OA metadata template (instructions)

Section	Metadata elements				help ref. No	Brief Descriptions
1	Submission date				1	Submission Date (for this record only, automated time-stamp may be used for the published metadata record).
2	Identification no. of related data sets				2	If you've previously submited a related data set to an archive before, and want to link the archive packages together, please write down all related data package identification numbers here.
3	Investigator (repeat as needed)	Name			3.1	Full name of the investigator (First Middle Last).
		Institution			3.2	Affiliated institution of the investigator (e.g., Woods Hole Oceanographic Institution).
		Address			3.3	Address of the affiliated institution of the investigator.
		Phone			3.4	Phone number of the investigator.
		Email			3.5	Email address of the investigator.
		researcher ID			3.6	We recommend to use person identifiers (e.g. ORCID, ResearcherID, etc.) to unambiguously identify the investigator
		ID type			3.7	Please indicate which type of person identifier is recorded in the above row.
4	Data Submitter	Name			4.1	If applicable, full name of the individual submitting the data to a data center or archive facility.
		Institution			4.2	Affiliated institution of the data submitter (e.g., Woods Hole Oceanographic Institution).
		Address			4.3	Address of the affiliated institution of the data submitter.
		Phone			4.4	Phone number of the data submitter.
		Email			4.5	Email address of the data submitter.
		researcher ID			4.6	We recommend to use person identifiers (e.g. ORCID, ResearcherID, etc.) to unambiguously identify the investigator
		ID type			4.7	Please indicate which type of person identifier is recorded in the above row.
5	Title				5	Provide a descriptive title for the data set.
6	Abstract				6	A narrative summary of the data set.
7	Purpose				7	The intentions with which the data set is developed.
8	Temporal coverage	Start date (YYYY-MM-DD)			8.1	Start date of the first measurement. Please use ISO date format (YYYY-MM-DD).
		End date (YYYY-MM-DD)			8.2	End date of the last measurement. Please use ISO date format (YYYY-MM-DD).
9	Bounding box coordinates	West bound longitude			9.1	Westernmost longitude of the sampling (decimal degrees, negative for Western Hemisphere longitude).
		East bound longitude			9.2	Easternmost longitude of the sampling (decimal degrees, negative for Western Hemisphere longitude)
		North bound latitude			9.3	Northernmost latitude of the sampling (decimal degrees, negative for Southern Hemisphere latitude)
		South bound latitude			9.4	Southernmost latitude of the sampling (decimal degrees, negative for Southern Hemisphere latitude)
10	Spatial reference system				10	A spatial reference system or coordinate reference system defines a specific map projection, as well as transformations between different spatial reference systems. WGS 84 is the reference coordinate system used by the Global Position System.
11	Geographic names				11	Names of the geographic area where the data collection takes place, e.g., Gulf of Mexico, Baltic Sea, etc.
12	Location of organism collection				12	For biological studies, please provide the location of the organism collection here, and use the above bounding box and geographic names for the water collection site.
13	Funding Agency (repeat as needed)	Funding agency name			13.1	Funding agency of the data collection. Examples include, National Science Foundation, NOAA's Ocean Acidificaiton Program, etc.
		Funding project title			13.2	The title of your funded project
		Funding project ID			13.3	The ID of your funded project
14	Research Projects				14	Project refers to the collaborative research effort, which the data collection is part of . For example, U.S. Joint Global Ocean Flux Study (U.S. JGOFS) is a project. If you have multiple Projects, please separate them with comma and put all of them into this field.
15	Platform (repeat as needed)	Name			15.1	Platforms are often the research vessels that carry out the research. However, platforms could be something other than a ship (e.g., glider, Argo, etc), or something that is fixed (e.g., moored buoys, towers, etc).
		ID			15.2	ICES platform code (e.g., 33RO, optional). For a list of ICES platform codes, please check out this link: http://vocab.ices.dk.
		Type			15.3	Platform type, e.g., research vessel, voluntary observing ships, fishing vessel, cargo ship, mooring, glider, etc.
		Owner			15.4	Platform owner
		Country			15.5	Country of the platform
16	EXPOCODE				16	The EXPOCODE, or expedition code, provides a standard nomenclature for cruise labels of research vessels. The expocode consists of the four digit ICES ship code, and the date of the first day of the cruise in the format of YYYYMMDD. If you have multiple EXPOCODES, please separate them with comma and put all of them into this field.
17	Cruise ID				17	Cruise ID is the particular ship cruise number (e.g., MT901), or other alias for the cruise. For example, the Cruise ID (e.g., A16N_2013) could consist of a Section ID (e.g., A16N), and the sampling year (e.g., 2013). If you have multiple Cruise IDs, please separate them with comma and put all of them into this field. Curise IDs may not be unique.
18	Section (Leg)				18	Section ID is the identification number for a research cruise section or leg. It is commonly used during the World Ocean Circulation Experiment (WOCE) studies, which often had many repeating cruises on a single section, e.g., A16N.
19	Author list for citation				19	Please provide the list of authors in their correct order for the creation of data citation for this data set. We require the format of Lastname1, Firstname1, Middlename1; Lastname2, Firstname2, Middlename2; … for this field.
20	References				20	Provide the bibliographic citations for publications describing the data set. Example: cruise report, scientific paper. Please follow the American Geophysical Union citation format as much as you can.
21	Supplemental information				21	A comment field to capture information useful to understanding the data which is not covered elsewhere in the template.

22	Dissolved Inorganic Carbon (DIC)	**Variable abbreviation in data files**			22.1	Column header name of the variable in the data files, e.g., DIC, TCO_2, etc.
		Observation type			22.2	How the variable is observed, e.g., surface underway, profile, time series, model output, etc. For experimental data, this could be: laboratory experiment, pelagic mesocosm, benthic mesocosm, benthic FOCE type studies, natural pertubration site studies, etc
		In-situ observation / manipulation condition / response variable			22.3	Whether the variable belongs to an in-situ observed variable, or a manipulation condition variable, or a response variable in a biological experimental study.
		Manipulation method			22.4	In perturbation experiments, seawater carbonate chemistry can be manipulated by different techniques, such as bubbling CO_2, adding acids or bases, etc.
		Variable unit			22.5	Units of measurement (e.g., micro-mol/kg).
		Measured or calculated			22.6	Variable is measured in-situ or calculated from other variables.
		Calculation method and parameters			22.7	If the variable is calculated describe the methodoology, as well as the set of equilibrium constants and/or total concentrations equations.
		Sampling instrument			22.8	Instrument that is used to collect water samples, or deploy sensors, etc. For example, a Niskin bottle, pump, CTD, etc is a sampling instrument.
		Analyzing instrument			22.9	Instrument that is used to analyze the water samples collected with the 'sampling instrument', or the sensors that are mounted on the 'sampling instrument' to measure the water body continuously. For example, a coulometer, winkler titrator, spectrophotometer, pH meter, thermosalinograph, oxygen sensor, YSI Multiparameter Meter, etc is an analyzing instrument. We encourage you to document as much detail (such as the make, model, resolution, precisions, etc) of the instrument as you can here.
		Detailed sampling and analyzing information			22.10	Additonal information about the sampling and analyzing procedures.
		Field replicate information			22.11	Repetition of sample collection and measurement, and the percentage of the samples with replicate sampling.
		Calibration information	**Calibration technique description**		22.12.1	Describe how the instrument is calibrated.
			Frequency of calibration		22.12.2	Frequency of instrument calibration.
			CRM information	**CRM manufacturer**	22.12.3.1	Manufacturer of the Certified Reference Material, e.g., Andrew Dickson's lab at Scripps Institution of Oceanography.
				Batch number	22.12.3.2	Batch number of the CRMs that are used to calibrate the instrument.
		Poisoning Information	**Poison used to preserve the sample**		22.13.1	Identify the type of poison used to preserve the sample, e.g., saturated solution of mercury(II) chloride.
			Poison volume		22.13.2	Identify the volume of poison added to each sample to kill the microbes. For example, 100 µL Mercury Chloride is added to 500 mL samples, or 0.02% of the volume.
			Poisoning correction description		22.13.3	Please specify whether the reported variables are corrected for poison usage, and if so, how are they corrected.
		Uncertainty			22.14	Ideally, the term “uncertainty” should be the standard uncertainty of measurement; that is with the associated confidence interval equivalent to that for a standard deviation. However, you could record any pieces of information that are related to the quality control of the variable in this field.
		Data quality flag description			22.15	Describe what the quality control flags stand for, e.g., 2 = good value, 3 = questionable value, 4 = bad value. The use of WOCE quality flags are recommended.
		Method reference (citation)			22.16	Citation for the dissolved inorganic carbon method.
		Researcher who measured this parameter	**Researcher Name**		22.17.1	Full name of the individual responsible for obtaining this measurement.
			Researcher Institution		22.17.2	The institution of the individual responsible for obtaining this measurement.

23	Total Alkalinity (TA)	**Variable abbreviation in data files**			23.1	Column header name of the variable in the data files, e.g., TA, Alk, etc.
		Observation type			23.2	How the variable is observed, e.g., surface underway, profile, time series, model output, etc. For experimental data, this could be: laboratory experiment, pelagic mesocosm, benthic mesocosm, benthic FOCE type studies, natural pertubration site studies, etc
		In-situ observation / manipulation condition / response variable			23.3	Whether the variable belongs to an in-situ observed variable, or a manipulation condition variable, or a response variable in a biological experimental study.
		Manipulation method			23.4	In perturbation experiments, seawater carbonate chemistry can be manipulated by different techniques, such as bubbling CO_2, adding acids or bases, etc.
		Variable unit			23.5	Units of measurement (e.g., micro-mol/kg).
		Measured or calculated			23.6	Variable is measured in-situ, or calculated from other variables.
		Calculation method, software, and parameters			23.7	If the variable is calculated describe the methodoology, as well as the set of equilibrium constants and/or total concentrations equations.
		Sampling instrument			23.8	Instrument that is used to collect water samples, or deploy sensors, etc. For example, a Niskin bottle, pump, CTD, etc is a sampling instrument.
		Analyzing instrument			23.9	Instrument that is used to analyze the water samples collected with the 'sampling instrument', or the sensors that are mounted on the 'sampling instrument' to measure the water body continuously. For example, a coulometer, winkler titrator, spectrophotometer, pH meter, thermosalinograph, oxygen sensor, YSI Multiparameter Meter, etc is an analyzing instrument. We encourage you to document as much detail (such as the make, model, resolution, precisions, etc) of the instrument as you can here.
		Type of titration			23.10	Titration method used to determine alkalinity
		Cell type (open or closed)			23.11	Whether the titration cell is open or closed.
		Curve fitting method			23.12	Curve fitting method used to determine the alkalinity.
		Detailed sampling and analyzing information			23.13	Additonal information about the sampling and analyzing procedures.
		Field replicate information			23.14	Repetition of sample collection and measurement, and the percentage of the samples with replicate sampling.
		Calibration information	**Calibration technique description**		23.15.1	Describe how the instrument is calibrated.
			Frequency of calibration		23.15.2	Frequency of instrument calibration.
			CRM information	**CRM manufacturer**	23.15.3.1	Manufacturer of the Certified Reference Material, e.g., Andrew Dickson's lab at Scripps Institution of Oceanography.
				Batch Number	23.15.3.2	The batch number of the CRMs that are used to calibrate the instrument.
		Poisoning Information	**Poison used to preserve the sample**		23.16.1	Identify the type of poison used to preserve the sample, e.g., saturated solution of mercury(II) chloride.
			Poison volume		23.16.2	Identify the volume of poison added to each sample to kill the microbes. For example, 100 µL Mercury Chloride is added to 500 mL samples, or 0.02% of the volume.
			Poisoning correction description		23.16.3	Please specify whether the reported variables are corrected for poison usage, and if so, how are they corrected.
		Uncertainty			23.18	Ideally, the term “uncertainty” should be the standard uncertainty of measurement; that is with the associated confidence interval equivalent to that for a standard deviation. However, you could record any pieces of information that are related to the quality control of the variable in this field.
		Data quality flag description			23.19	Describe what the quality control flags stand for, e.g., 2 = good value, 3 = questionable value, 4 = bad value. The use of WOCE quality flags are recommended.
		Method reference (citation)			23.20	Citation for the alkalinity method.
		Researcher who measured this parameter	**Researcher Name**		23.21.1	Full name of the individual responsible for obtaining this measurement.
			Researcher Institution		23.21.2	The institution of the individual responsible for obtaining this measurement.

24	pH	**Variable abbreviation in data files**			24.1	Column header name of the variable in the data files, e.g., pH
		Observation type			24.2	How the variable is observed, e.g., surface underway, profile, time series, model output, etc. For experimental data, this could be: laboratory experiment, pelagic mesocosm, benthic mesocosm, benthic FOCE type studies, natural pertubration site studies, etc
		In-situ observation / manipulation condition / response variable			24.3	Whether the variable belongs to an in-situ observed variable, or a manipulation condition variable, or a response variable in a biological experimental study.
		Manipulation method			24.4	In perturbation experiments, seawater carbonate chemistry can be manipulated by different techniques, such as bubbling CO_2, adding acids or bases, etc.
		Measured or calculated			24.5	Whether the variable is measured, or calculated from other variables
		Calculation method, software, and parameters			24.6	If the variable is calculated describe the methodoology, as well as the set of equilibrium constants and/or total concentrations equations.
		Sampling instrument			24.7	Instrument that is used to collect water samples, or deploy sensors, etc. For example, a Niskin bottle, pump, CTD, etc is a sampling instrument.
		Analyzing instrument			24.8	Instrument that is used to analyze the water samples collected with the 'sampling instrument', or the sensors that are mounted on the 'sampling instrument' to measure the water body continuously. For example, a coulometer, winkler titrator, spectrophotometer, pH meter, thermosalinograph, oxygen sensor, YSI Multiparameter Meter, etc is an analyzing instrument. We encourage you to document as much detail (such as the make, model, resolution, precisions, etc) of the instrument as you can here.
		pH scale			24.9	Identify the pH scale used, e.g. total scale, seawater scale, NBS scale, etc.
		Temperature of measurement			24.10	Temperature at which the samples are measured.
		Detailed sampling and analyzing information			24.11	Additonal information about the sampling and analyzing procedures.
		Field replicate information			24.12	Repetition of sample collection and measurement, and the percentage of the samples with replicate sampling.
		Calibration information	**Calibration technique description**		24.13.1	Describe how the instrument is calibrated.
			Frequency of calibration		24.13.2	Frequency of instrument calibration.
			pH values of the standards		24.13.3	pH values of the standards used for calibration, e.g., 4.0, 7.0, 10.0. For spectrophotometric pH methods, please ignore this field.
			Temperature of calibration		24.13.4	Temperature at which the instrument calbration is performed.
		Temperature correction method			24.14	How the temperature effect is corrected.
		at what temperature is pH reported			24.15	The input could be a constant temperature value, or something like, in-situ temperature, temperature of analysis, etc.
		Uncertainty			24.16	Ideally, the term “uncertainty” should be the standard uncertainty of measurement; that is with the associated confidence interval equivalent to that for a standard deviation. However, you could record any pieces of information that are related to the quality control of the variable in this field.
		Data quality flag description			24.17	Describe what the quality control flags stand for, e.g., 2 = good value, 3 = questionable value, 4 = bad value. The use of WOCE quality flags are recommended.
		Method reference (citation)			24.18	Citation for the pH method.
		Researcher who measured this parameter	**Researcher Name**		24.19.1	Full name of the individual responsible for obtaining this measurement.
			Researcher Institution		24.19.2	The institution of the individual responsible for obtaining this measurement.

25	pCO_2/fCO_2 (autonomous)	**Variable abbreviation in data files**			25.1	Column header name of the variable in the data files, e.g., pCO_2, etc.
		Observation type			25.2	How the variable is observed, e.g., surface underway, profile, time series, model output, etc. For experimental data, this could be: laboratory experiment, pelagic mesocosm, benthic mesocosm, benthic FOCE type studies, natural pertubration site studies, etc
		In-situ observation / manipulation condition / response variable			25.3	Whether the variable belongs to an in-situ observed variable, or a manipulation condition variable, or a response variable in a biological experimental study.
		Manipulation method			25.4	In perturbation experiments, seawater carbonate chemistry can be manipulated by different techniques, such as bubbling CO_2, adding acids or bases, etc.
		Variable unit			25.5	Units of measurement (e.g., micro-atmosphere).
		Measured or calculated			25.6	Whether the variable is measured, or calculated from other variables
		Calculation method, software, and parameters			25.7	If the variable is calculated describe the methodoology, as well as the set of equilibrium constants and/or total concentrations equations.
		Sampling instrument			25.8	Instrument that is used to collect water samples, or deploy sensors, etc. For example, a Niskin bottle, pump, CTD, etc is a sampling instrument.
		Location of seawater intake			25.9	Whereabout of the seawater intake
		Depth of seawater intake			25.10	Water depth of the seawater intake
		Analyzing instrument			25.11	Instrument that is used to analyze the water samples collected with the 'sampling instrument', or the sensors that are mounted on the 'sampling instrument' to measure the water body continuously. For example, a coulometer, winkler titrator, spectrophotometer, pH meter, thermosalinograph, oxygen sensor, YSI Multiparameter Meter, etc is an analyzing instrument. We encourage you to document as much detail (such as the make, model, resolution, precisions, etc) of the instrument as you can here.
		Detailed sampling and analyzing information			25.12	Additonal information about the sampling and analyzing procedures.
		Equilibrator information	**Equilbrator type**		25.13.1	Type of the equilibrator for the CO_2 measurement, e.g., shower type equilibrator, bubble type equilibrator, or laminary flow type equilibrator.
			Equilibrator volume (L)		25.13.2	The total volume of the CO_2 equilibrator.
			Vented or not		25.13.3	Is the equilibrator vented or not?
			Water flow rate (L/min)		25.13.4	Flow rate of the flow through seawater.
			Headspace gas flow rate (L/min)		25.13.5	Identify the flow rate of the gas from the equilibrator to the CO_2 analyzer.
			How is temperature inside the equilibrator measured .		25.13.6	Please specify whether temperatrure inside the equilibrator is measured or not. If so, please describe how the temperature is measured.
			How is pressure inside the equilibrator measured.		25.13.7	Please specify whether pressure inside the equilibrator is measured or not. If so, please describe how the pressure is measured.
		Drying method for CO2 gas			25.14	The method used to dry the gas coming out of CO_2 equilibrator, before it is pumped into the CO_2 sensor.
		Gas detector information	**Manufacturer**		25.15.1	Manufacturer of the CO_2 sensor.
			Model		25.15.2	Model number of the CO2 sensor.
			Resolution		25.15.3	Resolution of the CO_2 sensor.
			Uncertainty		25.15.4	Uncertainty of the CO_2 sensor.
		Calibration information	**Calibration technique description**		25.16.1	Document the CO2 instrument calibration procedure.
			Frequency of calibration		25.16.2	Frequency of instrument calibration.
			Standard gas information	**Manufacturer of standard gas**	25.16.3.1	Manufacturer of the CO_2 standard gas.
				Concentrations of standard gas	25.16.3.2	Concentrations of the CO_2 standard gases that are used to calibrate the CO_2 sensor, e.g., 200, 350, 510ppm.
				Uncertainties of standard gas	25.16.3.3	Uncertainties of the CO_2 standard gas, e.g., 0.5%.
		Water vapor correction method			25.17	How the water vapor pressure inside the equilibrator is determined
		Temperature correction method			25.18	How the temperature effect is corrected.
		at what temperature is pCO2 reported			25.19	The input could be a constant temperature value, or something like, in-situ temperature, temperature of analysis, etc.
		Uncertainty			25.20	Ideally, the term “uncertainty” should be the standard uncertainty of measurement; that is with the associated confidence interval equivalent to that for a standard deviation. However, you could record any pieces of information that are related to the quality control of the variable in this field.
		Data quality flag description			25.21	Describe what the quality control flags stand for, e.g., 2 = good value, 3 = questionable value, 4 = bad value. The use of WOCE quality flags are recommended.
		Method reference (citation)			25.22	Citation for the pCO_2 method.
		Researcher who measured this parameter	**Researcher Name**		25.23.1	Full name of the individual responsible for obtaining this measurement.
			Researcher Institution		25.23.2	The institution of the individual responsible for obtaining this measurement.

26	**pCO_2/fCO_2 (discrete)**	**Variable abbreviation in data files**			26.1	Column header name of the variable in the data files, e.g., pCO_2, etc.
		Observation type			26.2	How the variable is observed, e.g., surface underway, profile, time series, model output, etc. For experimental data, this could be: laboratory experiment, pelagic mesocosm, benthic mesocosm, benthic FOCE type studies, natural pertubration site studies, etc
		In-situ observation / manipulation condition / response variable			26.3	Whether the variable belongs to an in-situ observed variable, or a manipulation condition variable, or a response variable in a biological experimental study.
		Manipulation method			26.4	In perturbation experiments, seawater carbonate chemistry can be manipulated by different techniques, such as bubbling CO_2, adding acids or bases, etc.
		Variable unit			26.5	Units of measurement (e.g., micro-atmosphere).
		Measured or calculated			26.6	Whether the variable is measured, or calculated from other variables
		Calculation method, software, and parameters			26.7	If the variable is calculated describe the methodoology, as well as the set of equilibrium constants and/or total concentrations equations.
		Sampling instrument			26.8	Instrument that is used to collect water samples, or deploy sensors, etc. For example, a Niskin bottle, pump, CTD, etc is a sampling instrument.
		Analyzing instrument			26.9	Instrument that is used to analyze the water samples collected with the 'sampling instrument', or the sensors that are mounted on the 'sampling instrument' to measure the water body continuously. For example, a coulometer, winkler titrator, spectrophotometer, pH meter, thermosalinograph, oxygen sensor, YSI Multiparameter Meter, etc is an analyzing instrument. We encourage you to document as much detail (such as the make, model, resolution, precisions, etc) of the instrument as you can here.
		Storage method			26.10	Describe how the samples are stored before the measurement.
		Seawater volume (mL)			26.11	Volume of seawater in the flask.
		Headspace volume (mL)			26.12	Volume of headspace (water displaced in the flask plus volume of the tubing).
		Temperature of measurement			26.13	Temperature at which the samples are analyzed.
		Detailed sampling and analyzing information			26.14	Additonal information about the sampling and analyzing procedures.
		Field replicate information			26.15	Repetition of sample collection and measurement, and the percentage of the samples with replicate sampling.
		Gas detector information	**Manufacturer**		26.16.1	Manufacturer of the CO_2 sensor.
			Model		26.16.2	Model number of the CO_2 sensor.
			Resolution		26.16.3	Resolutin of the CO_2 sensor.
			Uncertainty		26.16.4	Uncertainity of the CO_2 sensor.
		Calibration information	**Calibration technique description**		26.17.1	Describe how the instrument is calibrated.
			Frequency of calibration		26.17.2	Frequency of instrument calibration.
			Temperature of calibration		26.17.3	Temperature at which normalization is done.
			Standard gas information	**Manufacturer of standard gas**	26.17.4.1	Manufacturer of the CO_2 standard gas.
				Concentrations of standard gas	26.17.4.2	Concentrations of the CO_2 standard gases that are used to calibrate the CO_2 sensor, e.g., 260, 350, 510ppm.
				Uncertainties of standard gas	26.17.4.3	Uncertainties of the CO_2 standard gas, e.g., 0.5%.
		Water vapor correction method			26.18	How the water vapor pressure inside the equilibrator is determined
		Temperature correction method			26.19	How the temperature effect is corrected.
		at what temperature is pCO2 reported			26.20	The input could be a constant temperature value, or something like, in-situ temperature, temperature of analysis, etc.
		Uncertainty			26.21	Ideally, the term “uncertainty” should be the standard uncertainty of measurement; that is with the associated confidence interval equivalent to that for a standard deviation. However, you could record any pieces of information that are related to the quality control of the variable in this field.
		Data quality flag description			26.22	Describe what the quality control flags stand for, e.g., 2 = good value, 3 = questionable value, 4 = bad value. The use of WOCE quality flags are recommended.
		Method reference (citation)			26.23	Citation for the pCO_2 method.
		Researcher who measured this parameter	**Researcher Name**		26.24.1	Full name of the individual responsible for obtaining this measurement.
			Researcher Institution		26.24.2	The institution of the individual responsible for obtaining this measurement.

27	**Other measured variable** (repeat as needed)	**Variable abbreviation in data files**			27.1	Column header name of the variable in the data files, e.g., T, DO, etc.
		Full variable name			27.2	Here "Variable" refers to the observed property of your study, e.g., Temperature, Dissolved Oxygen, Nitrate, etc. Information such as Station ID, Bottle number, etc are not variables. Similarly, ancillary variables, such as Nitrate_stdev, Nitrate_Flag, temp_eq, press_eq, etc are not treated as "Variables" as well. In this example, only their parent variable (Nitrate, and pCO_2) are treated as variables.
		Observation type			27.4	How the variable is observed, e.g., surface underway, profile, time series, model output, etc. For experimental data, this could be: laboratory experiment, pelagic mesocosm, benthic mesocosm, benthic FOCE type studies, natural pertubration site studies, etc
		In-situ observation / manipulation condition / response variable			27.5	Whether the variable belongs to an in-situ observed variable, or a manipulation condition variable, or a response variable in a biological experimental study.
		Variable unit			27.7	Units of measurement (e.g., micro-mol/kg, degrees Celsius).
		Measured or calculated			27.8	Variable is measured in-situ or calculated from other variables.
		Calculation method, software, and parameters			27.9	If the variable is calculated describe the methodoology, as well as the set of equilibrium constants and/or total concentrations equations.
		Sampling instrument			27.10	Instrument that is used to collect water samples, or deploy sensors, etc. For example, a Niskin bottle, pump, CTD, etc is a sampling instrument.
		Analyzing instrument			27.11	Instrument that is used to analyze the water samples collected with the 'sampling instrument', or the sensors that are mounted on the 'sampling instrument' to measure the water body continuously. For example, a coulometer, winkler titrator, spectrophotometer, pH meter, thermosalinograph, oxygen sensor, YSI Multiparameter Meter, etc is an analyzing instrument. We encourage you to document as much detail (such as the make, model, resolution, precisions, etc) of the instrument as you can here.
		Duration (for settlement/colonization methods)			27.12	Biological experiment duration.
		Detailed sampling and analyzing information			27.13	Additonal information about the sampling and analyzing procedures.
		Field replicate information			27.14	Repetition of sample collection and measurement, and the percentage of the samples with replicate sampling.
		Uncertainty			27.15	Ideally, the term “uncertainty” should be the standard uncertainty of measurement; that is with the associated confidence interval equivalent to that for a standard deviation. However, you could record any pieces of information that are related to the quality control of the variable in this field.
		Data quality flag description			27.16	Describe what the quality control flags stand for, e.g., 2 = good value, 3 = questionable value, 4 = bad value. The use of WOCE quality flags are recommended.
		Method reference (citation)			27.17	Citation for the method.
		Biological subject			27.18	For biological variables, please state the taxonomy (a specific species genus or a community), upon which the variable is studied. For example, if you study the growth rate of a certain type of Salmon. The "variable/parameter" is growth rate, and "Type of biological subject" is that specific type of salmon.
		Species Identification code			27.19	If applicable, provide the unique species identification code and authority which issued this code. It is recommended to use the species reference databases from the Integrated Taxonomic Information System (or ITIS, http://www.itis.gov/), or World Register of Marine Species (or WoRMS, http://marinespecies.org/).
		Life stage of the biological subject			27.20	Life stage of the biological subject.
		Researcher who measured this parameter	**Researcher Name**		27.21.1	Full name of the individual responsible for obtaining this measurement.
			Researcher Institution		27.21.2	The institution of the individual responsible for obtaining this measurement.

28	**Non-measured variable** (repeat as needed)	**Variable abbreviation in data files**			28.1	For variables that are not measured variables, such as station number, cast number, date, longitude, latitude etc. The purpose of this section is to allow you to spell out all the abbreviations that appear in your data files.
		Full variable name			28.2	

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