



Extension of Argo in shallow coastal areas of the Mediterranean and Black Seas: the Euro-Argo RISE project

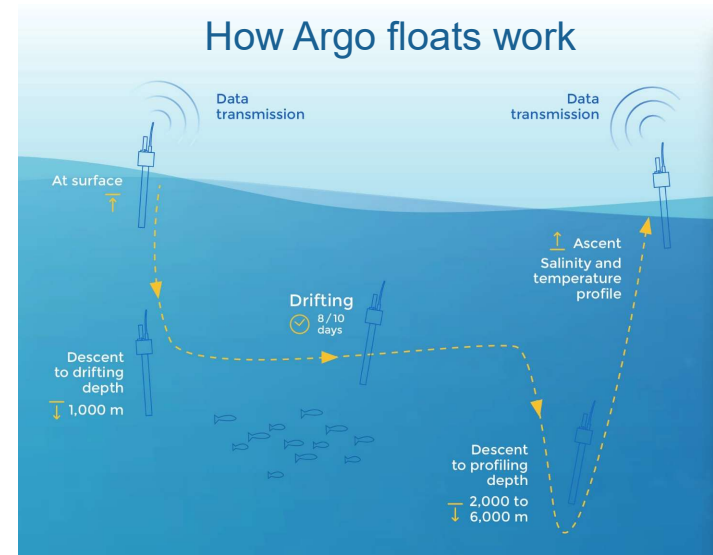
Notarstefano G.



8th MONGOOS ANNUAL MEETING & WORKSHOP “MODELLING AND OBSERVATIONS IN THE COASTAL
MEDITERRANEAN SEA: PHYSICAL AND BIOGEOCHEMICAL PROCESSES”. 3-5 December 2019 - Trieste (Italy)



- Euro-Argo ERIC
- Euro-Argo RISE project
- WP 6 Euro-Argo RISE
 - Extension of Argo in shallow coastal areas
 - Expansion of the Argo community at regional level
 - Develop regional partnership around the European Marginal Seas
 - Engage with neighbouring/riparian countries
- WP 7 & 8 Euro-Argo RISE
 - Euro-Argo visibility and integration with GOOS and EOOS



Outline

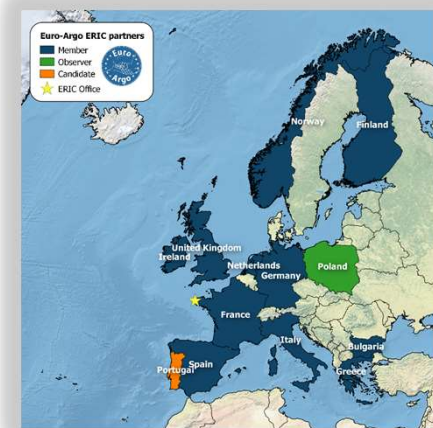




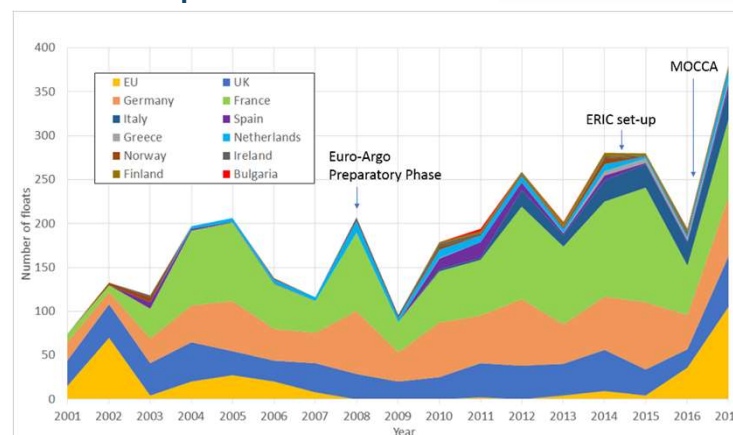
The Euro-Argo Research Infrastructure

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 2018 roadmap



Argo
EuroArgo
 European contribution to the Argo program via EuroArgo Research Infrastructure
 Latest locations of operational profiling floats (data distributed within the last 30 days)
 January 2019
 • Argo EU (832) • Argo non EU (3077)
 Generated by www.jamstec.go.jp

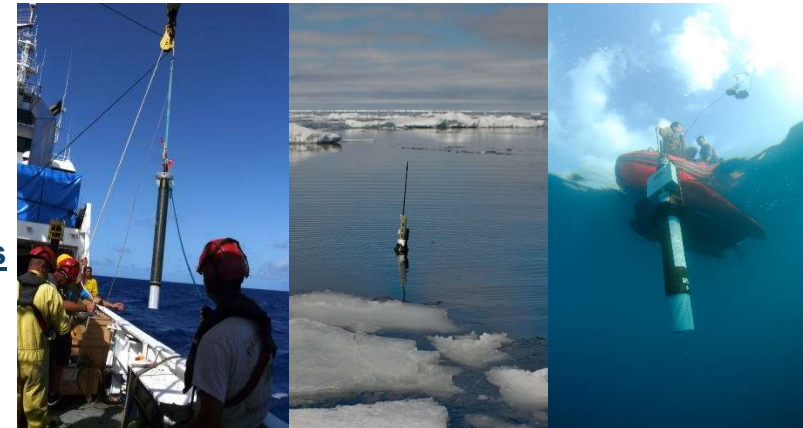


Increase of the European contribution to the international network
 (number of deployments / year)



Argo in Europe for the next decade

- Main Challenges:
 - **Maintain** the Research Infrastructure
 - **Extend** its capacity to abyssal ocean (4000 to 6000m), biogeochemistry, partially ice covered areas and shallow waters regions
- 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





Euro-Argo RISE project

- RISE stands for Euro-Argo **R**esearch **I**nfrastructure **S**ustainability and **E**nhancement
- This project is a research and innovation action (EU H2020 funded):
 - Implemented during 4 years (2019-2022)
 - By 19 partners
 - In 13 countries



Expected improvements on :

- ✓ Float technology
- ✓ Fleet management
- ✓ Data system
- ✓ Services to users
- ✓ Interaction with manufacturers

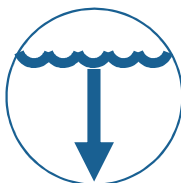


WP2



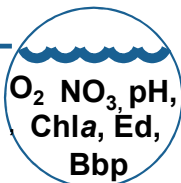
IMPROVEMENT OF THE **CORE ARGO** MISSION

- Floats lifetime & sensors' diversity
- Argo observation of boundary current regions
- Enhancement of DMQC methods



WP3

EXTENSION TO DEEP OCEAN



WP4

**EXTENSION TO
BIOGEOCHEMICAL
PARAMETERS**



WP5

**EXTENSION TO HIGH
LATITUDES**



WP6

**EXTENSION TO MARGINAL
SEAS**



WP7 & 8

**EURO-ARGO VISIBILITY &
INTEGRATION OF EURO-ARGO ACTIVITIES
IN THE GENERAL CONTEXT OF **GOOS AND
EOOS****

Euro-Argo RISE project

- Address sensors' accuracy & test new sensors
- Develop the DMQC methods
- New BGC sensors and products development
- BGC Data Management development & organisation
- New technologies for under-ice measurements
- Cooperation with high latitude countries
- Southern Ocean regional data quality assessments
- Assess the potential of Argo in shallow coastal seas
- Develop regional partnership around Mediterranean, Baltic and Black Seas
- Engage with neighbouring countries



Euro-Argo RISE project, WP6: extension in shallow coastal areas

1. Regional extensions and implementation of the Argo array

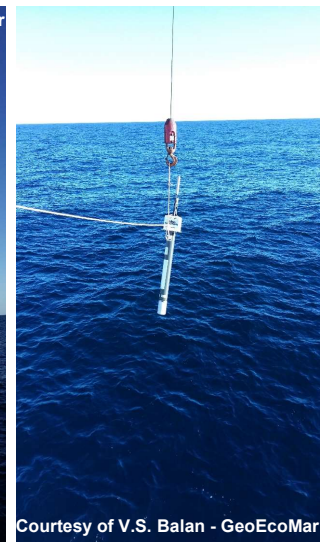
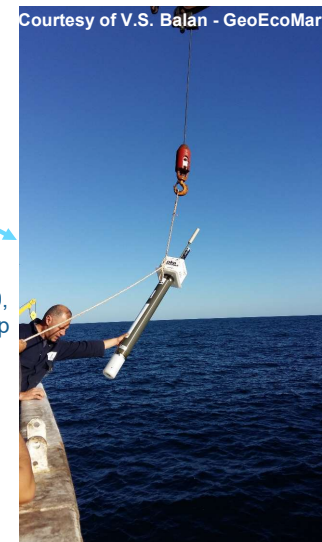
6 Euro-Argo RISE floats (yellow marks) will be deployed in coastal areas by the European partners:

- 2 in the Black Sea (OGS, IO-BAS)
- 4 in the Mediterranean Sea (OGS, SOCIB, HCMR, SU)

- Extension of Argo into shallow coastal waters of European marginal seas that have important socio-economic impact
- Improvement of technical aspect of Argo floats (optimization of the sampling characteristics) → (linked with task 2.1)
- Euro-Argo controlling and monitoring tools tailored for marginal seas (linked with task 2.1)



First Euro-Argo RISE float deployment in October 2019, WMO 6903271, with the help of Bulgarian and Romanian colleagues





E-A RISE, WP6: extension in shallow coastal areas

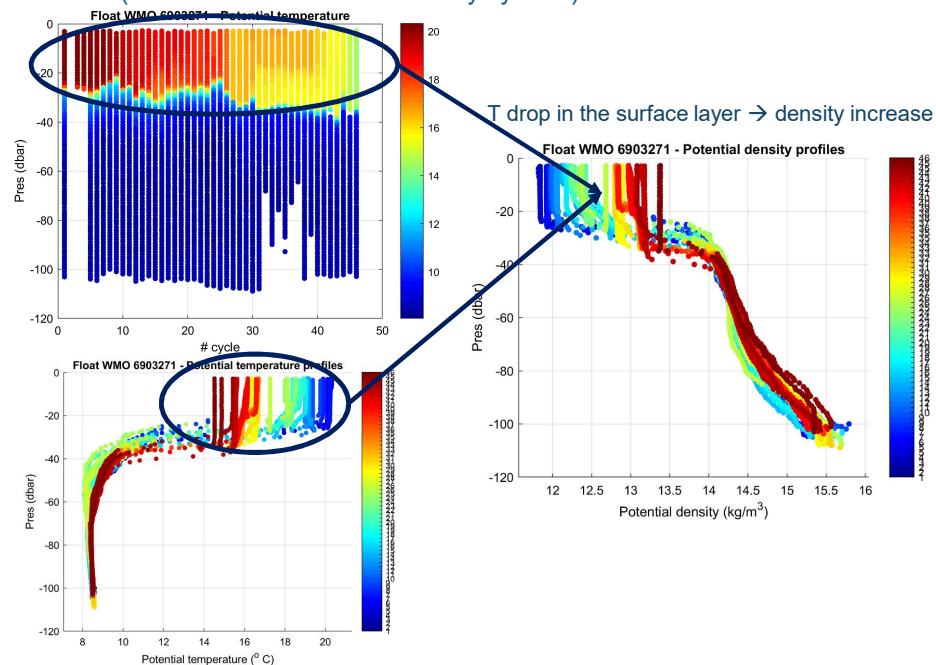
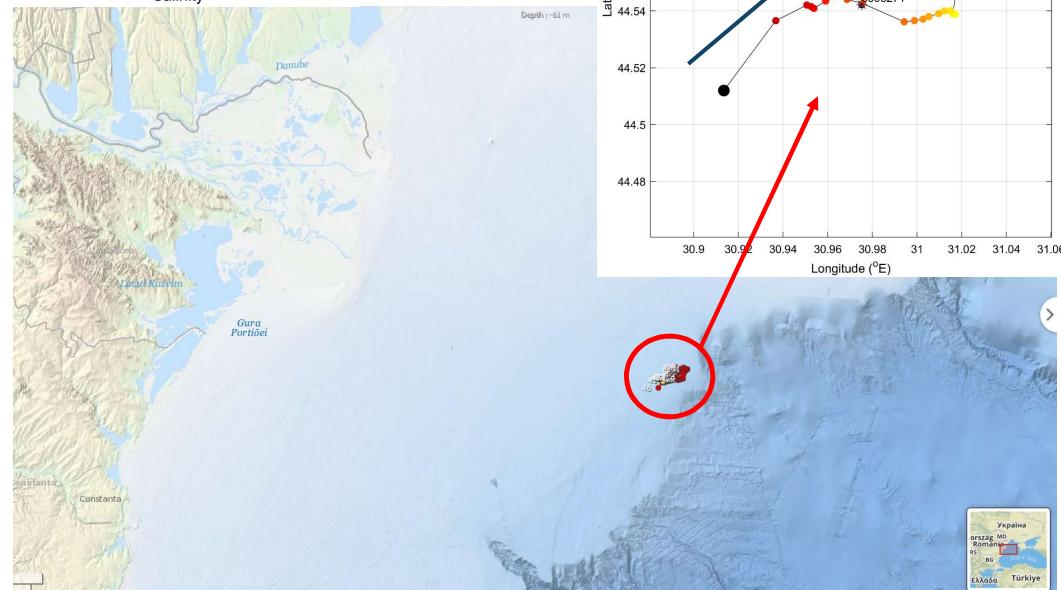
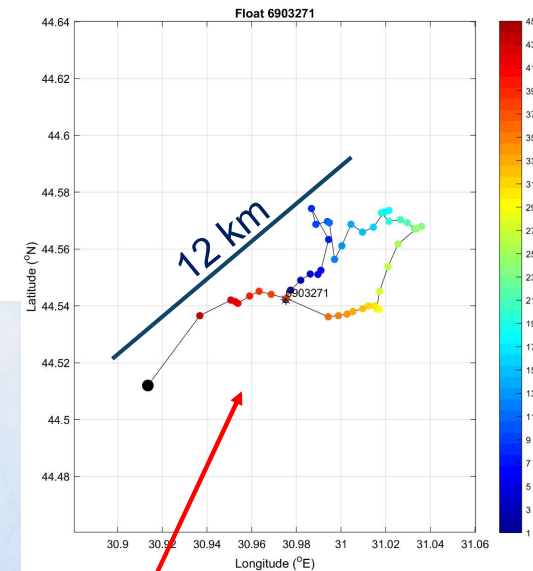
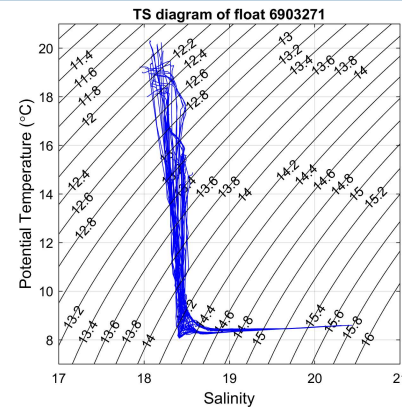
Float WMO 6903271

Launch date 01 Oct 2019, off the Danube River delta, 45 cycles performed (Euro-Argo RISE platform)

Target: keep the float on the shelf and try to use it as a virtual mooring

Radius of displacement: about 6 km in 2 months

Mission parameters changed by the operator when needed (Iridium bi-directional telemetry system)





E-A RISE, WP6: extension in shallow coastal areas

Float WMO 6903271

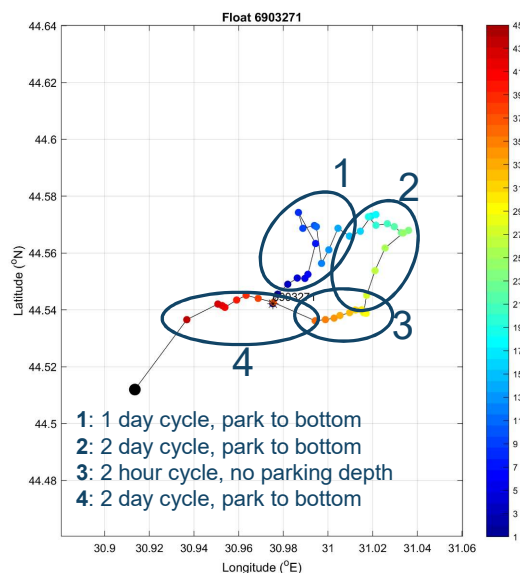
Coastal area operations:

- avoid stranding, maritime traffic
- need of a good monitoring system (Euro-Argo monitoring tool)
- Home-made tools (email alert system)

Float 6903271 last position
On date (UTC) 11-10-2019 06:33:58
Estimated bathymetry -104.5 m

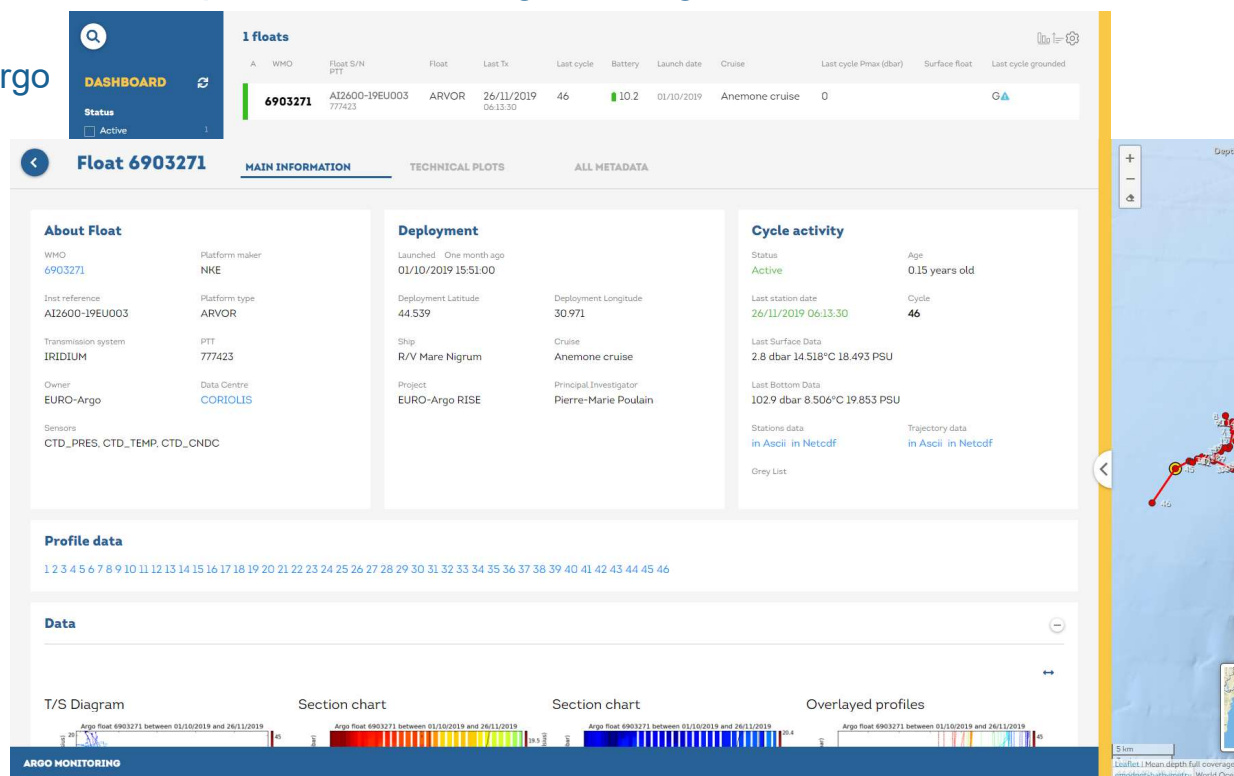
<http://maps.google.com/maps?q=loc:44.5611+31.0004>

6903271_Path.kml



Euro-Argo monitoring tool

<https://fleetmonitoring.euro-argo.eu/dashboard>





E-A RISE, WP6: extension in shallow coastal areas

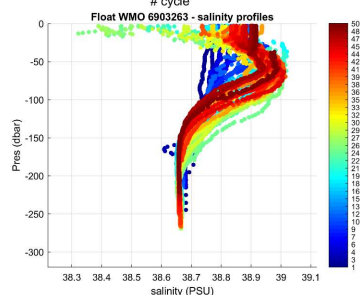
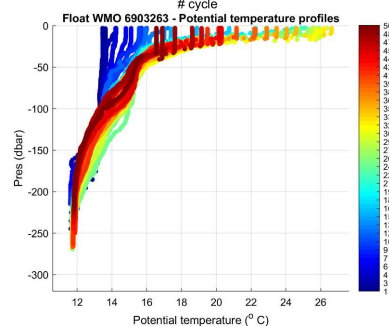
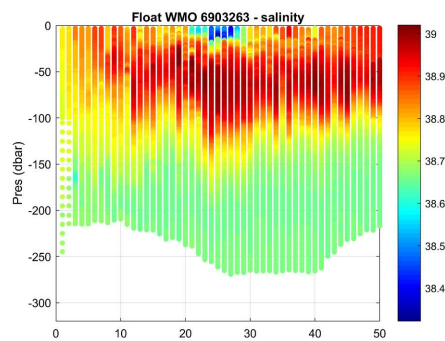
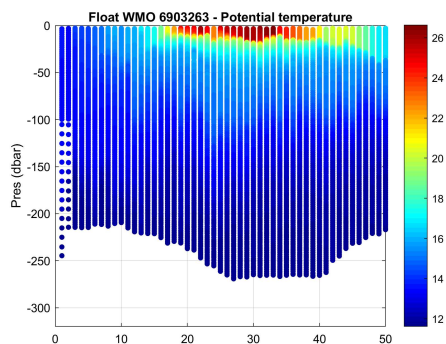
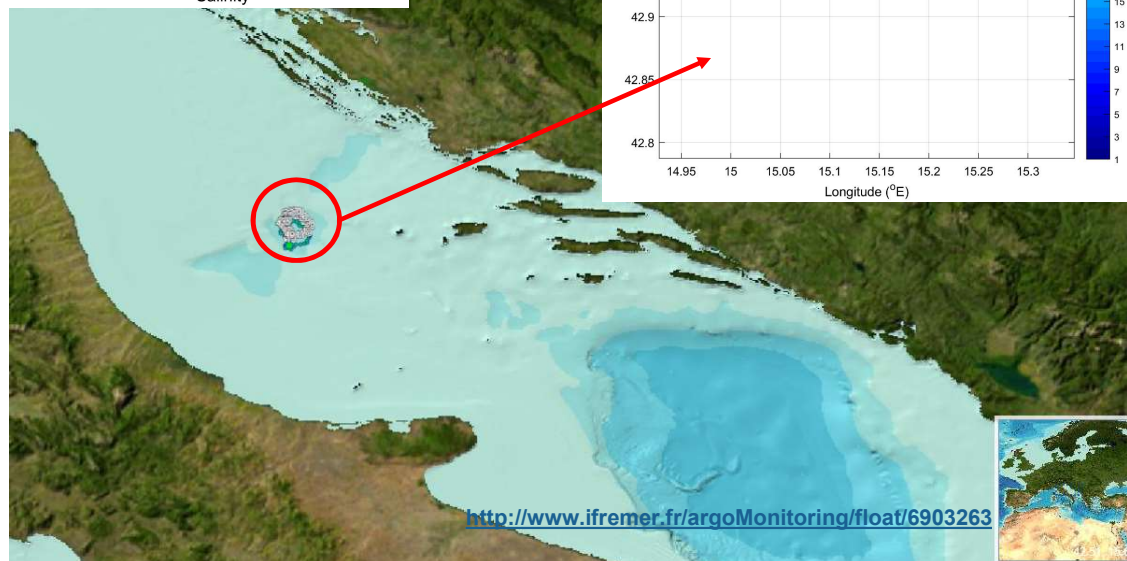
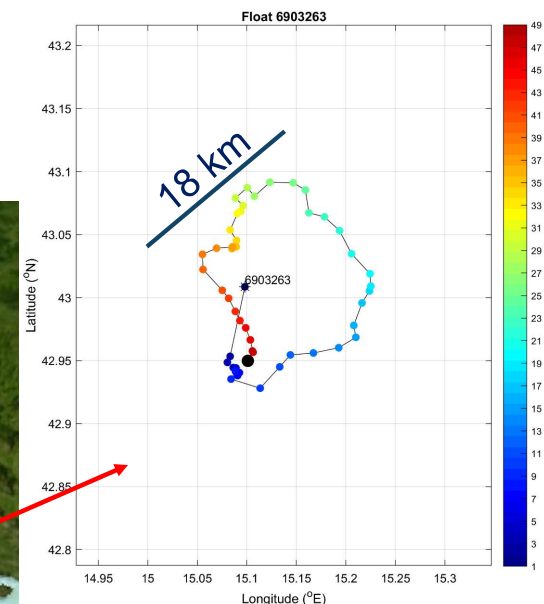
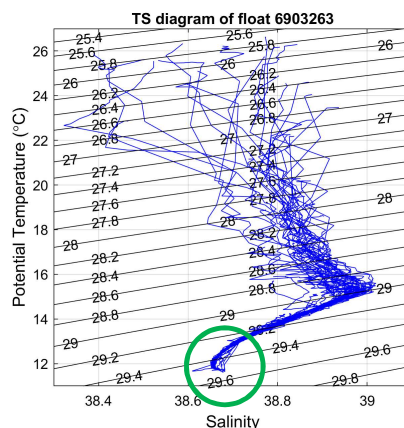
Float WMO 6903263

Launch date 23 Mar 2019, in the Central Adriatic Sea, 50 cycles performed (Argo-Italy platform)

Target: keep the float in the Pomo Pit (Central Adriatic)

Configuration: 5 day cycle, Parking depth to the bottom

Radius of displacement: about 9 km in 8 months





E-A RISE, WP6: expand the regional Argo community

Expansion of the Argo community at regional level

- Strengthen collaboration with riparian countries
 - sustain Argo activities (deployment, recovery, strategy)
 - float operations in territorial waters, EEZ, ...
- Attract new participants
 - workshops
 - take part in Argo activities
 - training
 - float donation
- Approach new countries to join Argo and for partnership in Euro-Argo ERIC
 - Specific events
 - political events
- Improvement of the connections with other RIs and regional networks
 - promote Argo, consolidate the network of scientists engaged in climate and ocean research at the regional level
 - collaboration at sea and in technical activities (cross-calibration of sensors)
 - sharing expertise and best practice



E-A RISE, WP 7&8: visibility and integration

- WP7: Develop the engagement with the European Argo user communities
 - User needs assessments (in terms of data, services such as training, etc.): **questionnaire** to be issued soon
 - Get new users onboard
 - ✓ *Improvement of data access*
 - ✓ *Improvement of data visualization*
 - } Argo online school
 - Facilitate Machine2Machine access to Argo data, implementing FAIR principles
 - MoU with key Euro-Argo users
 - Educational activities through the *Ocean Observers* network
-
- WP8: Integration of Euro-Argo activities in the general context of global ocean observations
 - Collaboration with other ERICs & networks (EMSO, ICOS, DANUBIUS, EGO, Eurofleets+, etc.)
 - Fostering links with industry (platforms & sensor manufacturers)
 - Develop scientific and technological coordination with EOOS & Argo international
 - Improvement of the general Euro-Argo deployment strategy
 - Development of a Long Term Sustainability Plan for the implementation of Argo new design



Conclusions

1. Extension of Argo in shallow coastal areas

- An open ocean platform in coastal areas! → First results are good
- Need of a high level controlling and monitoring tool
- Need of an experienced operator
- Possibility to recover floats
- Challenges: quality control in area of high natural variability

2. Expand the regional Argo community

- Some collaborations already established for deployment operations
- Mediterranean & Black Sea workshop (end of 2020)
 - Riparian/neighbouring countries
 - Scientific usage of Argo data
 - Technical aspects of floats
- Political event of the European Marginal Seas (June 2021)
 - Engage new countries
 - Policy/decision-makers and stakeholders from targeted countries on the value of Argo data in support to environmental and maritime policies

3. Visibility & Integration

- Strengthening and fostering interaction with RIs, research communities and observing networks is beneficial for both and reinforces the entire system
- Communication aspects will be improved in E-A RISE and are fundamental to better engage the existing and potential new users

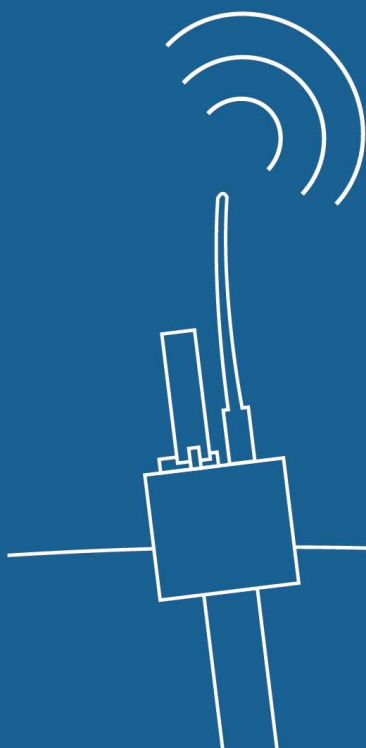
EURO-ARGO RISE



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Thank you for your attention



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