Data Management Plan

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1. Overview of OSNAP

OSNAP, designed to provide a continuous record of the full-water column, trans-basin fluxes of heat, mass and freshwater in the subpolar North Atlantic, consists of two legs: one extending from southern Labrador to the southwestern tip of Greenland across the mouth of the Labrador Sea (OSNAP West), and the second from the southeastern tip of Greenland to Scotland (OSNAP East). The observing system also includes subsurface floats (OSNAP Floats) in order to trace the pathways of overflow waters in the basin and to assess the connectivity of currents crossing the OSNAP line. The location of the OSNAP East and West legs purposefully melds with a number of long-term observational efforts in the North Atlantic: the Canadian repeat AR7W program in the Labrador Sea; the German Labrador Sea western boundary array at 53°N; the global Ocean Observatories Initiative node to be placed in the southwestern Irminger Sea; the repeat A1E/AR7E hydrographic sections across the Irminger and Iceland basins; and the Ellett line in the Rockall region. Importantly, this observing system, in conjunction with the RAPID/MOCHA array at 26ºN and the EU THOR/NACLIM program, will provide a comprehensive measure of the Atlantic Meridional Overturning Circulation (AMOC) and provide a means to evaluate intergyre connectivity in the North Atlantic.

2. International OSNAP Data Management Policy

OSNAP is a collaborative effort, which includes several countries including US, Canada, China, France, Germany, Netherlands and the UK. To ensure uniformity in the treatment of data, we have designed a data management and policy plan for the entire OSNAP community (see below). In addition, OSNAP PIs within each country will be solely responsible to conform to the country (or agency) specific requirements for data management.

Data Management

All data from the combined international OSNAP program will be loaded into a web-accessible database, with oversight from the OSNAP steering committee. All data on this site will be freely accessible to the public after a two-year limited (permission only) access period. OSNAP data policy encourages open, collaborative sharing of data, both between participants and with the general oceanographic community, and seeks to ensure that OSNAP investigators receive appropriate credit for the data produced by their efforts. Thus, while there is no restriction on data use, an acknowledgement to the OSNAP program and specific data provider is requested for publication of results derived from the measurements.

Policy

- Investigators are expected to communicate their analysis plans widely within the program by sending a contribution to the OSNAP annual report, and, where conflicts exist, develop plans for collaboration.
- Any person making use of OSNAP observational data and/or numerical results must communicate with the responsible investigators at the start of the analysis and anticipate that the data collectors will be co-authors of published results.
- Student projects (thesis and dissertation research) should be identified as early as possible and shared with all OSNAP investigators. All OSNAP investigators should respect the interests of these projects. However, no individual project, student or otherwise, should delay the delivery of the OSNAP data products.
- In cases where investigators choose not to be co-authors on publications that rely on their data, the parties responsible for collecting the data and the sponsoring funding agencies should be acknowledged, including reference to any relevant publications by the originating authors describing the data sets and a reference to the data set itself using its DOI name.
- Subject to the above conditions, OSNAP investigators are expected to make data and results freely available to others within the program as soon as possible.
- OSNAP collaborators are encouraged to submit real-time data to operational centers.

Finally, OSNAP data are intended for scholarly use by the academic and scientific community, with the express understanding that any such use will properly acknowledge the originating investigator.

3. Data Documentation and Metadata

The categories of data generated and used in this project include instrument data (e.g., mooring data, float data, glider data, shipboard data), and derived data products (e.g., gridded data, overturning metrics). To assure quality control (QC) and reproducibility of these data, NetCDF (Network Common Data Form) format is used to distribute all OSNAP data. The NetCDF format, including naming conventions as well as metadata content, should comply with OceanSITES conventions (*Appendix A*). Note that for shipboard data, PIs can follow the convention outlined in the WOCE manual updates found at the "GO-SHIP" website (http://www.go-ship.org/HydroMan.html).

Data files

Data files should contain one type of data (see Appendix B for the description of data types), from one deployment. Information specific to certain data type is described below.

(a). Moored instrument (ADCP, CM, MCTD, MT) data should be saved as one file per instrument.

(b). Shipboard data (CTD, DIS, LADCP) should be supplied as one file per CTD station. Down cast data should be included. If water samples have been collected, the discrete up cast value (measured at the time of the water sample) should be provided.

(c). Ship-mounted ADCP data (SADCP) should be included as a time series of profiles.

Data processing document

An additional processing document, outlining the procedures undertaken to process and quality check/control the data, should accompany each data file. This document should contain at least the following two sections:

(a). Calculating and applying calibrations – information about the calibration coefficients and methods of applying calibrations.

(b). Quality control – information about the quality and methods used for quality control.

4. Data Organization and Storage

The steps for the OSNAP data processing and storage are as follows (see Appendix C for OSNAP data flow chart).

Instrument data

Raw data is collected by PIs. PIs should follow the OSNAP protocols for processing all data (Appendix D). Raw data is calibrated and quality controlled by PIs with minimal processing:

(i). Remove bad data values and fill with 99999 (single precision) instead.

(ii). Use 99999 (single precision) for missing data values.

(iii). De-spike wherever needed.

(iv). Do not de-tide.

(v). Do not filter or interpolate.

The data is then converted to NetCDF format by PIs. The NetCDF data file, with the accompanying processing document, is uploaded to the OSNAP server by PIs as it becomes available. Note:

(i). Raw data can be kept at participating institutions and saved to the OSNAP server for backup.

(ii). The submitted data should be fully “worked up” (i.e., calibrated and quality controlled) with sufficient documentation to be of use to third parties without reference to the original collector.

(iii). Data submission is via a web-based uploader.

OSNAP Data Server

OSNAP uses Duke’s *Box* service for cloud storage and content collaboration across countries and institutions. Instrument and derived data saved on the OSNAP server are shared within the OSNAP community. All data and documents on the OSNAP server are backed up periodically.

Data files on the OSNAP Server include:

(a) *Observations:* Processed instrument data in NetCDF format are found in [ROOT_DIRECTORY]/Observations/[CATEGORY]/

(b) *Products:* Data products derived from OSNAP observational data may be made available on the OSNAP server in the near future. The product data files are found in [ROOT_DIRECTORY]/Products/

Data repository and DOI

All of the OSNAP datasets will be submitted to the appropriate data repositories or Global Data Assembly Center (GDAC) for long-term preservation, which will be available to the public with designated Digital Object Identifiers (DOIs). PIs are responsible for archiving their data and obtaining the DOI. Derived products from the integrated analysis will be archived at the Duke Digital Repository (DDR) that will become publicly available with DOI. All data DOIs can be found at the OSNAP website.

5. Data Access

The OSNAP data will be made publicly available no later than two years after the data are collected. Accordingly, the data have the following access requirements:

(a). Within the two-year period of access restriction, registration is required in order to have access to data on the OSNAP server. All datasets on the OSNAP Server are then accessible to the registered user.

(b). After the two-year period of access restriction, all OSNAP data will be uploaded to the appropriate data repository or GDAC, which will be made publicly available with DOI. All the datasets along with DOIs will be listed on the OSNAP website.

6. Data Preservation and Archiving

The data will be preserved and archived as follows:

(a). Data saved at each participating institution will be maintained throughout the OSNAP period.

(b). Data on the OSNAP server is to be retained 10-15 years.

(c). All OSNAP data eventually go to data repositories or data centers for long-term preservation.

A review mechanism will be initiated by the steering committee to periodically reconsider the costs and benefits of continuing to maintain the data.

7. OSNAP Website

The OSNAP website (https://www.o-snap.org/observations/data/) provides full descriptions of all available OSNAP datasets with proper download links for:

(a). *Instrument data:* Data description for different categories (mooring, glider, float, shipboard).

(b). *Derived data:* Description and preliminary results for OSNAP products.

8. Responsibilities of the OSNAP PIs

- OSNAP data should be submitted to the OSNAP server by the PI as soon as feasible, but no later than 12 months after acquisition. The acquisition date is the date when data is downloaded from the instruments or the end-date of the cruise.
- It is the responsibility of individual PIs to provide back-up strategies for data stored locally.
- PIs are expected to archive the data collected/generated by their groups and to get the DOI.
- Each participating country should designate a main contact regarding data issues.

Appendix A. Description of OceanSITES NetCDF Format Adapted for OSNAP Data

NetCDF file naming and contents are described (OceanSITES Data Format Reference Manual, Version 1.3, released on 1/12/2015). The following information includes some key elements of the OceanSITES conventions.

(1) File naming:

Data files normally contain one type of data, from one deployment. The data file name typically follows:

OS_[PlatformCode]_[DeploymentCode]_[DataMode]_[DataType]_[PARTX].nc

- OS – OceanSITES prefix
- [PlatformCode] – OSNAP-<internal_instrument_ID> OSNAP-<cruise_number>
- [DeploymentCode]
    - For mooring and float data: instrument deployment year and month
    - For shipboard data: cruise departure year and month
    - For glider data: year and month when mission begins
- [DataMode] – Data mode
- [DataType] – MCTD, CM, ADCP, MT, GLIDER. (see *Appendix B*)
- [PARTX] – An optional user defined field for identification of data; for example, shipboard CTD station number, moored sensor depth.

Example:

OS_OSNAP-UMM1_201407_MCTD_200m.nc
MicroCAT at the nominal depth of 200m on the U. Miami M1 mooring deployed in July 2014

OS_OSNAP-UMM1_201407_CM_1430m.nc
Current meter at the nominal depth of 1430m on the U.Miami M1 mooring deployed in July 2014

OS_OSNAP-IC1_201407_ADCP_475m.nc
ADCP at the nominal depth of 475m on the NIOZ IC1 mooring deployed in July 2014

OS_OSNAP-OG1_GLIDER_201407.nc
Glider (OG1 – Jura) survey began in July 2014

OS_OSNAP-2_201406_CTD_#1.nc
Shipboard CTD station #1 from cruise OSNAP2

OS_OSNAP-2_201406_SADCP.nc
Ship-mounted ADCP from cruise OSNAP2

OS_OSNAP-2_201406_LADCP.nc
Lowered LADCP from cruise OSNAP2

(2) Global attributes:

Discovery and identification		
Name	**Example**	**Note**
site_code	site_code = ”OSNAP”	Name of the site within OceanSITES project. The site codes are available on GDAC ftp servers. **Required (**GDAC)
platform_code	platform_code = ”OSNAP-IC1”. Temporarily, use ONSAP-<internal mooring ID>.	The unique platform code, assigned by an OceanSITES project. **Required**. (GDAC)
data_mode	data_mode = ”D”	Indicates if the file contains real-time, provisional or delayed-mode data. The list of valid data modes is in reference table 4. (GDAC)
title	title= ”Irminger Sea MCTD data 7/2014-7/2015”	Free-format text describing the dataset, for use by human readers. Use the file name if in doubt. (NUG)
summary	summary = ”Water temperature and salinity at nominal depth of 130m”	Longer free-format text describing the dataset. This attribute should allow data discovery for a human reader. A paragraph of up to 100 words is appropriate. (ACDD)
naming_authority	naming_authority= ”OceanSITES”	The organization that manages data set names. (ACDD)
id	id= ”OS_OSNAP-IC1_201407_MCTD_130m”	The “id” and “naming_authority” attributes are intended to provide a globally unique identification for each dataset. The id may be the file name without .nc suffix, which is designed to be unique. (ACDD)
source	source = ”subsurface mooring”	Use a term from the SeaVoX Platform

		Categories,(L06) list, usually one of the following: “moored surface buoy”, “subsurface mooring” (CF)
principal_investigator	principal_investigator = ”Alice Juarez”	Name of the person responsible for the project that produced the data contained in the file.
principal_investigator _email	principal_ investigator_email = ”AJuarez@whoi.edu”	Email address of the project lead for the project that produced the data contained in the file.
principal_investigator _url	principal_ investigator_url = ” whoi/edu/profile/AJuarez”	URL with information about the project lead.
institution	Institution = ” National Oceanographic Centre”	Specifies institution where the original data was produced. (CF)
project	project = ”OSNAP”	The scientific project that produced the data.
array	array = ”OSNAP”	A grouping of sites based on a common and identified scientific question, or on a common geographic location.
network	network = ”OSNAP”	A grouping of sites based on common shore-based logistics or infrastructure.
comment	comment = ”N/A”	Miscellaneous information about the data or methods used to produce it. Any free-format text is appropriate. (CF)

Geo-spatial-temporal		
Name	**Example**	**Note**
area	area= ”North Atlantic Ocean”	Geographical coverage. Try to compose of the following: North/Tropical/South Atlantic/Pacific/Indian Ocean, Southern Ocean, Arctic Ocean.

geospatial_lat_min	geospatial_lat_min= 59.1	The southernmost latitude, a value between -90 and 90 degrees; may be string or numeric. (ACDD, GDAC)
geospatial_lat_max	geospatial_lat_max= 59.1	The northernmost latitude, a value between -90 and 90 degrees. (ACDD, GDAC)
geospatial_lat_units	geospatial_lat_units= "degree_north"	Must conform to udunits. If not specified then ”degree_north” is assumed. (ACDD)
geospatial_lon_min	geospatial_lon_min= -33.68	The westernmost longitude, a value between -180 and 180 degrees. (ACDD, GDAC)
geospatial_lon_max	geospatial_lon_max= -33.68	The easternmost longitude, a value between -180 and 180 degrees. (ACDD, GDAC)
geospatial_lon_units	geospatial_lon_units= ”degree_east”	Must conform to udunits, If not specified then ”degree_east” is assumed. (ACDD)
geospatial_vertical_min	geospatial_vertical_min= 130	Minimum depth or height of measurements. (ACDD, GDAC)
geospatial_vertical_max	geospatial_vertical_max= 130	Maximum depth or height of measurements. (ACDD, GDAC)
geospatial_vertical_positive	geospatial_vertical_positive =”down”	Indicates which direction is positive; "up" means that z represents height, while a value of "down" means that z represents pressure or depth. If not specified then “down” is assumed. (ACDD)
geospatial_vertical_units	geospatial_vertical_units=’meter”	Units of depth, pressure, or height. If not specified then “meter” is assumed. (ACDD)
time_coverage_start	time_coverage_start= ” 2014-07-10T05:50:00Z”	Start date of the data in UTC. See note on time format below. (ACDD, GDAC)
time_coverage_end	time_coverage_end= ”	Final date of the data in

	2015-07-11T19:20:00Z"	UTC. See note on time format below. (ACDD, GDAC)
time_coverage_duration	time_coverage_duration= "P367D"	Use ISO 8601 (examples: P1Y ,P3M, P10D) (ACDD)
time coverage_resolution	Time_coverage_resolution= "PT15M"	Interval between records: Use ISO 8601 (PnYnMnDTnHnMnS) e.g. PT5M for 5 minutes, PT1H for hourly, PT30S for 30 seconds. (ACDD)
cdm_data_type	cdm_data_type="Station"	The Unidata CDM (common data model) data type used by THREDDS. e.g. point, profile, section, station, station_profile, trajectory, grid, radial, swath, image; use Station for OceanSITES mooring data. (ACDD)
featureType	featureType="timeSeries" or "timeSeriesProfile"	**Optional, and only** for files using the Discrete Sampling Geometry, available in CF-1.5 and later. See CF documents. (CF)
data_type	data_type="OceanSITES time-series data"	From Reference table 1: OceanSITES specific. (GDAC)

Conventions used		
Name	**Example**	**Note**
format_version	format_version="1.3"	OceanSITES format version; may be 1.1, 1.2, 1.3. **(GDAC)**
Conventions	Conventions="CF-1.6, OceanSITES-1.3, ACDD-1.2"	Name of the conventions followed by the dataset. (NUG)
netcdf_version	netcdf_version="4.3"	NetCDF version used for the data set

Provenance		
Name	**Example**	**Note**
date_created	date_created ="2016-	The date on which the data file was

	08-11T08:35:00Z"	created. **Version date and time for the data contained in the file. (UTC). See note on time format below.** (ACDD)
date_modified	date_modified= " 2016-02-17T19:39:18Z"	The date on which this file was last modified. (ACDD)
history	history= "Delayed time processed quality controlled at DAC"	Provides an audit trail for modifications to the original data. It should contain a separate line for each modification, with each line beginning with a timestamp, and including user name, modification name, and modification arguments. The time stamp should follow the format outlined in the note on time formats below. (NUG)
processing_level	processing_level =" Data manually reviewed"	Level of processing and quality control applied to data. Preferred values are listed in reference table 3.
QC_indicator	QC_indicator ="excellent"	A value valid for the whole dataset, one of: 'unknown' – no QC done, no known problems 'excellent' - no known problems, some QC done 'probably good' - validation phase 'mixed' - some problems, see variable attributes
contributor_name	contributor_name = "Jane Doe"	A semi-colon-separated list of the names of any individuals or institutions that contributed to the creation of this data. (ACDD)
contributor_role	contributor_role = "data processing and interpretation"	The roles of any individuals or institutions that contributed to the creation of this data, separated by semi-colons.(ACDD)
contributor_email	contributor_email = "Jdoe@ifremer.fr"	The email addresses of any individuals or institutions that contributed to the creation

(3) Dimensions:

Name	Example	Comment
TIME	TIME=unlimited	Number of time steps.

		Example: for a mooring with one value per day and a mission length of one year, TIME contains 365 time steps.
DEPTH	DEPTH=1	Number of depth levels.
LATITUDE	LATITUDE=1	Dimension of the LATITUDE coordinate variable.
LONGITUDE	LONGITUDE=1	Dimension of the LONGITUDE coordinate variable.

(4) Coordinate variables:

The following four coordinate variables are required:

TIME (time of measurement),

LATITUDE (latitude of measurement),

LONGITUDE (longitude of measurement),

DEPTH (nominal depth of instrument).

For ADCP data:

Use INSTUDEPTH (nominal depth of instrument) and BINDEPTH (nominal depths of ADCP bins) instead of DEPTH.

Type, name, dimension, attributes	**Comment**
Double **TIME**(TIME); TIME:standard_name = “time”; TIME:units = “days since 1950-01-01T00:00:00Z”; ‘ TIME:axis = “T”; TIME:long_name = “time of measurement”; TIME:valid_min = 0.0; TIME:valid_max = 90000.0; TIME:QC_indicator = <X>; TIME:Processing_level = <Y>;	Date and time (UTC) of the measurement in days since midnight, 1950-01-01. Example: Noon, Jan 2, 1950 is stored as 1.5. <X>: Text string from reference table 2. Replaces the TIME_QC if constant. Cf. note on quality control in data variable section,. <Y>: Text from reference table 3. <Z>: Choose appropriate value.

Float **LATITUDE**(LATITUDE); LATITUDE:standard_name = “latitude”; LATITUDE:units = “degree_north”; LATITUDE:axis=”Y”; LATITUDE:long_name = “latitude of measurement”; LATITUDE:reference="WGS84"; LATITUDE:coordinate_reference_frame="urn:ogc:def:crs:EPSG::4326"; LATITUDE:valid_min = -90.0; LATITUDE:valid_max = 90.0; LATITUDE:QC_indicator = <X>; LATITUDE:Processing_level= <Y>; LATITUDE:uncertainty = <Z>; or LATITUDE:accuracy = <Z>; LATITUDE:comment = “Surveyed anchor position”;	Latitude of the measurements. Units: degrees north; southern latitudes are negative. Example: 44.4991 for 44° 29’ 56.76’’ N <X>: Text string from reference table 2. Replaces POSITION_QC if constant. <Y>: Text from reference table 3. <Z>: Choose appropriate value.
Float **LONGITUDE**(LONGITUDE); LONGITUDE:standard_name = “longitude”; LONGITUDE:units = “degree_east”; LONGITUDE:axis=”X”; LONGITUDE:reference="WGS84"; LONGITUDE:coordinate_reference_frame="urn:ogc:def:crs:EPSG::4326"; LONGITUDE:long_name = “longitude of measurement”; LONGITUDE:valid_min = -180.0; LONGITUDE:valid_max = 180.0; LONGITUDE:QC_indicator = <X>; LONGITUDE:processing_level = <Y>; LONGITUDE:uncertainty = <Z>; or LONGITUDE:accuracy = <Z>;	Longitude of the measurements. Unit: degrees east; western latitudes are negative. Example: 16.7222 for 16° 43’ 19.92’’ E <X>: Text from reference table 2. Replaces POSITION_QC if constant. <Y>: Text from reference table 3. <Z>: Choose appropriate value.
Float **DEPTH**(DEPTH); DEPTH:standard_name = “depth”; DEPTH:units = “meter”; DEPTH:positive =<Q> DEPTH:axis=”Z”; DEPTH:reference=<R>; DEPTH:coordinate_reference_frame="urn:ogc:def:crs:EPSG:: <S>”; DEPTH:long_name = “depth of measurement”; DEPTH:valid_min = 0.0; DEPTH:valid_max = 12000.0; DEPTH:QC_indicator = <X>; DEPTH:processing_level = <Y>; DEPTH:uncertainty = <Z>; or DEPTH:accuracy = <Z>; DEPTH:comment = “These are nominal values. Use	Depth of measurements. Example: 513 for a measurement 513 meters below sea surface. <Q>: “Positive” attribute may be ”up” (atmospheric, or oceanic relative to sea floor) or ”down” (oceanic). <R>: The depth reference default value is “sea_level”.

PRES to derive time-varying depths of measurements.”;	Other possible values are : “mean_sea_level”, “mean_lower_low_water”, “wgs84_geoid” <S>: Use CRF 5831 for depth, or 5829 for height; relative to instantaneous sea level <X>: Text from reference table 2. Replaces DEPTH_QC if constant. <Y>: Text from reference table 3.

(5) Data variables:

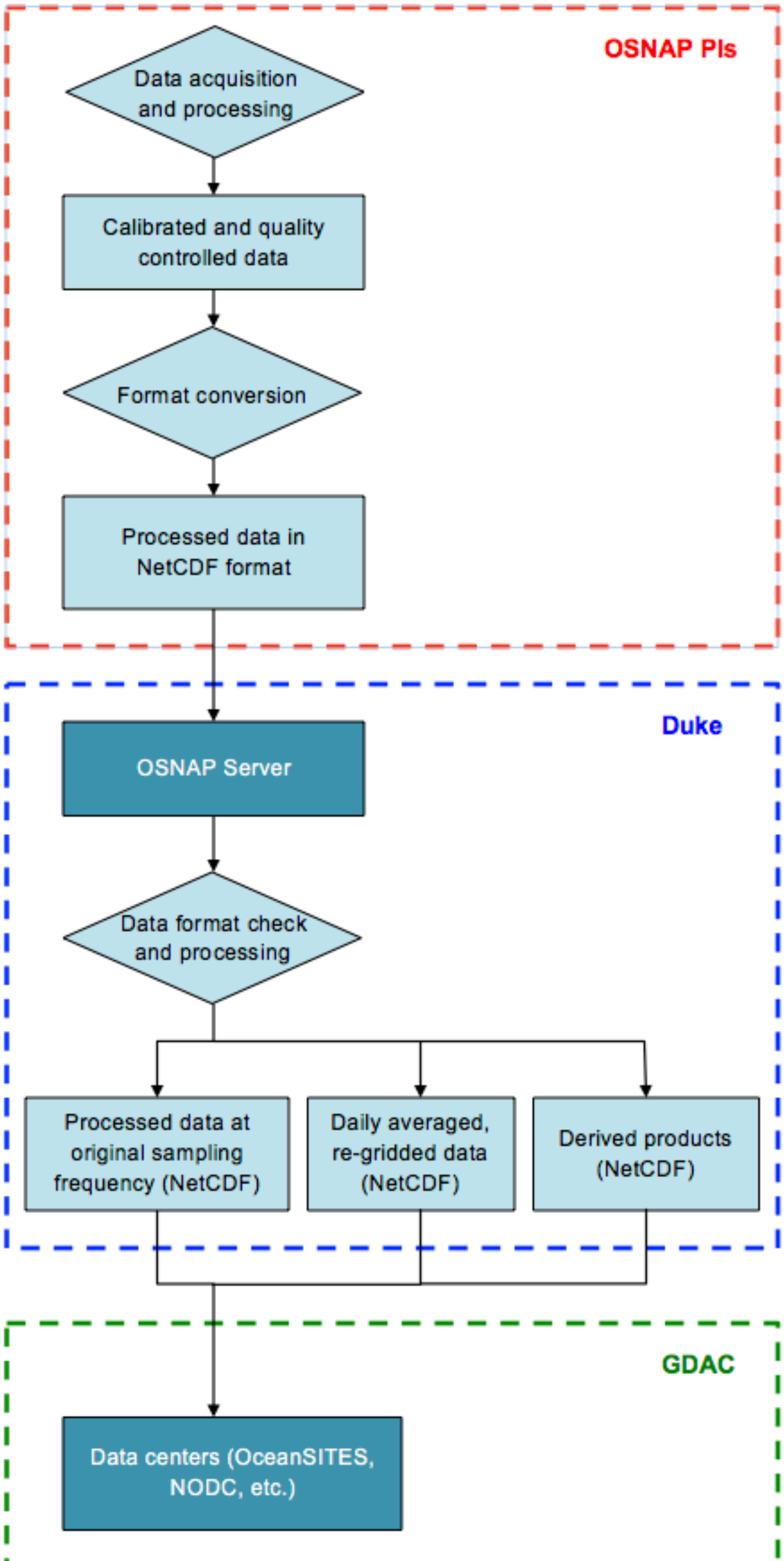
Type, name, dimension, attributes	**Comment**
Float <**PARAM**>(TIME, DEPTH);	or: Float <**PARAM**>(TIME);
<PARAM>:**standard_name** = <A>;	**standard_name: Required, if** there is an appropriate, existing standard name in CF.
<PARAM>:**units** = <A>;	**units:** Required
<PARAM>:**_FillValue** = <B>;	**_FillValue**: **Required** (99999f).
<PARAM>:**coordinates** = <B>;	**coordinates: Required, if** a data variable does not have 4 coordinates in its definition.
<PARAM>:long_name = <B>;	l**ong_name**: text; should be a useful label for the variable
<PARAM>:QC_indicator = <A>;	**QC_indicator**: (OceanSITES specific) text, ref table 2
<PARAM>:processing_level = <A>;	**processing_level:** text, ref table 3
<PARAM>:valid_min = <B>;	**valid_min**: Float. Minimum value for valid data
<PARAM>:valid_max = <B>;	**valid_max**: Float. Maximum value for valid data
<PARAM>:comment = <C>;	**comment**: Text; useful free-format text
<PARAM>:uncertainty = <B>;	**uncertainty**: Float. Overall measurement uncertainty, if constant.
<PARAM>:accuracy = <B>;	**accuracy**: Float. Nominal accuracy of data.
<PARAM>:precision = <B>;	**precision**: Float. Nominal precision of data.
<PARAM>:resolution = <B>;	**resolution**: Float. Nominal resolution of

	data.

Appendix B. Data Type ID and Description

Data type ID	**Description**
ADCP	Acoustic Doppler Current Profiler
BATH	Bathymetry
MBCS	Moored biological/chemical sensor
CM	Current Meter
CTD	Conductivity-Temperature-Depth profiler
DIS	Discrete water bottle samples
GLIDER	Glider
LADCP	Lowered Acoustic Doppler Current Profiler
MET	Meteorology
MT	Moored Thermistor
MCTD	Moored Conductivity-Temperature-Depth sensor
MMP	McLane Moored Profiler - profiling CTD and current meter
SADCP	Shipboard Acoustic Doppler Current Profiler

Appendix C. OSNAP Data Flow Chart



Appendix D. Processing Protocols for OSNAP Data

The goal of establishing the OSNAP data processing protocols is to provide uniform data calibration and processing procedures across different groups. The processing protocols for different data type are described below.

Moored ADCP and CM data

Processing of ADCP and CM data should follow what was described in Johannes et al. (2015) (Sections 4 and 5).

Reference: Karstensen, J., 2015. How to process mooring data? A cookbook for Microcat, ADCP and RCM data.

Moored CTD data

Deployment and recovery procedures should follow what was described in Houk and Johns (2016). This document and M-files used to process microcat caldips along with a brief document describing the processing steps can be found at (password protected): www.o-snap.org/pi

Reference: Houk and Johns, 2016. Microcat SBE37-SM deployment and conductivity calibration procedure, University of Miami.

Shipboard data

GO-SHIP standard is adopted for processing all shipboard measurements.

Reference: Hood, E.M., C.L. Sabine, and B.M. Sloyan, Eds., 2010. The GO-SHIP Repeat Hydrography Manual: A Collection of Expert Reports and Guidelines. IOCCP Report Number 14, ICPO Publication Series Number 134. Available online at http://www.go-ship.org/HydroMan.html.

RAFOS float data

Details on the processing of RAFOS float data can be found at http://www.whoi.edu/instrument/rafos/artoa-float-tracking