R/V BROOKS MCCALL
CRUISE REPORT

DEEPWATER HORIZON

May 7 – 12, 2010

6062804

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A. INTRODUCTION

The Deepwater Horizon MC 252 explosion occurred at approximately 11:00 PM on 20 April, 2010 with 126 crewmembers aboard. Eleven crewmembers lost their lives in the explosion and resulting fire. The rig burned for three days before collapsing. As a result of the structural failure of the rig, there was an uncontrolled and continuous release of oil from the riser.

The riser from the Deepwater Horizon rig is lying on the bottom of the Gulf of Mexico in 5000 feet (1524 m) of water and oil is jetting out at an estimated rate of 5000 barrels (210,000 gallons) per day. The source of oil is currently not under control.

The plume from the main source is a mixture of gas, oil and entrained water. The oil droplets are relatively large, on the order of several millimeters. The plume width increases slowly as the mix moves to the surface while the oil droplets separate from the gas. The oil reaches the sea surface in approximately three hours, forming a thick oil film that weathers and emulsifies, plus a larger sheen area of much reduced thickness, all of which threatens shoreline and nearshore habitats and resources. These impacts may be mitigated if the oil can be contained and recovered or burned and/or if the oil can be dispersed. Targeted aerial dispersant spray operations to protect the shoreline are underway, but subsurface injection of dispersant near the release point is also an option.

A preliminary period of injection indicated that such an approach may work. There are, however, a number of uncertainties concerning the physical processes which will govern mixing, effectiveness, and dispersion of the plume. As a result, a test plan was developed to allow for a 24-hour dispersant injection and monitoring operation. The monitoring objectives are:

- Confirm location and extent of the subsurface plume.
- Determine how much oil (total PAH) remains in the dispersed plume.
- Collect physical oceanographic data to validate the sub-surface dispersed plume model.

B. INJECTION OPERATIONS

The objective of the operation is to use aerial and boat monitoring to determine if the subsea dispersant injection operation is chemically dispersing the oil plume. The summary of the test parameters includes:

- Dispersant injection began at 04:30 on May 10, 2010 and ended at 03:30 on May 11, 2010.
- Pumped rate of dispersant = 10 gal/min
- Pumped a total of 11,560 gallons
- Delivery method into riser was improved upon from earlier tests by inserting the dispersant wand directly into the riser.

C. CRUISE OVERVIEW

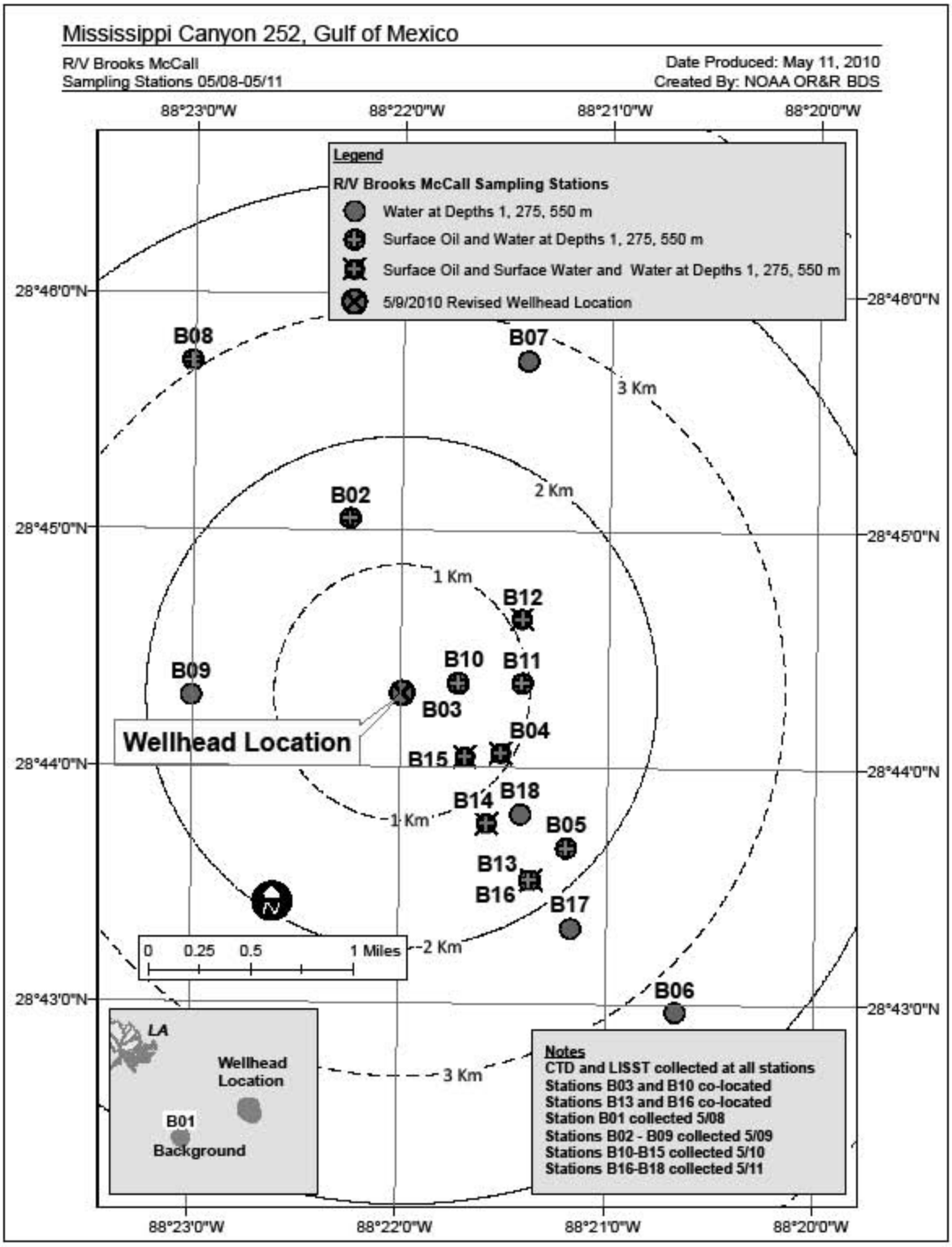
Section prepared on May 12, 2010 by Dr. Don Aurand, EM&A
Figure prepared by Ben Shorr, NOAA

The R/V Brooks McCall departed Port Fourchon, LA on the evening of May 7, 2010. On May 8, 2010 the vessel was engaged in planning operations, crew orientation, and operational checks of all equipment. After shakedown, one control sample station was occupied. On May 9, 2010 the vessel was instructed to transit to the vicinity of the release point and begin survey work. A total of eight sample series (labeled B02 through B09) were taken that day. On May 10, a series of six sample sets (labeled B10 through B15) were collected, based on estimates provided by the Area Command Environmental Team of the location where dispersed oil might reach the surface as a result of the subsea injection. On May 11, three additional sample sets (labeled B16 through B18) were taken in the same vicinity. Two sets were taken at the same coordinates (B3 on May 9 and B10 on May 10: B13 on May 10 and B16 on May 11). The locations of all samples and the data collection are shown in Figure C-1.

As described in detail in Section J, on May 10 the LISST instrument was deployed on a fixed boom. A long transect run on May 10 with the instrument deployed was repeated for comparative purposes on May 11. The ship's track is shown in Section J.

At noon on May 11 the vessel ceased data collection. We returned to Port Fourchon, arriving early on the morning of May 12.

Figure C-2 - Sampling Locations



D. FIELD SAMPLING PROTOCOLS AND OBSERVATIONS

Section prepared on May 12, 2010 by Jennifer Cragan, ASA and Andrew McQueen and John Williams, Entrix

Electronic data from water column profiling equipment and discrete water column samples were collected for analysis. The following is a description of the general sampling plan for the scientific team aboard the RV Brooks McCall, with brief summaries of any changes that were made to the initial plan as a result of onboard analyses or shifting priorities.

Grab samples will be collected for surface oil (where present), and discrete seawater samples will be collected using three 4 liter Niskin bottles at approximately 1 meter, 275 meters, and 550 meters below the water surface. The discrete samples will be analyzed immediately for dissolved oxygen and oil droplet size number and distribution, and preserved for total petroleum hydrocarbon and uv-fluorescence measurements.. Water column profiling to a maximum possible depth of 550 m using a Seabird 19 Plus will be performed and profile data will be collected for conductivity, temperature and depth using an SBE 25 Sealogger CTD and density will be calculated. The electronic data from these profiles will be recorded at each station. Samples will be logged in an electronically generated chain of custody form with appropriate labeling.

Roles and Responsibilities

During the field sampling campaign, Andrew McQueen (Entrix) and John Williams (Entrix) will be retrieving sample water and filling the appropriate sample jars. Robyn Conmy (EPA) and Blake Schaeffer (EPA) will be coordinating the acquisition and interpretation of the fluorescence data. Robyn Conmy will also be assisting in the measurement of dissolved oxygen. Ken Lee (Department of Fisheries and Oceans Canada, for EPA) and Zhengkai Li (Department of Fisheries and Oceans Canada, for EPA) will be analyzing water samples for particle size distribution using a Laser In-Situ Scattering and Transmissometry (LISST) 100X, manufactured by Sequoia, Scientific. Paul Kepkay (Department of Fisheries and Oceans Canada, for EPA) will be collecting samples and preserving them for subsequent uv-fluorescence analysis using a Shimadzu R5301 scanning fluorometer. Ben Shorr (NOAA) and Blake Schaeffer (EPA) are coordinating GIS data logging and electronic data management. Jennifer Cragan (ASA, for NOAA) is coordinating the sampling plan and assisting as needed with its execution. Don Aurand, Chief Scientist, is directing the scientific party.

Sampling details and order of sample collection

1. Discrete dissolved oxygen will be collected first, and delivered to the laboratory for analysis. Dissolved oxygen samples will be collected according to standard practice and will be analyzed immediately using a LaMotte Dissolved Oxygen Water Quality Test Kit #5860.
2. Two 4 ounce certified clean glass jars with Teflon inserts will be filled and delivered for LISST particle size distribution. The LISST samples may be used to

inform additional sampling efforts. One-half inch (½") of headspace will be left in the jar.

3. The remaining sample volume from these two jars will be delivered for preservation at 4 °C and subsequent uv-fluorescence measurement. Paul Kepkay will take custody of these samples.
4. A 1 liter certified clean amber glass jar will be used to collect a one liter sample for total petroleum hydrocarbon (TPH) analysis. These samples will be stored at 4 °C and one inch (1") of headspace will be left.
5. Two additional 4 ounce certified clean glass jars will be collected and handled according to the procedure outlined in steps 2 and 3 above. These samples will be used as a means of determining whether there is gradation within the Niskin bottle which would affect the quantity and distribution of any oil collected within the Niskin bottle.
6. An additional liter of seawater will collected and handled according to the procedure outlined in step 4.

Entrix staff will complete chain of custody forms and take custody of discrete samples collected except where samples are consumed and analyzed underway or earmarked for specialized measurement. Additional samples may be collected as needed or directed.

May 8, 2010

Samples collected were to test the CTD sampling equipment and to acquire a background set of samples that were believed to represent clean, non-oiled, water. Three Niskin bottles were attached to a rosette and triggered at predetermined depths using a transducer. The target depths were 550 meters, 275 meters, and 1 meter below the water surface. Water samples were collected for dissolved oxygen (DO), total petroleum hydrocarbons (TPH) and uv-fluorescence.

May 9, 2010

Water samples were collected for stations B02 through B09. Surface water samples were collected for some station locations from the port side of the ship using a bucket. These samples were collected where there appeared to be oil present that was of greater concentration than sheen. Samples for surface oil were collected by either submerging 8 ounce glass jar and collecting surface oil or taking a clean sorbent pad and attempting to sorb and skim oil off the surface for qualitative analysis. Samples for LISST and uv-fluorescence analysis were collected by submerging two 4 ounce jars while still closed below the surface, opening them, and resealing them below the surface. The sampling bucket was decontaminated using Dawn detergent and fresh water from the ship supply, and decontamination water was thrown back into the water. For discrete water samples from the Niskin, the protocol was modified to collect three (3) 1 L amber glass jars where visible sheen was present on the water surface inside the Niskin bottle, and to collect two (2) 1 L amber glass jars from all other Niskin bottles. The quantity of water samples collected for LISST and uv-fluorescence analysis were generally the same as for TPH analysis. Beginning with station B08, due to the fact

that the particle size count and distribution results did not appear to show a significant difference amongst duplicate samples collected from the same Niskin bottle, fewer LISST and uv-samples were collected than for TPH samples.

May 10, 2010

Water samples were collected for stations B10 through B15. Water sample collection protocols were modified with one TPH sample collected per Niskin bottle and typically 2 LISST and uv-fluorescence samples collected. Duplicate DO samples were collected for several stations and the additional samples were analyzed using an Extech DO handheld meter.

May 11, 2010

Water samples were collected for stations B16 through B18. DO samples were analyzed using the LaMotte colorimetric kit, and duplicate DO samples were collected for deep water samples and analyzed using the Extech handheld meter. Two LISST/uv-fluorescence samples were taken per Niskin bottle, and 1 TPH sample. In-situ fluorescence measurements were collected between stations using a Turner C3 fluorometer deployed from the starboard side while the boat was transiting at approximately 1 meter depth. A second LISST 100X was attached to a boom and deployed off the port side of the boat at 09:30 CST to collect particle size data at approximately 3 meters depth. As a result of this, bucket decontamination procedures were altered and the buckets were wiped with sorbent pads, but no detergents were used. Packaging procedures included clear packaging tape over labels, and electrical tape sealing each bottle cap. Containers were placed in 1 gal Ziploc bags then wrapped in bubble wrap and duct taped. Containers were then placed in original shipping box with cardboard dividers. Each box was then sealed in a trash bag and placed in ice chests on top of sealed Ziploc bags containing ice. Trip blanks were included in each oft the 5 ice chests, and each chest was custody sealed at time of transfer.

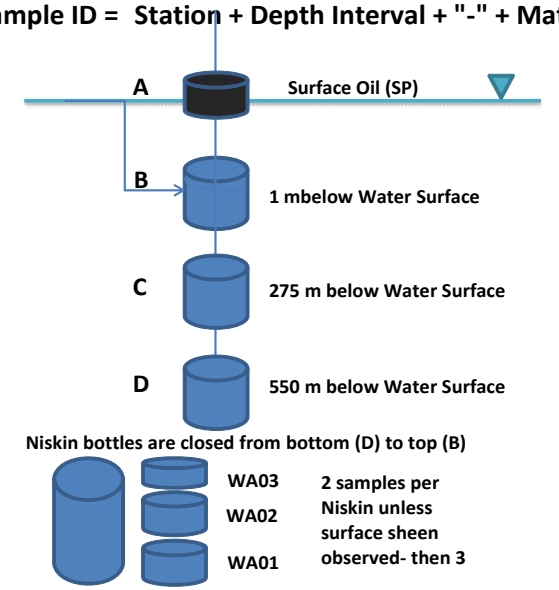
May 12, 2010

TPH samples were delivered according to Entrix Chain of Custody protocols, to be delivered to LSU for subsequent analysis. These samples were received by LSU as of 7:00 CST.

A summary of sample labeling protocols and a matrix of the number of samples collected per each station is attached as Figure D-1. A summary of surface observations are presented in Table D-1.

Figure D-1. Summary of Sampling Scheme and Number of Samples Collected

Sample ID = Station + Depth Interval + "-" + Matrix + Sample ID



	05/08/10	05/09/10								05/10/10						05/11/10		
	B01	B02	B03	B04	B05	B06	B07	B08	B09	B10	B11	B12	B13	B14	B15	B16	B17	B18
DO																		
SP		2		2	2			1		2	2	2	2	2	2	2		
LISST-UV				1						1	1	1	1	1	1	1	1	1
TPH				1							1	1	1	1	1		1	
DO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SP																		
LISST-UV	2	2	2	3	3	3	3	1	1	2	2	2	2	2	2	2	2	2
TPH	2	2	2	3	3	3	3	2	3	1	1	1	1	1	1	1	1	1
DO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
SP																		
LISST-UV		2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2
TPH		2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1
DO	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	2	2
SP																		
LISST-UV	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2
TPH	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1
Station Totals	11	17	15	21	19	17	13	13	13	15	17	16	16	17	18	16	15	14

DO	61
SP	21
LISST-UV	114
TPH	87
All	**283**

Table D-1. Summary of Surface Observations

Date	Time	Station	Notes/Observations
5/8/2010	17:09	B01	No visible oil at surface.
5/9/2010	7:30	B02	No visible slicks at surface but numerous tarballs. Sizes range from roughly the size of a Clementine to a navel orange.
5/9/2010	9:27	B03	No visible slicks near boat. No visible tarballs.
5/9/2010	10:09	B03	Industrial hygienist recorded VOC peaks around 37 - 41 ppm but not sustained.
5/9/2010	10:09	B04	Surface oil present at station appears brownish- orange in color. It appears that oil is surfacing here (from note for Station B05)
5/9/2010	13:11	B05	Oil at the surface appears maroon in color. VOCs in the air are ranging from 10 - 15 ppm.
5/9/2010	13:25	B05	Surface oil was described as rainbow sheen and weathered, emulsified oil. (Don Aurand and Ken Lee). The weathered, emulsified oil was very clearly visible and covered a significant portion of the surface water. Surface waves appeared to have brown caps instead of the usual white caps.
5/9/2010	15:06	B06 - B07	The ship appears to be sailing through emulsified weathered oil.
5/9/2010	16:38	B07	Sheen on the surface with some visible emulsified oil, but mostly just visible sheen (rainbows) on the surface. Sea state appears calmer.
5/9/2010	17:35	B08	While trying to collect bucket sample, it appeared as if oil droplets were bubbling up to the surface. Sampling crew attempted to collect a bucket - directed to skip surface grab sample at this location..
5/9/2010	18:40	B09	Ship's technical crew observed bubbling oil. It was visible on both the port and starboard sides of the boat. Air bubbles appeared to linger at the surface for several seconds (3 - 7 seconds).
5/9/2010	18:46	B09	Chief scientist explained that for the port side of the side, the boat appeared to be acting as a boom and collecting the oil against the side of the boat. This phenomenon appears to be occurring on the starboard side of the boat, and more vigorously, though this could be a transient phenomenon. Small droplets are surfacing and creating rainbow sheen at the surface. Some subsurface emulsified oil is present.
5/10/2010	11:00	B10	1mm - 2mm tarballs and milky strands of mucous-like material with yellow and orange colored bits at some of the edges. It may be biological in origin, but it is unclear.
5/10/2010	11:28	B10	Still seeing patches of the milky, stringy material and some emulsified oil.
5/10/2010	12:02	B11	Surface bucket samples have small tarballs and similar mucous-like material that stays intact when disturbed.
5/10/2010	12:55	B12	VOC concentrations are spiking around 43 ppm, but are not persistent.
5/10/2010	13:10	B12	Very heavy black oil at surface. Forms a very thick interface in the sample jar, roughly 1 cm for B12A-SP01A sample.

Date	Time	Station	Notes/Observations
5/10/2010	14:30	B13	Surface appears to be even oilier than Station B12. Bucket samples are even thicker. Thick black oil at the surface.
5/10/2010	15:00	B13	VOC levels appear to be somewhat lower. The air does not smell as strongly as at station B12.
5/10/2010	15:30	B14	Surface is heavily oiled, and appears to be essentially straight oil (ref: Ken Lee). The color and consistency looks to be that of used motor oil (10W-40). It is very dark to black. SP grab samples appear to have captured almost entirely oil, as there is no clear separation or interface.
5/10/2010	16:00	B14	Air at station does not smell as strongly as at station B13.
5/10/2010	16:40	B15	Sticky tar-like oil collected from the bucket sample. Globules, not a consistent surface covering.
5/11/2010	7:26	B16	Surface water has foamy white (with some orange) flocculates which appear to contain some oil. Thin oil sheen on the surface.
5/11/2010	8:35	B17	Very light sheen on water surface (port side) of boat, some surface material, but very little, that looks like the stringy mucous like substance previously noted.
5/11/2010	9:00	B17	Water surface on port side of boat has floating material, some round, some stringy, slightly orange in color. Not very dense in distribution (a few per square meter of surface are)
5/11/2010	9:50	B17	Crew/captain observed tuna swimming around the boat at some time during the CTD cast for B17. Current observation of water surface would not appear to indicate that a significant oil spill was occurring. Light sheen (rainbows).
5/11/2010	9:50	B18	Light sheen with some orange flocculates subsurface and milky with some orange mucous/stringy material previously observed.
5/11/2010	11:15	post B18	Transiting through a very high VOC patch. Appeared to be heavy surface oil. Brown Waves. 15 minute STEL = 78.8 ppm VOC. Sheen and emulsified oil visible. Lots of rainbow sheen. Peak in VOCs of 151 ppm, not sustained. Unsure what time that occurred.
5/11/2010	11:22	post B18	Now seeing somewhat less on the surface. VOCs appear to lessening. Odor is significantly less.
5/11/2010	11:35	post B18	Very well developed wind rows of rainbow sheen visible off the starboard side of the ship.
5/11/2010	12:10	post B18	Still in heavy oil sheen. Boat is heading west and it appears that we are still in the plume. Heavy sheen with stringy emulsified patches.
5/11/2010	12:39	post B18	Still appear to be in heavy oil sheen. Boat is heading west and it appears that we are still in the plume. Heavy sheen with stringy emulsified patches. Wind rows visible, length scale >100 m. The emulsified oil visible in the wind rows is very orange, thick.
5/11/2010	14:00	post B18	Samples in coolers placed on uppermost deck.
5/11/2010	14:40	post B18	Samples moved from deck to wheel house due to miscommunication regarding the helicopter arrangements and arrival time to Brooks McCall.

E. DATA MANAGEMENT AND GIS

Section prepared on 5/12/2010 by Ben Shorr, NOAA Office of Response and Restoration

Data Management

Data collected as part of the response to the Mississippi Canyon 252 Incident aboard the R/V Brooks McCall is managed based on 2 types of collection: Station locations and continuous data. Data that was collected at 18 discrete stations from a SBE 25 Sealogger CTD (conductivity, temperature and depth) data, water sample information (for lab analysis), oil samples, Laser In-Situ Scattering and Transmissometry (LISST) analysis, and dissolved oxygen measurements. Water samples were collected in a SBE 55 ECO Water Sampler in a 3-bottle configuration. Continuous or underway data includes a LISST instrument that was towed on 05/10 and 05/11, and a Turner C3 Fluorometer (customized for oil, CDOM, and turbidity measurements) that was towed on 05/10 and 05/11. Turner C3 Fluorometer summary is included in Section G and LISST data is in Section J.

The data package for the May 8-12 R/V Brooks McCall cruise is stored in folders under \\Brooks_McCall\DataCollection\

Stations and Samples

Station and sample information is recorded in the spreadsheet Sampling_Tracking_Master.xls which includes worksheets detailing the sample information, a data dictionary, sampling naming conventions and a daily summary of stations and samples. Dissolved oxygen is the only analysis reported in this table. Coordinates are recorded in degrees decimal minutes (source from ship navigation) and converted into decimal degrees for use in mapping. CTD and LISST data are organized in individual folders by date and station (e.g. 2010_0508_B01\CTD, 2010_0508_B01\LISST), with QC files for the LISST stored in folder by day (e.g. LISST_QC_2010_0509)

Table E-1 Sampling Stations Geographic coordinates NAD83

StationID	Longitude	Latitude	Date_Collected	Comment
B01	-88.84203	28.55052	5/8/2010	Water at Depths 1 275 550 m
B02	-88.37082	28.75083	5/9/2010	Surface Oil and Water at Depths 1 275 550 m
B03	-88.36202	28.73919	5/9/2010	Water at Depths 1 275 550 m
B04	-88.35855	28.73433	5/9/2010	Surface Oil and Surface Water and Water at Depths 1 275 550 m
B05	-88.35323	28.72767	5/9/2010	Surface Oil and Water at Depths 1 275 550 m
B06	-88.34441	28.71615	5/9/2010	Water at Depths 1 275 550 m
B07	-88.35667	28.76201	5/9/2010	Water at Depths 1 275 550 m
B08	-88.38352	28.76188	5/9/2010	Surface Oil and Water at Depths 1 275 550 m
B09	-88.38341	28.73828	5/9/2010	Water at Depths 1 275 550 m
B10	-88.36204	28.73928	5/10/2010	Surface Oil and Water at Depths 1 275 550 m
B11	-88.35688	28.73929	5/10/2010	Surface Oil and Water at Depths 1 275 550 m
B12	-88.35693	28.74379	5/10/2010	Surface Oil and Surface Water and Water at Depths 1 275 550 m
B13	-88.35602	28.72542	5/10/2010	Surface Oil and Surface Water and Water at Depths 1 275 550 m
B14	-88.35965	28.72938	5/10/2010	Surface Oil and Surface Water and Water at Depths 1 275 550 m
B15	-88.36140	28.73406	5/10/2010	Surface Oil and Surface Water and Water at Depths 1 275 550 m
B16	-88.35619	28.72539	5/11/2010	Surface Oil and Water at Depths 1 275 550 m
B17	-88.35287	28.72202	5/11/2010	Water at Depths 1 275 550 m
B18	-88.35697	28.73002	5/11/2010	Water at Depths 1 275 550 m

Continuous or Towed Data

Turner C3 Fluorometer data is stored in folders by day (e.g. 2010_0510_Towfish) and is described in the Fluorometer section.

GPS and Photographic Data

GPS (Geographic coordinate) data was collected for much of the sampling effort using 2 Garmin 76CSx units (NOAA and Entrix). The track logs for these units contain coordinates and a time stamp, which can be used to plot the vessels track and also for georeferencing photographs. The NOAA GPS unit was used for the Turner C3 Fluorometer survey and may contain an incomplete track log for 05/11.

Geographic Information Systems (GIS) Analysis and Mapping

GIS data including shapefiles and ArcView GIS 9.3 projects (.mxd's) are stored in the following folder structure:
Brooks_McCall\GIS

Table E-2 GIS folder structure

Folder	Description
Analysis	Station locations, navigation and sample design
Arc_Projects	ArcMap .mxd projects
Base	Base data from various sources
Hydro_Bathy	Hydrographic data from various sources
Plume_Modeling	Conjecture for sample design

Generally, coordinate systems for the shapefiles are defined and is UTM Zone 16 North, Meters, NAD83. Coordinates were received from ship navigation in Degrees Decimal Minutes WGS84 and were converted to Decimal Degrees NAD83 for plotting in GIS. Due to the iterative and changing nature of ship-based sampling, there are several shapefiles that describe planned and actual sampling locations. The shapefile **stations_combined_2010_0511.shp** contains a summary of daily sampling locations and includes station ID, date of sample collection, Latitude and Longitude in Decimal Degrees NAD83, and a field describing the type of samples collected at that station. ArcMap projects were used for generating field sampling maps and summary maps for Area Command.

The most recent ArcMap project is
tdi_brooks_mccall_sampling_all_2010_0512.mxd, and is at
\\Brooks_McCall\GIS\Arc_Projects.

F. PHYSICAL OCEANOGRAPHY

Section prepared on May 12, 2010 by Eddie Webb, TDI-Brooks
Data compilation by Ben Shorr, NOAA

Water sampling on this cruise was done with a SeaBird Electronics (SBE) 55 ECO Water Sampler in a 3-bottle configuration. The bottles have a 4 liter capacity. It is integrated with an SBE 25 Sealogger CTD profiler. Both Instruments have the plastic housing option, with a 600 meter depth rating. The SBE 25 CTD has an 8 hz scan rate and uses an SBE 3F temp. sensor, and SBE 4C conductivity sensor. The SBE 55 is programmed to close bottles at selected depths, allowing deployment with the plasma rope installed on the Brooks McCall traction winch. The depths selected for deployment were 1 meters, 275 meters and 550 meters, based on the depth rating. All data presented in this report is raw, unprocessed data. CTD plots for all 18 stations are presented in Appendix A.

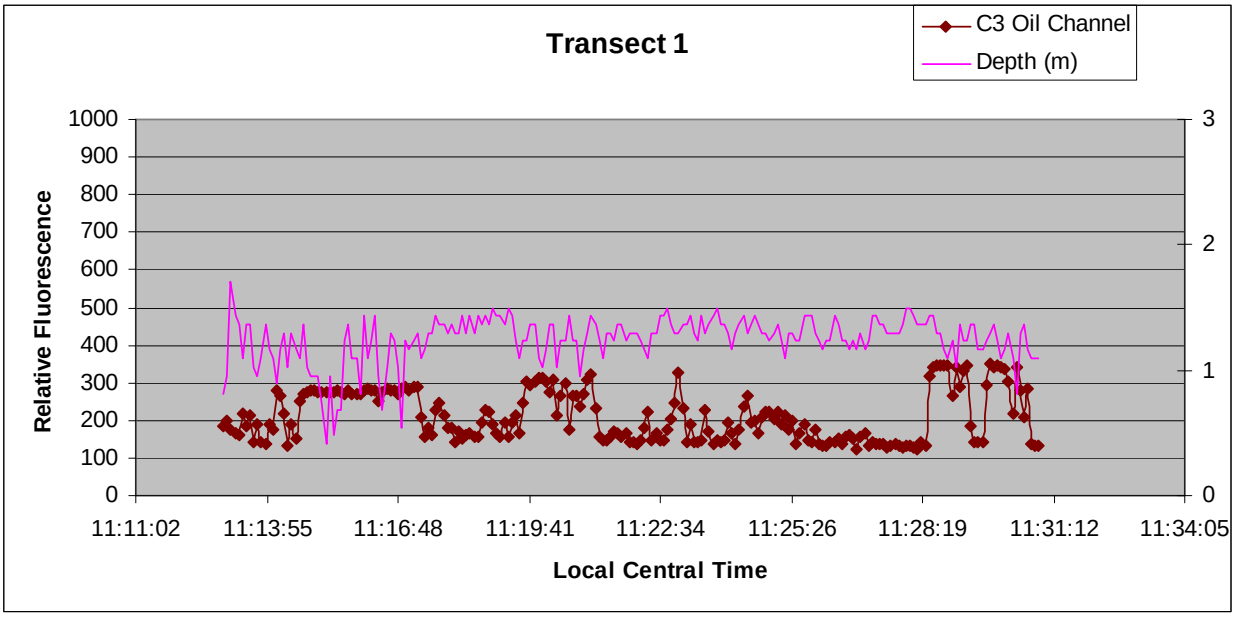
G. TURNER C3 TOWFISH FLUOROMETER SUMMARY

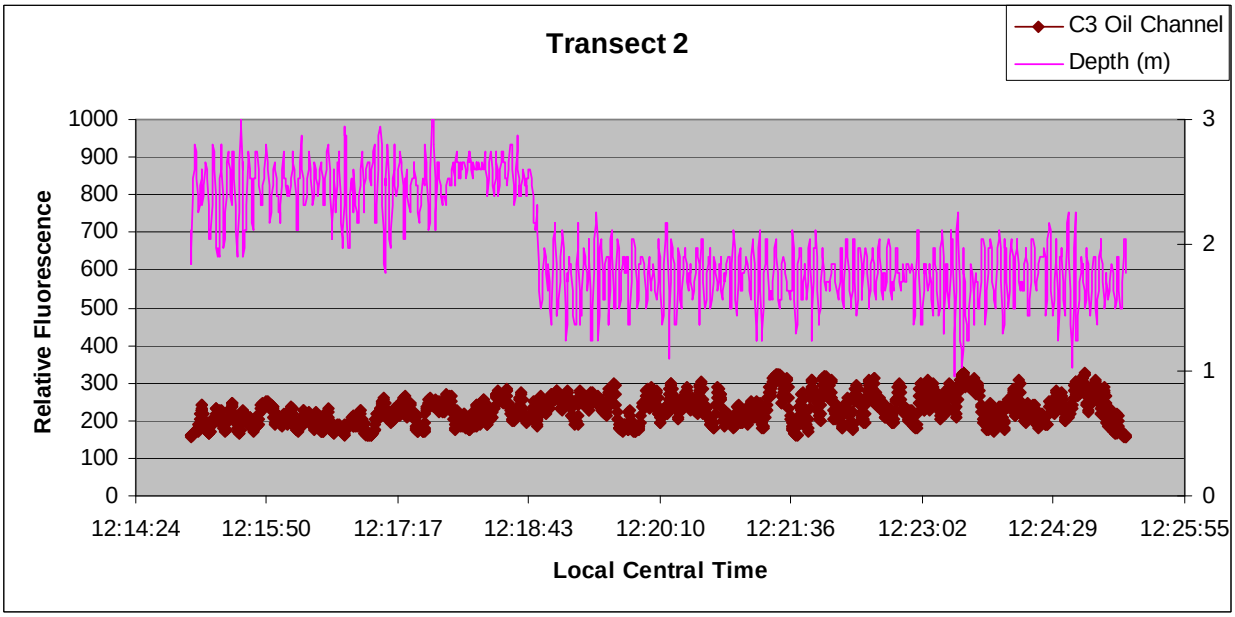
Section prepared on May 12, 2010 by Drs. Robyn N. Conmy and
Blake A. Schaeffer, EPA

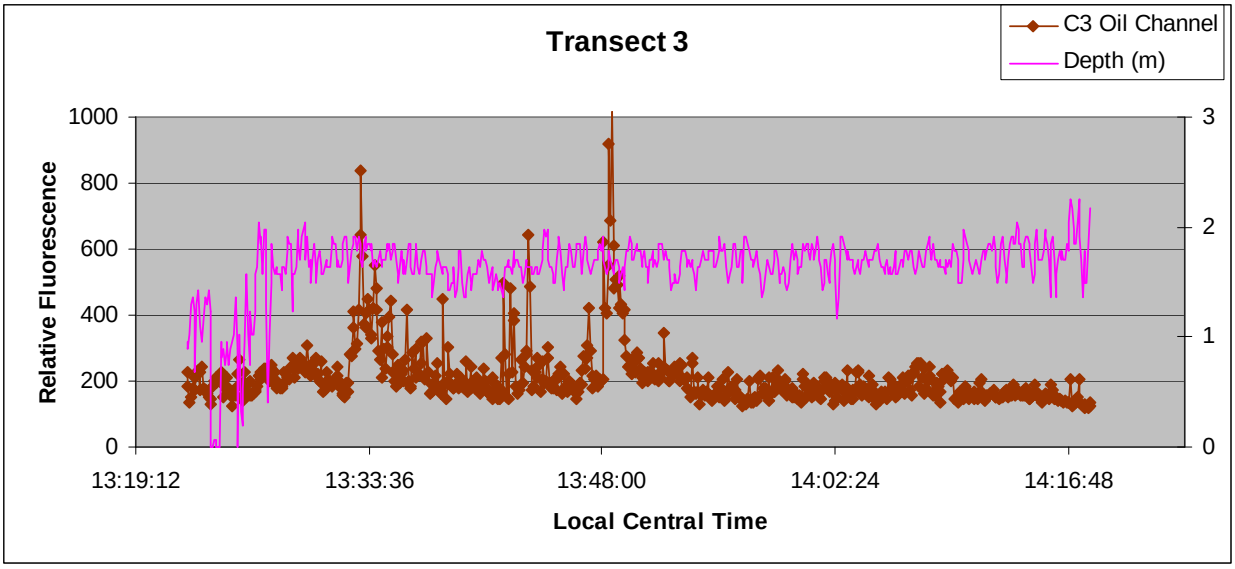
Objective
A Turner C3 towfish fluorometer was deployed to assist in identifying the presence of oil in waters of the Gulf of Mexico near the Deep Water Horizon oil rig. The fluorometer is customized with three fluorescence channels to detect the presence of oil, CDOM (Colored Dissolved Organic Matter), and turbidity. The sensor was deployed on two consecutive days, May 10 (Transects 1-5) and 11 (Transects 6-9), 2010 during the same period of time corresponding to deep water injections.

Day 1 transect data
The Turner C3 Towfish Fluorometer was deployed May 10 on the starboard A-frame and run continuously whilst transiting between CTD cast stations. Depth for fluorescence measurements was between 1-3 m at approximately 2 knots, to avoid surface bubble interference. Caution should be exercised when interpreting oil relative fluorescence as the signal changes with depth of deployment. No calibration files were provided with the sensor, so all data are reported as relative fluorescence counts. For data collected on the 5 transects (Figure G-1A,B,C), the oil detection channel ranged between 100-1200 counts, where most measurements were between 100-350 counts. Observed high values at transect 3 were coincident with an increase in turbidity values and at times, the CDOM fluorescence channel. All transect data is provided below.

Figure G-1A Turner C3 Oil Channel relative fluorescence and depth for each transect during Day One.







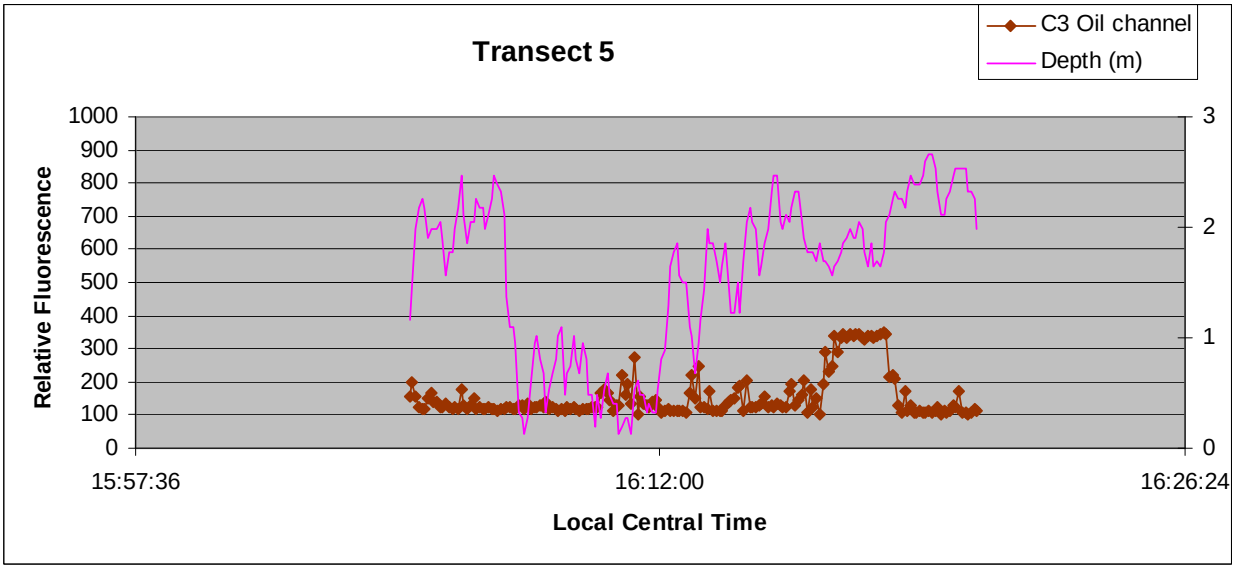
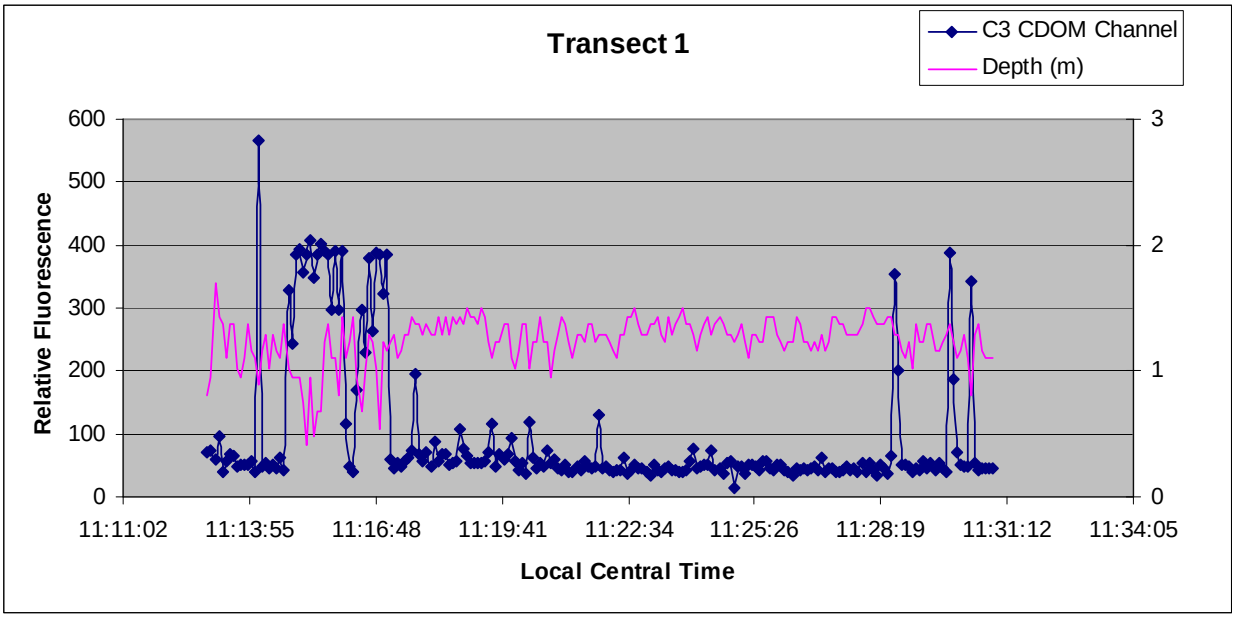
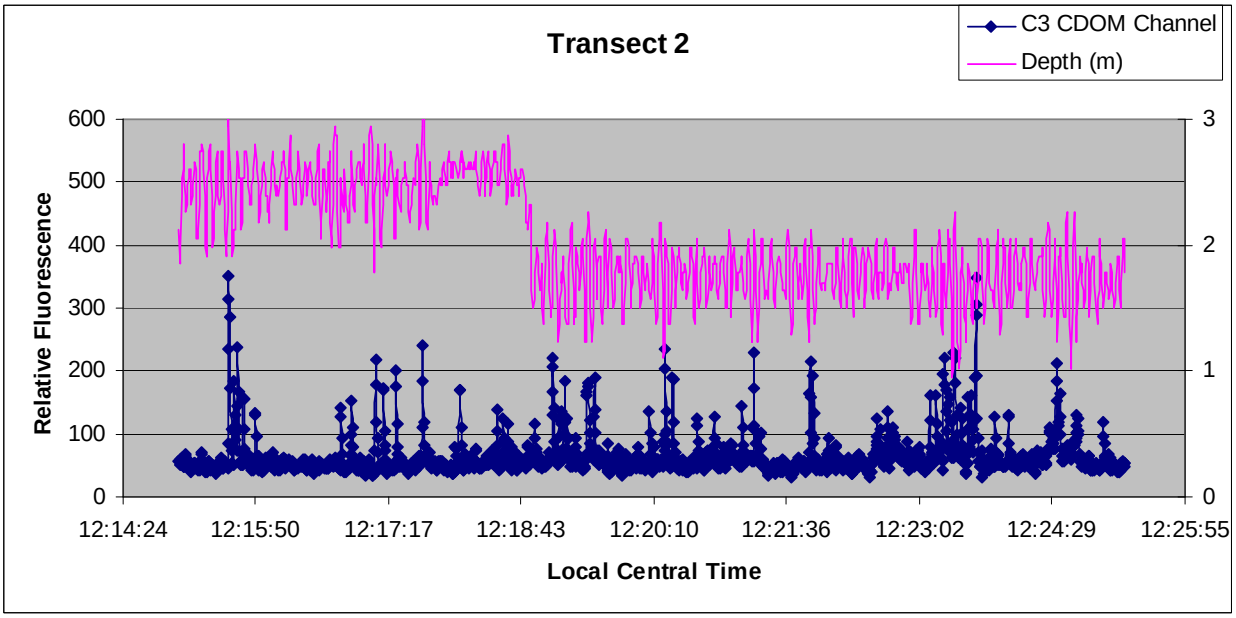
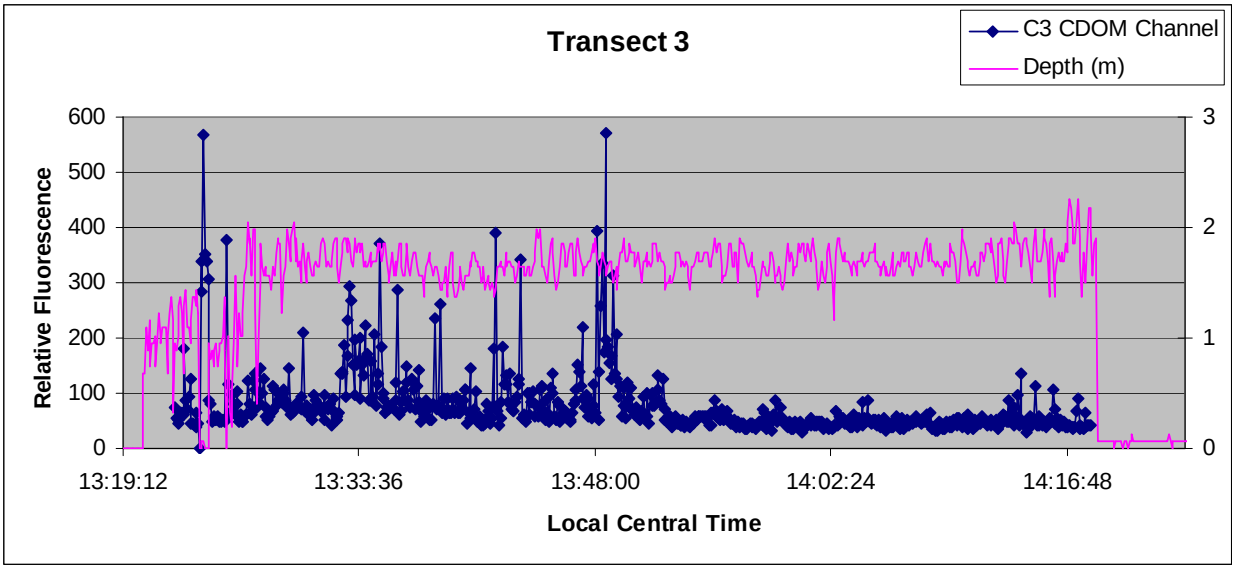


Figure G-1A (Cont.)

Figure G-1B Turner C3 CDOM Channel relative fluorescence and depth for each transect during Day One.







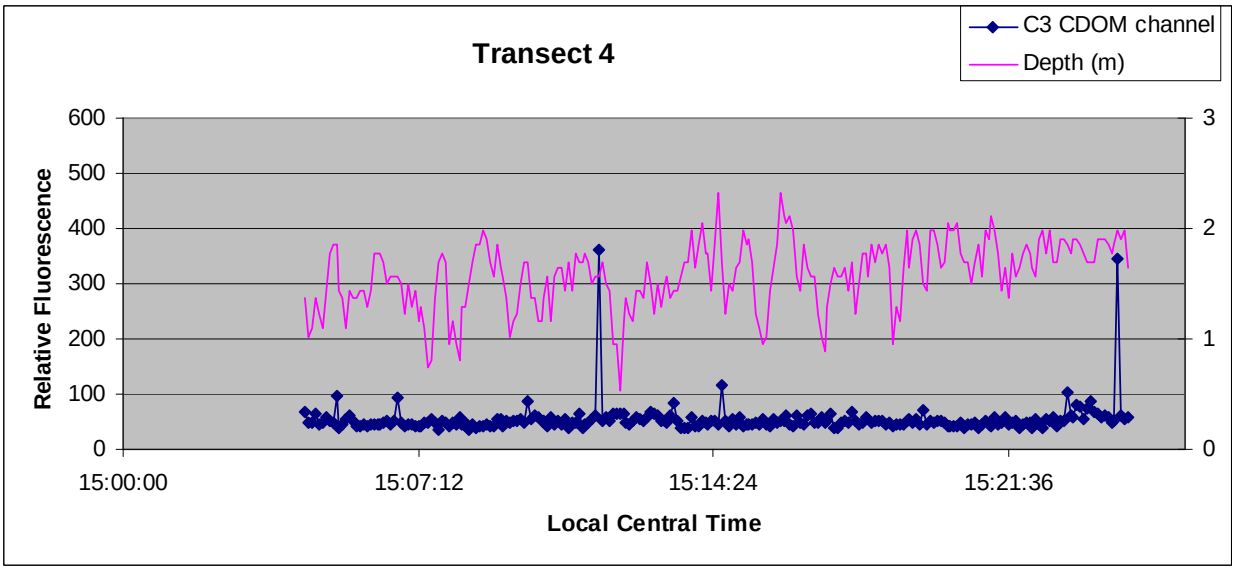


Figure G-1B (Cont.)

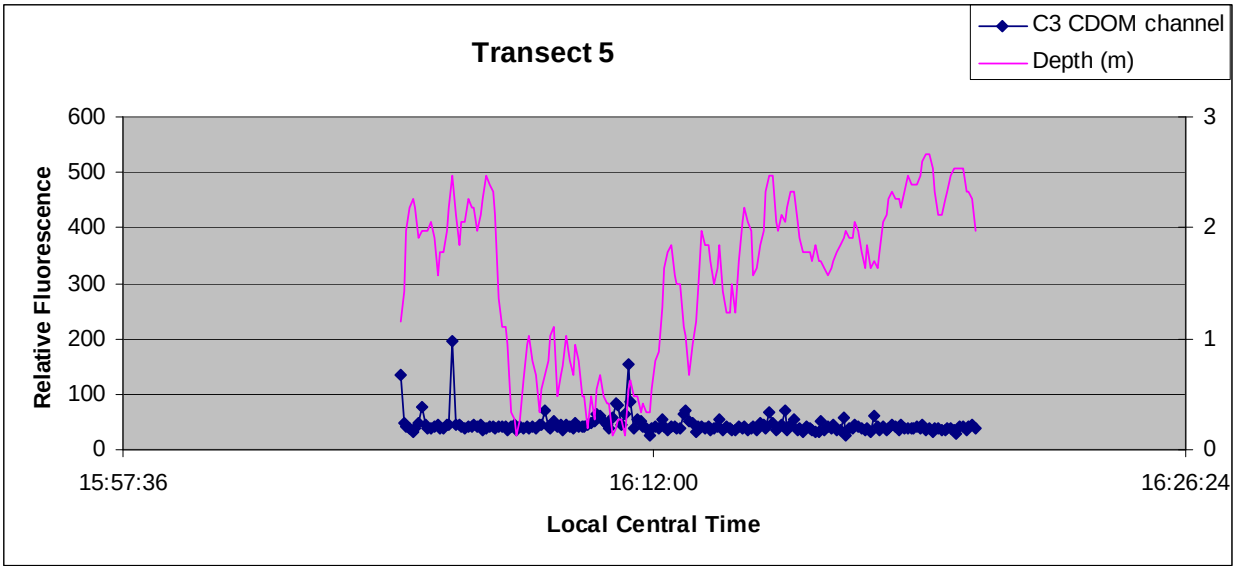
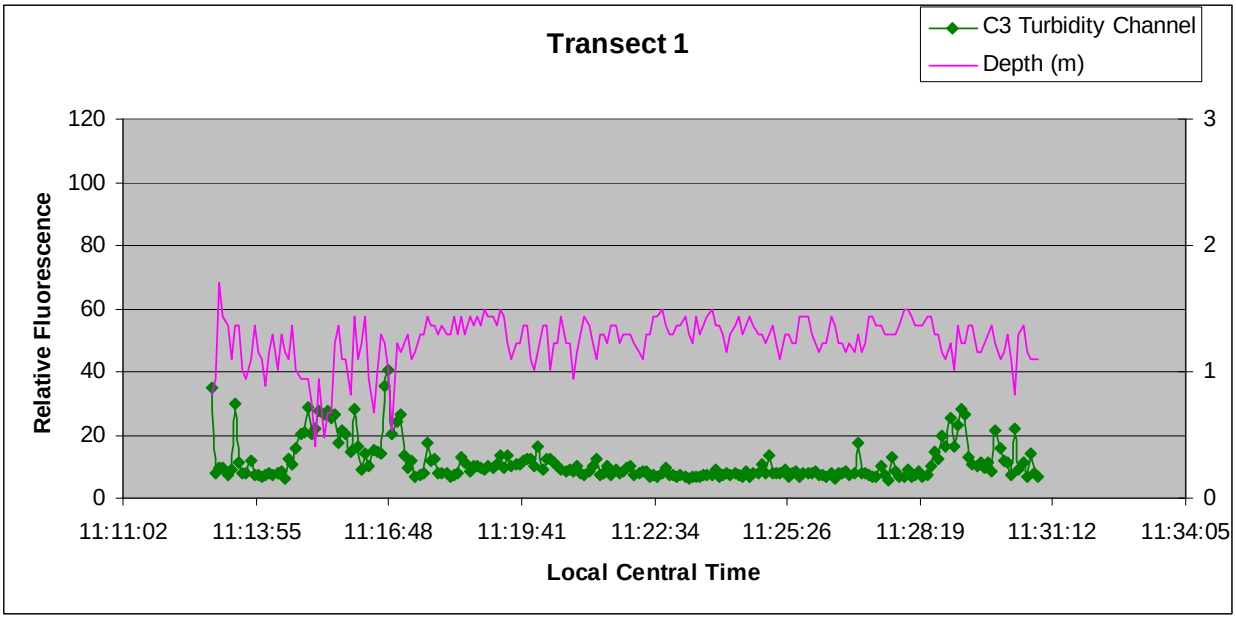
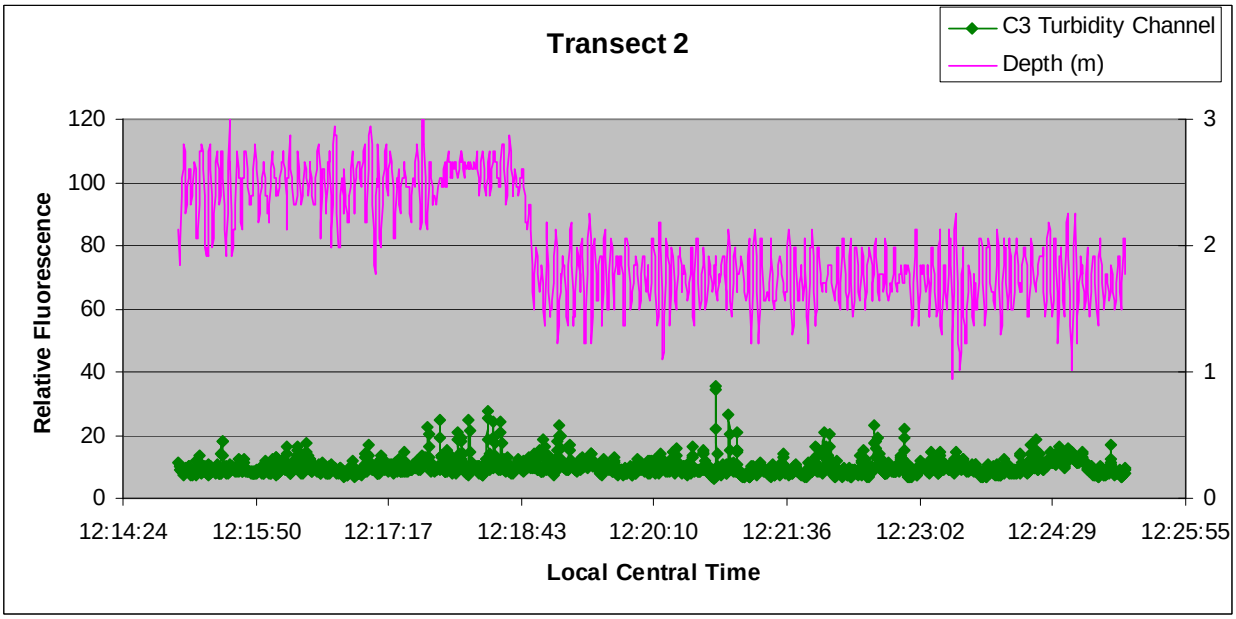
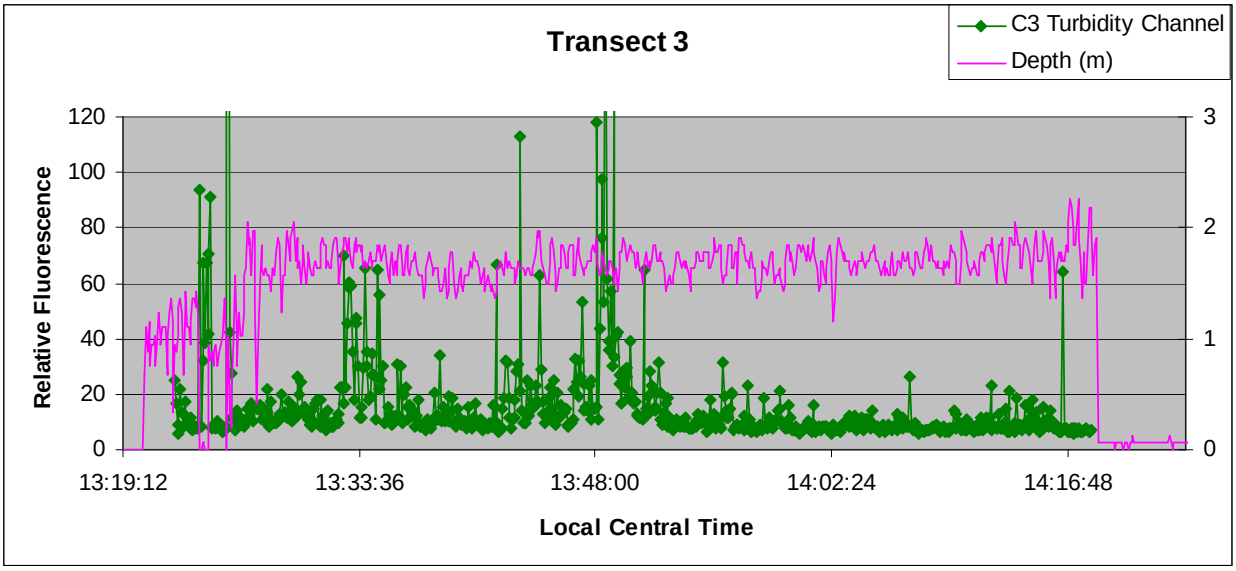


Figure G-1B (Cont.)

Figure G-1C Turner C3 Turbidity Channel relative fluorescence and depth for each transect during Day One.







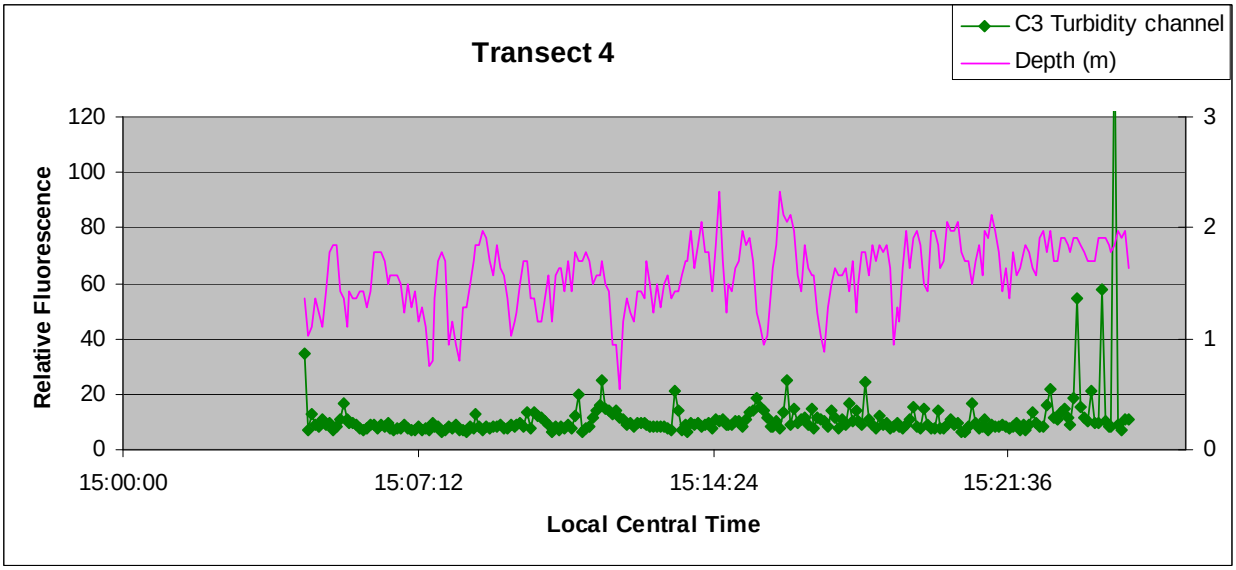


Figure G-1C (Cont.)

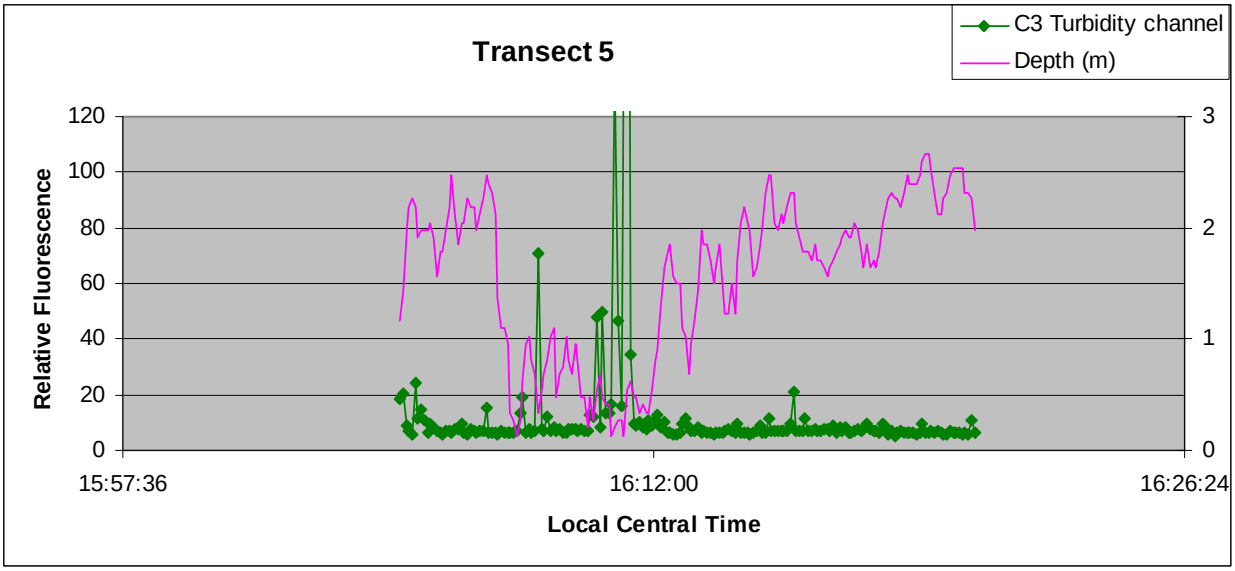


Figure G-1C (Cont.)

Day 2 transect data

On May 11, the fluorometer was deployed in the same fashion as May 10, 2010 from the R/V Brooks McCall. Three transects were collected (numbers 6, 7, and 8) as identified in Figure G-2A. During the first two transects, the oil fluorescence channel showed lower fluorescence values than the previous day. This could be the result of decreased oil but verification with discrete water samples would be needed to confirm this. Transect 8 shows counts similar to May 10, 2010 values. Increased noise in the depth sensor measurements were observed, which was not present the day before and could be the result of rougher sea state.

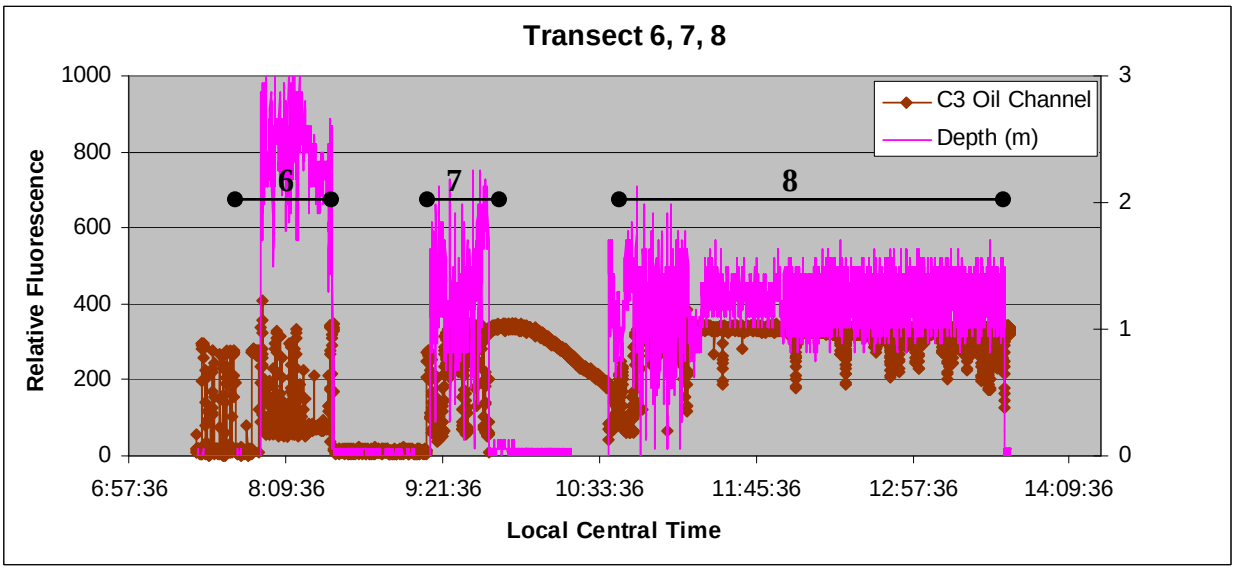


Figure G-2A Turner C3 Oil Channel relative fluorescence and depth for each transect during Day One.

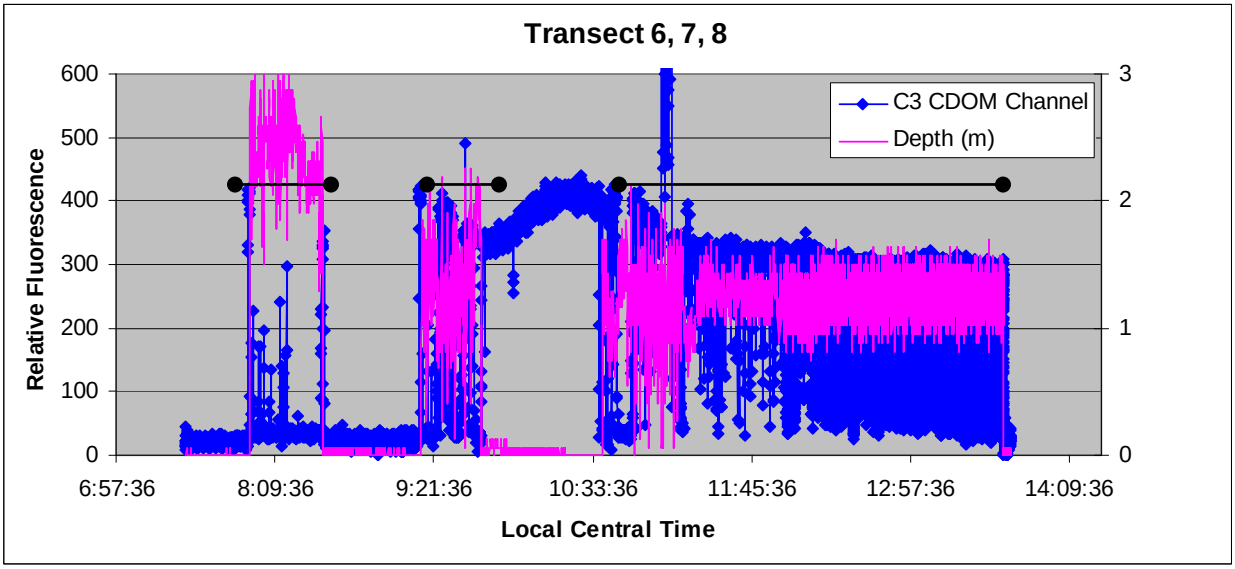


Figure G-2B Turner C3 CDOM Channel relative fluorescence and depth for each transect during Day One.

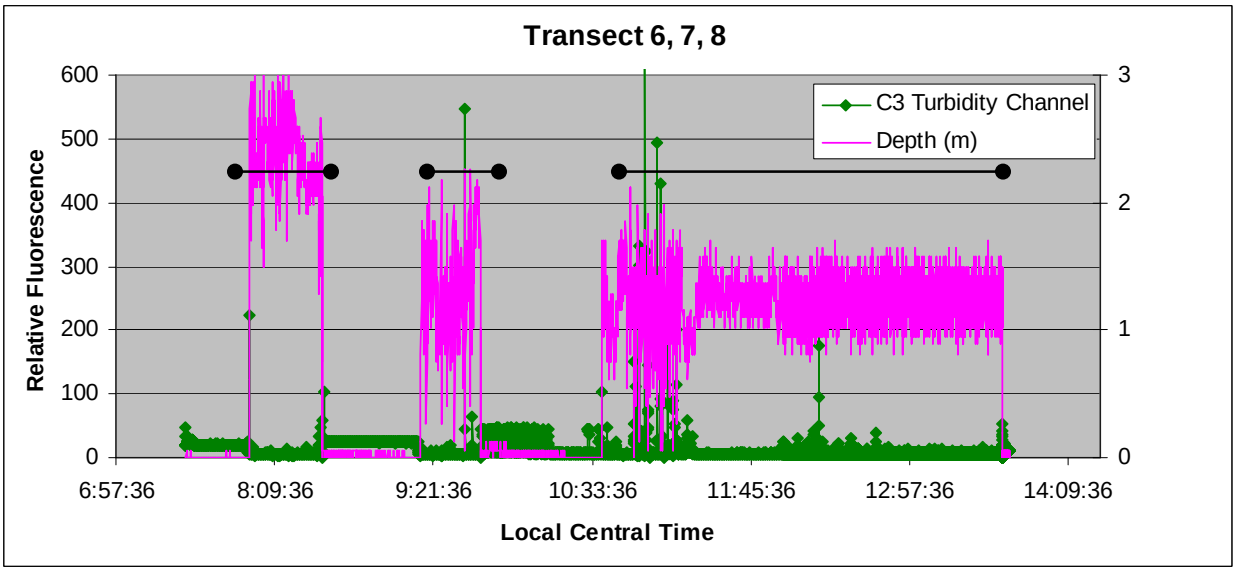


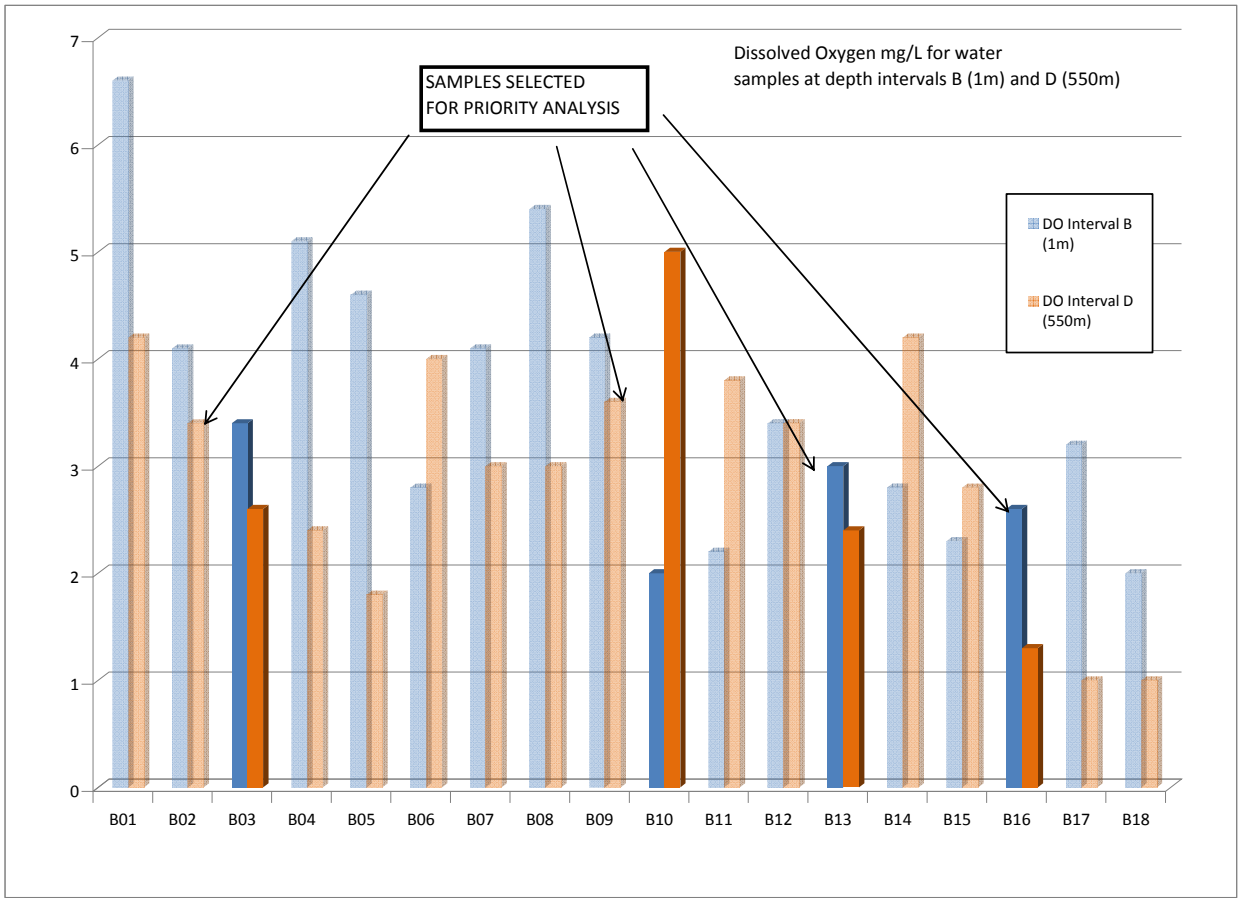
Figure G-2C Turner C3 Turbidity Channel relative fluorescence and depth for each transect during Day One.

H. WATER AND OIL SAMPLES FOR LABORATORY ANALYSIS

Section prepared on May 12, 2010 by Dr. Don Aurand, EM&A and Ben Shorr, NOAA

A total of 100 samples were collected for analysis of Total Polycyclic Aromatic Hydrocarbons (PAH). Eighty-one of these were water samples, and 19 were surface oil samples. Of these, 18 were identified for priority analysis as shown in Figure H-1.

Figure H-1 Priority Samples



The complete sample log is presented in Appendix B.

Water samples were collected at 1 meter, 275 meter and 550 meter depths for every CTD cast. Except for the Control Station (B1 series samples), where the 275 m Niskin bottle did not fire, all three samples were obtained at every station. Multiple samples were taken from some bottles, as described in Section D, and summarized in Appendix B. In addition, 18 samples were selected for priority analysis, as listed in Table H-1.

Table H-1 Priority Analysis Samples

Station	Sample ID	Matrix	Depth Interval	Container Size	Date	Depth_ m
B01	B01B-A0508-W01	Water	B	1L	05/08/10	1.3
B01	B01D-A0508-W01	Water	D	1L	05/08/10	553.8
B03	B03B-WA01	Water	B	1L	05/09/10	0.3
B03	B03C-WA01	Water	C	1L	05/09/10	272.7
B03	B03D-WA01	Water	D	1L	05/09/10	555.9
B10	B10A-SP01	Oil	A	8 oz	05/10/10	0
B10	B10B-WA01	Water	B	1L	05/10/10	1.48
B10	B10C-WA01	Water	C	1L	05/10/10	272.5
B10	B10D-WA01	Water	D	1L	05/10/10	556.9
B13	B13A-SP01	Oil	A	8 oz	05/10/10	0
B13	B13A-WA01	Water	A	1L	05/10/10	0
B13	B13B-WA01	Water	B	1L	05/10/10	1.4
B13	B13C-WA01	Water	C	1L	05/10/10	273
B13	B13D-WA01	Water	D	1L	05/10/10	556
B16	B16A-SP01	Oil	A	8 oz	05/11/10	0
B16	B16B-WA01	Water	B	1L	05/11/10	1.647
B16	B16C-WA01	Water	C	1L	05/11/10	273.006
B16	B16D-WA01	Water	D	1L	05/11/10	555.775

The rationale for their selection was as follows:

1. Samples starting with B1 were taken at our control station on 8 May.

2. Samples starting with B03 and B10 were taken at the same location. It is close to the well head location. B03 was taken on 9 May, and B10 was on 10 May (in the morning).

3. Samples starting with B13 and B16 were taken at the location we sampled based on the plume modeling results provided on 10 May. B13 was taken on 10 May (in the afternoon) and B16 was taken on 11 May.

4. Taken together, I believe these samples cover the period and areas of the most interest, and allow some site-specific comparison.

5. There are three surface oil samples and one bucket grab water sample associated with these samples and they are also included.

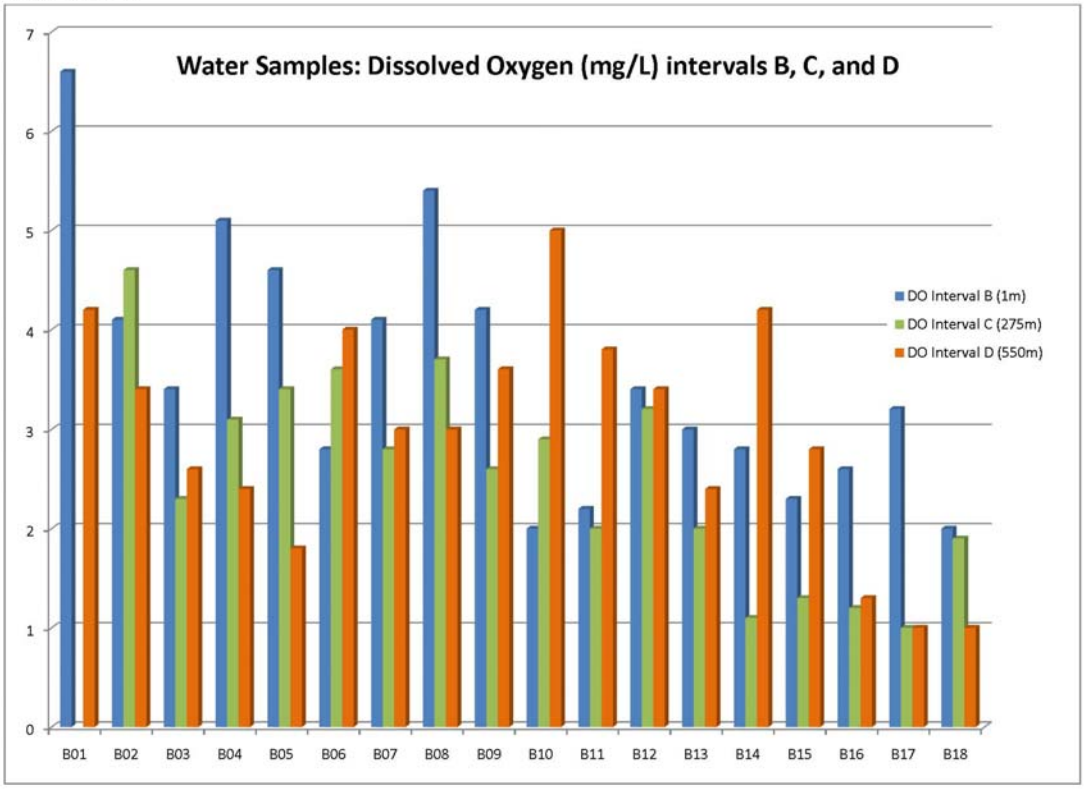
I. DISSOLVED OXYGEN FIELD MEASUREMENTS

Section prepared on May 12, 2010 by Dr. Robyn N. Conmy, EPA
Figure by Ben Shorr, NOAA

A LaMotte dissolved oxygen kit was used to measure D.O. levels in mg/l on water samples removed from the Niskin bottles (see Section D for sampling methods). Analysis was conducted within 5 minutes of obtaining the water samples. Results are presented in Figure I-1.

Figure I-1 Dissolved Oxygen Monitoring Results

Mississippi Canyon 252
R/V Brooks McCall



5/12/2010 Page 1 of 1

J. EVIDENCE OF DISPERSED OIL DROPLETS USING THE LISST-100X LASER PARTICLE ANALYZER

Section prepared on May 12, 2010 by Drs. Kenneth Lee, Zhengkai Li, Paul E. Kepkay

Centre for Offshore Oil, Gas and Energy Research (COOGER)
Bedford Institute of Oceanography
Department of Fisheries and Oceans Canada
Dartmouth, Nova Scotia, Canada

Objective

In response to the Gulf of Mexico oil spill, at the request from US EPA, NOAA, USCG, and BP, scientists from DFO Canada have joined other experts on board vessel R/V Brooks McCall to conduct on site monitoring of dispersed oil in the surrounding area of the exploration platform. The mission objectives of the team are: (1) to verify the presence and chemical characteristics of dispersed oil at locations identified by predictive trajectory models (NOAA, SINTEF, etc.) and, (2) Conduct transects for the recovery of water column samples at discrete depths to identify and track the subsurface plume of oil released from depth following the Deepwater Horizon blow-out.

Methodology

Based on our expertises in oil spill chemical dispersion and evaluation of dispersant effectiveness, we have conducted field survey of the dispersed oil droplet size distribution analysis using 2 *in situ* scattering and transmissometry (LISST-100X, Sequoia Scientific Inc., Seattle, WA).

One LISST was equipped with a small test chamber (120 ml), and is used to conduct bench top particle size analysis in the Geochemistry lab on board the R/V Brooks McCall. Grab samples of surface waters were collected by “bucket casts” and 3 different depths in the water column (1m, 275m and 550m) were recovered by Niskin bottles on an autonomous rosette sampler from 18 different stations, including station 1 as a background, stations 2 to 9 (taken on May 9, 2010 before underwater injection of chemical dispersants), stations 10 to 15 (taken on May 10, 2010 after underwater injection of dispersant), and stations 16 to 18 (taken on May 11 the second day after injection of dispersant). These samples were immediately transferred into the test chamber of LISST-100X to perform particle size distribution analysis every 2 seconds for 40 seconds.

A 2nd LISST is deployed in water at the end of a transponder boom at approximately 5m depth off the port side of the R/V Brooks McCall for in situ particle size analysis. The LISST was deployed on May 10, 2010 for approximately 6 hours, and then re-deployed on May 11, 2010 for about 8 hours.

A Shimadzu ultraviolet scanning fluorometer is currently in place at the BP Office at Port Fourchon to provide accurate estimates of the spectral characteristics of dispersed

versus non-dispersed oil. This information will hopefully be obtained by analysis of 200 samples on May 12th and the complex spectra reduced to simple ratios of fluorescence emission at 340 nm divided by emission at 445 nm. With these ratios, we will attempt to define if oil collected in the samples is poorly or well dispersed.

Results

LISST Particle Size Analyzer

The LISST-100X records 32 particle size intervals logarithmically spaced from 2.5 – 500 um in diameter, with the upper size in each bin 1.18 times the lower. Dispersed oil droplets of size less than or equal to 60 um are considered more permanently dispersed oil in the water column. For comparison, these dispersed small oil droplets is summed and plotted as a function of time. In addition, the mean and standard deviation of the 20 measures within 40 minutes was also summarized and presented for each station and depth.

Figure J-1 shows the bench-top measurement results of the mean dispersed oil droplets volume concentrations from the samples collected from a background station (station #1), which is approximately 50 miles away from the oil platform. Duplicate samples were collected from 1 m depth and 550 m depth, respectively. The average background small particle concentrations was about 0.5 ul/L at 1 m depth, and not significantly different from 0 at 550 m depth.

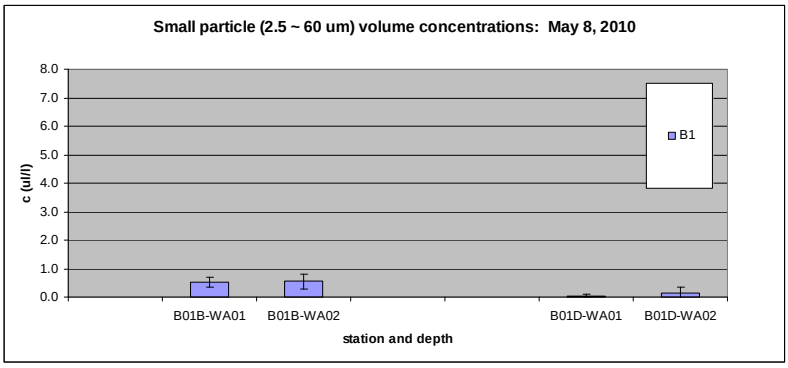
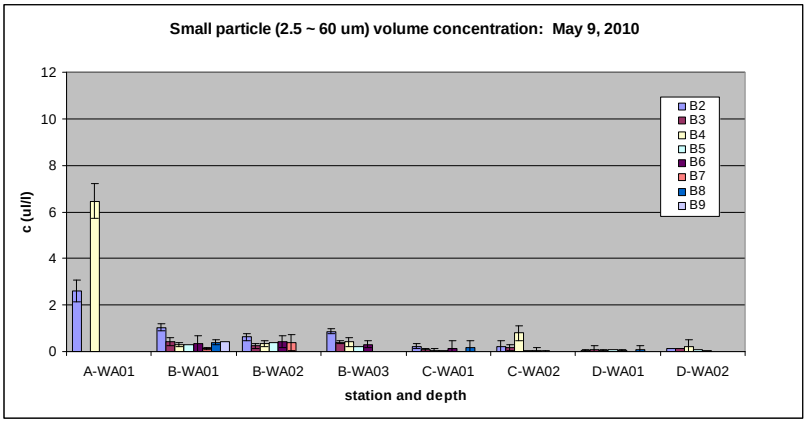


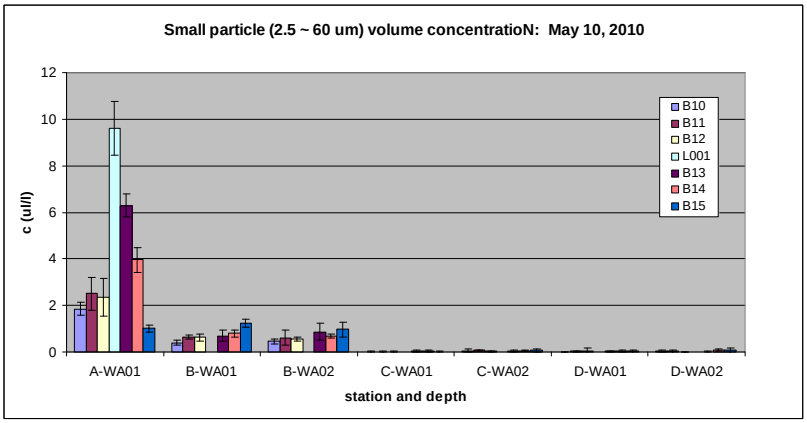
Figure J-1: Background particle concentrations measured from station #1, which is of 50 miles distance away from the drilling platform. Columns and error bars indicate mean and one standard deviation of 20 measurements.

Figure J-2 summarize the bench-top measurement results of the mean dispersed oil droplets volume concentrations of samples collected in the surrounding area of the oil platform for three days. These data illustrate that samples collected from surface water (collected by bucket) and 1m depth samples from all stations showed the presence of dispersed oil droplets (i.e. particles <60 um in diameter). The difference in <60 um particle count between the surface and 1 m samples varies from station to station. Low

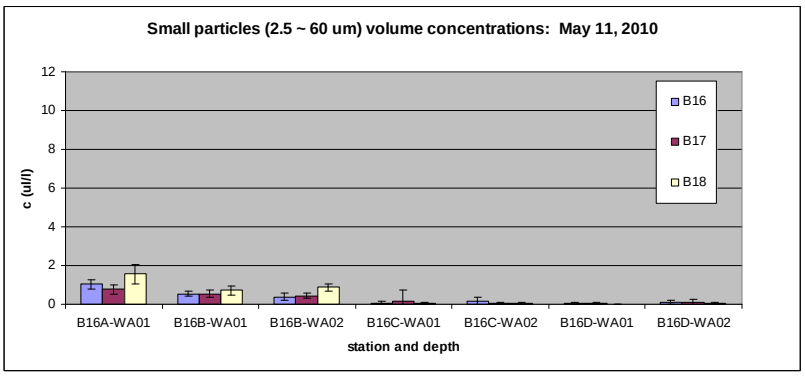
concentrations of <60 um particles were observed in the 2 lower depths (275 and 550 m).



(a)



(b)



(c)

Figure J-2: Dispersed small oil droplets measured with bench-top LISST-100X particle size analyzer: stations 2 to 9 were sampled on May 9 (a), stations 10 to 15 were sampled on May 10, and stations 16-18 were sampled on May 11, 2010 (c). Columns and error bars indicate mean and one standard deviation of 20 measurements.

A second LISST-100X particle counter was deployed at a depth of about 5m on May 10, 2010 and May 11, 2010 from a transponder boom off the port side of the R/V Brooks McCall for continuous monitoring while simultaneously conducting a SMART protocol survey based on oil fluorescence. The instrument has been recovered for downloading

of data. Data were recovered from the instrument on May 12, 2010, and the raw data were processed.

Figure J-3 illustrates typical dispersed oil droplet distribution profiles that were measured on May 10, 2010 and May 11, 2010, respectively. This could be attributed to lower concentrations of residual oil on the ocean surface due to the addition of dispersants and/or differences in physical dispersion processes after May 11, 2010.

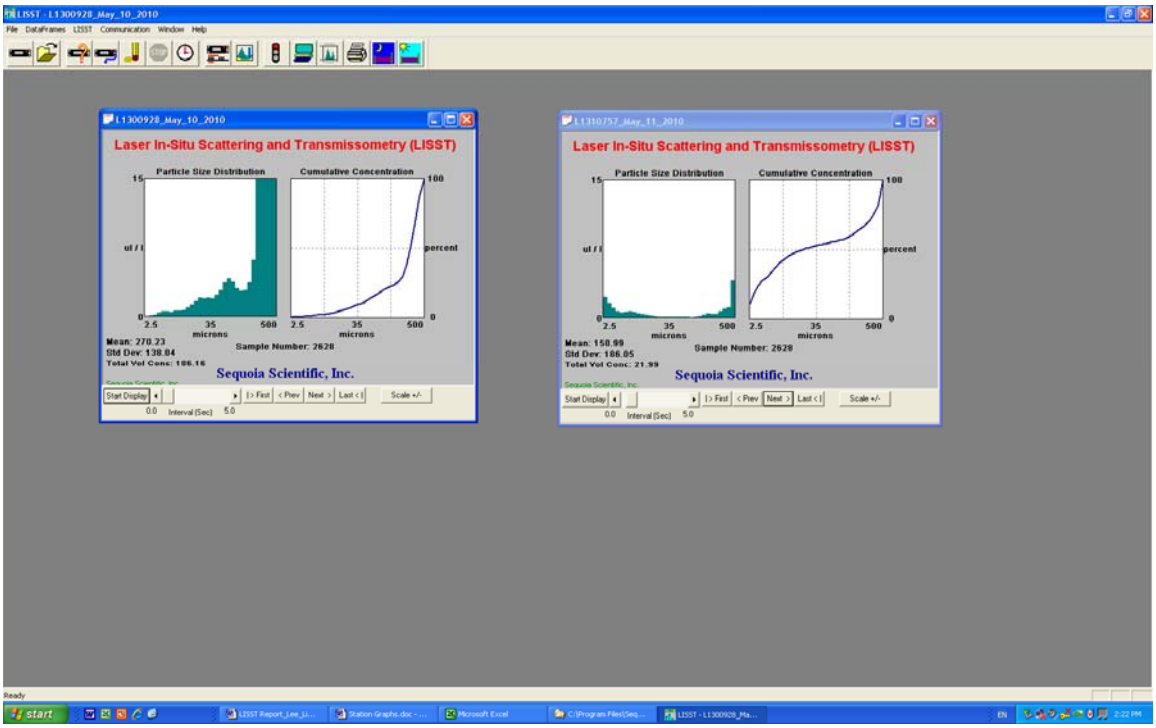


Figure J-3: Snapshots of the dispersed oil droplet size distribution measured with LISST-100X particle size analyzer deployed at the flank of the vessel. Detection window submerged approximately 5 m underwater. Left panel shows typical droplet size distribution of oil underwater measured on May 10, 2010; Right panel shows the droplet size distribution of oil underwater measured on May 11, 2010. Dispersant application commenced at 04:50 on May 10, 2010. NOAA predicted rise times for dispersed oil to take 15+ hours. Note the lower concentration of dispersed oil in the less than 60um fraction on May 11,2010 due to dilution.

Ultraviolet Fluorescence Analyses

A Shimadzu ultraviolet scanning fluorometer is located at the BP Office at Port Fourchon to provide accurate estimates of the spectral characteristics of dispersed versus non-dispersed oil. This information will be obtained by analysis of 200 samples beginning on May 12th and the complex spectra reduced to simple ratios of fluorescence emission at 340 nm divided by emission at 445 nm. With these ratios, we will attempt to define if oil collected in the samples is poorly or well dispersed. Results of the analysis were unavailable for this report.

When used in conjunction with the data on droplet size that has already been collected using the LISST laser particle counter, the results obtained with the fluorometer should provide a reasonably clear indication of the effect of dispersant.

The possibility of obtaining rapid feedback from fluorescence ratios measured onboard the R/V Brooks McCall awaits delivery of the two fixed wavelength fluorometers requested in the original science plan.

These preliminary results show that we could not detect a sub-surface plume of chemically dispersed oil at these stations.

Our results illustrate the capability of the LISST-100X to resolve particles in the size range expected for both physically and chemically dispersed oil.

The possibility of obtaining rapid feedback from fluorescence ratios measured onboard the R/V Brooks McCall awaits delivery of the two fixed wavelength fluorometers requested in the original science plan.

Figure J-4

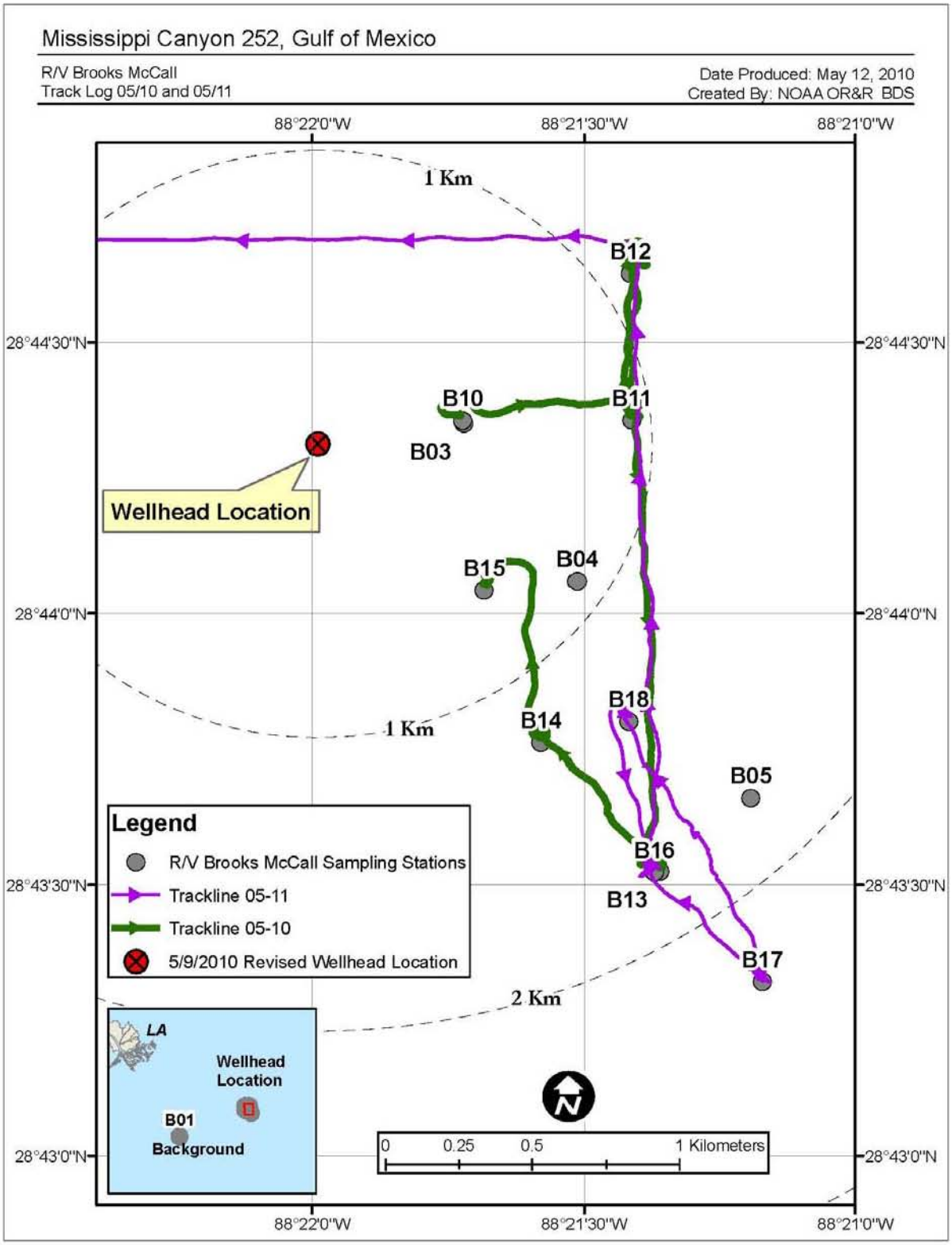
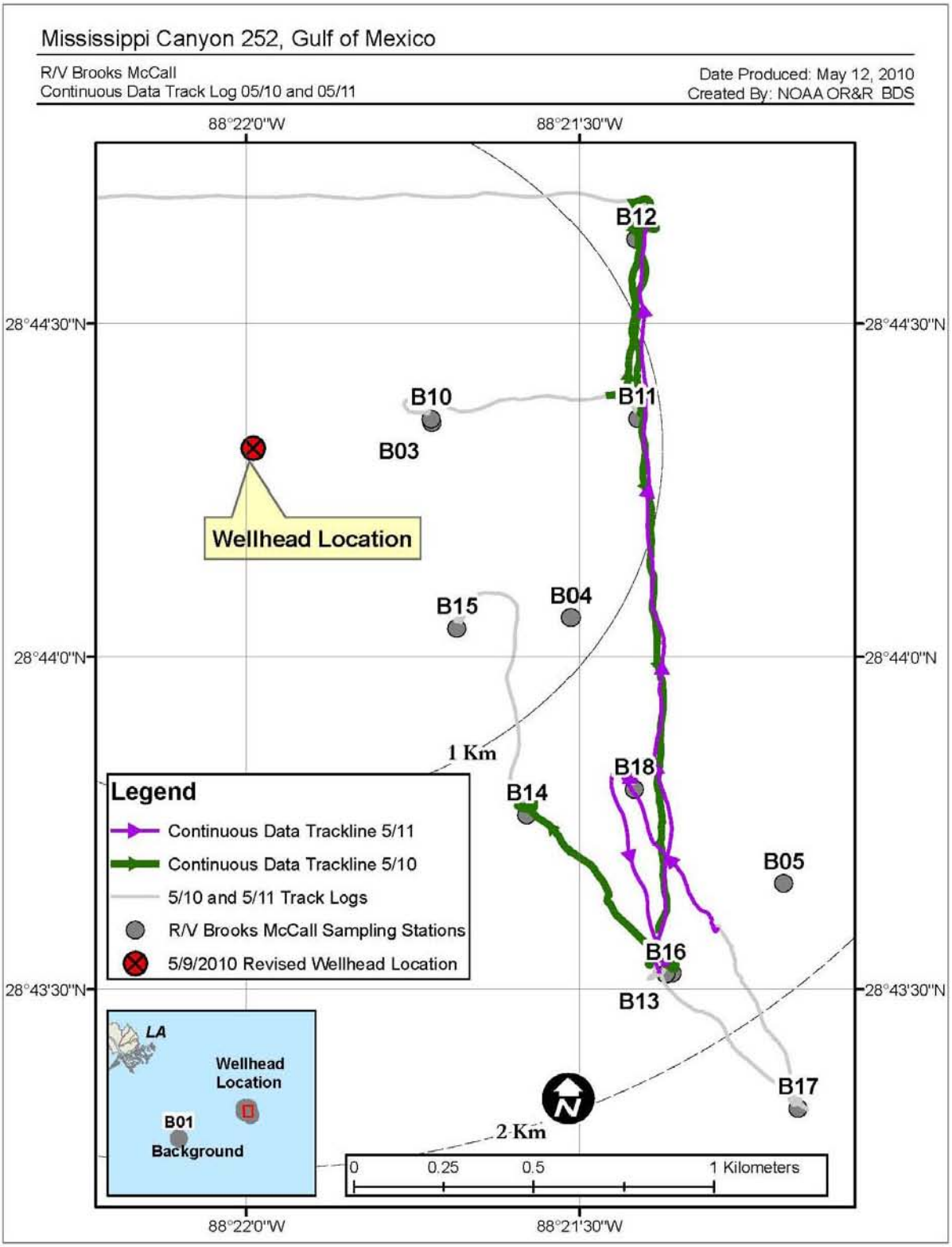

Mississippi Canyon 252, Gulf of Mexico
R/V Brooks McCall
Track Log 05/10 and 05/11
Date Produced: May 12, 2010
Created By: NOAA OR&R BDS
88°22'0"W
88°21'30"W
88°21'0"W
28°44'30"N
28°44'0"N
28°43'30"N
28°43'0"N
1 Km
2 Km
B12
B11
B10
B03
B15
B04
B14
B18
B05
B16
B13
B17
Wellhead Location
Legend
R/V Brooks McCall Sampling Stations
Trackline 05-11
Trackline 05-10
5/9/2010 Revised Wellhead Location
LA
Wellhead Location
B01
Background
0
0.25
0.5
1 Kilometers

Figure J-5


Mississippi Canyon 252, Gulf of Mexico
R/V Brooks McCall
Continuous Data Track Log 05/10 and 05/11
Date Produced: May 12, 2010
Created By: NOAA OR&R BDS
88°22'0"W
88°21'30"W
28°44'30"N
28°44'0"N
28°43'30"N
B12
B10
B11
B03
Wellhead Location
B15
B04
1 Km
B18
B14
B05
B16
B13
B17
2 Km
Legend
Continuous Data Trackline 5/11
Continuous Data Trackline 5/10
5/10 and 5/11 Track Logs
R/V Brooks McCall Sampling Stations
5/9/2010 Revised Wellhead Location
LA
Wellhead Location
B01
Background
0
0.25
0.5
1 Kilometers

K. Industrial Hygiene Monitoring

Section prepared on May 12, 2010 by Mike Caravello, Bureau Veritas NA

Bureau Veritas NA (BV) is pleased to present an overview of the direct-read monitoring performed aboard the research vessel the RV Brooks McCall from May 8 through May 11, 2010. The RV Brooks McCall is tasked with performing a survey to locate the dispersed oil plume in the waters surrounding the Deep Water Horizon Platform.

The survey involved the alternate deployment off the starboard midships of the CTD (Conductivity, Temperature and Depth) instrument and the Turner Tow-Fish C3 Flourometer via the installed U-frame installed. Skim bucket sampling was performed opposite this area on the midships port side and a LIST (Laser In-Situ Scattering and Transmissometry 100x) was affixed to the side to collect oil droplet data for oil droplets in the 2 to 20 micron range.

BV utilized a Rae Systems MultiRae Plus Quad Gas PID (photo-ionization) meter to collect direct-read measurements for Carbon Monoxide (CO), Carbon Dioxide (CO2), Oxygen (O2), Lower Explosive Limit (LEL), Hydrogen Sulfide (H2S), and Volatile Organic Compounds (VOCs) during this portion of the survey. VOCs are a concern in and around petroleum and/or dispersion agents on the water. The instrument was placed in data log mode to generate a continuous record of the measurements. Additionally, a “rolling STEL (15-minute short-term exposure limit)” value is available for the last 15 minutes of logged values. For this work, an Action Level of 100 parts per million (ppm) was established based on the VOC STEL value. Meeting this condition would trigger collection of an additional measurement for Benzene.

BV has available an additional Rae Systems instrument for the measurement of Benzene. This instrument, the Ultra Rae PID, operates for high sensitivity measurements with analyte-specific tubes. A RAE-Sep tube manufacturer’s number 012-3022-010 for Benzene has a sensitivity of 0.1 to 1000 ppm. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) for Benzene is 1 ppm. Should the VOC 100 ppm, 15 minute STEL Action Level occur and the subsequent Benzene tube reading be equal to or greater than 1.0 ppm, then the directive from BP Safety is to have everyone proceed to their cabins and the ship to leave the high level area.

BV logged direct-read measurement values on an hourly basis when instrumentation was being lowered over the side of the vessel, into the water, by the research team.

Calibration of the instrumentation is performed daily before each shift. This is accomplished using mixed compressed gas into a one liter Tedlar bag for the gas mix values and zeroing to ambient for the fresh air calibration portion.

The direct-read measurements of VOC for the duration of the test did not warrant Benzene measurements as a 100 ppm VOC STEL reading did not occur aboard the ship.

L. Aerial Data Collection

In the initial phases of dispersant injection, halfway through the injection and about 6 hours after the injection was stopped, aerial data of the spill site was obtained using photography in an attempt to understand if the impact of subsea dispersant injection could be observed at surface. Corresponding Side-Looking Acoustic Radar (SLAR) data was taken to identify the presence and thickness of oil on the surface of the water. The photos and SLAR images are shown in Figure L-1 to L-3.

Figure L-1

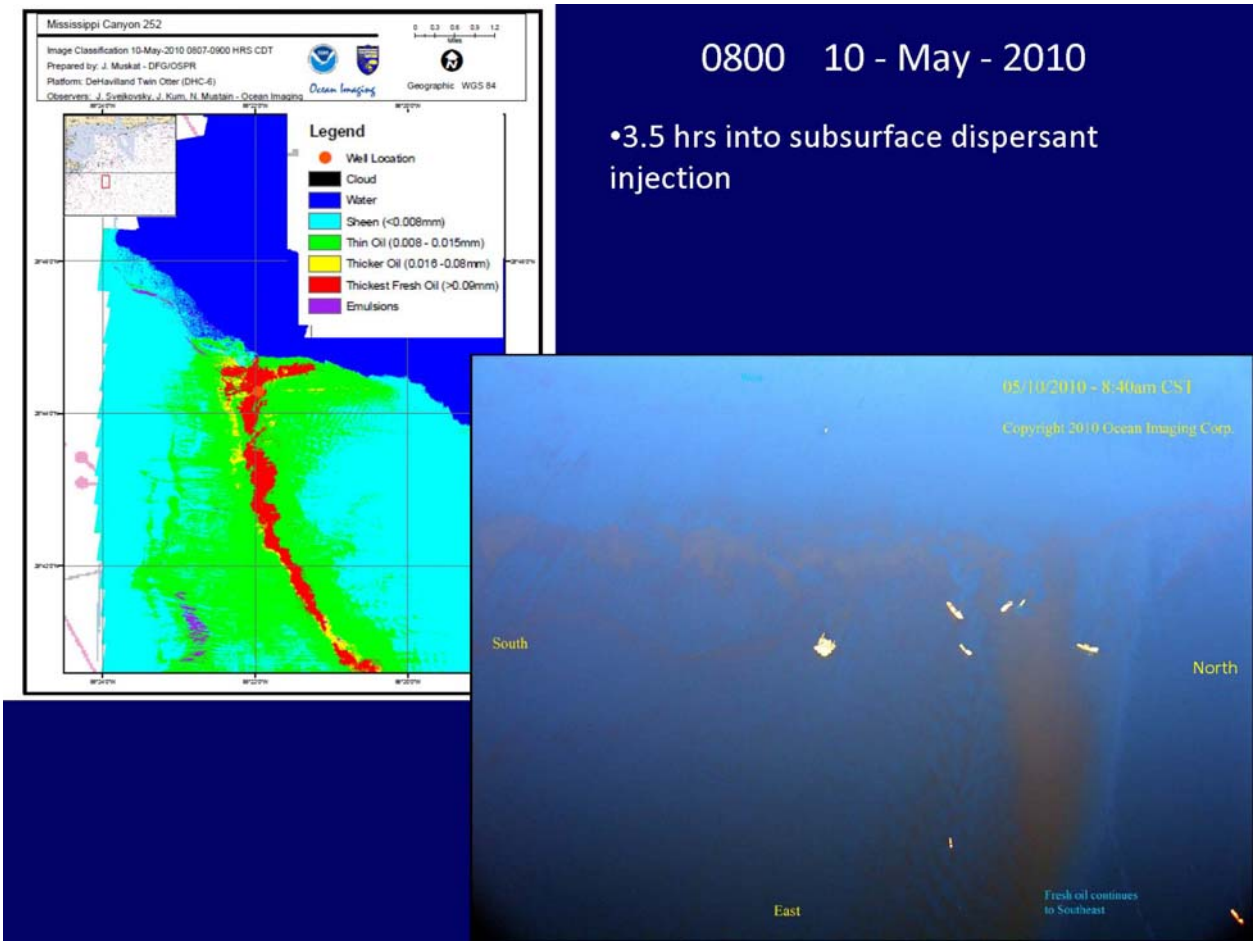


Figure L-2

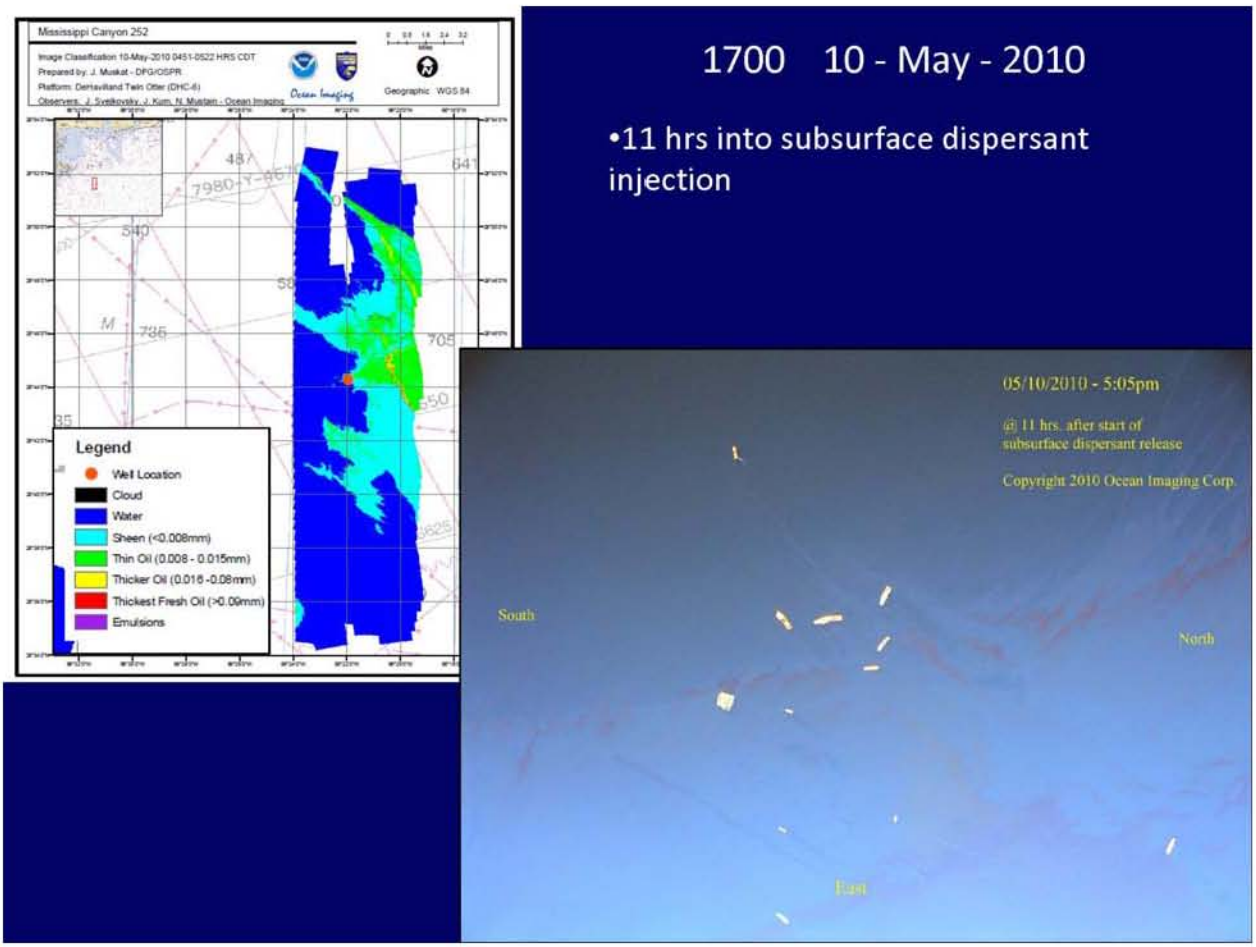
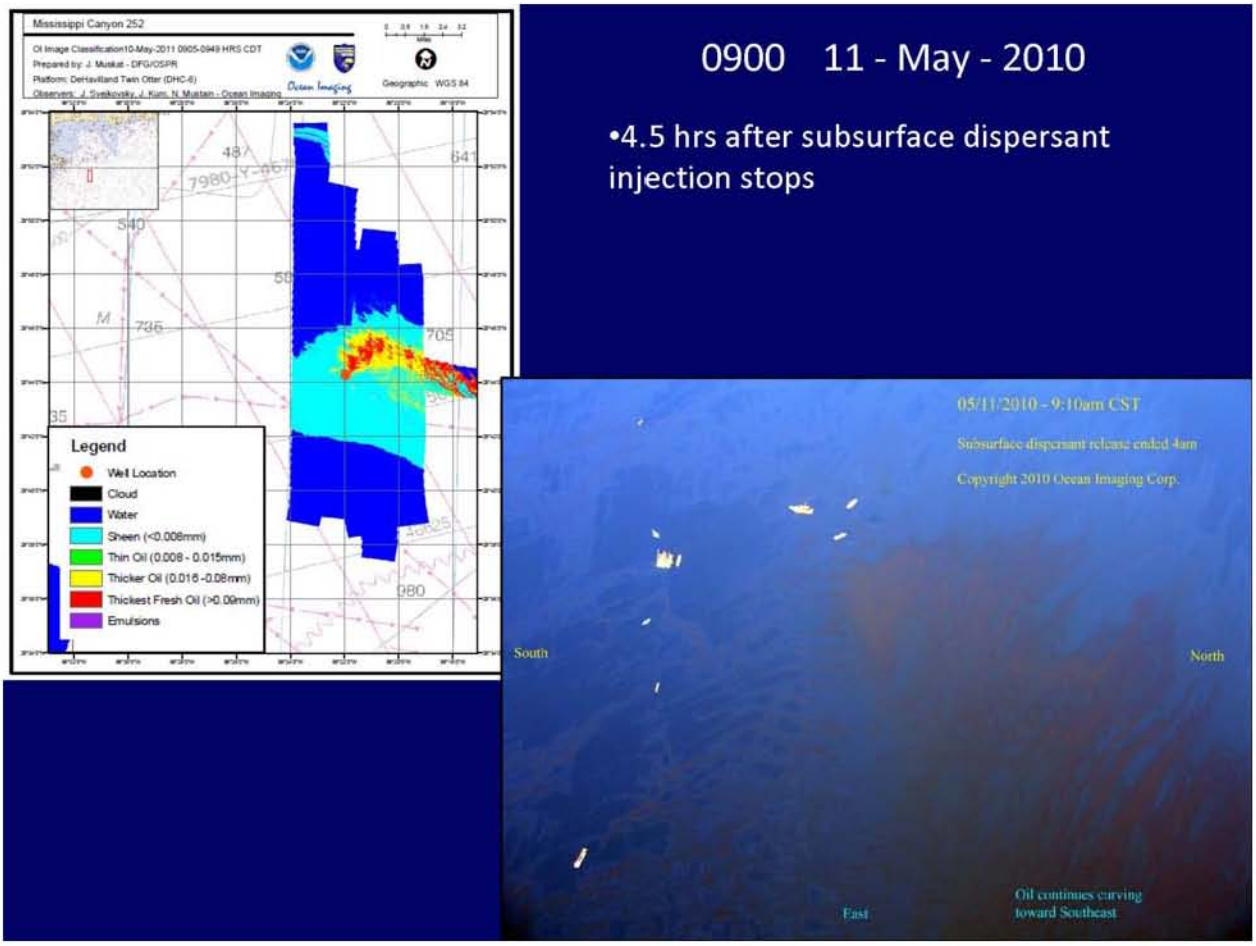
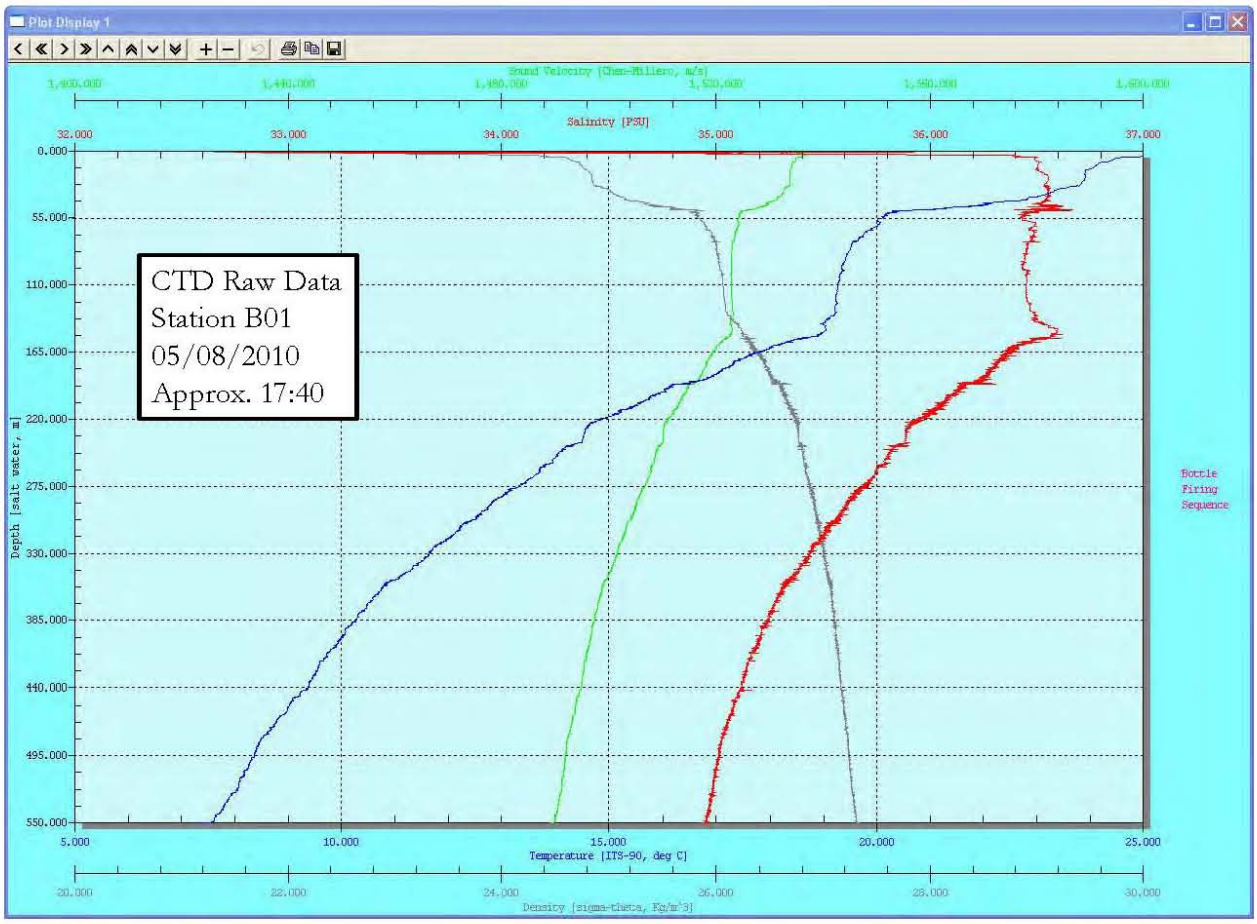

Mississippi Canyon 252
Image Classification 10-May-2010 0451-0522 HRS CDT
Prepared by: J. Muskat - DPG/OSPR
Platform: Dertsvilland Twin Otter (DHC-6)
Observers: J. Svetkovsky, J. Kum, N. Mustain - Ocean Imaging
Ocean Imaging
Geographic WGS 84
Legend
Well Location
Cloud
Water
Sheen (<0.008mm)
Thin Oil (0.008 - 0.015mm)
Thicker Oil (0.015 -0.08mm)
Thickest Fresh Oil (>0.09mm)
Emulsions
1700 10 - May - 2010
•11 hrs into subsurface dispersant injection
05/10/2010 - 5:05pm
@ 11 hrs. after start of subsurface dispersant release
Copyright 2010 Ocean Imaging Corp.
South
North
East

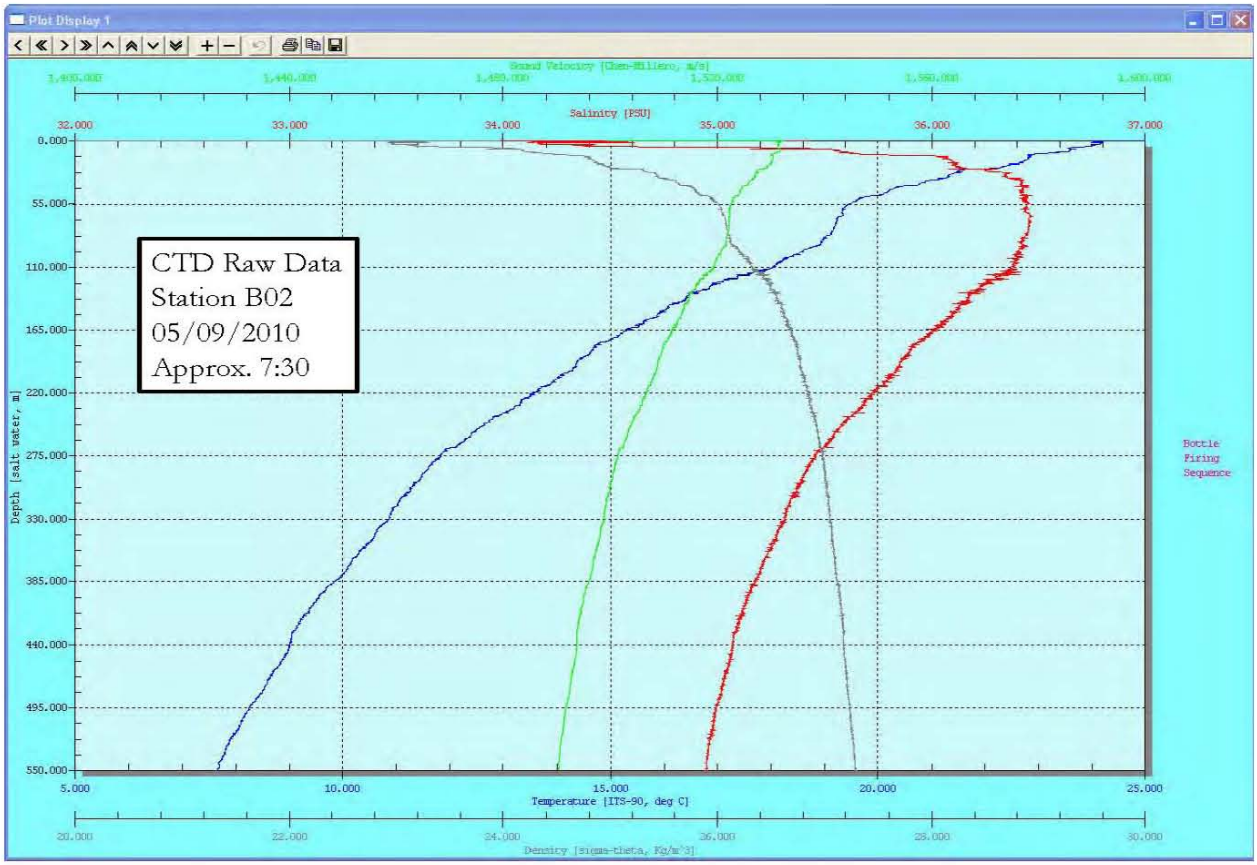
Figure L-3

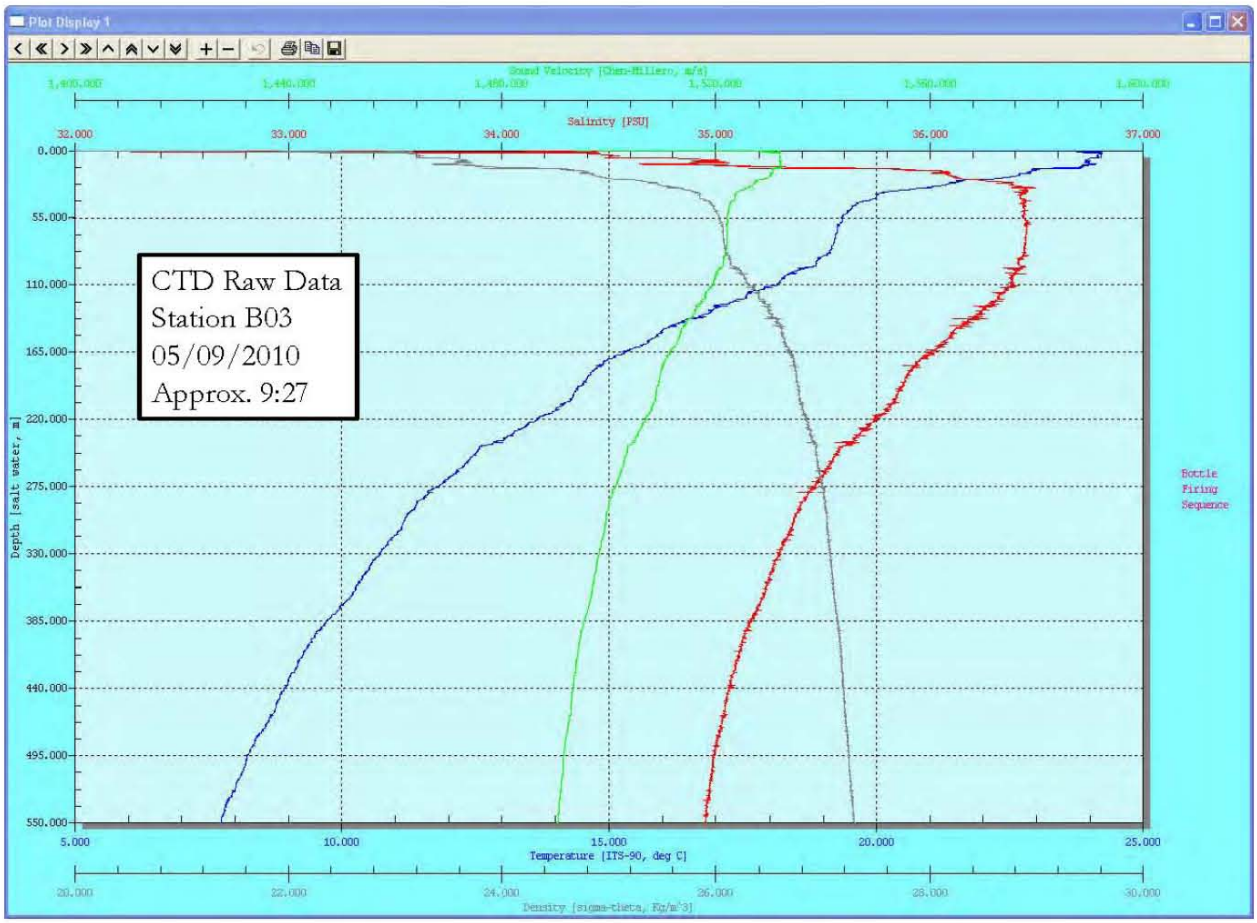

Mississippi Canyon 252
Geographic WGS 84
Legend
Well Location
Cloud
Water
Sheen (<0.008mm)
Thin Oil (0.008 - 0.015mm)
Thicker Oil (0.015 -0.08mm)
Thickest Fresh Oil (>0.09mm)
Emulsions
0900 11 - May - 2010
•4.5 hrs after subsurface dispersant injection stops
05/11/2010 – 9:10am CST
Subsurface dispersant release ended 4am
Copyright 2010 Ocean Imaging Corp.
South
North
East
Oil continues curving toward Southeast

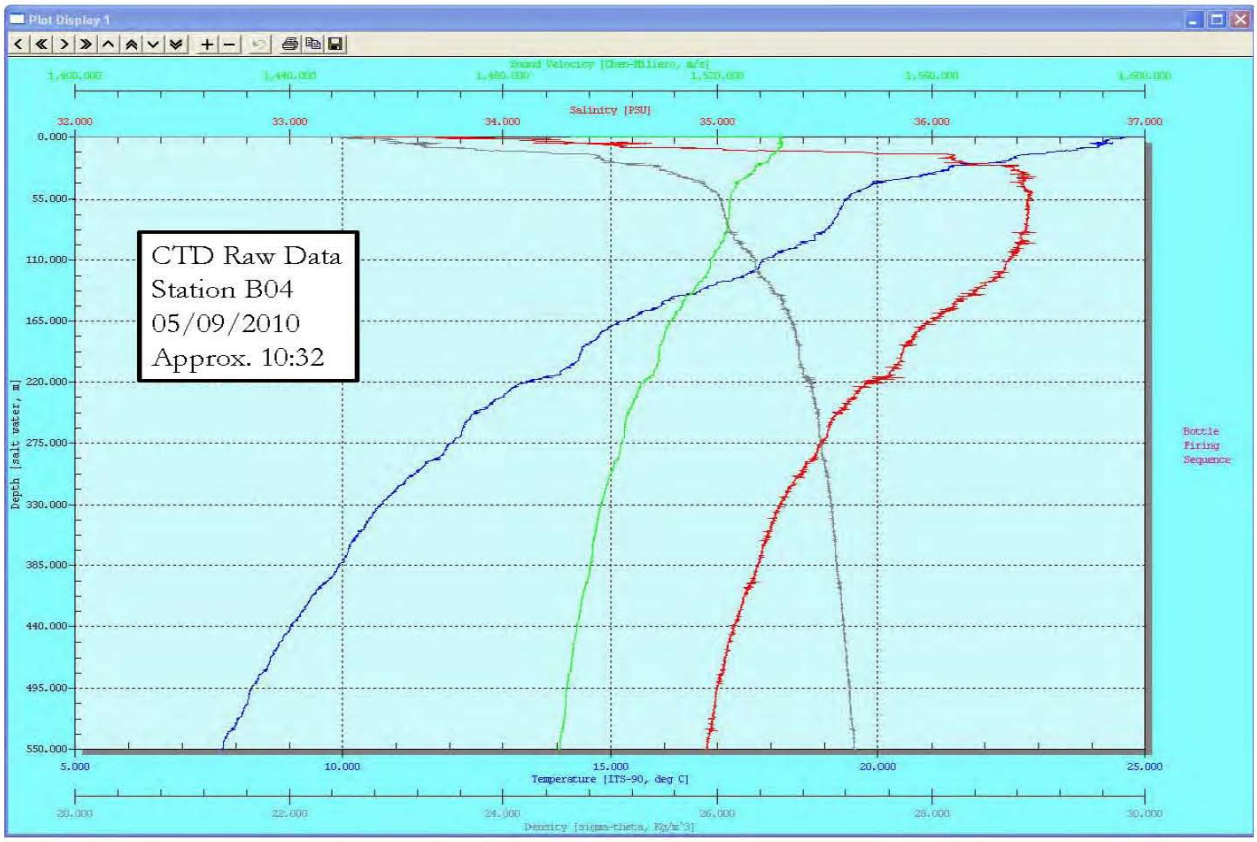
APPENDIX A

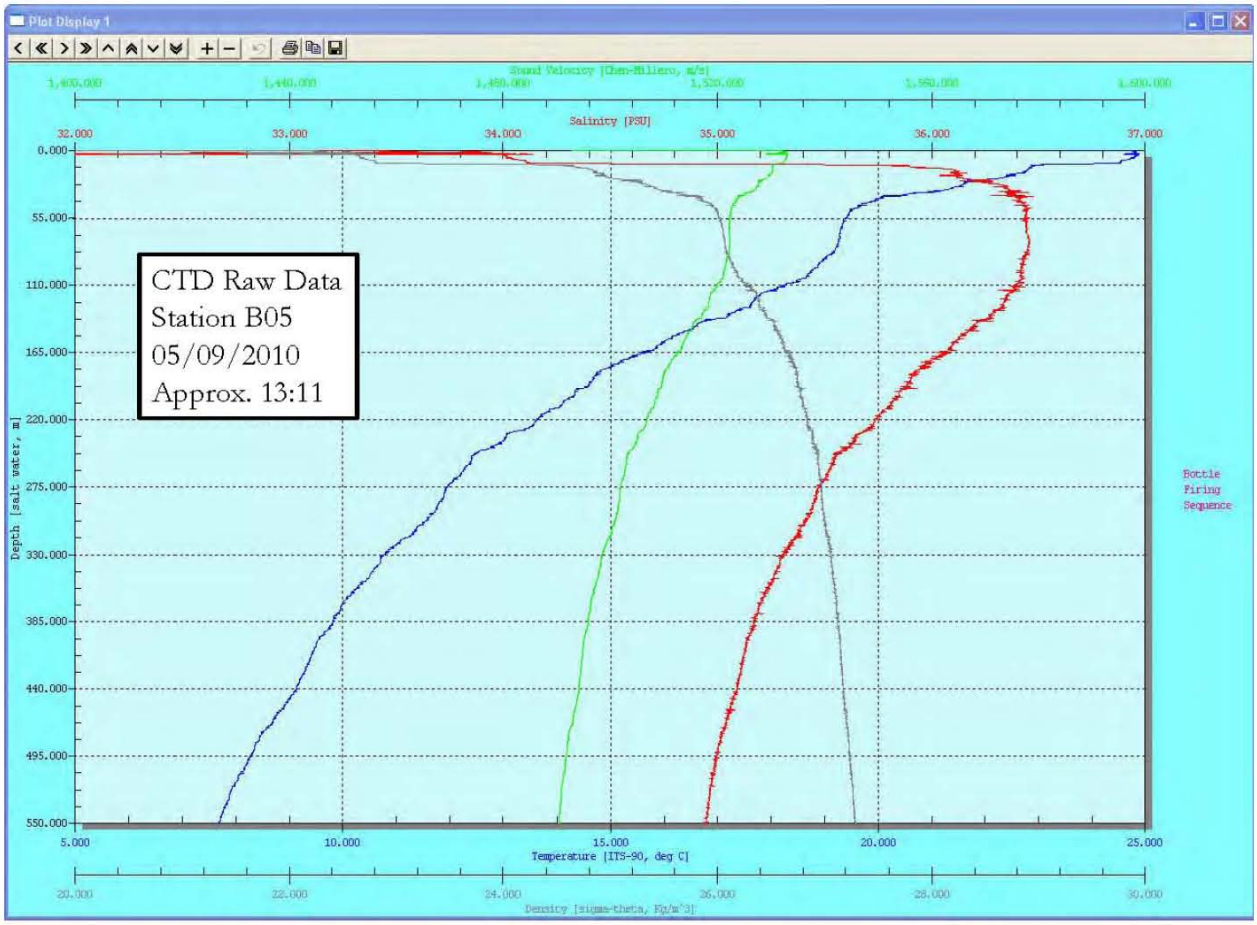
CTD PROFILES

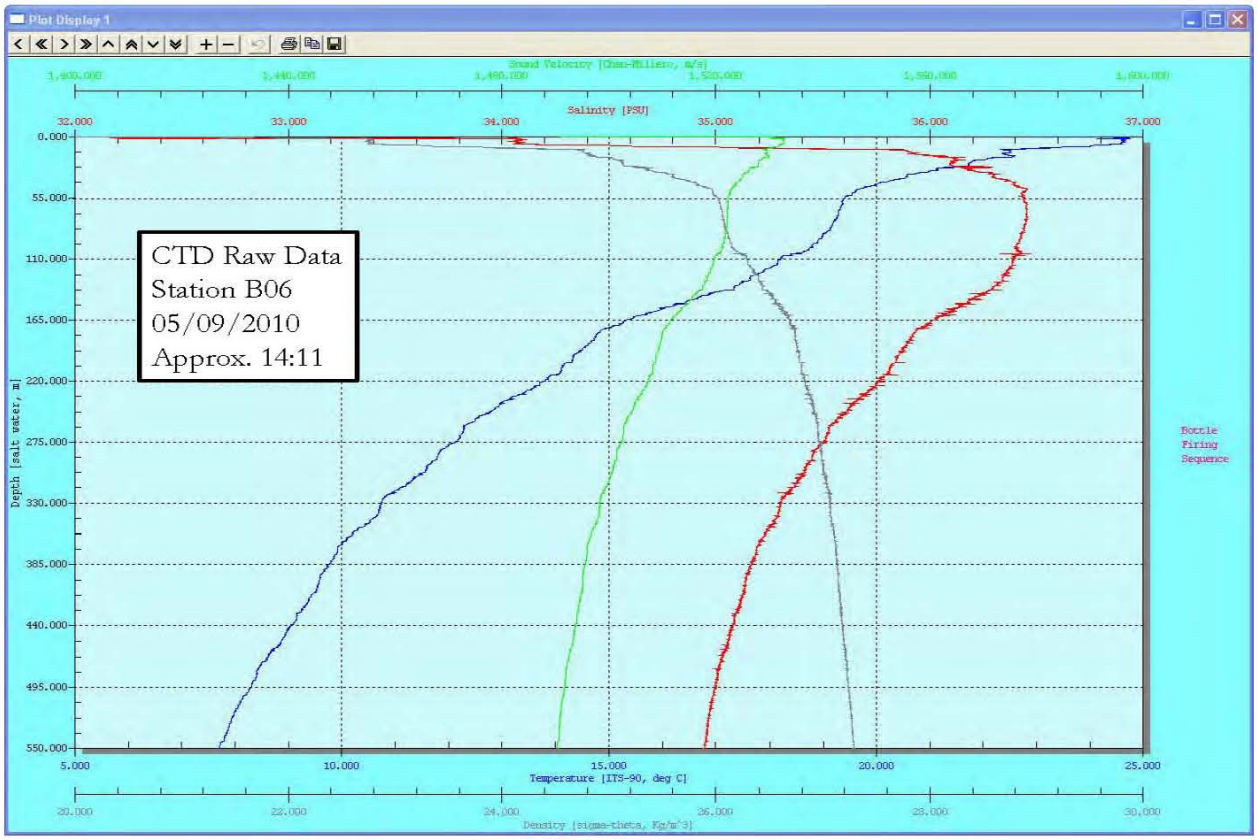

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
CTD Raw Data
Station B01
05/08/2010
Approx. 17:40
Depth [salt water, m]
Bottle
Firing
Sequence
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]

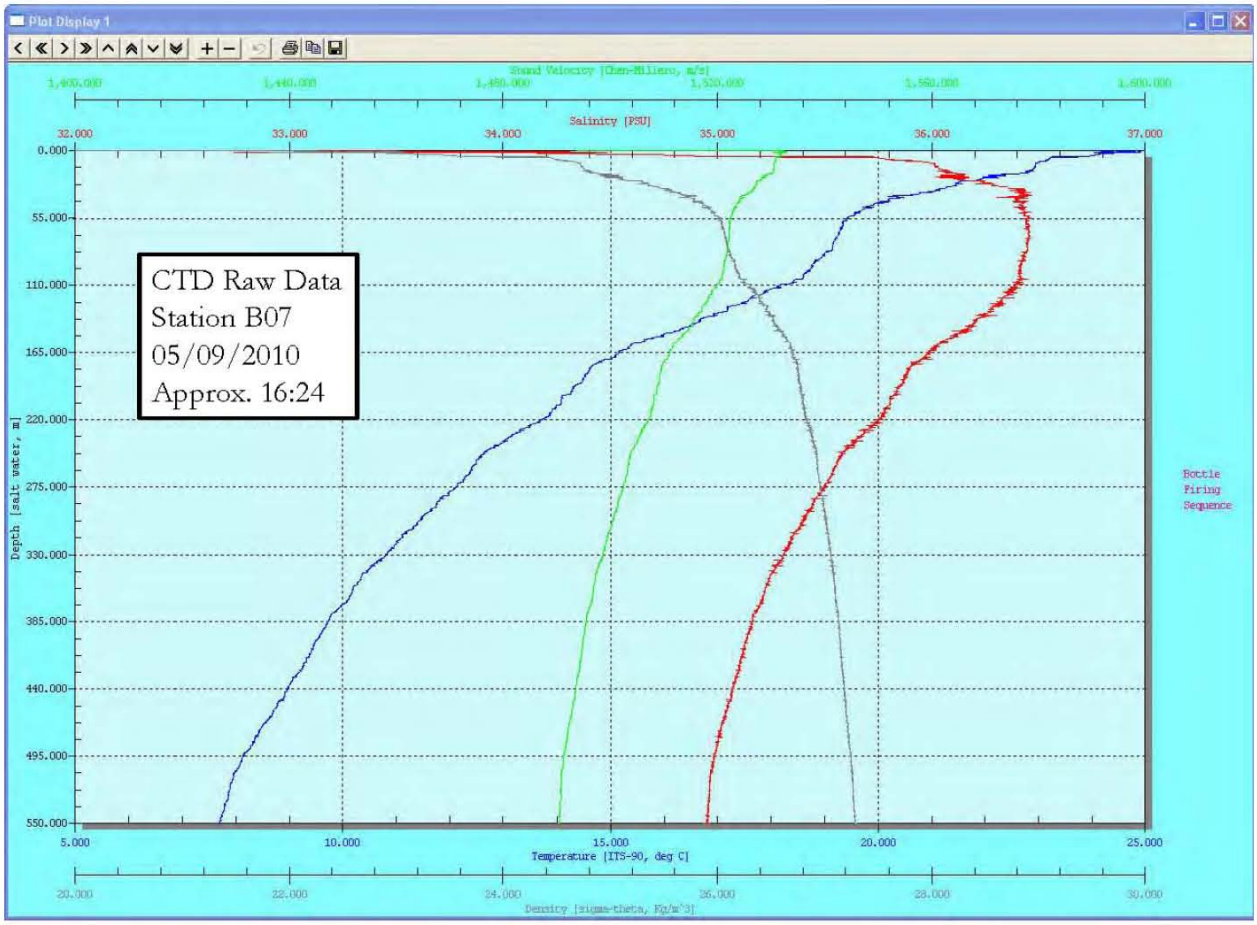

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B02
05/09/2010
Approx. 7:30

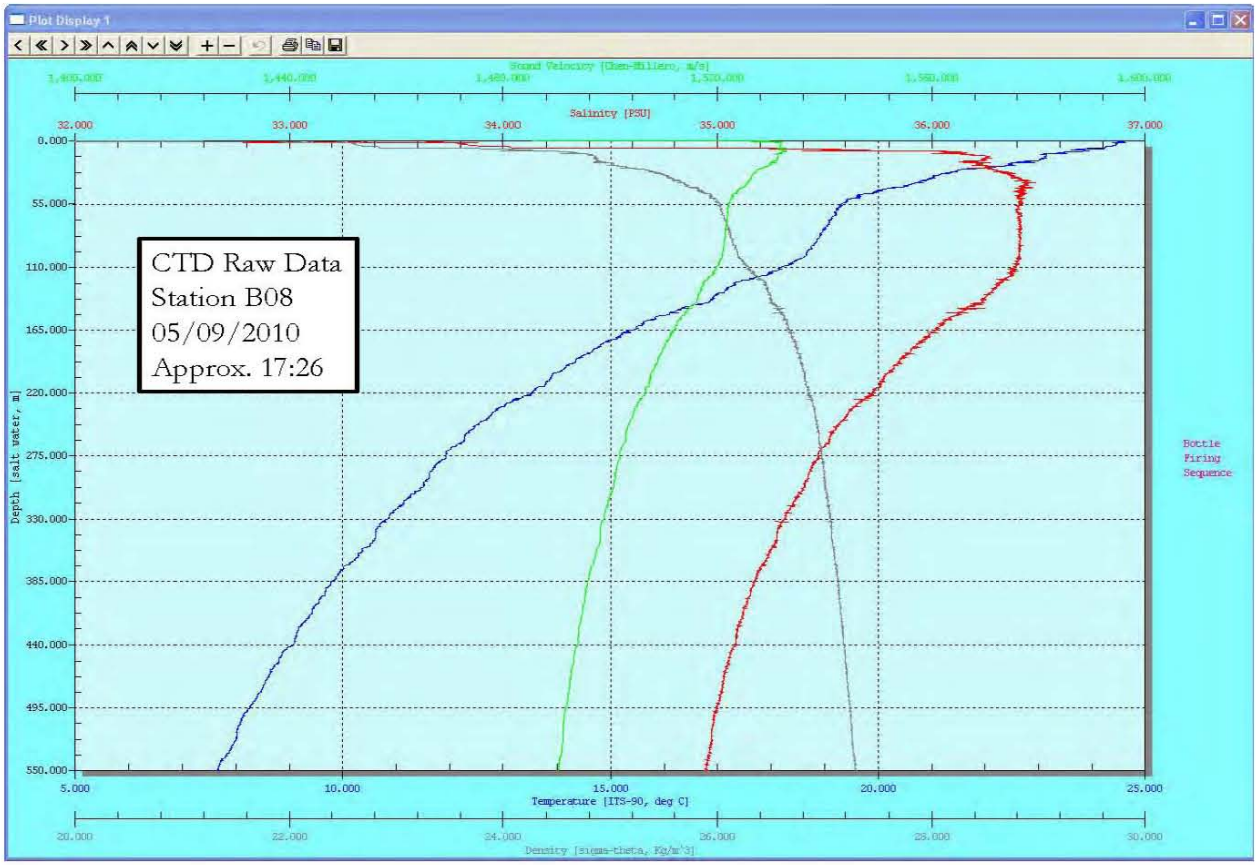

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B03
05/09/2010
Approx. 9:27

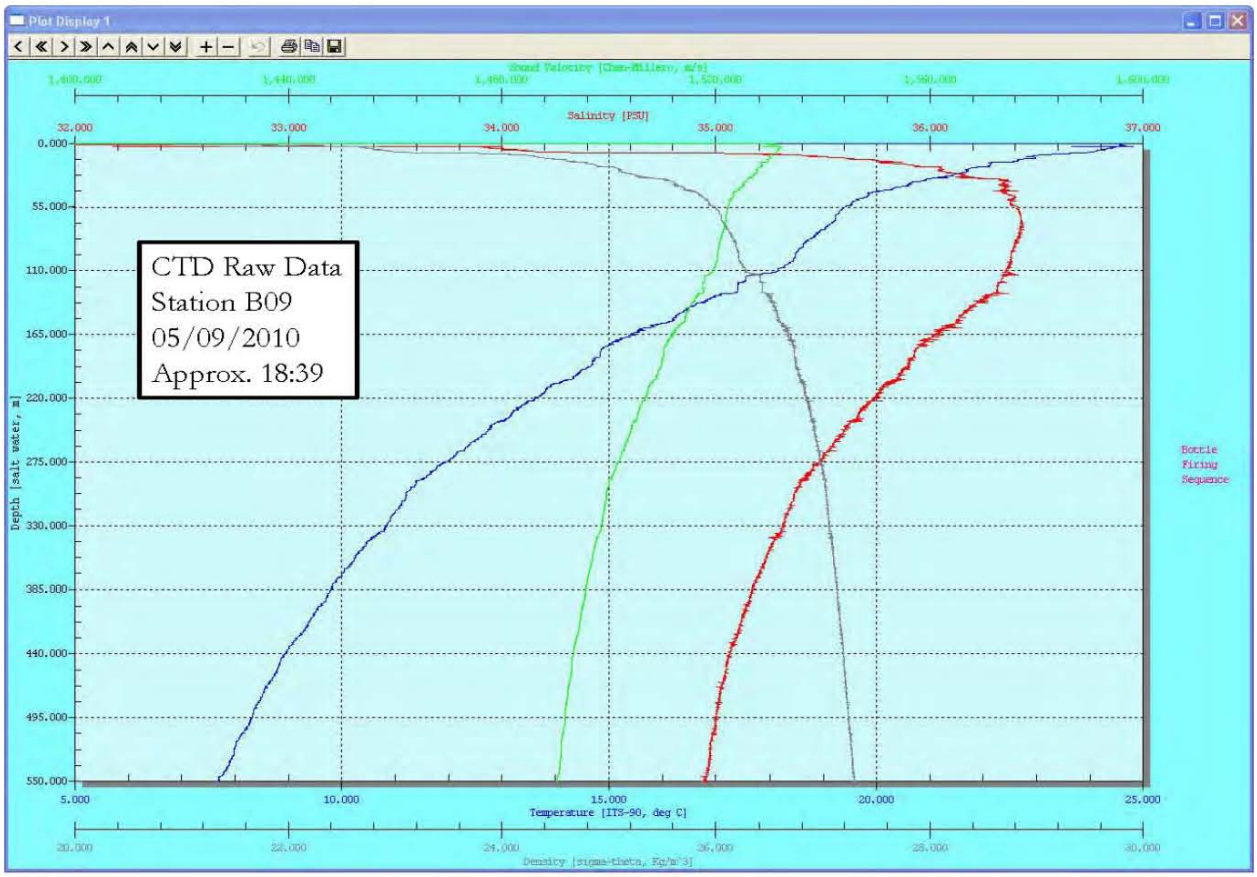

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B04
05/09/2010
Approx. 10:32

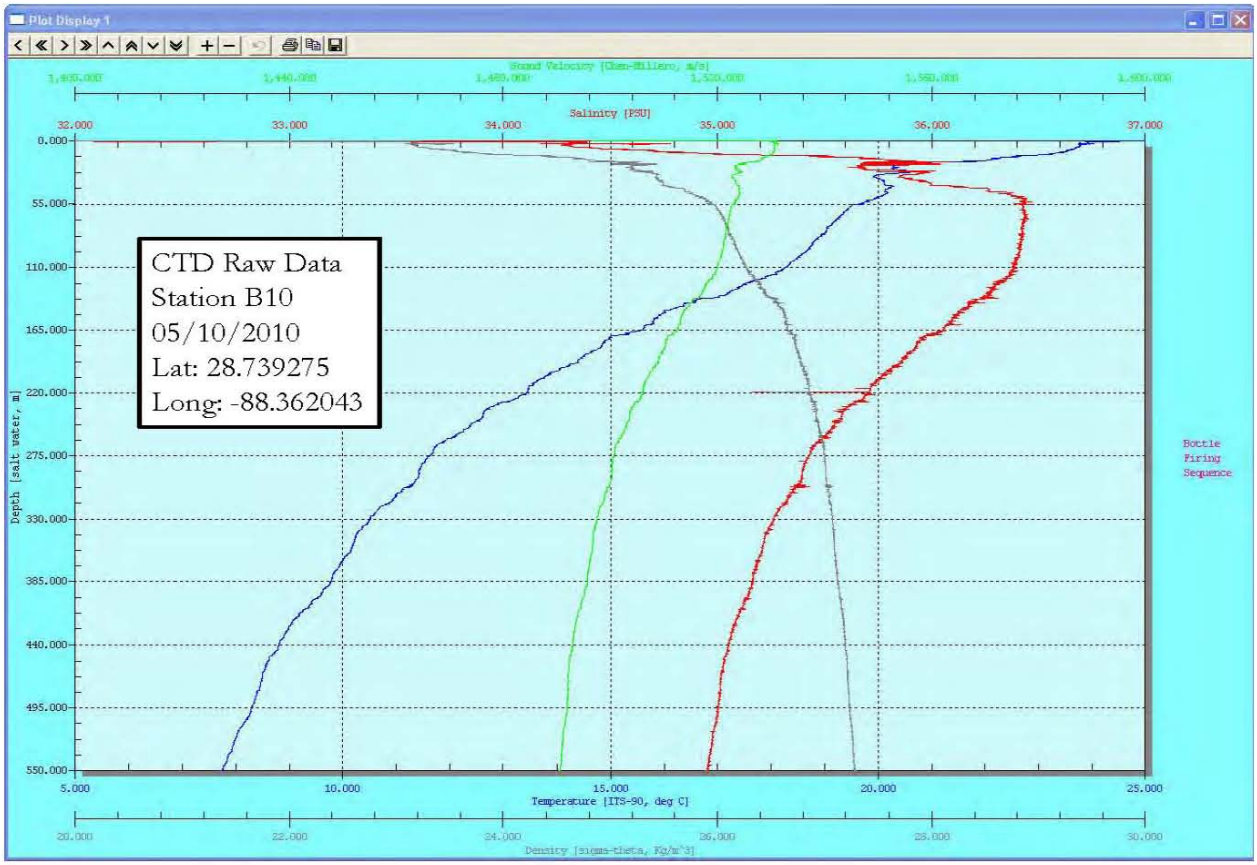

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B05
05/09/2010
Approx. 13:11

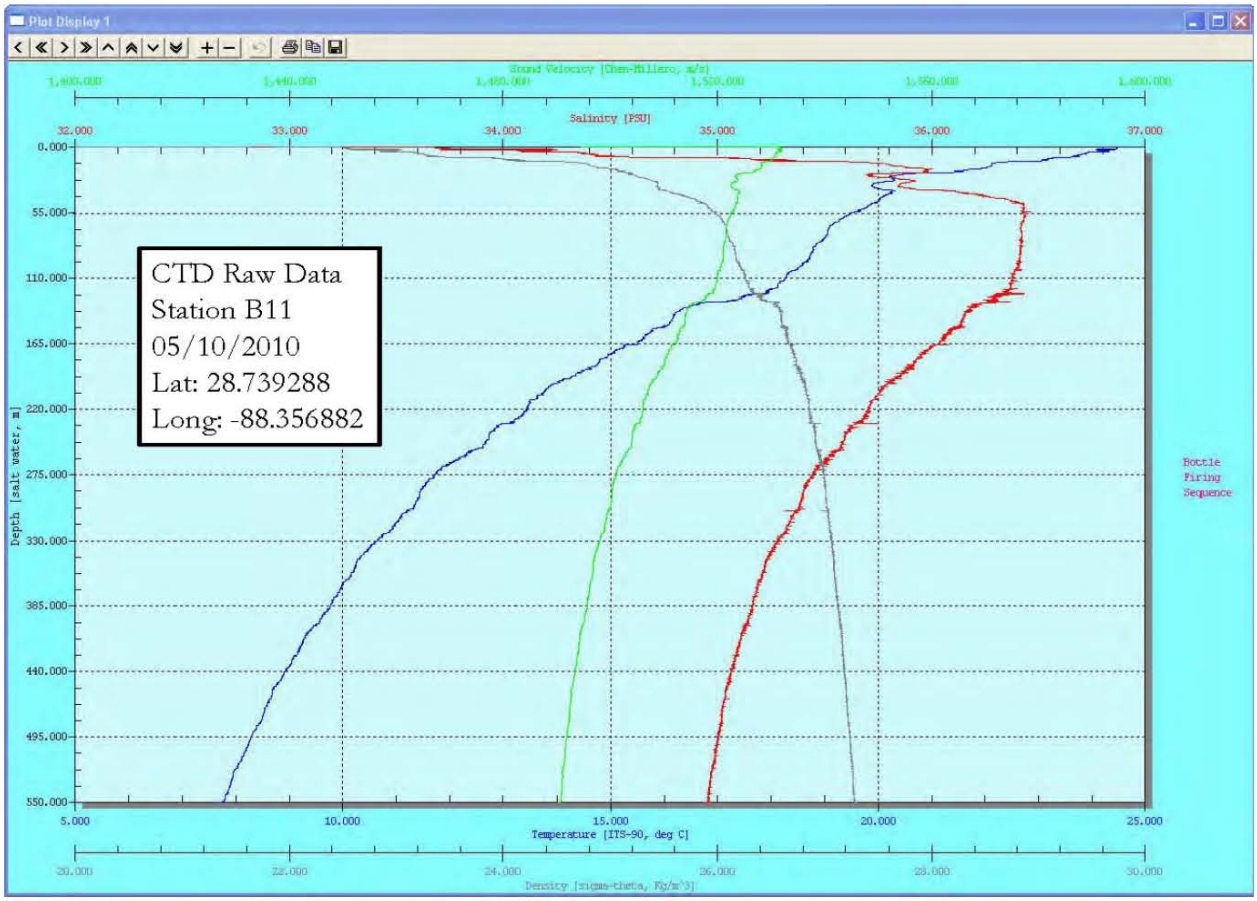

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B06
05/09/2010
Approx. 14:11

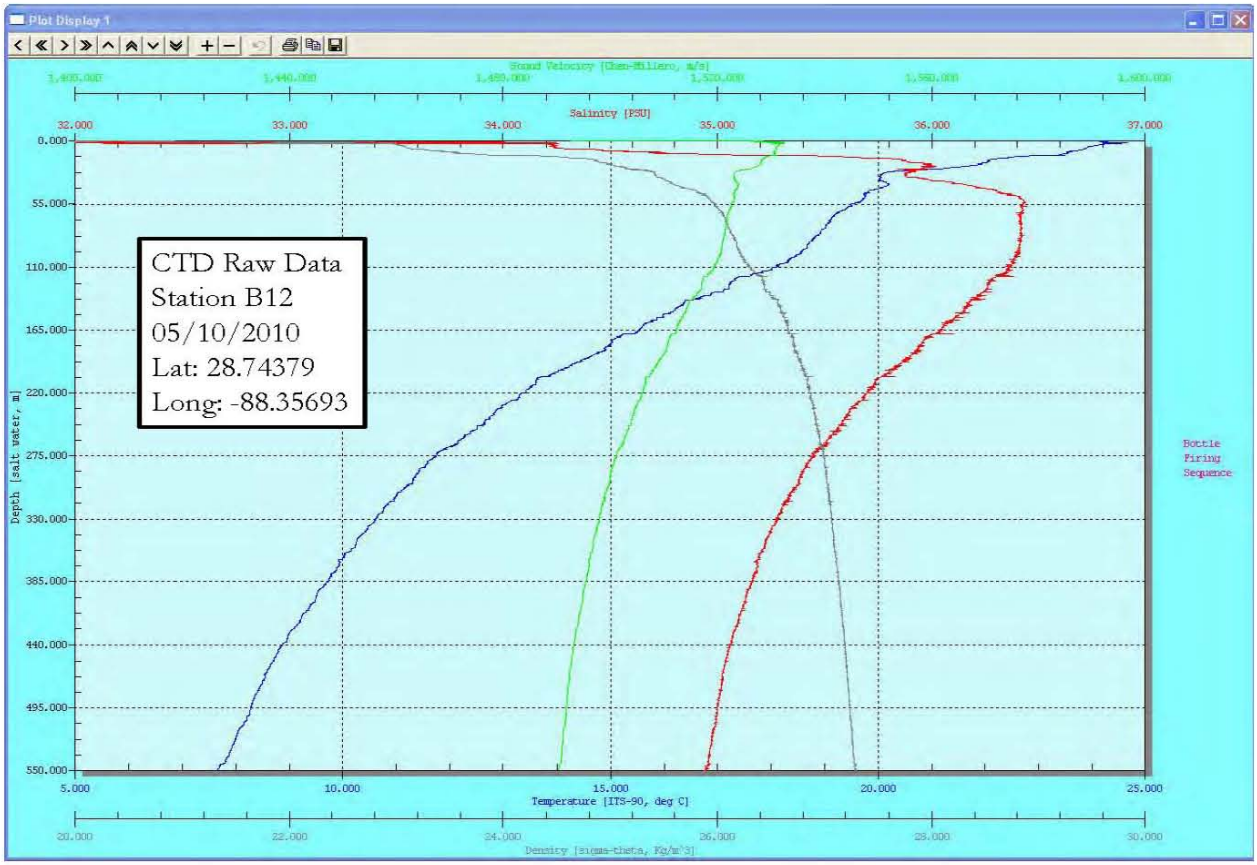

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B07
05/09/2010
Approx. 16:24

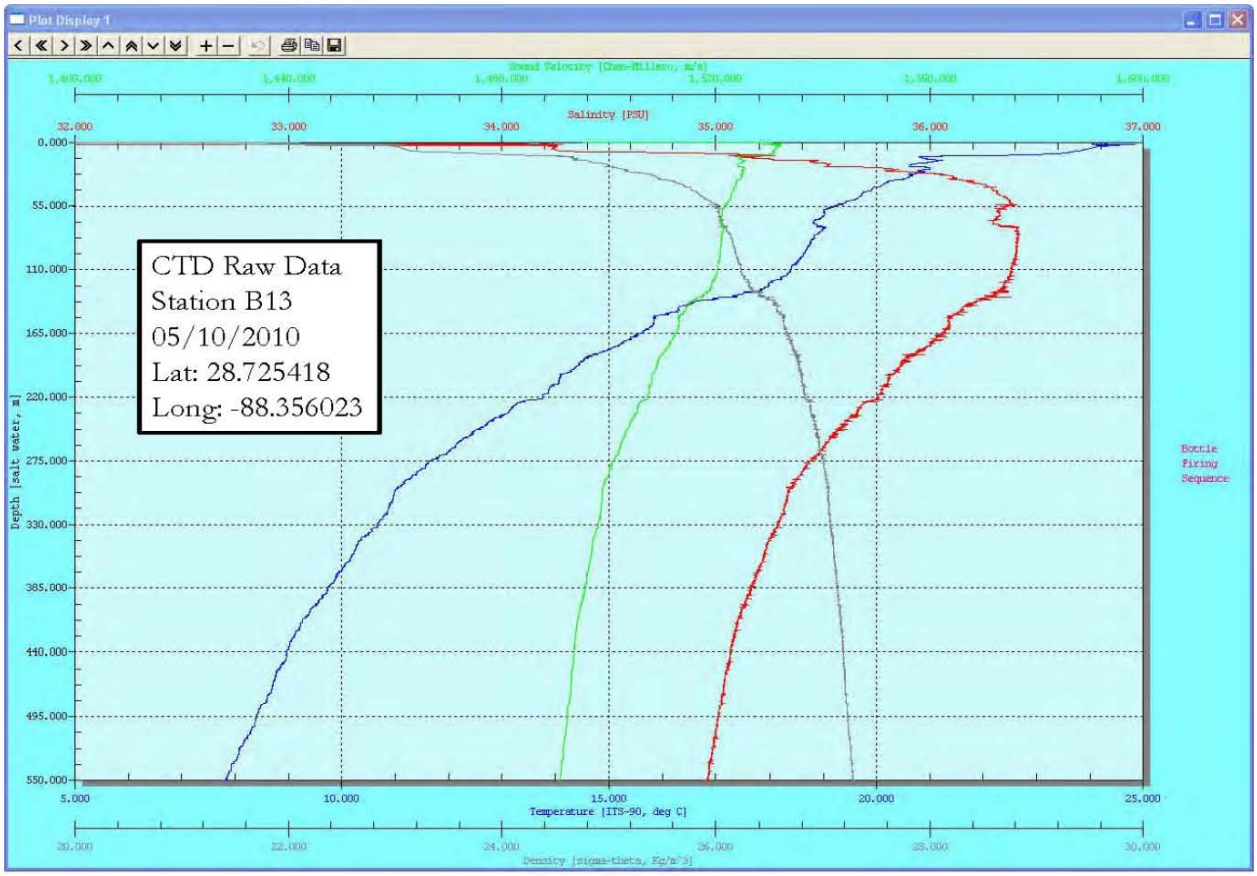

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B08
05/09/2010
Approx. 17:26

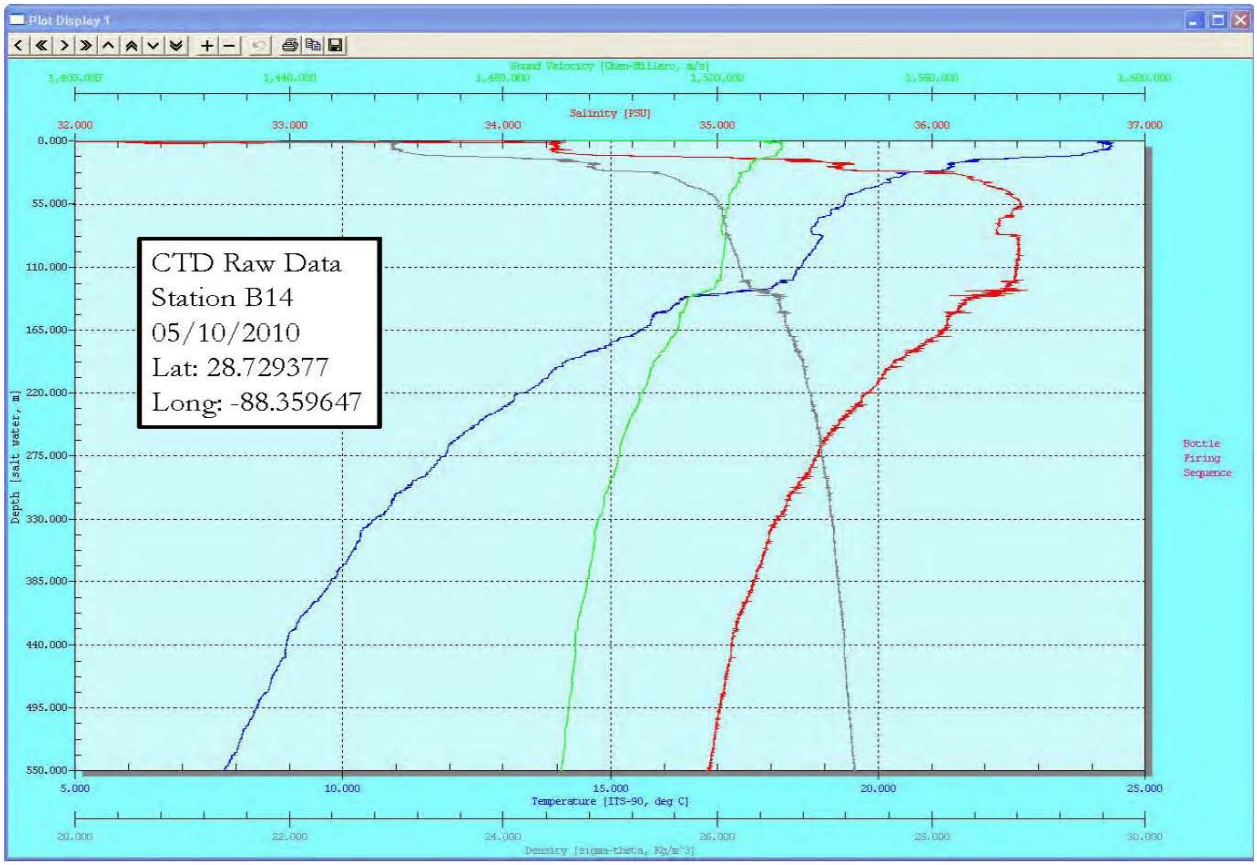

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B09
05/09/2010
Approx. 18:39

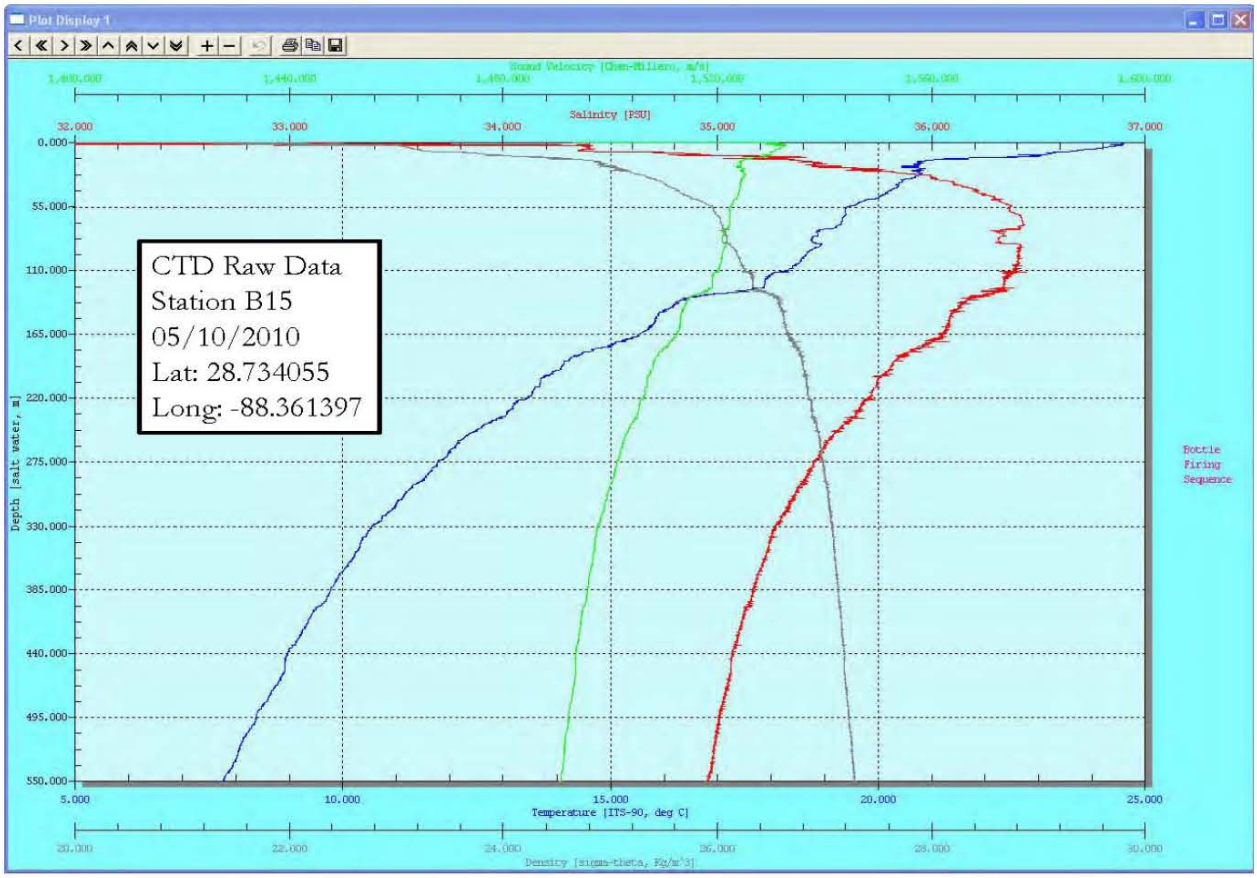

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B10
05/10/2010
Lat: 28.739275
Long: -88.362043

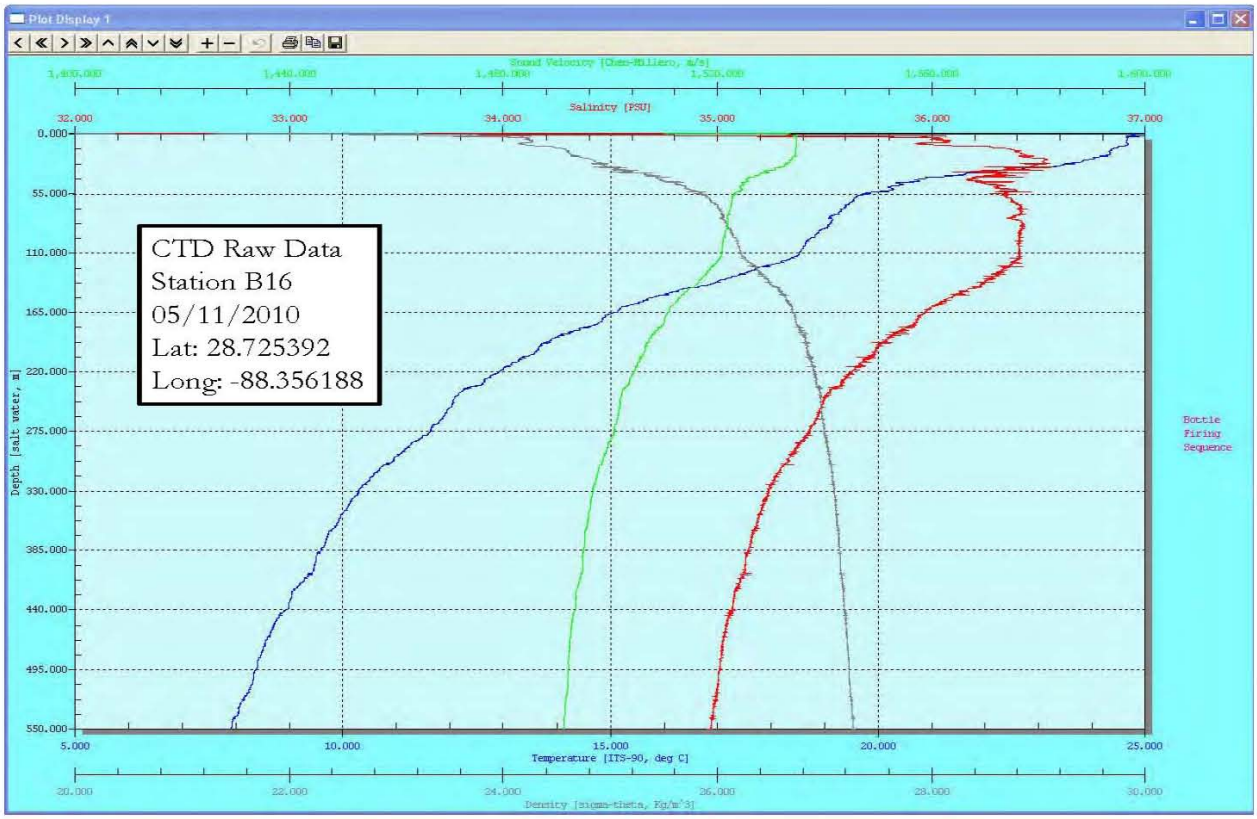

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B11
05/10/2010
Lat: 28.739288
Long: -88.356882

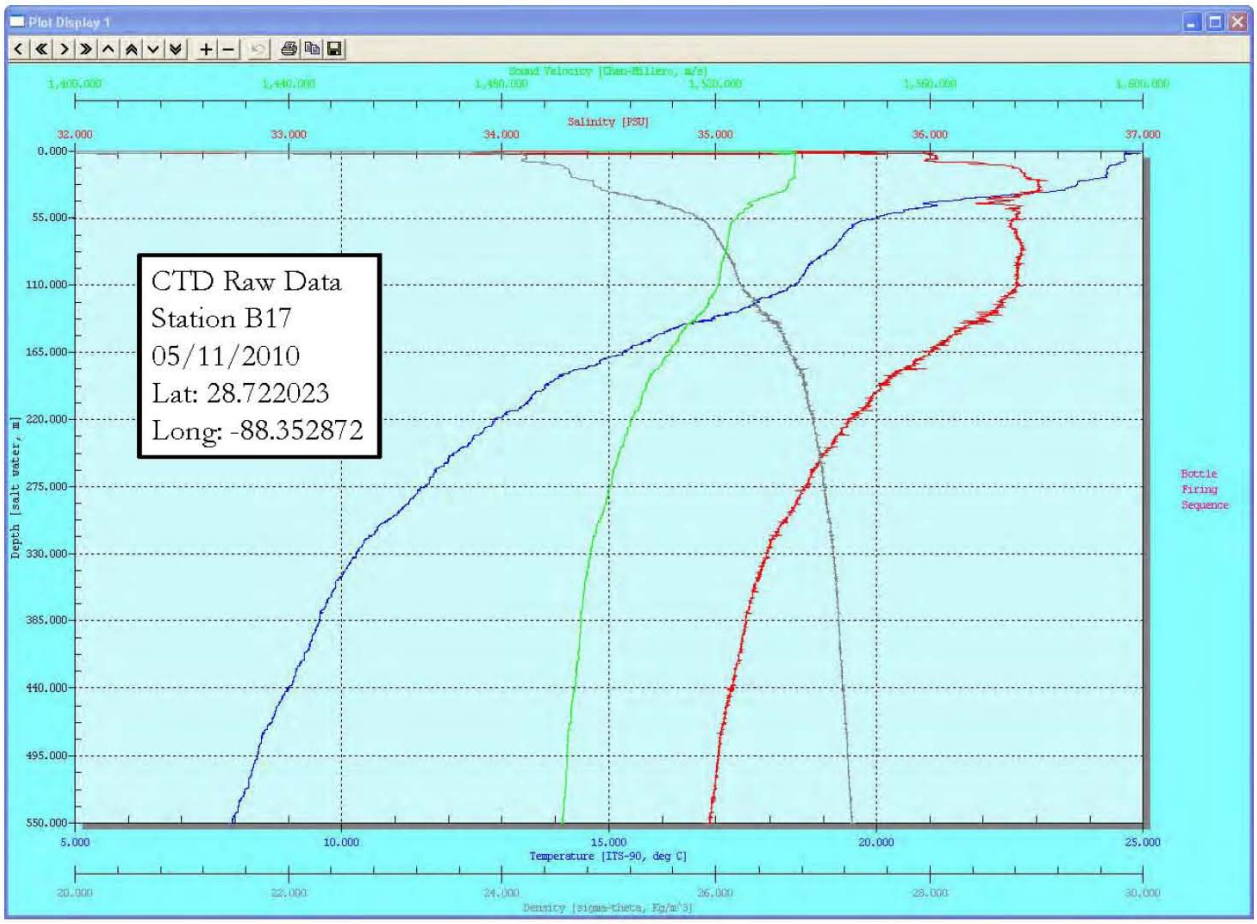

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B12
05/10/2010
Lat: 28.74379
Long: -88.35693

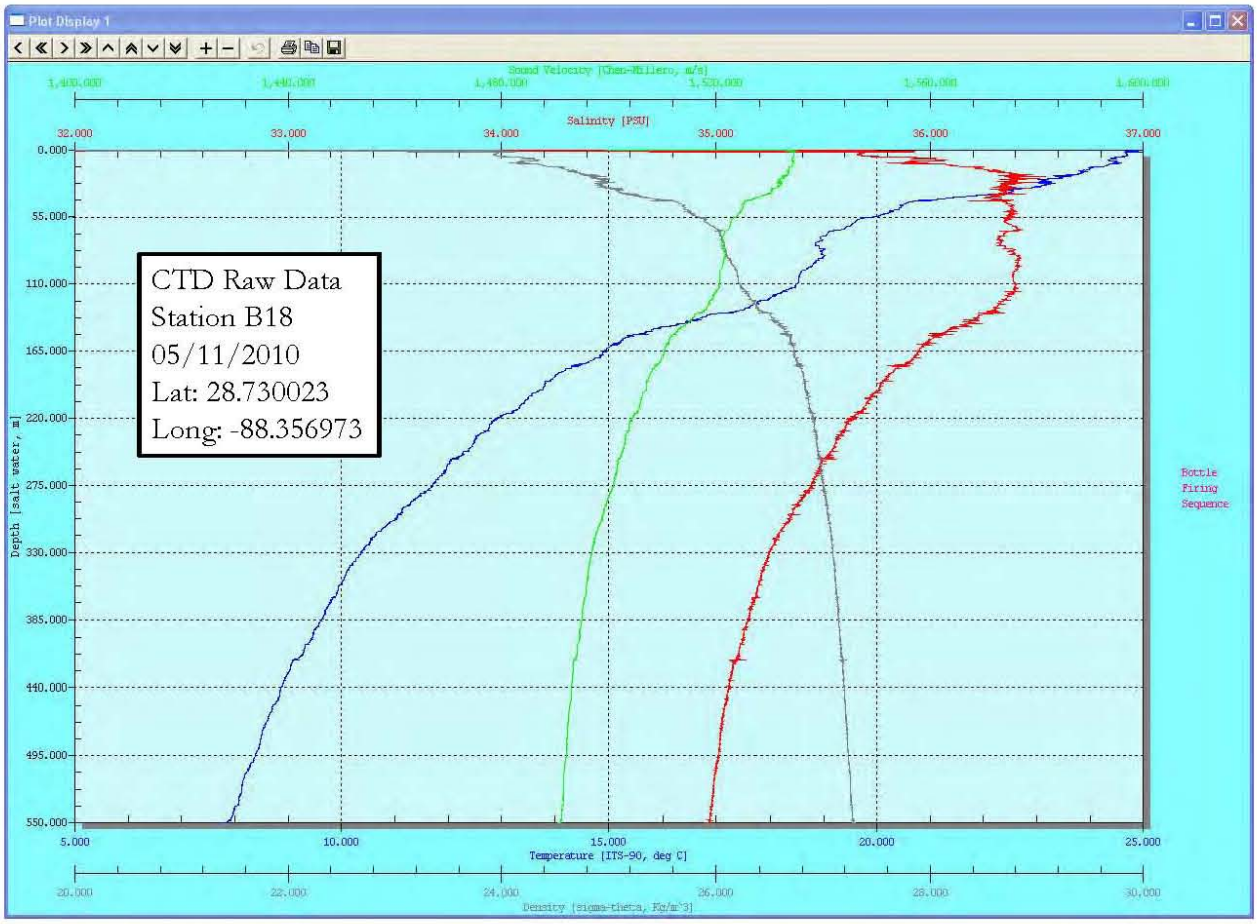

Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B13
05/10/2010
Lat: 28.725418
Long: -88.356023


Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B14
05/10/2010
Lat: 28.729377
Long: -88.359647


Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B15
05/10/2010
Lat: 28.734055
Long: -88.361397


Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B16
05/11/2010
Lat: 28.725392
Long: -88.356188


Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B17
05/11/2010
Lat: 28.722023
Long: -88.352872


Plot Display 1
Sound Velocity [Chen-Millero, m/s]
Salinity [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Density [sigma-theta, Kg/m^3]
Bottle Firing Sequence
CTD Raw Data
Station B18
05/11/2010
Lat: 28.730023
Long: -88.356973

APPENDIX B

SAMPLE LOG

Mississippi Canyon 252
R/V Brooks McCall Sampling

Index	Sample_Team	Date	Station	Matrix	Depth_Interval	SampleID	Container Size	Time Collected	Time Deployed	Analysis	Dissolved Oxygen (mg/L)	LISST	Notes	Planned Depth (m below surface)	Actual Depth (m below surface)	Water_Depth approx. (m)	Latitude (DDM)	Longitude (DDM)	Lat (DD)	Long (DD)
1	Entrix	05/08/10	B01	Water	B	B01B-A0508-W01	1L	17:50	17:17	TPH	6.6	2x 4oz		1	1.3	1143	28 33.0310	88 50.5202	28.55052	-88.84200
2	Entrix	05/08/10	B01	Water	B	B01B-A0508-W02	1L	17:50	17:17	TPH		2x 4oz		1	1.3	1143	28 33.0310	88 50.5202	28.55052	-88.84200
1	Entrix	05/08/10	B01	Water	D	B01D-A0508-W01	1L	17:33	17:17	TPH	4.2	2x 4oz		550	553.8	1143	28 33.0310	88 50.5202	28.55052	-88.84200
2	Entrix	05/08/10	B01	Water	D	B01D-A0508-W02	1L	17:33	17:17	TPH		2x 4oz		550	553.8	1143	28 33.0310	88 50.5202	28.55052	-88.84200
1	Entrix	05/09/10	B02	Oil	A	B02A-SP01	8 oz	7:40	7:30				orange tarballs collected with net	0		1646	28 45.0499	88 22.2492	28.75083	-88.37082
2	Entrix	05/09/10	B02	Oil	A	B02A-SP02	6 oz	7:42	7:30				orange tarballs collected with net	0		1646	28 45.0499	88 22.2492	28.75083	-88.37082
1	Entrix	05/09/10	B02	Water	B	B02B-WA01	1L	8:13	7:30	TPH	4.1	2x 4oz	Niskin triggered near water surface due to boat roll	1	1.1	1646	28 45.0499	88 22.2492	28.75083	-88.37082
2	Entrix	05/09/10	B02	Water	B	B02B-WA02	1L	8:13	7:30	TPH		2x 4oz	Niskin triggered near water surface due to boat roll	1	1.1	1646	28 45.0499	88 22.2492	28.75083	-88.37082
1	Entrix	05/09/10	B02	Water	C	B02C-WA01	1L	8:04	7:30	TPH	4.6	2x 4oz		275	272.4	1646	28 45.0499	88 22.2492	28.75083	-88.37082
2	Entrix	05/09/10	B02	Water	C	B02C-WA02	1L	8:04	7:30	TPH		2x 4oz		275	272.4	1646	28 45.0499	88 22.2492	28.75083	-88.37082
1	Entrix	05/09/10	B02	Water	D	B02D-WA01	1L	7:54	7:30	TPH	3.4	2x 4oz		550	555.1	1646	28 45.0499	88 22.2492	28.75083	-88.37082
2	Entrix	05/09/10	B02	Water	D	B02D-WA02	1L	7:54	7:30	TPH		2x 4oz		550	555.1	1646	28 45.0499	88 22.2492	28.75083	-88.37082
1	Entrix	05/09/10	B03	Water	B	B03B-WA01	1L	10:00	9:27	TPH	3.4	2x 4oz		1	0.3	1646	28 44.3513	88 21.7209	28.73919	-88.36202
2	Entrix	05/09/10	B03	Water	B	B03B-WA02	1L	10:00	9:27	TPH		2x 4oz		1	0.3	1646	28 44.3513	88 21.7209	28.73919	-88.36202
1	Entrix	05/09/10	B03	Water	C	B03C-WA01	1L	9:52	9:27	TPH	2.3	2x 4oz		275	272.7	1646	28 44.3513	88 21.7209	28.73919	-88.36202
2	Entrix	05/09/10	B03	Water	C	B03C-WA02	1L	9:52	9:27	TPH		2x 4oz		275	272.7	1646	28 44.3513	88 21.7209	28.73919	-88.36202
1	Entrix	05/09/10	B03	Water	D	B03D-WA01	1L	9:42	9:27	TPH	2.5	2x 4oz		550	555.9	1646	28 44.3513	88 21.7209	28.73919	-88.36202
2	Entrix	05/09/10	B03	Water	D	B03D-WA02	1L	9:42	9:27	TPH		2x 4oz		550	555.9	1646	28 44.3513	88 21.7209	28.73919	-88.36202
1	Entrix	05/09/10	B04	Water	A	B04A-WA01	1L	10:37	10:32	TPH		2x 4oz	water collected from bucket of surface water	0	0.0	1646	28 44.0597	88 21.5132	28.73433	-88.35855
2	Entrix	05/09/10	B04	Oil	A	B04A-SP01	8 oz	10:37	10:32				oil sample collected from bucket of surface	0	0.0	1646	28 44.0597	88 21.5132	28.73433	-88.35855
1	Entrix	05/09/10	B04	Oil	A	B04A-SP02	8 oz	10:37	10:32				oil sample collected from bucket of surface	0	0.0	1646	28 44.0597	88 21.5132	28.73433	-88.35855
2	Entrix	05/09/10	B04	Water	B	B04B-WA01	1L	11:12	10:32	TPH	5.1	2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.7	1646	28 44.0597	88 21.5132	28.73433	-88.35855
1	Entrix	05/09/10	B04	Water	B	B04B-WA02	1L	11:12	10:32	TPH		2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.7	1646	28 44.0597	88 21.5132	28.73433	-88.35855
2	Entrix	05/09/10	B04	Water	B	B04B-WA03	1L	11:12	10:32	TPH		2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.7	1646	28 44.0597	88 21.5132	28.73433	-88.35855
1	Entrix	05/09/10	B04	Water	C	B04C-WA01	1L	11:04	10:32	TPH	3.1	2x 4oz		275	272.6	1646	28 44.0597	88 21.5132	28.73433	-88.35855
2	Entrix	05/09/10	B04	Water	C	B04C-WA02	1L	11:04	10:32	TPH		2x 4oz		275	272.6	1646	28 44.0597	88 21.5132	28.73433	-88.35855
1	Entrix	05/09/10	B04	Water	D	B04D-WA01	1L	10:55	10:32	TPH	2.4	2x 4oz		550	555.4	1646	28 44.0597	88 21.5132	28.73433	-88.35855
2	Entrix	05/09/10	B04	Water	D	B04D-WA02	1L	10:55	10:32	TPH		2x 4oz		550	555.4	1646	28 44.0597	88 21.5132	28.73433	-88.35855
1	Entrix	05/09/10	B05	Oil	A	B05A-SP01	8 oz		13:25				oil sample collected on sorbent pad from bucket of surface water	0	0.0	1646	28 43.6601	88 21.1938	28.72767	-88.35323
2	Entrix	05/09/10	B05	Oil	A	B05A-SP02	8 oz		13:25				oil sample collected on sorbent pad from bucket of surface water	0	0.0	1646	28 43.6601	88 21.1938	28.72767	-88.35323
1	Entrix	05/09/10	B05	Water	B	B05B-WA01	1L	13:34	13:11	TPH	4.6	2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.9	1646	28 43.6601	88 21.1938	28.72767	-88.35323
2	Entrix	05/09/10	B05	Water	B	B05B-WA02	1L	13:34	13:11	TPH		2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.9	1646	28 43.6601	88 21.1938	28.72767	-88.35323
1	Entrix	05/09/10	B05	Water	B	B05B-WA03	1L	13:34	13:11	TPH		2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.9	1646	28 43.6601	88 21.1938	28.72767	-88.35323
2	Entrix	05/09/10	B05	Water	C	B05C-WA01	1L	13:26	13:11	TPH	3.4	2x 4oz		275	273.3	1646	28 43.6601	88 21.1938	28.72767	-88.35323
1	Entrix	05/09/10	B05	Water	C	B05C-WA02	1L	13:26	13:11	TPH		2x 4oz		275	273.3	1646	28 43.6601	88 21.1938	28.72767	-88.35323
2	Entrix	05/09/10	B05	Water	D	B05D-WA01	1L	13:16	13:11	TPH	1.8	2x 4oz		550	555.4	1646	28 43.6601	88 21.1938	28.72767	-88.35323
1	Entrix	05/09/10	B05	Water	D	B05D-WA02	1L	13:16	13:11	TPH		2x 4oz		550	555.4	1646	28 43.6601	88 21.1938	28.72767	-88.35323
2	Entrix	05/09/10	B06	Water	B	B06B-WA01	1L	14:45	14:11	TPH	2.8	2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.2	1646	28 45.7208	88 21.4001	28.76201	-88.35667
1	Entrix	05/09/10	B06	Water	B	B06B-WA02	1L	14:45	14:11	TPH		2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.2	1646	28 45.7208	88 21.4001	28.76201	-88.35667
2	Entrix	05/09/10	B06	Water	B	B06B-WA03	1L	14:45	14:11	TPH		2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.2	1646	28 45.7208	88 21.4001	28.76201	-88.35667
1	Entrix	05/09/10	B06	Water	C	B06C-WA01	1L	14:37	14:11	TPH	3.6	2x 4oz		275	273.0	1646	28 45.7208	88 21.4001	28.76201	-88.35667
2	Entrix	05/09/10	B06	Water	C	B06C-WA02	1L	14:37	14:11	TPH		2x 4oz		275	273.0	1646	28 45.7208	88 21.4001	28.76201	-88.35667

Page 1 of 4

Mississippi Canyon 252
R/V Brooks McCall Sampling

Index	Sample_Team	Date	Station	Matrix	Depth_Interval	SampleID	Container Size	Time Collected	Time Deployed	Analysis	Dissolved Oxygen (mg/l)	LISST	Notes	Planned Depth (m below surface)	Actual Depth (m below surface)	Water_Depth approx. (m)	Latitude (DDM)	Longitude (DDM)	Lat (DD)	Long (DD)
1	Entrix	05/09/10	B06	Water	D	B06D-WA01	1L	14:27	14:11	TPH	4.0	2x 4oz		550	555.0	1646	28 45.7206	88 21.4001	28.76201	-88.35667
2	Entrix	05/09/10	B06	Water	D	B06D-WA02	1L	14:27	14:11	TPH		2x 4oz		550	555.0	1646	28 45.7206	88 21.4001	28.76201	-88.35667
1	Entrix	05/09/10	B07	Water	B	B07B-WA01	1L	16:56	16:24	TPH	4.1	2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.4	1646	28 45.7129	88 23.0111	28.76188	-88.38352
2	Entrix	05/09/10	B07	Water	B	B07B-WA02	1L	16:56	16:24	TPH		2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.4	1646	28 45.7129	88 23.0111	28.76188	-88.38352
1	Entrix	05/09/10	B07	Water	B	B07B-WA03	1L	16:56	16:24	TPH			visible sheen on surface of water in Niskin bottle	1	1.4	1646	28 45.7129	88 23.0111	28.76188	-88.38352
2	Entrix	05/09/10	B07	Water	C	B07C-WA01	1L	16:50	16:24	TPH	2.8	2x 4oz		275	272.0	1646	28 45.7129	88 23.0111	28.76188	-88.38352
1	Entrix	05/09/10	B07	Water	D	B07D-WA01	1L	16:40	16:24	TPH	3.0	2x 4oz		550	556.0	1646	28 45.7129	88 23.0111	28.76188	-88.38352
2	Entrix	05/09/10	B08	Oil	A	B08A-SP01	8 oz	17:45	17:45				oil sample collected on sorbent pad from bucket of surface water	0	0.0	1646	28 45.7129	88 23.0111	28.76188	-88.38352
1	Entrix	05/09/10	B08	Water	B	B08B-WA01	1L	18:02	17:26	TPH	5.4	2x 4oz	light visible sheen on surface of Niskin bottle	1	1.4	1646	28 45.7129	88 23.0111	28.76188	-88.38352
2	Entrix	05/09/10	B08	Water	B	B08B-WA02	1L	18:02	17:26	TPH			light visible sheen on surface of Niskin bottle	1	1.4	1646	28 45.7129	88 23.0111	28.76188	-88.38352
1	Entrix	05/09/10	B08	Water	C	B08C-WA01	1L	17:54	17:26	TPH	3.7	2x 4oz		275	272.0	1646	28 45.7129	88 23.0111	28.76188	-88.38352
2	Entrix	05/09/10	B08	Water	C	B08C-WA02	1L	17:54	17:26	TPH				275	272.0	1646	28 45.7129	88 23.0111	28.76188	-88.38352
1	Entrix	05/09/10	B08	Water	D	B08D-WA01	1L	17:45	17:26	TPH	3.0	2x 4oz		550	555.8	1646	28 45.7129	88 23.0111	28.76188	-88.38352
2	Entrix	05/09/10	B08	Water	D	B08D-WA02	1L	17:45	17:26	TPH				550	555.8	1646	28 45.7129	88 23.0111	28.76188	-88.38352
1	Entrix	05/09/10	B09	Water	B	B09B-WA01	1L	19:14	18:39	TPH	4.2	2x 4oz	visible sheen on surface of water in Niskin bottle	1	1.7	1646	28 44.2969	88 23.0048	28.73828	-88.38341
2	Entrix	05/09/10	B09	Water	B	B09B-WA02	1L	19:14	18:39	TPH			visible sheen on surface of water in Niskin bottle	1	1.7	1646	28 44.2969	88 23.0048	28.73828	-88.38341
1	Entrix	05/09/10	B09	Water	B	B09B-WA03	1L	19:14	18:39	TPH			visible sheen on surface of water in Niskin bottle	1	1.7	1646	28 44.2969	88 23.0048	28.73828	-88.38341
2	Entrix	05/09/10	B09	Water	C	B09C-WA01	1L	19:05	18:39	TPH	2.6	2x 4oz		275	272.0	1646	28 44.2969	88 23.0048	28.73828	-88.38341
1	Entrix	05/09/10	B09	Water	C	B09C-WA02	1L	19:05	18:39	TPH				275	272.0	1646	28 44.2969	88 23.0048	28.73828	-88.38341
2	Entrix	05/09/10	B09	Water	D	B09D-WA01	1L	18:57	18:39	TPH	3.6	2x 4oz		550	554.0	1646	28 44.2969	88 23.0048	28.73828	-88.38341
1	Entrix	05/09/10	B09	Water	D	B09D-WA02	1L	18:57	18:39	TPH				550	554.0	1646	28 44.2969	88 23.0048	28.73828	-88.38341
2	Entrix	05/10/10	B10	Oil	A	B10A-SP01	8 oz	10:45	10:40				sorbent pad	0	0.0	1646	28 44.3565	88 21.7226	28.73928	-88.36204
1	Entrix	05/10/10	B10	Oil	A	B10A-SP02	8 oz	10:45	10:40				sorbent pad	0	0.0	1646	28 44.3565	88 21.7226	28.73928	-88.36204
2	Entrix	05/10/10	B10	Water	A	B10A-WA01	cup	10:47	10:25			cup	1mm-2mm tarballs on surface. Light sheen on water surface	0	0.0	1646	28 44.3565	88 21.7226	28.73928	-88.36204
1	Entrix	05/10/10	B10	Water	B	B10B-WA01	1L	10:57	10:25	TPH	2.0	cup		1	1.5	1646	28 44.3565	88 21.7226	28.73928	-88.36204
2	Entrix	05/10/10	B10	Water	B	B10B-WA02	cup	10:57	10:25			cup	LISST sample only	1	1.5	1646	28 44.3565	88 21.7226	28.73928	-88.36204
1	Entrix	05/10/10	B10	Water	C	B10C-WA01	1L	10:50	10:25	TPH	2.9	cup	visible sheen on surface of water in Niskin bottle	275	272.5	1646	28 44.3565	88 21.7226	28.73928	-88.36204
2	Entrix	05/10/10	B10	Water	C	B10C-WA02	cup	10:50	10:25			cup	visible sheen on surface of water in Niskin bottle	275	272.5	1646	28 44.3565	88 21.7226	28.73928	-88.36204
1	Entrix	05/10/10	B10	Water	D	B10D-WA01	1L	10:40	10:25	TPH	5.0	cup	visible sheen on surface of water in Niskin bottle	550	556.9	1646	28 44.3565	88 21.7226	28.73928	-88.36204
2	Entrix	05/10/10	B10	Water	D	B10D-WA02	cup	10:40	10:25			cup	LISST sample only	550	556.9	1646	28 44.3565	88 21.7226	28.73928	-88.36204
1	Entrix	05/10/10	B11	Oil	A	B11A-SP01	8 oz	11:45	11:35				small tar balls and stringy mucous-like substance	0	0.0	1646	28 44.3573	88 21.4129	28.73929	-88.35688
2	Entrix	05/10/10	B11	Oil	A	B11A-SP02	8 oz	11:55	11:35				small tar balls and stringy mucous-like substance	0	0.0	1646	28 44.3573	88 21.4129	28.73929	-88.35688
1	Entrix	05/10/10	B11	Water	A	B11A-WA01	cup	12:00	11:35	TPH		cup	LISST sample only	0	0.0	1646	28 44.3573	88 21.4129	28.73929	-88.35688
2	Entrix	05/10/10	B11	Water	B	B11B-WA01	1L	10:06	11:35	TPH	2.2	cup		1	1.9	1646	28 44.3573	88 21.4129	28.73929	-88.35688
1	Entrix	05/10/10	B11	Water	B	B11B-WA02	cup	12:00	11:35			cup	LISST sample only	1	1.9	1646	28 44.3573	88 21.4129	28.73929	-88.35688
2	Entrix	05/10/10	B11	Water	C	B11C-WA01	1L	12:02	11:35	TPH	2.0	cup	visible sheen on surface of water in Niskin bottle	275	272.1	1646	28 44.3573	88 21.4129	28.73929	-88.35688
2	Entrix	05/10/10	B11	Water	C	B11C-WA02	cup	12:02	11:35			cup	visible sheen on surface of water in Niskin bottle	275	272.1	1646	28 44.3573	88 21.4129	28.73929	-88.35688
1	Entrix	05/10/10	B11	Water	D	B11D-WA01	1L	11:51	11:35	TPH	3.8	cup		550	556.5	1646	28 44.3573	88 21.4129	28.73929	-88.35688
1	Entrix	05/10/10	B11	Water	D	B11D-WA02	cup	11:51	11:35			cup		550	556.5	1646	28 44.3573	88 21.4129	28.73929	-88.35688
2	Entrix	05/10/10	B12	Water	A	B12A-WA01	1L	13:10	13:10	TPH		cup	thick oil on water surface	0	0.0	1646	28 44.3573	88 21.4129	28.73929	-88.35688
1	Entrix	05/10/10	B12	Oil	A	B12A-SP01	8 oz	13:10	13:10				thick oil on water surface	0	0.0	1646	28 44.6274	88 21.4158	28.74379	-88.35699
2	Entrix	05/10/10	B12	Oil	A	B12A-SP02	8 oz	13:10	13:10				thick oil on water surface	0	0.0	1646	28 44.6274	88 21.4158	28.74379	-88.35699
1	Entrix	05/10/10	B12	Water	B	B12B-WA01	1L	13:16	12:42	TPH	3.4	cup	visible sheen on surface of water in Niskin bottle	1	2.0	1646	28 44.6274	88 21.4158	28.74379	-88.35699

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Mississippi Canyon 252
R/V Brooks McCall Sampling

Index	Sample_Team	Date	Station	Matrix	Depth_Interval	SampleID	Container Size	Time Collected	Time Deployed	Analysis	Dissolved Oxygen (mg/L)	LISST	Notes	Planned Depth (m below surface)	Actual Depth (m below surface)	Water_Depth approx. (m)	Latitude (DDM)	Longitude (DDM)	Lat (DD)	Long (DD)
1	Entrix	05/10/10	**B12**	Water	B	**B12B-WA02**	cup	13:16	12:42			cup	visible sheen on surface of water in Niskin bottle	1	2.0	1646	28 44.6274	88 21.4158	28.74379	-88.35693
2	Entrix	05/10/10	**B12**	Water	C	**B12C-WA01**	1L	13:09	12:42	TPH	3.2	cup	visible sheen on surface of water in Niskin bottle	275	271.6	1646	28 44.6274	88 21.4158	28.74379	-88.35693
2	Entrix	05/10/10	**B12**	Water	C	**B12C-WA02**	cup	13:09	12:42			cup	visible sheen on surface of water in Niskin bottle	275	271.6	1646	28 44.6274	88 21.4158	28.74379	-88.35693
1	Entrix	05/10/10	**B12**	Water	D	**B12D-WA01**	1L	12:59	12:42	TPH	3.4	cup	No visible sheen on Niskin	550	556.8	1646	28 44.6274	88 21.4158	28.74379	-88.35693
1	Entrix	05/10/10	**B12**	Water	D	**B12D-WA02**	cup	12:59	12:42			cup	No visible sheen on Niskin	550	556.8	1646	28 44.6274	88 21.4158	28.74379	-88.35693
2	Entrix	05/10/10	**B13**	Oil	A	**B13A-SP01**	8 oz	14:33	14:26				Thick black oil on surface	0	0.0	1646	28 43.5251	88 21.3614	28.72542	-88.35602
1	Entrix	05/10/10	**B13**	Oil	A	**B13A-SP02**	8 oz	14:33	14:26				Thick black oil on surface	0	0.0	1646	28 43.5251	88 21.3614	28.72542	-88.35602
2	Entrix	05/10/10	**B13**	Water	A	**B13A-WA01**	1L	14:33	14:26	TPH		cup	Thick black oil on surface	0	0.0	1646	28 43.5251	88 21.3614	28.72542	-88.35602
1	Entrix	05/10/10	**B13**	Water	B	**B13B-WA01**	1L	14:58	14:26	TPH	3.0	cup	visible sheen on surface of water in Niskin bottle	1	1.4	1646	28 43.5251	88 21.3614	28.72542	-88.35602
2	Entrix	05/10/10	**B13**	Water	B	**B13B-WA02**	cup	14:58	14:26			cup	LISST only	1	1.4	1646	28 43.5251	88 21.3614	28.72542	-88.35602
1	Entrix	05/10/10	**B13**	Water	C	**B13C-WA01**	1L	14:52	14:26	TPH	2.0	cup	visible sheen on surface of water in Niskin bottle	275	273.0	1646	28 43.5251	88 21.3614	28.72542	-88.35602
2	Entrix	05/10/10	**B13**	Water	C	**B13C-WA02**	cup	14:52	14:26			cup	LISST only	275	273.0	1646	28 43.5251	88 21.3614	28.72542	-88.35602
1	Entrix	05/10/10	**B13**	Water	D	**B13D-WA01**	1L	14:42	14:26	TPH	2.4	cup	no visible sheen	550	556.0	1646	28 43.5251	88 21.3614	28.72542	-88.35602
2	Entrix	05/10/10	**B13**	Water	D	**B13D-WA02**	cup	14:42	14:26			cup	LISST only	550	556.0	1646	28 43.5251	88 21.3614	28.72542	-88.35602
1	Entrix	05/10/10	**B14**	Oil	A	**B14A-SP01**	8 oz	15:35					heavy, thick, black emulsified oil	0		1646	28 43.7626	88 21.5788	28.72938	-88.35965
2	Entrix	05/10/10	**B14**	Oil	A	**B14A-SP02**	8 oz	15:35					heavy, thick, black emulsified oil	0		1646	28 43.7626	88 21.5788	28.72938	-88.35965
1	Entrix	05/10/10	**B14**	Water	A	**B14A-WA01**	1L	15:35		TPH		cup	heavy, thick, black emulsified oil	0	0.0	1646	28 43.7626	88 21.5788	28.72938	-88.35965
2	Entrix	05/10/10	**B14**	Water	B	**B14B-WA01**	1L	16:02	15:27	TPH	2.8	cup	visible sheen on surface of water in niskin bottle	1	1.6	1646	28 43.7626	88 21.5788	28.72938	-88.35965
1	Entrix	05/10/10	**B14**	Water	B	**B14B-WA02**	cup	16:02	15:27			cup	visible sheen on surface of water in niskin bottle	1	1.6	1646	28 43.7626	88 21.5788	28.72938	-88.35965
2	Entrix	05/10/10	**B14**	Water	C	**B14C-WA01**	1L	15:53	15:27	TPH	1.1	cup	visible sheen on surface of water in niskin bottle	275	272.3	1646	28 43.7626	88 21.5788	28.72938	-88.35965
1	Entrix	05/10/10	**B14**	Water	C	**B14C-WA02**	cup	15:53	15:27			cup	visible sheen on surface of water in niskin bottle	275	272.3	1646	28 43.7626	88 21.5788	28.72938	-88.35965
2	Entrix	05/10/10	**B14**	Water	D	**B14D-WA01**	1L	15:44	15:27	TPH	4.2	cup		550	554.6	1646	28 43.7626	88 21.5788	28.72938	-88.35965
1	Entrix	05/10/10	**B14**	Water	D	**B14D-WA02**	cup	15:44	15:27			cup		550	554.6	1646	28 43.7626	88 21.5788	28.72938	-88.35965
2	Entrix	05/10/10	**B15**	Oil	A	**B15A-SP01**	8 oz	16:40	16:35				tar-like, very sticky	0	0.0	1646	28 44.0433	88 21.6838	28.73406	-88.36140
1	Entrix	05/10/10	**B15**	Oil	A	**B15A-SP02**	8 oz	16:45	16:43				sticks to glass jar	0	0.0	1646	28 44.0433	88 21.6838	28.73406	-88.36140
2	Entrix	05/10/10	**B15**	Water	A	**B15A-WA01**	1L	16:42	16:35	TPH		cup	agglomerated oil separates quickly, tar-like surface	0	0.0	1646	28 44.0433	88 21.6838	28.73406	-88.36140
1	Entrix	05/10/10	**B15**	Water	B	**B15B-WA01**	1L	16:58	16:25	TPH	2.3	cup	light sheen	1	1.5	1646	28 44.0433	88 21.6838	28.73406	-88.36140
2	Entrix	05/10/10	**B15**	Water	B	**B15B-WA02**	1L	16:58	16:25			cup	LISST only	1	1.5	1646	28 44.0433	88 21.6838	28.73406	-88.36140
1	Entrix	05/10/10	**B15**	Water	C	**B15C-WA01**	1L	16:52	16:25	TPH	1.3	cup	light sheen	275	272.2	1646	28 44.0433	88 21.6838	28.73406	-88.36140
2	Entrix	05/10/10	**B15**	Water	C	**B15C-WA02**	1L	16:52	16:25			cup	LISST only	275	272.2	1646	28 44.0433	88 21.6838	28.73406	-88.36140
1	Entrix	05/10/10	**B15**	Water	D	**B15D-WA01**	1L	16:41	16:25	TPH	2.8	cup	No sheen	550	556.6	1646	28 44.0433	88 21.6838	28.73406	-88.36140
2	Entrix	05/10/10	**B15**	Water	D	**B15D-WA02**	1L	16:41	16:25			cup	LISST only	550	556.6	1646	28 44.0433	88 21.6838	28.73406	-88.36140
1	Entrix	05/11/10	**B16**	Water	A	**B16A-WA01**	cup	7:30				cup	LISST only	0	0.0	1646	28 43.5235	88 21.3713	28.72539	-88.35619
2	Entrix	05/11/10	**B16**	Oil	A	**B16A-SP01**	8 oz	7:30					sorbent pad, patches of foam and thin sheen.	0	0.0	1646	28 43.5235	88 21.3713	28.72539	-88.35619
1	Entrix	05/11/10	**B16**	Oil	A	**B16A-SP02**	8 oz	7:30					sorbent pad, patches of foam and thin sheen.	0	0.0	1646	28 43.5235	88 21.3713	28.72539	-88.35619
2	Entrix	05/11/10	**B16**	Water	B	**B16B-WA01**	1L	7:54	7:20	TPH	2.6	cup		1	1.6	1646	28 43.5235	88 21.3713	28.72539	-88.35619
1	Entrix	05/11/10	**B16**	Water	B	**B16B-WA02**	cup	7:54	7:20			cup	LISST only	1	1.6	1646	28 43.5235	88 21.3713	28.72539	-88.35619
2	Entrix	05/11/10	**B16**	Water	C	**B16C-WA01**	1L	7:46	7:20	TPH	1.2	cup		275	273.0	1646	28 43.5235	88 21.3713	28.72539	-88.35619
1	Entrix	05/11/10	**B16**	Water	C	**B16C-WA02**	cup	7:46	7:20			cup	LISST only	275	273.0	1646	28 43.5235	88 21.3713	28.72539	-88.35619
2	Entrix	05/11/10	**B16**	Water	D	**B16D-WA01**	1L	7:36	7:20	TPH	1.3	cup		550	555.8	1646	28 43.5235	88 21.3713	28.72539	-88.35619
1	Entrix	05/11/10	**B16**	Water	D	**B16D-WA02**	cup	7:36	7:20			cup	LISST only	550	555.8	1646	28 43.5235	88 21.3713	28.72539	-88.35619
2	Entrix	05/11/10	**B17**	Water	A	**B17A-WA01**	cup	9:16				cup	LISST only, sheen visible on surface of water	0	0.0	1646	28 43.3214	88 21.1723	28.72202	-88.35287
1	Entrix	05/11/10	**B17**	Water	B	**B17B-WA01**	1L	9:11	8:38	TPH	3.2	cup	visible sheen on surface of water in Niskin bottle	1	1.6	1646	28 43.3214	88 21.1723	28.72202	-88.35287

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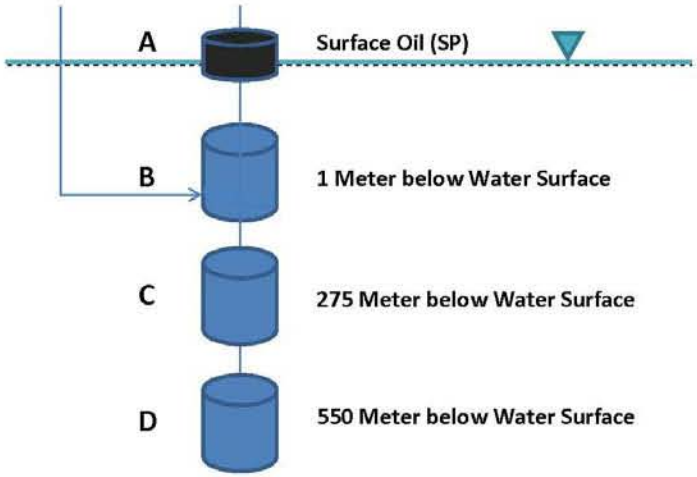
Mississippi Canyon 252
R/V Brooks McCall Sampling

Index	Sample_Team	Date	Station	Matrix	Depth_Interval	SampleID	Container Size	Time Collected	Time Deployed	Analysis	Dissolved Oxygen (mg/L)	LISST	Notes	Planned Depth (m below surface)	Actual Depth (m below surface)	Water_Depth approx. (m)	Latitude (DDM)	Longitude (DDM)	Lat (DD)	Long (DD)
2	Entrix	05/11/10	**B17**	Water	B	**B17B-WA02**	cup	9:11	8:38			cup	LISST only	1	1.6	1646	28 43.3214	88 21.1723	28.72202	-88.35287
1	Entrix	05/11/10	**B17**	Water	C	**B17C-WA01**	1L	9:04	8:38	TPH	1.0	cup	visible sheen on surface of water in Niskin bottle	275	272.7	1646	28 43.3214	88 21.1723	28.72202	-88.35287
2	Entrix	05/11/10	**B17**	Water	C	**B17C-WA02**	cup	9:04	8:38			cup	LISST only	275	272.7	1646	28 43.3214	88 21.1723	28.72202	-88.35287
1	Entrix	05/11/10	**B17**	Water	D	**B17D-WA01**	1L	8:54	8:38	TPH	1.0	cup	no visible sheen on surface of water in Niskin bottle	550	555.7	1646	28 43.3214	88 21.1723	28.72202	-88.35287
2	Entrix	05/11/10	**B17**	Water	D	**B17D-WA02**	cup	8:54	8:38			cup	LISST only	550	555.7	1646	28 43.3214	88 21.1723	28.72202	-88.35287
1	Entrix	05/11/10	**B18**	Water	A	**B18A-WA01**	cup	9:58	9:57			cup	LISST only, light sheen visible on surface of water	0	0.0	1646	28 43.8014	88 21.4184	28.73002	-88.35697
2	Entrix	05/11/10	**B18**	Water	B	**B18B-WA01**	1L	10:31	9:57	TPH	2.0	cup	visible sheen on surface of water in Niskin bottle	1	1.8	1646	28 43.8014	88 21.4184	28.73002	-88.35697
1	Entrix	05/11/10	**B18**	Water	B	**B18B-WA02**	cup	10:31	9:57			cup	LISST only	1	1.8	1646	28 43.8014	88 21.4184	28.73002	-88.35697
2	Entrix	05/11/10	**B18**	Water	C	**B18C-WA01**	1L	10:23	9:57	TPH	1.9	cup	visible sheen on surface of water in Niskin bottle	275	272.8	1646	28 43.8014	88 21.4184	28.73002	-88.35697
1	Entrix	05/11/10	**B18**	Water	C	**B18C-WA02**	cup	10:23	9:57			cup	LISST only	275	272.8	1646	28 43.8014	88 21.4184	28.73002	-88.35697
2	Entrix	05/11/10	**B18**	Water	D	**B18D-WA01**	1L	10:14	9:57	TPH	1.0	cup	no visible sheen on surface of water in Niskin bottle	550	555.6	1646	28 43.8014	88 21.4184	28.73002	-88.35697
1	Entrix	05/11/10	**B18**	Water	D	**B18D-WA02**	cup	10:14	9:57			cup	LISST only	550	555.6	1646	28 43.8014	88 21.4184	28.73002	-88.35697

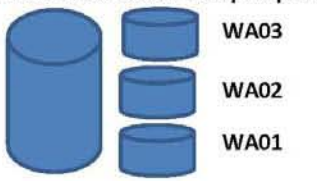
Sample Scheme

		Example:
Station	B = Brooks McCall + Numbered Station	B01
Depth Interval	A = Surface Interval, B, C, D... increasing depth	B
Matrix	WA = Water; SP = Surface Petroleum (Oil)	WA
Subsample ID	Sample # per Niskin bottle	WA01

Sample ID = Station + Depth Interval + "-" + Matrix + Sample ID
Example= B01B-WA01



Niskin bottles are closed from bottom (D) to top (B)
2 1L Amber Jar Water Samples per Niskin (WA01 and WA02)



2 samples per Niskin unless surface sheen observed- then 3 samples

5/13/2010

CTD

Files	Description
.con	serial number of SeaBird 55/25. SBE55 & SBE25 and contains configuration
.afm	bottle information from SBE55
.asc	tabular raw ascii conversion from cnv
.cnv	conversion to text from .hex
.hdr	CTD header information
.hex	Instrument recorded raw data
.ros	contains unprocessed but averaged depth and time bottle information

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Sample Tracking Spreadsheet

Sample_Team	Group collected samples
Date	Date sample collected
Station	Station
Matrix	Matrix of collected sample
SampleID	Sample ID composed of Station + Depth Interval + "-" + Matrix + Sample Increment
Container Size	Size of container for analysis.
Time Collected	Time sample gathered from source media (water sample bottles closes) from CTD
Time Deployed	Time sampler deployed from CTD
Analysis	Type of Analysis to be performed
Dissolved Oxygen (mg/L)	Ship-board Dissolved Oxygen test kit
LISST	Were samples collected for LISST analysis by DFO Canada?
Notes	Special Notes
Planned Depth (m below surface)	Planned depth below water surface for sample collection
Actual Depth (m below surface)	Actual depth based on CTD
Latitude	Latitude from R/V Brooks-McCall in Degrees Decimal Minutes
Longitude	Longitude from R/V Brooks-McCall in Degrees Decimal Minutes
Lat (DD)	Latitude calculated in Decimal Degrees to make GIS people happy
Long (DD)	Longitude calculated in Decimal Degrees to make GIS people happy
Water_Depth (ft)	Approximate water depth in fathoms from Chart # 11360 (115A) from R/V Brooks McCall

LISST Data Files

Fluorometer Data Files

Date	Stations sampled for Water	Stations where surface oil sample collected	Oil Samples total	Dissolved Oxygen samples	1L water Samples for analysis	sample intervals sampled by LISST
5/8/2010	1	0	0	2	4	4
5/9/2010	8	4	7	23	51	44
5/10/2010	6	6	12	15	25	36
5/11/2010						
Totals	15	10	19	40	80	84