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Table of contents

Executive summary

Management of metadata is a central piece of the European Ocean Observing System (EOOS). This document reports on the progress made on this topic for the European glider network and how this effort led by the European community is impacting the international program OceanGliders.

Thanks to the EuroSea project, the European glider community managed to re-organize the way metadata has been handled since the community started to work on glider data management. This new approach based on the use of online community tools has been endorsed by the international community and will increase user engagement on this topic through an effective, inclusive, open, transparent, and asynchronous way to share and build knowledge.

The tremendous progress made regarding glider metadata management so far, led by EuroSea D3.10 members, allows the European glider community to ambition the implementation of the FAIR principles. Thus, machine-to-machine metadata sharing in the coming years will be improving the European capacity to monitor glider activity and use glider data. The release of the OceanGliders 1.0 format will set the baseline for all glider data sets in the world. It will integrate the progress made by the EuroSea D3.10 team. This task contributed to the great improvement of glider data management in Europe, and also strongly influenced the data management approach of OceanGliders, the glider program of the Global Ocean Observing System.

1. Introduction: Metadata, fuel for FAIR and network monitoring

Effective data management requires collaboration across activities including observations, metadata and data assembly, quality assurance and control (QA/QC), and data publication that enables local and interoperable discovery and access and secures archiving that guarantees long-term preservation. To achieve this, data should be findable, accessible, interoperable, and reusable (FAIR).[1]

Metadata is a central piece to reaching FAIR data principles (Findable, Accessible, Interoperability, Reusable). The principles emphasise machine-actionability (i.e., the capacity of computational systems to find, access, interoperate, and reuse data with no or minimal human intervention) because humans increasingly rely on computational support to deal with the continuously increasing volume, complexity, and creation speed of data. To become findable**,** a dataset requires Unique Resource Identifier (URI) and must be described by standardized and rich metadata. Accessible means that data and all metadata should be retrievable by using the URI. Interoperability can be reached if metadata are constrained against shared and accessible vocabularies that must be understood by machines. Finally, the reusable principle implies the fulfilment of the three previous principles, plus the necessity to have metadata sufficiently described to be integrated with other data sources.

In addition to this overarching objective of reaching the FAIR principles, metadata are essential to monitoring the operation at sea, data quality and data flow. Moving from manual metadata harvesting and curation from

[1] Quote from Frontiers | Ocean FAIR Data Services (frontiersin.org)

an “operation centre” information system to an automated and operational monitoring system is one of the great challenges for the EU glider community.

Both objectives, FAIR principles implementation and improving the monitoring of the glider network are sharing the same needs of high quality, common, rich and controlled metadata. This deliverable report is on the progress made in the management of metadata for the glider community toward these two objectives.

2. The OG1.0 format

Since the start of the EuroSea project, a complete rethinking of data management is being discussed in the framework of the OceanGliders program, the glider program of the Global Ocean Observing System. The progress made on metadata management within EuroSea is fully integrated into this global international effort led by Europe.

One of the major milestones of this international community effort is the harmonisation of the different glider data formats used by OceanGliders partners around the world into one single common format named OG1.0 (standing for OceanGliders 1.0 format). This work, which is shared on the OceanGliders Github repository[2], encompasses the global data architecture, the formats, the community best practices, and the metadata. This document will report on the progress made on the metadata side only. Note that the launch of this critical tool has been made possible thanks to the EuroSea D3.9-Glider network, European coordination.

2.1. Alignment with the international standard

As a prerequisite to the definition of the metadata content, a high-level requirement of the OceanGliders data management team is to align OG1.0 with the existing metadata international standards. Several exist and are briefly described below.

Climate and Forecast metadata convention

“The Climate and Forecast (CF) Metadata Conventions are intended to promote interoperability among data providers, data users, and data services by providing a clear and unambiguous standard for representing geolocations and times of Earth science data, physical quantities that the data represent, and other ancillary information useful in interpreting the data or comparing it with data from other sources “

Other networks like Argo and OceanSITES are following this convention on metadata. Sticking with CF standards will make OG1.0 more interoperable with the other data format of the different observing networks format within EuroSea and outside.

Attribute Convention for Data Discovery (ACDD)

OG1.0 is a NetCDF data format. Consequently, the dataset is described by a list of global attributes, while variables are described by a list of variable attributes. Both global and variable attributes are metadata. ACDD define the recommended attributes for a proper description of the NetCDF dataset.

Following the ACDD 1.3 convention is crucial to increase OG1.0 discoverability.

[2] https://github.com/OceanGlidersCommunity/OG-format-user-manual

GOOS Observation Coordination Group / OceanOPS standard

Against standards like ACDD and CF., the Global Ocean Observing System, and its monitoring centre OceanOPS has recently released its own international standard for GOOS (Global Ocean Observing System) networks[3]. Such requirement is constraining further the information required in the data sets of the different GOOS programs.

Being compliant with the specific international GOOS standard will strongly increase the capacity to monitor the network.

It is important to note that the future OG1.0 format will be fully compliant with the three standards described above. This alignment is strongly impacting the metadata management of the international and European glider communities. This is an important step for the OceanGliders network to have now a data and metadata management system in line with international recommendations. It demonstrates the maturity of the network and the strong willingness to contribute to the international ocean observing effort.

2.2. A format constrained against control vocabularies

To harmonize metadata management, the OG1.0 format is constrained against controlled vocabularies. Those are collections of concepts common to all data providers and used to describe the dataset and the variables collected by the gliders. Controlled vocabularies are critical for the reusability and discoverability of the datasets.

A document describing the different concepts constrained by controlled vocabularies is available in the annexe of this report. The live google document[4] currently shared by the OG1.0 development team is available online and being reviewed before the official release of the OG1.0 format.

It is important to note that the management of vocabularies will evolve from a google doc to the OceanGliders community GitHub repository[5] following the OceanGliders best practices requirements.

2.3. Governance of vocabularies

One of the difficulties with metadata management is the definition, diffusion, and maintenance of the collections of vocabularies.

It has been agreed to use the NERC Vocabulary Server (NVS[6] hereafter) to display the most up-to-date collections. This system allows quick access to the collection of metadata with their definitions. Each concept is linked with a URI that makes the information both machine and human readable. The first collection for the OceanGliders program on NVS (*Ocean Glider Network Parameter Usage Vocabulary*) is accessible online[7]. This allows anyone to request publicly new concepts on any collections governed by the OceanGliders data management team.

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[3] https://www.ocean-ops.org/metadata/

[4] https://docs.google.com/document/d/1dN90xkw9oCbLs0sPPhOmszdOjLpwcqxiK5mjeZP7abA/edit#heading=h.5qmhjfogkkix

[5] https://github.com/OceanGlidersCommunity/OG-format-user-manual/blob/main/src/OG_Vocabulary.adoc

[6] https://vocab.nerc.ac.uk/search_nvs/

[7] https://vocab.nerc.ac.uk/search_nvs/OG1/?searchstr=&options=identifier,preflabel,altlabel,status_accepted&rbaddfilter=inc&searchstr2

In addition, the governance of each vocabulary is decided amongst the OceanGliders data management team. Such agreement will be made official with the release of the format. A dedicated GitHub community repository will serve as the entry point to suggest publicly new concepts to be included in the different collections.

Thanks to this effort, the governance of vocabularies has been clarified and made accessible to any partner of the glider community in Europe and beyond. This is a huge improvement in terms of transparency and accessibility for the OceanGliders community.

3. Community engagement on glider metadata management

The last 2 years have been dedicated to re-define the common base for metadata management for the OceanGliders community. This effort has been made possible thanks to the development of the OceanGliders Github repository[8] initiated by the Best Practices online meeting[9] organized in May 2021 with the support of EuroSea. The OceanGliders Oxygen Standard Operation Procedure (SOP)(Lopez-Garcia et al., 2022) was published in the OceanBestPractice[10] repository and endorsed by GOOS in the first SOP coming out from this community work. This initiative to create a "technical social media" where the international glider community is sharing and creating knowledge together has led to the creation of new repositories dedicated to data management, meeting reports, and training.

More recently, we also organized a European glider data management meeting in June 2022 (see minutes here[11]) where we also discussed metadata-related issues with a large audience of data managers, glider operators, and PIs.

Both meetings were very successful and are two relevant milestones to progress on glider metadata management. The interest of the glider community in these topics is important, with more than 100 individuals attending each. This is showing strong potential to engage collectively on those themes.

The GitHub approach is an important change of paradigm for the international glider community. It turns the governance from a vertical organisation to a horizontal one, where anyone can easily suggest the evolution of the common format, the rules, or the best practices. In the context of metadata, such a tool will become very powerful when the glider data management community will buy into the process.

Indeed, despite the interest shown by the number of attendees to the different meetings described above, the contribution of members to the GitHub data management repository remains quite low. Few people, mostly the ones engaged in the OceanGliders data management team, are actively contributing to the metadata management while many can already access it. However, we are confident in the fact that when the OG1.0 will be adopted this approach will be adopted too.

One of the key challenges in the next years will be to involve more people in the construction of the metadata management of the OG1.0. Demonstrating the added value of such a system and training people to this tool

[8] https://github.com/OceanGlidersCommunity
[9] https://eurosea.eu/download/news_and_events/OceanGliders-Best-Practices-Workshop-May-2021.pdf
[10] https://repository.oceanbestpractices.org/
[11] https://github.com/OceanGlidersCommunity/meeting_notes

while giving ownership, is certainly a challenge for next the years. Without stronger community support, we may miss part of the strength of this horizontal approach and part of the power of such a tool.

4. Cooperation with other EuroSea Work Packages

Metadata is a key element to achieve the FAIR principle. FAIR is also a requirement from WP4 in charge of data integration and assimilation. During EuroSea we had the chance to cooperate with WP4, under the task 4.1 (assimilation in the global and north-east Atlantic (IBI) Copernicus Marine modelling system and analysis/forecast quality assessment) and task 4.2 (Assimilation in the Mediterranean Sea Copernicus Marine modelling system and analysis/forecast quality assessment). The two tasks (4.1 and 4.2) experimented glider's data assimilation to produce forecasts and analysis. This cooperation highlighted the importance of a standardised and complete metadata description to understand how data were acquired and what is the level of quality of the data sets.

Even though this is a bit out of the scope of this report, it is important to highlight that this cooperation on metadata led to a poster, (see annexe 2) produced in collaboration with T4.1 and T4.2 leads and advertised during the EuroSea/OceanPredict workshop[12] in June 2022.

The WP1 of EuroSea on system governance has demonstrated (D1.6: maps and metrics on observing system and metadata[13]) the importance of metadata to monitor and pilot Ocean Observing Systems. In collaboration with WP1, we have identified key elements that must be included in the different network metadata management to achieve OOS monitoring. Amongst them, controlled vocabularies have been implemented in the OG1.0, based on T1.2 requirements.

5. Conclusion

Initiated by Europe and strongly supported by the EuroSea project, the glider community turned a corner in the data and metadata management governance with the promotion and operational use of the OceanGliders GitHub repository[14]. Considered a “technical social media” at the services of the glider international community, recent evolutions of the common format, current discussions on related issues and the important progress made on metadata management are publicly visible and can be debated. This is an important step forward to sharing and creating knowledge together as a community.

In addition to this evolution, the OG1.0 format and the related metadata have been completely re-discussed amongst an international team of experts, including EuroSea partners, to align with international standards, EuroSea WP4 and WP1 requirements and glider operator and data management needs. This led to a better structure of metadata management with controlled vocabularies, coming along with the level of need (mandatory, high desirable, requested), and managed through a European tool (NVS) particularly efficient for discovery and machine-to-machine use.

[12] https://oceanpredict.org/events/eurosea-oceanpredict-workshop-on-ocean-prediction-and-observing-system-design/#event-overview
[13] https://doi.org/10.3289/eurosea_d1.6
[14] https://github.com/OceanGlidersCommunity

However, this very important and structuring effort will only become a reality when the OG1.0 format will be officially released. This will hopefully happen before the end of the EuroSea project. The success of this task will also be materialized by a growing community engagement in the GitHub tool developed during the EuroSea project.

Finally, thanks to EuroSea support with dedicated human resources for the improvement of the European Glider network structuration, and in collaboration with T3.9 (Glider network, European coordination), we have been able to take the European and International glider network, to the next level of coordination moving from an unclear vertical organization to a more transparent horizontal approach on data and metadata management that was strongly lacking in the last decade.

References

López-García,, P., Hull, T., Thomsen, S., Hahn, J., Queste, B.Y, et al (2022) OceanGliders Oxygen SOP, Version 1.0.0. OceanGliders, 55pp. DOI: http://dx.doi.org/10.25607/OBP-1756. (GitHub Repository, OceanGliders Oxygen SOP. Available: https://oceangliderscommunity.github.io/Oxygen_SOP/sections/authors_SOP_development_process.html

Annexe 1: OG1.0 metadata collections

You can find the most up to date version of this document here.

This annexe is a copy paste of the google document shared by partners to work on the different collection of OceanGliders format. You can find comments and request for modifications on line.

OG1.0 – Control vocabularies

This document describes the OceanGliders requirements on global attributes and variable attributes. This is a first draft that needs edition from data management team.

Overview

Control vocabularies contribute to standardizing the information provided by the glider community in the OG1.0 format. It is part of the data management strategy to implement the FAIR principles.

The following element of OG1.0 falls under control vocabulary procedure. The aim is to manage the content of key elements of the format (variable and attribute), to build interoperability within the data providers and across networks. It is also required to implement part of the FAIR principles.

Each element of each collection listed below are agreed by the OceanGliders data management team. It is associated with a "short_name", a "long_name", a definition, and an uri (unique resource identifier). Host and manager of each collection is identified in the table below.

Metadata field	Vocabulary exists	Link to vocabulary	host	Possible governance
platform	yes	http://vocab.nerc.ac.uk/collection/L06/current/25/	NVS	SeaVox
site	No		NVS	OceanOPS
contributors_role	No		NVS	OceanGliders
agencies_role	No		NVS	OceanGliders
agencies_id	Yes	https://edmo.seadatanet.org/	Maris	SeaDataNet
rtqc_method	No		?	OceanGliders
phase_calculation_method	No		?	OceanGliders

Metadata field	Vocabulary exists	Link to vocabulary	host	Possible governance
platform_type	No	http://vocab.nerc.ac.uk/collection/L06/current/27/	NVS	OceanGliders
platform_model	Yes	http://vocab.nerc.ac.uk/collection/B76/current/	NVS	OceanGliders
ICES_code	Yes	https://ocean.ices.dk/codes/ShipCodes.aspx	ICES, mirrored in NVS C17)	ICES
platform_maker	Yes	http://vocab.nerc.ac.uk/collection/B75/current/	NVS	OceanGliders
battery_type	No		NVS	OceanGliders
telecom_type	No		NVS	OceanGliders
tracking_system	No		NVS	OceanGliders
sensor_model	Yes	http://vocab.nerc.ac.uk/collection/L22/current/	NVS	OceanGliders
data_mode	No		NVS	OceanGliders
phase	No		NVS	OceanGliders
variable names	Yes	http://vocab.nerc.ac.uk/collection/OG1/current/	NVS	OceanGliders

Management of the evolution of OG1.0 controlled vocabularies.

The data management board of OceanGliders will maintain its reference table autonomously. BODC will complement OG1.0 vocabulary and map it to master lists that cover more than the network's needs.

Collections

platform

Url	Short_name	Long_name	Definition	Status
http://vocab.nerc.ac.uk/collection/L06/current/25/	Autonomous underwater vehicle	Autonomous underwater vehicle	A free-roving platform operating in the water column with propulsion but no human operator on board .	approved

Master list: http://vocab.nerc.ac.uk/collection/L06/current/

Host: NERC Vocabulary Server

Management: OceanGliders

Note: “platform” does not refer to a collection but a single value for all ocean gliders.

sites

Sites listed here are under discussion within the data management group. This vocabulary collection is not approved yet. The definition of sites needs review and agreement

Url	Short_name	Long_name	Definition	Status
	53° North	53° North	LINESTRING (-52.00 53.00,-49.90 53.00)	
	A05	Atlantic Ocean 5	LINESTRING (-14.21 27.62, -13.4 27.92, -15.30 28.00)	
	Agulhas, GINA	Gliders in the Agulhas Experiment	POLYGON ((26.50 -34.50, 27.50 -34.50, 33.00 -29.500, 32.700 -27.80, 32.41 -28.54, 31.15 -29.80, 30.42 -30.96, 28.46 -32.811, 27.242 -33.574, 26.500 -34.500))	

Url	Short_name	Long_name	Definition	Status
	Alter Eco	Alternative framework to assess marine Ecosystem dunctioning in the shelf seas	LINESTRING (2.1 55.2, 2.12 56.5)	
	AntarcticPeninsula	Antarctic Peninsula	LINESTRING (-65 -64.35, -67 -63.75)	
	BaffinDavis	Baffin Davis	LINESTRING (-60.43 66.72, -56.8 67)	
	Bahamas1	Bahamas 1	LINESTRING (-75 25, -75 5)	
	Bahamas2	Bahamas 2	LINESTRING (-74.5 25.4, -76 25.4)	
	Balearic - Canales C1	Balearic - Canales C1	LINESTRING (2.3 39.48, 1.62 39.15, 1.4 39.14, 1.25 39.1, 1.2 39, 1.1 38.95, 0.1 38.9)	
	Balearic - NAlgeria C2	Balearic Island North Algeria C2	LINESTRING (3.15 39. 4.37 37)	
	Balearic . Sardinia C3	Balearic . Sardinia C3	LINESTRING (8.085 39.8, 4.585 39.83)	

Url	Short_name	Long_name	Definition	Status
	Baltic Sea - Saaremaa Line	Baltic Sea - Saaremaa Line	POLYGON ((144.007 -39.470, 144.183 -39.630, 144.261 -39.852, 144.177 -40.046, 144.007 -40.216, 144.020 -41.241, 144.652 -41.244, 144.642 -41.127, 144.606 -41.051, 144.578 -41.004, 144.579 -40.924, 144.660 -40.855, 144.629 -40.716, 144.650 -40.471, 144.695 -40.364, 144.896 -40.357, 144.986 -40.395, 145.101 -40.686, 145.231 -40.696, 145.379 -40.806, 145.512 -40.836, 145.582 -40.882, 145.739 -40.931, 145.908 -41.013, 146.138 -41.099, 146.368 -41.136, 146.530 -41.104, 146.695 -41.050, 146.861 -41.006, 146.936 -40.998, 146.984 -40.956, 147.167 -40.979, 147.234 -40.926, 147.331 -40.909, 147.449 -40.962, 147.533 -40.878, 147.583 -40.770, 147.622 -40.746, 147.702 -40.784, 147.838 -40.847, 147.884 -40.783, 147.895 -40.716, 148.022 -40.691, 148.156 -40.710,	

Url	Short_name	Long_name	Definition	Status
			148.253 -40.790, 148.316 -40.890, 148.363 -40.995, 148.315 -41.140, 148.415 -41.259, 148.529 -41.253, 148.606 -41.252, 148.605 -40.917, 148.575 -40.480, 148.499 -39.917, 148.453 -39.924, 148.374 -39.982, 148.331 -40.078, 148.409 -40.203, 148.516 -40.356, 148.547 -40.474, 148.190 -40.613, 147.979 -40.530, 147.711 -40.321, 147.665 -40.115, 147.675 -39.819, 147.844 -39.642, 148.015 -39.618, 148.205 -39.844, 148.453 -39.924, 148.500 -39.917, 148.254 -37.874, 148.014 -37.933, 147.385 -38.274, 146.862 -38.694, 146.735 -38.751, 146.595 -38.825, 146.560 -38.921, 146.533 -39.043, 146.509 -39.129, 146.388 -39.188, 146.266 -39.158,146.189 -39.091, 146.174 -38.930, 146.064 -38.863, 145.994 -38.938, 145.928 -38.938, 145.886 -38.906, 145.727 -38.689, 145.650 -	

Url	Short_name	Long_name	Definition	Status
			38.705, 145.533 - 38.681, 145.452 - 38.600, 145.331 - 38.599, 145.202 - 38.554, 145.022 - 38.526, 144.883 - 38.535, 144.829 - 38.487, 144.593 - 38.330, 144.586 - 38.326, 144.440 - 38.335, 144.234 - 38.439, 144.083 - 38.513, 143.978 - 38.619, 144.007 - 39.470, 144.007 - 39.470))	
	BarrowCanyon	Barrow Canyon	POLYGON ((-149.733 72.35, -155.66 73.5, -158.483 72.283, -152.15 71.05, -149.733 72.35))	

Url	Short_name	Long_name	Definition	Status
	BassStrait	Bass Strait	POLYGON ((144.007 -39.470, 144.183 -39.630, 144.261 -39.852, 144.177 -40.046, 144.007 -40.216, 144.020 -41.241, 144.652 -41.244, 144.642 -41.127, 144.606 -41.051, 144.578 -41.004, 144.579 -40.924, 144.660 -40.855, 144.629 -40.716, 144.650 -40.471, 144.695 -40.364, 144.896 -40.357, 144.986 -40.395, 145.101 -40.686, 145.231 -40.696, 145.379 -40.806, 145.512 -40.836, 145.582 -40.882, 145.739 -40.931, 145.908 -41.013, 146.138 -41.099, 146.368 -41.136, 146.530 -41.104, 146.695 -41.050, 146.861 -41.006, 146.936 -40.998, 146.984 -40.956, 147.167 -40.979, 147.234 -40.926, 147.331 -40.909, 147.449 -40.962, 147.533 -40.878, 147.583 -40.770, 147.622 -40.746, 147.702 -40.784, 147.838 -40.847, 147.884 -40.783, 147.895 -40.716, 148.022 -40.691, 148.156 -40.710,	

Url	Short_name	Long_name	Definition	Status
			148.253 -40.790, 148.316 -40.890, 148.363 -40.995, 148.315 -41.140, 148.415 -41.259, 148.529 -41.253, 148.606 -41.252, 148.605 -40.917, 148.575 -40.480, 148.499 -39.917, 148.453 -39.924, 148.374 -39.982, 148.331 -40.078, 148.409 -40.203, 148.516 -40.356, 148.547 -40.474, 148.190 -40.613, 147.979 -40.530, 147.711 -40.321, 147.665 -40.115, 147.675 -39.819, 147.844 -39.642, 148.015 -39.618, 148.205 -39.844, 148.453 -39.924, 148.500 -39.917, 148.254 -37.874, 148.014 -37.933, 147.385 -38.274, 146.862 -38.694, 146.735 -38.751, 146.595 -38.825, 146.560 -38.921, 146.533 -39.043, 146.509 -39.129, 146.388 -39.188, 146.266 -39.158,146.189 -39.091, 146.174 -38.930, 146.064 -38.863, 145.994 -38.938, 145.928 -38.938, 145.886 -38.906, 145.727 -38.689, 145.650 -	

Url	Short_name	Long_name	Definition	Status
			38.705, 145.533 - 38.681, 145.452 - 38.600, 145.331 - 38.599, 145.202 - 38.554, 145.022 - 38.526, 144.883 - 38.535, 144.829 - 38.487, 144.593 - 38.330, 144.586 - 38.326, 144.440 - 38.335, 144.234 - 38.439, 144.083 - 38.513, 143.978 - 38.619, 144.007 - 39.470, 144.007 - 39.470))	
	BATS Glider	Bermuda Atlantic Time-series Study	POLYGON ((-64.6 32.2, -64.4 32.4, -63.8 31.8, -64.2 31.5, -64.6 32.2))	

Url	Short_name	Long_name	Definition	Status
	BoB1	Bay of Bengal 1	LINESTRING (80.5 5.5, 80.5 2)	
	BoB2	Bay of Bengal 2	LINESTRING (82 8, 85.5 8)	
	Bonavista section	Bonavista section	LINESTRING (-52.967 48.73, -47.95 50.33)	
	CaboFrio	Cabo Frio	LINESTRING (-41.19 -23.51,-40.61 -23.91)	
	Calvert Island	Calvert Island	LINESTRING (-128.6 51.4, -128.2 51.69)	
	CONVEX	Convex	LINESTRING (17.1 41.42, 18.18 42.3)	
	Cretan Line	Cretan Line	LINESTRNIG (26.166 35.75, 25 35.78, 23.66 35.95)	
	CUGN66	California Underwater Current Network 66	LINESTRING (-121.84 36.9, -125.68 35.08)	
	CUGN80	California Underwater Current Network 80	LINESTRING (-120.48 34.48, -123.9 32.82)	
	CUGN90	California Underwater Current Network 90	LINESTRING (-117.755 33.5, -122.62 31.1)	
	CUGNAlong	California Underwater Current Network along	LINESTRING (-120 32.42-121.15 34.15)	

Url	Short_name	Long_name	Definition	Status
	DR1	Dominican Republic 1	LINESTRING (-69.1 17.885, -69.66 15.6)	
	DR2	Dominican Republic 2	LINESTRING (-69 15.4, -68.48 17.58)	
	EAC1	Eastern Australia Current 1	POLYGON ((152.770 -33.020, 153.110 -32.439, 153.690 -31.090, 153.620 -30.350, 153.989 -29.469, 153.489 -29.399, 153.370 -29.799, 153.230 -30.369, 153.129 -30.799, 153.170 -30.979, 153.079 -31.229, 153.000 -31.489, 152.850 -31.789, 152.649 -32.129, 152.620 -32.489, 151.850 -33.069, 151.620 -33.279, 151.300 -34.029, 151.600 -34.100, 151.850 -34.149, 152.770 -33.020))	
	EAC2	Eastern Australia Current 2	POLYGON ((151.750 -34.379, 151.950 -34.039, 152.770 -33.039, 153.230 -32.159, 152.640 -32.109, 152.620 -32.489, 152.059 -32.899, 151.660 -33.260, 151.430 -33.709, 151.290 -34.029, 150.980 -34.309, 150.950 -34.489, 151.329 -34.569, 151.600 -34.639, 151.750 -34.379))	

Url	Short_name	Long_name	Definition	Status
	EAC3	Eastern Australia Current 3	POLYGON ((150.600 -36.609, 150.739 -36.049, 151.670 -34.510, 150.980 -34.359, 150.940 -34.619, 150.800 -34.889, 150.899 -34.979, 150.800 -35.219, 150.640 -35.239, 150.489 -35.439, 150.360 -35.719, 150.210 -35.939, 150.180 -36.100, 150.210 -36.260, 150.120 -36.449, 150.110 -36.590, 150.000 -36.829, 149.969 -37.069, 150.550 -37.260, 150.600 -36.609))	
	EAC27 - inflow	Eastern Australia Current 27 inflow	LINESTRING (153.6 -27.51, 154.4 -27.32, 155.2 -27)	
	EAC36	Eastern Australia Current 36	LINESTRING (150.25000000 -36.25000000,151 -36.39,151.7 -36.5)	
	EasternLevantine	Eastern Levantine	POLYGON ((32 33,34 33,34 34.9,33 34.5,32.45 3,32 35, 32 33))	
	Fimbul	Fimbul	LINESTRING (5 -69,5 -67)	
	Fram	Fram Strait	LINESTRING (9 78.833,-7 78.833)	
	Gimsoy	Gimsoy	LINESTRING (13 68.78, 8.8 70.167)	

Url	Short_name	Long_name	Definition	Status
	GIRONA	GIRONA	LINESTRING (3.1 41.5,3.55 40.1)	
	GoM	Gulf of Mexico	POLYGON ((-85.01 26.80, -87.08 28.25000191, -89.47 28.43, -90.4 27.97, -92.93 26, -87.36 25.62, -84.55 24.2, -85 26.8))	
	GreatAustralianBay	Great Australian Bay	POLYGON ((135.503 -35.042, 135.042 -34.597, 134.946 -33.945, 134.555 -33.546, 134.287 -33.286, 133.877 -32.738, 133.251 -32.640, 133.137 -32.366, 132.636 -32.125, 132.259 -32.278, 131.953 -32.069, 131.230 -31.672, 130.445 -31.737, 129.726 -31.752, 128.892 -31.931, 127.122 -32.375, 126.058 -32.510, 124.495 -33.126, 124.049 -36.465, 135.537 -36.509, 135.503 -35.042, 135.503 -35.042))	

Url	Short_name	Long_name	Definition	Status
	GreatBarriereReef	Great Barriere Reef	POLYGON ((142.546 -10.667, 142.670 -10.734, 142.809 -11.017, 142.915 -11.374, 142.912 -11.743, 142.994 -11.878, 143.111 -11.859, 143.288 -11.974, 143.172 -12.283, 143.316 -12.374, 143.335 -12.524, 143.472 -12.610, 143.403 -12.817, 143.551 -12.833, 143.544 -13.027, 143.544 -13.174, 143.544 -13.311, 143.594 -13.363, 143.611 -13.424, 143.600 -13.533, 143.557 -13.735, 143.706 -14.015, 143.754 -14.234, 143.865 -14.439, 143.999 -14.456, 144.150 -14.343, 144.175 -14.201, 144.220 -14.114, 144.309 -14.141, 144.327 -14.235, 144.445 -14.202, 144.487 -14.139, 144.545 -14.143, 144.614 -14.258, 144.670 -14.346, 144.685 -14.481, 144.784 -14.537, 144.922 -14.588, 145.031 -14.752, 145.241 -14.817, 145.394 -14.970, 145.393 -15.246, 145.371 -15.554, 145.514 -16.023,	

Url	Short_name	Long_name	Definition	Status
			145.559 -16.308, 145.535 -16.465, 145.762 -16.796, 145.942 -16.828, 146.031 -16.900, 146.011 -17.051, 146.147 -17.465,146.205 -17.666, 146.346 -18.225, 146.518 -18.510, 146.758 -18.741, 147.047 -19.139, 147.371 -19.263, 147.479 -19.275, 147.803 -19.647, 148.075 -19.810, 148.413 -19.915, 148.916 -19.973, 149.130 -20.001, 149.465 -20.010,150.010 -20.020,147.081 -13.839,144.893 -10.679,142.546 -10.667,142.546 -10.667))	
	GreenlandSea	Greenland Sea	LINESTRING (2.0 73.50,-7.80 76.40)	
	GulfStream	Gulf Stream	POLYGON ((-79.32 25.5,-79.333 25.661,-79.086 26.744,-78.5 27.4,-78.4 29.4,-71 34.5,-66 37,-66 40,-71.25 40,-73.1 39,-75 35.7,-75.52 35.213,-80.25 31,-80 26.8,-80.072 25.913,-80.122 25.5,-79.32 25.5))	
	Halifax section	Halifax section	LINESTRING (-63.32 44.265, -61.43 42.48)	

Url	Short_name	Long_name	Definition	Status
	Hawaii	Hawaii	LINESTRING (-158 22.75,-157 34.50)	
	IcelandSea	Iceland Sea	LINESTRING (-10 70.63,-19.6 71)	
	Isreali Glider Monitoring Area	Isreali Glider Monitoring Area	POLYGON ((34.95 32.8,34.65 32.9,34.3 31.9,34.62 31.8,34.95 32.8))	
	Kimberley	Kimberley	POLYGON ((120.026 -18.515, 121.675 -18.515, 121.746 -18.428, 122.047 -18.293, 122.189 -18.158, 122.124 -18.011, 122.131 -17.758, 122.083 -17.544, 122.064 -17.223, 122.400 -16.879, 122.511 -16.686, 122.509 -15.011, 120.010 -15.003, 120.026 -18.515, 120.026 -18.515))	
	KW2JVille	Key West to Jaksonville	LINESTRING (-81.83 24.24, -80.62 24.35, -79.6 25.70, -80 26.1, -79.5 26.73, -79.45 28.00, -79.7 29.60, -79.90 30, -80.20 30.3)	

Url	Short_name	Long_name	Definition	Status
	Leeuwin	Leewin	POLYGON ((114.906 -34.246, 114.855 -33.735, 114.864 -33.545, 115.062 -33.424, 115.346 -33.577, 115.609 -33.204, 115.567 -32.633, 115.615 -32.151, 115.713 -31.974, 115.579 -31.691, 115.367 -31.340, 115.147 -30.846, 115.050 -30.638, 114.965 -30.349, 114.942 -30.214, 114.891 -30.026, 114.869 -29.725, 114.816 -29.335, 114.629 -29.031, 114.535 -28.758, 110.505 -28.783, 110.505 -34.263, 114.906 -34.246, 114.906 -34.246))	
	Line 106	Line 106	LINESTRING (129.0633 37.895,129.3683 37.895,129.6883 37.895,130 37.895,130.315 37.895,130.6283 37.895,130.9417 37.895,131.2517 37.895,131.5527 37.895)	
	LineP	Line to PAPA Site	LINESTRING (-125 48.6, -145.00 50)	
	Lofoten	Lofoten	LINESTRING (15 69.83, -5.00000000 69.83)	

Url	Short_name	Long_name	Definition	Status
	MackenzieTrough	Mackenzie Trough	POLYGON ((-134.816 70.366, -136 71.50, -140.866 71.366, -140.600 69.933, -137.65 69.55, -134.82 70.366))	
	Marica	Marica	LINESTRING (-42.325 -23.63, -41.64 -25)	
	Mindanao	Mindanao	LINESTRING (126.6 8.15, 130 8.76)	
	MohnRidge	Mohn Ridge	LINESTRING (4.5 72.2,2 73.50)	
	Moose_T00	Mediterranean Ocean Observing System Transect 00	LINESTRING (7.3 43.65, 7.92 43.4, 8.68 42.67)	
	Moose_T02	Mediterranean Ocean Observing System Transect 02	LINESTRING (5.22 43.07,5.21 42.65, 4.67 42.035, 4.15 40.175)	
	NCalifornia1	North California 1	LINESTRING (-124.372 41.05, -130 41.05)	
	NEC	North Equatorial Current	LINESTRING (134.31 8.50, 134.30 17.00,)	

Url	Short_name	Long_name	Definition	Status
	NorthWesternAustralia	North Western Australia	POLYGON ((113.437 -23.001, 113.737 -22.206, 113.864 -21.867, 114.064 -21.640, 115.225 -21.381, 115.191 -21.110, 115.240 -20.800, 115.370 -20.379, 115.614 -20.297, 116.188 -20.796, 116.406 -20.582, 116.558 -20.415, 116.858 -20.328, 117.130 -20.396, 117.175 -20.575, 117.271 -20.674, 117.402 -20.689, 117.755 -20.537, 117.889 -20.424, 118.133 -20.305, 118.236 -20.266, 118.371 -20.294, 118.574 -20.260, 118.739 -20.254, 118.831 -20.130, 118.944 -20.011, 119.059 -19.930, 119.217 -19.907, 119.398 -19.918, 119.604 -19.986, 119.692 -19.903, 120.052 -19.828, 120.010 -17.016, 110.003 -17.027, 110.013 -23.013, 113.437 -23.001, 113.437 -23.001))	
	NPR1	North Puerto Rico 1	LINESTRING (-66.65 18.9, -67.04 20.57, -66.75 21.75)	

Url	Short_name	Long_name	Definition	Status
	NPR2	North Puerto Rico 2	LINESTRING (-66 18.9, -66 21.75)	
	NRedSea	North Red Sea	LINESTRING (35 27, 35.60 27.35)	
	Nvancouver	North Vancouver	LINESTRING (-128.25 50.25, -135.25 48.25)	
	NWEuropeSlope	North western European Slope	LINESTRING (-8 56.5, 9.5 56.5)	
	OOI - 126W	Ocean Observatories Initiative – 126W	LINESTRING (-126.00 47.92, -126.00 43.50)	
	OOI - Cape Falcon Line	Ocean Observatories Initiative – Cape Falcon Line	LINESTRING (-124.00 45.77, -126.00 45.80)	
	OOI - Coastal Pionneer Array	Ocean Observatories Initiative – Coastal Pionneer Array	POLYGON ((-71.17 39.1,-70 39.1,-70 40.67,-71.17 40.67,-71.17 39.1))	
	OOI - Coos Bay Line	Ocean Observatories Initiative - Coos Bay Line	LINESTRING (-124.30 43.50, -126.00 43.50)	
	OOI - Global Argentina Bassin	Ocean Observatories Initiative – Global Argentina Bassin	POLYGON ((-42.88 -42.892,-42.1255 -42.496,-42.978 -42.4957,-42.88 -42.892))	
	OOI - Global Irminger Sea	Ocean Observatories Initiative – Global Irminger Sea	POLYGON ((-39.883 59.77,-39.46 60,-39.20 59.95,-39.883 59.77))	
	OOI - Global Southern Ocean	Ocean Observatories	POLYGON ((-89.5529 -54.1256,-89.9338 -54.0803,-	

Url	Short_name	Long_name	Definition	Status
		Initiative – Global Southern Ocean	89.24 -54.47,-89.5529 -54.1256))	
	OOI - Global Station Papa	Ocean Observatories Initiative – Global Station Papa	POLYGON ((-144.40 50.40,-144.80 50.07, -144.22 49.95,-144.40 50.40))	
	OOI - Gray Harbor Inshore Line	Ocean Observatories Initiative - Gray Harbor In shore Line	LINESTRING (-124.27 47.00, -124.96 46.96)	
	OOI - Gray Harbor Offshore Line	Ocean Observatories Initiative - Gray Harbor Offshore Line	LINESTRING (-124.84 46.96, -128.00 46.96,)	
	OOI - La Push Line	Ocean Observatories Initiative - La Push Line	LINESTRING (-124.74 47.91, -126.00 47.91)	
	OOI - Newport Harbor Inshore Line	Ocean Observatories Initiative - Newport Harbor In shore Line	LINESTRNIG (-124.10 44.65, -124.95 44.65)	
	OOI - Newport Harbor offshore Line	Ocean Observatories Initiative – Newport Harbor offshore Line	LINESTRNIG (-124.576 44.650, -128.00 44.668)	
	OSCM	Ocean Science Center Mindelo Area	POLYGON (18.00 -26.00, 18.00 -21.00, 14.00 26.00, 14.00 -21.00,18.00 -26.00)	

Url	Short_name	Long_name	Definition	Status
	Palau2WPapua	Palau to Western Papua New Guinea	LINESTRING (134.60 7.20, 133.90 -0.60)	
	PEACH	Processes driving Exchange at Cape Hatteras	POLYGON ((-74.867 36.907, -74.863 36.925, -74.542 36.886, -74.640 36.400, -74.676 35.829, -74.690 35.5, -74.710 35.5, -74.696 35.829 , -74.66 36.400, -74.563 36.872,-74.867 36.907))	
	PLOCAN1	PLOCAN 1	LINESTRING ((-9.63 39.54, -11. 00 39.52, -12.71 36.36, -16.00 32.33, -15.32 29.17)	
	PLOCAN2	PLOCAN 2	LINESTRING (-15.30 28.00, -15.34 29.17, -14.11 28.91)	
	Portland	Portland	POLYGON ((139.021 -37.254, 138.982 -40.044, 142.499 -40.004, 142.501 -38.454, 142.246 -38.441, 142.110 -38.416, 141.910 -38.313, 141.724 -38.294, 141.698 -38.412, 141.664 -38.448, 141.548 -38.453, 141.388 -38.420, 141.328 -38.378, 141.324 -38.285, 141.155 -38.155, 140.964 -38.078,	

Url	Short_name	Long_name	Definition	Status
			140.755 -38.081, 140.653 -38.085, 140.359 -37.932, 140.220 -37.763, 140.057 -37.585, 139.929 -37.492, 139.735 -37.262, 139.021 -37.254, 139.021 -37.254))	
	PtArena	Point Arean	LINESTRING (-123.75 38.94, -127.28 37.32)	
	ROGER93	West Galapagos Island 93	LINESTRING (-93.00 -2.00, -93.00 2.00)	
	ROGER95	West Galapagos Islands 95	LINESTRING (-95.00 -2.00, -95.00 2.00)	
	Solomon	Solomon	LINESTRING (156.58 -8.49, 154.29 -11.30)	

Url	Short_name	Long_name	Definition	Status
	SpencerGulf	Spencer Gulf	POLYGON ((138.012 -36.258, 138.022327778 2697 -35.934, 137.863 -35.919, 137.706 -35.952, 137.648 -36.068, 137.496 -36.107, 137.297 -36.088, 137.130 -36.071, 136.716 -36.102, 136.522 -35.963, 136.514 -35.7342, 136.757 -35.665, 137.104 -35.614, 137.333 -35.532, 137.640 -35.525, 137.721 -35.5854, 137.842 -35.712, 138.019 -35.674, 138.006 -34.504, 137.882 -34.998, 137.817 -35.200, 137.591 -35.207, 137.438 -35.137, 137.303 -35.226, 137.178 -35.271, 137.025 -35.271, 136.887 -35.381, 136.775 -35.367, 136.758 -35.273, 136.791 -35.145, 136.899 -35.066, 136.895 -34.973, 136.954 -34.857, 137.105 -34.868, 137.233 -34.850, 137.384 -34.866, 137.434 -34.624, 137.429 -34.536, 137.300 -34.571, 137.270 -34.470, 137.343 -34.393, 137.430 -34.317, 137.394 -34.133,	

Url	Short_name	Long_name	Definition	Status
			136.555 -34.051, 136.360 -34.273, 136.242 -34.389, 136.432 -34.674, 136.322 -34.775, 136.257 -35.071, 136.180 -35.163, 135.991 -35.098, 135.648 -35.091, 135.391 -34.909, 135.232 -34.702, 135.081 -34.655, 135.064 -34.504, 135.003 -34.509, 135.006 -34.653, 135.038 -36.259, 138.012 -36.258, 138.012 -36.258))	
	SPR1	South Puerto Rico 1	LINESTRING (-67.755 17.55, -68.21 15.60)	
	SPR2	South Puerto Rico 2	LINESTRING (-67.31515.40, -66.61 17.175)	
	SRedSea	South Red Sea	LINESTRING (38.054 22.21, 38.835 22.21)	

Url	Short_name	Long_name	Definition	Status
	StormBay	Storm bay	POLYGON ((147.427 -43.102, 147.466 -43.262, 147.402 -43.292, 147.384 -43.339, 147.401 -43.388, 147.369 -43.458, 147.346 -43.515, 147.299 -43.556, 147.259 -43.758, 148.251 -43.757, 148.027 -43.268, 147.910 -43.234, 147.818 -43.253, 147.773 -43.264, 147.730 -43.229, 147.680 -43.203, 147.656 -43.171, 147.640 -43.142, 147.642 -43.117, 147.610 -43.098, 147.427 -43.102, 147.427 -43.102))	
	SVancouver	South Vancouver	LINESTRING (-125.00 48.51, -132.00 46.51)	
	Svinoy	Svinoy	LINESTRING (4.43 62.72,0 64.66)	
	TaiwanKuroshioN	Taiwan Kuroshio North	LINESTRING (121.4 23.12, 124.00 21.50, 121.48 23.125)	
	TaiwanKuroshioS	Taiwan Kuroshio South	LINESTRING (120.00 20.00, 123.75 21.20, 121.00 21.90)	

Url	Short_name	Long_name	Definition	Status
	TassieEastCoast	Tazmania Eastern Coast	POLYGON ((148.339 -41.052, 148.317 -41.157, 148.363 -41.231, 148.369 -41.295, 148.304 -41.455, 148.335 -41.540, 148.346 -41.611, 148.316 -41.792, 148.356 -41.911, 148.380 -42.114, 148.382 -42.347, 148.182 -42.485, 148.243 -42.660, 148.099 -43.003, 151.504 -42.995, 151.506 -41.013, 148.373 -41.001, 148.339 -41.052, 148.339 -41.052))	
	UKOSNAP	UK Overturning Sub-polar North Atlantic Program	LINESTRING (-21.00 58.00, -14.50 58.00)	
	USMidAtlantic	US Mid-Atlantic Bay	POLYGON ((-75.66 36.73, -73.73 36.25, -70.83 38.97, -73.22 40.25, -75.66 36.73))	
	USVI	US Virgin Islands	LINESTRING (-65.62 17.56, -65.30 16.21, 65.19 16.21, -64.88 17.55)	
	WACoastCascadia	Washington Coast Cascadia	LINESTRING (-128.00 47.00, -124.00 47.00)	
	WACoastNANOOS	Washington Coast NANOOS	LINESTRING (-125.17 47.87, -127.00 47.00)	

Url	Short_name	Long_name	Definition	Status
	WSC	Western Svalbard Current	LINESTRING (0 77.25,12 77.25)	

Master list: None·

Host: NERC Vocabulary Server

Management: OceanOPS

Note: Sites are already registered in the OceanOPS system.

contributors_role

collection	definition	Status
glider pilot	pilot of the glider during the mission	approved
principal operator	person in charge of the operations until deployment and from recovery of the glider. Operations does not cover piloting, data management and scientific approach	approved
operator	person involved in operations from pre-deployment to recovery of the glider. Operations does not cover piloting, data management and science.	
principal investigator	Scientist in charge of the scientific aspects of the glider mission	approved
scientist	Scientist involved in the scientific aspects of the glider mission	approved
data manager	person in charge of the collection, processing and archiving of the data and metadata acquired during the glider mission	approved
data curator		
quality control	person in charge of the quality control of the data acquired during the glider mission	approved

Master list: None

Host : NVS or existing list.

Management : OceanGliders, OceanOPS or existing management.

Note:

agencies_role

collection	definition	Status
funding agency	agency that is funding hardware and ship time for operation at sea	
operating agency	agency who is operating the glider before, during and after the mission. Operation does not cover data management and scientific use of the data	approved
scientific agency	agency involved is the scientific use of the data acquired during the glider mission	
data assembly center	agency in charge of the processing of the raw data acquire during the glider mission into the community format. Reference agency and data assembly center can be the same	approved
Global data assembly center	Agency in charge of the collection of all OceanGliders data set under the common format.	

Master list: None

Host : NVS

Management : OceansGliders or OceanOPS

Note : Such vocab already exist like ; SDNPR002 / programme operation responsibility or SDNPR008 / programme realtime responsibility. But it doesn't suite perfectly what we need.

agencies_id

Definition: Code referring to the marine organisation registered in the European Directory of Marine Organisations.

Master list: https://www.seadatanet.org/Metadata/EDMO-Organisations

Management: EDMO (European Directory of Marine Organisations) code are managed by Maris in the framework of SeaDataNet project. Meanwhile its name, the EDMO code covers the global marine organisations.

Note:

rtqc_method

Collection	definition	Status
QUARTOD manual	https://ioos.noaa.gov/project/qartod/	Approved when published on OBPS
ego quality control manual	http://doi.org/10.13155/51485	Approved when published on OBPS
SOCIB QC manual	https://doi.org/10.25704/q4zs-tspv	Approved when published on OBPS
gliders tools – SOCCO	https://doi.org/10.3389/fmars.2019.00738	Approved when published on OBPS
uea Seaglider toolbox	http://www.byqueste.com/toolbox.html	Approved when published on OBPS
CoTeDe	https://doi:10.21105/joss.02063	Approved when published on OBPS

Master List : None

Host : NVS (suggested)

Management : OceanGliders through Ocean Best Practices repository

Note: RTQC methods need publishing as a best practice document separately to the OG1.0 ToR. Each value should be a DOI.

Phase_calculation_method

To be done

platform_type

Option 1

Url	Short_name	Long_name	Definition	Status
http://vocab.nerc.ac.uk/collection/L06/current/27/	sub-surface gliders	sub-surface gliders	Platforms with buoyancy-based propulsion that are capable of operations at variable depths which are not constrained to be near the sea surface.	Under discussion

Master list: http://vocab.nerc.ac.uk/collection/L06/current/

Host : NVS

Management : NVS/BODC

Note : In OG1.0, PLATFORM_TYPE is a variable. With this option PLATFORM_TYPE will be the same for all OceanGliders data sets. But this is close to the platform attribute ("Autonomous underwater vehicles").

Option 2 :

collection	definition	Status
seaglider	generic name of underwater glider manufactured by Kongsberg	Under discussion
slocum	generic name of underwater glider manufactured by Teledyne Webb Research	Under discussion
spray	name of underwater glider manufactured by Blue Finn Robotics	Under discussion
seaexplorer	generic name of underwater glider manufactured by Alseamar	Under discussion

Note:; In that case we "platform model" should become highly desirable instead of Mandatory.

platform_model

collection	definition	Status
seaglider	generic name of underwater glider manufactured by Kongsberg	Under discussion
slocum	generic name of underwater glider manufactured by Teledyne Webb Research	Under discussion
spray	name of underwater glider manufactured by Scripps Institution of Oceanography	Under discussion
seaexplorer	generic name of underwater glider manufactured by Alseamar	Under discussion
deepexplorer	underwater glider manufactured by Alsemar with a maximum depth capability of 6000 meters	Under discussion
seaglider C2	underwater glider manufactured by Kongberg optimized for performance in littoral (i.e. shallow, coastal) waters. The vehicle design incorporates a large variable buoyancy device with a high rate of volumetric change. Adaptations to the mass shifter enable high turn rates	Under discussion
seaglider M1	underwater glider manufactured by Kongsberg with a maximum depth capability of 1000 meters	Under discussion
seaglider M6	underwater glider manufactured by Kongsberg with a maximum depth capability of 6000 meters	Under discussion
slocum G1	first generation of the underwater glider manufactured by Teledyne Webb research	Under discussion
slocum G2	second generation of underwater glider manufactured by Teledyne Webb Research	Under discussion
slocum G3	thrid generation of underwater glider manufactured by Teledyne Webb Research	Under discussion

Master list: https://www.bodc.ac.uk/resources/vocabularies/vocabulary_search/B76/

Host : NVS

Management : OceanGliders

Note :

Already Existing vocabulary:

Url	Identifier	Pref Label	Definition
http://vocab.nerc.ac.uk/collection/B76/current/B7600002/	SDN:B76::B7600002	Kongsberg Maritime Seaglider M1 glider	An autonomous underwater vehicle (AUV) based on buoyancy. It was developed for continuous, long-term measurement of oceanographic parameters. It uses small changes in buoyancy and wings to achieve forward motion. The system's pitch and roll are controlled using adjustable ballast (the vehicle battery). The vehicle moves through the water in a saw-tooth like pattern and surfaces often to determine its position. Navigation is accomplished using a combination of GPS fixes while on the surface and internal sensors that monitor the vehicle heading, depth and attitude during dives. External sensors are constantly scanning the ocean to determine environmental properties. The glider is 1.8 - 2 m long with a maximum diameter of 30 cm and antenna mast length between 43 cm and 1 m. It weighs 52 kg with a wing span of 1 m. It has a deployment range of 4600 km, deployment length of 10 months and an operating depth range between 50-1000 m.

Url	Identifier	Pref Label	Definition
			Maximum speed is 25 cm/s.
http://vocab.nerc.ac.uk/collection/B76/current/B7600013/	SDN:B76::B7600013	Teledyne Webb Research Slocum G1 glider	A long-range autonomous underwater vehicle (AUV) based on buoyancy. It is used for remote water column sampling. It uses hydraulic buoyancy change to alter the vehicle density in relation to the surrounding water thereby causing the vehicle to either float or sink. Given an appropriate dive or climb angle, the wings and body lift and convert some of this vertical motion into a forward saw tooth horizontal motion. Periodically, the glider surfaces and calls via Iridium Satellite Phone (anywhere in world) or Free Wave RF Modem (line of sight) in to Dockserver (auto attendant computer) to relay navigational fix, data and receive further instructions for

Url	Identifier	Pref Label	Definition
			command and control. The glider is capable of storm sampling and can be flown in a coordinated fleet. It is 1.5 m in length, has a hull diameter of 22 cm and mass of 54 kgs. It has an exchangeable payload (capacity up to 6 L) which is capable of housing a variety of environmental sensors such as nitrate and oxygen. It uses lithium or alkaline batteries. It has a deployment range of 600-6000 km, a deployment length of 15 days to 12 months and an operating depth range of 4-1000m. Navigation is via GPS waypoints, a pressure and altimeter sensor. Maximum speed is .35 m/s. It transmits via RF modem, Iridium (RUDICS), ARGOS or acoustic modem.

Url	Identifier	Pref Label	Definition
http://vocab.nerc.ac.uk/collection/B76/current/B7600014/	SDN:B76::B7600014	Teledyne Webb Research Slocum G3 glider	A long-range autonomous underwater vehicle (AUV) based on buoyancy. It is used for remote water column sampling. It uses hydraulic buoyancy change to alter the vehicle density in relation to the surrounding water thereby causing the vehicle to either float or sink. Given an appropriate dive or climb angle, the wings and body lift and convert some of this vertical motion into a forward saw tooth horizontal motion. Periodically, the glider surfaces and calls via Iridium Satellite Phone (anywhere in world) or Free Wave RF Modem (line of sight) in to Dockserver (auto attendant computer) to relay navigational fix, data and receive further instructions for command and control. The glider is capable of storm sampling and can be flown in a coordinated fleet. It is 1.5 m in length, has a hull diameter of 22 cm and mass of 55-70 kgs (dependent upon configuration). It has an exchangeable payload (capacity up to 6 L) which is capable of

Url	Identifier	Pref Label	Definition
			housing a variety of environmental sensors such as nitrate and oxygen. It uses lithium or alkaline batteries. It has a deployment range of 350-13000 km (dependent upon configuration), a deployment length of 15 days to 18 months (dependent upon configuration) and an operating depth range of 4-1000m. Navigation is via GPS waypoints, a pressure and altimeter sensor. Maximum speed is 0.35 m/s (0.68 knot) with the buoyancy engine and an average up to 0.5 m/s (1 knots) with full drive, with the thruster: Up to 1 m/s (2 knots). It transmits via RF modem, Iridium (RUDICS), ARGOS or acoustic modem.
http://vocab.nerc.ac.uk/collection/B76/current/B7600001/	SDN:B76::B7600001	Teledyne Webb Research Slocum G2 glider	A long-range autonomous underwater vehicle (AUV) based on buoyancy. It is used for remote water column sampling. It uses hydraulic buoyancy change to alter the vehicle density in relation to the surrounding water thereby causing the vehicle to either float or sink. Given an appropriate dive or

Url	Identifier	Pref Label	Definition
			climb angle, the wings and body lift and convert some of this vertical motion into a forward saw tooth horizontal motion. Periodically, the glider surfaces and calls via Iridium Satellite Phone (anywhere in world) or Free Wave RF Modem (line of sight) in to Dockserver (auto attendant computer) to relay navigational fix, data and receive further instructions for command and control. The glider is capable of storm sampling and can be flown in a coordinated fleet. It is 1.5 m in length, has a hull diameter of 22 cm and mass of 54 kgs. It has an exchangeable payload (capacity up to 6 L) which is capable of housing a variety of environmental sensors such as nitrate and oxygen. It uses lithium or alkaline batteries. It has a deployment range of 600-6000 km, a deployment length of 15 days to 12 months and an operating depth range of 4-1000m. Navigation is via GPS waypoints, a pressure and altimeter sensor. Maximum speed is .35 m/s. It transmits via RF modem, Iridium

Url	Identifier	Pref Label	Definition
			(RUDICS), ARGOS or acoustic modem.

Note: The minimum level of granularity expected is the generic label (i.e. Spray, Seaglider, Seaexplorer, Slocum) but it is encouraged to provide the glider model.

ICES_code

Definition: SeaDataNet Ship and Platform Codes.

Master list: //vocab.ices.dk/?ref=315

Management: ICES/SEADATANET

Note:

platform_maker

Collection	definition	Status
Teledyne Webb Research	http://vocab.nerc.ac.uk/collection/B75/current/ORG01077/	approved
Kongsberg Maritime AS	http://vocab.nerc.ac.uk/collection/B75/current/ORG00360/	approved
Scripps Institution of Oceanography	http://vocab.nerc.ac.uk/collection/B75/current/ORG00134/	approved
Alseamar		To be completed
University of Washington		To be completed
IRobot		To be completed
Huntington Ingalls		To be completed

Master list : http://vocab.nerc.ac.uk/collection/B75/current/

Host : NVS

Management : OceanGliders

Note :

telecom_type

Collection	definition	Status
Iridium	Communication system based on IRIDIUM satellite constellation use by the glider when surfacing to relay to landstation (auto attendant computer) navigational fix, data and receive further instruction for command and control	approved
Freewave	Communication system based on Free Wave RF Modem (line of sight) use to relay to landstation (auto attendant computer) navigational fix, data and receive further instructions for command and control	approved
Cellular mobile		To be approved
Argos		To be approved

Master list : None

Host : NVS

Management : OceanGliders

Note :

tracking_system

Collection	definition	Status
gps	Global Positioning System is a satellite based radionavigation system	approved
argos doppler	ARGOS constellation satellite-based system used to distribute location data	approved
acoustic		To be approved

Master list : None

Host : NVS

Management : OceanGliders

Note :

battery_type

Collection	definition	Status
lithium rechargeable	Rechargeable lithium battery pack	approved
alkaline rechargeable	Rechargeable alkaline battery pack	approved
alkaline	alkaline battery pack	approved
lithium	lithium battery pack	approved
alkaline + lithium	alkaline and lithium battery pack	approved
Lithium primary		To be completed

Master list : None

Host : NVS

Management : OceanGliders

Note :

PHASES

Collection	definition	Status
ascent	the platform is moving up toward surface with no internal command on the pitch angle	To be approved
descent	the platform is moving down toward targeted depth of operation with no internal command on the pitch angle	To be approved
surfacing	the platform is drifting at the surface for communication, recovery or safety purpose"	To be approved
parking	the platform is maintained at a parking depth	To be approved
inflexion	the platform is changing pitch angle to move from a phase to another	To be approved
propelled	the platform momentum is increased by the propeller	To be approved
transition	This particular points could be part of the previous as well as the following phase.	To be approved

Definition: Terms describing the different behaviours of the glider at sea.

Master list : None

Host : NVS

Management : OceanGliders

Note : Phase calculation methods need publishing as a best practice document separately to the OG1.0 ToR.

Data_mode

Collection	definition	Status
R	Real-time data. Data coming from the glider through a communication channel without physical access to the instruments, disassembly or recovery of the platform.	To be approved
P	Provisional data. Data obtained after the glider has been recovered or serviced.	To be approved
A	Real-time adjusted data. Real-time or provisional data that have been adjusted by real-time automatic procedures	To be approved
D	Delayed-mode data. Data published after all calibrations and quality control procedures have been applied on the internally recorded or best available original data. This is the best possible version of processed data	To be approved
M	Mixed data. This value indicates that the file contains data in more than one of the above states	To be approved

Definition: data_mode indicates if the file contains real-time, provisional, mixed or delayed-mode data

Master list : None, but Argo is using the same code for their file naming convention.

Host : NVS

Management : OceanGliders

Note :

SENSOR_MODEL

Master list : http://vocab.nerc.ac.uk/collection/L22/current/

Host : NVS

Management : OceanGliders

Note: The minimum level of granularity expected is the generic sensor “label” (i.e. AANDERAA_OPTODE, SBE41) but it is highly encouraged to provide the most precise information about sensor model (i.e. AADENDERAA_OPTODE_4330_V2). L22 collection is already implemented in the vocab server. Our group should check if this list covers our needs or if we need to complete it or set a dedicated vocabulary for OG1.0.

Collection and definition:

Collection	Short name	BODC id	description	Status	Used by OG ?
AANDERAA_OPTODE	OPTODE	SDN:L22::TOOL0805		approved	Already used by OG
AANDERAA_OPTODE_3830	OPTODE_3830	SDN:L22::TOOL0836		approved	Already used by OG
AANDERAA_OPTODE_3835	OPTODE_3835	SDN:L22::TOOL0103		approved	Already used by OG
AANDERAA_OPTODE_3930	OPTODE_3930	SDN:L22::TOOL1421		approved	Already used by OG
AANDERAA_OPTODE_4330	OPTODE_4330	SDN:L22::TOOL1247		approved	Already used by OG
AANDERAA_OPTODE_4330F	OPTODE_4330F	SDN:L22::TOOL1248		approved	
AANDERAA_OPTODE_4831	OPTODE_4831	SDN:L22::TOOL1239	-	approved	Already used by OG
AANDERAA_OPTODE_4831F	PTODE_4831F	SDN:L22::TOOL1240	-	approved	Already used by OG
AANDERAA_OPTODE_5013	OPTODE_5013				Already used by OG
AANDERAA_OPTODE_5014	AANDERAA_OPTODE_5014				Already used by OG
ACOUSONDE					
ADCP_600k					Already used by OG
ARO-CAR-Z10	ARO-CAR-Z10				Already used by OG
AROD_FT					Already used by OG
ARO_FT			JAC RINKO		Already used by OG
BioShutter					
Biospherical_Instruments_PAR	Biospherical_Instruments_PAR				Already used by OG

Biospherical_Instruments_PAR_2150	QSP_2150				Already used by OG
Biospherical_Instruments_PAR_2155	QSP-2155	SDN:L22::TOOL1368		approved	Already used by OG
Biospherical_Instruments_PAR_2200	QSP-2200				
CRT_ACOUSONDE_3A	ACOUSONDE_3A				Already used by OG
CYCLOPS_7_FLUOROMETER		SDN:L22::TOOL1447		approved	
C_ROVER	CROVER		Transmissometer (WETLABS)		
CTD_F01					
DRUCK		SDN:L22::TOOL0837		approved	Already used by OG
DRUCK_10153PSIA					
DRUCK_2900PSIA					Already used by OG
DURA					
DISSOLVED_OXYGEN_SENSOR					Already used by OG
ECO_BB					
ECO_BB2					
ECO_BB3					Already used by OG
ECO_FL		SDN:L22::TOOL0172	-	approved	Already used by OG
ECO_FL2BB	ECO_FL2BB	SDN:L22::TOOL1282		approved	Already used by OG

ECO_FL2BB-IRB	ECO_FL2BB-IRB	SDN:L22::TOOL 1311		approved	Already used by OG
ECO_FL2BB-VMT	ECO_FL2BB-VMT	SDN:L22::TOOL 1309		approved	Already used by OG
ECO_FLBB		SDN:L22::TOOL 1361		approved	
ECO_FLBB2					Already used by OG
ECO_FLBB2-VMT	ECO_FLBB2-VMT	SDN:L22::TOOL 1309		approved	Already used by OG
ECO_FLBB2_V4	ECO_FLBB2-V4				Already used by OG
ECO_FLBB2_V5	ECO_FLBB2-V5				Already used by OG
ECO_FLBB2_V6	ECO_FLBB2-V6				Already used by OG
ECO_FLBBCD		SDN:L22::TOOL 1141	-	approved	Already used by OG
ECO_FLBBCD-SLC	ECO_FLBBCD-SLC	SDN:L22::TOOL 1312		approved	Already used by OG
ECO_FLBB_2K					
ECO_FLBB_AP2					
ECO_FLNTU		SDN:L22::TOOL 0215	-	approved	Already used by OG
ECO_NTU		SDN:L22::TOOL 0879	-	approved	
FSI					
ISUS					
ISUS_V3		SDN:L22::TOOL 0528	-	approved	
JASCO_M36-100	M36-100 hydrophone				Already used by OG
MCOMS_FLBB2					

MCOMS_FLBBCD					
MiniFluo-UV	MiniFluo				Already used by OG
NORTEK_SIGNATURE_1000		SDN:L22::TOOL1009		approved	Already used by OG
OceanSonics_icListen-HF PAM	HF PAM				Already used by OG
RAFOS					
Generic_RADIOMETER					Already used by OG
RBR_CTD					
RBR_concerto3_CTD	RBRconcerto3				Already used by OG
RBR_legato3_CTD	RBRlegato3_CTD				Already used by OG
Rockland_MicroRider_1000	MicroRider_1000	SDN:L22::TOOL1232		approved	Already used by OG
SATLANTIC_OCR504_ICSW					Already used by OG
SATLANTIC_OCR504_R10W	OCR504_R10W				
SATLANTIC_OCR507_ICSW					Already used by OG
SATLANTIC_OCR507_ICSWR10W					
SATLANTIC_OCR507_R10W					Already used by OG
SATLANTIC_PAR		SDN:L22::TOOL0973	-	approved	Already used by OG
SATLANTIC_OCR504_R10W					

SEABIRD_BioShutter					
SATLANTIC_BioShutter					
SEABIRD_SBE	SBE				Already used by OG
SEABIRD_SBE37	SBE37				Already used by OG
SEABIRD_SBE41	SBE41	SDN:L22::TOOL0668		approved	Already used by OG
SEABIRD_SBE41CP	SBE41CP	SDN:L22::TOOL0669		approved	Already used by OG
SEABIRD_SBE41CP_IDO	SBE43F_IDO	SDN:L22::TOOL0037	Seabird Electrochemical Dissolved Oxygen IDO sensor (frequency output)	approved	
SEABIRD_SBE41CP_V1					
SEABIRD_SBE41CP_V2					Already used by OG
SEABIRD_SBE41CP_V3					
SEABIRD_SBE41CP_V4					
SEABIRD_SBE41CP_V5					
SEABIRD_SBE41CP_V6					
SEABIRD_SBE41CP_V7					
SEABIRD_SBE41_IDO_V1					

SEABIRD_SBE41_IDO_V2					
SEABIRD_SBE41_IDO_V3					
SEABIRD_SBE41_V1					
SEABIRD_SBE41_V2					
SEABIRD_SBE41_V3					
SEABIRD_SBE43		SDN:L22::TOOL0036		approved	Already used by OG
SEABIRD_SBE43F_IDO	SBE43_IDO	SDN:L22::TOOL0037	Seabird Electrochemical Dissolved Oxygen IDO sensor (volt output)	approved	Already used by OG
SEABIRD_SBE43I	SBE43I	SDN:L22::TOOL1233	configuration option		
SEABIRD_SBE43_IDO					
SEABIRD_SBE63_OPTODE	SBE63_OPTODE	SDN:L22::TOOL0739	Seabird Optical Dissolved Oxygen Sensor		
SEABIRD_SBE706	SBE706				Already used by OG
SEABIRD_CT-Sail	SBE_CT Sail				Already used by OG
SEABIRD_GPCTD	GPCTD	SDN:L22::TOOL1026		approved	Already used by OG
SEABIRD_SeaFET_Ocean_pH	SeaFET				Already used by OG
SEABIRD_SeaFET_V1_Ocean_pH	SeaFET_V1				

SEABIRD_SeaFET_V2_Ocean_pH	SeaFET_V2				Already used by OG
SEAPOINT_TURBIDITY_METER					
SEQUOIA_LISST					
SEQUOIA_LISST_200					
SIMRAD_EK80	EK80				
SUNA		SDN:L22::TOOL0489			Already used by OG
SUNA_V2					
TELEDYNE_PATHFINDER_DVL_600					Already used by OG
TURBULENT_RESEARCH_PORPOISE	PORPOISE				Already used by OG
UVP6					
VEMCO_VMT	VMT		https://www.oceans-research.com/products/receivers/acoustic-monitoring-receivers/vmt/		
WETLABS_ECO_PAR	-	SDN:L22::TOOL0676	-	approved	
WETLABS_ECO_TRIPLET		SDN:L22::TOOL0674		approved	Already used by OG
WHOI_DMON	DMON		WHOI_Digital Acoustic Monitoring Instrument		

Example: (taken from “L22/SeaVox” vocabulary):

· Aanderaa 4831 oxygen Optode, A dissolved oxygen sensor which provides analogue (0-5V) and digital output (RS-232) to third party data loggers, gliders and floats. Measurement based on the ability of selected substances to act as dynamic fluorescence quenchers. The fluorescent indicator is a special platinum porphyrin complex embedded in a gas permeable foil that is exposed to the surrounding water. In this standard model, a black optical isolation coating protects the complex from sunlight and fluorescent particles in the water. This sensing foil is attached to a window providing optical access for the measuring system from inside a watertight housing. The foil is excited by modulated blue light, and the phase of a returned red light is measured. For improved stability the 4831 optode also performs a reference phase reading by use of a red LED that does not produce fluorescence in the foil. This model is fitted with a standard sensing foil. By linearizing and temperature compensating, with an incorporated temperature sensor, the absolute O2 concentration can be determined. Accuracy +/- 1.5% or 2uM; precision +/- 0.2 uM.

Variable names / Standard names

Definition: Terms used to describe measured phenomena within the OG1.0 format.

Collection: http://vocab.nerc.ac.uk/collection/OG1/current/

Note: Need to check why there are so many differences between Argo R03 and OG1 ? Maybe the list needs to be reviewed

Annexe 2: EuroSea / OceanPredict Workshop – June 2022