



Data flow and Data integration – WP7
5th meeting – Implementation phase
20th November 2017 at PLOCAN, Gran Canaria



Version 2.0

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Table of contents

1	Meeting objectives	3
2	Task 7.3 Implementation Phase session	3
2.1	AtlantOS catalog	3
2.2	Networks - progress on data management	4
2.2.1	WP2 – Ship based observation networks	4
2.2.2	WP3 - autonomous observing networks	5
2.2.3	WP4 – coastal observing system	6
2.3	Integrators - progress on enhancements (network data ingestion and services)	6
2.3.1	Copernicus INS TAC	6
2.3.2	EMODnet Physics	6
2.3.3	SeadataNet	7
2.3.4	ICES	8
2.3.5	EMODnet Biology & EurOBIS	8
2.4	Focus on GEOSS and the workshop on 24th Nov	9
2.5	Monitoring/Traceability services	9
3	« Atlantic Ocean data integration » session	10
3.1	Presentation of the outcomes of the « Transatlantic » workshop	10
3.2	Ocean data - Quality assurance and quality control	11
3.3	Data standardization	12
3.4	Interoperability, semantics and machine learning from a user community perspective	13
4	Presentation of WP7.4 activities	14
5	Presentation of WP7.5 activities	14
6	Roadmap by Network	16
6.1	WP2 – Ship based observation networks	16
6.2	WP3 – Autonomous observing networks	26
6.3	WP4 – Coastal observing system	37
7	Updated action plan	39
8	Appendix 1 - Agenda for WP7 fifth meeting	43
9	Appendix 2 - Participants to WP7 fifth meeting	45



1 Meeting objectives

See [11-WP7_5thmeeting-AtlantOS_Introduction.pptx](#)

The objectives of this fifth WP7 meeting (presented by S. Pouliquen/Ifremer co-coordinator of WP7) were

- review progress on the implementation (Task 7.3) of the recommendations and enhancements at Network and Integrator level based on actions decided at the 4th meeting mid-December 2016,
- progress on monitoring and traceability services that aims to assess Atlantic Ocean Observation performance and to feedback data providers with statistics for acknowledgement of their contribution to the systems,
- follow-up of the Transatlantic workshop held in June 2017 and the actions identified
- present the GEOSS workshop on 24th November 2017, starting point for the integration in GEOSS,
- review activities on-going in the further tasks of WP7 that aim (1) to assess the impact of AtlantOS observations in models through Copernicus (Task 7.4) and (2) to develop and deliver ocean products derived from these observations both for research and for applications (Task 7.5).

2 Task 7.3 Implementation Phase session

2.1 AtlantOS catalog

See [11-WP7_5thMeeting-AtlantOS_Catalogue.pptx](#)

The catalogue of the integrated AtlantOS data system provides a discovery service to users and facilitates the access to existing services (viewing, downloading and monitoring). It is also the front window for the WP7 AtlantOS efforts to aggregate and federate observations.

The setup started end of 2016 and since March 2017 it is on-line on the AtlantOS web portal (<https://www.atlantos-h2020.eu/atlantos-catalogue>). The first two priorities are achieved: all networks are described (preliminary version for ETN), plus a product entry created for SOCAT, and all integrators are described, with product entries relevant on Atlantic for Copernicus INS TAC and SeaDataNet.

Two filters to browse the catalogue entries are now actives in the catalogue interface: **ELEMENTS OF THE INTEGRATED SYSTEM** that applies on ('Networks', 'Integrators', 'Products', 'Monitoring') and **ESSENTIAL VARIABLES** that applies on the terms from the vocabulary 'AtlantOS EVs'.

The next steps for this catalogue are to add more product entries relevant for Atlantic, including the WP7.5 products, to update the catalogue entries for 'Biology' when EBVs are integrated in A05 vocabulary, to connect the catalogue to the EuroGOOS webpage for sustainability and to feed other catalogues (at least GEOSS common infrastructure within WP7 activities).



2.2 Networks - progress on data management

See 11-WP7_5thMeeting-AtlantOS_Network_*.pptx [under WP7 cloud](#).

Each network representative presented the progress on data management according to the roadmaps for WP7 by network established at the 4th held mi-December 2016.

The **updates of the roadmaps are in section 6 of this report and hereafter are the highlights** from the presentations.

2.2.1 WP2 – Ship based observation networks

- **CPR** (D. Broughton/SAHFOS) - on-going work on setting up a SeaDataNet node (see roadmap update) for physical data, as biology data goes already to EMODnet-Biology integrator. Issue with linking to cruise report => Action: MARIS to support SAFHOS on CSR registry.
- **Fish & plankton survey** (N. Holdsworth/ICES) - *warning on data flow restriction to EurOBIS/SeaDataNet* : data are generally open access as provided via research surveys, but still in specific instances the submitting institute is not allowing redistribution. So ok to have detailed data at ICES but can't provide this to EurOBIS/SeaDataNet without prior approval from the data originating institute, so only metadata is available for redistribution in some cases. *Methodology for data collection and QC*:described in protocol publications ([SISPs](#)), for acoustics online at <http://acoustic.ices.dk/validationrules> and reference to XML validation, for biological trawl (DATRAS) defined in <http://ices.dk/marine-data/tools/Pages/quality-control.aspx> catalogue of checks for each survey type.
- **Seafloor mapping** (C. Devey/GEOMAR) - for society gridded products are important and for scientists data are better. The goal within WP7 is first to convince people to make their data freely and openly accessible. QA & QC will be a second step. At the level of individual national data centres (NODCs), BODC, IFREMER, GEOMAR and NIOZ are working on a compilation of their non-accessible/non-findable data to assess how much can be made findable/accessible. These data sets, which are probably also not in EMODNet and SeaDataNet, will then become available for these integrators. Also links are established with Canada and USA within Galway Statement. Since Dec. 2016 the role of IHO/GEBCO in collecting international multibeam data has become much stronger, especially with their Seabed2030 initiative. C. Devey thinks this is the ideal repository for all transit data - it gets put into free and open map products at the best-possible resolution with access also directly to the raw data.
- **VOS/SOOP** (U. Schuster/University of Exeter) - the surface ocean fCO₂ observations (with related intake temperature and salinity) continue to be submitted to, and 2nd-level quality controlled, via the web portal of SOCAT, the Surface Ocean CO₂ Atlas. SOCAT version 5 has been made public in the summer of 2017, version 6 is planned to be made public in spring/summer 2018. Progress is being made to move over to a rolling submission, QC, and publication of observations. Additionally, it is now possible to submit observations that were made alongside the sea surface fCO₂ related parameters (for example dissolved oxygen, dissolved inorganic carbon, total alkalinity, atmospheric dry xCO₂), so that they are secured in a data depository; however, these additional data will not be data quality controlled, as we do not have the required FTE to perform that task.



Through the European ICOS programme (Integrated Carbon Observations System), AtlantOS is linked to the other carbon observational networks, atmosphere and ecosystems, linking the AtlantOS data management efforts to the ICOS carbon portal.

By an initiative of IOCCP and JCOMM-OPS, a global sea surface carbon observational network is being created. This is an effort to co-ordinate the work of the analytical/technical/instrumental work of scientist, engineers, and technical support staff involved in the installation and maintenance of instrumentation onboard VOS/SOOP. An initial workshop is being organized for February 2018. This network will work very closely with data management/harmonization teams.

- **GO-SHIP** (T. Tanhua/GEOMAR) - Research vessels are providing data of all kinds to all networks, focusing on ocean interior. A GOSHIP center exists in CCHDO and at EU level data go to SeaDataNet. ADCP data management is progressing in link with GOSUD (extend from TSG to ADCP). In UK (BAS) there is a system to send automatically data to GTS and MetOffice. The issue on data that are distributed at different steps is not easy to monitor (information exist at CCHDO but not interoperable). Link with JCOMMOPS and sharing best practices with OceanSITES could benefit all platforms.

2.2.2 WP3 - autonomous observing networks

- **Argo** (T. Carval/Ifremer) - work on-going to set up French Argo GDAC as a SeaDataNet node. All the CDI and the ODV files have been generated and are ready for ingestion by SeaDataNet.
- **Glider** (T. Carval/Ifremer on behalf of V. Turpin/LOCEAN) - goal is to apply the same methodology under investigation first for Argo, for setting up a SeaDataNet node when the method is validated. Link for ICES Neil to check. DOI strategy has been defined (level EGO – Network/science – deployment) and started to be assigned for Germany (through Pangea) and France through (Ifremer/Seanoë).
- **Drifter** (T. Carval/Ifremer on behalf of P. Poli/EUMETNET) - implementation of the two GDACs endorsed by JCOMM and DBCP, and it has started with the goal to have the first GDAC in Europe in 2018. It is a joint action between MEDS, AOML (DM), SCRIPPS (WAVE) GHRSSST (HR SST) and MBARI (ERDAP-GTS link). Format, GDAC organization, QC and processing chain are documented and were validated at DBPC mid-November 2017. Link with ICES need to be studied.
- **OceanSITES** (H. Snaith/NERC) - most of the data providers connect directly to SeaDataNet and some goes to OceanSITES GDAC (and thus Copernicus INS TAC and EMODnet-Physics). H. Snaith is chasing for the WP3 funded networks so they transfer the data to OceanSites. Work is going-on with JCOMMOPS to update the OceanSITES database to be able to trace what has been deployed and then trace what is available (plan to link to OceanSITES GDAC but also to the other data centers). Looking for another mean to integrate data in OceanSITES, like using ERDDAP servers, and that will also help to link with EMSO and ICOS that are managing those data.
- **ETN** (F. Souza Diaz/VLIZ) – for this new network the data management is at an early stage. A database has been set up and the next step will be the integration in EMODnet-Biology, taking into account that these data are only positions without species information.



2.2.3 WP4 – coastal observing system

- **“Tide Gauges”** (L. Rickards/NERC) - more data goes to Copernicus INS TAC and less to SeaDataNet , as not connected as SeaDataNet node. Fostering the activities through the EuroGOOS Task Team Working group. It is moving slowing on site identification.

2.3 Integrators - progress on enhancements (network data ingestion and services)

See 11-WP7_5thMeeting-AtlantOS_Integrator_*.pptx [under WP7 cloud](#).

Each integrator representative presented the progress on enhancing their system on network data ingestion and services (S. Pouliquen/Ifremer for Copernicus INS TAC, P.Thijsse/ MARIS for SeaDataNet and on behalf of A. Novellino/ETT forEMODnet Physics, N. Holdsworth/ICES, F. Souza Diaz/VLIZ for EMODnet Biology & EurOBIS).

Hereafter are the highlights from the presentations.

2.3.1 Copernicus INS TAC

Services on networks side:

- *Enhancing data ingestion:* will connect to GDAC drifter to ingest more data, more data available for Gliders, strong activity for Argo-BGC.
- *Cross network assessments* done for T&S and wave, under development for Chlorophyll and oxygen, under preparation for Carbon (in Copernicus phase 2).
- *Feedback to network:* involved in the group working on the common log format and tools giving visibility on data usage (see §2.5).

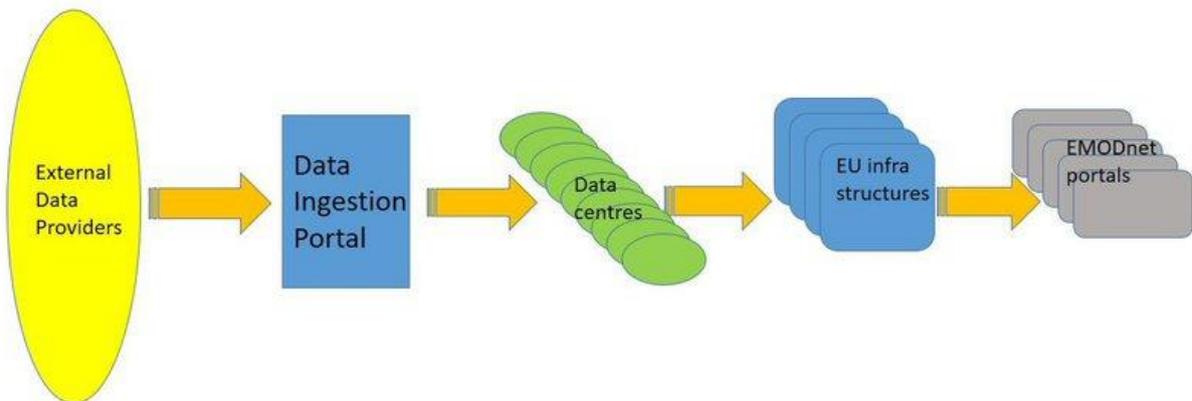
Services on providers and users side: for viewing, a dashboard has been setup (<http://www.marineinsitu.eu/dashboard/>) and will be upgraded using existing services either from Coriolis or EMODnet Physics. For downloading, enhanced subsetting facilities will be addressed in near future. Also traceability/monitoring tools are now available (<http://www.marineinsitu.eu/monitoring/>)

Implementing AtlantOS agreed standards: EDMO codes added to the files for all platforms when the provider is well identified, and the recommendations for platform IDs and common vocabularies for parameters are implemented.

2.3.2 EMODnet Physics

Services on networks side:

- *Enhance data ingestion:* EMODnet Physics benefits from the portal set up by EMODnet Data Ingestion project (www.emodnet-ingestion.eu). Data are first submitted and then processed and made available via the European infrastructures (NRT data flow into ROOSs, Copernicus INS TAC and EMODnet Physics; Historical data flow into NODCs, SeaDataNet and EMODnet Physics).



- *Cross network assessments*: the plan is to develop a specific product (view) for a given parameter as recorded by more networks (e.g. T as recorded by ARGO & DB & FB...).
- *Feedback to networks*: a platform page dashboard (<http://www.emodnet-physics.eu/map/platinfo/pidashboard.aspx?platformid=9027>), a general AtlantOS dashboard with many queries (www.emodnet-physics.eu/atlantos/dashboard) setup within WP9.1, and a periodic email report (platforms to be monitored are associated to an email). Also involved in the group working on the common log format and tools giving visibility on data usage (see §2.5).

Services on providers and users side: plots and views are customized according to the platform/network. For downloading, no restrictions and no authentication is needed for past 60 days and for data coming from international cooperation programs. Also, as much information as possible (who=IP/userid; when=time; what=selected platforms/parameters ...) is collected to enhance traceability/monitoring,.

Implementing AtlantOS agreed standards: they are followed and promoted. An annual check is performed to add missing EDMO codes for data providers. Concerning parameters when new ones are popping up in data it opens discussion with BODC.

2.3.3 SeadataNet

Services on networks side: the enhancement of Network data ingestion follows the plan set up with the network for SeaDataNet preferred connection (becoming an “own SeaDataNet node” or arrange via NODCs). The table below shows current status.

Network	Central / national	Preferred connection	Status
VOS/SOOP, GO-SHIP	Central	Own node for SOCAT data, for GO-SHIP large part via networks and via NODCs	SOCAT: Almost done (reduce service)
Ferryboxes	Central (HZG)	Own node	In discussion
Drifters	Central (GDAC planned)	Own node (prototype under	Will follow Argo prototype



		AtlantOS)*	
Argo	Central (GDAC) and partly national	Own node via GDAC for some countries (France already), others via NODC*	Under development, check per country
OceanSITES	Central (at IFREMER and USNDBC) and some national	Mostly via national centers	For archives no actual networks with central data storage (via national centers)
Tide gauges	Central (European node at VLIZ)	Mostly via national	No actual networks with central data storage (via national centers)
Gliders	Central (GDAC (Ifremer))	Own node and via national, test first*	Will follow Argo prototype
Seafloor Mapping	National	Via NODC and other datacenters (already)	No actual networks with central data storage (via national centers)
Fish and plankton survey (ICES)	Central	Via EurOBIS/EMODnet bio	Done for relevant data
EATN	Central	Via EurOBIS/EMODnet bio	-
CPR/SAHFOS	Central	Own node for Physical data	Under development (started)

Implementing AtlantOS agreed standards: already done as there are SeaDataNet standards. All needed updates are done in C17 for platforms codes and EDMO for institutions codes, and all the codes are in JCOMMOPS.

2.3.4 ICES

Enhancements of data ingestion: data come from the EU CFP but also non-EU countries, so ICES is improving data availability for non-EU but still missing some surveys. The plan is to work further on this in 2018, with specific workshops outside of AtlantOS scope.

Enhancements of services: still working on getting survey areas defined as map resources in Geoserver/network.

2.3.5 EMODnet Biology & EurOBIS

Services on networks side:

- *Enhance data ingestion:* EMODnet Biology also benefits from the portal set up by EMODnet Data Ingestion project (www.emodnet-ingestion.eu), and guidance helps providers to submit data.
- *Cross network assessments* <http://www.iobis.org/2017/01/12/obisenvdata/>.
- *Feedback to network:* EMODnet biology serves data through an API (<http://www.emodnet-biology.eu/emodnet-biology-api>) will develop a dashboard like for physics



Services on providers and users side: plan to couple viewing and downloading services. The EDMODnet Biology downloading tool has been redeveloped (<http://www.emodnet-biology.eu/tutorials>).

Implementing AtlantOS agreed standards: work on having EDMO codes promoted for data providers metadata. Unique platform/stations IDs can be referenced in an additional filed (measurementValueID)._Worms is part of P01 vocabulary.

2.4 Focus on GEOSS and the workshop on 24th Nov

See [11-WP7 5thmeeting-AtlantOS GEOSS workshop.pptx](#)

K. Koop-Jakobsen/MARUM-UNIHB gave an overview of the role of GEOSS in AtlantOS. At the AtlantOS GA, WP7 had organized a GEOSS workshop in collaboration with the EU-projects COOP+ and ENVRI+ on Friday Nov 24th. The workshop had the scope to define the role of GEOSS in AtlantOS establishing a better link between AtlantOS data providers and GEOSS, and thereby make better use of GEOSS as an integrator of trans-Atlantic data.

At the workshop, which had a hands-on component, AtlantOS was registered within the “Yellow pages” at GEOSS, and a strategy was developed for how to display the assets of the data providers in AtlantOS in GEOSS. An AtlantOS hub will be generated in the GEOSS portal, where a new feature “View”, will enable a filtering system that can display data and resources provided by data providers in AtlantOS. This will make use of the descriptions and their metadata available in the AtlantOS catalogue.

For more information on the outcome of the workshop – See the web-announcement on the workshop outcome generated by GEOSS:

https://earth.esa.int/web/guest/news/-/asset_publisher/G2mU/content/atlantos-registered-in-geoss

2.5 Monitoring/Traceability services

See [11-WP7 5thMeeting-AtlantOS Monitoring.pptx](#)

P.Thijsse/ MARIS (on behalf of A. Novellino / ETT) and T. Carval/Ifremer presented the joint work between WP7.2 and WP9.1 to create a process and format to track and trace “*who, when, what, ... from which integrator or network*” and to define available services for data providers and data managers to access these monitoring information.

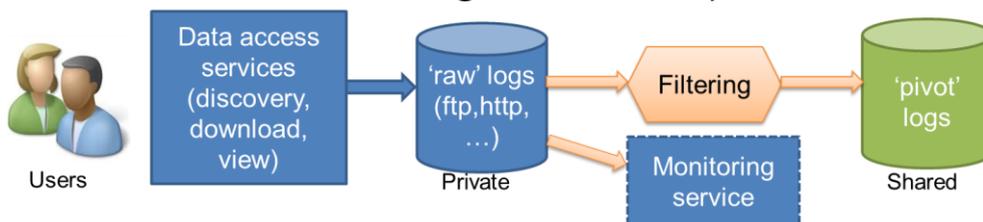
A group was set up to work collaboratively: Ifremer, ETT, JCOMMOPS and representatives of integrators (SeaDataNet, EMODnet physics, Copernicus INS TAC, EMODnet biology, ICES) and networks (ICES, CPR, GO-SHIP, FerryBox).

The first 3 working sessions were mostly dedicated to seek for a common set of minimal tracking information available in the diversity of networks and integrators services (data plots without any restriction, different services with different rules and different service level agreements, privacy

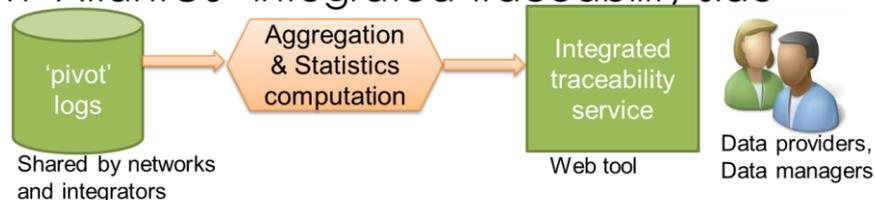
laws,...) and that can be shared by the networks and integrators. The definition of a common format, termed 'pivot', is underway (70% done, precise definition of fields to be completed). It includes a minimum set of mandatory and shared fields to allow core statistics and optional fields (only if available and sharable by a system) to allow more detailed statistics.

Then, the strategy is 1) on network and integrator data system to process and share the 'pivot' logs, and 2) to aggregate those logs and compute statistics in an integrated traceability service (central AtlantOS web dashboard and/or email reporting).

- On network or integrator data system side



- On 'AtlantOS' integrated traceability side



The next steps for the working group are to define the filtering methods to go from 'raw' log information at network or integrator level to the 'pivot' log information, to define the statistics to compute from the 'pivot' log information, and to define the tools.

T. Carval/ifremer demonstrated the prototype developed on statistics computation based on the number of data downloads for Argo and for Copernicus INS TAC. This illustrates what could be developed in the end as web dashboard.

3 « Atlantic Ocean data integration » session

This session was led by MARUM/C. Waldmann, K. Koop-Jakobsen and aimed to move towards the three goals within WP7 for "Atlantic Ocean data integration":

- Input for AtlantOS deliverable on transatlantic harmonization (D7.8)
- Input for AtlantOS blueprint
- White papers to be presented at the OceanObs19 conference

MARUM, MARIS, Ifremer, BODC, UiB want to be involved for the white papers. ODIP, ENVRI+ IOOS, IMOS and South Africa people (Juliet Hermes, Tania Morris) will also be involved.

3.1 Presentation of the outcomes of the « Transatlantic » workshop

See [11-WP7_5thmeeting-AtlantOS_TransatlanticWS_outcomes.pptx](#)



K. Koop-Jakobsen/MARUM presented an overview of the outcome of AtlantOS WP7 workshop on transatlantic data sharing, which was held in Brussels on July 4th with participants from all 4 continents bordering the Atlantic Ocean. For a full workshop report see:

<https://www.atlantos-h2020.eu/download/Report-from-AtlantOS-Transatlantic-Ocean-Data-Harmonization-Workshop-June-2017.pdf>

The workshop gave an overview of Atlantic Ocean data landscape identifying gap in the international data management network, with

- North America and Europe : well advanced data systems
- Africa: A big center in South Africa for the South Africa , less integration in North Africa
- South America: Open Data Sharing is still not in this continent culture

Then, the workshop identified key-area were improved transatlantic collaboration on ocean data management could have a significant impact. As an outcome of the workshop, the setup of three working groups were proposed to continue the work on the identified key areas with the goal of presenting white papers on these selected topics at the OceanOBS19-conference. The working groups and production of white papers are intended to be a community driven effort by the international ocean data community with representation from all continents bordering the Atlantic Ocean, as well as the inclusion of essential current projects and initiatives, such as AtlantOS, ODIP, RDA and IEEE.

The topics are:

1. **Ocean data - Quality assurance and quality control** (chair: Christoph Waldmann, MARUM, and Mark Bushnell, NOAA)
2. **Data standardization** (chair: Justin Buck, BODC, in an initiative with Jay Pearlman, IEEE)
3. **Interoperability, semantics and machine learning from a user community perspective** including new services that could emerge from big data technologies (Chair: Tobias Spears, Fisheries & Oceans Canada, Thomas Loubrieu Ifremer. Following taken over by Thierry Carval, Ifremer).

The outcome from this workshop will also be used to populate the data section for the AtlantOS blueprint.

3.2 Ocean data - Quality assurance and quality control

See [11-WP7 5thmeeting-AtlantOS QC QA.pptx](#)

C. Waldmann/MARUM presented this topic. The people already involved in this working group are C. Waldmann, Robert Huber, MARUM, Mark Bushnell, IOOS, and AtlantOS WP7 partners.

- **The Scope:** establishing a globally harmonized QA/QC framework linking to ongoing initiatives and making use of existing reference documents developed in relevant projects (FIXO3, QARTOD, Neptune Canada, OTN, ENVRI+, EMSODEV, etc.), as well as the GOOS best practices repository and the QARTOD program of IOOS GOOS Bio/Eco panel ISO initiative.
- **The goals:** the goal of this working group is to establish guidelines for providing transparent and dependable error and uncertainty information for ocean data, which is a necessity for the generation of reliable data products. In general, there is a strong need for harmonization



of best practices of quality assurance and quality control procedures in a transcontinental context.

- **The plan:** these goals shall be reached through Standardization of QA/QC procedures. Achieving even a basic level of standardization on quality assurance and quality control requires harmonization of existing protocols and workflows, which are already in use at the instrumentation level. The benefits of consolidating best practices to include a level of confidence to be delivered with the data, at least at an EOV level, are obvious.
- **The work:** The starting point of the working group will be the introduction of best practices by standardizing the concept of uncertainty among data providers. This will assure that the uncertainty estimates provided are in compliance with ratified standards such as ISO, BIPM, and any standardization body of relevance. The best practices shall be concerned with use of international vocabulary for metrology, and will include the formulation of a QA manual to the expression of uncertainty in measurement, as well as the use of GEO QA4EO, as it defines a quality assurance framework for earth observation.
- **The Timeline:** The work started on October 1st. First step; the ideas behind a QA manual will be presented and discussed at the Fall AGU meeting. Furthermore, a committee will be established to help draft that plan. The duration will be adjusted depending on the extent of workplan, which will determine when the committee is together.
- **The outcome:** The finalized QA manual will be presented as a white paper to be presented at OceanObs'19.

3.3 Data standardization

This topic was led by J. Buck/BODC and made the focus on three topics.

- **Data standardisation action** (J. Buck/BODC) - see [11-WP7_5thmeeting-AtlantOS_Standardization.pptx](#)

As discussed at the trans-Atlantis data harmonisation workshop, data standards work in AtlantOS will be progressed by the production of white papers for OceanObs'19. The time scale is short with the timeline at <http://www.oceanobs19.net/questions/>. Abstract submissions will remain open until March 15, 2018. The Program Committee will review and consolidate the Community White Paper list from March 15 – April 30, 2018. Invitations to group authors for Community White Papers will be sent by April 30, 2018. Final Community White Papers will be collected by September 30, 2018.

It was decided to split the papers into 4 themes: Data standards from sensors, Data and metadata brokering, QA/QC, The future (in regard to preservation and dissemination of best practices).

Paper titles, leads and themes with potential co-authors were drafted following the <https://docs.google.com/document/d/1jGd1CowkrDAdoGKwYPtsLyFKtSmTyT2tB1eKLG7PNXA/edit>

The OceanOBS19 review process with aggregate abstracts into working groups so it will not be necessary to work with all co-authors at the abstract stage of the process.



- **Outcomes of the Evolving and sustaining ocean best practices workshop** – see [11-WP7 5thmeeting-AtlantOS Standardization WP6.2 Best Practices.pptx](#)

J. Pearlman/IEEE, co-leader of WP6 in AtlantOS, presented the strategy towards an Ocean Best Practices System. Today, most potential Ocean BPs are scattered, have varying degrees of accessibility, and varying digital lifetimes. The goal is to develop an open access and central searchable repository of Ocean BP documents, with priority to consistent machine readable and “taggable” texts with robust metadata. This system should benefit both to users and to contributors. For sustainability of such a system, the support of the internationally recognized UNESCO/IOC – IODE is foreseen. That implies to speed up somehow the review/update processes of IODE.

- **Essential variables update**– see [11-WP7 5thmeeting-AtlantOS Standardization EVs.pptx](#)

J. Buck/BODC recalled that the definition of AtlantOS Essential Variables are based on GOOS EOVs, GCOS ECVs and AtlantOS user-specified variables. EVs for physics and biogeochemistry are published since June 2016 on the NERC/BODC Vocabulary Server (version 2.0) as A05 vocabulary with the mapping to the standards recommended for AtlantOS parameter metadata (P01, P07, P06 from SeaDataNet). For biology, the GOOS EOVs are beginning to become mature and in the next few months a final agreement should be reached on what will be measured for these as part of AtlantOS. A05 vocabulary will link P01 standard with the WoRMS AphaIDs for biological entities.

3.4 Interoperability, semantics and machine learning from a user community perspective

See [11-WP7 5thMeeting-AtlantOS AdvancedUserServices.pptx](#)

In everyday life we already use on the web, without knowing it, advanced technologies and tools based on interoperability of systems. Everyone have some ideas about “Cloud” and “Big data”. The challenge in the domain of Ocean Sciences is to study how scientist will change the way they do their scientific work in the future using e-infrastructures, VRE (Virtual Research Environment) or CWE (Collaborative Working Environment).

T. Carval/Ifremer presented the scope in this innovative field, as well as the present/coming projects or initiatives that aim to develop prototypes of what could be advanced services to users.

The e-infrastructures implement advanced technologies and attractive web tools (cloud, web processing, virtualLabs, advanced geoviewers ...) that will allow the users to discover, access, view and process diverse and interoperable sources of data, benefiting of the scalability capacities for large volume of data. Several e-infrastructures are developing through projects or initiatives, more in a ‘use cases’ or prototyping way (EOSC-Hub, Marinet 2, SeaDataNet, EMODnet chemistry, EMODnet ingestion,...) .

Thus, the way to organize the data systems will change in order to integrate the user services in such e-infrastructures. The e-infrastructures developed will have to be sustained somehow.



Maris (P. Thijsse) and UiB (B. Pfeil) express their willingness to participate with Ifremer and BODC to a paper on that topic for OceanObs19. The author list will also include other participant around Atlantic such at IOOS representative.

4 Presentation of WP7.4 activities

See [11-WP7 5thmeeting-AtlantOS WP7.4 synthesis.pptx](#)

E. Remy/Mercator Ocean presented the WP7.4 activities that started in April 2017.

The partners (Mercator Ocean, UK MetOffice, CLS, ECMWF) will assess the impact of near real-time WP2 and WP3 AtlantOS in-situ observations (physical and biogeochemical) for model validation and for data assimilation in Global ocean short term monitoring and forecasting systems, and Ocean-atmosphere seasonal forecasting system.

Mercator Ocean will assess the impact of AtlantOS observations on short-term ocean analysis and predictions at $1/12^\circ$. UK MetOffice will assess the impact of AtlantOS physical observations on short-term ocean analysis and prediction system at $1/4^\circ$. CLS will assess the impact of AtlantOS physical observations on ARMOR3D, producing observation based ocean analysis. ECMWF will identify the important ocean regions and observations to observe in order to reduce the error forecast for coupled seasonal prediction. The planned experiments are: OSEs by removing observing system components everywhere and specific OSEs by removing observing system components in a given area.

It was agreed to focus on specific networks to benefit from the use of several systems and allow more robust conclusions on observation impact. The common sensitivity experiments will concern the deep Argo floats, the surface drifters and PIRATA moorings (all partners). Some additional experiments will be conducted by individual partners (Argo BGC,...).

ECMWF will also identify the important ocean regions to observe in order to reduce the error forecast for coupled seasonal prediction.

5 Presentation of WP7.5 activities

See [11-WP7 5thmeeting-AtlantOS WP7.5 synthesis.pptx](#)

S. Guinehut/ CLS with G. Dall'Olmo/PML presented the scope of WP7.5 activities that started in April 2017 and will end in April 2018.

The objective is to develop EOVS synthesis products from WP2 and WP3 networks and historical data sets for ocean, carbon, ecosystem and climate research. Task 7.5 includes 6 subtasks.

- The Biogeochemical EOVS synthesis merge data from ocean-colour satellite and bio-optical data acquired by BGC-Argo profiling floats to estimate 3D fields of Chl-a and backscatter coefficients.
- Surface carbon EOVS synthesis provide surface ocean carbon synthesis products, specifically by contributing to the international community effort Surface Ocean CO₂ Atlas (SOCAT) and



use statistical techniques (Feed-Forward Neural network Model) to produce a proof-of-concept of the feasibility of ocean carbon system estimates resolving seasonal and inter-annual variability.

- Ocean carbon interior synthesis subtask objective is to release an updated version of GLODAP (GLODAPv2.2018) by mid-2018. This new version will contain roughly 100 additional cruises compared to GLODAPv2 and will include AtlantOS funded, and coordinated, interior ocean observations. The impact of the AtlantOS observations on interior ocean biogeochemistry will be assessed.
- Temperature, Salinity and Oxygen synthesis subtask uses the ISAS objective analysis tool to produce temperature, salinity and oxygen syntheses of the Atlantic Ocean over the last 10 years.
- Ecological EOVs subtask will provide ecological EOVs from Continuous Plankton Recorder CPR rich biodiversity data. Processed EOVs will target specific areas relevant to observing change and will directly deliver key information of significant societal relevance such as human health climate change impacts on ecosystems, ocean acidification, biodiversity and fisheries.
- Merged satellite/in-situ surface current products will use past and AtlantOS ADCP data to validate and enhance merged satellite/in-situ (sub) surface current products.

Activities are running as expected. Data processing tools (interfaces with networks, quality control, mapping) have been developed for all of the six subtasks and are now tested.



6 Roadmap by Network

6.1 WP2 – Ship based observation networks

CPR			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none"> • CPR physic data : Temperature, Salinity and fluorescence data • Will set up an own SeaDataNet node (following SOCAT example currently finishing) • Will work on QC procedures taking into account the AtlantOS recommendations • MARIS will send technical documentation about Download manager installation and process towards connection. 	<ul style="list-style-type: none"> • Providing average Temperature, Depth, and Salinity per sample; the data should be available by end of November 2017 • Development started to become a SeaDataNet node
	Copernicus and EMODnet physics	<ul style="list-style-type: none"> • No RT data • Data flow to be set up for CPR Physics (T, S, Fluorescence) through SeaDataNet SAHFOS node to be setup → SeaDataNet/EMODnet physics → Copernicus INS TAC 	N/A
	ICES, EurOBIS and EDMODnet Biology	Already well connected for CPR Biology through IPT (integrated publishing Tool) → EurOBIS/EMODnet biology	N/A



Harmonization and discovery enhancements	Metadata - EDMO codes for data providers	<ul style="list-style-type: none"> • will map to EDMO while setting up the SeaDataNet node • The past 10 years of data is feasible but for older data it's more difficult and work is going on with BODC. Somehow to add 	Only one EDMO code (50) and added to all the datasets
	Metadata -Unique platform/station IDs	<ul style="list-style-type: none"> • Platform code (Ship-code + cruise ID + trawl id) • will map to C17 when working on SeaDataNet CDI connecting to publish archives (and to EurOBIS) • The past 10 years of data is feasible but for older data it's more difficult and work is going on with BODC. Somehow to add 	Current state = unknown, platform IDs are frequently not unique. For instance, the CPR is towed on at least three vessels also using Ferrybox ⇒ MARIS to support SAFHOS on link to cruise summary report for this issue
	Common vocabularies for parameters	Developing a data format, NERC to advise on best practise for included attributes	To be done ; Handled by mappings in Mikado (for physical data) and IPT (for biological)
	AtlantOS catalogue under Sextant	Network description already available	N/A
	DOI strategy for data citation	Use DOIs without a network strategy	To be done ; Strategy chosen= a single DOI per dataset, using fragments (eg, #year=yyyy-yyyy) to identify the year range as new data is added
	Platform catalogue at GDAC level	Not a candidate network	
	NRT QC	Not applicable, only DM data	



Fish & plankton survey (ICES)			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	Already linked with SeaDataNet (is CDI fed)	N/A
	Copernicus and EMODnet physics	Oceanographic data served through http://ocean.ices.dk data portal. Possibility to update periodically Integrators with new data.	N/A
	ICES, EurOBIS and EDMODnet Biology	Biology data from DATRAS system (Trawl survey + acoustic) already available in EMODNet-biology. ICES provides Web and R services to allow machine to machine connection.	N/A
Harmonization and discovery	Metadata - EDMO codes for data providers	<ul style="list-style-type: none"> Implementation of EDMO codes in fisheries data is already on-going EDMO codes will be added for oceanographic data 	EDMO mapping underway : ok for acoustic, incomplete for Biological trawl
	Metadata -Unique platform/station IDs	Will map Platform codes to existing ship codes in fisheries data	Platforms ok, now mapped the biological trawl research vessels and exposed at http://vocab.ices.dk but haven't attached to data outputs yet



Common vocabularies for parameters	Biology data already include AphiaID from WoRMS for Taxa	N/A
AtlantOS catalogue under Sextant	Description to be sent for fish surveys	Done
DOI strategy for data citation	use DOIs (ICES is a DOIs publisher) without a network strategy	DOI's are minted at ICES via Datacite. <ul style="list-style-type: none">• INPUT of data: Need to address ability for data provider to cite their own DOI when providing data into ICES, or ICES will mint when no DOI is provided• OUTPUT: the process not in place for data outputs yet, plan in early 2018, more straightforward
Platform catalogue at GDAC level	Not a candidate network	
NRT QC	Not applicable, only DM oceanographic data	



Seafloor mapping			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none"> • GEOMAR currently collecting Atlantic datasets from BSH when allowed to be used, collecting data from transit bathymetry from German research vessels • Data sets are provided to Pangaea on a national level and GMRT on an international level • Focus on international waters • Data flow to EMODnet-Bathymetry (surveys present in SeaDataNet CDI). Content of EMODnet Bathymetry to be checked : identify possible gaps, add more 	<p>At the level of individual national data centres - BODC, IFREMER, GEOMAR and NIOZ are working on a compilation of their non-accessible/non-findable data to assess how much can be made findable/accessible. These data sets, which are probably also not in EMODNet and SeaDataNet, will then become available for these integrators.</p> <p>The current status is: for German data GEOMAR is trying to have the data, a lot of Dutch and UK data are available at BODC and NIOZ but not metadata, French data are well archived at Ifremer but not openly accessible.</p>
	EMODnet Bathymetry		
	ICES, EurOBIS and EDMODnet Biology	Not applicable	
Harmonization and discovery	Metadata - EDMO codes for data providers	Geomar is harvesting data from other networks (that might use EDMO such as SeaDataNet / EMODNet Bathymetry). No network as such to implement EDMO codes	EDMO codes for data providers could be given - for example German data would be associated with BSH (code 1850). But is this useful?
	Metadata -Unique platform/station IDs	Geomar is harvesting data from other networks (that might use Platform/Station ID's such as SeaDataNet / EMODNet Bathymetry). No network as such to implement Platform/station ID's	Each ship has a unique name so the platform is identified



	Common vocabularies for parameters	will incorporate appropriate vocabularies as work stream evolves	There is a common vocabulary for bathymetry as it is fairly simple. The common vocabulary for acoustic backscatter will be more difficult to define.
	AtlantOS catalogue under Sextant	Description to be provided	Done, to be completed for Quality metadata
	DOI strategy for data citation	Use DOIs without a network strategy	All data set should have a DOI. Linkage to ORCID may also be interesting
	Platform catalogue at GDAC level	Not a candidate network	
	NRT QC	Not applicable	



VOS/SOOP			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	Start with SOCAT as a node for carbon data (pCO ₂) and download manager is setup. Mapping to vocabularies, EDMO is done. 90% done.	Almost done (reduce service)
	Copernicus and EMODnet physics	<ul style="list-style-type: none"> No RT data presently but there will be some tests with voluntary ICOS stations with some lines (e.g. Nuka Artica) to demonstrate the possibilities Data flow for historical data will be sent through ICOS portal. Presently it's a viewing portal and data must be asked to individual PIs one by one which doesn't suit with operational needs while these data are essential for ecosystem model validation. Demonstration of access to data through GDAC for marine Biogeochemistry (not funded yet) for integration in Copernicus products would be important for future evolution of Copernicus INS TAC. 	linking the AtlantOS data management efforts to the ICOS carbon portal
	ICES, EurOBIS and EDMODnet Biology	Not applicable	
Harmonization and discovery	Metadata - EDMO codes for data providers	On-going	On-going
	Metadata -Unique platform/station IDs	On-going	On-going



	Common vocabularies for parameters	Already using the SeaDataNet recommendations so mapping is possible and in contact with NERC for updates.	On-going
	AtlantOS catalogue under Sextant	Network description was sent to L. Petit de la Villeon, but Ute Schuster validation is needed. SOCAT description will be provided in coming weeks also.	Done
	DOI strategy for data citation	Would like to use DOIs with a network strategy that need to be more elaborated as a decentralised strategy. Currently each voyage has its own DOI within SOCAT but the use of parent or clustered DOIs is planned.	On-going
	Platform catalogue at GDAC level	Not applicable	
	NRT QC	Done for Carbon and sea surface Temperature	N/A



GO-SHIP			
Roadmap mid-December 2016		Updates as of November 2017	
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none"> • Start with some GO-SHIP data that is included within SOCAT as a node for surface carbon data (pCO₂) and download manager is setup. Mapping to vocabularies, EDMO is done. 90% done • For the Ocean interior, GLODAP (1million bottle data), the Observation data are adjusted + gridded field. The route is to have a GDAC structure and is depending from additional funding. • Access to ADCP should be improved in link with WP2.5 • Stimulate the submission of WP2 GO-SHIP cruise to the NODC and clearly identified as GO-SHIP cruise in SeaDataNet • In SeaDataNet better identify the GO-SHIP lines using information coming from JCOMMOPS and GLODAP 	<p>On-going</p> <ul style="list-style-type: none"> • large part of data via networks and via NODCs • New version of GLODAP (GLODAPv2.2018) is in development
	Copernicus and EMODnet physics	<ul style="list-style-type: none"> • No RT data except CDT data where there is already an NRT distribution through Coriolis. Important to keep the expocode and GO-SHIP line information to be able to update with DM data. Ifremer in link with JCOMMOPS to study how to link to GO-SHIP line automatically. • For reanalysis, recommendation is to synchronize with CCHDO. When there is duplicate between SeaDataNet and CCHDO there should be a recommendation from GO-SHIP on which version to keep. 	<p>On-going</p>
	ICES, EurOBIS and EDMODnet Biology	Not applicable	



Harmonization and discovery enhancements	Metadata - EDMO codes for data providers	On-going	On-going
	Metadata -Unique platform/station IDs	On-going	On-going
	Common vocabularies for parameters	Already using the SDN recommendations so mapping is possible with NERC for updates	N/A
	AtlantOS catalogue under Sextant	Network description is available	N/A
	DOI strategy for data citation	Would like to use DOIs with a network strategy that need to be more elaborated as a decentralised strategy. The idea is to have a DOI for the line that links to the each individual cruises that links to the different datasets (bottles, CTD, ACDP...)	On-going
	Platform catalogue at GDAC level	Candidate network <u>but</u> need additional funding to set it up	On-going
	NRT QC	Mainly DM data. Will be done by Coriolis for CTD data transmitted in NRT.	On-going



6.2 WP3 – Autonomous observing networks

Argo			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none"> • Create CDI metadata files from Argo dataset files (T. Carval/Ifremer and P. Thijsse check together) and from JCOMMOPS for EDMO codes • Create ODV files from Argo data files • Setup method for exclusion in export to SeaDataNet CDI of certain floats (already distributed via Data Centres) 	<ul style="list-style-type: none"> • The CDI and ODV format for Argo has been defined <ul style="list-style-type: none"> ○ CDI : one per Argo cycle (and direction) ○ ODV : one simple synthetic profile file composed of the merged core-Argo and BGC-Argo (P, T, S, oxygen, chlorophyll, pH, pCO₂, optics, ...) • The GDAC content has been published as 2 million CDI-ODV files (http://www.ifremer.fr/co/seadatacloud-argo), sample files checked with Mikado
	Copernicus and EMODnet physics	Already well connected, no missing data	N/A
	ICES, EurOBIS and EDMODnet Biology	Some Biogeochemistry data are collected that might be of interest for ICES, to be investigated	No need to link to these integrators



Harmonization and discovery enhancements	Metadata - EDMO codes for data providers	<ul style="list-style-type: none">JCOMMOPS for Argo is committed to manage EDMO in its DatabaseEDMO codes are added when Argo data are pushed to Copernicus, there are not present in Argo GDAC files themselves : mapping implemented as far as possible for now (65/70% done already for Copernicus)Own organization names/labels still in use as well in Argo files, not taken from EDMOImprovement/update will take place continuously	<ul style="list-style-type: none">Done for European platform institutionsDone for non-European institutions having an EDMO code <p>Update will take place continuously</p>
	Metadata -Unique platform/station IDs	already WMO platform codes	N/A
	Common vocabularies for parameters	International agreed format and content that can't be changed, but a one to one mapping exists between Argo variables and P01 codes and is described in the Argo documentation	Done in the Argo parameter list
	AtlantOS catalogue under Sextant	Network description already available	N/A
	DOI strategy for data citation	Network wide strategy where DOIs are centrally managed (a unique DOI for Argo data with fragments to identify monthly versions =snapshot)	
	Platform catalogue at GDAC level	Already implemented	N/A
	NRT QC	all AtlantOS recommendations are already implemented for T&S, Current, O2 and Chla, and are planned to be implemented for Nitrate	Done



Glider			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none"> • Setup similar to Argo • Will follow exactly actions of Argo 	To be done when the method for Argo is validated
	Copernicus and EMODnet physics	The bigger gap is UK data and plan to be delivered within 2017 at GDAC (already data on GTS but only T&S)	<ul style="list-style-type: none"> • At EU level, Norwegian data are now available • UK data by way of GTS, not yet EGO NetCDF • Coordination underway with EGO for delayed mode
	ICES, EurOBIS and EDMODnet Biology	Some Biogeochemistry data are collected that might be of interest for ICES, to be investigated	To be checked by ICES
Harmonization and discovery enhancements	Metadata - EDMO codes for data providers	<ul style="list-style-type: none"> • Adopted in data model, at least one (provider) will be part, probably more, e.g. for the DAC • Mapping already done (new codes created) 	<ul style="list-style-type: none"> • Done for European platform institutions • Done for non-European institutions having an EDMO code Update will take place continuously
	Metadata -Unique platform/station IDs	already WMO platform codes	N/A
	Common vocabularies for parameters	Format based on Argo variables and including the reference (sdn_parameter_urn) to SeaDataNet vocabularies explicitly	Done (link with P06 SeaDataNet vocabulary)



AtlantOS catalogue under Sextant	Network description to be provided	Done
DOI strategy for data citation	Preparing a strategy	Underway, one hundred DOI already assigned to German (through PANGEA) or French gliders (through Ifremer/Seanoë) <ul style="list-style-type: none">• a DOI assigned per glider deployment (a NetCDF file) and manage DOIs of DOIs to group a series of deployment (Network level, Science process)• Use ORCID to give credit to PIs and contributors
Platform catalogue at GDAC level	Candidate Network	Underway, add a platform catalogue on EGO GDAC derived from data index
NRT QC	all AtlantOS recommendations are already implemented for T&S and Chla (although no data in production yet), have to be done for Oxygen and Nitrate	Done



Drifter			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none">• Setup prototype GDAC (2017) with netCDF• Test production of CDI and ODV files from data model, according to Argo commitment first• Mapping will be investigated• During set up of data model already demands (EDMO, other vocabs) will be taken into account	<ul style="list-style-type: none">• GDAC implementation has progressed• First draft NetCDF format has been finalized: Drifter data management document submitted to DBCP community for comments (at DBCP-33 meeting): https://cloud.ifremer.fr/index.php/s/fwjC6H2ZQ4K9k5B• First mock-up NetCDF has been produced, and production chain documented: Drifting buoys DAC data processing chain, version 0.9. SEANOE. http://doi.org/10.17882/51148
	Copernicus and EMODnet physics	Already well connected (data on GTS)	N/A
	ICES, EurOBIS and EDMODnet Biology	Not concerned	Link with ICES to be investigated



Harmonization and discovery enhancements	Metadata - EDMO codes for data providers	<ul style="list-style-type: none">• EDMO code implementation in the work plan• Use at least one, but probably more, for different roles (provider, assembly center, data holder, etc). Labels in data format can be taken from ARGO	<ul style="list-style-type: none">• Proposal for drifting buoy metadata in the WIGOS Metadata Standard submitted to DBCP community for comments (at DBCP-33 meeting): https://drive.google.com/drive/folders/0BytL8e3zpeffQWg3NIFBcmZWT2s• But already: the NetCDF format includes: “institution”, “data_assembly_center”, and “contributor” (name and role)• EDMO codes to be added in a later (second) version of the format
	Metadata -Unique platform/station IDs	already WMO platform codes	N/A
	Common vocabularies for parameters	format based on Gliders (with sdn_parameter_urn explicitly in the data) under development	<ul style="list-style-type: none">• Adopted common vocabularies from BODC tables (large overlap with OceanSITES variable names)
	AtlantOS catalogue under Sextant	Network description already available	N/A



DOI strategy for data citation	Preparing a strategy	<ul style="list-style-type: none">The possibility (added during development) of considering a NRT feed from the raw data (if the GDAC could receive them, as back-up to DACs) opens a new dimension. This should be possible as currently the US imposes the use of 2 (US) email addresses for all drifter operators (max. allowed by Iridium: 5 addresses). It should hence be feasible to request that at least 1 address be added as back-up for the European GDAC. This needs a bit of discussion and if no solution is found the back-up is to adopt the following solution: doi: 10.17882/<singlenumber> with one snapshot every month, since the beginning
Platform catalogue at GDAC level	this catalogue will be part of the prototype in 2017 and the index of data files will contain at least: DAC identification, file_name, geospatial coverage (geospatial_lat_min,geospatial_lat_max, geospatial_lon_min, geospatial_lon_max), first and last valid location (x,y,t), date_update, data_mode, parameters, institutions, institution_edmo_codes, institution_wmo_locators	<ul style="list-style-type: none">Will be derived once a full set of files have been created. Postponed to 2018.
NRT QC	the recommendations for T&S and Current are going to be implemented with the setup of the GDAC	<ul style="list-style-type: none">Will be derived once a full set of files has been created. Postponed to 2018.



OceanSITES			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none"> • Approach via connection of GDAC to be investigated (GDAC not the only point of delivery and some of the NODC's already publish their data) • Under AtlantOS the metadata and data model of OceanSITES stations could be checked and compared to what is needed for CDI and producing ODV files • Identify gaps • Provide recommendations to feed back into OceanSITES, allowing easier link to SeaDataNet later on. 	<ul style="list-style-type: none"> • Most of the data providers delivering to SeaDataNet (directly or via Pangea) • GDAC approach still to be investigated
	Copernicus and EMODnet physics	for Transport Mooring Arrays (TMA) at least the data from platform deployments funded for in WP3 should be pushed to OceanSITES	Chasing for data providers concerned to transfer to OceanSITES GDAC
	ICES, EurOBIS and EDMODnet Biology	Some Biogeochemistry data are collected that might be of interest for ICES, to be investigated	to be checked by ICES
Harmonization and discovery enhancements	Metadata - EDMO codes for data providers	Much OceanSITES station data currently available already in SeaDataNet via the NODC's. In that case mapping to EDMO ID's will run via that path. Investigation under AtlantOS as defined above might lead to further integration.	Checking all inputs



Metadata -Unique platform/station IDs	Much OceanSITES station data currently available already in SeaDataNet via the NODC's. In that case mapping to Platform/Station ID's will run via that path. Investigation under AtlantOS as defined above might lead to further integration.	<ul style="list-style-type: none">• Covered under JCOMMOPS and OceanSITES designation• Work on-going with JCOMMOPS to update the OceanSITES database to be able to trace what has been deployed and then what is available
Common vocabularies for parameters	Data format includes CF standard_name	N/A
AtlantOS catalogue under Sextant	Network description already provided to be put in the catalogue	Done
DOI strategy for data citation	No plans yet. Action to investigate creating guidelines for OceanSITES providers.	Underway, work with OceanSITES DMT to propose a strategy
Platform catalogue at GDAC level	To be done at the existing UE GDAC	Underway, add a platform catalogue on OceanSITES GDAC, derived from data index <ul style="list-style-type: none">• work within OceanSITES / JCOMMOPS to ensure catalogue update and maintenance• new platforms being developed at JCOMMOPS
NRT QC	most of the data are not quality controlled, an action to undertake for platform deployments funded by AtlantOS WP3 , fixO3 observatories and Transport Mooring Arrays (TMA)	<ul style="list-style-type: none">• Recommend NRT QC protocols to platform operators via OceanSITES DMT• As NRT data streams come online / upgraded, ensure they comply => ongoing work to check



ETN			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	no physical data only positions at the moment, to be reconsidered if future animals are equipped with other sensors	
	Copernicus and EMODnet physics		
	ICES, EurOBIS and EDMODnet Biology	Integration of data in EMODnet biology has started	early stage; ETN Database operational; several meetings on exchange formats (International Metadata Standardization Meeting, June 2017, ICFT Cairns; OTN Data Management Committee meeting, October 2017, Halifax; IBLS workshop on bio-logging data standards, Konstanz, September 2017; OBIS event data pilot meeting; ...)
Harmonization and discovery	Metadata - EDMO codes for data providers	Via EMODnet Biology	Will lift along with EMODnet biology integration (based on the link with the Integrated Marine Information System)
	Metadata -Unique platform/station IDs	Definition for platform+deploymentID will be done jointly with ICES which will ease future integration in EMODnet-Biology (and EurOBIS)	To be done



Common vocabularies for parameters	Via EMODnet Biology	Will lift along with EMODnet biology integration (linked to WORMS for taxa)
AtlantOS catalogue under Sextant	Description to be provided	Initial version done, to be consolidated by ETN team
DOI strategy for data citation	No plans yet	In preparation, LIZ-DataCite data publication service + First data papers
Platform catalogue at GDAC level	Not a candidate Network	
NRT QC	Not applicable	



6.3 WP4 – Coastal observing system

Tide Gauges			
Roadmap mid-December 2016			Updates as of November 2017
Integration in integrators	SeaDataNet for archive data	<ul style="list-style-type: none"> There is not a coordinated network for Tide gauges at the European level and EuroGOOS tide gauge task team is the right point to achieve progress <ul style="list-style-type: none"> Different operators and rules differ for one operator to another, especially on identification of Tide Gauges (see action A-012d) Data available not on a global repository and non-homogenous datasets SeaDataNet: <ul style="list-style-type: none"> Few (117) Atlantic tide gauges already in SeaDataNet CDI system (to be checked, see action A-015d) EMODnet Physics 3 could provide limited financial support 	More data goes to CMEMS and less to SDN as not connected as SDN node
	Copernicus and EMODnet physics		
	ICES, EurOBIS and EDMODnet Biology	Not applicable	
Harmonization and discovery	Metadata - EDMO codes for data providers	<ul style="list-style-type: none"> Codes for organizations are available EDMO codes in the datasets will be brought in via on-going ROOS actions. Mapping is supplied. (ROOS leader will introduce EDMO codes downwards towards source) 	On-going
	Metadata - Unique platform/station IDs	will get in contact with ICES for bulk upload of the stations in the ICES dictionary	Working slowly on Site ID



	Common vocabularies for parameters	work through EuroGOOS Task Team to encourage use of standard vocabularies	On-going
	AtlantOS catalogue under Sextant	GLOSS to be described	Done
	DOI strategy for data citation	No plan yet	To do
	Platform catalogue at GDAC level	Not a candidate network	
	NRT QC	work through EuroGOOS Task Team to encourage the implementation of the recommendations for Sea Level	On-going



7 Updated action plan

Action	Description	Who?	Planned date
A-001	Organize the AtlantOS Transatlantic Data Harmonization workshop	WP7 Coordination	Done (7-8 June 2017)
WP7.1 Data Harmonisation : metadata - RTQC			
A-002	parameter list/metadata mapping with Integrator vocabularies : Finalize priority (3)Biology	BODC/L. Darroch + SAHFOS,EATN, ICES and EMODnet-Bio	On-going action
A-003	Providers in EDMO and data formats	MARIS/P. Thijsse + All the Networks	On-going action
A-003b	Set up to the simple hierarchy in EDMO catalog in the framework of SeaDataCloud projet	MARIS/P. Thijsse	Implementation Phase (WP7.3)
A-003c	Check if GO-SHIP and VOS/SOOP cruises are part of CSR and/or how they can be added in a sustained way. Then integrate EDMO codes also in GO-SHIP datafiles	GEOMAR/T. Tanhua (with MARIS/ P. Thijsse)	Implementation Phase (WP7.3)
A-004b	complete recommendations for RTQC on Carbon	UiB/B.Pfeil	Implementation Phase (WP7.3)
A-004d	NRT QC recommendations for Oxygen, Chla and Nitrate to be implemented (high importance for Ecosystems models)	All Networks performing RT measurements on those EOVs – see roadmap by network	Implementation phase (WP7.3)
A-004e	All NRT QC recommendations to be implemented at least for the data from platform deployments funded for in WP2 and WP3.	OceanSITES for TMA and FixO3 moorings	Implementation phase (WP7.3)



Action	Description	Who?	Planned date
WP7.2 Data flow and integration			
A-010	Platform catalogue at Network level as index files	Candidate Networks (GO-SHIP, VOS, Drifters, Gliders and FerryBox) to set up a platform catalogue with support of T. Carval/Ifremer	On-going action
A-011	SensorML description for platforms : dedicated meeting to be set up (T. Loubrieu/Ifremer)	T. Loubrieu/Ifremer + Candidate Networks (Argo, OceanSITES for FIX03 PAP mooring, GO-SHIP and FerryBox)	Done
A-012b	ICES station directory : guidelines to add tide gauges (a first example)	BODC/E. Bradshaw	Implementation phase (WP7.3)
A-012c	Platform id management : organize the dissemination for the set of recommendations	S. Pouliquen/Ifremer, P. Gorringer/EuroGoos	Next DATAMEQ in 2018
A-012d	Platform id management for Tide Gauges : compare the IOC list with what is presently circulating in the Atlantic to identify the gaps	A. Novellino/ETT, A. Lizé/JCOMMOPS	On-going action
A-013a	AtlantOS catalogue under Sextant : Network descriptions	1)Description to be provided for VOS/SOOP, EATN, ICES, GLOSS for Tide Gauges, Seafloor mapping 2) Add a keyword for AtlantOS EVs in the descriptions ((Ifremer/V. Harscoat and Network representatives)	Done
A-013b	AtlantOS catalogue under Sextant : Integrator description and their products relevant on the Atlantic	Copernicus INS TAC, ICES, EMODnet Biology and EuroBIS	Done for integrators To be completed for products



Action	Description	Who?	Planned date
A-014	Implementation of DOI	Implement a strategy for their network : Drifter, Glider, OceanSITES, VOS/SOOP, GO-SHIP and, when strategy decided, Tide Gauges, EATN with support of T. Carval/Ifremer	On-going action
A-015c	Enhance connection to SeaDataNet: update the work plan and define achievable steps and deadlines for implementation starting in March 2017	MARIS + All the Networks	On-going action
A-015d	Enhance connection to SeaDataNet: which data are exactly in CDI and what is missing! Check “problem zones”	NERC/Tide gauges team with support of MARIS	Implementation phase (WP7.3)
A-016c	Enhance connection to Copernicus: WP3.3 Transport mooring arrays data flow to OceanSITES	BODC/H. Snaith	On-going action
A-016d	Enhance connection to Copernicus: :WP4 to provide recommendations on how to integrate Sea Level data, Ferrybox and FOS	BODC – GEOMAR – WP4 leader	On-going action Ferrybox data go to ROOSes
A-017	Enhance EMODnet Services for AtlantOS	All networks to provide feedback on the priorities to ETT (EMODnet-physics) and VLIZ (EMODnet-biology and central)	On-going action
A-018a	Monitoring and dashboard services to show AtlantOS : set up a Working Group for download statistics	Ifremer/T.Carval, V. Harscoat, ETT/A. Novellino, JCOMMOPS/A. Lizé	WG setup and activity on-going since May 2017
A-018b	Monitoring and dashboard services to show AtlantOS : user survey to assess of the services provided from the Networks and Integrators	ETT/A. Novellino	Done



Action	Description	Who?	Planned date
A-018c	Monitoring and dashboard services to show AtlantOS : define EMODnet-Biology indicators	VLIZ/F. Souza Diaz	On-going action
A-019a	Propose a strategy to improve the links to GEO: GEOSS	MARUM/Christoph Waddman, Ketil Koop-Jakobsen	On-going action
A-019b	Organise a GEOSS user workshop for AtlantOS data providers	UniHB /WP7 representatives	Done (24th November 2017)
A-019c	Link to GEOSS : Integrate the AtlantOS catalogue	MARUM/ Ketil Koop-Jakobsen, Ifremer/V. Harscoat	2018
A-020	Enhance integrated access to data at Network level : VOS/SOOP and GO-SHIP	GO-SHIP/T. Tanhua, VOS/B. Pfeil to describe their project	Done
A-021	Feeding SeaDatNet CDI from GDACs : raise the issue at SDN steering team level	MARIS	ASAP
A-022	Enhance connection to GEOBON/MBON : Establish close links to OBIS/EUR-OBIS and interact with EMODnet	MARUM	December 2016 and onwards
A-023	Enhance connection of BCG data to ICES : to be investigated	ICES with Argo, Glider and OceanSITES representatives	Implementation phase (WP7.3)
A-024	Atlantic Ocean Data integration - white papers at the OceanObs'19 conference : submit abstracts on identified topics for	Leading people on WP7 side : MARUM/C. Waldman, BODC/J. Buck, Ifremer/T.Carval	Mid-March 2018



8 Appendix 1 - Agenda for WP7 fifth meeting

20th Nov Morning	8:15 – 9:00	Shuttle LP to PLOCAN and registration
	9:00 - 9:15	WP7 Meeting objectives (15min) Sylvie Pouliquen, WP7 co-coordinator
	9:15 – 13:00	Task 7.3 Implementation Phase session
		<p>9:15 – 9:25 AtlantOS catalog (Ifremer/V. Harscoat)</p> <p>9:25 – 10:30 Network representatives to present (5 min per network) the progress on their data management roadmap established at the 4th meeting – Dec 2016</p> <ul style="list-style-type: none"> ▪ WP2 – Ship based observation networks : CPR , Fish & plankton survey , Seafloor mapping , VOS/SOOP, GO-SHIP ▪ WP3 - autonomous observing networks : Argo, Glider, Drifter, OceanSITES , EATN ▪ WP4 – coastal observing system: “Tide Gauges”, Ferry Box
		<p style="background-color: #e1eef6;">10:30 – 11:00 Coffee break</p> <p>10:30 – 11:00 Integrator representatives to present (5 min per integrator) the progress on enhancements (network data ingestion and services)</p> <ul style="list-style-type: none"> ▪ Copernicus ▪ EMODnet Physics ▪ SeadataNet ▪ ICES ▪ EMODnet Biology ▪ EurOBIS <p>11:00 – 11:15 Focus on GEOSS and the workshop on 24th Nov (MARUM/K.Koop-Jakobsen)</p> <p>11:15 – 12:50 Monitoring/Traceability services (led by Ifremer/T. Carval, ETT/A. Novellino, JCOMMOPS/M. Belbeoch)</p> <ul style="list-style-type: none"> ▪ In link with WP9.1 ▪ Usage log monitoring <p>12:50 – 13:00 Morning session wrap-up</p>
	13:00 - 14:00	Lunch break / continuation of registration



20th Nov Afternoon	14:00 – 16:30	« Atlantic Ocean data integration » session (led by MARUM/C. Waldmann, K. Koop-Jakobsen)
		14:00 – 14:10 Presentation of the outcomes of the « Transatlantic » workshop (MARUM/K.Koop-Jakobsen, Ifremer/S.Pouliquen) 14:10 – 14:50 Ocean data - Quality assurance and quality control (led by MARUM/C. Waldmann) 14:50 – 15:30 Data standardization (led by BODC/J. Buck) with focus on <ul style="list-style-type: none">▪ Outcomes of the « Evolving and Sustaining Ocean Best Practices» Workshop – in link with WP6.4 (MARIS/ P. Thijssse)▪ EBVs vocabularies (BODC/J. Buck, VLIZ/ F. Souza Dias)
		15:30 – 16:00 coffee break / continuation of registration
		16:00 – 16:40 Interoperability, semantics and machine learning from a user community perspective (led by Ifremer/T. Carval, MARUM/K. Koop-Jakobsen) 16:40 – 16:45 session wrap-up
	16:45 – 17:30	16:45 – 17:00 Presentation of WP7.4 activities (MERCATOR Ocean/E. Remy) 17:00 – 17:30 Presentation of WP7.5 activities (7.5.6 CLS/S. Guinehut, 7.5.1 PML/G. Dall’Olmo, 7.5.2 UiB/B. Pfeil, 7.5.5 SAHFOS/ M.Edwards)
	17:30 – 18:00	Meeting wrap-up
	18:00 – 18:30	Shuttle from PLOCAN to LP



9 Appendix 2 - Participants to WP7 fifth meeting

Institute	Tasks	Main Skill	Name	Attendance
CNRS/LOCEAN	7.1	T/S/Current	Gilles Reverdin reve@locean-ipsl.upmc.fr	Partially (morning)
CNRS/LOCEAN	7.1 7.2 7.3	Glider	Pierre Testor testor@locean-ipsl.upmc.fr Victor Turpin vtlod@locean-ipsl.upmc.fr	Not present Present
CNRS/LOV	7.1 7.2	CHL	Julia Uitz julia.uitz@obs-vlfr.fr	Represented by Gilles Reverdin
CNRS/LOV	7.1 7.3	Nitrate	Fabrizio D'Ortenzio dortenzio@obs-vlfr.fr	Represented by Gilles Reverdin
ETT	7.1 7.2 7.3	EMODnet	Antonio Novellino antonio.novellino@ettsolutions.com	Partially (afternoon) by webex
EUMETNET	7.1 7.2 7.3	Drifter	Paul Poli paul.poli@meteo.fr	Represented by Thierry Carval
EuroGOOS Office	7.1 7.2	EuroGOOS EMODnet	Patrick Gorringer patrick.gorringer@eurogoos.eu	Not present
GEOMAR	7.1 7.2 7.3 7.5	GOSHIP	Toste Tanhua ttanhua@geomar.de	Partially (morning)
GEOMAR	7.1 7.2 7.3	SEAFLOOR Mapping	Colin Devey cdevey@geomar.de Anne-Cathrin Wölfel awoelfl@geomar.de	Partially (morning) Present
HZG	7.1 7.2 7.3	Ferrybox	Wilhelm Petersen wilhelm.petersen@hzg.de	Not Present
ICES	7.1 7.2 7.3	Fish plankton survey	Neil Holdsworth NeilH@ices.dk	Partially (morning) by webex
Ifremer	7.0	Coordination Copernicus	Sylvie Pouliquen atlantos_wp7_coordination@ifremer.fr	Present
Ifremer	7.0	Coordination	Valérie Harscoat atlantos_wp7_coordination@ifremer.fr	Present
Ifremer	7.1 7.2 7.3	Argo DOI Copernicus	Thierry Carval Thierry.Carval@ifremer.fr	Present by webex
Ifremer	7.1 7.2 7.3	Copernicus	Loic Petit de la Villeon Loic.Petit.De.La.Villeon@ifremer.fr	Represented by Sylvie Pouliquen



Institute	Tasks	Main Skill	Name	Attendance
Ifremer	7.1 7.2 7.3	Catalogue Interoperability Tools	Thomas Loubrieu Thomas.Loubrieu@ifremer.fr	Represented by Thierry Carval
Ifremer	7.1 7.5	O2	Virginie Thierry Virginie.Thierry@ifremer.fr	Represented by Gilles Reverdin
IMAR	7.1 7.2 7.3	EATN	Pedro Afonso afonso@uac.pt	Represented by Francisco Souza Diaz francisco.souzadiaz@vliz.be
OTN/Un. Dalhousie	7.1 7.2 7.3	EATN	Frederick Whoriskey FWhoriskey@Dal.Ca	Not present
JCOMMOPS	Link with WP9	JCOMM network monitoring	Anthonin Lizé alize@jcommops.org	Not present
MARIS	7.1 7.2 7.3	Vocabularies SeaDataNet EMODnet	Dick Schaap dick@maris.nl	Represented by Peter Thijssen peter@maris.nl
MARUM- UNIHB	7.0 7.1 7.2 7.3	Coordination GEOSS Standardization	Christoph Waldmann waldmann@marum.de Ketil Koop-Jakobsen kjakobsen@marum.de	Present Present
NERC/BODC	7.1 7.2 7.3	Standardization DOI Interoperability tools	Justin Buck juck@bodc.ac.uk Louise Darroch louise.darroch@bodc.ac.uk	Present Not present
NERC/BODC	7.1 7.3	Sea Level	Lesley Rickards ljr@bodc.ac.uk	Present
NERC/NOC	7.1 7.2 7.3	OceanSITES	Helen Snaith h.snaith@bodc.ac.uk	Present
SAHFOS	7.1 7.2 7.3 7.5	CPR	Martin Edwards maed@sahfos.ac.uk Derek Broughton derbro@sahfos.ac.uk	Present Present
UiB	7.1 7.2 7.3	Carbon	Benjamin Pfeil benjamin.pfeil@gfi.uib.no	Present
University of Exeter	7.1 7.2 7.3	SOOP	UTE Schuster U.Schuster@exeter.ac.uk	Present



Institute	Tasks	Main Skill	Name	Attendance
VLIZ	7.1 7.2 7.3	EurOBIS	Klaas Deneudt klaas.deneudt@vliz.be	Represented by Francisco Souza Diaz francisco.souzadiaz@vliz.be
VLIZ	7.1 7.2 7.3	EMODnet	Simon Claus simon.claus@vliz.be	Represented by Francisco Souza Diaz francisco.souzadiaz@vliz.be
SeaScape/ EMODnet Secretariat	7.1 7.2 7.3	EMODnet	Jan-Bart Calewaert janbart.calewaert@emodnet.eu Belen Martin-Miguez belen.martin-miguez@emodnet.eu	Not present Partially
Ifremer	WP4	WP4 leader	Patrick Farcy Patrick.Farcy@ifremer.fr	Not present
MERCATOR Ocean	7.4	Task 7.4 coordination	Yann Drillet yann.drillet@mercator-ocean.fr	Represented by Elisabeth Remy elisabeth.remy@mercator-ocean.fr
MERCATOR Ocean	7.5	Task 7.5 coordination	Pierre-Yves Le Traon pierre-yves.letraon@mercator-ocean.fr	Represented by Stephanie Guinehut
PML	7.5	Biogeochemical EOVs from satellite and bio-Argo measurement	Giorgio Dall'Olmo gdal@pml.ac.uk	Present
CLS	7.4 7.5	Environmental monitoring	Stephanie Guinehut sguinehut@cls.fr	Present
EuroGOOS	WP1	WP1	Erik Buch erik.buch@eurogoos.eu	Partially (morning)
PML	7.5 WP2	Marine Biogeochemistry and Ocean observations	Tim Smyth tjasm@pml.ac.uk	Present
BRUNCIN	WP3	WP3	Lovro Valcic lovro@bruncin.com	Present