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<b>Title</b>	<b>MEDIN data guideline for the recording of oceanographic data while underway</b>
<b>MEDIN Discipline</b>	Marine Chemistry, Physical Oceanography, Marine Biodiversity, Anthropogenic Properties
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<b>Summary</b>	This guideline is a data archive standard for surface oceanographic data collected from instruments fixed on a vessel while underway. Used correctly the guideline facilitates easy use and reuse of the data. A template to record metadata and data is also provided if required.
<b>Keywords</b>	CTD, Oceanography, Underway, Salinity, Conductivity, Temperature, Depth, DO, turbidity, fluorescence.

<b>Change history</b>		
<b>Version</b>	<b>Date</b>	<b>Change</b>
1.0	12/01/10	First draft of document
2.0	27/05/10	Redraft to take into account new structure and comments on the ocean profile data guideline.
3.0	14/07/10	Minor edits following comments from reviewers.

4.0	13/09/11	Edits following reviews and new structure
4.1	27/11/13	Added a dBASE compatible field title. Added a colour coded field name summary list. Revised in light of new comments and put into new structure

# 1 Introduction

## 1.1 What are MEDIN compliant data?

There are 3 requirements to ensure that your underway oceanographic data are MEDIN compliant:

- 1) **You supply General Metadata about your data** – *See Appendix A*
- 2) **You supply Detailed Metadata about your data** – *This may be included in a survey/cruise report or as additional metadata – See Appendix B*
- 3) **Your data are in a format that MEDIN accepts** – *See Appendix C*

### Example of a MEDIN compliant underway dataset:

A file containing General Metadata (Appendix A)

A Survey Report that contains Detailed Metadata (Appendix B)

Underway data submitted in a well organized folder structure (Appendix C)

## 1.2 Scope

This guideline defines the format of data and information produced from the collection of surface oceanographic data from instruments fixed on a vessel while underway. It covers both the raw data, methodologies used and derived summary information.

## 1.3 Archiving Data

The British Oceanographic Data Centre (BODC) is the MEDIN Data Archive Centre (DAC) responsible for archiving oceanographic data collected whilst underway.

### Contact Details:

#### The British Oceanographic Data Centre (BODC)

Email: [enquiries@bodc.ac.uk](mailto:enquiries@bodc.ac.uk)

Telephone: +44 (0) 151 795 4884

## 1.4 Summary of the information required

### A General Metadata:

*This section lists the general metadata that should be provided with your data.*

*You can use the form [here](#) to record your General Metadata and can find additional information in Appendix A*

The General Metadata fields are common throughout all MEDIN data guidelines and only need to be given once and referenced if your data set is composed of many data types and therefore conforms to a number of MEDIN Data Guidelines. If your collection of data forms part of a wider project or time series then the **Project Information** must be recorded but if the work is a small survey then project details may not be required.

#### What is a Survey/Project?

A **survey** is a uniquely identifiable programme of data collection such as a research cruise, moored instrument deployment or survey event. This information is likely to be the same for all sample events (e.g. stations) and subsamples in a given data set such as a cruise. Note that in the event that these are not common to all sample events then they should be specified for each one.

A **project** is a collection of surveys that have been completed for a common purpose. For example: an environmental impact assessment composed of a number of separate surveys; scientific research composed of a number of different research cruises; a legislative monitoring programme which is conducted each year over several years. A project is usually funded by the same organization(s) for its lifetime.

#### Survey Information:

This information is mandatory and **must** be supplied with your data to ensure it can be reused:

1. [surveyName](#)
2. [surveyType](#)
3. [surveyAbstract](#)
4. [surveyCode](#)
5. [originator](#)
6. [owner](#)
7. [surveyStartDate](#)
8. [surveyEndDate](#)
9. [timeZone](#)
10. [spatialCRS](#)
11. [positionFix](#)
12. [horizontalAccuracy](#)

**Additional items:**

Please provide as much of the following information as possible to help others assess your data:

**Survey Information:**

1. [originalCRS](#)
2. [transformation](#)
3. [depthCRS](#)
4. [verticalAccuracy](#)
5. [platformType](#)
6. [platformName](#)
7. [cruiseReportReference](#)
8. [confidentiality](#)

**Project Information:**

Please provide as much of the following information as possible if your survey forms part of a wider project:

1. [projectName](#)
2. [projectCode](#)
3. [projectStartDate](#)
4. [projectEndDate](#)
5. [projectWebsite](#)

## B Detailed Metadata:

*This section lists the detailed metadata that should be collected with your data, in order to provide information about the instrument and processing techniques used.*

*You can use the form [here](#) to record your Detailed Metadata and can find additional information in Appendix B.*

The Detailed Metadata fields are specific to each data guideline and should be completed for each type of data. The information requested here may be supplied as additional metadata or may be supplied in a cruise or survey report.

The information in this category covers sample methods, instruments and processing techniques, and should be completed for each underway sampling method.

### Acquisition Method:

This information is mandatory and **must** be supplied with your data to ensure it can be reused:

1. [methodID](#)
2. [depthWaterIntake](#)
3. [instrumentDetails](#)
4. [instrumentSensor](#)

### Additional Items:

Please provide as much of the following information as possible to help others assess your data:

### Acquisition Method:

1. [flowDetails](#)
2. [instrumentCalib](#)
3. [instrumentDataRetrieval](#)
4. [waterSampleCalibration](#)
5. [dataProcessDetails](#)

## C Data:

*This section gives a summary of the required data content and format for oceanographic data collected while a vessel is underway. It covers:*

*Station Information,  
Sample Event Information,  
and  
Sample Data*

*You can use the forms [here](#) to record your station and sample event data.*

### Format

To submit this data to a Data Archive Centre (DAC) or transfer it to other organisations, the raw data should be provided in the file type outputted from the instrument. If it is not appropriate to submit the raw instrument files then processed data may be supplied after discussion with the relevant data managers and full details of the processing applied. Other tables should be provided in the .csv format.

### Content

#### What is a Station?

A station refers to a specific target location of sampling. It is useful to record the station position in addition to the sample event information, for example if you are returning to a fixed target station as a basis for repeat replicate sample events and for repeat monitoring surveys.

#### What is a Sample Event?

A sample event is the collection of a sample at a specific date, time and location. For underway oceanographic data it refers to the specific date, time and location of the transect.

#### Station Information:

Please provide as much of the following information as possible if your sampling takes place at defined stations:

1. [stationID](#)
2. [geometry](#)
3. [primaryLatitude](#)
4. [primaryLongitude](#)
5. [stationName](#)
6. [secondaryLatitude](#)
7. [secondaryLongitude](#)
8. [originalCoordinates](#)
9. [stationNotes](#)

**Sample Event (Transect Information):**

This information is mandatory and **must** be supplied with your data to ensure it can be reused:

1. [sampleEventID](#)
2. [surveyCode](#)
3. [methodID](#)
4. [startDateTime](#)
5. [originalStartLatitude](#)
6. [originalStartLongitude](#)
7. [startLatitude](#)
8. [startLongitude](#)
9. [endDateTime](#)
10. [originalEndLatitude](#)
11. [originalEndLongitude](#)
12. [endLatitude](#)
13. [endLongitude](#)

**Additional Items:**

Please provide as much of the following information as possible to help others assess your data:

1. [stationID](#)
2. [transectDescription](#)
3. [waterBottleSample](#)

**Sample Data (Underway Data):**

Surface underway data typically consists of a combination of position, time, pressure, conductivity, temperature and any other parameters measured such as turbidity. It is recommended that the raw files from the instrument are supplied as well as any additional files to which calibrations may have been applied to. These data should be provided in a readable form with the header information sufficiently explained. The recommended format for surface underway data is as a matrix with date/time as the primary channel and other parameters details as additional fields. The sample event (transect) code should be identified either in the file names or within the file to allow the data to be matched to a transect within a survey. Please ensure that there is a clear relationship between the instrument sensors calibration information and the fields (channels) for each sensor within the sample data files.



## 2 Guidance

### 2.1 Background to Data Guidelines

The Marine Environmental Data and Information Network (MEDIN) is working towards creating a framework of consistent standards covering the major types of data collection undertaken in the marine environment around the UK. The principle benefits of this suite of standards are:

- Allows contracting organisation to easily specify a format that data should be returned in that can be readily used and includes all relevant attributes
- Provides a consistent format for contractors to work to (rather than a different format for each contract)
- Data can be readily exported to Data Archiving Centres and other users
- Instils good practice amongst users

Each standard defines the data and information that must be stored with a particular data type to ensure it can be readily used and reused. As this type of information is specific for different data types, guidelines are developed for each type. This document describes one such format. Other standards can be accessed through [www.oceannet.org](http://www.oceannet.org).

### 2.2 Using this Data Guideline

The data guideline is split into sections that refer to information that should be collated at different levels as shown below:

- A General Metadata**
- B Detailed Metadata**
- C Data**

#### **A General Metadata**

The General Metadata tables are common to all Data Guidelines and so only need to be completed once for a survey even if a number of different techniques and data guidelines are used.

**Survey** - a uniquely identifiable programme of data collection such as a research cruise, moored instrument deployment or survey event

**Project** - a collection of surveys that have been completed for a common purpose

#### **B Detailed Metadata**

The detailed metadata are specific to a technique of data collection (e.g. trawl, grab etc) and are subsequently specific to each Data Guideline.

**Sampling Method** (Data Production Tools) – Details of any method or instruments used to collect the data

#### **C Data**

**Station** – a target location used as the basis for replicate sample events and for repeat monitoring surveys. The fixed station table should only be used if a fixed point, transect or area is used as the basis for replicate sample events and for repeat monitoring surveys.

**Sample Event (Transect Information)** – date, time and location of specific data collection event, details of any accompanying data.

**Sample Data** – the data

The tables in the Appendices outline the data fields, a description and, where available, a controlled vocabulary and/or format which should be used to store the data. Each field is either mandatory, conditional or optional as indicated by M, C, or O respectively. Conditional means that the field must be completed if a value is known. In the absence of an existing spreadsheet or database to hold the information, it is recommended that the template [here](#) is used. Instructions are also provided in the template.

In the event that historical data which does not have all the necessary mandatory fields is being configured into this guideline, then it is permissible to use the following entry terms:

Term	Description
unknown	The correct value is not known to and not computable by the creator of this information. However a correct value probably exists.
inapplicable	There is no appropriate value. To be used in cases where metadata elements cannot be set null due to schema constraints.

In some cases it may be necessary to extend this guideline for a specific purpose such as a specific exchange of data between applications or to fulfil the needs of a specific project. This is permissible, however we advise that the broad structure and format is maintained and that where possible controlled vocabularies are used. As any extension to the structure and format may be useful for other organisations please inform MEDIN of further agreements.

## 2.3 Controlled Vocabularies

MEDIN makes use of controlled vocabularies (sometimes called “Term Lists”) to ensure that information provided alongside data is unambiguous. The available catalogues of controlled vocabularies used for this MEDIN data guideline are provided primarily by SeaDataNet, the International Council for the Sea (ICES) and EPSG. If a term is not available in a recommended list then please contact MEDIN to arrange for the term to be added.

The SeaDataNet list may be viewed at [http://seadatanet.maris2.nl/v\\_bodc\\_vocab\\_v2/welcome.asp](http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp). By clicking on the list any term may be searched for by using the drop-down menus or all terms viewed by clicking search. The terms may be viewed in groups of 15 or may be downloaded into an excel file.

The ICES term lists are available at <http://vocab.ices.dk/>  
Use the search box to find term lists, you can also select the theme you require to filter your search. The results are shown for the selected list and may be downloaded into MS Excel by selecting the Excel symbol at the top right of the list.

The EPSG database of coordinate reference systems (<http://www.epsg-registry.org/>) provides a dictionary of reference systems with a code for each entry. In brief, to find a code, enter the title (e.g. WGS84) into the ‘Name’ field and click search. The name, code and further information is displayed. If you are looking for a specific type of reference system such as ‘vertical’ then click

in the 'Type' box, hover over coordinate reference system and click on vertical and then click the search button and all recorded vertical reference systems are shown. If you want to search for a reference system in a particular part of the world (e.g. Northern Ireland Grid) the you may do so by submitting a term to the 'Area' box or fill out the lat and longs then click search. The website also provides a database of the reference systems and web services to access the information.

## **2.4 Relationship between MEDIN data guidelines and MEDIN discovery metadata**

The MEDIN discovery metadata format is aimed at allowing the non-informed user to discover data sets and it is likely that one 'discovery' data set record will contain a large range of data types that are in turn covered by a range of data guidelines. To enable individuals to reuse data of a specific nature (e.g. benthic invertebrate data) then related information must be collected (e.g. data owner, reference systems used etc). Some of the information which is collected in the General Metadata in a data guideline is also required to create a discovery metadata record. Who creates the MEDIN discovery record for a dataset is case specific and dependant on the organisation, and the relationship it has with a Data Archive Centre. However it is intended that the information collected at the 'Survey Information' level is reused for creating a MEDIN discovery metadata record. Further details are available on the MEDIN website which demonstrate clearly which fields in the MEDIN Data Guidelines can be reused for which elements in the MEDIN Discovery Metadata Standard.

## **2.5 Updates and Feedback**

If you have any comments or feedback on this guidelines please contact [enquiries@oceannet.org](mailto:enquiries@oceannet.org) . Standards develop over time and it is likely that this standard will change in the future. We advise that you return to the [MEDIN website](#) to identify new versions and that you sign up to the MEDIN Standards e-mail listing (e-mail [enquiries@oceannet.org](mailto:enquiries@oceannet.org)) and [Marine Data News](#) to be kept informed of developments.

## Appendix A

### General Metadata:

*This section describes the general metadata that should be provided with your data.*

*You can use the form [here](#) to record your General Metadata*

The General Metadata fields are common throughout all MEDIN data guidelines and only need to be given once and referenced if your data set is composed of many data types and therefore conforms to a number of MEDIN Data Guidelines. Where data collection is undertaken on research vessels the data below can often be sourced in the Cruise Summary Report. If your collection of data forms part of a wider project or time series then the **Project Information** must be recorded but if the work is a small survey then project details may not be required.

#### A.1 Guidance:

Detailed descriptions and examples are given below to help you create General Metadata to accompany your data.

#### Survey Information:

This information **must** be supplied with your data to ensure it can be reused:

Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
surveyName	M	Title of the survey	Free text;	2004 CCW Menai Strait benthic monitoring survey
surveyType	M	Category of survey for use in subsequent searching for certain types of surveys.	Controlled Vocabulary; OGP SSDM WORK_CATEG ORY Domain;	Geophysical and Hi-Res Seismic (Analogue and Digital Survey) <b>Or</b> Free text; Oceanographic; benthic biology; fish stock

<b>surveyAbstract</b>	M	Brief description of the purpose of the survey and other types of measurements that were made for the survey.	Free text;	Survey was the first in a series of 3 in 2010 whose specific aim was to identify sites suitable for further monitoring. Geophysical techniques were used in combination with grabs and cores to assess seabed type.
<b>surveyCode</b>	M	A unique code for the survey to allow links to be built between this and sample event data, (the cruise identifier code could be used). To ensure uniqueness, it is recommended that the website of the organization responsible for the work is used followed by a unique code designated by the responsible organization.	Free text;	<a href="http://www.noc.ac.uk/JCR3022">http://www.noc.ac.uk/JCR3022</a> ; <a href="http://www.bennett.ac.uk/RIBJULY_03_01">http://www.bennett.ac.uk/RIBJULY_03_01</a>
<b>originator</b>	M	The organization who has created the data set. If the organization is not in EDMO please contact <a href="mailto:enquiries@oceannet.org">enquiries@oceannet.org</a> to add it. If a person who is not associated with any organization generated the data then please provide the name in the sample event table.	Controlled vocabulary: <b>European Directory of Marine Organizations</b> at <a href="http://seadatanet.maris2.nl/v_edmo/welcome.asp">http://seadatanet.maris2.nl/v_edmo/welcome.asp</a> ;	28: Centre for Environment, Fisheries and Aquaculture Science, Lowestoft Laboratory 2588: ABP Marine Environmental Services Ltd
<b>owner</b>	M	Organization that owns the data set. If the organization is not in EDMO please contact <a href="mailto:enquiries@oceannet.org">enquiries@oceannet.org</a> to add it.	Controlled vocabulary: <b>European Directory of Marine Organizations</b> at <a href="http://seadatanet.maris2.nl/edmo/">http://seadatanet.maris2.nl/edmo/</a> ;	78: Department of Environment Fisheries and Rural Affairs 53: BP Exploration and Production

<b>surveyStartDate</b>	M	The date and time that the survey started.	Date or DateTime; yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-01-24 12:33:00
<b>surveyEndDate</b>	C	The date and time that the survey ended. May be left null if the survey is ongoing.	Date or DateTime; yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-02-16 16:33:00
<b>timeZone</b>	M	Give the time zone in which the date and time of the data acquisition is made (preferably Coordinated Universal Time (UTC))	Free text;	UTC
<b>spatialCRS</b>	M	Spatial coordinate reference system. Describes the system of spatial referencing. i.e. the datum used to supply the decimal latitudes and longitudes. There are additional fields to indicate the datum of the original data if the coordinates have been transformed.	Controlled vocabulary: <b>EPSG Geodetic Parameter Dataset</b> at <a href="http://www.epsg-registry.org/">http://www.epsg-registry.org/</a>	<b>WGS84</b> code: EPSG::7030; <b>British National Grid</b> (projected) code: EPSG::27700; <b>ETRS89 / UTM zone 28N</b> code: EPSG::25828; <b>ETRS89 / UTM zone 29N</b> code: EPSG::25829; <b>ED50</b> code: EPSG::4230; <b>UTM31N</b> code: EPSG::23031
<b>positionFix</b>	M	Position fix method and source. Give the method and source of the position fix instrument.	Free text;	Differential GPS taken from the ships navigation equipment. 4 point satellite fix achieved
<b>horizontal Accuracy</b>	M	Horizontal positional accuracy. How accurate the spatial positions are likely to be.	Decimal; units = metres	15.2

**Additional Items:**

Please provide as much of the following information as possible to help others assess your data:

**Survey Information:**

	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	<b>originalCRS</b>	C	Datum of original coordinate if different from the one used to supply data.	Controlled vocabulary: EPSG Geodetic Parameter Dataset at <a href="http://www.epsg-registry.org/">http://www.epsg-registry.org/</a> or other defined coordinate reference system register;	
	<b>transformation</b>	C	Transformation used to create decimal degrees if transformation undertaken.	Free text;	Data was converted from OSGB to WGS84 in ArcGIS using the petroleum transformation.
	<b>depthCRS</b>	C	Depth coordinate reference system. Give the reference to which the depth has been calculated e.g. Ordnance Datum Newlyn; Highest Astronomical Tide. Mandatory if seabed depths are given for each sample. See controlled vocabulary lists.	Controlled vocabulary: <b>EPSG Geodetic Parameter Dataset</b> at <a href="http://www.epsg-registry.org/">http://www.epsg-registry.org/</a>	<b>Ordnance Datum Newlyn</b> code: EPSG::5701 <b>Malin Head height</b> code: EPSG::5731
	<b>verticalAccuracy</b>	C	Vertical positional accuracy. How accurate the vertical resolution is. Must be provided if seabed depths are given.	Decimal; units = metres	0.5

<b>platformType</b>	O	The platform type (e.g. Research Vessel) from which the sampling device was deployed.	Controlled vocabulary: SeadataNet Platform Classes, <b>Table L06</b> at <a href="http://seadatane.t.maris2.nl/v_bo dc_vocab_v2/welcome.asp">http://seadatane.t.maris2.nl/v_bo dc_vocab_v2/welcome.asp</a> ;	31: Research Vessel; 13: beach/intertidal zone structure; 48: mooring; 71: human
<b>platformName</b>	C	Mandatory if a vessel was used for the survey. The name of the ship from which the sampling device was deployed. If your ship is not on the list please contact <a href="mailto:accessions@ices.dk">accessions@ices.dk</a>	Controlled vocabulary: ICES Reference Codes, <b>Table SHIPC</b> at <a href="http://vocab.ices.dk/">http://vocab.ices.dk/</a>	74LG: Lough Foyle AA30: Unspecified Ship 74E9: Cefas Endeavour AA36: Unspecified Fishing Vessel AA33: Unspecified Self-Propelled Small Boat
<b>cruiseReportReference</b>	O	Cruise report or boat log reference if applicable.	Free text; in reference format.	Litt, E.J. 2009. PHiXT 4. 30 July to 2 August 2009 RV Prince Madog POL Coastal Observatory Liverpool Bay Cruise Report. POL Coastal Observatory, Liverpool.
<b>confidentiality</b>	O	Note if the survey is confidential	Free text;	Restricted access; Public;



**Project Information:**

Please provide as much of the following information as possible if your survey forms part of a wider project

	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	<b>projectName</b>	M	The nationally/internationally accepted version of the project name.	Free text; Programme 1989-2010 ;	North Hoyle Windfarm EIA; Rapid Climate Change; Dogger Bank pSAC Monitoring Programme; EA Bathing Water Monitoring
	<b>projectCode</b>	M	Provide a code to uniquely identify the project and allow links to be made between the tables. To ensure uniqueness, it is recommended that the website of the data owner is used, followed by a unique code which should reflect the code used by the funding organization where possible. e.g. contract code.	Free text;	<a href="http://www.dassh.ac.uk/">http://www.dassh.ac.uk/</a> ; <a href="http://www.bodc.ac.uk/">http://www.bodc.ac.uk/</a>
	<b>projectStartDate</b>	M	The date that the project started which is from when the funding was in place to start. Use the 1 <sup>st</sup> of the month if the exact date is not known	Date; yyyy-mm-dd;	2001-01-24; 1973-01-01
	<b>projectEndDate</b>	C	The date that the project finished or is due to finish. Use the 1 <sup>st</sup> of the month if the exact date is not known.	Date; yyyy-mm-dd;	2007-01-24; 1976-01-01
	<b>projectWebsite</b>	C	If a project website exists give the address. This should be the web address of the environmental survey and not, in the case of environmental impact assessments, the engineering development.	URL;	<a href="http://www.southampton.ac.uk/oes/research/projects/rapid_meridional_overturning_circulation_moc.page">http://www.southampton.ac.uk/oes/research/projects/rapid_meridional_overturning_circulation_moc.page</a>

## Appendix B

### Detailed Metadata:

*This section describes the detailed metadata that should be collected with your data.*

*You can use the form [here](#) to record your Detailed Metadata*

The Detailed Metadata fields are specific to each data guideline and should be completed for each type of data. The information requested here may be supplied as additional metadata or may be supplied in a cruise or survey report.

#### B.1 Guidance:

Detailed descriptions and examples are given below to help you create Detailed Metadata to accompany your data.

#### Method Information:

This information **must** be supplied with your data to ensure it can be reused:

	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	<b>methodID</b>	M	Method Identifier. A unique code for the methods to allow links to be built between this and sample event data.	Free text;	TIMES4376
	<b>depthWater Intake</b>	M	Give the depth at which the water intake is. If measurements are not taken from a water supply then give the depth of the sensor.	Decimal; units=metres	0.5
	<b>instrument Details</b>	M	Instrument description, reference number, manufacturer and model - provide a literature reference, web site reference or briefly describe. Include accuracy, resolution and response range of individual sensors	Free text;	SeaBird CTD model, number 3756a, serial number BX472946HJK647, accuracy, resolution and response range of sensors can be viewed at <a href="http://www.seabird.com">www.seabird.com</a>

	<b>instrument Sensor</b>	M	Provide details of which instrument sensors applt to which data file headings	Free text;	The conductivity, temperature and depth sensors on instrument BX472946HJK647 refer to the field headings CON, TEMP, DEP respectively in the sample data files SB_100m_001 to SB_100m_034
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#### Additional items:

Please provide as much of the following information as possible to help others assess your data:

	<b>Field Title</b>	<b>M C O</b>	<b>Description</b>	<b>Recommended Controlled Vocabulary or Format</b>	<b>Examples</b>
	<b>flowDetails</b>	C	Describe the length and diameter of tube between intake and sensors and the flow rate. Only relevant where a water supply is used.	Free text;	A 10mm diameter polyethylene tube was 12 metres in length between intake and instruments and had a flow rate of 50l/min.
	<b>instrumentData Retrieval</b>	O	Give the software and operating system used to retrieve and record the information from the instruments.	Free text;	Seabird software used to retrieve binary file which was then recorded using MS Excel and manipulated using the Windows 2005 operating system

<b>instrumentCalib</b>	C	If calibrations have been applied to the instrument a description should be given here including the date of the calibration.	Free text;	The CTD was returned to Calibration a description should be given here including the date of the calibration. Seabird on the 24/03/2007 and calibrated according to their standards in the laboratory
<b>waterSample Calibration</b>	C	If water samples have been taken to calibrate the instrument then details of those should be given here including any field and laboratory coefficients used. These should include description of or reference to full laboratory methods and procedures. Details of any external sample analysis, including laboratory name and accreditation level. A description of or reference to any external quality assurance procedures.	Free text;	Water samples were taken after and before deployment at the instrument depths. All parameters were measured to allow an estimation of instrument accuracy and status of biofouling. Nutrients were measured by nitrate reduction following the method of Strickland (1972) at CEFAS Lowestoft laboratory which participates in the UK National Marine Chemistry Analytical QC scheme.
<b>dataProcess Details</b>	C	If the data has been processed following recovery then detail the steps here including, de spiking or smoothing methods, editing and quality control methods, and an overview report. Sampling intervals and nominal intervals of the processed data.	Free text;	All instrument data was screened and despiked following expert examination. Any data that was suspect due to suspected biofouling was flagged, etc

## Appendix C

### Data

*This section gives the required data content and format for oceanographic data collected while a vessel is underway. It covers:*

*Station Information,  
Sample Event Information,  
and  
Sample Data*

*You can use the forms [here](#) to record your station and sample event data.*

The data content and format are specific to each data guideline and the relevant data guideline should be consulted for each type of data.

#### C.1 Guidance

Detailed descriptions and examples are given below to help you to produce your data in the preferred format.

##### Station Information:

If your data collection took place at target stations, this information **must be** supplied with your data to ensure it can be reused:

	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	<b>stationID</b>	M	Station identifier. A unique identifier for the station.	Free text.	Stanton_Bank_station_4 (point); EastChan_Innerdover_se04; Liverpool_Dublin_ferry_route1 (transect); Lagan_Estuary (area)

<b>geometry</b>	M	Description of station spatial form. Describe if the the fixed station is a point, transect (curve) or an area (surface).	Controlled Vocabulary; SeadataNet Geospatial Feature Type, <b>Table L02</b> at <a href="http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp">http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp</a>	004: Point; 003: Curve; 005: Surface;
<b>primaryLatitude</b>	M	The primary latitude of the station must be given in decimal degrees. For a point this field is set to the point latitude; for a transect it is set to the latitude of the start of the transect; for an area it is set to the southern edge of the box. Units are positive North.	Decimal degrees; minimum of four decimal places.	54.5837
<b>primary Longitude</b>	M	The primary longitude of the station must be given in decimal degrees. For a point this field is set to the point longitude; for a transect it is set to the longitude of the start of the transect; for an area it is set to the western edge of the box. Units are positive east (West is negative, East is positive).	Decimal degrees; minimum of four decimal places.	-5.5837

### Station Information

#### Additional items:

Please provide as much of the following information as possible to help others assess you data:

	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	<b>stationName</b>	O	The name by which a particular station is known	Free text.	L4 Stannock Head

	<b>secondary Latitude</b>	C	The secondary latitude of the station must be given in decimal degrees. For a point this field is not required; for a transect it is set to the latitude of the end of the transect; for an area it is set to the northern edge of the box. Units are positive North.	Decimal degrees; minimum of four decimal places.	55.7393
	<b>secondary Longitude</b>	C	The secondary longitude of the station must be given in decimal degrees. For a point this field is not required; for a transect it is set to the longitude of the end of the transect; for an area it is set to the eastern edge of the box. Units are positive east (West is negative, East is positive).	Decimal degrees; minimum of four decimal places.	-3.7394
	<b>original Coordinates</b>	C	Original coordinates and coordinate transformation technique. If coordinates were transformed from a different reference system into decimal degrees then the original coordinate and original coordinate reference system should be given, the method used to transform stated and any differences in the relative (significant figures) of the original transformation explained.	Free text;	SX498476, Coordinates were transformed from British National Grid using in house software 'BODC_transform'. The number of significant figures was reduced to 4 decimal degrees in line with the accuracy of the coordinate and transformation technique.
	<b>stationNotes</b>	O	Any further notes on the station that may be of relevance can be added here.	Free text;	Rocky reef, west of West Maiden; Also known as Hell's Mouth

**Sample Event (Transect Information):**

This information **must** be supplied with your data to ensure it can be reused:

	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	<b>sampleEventID</b>	M	Sample Event Identifier. A unique identifier for the sample under consideration. Replicate identifiers should be suffixed to the end of a sample identifier using an underscore such as _1 or _a	Free text;	CTD009 69729
	<b>surveyCode</b>	M	The survey code must be stated to allow links to be built between this table and the metadata. The cruise identifier code could be used. Copy from Metadata table	Free text;	JCR3022
	<b>methodID</b>	M	Method identifier. Provide the identifier for the methods (copy from the detailed metadata). If multiple methods were used separate codes using a comma.	Free text;	TIMES4376; 02465, 02896
	<b>startDateTime</b>	M	The start date and time of the transect.	yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-01-24 13:33:00
	<b>originalStart Latitude</b>	M	The start latitude of the transect given in whichever format was used to record at the time of sampling. Units are positive north.	Free text;	50°47'24''
	<b>originalStart Longitude</b>	M	The start longitude of the transect given in whichever format was used to record at the time of sampling. Units are positive east.	Free text;	-4°21'53''



<b>startLatitude</b>	M	The start latitude of the transect given in decimal degrees. Units are positive north.	Decimal degrees; minimum of two decimal places.	54.5837
<b>startLongitude</b>	M	The start longitude of the transect given in decimal degrees. Units are positive east.	Decimal degrees; minimum of two decimal places.	-3.476
<b>endDateTime</b>	M	The end date and time of the transect.	yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-01-26 13:33:00
<b>originalEndLatitude</b>	M	The end latitude of the transect given in whichever format was used to record at the time of sampling. Units are positive north.	Free text;	50°47'24"
<b>originalEndLongitude</b>	M	The end longitude of the transect given in whichever format was used to record at the time of sampling. Units are positive east.	Free text;	-4°21'53"
<b>endLatitude</b>	M	The end latitude of the sample given in decimal degrees. Units are positive north.	Decimal degrees; minimum of two decimal places.	54.5837
<b>endLongitude</b>	M	The end longitude of the sample given in decimal degrees. Units are positive east.	Decimal degrees; minimum of two decimal places.	-3.476

#### Sample Event (Transect Information):

##### Additional items:

Please provide as much of the following information as possible to help others assess you data:

	<b>Field Title</b>	<b>M C O</b>	<b>Description</b>	<b>Recommended Controlled Vocabulary or Format</b>	<b>Examples</b>
	<b>stationID</b>	C	Station Identifier. Copy from Station Table.	Free text;	Stanton Bank site 4, PS74926

<b>transect Description</b>	O	Provide a brief description of the transect	Free text;	Transect made at 1/2 degree intervals of latitude through the NW Irish Sea
<b>waterBottle Sample</b>	C	If water samples were also taken at the time of the profile then details should be given here to allow the water sample data to be linked to the profile data	Free text;	Water samples were taken at 10, 50, 100, 150, 200, 300, 400 and 500m depth. Samples were analysed for nutrients. SPM and trace metal concentrations. Data is recorded in the Bottle database under the same station and profile identifiers as recorded here.

### Sample Data:

Surface underway data typically consists of a combination of Position, time, pressure, conductivity, temperature and any other parameters measured such as turbidity. It is recommended that the raw files from the instrument are supplied as well as any additional files to which calibrations may have been applied to. These data should be provided in a readable form with the header information sufficiently explained. The recommended format for surface underway data is as a matrix with date/time as the primary channel and other parameters details as additional fields. The sample event (transect) code should be identified either in the file names or within the file to allow the data to be matched to a transect within a survey. Please ensure that there is a clear relationship between the instrument sensors calibration information and the fields (channels) for each sensor within the sample data files.