

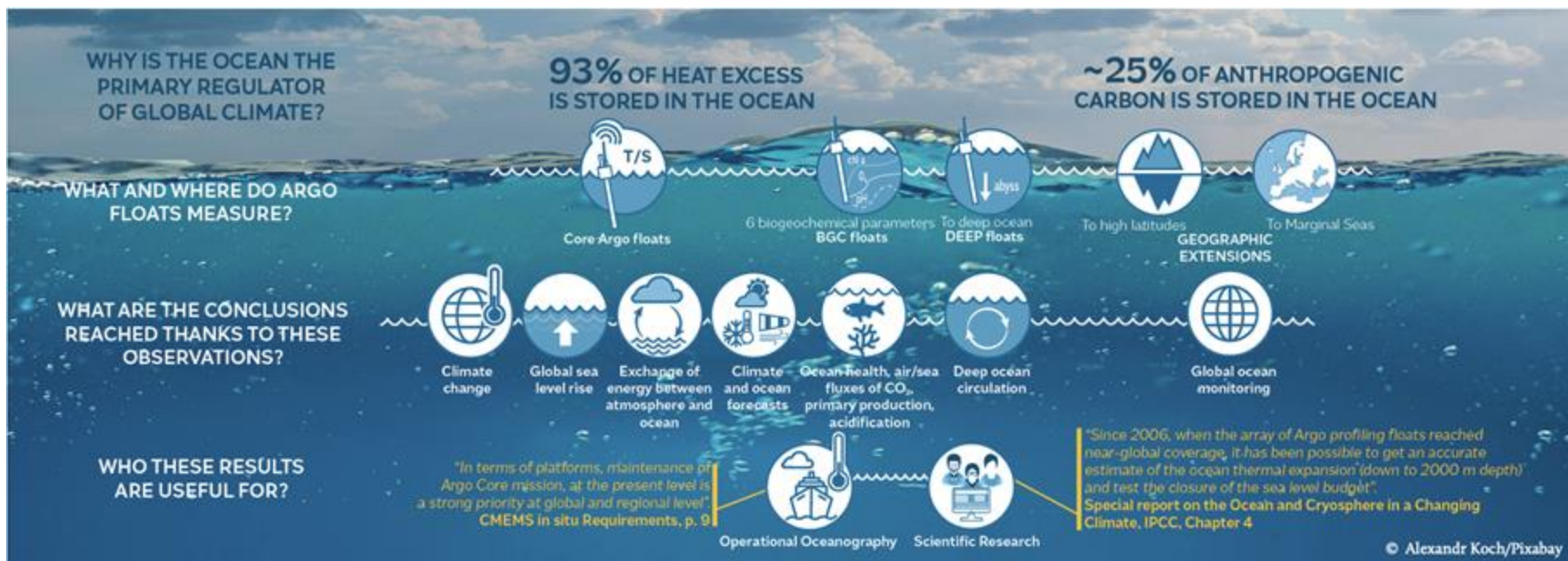
HANDS-ON TRAINING 1:

PHYSICAL and Biogeochemical Essential Ocean Variables

Manage and curate data at Euro-Argo

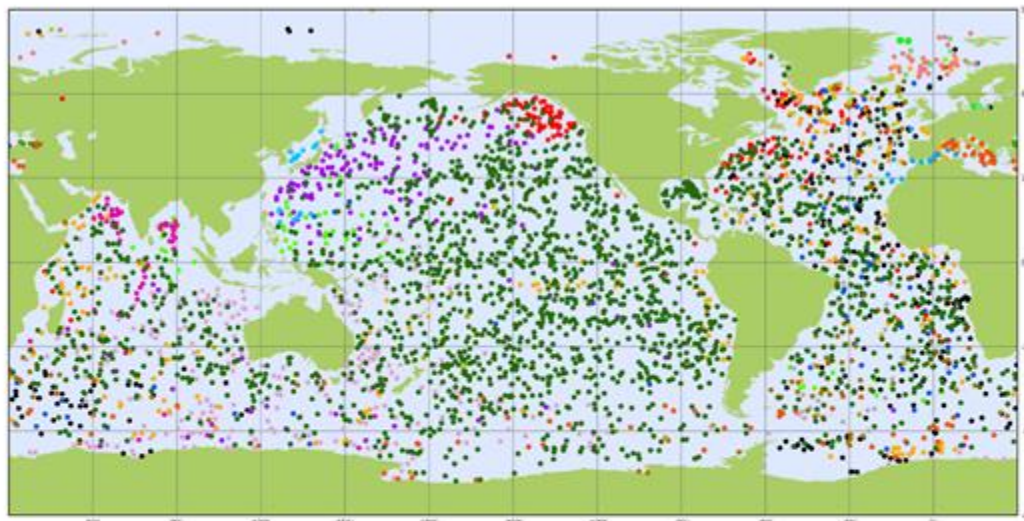
*Delphine Dobler
Euro-Argo ERIC Data Scientist
contact@euro-argo.eu*





Argo is the first global real-time in situ observing network in the history of oceanography.

- Argo represents a fleet of about **4000 autonomous floats**, deployed all over the world ocean, down to **depths of 2000m**, and for the deep mission subset, down to depths of 6000m
- They carry sensors to report **profiles of ocean properties** (temperature, salinity and possibly up to 6 biogeochemical parameters).



Argo

National contributions - 3879 operational floats
Latest location of operational floats (data distributed within the last 30 days)

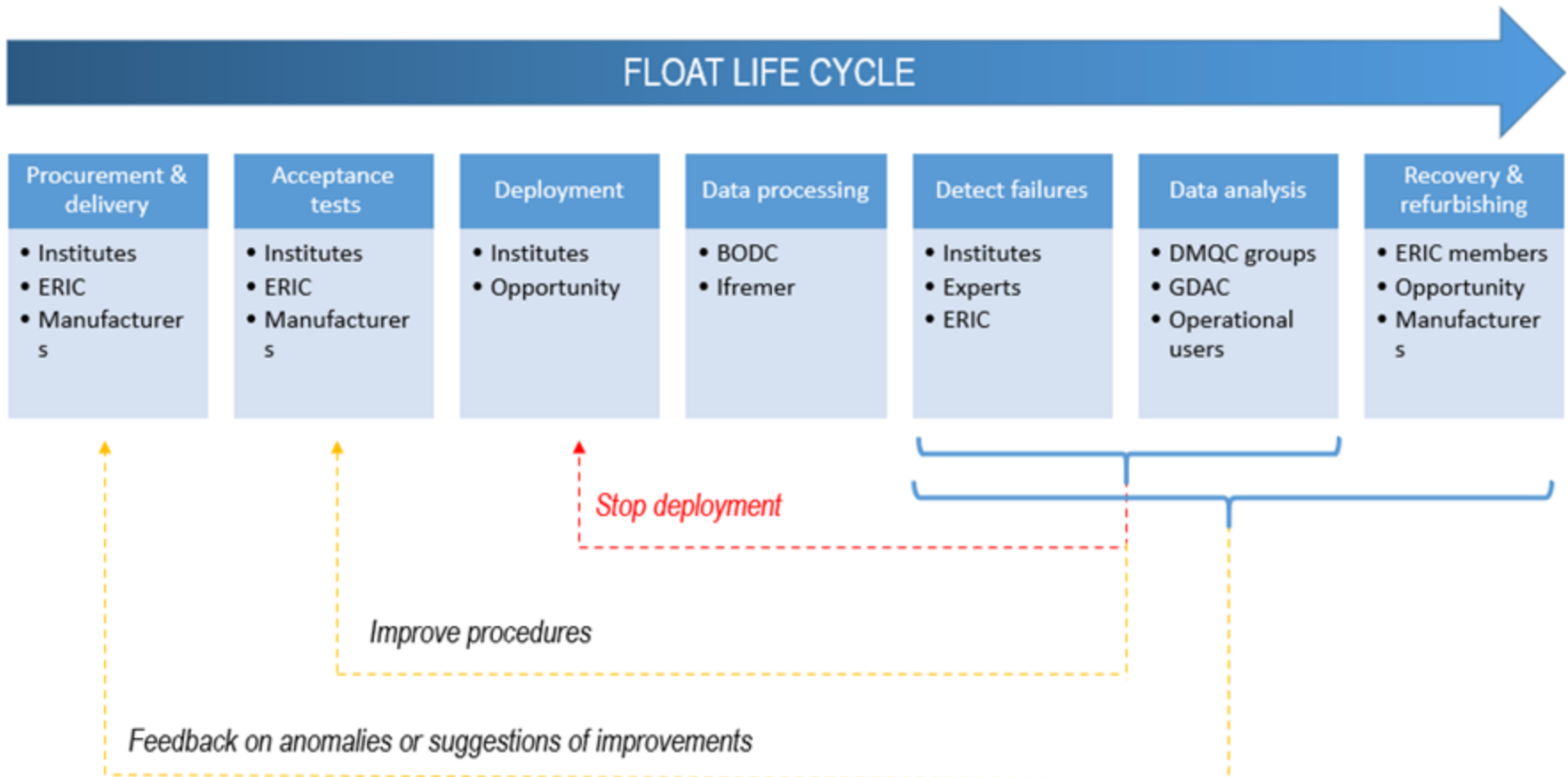
January 2024

• AUSTRALIA (298)	• FINLAND (2)	• INDONESIA (1)	• NEW ZEALAND (14)	• SPAIN (18)
• BULGARIA (9)	• FRANCE (283)	• IRELAND (16)	• NORWAY (42)	• UK (128)
• CANADA (172)	• GERMANY (248)	• ITALY (88)	• PERU (1)	• USA (2120)
• CHINA (62)	• GREECE (5)	• JAPAN (169)	• POLAND (9)	• OTHER (3)
• EUROPE (182)	• INDIA (49)	• NETHERLANDS (42)	• KOREA, REPUBLIC OF (18)	

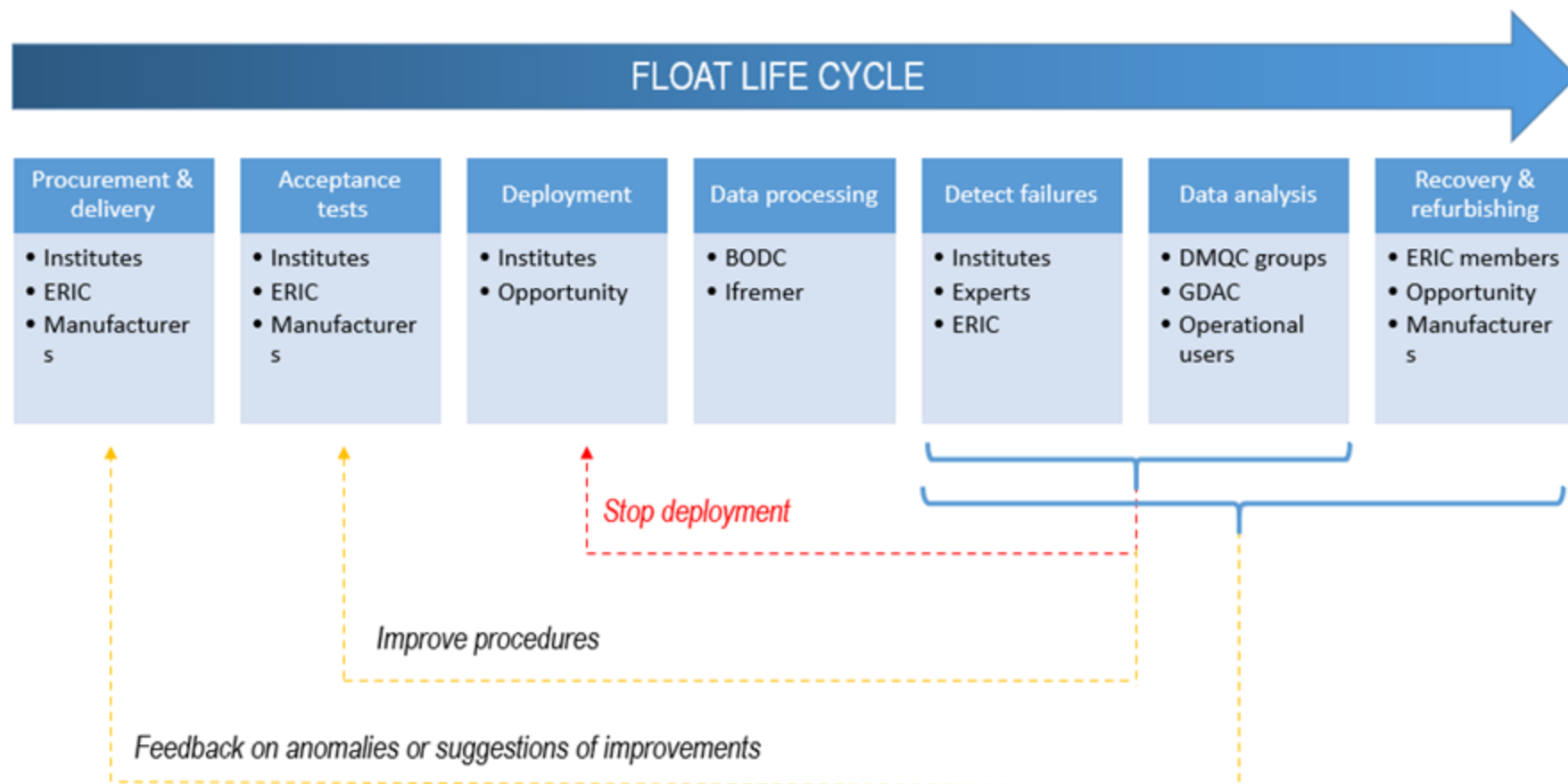


Generated by ocean-ops.org, 2024-02-01
Projection: Plate Carree (150,000)

Float management also follows documented procedures

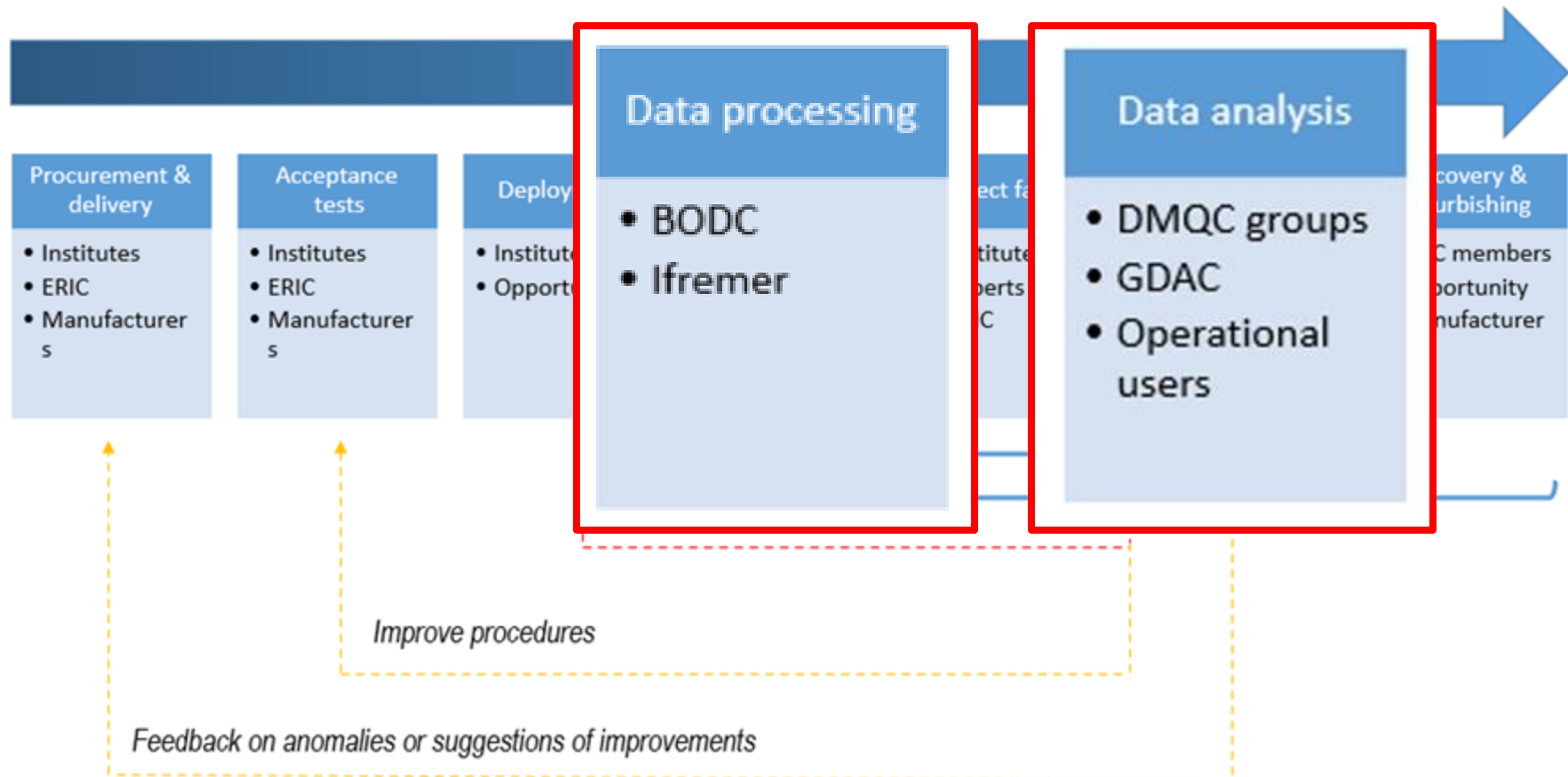


Float management also follows documented procedures



data content (meta data, technical data, mission data, measurements)

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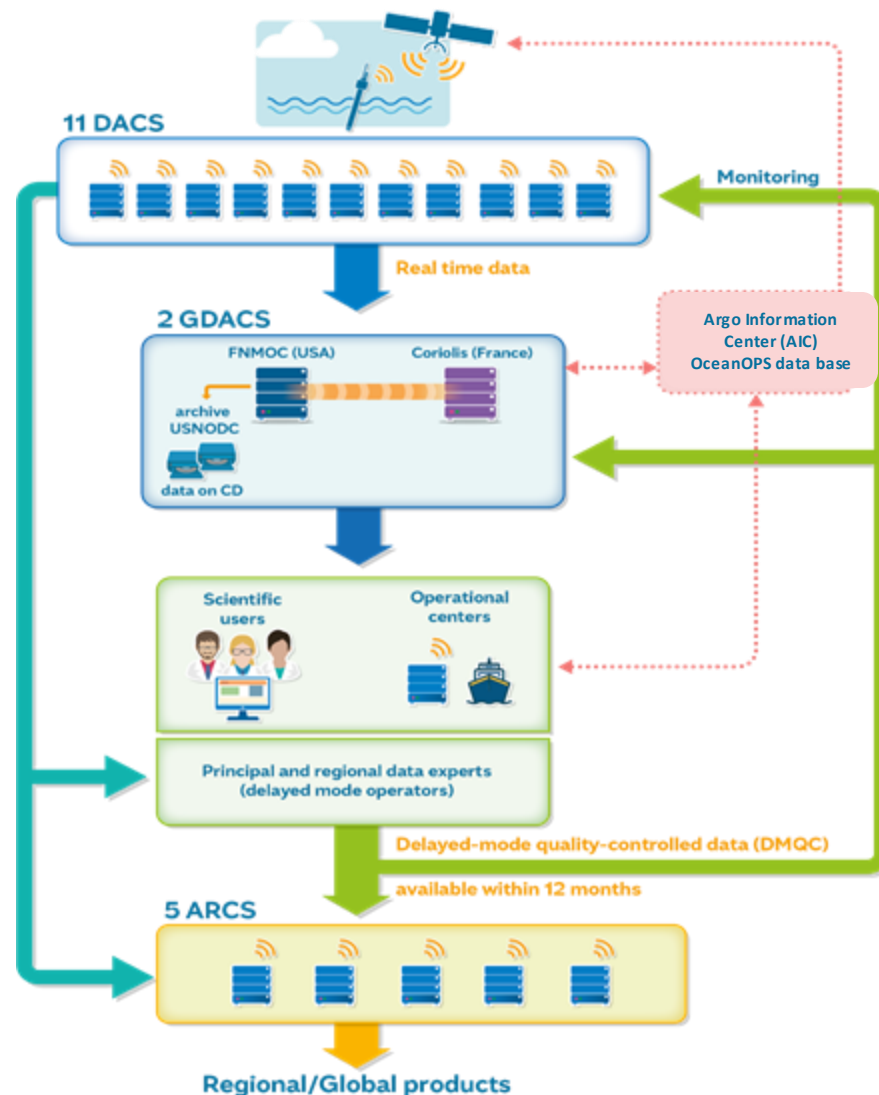


data content (meta data, technical data, mission data, measurements)

Data are managed at international level:

- Floats send their measurements to **DACs***, where raw data are processed and sent to **the 2 GDACs***:
 - ✓ 1 GDAC in Europe (Coriolis/Ifremer)
 - ✓ 2 DACs in Europe (Coriolis/Ifremer, France and BODC, UK)
- **5 ARCs*** : 3 are coordinated by European partners:
 - ✓ Atlantic ARC (Ifremer, France)
 - ✓ Southern Ocean ARC (BODC, UK)
 - ✓ Med & Black Seas ARC (OGS, Italy)
- **Argo Information Centre (AIC)** at OceanOPS:
 - ✓ Registration of floats
 - ✓ Information on data (“metadata”) and Argo array high-level monitoring

DOORS Training, 4th April 2025



*(G)DAC = (Global) Data Assembly Centre

*ARC = Argo Regional Centre

Data flows

• Real Time

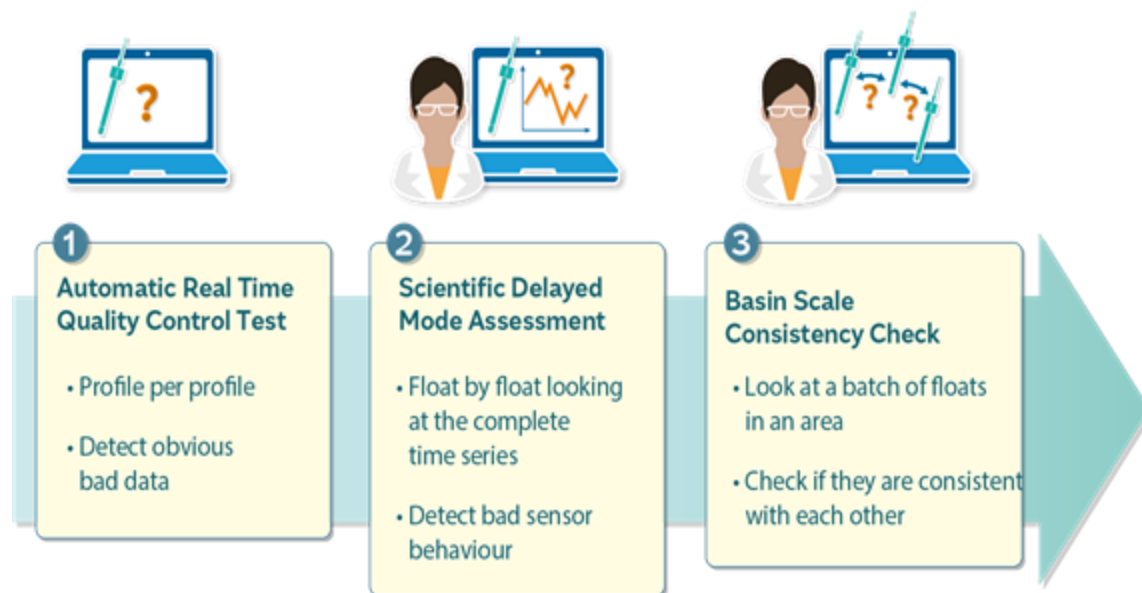
- ✓ 12 hours max
- ✓ Automatic Quality Control tests
- ✓ Operational applications

• Delayed Mode

- ✓ 12 months
- ✓ Detailed time serie analysis and corrections
- ✓ Ocean & climate science applications

• Basin scale consistency

Additional expert analyses are then completed at basin scales (Argo Regional Centres)



Data flows

• Real Time

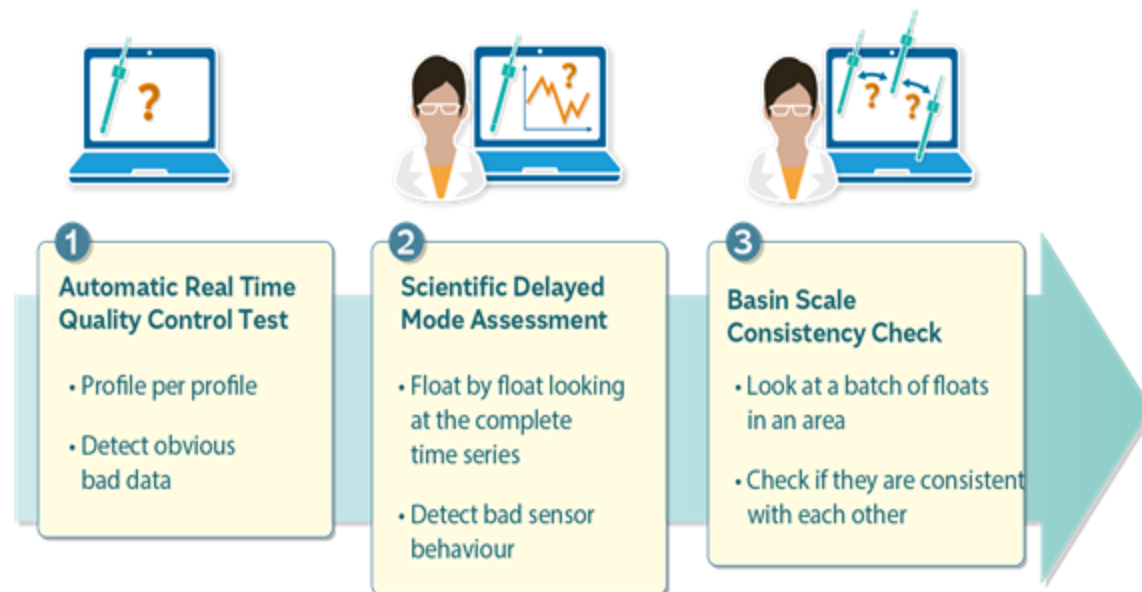
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Documentation for applied Quality Controls:
<http://www.argodatamgt.org/Documentation>

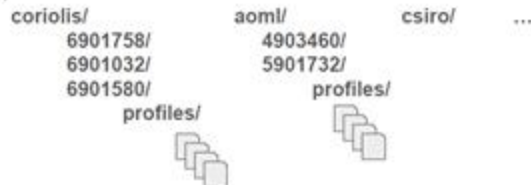
e.g. used tools for data visualisation for additional Qualification Code (QC) application (near real time and/or delayed mode):

- **Scoop** (<https://www.seanoe.org/data/00374/48531/>)
- **Ocean Data View** (<https://odv.awi.de/> and its web service version <https://webodv-egi-ace.cloud.ba.infn.it/>)

- 2 e.g. used tools for scientific delayed mode calibration assessment
 - **OWC** (CTD calibration) (Matlab) https://github.com/ArgoDMQC/matlab_owc and (Python) https://github.com/euroargodev/argodmqc_owc
 - **LOCODOX** (Dissolved Oxygen) <https://github.com/euroargodev/LOCODOX/>

Argo dataset architecture
(contains metadata and
data, raw and delayed
mode, indexes, ...)

General Data Assembly Center /
DAC /



Direct Access

Daily
Copy

Monthly
Copy

Copy +
Additional
QC

Services

- 1) <ftp://ftp.ifremer.fr/ifremer/argo>
- 2) <https://data-argo.ifremer.fr/>

Service

- 3) Synchronisation by Rsync:
<http://www.argodatamgt.org/Access-to-data/Argo-GDAC-synchronization-service>

S3 bucket on
Amazon Cloud
<https://argo-gdac-sandbox.s3.eu-west-3.amazonaws.com/pub/index.html#pub/dac/aoml/3902341/profiles/>

New

Seano DOI
[10.17882/42182](https://doi.org/10.17882/42182)

Latest Monthly Archive
[10.17882/42182#113868](https://doi.org/10.17882/42182#113868)

Within Aggregated
dataset in:

- Copernicus Marine Service
- Emodnet
- SeaDataNet
- World Ocean Database (WOD)

1) Web Services & API

- Fleet Monitoring
<https://fleetmonitoring.euro-argo.eu/swagger-ui.html#>
- Argo Data Selection
<https://dataselection.euro-argo.eu/swagger-ui.html#>
- ERDDAP
<https://erddap.ifremer.fr/erddap/tabledap/ArgoFloats.html>
- Thredds
<https://tds0.ifremer.fr/thredds/catalog/CORIOLIS-ARGO-GDAC-OBS/catalog.html>
- Argo SparQL EndPoint
<https://co.ifremer.fr/co/argo-linked-data/html/Argo-HTML-SPARQL/>
- Nerc Vocabulary Services
https://vocab.nerc.ac.uk/search_nvs/cvl/?searchstr=argo&options=governance

2) Library

- ArgoPy
<https://github.com/euroargodev/argopy>

Additionally: DAC sends
Argo data to **GTS/WMO**

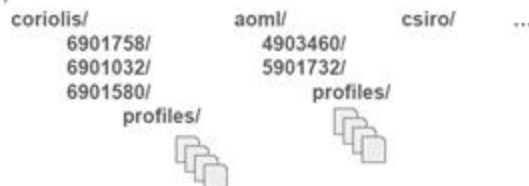
These accesses are used (and enhanced) by several
EOSC-related projects:



OceanOPS AIC: WMO id attribution
and array high-level monitoring
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General Data Assembly Center /
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<https://fleetmonitoring.euro-argo.eu/swagger-ui.html#>

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<https://dataselection.euro-argo.eu/swagger-ui.html#>

2) Threads

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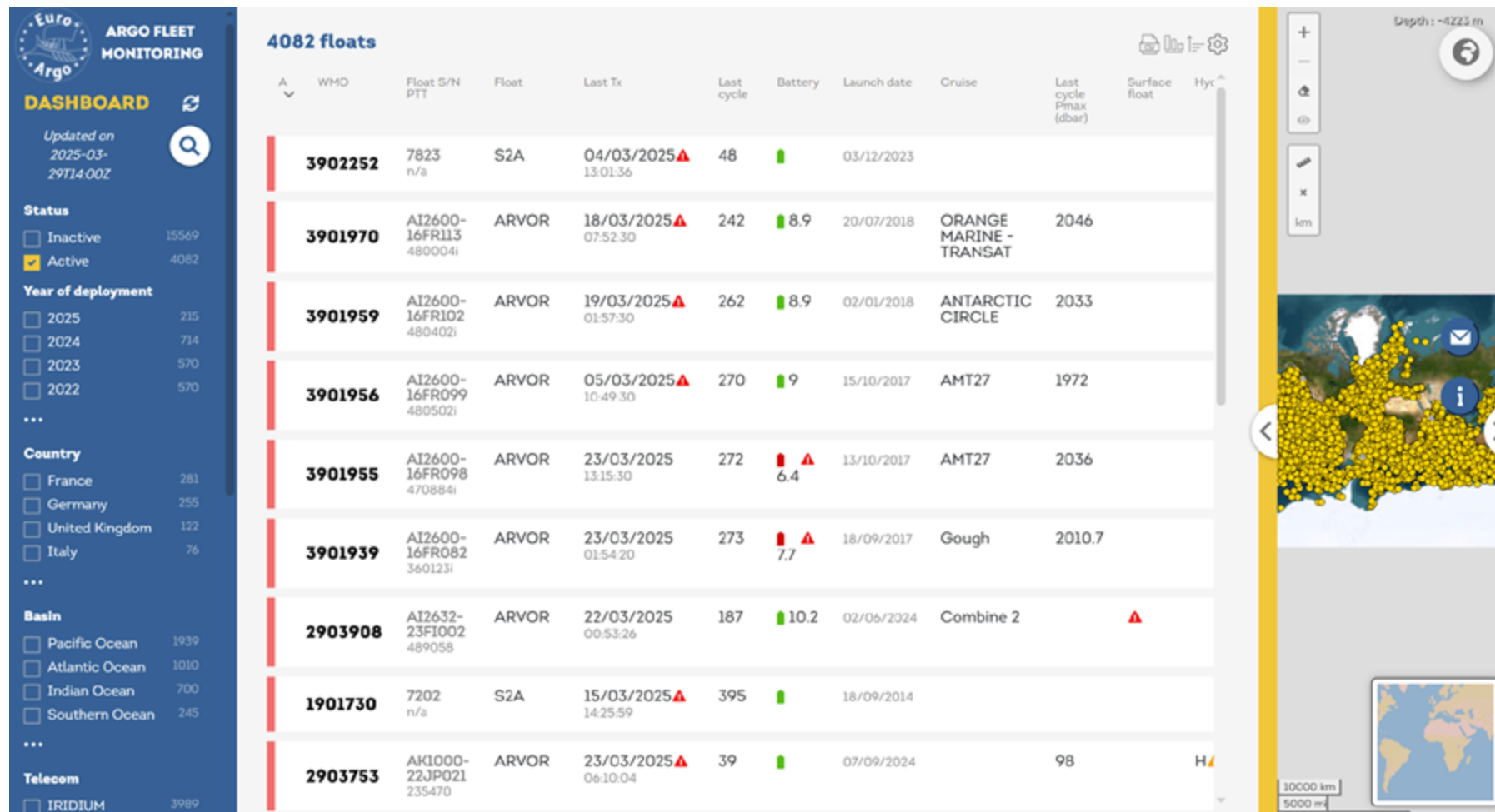
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Argo Fleet Monitoring



Search

Search everywhere

black

All above (2)

BLACK SEA Sub-basin

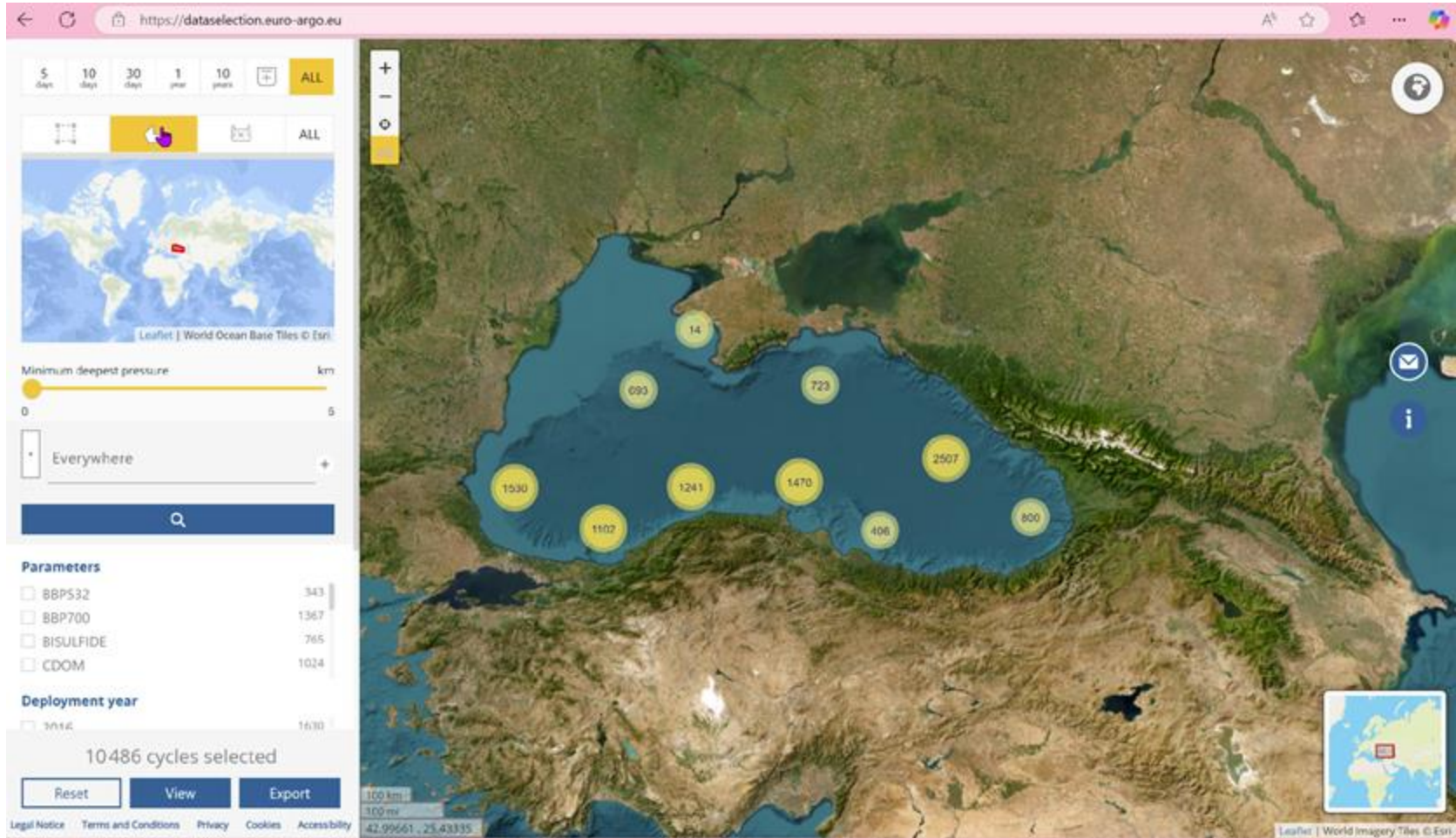
DEKOSIM BLACK SEA PROJECT Cruise

ID	Name	Status	Last Tx	Last cycle	Battery	Launch date	Cruise	Depth
3901959	AI2600-16FR102 480402i	ARVOR	19/03/2025 01:57:30	262	8.9	02/01/2018	ANTARCTIC CIRCLE	2033
3901956	AI2600-16FR099 480502i	ARVOR	05/03/2025 10:49:30	270	9	15/10/2017	AMT27	1972
3901955	AI2600-16FR098 470884i	ARVOR	23/03/2025 13:15:30	272	6.4	13/10/2017	AMT27	2036
3901939	AI2600-16FR082 360123i	ARVOR	23/03/2025 01:54:20	273	7.7	18/09/2017	Gough	2010.7
2903908	AI2632-23FI002 489058	ARVOR	22/03/2025 00:53:26	187	10.2	02/06/2024	Combine 2	
1901730	7202 n/a	S2A	15/03/2025 14:25:59	395		18/09/2014		
2903753	AK1000-22JP021 235470	ARVOR	23/03/2025 06:10:04	39		07/09/2024		98

Depth: -4223 m

10000 km
5000 m
89.996°

Switch to <https://fleetmonitoring.euro-argo.eu/dashboard?Status=Active,Inactive&Sub-basin=BLACK%20SEA>
 e.g. <https://fleetmonitoring.euro-argo.eu/float/4903711> (in real-time) or <https://fleetmonitoring.euro-argo.eu/float/6900807> (processed in delayed-mode)



Switch to <https://dataselection.euro-argo.eu/>

- Data management and curation concern several layers:
 - From upstream to downstream (transmission, decoding, qualification, calibration, validation and delivery), several tools co-exist serving their specific purposes.
 - They can relate to various data sub-types: metadata, technical data, (E)OV measurements, web-exposition data
 - They follow FAIR principles (Findable, Accessible, Interoperable and Re-Usable) and Open standard (e.g. process are documented, software codes are available on the web, data is accessible from several data access services). Continuous developments aim at improving this FAIRness to better serve our user's needs.

Thank you for your attention

Contact : delphine.dobler@euro-argo.eu
contact@euro-argo.eu

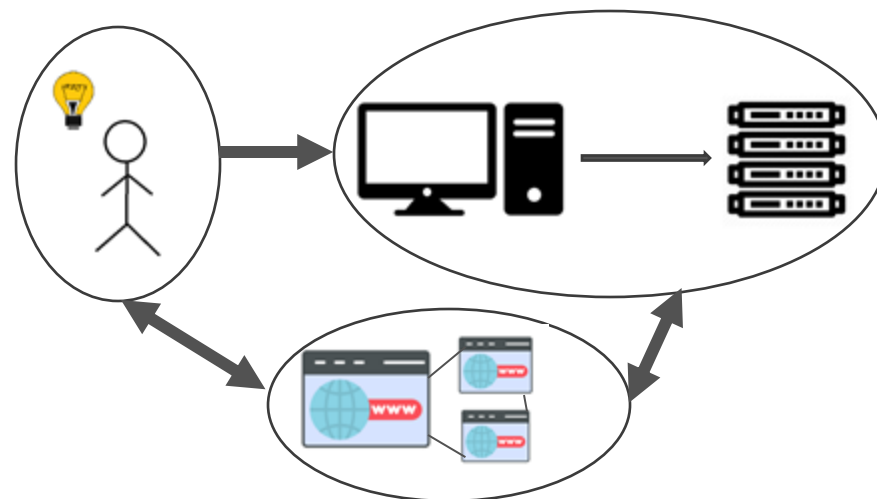
FAIR-ness means being Findable Accessible Interoperable Re-Usable a necessary step toward Open-Science



This is a **multifaceted** principle/concept.

For who/what ?

- Humans
- Machines via:
 - Distant but « direct » access to repositories
 - web services/application)



About which features ?

- Used Technologies
- Format
- Content

Applied on which objects of the system ? Examples:

- Datasets
- Services
- Softwares and procedures
- Metadata
- Vocabularies, i.e. a dictionnary for the possible fields' values.
- Web-metadata (description of a dataset or a service, exposed on the web, using web-semantic)