[[_heading=h.2p2csry]]	**OceanGliders 1.0 Harmonizing format across OceanGliders Terms of References**

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_Finalized and proposed: data format harmonization group – _

Endorsed: OceanGliders Steering Team –

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[[_heading=h.1fob9te]]*This document has been endorsed by the OceanGliders steering team, the OceanGliders data management task team, and the following OceanGliders Data Assembly Centers:*

_IOOS/glider DAC (USA), _

_Coriolis (France), _

_BODC (UK), _

IMOS/AODN (Australia),

_SOCIB (Spain), _

_C-IOOS (Canada), _

EMODNET Physics (EU),

Background

The OceanGliders program brings together marine scientists and glider operators from all over the world who observe the long-term physical, biogeochemical, biological ocean processes, and phenomena relevant for societal applications. It allows active coordination and strengthening the roles of gliders in the ocean observation programs worldwide and contributes to the present international efforts for ocean observation for climate, ocean health and real-time services.

The program oversees the monitoring of global glider activity, a prerequisite for active coordination. By sharing requirements, efforts and scientific knowledge needed for glider data collection OceanGliders aims to continuously develop the network by supporting the dissemination of glider data in global databases, in real-time and delayed mode, for a wider community.

The OceanGliders program was created about 10 years after the popularization of the use of gliders by ocean scientists. With no common rules on format, data managers from Australia, the USA, and Europe processed 3 regional formats that are not interoperable.

Harmonization toward interoperability within the 3 current formats and other networks is a recommendation from the OceanGliders steering team to strengthen the network and reach the FAIR principles (Findable, Accessible, Interoperable, Reusable) adopted by GOOS (Global Ocean Observing System), and better monitor the program activity.

Objectives

This document defines the requirements of the future OceanGliders harmonized format, hereafter OG1.0, and the agenda for achievements.

OG1.0 General conventions

- The required granularity of the data set is the glider mission, starting from deployment at sea to recovery.
- Data are recorded as a trajectory Discrete Geometry, using NetCDF[1] system and following CF 1.8 [2] (Climate and Forecast) specifications. Each data file contains a series of dive cycles representing the mission of the glider. It can be produced in near real time after every glider transmission and revised later into a recovery-mode (when glider on shore and any data gaps filled in) or a delayed-mode (after rigorous QC) version.
- Format follows the ACDD 1.3 convention.
- Variables are identified in capital letters.
- Attributes are identified in lower case.
- Vocabulary collections will be hosted in different places (NERC Vocabulary Server -NVS, OceanOPS, ICES, etc). The OceanGliders data management team will manage (additions, updates, etc.) the collections.
- OG1.0 overseen the following parameters: CTD measurements, Oxygen measurements, Optical fluorescence, and backscatter measurements. Other types of measurements (intermediate parameters, technical measurements, and other variables) not framed by OG1.0 could be included in OG1.0 data files. No control will be applied to those measurements.
- GPS variables and along-track positioning variables are mandatory.
- Interpolation methodologies used to compute along-track positioning variables, phases and QC needs publishing as a best practice document under strict rules.
- A list of mandatory metadata describing the data set is defined below.
- It is highly encouraged to use a unique resource identifier (uri) to increase machine-to-machine

communications.

- 3 recommendations level have been defined for attributes:
  - Mandatory: Minimum metadata set to be compliant with OG1.0 requirement.
  - Highly desirable: Worth having for complete use of the data set.
  - Suggested: If the information is available.

DOI management

- DOI can be minted at any level (PI, Reference Data Center, Data Assembly Center, Global Data Assembly Center) following the internal policy of data curation.
- DOI can be minted for a single glider mission or multiple glider missions (i.e. project, reference lines).
- DOI if included in OG files needs to be preserved. The DOI must remain unchanged if there is no valuable modification. If valuable information is aggregated/added or a new product produced, a new DOI shall be created and the new DOI MUST link to the original DOI to acknowledge as the source
- GDACs will create an evolving global data set with a DOI referring to all existing DOIs.
- The most effective way of preserving the integrity of the source citation is to preserve the intitial DOI added in the OG file.

OG1.0 file naming convention

- Data files should be named as follows:
  - "file_name" : "<id>.nc" (ex : "sp065_20210616T1430_R.nc")
- Recalling that:
  - "id" : "<trajectory>_<data_mode>" (ex : "sp065_20210616T1430_R")
  - "trajectory" : "<platform_code>_<start_date>" (ex : "sp065_20210616T1430")
  - "platform_code", "start_date", "data_mode" are as described below in this document.

Global attributes

The global attribute section is used for data discovery. The following global attributes should appear in the global section. The NetCDF Climate and Forecast (CF) Metadata Conventions are available from: *http://cfconventions.org/Data/cf-conventions/cf-conventions-1.8/cf-conventions.html#trajectory-data*

Global attribute	Definition	Requirement status	Format or fixed value
title	A short phrase or sentence describing the dataset.	mandatory	“OceanGliders trajectory file”

Global attribute	Definition	Requirement status	Format or fixed value
platform	Name of the platform(s) that supported the sensors data used to create this data set or product. *https://vocab.nerc.ac.uk/collection/L06/current/*	mandatory	“Autonomous Underwater Vehicle”
platform_vocabulary	Controlled vocabulary for the names used in the "platform" attribute.	mandatory	*https://vocab.nerc.ac.uk/collection/L06/current/27/*
id	Formatted mission name: <platform_code>_<start_date>_<data_mode> • _ Example: sverdrup_20200512T001245_delayed • __ Example: SL287_20180715T012451_delayed • _ Example: p202_20150923T150451_R	mandatory	

Global attribute	Definition	Requirement status	Format or fixed value
naming_authority	A unique name that identifies the institution who provided the id. ACDD-1.3 recommends using reverse-DNS naming. Examples: * IOOS * IMOS * Coriolis * edu.ucsd.spray	highly desirable	
institution	The name of the institution where the original data was produced. • ___ Example: Texas A-M University • _ Example: IMOS • _ Example: PLOCAN	highly desirable	

Global attribute	Definition	Requirement status	Format or fixed value
internal_mission_identifier	The mission identifier used by the institution principally responsible for originating this data • __ Example: sverdrup_20200512_delayed • __ Example: Forster20201109 • ___ Example: Estoc_2015	highly desirable	
geospatial_lat_min	Describes a simple lower latitude limit	suggested	decimal degree
geospatial_lat_max	Describes a simple upper latitude limit	suggested	decimal degree
geospatial_lon_min	Describes a simple longitude limit	suggested	decimal degree
geospatial_lon_max	Describes a simple longitude limit	suggested	decimal degree
geospatial_vertical_min	Describes the numerically smaller vertical limit.	suggested	meter depth
geospatial_vertical_max	Describes the numerically larger vertical limit	suggested	meter depth
time_coverage_start			iso 8601
time_coverage_end			iso 8601
site	The name of the regular sample line or area.	highly desirable	

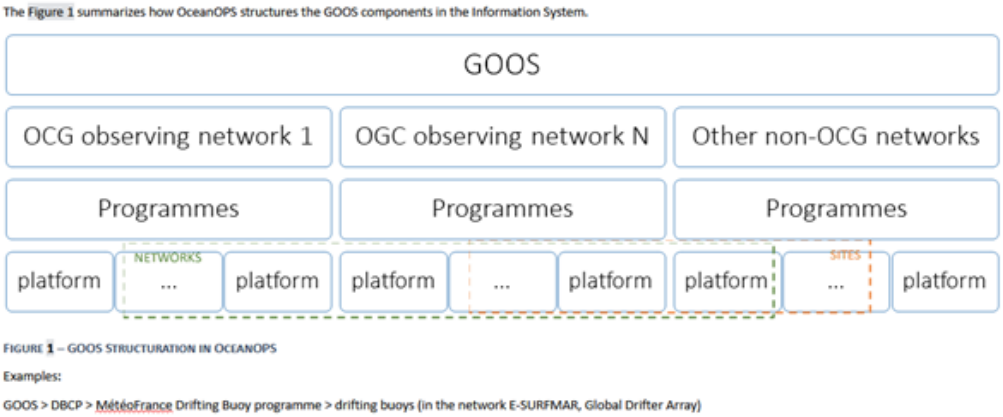
Global attribute	Definition	Requirement status	Format or fixed value
site_vocabulary	Controlled vocabulary of the names used in the “site” attribute	highly desirable	To be defined
program	The overarching program(s) of which the dataset is a part. A program consists of a set (or portfolio) of related and possibly interdependent projects that meet an overarching objective.	Highly desirable	
project	The name of the project(s) principally responsible for originating this data. Multiple projects can be separated by commas	suggested	
network	A network is a group of platforms crossing the boundaries of a single program. It can represent a mutual scientific objective, a geographical focus, an array and/or a project. Multiple networks shall be separated by commas.	suggested	
contributor_name	Name of the contributors to the glider mission. Multiple contributors are separated by commas.	PI name is mandatory	
contributor_email	Email if the contributors to the glider mission. Multiple contributors’ emails are separated by commas.	PI email is mandatory	

Global attribute	Definition	Requirement status	Format or fixed value
contributor_id	Unique id of the contributors to the glider mission. Multiple contributors' ids are separated by commas.	highly desirable	
contributor_role	Role of the contributors to the glider mission. Multiple contributors' roles are separated by commas.	PI vocabulary is mandatory	
contributor_role_vocabulary	Controlled vocabulary for the roles used in the "contributors_role". Multiple contributors' roles and vocabularies are separated by commas.	PI vocabulary is mandatory	*https://orcid.org/*
agency	Name of agencies involved in the glider mission. Multiple agencies are separated by commas.	operating agency is mandatory	
agency_role	Role of the agencies involved in the glider mission. Multiple agencies' roles are separated by a comma.	operating agency role is mandatory	
agency_role_vocabulary	The controlled vocabulary of the role used in the agency's role. Multiple vocabularies are separated by commas.	operating agency vocabulary is mandatory	*https://vocab.nerc.ac.uk/collection/C86/current/*
agency_id	code of the agency involved in the glider mission. Multiple ids are separated by a comma.	highly desirable	
agency_id_vocabulary	url to the repository of the id	highly desirable	EMDO, ROR, etc.

Global attribute	Definition	Requirement status	Format or fixed value
uri	Other universal resource identifiers relevant to be linked to this dataset. Multiple uris are separated by a comma.	suggested	EDIOS, CSR, EDMERP, EDMED, CDI, ICES, etc.
data_url	url link to OG1.0 data file	mandatory	
doi	The digital object identifier of the OG1.0 data file	highly desirable	
rtqc_method	The method used by DAC to apply real-time quality control to the data set	mandatory	
rtqc_method_doi	The digital object identifier of the methodology used to apply real-time quality control to the data set.	mandatory	
web_link	url that provides useful information about anything related to the glider mission. Multiple urls are separated by commas.	suggested	
comment	Miscellaneous information about the data or methods used to produce it.	suggested	
date_created	date of creation of this data set	mandatory	iso 8601
featureType	Description of a single feature with this discrete sampling geometry	mandatory	trajectory

Global attribute	Definition	Requirement status	Format or fixed value
Conventions	A comma-separated list of the conventions that are followed by the dataset. For files that follow this version of ACDD, include the string 'ACDD-1.3'	highly desirable	CF-1.8, ACDD-1.3, OG-1.0

Note about program, networks, and sites: Some examples are provided in Examples using program, network, and site. The image below describes the architecture of the GOOS/OceanOPS database.



Dimension and definition

Name	Definition	Comment
N_MEASUREMENTS	N_MEASUREMENTS = unlimited;	Number of recorded locations.
N_PARAM	N_PARAM = <int value>;	Number of parameters measured or calculated for a pressure sample. Examples :(pressure, temperature) : N_PARAM = 2 (pressure, temperature, salinity) : N_PARAM = 3 (pressure, temperature, conductivity, salinity) : N_PARAM = 4
N_SENSOR	N_SENSOR = <int value>;	Number of sensors mounted on the platform and used to measure the parameters.

Location variables

GPS variables

OG1.0 requirements cover the GPS variables delivered by the glider when at the sea surface.

- OG1.0 requirement for GPS variables: The table below describes mandatory GPS variables and their attributes.

VARIABLE NAME	variable attributes	requirement status
LATITUDE_GPS	double LATITUDE_GPS(N_MEASUREMENTS) LATITUDE_GPS:long_name = “latitude of each GPS location”; LATITUDE_GPS:standard_name = “latitude”; LATITUDE_GPS:units = “degrees_north”; LATITUDE_GPS:FillValue = -9999.9; LATITUDE_GPS:valid_min = -90.0; LATITUDE_GPS:valid_max = 90.0; LATITUDE_GPS:ancillary_variables = "LATITUDE_GPS_QC"	mandatory

VARIABLE NAME	variable attributes	requirement status
LONGITUDE_GPS	double LONGITUDE_GPS(N_MEASUREMENTS) LONGITUDE_GPS:long_name = “longitude of each GPS location”; LONGITUDE_GPS:standard_name = “longitude”; LONGITUDE_GPS:units = “degrees_east”; LONGITUDE_GPS:FillValue = -9999.9; LONGITUDE_GPS:valid_min = -180.0; LONGITUDE_GPS:valid_max = 180.0; LONGIITUDE_GPS:ancillary_variables = "LONGITUDE_GPS_QC"	mandatory
TIME_GPS	double TIME_GPS(N_MEASUREMENTS) TIME_GPS:long_name = “time of each GPS location”; TIME_GPS:calendar = "gregorian" ; TIME_GPS:units = “seconds since 1970-01-01T00:00:00Z”; TIME_GPS:valid_min = 1e9 ; TIME_GPS:valid_max = 4e9 ; TIME_GPS:FillValue = -1.0 ; TIME_GPS:ancillary_variables = “TIME_GPS_QC”	mandatory

Along track positioning variables

OG1.0 requirements cover positioning variables and geolocating any scientific measurements made by the glider during its mission.

- OG1.0 requirement for positioning variable: The table below describes the mandatory positioning variables and their attributes.

VARIABLE NAME	variable attributes	requirement status
LATITUDE	double LATITUDE (N_MEASUREMENTS) LATITUDE:long_name = “latitude of each measurements and GPS location”; LATITUDE:standard_name = “latitude”; LATITUDE:units = “degrees_north”; LATITUDE:FillValue = -9999.9; LATITUDE:valid_min = -90.0; LATITUDE:valid_max = 90.0; LATITUDE:interpolation_methodology = “”; LATITUDE:interpolation_methodology_vocabulary = “”; LATITUDE:interpolation_methodology_doi = “”;	mandatory

VARIABLE NAME	variable attributes	requirement status
LONGITUDE	double LONGITUDE (N_MEASUREMENTS) LONGITUDE:long_name = “longitude of each measurements and GPS location”; LONGITUDE:standard_name = “longitude”; LONGITUDE:units = “degrees_east”; LONGITUDE:FillValue = -9999.9; LONGITUDE:valid_min = -180.0; LONGITUDE:valid_max = 180.0; LONGITUDE:interpolation_methodology = “”; LONGITUDE:interpolation_methodology_vocabulary = “”; LONGITUDE:interpolation_methodology_doi = “”;	mandatory

VARIABLE NAME	variable attributes	requirement status
TIME	double TIME (N_MEASUREMENTS) TIME:long_name = “time of measurement and gps location”; TIME:standard_name = “time”; TIME:calendar = "gregorian" ; TIME:units = “seconds since 1970-01-01T00:00:00Z”; TIME:FillValue = -1.0 ; TIME:interpolation_methodology = “”; TIME:interpolation_methodology_vocabulary = “”; TIME:interpolation_methodology_doi = “”;	mandatory

Interpolation methodologies need publishing as a best practice document separately to the OG1.0 terms of reference.

General Information

In this following section, two options, “encapsulate variable” and “individual variable” are proposed to store the general information.

Trajectory Name

VARIABLE NAME	variable attributes	requirement status
TRAJECTORY	string TRAJECTORY TRAJECTORY:cf_role = "trajectory_id" TRAJECTORY:long_name = “trajectory name”; TRAJECTORY:data_mode_vocabulary = “”;	mandatory Value: <platform_code>_<start_date> Where <platform_code> refers to the name of the glider, <start_date> refers to the deployment start UTC date under iso 8601, Ex : eltanin_20210909T1605 If the glider has no <platform_code> use <platform_serial_number> instead to create the TRAJECTORY Ex.: sp042_20210218T2325

Platform information

VARIABLE NAME	variable attributes	requirement status
PLATFORM_TYPE	string PLATFORM_TYPE PLATFORM_TYPE:long_name: “type of glider”; PLATFORM_TYPE:platform_type_vocabulary = “”;	mandatory
PLATFORM_MODEL	string PLATFORM_MODEL PLATFORM_MODEL:long_name : “model of the glider”; PLATFORM_MODEL:platform_model_vocabulary = “”;	mandatory
WMO_IDENTIFIER	string WMO_IDENTIFIER WMO_IDENTIFIER:long_name = “wmo id”;	mandatory

VARIABLE NAME	variable attributes	requirement status
PLATFORM_SERIAL_NUMBER	string PLATFORM_SERIAL_NUMBER PLATFORM_SERIAL_NUMBER:long_name = “glider serial number”;	highly desirable
PLATFORM_CODE	string PLATFORM_CODE PLATFORM_CODE:long_name = “nickname of the glider”;	highly desirable
PLATFORM_DEPTH_RATING	integer PLATFORM_DEPTH_RATING PLATFORM_DEPTH_RATING:long_name = “depth limit in meters of the glider for this mission”; PLATFORM_DEPTH_RATING:convention = “positive value expected - e.g. 100m depth = 100”;	highly desirable
ICES_CODE	string ICES_CODE ICES_CODE:long_name = “ICES code” ; ICES_CODE :ices_code_vocabulary = “” ;	highly desirable
PLATFORM_MAKER	string PLATFORM_MAKER PLATFORM_MAKER:long_name = “glider manufacturer”; PLATFORM_MAKER:platform_maker_vocabulary = “”;	suggested

Deployment information

VARIABLE NAME	variable attributes	requirement status
DEPLOYMENT_TIME	double DEPLOYMENT_TIME long_name = “date of deployment”;	mandatory

VARIABLE NAME	variable attributes	requirement status
DEPLOYMENT_LATITUDE	string DEPLOYMENT_LATITUDE DEPLOYMENT_LATITUDE:long_name = “latitude of deployment”;	mandatory
DEPLOYMENT_LONGITUDE	string DEPLOYMENT_LONGITUDE long_name = “longitude of deployment”;	mandatory

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Field comparison information

VARIABLE NAME	variable attributes	requirement status
FIELD_COMPARISON_REFERENCE	String FIELD_COMPARISON_REFERENCE: FIELD_COMPARISON_REFERENCE:long_name = “links (uri or url) to supplementary data that can provide field comparison for platform sensors.”; FIELD_COMPARISON_REFERENCE:comment = “multiple links are separated by a comma”	highly desirable

Note: FIELD_COMPARISON_REFERENCE is applicable to deployment, recovery, and delayed versions.

Hardware information

VARIABLE NAME	variable attributes	requirement status
GLIDER_FIRMWARE_VERSION	string GLIDER_FIRMWARE_VERSION GLIDER_FIRMWARE_VERSION:long_name = “version of the internal glider firmware”;	highly desirable

VARIABLE NAME	variable attributes	requirement status
LANDSTATION_VERSION	string LANDSTATION_VERSION LANDSTATION_VERSION:long_name = “version of the server onshore”;	highly desirable
BATTERY_TYPE	string BATTERY_TYPE BATTERY_TYPE:long_name = “type of the battery”; BATTERY_TYPE:battery_type_vocabulary = “”;	suggested
BATTERY_PACK	string BATTERY_PACK BATTERY_PACK:long_name = “battery packaging”;	suggested

Telecom information

VARIABLE NAME	variable attributes	requirement status
TELECOM_TYPE	string TELECOM_TYPE TELECOM_TYPE:long_name = “type of telecommunication systems used by the glider”; TELECOM_TYPE:telecom_type_vocabulary = “”;	highly desirable
TRACKING_SYSTEM	string TRACKING_SYSTEM TRACKING_SYSTEM:long_name = “type of tracking systems used by the glider”; TRACKING_SYSTEM:tracking_system_vocabulary = “”;	highly desirable

Phase variable

PHASE describes the glider behaviors when at sea. The different behaviors are described in the phase vocabulary (ascent, descent, surfacing, parking, inflection, etc.)

Note that the vocabulary will be fully described and implemented in the control vocabulary tool during the implementation phase.

Phase calculation methodologies need publishing as a best practice document separately to the OG1.0 terms of reference.

The tables below describe the mandatory information to PHASE stored in two ways.

VARIABLES NAME	variable attributes	requirement status
PHASE	Byte PHASE(N_MEASUREMENTS) PHASE:long_name = “behavior of the glider at sea”; PHASE:phase_vocabulary: “url to phase vocab list”; PHASE:_FillValue = 0b ; PHASE:phase_calculation_method = “”; PHASE:phase_calculation_method_vocabulary = “”; PHASE:phase_calculation_method_doi = “”; PHASE: ancillary_variables = "PHASE_QC"	Highly desirable
PHASE_QC	Byte PHASE_QC(N_MEASUREMENTS) PHASE_QC:long_name = "quality flag";	Highly desirable

Note 1: For a simple case, PHASE calculation is relatively easy. But in some cases, PHASE calculation remains difficult. When code will be available publicly and described in some published best practices, PHASE will become mandatory. Note 2: Quality control of the PHASE could be useful to manage difficult cases.

Note 3: PHASE is used to derive data product (profile, trajectory profiles, gridded product) from OG1.0 data sets. It is recommended to include PHASE when possible.

Sensor information

A sensor is a device used to measure a physical parameter. Sensor outputs are provided in parameter counts and need to be converted into parameter physical units using a calibration equation. This conversion can be done onboard the float or during the decoding process.

This section contains information about the sensors of the glider. Each ocean state variable to be recorded must be described with its sensor. Gears with multiple sensors (i.e. CTD) should consider separated sensors in particular if there is not a unique serial number and calibration date for the sensors.

VARIABLE NAME	variable attributes	requirement status
SENSOR	string SENSOR(N_SENSOR) SENSOR:long_name = “Terms describing sensor types”; SENSOR:sensor_vocabulary = “”;	mandatory
SENSOR_MAKER	string SENSOR_MAKER(N_SENSOR) SENSOR_MAKER:long_name = “manufacturer of the sensor”; SENSOR_MAKER:sensor_maker _vocabulary =“”;	highly desirable
SENSOR_MODEL	string SENSOR_MODEL(N_SENSOR) SENSOR_MODEL:long_name = “model of the sensor”; SENSOR_MODEL:sensor_model _vocabulary = “”;	Highly desirable
SENSOR_SERIAL_NUMBER	string SENSOR_SERIAL_NUMBER(N_SENSOR) SENSOR_SERIAL_NUMBER:long_name = “serial number of the sensor”;	highly desirable
SENSOR_CALIBRATION_DATE	string SENSOR_CALIBRATION_DATE(N_SENSOR) SENSOR_CALIBRATION_DATE:long_name = “date of calibration of the sensor”;	highly desirable - ISO 8601

Parameter’s information

A parameter is a measurement of a physical phenomenon; it can be provided by a sensor (in sensor counts or in physical units) or computed (derived) from other parameters. A sensor can measure 1

to N parameter(s). A parameter can be measured by 1 or N sensor(s).

This section contains information about the parameters measured by the glider or derived from glider measurements.

VARIABLE NAME	variable attributes	requirement status
PARAMETER	string PARAMETER(N_PARAM) PARAMETER:long_name = “name of parameter computed from glider measurements”; PARAMETER:parameter_vocabulary = “https://vocab.nerc.ac.uk/collection/OG1/current/[*https://vocab.nerc.ac.uk/collection/OG1/current/*]”;	mandatory
PARAMETER_SENSOR	string PARAMETER_SENSOR(N_PARAM) PARAMETER_SENSOR:long_name = “”;	mandatory
PARAMETER_UNITS	string PARAMETER_UNITS(N_PARAM) PARAMETER_UNITS:long_name = “”; PARAMETER_UNITS:parameter_units_vocabulary = “”;	highly desirable

Geophysical variables

VARIABLE NAME	variable attributes	requirement status
<PARAM>	float <PARAM>(N_MEASUREMENT); <PARAM>:long_name = "<X>"; <PARAM>:standard_name = “<X>"; <PARAM>:vocabulary = “https://vocab.nerc.ac.uk/collection/OG1/current/[*https://vocab.nerc.ac.uk/collection/OG1/current/*]"; <PARAM>:_FillValue = <X>; <PARAM>:units = "<X>"; <PARAM>:ancillary_variables = "PARAM_QC"	mandatory <PARAM> contains the values of a parameter listed in the control vocabulary related to OceanGliders parameters. <X>: these fields are specified in the control vocabularies.
<PARAM>_QC	Byte <PARAM>_QC(N_MEASUREMENT); <PARAM>_QC:long_name = "quality flag"; <PARAM>_QC:FillValue = " "; <PARAM>_QC:RTQC_methodology = “”; vocabulary = ""; <PARAM>_QC:RTQC_methodology_vocabulary = “”; <PARAM>_QC:RTQC_methodology_doi = “”;	mandatory

Note: It is anticipated to upgrade the ancillary variable related to QC by refining the ancillary variable name like < PARAM >_qc_generic, < PARAM >_qc_spike_test, <PARAM>_qc_land_test, etc.

Control vocabularies

A list of vocabularies of this format is controlled for harmonization across multiple stakeholders. The different collections with hosts and managers are listed below.

Control vocabularies will cover the metadata listed in the table (with a summary of existing candidate vocabularies and proposed governance):

Metadata field	Vocabulary exists	Link to vocabulary	host	Possible governance
platform	yes	*https://vocab.nerc.ac.uk/collection/L06/current/25/*	NVS	OceanGliders
oceangliders_site	No	*OG1 - Vocabulary Collection*	NVS	OceanOPS
contributors_role	No	*OG1 - Vocabulary Collection*	NVS	OceanGliders
agencies_role	No	*OG1 - Vocabulary Collection*	NVS	OceanGliders
agencies_id	Yes	*https://edmo.seadatanet.org/*	Maris	SeaDataNet
naming_authority	Yes	*https://edmo.seadatanet.org/*	Maris	SeaDataNet
institution	Yes	*https://edmo.seadatanet.org/*	Maris	SeaDataNet
rtqc_method	No	*OG1 - Vocabulary Collection*	?	OceanGliders
phase_calculation_methodology	No	*OG1 - Vocabulary Collection*	?	OceanGliders
platform_type	No	*OG1 - Vocabulary Collection*	NVS	OceanGliders
platform_model	Yes	*OG1 - Vocabulary Collection*	NVS	OceanGliders
ICES_code	Yes	*OG1 - Vocabulary Collection*	? (ICES / NVS)	ICES
platform_maker	Yes	*OG1 - Vocabulary Collection*	NVS	OceanGliders
battery_type	No	*OG1 - Vocabulary Collection*	NVS	OceanGliders
telecom_type	No	*OG1 - Vocabulary Collection*	NVS	OceanGliders
tracking_system	No	*OG1 - Vocabulary Collection*	NVS	OceanGliders
sensor_model	Yes	*OG1 - Vocabulary Collection*	NVS	OceanGliders
data_mode	No	*OG1 - Vocabulary Collection*	?	OceanGliders

Metadata field	Vocabulary exists	Link to vocabulary	host	Possible governance
phase	No	*OG1 - Vocabulary Collection*	NVS	OceanGliders
variable names	Yes	*OG1 - Vocabulary Collection*	NVS	OceanGliders

Notes:

- Units are a special case to be discussed because the convention in GOOS is UD units which are a conflation of observed property and measurement scale. UD units are available in spreadsheet form but not on a vocabulary server. Efforts are ongoing in the internal community to harmonize a common unit's vocabulary.
- A sustainable model to resource the development and ongoing maintenance of vocabularies will need to be identified during the implementation phase of the OG1.0.

Vocabularies will be fully defined during the implementation phase of the OG1.0. The current version of the vocabulary collections is available here: *OG1 - Vocabulary Collection*

Best practices

[[*heading=h.3whwml4]]Methodologies used to compute OG1.0 format need publishing as best practices document in the IODE Ocean Best Practice repository (_https://repository.oceanbestpractices.org/*) under the community "OceanGliders" and the collection "data management". It covers the following topic:

- Interpolation methodologies
- PHASE computing methodologies
- RTQC methodologies

Methodologies should describe the computation methods used by DAC to produce the data set. Methodologies should have a DOI and be labialized as "OceanGliders practices" by the OceanGliders data management task team.

Evolution process, the inclusion of new variables.

Management of the evolution of the format will be organized by the OceanGliders data management team.

Reporting

The meeting will be organized (every 6 months?) with DACs to report about the implementation process until September 2023.

Agenda

Agreement on the Term of Reference: 3 months – Jan 2021 – March 2021

A proposal will be delivered by the working group on December 14th for endorsement by the OceanGliders steering committee.

The OG1.0 ToR will be addressed to the OceanGliders community for questions and feedback for 3 months.

Our working group will agree on a final version of the common format.

Implementation phase: 18 months – April 2021 to Oct 2022

During the implementation phase, operators, DACs and GDACs will develop tools and procedures to produce real-time gliders data files compliant with OG1.0 requirements described in the ToR.

Regular meetings (frequency to be discussed) will be organized by the data management task team and DACs to evaluate progress in the different steps of the implementation phase.

The OceanGliders data management team will agree on vocabulary collection.

Operational phase: 3 months – Oct 2022 to Dec 2023

2 years after the agreement on the Terms of Reference OG1.0 will become the unique format for the OceanGliders program.

[[_heading=h.1egqt2p]]Glider missions not delivering OG1.0 will not be considered as part of the OceanGliders program. It will be encouraged that legacy files be converted and added to OceanGliders final repository

Appendix A: Examples

Program, network, and site

Example 1:

- platform (i.e. glider mission): kraken_20210205
- Program: MOOSE glider program
- Site: MOOSE_T00, MOOSET_02
- Networks: Mediterranean Ocean Observing Systems for the Environment (MOOSE), Boundary Ocean Observing Network (BOON), OceanGliders Water Transformation task team”

Example 2:

- platform: sdeep09_sdeep04_20200929
- Program: SOCIB Glider Programme

- Site: Canales
- Network: Boundary Ocean Observing Network (BOON)

Example 3:

- platform: SG669-20210617
- Program: NOAA Hurricane Glider program
- Site: NPR1 (North Puerto Rico 1)
- Networks: Integrated Ocean Observing System (IOOS), Caribbean Coastal Ocean Observing System (CARICOOS), Boundary Ocean Observing Network (BOON), OceanGliders Storms, AtlantOS

Example 4:

- platform: sp058-20210812T1703
- Program: Scripps glider program
- Site: CUGN90
- Network: Integrated Ocean Observing System (IOOS), Southern California Coastal Ocean Observing System (SCCOOS), California Network Spray Program, California Underwater Glider Network (CUGN), Boundary Ocean Observing Network (BOON)

Example 5:

- platform: ce_917-20210730
- Program: OOI - Coastal and Endurance array
- Site: OOI - Newport Harbor Inshore Line, OOI - Newport Harbor offshore Line
- Network: Ocean Observatories Initiative (OOI), Northwest Association of Networked Ocean Observing Systems (NANOOS), Boundary Ocean Observing Network (BOON)

Example 6:

- platform: SL287 - StormBay-15Apr21
- Program: Integrated Marine Observing System - Glider
- Site: no site
- Network: IMOS

Example 7:

- platform: stella_20180207
- Program: MARS Glider program
- Site: no site
- Network: Alter_ECO

[1] NetCDF-3 does not satisfy the requirements of OG1.0 format

[2] http://cfconventions.org/Data/cf-conventions/cf-conventions-1.8/cf-conventions.html#trajectory-data