



Enhancing the integration of in-situ Atlantic Observation data and services to users

IMDIS 2018 Session 3

Author: V. Harscoat, S Poulouen and
WP7 partners
Date: 6 November 2018





Contents

- The European data system targeted within the AtlantOS project
- Achievements on enhancing data integration
- Achievements on enhancing services to users



Contents

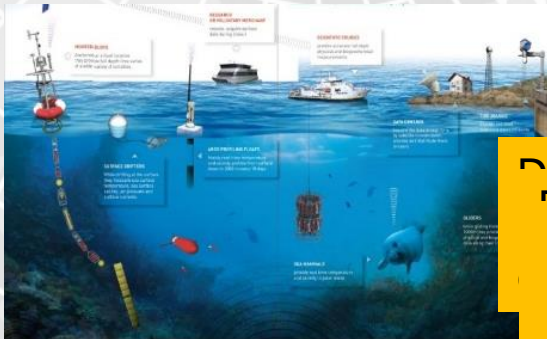
- The European data system targeted within the AtlantOS project
 - The existing systems involved
 - The starting point and the target of enhanced data integration
 - The integrated data system
- Achievements on enhancing data integration
- Achievements on enhancing services to users



The existing systems involved in the AtlantOS integration

In-situ observing Networks active in the Atlantic Ocean

- Networks are **platform oriented**
- their **data systems are organised** to provide homogeneous data processed according to common standards in terms of Quality Control, metadata and formats
- Networks also **ease access to their data**

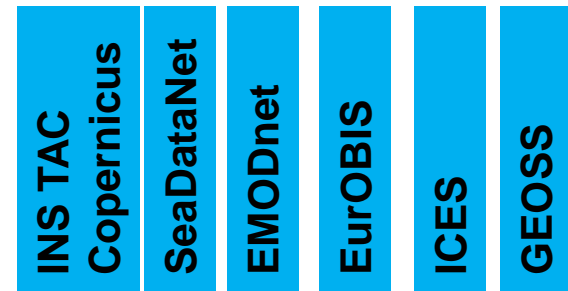


Data mgt for network

- **Ship-based observation** (GO-SHIP, VOS/SOOP, Continuous Plankton Recorder, fish and plankton surveys, seafloor mapping)
- **Autonomous observation** (Argo, Gliders, Drifters, OceanSITES, European animal Tracking)
- **Coastal observation** (Ferrybox, Fishery Observing System, coastal profilers, fixed moorings)

European Integrators

- **An Integrator aggregates data** from various networks, data centers and platform operators **to provide an integrated thematic service to users.**
- It **checks consistency** of the Essential Ocean Variables in time and space **to provide easy to use specific products to end users**



Infrastructures

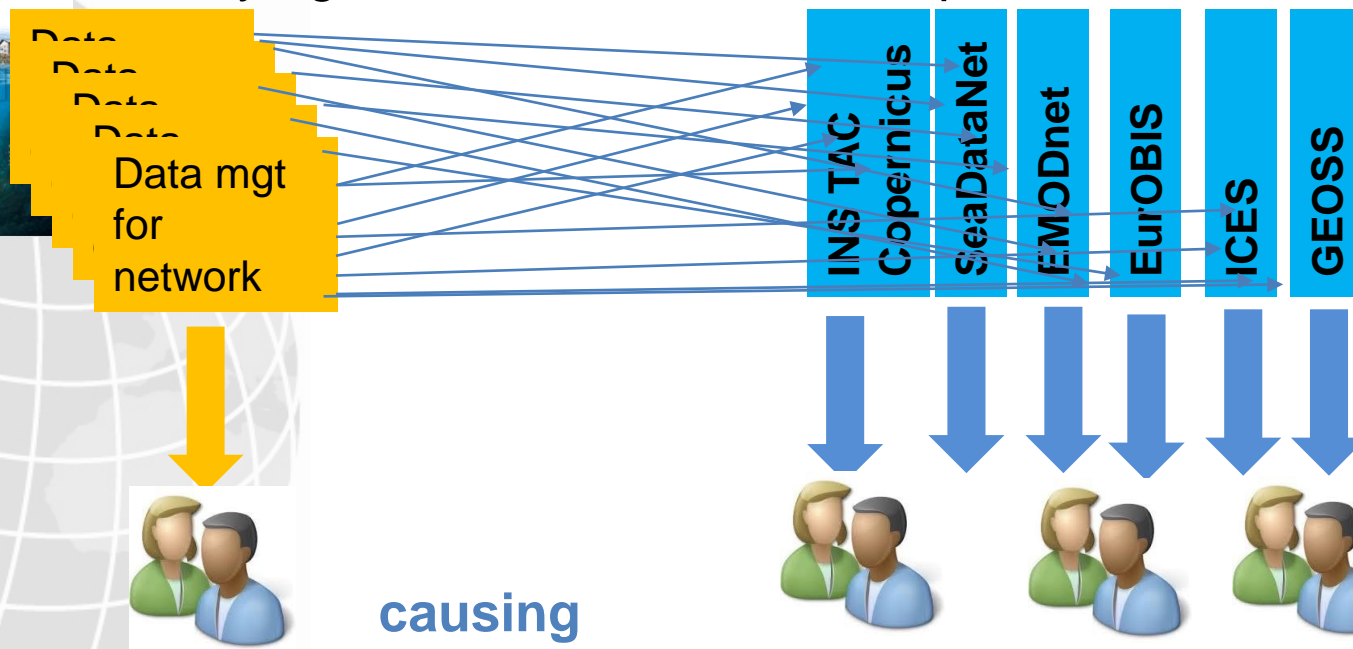
- **For marine environmental data:** SeaDataNet for validated and archived data and the Copernicus INS TAC for NRT data and for the past 60 years of historical data assembled for reanalysis needs
 - **For marine biodiversity data:** ICES and EurOBIS
- and portals
- **EMODnet lots** fed by Copernicus INS TAC, SeaDataNet and EurOBIS
 - **GEOSS** (Global Earth Observation System of Systems)



Integration starting point

Lack of harmonization across the existing systems for

- in-situ observations connection to Integrators (ad'hoc interfaces)
- Common identification of platforms, institutions, parameters,...
- Commonly agreed Near Real Time QC procedures across systems

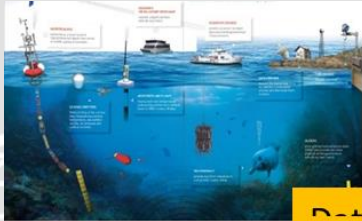


causing

- Duplication of efforts
- Risk of “mixing apples and oranges”
- Difficulty in tracing data usage
- Underuse of existing services



Integration target



Data mgt
for network

TOOLS



Virtual Data exchange backbone

INS TAC
Copernicus
SeaDataNet
EMODnet
Euro-BIS
ICES
GEOSS

TOOLS



Services



Users

Standardization between networks
from acquisition to service to users



The integrated data system

Not a new system !

A continuous improvement loop that will function even after the AtlantOS project ends

Minimum set of agreed recommendations

- **Ingest and deliver** more in-situ data
- **Serve the users better** in a more **harmonised** way

Enhance Network Data Systems

Upgrade existing integrators to serve networks and users better

A data exchange backbone to ease discovery, viewing and downloading by users



Contents

- The European data system targeted within the AtlantOS project
- Achievements on enhancing data integration
 - Harmonisation across data systems
 - Enhanced interoperability
- Achievements on enhancing services to users



Harmonisation across data systems

Implementation of agreed recommendations

- **For metadata** relying on existing standards and allowing easier traceability
 - Common and unique identification for
 - **Platforms** (WMO codes present in C17 SeaDataNet vocabulary and station ids in ICES directory)
 - **Institutions** (EDMO codes)
 - Common **A05 vocabulary** for ‘Essential Variables’ and **mapped to recommended vocabularies** (P01,P07,P06 of SeaDataNet and WoRMS for species)
- **For quality procedures**
 - For **Essential Variables measured by two or more networks**: Temperature, Salinity, Current, Sea level, Oxygen, Chlorophyll-A, Nitrate and Carbon
 - For data acquired in **Near Real Time** (distributed within a few hours up to several days)

Recommendations to evolve under the EuroGOOS umbrella (DATAMEQ working group and Task teams)



Enhanced interoperability

- **Enhanced access to network data by setting up a unique entry point to discover and download existing data**
 - **More data in the existing Global data centres** (EGO for gliders, OceanSITES for fix point platforms and transport array, ICOS-Ocean for some VOS and GO-SHIP carbon data)
 - **Improved access to ADCP data** for GO-SHIP
 - **A new GDAC for drifters** (endorsed by DBCP/JCOMM) for data access to NRT data and best copy selection of DM data
- **Enhanced ingestion of network data in integrators: improved “connection” and greater data**
 - **Setting up new nodes** (ICOS-Ocean, physical data from CPR) or **direct GDAC data flow** ((Argo, Gliders, Drifters and OceanSITES) in **SeaDataNet**
 - **New marine biological data flow to integrators** (Fish Acoustics to ICES, ETN to EMODnet-Biology)
 - **More data in Copernicus INS TAC** through GDACs harvesting
- **Enhanced checking of data integration through monitoring facilities provided by JCOMMOPS**



Contents

- The European data system targeted within the AtlantOS project
- Achievements on enhancing data integration
- Achievements on enhancing services to users
 - The AtlantOS catalogue to discover and facilitate the access to data services
 - Monitoring services designed under the JCOMMOPS and EuroGOOS umbrellas
 - A traceability service to give visibility of data usage



The AtlantOS catalogue

<https://www.atlantos-h2020.eu/atlantos-catalogue/>

AtlantOS
Optimising and Enhancing the Integrated Atlantic Ocean Observing Systems

- Project Information
- Consortium members
- Members
- Concepts & Objectives
- AtlantOS catalogue
- Work Packages
- Deliverables
- Milestones
- Meeting Reports
- Relevant Documents
- Integrated Data Portal
- Best Practices Working Group
- Monitoring monthly maps
- Monitoring dashboard

Search ...

World map with a highlighted region in the Atlantic Ocean.

ELEMENTS OF THE INTEGRATED SYSTEM

- Networks (13)
- Products (8)
- Integrators (7)
- Monitoring (3)

ESSENTIAL VARIABLES

- Temperature (24)
- Salinity (22)
- Oxygen (13)
- Atmospheric pressure (10)
- Chlorophyll-a and fluorescence (10)
- Currents (10)

Reset filters

Discovering by browsing through the catalogue entries (ISO 19115 descriptions – INSPIRE compliant)

Elements of the integrated system among ‘Networks’, ‘Integrators’, ‘Products’ and ‘Monitoring’

Essential Variables vocabulary ‘AtlantOS EVs’
(https://www.bodc.ac.uk/data/codes_and_formats/vocabulary_search/A05/)



Discovering

For example : which Networks handle “Carbonate system” data ?

The image shows a two-part interface. On the left is a search filter panel, and on the right is a search results page. An arrow points from the filter panel to the results page.

Search Filter Panel (Left):

- Search bar: Search ...
- Map: A world map with an orange box highlighting the North Atlantic region.
- ELEMENTS OF THE INTEGRATED SYSTEM**
 - Networks (4)
- ESSENTIAL VARIABLES**
 - Carbonate system (4)
 - Air humidity (3)
 - Air temperature (3)
 - Atmospheric pressure (3)
 - Chlorophyll-a and fluorescence (3)
 - Nutrients (2)
- Reset filters button

Search Results Page (Right):

- Navigation: CATALOG MAP MY DOWNLOADS
- Results: Results 1 to 4 on 4 : 20 by page
- Sort by: Popularity
- Data from repeat hydrography (GO-SHIP)**
 - Logo: GO-SHIP
 - Description: GO-SHIP, the Global Ocean Ship-Based Hydrographic Investigations Program, is conducting repeat hydrography with high accuracy high precision reference measurements of a variety of EOVs through the whole water column. A selection of continent-to-continent full.
 - Source: GOSHIP
- OceanSITES, a worldwide system of deepwater reference station**
 - Logo: OceanSITES
 - Description: The mission of OceanSITES is to collect, deliver and promote the use of high-quality data from long-term, high-frequency observations at fixed locations in the open ocean. OceanSITES typically aim to collect multidisciplinary data worldwide from ...
 - Source: OceanSites
- Marine biogeochemistry data from the Voluntary Observing Ships or Ships of Opportuni...**
 - Logo: VOS
 - Description: VOS/SOOP tracks are usually repeated several times a year and inform about the marine sinks and sources of atmospheric carbon dioxide on a global bases and their variability. Data from this network has been made available to the scientific community ...
 - Source: NCEI, UEA, UIB amongst others
- European database for underway data from FerryBoxes**
 - Logo: FerryBox
 - Description: Data from FerryBoxes on ships of opportunity going on permanent routes are stored inside this database (ferrydata.hzg.de). Parameters are temperature, salinity, chlorophyll-a fluorescence, oxygen and different others. The data model is transect ...
 - Source: HZG_EUROPEAN_DATABASE_FERRYBOXES

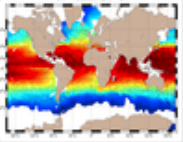


Facilitating access to data services

Viewing

For WMS services made available in the catalogue entries, the different data layers can be displayed in the map facility of the tool

Global Ocean- Delayed Mode gridded CORA- In-situ Observations objective analysis in ...



Short description: For the Global Ocean-Gridded objective analysis fields of temperature and salinity using profiles from the reprocessed in-situ global product CORA (INSITU_GLO_TS_REP_OBSERVATIONS_ using the ISAS software. Objective ...

Source: E.U. Copernicus Marine Service Information

sea_water_salinity
 Error on sea_water_salinity (% variance)
 sea_water_temperature
 Error on sea_water_temperature (% variance)

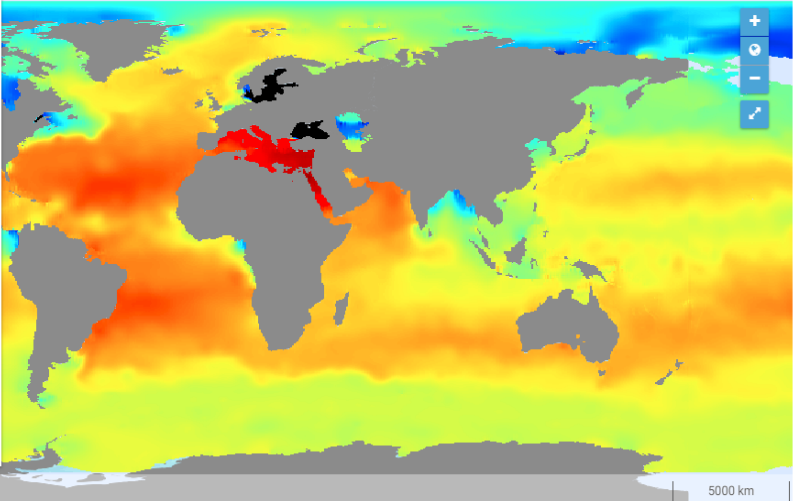
+ Add all 4 layers to the map

CATALOG MAP MY DOWNLOADS Search a place...

Filter
 sea_water_salinity

LEGENDS SORT SOURCES

SEA_WATER_SALINITY
 40
 36.25
 32.5
 28.75
 (62.5-64.5) salinity [psu] Sea




WGS84 5000 km

Downloading

The FTP download services, when made available in the catalogue entries, can be accessed directly

OceanSites, a worldwide system of deepwater reference station



The mission of OceanSITES is to collect, deliver and promote the use of high-quality data from long-term, high-frequency observations at fixed locations in the open ocean. OceanSITES typically aim to collect multidisciplinary data worldwide from the full-depth water column as well as the ...

Source: OceanSites

Download



Facilitating access to data services

Access to more resources
Through external web links made available in the catalogue entries

EGO Gliders : Data and metadata from Global Data Assembly Centre (EGO GDAC)



The Everyone's Gliding Observatories (EGO) initiative is a gathering of several teams of oceanographers, interested in developing the use of gliders for ocean observations. EGO started in Europe with members from France, Germany, Italy, Norway, Spain, and the United Kingdom. The partners of EGO ...

Source: EGO gliders

EGO Web Site
EGO gliders NetCDF format reference manual
EGO gliders data processing chain

AtlantisOS catalogue | All | EGO gliders data process | start [EGO glider website] x

https://www.ego-network.org/dokuwiki/doku.php

EGO Everyone's Gliding Observatories

2018-07-17 12:30:02

HOME

- What is ego?
- Why gliders?
- What are gliders?
- How do gliders work?
- News documents

COMMUNITY

- Full coordination
- Newsletters
- Historics
- Links
- EGO Groups
- Forum

WORKSHOPS AND GLIDER SCHOOLS

- 2016 Southampton
- 2014 Rio
- 2011 Tetis
- 2009 Lamezia
- 2008 La Spezia
- 2007 Mallorca
- 2006 Paris

GLIDER ACTIVITY

- Deployments
- Projects
- Observatories
- Fleet experiments

DATA MANAGEMENT

- Reference documents
- How to register a glider
- Upload your data
- Data access

Developing a new observational capacity for process studies and long term observations of the ocean physics, biogeochemistry and biology with gliders. Going beyond the marine sciences frontiers.

Welcome to the EGO website

This site is dedicated to the promotion of the glider technology and its applications. The EGO group promotes glider applications through coordination, training, liaison between providers and users, advocacy, and provision of expert advice.

We intend to favor oceanographic experiments and the operational monitoring of the oceans with gliders through scientific and international collaboration. We provide news, support, information about glider projects and glider data management, as well as resources related to gliders. If you use the glider technology (or plan to use it), please first register to have full access to this website and contact us if you want to contribute to our international coordination efforts.

Tweets by gliderman

gliderman @glopp_gliderman
Registrations are open for the EuroGOOS glider data management meeting the 18-20th of september in Genoa. More information at: ego-network.org/dokuwiki/doku...

Connecting glider data flows in Europe and beyond - Genova - 18-20/09/2018
An international conference on glider data management

EGO GLIDERS

- [By Observatories]
- [By EGO groups]
- [By Observations]
- [All Gliders]

- [AWI]
- [BAG]
- [BCCR]
- [CEPREM]
- [CEFSM]
- [CMRE]
- [CNR-ISMAR]
- [CNR]
- [DFP]
- [DVIAM]
- [DT HOUS]
- [ENSTA ParisTech]
- [FMA]
- [FRFEMER]
- [IMARPE]
- [IMDEA]
- [IOUP]
- [IOUAT]
- [LEOCEAN]
- [LIPU]
- [MARIS]
- [MI]
- [MOC]

AtlantisOS catalogue | All | EGO gliders data process | start [EGO glider website] x

www.seanoe.org/data/00343/45402/

SEANOE

EGO gliders data processing chain, version 20160420_004a

Date 2016-06-24

Author(s) EGO gliders data management team

Contributor(s) Rannou Jean-Philippe, Gourcuff Claire, Carval Thierry

DOI 10.17882/45402

Publisher SEANOE

Abstract The EGO data processing chain decodes, processes, formats and performs quality control on glider data and metadata. The decoder performs the following actions for a glider deployment:

- Decode and format the glider deployment data and metadata into an EGO NetCDF time series file
- Apply Real Time Quality Control (RTQC) tests on EGO NetCDF time series file.
- For Slocum gliders, estimate subsurface currents and store them into the EGO file.
- Generate NetCDF profile files from EGO file data and apply specific RTQC tests to them.

The decoder manages Slocum, SeaGlider and SeaExplorer gliders observations. It is a Matlab script.

Licence

Data

File	Size	Format	Processin g	Access
45109.7z	2 MB	Matlab scripts, compress ed		Open access

Click to download the data

Download metadata TXT, RIS, XLS

References

Ego Gliders Data Management Team (2017). EGO gliders Quality Control tests on timeseries and profiles data.

AtlantisOS catalogue | All | EGO gliders data process | start [EGO glider website] x

archimer.fr/emmer.fr/doc/00239/34980/

ARCHIMER

EGO gliders NetCDF format reference manual version 1.2

Type Report

Date 2017-05-11

Language English

Author(s) EGO gliders data management team

Contributor(s) Carval Thierry, Gourcuff Claire, Rannou Jean-Philippe, Buck Justin J.H., Garau Bartolome

DOI 10.13155/34980

Publisher Ifremer

Version 1.2

Abstract This document specifies the NetCDF file format of EGO-glidiers that is used to distribute glider data, metadata and technical data. It documents the standards used therein; this includes naming conventions as well as metadata content. It was initiated in October 2012, based on OceanSITES, Argo and ANFOG users' manuals. Everyone's Gliding Observatories - EGO is dedicated to the promotion of the glider technology and its applications. The EGO group promotes glider applications through coordination, training, liaison between providers and users, advocacy, and provision of expert advice. We intend to favor oceanographic experiments and the operational monitoring of the oceans with gliders through scientific and international collaboration. We provide news, support, information about glider projects and glider data management, as well as resources related to gliders.

Click to download the PDF

Download metadata TXT, RIS, XLS

References

Ego Gliders Data Management Team (2017). EGO gliders Quality Control tests on timeseries and profiles data.

Related datasets

Copernicus, Ego, Oceanres, Argo Data Management (2018). NetCDF file format checker for Argo floats. Copernicus In Situ TAC, EGO



AtlantOS catalogue sustainability

Achieved through GEOSS

Enter search words ...

Search Results Number of results: 28

Filters

KEYWORD FORMAT SOURCE PROTOCOL ORGANISATION

SeaDataNet climatologies over the Atlantic Ocean
(Organization: SeaDataNet)
SeaDataNet gridded climatologies are based on the SeaDataNet Temperature and Salinity historical data collection v1.3. For the Atlantic Ocean there are covering 2 European sea basins: North Arctic Ocean, and North Atlantic Ocean The preparation of the products has also improved the quality, the cons ...
Start date: 1900-01-01

Argo float data and metadata from Global Data Assembly Centre (Argo GOAC)
(Organization: Argo)
Argo is a global array of 3,000 free-drifting profiling floats that measures the temperature and salinity of the upper 2000 m of the ocean. This allows, for the first time, continuous monitoring of the temperature, salinity, and velocity of the upper ocean, with all data being relayed and made public ...

Global Ocean- Delayed Mode gridded CORA- In-situ Observations objective analysis in Delayed Mode (1990-2014)
(Organization: ZINC DPREMER BREST-FR (WPLI))
"Short description:" For the Global Ocean- Gridded objective analysis fields of temperature and salinity using profiles from the reprocessed in-situ global product (CORA (INSTIU_GLO_TS_REP_OBSERVATIONS_013_001_0)) using the ISAS software. Objective analysis is based on a statistical estimation met ...
Collection start date: 1990-01-01

EGO Gliders : Data and metadata from Global Data Assembly Centre (EGO GOAC)
(Organization: EGO gliders)
The Everyone's Gliding Observatories (EGO) initiative is a gathering of several teams of oceanographers, interested in developing the use of gliders for ocean observations. EGO started in Europe with members from France, Germany, Italy, Norway, Spain, and the United Kingdom. The partners of EGO have ...
Start date: 2004-01-01

Visible 1-10 of 28

and EuroGOOS



Monitoring services

Two web services developed within the AtlantOS project (WP9.1)

- **The European service** (including coastal/regional regions) (embedded into the EuroGOOS web page <http://eurogoos.eu/atlantos/atlant- dashboard/>) **to track from the user's side**
- **and the international service (IOC/JCOMMOPS)**, to track the implementation of networks (<http://www.jcommops.org/board?t=atlant- os>)

The dashboard includes sections for:

- Data networks and Providers:** TABLE 1 (list of connected platforms per data network), TABLE 2 (list of connected and available platforms), REPORT 1 (Volume of data made available through the portal), REPORT 2 (Platform catalogue and metadata (list per Country)), REPORT 3 (Platform type and parameters (list by country)).
- Provider:** INDICATOR 1 (number of platforms (and type) listed by providers), INDICATOR 2 (number of platforms monitoring a given parameter (listed by provider)), INDICATOR 3 (Report on platforms views and data downloads (per Provider)).
- Geo reports:** GR 1 (recently connected platforms), GR 2.
- Data Availability:** KPI 1 PLOT (platforms providing latest data (#plat vs days)), KPI 1 LIST (platforms providing latest data), KPI 2 PLOT (platforms providing recent data (months vs #plat)), KPI 2 LIST (platforms providing recent data (#plat vs month)), KPI 3 (Platforms - number of available dataset).
- Report on data downloads:** Report on data downloads.

The interface shows a map of the Atlantic Ocean with various data points. The legend includes:

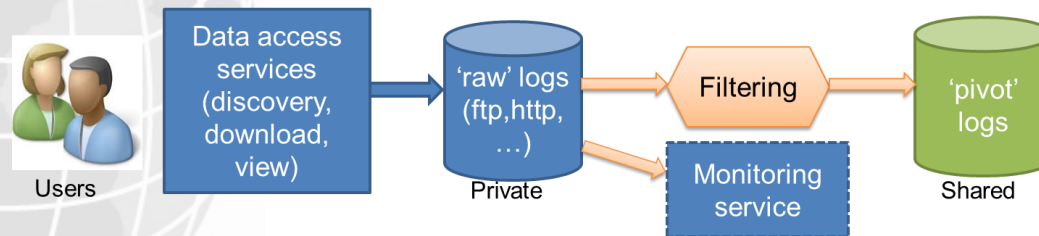
- Argo:** Argo (1156), Deep-Argo (18), BGC-Argo (110).
- OceanSITES:** Platforms (157), GO-SHIP, GO-SHIP (28).
- DBCOP:** Surface Drifters (512), Fixed Platforms (93), Ice Buoys (11), Moored Buoys (132), Tsunameter (4), Tide Gauges (74).
- SOT:** VOSCLIM-Automated (78), VOSCLIM-Manned (168), VOS-Automated (110), VOS-Manned (393), ASAP-Radiosondes (11), SOOP-38Ts (13).
- Other Networks:** HF Radars (77), Animal Borne Sensors (21).

The map is titled "Monthly maps" and shows data for August 2018. The interface also includes a "News" section with a tweet and a "Link to AtlantOS website" button.

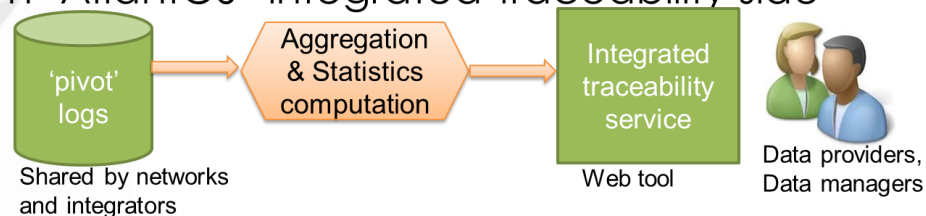


The traceability service on data usage

- **Diversity among data services (discovery, download, viewing, DOI,...)**
 - Data plots with no restriction
 - Different services with different rules and different service level agreements
 - Privacy laws
 - ...
- **But still maintaining a common set of minimal tracking information, that can be shared to compute usage statistics in an integrated traceability service**
 - On the network or integrator data system side



- On 'AtlantOS' integrated traceability side





The traceability service on data usage

A Web interactive dashboard Core statistics giving visibility of data usage to data providers and system managers

Nb of downloads

Nb of unique identified users

Map of downloads

Top 50 data providers (Institutions)

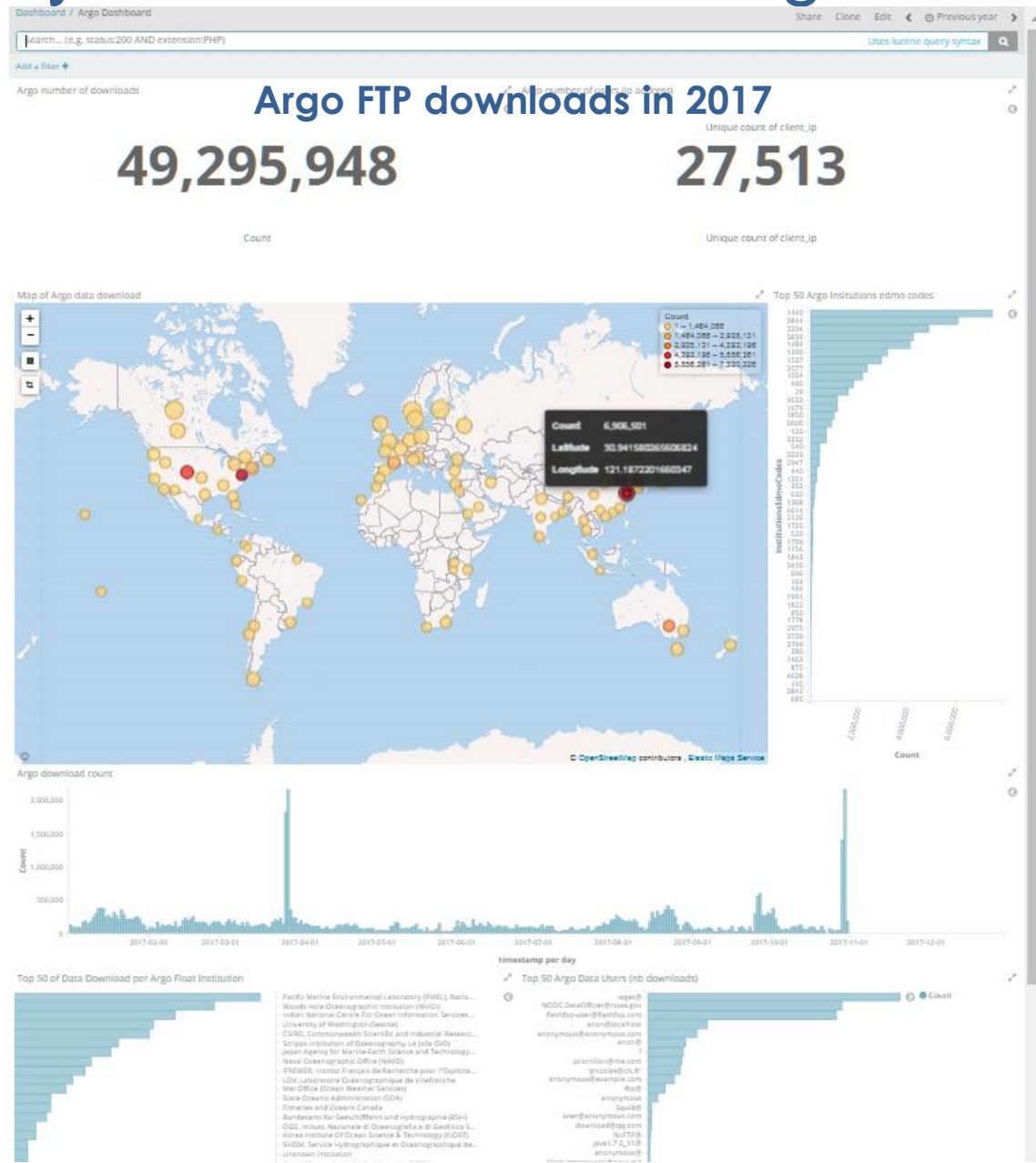
Nb of downloads per day

Top 50 users downloading data

Top 50 downloaded datasets

Joint developments (Ifremer, ETT, JCOMMOPS)

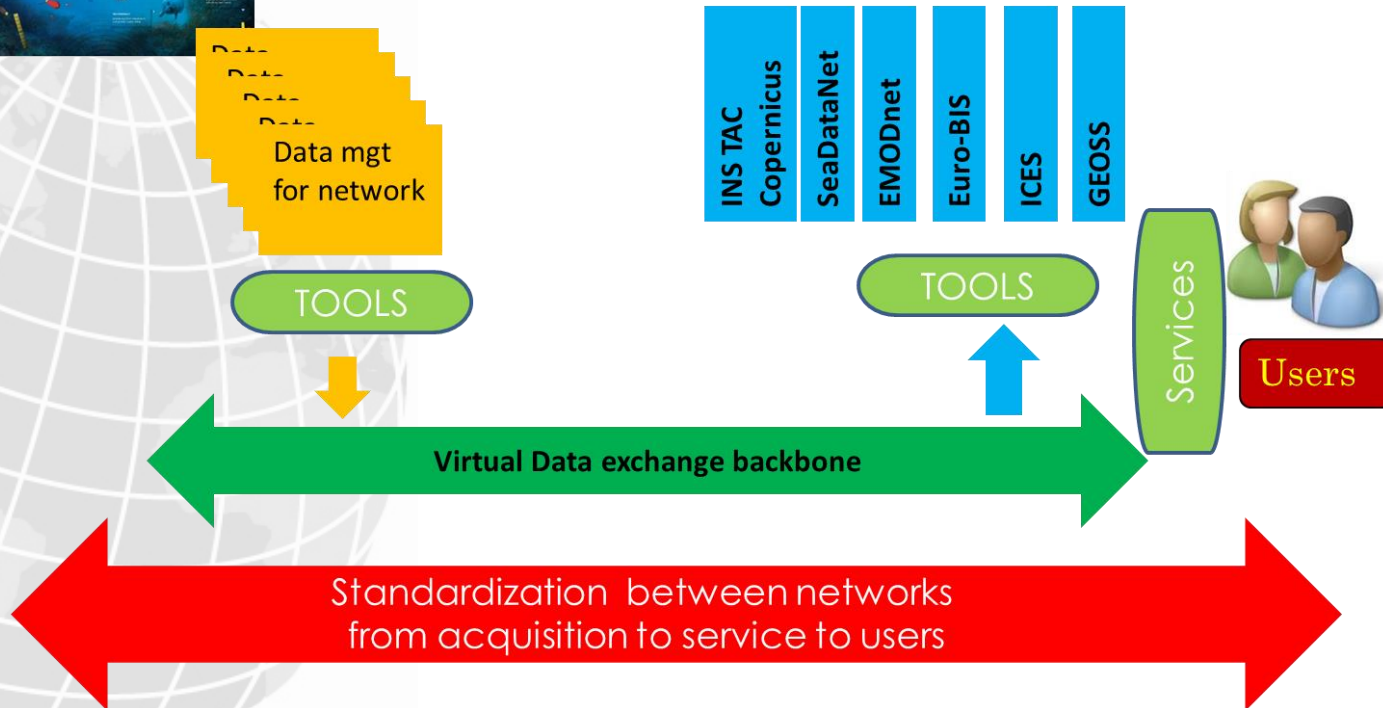
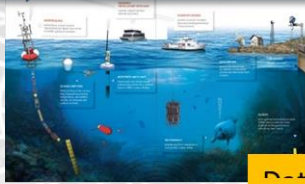
- Initial version for FTP downloads to be made available by the end of 2018
- Later versions will include other data services (http, wms,...)





Conclusion

An enhanced system based on existing (sustained) infrastructures that will continue to run even after the AtlantOS project has ended



Implementation has started within the AtlantOS project and will continue in the framework of other projects



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 633211.