# Guidance for Shipboard
# Data Management Coordinator

## Data Format and Transmission Specifications

Subsurface Monitoring Unit

MC252 Deepwater Horizon Oil Spill


Prepared by:

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Natural Resource Damage Assessment (NRDA)

NOAA National Oceanographic Data Center (NODC)

BP


Updated Sunday, June 13, 2010

Version 2

# Table of Contents

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## Change Log

| New Version | Author | Update Made |
|---|---|---|
| 1.1 | Tim Morgan | Changed document name and title |
| | | Updated first section to reflect addition of the LISST data format to the specification |
| | | Binning interval changed from 0.5 meters to 1 meters. |
| | | CTD Detail Record – Field Name "X" changed to "Long", and "Y" changed to "Lat". Modified date format to be consistent with other formats in file. |
| | | Added LISST section |
| 1.2 | Tim Morgan | Added diagram to illustrate purpose of the standard and mapping |
| 1.3 | Tim Morgan | Following discussions with Fugro (Rosemary Smith), added section on CTD scan 'source' standard. This is the expected, standardized output from the Seabird software to from which BP can map to its target specification. |
| | | Added source to target mapping assignment. |
| 1.4 | Tim Morgan | In mapping from source to target, NULL values are to be replaced with -99999 |
| 2.0 | Lauren Decker | Incorporating with "Sample Guidance for Data Managers" document |
| 2.01 | Lauren Decker | Changed the Annotated CTD plots x-axies scale for Fluorescence from 100 to 50 and Temperature from 24 to 26. |
| 2.02 | Lauren Decker | Added description of *data manager* roll, changed doc name/title |

# Overview

## Purpose

We are providing shipboard guidance to research vessel data managers to expedite onboarding of new personnel and equipment/data setup.  By ensuring consistency between vessels, cruises and samples of recorded datasets, post sampling processes and analysis can be accelerated.  In this document we discuss the data flow, organization, and processing of shipboard digital data.

## Who we are

The Subsurface Monitoring Unit (SMU) is an umbrella group built to coordinate research vessel activity in the Gulf of Mexico relating to the MC252 incident.  Our goal is to provide ship coordination and data management between the research fleet and Incident Command (plus all other interested parties.)

## Who YOU are (the Data Manager)

The data manager on the ship has several very important roles that differentiate them from the sample manager (who physically takes water samples.)  Your role includes:

- Generation and delivery of the "Daily Deliverables"

- Data uploads to ftp (including raw data) for archiving

- Recording information in the sample log sheets

- Sample ID generation (labels for bottles)

- General assistant to water sampling team

## Policy

All observational data will be routed through the Data Processing Workflow, to include (at a minimum) quality assurance and quality control (QA/QC) steps, model ingestion (where relevant), and analysis by the Joint Analysis Group (JAG).

## Approach

Data management is a critical part of the overall sampling strategy.  The basic approach is to aggregate validated sampling data via direction from the UAC.  This effort will be directed by the NOAA SSC at the area command.  All observations that are developed under this overall plan will be transmitted to a NOAA-managed SFTP server at the area command and then transmitted to the assigned modeling groups.  This will establish an "authoritative source" and chain of custody for data, so that modeling efforts will maintain consistency and reliability.  Sub-surface data can also be integrated with surface observations, shoreline data, and atmospheric

conditions.

Modeling output can also be transferred via this SFTP service, but will most effectively be managed by the modeling groups directly due to file size and format specifications. Alignment with the unified command priorities and incident command needs is critical. With numerous vessels, platforms, and activities in the region the operational unit leaders need to be made aware of any new sampling efforts or equipment being deployed. Informational updates will be provided on a daily basis to ensure the security and integrity of the sub-surface cruises.

Numerous organizations are keenly interested in receiving timely shipboard data (CTD and LISST) for analysis. Currently, this data is being delivered in numerous formats using a number of delivery channels which is complicating the preparation of the data for analysis.

In order to accelerate the analysis and the decision making process related to the CTD and LISST data, a consistent data file format is required for both sets of data. This document lays out a data specification for the consistent creation of the CTD and LISST data in Appendix 3.

SOPs (Standard Operating Procedures) are available, such as clean sampling techniques and decontamination procedures, as part of the cruise plan.



MC252 Response Need--Mission Plan Data Policy

# STEP 1: Before the Cruise

## Let us know you are heading out!

Before the cruise begins, the Data Management Coordinator must email the following information about themselves to epadwh@gmail.com:

- Name
- Name of Vessel
- Email Address
- Satellite Phone Number on Board the Vessel (can be delivered upon arrival to vessel)
- Cell Phone Number
- Start Date of Cruise
- Projected End Date of Cruise

## Gathering forms

When we are able to contact you, we can build a log book with you, and give you a 1TB hard drive with a pre-made file structure to organize your data (explained more in Appendix 1: Organization of Data During the Cruise.)  This will be important to receive the correct sampling sheets, COCs, paperwork and contacts that will help facilitate the processing, integration, and analysis of the cruise data.  The set of forms you will need in your log book are:

- This Document (Guidance for Shipboard Data Management Coordinator)
- Locations Template + example
- Sample Template + example
- Rototox Template + example
- Blank COC forms/labels for sample bottles

## STEP 2: During the Cruise

## Ship to Shore Data Management Links

**Daily Deliverables (Ships → Shore)**
Email epadwh@gmail.com your daily updates (more in the next section)

**Daily Ship Calls (Ships ←→ Shore)**
SMU calls each ship in the mornings (between 0830 and 1000)

**SMU Wiki (Ships ←→ Shore)**
Information on daily reporting requests, sampling tracking sheet formats, cruise logistics, contacts, products and reports. (Email the SMU for log in credentials.)

https://www.st.nmfs.noaa.gov/confluence/display/OOP

**OR&R SFTP (Ships ←→ Shore)**
***The*** Data archive for all research ships. If you have connectivity, you can find all other ships data here & upload your data in near real time. See Appendix 1 for more login help, and email the SMU for login information.

## Daily Deliverables

Daily data packages should be submitted to epadwh@gmail.com by **midnight central time**. These data packages must include the following deliverables:

1. Detailed Status Report (Required)
2. Data Table of Sampling/Monitoring Locations (Required)
3. Data Table of Sampling Information (Required)
4. Annotated CTD Plots (Required)
5. Processed CTD .asc files (if sufficient internet connectivity, see Appendix 3: Processing CTD data for more instructions)
6. Data Table of Rototoxicity Test Results (Optional)
7. LISST Particle Analysis Report (Optional)
8. Map if vessel provides (Optional)

Data packages will be compared against the requirements described in this document as well as the field description tab of each data entry template. If deliverables within a given data package do not meet these requirements, an email will be sent to the offending Data Management Coordinator. Such emails will provide some indication of the reason why the deliverable is being rejected. Emails will also be sent to relevant Data Management Coordinators who miss a deadline and/or fail to provide complete data packages.

**The SMART team will upload the daily deliverables to the folder "CURRENT_CRUISE" under a date folder (YYYY_MMDD) for the deliverables on a daily bases - this is at the root of the ship folder.**

For timely analysis during the cruise (if you have internet connectivity) please process the CTD data in the specified format and include in the daily deliverables (See Appendices). The data should be provided in a text format e.g. csv or asc. The complete .hex and .con files are not part of the daily deliverables.

## STEP 3: After your cruise

### Uploading Complete Data Set (must include raw data)

After each cruise, load the entire "Cruise#_MMDD-MMDD" folder on to the ftp site: **sftp.orr.noaa.gov/Deepwater_Horizon_Int/Subsurface_Monitoring/Your_Ships_Name** This folder structure and a single hard drive can be used during the cruise so that data distribution between all parties can receive copies easily after the cruise. You can release your log book to the Subsurface Monitoring Unit - room 310, first table (remember that the physical log book will have a Chain of Custody!)

**\*If you have a good internet connection on your ship\*** you can upload data directly to the sftp OR&R site in the folder structure as you receive it.  This is the preferred method, since we will be able to see more data closer to real time.  (See Appendix 3 on FTP instructions, and email the SMU for login information.)

### Pass the Baton

Find out who is the next data manager for your ship, and get in contact with them!  Give them this packet, and any information that you found important during your cruise.

**…And from the Subsurface Monitoring Unit (down in Houma Louisiana), to all the data managers, scientific crew, ships crews, and everyone helping with this effort:**

# Thank you!

# Appendix 1 – Organization of Data During the Cruise

## File naming convention

Within the FTP folder, each vessel has its own folder under which individual folders for the CTD, LISST and Location data has been created.

Data created in each folder must have the following format:

<DATA_TYPE>_<VESSEL_CODE>_<DATE>_<CRUISE_NUMBER>_<Station_ID>

<DATA_TYPE> = "CTD", "LISST", "LOC"

<VESSEL_CODE> = "BM", "OV", "RC"

<DATE> = MMDDYYYY

Note: that if a sample is repeated at a given location then this sample should be uniquely identified from the original sample by the date and time assigned to each.
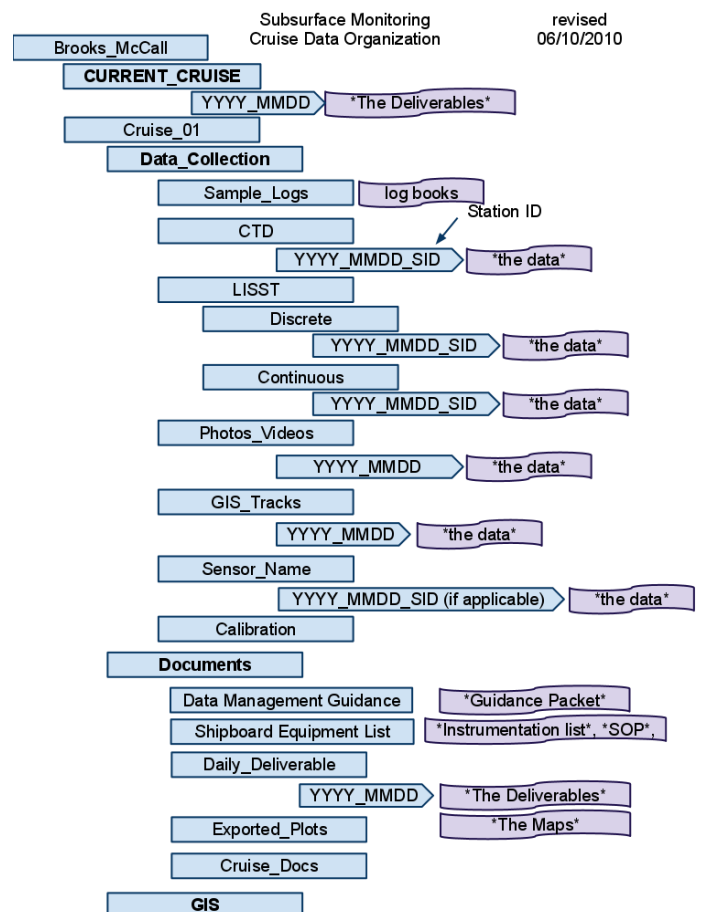
## Folder Structure for CTD / LISST / Pictures / etc.

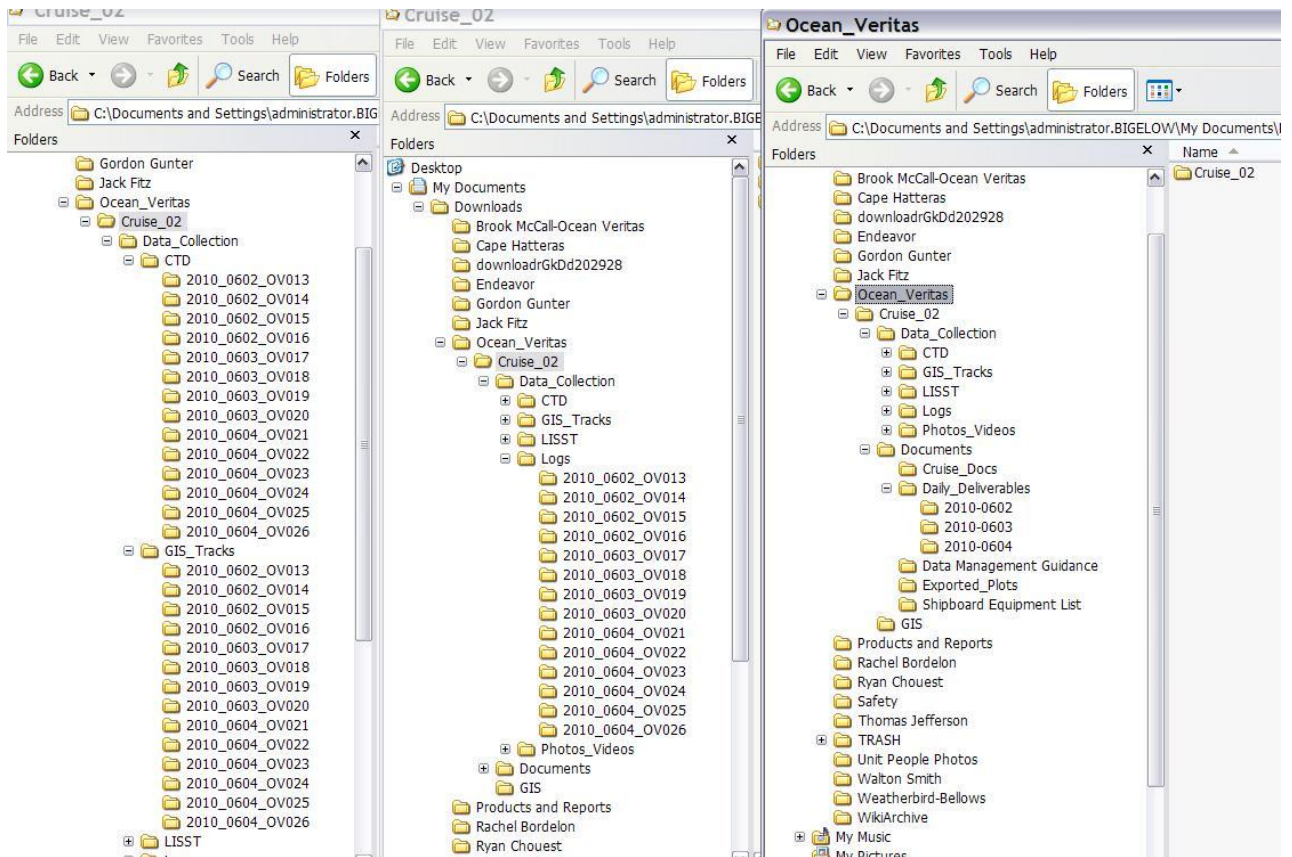Basic folder structure for each cruise is shown at the right & below.

**The SMART team will upload the daily deliverables to the folder "CURRENT_CRUISE" under a date folder (YYYY_MMDD) for the deliverables on a daily bases - this is at the root of the ship folder**. The cruise data manager will save the daily deliverables sent under Documents > Daily_Deliverables > YYYY_MMDD > *the documents*. (These will be near duplicates, but the SMART team usually has to tweak small changes sent to them before uploading into the SCRIBE database, so it is important to keep all versions of the data.)

Sample_Logs (under Data_Collection) will be the location for storing the xls files of samples collected/stations/etc – your log books.

Each ship will have a folder, containing each cruise. The cruise data will be divided up by the *Data_Collection* and *Documentation*. Most of the data will be sorted in the *Data_Collection* folder by **instrument** > **date**-**station ID** > **data file** (Except for continuous data/transects, which should be under a just-date folder.)   Each Instrument should have its own sensor folder!

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Subsurface Monitoring Cruise Data Organization — revised 06/10/2010

- Brooks_McCall
  - **CURRENT_CRUISE**
    - YYYY_MMDD > *The Deliverables*
    - Cruise_01
      - **Data_Collection**
        - Sample_Logs — log books / Station ID
        - CTD
          - YYYY_MMDD_SID > *the data*
        - LISST
          - Discrete
            - YYYY_MMDD_SID > *the data*
          - Continuous
            - YYYY_MMDD_SID > *the data*
        - Photos_Videos
          - YYYY_MMDD > *the data*
        - GIS_Tracks
          - YYYY_MMDD > *the data*
        - Sensor_Name
          - YYYY_MMDD_SID (if applicable) > *the data*
        - Calibration
      - **Documents**
        - Data Management Guidance — *Guidance Packet*
        - Shipboard Equipment List — *Instrumentation list*, *SOP*,
        - Daily_Deliverable
          - YYYY_MMDD > *The Deliverables* / *The Maps*
        - Exported_Plots
        - Cruise_Docs
  - **GIS**

**Window 1 — Cruise_02**

File  Edit  View  Favorites  Tools  Help

Back  |  Search  |  Folders

Address  C:\Documents and Settings\administrator.BIG

Folders

- Gordon Gunter
- Jack Fitz
- Ocean_Veritas
  - Cruise_02
    - Data_Collection
      - CTD
        - 2010_0602_OV013
        - 2010_0602_OV014
        - 2010_0602_OV015
        - 2010_0602_OV016
        - 2010_0603_OV017
        - 2010_0603_OV018
        - 2010_0603_OV019
        - 2010_0603_OV020
        - 2010_0604_OV021
        - 2010_0604_OV022
        - 2010_0604_OV023
        - 2010_0604_OV024
        - 2010_0604_OV025
        - 2010_0604_OV026
      - GIS_Tracks
        - 2010_0602_OV013
        - 2010_0602_OV014
        - 2010_0602_OV015
        - 2010_0602_OV016
        - 2010_0603_OV017
        - 2010_0603_OV018
        - 2010_0603_OV019
        - 2010_0603_OV020
        - 2010_0604_OV021
        - 2010_0604_OV022
        - 2010_0604_OV023
        - 2010_0604_OV024
        - 2010_0604_OV025
        - 2010_0604_OV026
      - LISST
      - Logs

**Window 2 — Cruise_02**

File  Edit  View  Favorites  Tools  Help

Back  |  Search  |  Folders

Address  C:\Documents and Settings\administrator.BIGE

Folders

- Desktop
  - My Documents
    - Downloads
      - Brook McCall-Ocean Veritas
      - Cape Hatteras
      - downloadrGkDd202928
      - Endeavor
      - Gordon Gunter
      - Jack Fitz
      - Ocean_Veritas
        - Cruise_02
          - Data_Collection
            - CTD
            - GIS_Tracks
            - LISST
            - Logs
              - 2010_0602_OV013
              - 2010_0602_OV014
              - 2010_0602_OV015
              - 2010_0602_OV016
              - 2010_0603_OV017
              - 2010_0603_OV018
              - 2010_0603_OV019
              - 2010_0603_OV020
              - 2010_0604_OV021
              - 2010_0604_OV022
              - 2010_0604_OV023
              - 2010_0604_OV024
              - 2010_0604_OV025
              - 2010_0604_OV026
            - Photos_Videos
          - Documents
          - GIS
      - Products and Reports
      - Rachel Bordelon
      - Ryan Chouest

**Window 3 — Ocean_Veritas**

File  Edit  View  Favorites  Tools  Help

Back  |  Search  |  Folders

Address  C:\Documents and Settings\administrator.BIGELOW\My Documents\

Folders

- Brook McCall-Ocean Veritas
- Cape Hatteras
- downloadrGkDd202928
- Endeavor
- Gordon Gunter
- Jack Fitz
- Ocean_Veritas
  - Cruise_02
    - Data_Collection
      - CTD
      - GIS_Tracks
      - LISST
      - Logs
      - Photos_Videos
    - Documents
      - Cruise_Docs
      - Daily_Deliverables
        - 2010-0602
        - 2010-0603
        - 2010-0604
      - Data Management Guidance
      - Exported_Plots
      - Shipboard Equipment List
    - GIS
- Products and Reports
- Rachel Bordelon
- Ryan Chouest
- Safety
- Thomas Jefferson
- TRASH
- Unit People Photos
- Walton Smith
- Weatherbird-Bellows
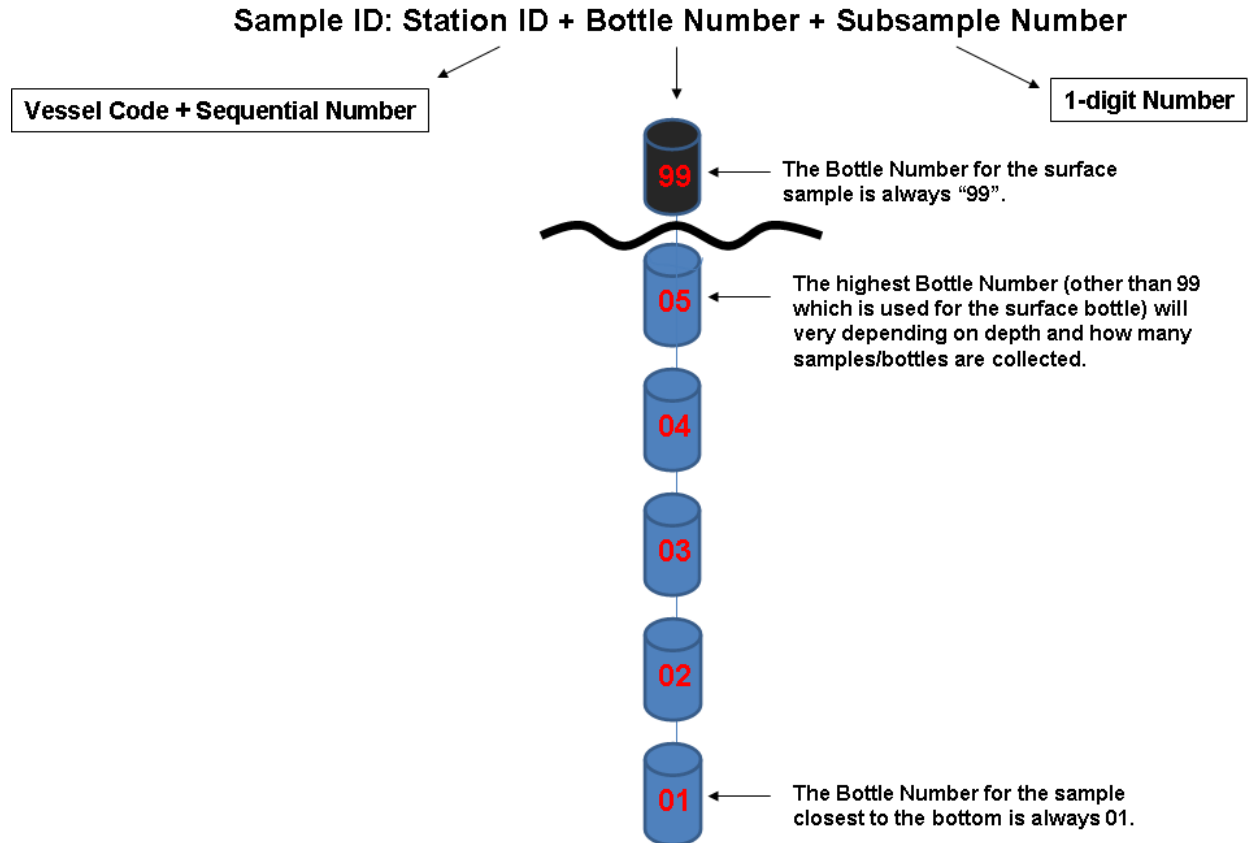- WikiArchive
- My Music
- My Pictures

Name
- Cruise_02

# Explanation of Sampling Scheme

Example for Brooks McCall (BM):

BM42111 would be at Station BM42, Niskin (or other sampler) Bottle #11, Subsample Number #1
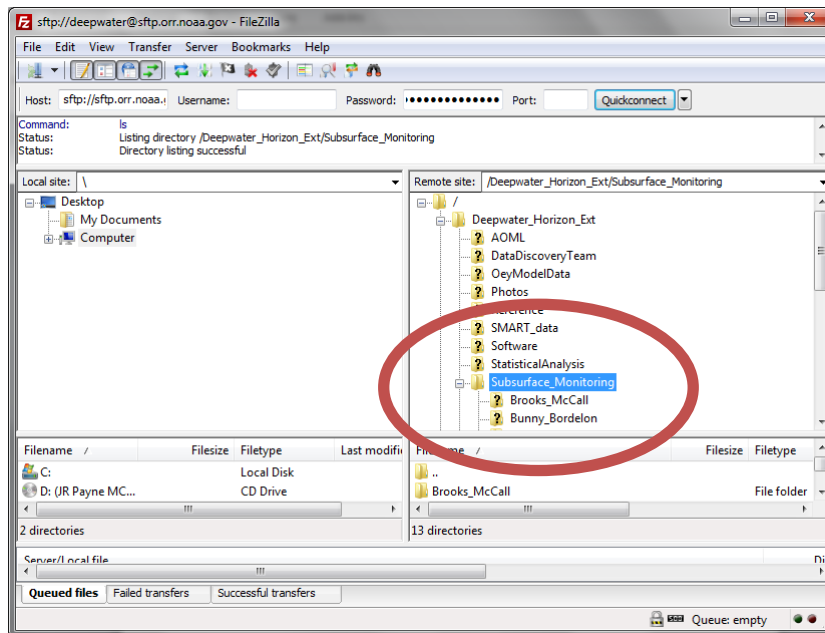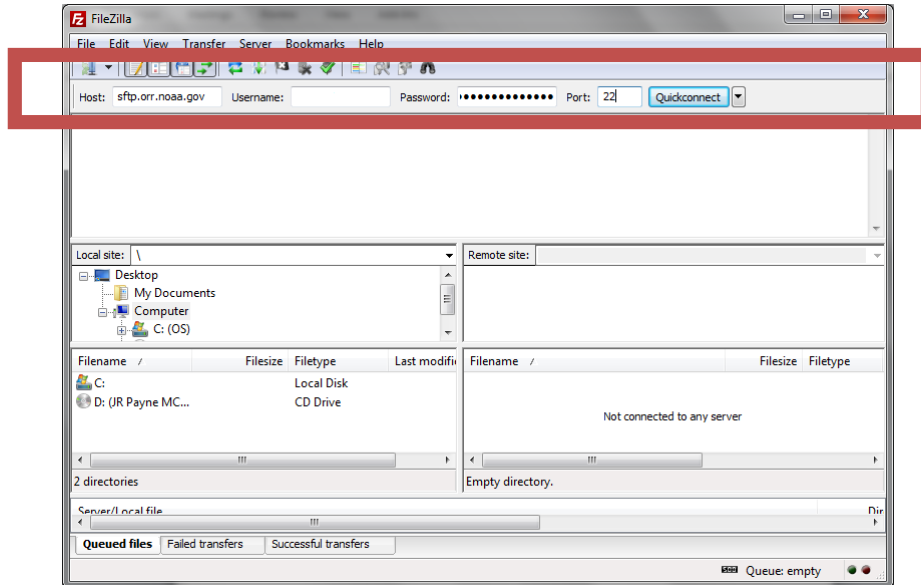
**Sample ID: Station ID + Bottle Number + Subsample Number**

Vessel Code + Sequential Number

1-digit Number

99 ← The Bottle Number for the surface sample is always "99".

05 ← The highest Bottle Number (other than 99 which is used for the surface bottle) will very depending on depth and how many samples/bottles are collected.

04

03

02

01 ← The Bottle Number for the sample closest to the bottom is always 01.

## FTP Instructions

Download an FTP program (like firezilla: http://filezilla-project.org/download.php)

Email the SMU to get login credentials for sftp.orr.noaa.gov.

You can navigate to the /Deepwater_Horizon_Ext/Subsurface_Monitoring/*Your_Ship_Name* to upload data under the file structure or pull data down off the FTP.

# Appendix 2 – Descriptions of Required Daily Deliverables

Example files and templates should be included on your hard drive, and are also located on the OR&R SFTP site.

**Deliverable:** Detailed Status Report
**Description:** A concise log and report of the vessels activities during a 24-hour operating period. Include a summary of ongoing Rototoxicity tests (what test are ongoing, what is the progress, etc).
**Format:** Microsoft Word (.doc) Document
*File Naming Convention: <*Date (in the format MM-DD-YYYY)>_<Vessel Name>_Status Report
**Name of Example File:** 05-23-10_Brooks McCall_Status Report


**Deliverable:** Data Table of Sampling/Monitoring Locations
**Description:** A spreadsheet that documents the locations where the vessel conducted sampling and monitoring activities. This should be a cumulative log for the entire cruise (do not delete what was reported the previous day).
**Format:** Microsoft Excel (.xls) Spreadsheet
*File Naming Convention: <*Date (in the format MM-DD-YYYY)>_<Vessel Name>_Locations
**Name of Example File:** 05-23-2010_Brooks McCall_Locations


**Deliverable:** Data Table of Sampling Information\
**Description:** A spreadsheet that documents the samples that were collected at specific locations and depths. This should be a cumulative log for the entire cruise (do not delete what was reported the previous day).
**Format:** Microsoft Excel (.xls) Spreadsheet
*File Naming Convention: <*Date (in the format MM-DD-YYYY)>_<Vessel Name>_Samples
**Name of Example File:** 05-23-2010_Brooks McCall_Samples


**Deliverable:** Annotated CTD Plots
**Description:** An image (.jpg) file of the plot as produced by the Seabird software with the following annotations: StationID, Date, Latitude (in decimal degrees) and Longitude (in decimal degrees). Recommended method: 1) Import the .jpg generated by the Seabird software into Microsoft PowerPoint. 2) Add the annotations. 3) Save the file as a JPEG File Interchange Format.
**Format:** .jpg
*File Naming Convention: <*Date (in the format MM-DD-YYYY)><*Vessel Name>_CDT*<StationID>
**Name of Example File:** 05-23-10_Brooks McCall_CTD_<StationID>

**Deliverable:** Data Table of Rototoxicity Test Results
**Description:** Results of the Rototoxicity assessment.
**Format:** Microsoft Excel (.xls) Spreadsheet
*File Naming Convention: <*Date (in the format MM-DD-YYYY)><*Vessel Name>_Rototox<StationID>
**Name of Example File:** 05-23-10_Brooks McCall_RotoTox_<StationID>


**Deliverable:** LISST Particle Analysis Report
**Description:** A report of LISST analysis activities.
**Format:** Microsoft Word (.doc) Document
*File Naming Convention: <*Date (in the format MM-DD-YYYY)>_<Vessel Name>_LISST
**Name of Example File:** 05-23-2010_Brooks McCall_LISST


**Deliverable:** Processed CTD ascii file
**Description:** A processed CTD (ascii) file as produced by the Seabird software. A much more detailed description is in the following appendix.
**Format:** .asc
*File Naming Convention: <*Date (in the format MM-DD-YYYY)><*Vessel Name>_CDT<StationID>
**Name of Example File:** 05-23-10_Brooks_McCall_CTD_<StationID>


## Image Formatting

In order to analyze and process the CTD deliverable from different vessels and different CTD setups, this framework aims to provide consistent parameters for generation of the plot and its annotation for the data manager to deliver back to the Deep Water Integrated Oceans Operations team (through epadwh@gmail.com).

Check in with the CTD operator/engineering technician aboard the vessel concerning…

## X-Axis Variables and Parameters

These variables and their ranges shown in the plot need to be consistent. This information can be programmed into the SeaBird processing software.

| Variable | Units | Axis minimum | Axis maximum |
|---|---|---|---|
| **Fluorescence** | mg/m³ | 0 | 50 |
| **Dissolved Oxygen** | mg/L | 0 | 20 |
| **Temperature** | deg C | 0 | 26 |
| **Salinity** | PSU | 32 | 37 |

## Downscan

For ease of viewing and the smoothest data scan, only the downscan of each of the above variables should be included in the plot. This can be accomplished by splitting the data and generating the plot or stopping the plot generation at the maximum depth. Note: this is only for the purpose of generating a clean deliverable; the sensor data should be recorded for the CTD's trip through the water column as decided by the Chief Scientist and those in charge of mission planning.

Once the plot is exported as an image from the SeaBird software…

## Annotation Requirements

Please add an annotation tag to each plot in Microsoft Powerpoint (or other suitable software), and save the plot tied to the annotation as a JPEG image. This tag should include only the following information:

- "CTD Raw Data"
- StationID
- Date
- Latitude
- Longitude

Save this powerpoint slide as a JPEG image and include one for each station in the daily deliverable package.

**See following page for an example plot with related annotation.**

## Example CTD Plot
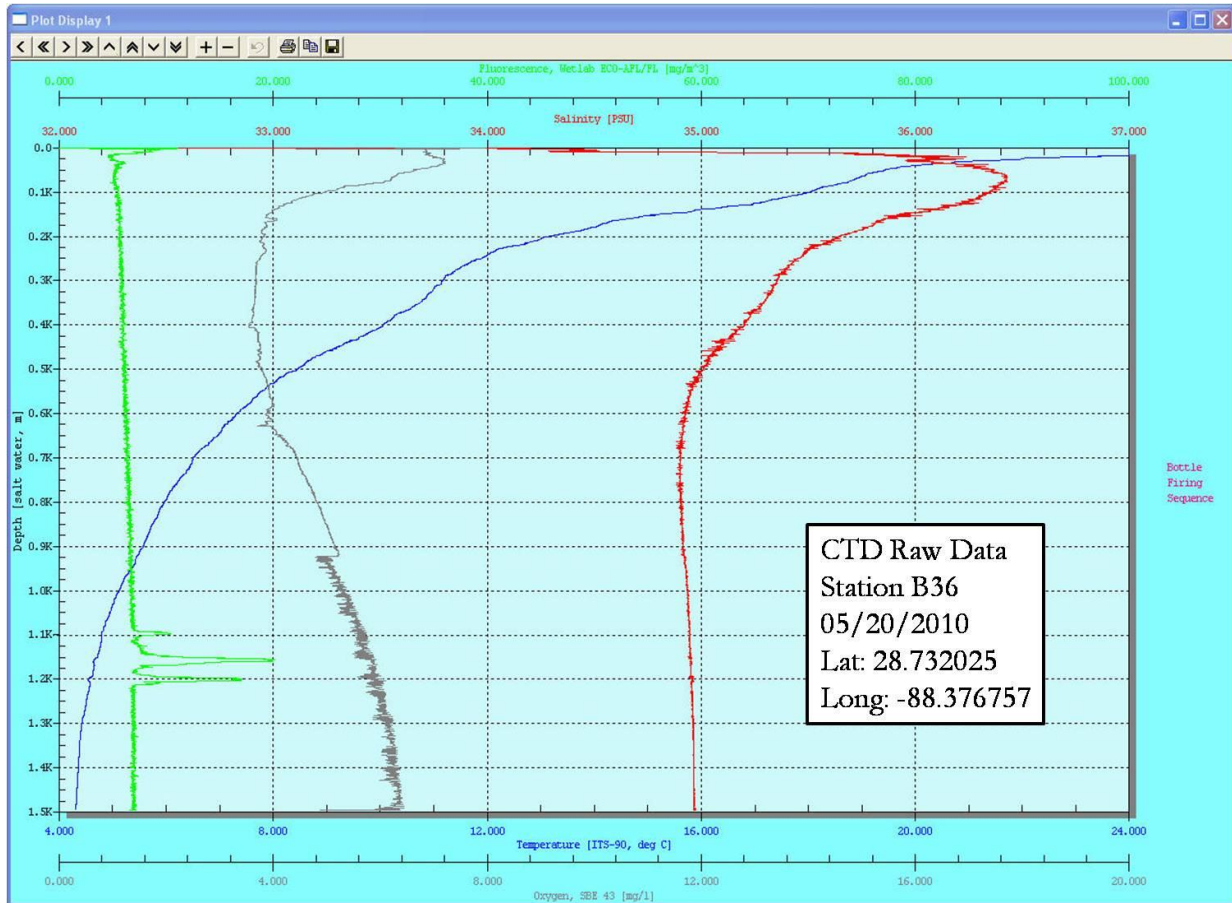


## Metadata

To provide adequate background information on data collected during your cruise, we need "data about data". This includes basic information for a minimal metadata record.

Most of this information is can be produced by the technician of the instrument. (For example, the CTD header file is updated before every cast with some basic metadata – see the shipboard data processing section for those requirements.)

Please make sure you have this set of information for each instrument, for each raw data file produced:

- Person to contact about the data, and their contact information (most likely the data manager, maybe the tech)
- Instrument used
- Time/Location of data collection
- Processing steps

# Appendix 3 – Shipboard Data Processing

## Vessel "Source" Format

The table below details CTD instrumentation setup and detail data specification for the Sea-Bird software. Configuring the CTD scan using these parameters will ensure consistency in data analysis between cruises and between vessels.

It is important to ensure that the parameters specified here are configured exactly as detailed e.g. the order of the "name" fields is important so that this data can be mapped to the target specification.

An example header of the original hex file header (needed for metadata – so make sure the tech updates the file!):

| Source File Data | Comment |
|---|---|
| * Sea-Bird SBE 9 Data File: | |
| * FileName = D:\03 June _SBE 9 data\SBE 9 Data\OV02101.hex | |
| * Software Version Seasave V 7.20d | |
| * Temperature SN = 2234 | |
| * Conductivity SN = 1815 | |
| * Number of Bytes Per Scan = 30 | |
| * Number of Voltage Words = 4 | |
| * Number of Scans Averaged by the Deck Unit = 1 | |
| * System UpLoad Time = Jun 04 2010 12:12:29 | |
| ** Vessel: Ocean Veritas | |
| ** Station ID: OV02101 | Use agreed format of <VESSEL_ID><STATION_ID> |
| ** Date / Time: 4 Jun 2010 / 12:12 | |
| ** Nav. Datum-NAD-27 | |
| ** Lat: 28.706530 | Latitude in decimal degrees |
| ** Lon: -88.348059 | Longitude in decimal degrees |
| ** Operator: WJ Bekins | |

Order of variables in the file (#name 0 is the first column of data) built after the "datacvn" processing:

| | |
|---|---|
| # nquan = 15 | |
| # nvalues = 3000 | |
| # units = specified | |
| # name 0 = t090C: Temperature [ITS-90, deg C] | Ensures that temperature will be presented in column 1 of the detail output |
| # name 1 = prDM: Pressure, Digiquartz [db] | Ensures that pressure will be presented in column 2 of the detail output |

| | |
|---|---|
| # name 2 = sbeox0V: Oxygen Voltage, SBE 43 | Ensures that oxygen voltage will be presented in column 3 of the detail output |
| # name 3 = flECO-AFL: Fluorescence, Wetlab ECO-AFL/FL [mg/m^3] | Ensures that flurorescence will be presented in column 4 of the detail output |
| # name 4 = v1: Voltage 1 | Ensures that voltage 1 will be presented in column 5 of the detail output |
| # name 5 = v2: Voltage 2 | Ensures that voltage 2 will be presented in column 6 of the detail output |
| # name 6 = v3: Voltage 3 | Ensures that voltage 3 will be presented in column 7 of the detail output |
| # name 7 = c0S/m: Conductivity [S/m] | Ensures that conductivity will be presented in column 8 of the detail output |
| # name 8 = depSM: Depth [salt water, m], lat = 29 | Ensures that depth will be presented in column 9 of the detail output |
| # name 9 = sal00: Salinity, Practical [PSU] | Ensures that salinity will be presented in column 10 of the detail output |
| # name 10 = density00: Density [density, Kg/m^3] | Ensures that density will be presented in column 11 of the detail output |
| # name 11 = svCM: Sound Velocity [Chen-Millero, m/s] | Ensures that sound velocity will be presented in column 12 of the detail output |
| # name 12 = sbeox0Mg/L: Oxygen, SBE 43 [mg/l], WS = 2 | Ensures that oxygen will be presented in column 13 of the detail output |
| # name 13 = sbeox0ML/L: Oxygen, SBE 43 [ml/l], WS = 2 | Ensures that oxygen will be presented in column 14 of the detail output |
| # name 14 = flag: flag | |
| # span 0 =    4.3540,   28.0873 | |
| # span 1 =    3.020,   1518.186 | |
| # span 2 =    1.8009,    3.7157 | |
| # span 3 =    3.1479,   42.4415 | |
| # span 4 =    1.8014,    3.7191 | |
| # span 5 =    0.0781,    0.4918 | |
| # span 6 =    4.9426,    4.9426 | |
| # span 7 =   3.345567,   5.778150 | |
| # span 8 =    3.000,   1502.500 | |
| # span 9 =   33.3517,   36.6291 | |
| # span 10 =  1021.1595,  1034.6632 | |
| # span 11 =   1486.90,   1542.73 | |
| # span 12 =   3.73192,   7.85966 | |
| # span 13 =   2.61137,   5.49972 | |
| # span 14 = 0.0000e+00, 0.0000e+00 | |

## CTD Processing Specifications

The CTD processing steps in the Seabird Software:

Datcnv > filter> alignctd > celltm > loopedit > wildedit > Derive > binavg> ascii_out

Specifics are outlined for each step below (see the seabird website for more detailed instructions on how to use their free software.)

| | |
|---|---|
| # interval = meters: 1 | Interval specified at 1 meter |
| # start_time = Jun 04 2010 12:12:29 | |
| # bad_flag = -9.990e-29 | |
| # datcnv_date = Jun 07 2010 13:04:28, 7.20c | |
| # datcnv_in = C:\C16408\4-Jun-10\ctd re-run\OV02101.hex C:\C16408\4-Jun-10\ctd re-run\OV02101.XMLCON | |
| # datcnv_skipover = 0 | |
| # datcnv_ox_hysteresis_correction = yes | |
| # filter_date = Jun 07 2010 13:06:20, 7.20c | |
| # filter_in = C:\C16408\4-Jun-10\ctd re-run\OV02101.cnv | |
| # filter_low_pass_tc_A = 0.030 | |
| # filter_low_pass_tc_B = 0.150 | |
| # filter_low_pass_A_vars = | |
| # filter_low_pass_B_vars = prDM | |
| # alignctd_date = Jun 07 2010 13:07:09, 7.20c | |
| # alignctd_in = C:\C16408\4-Jun-10\ctd re-run\OV02101-f.cnv | |
| # alignctd_adv = sbeox0V 3.500, c0S/m 0.073 | |
| # celltm_date = Jun 07 2010 13:07:23, 7.20c | |
| # celltm_in = C:\C16408\4-Jun-10\ctd re-run\OV02101-f-a.cnv | |
| # celltm_alpha = 0.0300, 0.0000 | |
| # celltm_tau = 7.0000, 0.0000 | |
| # celltm_temp_sensor_use_for_cond = primary, | |
| # loopedit_date = Jun 07 2010 13:07:38, 7.20c | |
| # loopedit_in = C:\C16408\4-Jun-10\ctd re-run\OV02101-f-a-c.cnv | |
| # loopedit_minVelocity = 0.200 | |
| # loopedit_surfaceSoak: do not remove | |
| # loopedit_excl_bad_scans = yes | |
| # wildedit_date = Jun 07 2010 13:07:53, 7.20c | |
| # wildedit_in = C:\C16408\4-Jun-10\ctd re-run\OV02101-f-a-c-l.cnv | |
| # wildedit_pass1_nstd = 2.0 | |

| | |
|---|---|
| # wildedit_pass2_nstd = 20.0 | |
| # wildedit_pass2_mindelta = 0.000e+000 | |
| # wildedit_npoint = 100 | |
| # wildedit_vars = t090C prDM v2 v3 c0S/m | |
| # wildedit_excl_bad_scans = yes | |
| # Derive_date = Jun 07 2010 13:09:51, 7.20c | |
| # Derive_in = C:\C16408\4-Jun-10\ctd re-run\OV02101-f-a-c-l-w.cnv<br>C:\C16408\4-Jun-10\from ftp\C16408 Data\SBE 9  21-26\test2601.XMLCON | |
| # derive_time_window_docdt = seconds: 2 | |
| # derive_ox_tau_correction = yes | |
| # binavg_date = Jun 07 2010 13:12:34, 7.20c | |
| # binavg_in = C:\C16408\4-Jun-10\ctd re-run\OV02101-f-a-c-l-w-d.cnv | |
| # binavg_bintype = meters | |
| # binavg_binsize = 1 | Bin size must be 1 meter |
| # binavg_excl_bad_scans = yes | |
| # binavg_skipover = 0 | |
| # binavg_surface_bin = no, min = 0.000, max = 0.000, value = 0.000 | |
| # file_type = ascii | |
| *END* | Required to indicate the end of the header section |

## BP "Target" Format

### Header Record

| Field Name | Description | Format/Unit of Measure |
| --- | --- | --- |
| Orig Datum Used* | Original Datum Used | See note below |
| Date | Date | MMDDYYYY |
| Start Time | Start Time – in GMT | HHMMSS |
| End Time | End Time  - in GMT | HHMMSS |
| Longitude | Longitude | Decimal Degrees (8 decimal places) |
| Latitude | Latitude | Decimal Degrees (8 decimal places) |

* To ensure the integrity of all spatial data associated with the Deepwater Horizon Project, any coordinates supplied in Latitude and Longitude must state which Datum the coordinates are on. In almost all cases this will be WGS84, NAD83 or NAD27.

### Detail Record

| Field Name | Description | Format/Unit of Measure |
| --- | --- | --- |
| Long | Longitude | Decimal Degrees (8 decimal places) |
| Lat | Latitude | Decimal Degrees (8 decimal places) |
| Depth_m | Depth | Meters |
| Temp_C | Temperature | Celsius |
| Sal_PSU | Salinity | PSU |
| Den_Kg_m3 | Density | Kg/m3 |
| Vp_m_s | Sound Velocity | m/s |
| Pres_db | Pressure | Db |
| O2_mg_l | Oxygen | Mg/l |
| O2_ml_l | Oxygen | Ml/l |
| Fluoro_mg_m3 | Fluorescence | Mg/m3 |
| V1 (to VN as req'd) | Voltage Readings | V |

### Source to Target Field Mapping

The table below provides the source to target field mapping assignment for the header data. Note that any NULL records must be converted to -99999.

| Target Field Name | Source Field Name |
| --- | --- |
| Orig Datum Used* | ** Nav. |
| Date | ** Date / Time: |
| Start Time | # start_time |
| End Time | |
| Longitude | ** Lon: |
| Latitude | ** Lat: |

The table below provides the source to target field mapping assignment for the detailed data.

| Target Field Name | Source Field Name |
|---|---|
| Long | ** Lon: |
| Lat | ** Lat: |
| Depth_m | Column 9 |
| Temp_C | Column 1 |
| Sal_PSU | Column 10 |
| Den_Kg_m3 | Column 11 |
| Vp_m_s | Column 12 |
| Pres_db | Column 2 |
| O2_mg_l | Column 13 |
| O2_ml_l | Column 14 |
| Fluoro_mg_m3 | Column 4 |
| V1 | Column 5 |
| V2 | Column 6 |
| V3 | Column 7 |

## LISST Sampling

In reviewing LISST data samples from both the Ocean Veritas and the Brooks McCall and determining that they were using the same format, the data format detailed below was adopted, eliminating the need for either vessel to change their formatting.

Within the data format there are 32 size ranges logarithmically placed form 2.5 – 500 microns (the upper size in each bin is 1.180 times the lower). The numbers in columns A through AF shows the median size of each size class.

Processing the Data for Daily Reports:

The volume concentrations from columns A-S (2.5 to 53.5µm) is summed for each of the first twenty rows and averaged.

| Field Name | Descriptions | Format/Unit of Measure |
|---|---|---|
| Filename | 2 digit vessel + 3 digit station + 2 digit id | |
| Vol_1 | 2.72 | µl/l |
| Vol_2 | 3.2 | µl/l |
| Vol_3 | 3.78 | µl/l |
| Vol_4 | 4.46 | µl/l |
| Vol_5 | 5.27 | µl/l |
| Vol_6 | 6.21 | µl/l |
| Vol_7 | 7.33 | µl/l |
| Vol_8 | 8.65 | µl/l |
| Vol_9 | 10.2 | µl/l |
| Vol_10 | 12.1 | µl/l |
| Vol_11 | 14.2 | µl/l |
| Vol_12 | 16.8 | µl/l |
| Vol_13 | 19.8 | µl/l |

| | | |
|---|---|---|
| Vol_14 | 23.4 | µl/l |
| Vol_15 | 27.6 | µl/l |
| Vol_16 | 32.5 | µl/l |
| Vol_17 | 38.4 | µl/l |
| Vol_18 | 45.3 | µl/l |
| Vol_19 | 53.5 | µl/l |
| Vol_20 | 63.1 | µl/l |
| Vol_21 | 74.5 | µl/l |
| Vol_22 | 87.9 | µl/l |
| Vol_23 | 104 | µl/l |
| Vol_24 | 122 | µl/l |
| Vol_25 | 144 | µl/l |
| Vol_26 | 170 | µl/l |
| Vol_27 | 201 | µl/l |
| Vol_28 | 237 | µl/l |
| Vol_29 | 280 | µl/l |
| Vol_30 | 331 | µl/l |
| Vol_31 | 390 | µl/l |
| Vol_32 | 460 | µl/l |
| LTS | Laser Transmission sensor | |
| Battery | Battery Voltage | |
| ExtAux1 | External Auxiliary Input 1 | |
| LRS | Laser Reference Sensor | |
| Pressure | Pressure | |
| Temperature | Temperature | |
| Day | (Day*100 + Hour) | |
| Mins | (Minutes*100 + Seconds) | |
| OpticalTrans | Computed % Optical Transmissions | |
| ComputedBeam | Computed Beam-C in Units of 1/m | |

# Appendix 4- Accessing Analytical Data - The SCRIBE Database

EPA uses the daily deliverables to update a database of the samples taken for research ship analytical data (physical water/oil samples that go to a lab.) If you would like to access the SCRIBE data base, download the latest version of SCRIBE off of the website: epaosc.net/scribe

Then email the EPA Deep Water Horizon team at: *epadwh@gmail.com* for subscription information.