap : 2004/2005
- Part of the first ESFRI roadmap – 2006.
- FP7 Euro-Argo preparatory phase: 2008-2011
- Interim Phase (consortium agreement): 2011-2013
- May 2014. Creation of the Euro-Argo ERIC.

Three FP7/H2020 projects: Euro-Argo PP (2008-2011), SIDERI (2011-2012) and E-AIMS (2013-2015)





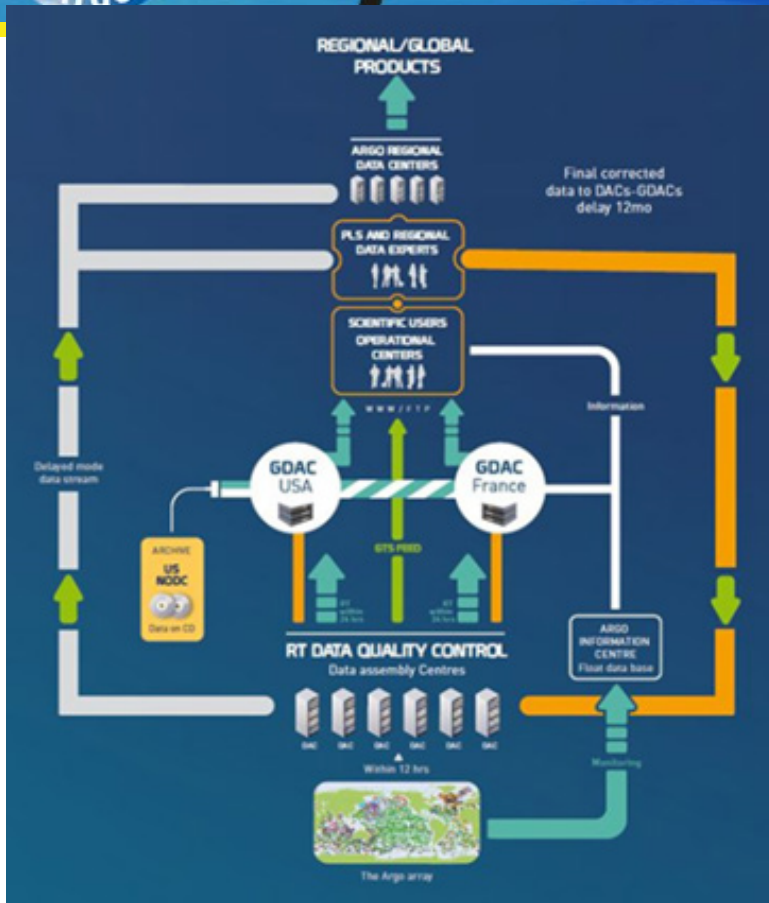
European contribution to Argo



- Europe has played an important role in Argo since its start in 2000's both at Scientific coordination and Data management levels
 - European partners participated to the set up of the Argo International programme and actively contribute to it
 - Contribution to the international network with the deployment that slightly increased from 120 in 2002 to more than 200 now . Since 2002 **2737 floats** have been deployed by European partners among than **11900 floats** at global scale .
 - Technological development (PROVOR/ARVOR/Prov-BIO/NEMO)



Coordinate Data Management



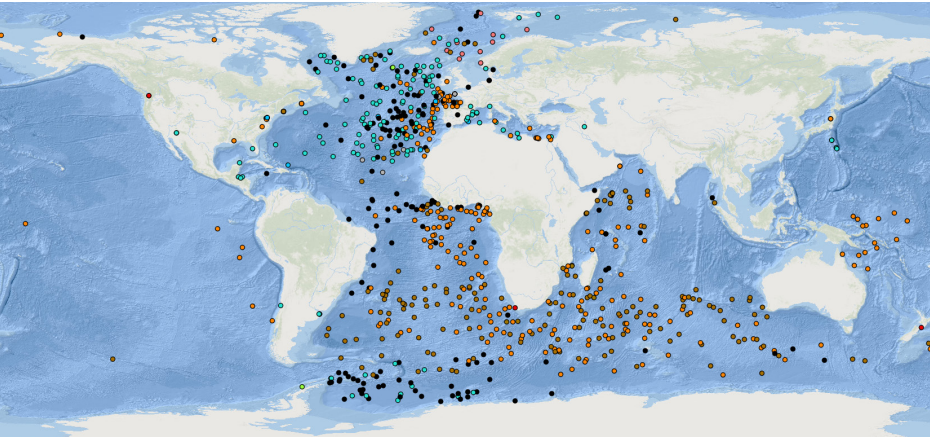
- Coordinate European contribution to Argo data Management
- Ensure that all European floats is processed in real time Delayed mode
- Consolidate Argo data at basin scale : North Atlantic Med and Black Seas, Southern Ocean (Atlantic area)

- Global Data Centre : France
- 2 Data centres : France and UK
- 4 Delayed Mode Operators: France Germany Italy and UK
- 3 regional coordination : France Italy and UK

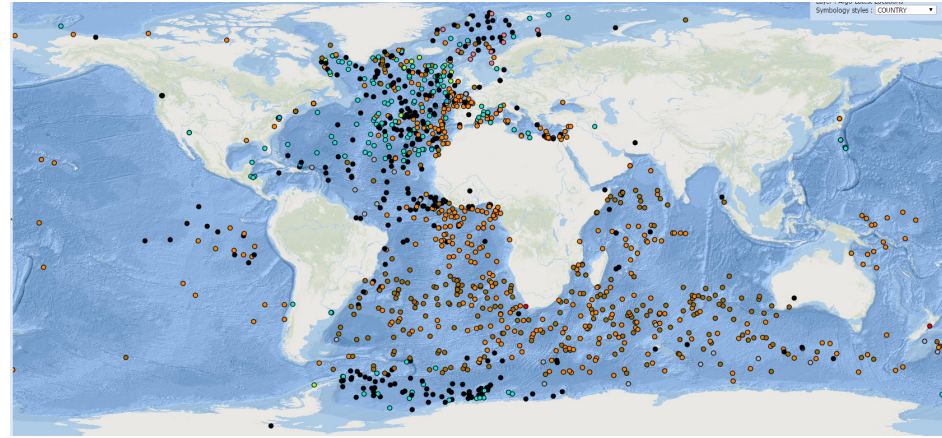


Evolution of the number of floats deployed per European Countries in past 15 years

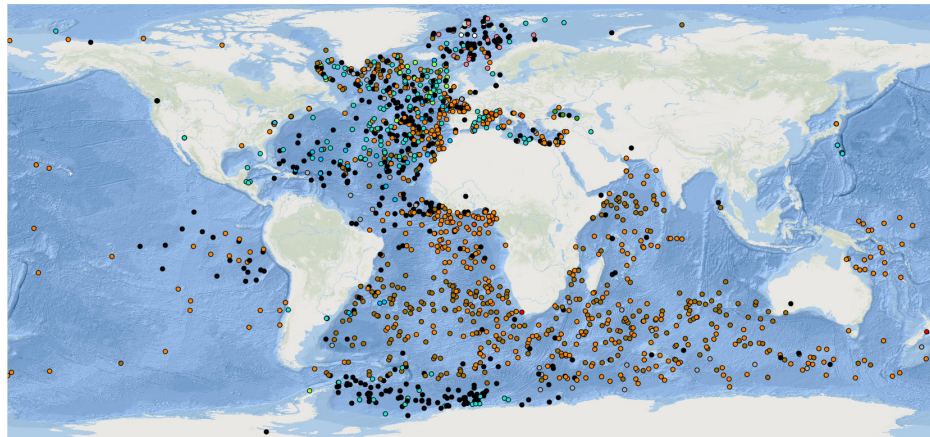
2002-2006



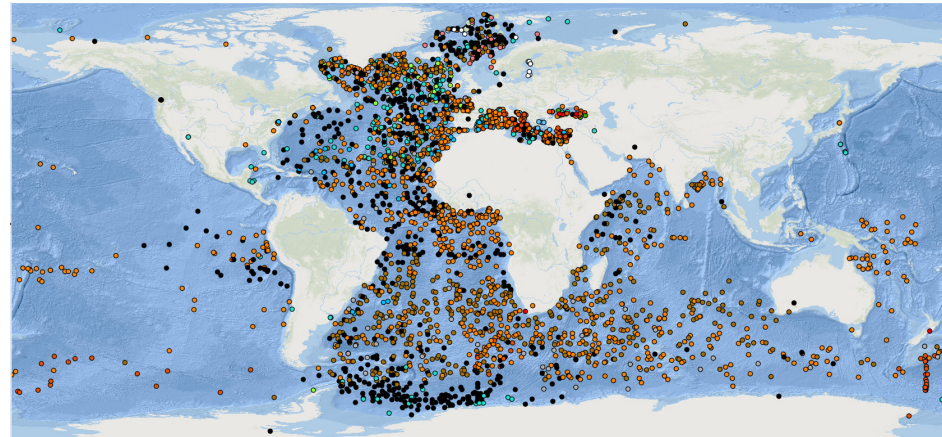
2002-2009



2002-2012



2002-2016

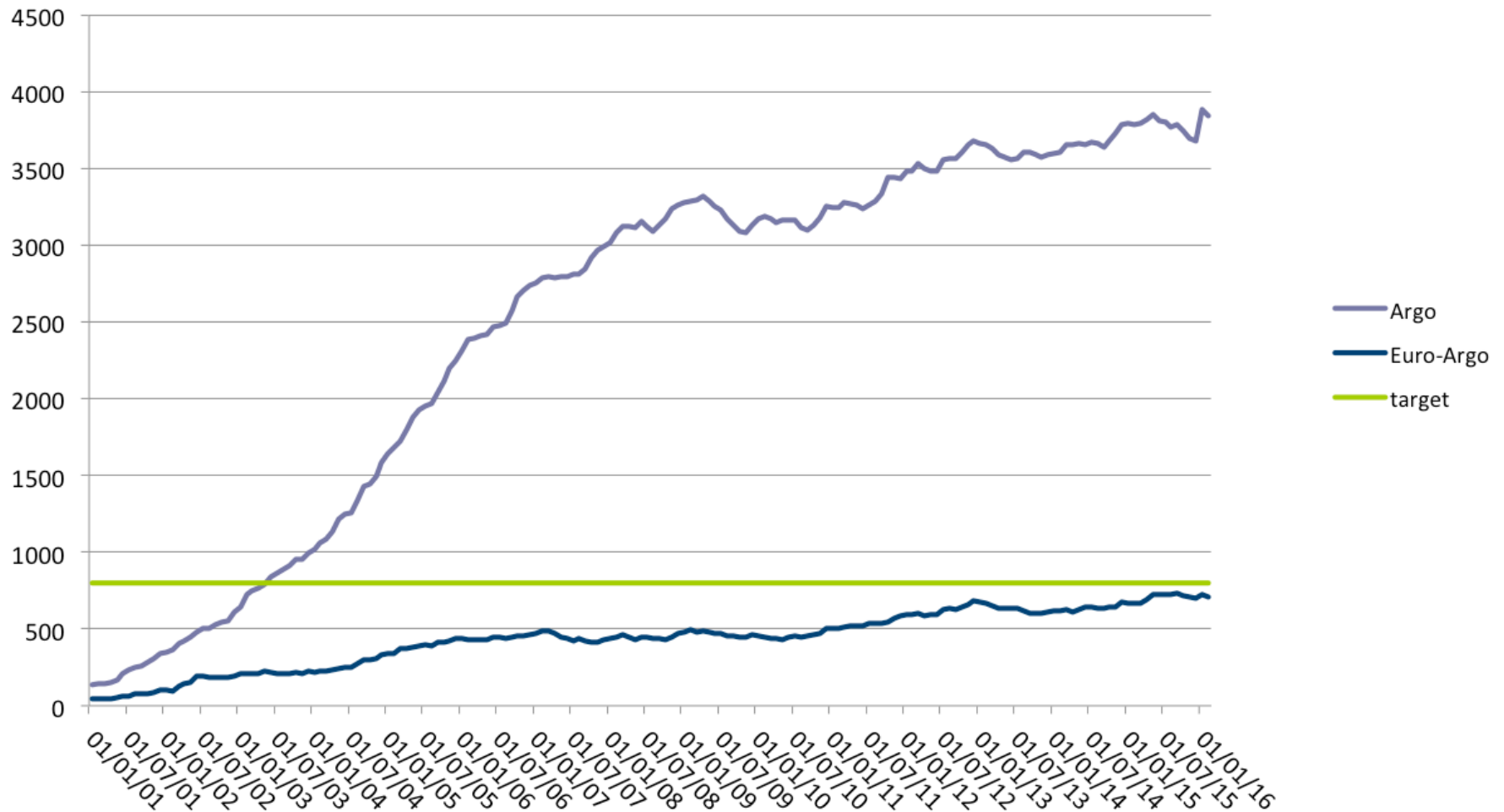




Coordination of float processing



**Euro-Argo distinct floats distributing data at GDACs
vs Argo
(monthly values)**





European contribution to Argo



- Euro-Argo is recognised as an important Research Infrastructure and is in the European Roadmap ESFRI since 2006
- Since 2014 Euro-Argo moved to an ERIC signed at ministry level with commitments of the countries on the long term
- Objectives:
 - Deploy about 250 floats per year to contribute to the Argo core mission including regional enhancements (Nordic seas, Mediterranean & Black seas) (maintain an array of 800 floats).
 - Prepare and contribute to the extension of Argo (e.g. marginal seas, biogeochemistry, deep ocean, polar regions).
 - Users and applications: ocean and climate research and operational oceanography (Copernicus Marine Service).



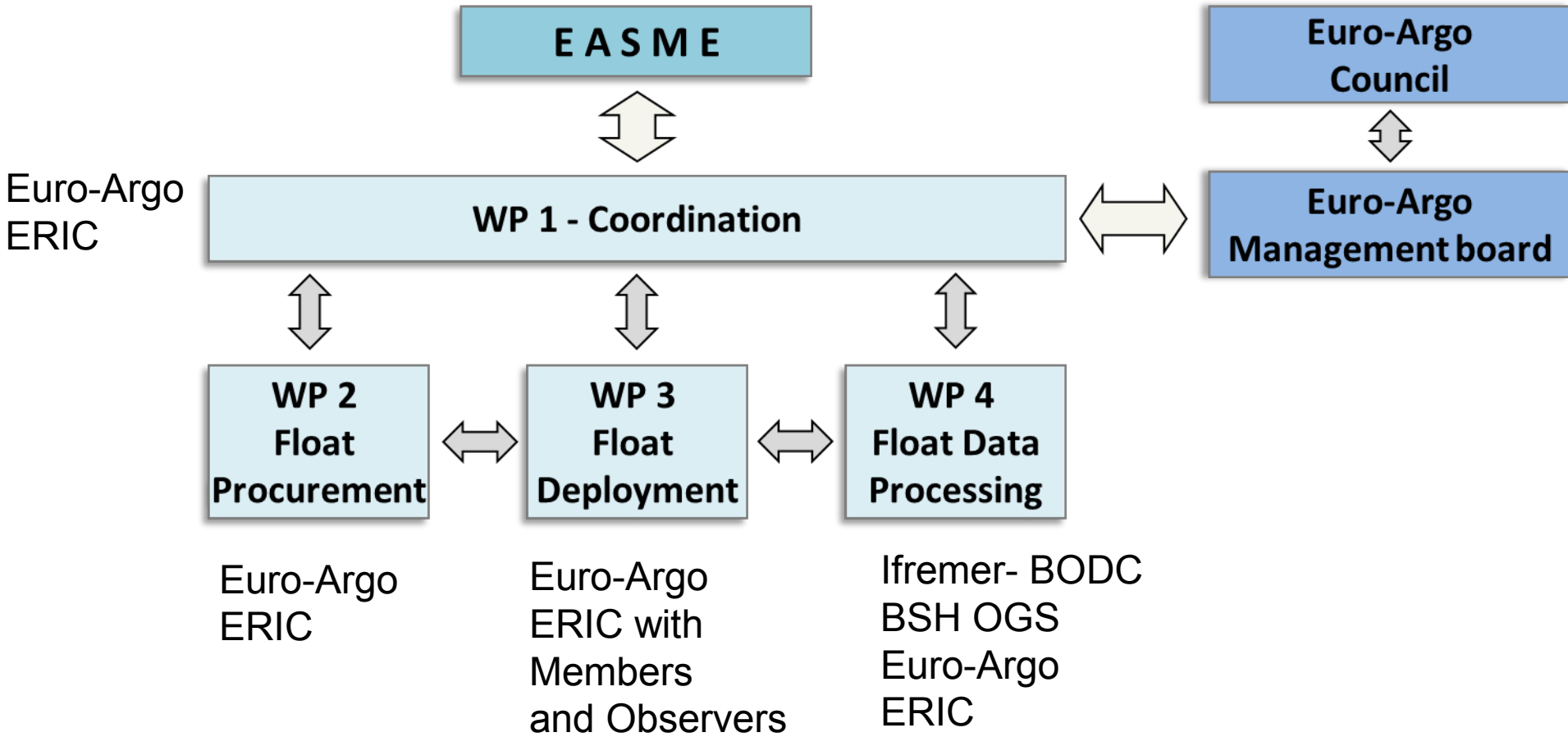
European Commission support to Euro-Argo

- Based on National funds only the European contribution has reached a plateau
- Since its start Euro-Argo has worked closely with the European commission (DG-Mare(EMODNet) , DG-Research and DG-GROWTH (Copernicus)) to develop a long term contribution to Argo
- DG-Mare through EASME contacted the Euro-Argo ERIC to submit an application for a grant for the implementation of the action Monitoring the Oceans - Action 1.2.1.1. of the EMFF Work Programme 2015
- The Proposal was submitted 10th April, revised according to review on 6th May and signed Mid June and started end of June 2015



The MOCCA project :Monitoring the Ocean Climate Change with Argo

- The goal: procurement and deployment of 150 floats, and the processing of collected data as a contribution towards the European effort under the international Argo programme.
- 80% co-funding achieved by transfer of funds for 20 floats from members

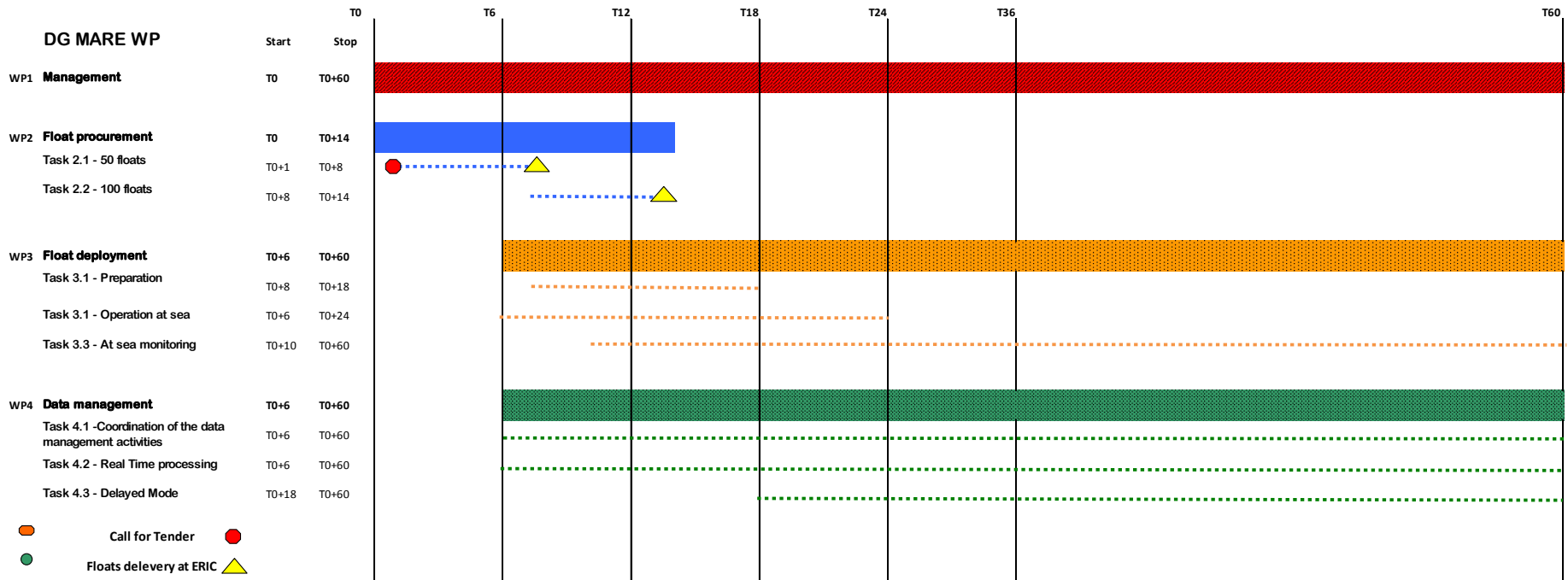




The MOCCA project



- Started end June 2015 – Will end in June 2020
- Call for tender issued end July 2015; NKE won the tender





MOCCA deployment plan - 2016



- MOCCA schedule:
 - 40 floats received in April
 - 10 co-financed floats on they way to Barbados (BSH)
 - 2 co-financed floats (Italy) going in early May on « La Belle Poule »
 - 2 co-financed floats (Poland) going in early June to Sopot
 - 7 co-financed floats (Netherlands) to be shipped by the end of August
 - Acceptance tests pending for remaining floats
 - 40 floats in May
 - Acceptance tests in May
 - Ready to be deployed early summer
 - 40 floats in July
 - 30 floats in September



MOCCA deployment plan - 2016



- MOCCA floats:
 - T/S Core and Iridium
 - 60 floats in 2016
 - 70 floats in 2017
- Input:
 - Tables and graphs from Euro-Argo draft implementation plan
 - National plans
 - Argo density/age maps (JCOMMOPS)
 - Cruises opportunities from partners

2016

European Floats deployed for current year

Area	Target			T/S Core			T/S Ice			Bio			Deep		
	Target	planned	gap	Target	planned	gap	Target	Status	gap	Target	Status	gap	Target	Status	gap
Nordic Seas	15	12	-3	12	11	-1	0	0	0	3	1	-2	0	0	0
Mediterranean Sea	30	29	-1	25	24	-1	0	0	0	5	3	-2	0	2	2
Black Sea	4	5	1	2	4	2	0	0	0	2	1	-1	0	0	0
Baltic Sea	3	3	0	0	1	1	0	0	0	3	2	-1	0	0	0
Southern Ocean	25	9	-16	0	0	0	7	0	-7	15	6	-9	3	3	0
Arctic Ocean	3	4	1	0	0	0	1	0	-1	2	4	2	0	0	0
Global Ocean	270	252	-18	203	220	17	0	0	0	20	15	-5	47	17	-30
Total	350	314	-36	242	260	18	8	0	-8	50	32	-18	50	22	-28

2017

European Floats deployed for current year

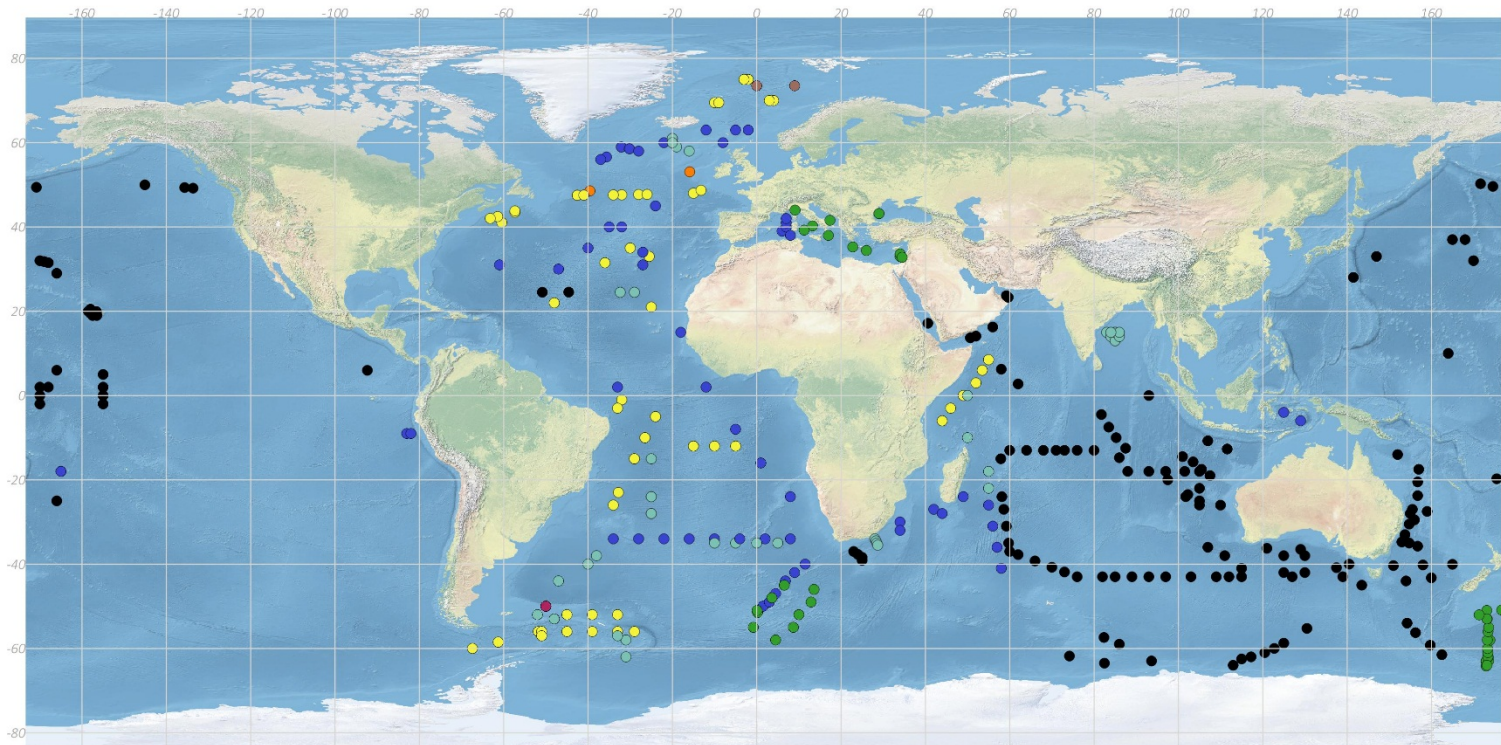
Area	Target			T/S Core			T/S Ice			Bio			Deep		
	Target	Status	gap	Target	Status	gap	Target	Status	gap	Target	Status	gap	Target	Status	gap
Nordic Seas	15	10	-5	12	9	-3	0	0	0	3	1	-2	0	0	0
Mediterranean Sea	30	35	5	25	30	5	0	0	0	5	5	0	0	0	0
Black Sea	4	2	-2	2	2	0	0	0	0	2	0	-2	0	0	0
Baltic Sea	3	4	1	0	1	1	0	0	0	3	3	0	0	0	0
Southern Ocean (WG)	25	25	0	0	0	0	7	25	18	15	0	-15	3	0	-3
Arctic Ocean (Ice)	3	0	-3	0	0	0	1	0	-1	2	0	-2	0	0	0
Global Ocean	270	268	-2	203	235	32	0	0	0	20	12	-8	47	21	-26
Total	350	344	-6	242	277	35	8	25	17	50	21	-29	50	21	-29



MOCCA deployment plan - 2016



- MOCCA target deployment areas:
 - Southern Ocean (ice-free): poor density in Argo network
 - Nordic Seas (ice free): based on actual national plans, gap in the area from target identified in strategy document
 - Black Sea (2 floats in 2017)
 - Mediterranean Sea (Aegean, Levantine): 2017?
 - Baltic Sea (2017?)
 - Opportunity cruises : will require to develop training material for float deployment by new teams .



DEPLOYMENT PLAN FOR ARGO FLOATS in 2016

● Bulgaria [0]	● Greece [0]	● Poland [2]
○ Finland [0]	● Ireland [2]	● Spain [0]
● France [62]	● Italy [43]	● United Kingdom [42]
● Germany [58]	● Netherlands [7]	● Other [159]
	● Norway [0]	

National deployment plans
 From JCOMMOPS database (22 April 2016)

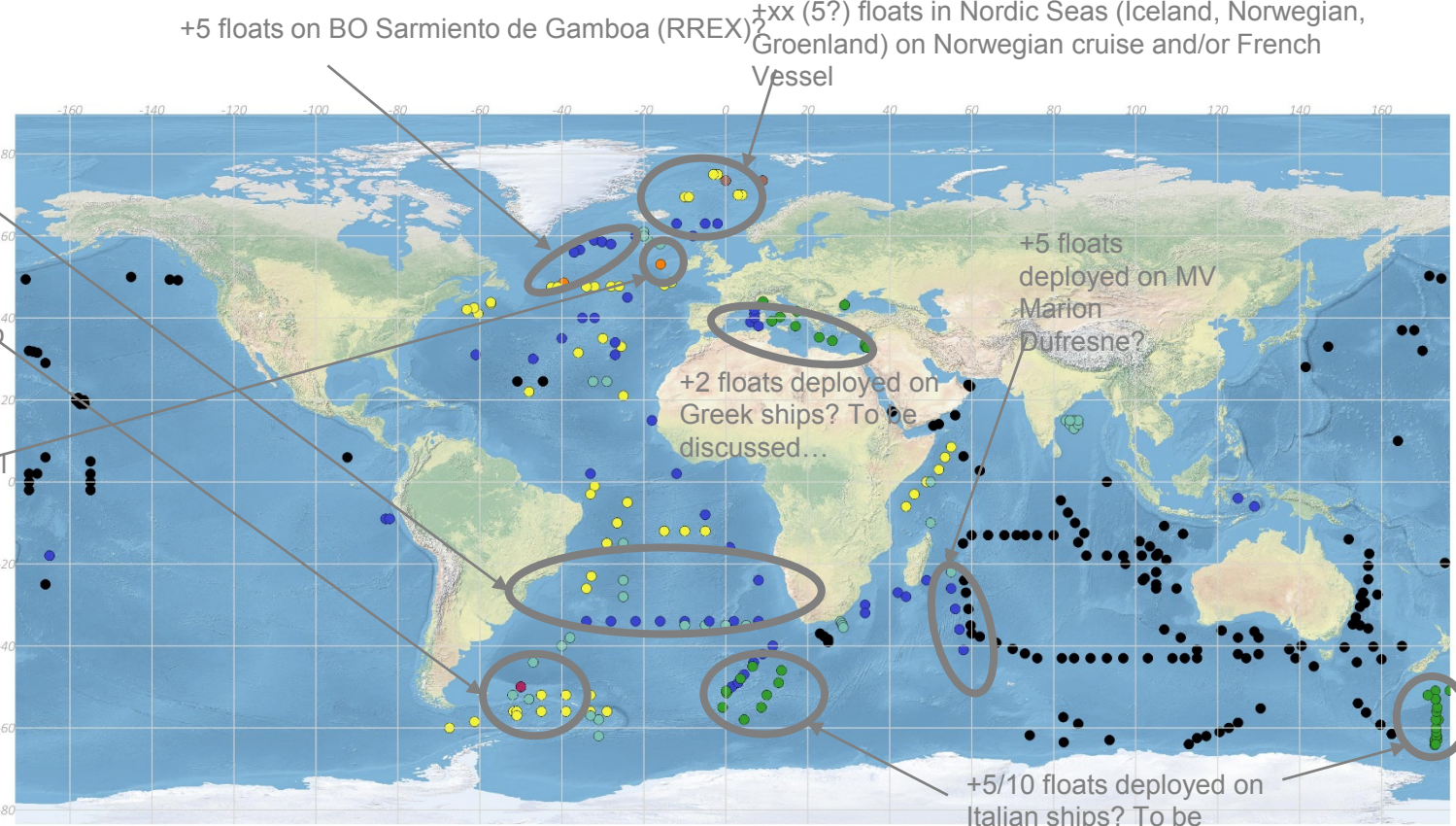
 Probable, Confirmed, Registered
 Year 2016

 European countries and rest of the world



Draft deployment plan for MOCCA

- +xx floats on FS METEOR (Southern Ocean)?
- +xx floats on RV POLARSTERN (Southern Ocean)?
- Others on German ships? To be discussed...
- +1-2 floats on Irish cruises (RV Celtic Voyager)? Rockall Trough NW of Ireland
- MI Transatlantic GO-Ship A02 in 2017?
- +xx floats on Dutch cruises? To be discussed...
- +xx floats on OGS-Explora: transit between Italy and Antarctic (Southern Ocean)?
- +xx floats on R/V Hesperides (Spain) off the coast of South America (Ushuaia-Rio)?
- + others (Black Sea, Baltic Sea, UK, Atlantic Meridional Transect, GO-SHIP etc.)



DEPLOYMENT PLAN FOR ARGO FLOATS in 2016

● Bulgaria [0]	● Greece [0]	● Poland [2]
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● Norway [0]		

National deployment plans
 From JCOMMOPS database (22 April 2016)

 Probable, Confirmed, Registered
 Year 2016

 European countries and rest of the world



Monitoring the European Fleet



- Goal :
 - rapidly detect failures that would need to stop deployment and
 - provide feedback to manufacturers on anomalies or improvements that need to be studied.
 - Provide Euro-Argo members and observers annual report on European fleet behaviour
- How
 - Based on analyses of European fleet data at Coriolis G-Dac based on V3 technical files loaded in the Coriolis database
 - At the ERIC , floats behaviour (at list the failures) will be periodically analysed and a summary report provided .
 - The ERIC will rely on the national experts
 - for in depth analysis of failure
 - and also liaise with float and sensor manufacturers, especially when new failure modes are identified
- When :
 - Starts in 2016 when floats are deployed using Ifremer tools
 - will be enhanced in 2017 based on first experience and partners feedback



Conclusion



- The Euro-Argo is ready to manage European contribution to Argo
- Within MOCCA the Euro-Argo ERIC will demonstrate its operational capabilities
- Important to continue to work with European Commission to sustain the European contribution to Argo and better define European contribution to the network and its extensions