NOAA Office of Ocean Exploration and Research

MAPPING DATA ACQUISITION AND PROCESSING REPORT

CRUISE EX-13-04 Leg 1

Exploration, NE Canyons

July 8 - 25, 2013

Report Contributors:
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1. Introduction

The NOAA Ship *Okeanos Explorer*

Commissioned in August 2008, the NOAA Ship *Okeanos Explorer* is the nation's only federal vessel dedicated to ocean exploration. With 95% of the world's oceans left unexplored, the ship's combination of scientific and technological tools uniquely positions it to systematically explore new areas of our largely unknown ocean. These exploration cruises are explicitly designed in collaboration with the broad science community to provide a foundation of publicly accessible baseline data and information to support science and management needs. This baseline information often leads to further more detailed investigations by other parties.

The unique combination of mission capabilities including a high-resolution multibeam sonar deep water remotely operated vehicles, telepresence technology, and integrated data management system quicken the scientific discovery and dissemination process. These systems enable us to identify new targets in real time, dive on those targets shortly after initial detection, and then send this information back to shore for immediate near-real-time collaboration with scientists and experts at Exploration Command Centers around the world. The integrated data management system provide for the quick dissemination of information-rich products to the scientific community. This ensures that discoveries are immediately available to experts in relevant disciplines for research and analysis.

Through the operation and maintenance of the mission capabilities, NOAA's Office of Ocean Exploration and Research (OER) provides the nation with unparalleled capacity to discover and investigate new oceanic regions and phenomena, conduct the basic research required to document discoveries, and seamlessly disseminate data and information-rich products to a multitude of users. OER strives to develop technological solutions and innovative applications to critical problems in undersea exploration and to provide resources for developing, testing, and transitioning solutions to meet these needs.

***Okeanos Explorer* Management – a unique partnership within NOAA**

The *Okeanos Explorer* mode of operations systematic telepresence-enabled exploration, requires a robust with shore-based high speed network and infrastructure.. The ship is operated, managed and maintained by NOAA's Office of Marine and Aviation Operations, which includes commissioned officers of the NOAA Corps and civilian wage mariners. OER owns and is responsible for operating and managing the cutting-edge ocean exploration systems on the vessel (ROV, mapping and telepresence) and ashore including Exploration Command Centers and terrestrial high speed networks. The ship and shore-based infrastructure combine to be the only federal program dedicated to systematic telepresence-enabled exploration of the planet's largely unknown ocean.

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2. Report Purpose

The purpose of this report is to briefly describe the mapping data collection and processing methodsutilized during EX-13-04 Leg 1, and to report the results of the cruise from a mapping data standpoint. This report does not attempt to summarize overall ROV shakedown results from the cruise, which were the main objective for the latter two weeks of the cruise. See the overall EX-13-04 cruise report for complete ROV results.

For a detailed description of the *Okeanos Explorer* mapping capabilities, see the appendix section'Kongsberg EM 302 Multibeam Sonar Description and Operational Specifications' and the ship's readiness report, which can be obtained by contacting the ships operations officer (ops.explorer@noaa.gov).

3. Cruise Objectives

EX-13-04Leg 1 operations commenced on July 8, 2013 in North Kingstown, RI and concluded on July 25, 2013 in New York, NY. Combined 24-hour multibeam mapping, remotely operated vehicle (ROV) and CTD/rosette operations were conducted, and included telepresence enabled shore-side participation.The 2013 Northeast U.S. Canyons Expedition, comprised of two legs, focused primarily on Northeast Canyons and inter-canyon areas.. The May 2011 NOAA Workshop on Systematic Telepresence-Enabled Exploration in the Atlantic Basin (Summary Report available at http://explore.noaa.gov/sites/OER/Documents/atl-basin-workshop-summary-oct2011.pdf*last accessed 1/13/14*) identified canyons and seamounts as priority areas for systematic ocean exploration. Operating areas were further refined based on input from other NOAA programs and the ocean management community.

The mapping activities occurred in vicinity of Alvin, Atlantis and Hydrographer canyons, landslide features near Veatch canyon identified by USGS prior to the cruise, susepected sites of New England seep sites based on previous mapping data.

EX-13-04 Legs 1 and 2 efforts built on the 2012 Atlantic Canyons Undersea Mapping Expeditions (ACUMEN). The ACUMEN expeditions have so far included seven cruises conducted by NOAA Ships *Okeanos Explorer, Ferdinand Hassler and Henry B. Bigelow* in 2012 and 2013. These cruises gathered baseline information on deep water canyons off the northeastern U.S. seaboard, mapping along the continental shelf and slope from Virginia to the northeastern boundary of the U.S. Exclusive Economic Zone (EEZ). These mapping operations provided the basis for preliminary ROV dive target selection during EX-13-04 Legs 1 and 2..

The daily schedule throughout the cruisewas split between daytime ROV operations and evening/overnight CTD rosette and mapping operations. Mapping operations included the collection of new subbottom data over key features, new multibeam data collection over canyon heads requiring coverage development, andmultibeam holiday lines complimenting previous multibeamcoverage.

4. Participating Mapping Personnel

NAME	ROLE	AFFILIATION
CDR Ricardo Ramos	Commanding Officer	NOAA Corps
LT Laura Gallant	Field Operations Officer	NOAA Corps
Kelley Elliott	Expedition Coordinator	NOAA OER (Ascentia)
Elizabeth “Meme” Lobecker	Mapping Team Lead	NOAA OER (ERT Inc.)
Jacklyn James	Survey Technician	NOAA OMAO
Richard Conway	Chief Electronics Technician	NOAA OMAO - EEB
Annemieke Raymond	Physical Scientist / Mapping Watchstander	NOAA PHB
Dr. Carolyn Ruppel	Shore-based Mapping/Science Participant	USGS
Dr. Jason Chaytor	Shore-based Mapping/Science Participant	USGS

5. Summary of Major Findings

Cruise Map

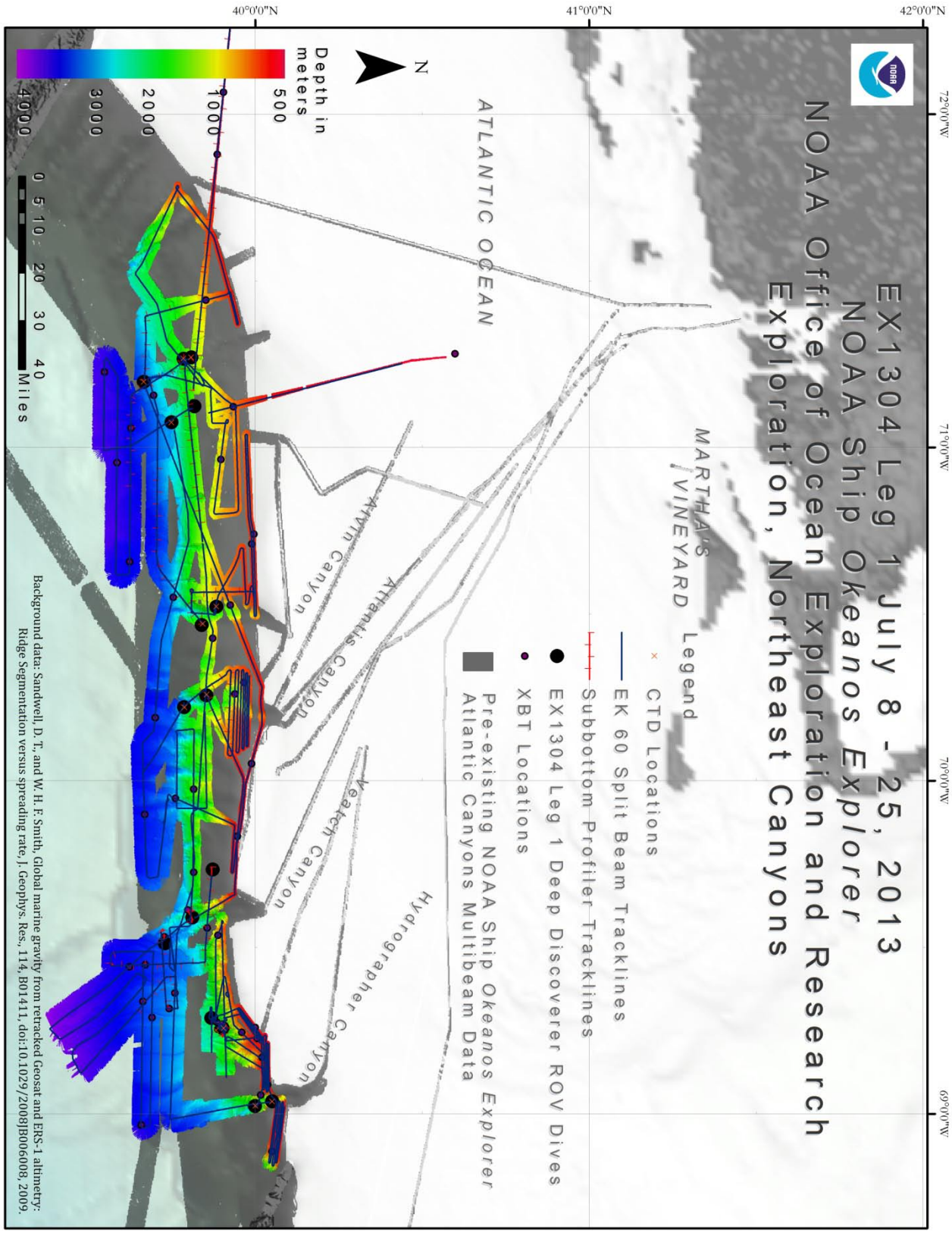

Figure 1.EX-13-04 Leg 1 cruise map made in ArcMap 10.

Features of Interest

Each of the sixteenEX-13-04 Leg 1 ROV divesresulted in spectacular video footage and in several cases potential discoveries were made. Dive plans were laid out to explore new gaseous seeps and chemosynthetic communities, coral diversity on steep canyon walls, and marine geohazards such as slumps and landslides based on multibeam bathymetry and backscatter. Below are images of a representative sample of ROV dives. Full dive summaries are available for each dive, a sample of which is provided in the appendices of this report.

ROV Dive 4, July 12, "New England Seeps 2"

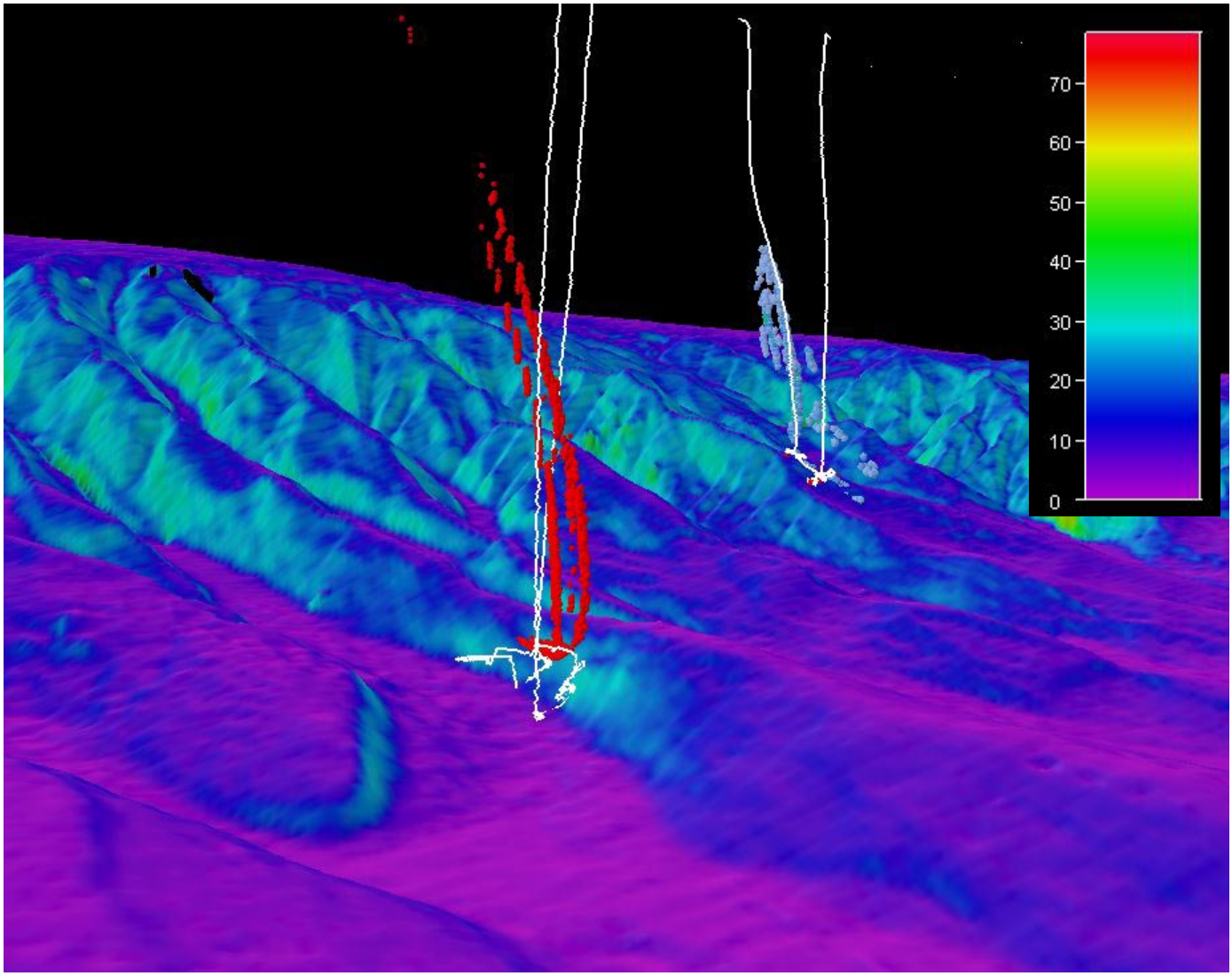

Figure 2. Screenshot taken in Fledermaus of gridded multibeam bathymetry colored by slope angle in degrees, with seep gas signature shown in red and ROV dive track in white.

ROV Dive 5, July 13, Hydrographer Canyon Wall

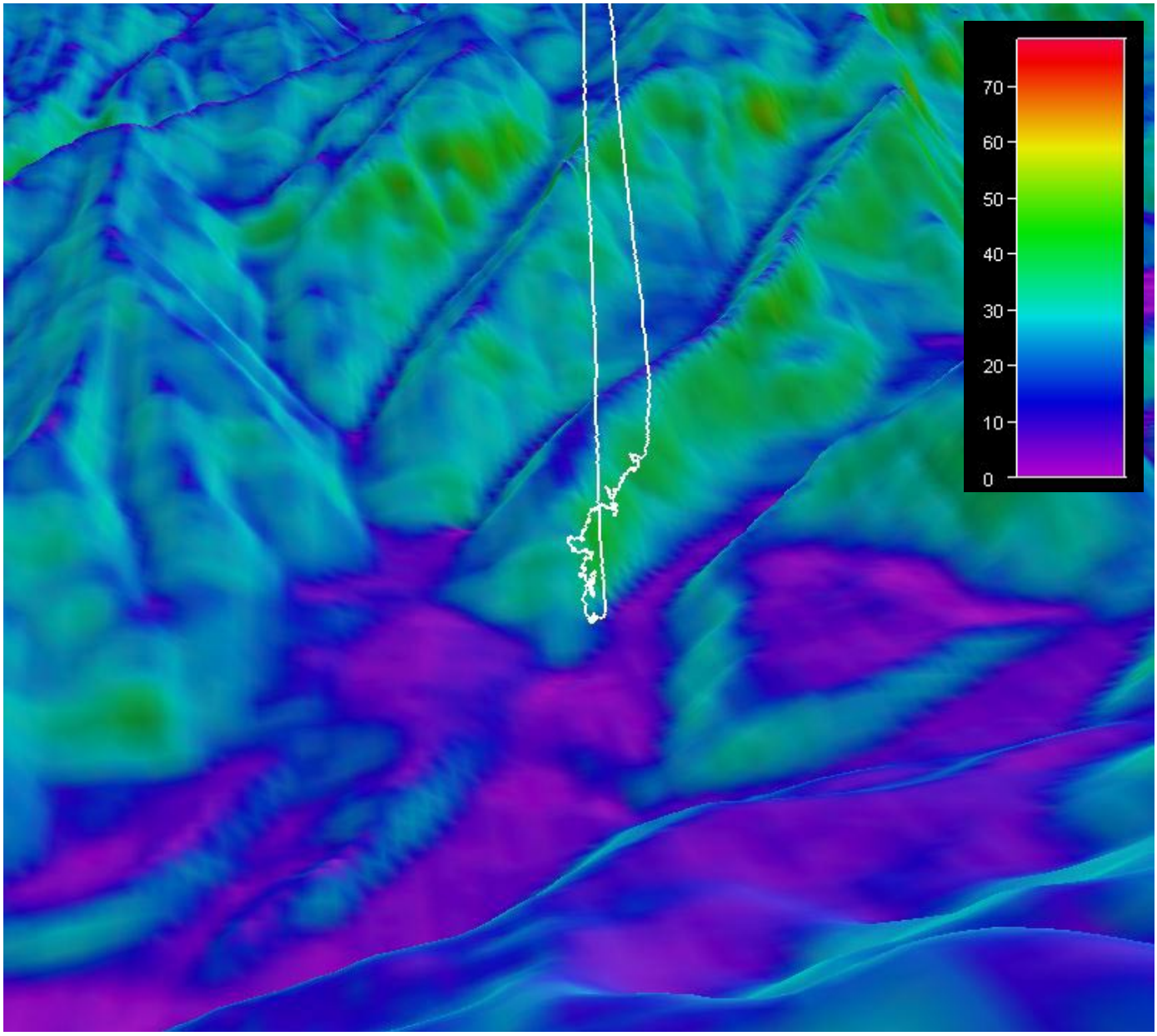

Figure 3.Screenshot taken in Fledermaus of gridded multibeam bathymetry colored by slope angle in degrees, with ROV dive track in white.

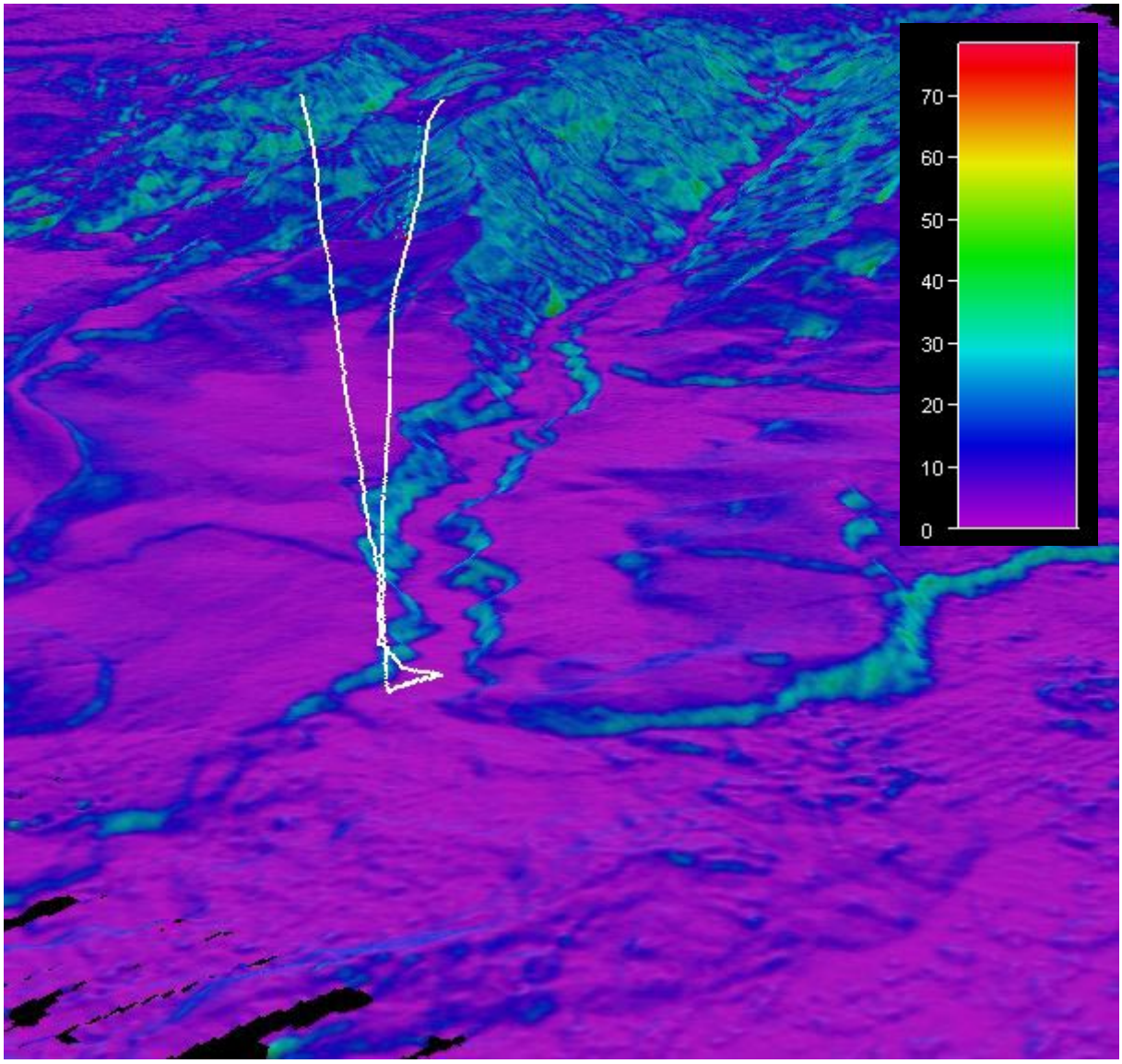

Figure 4.Screenshot taken in Fledermaus of gridded multibeam bathymetry colored by slope angle in degrees, with ROV dive track in white.

ROV Dive 16, July 24, " Gauntlet Minor", Final Dive

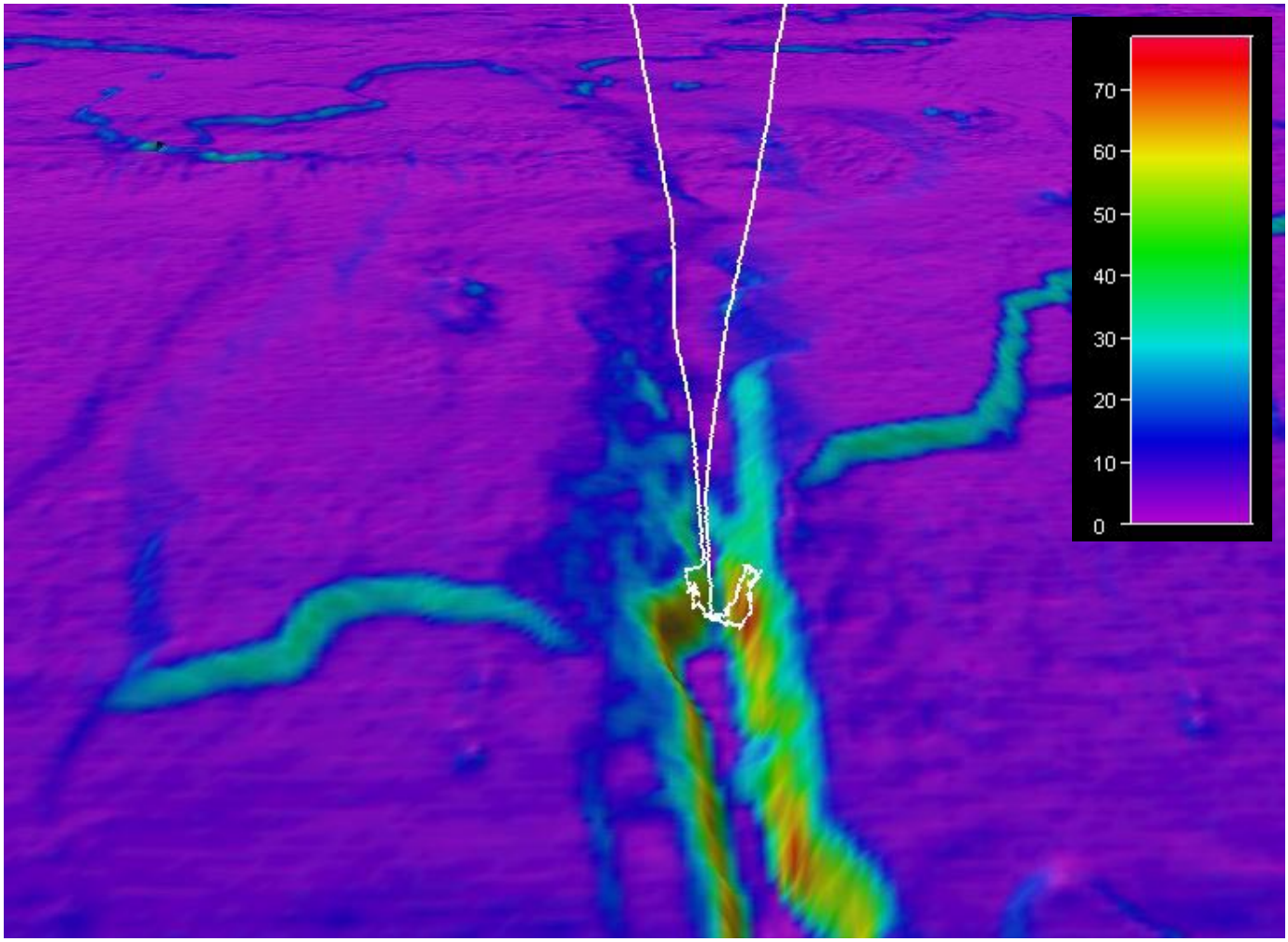

Figure 5.Screenshot taken in Fledermaus of gridded multibeam bathymetry colored by slope angle in degrees, with ROV dive track in white.

Table of ROV Deep Discoverer Dive Locations

Dive No.	Date	Latitude	Longitude	Name	Depth (meters)
1	7/9/2013	39° 44.912' N	71° 04.521' W	USGS Hazards 3	1880
2	7/10/2013	39° 52.331' N	69° 43.990' W	USGS Hazards 4	608
3	7/11/2013	39° 54.063' N	69° 15.435'W	New England Seep 3	1139
4	7/12/2013	39° 52.087' N	69° 17.248' W	New England Seep 2	1476
5	7/13/2013	39° 59.941' N	69° 01.404' W	Hydrographer Canyon Mid 1	1422
6	7/14/2013	40° 03.012' N	69° 02.244' W	Hydrographer Canyon Shallow 2	908
7	7/15/2013	39° 51.167' N	70° 15.370 W	Atlantis Canyon Mid 1	1105
8	7/16/2013	39° 47.184 N	70° 13.228' W	Atlantis Canyon Deep	1793
9	7/17/2013	39° 52.993' N	70° 31.299' W	Alvin Canyon Shallow 1	926
10	7/18/2013	39° 50.323' N	70° 28.026' W	Atlantic Canyon Mid 2	1109
11	7/19/2013	39° 47.088' N	71° 15.975' W	Block Canyon Mid 2	1351
12	7/20/2013	39° 43.720' N	69° 30.698'W	USGS Hazards 2	2026

Dive No.	Date	Latitude	Longitude	Name	Depth (meters)
13	7/21/2013	39° 48.670' N	69° 35.333'W	New England Seep 1	1423
14	7/22/2013	39° 39.939' N	71° 11.798' W	Block Canyon Deep	2135
15	7/23/2013	39 48.487° N	71 16.213° W	Block Canyon Shallow 1	1137
16	7/24/2013	39 49.007° N	71 07.401° W	"Gauntlet Minor"	1121

6. Mapping Statistics

Dates	May 13 - June 6, 2013
Days lost to weather	0 days
Total mapping days (partial days)	17 partial days
Total non-mapping days	0 days
Line kilometers of survey	2705.5 km
Square kilometers mapped	7231 km^2
Number / Data Volume of EM 302 raw bathymetric / bottom backscattermultibeam files	263 / 23 GB
Number / Data Volume of EM 302 water column multibeam files	263 / 71.6 GB
Number / Data Volume of EK 60 water column split beam files	909 / 4.08 GB
Number / Data Volume of subbottom sonar files	127 / 511 MB
Number of XBT casts	48
Number of CTD casts (including test casts)	12
Beginning draft	15' 3'' forward 13' 9' aft
Ending draft	14' 06'' forward 14' 01' aft
Average ship speed for survey	8.15 kts

7. Mapping Sonar Setup

Detailed mapping sonar setup can be found in the 2013 readiness report that can be obtained by contacting the ship (ops.explorer@noaa.gov) or the OER mapping team (oar.oer.exmappingteam@noaa.gov). Following is a brief description of mapping equipment.

The NOAA Ship *Okeanos Explorer* is equipped with a 30 kHz Kongsberg EM 302 multibeam sonar capable of mapping the seafloor in 0 to 8000 meters of water. The system generates a 150° beam fan containing up to 432 soundings per ping in waters deeper than 3000 meters. In waters less than 3000 meters, the system is operated in multiping, or dual swath mode, and obtains up to 864 soundings per ping, by generating two swaths per ping cycle.Appendix G contains a detailed description of sonar system functionality and technical specifications, including expected crosstrack and alongtrack data resolutions.

The ship is also equipped with aKongsberg EK 60 singlebeam fisheries sonar. The transducer operates at 18 kHz and transmits a 7° beam fan.

Additionally the ship is equipped with a Knudsen 3260 subbottom profiler. The transducers produce a 3.5 kHz chirp signal.

8. Data Acquisition Summary

EX-13-04 Leg 1 operations included EM 302 multibeam, EK 60 singlebeam, and Knudsen 3260 subbottom profile data collection. Tracklines for the sonar data are shown in Figure 1. Background data used for mapping planning included multibeam data collected by the U.S. Extended Continental Shelf Project (http://continentalshelf.gov/*last accessed 09/10/13*) and Sandwell and Smith satellite altimetry bathymetric data (http://topex.ucsd.edu/marine_topo/*last accessed 10/9/13*).

Tables listing all sonar files collected and products created during the cruise are provided in the appendices of this report. Tables listing all sound speed profiles collected during the cruise are also provided.

EM 302 Data

EM 302 multibeam data was collected during evening hours after the ROV was recovered, and on days when ROV dives were called early due to mechanical trouble or weather.

EK 60 Singlebeam Data

EK 60 singlebeam sonar data was collected concurrently with EM 302 data collection.

Knudsen Subbottom Profiler Data

Due to high noise caused by subbottom operations in living quarters, Knudsen subbottom sonar data collection occurred daily following evening ROV recovery until only 0200 UTC (2200 local ship time). Subbottom data was also collected opportunistically during daylight hours if ROV dives were cancelled or delayed. Focused subbottom survey efforts occurred over Veatch Canyon seeps and nearby landslide.

Sound speed profiles

Expendable bathythermographs were deployed every two to four hours to observe changes in sound speed in the water column, and the resulting processed profiles were applied in real time using Seafloor Information Software (SIS). Sound speed at the multibeam sonar head was determined using the Reson SVP-70 probe throughout the cruise. Data from these two systems was monitored for consistency throughout the cruise, and are available in the NODC archives.

9. Sonar Data Quality Assessment and Data Processing

EM 302 MultibeamBathymetry Data

Okeanos Explorer's annualmultibeam patch test was conducted during EX-13-02 and the calculated offsets are provided below.

Offset Test	Line Numbers	Speed (kts)	Heading	Offset
Timing	0000_20130514_151828_EX-13-02_MB.all 0002_20130514_171416_EX-13-02_MB.all	4 8	35°	0 seconds
Pitch	0000_20130514_151828_EX-13-02_MB.all 0001_20130514_142318_EX-13-02_MB.all 0002_20130514_171416_EX-13-02_MB.all 0001_20130514_162553_EX-13-02_MB.all	4 4 8 8	35° 215° 35° 215°	-0.73°
Heading	0000_20130514_212142_EX-13-02_MB.all 0002_20130514_230116_EX-13-02_MB.all	7.5 7.5	35° 35°	-0.1°
Roll	0004_20130515_000238_EX-13-02_MB.all 0005_20130515_003546_EX-13-02_MB.all 0006_20130515_005226_EX-13-02_MB.all	8 8 8	40° 220° 220°	0°

Table 1. EM 302 transducer offset values determined during EX-13-02.

Throughout the cruise, multibeam data quality was monitored inrealtime by acquisition watchstanders. Expendable bathythermographs (XBTs) were conducted every two to four hours as necessary to maintain data quality. Ship speed was adjusted to maintain data quality as necessary.Line spacing was planned to ensure ¼ to ½ overlap between lines at all times. Cutoff angles in SIS were generally set to 75° on both the port and starboard sides in order to obtain maximum swath width.

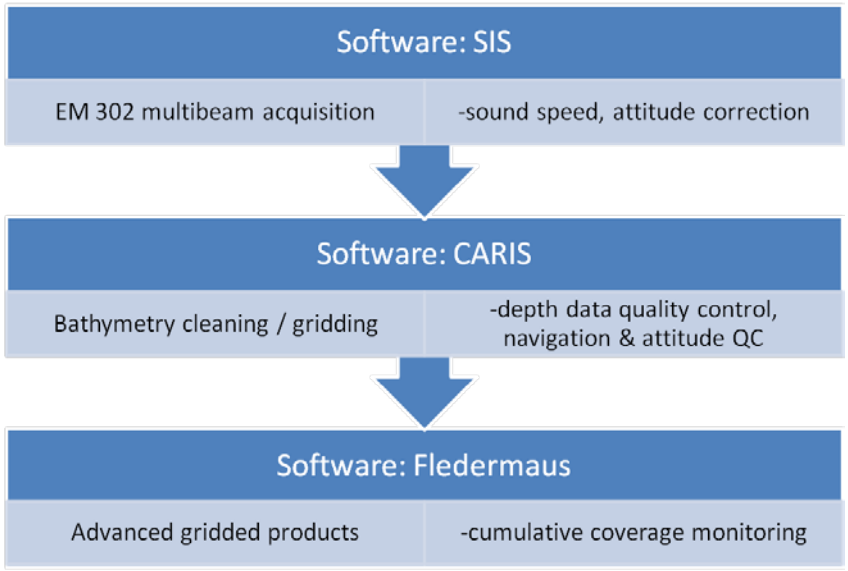

Figure 6. Shipboard multibeam data flow.

Raw multibeambathymetry data files were acquired by SIS, and were imported into CARIS. In CARIS, attitude and navigation data stored in each file were checked, and erroneous soundings were removed using CARIS Swath Editor and Subset Editor. Once per day, cleaned, gridded bathymetric data were exported to ASCII text files (y,x,z) at 50 meter cell size in WGS84 datum. The ASCII files were then used to create Fledermaus SD objects. These SD objects were then exported to geotiff and Google Earth KMZ, which were transferred to the shoreside FTP on a daily basis to enableshoreside scientist participation.

EM 302 MultibeamWater Column Backscatter Data Processing

All water column backscatter data files collected with the EM 302 multibeam sonar were reviewed daily for the presence of seeps using Fledermaus Midwater. Newly detected seeps were converted to point SD files and viewed in Fledermaus along with other datasets, including bathymetry, bottom backscatter, and oxidation reduction potential data.A table detailing all water column data processing is provided in the appendices section of this report.

EM 302 Multibeam Bottom Backscatter Data Processing

On an as needed basis, multibeam bottom backscatter data were imported into Fledermaus FMGT, and backscatter mosaics were generated. These mosaics aided in determining ROV dive target location based on relative acoustic backscatter of the seabed.

EM 302 Built In System Tests(BISTs)

Eight built in system tests (BIST) were run during the cruise to monitor the performance of the EM 302 sonar electronics. In all cases, the sonar performed well. A summary table of BIST results and a sample full BIST result is provided in the appendices of this report.

EM 302 MultibeamCrossline Analysis

Two crosslines were run during the cruise and are analyzed below according to the following method. Mainscheme lines were cleaned and gridded in CARIS, exported to ASCII xyz text files, imported into FledermausDMagic, and converted to an SD surface. The SD surface was then compared to the raw .all crossline file using the Fledermaus Crosscheck routine. Following are the EM 302 crossline analysis statistics from Fledermaus Crosscheck, showing multibeam data adherence to established IHO Order 1 and 2 survey standards.

The first crossline was 0008_20130710_224649_EX1304L1_MB.all and crossed mainscheme line 0101_20130715_031811_EX1304L1_MB.all.

-1945.352189 # Data Mean
-1945.148145 # Reference Mean
-0.204040 # Mean
-0.411230 # Median
8.776700 # Std. Deviation
-2063.08 -1763.07 # Data Z - Range
-2058.63 -1753.90 # Ref. Z - Range
-41.66 147.04 # Diff Z - Range
17.757378 # Mean + 2*stddev
17.964564 # Median + 2*stddev
25.291868 # Ord 1 Error Limit
44.749580 # Ord 2 Error Limit
14.590753 # Special Order Error Limit
0.000000 # Custom Error Limit
0.010019 # Ord 1 P-Statistic
0.000105 # Ord 2 P-Statistic
0.106382 # Special Order P-Statistic
1615 # Ord 1 - # Rejected
17 # Ord 2 - # Rejected

17148 # Special Order - # Rejected
1 # Order 1 Survey ACCEPTED
1 # Order 2 Survey ACCEPTED
0 # Special Order Survey REJECTED

The second crossline was 0261_20130724_084202_EX1304L1_MB.all and crossed mainscheme lines0252_20130724_003412_EX1304L1_MB.all, 0256_20130724_034115_EX1304L1_MB.all, and 0257_20130724_054117_EX1304L1_MB.all.

193551 # Number of Points of Comparison
-2299.448791 # Data Mean
-2293.275287 # Reference Mean
-6.173500 # Mean
-5.356200 # Median
11.198000 # Std. Deviation
-2987.74 -2044.18 # Data Z - Range
-2406.94 -2102.93 # Ref. Z - Range
-782.82 222.31 # Diff Z - Range
28.569559 # Mean + 2*stddev
27.752298 # Median + 2*stddev
27.342710 # Ord 1 Error Limit
48.377811 # Ord 2 Error Limit
15.773985 # Special Order Error Limit
0.000000 # Custom Error Limit
0.003890 # Ord 1 P-Statistic
0.001038 # Ord 2 P-Statistic
0.062175 # Special Order P-Statistic
1.000000 # Custom P-Statistic
753 # Ord 1 - # Rejected
201 # Ord 2 - # Rejected
12034 # Special Order - # Rejected
193551 # Custom - # Rejected
1 # Order 1 Survey ACCEPTED
1 # Order 2 Survey ACCEPTED
0 # Special Order Survey REJECTED
0 # Custom Survey REJECTED

EK 60 Singlebeam Sonar Data

EK 60 data was collected at all times during mapping operations and was valuablein confirming the location of seeps. Data were monitored in realtime for the presence of seeps but were not processed. All instances of seeps observed in EK 60 data were also observed in EM 302 water column data.

Knudsen 3260 Subbottom *Profiler Data*

Collection of Knudsen 3260 subbottom profiler data was prioritized during evening mapping operations. Data were monitored in realtime for data quality and for the presence of gas pockets and intrusions under the seabed.Data was collected over areas chosen in collaboration with scientists

from the U.S. Geological Survey. Subbottom profiler data was not processed on the ship .Below is an example of data collected at the submarine landslide near Veatch Canyon.

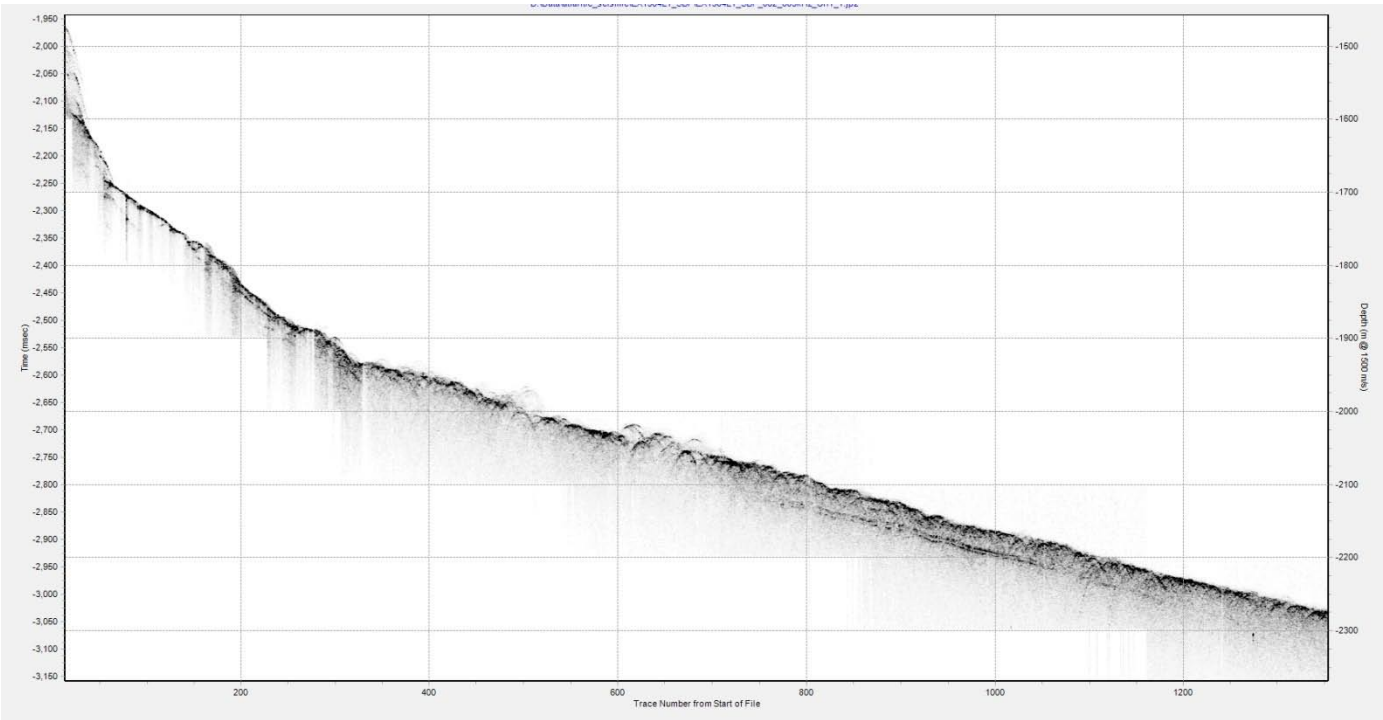

Figure 7. Screenshot of processed Knudsen subottom profiler data collected near Veatch Canyon. Data processing courtesy Jason Chaytor, USGS.

10. Telepresence

A 20mb/s ship-to-shore connection was available throughout the cruise.

The 4-panel multicast feed was transmitted to shore throughout the cruise and was available at http://oceanexplorer.noaa.gov/okeanos/media/exstream/exstream.html.

11. Data Archival Procedures

All mapping data collected by *Okeanos Explorer*are archived and publically available within 90 days of the end of each cruise via the National Geophysical Data Center's (NGDC) online archives. Data can be accessed via the following websites (last accessed 01/13/14):

- the NGDC Bathymetry Data Viewer at http://maps.ngdc.noaa.gov/viewers/bathymetry/
- the NGDC Geophysical Survey Data Viewer at http://maps.ngdc.noaa.gov/viewers/geophysics/
- the NGDC Multibeam Survey List at http://www.ngdc.noaa.gov/nndc/struts/results?op_0=l&v_0=&op_1=l&v_1=&t=101378&s=300&d=21&d=411&d=79

The complete EX-13-04 Leg 1*Okeanos Explorer* data management plan for mapping data is provided in the appendices of this report.

12. Cruise Calendar

All times listed are in UTC. Local ship time was -4 hours from UTC.

July 2013						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
7 Mapping mission personnel arrive at ship.	8 Depart dock for working grounds; overnight transit mapping.	9 Evening/overnight mapping.	10 Subbottom data collection over submarine landslide near Veatch Canyon.	11 2 CTD casts; overnight seep mapping.	12 Subbottom data collection over ROV Dive 03 site; shallow canyon head development.	13 1 CTD cast; overnight mapping ACUMEN holidays.
14 1 CTD cast; overnight transit mapping.	15 1 CTD cast; overnight shallow water shelf edge mapping, ACUMEN multibeam holiday mapping, subbottom data collection until 0200.	16 1 CTD cast with water samples; overnight mapping, subbottom data collection until 0200.	17 1 CTD cast; overnight multibeam mapping, subbottom data collection until 0200.	18 1 CTD cast with water samples; overnight multibeam mapping.	19 CTD cast with water samples; overnight multibeam mapping, subbottom data collection until 0200.	20 1 CTD cast; overnight multibeam mapping, subbottom lines until 0200.
21 Conducted telepresence event for National Ocean Exploration Forum, 2013 in Long Beach, CA. ; no CTD; mapping: seep confirmation, transit to 7/22 dive; SBP until 0200.	22 1 CTD with no water samples; evening subbottom data collection; overnight ACUMEN multibeam bottom backscatter reshoots.	23 1 CTD with no water samples; evening subbottom data collection; Block Canyon mapping	24 Transit mapping en route to port. Sonars secured when 50 m depth reached.	25 In port, NYC.		

13. Daily Cruise Log

All timeslistedare local ship time, which was -4 hours from UTC.

July 8, 2013

The ship departed from dock in North Kingston, Rhode Islandat approximately 1200 and commenced transit towards the first planned ROV dive of the cruise, located east of Block Canyon. Crew and mission personnel spent the day training new personnel and preparing systems for operation.

A BIST was run in Narragansett Bay and all tests passed. Noise levels were high in the high 60's to low 70's dB due to shallow water and bay conditions, and will be monitored. Transit mapping was conducted enroute to the first dive location and multibeam data quality was high. New mapping personnel were trained overnight. The EK 60 would not ping until an old image of the computer was installed.

July 9, 2013
The first set of daily multibeam products were sent to shore. Overnight, transit mapping and ACUMEN holiday fill lines were conducted. A BIST was conducted and all tests passed. RX Noise levels were back down in the 40's dB range, which is normal. New mapping watchstander training continued.

A CTD cast was conducted in the evening to collect CTD and *in situ* sensor data over the ROV dive site. Water samples were collected and frozen for post-cruise nutrient analysis by the New England Fisheries Science Center (NEFSC).

July 10, 2013
All TX36 cables were checked for connectivity per Kongsberg suggestion for troubleshooting what appears to be single ping drops at time of line switch. The ping drops are seen in CARIS after raw data are converted and gridded data in BASE surfaces, so it may be an artifact of the conversion or gridding process.Fledermaus was upgraded to 7.3.4c on the computer MBPROC3 to work with processed multibeam grids created in preparation for the cruise.A long subbottom line was run heading offshore over a submarine landslide south of Veatch Canyon.Data quality from all sonars has been high.Training of new personnel is ongoing.

July 11, 2013
Following today's ROV dive, two CTD casts were conducted. One cast was conducted directly overtop an area where chemosynthetic communities and hydrates were seen during the dive; water samples were collected for nutrient analysis. A second cast was conducted about 2 kilometers off-site; no water samples were collected. All *in situ* sensors have been added to the CTD (LSS, DO, ORP) and are functioning properly.

Evening and overnight survey operations focused on confirming the seeps at three seep sites discovered in 2012. It was determined that at both sites, the previously detected seeps were no longer active, and new sites nearby (~10 to 90 meters) were showing active seeps. Geographical locations of the new seeps were provided to onboard scientists to guide the 7/12/13 dive towards the newly detected seeps. Development lines were collected between Veatch and Shallop Canyon heads. Multibeam data quality was high.

July 12, 2013
Evening survey operations focused on subbottom data collection at the 7/11 seep dive location ("New England Seep 3") in collaboration with USGS Hydrates Project; subbottom data quality was excellent. Overnight survey operations focused on development of shallow water area between Dogbody and Shallop Canyon heads. Multibeam data quality was high.

July 13, 2013
A CTD cast was conducted in the evening in deep water at Hydrographer Canyon. Water samples were collected for later nutrient analysis.Overnight mapping operations focused on recollecting

ACUMEN data over areas of poor bottom backscatter data quality between Hydrographer and Veatch Canyons.

July 14, 2013
Telnet BIST tests numbers 30 - 36 were run on the EM 302. Test results were positive with only 10 of 1728 elements showing high Z values.

Following the ROV dive a CTD cast was conducted at approximately the same location as the starting point of ROV dive. No water samples were collected; all *in situ* sensors are installed and working properly. Overnight mapping operations focused on recollecting multibeam data in areas of poor bottom backscatter quality. Multibeam data quality was high.

July 15, 2013
Following the ROV dive a CTD cast was conducted at approximately the same location as the starting point of ROV dive. No water samples were collected; all *in situ* sensors are installed and working properly. Overnight mapping operations focused on development of shallow water area between Atlantis and Veatch Canyons, and filling multibeam holidays in ACUMEN coverage.

July 16, 2013
Following the ROV dive a CTD cast was conducted at approximately the same location as the starting point of ROV dive. Water samples were collected to 500meters. Overnight mapping operations focused on multibeam holiday and subbottom lines over Atlantis Canyon. Data quality from all sonars was high.

July 17, 2013
Overnight mapping operations focused on multibeam holiday and subbottom lines in the vicinity of Atlantis Canyon.

ACTD cast was conducted over today's dive site. No water samples were collected.

July 18, 2013
Overnight mapping operations focused on ACUMEN multibeam holidays between Block and Alvin Canyons. Subbottom data are being regularly collected until 0200 (7/19 UTC) every evening.

A CTD was conducted at the ROV dive site and included water sample collection for later nutrient analysis by NEFSC.

July 19, 2013
Transit mapping operations were conducted overnight en route to tomorrow's dive site, including filling in ACUMEN multibeam holidays and conducting water column data overtop of New England Seep 1, where the multibeam confirmed detection of several possible seeps. Subbottom data continues to be acquired until 0200 (7/20 UTC).

A CTD was conducted at the ROV dive site and included water sample collection for later nutrient analysis by NEFSC.

July 20, 2013

Overnight mapping operations focused on subbottom and multibeam data collection over the landslide adjacent to Veatch Canyon. Weather conditions deteriorated in the evening and data quality deteriorated on all sonars. Overnight lines were planned to attempt to maximize data quality and ship's ride.Subbottom data continues to be acquired until 0200 (7/21 UTC).

July 21, 2013
Overnight mapping operations focused on confirming the presence of seeps at today's dive location and transit multibeam mapping en route to tomorrow's dive site at Block Canyon. Data quality was high.Subbottom data continues to be acquired until 0200 (7/22 UTC).

July 22, 2013
Evening mapping operations focused on collecting a single subbottom line between Block and McMaster Canyons until 0200 (7/23 UTC). Large amounts of tightly spaced lobster traps prevented shallow water continental shelf coverage development. Multibeam data collected focused on reshooting areas of poor bottom backscatter data quality in previous ACUMEN coverage.

July 23, 2013
A CTD cast was conducted over today's dive site. No water samples were collected. Evening mapping operations focused on collecting multibeam data over a landslide near Block Canyon, extending previous ACUMEN coverage offshore. Data quality was high. Subbottom data continues to be acquired until 0200 (7/24 UTC).

July 24, 2013
Transit mapping data was collected until midnight when the ship reached approximately 50 meters water depth. A summary map is being produced showing ACUMEN bathy, ROV dive and CTD locations.

July 25, 2013
Okeanos Explorer pulled into Pier 36 in New York, NY at approximately 1600 UTC. Onboard personnel were busy wrapping up the cruise, cleaning up spaces, finalizing cruise documentation and preparing for upcoming ship tours in port.A summary map was produced showing ACUMEN bathy, ROV dive and CTD locations.

14. References

The 2013 Survey Readiness Report can be obtained by contacting NOAA Ship *Okeanos Explorer* at ops.explorer@noaa.gov or the mapping team at oar.oer.exmappingteam@noaa.gov.

EX-13-04 Leg 1 Cruise Instructions can be obtained by contacting NOAA Ship *Okeanos Explorer* at ops.explorer@noaa.gov.

Sandwell, D. T., and W. H. F. Smith, Global marine gravity from retrackedGeosat and ERS-1 altimetry: Ridge Segmentation versus spreading rate, J. Geophys. Res., 114, B01411, doi:10.1029/2008JB006008, 2009.

15. Appendices

Appendix A: EX-13-04 Legs 1 and 2 Data Management Plan

Document Purpose
This document is an addendum to the overarching Okeanos Explorer FY13 Data Management Plan (EX_FY13_DMP.pdf) and is specific to the EX-13-04 mission entitled "Northeast U.S. Canyons Exploration" For more detailed information on the data management effort for the Okeanos Explorer in FY13, please refer to that document.

General Description of the Data to be Managed
EX1304 will employ the new 6,000 meter ROV and the camera sled Seirios to explore some targeted areas in the Northeast U.S. Canyons over two legs: July 8-25 and July 31-August 17. 24-hour operations, including multibeam mapping, ROV operations, and CTD/rosette deployment will be conducted. All data will be fully processed according to OER standard onboard procedures and will be archived with the NOAA National Data Centers.Data management procedures are fully documented in the data management plan for the *Okeanos Explorer* for the FY13 field season (EX_FY13_DMP.pdf)

- Name of Dataset
  - : "EX1304: Northeast U.S. Canyons Exploration"
- Mission Specific Keywords:
  - Place Specific:
    - New England Seamount Chain
    - Western North Atlantic Ocean
    - Mytilus Seamount
    - Block Canyon
    - Alvin Canyon
    - Atlantis Canyon
    - Hydrographer Canyon
    - Veatch Canyon
    - Oceanographer Canyon
    - Lydonia Canyon
    - Powell Canyon
    - Munson Canyon
    - Nygren Canyon
    - Heezen Canyon
    - Chebacco Canyon

  - Theme Specific:
    - Multibeam
    - Multibeam sonar
    - Multi-beam sonar
    - Sub-bottom profile
    - Mapping survey
    - Multibeam backscatter

        - Water column backscatter
        - Singlebeam sonar
        - Singe beam sonar
        - Single-beam sonar
        - Sub-bottom profile mapping
        - ACUMEN
        - Atlantic Canyons Undersea Mapping Expedition
        - Extended Continental Shelf
        - ECS
        - Continental shelf mapping
        - USGS Marine Hazards
        - Gas seeps
        - Landslide features
        - Deep sea corals
        - Underwater cultural heritage
        - Deep Discoverer
        - Seirios

- Summary Description:

EX-13-04 efforts complement and continue the 2012 Atlantic Canyons Undersea Mapping Expeditions (ACUMEN). The 2012 series of five ACUMEN cruises (NOAA Ships *Okeanos Explorer, Ferdinand Hassler and Henry B. Bigelow*), and two*Okeanos Explorer* cruises since then gathered baseline information on deep water canyons off the northeastern U.S. seaboard, mapping along the continental shelf and slope from Virginia to the northeastern boundary of the U.S. Exclusive Economic Zone (EEZ). These mapping operations provide the basis for preliminary target selection, and enable EX-13-04 Legs I and II to commence the next steps in systematic ocean exploration, investigating deep water areas in and along the northeast canyons off the U.S. East Coast.

- Temporal Bounds:
    - Leg I: July 8 – July 25, 2013
    - Leg II: July 31 – August 17, 2013
- Spatial Bounds:
    - Northern:41.5
    - Southern:39
    - Western: -72
    - Eastern: -66
- Data Type Collections for Preservation/Stewardship:
    - Underwater Video – capture of full-resolution underwater video in several resolutions from the 6,000 meter ROV and the Seirios camera sled
    - Multibeam Bathymetry – continuous collection during the duration of the expedition.

    - Bottom Backscatter – continuous collection during the entire duration of the expedition
    - Water Column Backscatter – continuous collection during the entire duration of the expedition
    - Scientific Computing System (SCS) output – continuous collection of navigational, meteorological, integrated oceanographic sensor data
    - CTD / Rosette – casts will be conducted as needed to guide science operations
    - XBT – casts will be conducted at an interval defined by prevailing oceanographic conditions, but not to exceed 6 hours. Casts will collect water temperature at depth for sound velocity calculations to maintain multibeam data quality
    - Knudsen CHIRP 3260 –sub-bottom profiler data collected between 1000 and 1800 each day
    - EK60 – single beam sonar for water column features during the entire duration of the expedition
- Data Product/Product Collections for Preservation/Stewardship:
    - Gridded bathymetry (.txt)
    - Gridded bathymetric image (.tif)
    - Fledermaus gridded bathymetry imagery (.sd)
    - Fledermaus gridded backscatter imagery (.sd)
    - Fledermaus multi-layer image file (.scene)
    - Google Earth gridded bathymetry (.kml)
    - ArcView gridded bathymetry (.asc)
    - SCS data output in NetCDF
    - Highlight Videos
    - Final Mapping Summary document
    - Final Cruise Summary document
- Volume of Data Expected
    - The volume of data expected from this cruise is approximately 6 TB per leg including full-resolution video. Without the full-resolution video, the total volume of data expected is 650 GB.
- Personally Identifiable Information (PII) concerns
    - No PII will be included in these data.

Points of Contact

- Overall Point of Contact (POC) for the data:
    - Expedition Coordinator: Kelley Elliott, Kelley.Elliott@noaa.gov
    - Data Acquisition: EX Mapping Team: oar.oer.exmappingteam@noaa.gov
    - Data Management: OER Data Management Team (oer.info.mgmt@noaa.gov)
- Responsible for Data Quality:
    - Seafloor mapping and water column data:
      EX Mapping Team: oar.oer.exmappingteam@noaa.gov
    - SCS data: Office of Marine and Aviation Operations (OMAO): Lt. Laura Gallant, Okeanos Explorer Operations Officer (Ops.Explorer@noaa.gov)

- Responsible for data documentation and metadata activities:
    - National Coastal Data Development Center (NCDDC); OER Data Management Team (oer.info.mgmt@noaa.gov)
- Responsible for the data storage and data disaster recovery activities:
    - NOAA National Data Centers; National Oceanographic Data Center (NODC), National Geophysical Data Center (NGDC), NOAA Central Library (NCL)
- Responsible for ensuring adherence to this data management plan, including resources are made available to implement the DMP:
    - Data Acquisition: Kelley Elliott, Expedition Coordinator
    - Data Acquisition: EX Mapping Team, oar.oer.exmappingteam@noaa.gov
    - Data Acquisition: Lt. Laura Gallant, OMAO, Okeanos Explorer Operations Officer
    - Data Management: OER Data Management Team

Data Stewardship

- What quality control procedures will be employed?
    - Quality control procedures for the data from the Kongsberg EM302 is handled at UNH CCOM/JHC. Raw (level-0) bathymetry files are cleaned/edited into new data files (level-1) and converted to a variety of products (level-2).
    - Data from sensors monitored through the SCS are archived in their native format and are not quality controlled.
    - Data from XBT firings are archived in their native format and are not quality controlled.
- What is the overall lifecycle of the data from collection or acquisition to making it available to customer?
    - All ship data from this mission is expected to be archived and accessible within 60-90 days post-mission.
    - METOC data from the SCS are converted in a post-mission model into archive-ready compressed NetCDF3 format and stored within the NCDDC THREDDS open-access server.
    - CTD data from casts are processed in a post-mission model and converted into archive-ready compressed NetCDF3 format and stored within the NCDDC THREDDS open-access server.

Data Documentation

- An ISO format metadata record to document the mission will be generated during pre-cruise planning and published in an OER catalog for public discovery and access. Documentation templates will be provided for post-mission products with references back to the overall mission metadata documents. Data collections and products will be documented with ISO or FGDC CSDGM metadata and published at the appropriate NOAA Data Center.
- ISO 19115-2 Geographic Information with Extensions for Imagery and Gridded Data will be the metadata standard employed.

Data Sharing

- All data recorded, observed, generated or otherwise produced on the *Okeanos Explorer* are considered non-proprietary and will be made available to the public as soon as possible after a period of due diligence in performing quality assurance and data documentation procedures.

Initial Data Storage and Protection

- Data are recorded and stored on NOAA shipboard systems compliant with NOAA IT procedures. Data are moved from ship to shore using a variety of standard, documented data custody transfer procedures. Data are transferred to NOAA data centers using digital and physical data transfer models depending upon data volume.

Long-Term Archiving and Preservation

- Data from this mission will be preserved and stewarded through the NOAA National Data Centers. Refer to the *Okeanos Explorer* FY13 Data Management Plan (EX_FY13_DMP.pdf) for detailed descriptions of the processes, procedures, and partners involved in this collaborative process. Appendix A has an excerpt from EX_FY13_DMP.pdf) that illustrates the data and product pipelines that will be employed for this mission.

Data Management Objectives

The DMT's common objectives for this mission are:

- Ensure the near real-time update of the *Okeanos Atlas* with
    - Ship track and hourly observations received via email.
    - Daily logs pulled from URI through RSS feeds and links to related images on oceanexplorer.noaa.gov website.
    - Daily cumulative bathymetric image overlays received via URI SRS.
- Execute multibeam and oceanographic data pipelines according to the FY13 DMP (EX_FY13_DMP.pdf).
- Develop ISO metadata for collection-level and dataset-level records collected from the ship(multibeam, singlebeam sonar, sub-bottom profiler, XBT, CTD, EX METOC,)

Specific mission objectives include:

- Ensure that SOP and standard naming conventions are understood and being followed by ship personnel.
- Review and correct the list of camera names/codes/locations in the standard naming conventions documentation
- Ensure that the full-resolution video capture procedures are fully functioning and are capturing the video at the best possible resolution
- Develop a consistent, automated method for ensuring that video products are being generated
- Determine the status of the SCS data capture of the CTD sensor data on the submersibles and resolve any issues

- If additional sensors are added to the CTD, develop SOP to properly capture data in SCS

Expedition Principals for Data Management

Webb Pinner, OER Telepresence, EX Data and Information Lead, Webb.Pinner@noaa.gov
Brendan Reser, NCDDC, Okeanos Explorer Program Data Manager, Brendan.Reser@noaa.gov
Sharon Mesick, NCDDC, Federal Program Manager, Data Management IPT Chair, Sharon.Mesick@noaa.gov
Susan Gottfried, NCDDC, OER Data Management Coordinator, Susan.Gottfried@noaa.gov
Andy Navard, NCDDC, Okeanos Atlas Developer, Andrew.Navard@noaa.gov
Evan Robertson, NGDC, Geophysical Data Officer, Evan.Robertson@noaa.gov
Tom Ryan, NODC, Oceanographic Data Officer, Thomas.Ryan@noaa.gov
Anna Fiolek, NCL, Multimedia Librarian, Anna.Fiolek@noaa.gov

Oceanographic/Meteorological/Navigational Data Archive Pipeline

Data from hull-mounted and off-board oceanographic and meteorological (METOC) sensors; integrated oceanographic sensors from the submersibles; and navigational instrumentation on both the vessel and its submersibles are monitored through the ship's Scientific Computer System (SCS). Some of these data will be used in a near real-time mode to update the *Okeanos Atlas.* All of these data will be archived at the National Oceanographic Data Center (NODC) Marine Data Stewardship Division (MDSD) in Silver Spring, MD. A cruise-level and several collection level metadata records describing the data inventory to be archived at the NODC/MDSD will be included with the data submission.

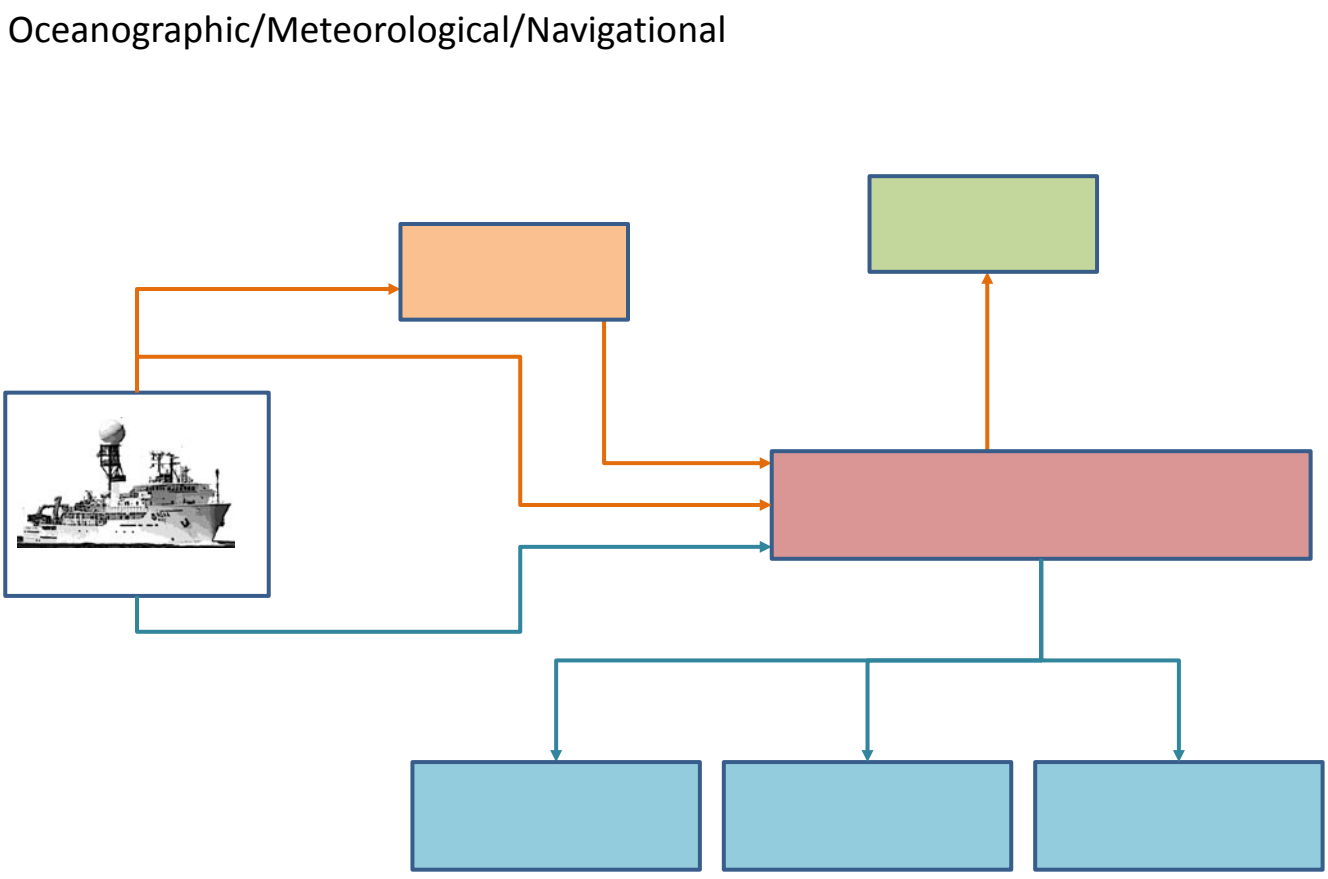

Fig 4: Okeanos Explorer Oceanographic Data Pipeline

Near Real-Time:

At periodic (currently fifteen minutes) intervals, an email from the ship to NCDDC is delivered with the ship's position and a snapshot of the SCS sensor suite.

As CTD casts are deployed, the results of the cast are included in the periodic synchronizations to the SRS.

The GIS team at NCDDC processes:

- CTD cast data into thinned profiles for comparison to World Ocean Atlas historical profiles in the same region and month. The thinned profiles are geo-located on the *Okeanos Atlas*. The corresponding temperature profile plot from the World Ocean Atlas is added for comparison.
- Ship track and sensor snapshot readings are geo-located on the *Okeanos Atlas*.

Post-Mission

All SCS data, including navigation and CTD/XBT cast data are delivered to NCDDC either via ftp or through a Collection Service.

SCS navigation data are used to apply a thinning algorithm and return an optimized thinned navigation track, which is added to the GeoDatabase for GIS applications.

Using the SCS configuration file, a header line is appended to each SCS ASCII data file.

All of the SCS data files are used to generate an archive-ready compressed NetCDF-3 formatted file.

The CTD Cast raw data are used to generate a second NetCDF-3 formatted file.

ncISO metadata records are generated for the NetCDF-3 files, and FGDC CSDGM metadata records are generated for the SCS ASCII files, the NAV data set, and the CTD and XBT data sets.

All data sets and the corresponding metadata are uploaded to the National Oceanographic Data Center (NODC), where they will be accessioned and archived.

The NetCDF3 file will be ingested into an NCDDC hosted Thematic Real-time Environmental Distributed Data Services (THREDDS) server for user discoverability and access.

Data Class	Instrument	Data Type	Format	Metadata Granularity	Archive Center
OCN/	All SCS	Meteorological and	ASCII	1 meta rec	NODC/MDSD

MET	monitored sensors	Oceanographic data sensors			
NAV	DGPS, CNAV	EX, ROV, and sled navigation	ASCII	1 meta rec	NODC/MDSD
ALL	All	Archive Ready	NetCDF-3	1 meta rec	NODC/MDSD

Table 3: Oceanographic/Meteorological/Navigational Metadata Granularity and Target Archive

Multibeam Survey Data Archive Pipeline

The multibeam survey data collected by bottom-looking and complementary sensors, data from the calibration instruments, and the products generated after the data is returned to and post-processed at UNH will be archived at the NGDC. These data will be accompanied with a collection level metadata record for the NGDC as well as individual metadata records for each raw (level-0) file, each edited (level-1) file and each data product (level-2) and report (level-3) generated as a result. In addition, the submission to NGDC will include the following:

- raw (level-0) mapping survey and water column data files,
- CTD and/or XBT profile data used for calibration in multibeam survey,
- post-processed, quality assured, and edited (level-1) data files,
- specific data products (level-2) from the Fledermaus software, including cumulative GeoTIF images, gridded bathymetric files, KML files, KMZ images, .sd output files, and an ArcGrid format, and
- comprehensive mapping survey data summary (level-3) report.

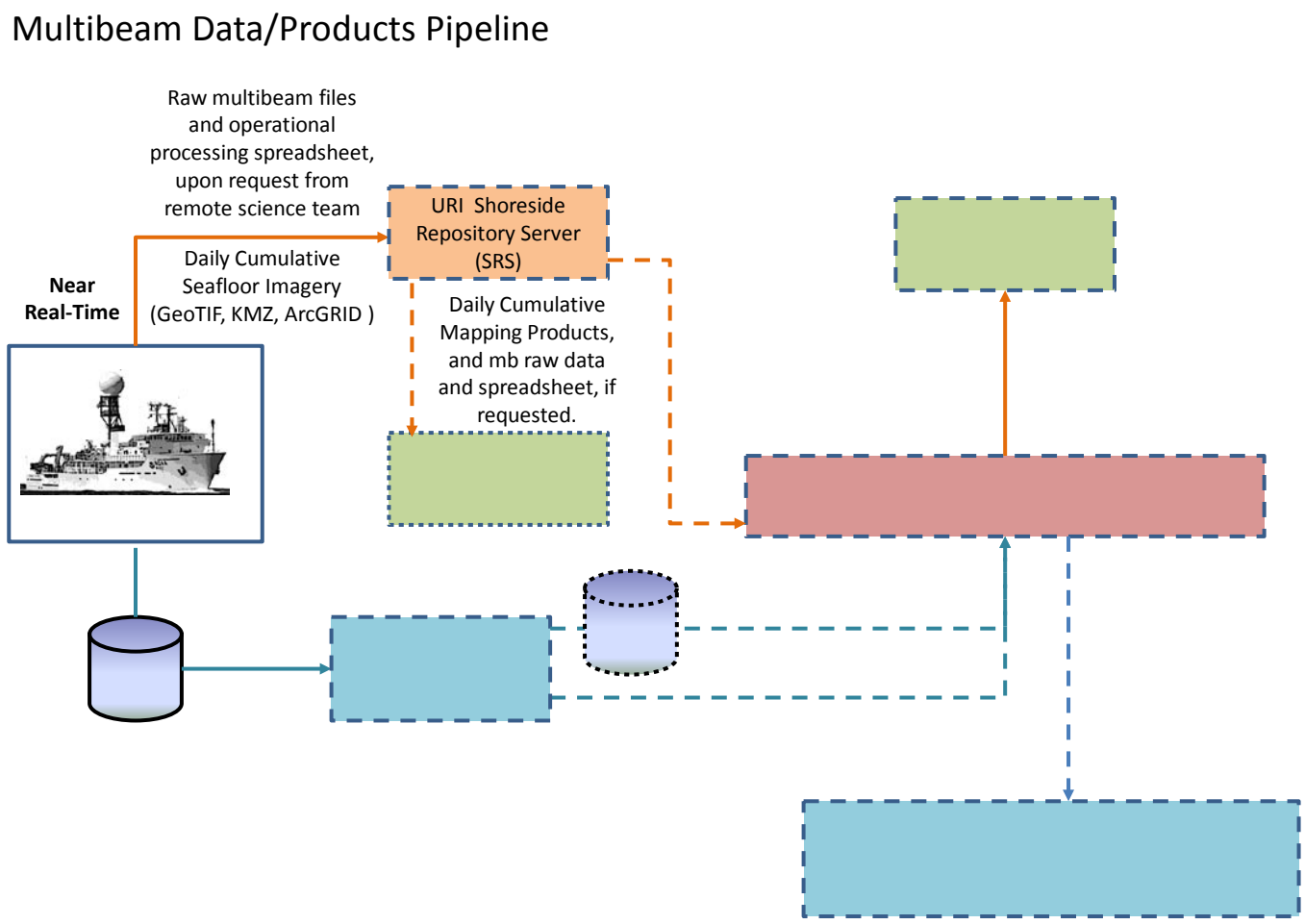

Fig. 5: Okeanos Explorer Multibeam Data Pipeline

Near Real-Time

If the remote science team has requested that some raw multibeam data be transferred in near real-time to the SRS, the raw data and a current copy of the processing spreadsheet will be transmitted during the Rsync process.

As operational GeoTIFF images are created, these will also be transmitted to the SRS by the Rsync process.

The data management team at NCDDC will pull the GeoTIFF images and the operational bathymetry processing spreadsheet for near real-time metadata generation. Participating scientists

wanting access to the raw multibeam in near real-time can pull the individual files with the metadata that provides operational and provisional processing steps and a disclaimer for non-QC status of the data.

Daily cumulative GeoTIFF images of the seafloor imagery will be geo-located on the Okeanos Atlas by the GIS team at NCDDC.

Post-Mission

All bottom-looking sensor data and complementary data (water column and sound velocity) are saved to a hard-drive. This hard-drive will be either brought back or shipped to the University of New Hampshire Center for Coastal and Ocean Mapping (UNH CCOM) for post-processing.

A full complement of multibeam data from a 30-day EX cruise on which the Kongsberg EM302 multibeam system runs continuously will produce 200-300 Gigabytes of raw multibeam (37.5% of total volume) and water column data (62.5% of total volume). At UNH, the mapping team will post-process the multibeam data through the following steps:

- The raw (level-0) data will be saved to the CCOM file servers, where they will be quality checked and post-processed.
- The edited level-0 data is saved as level-1 data filesin a non-proprietary format – ASCII xyz files (cleaned not gridded).
- The post-processing steps used to produce the level-1 data will be documented.
- Level-2 products will be generated from the level-1 data files.
- The post-processing steps used to produce the level-2 data products will be documented.
- The level-1 data, level-2 products, post-processing steps, and working data processing spreadsheets will be copied to the hard drive in a new folder. A processing spreadsheet for FY13 will contain the temporal and spatial limits of each file and any supplemental information documenting problems or issues that affected the quality of the data in that file.

In FY13, an attempt to use an ftp protocol or collection service to transfer the multibeam data and products from UNH is planned. A normal hard-drive delivery will remain in effect as a backup until the digital file transfer process is sufficiently tested and becomes normal operations.

At NCDDC, all multibeam related files will be post-processed through metadata generation procedures. Metadata will be generated for each individual survey track file (level-0 and -1), for accompanying CTD/XBT profile data sets, for composite xyz files, KMZs, GeoTIFs, png images, and Fledermaus output (level-2), and a set of data products and reports (level-3). Finalized data/metadata will be compressed and bundled using the Bagit software and delivered to NGDC via ftp protocol.

Data Class	Instrument	Data Type	Format	Metadata Granularity	Archive Center
GEO	Kongsberg EM302 (30 kHz)	Multibeam Bathymetry, Bottom Backscatter, Water Column Backscatter (proprietary format read into MBSystem)	.all, .wcd (proprietary)	1 meta rec per .all file in Multibeam Data folder and subfolders	NGDC
GEO	Simrad EK60	Singlebeam (time,depth)	.txt, (ASCII), .raw (proprietary)	Included in the SCS feed	TBD
GEO	Knudsen CHIRP 3260 (3.5 kHz)	Sub-bottom profile	.sgy, .kea, .keb (proprietary)	1 meta rec = Subbottom Profile Data folder	NGDC
OCN	SeaBird SBE-911plus	CTD Cast	.hex, .con (Proprietary); .cnv, .hdr, .bl, .jpg (processed)	1 meta rec = CTD folder	NGDC
OCN	Sippican MK-21 eXpendableBathyThermograph (XBT)	XBT	.edf (ASCII), .rdf (proprietary)	1 meta rec = XBT folder	NGDC
OCN	RESON	Sound Velocity (m/s)	TBD	1 meta rec = RESON folder	NGDC
OCN	Calculated	Sound Velocity (m/s)	.asvp (ASCII)	1 meta rec = Profile_Data/SVP or Profile_Data/ASVP	NGDC

Table 4:Multibeam Survey Metadata Granularity and Target Archive

Appendix B: Categorical Exclusion Letter

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
OCEANIC AND ATMOSPHERIC RESEARCH
Office of Ocean Exploration and Research
Silver Spring, MD 20910

July 2, 2013

MEMORANDUM FOR: The Record

FROM: John McDonough
Acting Director NOAA Office of Ocean Exploration and Research (OER)

SUBJECT: Categorical Exclusion for NOAA Ship *Okeanos Explorer* cruise EX304, Legs 1 & 2

NAO 216-6, Environmental Review Procedures, requires all proposed projects to be reviewed with respect to environmental consequences on the human environment. This memorandum addresses the NOAA Ship *Okeanos Explorer's* scientific sensors possible affect on the human environment.

Description of Projects
This project is part of the Office of Ocean Exploration and Research's "Science Program." It will conduct remotely operated vehicle (ROV) operations and ocean mapping activities designed to increase knowledge of the marine environment. This project is entitled "EX1304 Northeast U.S. Canyons Expedition" and will be led by Kelley Elliott, an Expedition Manager for NOAA OER. The work will be conducted in July and August at various locations along the Northeast U.S. Submarine Canyons and at Mytilus Seamount. A tandem 6,000 meter ROV system will be deployed and CTD rosette casts may be conducted during the expedition. The Kongsberg EM 302 multibeam (30 kHz) and the Kongsberg EK 60 singlebeam (18 kHz) will be operated during the project. A Knudsen 3260 Sub-Bottom Profiler (3.5 kHz) is expected to be occasionally operated during the cruise. Additionally, expendable bathythermographs (XBTs) will be conducted in conjunction with multibeam data collection. Multibeam mapping operations will be conducted at all times during the transit.

Effect of Projects
As expected with ocean research with limited time or presence in the marine environment, this project will not have the potential for significant impacts. Knowledgeable experts who are aware of the sensitivities of the marine environment will conduct the at-sea portions of this project.

Categorical Exclusion
This project would not result in any changes to the human environment. As defined in Sections 5.05 and 6.03.c.3 (a) of NAO 216-6, this is a research project of limited size or magnitude or

Appendix C: Survey of Opportunity: NASA Maritime Aerosols Network

Survey or Project Name

Maritime Aerosol Network

Points of Contact (POC)

Lead POC or Principle Investigator (PI & Affiliation)	*Supporting Team Members ashore*
POC: Dr. Alexander Smirnov	*Supporting Team Members aboard (if required)*

Activities Description(s)*(Include goals, objectives and tasks)*

The Maritime Aerosol Network (MAN) component of AERONET provides ship-borne aerosol optical depth measurements from the Microtops II sun photometers. These data provide an alternative to observations from islands as well as establish validation points for satellite and aerosol transport models. Since 2004, these instruments have been deployed periodically on ships of opportunity and research vessels to monitor aerosol properties over the World Oceans.

Appendix D: EM 302 Processing Parameters

```
#// Database Parameters

#// Seafloor Information System
#// Kongsberg Maritime AS
#// Saved:  2013.06.06 05:04:08

#// Build info:
#* SIS:                [Version: 3.9.2, Build: 187,
DBVersion 20.0 CD generated: Thu Sep  6
12:42:32 2012]
[Fox ver = 1.6.40]
[dbver = 20, proc = 20.0]
[OTL = 4.0.-95]
[ACE ver = 5.8.3]
[Coin ver = 2.5.0]
[Simagever = 1.6.2a]
[Dime ver = DIME v0.9]
[STLPortver = 8.0]
[FreeTypever = 2.3.7]
[TIFF ver = 3.9.2]
[GeoTIFFver = 1250]
[GridEnginever = 3.0.0]

#* Language            [3] #// Current language, 1-
Norwegian, 2-German,3-English, 4-
Spanish|Remember to restart SIS after a change.
German is currently not available.

#* Type                [302]
#* Serial no.          [101]
#* Number of heads     [2]
#* System descriptor    [50331648] #// 03000000

#//
************************************************************
************
#{ User comment #//


#} User comment

#//
************************************************************
************

#//
************************************************************
************
#// Installation parameters

#{ Input Setup #// All Input setup parameters

#{ COM1 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #* Baud rate:          [9600]
        #* Data bits           [8]
        #* Stop bits:          [1]
        #* Parity:             [NONE]
      #} Com. settings

#{ Position #// Position input settings.
        #* None               [1] [0]
        #* GGK                [1] [0]
        #* GGA                [1] [1]
        #* GGA_RTK            [1] [0]
        #* SIMRAD90           [1] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude           [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock          [1] [1]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [1] [0]
        #* DPT Depth          [1] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [1] [0]
        #* Height, special purp [1] [0]
        #* Attitude/Velocity   [0] [0]
      #} Input Formats

    #} COM1

#{ COM2 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #* Baud rate:          [19200]
        #* Data bits           [8]
        #* Stop bits:          [1]
        #* Parity:             [NONE]
      #} Com. settings

#{ Position #// Position input settings.
        #* None               [0] [1]
        #* GGK                [0] [0]
        #* GGA                [0] [0]
        #* GGA_RTK            [0] [0]
        #* SIMRAD90           [0] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude           [1] [1]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock          [0] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [0] [0]
        #* DPT Depth          [0] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity   [0] [0]
      #} Input Formats

    #} COM2

#{ COM3 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #* Baud rate:          [4800]
        #* Data bits           [8]
        #* Stop bits:          [1]
        #* Parity:             [NONE]
      #} Com. settings

#{ Position #// Position input settings.
        #* None               [1] [1]
        #* GGK                [1] [0]
        #* GGA                [1] [0]
        #* GGA_RTK            [1] [0]
        #* SIMRAD90           [1] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude           [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock          [0] [0]
        #* HDT Heading        [1] [1]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [1] [0]
        #* DPT Depth          [1] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [1] [0]
        #* Height, special purp [1] [0]
        #* Attitude/Velocity   [0] [0]
      #} Input Formats

    #} COM3

#{ COM4 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #* Baud rate:          [9600]
        #* Data bits           [8]
        #* Stop bits:          [1]
        #* Parity:             [NONE]
      #} Com. settings

#{ Position #// Position input settings.
        #* None               [1] [1]
        #* GGK                [1] [0]
        #* GGA                [1] [0]
        #* GGA_RTK            [1] [0]
        #* SIMRAD90           [1] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude           [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock          [0] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [1] [0]
        #* DPT Depth          [1] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [1] [0]
        #* Height, special purp [1] [0]
        #* Attitude/Velocity   [0] [0]
      #} Input Formats

    #} COM4

#{ UDP2 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
      #} Com. settings

#{ Position #// Position input settings.
        #* None               [1] [1]
        #* GGK                [1] [0]
        #* GGA                [1] [0]
        #* GGA_RTK            [1] [0]
        #* SIMRAD90           [1] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude           [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock          [0] [0]
        #* HDT Heading        [0] [0]
```

```
        #* SKR82 Heading       [0] [0]
        #* DBS Depth           [0] [0]
        #* DPT Depth           [0] [0]
        #* EA500 Depth         [1] [0]
#* ROV.depth          [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity    [0] [0]
      #} Input Formats

  #} UDP2

#{ UDP3 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
      #} Com. settings

#{ Position #// Position input settings.
        #* None              [0] [1]
        #* GGK               [0] [0]
        #* GGA               [0] [0]
        #* GGA_RTK           [0] [0]
        #* SIMRAD90          [0] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock         [0] [0]
        #* HDT Heading        [1] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [1] [0]
        #* DPT Depth          [1] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [1] [0]
        #* Height, special purp [1] [0]
        #* Attitude/Velocity    [0] [0]
      #} Input Formats

  #} UDP3

#{ UDP4 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
      #} Com. settings

#{ Position #// Position input settings.
        #* None              [0] [1]
        #* GGK               [0] [0]
        #* GGA               [0] [0]
        #* GGA_RTK           [0] [0]
        #* SIMRAD90          [0] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [1] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock         [0] [0]
        #* HDT Heading        [1] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [1] [0]
        #* DPT Depth          [1] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [1] [0]
        #* Height, special purp [1] [0]
        #* Attitude/Velocity    [0] [0]
      #} Input Formats

  #} UDP4

#{ UDP5 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
      #} Com. settings

#{ Position #// Position input settings.
        #* None              [0] [0]
        #* GGK               [0] [0]
        #* GGA               [0] [0]
        #* GGA_RTK           [0] [0]
        #* SIMRAD90          [0] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock         [0] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [0] [0]
        #* DPT Depth          [0] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity    [1] [1]
      #} Input Formats

#{ Ethernet Interface Settings #// Only relevant for
UDP5 on EM122, EM302, EM710, EM2040
currently
        #* VSU               [5602] #// UDP5:
        #* VSE               [2] #// 0= Not in use, 1=
Use legacy Ethernet, 2=Use Ethernet 2
        #* VSI               [192.168.2.20] #// IP addr.:
        #* VSM               [255.255.255.0] #// Net
mask:
      #} Ethernet Interface Settings

  #} UDP5

#{ UDP6 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
      #} Com. settings

#{ Position #// Position input settings.
        #* None              [0] [0]
        #* GGK               [0] [0]
        #* GGA               [0] [0]
        #* GGA_RTK           [0] [0]
        #* SIMRAD90          [0] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock         [0] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [0] [0]
        #* DPT Depth          [0] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity    [1] [0]
      #} Input Formats

#{ Ethernet Interface Settings #// Only relevant for
UDP6 on EM122, EM302, EM710, EM2040
currently
        #* VTU               [3000] #// UDP6:
        #* VTE               [0] #// 0= Not in use, 1=
Use legacy Ethernet, 2=Use Ethernet 2
        #* VSI               [192.168.2.20] #// IP addr.:
        #* VSM               [255.255.255.0] #// Net
mask:
      #} Ethernet Interface Settings

  #} UDP6

#{ MCAST1 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
      #} Com. settings

#{ Position #// Position input settings.
        #* None              [1] [1]
        #* GGK               [0] [0]
        #* GGA               [0] [0]
        #* GGA_RTK           [0] [0]
        #* SIMRAD90          [0] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock         [1] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [0] [0]
        #* DPT Depth          [0] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity    [1] [0]
      #} Input Formats

  #} MCAST1

#{ MCAST2 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
      #} Com. settings

#{ Position #// Position input settings.
        #* None              [1] [1]
        #* GGK               [1] [0]
        #* GGA               [1] [0]
        #* GGA_RTK           [1] [0]
        #* SIMRAD90          [1] [0]
      #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock         [1] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [0] [0]
        #* DPT Depth          [0] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth          [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity    [1] [0]
      #} Input Formats

  #} MCAST2

#{ MCAST3 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
```

```
        #// N/A
    #} Com. settings

#{ Position #// Position input settings.
        #* None              [1] [1]
        #* GGK               [1] [0]
        #* GGA               [1] [0]
        #* GGA_RTK           [1] [0]
        #* SIMRAD90          [1] [0]
    #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock          [1] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [0] [0]
        #* DPT Depth          [0] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth        [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity   [1] [0]
    #} Input Formats

  #} MCAST3

#{ MCAST4 #// Link settings.

#{ Com. settings #// Serial line parameter settings.
        #// N/A
    #} Com. settings

#{ Position #// Position input settings.
        #* None              [0] [1]
        #* GGK               [0] [0]
        #* GGA               [0] [0]
        #* GGA_RTK           [0] [0]
        #* SIMRAD90          [0] [0]
    #} Position

#{ Input Formats #// Format input settings.
        #* Attitude          [0] [0]
        #* MK39 Mod2 Attitude,  [0] [0]
        #* ZDA Clock          [1] [0]
        #* HDT Heading        [0] [0]
        #* SKR82 Heading      [0] [0]
        #* DBS Depth          [0] [0]
        #* DPT Depth          [0] [0]
        #* EA500 Depth        [0] [0]
#* ROV.depth        [0] [0]
        #* Height, special purp [0] [0]
        #* Attitude/Velocity   [1] [0]
    #} Input Formats

  #} MCAST4


#{ Misc. #// Misc. input settings.
    #* External Trigger    [1] [0]
#} Misc.

#} Input Setup

#{ Output Setup #// All Output setup parameters

  #* Log watercolumn to s [1] [1]

#{ Host UDP1 #// Host UDP1 Port: 16100

#{ Datagram subscription #//
        #* Depth             [0] [0]
        #* Raw range and beam a [0] [0]
        #* Seabed Image       [0] [0]
        #* Central Beams      [0] [0]
        #* Position           [0] [0]
        #* Attitude           [0] [0]
        #* Heading            [0] [0]
        #* Height             [0] [0]
        #* Clock              [0] [0]
        #* Single beam echosoun [0] [0]
        #* Sound Speed Profile  [0] [1]
        #* Runtime Parameters   [0] [1]
        #* Installation Paramet [0] [1]
        #* BIST Reply          [0] [1]
        #* Status parameters    [0] [1]
        #* PU Broadcast        [0] [0]
        #* Detection quality    [0] [0]
        #* Stave Display       [0] [0]
        #* Water Column        [0] [0]
        #* Internal, Range Data [0] [0]
        #* Internal, Scope Data [0] [0]
    #} Datagram subscription

  #} Host UDP1


#{ Host UDP2 #// Host UDP2 Port: 16101

#{ Datagram subscription #//
        #* Depth             [1] [1]
        #* Raw range and beam a [1] [1]
        #* Seabed Image       [1] [1]
        #* Central Beams      [1] [0]
        #* Position           [1] [1]
        #* Attitude           [1] [1]
        #* Heading            [1] [1]
        #* Height             [1] [1]
        #* Clock              [1] [1]
        #* Single beam echosoun [1] [1]
        #* Sound Speed Profile  [0] [1]
        #* Runtime Parameters   [0] [1]
        #* Installation Paramet [0] [1]
        #* BIST Reply          [1] [1]
        #* Status parameters    [0] [1]
        #* PU Broadcast        [1] [0]
        #* Detection quality    [1] [0]
        #* Stave Display       [0] [1]
        #* Water Column        [0] [1]
        #* Internal, Range Data [1] [0]
        #* Internal, Scope Data [1] [0]
    #} Datagram subscription

  #} Host UDP2


#{ Host UDP3 #// Host UDP3 Port: 16102

#{ Datagram subscription #//
        #* Depth             [0] [1]
        #* Raw range and beam a [0] [0]
        #* Seabed Image       [0] [0]
        #* Central Beams      [0] [0]
        #* Position           [0] [0]
        #* Attitude           [0] [1]
        #* Heading            [0] [0]
        #* Height             [0] [1]
        #* Clock              [0] [0]
        #* Single beam echosoun [0] [1]
        #* Sound Speed Profile  [0] [1]
        #* Runtime Parameters   [0] [0]
        #* Installation Paramet [0] [1]
        #* BIST Reply          [0] [0]
        #* Status parameters    [0] [0]
        #* PU Broadcast        [0] [0]
        #* Detection quality    [0] [0]
        #* Stave Display       [0] [0]
        #* Water Column        [0] [0]
        #* Internal, Range Data [0] [0]
        #* Internal, Scope Data [0] [1]
    #} Datagram subscription

  #} Host UDP3


#{ Host UDP4 #// Host UDP4 Port 16103

#{ Datagram subscription #//
        #* Depth             [1] [1]
        #* Raw range and beam a [1] [0]
        #* Seabed Image       [1] [0]
        #* Central Beams      [1] [0]
        #* Position           [1] [1]
        #* Attitude           [1] [0]
        #* Heading            [1] [0]
        #* Height             [1] [0]
        #* Clock              [1] [0]
        #* Single beam echosoun [1] [0]
        #* Sound Speed Profile  [1] [1]
        #* Runtime Parameters   [1] [1]
        #* Installation Paramet [1] [0]
        #* BIST Reply          [1] [0]
        #* Status parameters    [1] [0]
        #* PU Broadcast        [1] [0]
        #* Detection quality    [1] [0]
        #* Stave Display       [1] [0]
        #* Water Column        [1] [0]
        #* Internal, Range Data [1] [0]
        #* Internal, Scope Data [1] [0]
    #} Datagram subscription

  #} Host UDP4


#{Watercolumn #// Host UDP4 Port 16103

#{ Datagram subscription #//
        #* Depth             [1] [0]
        #* Raw range and beam a [1] [0]
        #* Seabed Image       [1] [0]
        #* Central Beams      [1] [0]
        #* Position           [1] [1]
        #* Attitude           [1] [1]
        #* Heading            [1] [1]
        #* Height             [1] [0]
        #* Clock              [1] [0]
        #* Single beam echosoun [1] [0]
        #* Sound Speed Profile  [1] [1]
        #* Runtime Parameters   [1] [1]
        #* Installation Paramet [1] [1]
        #* BIST Reply          [1] [0]
        #* Status parameters    [1] [0]
        #* PU Broadcast        [1] [0]
        #* Detection quality    [1] [0]
        #* Stave Display       [1] [0]
        #* Water Column        [1] [1]
        #* Internal, Range Data [1] [0]
        #* Internal, Scope Data [1] [0]
    #} Datagram subscription

  #} Watercolumn

#} Output Setup

#{ Clock Setup #// All Clock setup parameters
```

```
#{ Clock #// All clock settings.
    #* Source:           [1] #// External ZDA Clock
    #* 1PPS Clock Synch.  [1] #// Falling Edge
    #* Offset (sec.):     [0]
  #} Clock

#} Clock Setup

#{ Settings #// Sensor setup parameters

#{ Positioning System Settings #// Position related
settings.

#{ COM1 #// Positioning System Ports:
      #* P1S              [1] #// Serial
      #* P1T              [1] #// Datagram
      #* P1M              [0] #// Enable position
motion correction
      #* P1D              [0.000] #// Position delay
(sec.):
      #* P1G              [WGS84] #// Datum:
      #* P1Q              [1] #// Enable
      #* Pos. qual. indicator [] #//
    #} COM1

  #} Positioning System Settings

#{ Attitude Sensor Settings #// Attitude related
settings.

#{ COM2 #// Attitude Sensor Ports:
      #* MRP              [RP] #// Rotation
(POSMV/MRU)
      #* MSD              [0] #// Attitude Delay
(msec.):
      #* MAS              [1.00] #// Motion Sensor
Roll Scaling:
    #} COM2

#{ UDP5 #// Attitude Sensor Ports:
      #* MRP              [RP] #// Rotation
(POSMV/MRU)
      #* MSD              [0] #// Attitude Delay
(msec.):
      #* MAS              [1.00] #// Motion Sensor
Roll Scaling:
    #} UDP5

  #} Attitude Sensor Settings

#{ Active Sensors #//
    #* APS              [0] [COM1] #// Position:
    #* ARO              [2] [COM2] #// Attitude:
    #* AHE              [2] [COM2] #// Attitude:
    #* AHS              [2] [COM2] #// Heading:
    #* VSN              [1] [UDP5] #// Velocity:
  #} Active Sensors

#} Settings

#{ Locations #// All location parameters

#{ Location offset (m) #//

#{Pos, COM1: #//
      #* P1X            [0.00] #// Forward (X)
      #* P1Y            [0.00] #// Starboard (Y)
      #* P1Z            [0.00] #// Downward (Z)
    #} Pos, COM1:

#{Pos, COM3: #//
      #* P2X            [0.00] #// Forward (X)
      #* P2Y            [0.00] #// Starboard (Y)
      #* P2Z            [0.00] #// Downward (Z)
    #} Pos, COM3:

#{Pos, COM4/UDP2: #//
      #* P3X            [0.00] #// Forward (X)
      #* P3Y            [0.00] #// Starboard (Y)
      #* P3Z            [0.00] #// Downward (Z)
    #} Pos, COM4/UDP2:

#{ TX Transducer: #//
      #* S1X            [6.147] #// Forward (X)
      #* S1Y            [1.822] #// Starboard (Y)
      #* S1Z            [6.796] #// Downward (Z)
    #} TX Transducer:

#{ RX Transducer: #//
      #* S2X            [2.497] #// Forward (X)
      #* S2Y            [2.481] #// Starboard (Y)
      #* S2Z            [6.790] #// Downward (Z)
    #} RX Transducer:

#{ Attitude 1, COM2/UDP5: #//
      #* MSX            [0.00] #// Forward (X)
      #* MSY            [0.00] #// Starboard (Y)
      #* MSZ            [0.00] #// Downward (Z)
    #} Attitude 1, COM2/UDP5:

#{ Attitude 2, COM3/UDP6: #//
      #* NSX            [0.00] #// Forward (X)
      #* NSY            [0.00] #// Starboard (Y)
      #* NSZ            [0.00] #// Downward (Z)
    #} Attitude 2, COM3/UDP6:

#{ Waterline: #//
      #* WLZ            [4.42] #// Downward (Z)
    #} Waterline:

  #} Location offset (m)

#} Locations

#{ Angular Offsets #// All angular offset
parameters

#{ Offset angles (deg.) #//

#{ TX Transducer: #//
      #* S1R            [0.00] #// Roll
      #* S1P            [0.00] #// Pitch
      #* S1H            [359.98] #// Heading
    #} TX Transducer:

#{ RX Transducer: #//
      #* S2R            [0.00] #// Roll
      #* S2P            [0.00] #// Pitch
      #* S2H            [0.03] #// Heading
    #} RX Transducer:

#{ Attitude 1, COM2/UDP5: #//
      #* MSR            [0.00] #// Roll
      #* MSP            [-0.725] #// Pitch
      #* MSG            [-0.13] #// Heading
    #} Attitude 1, COM2/UDP5:

#{ Attitude 2, COM3/UDP6: #//
      #* NSR            [0.00] #// Roll
      #* NSP            [0.00] #// Pitch
      #* NSG            [0.00] #// Heading
    #} Attitude 2, COM3/UDP6:

#{ Stand-alone Heading: #//
      #* GCG            [0.00] #// Heading
    #} Stand-alone Heading:

  #} Offset angles (deg.)

#} Angular Offsets

#{ ROV. Specific #// All ROV specific parameters

#{ Depth/Pressure Sensor #//
    #* DSF              [1.00] #// Scaling:
    #* DSO              [0.00] #// Offset:
    #* DSD              [0.00] #// Delay (msec.):
    #* DSH              [NI] #// Disable Heave
Sensor
  #} Depth/Pressure Sensor

#} ROV. Specific

#{ System Parameters #// All system parameters

#{ System Gain Offset #//
    #* GO1              [0.0] #// BS Offset (dB)
  #} System Gain Offset

#{ Opening angles #//
    #* S1S              [0] #// TX Opening angle:
0.5
    #* S2S              [1] #// RX Opening angle: 1
  #} Opening angles

#{ Misc. parameters #//
    #* SNL              [0] #// Ship's noise level:
NORMAL
  #} Misc. parameters

#} System Parameters

#//
************************************************************
***********
#// Runtime parameters


#{ Sounder Main #//

#{ Sector Coverage #//

#{ Max. angle (deg.): #//
      #* MPA              [75] #// Port
      #* MSA              [75] #// Starboard
#} Max.angle (deg.):

#{ Max. Coverage (m): #//
      #* MPC              [5000] #// Port
      #* MSC              [5000] #// Starboard
#} Max. Coverage (m):

    #* ACM              [1] #// Angular Coverage
mode: AUTO
    #* BSP              [2] #// Beam Spacing: HD
EQDST

  #} Sector Coverage

#{ Depth Settings #//
    #* FDE              [3421] #// Force Depth (m):
    #* MID              [50] #// Min. Depth (m):
    #* MAD              [4500] #// Max. Depth (m):
    #* DSM              [2] #// Dual swath mode:
DYNAMIC
    #* PMO              [0] #// Ping Mode: AUTO
```

```
    #* FME              [1] #// FM disable
  #} Depth Settings

#{ Stabilization #//
#// For EM122, EM302, EM710, EM2040 this
block is now called Transmit Control in GUI.
    #* YPS              [1] #// Pitch stabilization
    #* MPK              [0.0] #// Min. Swath Dist.
(m)          Required minimum distance between
individual swats. 0 is off.
    #* TXA              [0.0] #// Along Direction
(deg.):

#{ Yaw Stabilization #//
      #* YSM            [2] #// Mode: REL. MEAN
HEADING
      #* YMA            [300] #// Heading:
      #* HFI            [1] #// Heading filter:
MEDIUM
    #} Yaw Stabilization

  #} Stabilization
#} Sounder Main

#{ Sound Speed #//

#{ Sound Speed at Transducer #//
    #* SHS              [0] #// Source SENSOR
    #* SST              [14700] #// Sound Speed
(dm/sec.):
    #* Sensor Offset (m/sec [0] #//
    #* Filter (sec.):    [4] #//
  #} Sound Speed at Transducer

#} Sound Speed

#{ Filter and Gains #//

#{ Filtering #//
    #* SFS              [2] #// Spike Filter Strength:
MEDIUM
    #* PEF              [0] #// Penetration Filter
Strength: OFF
    #* RGS              [1] #// Range Gate:
NORMAL
    #* PHR              [1] #// Phase ramp:
NORMAL
    #* SLF              [0] #// Slope
    #* AEF              [1] #// Aeration
    #* STF              [0] #// Sector Tracking
    #* IFF             [1] #// Interference
  #} Filtering

#{ Absorption Coefficient #//
    #* Source:          [0] #// Salinity. Note: This is
not a PU parameter.
    #* ABC              [6.847] #// 31.5 kHz
  #} Absorption Coefficient

#{ Normal incidence sector #//
    #* TCA              [6] #// Angle from nadir
(deg.):
  #} Normal incidence sector


#{ Mammal protection #//
    #* TXP              [0] #// TX power level (dB):
Max.
    #* SSR              [5] #// Soft startup ramp
time (min.):
  #} Mammal protection
#} Filter and Gains

#{ Data Cleaning #//
  #* Number of user rules [1]
  #* User rule 1        [STANDARD] #//

  #* Active rule:       [AUTOMATIC1] #//

#{ AUTOMATIC1 #//
    #* PingProc.maxPingCountRadius
[10]
    #* PingProc.radiusFactor
[0.050000]
    #* PingProc.medianFactor
[1.500000]
    #* PingProc.beamNumberRadius
[3]
    #* PingProc.sufficientPointCount
[40]
    #* PingProc.neighborhoodType
[Elliptical]
    #* PingProc.timeRule.use
[false]
    #* PingProc.overhangRule.use
[false]
    #* PingProc.medianRule.use
[false]
    #* PingProc.medianRule.depthFactor
[0.050000]
    #* PingProc.medianRule.minPointCount
[6]
    #* PingProc.quantileRule.use
[false]
    #* PingProc.quantileRule.quantile
[0.100000]
    #* PingProc.quantileRule.scaleFactor
[6.000000]
    #* PingProc.quantileRule.minPointCount
[40]
    #* GridProc.minPoints              [8]
    #* GridProc.depthFactor
[0.200000]
    #* GridProc.removeTooFewPoints
[false]
    #* GridProc.surfaceFitting.surfaceDegree
[1]
    #* GridProc.surfaceFitting.tukeyConstant
[6.000000]
    #* GridProc.surfaceFitting.maxIteration
[10]
    #* GridProc.surfaceFitting.convCriterion
[0.010000]
    #* GridProc.surfaceDistanceDepthRule.use
[false]
    #*
GridProc.surfaceDistanceDepthRule.depthFactor
[0.050000]
    #* GridProc.surfaceDistancePointRule.use
[false]
    #*
GridProc.surfaceDistancePointRule.scaleFactor
[1.000000]
    #* GridProc.surfaceDistanceUnitRule.use
[false]
    #*
GridProc.surfaceDistanceUnitRule.scaleFactor
[1.000000]
    #* GridProc.surfaceDistanceStDevRule.use
[false]
    #*
GridProc.surfaceDistanceStDevRule.scaleFactor
[2.000000]
    #* GridProc.surfaceAngleRule.use
[false]
    #* GridProc.surfaceAngleRule.minAngle
[20.000000]
    #* SonarProc.use
[false]
    #* SonarProc.gridSizeFactor
[4]
    #* SonarProc.mergerType
[Average]
    #* SonarProc.interpolatorType
[TopHat]
    #* SonarProc.interpolatorRadius
[1]
    #* SonarProc.fillInOnly
[true]
  #} AUTOMATIC1
#{ STANDARD #//
    #* PingProc.maxPingCountRadius
[10]
    #* PingProc.radiusFactor
[0.050000]
    #* PingProc.medianFactor
[1.500000]
    #* PingProc.beamNumberRadius
[3]
    #* PingProc.sufficientPointCount
[40]
    #* PingProc.neighborhoodType
[Elliptical]
    #* PingProc.timeRule.use
[false]
    #* PingProc.overhangRule.use
[false]
    #* PingProc.medianRule.use
[false]
    #* PingProc.medianRule.depthFactor
[0.050000]
    #* PingProc.medianRule.minPointCount
[6]
    #* PingProc.quantileRule.use
[false]
    #* PingProc.quantileRule.quantile
[0.100000]
    #* PingProc.quantileRule.scaleFactor
[6.000000]
    #* PingProc.quantileRule.minPointCount
[40]
    #* GridProc.minPoints              [8]
    #* GridProc.depthFactor
[0.200000]
    #* GridProc.removeTooFewPoints
[false]
    #* GridProc.surfaceFitting.surfaceDegree
[1]
    #* GridProc.surfaceFitting.tukeyConstant
[6.000000]
    #* GridProc.surfaceFitting.maxIteration
[10]
    #* GridProc.surfaceFitting.convCriterion
[0.010000]
    #* GridProc.surfaceDistanceDepthRule.use
[false]
    #*
GridProc.surfaceDistanceDepthRule.depthFactor
[0.050000]
    #* GridProc.surfaceDistancePointRule.use
[false]
    #*
GridProc.surfaceDistancePointRule.scaleFactor
[1.000000]
```

```
    #* GridProc.surfaceDistanceUnitRule.use
[false]
    #*
GridProc.surfaceDistanceUnitRule.scaleFactor
[1.000000]
    #* GridProc.surfaceDistanceStDevRule.use
[false]
    #*
GridProc.surfaceDistanceStDevRule.scaleFactor
[2.000000]
    #* GridProc.surfaceAngleRule.use
[false]
    #* GridProc.surfaceAngleRule.minAngle
[20.000000]
    #* SonarProc.use
[false]
    #* SonarProc.gridSizeFactor
[4]
    #* SonarProc.mergerType
[Average]
    #* SonarProc.interpolatorType
[TopHat]
    #* SonarProc.interpolatorRadius
[1]
    #* SonarProc.fillInOnly
[true]
  #} STANDARD

#{ Seabed Image Processing #//
    #* Seabed Image Process [1] [0]
  #} Seabed Image Processing
#} Data Cleaning

#{ Advanced param. #//
#} Advanced param.
```

Appendix E: EM 302 Built In System Test (BIST) Results

Saved: 2013.07.21 13:02:53

Sounder Type: 302, Serial no.: 101

Date Time Ser. No. BIST Result

2013.07.21 12:48:41.732 101 0 OK

Number of BSP67B boards: 2

BSP 1 Master 2.3 090702 4.3 070913 4.3 070913

BSP 1 Slave 2.3 090702 6.0 080902

BSP 1 RXI FPGA 3.6 080821

BSP 1 DSP FPGA A 4.0 070531

BSP 1 DSP FPGA B 4.0 070531

BSP 1 DSP FPGA C 4.0 070531

BSP 1 DSP FPGA D 4.0 070531

BSP 1 PCI TO SLAVE A1 FIFO: ok

BSP 1 PCI TO SLAVE A2 FIFO: ok

BSP 1 PCI TO SLAVE A3 FIFO: ok

BSP 1 PCI TO SLAVE B1 FIFO: ok

BSP 1 PCI TO SLAVE B2 FIFO: ok

BSP 1 PCI TO SLAVE B3 FIFO: ok

BSP 1 PCI TO SLAVE C1 FIFO: ok

BSP 1 PCI TO SLAVE C2 FIFO: ok

BSP 1 PCI TO SLAVE C3 FIFO: ok

BSP 1 PCI TO SLAVE D1 FIFO: ok

BSP 1 PCI TO SLAVE D2 FIFO: ok

BSP 1 PCI TO SLAVE D3 FIFO: ok

BSP 1 PCI TO MASTER A HPI: ok

BSP 1 PCI TO MASTER B HPI: ok

BSP 1 PCI TO MASTER C HPI: ok

BSP 1 PCI TO MASTER D HPI: ok

BSP 1 PCI TO SLAVE A1 HPI: ok

BSP 1 PCI TO SLAVE A2 HPI: ok

BSP 1 PCI TO SLAVE A3 HPI: ok

BSP 1 PCI TO SLAVE B1 HPI: ok

BSP 1 PCI TO SLAVE B2 HPI: ok

BSP 1 PCI TO SLAVE B3 HPI: ok

BSP 1 PCI TO SLAVE C1 HPI: ok

BSP 1 PCI TO SLAVE C2 HPI: ok

BSP 1 PCI TO SLAVE C3 HPI: ok

BSP 1 PCI TO SLAVE D1 HPI: ok

BSP 1 PCI TO SLAVE D2 HPI: ok

BSP 1 PCI TO SLAVE D3 HPI: ok

BSP 2 Master 2.3 090702 4.3 070913 4.3 070913

BSP 2 Slave 2.3 090702 6.0 080902

BSP 2 RXI FPGA 3.6 080821

BSP 2 DSP FPGA A 4.0 070531

BSP 2 DSP FPGA B 4.0 070531

BSP 2 DSP FPGA C 4.0 070531

BSP 2 DSP FPGA D 4.0 070531

BSP 2 PCI TO SLAVE A1 FIFO: ok

BSP 2 PCI TO SLAVE A2 FIFO: ok

BSP 2 PCI TO SLAVE A3 FIFO: ok

BSP 2 PCI TO SLAVE B1 FIFO: ok

BSP 2 PCI TO SLAVE B2 FIFO: ok

BSP 2 PCI TO SLAVE B3 FIFO: ok

BSP 2 PCI TO SLAVE C1 FIFO: ok

BSP 2 PCI TO SLAVE C2 FIFO: ok

BSP 2 PCI TO SLAVE C3 FIFO: ok

BSP 2 PCI TO SLAVE D1 FIFO: ok

BSP 2 PCI TO SLAVE D2 FIFO: ok

BSP 2 PCI TO SLAVE D3 FIFO: ok

BSP 2 PCI TO MASTER A HPI: ok

BSP 2 PCI TO MASTER B HPI: ok

BSP 2 PCI TO MASTER C HPI: ok

BSP 2 PCI TO MASTER D HPI: ok

BSP 2 PCI TO SLAVE A1 HPI: ok

BSP 2 PCI TO SLAVE A2 HPI: ok

BSP 2 PCI TO SLAVE A3 HPI: ok

BSP 2 PCI TO SLAVE B1 HPI: ok

BSP 2 PCI TO SLAVE B2 HPI: ok

BSP 2 PCI TO SLAVE B3 HPI: ok

BSP 2 PCI TO SLAVE C1 HPI: ok

BSP 2 PCI TO SLAVE C2 HPI: ok

BSP 2 PCI TO SLAVE C3 HPI: ok

BSP 2 PCI TO SLAVE D1 HPI: ok

BSP 2 PCI TO SLAVE D2 HPI: ok

BSP 2 PCI TO SLAVE D3 HPI: ok

Summary:

BSP 1: OK

BSP 2: OK

2013.07.21 12:48:44.583 101 1 OK

High Voltage Br. 1

TX36 Spec: 90.0 - 145.0

0-1 122.6

0-2 122.1

0-3 121.7

0-4 122.1

0-5 122.1

0-6 121.3

0-7 122.1

0-8 120.9

0-9 121.7

0-10 122.1

0-11 122.6

0-12 121.3

0-13 123.0

0-14 121.7

0-15 123.0

0-16 122.6

0-17 121.7

0-18 122.1

0-19 121.7

0-20 121.7

0-21 121.3

0-22 122.6

0-23 120.9

0-24 121.7

High Voltage Br. 2

TX36 Spec: 90.0 - 145.0

0-1 122.2

0-2 121.7

0-3 121.7

0-4 121.3

0-5 121.3

0-6 121.7

0-7 121.3

0-8 121.3

0-9 122.2

0-10 122.2

0-11 121.7

0-12 123.0

0-13 120.9

0-14 122.2

0-15 122.6

0-16 122.2

0-17 121.7

0-18 121.7

0-19 121.3

0-20 121.7

0-21 122.2

0-22 122.2

0-23 121.7

0-24 121.7

Input voltage 12V

TX36 Spec: 11.0 - 13.0

0-1 11.9

0-2 11.9

0-3 11.9

0-4 11.9

0-5 11.9

0-6 11.9

0-7 11.9

0-8 11.9

0-9 11.9

0-10 11.9

0-11 11.9

0-12 11.9

0-13 11.9

0-14 11.9

0-15 11.9

0-16 12.0

0-17 11.9

0-18 11.9

0-19 11.9

0-20 11.9

0-21 11.9

0-22 11.9

0-23 11.8

0-24 11.9

Digital 3.3V

TX36 Spec: 2.8 - 3.5

0-1 3.3

0-2 3.3

0-3 3.3

0-4 3.3

0-5 3.3

0-6 3.3

0-7 3.3

0-8 3.3

0-9 3.3

0-10 3.3

0-11 3.3

0-12 3.3

0-13 3.3

0-14 3.3

0-15 3.3

0-16 3.3

0-17 3.3

0-18 3.3

0-19 3.3

0-20 3.3

0-21 3.3

0-22 3.3

0-23 3.3

0-24 3.3

Digital 2.5V

TX36 Spec: 2.4 - 2.6
0-1 2.5
0-2 2.5
0-3 2.5
0-4 2.5
0-5 2.5
0-6 2.5
0-7 2.5
0-8 2.5
0-9 2.5
0-10 2.5
0-11 2.5
0-12 2.5
0-13 2.5
0-14 2.5
0-15 2.5
0-16 2.5
0-17 2.5
0-18 2.5
0-19 2.5
0-20 2.5
0-21 2.5
0-22 2.5
0-23 2.5
0-24 2.5

Digital 1.5V

TX36 Spec: 1.4 - 1.6
0-1 1.5
0-2 1.5
0-3 1.5
0-4 1.5
0-5 1.5
0-6 1.5
0-7 1.5
0-8 1.5
0-9 1.5
0-10 1.5
0-11 1.5
0-12 1.5
0-13 1.5
0-14 1.5
0-15 1.5
0-16 1.5
0-17 1.5
0-18 1.5
0-19 1.5
0-20 1.5
0-21 1.5
0-22 1.5
0-23 1.5
0-24 1.5

Temperature

TX36 Spec: 15.0 - 75.0
0-1 34.4
0-2 34.4
0-3 34.4
0-4 33.6
0-5 34.4
0-6 34.4
0-7 34.8
0-8 35.2
0-9 34.8
0-10 32.0
0-11 31.6
0-12 32.4
0-13 34.0
0-14 35.6
0-15 34.4
0-16 34.4
0-17 34.8
0-18 35.2
0-19 34.0
0-20 34.4
0-21 34.0
0-22 33.6
0-23 34.0
0-24 34.0

Input Current 12V

TX36 Spec: 0.3 - 1.5
0-1 0.6
0-2 0.5
0-3 0.5
0-4 0.5
0-5 0.5
0-6 0.5
0-7 0.6
0-8 0.5
0-9 0.6
0-10 0.5
0-11 0.6
0-12 0.6
0-13 0.6
0-14 0.6
0-15 0.6
0-16 0.5
0-17 0.8
0-18 0.7
0-19 0.6
0-20 0.6
0-21 0.7
0-22 0.5
0-23 0.6
0-24 0.6

TX36 power test passed

IO TX MB Embedded PPC Embedded PPC Download
2.11 One CPU1.13 Reduced Performance: 1 voice/Mar 5 2007/1.07 Jun 17 2008/1.11

TX36 unique firmware test OK

2013.07.21 12:48:44.733 101 2 OK
Input voltage 12V

RX32 Spec: 11.0 - 13.0
7-1 11.6
7-2 11.7
7-3 11.7
7-4 11.7

Input voltage 6V

RX32 Spec: 5.0 - 7.0
7-1 5.7
7-2 5.7
7-3 5.7
7-4 5.7

Digital 3.3V

RX32 Spec: 2.8 - 3.5
7-1 3.3
7-2 3.3
7-3 3.3
7-4 3.3

Digital 2.5V

RX32 Spec: 2.4 - 2.6
7-1 2.5
7-2 2.5
7-3 2.5
7-4 2.5

Digital 1.5V

RX32 Spec: 1.4 - 1.6
7-1 1.5
7-2 1.5
7-3 1.5
7-4 1.5

Temperature

RX32 Spec: 15.0 - 75.0
7-1 39.0
7-2 40.0
7-3 40.0
7-4 34.0

Input Current 12V

RX32 Spec: 0.4 - 1.5
7-1 0.7
7-2 0.7
7-3 0.7
7-4 0.6

Input Current 6V

RX32 Spec: 2.4 - 3.3
7-1 2.7
7-2 2.8
7-3 2.8
7-4 2.8

RX32 power test passed

IO RX MB Embedded PPC Embedded PPC Download
1.12 Generic1.14 GenericMay 5 2006/1.06 May 5 2006/1.07 Feb 18 2010/1.11

RX32 unique firmware test OK

2013.07.21 12:48:44.833 101 3 OK
High Voltage Br. 1

TX36 Spec: 90.0 - 145.0
0-1 122.6
0-2 122.1
0-3 121.7
0-4 122.1
0-5 122.1
0-6 121.3
0-7 122.1
0-8 120.9
0-9 122.1
0-10 122.1
0-11 122.6
0-12 121.3
0-13 123.0
0-14 121.7
0-15 123.0
0-16 122.6
0-17 121.7
0-18 122.1
0-19 121.7
0-20 121.7
0-21 121.7
0-22 122.6
0-23 120.9
0-24 121.7

High Voltage Br. 2

TX36 Spec: 90.0 - 145.0
0-1 122.2
0-2 121.7
0-3 121.7
0-4 121.3
0-5 121.3
0-6 121.7
0-7 121.3
0-8 121.3
0-9 122.2
0-10 122.2
0-11 121.7
0-12 123.0
0-13 120.5
0-14 122.2
0-15 122.6
0-16 122.2
0-17 121.7
0-18 121.7
0-19 121.3
0-20 121.7
0-21 122.2
0-22 122.6
0-23 121.7
0-24 121.7

Input voltage 12V

TX36 Spec: 11.0 - 13.0
0-1 11.9
0-2 11.9
0-3 11.9
0-4 11.9
0-5 11.9
0-6 11.9
0-7 11.9
0-8 11.9
0-9 11.9
0-10 11.9
0-11 11.9
0-12 11.9
0-13 12.0
0-14 11.9
0-15 11.9
0-16 12.0
0-17 11.9
0-18 11.9
0-19 11.9
0-20 11.9
0-21 11.9
0-22 11.9
0-23 11.8
0-24 11.9

RX32 Spec: 11.0 - 13.0
7-1 11.6
7-2 11.7
7-3 11.7
7-4 11.7

Input voltage 6V

RX32 Spec: 5.0 - 7.0
7-1 5.7
7-2 5.7
7-3 5.7
7-4 5.7

TRU power test passed

2013.07.21 12:48:44.983 101 4 OK
EM 302 High Voltage Ramp Test
Test Voltage:20.00 Measured Voltage: 19.00
PASSED
Test Voltage:40.00 Measured Voltage: 39.00
PASSED
Test Voltage:60.00 Measured Voltage: 59.00
PASSED
Test Voltage:80.00 Measured Voltage: 79.00
PASSED
Test Voltage:100.00 Measured Voltage: 100.00
PASSED
Test Voltage:120.00 Measured Voltage: 121.00
PASSED
Test Voltage:120.00 Measured Voltage: 121.00
PASSED
Test Voltage:100.00 Measured Voltage: 106.00
PASSED
Test Voltage:80.00 Measured Voltage: 85.00
PASSED
Test Voltage:60.00 Measured Voltage: 65.00
PASSED
Test Voltage:40.00 Measured Voltage: 45.00
PASSED

11 of 11 tests OK

2013.07.21 12:51:20.809 101 5 OK

BSP 1 RXI TO RAW FIFO: ok
BSP 2 RXI TO RAW FIFO: ok

2013.07.21 12:51:26.292 101 6 OK
Receiver impedance limits [600.0 1000.0] ohm
Board 1 2 3 4
1: 857.0 852.7 825.9 856.1
2: 831.4 856.8 826.9 859.7
3: 816.4 850.5 852.3 855.0
4: 842.4 836.8 843.2 851.2
5: 846.1 847.2 797.8 863.8
6: 854.0 855.9 836.0 865.5
7: 833.9 851.0 838.3 869.6
8: 843.2 845.0 854.6 845.6
9: 835.3 843.9 831.8 837.7
10: 818.1 855.7 788.9 853.8
11: 837.2 835.8 836.4 837.4
12: 845.2 825.7 843.7 851.7
13: 842.5 836.1 821.0 850.4
14: 826.5 839.3 859.0 854.4
15: 821.7 842.2 845.9 849.0
16: 848.6 829.7 853.1 844.8
17: 826.3 889.3 856.1 851.8
18: 845.3 845.0 859.7 859.6
19: 815.0 842.1 840.7 846.4
20: 830.1 868.6 851.5 853.7
21: 858.2 846.0 879.1 858.0
22: 878.0 850.1 840.3 857.9
23: 869.6 865.8 858.8 857.6
24: 881.6 882.0 874.5 868.0
25: 839.8 841.1 846.1 859.1
26: 842.2 831.6 850.3 853.6
27: 825.6 839.7 846.6 855.3
28: 814.9 838.6 821.9 854.3
29: 815.2 854.8 842.8 855.3
30: 852.9 833.6 845.1 856.7
31: 828.6 832.3 851.9 844.4
32: 851.5 876.6 855.4 858.4

Transducer impedance limits [250.0 2000.0] ohm
Board 1 2 3 4
1: 330.8 345.5 352.4 355.2
2: 345.7 348.6 355.2 357.6
3: 329.7 331.5 362.2 342.7
4: 336.6 350.0 373.8 349.2
5: 328.0 355.4 363.9 335.0
6: 317.4 340.1 345.7 348.6
7: 332.3 341.4 379.2 354.2
8: 323.5 334.0 354.7 354.9
9: 354.6 353.5 372.4 351.6
10: 349.2 345.4 370.8 345.9
11: 320.1 354.2 357.9 351.5
12: 333.5 359.9 355.6 342.0
13: 327.9 341.8 375.7 342.3
14: 356.2 341.4 366.8 336.2
15: 322.4 339.2 365.5 331.6
16: 322.5 351.4 368.4 335.9
17: 322.2 357.7 346.2 348.5
18: 337.2 342.8 354.0 351.9
19: 343.6 349.8 351.9 355.5
20: 341.4 339.3 349.9 335.9
21: 336.1 342.6 347.3 352.6
22: 348.2 354.7 365.7 344.6
23: 352.7 338.4 355.0 349.6
24: 350.2 353.6 346.2 334.5
25: 335.0 359.5 353.7 346.0
26: 343.7 366.3 359.5 346.9
27: 334.6 352.0 357.4 351.6
28: 352.3 362.2 360.4 333.6
29: 345.8 354.7 370.5 354.1
30: 325.3 342.5 344.0 364.5

31: 338.9 359.3 351.6 350.7
32: 329.9 352.6 348.8 359.7

Receiver Phase limits [-50.0 20.0] deg

Board	1	2	3	4
1:	-2.0	2.3	4.8	2.2
2:	1.4	-3.2	3.5	0.9
3:	3.7	-2.4	-0.9	0.0
4:	-0.7	1.9	1.1	0.5
5:	-0.9	0.6	6.1	-0.9
6:	-3.4	-2.8	0.2	-1.7
7:	2.1	0.0	2.9	-0.8
8:	-2.0	0.1	-3.6	1.0
9:	-0.2	2.8	3.0	2.1
10:	3.4	-2.4	7.5	-0.2
11:	-2.2	2.4	-0.9	3.2
12:	-0.8	2.5	-1.8	-0.9
13:	0.7	1.5	4.4	-0.7
14:	2.3	0.0	-0.6	-1.6
15:	1.5	-2.6	-0.4	0.3
16:	-2.1	3.0	-1.9	-1.4
17:	0.4	-3.3	-3.0	1.7
18:	-3.1	2.1	-3.3	-1.9
19:	2.3	2.0	-2.6	2.6
20:	1.9	-2.6	-1.2	1.0
21:	-0.6	2.3	-4.6	-1.8
22:	-2.7	-1.4	0.9	-1.4
23:	-0.2	-3.5	-1.0	-2.0
24:	-3.3	-3.0	-4.4	-3.1
25:	-0.3	1.9	1.2	0.4
26:	-0.9	4.8	-3.2	-0.2
27:	2.1	-1.3	-0.4	-0.5
28:	5.8	-1.0	1.7	-1.4
29:	2.8	1.0	0.4	0.3
30:	-2.8	0.7	-0.7	1.7
31:	1.2	1.7	-1.3	3.3
32:	-3.5	-4.5	-1.8	-0.4

Transducer Phase limits [-100.0 0.0] deg

Board	1	2	3	4
1:	-34.4	-37.7	-34.1	-33.4
2:	-35.6	-38.1	-31.9	-38.5
3:	-30.5	-40.6	-34.6	-35.7
4:	-38.0	-35.5	-37.4	-30.5
5:	-37.2	-39.8	-37.1	-32.5
6:	-35.9	-35.5	-35.2	-32.4
7:	-33.2	-38.3	-35.7	-33.5
8:	-35.9	-39.1	-41.4	-32.4
9:	-38.9	-35.3	-34.9	-34.1
10:	-40.6	-38.1	-28.3	-29.0
11:	-37.1	-38.2	-42.0	-31.3
12:	-34.8	-36.2	-43.7	-33.6
13:	-34.7	-41.4	-32.8	-36.8
14:	-36.3	-43.1	-35.3	-33.6
15:	-29.8	-44.9	-37.2	-25.6
16:	-37.7	-38.6	-36.0	-32.2
17:	-28.8	-37.1	-40.1	-30.5
18:	-32.8	-34.3	-38.3	-33.7
19:	-35.0	-36.1	-35.8	-32.9
20:	-32.9	-40.2	-40.7	-32.3
21:	-32.5	-37.6	-35.6	-32.8
22:	-35.7	-40.0	-31.3	-32.0
23:	-35.3	-42.2	-35.1	-30.6
24:	-36.1	-39.1	-39.1	-26.9
25:	-29.3	-34.7	-35.4	-31.9
26:	-40.1	-36.2	-34.6	-34.8
27:	-31.7	-37.4	-34.2	-34.3
28:	-35.8	-38.4	-33.5	-31.1
29:	-36.8	-40.0	-38.1	-31.2
30:	-33.9	-38.7	-37.7	-28.1
31:	-39.8	-40.2	-34.5	-24.6
32:	-40.2	-40.0	-35.5	-35.2

Rx Channels test passed

2013.07.21 12:51:54.461 101 7 OK
Tx Channels test passed

2013.07.21 12:54:35.587 101 8 OK
RX NOISE LEVEL

Board No:	1	2	3	4	
0:	47.3	41.5	40.4	42.3	dB
1:	45.6	41.1	40.2	43.0	dB
2:	44.2	42.0	40.8	42.7	dB
3:	42.4	40.2	39.8	41.3	dB
4:	42.4	42.2	41.2	43.4	dB
5:	41.9	41.4	41.7	42.3	dB
6:	41.7	41.6	41.6	40.0	dB
7:	40.6	41.0	41.4	41.0	dB
8:	40.6	41.7	41.0	41.8	dB
9:	41.1	40.2	41.2	41.7	dB
10:	41.5	40.8	41.7	41.1	dB
11:	40.8	40.8	41.3	41.8	dB
12:	41.1	41.9	42.1	40.1	dB
13:	40.5	41.2	41.7	41.3	dB
14:	40.3	41.0	41.5	40.6	dB
15:	40.8	40.9	41.4	42.1	dB
16:	38.7	40.7	40.3	40.6	dB
17:	41.6	40.5	40.1	40.7	dB
18:	40.6	40.6	39.9	41.1	dB
19:	40.5	39.9	39.4	39.9	dB
20:	40.4	41.2	41.0	41.9	dB
21:	41.0	40.4	41.9	41.5	dB
22:	41.6	40.0	41.4	43.1	dB
23:	41.3	41.3	41.6	41.5	dB
24:	41.0	40.6	41.7	42.8	dB
25:	40.6	41.7	41.1	41.6	dB
26:	41.1	40.8	41.8	42.3	dB
27:	40.8	40.4	40.9	43.7	dB
28:	41.2	41.4	42.0	44.0	dB
29:	40.3	40.4	40.6	44.1	dB
30:	39.9	40.8	41.4	46.1	dB
31:	40.2	41.4	42.0	49.4	dB

Maximum noise at Board 4 Channel 31 Level: 49.4 dB

Broadband noise test

Average noise at Board 1 41.8 dB OK
Average noise at Board 2 41.0 dB OK
Average noise at Board 3 41.2 dB OK
Average noise at Board 4 42.7 dB OK

2013.07.21 12:54:42.421 101 9 OK
RX NOISE SPECTRUM

Board No:	1	2	3	4	
26.1 kHz:	45.1	44.6	44.2	44.9	dB
26.3 kHz:	43.0	42.3	41.9	42.5	dB
26.5 kHz:	44.2	42.5	41.4	43.0	dB
26.7 kHz:	43.4	42.9	41.5	42.8	dB
26.9 kHz:	44.4	43.0	43.2	44.7	dB
27.1 kHz:	43.2	41.9	40.8	40.8	dB
27.3 kHz:	43.5	42.0	41.2	43.9	dB
27.5 kHz:	44.1	42.3	40.8	45.7	dB
27.7 kHz:	42.9	41.4	41.6	47.0	dB
27.9 kHz:	42.1	41.3	41.8	44.9	dB
28.1 kHz:	41.8	40.2	41.3	43.7	dB
28.3 kHz:	42.1	40.5	40.6	43.1	dB
28.5 kHz:	41.0	40.5	39.9	41.6	dB
28.7 kHz:	41.6	40.7	40.9	42.2	dB
28.9 kHz:	41.4	40.8	40.5	43.2	dB
29.1 kHz:	41.2	40.4	41.2	42.8	dB
29.3 kHz:	41.3	41.5	42.3	43.4	dB
29.5 kHz:	44.6	46.0	47.2	46.4	dB
29.7 kHz:	41.7	42.6	43.1	42.3	dB
29.9 kHz:	40.8	40.7	42.0	41.8	dB
30.1 kHz:	40.0	40.3	41.4	41.0	dB
30.3 kHz:	40.0	39.1	40.2	41.5	dB
30.5 kHz:	40.0	39.9	41.2	43.2	dB
30.7 kHz:	39.7	38.9	39.1	40.9	dB
30.9 kHz:	39.6	39.2	39.7	41.4	dB
31.1 kHz:	40.0	39.5	40.1	43.5	dB
31.4 kHz:	39.2	38.9	39.7	40.5	dB
31.6 kHz:	38.3	37.8	38.6	40.3	dB
31.8 kHz:	39.2	38.7	39.2	40.8	dB
32.0 kHz:	39.1	37.8	38.5	40.7	dB
32.2 kHz:	38.4	37.3	37.6	38.8	dB
32.4 kHz:	38.3	37.6	38.4	39.9	dB
32.6 kHz:	38.3	37.8	37.1	38.9	dB
32.8 kHz:	37.9	37.4	37.8	39.3	dB
33.0 kHz:	38.2	37.5	37.1	38.5	dB
33.2 kHz:	38.1	37.2	36.8	37.6	dB
33.4 kHz:	37.1	36.7	36.9	37.8	dB
33.6 kHz:	36.7	36.5	35.9	37.3	dB
33.8 kHz:	37.3	35.9	35.7	36.5	dB
34.0 kHz:	36.1	35.8	35.3	36.9	dB

Maximum noise at Board 3 Frequency 29.5 kHz Level: 47.2 dB

Spectral noise test

Average noise at Board 1 41.3 dB OK
Average noise at Board 2 40.6 dB OK
Average noise at Board 3 40.8 dB OK
Average noise at Board 4 42.4 dB OK

2013.07.21 12:54:49.255 101 10 OK
CPU: KOM CP6011
Clock 1795 MHz
Die 35 oC (peak: 45 oC @ 2013-07-21 - 01:03:00)
Board 35 oC (peak: 38 oC @ 2013-07-21 - 00:05:36)
Core 1.36 V
3V3 3.28 V
12V 12.11 V
-12V -12.04 V
BATT 0.00 V
Primary network: 157.237.14.60:0xffff0000
Secondary network: 192.168.2.20:0xffffff00

2013.07.21 12:54:49.288 101 15 OK

EM 302
BSP67B Master: 2.2.3 090702
BSP67B Slave: 2.2.3 090702
CPU: 1.5.5 120622

DDS: 3.5.4 120124
DSV: 3.1.4 120508
RX32 version : Feb 18 2010 Rev 1.11
TX36 LC version : Jun 17 2008 Rev 1.11

VxWorks 5.5.1 Build 1.2/2-IX0100 May 16 2007, 11:31:17

Appendix F: Data Tables

EX-13-04 Leg 1 BIST LOG									
BIST FILE NAME	DATE (GMT)	TIME (GMT)	BIST TYPE	Max RX Noise (dB)/Board/Channel	Avg RX Noise Board 1 (dB)	Avg RX Noise Board 2 (dB)	Avg RX Noise Board 3 (dB)	Avg RX Noise Board 4 (dB)	NOTES
EX1304L1_1.txt	7/8/13	2224	ALL	Board 1 Channel 27 Level: 72.9 dB	70.2	66.0	64.7	65.3	HIGH VALUES - IN NARRAGANSETT BAY
EX1304L1_2.txt	7/10/13	0004	ALL	Board 4 Channel 31 Level: 51.5 dB	42.7	44.3	46.4	46.5	
EX1304L1_3.txt	7/12/13	0036	ALL	Board 1 Channel 0 Level: 48.2 dB	42.3	40.9	40.1	39.6	
EX1304L1_4.txt	7/14/13	2212	ALL	Board 1 Channel 0 Level: 48.2 dB	41.9	40.4	39.7	38.6	
EX1304L1_5.txt	7/21/13	1302	ALL	Board 4 Channel 31 Level: 49.4 dB	41.8	41	41.2	42.7	
EX1304L1_6.txt	7/22/13	1225	ALL	Board 4 Channel 31 Level: 51.9 dB	46.3	45.3	44.0	44.4	
EX1304L1_7.txt	7/23/13	2127	ALL	Board 4 Channel 31 Level: 50.6 dB	42.7	41.2	40.9	42.5	
EX1304L1_8.txt	7/24/13	2036	ALL	Board 1 Channel 0 Level: 51.1 dB	45.9	44.9	43.8	43.6	
EX1304L1_TelnetBIST_4.log	7/14/13	TIME UNAVAIL.	TELNET 30 -36	Board 1 Channel 0 Level: 49.0 dB	42.2	40.4	39.1	38.2	TELNET BISTS 30-36

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0277_20130709_004806_EX1304L1_MB	EX1304L1_XBT001_130709.asvp	190	7/9/2013	7.7231	173.132	071-16.29W	071-13.06W	40-19.05N	40-34.33N	2013-07-09 00:48:06.972	2013-07-09 02:48:06.502	
0278_20130709_024806_EX1304L1_MB	EX1304L1_XBT001_130709.asvp	190	7/9/2013	8.362	170.325	071-13.41W	071-10.43W	40-09.14N	40-19.08N	2013-07-09 02:48:07.001	2013-07-09 04:00:24.022	
0001_20130709_040458_EX1302_MB	EX1304L1_XBT001_130709.asvp	190	7/9/2013	8.3947	170.313	071-10.82W	071-08.66W	40-02.88N	40-08.54N	2013-07-09 04:04:58.521	2013-07-09 04:49:56.535	No depth data S portion of line. Raw renamed to 1304
0002_20130709_045142_EX1302_MB	EX1304L1_XBT002_130709.asvp	190	7/9/2013	8.541	170.246	071-09.36W	071-05.29W	39-52.26N	40-02.13N	2013-07-09 04:51:43.034	2013-07-09 06:01:12.556	Raw renamed to 1304
0003_20130710_002645_EX1302_MB	EX1304L1_XBT003_130710.asvp	191	7/10/2013	9.3783	086.393	071-03.51W	070-38.64W	39-43.67N	39-49.50N	2013-07-10 00:26:45.851	2013-07-10 02:26:44.885	n

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0004_20130710_022645_EX1302_MB	EX1304L1_XBT004_130710.asvp	191	7/10/2013	9.4523	105.271	070-40.14W	070-15.45W	39-40.29N	39-48.52N	2013-07-10 02:26:45.384	2013-07-10 04:26:45.917	
0005_20130710_042646_EX1302_MB	EX1304L1_XBT005_130710.asvp	191	7/10/2013	9.2362	102.261	070-16.06W	069-59.98W	39-37.59N	39-44.35N	2013-07-10 04:26:46.415	2013-07-10 05:52:00.939	
0006_20130710_223012_EX1304L1_MB	EX1304L1_XBT006_130710.asvp	191	7/10/2013	9.5482	092.97	069-30.53W	069-26.42W	39-49.12N	39-52.52N	2013-07-10 22:30:13.208	2013-07-10 22:44:54.216	
0007_20130710_224454_EX1304L1_MB	EX1304L1_XBT006_130710.asvp	191	7/10/2013	8.1049	168.901	069-29.25W	069-25.04W	39-50.23N	39-51.73N	2013-07-10 22:44:54.716	2013-07-10 22:46:49.216	
0008_20130710_224649_EX1304L1_MB	EX1304L1_XBT006_130710.asvp	191	7/10/2013	5.8524	178.395	069-29.78W	069-24.32W	39-42.44N	39-50.91N	2013-07-10 22:46:49.715	2013-07-11 00:09:11.240	
0009_20130711_000911_EX1304L1_MB	EX1304L1_XBT007_130711.asvp	192	7/11/2013	5.6668	178.659	069-29.63W	069-24.02W	39-34.31N	39-43.00N	2013-07-11 00:09:11.740	2013-07-11 01:37:10.262	
0011_20130711_014049_EX1304L1_MB	EX1304L1_XBT007_130711.asvp	192	7/11/2013	8.687	040.943	069-31.39W	069-18.59W	39-32.30N	39-43.29N	2013-07-11 01:40:49.262	2013-07-11 03:40:48.793	No line 0010
0012_20130711_034049_EX1304L1_MB	EX1304L1_XBT008_130711.asvp	192	7/11/2013	8.7868	091.395	069-18.60W	068-58.84W	39-39.50N	39-42.85N	2013-07-11 03:40:49.292	2013-07-11 05:24:50.321	
0013_20130711_052450_EX1304L1_MB	EX1304L1_XBT008_130711.asvp	192	7/11/2013	8.8336	092.081	068-58.92W	068-57.87W	39-39.40N	39-42.78N	2013-07-11 05:24:50.821	2013-07-11 05:29:13.823	
0014_20130711_052914_EX1304L1_MB	EX1304L1_XBT008_130711.asvp	192	7/11/2013	8.2785	154.659	068-59.78W	068-55.67W	39-39.40N	39-42.77N	2013-07-11 05:29:14.323	2013-07-11 05:33:36.824	
0015_20130711_053337_EX1304L1_MB	EX1304L1_XBT008_130711.asvp	192	7/11/2013	8.2053	178.644	068-59.64W	068-55.11W	39-38.07N	39-41.07N	2013-07-11 05:33:37.325	2013-07-11 05:41:36.828	
0016_20130711_054137_EX1304L1_MB	EX1304L1_XBT008_130711.asvp	192	7/11/2013	7.5823	255.154	068-58.73W	068-56.59W	39-37.84N	39-41.04N	2013-07-11 05:41:37.329	2013-07-11 05:42:57.328	
0017_20130711_054257_EX1304L1_MB	EX1304L1_XBT009_130711.asvp	192	7/11/2013	7.751	271.038	069-18.09W	068-57.21W	39-37.79N	39-41.20N	2013-07-11 05:42:57.828	2013-07-11 07:42:58.356	
0018_20130711_074258_EX1304L1_MB	EX1304L1_XBT010_130711.asvp	192	7/11/2013	7.1209	271.402	069-26.00W	069-17.77W	39-38.22N	39-41.37N	2013-07-11 07:42:58.856	2013-07-11 08:34:50.373	
0019_20130712_014757_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	8.2134	355.384	069-18.15W	069-14.50W	39-52.61N	39-55.47N	2013-07-12 01:47:58.143	2013-07-12 01:55:54.147	
0020_20130712_015554_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	8.015	075.457	069-16.09W	069-14.18W	39-52.42N	39-55.78N	2013-07-12 01:55:54.647	2013-07-12 02:03:34.149	
0021_20130712_020334_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	7.7047	131.907	069-15.99W	069-13.06W	39-53.09N	39-55.71N	2013-07-12 02:03:34.648	2013-07-12 02:04:41.648	
0022_20130712_020442_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	7.515	168.247	069-16.42W	069-12.71W	39-53.70N	39-55.14N	2013-07-12 02:04:42.148	2013-07-12 02:05:55.649	
0023_20130712_020555_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	6.5553	224.208	069-16.31W	069-12.99W	39-52.92N	39-55.28N	2013-07-12 02:05:56.149	2013-07-12 02:06:45.148	
0024_20130712_020645_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	7.3354	220.418	069-19.10W	069-13.55W	39-50.57N	39-55.45N	2013-07-12 02:06:45.649	2013-07-12 02:34:57.656	
0025_20130712_023457_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	7.5174	274.718	069-17.96W	069-16.59W	39-50.01N	39-53.29N	2013-07-12 02:34:58.157	2013-07-12 02:36:33.657	
0026_20130712_023634_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	8.0481	282.821	069-20.56W	069-17.24W	39-49.97N	39-53.60N	2013-07-12 02:36:34.157	2013-07-12 02:46:46.160	
0027_20130712_024646_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	6.996	044.221	069-20.79W	069-16.97W	39-50.61N	39-53.47N	2013-07-12 02:46:46.660	2013-07-12 02:49:10.159	
0028_20130712_024910_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	7.9412	057.324	069-19.38W	069-14.25W	39-50.27N	39-54.02N	2013-07-12 02:49:10.660	2013-07-12 03:10:51.667	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0029_20130712_031052_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	8.5212	356.135	069-19.05W	069-14.54W	39-53.21N	39-54.96N	2013-07-12 03:10:52.167	2013-07-12 03:20:42.166	
0030_20130712_032042_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	6.8835	280.192	069-18.04W	069-15.73W	39-53.62N	39-55.73N	2013-07-12 03:20:42.666	2013-07-12 03:23:21.671	
0031_20130712_032321_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	6.4818	208.271	069-18.62W	069-15.45W	39-53.37N	39-55.21N	2013-07-12 03:23:22.171	2013-07-12 03:27:55.173	
0032_20130712_032755_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	5.4111	010.093	069-18.59W	069-15.71W	39-53.44N	39-55.15N	2013-07-12 03:27:55.672	2013-07-12 03:30:21.666	
0033_20130712_033021_EX1304L1_MB	EX1304L1_XBT011_130712.asvp	193	7/12/2013	8.6108	358.195	069-18.90W	069-16.11W	39-54.37N	39-57.87N	2013-07-12 03:30:22.165	2013-07-12 03:52:42.174	
0034_20130712_035242_EX1304L1_MB	EX1304L1_XBT012_130712.asvp	193	7/12/2013	8.8025	047.325	069-17.77W	069-12.32W	39-57.27N	40-01.10N	2013-07-12 03:52:42.674	2013-07-12 04:26:29.184	
0035_20130712_042629_EX1304L1_MB	EX1304L1_XBT012_130712.asvp	193	7/12/2013	7.6425	303.175	069-13.27W	069-12.34W	40-00.85N	40-01.44N	2013-07-12 04:26:29.684	2013-07-12 04:29:19.186	
0036_20130712_042919_EX1304L1_MB	EX1304L1_XBT012_130712.asvp	193	7/12/2013	7.0748	226.194	069-19.12W	069-12.84W	39-56.47N	40-01.33N	2013-07-12 04:29:19.687	2013-07-12 05:21:26.702	
0037_20130712_052127_EX1304L1_MB	EX1304L1_XBT012_130712.asvp	193	7/12/2013	7.4019	354.455	069-19.52W	069-18.31W	39-56.40N	39-57.42N	2013-07-12 05:21:27.201	2013-07-12 05:24:56.200	
0038_20130712_052456_EX1304L1_MB	EX1304L1_XBT012_130712.asvp	193	7/12/2013	8.8795	045.752	069-19.16W	069-13.28W	39-56.74N	40-01.45N	2013-07-12 05:24:56.701	2013-07-12 06:04:21.710	
0039_20130712_060422_EX1304L1_MB	EX1304L1_XBT012_130712.asvp	193	7/12/2013	7.3887	335.866	069-13.75W	069-12.81W	40-00.93N	40-01.77N	2013-07-12 06:04:22.212	2013-07-12 06:09:56.209	
0040_20130712_060956_EX1304L1_MB	EX1304L1_XBT013_130712.asvp	193	7/12/2013	7.7029	171.952	069-19.90W	069-11.76W	39-50.20N	40-01.62N	2013-07-12 06:09:56.710	2013-07-12 08:09:59.240	
0041_20130712_080959_EX1304L1_MB	EX1304L1_XBT013_130712.asvp	193	7/12/2013	9.3584	089.937	069-11.88W	069-10.95W	39-50.25N	39-53.95N	2013-07-12 08:09:59.741	2013-07-12 08:14:04.244	
0042_20130712_213327_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.7369	091.69	069-17.46W	069-14.02W	39-52.77N	39-55.42N	2013-07-12 21:33:27.443	2013-07-12 21:50:50.946	
0043_20130712_215051_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	4.8883	078.301	069-15.46W	069-12.22W	39-52.75N	39-55.37N	2013-07-12 21:50:51.446	2013-07-12 21:58:46.450	
0044_20130712_215846_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.9111	274.13	069-16.17W	069-13.83W	39-52.88N	39-55.55N	2013-07-12 21:58:46.947	2013-07-12 22:15:48.454	
0045_20130712_221548_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	6.0348	044.745	069-17.79W	069-14.69W	39-53.20N	39-55.76N	2013-07-12 22:15:48.955	2013-07-12 22:24:15.953	
0046_20130712_222416_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.4076	171.441	069-17.17W	069-13.75W	39-53.42N	39-55.42N	2013-07-12 22:24:16.453	2013-07-12 22:36:06.462	
0047_20130712_223606_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.5888	025.296	069-17.22W	069-13.53W	39-52.20N	39-54.70N	2013-07-12 22:36:06.963	2013-07-12 22:46:07.462	
0048_20130712_224607_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	6.2809	346.777	069-17.13W	069-13.79W	39-53.45N	39-55.16N	2013-07-12 22:46:07.962	2013-07-12 22:54:35.962	
0049_20130712_225436_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.2286	073.51	069-16.74W	069-13.97W	39-53.71N	39-55.94N	2013-07-12 22:54:36.462	2013-07-12 22:57:48.965	
0050_20130712_225749_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.1445	123.206	069-16.37W	069-13.38W	39-53.62N	39-55.90N	2013-07-12 22:57:49.464	2013-07-12 23:03:18.468	
0051_20130712_230319_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	4.0215	181.94	069-16.45W	069-13.19W	39-54.05N	39-54.99N	2013-07-12 23:03:18.968	2013-07-12 23:04:13.466	
0052_20130712_230413_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.0058	229.902	069-17.22W	069-13.42W	39-52.53N	39-55.22N	2013-07-12 23:04:13.967	2013-07-12 23:22:32.972	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0053_20130712_232233_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	5.7721	000.622	069-17.70W	069-14.74W	39-52.42N	39-54.71N	2013-07-12 23:22:33.470	2013-07-12 23:25:59.970	
0054_20130712_232600_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	6.633	066.815	069-17.10W	069-13.83W	39-52.61N	39-55.49N	2013-07-12 23:26:00.470	2013-07-12 23:39:54.471	
0055_20130712_233954_EX1304L1_MB	EX1304L1_XBT014_130712.asvp	193	7/12/2013	7.9344	012.924	069-15.05W	069-11.42W	39-53.12N	39-57.90N	2013-07-12 23:39:54.971	2013-07-13 00:11:06.482	
0056_20130713_001106_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	9.2137	005.333	069-14.18W	069-12.67W	39-57.83N	40-01.36N	2013-07-13 00:11:06.983	2013-07-13 00:35:31.986	
0057_20130713_003532_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	8.852	087.554	069-13.08W	069-06.80W	40-00.69N	40-01.60N	2013-07-13 00:35:32.486	2013-07-13 01:07:54.494	
0058_20130713_010754_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	9.3807	090.076	069-06.89W	069-04.04W	40-00.77N	40-01.64N	2013-07-13 01:07:54.993	2013-07-13 01:19:58.997	
0059_20130713_011959_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	8.2548	294.287	069-05.28W	069-03.77W	40-01.07N	40-01.99N	2013-07-13 01:19:59.497	2013-07-13 01:26:56.001	
0060_20130713_012656_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	9.2209	268.87	069-13.65W	069-05.29W	40-01.13N	40-01.91N	2013-07-13 01:26:56.500	2013-07-13 02:08:40.512	
0061_20130713_020840_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	8.8639	047.025	069-14.41W	069-13.05W	40-01.27N	40-02.16N	2013-07-13 02:08:41.013	2013-07-13 02:18:42.012	
0062_20130713_021842_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	9.0576	089.227	069-13.12W	069-04.01W	40-01.53N	40-02.32N	2013-07-13 02:18:42.512	2013-07-13 03:04:19.523	
0063_20130713_030419_EX1304L1_MB	EX1304L1_XBT015_130713.asvp	194	7/13/2013	7.6377	356.202	069-04.41W	069-03.38W	40-01.58N	40-02.63N	2013-07-13 03:04:20.023	2013-07-13 03:07:39.527	
0064_20130713_030739_EX1304L1_MB	EX1304L1_XBT016_130713.asvp	194	7/13/2013	9.0012	268.596	069-12.27W	069-04.13W	40-01.82N	40-02.59N	2013-07-13 03:07:40.028	2013-07-13 03:49:11.538	
0065_20130713_034911_EX1304L1_MB	EX1304L1_XBT016_130713.asvp	194	7/13/2013	8.6866	326.648	069-13.02W	069-12.24W	40-01.82N	40-02.59N	2013-07-13 03:49:12.040	2013-07-13 03:53:57.537	
0066_20130713_035357_EX1304L1_MB	EX1304L1_XBT016_130713.asvp	194	7/13/2013	9.1332	089.06	069-12.56W	069-04.18W	40-02.12N	40-02.81N	2013-07-13 03:53:58.037	2013-07-13 04:35:19.046	
0067_20130713_043519_EX1304L1_MB	EX1304L1_XBT016_130713.asvp	194	7/13/2013	8.6964	057.675	069-04.46W	069-01.59W	40-01.98N	40-04.67N	2013-07-13 04:35:19.545	2013-07-13 04:52:39.554	
0068_20130713_045239_EX1304L1_MB	EX1304L1_XBT016_130713.asvp	194	7/13/2013	8.6516	099.835	069-01.73W	068-51.74W	40-01.45N	40-04.39N	2013-07-13 04:52:40.053	2013-07-13 05:45:41.565	
0069_20130713_054541_EX1304L1_MB	EX1304L1_XBT016_130713.asvp	194	7/13/2013	8.4161	057.476	068-52.23W	068-50.02W	40-01.15N	40-03.37N	2013-07-13 05:45:42.066	2013-07-13 05:52:03.566	
0070_20130713_055203_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	9.3449	280.112	069-02.89W	068-51.12W	40-01.78N	40-04.74N	2013-07-13 05:52:04.067	2013-07-13 06:46:42.085	
0071_20130713_064642_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	7.3527	043.233	069-03.24W	069-01.51W	40-03.48N	40-05.18N	2013-07-13 06:46:42.584	2013-07-13 06:49:57.583	
0072_20130713_064958_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	8.4102	099.339	069-02.02W	068-51.12W	40-02.10N	40-04.93N	2013-07-13 06:49:58.082	2013-07-13 07:50:19.096	
0073_20130713_075019_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	8.269	335.694	068-51.76W	068-49.45W	40-01.80N	40-03.93N	2013-07-13 07:50:19.596	2013-07-13 07:59:19.100	
0074_20130713_075919_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	9.6409	279.563	069-01.80W	068-51.26W	40-02.61N	40-05.06N	2013-07-13 07:59:19.599	2013-07-13 08:48:39.144	
0075_20130713_084839_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	8.195	022.399	069-03.28W	069-01.46W	40-03.96N	40-05.47N	2013-07-13 08:48:39.613	2013-07-13 08:56:32.142	
0076_20130713_085632_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	8.2653	099.774	069-01.53W	068-51.73W	40-02.99N	40-05.25N	2013-07-13 08:56:32.617	2013-07-13 09:51:31.143	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0077_20130713_095131_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	7.935	041.059	068-51.89W	068-50.66W	40-02.82N	40-04.36N	2013-07-13 09:51:31.628	2013-07-13 09:57:59.631	
0078_20130713_095800_EX1304L1_MB	EX1304L1_XBT017_130713.asvp	194	7/13/2013	9.333	279.939	069-01.45W	068-51.41W	40-03.33N	40-05.47N	2013-07-13 09:58:00.142	2013-07-13 10:47:12.641	
0079_20130714_004524_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	8.352	258.797	069-08.34W	069-06.51W	40-01.33N	40-02.08N	2013-07-14 00:45:24.851	2013-07-14 00:54:28.356	
0080_20130714_005428_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	8.839	204.919	069-13.79W	069-07.69W	39-54.50N	40-01.69N	2013-07-14 00:54:28.856	2013-07-14 01:42:02.367	
0081_20130714_014202_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	8.745	229.155	069-14.10W	069-09.96W	39-52.92N	39-56.14N	2013-07-14 01:42:02.867	2013-07-14 01:48:01.871	
0082_20130714_014802_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	8.431	289.976	069-15.49W	069-12.48W	39-52.95N	39-56.28N	2013-07-14 01:48:02.372	2013-07-14 01:55:44.372	
0083_20130714_015544_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	7.281	007.508	069-15.58W	069-11.86W	39-54.64N	39-55.43N	2013-07-14 01:55:44.872	2013-07-14 01:56:29.372	
0084_20130714_015629_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	7.978	026.901	069-15.61W	069-09.51W	39-54.52N	40-01.04N	2013-07-14 01:56:29.871	2013-07-14 02:44:35.882	
0085_20130714_024436_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	7.973	010.017	069-10.73W	069-09.23W	40-00.58N	40-02.13N	2013-07-14 02:44:36.382	2013-07-14 02:54:17.385	
0086_20130714_025417_EX1304L1_MB	EX1304L1_XBT018_130714.asvp	195	7/14/2013	8.318	256.456	069-10.93W	069-09.81W	40-01.50N	40-02.21N	2013-07-14 02:54:17.885	2013-07-14 02:58:43.892	
0087_20130714_025843_EX1304L1_MB	EX1304L1_XBT019_130714.asvp	195	7/14/2013	8.317	231.503	069-22.72W	069-10.25W	39-53.74N	40-01.94N	2013-07-14 02:58:44.390	2013-07-14 04:31:27.411	
0088_20130714_043127_EX1304L1_MB	EX1304L1_XBT019_130714.asvp	195	7/14/2013	8.081	254.517	069-22.03W	069-20.74W	39-54.55N	39-55.90N	2013-07-14 04:31:27.911	2013-07-14 04:35:31.414	
0089_20130714_043531_EX1304L1_MB	EX1304L1_XBT019_130714.asvp	195	7/14/2013	8.940	256.654	069-24.51W	069-21.49W	39-53.78N	39-55.71N	2013-07-14 04:35:31.914	2013-07-14 04:49:19.916	
0090_20130714_044920_EX1304L1_MB	EX1304L1_XBT019_130714.asvp	195	7/14/2013	8.136	134.279	069-25.46W	069-23.41W	39-53.12N	39-55.26N	2013-07-14 04:49:20.416	2013-07-14 04:59:02.919	
0091_20130714_045903_EX1304L1_MB	EX1304L1_XBT019_130714.asvp	195	7/14/2013	8.219	104.785	069-23.86W	069-16.44W	39-51.08N	39-54.88N	2013-07-14 04:59:03.420	2013-07-14 05:34:56.931	
0092_20130714_053457_EX1304L1_MB	EX1304L1_XBT019_130714.asvp	195	7/14/2013	7.649	049.557	069-19.03W	069-15.06W	39-51.04N	39-54.39N	2013-07-14 05:34:57.432	2013-07-14 05:41:50.429	
0093_20130714_054150_EX1304L1_MB	EX1304L1_XBT019_130714.asvp	195	7/14/2013	8.943	269.924	069-31.19W	069-17.28W	39-51.05N	39-54.54N	2013-07-14 05:41:50.929	2013-07-14 06:53:38.950	
0094_20130714_065339_EX1304L1_MB	EX1304L1_XBT020_130714.asvp	195	7/14/2013	8.596	296.798	069-34.35W	069-30.89W	39-51.92N	39-54.44N	2013-07-14 06:53:39.451	2013-07-14 07:09:24.452	
0095_20130714_070924_EX1304L1_MB	EX1304L1_XBT020_130714.asvp	195	7/14/2013	7.597	275.354	069-36.26W	069-33.54W	39-52.70N	39-55.04N	2013-07-14 07:09:24.952	2013-07-14 07:18:32.951	
0096_20130714_071833_EX1304L1_MB	EX1304L1_XBT020_130714.asvp	195	7/14/2013	8.915	087.917	069-34.69W	069-11.31W	39-52.69N	39-56.22N	2013-07-14 07:18:33.452	2013-07-14 09:18:34.983	
0097_20130714_091835_EX1304L1_MB	EX1304L1_XBT020_130714.asvp	195	7/14/2013	9.108	088.161	069-11.52W	069-06.83W	39-52.89N	39-56.42N	2013-07-14 09:18:35.484	2013-07-14 09:41:50.491	
0098_20130714_231738_EX1304L1_MB	EX1304L1_CTD005_130714.asvp	196	7/15/2013	9.243	172.526	069-03.33W	068-56.52W	39-44.59N	40-02.65N	2013-07-14 23:17:39.197	2013-07-15 01:14:20.727	
0099_20130715_011420_EX1304L1_MB	EX1304L1_CTD005_130714.asvp	196	7/15/2013	8.565	259.571	069-01.45W	068-56.92W	39-42.77N	39-46.62N	2013-07-15 01:14:21.226	2013-07-15 01:18:06.225	
0100_20130715_011806_EX1304L1_MB	EX1304L1_XBT021_130715.asvp	196	7/15/2013	9.467	272.924	069-24.32W	068-59.15W	39-42.75N	39-47.69N	2013-07-15 01:18:06.726	2013-07-15 03:18:10.759	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0101_20130715_031811_EX1304L1_MB	EX1304L1_XBT021_130715.asvp	196	7/15/2013	8.6993	283.104	069-42.49W	069-24.05W	39-43.64N	39-50.11N	2013-07-15 03:18:11.258	2013-07-15 04:59:28.284	
0102_20130715_045928_EX1304L1_MB	EX1304L1_XBT022_130715.asvp	196	7/15/2013	8.512	271.053	070-04.64W	069-42.47W	39-46.99N	39-50.55N	2013-07-15 04:59:28.785	2013-07-15 06:59:28.813	
0103_20130715_065929_EX1304L1_MB	EX1304L1_XBT022_130715.asvp	196	7/15/2013	9.0543	227.209	070-11.68W	070-04.53W	39-44.20N	39-50.56N	2013-07-15 06:59:29.313	2013-07-15 07:44:11.821	
0104_20130715_074412_EX1304L1_MB	EX1304L1_XBT022_130715.asvp	196	7/15/2013	9.5582	090.286	070-10.20W	069-55.21W	39-43.72N	39-47.90N	2013-07-15 07:44:12.320	2013-07-15 08:50:40.337	
0105_20130715_085040_EX1304L1_MB	EX1304L1_XBT022_130715.asvp	196	7/15/2013	9.1926	024.59	069-57.37W	069-52.66W	39-44.18N	39-47.69N	2013-07-15 08:50:40.837	2013-07-15 08:53:59.840	
0106_20130715_085400_EX1304L1_MB	EX1304L1_XBT022_130715.asvp	196	7/15/2013	9.4179	000.551	069-57.36W	069-52.49W	39-46.27N	39-50.96N	2013-07-15 08:54:00.340	2013-07-15 09:23:32.847	
0107_20130715_092333_EX1304L1_MB	EX1304L1_XBT022_130715.asvp	196	7/15/2013	8.7886	304.138	069-56.74W	069-53.15W	39-49.76N	39-52.57N	2013-07-15 09:23:33.346	2013-07-15 09:28:58.348	
0108_20130715_092858_EX1304L1_MB	EX1304L1_XBT022_130715.asvp	196	7/15/2013	8.8089	269.162	070-12.44W	069-55.61W	39-49.33N	39-52.54N	2013-07-15 09:28:58.851	2013-07-15 10:56:42.873	
0109_20130715_233239_EX1304L1_MB	EX1304L1_CTD006_130715.asvp	196	7/15/2013	9.3779	060.934	070-15.20W	070-01.34W	39-49.92N	39-57.63N	2013-07-15 23:32:40.059	2013-07-16 00:46:48.581	
0110_20130716_004648_EX1304L1_MB	EX1304L1_CTD006_130715.asvp	197	7/16/2013	9.3865	069.399	070-01.71W	069-59.98W	39-57.10N	39-58.09N	2013-07-16 00:46:49.082	2013-07-16 00:55:09.082	
0111_20130716_005509_EX1304L1_MB	EX1304L1_CTD006_130715.asvp	197	7/16/2013	9.2299	094.15	070-00.01W	069-58.39W	39-57.55N	39-58.06N	2013-07-16 00:55:09.582	2013-07-16 01:02:58.585	
0112_20130716_010259_EX1304L1_MB	EX1304L1_XBT023_130716.asvp	197	7/16/2013	9.2626	099.171	069-58.48W	069-43.88W	39-55.85N	39-57.98N	2013-07-16 01:02:59.086	2013-07-16 02:16:05.142	
0113_20130716_021605_EX1304L1_MB	EX1304L1_XBT023_130716.asvp	197	7/16/2013	8.3828	121.023	069-43.97W	069-43.09W	39-55.76N	39-56.26N	2013-07-16 02:16:05.607	2013-07-16 02:19:47.142	
0114_20130716_021947_EX1304L1_MB	EX1304L1_XBT023_130716.asvp	197	7/16/2013	7.8766	198.776	069-43.77W	069-43.08W	39-55.68N	39-55.85N	2013-07-16 02:19:47.607	2013-07-16 02:20:26.606	
0115_20130716_022026_EX1304L1_MB	EX1304L1_XBT023_130716.asvp	197	7/16/2013	8.5696	262.869	069-43.90W	069-43.13W	39-55.36N	39-55.95N	2013-07-16 02:20:27.142	2013-07-16 02:23:01.143	
0116_20130716_022301_EX1304L1_MB	EX1304L1_XBT023_130716.asvp	197	7/16/2013	9.6045	275.912	069-51.61W	069-43.90W	39-55.41N	39-56.52N	2013-07-16 02:23:01.608	2013-07-16 02:59:54.615	
0117_20130716_025954_EX1304L1_MB	EX1304L1_XBT023_130716.asvp	197	7/16/2013	8.8996	229.371	069-52.63W	069-51.51W	39-55.67N	39-56.56N	2013-07-16 02:59:55.140	2013-07-16 03:05:15.620	
0118_20130716_030516_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	9.2165	199.769	069-59.49W	069-51.66W	39-44.08N	39-55.96N	2013-07-16 03:05:16.143	2013-07-16 04:20:27.638	
0119_20130716_042027_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	8.7899	188.677	069-59.87W	069-55.11W	39-42.58N	39-46.05N	2013-07-16 04:20:28.143	2013-07-16 04:26:21.140	
0120_20130716_042621_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	9.4493	099.736	069-58.01W	069-52.54W	39-41.67N	39-46.14N	2013-07-16 04:26:21.635	2013-07-16 04:47:57.145	
0121_20130716_044757_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	7.8929	085.307	069-54.73W	069-50.03W	39-41.74N	39-45.35N	2013-07-16 04:47:57.644	2013-07-16 04:53:48.643	
0122_20130716_045348_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	8.2143	276.248	069-56.48W	069-51.74W	39-41.75N	39-46.09N	2013-07-16 04:53:49.143	2013-07-16 05:14:27.152	
0123_20130716_051427_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	7.8036	307.034	069-59.02W	069-54.19W	39-42.42N	39-46.21N	2013-07-16 05:14:27.652	2013-07-16 05:22:49.654	
0124_20130716_052250_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	9.4994	099.539	069-57.06W	069-42.47W	39-40.48N	39-46.06N	2013-07-16 05:22:50.155	2013-07-16 06:29:49.670	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0125_20130716_062950_EX1304L1_MB	EX1304L1_XBT024_130716.asvp	197	7/16/2013	9.2131	184.775	069-45.31W	069-39.95W	39-38.87N	39-44.31N	2013-07-16 06:29:50.171	2013-07-16 06:44:46.175	
0126_20130716_064446_EX1304L1_MB	EX1304L1_XBT025_130716.asvp	197	7/16/2013	9.0926	276.986	070-06.69W	069-42.42W	39-37.79N	39-44.04N	2013-07-16 06:44:37.175	2013-07-16 08:44:54.203	
0127_20130716_084444_EX1304L1_MB	EX1304L1_XBT025_130716.asvp	197	7/16/2013	8.4657	306.04	070-14.70W	070-03.77W	39-40.91N	39-48.94N	2013-07-16 08:44:34.704	2013-07-16 09:42:52.218	
0128_20130716_232646_EX1304L1_MB	EX1304L1_CTD007_130716.asvp	197	7/16/2013	8.5686	330.074	070-19.86W	070-11.86W	39-45.93N	39-55.32N	2013-07-16 23:26:46.430	2013-07-17 00:28:25.944	
0130_20130717_002826_EX1304L1_MB	EX1304L1_CTD007_130716.asvp	198	7/17/2013	8.6696	346.329	070-20.57W	070-18.72W	39-54.18N	39-56.19N	2013-07-17 00:28:26.444	2013-07-17 00:38:02.945	
0131_20130717_003753_EX1304L1_MB	EX1304L1_CTD007_130716.asvp	198	7/17/2013	9.5528	093.977	070-19.52W	070-05.12W	39-54.00N	39-56.57N	2013-07-17 00:37:43.447	2013-07-17 01:47:32.463	
0132_20130717_014723_EX1304L1_MB	EX1304L1_CTD007_130716.asvp	198	7/17/2013	9.016	356.354	070-05.36W	070-03.84W	39-54.43N	39-56.34N	2013-07-17 01:47:13.464	2013-07-17 01:58:07.968	
0134_20130717_015808_EX1304L1_MB	EX1304L1_XBT026_130717.asvp	198	7/17/2013	9.3386	273.631	070-19.31W	070-05.15W	39-55.15N	39-57.31N	2013-07-17 01:57:58.968	2013-07-17 03:07:29.990	
0135_20130717_030720_EX1304L1_MB	EX1304L1_XBT026_130717.asvp	198	7/17/2013	8.7668	330.718	070-20.68W	070-19.16W	39-55.92N	39-57.53N	2013-07-17 03:07:11.486	2013-07-17 03:15:05.985	
0136_20130717_031456_EX1304L1_MB	EX1304L1_XBT026_130717.asvp	198	7/17/2013	9.4314	090.772	070-19.82W	070-04.51W	39-55.74N	39-57.77N	2013-07-17 03:14:46.489	2013-07-17 04:29:43.007	
0137_20130717_042933_EX1304L1_MB	EX1304L1_XBT026_130717.asvp	198	7/17/2013	8.6461	279.08	070-05.54W	070-05.14W	39-56.60N	39-57.39N	2013-07-17 04:29:23.509	2013-07-17 04:30:04.510	
0138_20130717_042954_EX1304L1_MB	EX1304L1_XBT026_130717.asvp	198	7/17/2013	9.36	273.487	070-19.04W	070-05.24W	39-56.37N	39-58.22N	2013-07-17 04:29:45.009	2013-07-17 05:37:19.529	
0139_20130717_053710_EX1304L1_MB	EX1304L1_XBT026_130717.asvp	198	7/17/2013	9.0085	346.904	070-20.57W	070-18.96W	39-56.99N	39-58.44N	2013-07-17 05:37:01.025	2013-07-17 05:47:43.028	
0140_20130717_054733_EX1304L1_MB	EX1304L1_XBT027_130717.asvp	198	7/17/2013	9.1501	092.623	070-19.25W	070-05.67W	39-56.86N	39-58.59N	2013-07-17 05:47:23.528	2013-07-17 06:54:56.543	
0141_20130717_065447_EX1304L1_MB	EX1304L1_XBT027_130717.asvp	198	7/17/2013	8.5091	317.257	070-06.29W	070-05.19W	39-57.24N	39-58.30N	2013-07-17 06:54:37.543	2013-07-17 07:00:06.048	
0142_20130717_065956_EX1304L1_MB	EX1304L1_XBT027_130717.asvp	198	7/17/2013	9.5757	272.677	070-19.10W	070-06.19W	39-57.23N	39-58.89N	2013-07-17 06:59:47.048	2013-07-17 08:01:58.564	
0143_20130717_080148_EX1304L1_MB	EX1304L1_XBT027_130717.asvp	198	7/17/2013	8.5569	023.471	070-20.05W	070-18.73W	39-57.80N	39-59.10N	2013-07-17 08:01:39.063	2013-07-17 08:08:13.063	
0144_20130717_080813_EX1304L1_MB	EX1304L1_XBT027_130717.asvp	198	7/17/2013	8.9049	092.378	070-18.91W	070-06.49W	39-57.62N	39-59.19N	2013-07-17 08:08:13.564	2013-07-17 09:12:24.077	
0145_20130717_091214_EX1304L1_MB	EX1304L1_XBT027_130717.asvp	198	7/17/2013	8.266	351.407	070-06.61W	070-05.72W	39-57.97N	39-58.98N	2013-07-17 09:12:05.577	2013-07-17 09:17:52.083	
0146_20130717_091742_EX1304L1_MB	EX1304L1_XBT027_130717.asvp	198	7/17/2013	9.9455	272.491	070-18.92W	070-06.55W	39-57.99N	39-59.48N	2013-07-17 09:17:33.583	2013-07-17 10:14:48.596	
0147_20130717_233444_EX1304L1_MB	EX1304L1_CTD008_130717.asvp	198	7/17/2013	9.3774	110.847	070-31.22W	070-28.62W	39-51.29N	39-54.20N	2013-07-17 23:34:44.796	2013-07-17 23:39:04.298	
0148_20130717_233904_EX1304L1_MB	EX1304L1_CTD008_130717.asvp	199	7/18/2013	9.2364	184.464	070-32.22W	070-28.30W	39-48.46N	39-52.81N	2013-07-17 23:39:04.798	2013-07-18 00:05:40.805	
0149_20130718_000531_EX1304L1_MB	EX1304L1_CTD008_130717.asvp	199	7/18/2013	7.349	273.939	070-35.43W	070-28.28W	39-46.61N	39-50.23N	2013-07-18 00:05:21.306	2013-07-18 00:32:29.810	
0150_20130718_003220_EX1304L1_MB	EX1304L1_CTD008_130717.asvp	199	7/18/2013	6.906	128.688	070-36.38W	070-32.16W	39-46.87N	39-49.91N	2013-07-18 00:32:11.309	2013-07-18 00:42:25.309	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0151_20130718_004215_EX1304L1_MB	EX1304L1_CTD008_130717.asvp	199	7/18/2013	7.046	003.227	070-35.63W	070-32.24W	39-48.42N	40-00.40N	2013-07-18 00:42:06.308	2013-07-18 02:23:11.841	
0152_20130718_022302_EX1304L1_MB	EX1304L1_CTD008_130717.asvp	199	7/18/2013	8.1646	233.776	070-34.00W	070-32.79W	39-59.24N	40-00.17N	2013-07-18 02:22:52.843	2013-07-18 02:28:30.339	
0153_20130718_022830_EX1304L1_MB	EX1304L1_XBT028_130718.asvp	199	7/18/2013	9.0874	267.139	070-57.54W	070-33.95W	39-57.87N	39-59.96N	2013-07-18 02:28:20.840	2013-07-18 04:28:41.370	
0154_20130718_042831_EX1304L1_MB	EX1304L1_XBT028_130718.asvp	199	7/18/2013	9.4094	268.855	071-02.12W	070-57.51W	39-57.60N	39-58.80N	2013-07-18 04:28:21.872	2013-07-18 04:50:57.379	
0155_20130718_045057_EX1304L1_MB	EX1304L1_XBT028_130718.asvp	199	7/18/2013	9.0427	070.453	071-03.02W	071-00.78W	39-57.59N	39-59.10N	2013-07-18 04:50:48.377	2013-07-18 05:01:43.879	
0156_20130718_050134_EX1304L1_MB	EX1304L1_XBT028_130718.asvp	199	7/18/2013	9.4781	088.032	071-00.84W	070-50.40W	39-58.08N	39-59.44N	2013-07-18 05:01:24.880	2013-07-18 05:52:10.392	
0157_20130718_055210_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	8.6304	086.931	070-50.45W	070-30.36W	39-58.58N	40-00.71N	2013-07-18 05:52:00.894	2013-07-18 07:40:04.921	
0158_20130718_073955_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	8.7902	125.504	070-30.50W	070-28.89W	39-59.09N	40-00.86N	2013-07-18 07:39:45.420	2013-07-18 07:46:37.926	
0159_20130718_074628_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	9.2208	268.612	070-34.80W	070-29.55W	39-59.00N	40-00.52N	2013-07-18 07:46:18.425	2013-07-18 08:11:44.428	
0160_20130718_081134_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	8.702	195.299	070-35.56W	070-34.49W	39-59.02N	40-00.02N	2013-07-18 08:11:24.930	2013-07-18 08:16:01.930	
0161_20130718_081552_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	9.2231	115.091	070-35.37W	070-30.78W	39-57.73N	39-59.48N	2013-07-18 08:15:42.929	2013-07-18 08:36:34.437	
0162_20130718_083634_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	8.8236	267.917	070-41.61W	070-32.09W	39-57.41N	39-58.77N	2013-07-18 08:36:25.434	2013-07-18 09:26:11.948	
0163_20130718_092602_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	9.3187	133.351	070-42.56W	070-39.97W	39-56.47N	39-58.31N	2013-07-18 09:25:52.449	2013-07-18 09:38:38.954	
0164_20130718_093839_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	9.4286	124.933	070-40.51W	070-32.79W	39-52.69N	39-57.37N	2013-07-18 09:38:29.954	2013-07-18 10:20:22.966	
0165_20130718_102013_EX1304L1_MB	EX1304L1_XBT029_130718.asvp	199	7/18/2013	9.7199	108.513	070-33.65W	070-29.49W	39-51.21N	39-54.00N	2013-07-18 10:20:03.966	2013-07-18 10:36:03.468	
0166_20130718_232006_EX1304L1_MB	EX1304L1_CTD009_130718.asvp	199	7/18/2013	9.2316	231.258	070-41.31W	070-27.04W	39-40.21N	39-51.84N	2013-07-18 23:20:06.666	2013-07-19 00:47:08.187	
0167_20130719_004708_EX1304L1_MB	EX1304L1_CTD009_130718.asvp	200	7/19/2013	9.765	271.917	071-06.19W	070-41.09W	39-40.08N	39-44.48N	2013-07-19 00:47:08.687	2013-07-19 02:46:26.219	
0168_20130719_024616_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	9.5231	251.901	071-13.26W	071-05.97W	39-39.25N	39-44.27N	2013-07-19 02:46:07.219	2013-07-19 03:15:36.228	
0169_20130719_031526_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	9.0814	292.757	071-14.86W	071-09.82W	39-38.84N	39-42.52N	2013-07-19 03:15:17.727	2013-07-19 03:21:54.729	
0170_20130719_032154_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	9.8083	007.916	071-15.27W	071-09.82W	39-41.07N	39-51.65N	2013-07-19 03:21:45.230	2013-07-19 04:25:53.246	
0171_20130719_042544_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	9.5549	054.899	071-12.09W	071-09.55W	39-51.03N	39-52.91N	2013-07-19 04:25:34.245	2013-07-19 04:33:38.748	
0172_20130719_043329_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	9.756	088.028	071-10.26W	071-04.58W	39-50.95N	39-53.00N	2013-07-19 04:33:19.745	2013-07-19 04:59:05.252	
0173_20130719_045905_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	9.2988	024.928	071-05.54W	071-03.18W	39-51.20N	39-53.07N	2013-07-19 04:58:55.754	2013-07-19 05:03:05.257	
0174_20130719_050256_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	9.6592	357.853	071-05.44W	071-03.35W	39-52.66N	39-55.62N	2013-07-19 05:02:46.256	2013-07-19 05:18:06.260	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0175_20130719_051756_EX1304L1_MB	EX1304L1_XBT030_130719.asvp	200	7/19/2013	8.783	171.568	071-06.01W	071-04.01W	39-53.92N	39-55.80N	2013-07-19 05:17:46.759	2013-07-19 05:25:10.263	
0176_20130719_052510_EX1304L1_MB	EX1304L1_XBT031_130719.asvp	200	7/19/2013	9.7604	100.693	071-04.77W	070-48.20W	39-51.55N	39-55.29N	2013-07-19 05:25:10.762	2013-07-19 06:42:31.280	
0177_20130719_064221_EX1304L1_MB	EX1304L1_XBT031_130719.asvp	200	7/19/2013	9.7573	000.585	070-49.13W	070-46.92W	39-51.66N	39-57.01N	2013-07-19 06:42:11.779	2013-07-19 07:08:48.290	
0178_20130719_070838_EX1304L1_MB	EX1304L1_XBT031_130719.asvp	200	7/19/2013	8.7056	306.751	070-49.14W	070-47.78W	39-56.35N	39-57.49N	2013-07-19 07:08:28.789	2013-07-19 07:12:01.789	
0179_20130719_071152_EX1304L1_MB	EX1304L1_XBT031_130719.asvp	200	7/19/2013	8.4086	269.22	071-06.82W	070-48.76W	39-55.88N	39-57.51N	2013-07-19 07:11:42.790	2013-07-19 08:50:08.820	
0180_20130719_085009_EX1304L1_MB	EX1304L1_XBT031_130719.asvp	200	7/19/2013	7.8315	226.837	071-08.56W	071-06.67W	39-55.23N	39-57.02N	2013-07-19 08:49:59.816	2013-07-19 09:00:46.322	
0181_20130719_090036_EX1304L1_MB	EX1304L1_XBT031_130719.asvp	200	7/19/2013	7.82	217.175	071-17.06W	071-07.23W	39-45.91N	39-55.85N	2013-07-19 09:00:27.322	2013-07-19 10:21:29.342	
0182_20130719_232934_EX1304L1_MB	EX1304L1_CTD010_130718.asvp	200	7/19/2013	9.4933	085.745	071-16.44W	071-02.88W	39-45.47N	39-49.74N	2013-07-19 23:29:35.049	2013-07-20 00:33:37.067	
0183_20130720_003337_EX1304L1_MB	EX1304L1_CTD010_130718.asvp	201	7/20/2013	9.8524	083.338	071-03.04W	070-37.48W	39-46.68N	39-51.91N	2013-07-20 00:33:37.568	2013-07-20 02:33:35.598	
0184_20130720_023335_EX1304L1_MB	EX1304L1_CTD010_130718.asvp	201	7/20/2013	8.8976	084.673	070-37.79W	070-24.67W	39-49.70N	39-53.15N	2013-07-20 02:33:26.099	2013-07-20 03:41:21.617	
0185_20130720_034122_EX1304L1_MB	EX1304L1_XBT032_130720.asvp	201	7/20/2013	8.4368	101.976	070-25.07W	070-18.61W	39-49.96N	39-52.92N	2013-07-20 03:41:12.141	2013-07-20 04:15:46.626	
0186_20130720_041537_EX1304L1_MB	EX1304L1_XBT032_130720.asvp	201	7/20/2013	9.2244	095.95	070-18.86W	069-53.68W	39-47.81N	39-52.50N	2013-07-20 04:15:27.629	2013-07-20 06:15:36.660	
0187_20130720_061526_EX1304L1_MB	EX1304L1_XBT032_130720.asvp	201	7/20/2013	3.7361	157.811	069-56.69W	069-53.02W	39-48.83N	39-50.43N	2013-07-20 06:15:17.162	2013-07-20 06:22:35.663	
0188_20130720_062226_EX1304L1_MB	EX1304L1_XBT032_130720.asvp	201	7/20/2013	3.4142	127.114	069-56.50W	069-52.81W	39-46.75N	39-49.86N	2013-07-20 06:22:16.163	2013-07-20 06:44:38.665	
0189_20130720_064438_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	8.9465	090.44	069-53.52W	069-37.36W	39-46.58N	39-50.30N	2013-07-20 06:44:29.170	2013-07-20 08:07:23.690	
0190_20130720_080713_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	6.0636	094.007	069-37.75W	069-34.03W	39-46.40N	39-50.22N	2013-07-20 08:07:04.192	2013-07-20 08:33:51.198	
0191_20130720_083341_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	5.2094	142.806	069-35.53W	069-31.96W	39-46.23N	39-50.14N	2013-07-20 08:33:32.195	2013-07-20 08:37:49.700	
0192_20130720_083740_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	7.4848	177.556	069-36.18W	069-31.15W	39-44.67N	39-48.29N	2013-07-20 08:37:30.701	2013-07-20 09:03:58.706	
0193_20130720_090349_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	7.2539	120.855	069-35.98W	069-31.30W	39-42.74N	39-46.31N	2013-07-20 09:03:39.206	2013-07-20 09:07:49.708	
0194_20130720_090740_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	9.225	080.891	069-33.62W	069-25.73W	39-42.73N	39-47.38N	2013-07-20 09:07:30.706	2013-07-20 09:42:41.214	
0195_20130720_094232_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	6.985	159.414	069-28.05W	069-23.70W	39-43.48N	39-47.41N	2013-07-20 09:42:22.715	2013-07-20 09:51:14.219	
0196_20130720_095104_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	5.955	221.679	069-28.20W	069-24.27W	39-43.17N	39-46.39N	2013-07-20 09:50:54.721	2013-07-20 09:56:27.720	
0197_20130720_095617_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	4.6754	274.059	069-27.75W	069-25.34W	39-42.78N	39-46.42N	2013-07-20 09:56:08.224	2013-07-20 10:00:36.219	
0198_20130720_100026_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	5.4733	271.395	069-27.21W	069-27.14W	39-43.48N	39-45.74N	2013-07-20 10:00:17.220	2013-07-20 10:02:58.720	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0199_20130720_100259_EX1304L1_MB	EX1304L1_XBT033_130720.asvp	201	7/20/2013	5.9682	271.328	069-30.76W	069-27.20W	39-42.58N	39-46.62N	2013-07-20 10:02:49.723	2013-07-20 10:30:30.729	
0201_20130720_214433_EX1304L1_MB	EX1304L1_XBT034_130720.asvp	201	7/20/2013	5.7905	085.225	069-33.05W	069-19.12W	39-41.02N	39-45.92N	2013-07-20 21:44:33.406	2013-07-20 23:33:41.438	
0202_20130720_233332_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	201	7/20/2013	5.2704	058.182	069-21.37W	069-16.66W	39-41.96N	39-45.90N	2013-07-20 23:33:22.935	2013-07-20 23:39:08.939	
0203_20130720_233859_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	201	7/20/2013	5.4124	359.672	069-21.56W	069-16.38W	39-43.66N	39-46.21N	2013-07-20 23:38:50.439	2013-07-20 23:59:00.443	
0204_20130720_235850_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	201	7/20/2013	4.1906	338.527	069-21.01W	069-16.92W	39-45.59N	39-46.39N	2013-07-20 23:58:40.945	2013-07-20 23:59:15.443	
0205_20130720_235905_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	201	7/20/2013	3.3609	274.863	069-20.47W	069-17.55W	39-44.36N	39-47.72N	2013-07-20 23:59:05.944	2013-07-21 00:03:50.946	
0206_20130721_000351_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	5.2777	265.844	069-24.99W	069-18.90W	39-43.85N	39-47.86N	2013-07-21 00:03:51.446	2013-07-21 00:52:25.462	
0207_20130721_005216_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	5.9519	177.622	069-26.80W	069-22.98W	39-44.14N	39-47.13N	2013-07-21 00:52:06.462	2013-07-21 00:56:28.963	
0208_20130721_005626_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	8.51	141.749	069-27.01W	069-09.43W	39-31.04N	39-45.67N	2013-07-21 00:56:16.465	2013-07-21 02:56:29.994	
0209_20130721_025620_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	9.0677	139.527	069-13.32W	069-06.60W	39-28.42N	39-33.64N	2013-07-21 02:56:11.492	2013-07-21 03:18:37.998	
0210_20130721_031829_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	6.9066	223.741	069-12.88W	069-05.55W	39-25.31N	39-31.07N	2013-07-21 03:18:19.502	2013-07-21 04:03:29.510	
0211_20130721_040329_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	7.2521	325.292	069-24.00W	069-09.59W	39-26.09N	39-40.35N	2013-07-21 04:03:20.013	2013-07-21 06:03:35.545	
0212_20130721_060326_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	7.1254	308.912	069-25.38W	069-20.42W	39-37.87N	39-42.03N	2013-07-21 06:03:16.543	2013-07-21 06:20:00.047	
0213_20130721_061950_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	6.5635	204.594	069-26.85W	069-22.48W	39-38.39N	39-42.10N	2013-07-21 06:19:40.547	2013-07-21 06:41:38.551	
0214_20130721_064128_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	8.5698	146.524	069-27.20W	069-11.21W	39-24.26N	39-39.63N	2013-07-21 06:41:19.551	2013-07-21 08:36:17.082	
0215_20130721_083607_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	6.2926	213.918	069-16.24W	069-11.26W	39-23.09N	39-25.96N	2013-07-21 08:35:58.082	2013-07-21 08:54:22.088	
0216_20130721_090312_EX1304L1_MB	EX1304L1_XBT035_130720.asvp	202	7/21/2013	7.6248	329.326	069-27.80W	069-12.91W	39-22.27N	39-37.50N	2013-07-21 09:03:13.087	2013-07-21 11:03:11.145	
0217_20130721_110311_EX1304L1_MB	EX1304L1_XBT036_130721.asvp	202	7/21/2013	8.1648	328.362	069-37.36W	069-23.45W	39-35.10N	39-50.09N	2013-07-21 11:03:11.619	2013-07-21 12:47:09.650	
0219_20130722_011902_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	8.0615	058.143	069-37.39W	069-33.68W	39-46.59N	39-50.20N	2013-07-22 01:19:02.338	2013-07-22 01:29:02.342	NO Line 0218
0220_20130722_012852_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	6.5572	199.74	069-36.49W	069-32.39W	39-46.53N	39-50.36N	2013-07-22 01:28:43.340	2013-07-22 01:38:31.845	
0221_20130722_013822_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	7.0373	282.2	069-37.09W	069-34.62W	39-46.56N	39-50.18N	2013-07-22 01:38:12.844	2013-07-22 01:49:05.845	
0222_20130722_014856_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	7.1152	037.587	069-38.93W	069-34.58W	39-47.07N	39-50.64N	2013-07-22 01:48:46.348	2013-07-22 01:58:01.848	
0223_20130722_015752_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	7.252	146.168	069-37.81W	069-32.90W	39-46.73N	39-50.15N	2013-07-22 01:57:42.351	2013-07-22 02:12:12.357	
0224_20130722_021212_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	6.7417	274.034	069-37.88W	069-32.56W	39-45.73N	39-49.10N	2013-07-22 02:12:03.354	2013-07-22 02:22:43.354	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0225_20130722_022233_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	7.456	014.315	069-37.97W	069-33.05W	39-47.21N	39-49.44N	2013-07-22 02:22:23.854	2013-07-22 02:34:41.858	
0226_20130722_023432_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	8.532	336.733	069-39.77W	069-33.08W	39-48.71N	39-56.27N	2013-07-22 02:34:23.357	2013-07-22 03:29:14.873	
0227_20130722_032904_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	8.447	283.851	069-39.99W	069-38.88W	39-56.01N	39-56.62N	2013-07-22 03:28:55.873	2013-07-22 03:32:51.375	
0228_20130722_033242_EX1304L1_MB	EX1304L1_XBT037_130722.asvp	203	7/22/2013	8.375	279.192	070-01.43W	069-39.95W	39-56.01N	39-59.03N	2013-07-22 03:32:32.375	2013-07-22 05:32:51.905	
0229_20130722_053242_EX1304L1_MB	EX1304L1_XBT038_130722.asvp	203	7/22/2013	8.483	282.135	070-16.90W	070-01.26W	39-58.59N	40-01.83N	2013-07-22 05:32:32.907	2013-07-22 07:00:07.927	
0230_20130722_070008_EX1304L1_MB	EX1304L1_XBT039_130722.asvp	203	7/22/2013	8.546	244.177	070-37.10W	070-16.71W	39-52.85N	40-01.57N	2013-07-22 06:59:58.924	2013-07-22 09:00:08.954	
0231_20130722_090009_EX1304L1_MB	EX1304L1_XBT039_130722.asvp	203	7/22/2013	8.399	244.501	070-57.20W	070-36.29W	39-44.45N	39-54.15N	2013-07-22 08:59:59.458	2013-07-22 11:00:17.985	
0232_20130722_110008_EX1304L1_MB	EX1304L1_XBT039_130722.asvp	203	7/22/2013	10.0748	244.659	071-12.12W	070-55.08W	39-38.60N	39-47.46N	2013-07-22 10:59:58.487	2013-07-22 12:16:51.007	
0233_20130723_000408_EX1304L1_MB	EX1304L1_CTD011_130722.asvp	204	7/23/2013	8.384	274.259	071-25.80W	071-12.13W	39-38.13N	39-42.16N	2013-07-23 00:04:08.689	2013-07-23 01:09:38.206	
0234_20130723_010928_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	7.540	349.971	071-28.16W	071-21.49W	39-40.07N	39-54.97N	2013-07-23 01:09:19.205	2013-07-23 03:06:09.736	
0235_20130723_030610_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	8.007	349.328	071-28.50W	071-26.94W	39-54.73N	39-55.93N	2013-07-23 03:06:00.736	2013-07-23 03:13:40.238	
0236_20130723_031330_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	8.204	075.644	071-27.93W	071-21.63W	39-55.14N	39-57.30N	2013-07-23 03:13:21.739	2013-07-23 03:47:16.251	
0237_20130723_034707_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	8.318	250.679	071-39.09W	071-21.59W	39-51.64N	39-57.09N	2013-07-23 03:46:57.250	2013-07-23 05:26:25.775	
0238_20130723_052616_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	8.278	227.472	071-47.07W	071-38.26W	39-45.33N	39-52.30N	2013-07-23 05:26:07.272	2013-07-23 06:30:54.290	
0239_20130723_063044_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	8.559	007.963	071-47.73W	071-46.47W	39-45.37N	39-46.66N	2013-07-23 06:30:34.791	2013-07-23 06:35:49.292	
0240_20130723_063540_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	9.026	123.355	071-47.15W	071-32.04W	39-38.26N	39-46.60N	2013-07-23 06:35:30.294	2013-07-23 07:58:34.315	
0241_20130723_075824_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	8.199	123.743	071-34.33W	071-29.61W	39-36.85N	39-40.92N	2013-07-23 07:58:15.316	2013-07-23 08:13:57.314	
0242_20130723_081357_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	9.119	048.539	071-32.46W	071-24.46W	39-37.49N	39-43.42N	2013-07-23 08:13:48.315	2013-07-23 08:49:22.824	
0243_20130723_084912_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	6.572	065.935	071-27.19W	071-24.50W	39-40.82N	39-44.02N	2013-07-23 08:49:03.325	2013-07-23 08:53:44.825	
0244_20130723_085344_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	8.874	072.366	071-26.15W	071-18.09W	39-40.91N	39-45.51N	2013-07-23 08:53:35.328	2013-07-23 09:28:30.336	
0245_20130723_092821_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	7.770	045.623	071-20.21W	071-16.90W	39-42.85N	39-45.66N	2013-07-23 09:28:11.835	2013-07-23 09:33:49.838	
0246_20130723_093340_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	9.113	045.456	071-19.81W	071-10.09W	39-43.53N	39-51.03N	2013-07-23 09:33:30.337	2013-07-23 10:26:41.848	
0247_20130723_102642_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	7.470	298.742	071-12.52W	071-09.81W	39-49.76N	39-51.82N	2013-07-23 10:26:32.349	2013-07-23 10:33:25.355	
0248_20130723_103315_EX1304L1_MB	EX1304L1_XBT040_130723.asvp	204	7/23/2013	9.244	237.573	071-14.30W	071-10.97W	39-48.77N	39-51.53N	2013-07-23 10:33:05.855	2013-07-23 10:43:26.855	

EX-13-04 Leg 1 MULTIBEAM (BATHYMETRY, SEABED BACKSCATTER, WATER COLUMN BACKSCATTTER) ACQUISITION / FIELD PROCESSING LOG												
MB Line Filename (.all, .wcd)	SVP File Applied	Julian Day	Date (GMT)	SOG (KTS)	Hdg	Min Lon (dm)	Max Lon (dm)	Min Lat (dm)	Max Lat (dm)	Min Time	Max Time	Comments
0249_20130723_231311_EX1304L1_MB	EX1304L1_CTD012_130723.asvp	204	7/23/2013	9.185	155.165	071-17.76W	071-10.15W	39-41.38N	39-48.88N	2013-07-23 23:13:12.055	2013-07-24 00:01:53.567	
0250_20130724_000153_EX1304L1_MB	EX1304L1_CTD012_130723.asvp	205	7/24/2013	9.693	156.909	071-13.91W	071-07.68W	39-37.45N	39-42.30N	2013-07-24 00:01:54.066	2013-07-24 00:28:17.576	
0251_20130724_002808_EX1304L1_MB	EX1304L1_CTD012_130723.asvp	205	7/24/2013	8.008	112.055	071-10.99W	071-07.96W	39-35.90N	39-39.69N	2013-07-24 00:27:58.572	2013-07-24 00:34:22.572	
0252_20130724_003412_EX1304L1_MB	EX1304L1_XBT041_130724.asvp	205	7/24/2013	8.842	091.947	071-08.88W	070-45.86W	39-35.38N	39-39.65N	2013-07-24 00:34:03.571	2013-07-24 02:34:21.603	
0253_20130724_023411_EX1304L1_MB	EX1304L1_XBT042_130724.asvp	205	7/24/2013	8.950	092.097	070-46.04W	070-37.09W	39-35.31N	39-39.47N	2013-07-24 02:34:02.105	2013-07-24 03:18:59.142	
0254_20130724_031849_EX1304L1_MB	EX1304L1_XBT042_130724.asvp	205	7/24/2013	7.373	173.515	070-39.67W	070-34.44W	39-35.12N	39-39.01N	2013-07-24 03:18:40.142	2013-07-24 03:36:35.625	
0255_20130724_033626_EX1304L1_MB	EX1304L1_XBT042_130724.asvp	205	7/24/2013	6.862	228.884	070-39.27W	070-34.83W	39-33.22N	39-36.56N	2013-07-24 03:36:16.622	2013-07-24 03:41:14.620	
0256_20130724_034115_EX1304L1_MB	EX1304L1_XBT043_130724.asvp	205	7/24/2013	8.735	272.05	071-00.13W	070-37.11W	39-32.86N	39-37.16N	2013-07-24 03:41:05.141	2013-07-24 05:41:26.656	
0257_20130724_054117_EX1304L1_MB	EX1304L1_XBT043_130724.asvp	205	7/24/2013	8.692	264.258	071-16.59W	070-59.94W	39-32.12N	39-37.34N	2013-07-24 05:41:08.153	2013-07-24 07:07:07.679	
0258_20130724_070658_EX1304L1_MB	EX1304L1_XBT043_130724.asvp	205	7/24/2013	8.744	194.772	071-18.27W	071-13.82W	39-31.26N	39-35.36N	2013-07-24 07:06:48.179	2013-07-24 07:15:36.182	
0259_20130724_071527_EX1304L1_MB	EX1304L1_XBT044_130724.asvp	205	7/24/2013	8.908	092.268	071-16.75W	071-00.28W	39-30.62N	39-34.95N	2013-07-24 07:15:17.182	2013-07-24 08:35:43.200	
0260_20130724_083533_EX1304L1_MB	EX1304L1_XBT044_130724.asvp	205	7/24/2013	8.771	059.934	071-02.12W	070-56.93W	39-30.65N	39-34.80N	2013-07-24 08:35:24.201	2013-07-24 08:42:02.204	
0261_20130724_084202_EX1304L1_MB	EX1304L1_XBT044_130724.asvp	205	7/24/2013	9.735	351.473	071-02.79W	070-56.91W	39-32.80N	39-39.10N	2013-07-24 08:41:53.204	2013-07-24 09:14:28.713	
0262_20130724_091419_EX1304L1_MB	EX1304L1_XBT044_130724.asvp	205	7/24/2013	9.781	336.228	071-08.87W	070-58.46W	39-37.37N	39-49.02N	2013-07-24 09:14:09.712	2013-07-24 10:25:26.732	
0263_20130724_203953_EX1304L1_MB	EX1304L1_XBT045_130724.asvp	205	7/24/2013	9.424	278.588	071-33.85W	071-09.50W	39-47.36N	39-51.76N	2013-07-24 20:39:53.894	2013-07-24 22:40:02.427	
0264_20130724_223953_EX1304L1_MB	EX1304L1_XBT046_130725.asvp	205	7/24/2013	9.642	279.336	071-55.76W	071-33.62W	39-50.72N	39-53.60N	2013-07-24 22:39:43.426	2013-07-25 00:26:02.453	
0265_20130725_002602_EX1304L1_MB	EX1304L1_XBT047_130725.asvp	206	7/25/2013	9.297	279.583	072-19.68W	071-55.68W	39-53.23N	39-55.98N	2013-07-25 00:26:02.953	2013-07-25 02:26:11.486	
0266_20130725_022602_EX1304L1_MB	EX1304L1_XBT048_130725.asvp	206	7/25/2013	8.829	279.825	072-37.69W	072-19.63W	39-55.76N	39-57.80N	2013-07-25 02:25:52.487	2013-07-25 04:01:08.009	

EX1304 Leg 1 SVP LOG					
DATE (GMT)	TIME (GMT)	XBT/CTD FILE NAME	LAT (WGS84)	LONG (WGS84)	Probe Type
7/9/2013	00:35:38	EX1304L1_XBT001_130709	40 35.8645N	71 16.85303W	DEEP BLUE
7/9/2013	05:35:33	EX1304L1_XBT002_130709	39 55.99561N	71 7.32959W	DEEP BLUE
7/10/2013	00:19:29	EX1304L1_XBT003_130710	39 45.23145N	71 4.47168W	DEEP BLUE
7/10/2013	02:59:35	EX1304L1_XBT004_130710	39 45.23389N	70 32.99512W	DEEP BLUE
7/10/2013	04:48:51	EX1304L1_XBT005_130710	39 41.97681N	70 11.33984W	DEEP BLUE
7/10/2013	22:15:13	EX1304L1_XBT006_130710	39 51.32104N	69 33.45996W	DEEP BLUE
7/11/2013	00:36:45	EX1304L1_XBT007_130711	39 40.17383N	69 26.85889W	DEEP BLUE
7/11/2013	03:47:01	EX1304L1_XBT008_130711	39 41.4126N	69 17.35889W	DEEP BLUE
7/11/2013	05:43:34	EX1304L1_XBT009_130711	39 39.46802N	68 57.98779W	DEEP BLUE
7/11/2013	07:57:57	EX1304L1_XBT010_130711	39 39.77344N	69 20.23779W	DEEP BLUE
7/12/2013	01:41:18	EX1304L1_XBT011_130712	39 53.22705N	69 15.25635W	DEEP BLUE
7/12/2013	04:20:26	EX1304L1_XBT012_130712	40 0.34985N	69 13.55469W	DEEP BLUE
7/12/2013	06:27:51	EX1304L1_XBT013_130712	39 59.97119N	69 15.52002W	DEEP BLUE
7/12/2013	21:25:57	EX1304L1_XBT014_130712	39 53.10742N	69 16.47705W	DEEP BLUE
7/13/2013	00:51:06	EX1304L1_XBT015_130713	40 1.18091N	69 10.13867W	DEEP BLUE
7/13/2013	03:13:24	EX1304L1_XBT016_130713	40 2.17456N	69 5.23877W	DEEP BLUE
7/13/2013	06:01:09	EX1304L1_XBT017_130713	40 2.97144N	68 53.19336W	DEEP BLUE
7/14/2013	00:26:55	EX1304L1_XBT018_130714	40 0.94751N	69 3.35547W	DEEP BLUE
7/14/2013	03:33:45	EX1304L1_XBT019_130714	39 57.552N	69 14.65332W	DEEP BLUE
7/14/2013	06:59:18	EX1304L1_XBT020_130714	39 53.24097N	69 32.12988W	DEEP BLUE
7/15/2013	22:12	EX1304L1_CTD005_130714	40 02.98002N	69 02.2200W	CTD
7/15/2013	03:06:23	EX1304L1_XBT021_130715	39 45.52783N	69 21.72363W	DEEP BLUE
7/15/2013	06:25:32	EX1304L1_XBT022_130715	39 48.91431N	69 58.44385W	DEEP BLUE
7/16/2013	22:15	EX1304L1_CTD006_130715	39 51.19002N	70 15.46002W	CTD

EX1304 Leg 1 SVP LOG					
DATE (GMT)	TIME (GMT)	XBT/CTD FILE NAME	LAT (WGS84)	LONG (WGS84)	Probe Type
7/16/2013	01:44:43	EX1304L1_XBT023_130716	39 56.76978N	69 49.99023W	DEEP BLUE
7/16/2013	04:15:31	EX1304L1_XBT024_130716	39 45.6189N	69 56.7998W	DEEP BLUE
7/16/2013	07:40:48	EX1304L1_XBT025_130716	39 40.11523N	69 53.9043W	DEEP BLUE
7/16/2013	22:28	EX1304L1_CTD007_130716	39 47.20002N	70 13.18998W	CTD
7/17/2013	02:49:24	EX1304L1_XBT026_130717	39 56.30859N	70 15.5835W	DEEP BLUE
7/17/2013	05:54:51	EX1304L1_XBT027_130717	39 57.92139N	70 17.6626W	DEEP BLUE
7/17/2013	21:58	EX1304L1_CTD008_130717	39 52.95000N	70 3133002W	CTD
7/18/2013	03:09:58	EX1304L1_XBT028_130718	39 59.33496N	70 42.60693W	DEEP BLUE
7/18/2013	06:31:52	EX1304L1_XBT029_130718	39 59.69971N	70 44.36621W	DEEP BLUE
7/18/2013	21:57	EX1304L1_CTD009_130718	39.841833N	70.470333W	CTD
7/19/2013	03:02:18	EX1304L1_XBT030_130719	39 41.70288N	71 9.36768W	DEEP BLUE
7/19/2013	05:57:33	EX1304L1_XBT031_130719	39 53.78418N	70 57.82568W	DEEP BLUE
7/19/2113	21:59	EX1304L1_CTD010_130719	39 47.02002N	71 16.00002W	CTD
7/20/2013	03:37:04	EX1304L1_XBT032_130720	39 52.31519N	70 25.62012W	DEEP BLUE
7/20/2013	07:36:26	EX1304L1_XBT033_130720	39 48.88257N	69 43.50146W	DEEP BLUE
7/20/2013	21:22:41	EX1304L1_XBT034_130720	39 43.62061N	69 31.86426W	DEEP BLUE
7/20/2013	23:42:53	EX1304L1_XBT035_130720	39 44.48486N	69 18.93164W	DEEP BLUE
7/21/2013	11:12:25	EX1304L1_XBT036_130721	39 37.35889N	69 26.48145W	DEEP BLUE
7/22/2013	01:03:12	EX1304L1_XBT037_130722	39 47.84497N	69 36.72607W	DEEP BLUE
7/22/2013	05:42:23	EX1304L1_XBT038_130722	39 59.30908N	70 3.07178W	DEEP BLUE
7/22/2013	08:29:10	EX1304L1_XBT039_130722	39 55.47437N	70 31.59277W	DEEP BLUE
7/22/2013	22:17	EX1304L1_CTD011_130722	39 39.88998N	71 11.79000W	CTD
7/23/2013	02:38:47	EX1304L1_XBT040_130723	39 51.07617N	71 26.51904W	DEEP BLUE
7/23/2013	22:00	EX1304L1_CTD012_130722	39 48.43002N	71 16.21998W	CTD

EX1304 Leg 1 SVP LOG					
DATE (GMT)	TIME (GMT)	XBT/CTD FILE NAME	LAT (WGS84)	LONG (WGS84)	Probe Type
7/24/2013	01:02:08	EX1304L1_XBT041_130724	39 37.62598N	71 3.45605W	DEEP BLUE
7/24/2013	03:08:00	EX1304L1_XBT042_130724	39 37.37354N	70 39.40576W	DEEP BLUE
7/24/2013	05:26:35	EX1304L1_XBT043_130724	39 35.13623N	70 57.27197W	DEEP BLUE
7/24/2013	07:25:39	EX1304L1_XBT044_130724	39 32.86719N	71 13.59277W	DEEP BLUE

EX1304 Leg 1 SVP LOG					
DATE (GMT)	TIME (GMT)	XBT/CTD FILE NAME	LAT (WGS84)	LONG (WGS84)	Probe Type
7/24/2013	20:32:00	EX1304L1_XBT045_130724	39 48.77905N	71 8.00781W	DEEP BLUE
7/25/2013	00:11:53	EX1304L1_XBT046_130725	39 53.12109N	71 52.77344W	DEEP BLUE
7/25/2013	01:06:44	EX1304L1_XBT047_130725	39 54.26514N	72 3.93457W	DEEP BLUE
7/25/2013	03:01:15	EX1304L1_XBT048_130725	39 56.57031N	72 26.45215W	DEEP BLUE

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/8/2013	11,480	EX1304L1_EK60_-D20130709-T015116.bot
7/8/2013	19,448	EX1304L1_EK60_-D20130709-T015116.idx
7/8/2013	18,762,032	EX1304L1_EK60_-D20130709-T015116.raw
7/8/2013	11,480	EX1304L1_EK60_-D20130709-T022914.bot
7/8/2013	19,448	EX1304L1_EK60_-D20130709-T022914.idx
7/8/2013	18,769,264	EX1304L1_EK60_-D20130709-T022914.raw
7/8/2013	10,712	EX1304L1_EK60_-D20130709-T030723.bot
7/8/2013	18,104	EX1304L1_EK60_-D20130709-T030723.idx
7/8/2013	17,426,900	EX1304L1_EK60_-D20130709-T030723.raw
7/9/2013	9,592	EX1304L1_EK60_-D20130709-T034303.bot
7/9/2013	16,144	EX1304L1_EK60_-D20130709-T034303.idx
7/9/2013	15,575,152	EX1304L1_EK60_-D20130709-T034303.raw
7/9/2013	9,528	EX1304L1_EK60_-D20130709-T041801.bot
7/9/2013	16,032	EX1304L1_EK60_-D20130709-T041801.idx
7/9/2013	15,512,804	EX1304L1_EK60_-D20130709-T041801.raw
7/9/2013	9,880	EX1304L1_EK60_-D20130709-T045407.bot
7/9/2013	16,648	EX1304L1_EK60_-D20130709-T045407.idx
7/9/2013	16,063,188	EX1304L1_EK60_-D20130709-T045407.raw
7/9/2013	8,312	EX1304L1_EK60_-D20130709-T052935.bot
7/9/2013	13,904	EX1304L1_EK60_-D20130709-T052935.idx
7/9/2013	13,569,008	EX1304L1_EK60_-D20130709-T052935.raw
7/9/2013	9,080	EX1304L1_EK60_-D20130710-T002657.bot
7/9/2013	15,248	EX1304L1_EK60_-D20130710-T002657.idx
7/9/2013	14,607,716	EX1304L1_EK60_-D20130710-T002657.raw
7/9/2013	9,496	EX1304L1_EK60_-D20130710-T005856.bot
7/9/2013	15,976	EX1304L1_EK60_-D20130710-T005856.idx
7/9/2013	15,304,760	EX1304L1_EK60_-D20130710-T005856.raw
7/9/2013	8,824	EX1304L1_EK60_-D20130710-T013127.bot
7/9/2013	14,800	EX1304L1_EK60_-D20130710-T013127.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/9/2013	14,190,132	EX1304L1_EK60_-D20130710-T013127.raw
7/9/2013	9,016	EX1304L1_EK60_-D20130710-T020325.bot
7/9/2013	15,136	EX1304L1_EK60_-D20130710-T020325.idx
7/9/2013	14,516,656	EX1304L1_EK60_-D20130710-T020325.raw
7/9/2013	9,208	EX1304L1_EK60_-D20130710-T023513.bot
7/9/2013	15,472	EX1304L1_EK60_-D20130710-T023513.idx
7/9/2013	14,830,456	EX1304L1_EK60_-D20130710-T023513.raw
7/9/2013	9,016	EX1304L1_EK60_-D20130710-T030702.bot
7/9/2013	15,136	EX1304L1_EK60_-D20130710-T030702.idx
7/9/2013	14,541,620	EX1304L1_EK60_-D20130710-T030702.raw
7/10/2013	8,664	EX1304L1_EK60_-D20130710-T033930.bot
7/10/2013	14,520	EX1304L1_EK60_-D20130710-T033930.idx
7/10/2013	13,905,024	EX1304L1_EK60_-D20130710-T033930.raw
7/10/2013	8,696	EX1304L1_EK60_-D20130710-T041047.bot
7/10/2013	14,576	EX1304L1_EK60_-D20130710-T041047.idx
7/10/2013	13,994,980	EX1304L1_EK60_-D20130710-T041047.raw
7/10/2013	8,824	EX1304L1_EK60_-D20130710-T044306.bot
7/10/2013	14,800	EX1304L1_EK60_-D20130710-T044306.idx
7/10/2013	14,235,052	EX1304L1_EK60_-D20130710-T044306.raw
7/10/2013	8,568	EX1304L1_EK60_-D20130710-T051558.bot
7/10/2013	14,352	EX1304L1_EK60_-D20130710-T051558.idx
7/10/2013	13,791,964	EX1304L1_EK60_-D20130710-T051558.raw
7/10/2013	1,208	EX1304L1_EK60_-D20130710-T054825.bot
7/10/2013	1,472	EX1304L1_EK60_-D20130710-T054825.idx
7/10/2013	629,392	EX1304L1_EK60_-D20130710-T054825.raw
7/10/2013	7,960	EX1304L1_EK60_-D20130710-T212921.bot
7/10/2013	13,288	EX1304L1_EK60_-D20130710-T212921.idx
7/10/2013	12,723,268	EX1304L1_EK60_-D20130710-T212921.raw
7/10/2013	6,424	EX1304L1_EK60_-D20130710-T220046.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/10/2013	10,600	EX1304L1_EK60_-D20130710-T220046.idx
7/10/2013	10,252,860	EX1304L1_EK60_-D20130710-T220046.raw
7/10/2013	11,032	EX1304L1_EK60_-D20130710-T223201.bot
7/10/2013	18,664	EX1304L1_EK60_-D20130710-T223201.idx
7/10/2013	18,115,272	EX1304L1_EK60_-D20130710-T223201.raw
7/10/2013	14,232	EX1304L1_EK60_-D20130710-T231229.bot
7/10/2013	24,264	EX1304L1_EK60_-D20130710-T231229.idx
7/10/2013	23,794,320	EX1304L1_EK60_-D20130710-T231229.raw
7/10/2013	14,072	EX1304L1_EK60_-D20130711-T000521.bot
7/10/2013	23,984	EX1304L1_EK60_-D20130711-T000521.idx
7/10/2013	23,580,608	EX1304L1_EK60_-D20130711-T000521.raw
7/10/2013	12,888	EX1304L1_EK60_-D20130711-T005930.bot
7/10/2013	21,912	EX1304L1_EK60_-D20130711-T005930.idx
7/10/2013	21,458,412	EX1304L1_EK60_-D20130711-T005930.raw
7/10/2013	10,808	EX1304L1_EK60_-D20130711-T014832.bot
7/10/2013	18,272	EX1304L1_EK60_-D20130711-T014832.idx
7/10/2013	17,702,892	EX1304L1_EK60_-D20130711-T014832.raw
7/10/2013	5,816	EX1304L1_EK60_-D20130711-T022759.bot
7/10/2013	9,536	EX1304L1_EK60_-D20130711-T022759.idx
7/10/2013	9,340,084	EX1304L1_EK60_-D20130711-T022759.raw
7/10/2013	5,592	EX1304L1_EK60_-D20130711-T030111.bot
7/10/2013	9,144	EX1304L1_EK60_-D20130711-T030111.idx
7/10/2013	8,884,568	EX1304L1_EK60_-D20130711-T030111.raw
7/11/2013	6,104	EX1304L1_EK60_-D20130711-T033203.bot
7/11/2013	10,040	EX1304L1_EK60_-D20130711-T033203.idx
7/11/2013	9,811,040	EX1304L1_EK60_-D20130711-T033203.raw
7/11/2013	6,104	EX1304L1_EK60_-D20130711-T040530.bot
7/11/2013	10,040	EX1304L1_EK60_-D20130711-T040530.idx
7/11/2013	9,837,864	EX1304L1_EK60_-D20130711-T040530.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/11/2013	6,264	EX1304L1_EK60_-D20130711-T043940.bot
7/11/2013	10,320	EX1304L1_EK60_-D20130711-T043940.idx
7/11/2013	10,121,684	EX1304L1_EK60_-D20130711-T043940.raw
7/11/2013	8,696	EX1304L1_EK60_-D20130711-T051430.bot
7/11/2013	14,576	EX1304L1_EK60_-D20130711-T051430.idx
7/11/2013	14,126,916	EX1304L1_EK60_-D20130711-T051430.raw
7/11/2013	10,776	EX1304L1_EK60_-D20130711-T055011.bot
7/11/2013	18,216	EX1304L1_EK60_-D20130711-T055011.idx
7/11/2013	17,525,784	EX1304L1_EK60_-D20130711-T055011.raw
7/11/2013	6,840	EX1304L1_EK60_-D20130711-T062618.bot
7/11/2013	11,328	EX1304L1_EK60_-D20130711-T062618.idx
7/11/2013	11,226,072	EX1304L1_EK60_-D20130711-T062618.raw
7/11/2013	7,544	EX1304L1_EK60_-D20130711-T070536.bot
7/11/2013	12,560	EX1304L1_EK60_-D20130711-T070536.idx
7/11/2013	12,463,720	EX1304L1_EK60_-D20130711-T070536.raw
7/11/2013	7,896	EX1304L1_EK60_-D20130711-T074724.bot
7/11/2013	13,176	EX1304L1_EK60_-D20130711-T074724.idx
7/11/2013	13,059,656	EX1304L1_EK60_-D20130711-T074724.raw
7/11/2013	1,688	EX1304L1_EK60_-D20130711-T082948.bot
7/11/2013	2,312	EX1304L1_EK60_-D20130711-T082948.idx
7/11/2013	1,818,516	EX1304L1_EK60_-D20130711-T082948.raw
7/11/2013	1,624	EX1304L1_EK60_-D20130712-T014531.bot
7/11/2013	2,200	EX1304L1_EK60_-D20130712-T014531.idx
7/11/2013	1,380,464	EX1304L1_EK60_-D20130712-T014531.raw
7/11/2013	7,736	EX1304L1_EK60_-D20130712-T014900.bot
7/11/2013	12,896	EX1304L1_EK60_-D20130712-T014900.idx
7/11/2013	12,721,268	EX1304L1_EK60_-D20130712-T014900.raw
7/11/2013	8,088	EX1304L1_EK60_-D20130712-T022905.bot
7/11/2013	13,512	EX1304L1_EK60_-D20130712-T022905.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/11/2013	13,234,608	EX1304L1_EK60_-D20130712-T022905.raw
7/11/2013	8,824	EX1304L1_EK60_-D20130712-T030734.bot
7/11/2013	14,800	EX1304L1_EK60_-D20130712-T030734.idx
7/11/2013	14,407,920	EX1304L1_EK60_-D20130712-T030734.raw
7/12/2013	9,720	EX1304L1_EK60_-D20130712-T034516.bot
7/12/2013	16,368	EX1304L1_EK60_-D20130712-T034516.idx
7/12/2013	15,741,032	EX1304L1_EK60_-D20130712-T034516.raw
7/12/2013	11,704	EX1304L1_EK60_-D20130712-T041943.bot
7/12/2013	19,840	EX1304L1_EK60_-D20130712-T041943.idx
7/12/2013	19,232,588	EX1304L1_EK60_-D20130712-T041943.raw
7/12/2013	10,808	EX1304L1_EK60_-D20130712-T050059.bot
7/12/2013	18,272	EX1304L1_EK60_-D20130712-T050059.idx
7/12/2013	17,669,216	EX1304L1_EK60_-D20130712-T050059.raw
7/12/2013	10,424	EX1304L1_EK60_-D20130712-T053929.bot
7/12/2013	17,600	EX1304L1_EK60_-D20130712-T053929.idx
7/12/2013	16,939,120	EX1304L1_EK60_-D20130712-T053929.raw
7/12/2013	12,120	EX1304L1_EK60_-D20130712-T061520.bot
7/12/2013	20,568	EX1304L1_EK60_-D20130712-T061520.idx
7/12/2013	19,956,256	EX1304L1_EK60_-D20130712-T061520.raw
7/12/2013	9,912	EX1304L1_EK60_-D20130712-T065751.bot
7/12/2013	16,704	EX1304L1_EK60_-D20130712-T065751.idx
7/12/2013	16,244,872	EX1304L1_EK60_-D20130712-T065751.raw
7/12/2013	9,048	EX1304L1_EK60_-D20130712-T073703.bot
7/12/2013	15,192	EX1304L1_EK60_-D20130712-T073703.idx
7/12/2013	14,650,312	EX1304L1_EK60_-D20130712-T073703.raw
7/12/2013	1,336	EX1304L1_EK60_-D20130712-T081135.bot
7/12/2013	1,696	EX1304L1_EK60_-D20130712-T081135.idx
7/12/2013	851,580	EX1304L1_EK60_-D20130712-T081135.raw
7/12/2013	11,192	EX1304L1_EK60_-D20130712-T223203.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/12/2013	18,944	EX1304L1_EK60_-D20130712-T223203.idx
7/12/2013	18,851,432	EX1304L1_EK60_-D20130712-T223203.raw
7/12/2013	6,968	EX1304L1_EK60_-D20130712-T232642.bot
7/12/2013	11,552	EX1304L1_EK60_-D20130712-T232642.idx
7/12/2013	11,170,696	EX1304L1_EK60_-D20130712-T232642.raw
7/12/2013	8,632	EX1304L1_EK60_-D20130712-T235921.bot
7/12/2013	14,464	EX1304L1_EK60_-D20130712-T235921.idx
7/12/2013	13,828,188	EX1304L1_EK60_-D20130712-T235921.raw
7/12/2013	9,880	EX1304L1_EK60_-D20130713-T003031.bot
7/12/2013	16,648	EX1304L1_EK60_-D20130713-T003031.idx
7/12/2013	15,997,728	EX1304L1_EK60_-D20130713-T003031.raw
7/12/2013	9,784	EX1304L1_EK60_-D20130713-T010456.bot
7/12/2013	16,480	EX1304L1_EK60_-D20130713-T010456.idx
7/12/2013	15,816,292	EX1304L1_EK60_-D20130713-T010456.raw
7/12/2013	9,336	EX1304L1_EK60_-D20130713-T013833.bot
7/12/2013	15,696	EX1304L1_EK60_-D20130713-T013833.idx
7/12/2013	15,039,260	EX1304L1_EK60_-D20130713-T013833.raw
7/12/2013	10,040	EX1304L1_EK60_-D20130713-T021044.bot
7/12/2013	16,928	EX1304L1_EK60_-D20130713-T021044.idx
7/12/2013	16,247,888	EX1304L1_EK60_-D20130713-T021044.raw
7/12/2013	9,752	EX1304L1_EK60_-D20130713-T024446.bot
7/12/2013	16,424	EX1304L1_EK60_-D20130713-T024446.idx
7/12/2013	15,762,112	EX1304L1_EK60_-D20130713-T024446.raw
7/12/2013	9,912	EX1304L1_EK60_-D20130713-T031822.bot
7/12/2013	16,704	EX1304L1_EK60_-D20130713-T031822.idx
7/12/2013	16,019,280	EX1304L1_EK60_-D20130713-T031822.raw
7/13/2013	9,784	EX1304L1_EK60_-D20130713-T035141.bot
7/13/2013	16,480	EX1304L1_EK60_-D20130713-T035141.idx
7/13/2013	15,788,048	EX1304L1_EK60_-D20130713-T035141.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/13/2013	9,560	EX1304L1_EK60_-D20130713-T042438.bot
7/13/2013	16,088	EX1304L1_EK60_-D20130713-T042438.idx
7/13/2013	15,464,592	EX1304L1_EK60_-D20130713-T042438.raw
7/13/2013	10,136	EX1304L1_EK60_-D20130713-T045844.bot
7/13/2013	17,096	EX1304L1_EK60_-D20130713-T045844.idx
7/13/2013	16,433,856	EX1304L1_EK60_-D20130713-T045844.raw
7/13/2013	9,272	EX1304L1_EK60_-D20130713-T053340.bot
7/13/2013	15,584	EX1304L1_EK60_-D20130713-T053340.idx
7/13/2013	14,981,616	EX1304L1_EK60_-D20130713-T053340.raw
7/13/2013	9,528	EX1304L1_EK60_-D20130713-T060716.bot
7/13/2013	16,032	EX1304L1_EK60_-D20130713-T060716.idx
7/13/2013	15,347,736	EX1304L1_EK60_-D20130713-T060716.raw
7/13/2013	10,456	EX1304L1_EK60_-D20130713-T063917.bot
7/13/2013	17,656	EX1304L1_EK60_-D20130713-T063917.idx
7/13/2013	17,011,140	EX1304L1_EK60_-D20130713-T063917.raw
7/13/2013	10,104	EX1304L1_EK60_-D20130713-T071540.bot
7/13/2013	17,040	EX1304L1_EK60_-D20130713-T071540.idx
7/13/2013	16,400,736	EX1304L1_EK60_-D20130713-T071540.raw
7/13/2013	9,112	EX1304L1_EK60_-D20130713-T075101.bot
7/13/2013	15,304	EX1304L1_EK60_-D20130713-T075101.idx
7/13/2013	14,680,080	EX1304L1_EK60_-D20130713-T075101.raw
7/13/2013	9,336	EX1304L1_EK60_-D20130713-T082322.bot
7/13/2013	15,696	EX1304L1_EK60_-D20130713-T082322.idx
7/13/2013	15,047,884	EX1304L1_EK60_-D20130713-T082322.raw
7/13/2013	10,808	EX1304L1_EK60_-D20130713-T085545.bot
7/13/2013	18,272	EX1304L1_EK60_-D20130713-T085545.idx
7/13/2013	17,591,540	EX1304L1_EK60_-D20130713-T085545.raw
7/13/2013	10,072	EX1304L1_EK60_-D20130713-T093223.bot
7/13/2013	16,984	EX1304L1_EK60_-D20130713-T093223.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/13/2013	16,350,228	EX1304L1_EK60_-D20130713-T093223.raw
7/13/2013	9,496	EX1304L1_EK60_-D20130713-T100745.bot
7/13/2013	15,976	EX1304L1_EK60_-D20130713-T100745.idx
7/13/2013	15,292,280	EX1304L1_EK60_-D20130713-T100745.raw
7/13/2013	2,680	EX1304L1_EK60_-D20130713-T103945.bot
7/13/2013	4,048	EX1304L1_EK60_-D20130713-T103945.idx
7/13/2013	3,228,312	EX1304L1_EK60_-D20130713-T103945.raw
7/13/2013	20,440	EX1304L1_EK60_-D20130713-T231615.bot
7/13/2013	35,128	EX1304L1_EK60_-D20130713-T231615.idx
7/13/2013	35,198,496	EX1304L1_EK60_-D20130713-T231615.raw
7/13/2013	9,528	EX1304L1_EK60_-D20130714-T004542.bot
7/13/2013	16,032	EX1304L1_EK60_-D20130714-T004542.idx
7/13/2013	15,444,736	EX1304L1_EK60_-D20130714-T004542.raw
7/13/2013	7,960	EX1304L1_EK60_-D20130714-T012033.bot
7/13/2013	13,288	EX1304L1_EK60_-D20130714-T012033.idx
7/13/2013	12,866,528	EX1304L1_EK60_-D20130714-T012033.raw
7/13/2013	9,016	EX1304L1_EK60_-D20130714-T015441.bot
7/13/2013	15,136	EX1304L1_EK60_-D20130714-T015441.idx
7/13/2013	14,710,992	EX1304L1_EK60_-D20130714-T015441.raw
7/13/2013	9,976	EX1304L1_EK60_-D20130714-T023234.bot
7/13/2013	16,816	EX1304L1_EK60_-D20130714-T023234.idx
7/13/2013	16,223,180	EX1304L1_EK60_-D20130714-T023234.raw
7/13/2013	9,368	EX1304L1_EK60_-D20130714-T030853.bot
7/13/2013	15,752	EX1304L1_EK60_-D20130714-T030853.idx
7/13/2013	15,191,476	EX1304L1_EK60_-D20130714-T030853.raw
7/14/2013	9,784	EX1304L1_EK60_-D20130714-T034345.bot
7/14/2013	16,480	EX1304L1_EK60_-D20130714-T034345.idx
7/14/2013	15,967,996	EX1304L1_EK60_-D20130714-T034345.raw
7/14/2013	9,528	EX1304L1_EK60_-D20130714-T042125.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/14/2013	16,032	EX1304L1_EK60_-D20130714-T042125.idx
7/14/2013	15,488,812	EX1304L1_EK60_-D20130714-T042125.raw
7/14/2013	8,216	EX1304L1_EK60_-D20130714-T045729.bot
7/14/2013	13,736	EX1304L1_EK60_-D20130714-T045729.idx
7/14/2013	13,383,796	EX1304L1_EK60_-D20130714-T045729.raw
7/14/2013	6,712	EX1304L1_EK60_-D20130714-T053410.bot
7/14/2013	11,104	EX1304L1_EK60_-D20130714-T053410.idx
7/14/2013	10,862,332	EX1304L1_EK60_-D20130714-T053410.raw
7/14/2013	7,128	EX1304L1_EK60_-D20130714-T060907.bot
7/14/2013	11,832	EX1304L1_EK60_-D20130714-T060907.idx
7/14/2013	11,477,480	EX1304L1_EK60_-D20130714-T060907.raw
7/14/2013	9,464	EX1304L1_EK60_-D20130714-T064217.bot
7/14/2013	15,920	EX1304L1_EK60_-D20130714-T064217.idx
7/14/2013	15,385,760	EX1304L1_EK60_-D20130714-T064217.raw
7/14/2013	9,336	EX1304L1_EK60_-D20130714-T071816.bot
7/14/2013	15,696	EX1304L1_EK60_-D20130714-T071816.idx
7/14/2013	15,165,500	EX1304L1_EK60_-D20130714-T071816.raw
7/14/2013	8,824	EX1304L1_EK60_-D20130714-T075419.bot
7/14/2013	14,800	EX1304L1_EK60_-D20130714-T075419.idx
7/14/2013	14,237,872	EX1304L1_EK60_-D20130714-T075419.raw
7/14/2013	7,032	EX1304L1_EK60_-D20130714-T082745.bot
7/14/2013	11,664	EX1304L1_EK60_-D20130714-T082745.idx
7/14/2013	11,284,124	EX1304L1_EK60_-D20130714-T082745.raw
7/14/2013	6,040	EX1304L1_EK60_-D20130714-T090015.bot
7/14/2013	9,928	EX1304L1_EK60_-D20130714-T090015.idx
7/14/2013	9,683,024	EX1304L1_EK60_-D20130714-T090015.raw
7/14/2013	2,584	EX1304L1_EK60_-D20130714-T093310.bot
7/14/2013	3,880	EX1304L1_EK60_-D20130714-T093310.idx
7/14/2013	3,194,472	EX1304L1_EK60_-D20130714-T093310.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/14/2013	14,040	EX1304L1_EK60_-D20130714-T224350.bot
7/14/2013	23,928	EX1304L1_EK60_-D20130714-T224350.idx
7/14/2013	23,880,008	EX1304L1_EK60_-D20130714-T224350.raw
7/14/2013	6,552	EX1304L1_EK60_-D20130714-T234803.bot
7/14/2013	10,824	EX1304L1_EK60_-D20130714-T234803.idx
7/14/2013	10,542,524	EX1304L1_EK60_-D20130714-T234803.raw
7/14/2013	7,768	EX1304L1_EK60_-D20130715-T002103.bot
7/14/2013	12,952	EX1304L1_EK60_-D20130715-T002103.idx
7/14/2013	12,480,980	EX1304L1_EK60_-D20130715-T002103.raw
7/14/2013	8,824	EX1304L1_EK60_-D20130715-T005254.bot
7/14/2013	14,800	EX1304L1_EK60_-D20130715-T005254.idx
7/14/2013	14,214,372	EX1304L1_EK60_-D20130715-T005254.raw
7/14/2013	8,984	EX1304L1_EK60_-D20130715-T012502.bot
7/14/2013	15,080	EX1304L1_EK60_-D20130715-T012502.idx
7/14/2013	14,463,008	EX1304L1_EK60_-D20130715-T012502.raw
7/14/2013	9,208	EX1304L1_EK60_-D20130715-T015655.bot
7/14/2013	15,472	EX1304L1_EK60_-D20130715-T015655.idx
7/14/2013	14,844,684	EX1304L1_EK60_-D20130715-T015655.raw
7/14/2013	9,048	EX1304L1_EK60_-D20130715-T022919.bot
7/14/2013	15,192	EX1304L1_EK60_-D20130715-T022919.idx
7/14/2013	14,549,176	EX1304L1_EK60_-D20130715-T022919.raw
7/14/2013	8,760	EX1304L1_EK60_-D20130715-T030045.bot
7/14/2013	14,688	EX1304L1_EK60_-D20130715-T030045.idx
7/14/2013	14,069,744	EX1304L1_EK60_-D20130715-T030045.raw
7/15/2013	10,264	EX1304L1_EK60_-D20130715-T033159.bot
7/15/2013	17,320	EX1304L1_EK60_-D20130715-T033159.idx
7/15/2013	16,712,548	EX1304L1_EK60_-D20130715-T033159.raw
7/15/2013	10,040	EX1304L1_EK60_-D20130715-T040833.bot
7/15/2013	16,928	EX1304L1_EK60_-D20130715-T040833.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/15/2013	16,257,212	EX1304L1_EK60_-D20130715-T040833.raw
7/15/2013	9,112	EX1304L1_EK60_-D20130715-T044248.bot
7/15/2013	15,304	EX1304L1_EK60_-D20130715-T044248.idx
7/15/2013	14,755,452	EX1304L1_EK60_-D20130715-T044248.raw
7/15/2013	7,256	EX1304L1_EK60_-D20130715-T051714.bot
7/15/2013	12,056	EX1304L1_EK60_-D20130715-T051714.idx
7/15/2013	11,758,988	EX1304L1_EK60_-D20130715-T051714.raw
7/15/2013	7,448	EX1304L1_EK60_-D20130715-T055213.bot
7/15/2013	12,392	EX1304L1_EK60_-D20130715-T055213.idx
7/15/2013	12,100,600	EX1304L1_EK60_-D20130715-T055213.raw
7/15/2013	6,968	EX1304L1_EK60_-D20130715-T062758.bot
7/15/2013	11,552	EX1304L1_EK60_-D20130715-T062758.idx
7/15/2013	11,318,164	EX1304L1_EK60_-D20130715-T062758.raw
7/15/2013	6,840	EX1304L1_EK60_-D20130715-T070343.bot
7/15/2013	11,328	EX1304L1_EK60_-D20130715-T070343.idx
7/15/2013	11,025,724	EX1304L1_EK60_-D20130715-T070343.raw
7/15/2013	9,144	EX1304L1_EK60_-D20130715-T073705.bot
7/15/2013	15,360	EX1304L1_EK60_-D20130715-T073705.idx
7/15/2013	14,714,228	EX1304L1_EK60_-D20130715-T073705.raw
7/15/2013	8,984	EX1304L1_EK60_-D20130715-T080908.bot
7/15/2013	15,080	EX1304L1_EK60_-D20130715-T080908.idx
7/15/2013	14,421,780	EX1304L1_EK60_-D20130715-T080908.raw
7/15/2013	7,832	EX1304L1_EK60_-D20130715-T084027.bot
7/15/2013	13,064	EX1304L1_EK60_-D20130715-T084027.idx
7/15/2013	12,567,084	EX1304L1_EK60_-D20130715-T084027.raw
7/15/2013	7,512	EX1304L1_EK60_-D20130715-T091213.bot
7/15/2013	12,504	EX1304L1_EK60_-D20130715-T091213.idx
7/15/2013	12,103,440	EX1304L1_EK60_-D20130715-T091213.raw
7/15/2013	7,864	EX1304L1_EK60_-D20130715-T094521.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/15/2013	13,120	EX1304L1_EK60_-D20130715-T094521.idx
7/15/2013	12,709,140	EX1304L1_EK60_-D20130715-T094521.raw
7/15/2013	7,736	EX1304L1_EK60_-D20130715-T101905.bot
7/15/2013	12,896	EX1304L1_EK60_-D20130715-T101905.idx
7/15/2013	12,544,844	EX1304L1_EK60_-D20130715-T101905.raw
7/15/2013	1,464	EX1304L1_EK60_-D20130715-T105405.bot
7/15/2013	1,920	EX1304L1_EK60_-D20130715-T105405.idx
7/15/2013	1,100,736	EX1304L1_EK60_-D20130715-T105405.raw
7/15/2013	7,896	EX1304L1_EK60_-D20130715-T232343.bot
7/15/2013	13,176	EX1304L1_EK60_-D20130715-T232343.idx
7/15/2013	12,797,624	EX1304L1_EK60_-D20130715-T232343.raw
7/15/2013	9,080	EX1304L1_EK60_-D20130715-T235911.bot
7/15/2013	15,248	EX1304L1_EK60_-D20130715-T235911.idx
7/15/2013	14,608,064	EX1304L1_EK60_-D20130715-T235911.raw
7/15/2013	9,432	EX1304L1_EK60_-D20130716-T003120.bot
7/15/2013	15,864	EX1304L1_EK60_-D20130716-T003120.idx
7/15/2013	15,186,192	EX1304L1_EK60_-D20130716-T003120.raw
7/15/2013	9,528	EX1304L1_EK60_-D20130716-T010335.bot
7/15/2013	16,032	EX1304L1_EK60_-D20130716-T010335.idx
7/15/2013	15,348,652	EX1304L1_EK60_-D20130716-T010335.raw
7/15/2013	9,624	EX1304L1_EK60_-D20130716-T013535.bot
7/15/2013	16,200	EX1304L1_EK60_-D20130716-T013535.idx
7/15/2013	15,530,484	EX1304L1_EK60_-D20130716-T013535.raw
7/15/2013	9,496	EX1304L1_EK60_-D20130716-T020819.bot
7/15/2013	15,976	EX1304L1_EK60_-D20130716-T020819.idx
7/15/2013	15,303,084	EX1304L1_EK60_-D20130716-T020819.raw
7/15/2013	9,336	EX1304L1_EK60_-D20130716-T024028.bot
7/15/2013	15,696	EX1304L1_EK60_-D20130716-T024028.idx
7/15/2013	15,059,008	EX1304L1_EK60_-D20130716-T024028.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/15/2013	8,312	EX1304L1_EK60_-D20130716-T031308.bot
7/15/2013	13,904	EX1304L1_EK60_-D20130716-T031308.idx
7/15/2013	13,417,620	EX1304L1_EK60_-D20130716-T031308.raw
7/16/2013	7,512	EX1304L1_EK60_-D20130716-T034611.bot
7/16/2013	12,504	EX1304L1_EK60_-D20130716-T034611.idx
7/16/2013	12,087,344	EX1304L1_EK60_-D20130716-T034611.raw
7/16/2013	9,016	EX1304L1_EK60_-D20130716-T041831.bot
7/16/2013	15,136	EX1304L1_EK60_-D20130716-T041831.idx
7/16/2013	14,540,004	EX1304L1_EK60_-D20130716-T041831.raw
7/16/2013	10,232	EX1304L1_EK60_-D20130716-T045123.bot
7/16/2013	17,264	EX1304L1_EK60_-D20130716-T045123.idx
7/16/2013	16,659,576	EX1304L1_EK60_-D20130716-T045123.raw
7/16/2013	8,664	EX1304L1_EK60_-D20130716-T052804.bot
7/16/2013	14,520	EX1304L1_EK60_-D20130716-T052804.idx
7/16/2013	13,925,964	EX1304L1_EK60_-D20130716-T052804.raw
7/16/2013	8,504	EX1304L1_EK60_-D20130716-T060005.bot
7/16/2013	14,240	EX1304L1_EK60_-D20130716-T060005.idx
7/16/2013	13,645,936	EX1304L1_EK60_-D20130716-T060005.raw
7/16/2013	8,984	EX1304L1_EK60_-D20130716-T063131.bot
7/16/2013	15,080	EX1304L1_EK60_-D20130716-T063131.idx
7/16/2013	14,512,284	EX1304L1_EK60_-D20130716-T063131.raw
7/16/2013	8,952	EX1304L1_EK60_-D20130716-T070441.bot
7/16/2013	15,024	EX1304L1_EK60_-D20130716-T070441.idx
7/16/2013	14,462,908	EX1304L1_EK60_-D20130716-T070441.raw
7/16/2013	8,760	EX1304L1_EK60_-D20130716-T073807.bot
7/16/2013	14,688	EX1304L1_EK60_-D20130716-T073807.idx
7/16/2013	14,110,112	EX1304L1_EK60_-D20130716-T073807.raw
7/16/2013	8,984	EX1304L1_EK60_-D20130716-T081031.bot
7/16/2013	15,080	EX1304L1_EK60_-D20130716-T081031.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/16/2013	14,497,604	EX1304L1_EK60_-D20130716-T081031.raw
7/16/2013	9,720	EX1304L1_EK60_-D20130716-T084343.bot
7/16/2013	16,368	EX1304L1_EK60_-D20130716-T084343.idx
7/16/2013	15,770,124	EX1304L1_EK60_-D20130716-T084343.raw
7/16/2013	7,000	EX1304L1_EK60_-D20130716-T091901.bot
7/16/2013	11,608	EX1304L1_EK60_-D20130716-T091901.idx
7/16/2013	10,922,608	EX1304L1_EK60_-D20130716-T091901.raw
7/16/2013	7,992	EX1304L1_EK60_-D20130716-T232422.bot
7/16/2013	13,344	EX1304L1_EK60_-D20130716-T232422.idx
7/16/2013	13,039,284	EX1304L1_EK60_-D20130716-T232422.raw
7/16/2013	9,432	EX1304L1_EK60_-D20130717-T000130.bot
7/16/2013	15,864	EX1304L1_EK60_-D20130717-T000130.idx
7/16/2013	15,292,136	EX1304L1_EK60_-D20130717-T000130.raw
7/16/2013	8,312	EX1304L1_EK60_-D20130717-T003601.bot
7/16/2013	13,904	EX1304L1_EK60_-D20130717-T003601.idx
7/16/2013	13,335,500	EX1304L1_EK60_-D20130717-T003601.raw
7/16/2013	8,376	EX1304L1_EK60_-D20130717-T010736.bot
7/16/2013	14,016	EX1304L1_EK60_-D20130717-T010736.idx
7/16/2013	13,450,208	EX1304L1_EK60_-D20130717-T010736.raw
7/16/2013	9,112	EX1304L1_EK60_-D20130717-T013930.bot
7/16/2013	15,304	EX1304L1_EK60_-D20130717-T013930.idx
7/16/2013	14,686,968	EX1304L1_EK60_-D20130717-T013930.raw
7/16/2013	8,856	EX1304L1_EK60_-D20130717-T021206.bot
7/16/2013	14,856	EX1304L1_EK60_-D20130717-T021206.idx
7/16/2013	14,270,404	EX1304L1_EK60_-D20130717-T021206.raw
7/16/2013	8,920	EX1304L1_EK60_-D20130717-T024418.bot
7/16/2013	14,968	EX1304L1_EK60_-D20130717-T024418.idx
7/16/2013	14,380,976	EX1304L1_EK60_-D20130717-T024418.raw
7/16/2013	8,696	EX1304L1_EK60_-D20130717-T031646.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/16/2013	14,576	EX1304L1_EK60_-D20130717-T031646.idx
7/16/2013	13,980,404	EX1304L1_EK60_-D20130717-T031646.raw
7/17/2013	9,208	EX1304L1_EK60_-D20130717-T034854.bot
7/17/2013	15,472	EX1304L1_EK60_-D20130717-T034854.idx
7/17/2013	14,786,880	EX1304L1_EK60_-D20130717-T034854.raw
7/17/2013	8,952	EX1304L1_EK60_-D20130717-T042015.bot
7/17/2013	15,024	EX1304L1_EK60_-D20130717-T042015.idx
7/17/2013	14,450,544	EX1304L1_EK60_-D20130717-T042015.raw
7/17/2013	8,664	EX1304L1_EK60_-D20130717-T045316.bot
7/17/2013	14,520	EX1304L1_EK60_-D20130717-T045316.idx
7/17/2013	13,952,116	EX1304L1_EK60_-D20130717-T045316.raw
7/17/2013	9,080	EX1304L1_EK60_-D20130717-T052516.bot
7/17/2013	15,248	EX1304L1_EK60_-D20130717-T052516.idx
7/17/2013	14,629,496	EX1304L1_EK60_-D20130717-T052516.raw
7/17/2013	8,728	EX1304L1_EK60_-D20130717-T055736.bot
7/17/2013	14,632	EX1304L1_EK60_-D20130717-T055736.idx
7/17/2013	14,049,656	EX1304L1_EK60_-D20130717-T055736.raw
7/17/2013	9,752	EX1304L1_EK60_-D20130717-T063013.bot
7/17/2013	16,424	EX1304L1_EK60_-D20130717-T063013.idx
7/17/2013	15,757,128	EX1304L1_EK60_-D20130717-T063013.raw
7/17/2013	8,888	EX1304L1_EK60_-D20130717-T070347.bot
7/17/2013	14,912	EX1304L1_EK60_-D20130717-T070347.idx
7/17/2013	14,319,972	EX1304L1_EK60_-D20130717-T070347.raw
7/17/2013	8,696	EX1304L1_EK60_-D20130717-T073552.bot
7/17/2013	14,576	EX1304L1_EK60_-D20130717-T073552.idx
7/17/2013	13,987,228	EX1304L1_EK60_-D20130717-T073552.raw
7/17/2013	9,144	EX1304L1_EK60_-D20130717-T080729.bot
7/17/2013	15,360	EX1304L1_EK60_-D20130717-T080729.idx
7/17/2013	14,751,060	EX1304L1_EK60_-D20130717-T080729.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/17/2013	9,912	EX1304L1_EK60_-D20130717-T084045.bot
7/17/2013	16,704	EX1304L1_EK60_-D20130717-T084045.idx
7/17/2013	16,054,236	EX1304L1_EK60_-D20130717-T084045.raw
7/17/2013	9,016	EX1304L1_EK60_-D20130717-T091528.bot
7/17/2013	15,136	EX1304L1_EK60_-D20130717-T091528.idx
7/17/2013	14,474,276	EX1304L1_EK60_-D20130717-T091528.raw
7/17/2013	8,312	EX1304L1_EK60_-D20130717-T094607.bot
7/17/2013	13,904	EX1304L1_EK60_-D20130717-T094607.idx
7/17/2013	13,262,712	EX1304L1_EK60_-D20130717-T094607.raw
7/17/2013	21,176	EX1304L1_EK60_-D20130717-T222729.bot
7/17/2013	36,416	EX1304L1_EK60_-D20130717-T222729.idx
7/17/2013	36,581,736	EX1304L1_EK60_-D20130717-T222729.raw
7/17/2013	8,152	EX1304L1_EK60_-D20130718-T000236.bot
7/17/2013	13,624	EX1304L1_EK60_-D20130718-T000236.idx
7/17/2013	13,423,420	EX1304L1_EK60_-D20130718-T000236.raw
7/17/2013	11,640	EX1304L1_EK60_-D20130718-T004338.bot
7/17/2013	19,728	EX1304L1_EK60_-D20130718-T004338.idx
7/17/2013	19,279,588	EX1304L1_EK60_-D20130718-T004338.raw
7/17/2013	11,768	EX1304L1_EK60_-D20130718-T012911.bot
7/17/2013	19,952	EX1304L1_EK60_-D20130718-T012911.idx
7/17/2013	19,399,856	EX1304L1_EK60_-D20130718-T012911.raw
7/17/2013	9,432	EX1304L1_EK60_-D20130718-T021220.bot
7/17/2013	15,864	EX1304L1_EK60_-D20130718-T021220.idx
7/17/2013	15,226,476	EX1304L1_EK60_-D20130718-T021220.raw
7/17/2013	9,176	EX1304L1_EK60_-D20130718-T024521.bot
7/17/2013	15,416	EX1304L1_EK60_-D20130718-T024521.idx
7/17/2013	14,755,712	EX1304L1_EK60_-D20130718-T024521.raw
7/17/2013	10,104	EX1304L1_EK60_-D20130718-T031658.bot
7/17/2013	17,040	EX1304L1_EK60_-D20130718-T031658.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/17/2013	16,462,592	EX1304L1_EK60_-D20130718-T031658.raw
7/18/2013	8,472	EX1304L1_EK60_-D20130718-T035354.bot
7/18/2013	14,184	EX1304L1_EK60_-D20130718-T035354.idx
7/18/2013	13,612,052	EX1304L1_EK60_-D20130718-T035354.raw
7/18/2013	8,952	EX1304L1_EK60_-D20130718-T042543.bot
7/18/2013	15,024	EX1304L1_EK60_-D20130718-T042543.idx
7/18/2013	14,414,900	EX1304L1_EK60_-D20130718-T042543.raw
7/18/2013	8,632	EX1304L1_EK60_-D20130718-T045806.bot
7/18/2013	14,464	EX1304L1_EK60_-D20130718-T045806.idx
7/18/2013	13,863,968	EX1304L1_EK60_-D20130718-T045806.raw
7/18/2013	8,792	EX1304L1_EK60_-D20130718-T052951.bot
7/18/2013	14,744	EX1304L1_EK60_-D20130718-T052951.idx
7/18/2013	14,135,636	EX1304L1_EK60_-D20130718-T052951.raw
7/18/2013	11,896	EX1304L1_EK60_-D20130718-T060155.bot
7/18/2013	20,176	EX1304L1_EK60_-D20130718-T060155.idx
7/18/2013	19,543,912	EX1304L1_EK60_-D20130718-T060155.raw
7/18/2013	9,240	EX1304L1_EK60_-D20130718-T064344.bot
7/18/2013	15,528	EX1304L1_EK60_-D20130718-T064344.idx
7/18/2013	14,833,492	EX1304L1_EK60_-D20130718-T064344.raw
7/18/2013	9,304	EX1304L1_EK60_-D20130718-T071454.bot
7/18/2013	15,640	EX1304L1_EK60_-D20130718-T071454.idx
7/18/2013	14,992,620	EX1304L1_EK60_-D20130718-T071454.raw
7/18/2013	9,240	EX1304L1_EK60_-D20130718-T074728.bot
7/18/2013	15,528	EX1304L1_EK60_-D20130718-T074728.idx
7/18/2013	14,896,596	EX1304L1_EK60_-D20130718-T074728.raw
7/18/2013	9,592	EX1304L1_EK60_-D20130718-T082011.bot
7/18/2013	16,144	EX1304L1_EK60_-D20130718-T082011.idx
7/18/2013	15,511,556	EX1304L1_EK60_-D20130718-T082011.raw
7/18/2013	9,688	EX1304L1_EK60_-D20130718-T085350.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/18/2013	16,312	EX1304L1_EK60_-D20130718-T085350.idx
7/18/2013	15,666,464	EX1304L1_EK60_-D20130718-T085350.raw
7/18/2013	9,304	EX1304L1_EK60_-D20130718-T092748.bot
7/18/2013	15,640	EX1304L1_EK60_-D20130718-T092748.idx
7/18/2013	14,987,364	EX1304L1_EK60_-D20130718-T092748.raw
7/18/2013	8,728	EX1304L1_EK60_-D20130718-T095939.bot
7/18/2013	14,632	EX1304L1_EK60_-D20130718-T095939.idx
7/18/2013	14,051,424	EX1304L1_EK60_-D20130718-T095939.raw
7/18/2013	1,784	EX1304L1_EK60_-D20130718-T103129.bot
7/18/2013	2,480	EX1304L1_EK60_-D20130718-T103129.idx
7/18/2013	1,695,796	EX1304L1_EK60_-D20130718-T103129.raw
7/18/2013	23,128	EX1304L1_EK60_-D20130718-T220643.bot
7/18/2013	39,832	EX1304L1_EK60_-D20130718-T220643.idx
7/18/2013	40,249,916	EX1304L1_EK60_-D20130718-T220643.raw
7/18/2013	9,080	EX1304L1_EK60_-D20130718-T235417.bot
7/18/2013	15,248	EX1304L1_EK60_-D20130718-T235417.idx
7/18/2013	14,602,724	EX1304L1_EK60_-D20130718-T235417.raw
7/18/2013	8,440	EX1304L1_EK60_-D20130719-T002532.bot
7/18/2013	14,128	EX1304L1_EK60_-D20130719-T002532.idx
7/18/2013	13,533,684	EX1304L1_EK60_-D20130719-T002532.raw
7/18/2013	8,312	EX1304L1_EK60_-D20130719-T005625.bot
7/18/2013	13,904	EX1304L1_EK60_-D20130719-T005625.idx
7/18/2013	13,312,624	EX1304L1_EK60_-D20130719-T005625.raw
7/18/2013	8,440	EX1304L1_EK60_-D20130719-T012713.bot
7/18/2013	14,128	EX1304L1_EK60_-D20130719-T012713.idx
7/18/2013	13,516,720	EX1304L1_EK60_-D20130719-T012713.raw
7/18/2013	8,600	EX1304L1_EK60_-D20130719-T015747.bot
7/18/2013	14,408	EX1304L1_EK60_-D20130719-T015747.idx
7/18/2013	13,786,740	EX1304L1_EK60_-D20130719-T015747.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/18/2013	9,016	EX1304L1_EK60_-D20130719-T022840.bot
7/18/2013	15,136	EX1304L1_EK60_-D20130719-T022840.idx
7/18/2013	14,486,988	EX1304L1_EK60_-D20130719-T022840.raw
7/18/2013	9,144	EX1304L1_EK60_-D20130719-T030010.bot
7/18/2013	15,360	EX1304L1_EK60_-D20130719-T030010.idx
7/18/2013	14,712,404	EX1304L1_EK60_-D20130719-T030010.raw
7/19/2013	6,424	EX1304L1_EK60_-D20130719-T033158.bot
7/19/2013	10,600	EX1304L1_EK60_-D20130719-T033158.idx
7/19/2013	10,237,360	EX1304L1_EK60_-D20130719-T033158.raw
7/19/2013	8,152	EX1304L1_EK60_-D20130719-T040250.bot
7/19/2013	13,624	EX1304L1_EK60_-D20130719-T040250.idx
7/19/2013	13,046,440	EX1304L1_EK60_-D20130719-T040250.raw
7/19/2013	8,728	EX1304L1_EK60_-D20130719-T043333.bot
7/19/2013	14,632	EX1304L1_EK60_-D20130719-T043333.idx
7/19/2013	13,998,828	EX1304L1_EK60_-D20130719-T043333.raw
7/19/2013	8,760	EX1304L1_EK60_-D20130719-T050436.bot
7/19/2013	14,688	EX1304L1_EK60_-D20130719-T050436.idx
7/19/2013	14,101,468	EX1304L1_EK60_-D20130719-T050436.raw
7/19/2013	7,832	EX1304L1_EK60_-D20130719-T053650.bot
7/19/2013	13,064	EX1304L1_EK60_-D20130719-T053650.idx
7/19/2013	12,567,636	EX1304L1_EK60_-D20130719-T053650.raw
7/19/2013	7,992	EX1304L1_EK60_-D20130719-T060804.bot
7/19/2013	13,344	EX1304L1_EK60_-D20130719-T060804.idx
7/19/2013	12,790,268	EX1304L1_EK60_-D20130719-T060804.raw
7/19/2013	8,088	EX1304L1_EK60_-D20130719-T063816.bot
7/19/2013	13,512	EX1304L1_EK60_-D20130719-T063816.idx
7/19/2013	12,953,844	EX1304L1_EK60_-D20130719-T063816.raw
7/19/2013	9,496	EX1304L1_EK60_-D20130719-T070903.bot
7/19/2013	15,976	EX1304L1_EK60_-D20130719-T070903.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/19/2013	15,411,244	EX1304L1_EK60_-D20130719-T070903.raw
7/19/2013	9,688	EX1304L1_EK60_-D20130719-T074437.bot
7/19/2013	16,312	EX1304L1_EK60_-D20130719-T074437.idx
7/19/2013	15,744,072	EX1304L1_EK60_-D20130719-T074437.raw
7/19/2013	9,432	EX1304L1_EK60_-D20130719-T082043.bot
7/19/2013	15,864	EX1304L1_EK60_-D20130719-T082043.idx
7/19/2013	15,336,580	EX1304L1_EK60_-D20130719-T082043.raw
7/19/2013	9,720	EX1304L1_EK60_-D20130719-T085700.bot
7/19/2013	16,368	EX1304L1_EK60_-D20130719-T085700.idx
7/19/2013	15,894,908	EX1304L1_EK60_-D20130719-T085700.raw
7/19/2013	9,752	EX1304L1_EK60_-D20130719-T093459.bot
7/19/2013	16,424	EX1304L1_EK60_-D20130719-T093459.idx
7/19/2013	15,986,352	EX1304L1_EK60_-D20130719-T093459.raw
7/19/2013	2,072	EX1304L1_EK60_-D20130719-T101403.bot
7/19/2013	2,984	EX1304L1_EK60_-D20130719-T101403.idx
7/19/2013	2,264,372	EX1304L1_EK60_-D20130719-T101403.raw
7/19/2013	11,576	EX1304L1_EK60_-D20130719-T232116.bot
7/19/2013	19,616	EX1304L1_EK60_-D20130719-T232116.idx
7/19/2013	18,837,124	EX1304L1_EK60_-D20130719-T232116.raw
7/19/2013	9,880	EX1304L1_EK60_-D20130719-T235826.bot
7/19/2013	16,648	EX1304L1_EK60_-D20130719-T235826.idx
7/19/2013	15,889,400	EX1304L1_EK60_-D20130719-T235826.raw
7/19/2013	9,656	EX1304L1_EK60_-D20130720-T002947.bot
7/19/2013	16,256	EX1304L1_EK60_-D20130720-T002947.idx
7/19/2013	15,496,800	EX1304L1_EK60_-D20130720-T002947.raw
7/19/2013	9,560	EX1304L1_EK60_-D20130720-T010022.bot
7/19/2013	16,088	EX1304L1_EK60_-D20130720-T010022.idx
7/19/2013	15,328,264	EX1304L1_EK60_-D20130720-T010022.raw
7/19/2013	9,464	EX1304L1_EK60_-D20130720-T013036.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/19/2013	15,920	EX1304L1_EK60_-D20130720-T013036.idx
7/19/2013	15,159,592	EX1304L1_EK60_-D20130720-T013036.raw
7/19/2013	2,616	EX1304L1_EK60_-D20130720-T020031.bot
7/19/2013	3,992	EX1304L1_EK60_-D20130720-T020031.idx
7/19/2013	3,152,836	EX1304L1_EK60_-D20130720-T020031.raw
7/19/2013	888	EX1304L1_EK60_-D20130720-T020741.bot
7/19/2013	912	EX1304L1_EK60_-D20130720-T020741.idx
7/19/2013	37,824	EX1304L1_EK60_-D20130720-T020741.raw
7/19/2013	10,264	EX1304L1_EK60_-D20130720-T020834.bot
7/19/2013	17,320	EX1304L1_EK60_-D20130720-T020834.idx
7/19/2013	16,548,728	EX1304L1_EK60_-D20130720-T020834.raw
7/19/2013	10,424	EX1304L1_EK60_-D20130720-T024114.bot
7/19/2013	17,600	EX1304L1_EK60_-D20130720-T024114.idx
7/19/2013	16,844,640	EX1304L1_EK60_-D20130720-T024114.raw
7/19/2013	10,904	EX1304L1_EK60_-D20130720-T031428.bot
7/19/2013	18,440	EX1304L1_EK60_-D20130720-T031428.idx
7/19/2013	17,693,200	EX1304L1_EK60_-D20130720-T031428.raw
7/20/2013	10,872	EX1304L1_EK60_-D20130720-T034923.bot
7/20/2013	18,384	EX1304L1_EK60_-D20130720-T034923.idx
7/20/2013	17,645,316	EX1304L1_EK60_-D20130720-T034923.raw
7/20/2013	10,040	EX1304L1_EK60_-D20130720-T042411.bot
7/20/2013	16,928	EX1304L1_EK60_-D20130720-T042411.idx
7/20/2013	16,171,776	EX1304L1_EK60_-D20130720-T042411.raw
7/20/2013	10,136	EX1304L1_EK60_-D20130720-T045606.bot
7/20/2013	17,096	EX1304L1_EK60_-D20130720-T045606.idx
7/20/2013	16,339,872	EX1304L1_EK60_-D20130720-T045606.raw
7/20/2013	10,328	EX1304L1_EK60_-D20130720-T052820.bot
7/20/2013	17,432	EX1304L1_EK60_-D20130720-T052820.idx
7/20/2013	16,677,308	EX1304L1_EK60_-D20130720-T052820.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/20/2013	16,088	EX1304L1_EK60_-D20130720-T060115.bot
7/20/2013	27,512	EX1304L1_EK60_-D20130720-T060115.idx
7/20/2013	26,804,892	EX1304L1_EK60_-D20130720-T060115.raw
7/20/2013	10,392	EX1304L1_EK60_-D20130720-T065411.bot
7/20/2013	17,544	EX1304L1_EK60_-D20130720-T065411.idx
7/20/2013	16,788,396	EX1304L1_EK60_-D20130720-T065411.raw
7/20/2013	10,296	EX1304L1_EK60_-D20130720-T072719.bot
7/20/2013	17,376	EX1304L1_EK60_-D20130720-T072719.idx
7/20/2013	16,620,576	EX1304L1_EK60_-D20130720-T072719.raw
7/20/2013	14,104	EX1304L1_EK60_-D20130720-T080006.bot
7/20/2013	24,040	EX1304L1_EK60_-D20130720-T080006.idx
7/20/2013	23,312,824	EX1304L1_EK60_-D20130720-T080006.raw
7/20/2013	11,384	EX1304L1_EK60_-D20130720-T084608.bot
7/20/2013	19,280	EX1304L1_EK60_-D20130720-T084608.idx
7/20/2013	18,542,952	EX1304L1_EK60_-D20130720-T084608.raw
7/20/2013	12,056	EX1304L1_EK60_-D20130720-T092243.bot
7/20/2013	20,456	EX1304L1_EK60_-D20130720-T092243.idx
7/20/2013	19,717,408	EX1304L1_EK60_-D20130720-T092243.raw
7/20/2013	9,336	EX1304L1_EK60_-D20130720-T100138.bot
7/20/2013	15,696	EX1304L1_EK60_-D20130720-T100138.idx
7/20/2013	14,913,732	EX1304L1_EK60_-D20130720-T100138.raw
7/20/2013	15,576	EX1304L1_EK60_-D20130720-T214656.bot
7/20/2013	26,616	EX1304L1_EK60_-D20130720-T214656.idx
7/20/2013	25,872,060	EX1304L1_EK60_-D20130720-T214656.raw
7/20/2013	16,056	EX1304L1_EK60_-D20130720-T223803.bot
7/20/2013	27,456	EX1304L1_EK60_-D20130720-T223803.idx
7/20/2013	14,652,768	EX1304L1_EK60_-D20130720-T223803.raw
7/20/2013	17,464	EX1304L1_EK60_-D20130720-T233052.bot
7/20/2013	29,920	EX1304L1_EK60_-D20130720-T233052.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/20/2013	15,701,788	EX1304L1_EK60_-D20130720-T233052.raw
7/20/2013	15,064	EX1304L1_EK60_-D20130721-T002834.bot
7/20/2013	25,720	EX1304L1_EK60_-D20130721-T002834.idx
7/20/2013	13,451,556	EX1304L1_EK60_-D20130721-T002834.raw
7/20/2013	11,288	EX1304L1_EK60_-D20130721-T011756.bot
7/20/2013	19,112	EX1304L1_EK60_-D20130721-T011756.idx
7/20/2013	9,896,012	EX1304L1_EK60_-D20130721-T011756.raw
7/20/2013	10,392	EX1304L1_EK60_-D20130721-T015411.bot
7/20/2013	17,544	EX1304L1_EK60_-D20130721-T015411.idx
7/20/2013	9,049,928	EX1304L1_EK60_-D20130721-T015411.raw
7/20/2013	10,328	EX1304L1_EK60_-D20130721-T022719.bot
7/20/2013	17,432	EX1304L1_EK60_-D20130721-T022719.idx
7/20/2013	8,990,344	EX1304L1_EK60_-D20130721-T022719.raw
7/20/2013	11,224	EX1304L1_EK60_-D20130721-T030014.bot
7/20/2013	19,000	EX1304L1_EK60_-D20130721-T030014.idx
7/20/2013	9,834,924	EX1304L1_EK60_-D20130721-T030014.raw
7/21/2013	13,944	EX1304L1_EK60_-D20130721-T033615.bot
7/21/2013	23,760	EX1304L1_EK60_-D20130721-T033615.idx
7/21/2013	12,396,560	EX1304L1_EK60_-D20130721-T033615.raw
7/21/2013	12,792	EX1304L1_EK60_-D20130721-T042147.bot
7/21/2013	21,744	EX1304L1_EK60_-D20130721-T042147.idx
7/21/2013	11,306,468	EX1304L1_EK60_-D20130721-T042147.raw
7/21/2013	12,536	EX1304L1_EK60_-D20130721-T050320.bot
7/21/2013	21,296	EX1304L1_EK60_-D20130721-T050320.idx
7/21/2013	11,064,232	EX1304L1_EK60_-D20130721-T050320.raw
7/21/2013	12,952	EX1304L1_EK60_-D20130721-T054358.bot
7/21/2013	22,024	EX1304L1_EK60_-D20130721-T054358.idx
7/21/2013	11,456,756	EX1304L1_EK60_-D20130721-T054358.raw
7/21/2013	12,184	EX1304L1_EK60_-D20130721-T062604.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/21/2013	20,680	EX1304L1_EK60_-D20130721-T062604.idx
7/21/2013	10,743,452	EX1304L1_EK60_-D20130721-T062604.raw
7/21/2013	10,744	EX1304L1_EK60_-D20130721-T070530.bot
7/21/2013	18,160	EX1304L1_EK60_-D20130721-T070530.idx
7/21/2013	9,383,936	EX1304L1_EK60_-D20130721-T070530.raw
7/21/2013	10,904	EX1304L1_EK60_-D20130721-T073954.bot
7/21/2013	18,440	EX1304L1_EK60_-D20130721-T073954.idx
7/21/2013	9,535,588	EX1304L1_EK60_-D20130721-T073954.raw
7/21/2013	12,504	EX1304L1_EK60_-D20130721-T081452.bot
7/21/2013	21,240	EX1304L1_EK60_-D20130721-T081452.idx
7/21/2013	11,046,064	EX1304L1_EK60_-D20130721-T081452.raw
7/21/2013	12,472	EX1304L1_EK60_-D20130721-T085524.bot
7/21/2013	21,184	EX1304L1_EK60_-D20130721-T085524.idx
7/21/2013	11,006,552	EX1304L1_EK60_-D20130721-T085524.raw
7/21/2013	12,152	EX1304L1_EK60_-D20130721-T093550.bot
7/21/2013	20,624	EX1304L1_EK60_-D20130721-T093550.idx
7/21/2013	10,701,908	EX1304L1_EK60_-D20130721-T093550.raw
7/21/2013	12,408	EX1304L1_EK60_-D20130721-T101509.bot
7/21/2013	21,072	EX1304L1_EK60_-D20130721-T101509.idx
7/21/2013	10,942,372	EX1304L1_EK60_-D20130721-T101509.raw
7/21/2013	11,800	EX1304L1_EK60_-D20130721-T105521.bot
7/21/2013	20,008	EX1304L1_EK60_-D20130721-T105521.idx
7/21/2013	10,371,080	EX1304L1_EK60_-D20130721-T105521.raw
7/21/2013	10,840	EX1304L1_EK60_-D20130721-T113326.bot
7/21/2013	18,328	EX1304L1_EK60_-D20130721-T113326.idx
7/21/2013	9,465,312	EX1304L1_EK60_-D20130721-T113326.raw
7/21/2013	10,936	EX1304L1_EK60_-D20130721-T120811.bot
7/21/2013	18,496	EX1304L1_EK60_-D20130721-T120811.idx
7/21/2013	9,555,848	EX1304L1_EK60_-D20130721-T120811.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/21/2013	2,168	EX1304L1_EK60_-D20130721-T124315.bot
7/21/2013	3,152	EX1304L1_EK60_-D20130721-T124315.idx
7/21/2013	1,237,652	EX1304L1_EK60_-D20130721-T124315.raw
7/21/2013	888	EX1304L1_EK60_-D20130722-T023406.bot
7/21/2013	912	EX1304L1_EK60_-D20130722-T023406.idx
7/21/2013	55,560	EX1304L1_EK60_-D20130722-T023406.raw
7/21/2013	10,968	EX1304L1_EK60_-D20130722-T023419.bot
7/21/2013	18,552	EX1304L1_EK60_-D20130722-T023419.idx
7/21/2013	17,796,364	EX1304L1_EK60_-D20130722-T023419.raw
7/21/2013	10,808	EX1304L1_EK60_-D20130722-T030925.bot
7/21/2013	18,272	EX1304L1_EK60_-D20130722-T030925.idx
7/21/2013	17,532,692	EX1304L1_EK60_-D20130722-T030925.raw
7/22/2013	11,704	EX1304L1_EK60_-D20130722-T034400.bot
7/22/2013	19,840	EX1304L1_EK60_-D20130722-T034400.idx
7/22/2013	19,108,876	EX1304L1_EK60_-D20130722-T034400.raw
7/22/2013	11,096	EX1304L1_EK60_-D20130722-T042141.bot
7/22/2013	18,776	EX1304L1_EK60_-D20130722-T042141.idx
7/22/2013	18,039,540	EX1304L1_EK60_-D20130722-T042141.raw
7/22/2013	11,032	EX1304L1_EK60_-D20130722-T045716.bot
7/22/2013	18,664	EX1304L1_EK60_-D20130722-T045716.idx
7/22/2013	17,926,860	EX1304L1_EK60_-D20130722-T045716.raw
7/22/2013	10,808	EX1304L1_EK60_-D20130722-T053238.bot
7/22/2013	18,272	EX1304L1_EK60_-D20130722-T053238.idx
7/22/2013	17,532,636	EX1304L1_EK60_-D20130722-T053238.raw
7/22/2013	11,416	EX1304L1_EK60_-D20130722-T060713.bot
7/22/2013	19,336	EX1304L1_EK60_-D20130722-T060713.idx
7/22/2013	18,602,268	EX1304L1_EK60_-D20130722-T060713.raw
7/22/2013	11,096	EX1304L1_EK60_-D20130722-T064354.bot
7/22/2013	18,776	EX1304L1_EK60_-D20130722-T064354.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/22/2013	18,042,760	EX1304L1_EK60_-D20130722-T064354.raw
7/22/2013	10,872	EX1304L1_EK60_-D20130722-T071929.bot
7/22/2013	18,384	EX1304L1_EK60_-D20130722-T071929.idx
7/22/2013	17,650,028	EX1304L1_EK60_-D20130722-T071929.raw
7/22/2013	10,968	EX1304L1_EK60_-D20130722-T075417.bot
7/22/2013	18,552	EX1304L1_EK60_-D20130722-T075417.idx
7/22/2013	17,818,464	EX1304L1_EK60_-D20130722-T075417.raw
7/22/2013	11,000	EX1304L1_EK60_-D20130722-T082925.bot
7/22/2013	18,608	EX1304L1_EK60_-D20130722-T082925.idx
7/22/2013	17,874,700	EX1304L1_EK60_-D20130722-T082925.raw
7/22/2013	11,416	EX1304L1_EK60_-D20130722-T090440.bot
7/22/2013	19,336	EX1304L1_EK60_-D20130722-T090440.idx
7/22/2013	18,606,724	EX1304L1_EK60_-D20130722-T090440.raw
7/22/2013	12,152	EX1304L1_EK60_-D20130722-T094121.bot
7/22/2013	20,624	EX1304L1_EK60_-D20130722-T094121.idx
7/22/2013	19,896,948	EX1304L1_EK60_-D20130722-T094121.raw
7/22/2013	10,328	EX1304L1_EK60_-D20130722-T102036.bot
7/22/2013	17,432	EX1304L1_EK60_-D20130722-T102036.idx
7/22/2013	16,682,396	EX1304L1_EK60_-D20130722-T102036.raw
7/22/2013	9,816	EX1304L1_EK60_-D20130722-T105331.bot
7/22/2013	16,536	EX1304L1_EK60_-D20130722-T105331.idx
7/22/2013	15,790,624	EX1304L1_EK60_-D20130722-T105331.raw
7/22/2013	9,368	EX1304L1_EK60_-D20130722-T112439.bot
7/22/2013	15,752	EX1304L1_EK60_-D20130722-T112439.idx
7/22/2013	15,004,948	EX1304L1_EK60_-D20130722-T112439.raw
7/22/2013	7,160	EX1304L1_EK60_-D20130722-T115413.bot
7/22/2013	11,888	EX1304L1_EK60_-D20130722-T115413.idx
7/22/2013	11,112,652	EX1304L1_EK60_-D20130722-T115413.raw
7/22/2013	10,264	EX1304L1_EK60_-D20130723-T000423.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/22/2013	17,320	EX1304L1_EK60_-D20130723-T000423.idx
7/22/2013	16,688,280	EX1304L1_EK60_-D20130723-T000423.raw
7/22/2013	10,104	EX1304L1_EK60_-D20130723-T004018.bot
7/22/2013	17,040	EX1304L1_EK60_-D20130723-T004018.idx
7/22/2013	16,499,676	EX1304L1_EK60_-D20130723-T004018.raw
7/22/2013	8,408	EX1304L1_EK60_-D20130723-T011809.bot
7/22/2013	14,072	EX1304L1_EK60_-D20130723-T011809.idx
7/22/2013	14,082,496	EX1304L1_EK60_-D20130723-T011809.raw
7/22/2013	8,920	EX1304L1_EK60_-D20130723-T020520.bot
7/22/2013	14,968	EX1304L1_EK60_-D20130723-T020520.idx
7/22/2013	14,459,484	EX1304L1_EK60_-D20130723-T020520.raw
7/22/2013	9,656	EX1304L1_EK60_-D20130723-T023959.bot
7/22/2013	16,256	EX1304L1_EK60_-D20130723-T023959.idx
7/22/2013	15,709,956	EX1304L1_EK60_-D20130723-T023959.raw
7/22/2013	9,848	EX1304L1_EK60_-D20130723-T031607.bot
7/22/2013	16,592	EX1304L1_EK60_-D20130723-T031607.idx
7/22/2013	16,054,968	EX1304L1_EK60_-D20130723-T031607.raw
7/23/2013	9,688	EX1304L1_EK60_-D20130723-T035326.bot
7/23/2013	16,312	EX1304L1_EK60_-D20130723-T035326.idx
7/23/2013	15,767,184	EX1304L1_EK60_-D20130723-T035326.raw
7/23/2013	9,656	EX1304L1_EK60_-D20130723-T042941.bot
7/23/2013	16,256	EX1304L1_EK60_-D20130723-T042941.idx
7/23/2013	15,683,924	EX1304L1_EK60_-D20130723-T042941.raw
7/23/2013	9,912	EX1304L1_EK60_-D20130723-T050506.bot
7/23/2013	16,704	EX1304L1_EK60_-D20130723-T050506.idx
7/23/2013	16,133,592	EX1304L1_EK60_-D20130723-T050506.raw
7/23/2013	9,656	EX1304L1_EK60_-D20130723-T054131.bot
7/23/2013	16,256	EX1304L1_EK60_-D20130723-T054131.idx
7/23/2013	15,709,300	EX1304L1_EK60_-D20130723-T054131.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/23/2013	9,880	EX1304L1_EK60_-D20130723-T061744.bot
7/23/2013	16,648	EX1304L1_EK60_-D20130723-T061744.idx
7/23/2013	16,038,940	EX1304L1_EK60_-D20130723-T061744.raw
7/23/2013	8,536	EX1304L1_EK60_-D20130723-T065244.bot
7/23/2013	14,296	EX1304L1_EK60_-D20130723-T065244.idx
7/23/2013	13,787,512	EX1304L1_EK60_-D20130723-T065244.raw
7/23/2013	7,576	EX1304L1_EK60_-D20130723-T072554.bot
7/23/2013	12,616	EX1304L1_EK60_-D20130723-T072554.idx
7/23/2013	12,237,364	EX1304L1_EK60_-D20130723-T072554.raw
7/23/2013	6,424	EX1304L1_EK60_-D20130723-T075927.bot
7/23/2013	10,600	EX1304L1_EK60_-D20130723-T075927.idx
7/23/2013	10,369,556	EX1304L1_EK60_-D20130723-T075927.raw
7/23/2013	6,296	EX1304L1_EK60_-D20130723-T083347.bot
7/23/2013	10,376	EX1304L1_EK60_-D20130723-T083347.idx
7/23/2013	10,151,276	EX1304L1_EK60_-D20130723-T083347.raw
7/23/2013	6,040	EX1304L1_EK60_-D20130723-T090805.bot
7/23/2013	9,928	EX1304L1_EK60_-D20130723-T090805.idx
7/23/2013	9,733,620	EX1304L1_EK60_-D20130723-T090805.raw
7/23/2013	6,552	EX1304L1_EK60_-D20130723-T094222.bot
7/23/2013	10,824	EX1304L1_EK60_-D20130723-T094222.idx
7/23/2013	10,534,128	EX1304L1_EK60_-D20130723-T094222.raw
7/23/2013	7,512	EX1304L1_EK60_-D20130723-T101543.bot
7/23/2013	12,504	EX1304L1_EK60_-D20130723-T101543.idx
7/23/2013	11,881,836	EX1304L1_EK60_-D20130723-T101543.raw
7/23/2013	6,456	EX1304L1_EK60_-D20130723-T231543.bot
7/23/2013	10,656	EX1304L1_EK60_-D20130723-T231543.idx
7/23/2013	10,360,032	EX1304L1_EK60_-D20130723-T231543.raw
7/23/2013	6,776	EX1304L1_EK60_-D20130723-T234753.bot
7/23/2013	11,216	EX1304L1_EK60_-D20130723-T234753.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/23/2013	10,847,852	EX1304L1_EK60_-D20130723-T234753.raw
7/23/2013	8,792	EX1304L1_EK60_-D20130724-T001906.bot
7/23/2013	14,744	EX1304L1_EK60_-D20130724-T001906.idx
7/23/2013	14,215,924	EX1304L1_EK60_-D20130724-T001906.raw
7/23/2013	9,016	EX1304L1_EK60_-D20130724-T005301.bot
7/23/2013	15,136	EX1304L1_EK60_-D20130724-T005301.idx
7/23/2013	14,569,944	EX1304L1_EK60_-D20130724-T005301.raw
7/23/2013	9,048	EX1304L1_EK60_-D20130724-T012653.bot
7/23/2013	15,192	EX1304L1_EK60_-D20130724-T012653.idx
7/23/2013	14,638,360	EX1304L1_EK60_-D20130724-T012653.raw
7/23/2013	8,952	EX1304L1_EK60_-D20130724-T020110.bot
7/23/2013	15,024	EX1304L1_EK60_-D20130724-T020110.idx
7/23/2013	14,468,796	EX1304L1_EK60_-D20130724-T020110.raw
7/23/2013	9,016	EX1304L1_EK60_-D20130724-T023506.bot
7/23/2013	15,136	EX1304L1_EK60_-D20130724-T023506.idx
7/23/2013	14,569,124	EX1304L1_EK60_-D20130724-T023506.raw
7/23/2013	10,424	EX1304L1_EK60_-D20130724-T030855.bot
7/23/2013	17,600	EX1304L1_EK60_-D20130724-T030855.idx
7/23/2013	17,054,368	EX1304L1_EK60_-D20130724-T030855.raw
7/24/2013	9,016	EX1304L1_EK60_-D20130724-T034735.bot
7/24/2013	15,136	EX1304L1_EK60_-D20130724-T034735.idx
7/24/2013	14,594,764	EX1304L1_EK60_-D20130724-T034735.raw
7/24/2013	8,888	EX1304L1_EK60_-D20130724-T042158.bot
7/24/2013	14,912	EX1304L1_EK60_-D20130724-T042158.idx
7/24/2013	14,384,248	EX1304L1_EK60_-D20130724-T042158.raw
7/24/2013	8,984	EX1304L1_EK60_-D20130724-T045617.bot
7/24/2013	15,080	EX1304L1_EK60_-D20130724-T045617.idx
7/24/2013	14,533,384	EX1304L1_EK60_-D20130724-T045617.raw
7/24/2013	9,048	EX1304L1_EK60_-D20130724-T053022.bot

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/24/2013	15,192	EX1304L1_EK60_-D20130724-T053022.idx
7/24/2013	14,649,444	EX1304L1_EK60_-D20130724-T053022.raw
7/24/2013	8,952	EX1304L1_EK60_-D20130724-T060445.bot
7/24/2013	15,024	EX1304L1_EK60_-D20130724-T060445.idx
7/24/2013	14,491,180	EX1304L1_EK60_-D20130724-T060445.raw
7/24/2013	9,336	EX1304L1_EK60_-D20130724-T063905.bot
7/24/2013	15,696	EX1304L1_EK60_-D20130724-T063905.idx
7/24/2013	15,151,080	EX1304L1_EK60_-D20130724-T063905.raw
7/24/2013	8,728	EX1304L1_EK60_-D20130724-T071415.bot
7/24/2013	14,632	EX1304L1_EK60_-D20130724-T071415.idx
7/24/2013	14,084,800	EX1304L1_EK60_-D20130724-T071415.raw
7/24/2013	8,920	EX1304L1_EK60_-D20130724-T074739.bot
7/24/2013	14,968	EX1304L1_EK60_-D20130724-T074739.idx
7/24/2013	14,442,148	EX1304L1_EK60_-D20130724-T074739.raw
7/24/2013	8,472	EX1304L1_EK60_-D20130724-T082217.bot
7/24/2013	14,184	EX1304L1_EK60_-D20130724-T082217.idx
7/24/2013	13,632,676	EX1304L1_EK60_-D20130724-T082217.raw
7/24/2013	8,504	EX1304L1_EK60_-D20130724-T085438.bot
7/24/2013	14,240	EX1304L1_EK60_-D20130724-T085438.idx
7/24/2013	13,637,940	EX1304L1_EK60_-D20130724-T085438.raw
7/24/2013	8,920	EX1304L1_EK60_-D20130724-T092536.bot
7/24/2013	14,968	EX1304L1_EK60_-D20130724-T092536.idx
7/24/2013	14,310,228	EX1304L1_EK60_-D20130724-T092536.raw
7/24/2013	6,296	EX1304L1_EK60_-D20130724-T095623.bot
7/24/2013	10,376	EX1304L1_EK60_-D20130724-T095623.idx
7/24/2013	9,949,988	EX1304L1_EK60_-D20130724-T095623.raw
7/24/2013	7,352	EX1304L1_EK60_-D20130724-T204530.bot
7/24/2013	12,224	EX1304L1_EK60_-D20130724-T204530.idx
7/24/2013	11,813,528	EX1304L1_EK60_-D20130724-T204530.raw

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/24/2013	8,952	EX1304L1_EK60_-D20130724-T211759.bot
7/24/2013	15,024	EX1304L1_EK60_-D20130724-T211759.idx
7/24/2013	14,383,312	EX1304L1_EK60_-D20130724-T211759.raw
7/24/2013	8,568	EX1304L1_EK60_-D20130724-T214924.bot
7/24/2013	14,352	EX1304L1_EK60_-D20130724-T214924.idx
7/24/2013	13,764,708	EX1304L1_EK60_-D20130724-T214924.raw
7/24/2013	8,888	EX1304L1_EK60_-D20130724-T222058.bot
7/24/2013	14,912	EX1304L1_EK60_-D20130724-T222058.idx
7/24/2013	14,300,532	EX1304L1_EK60_-D20130724-T222058.raw
7/24/2013	9,240	EX1304L1_EK60_-D20130724-T225255.bot
7/24/2013	15,528	EX1304L1_EK60_-D20130724-T225255.idx
7/24/2013	14,881,728	EX1304L1_EK60_-D20130724-T225255.raw
7/24/2013	9,240	EX1304L1_EK60_-D20130724-T232504.bot
7/24/2013	15,528	EX1304L1_EK60_-D20130724-T232504.idx
7/24/2013	14,851,928	EX1304L1_EK60_-D20130724-T232504.raw
7/24/2013	9,240	EX1304L1_EK60_-D20130724-T235626.bot
7/24/2013	15,528	EX1304L1_EK60_-D20130724-T235626.idx
7/24/2013	14,825,956	EX1304L1_EK60_-D20130724-T235626.raw
7/24/2013	9,656	EX1304L1_EK60_-D20130725-T002706.bot
7/24/2013	16,256	EX1304L1_EK60_-D20130725-T002706.idx
7/24/2013	15,543,912	EX1304L1_EK60_-D20130725-T002706.raw
7/24/2013	10,072	EX1304L1_EK60_-D20130725-T005852.bot
7/24/2013	16,984	EX1304L1_EK60_-D20130725-T005852.idx
7/24/2013	16,264,056	EX1304L1_EK60_-D20130725-T005852.raw
7/24/2013	9,944	EX1304L1_EK60_-D20130725-T013148.bot
7/24/2013	16,760	EX1304L1_EK60_-D20130725-T013148.idx
7/24/2013	16,045,620	EX1304L1_EK60_-D20130725-T013148.raw
7/24/2013	10,008	EX1304L1_EK60_-D20130725-T020423.bot
7/24/2013	16,872	EX1304L1_EK60_-D20130725-T020423.idx

EX1304 Leg 1 EK60 Singlebeam Log		
Date Collected	File Size (bytes)	File Name
7/24/2013	16,158,304	EX1304L1_EK60_-D20130725-T020423.raw
7/24/2013	10,200	EX1304L1_EK60_-D20130725-T023710.bot
7/24/2013	17,208	EX1304L1_EK60_-D20130725-T023710.idx
7/24/2013	20,291,876	EX1304L1_EK60_-D20130725-T023710.raw
7/24/2013	10,200	EX1304L1_EK60_-D20130725-T031029.bot
7/24/2013	17,208	EX1304L1_EK60_-D20130725-T031029.idx
7/24/2013	31,697,208	EX1304L1_EK60_-D20130725-T031029.raw
7/25/2013	5,976	EX1304L1_EK60_-D20130725-T034354.bot
7/25/2013	9,816	EX1304L1_EK60_-D20130725-T034354.idx
7/25/2013	17,359,612	EX1304L1_EK60_-D20130725-T034354.raw

Appendix G: Kongsberg EM 302 Multibeam Sonar Description and Operational Specifications

Several features of the *Okeanos Explorer's* 30 kHz multibeam make it an excellent tool for ocean exploration. The following is a brief description of these features.

Depth Range

The system is designed to map the seafloor in water depths of 10 to 7000 meters. This leaves only the deepest parts of the deeper ocean trenches out of the EM 302's reach. In fact, when the ship transited over the Mariana Trench going to and from Indonesia in 2010, the system was able to detect the bottom at depths of up to 8000 meters.

High Density Data

In multibeam data, the denser the data, the finer resolution maps can be produced. In water deptsh 3000 meters and shallower, the system can operate in dual swath, or multiping mode, which results in increased along track data density. This is achieved by detecting two swaths per ping cycle, resulting in up to 864 beams per ping.

The *Okeanos Explorer* mapping team typically operates the multibeam in high density equidistant ping mode, which results in up to 864 evenly spaced soundings on the seafloor per ping.

Multiple Data Types Collected

The system collects seafloor backscatter data, which provides information about the character of the seafloor in terms of bottom type.

The system also collects water column backscatter data, which has the ability to detect gaseous plumes in the water column. The full value of this feature is still being realized.

FM chirp mode is utilized in water depths greater than 1000 meters, and allows for the detection of the bottom further out from nadir than with previous 30 kHz systems. This results in wider swath widths, giving a higher likelihood of new discoveries as well as efficiency of survey operations.

Multibeam Primer

The area of the seafloor covered, or ensonified, by a single beam within a pulse of sound, or ping, is called the beam footprint. This beam footprint is defined in terms of the across track and along track values. Both of these values are dependent on water depth and the beam width at which the sound pulse is transmitted and received. The across track beam width value is also dependent on the receive angle, or "listening" angle, of the system, and the angle from nadir which it is received. The transmit angle for the transmit transducer is 0.5°, which is the smallest possible angle currently available for the EM302 system. The further out from nadir a sounding occurs, the larger the footprint will be. The receive angle for the receive transducer is 1°. As an example, as seen in Table 1 below, in 2000 meters of water, a beam footprint will have a radius of 18 meters at nadir but 25 meters by the time it hits the seafloor at an angle 140 degrees out from nadir.

Calculated acrosstrack acoustic beam footprint in meters for EM 302 (high density ping mode, 432 soundings/profile)

Water depth (m)	Angle from nadir			
50	1 deg RX center	90 deg	120 deg	140 deg
100	1	0.5	1	1
200	2	1	2	3

400	4	2	3	5
1000	7	4	6	10
2000	18	9	16	25
4000	35	19	32	-
6000	70	37	-	-
7000	105	56	-	-

Table 2.Calculated across track EM 302 beam footprint. Reference: Kongsberg Product description, Kongsberg document 302675 Rev B, Date 14/06/06, p. 17.

Calculated acrosstrack sounding density for EM 302 (high density ping mode, 432 soundings/profile)			
Water depth (m)	**Swath Width**		
50	90 deg	120 deg	140 deg
100	0.2	0.4	0.9
200	0.5	0.8	1.7
400	0.9	1.6	3.5
1000	1.9	3.2	6.9
2000	4.6	8.1	17.4
4000	9.3	16.2	-

Table 3.Calculated across track EM 302 sounding density. Reference: Kongsberg Product description, Kongsberg document 302675 Rev B, Date 14/06/06, p. 17.

Acrosstrack sounding density describes the spacing between individual soundings on the seafloor in the acrosstrack direction. The maximum swath of the EM 302 is 150 degrees. At this swath, the sounding density will be the least dense, since the beams will be spread out over a larger horizontal distance over the seafloor. As the swath angle (width) is decreased, the sounding density will increase, as the same number of beams are now spread out over a smaller horizontal distance over the seafloor.

Calculated ping rate and alongtrack resolution for EM 302					
140 deg swath, one profile per ping					
			Alongtrack distance between profiles (m)		
Water depth (m)	**Swath Width (m)**	**Ping Rate (pings/second)**	**@4 kts**	**@8 kts**	**@12 kts**

50	275	3.2	0.7	1.2	1.9
100	550	1.8	1.1	2.2	3.3
200	1100	1	2.1	4.2	6.3
400	2200	0.5	4.1	8.2	12.2
1000	5500	0.2	10	20	30
2000	8000	0.1	15.2	30.5	45.7
4000	8000	0.06	19.2	38.5	57.7
6000	8000	0.04	24.5	49	73.4

Table 4. Calculated ping rate and along track EM 302 sounding density, one profile per ping. Reference: Kongsberg Product description, Kongsberg document 302675 Rev B, Date 14/06/06, p. 15.

Calculated ping rate and alongtrack resolution for EM 302					
140 deg swath, two profiles per ping					
			Alongtrack distance between profiles (m)		
Water depth (m)	Swath Width (m)	Ping Rate	@4 kts	@8 kts	@12 kts
50	275	3.2	0.3	0.6	0.9
100	550	1.8	0.6	1.1	1.7
200	1100	1	1.1	2.1	3.2
400	2200	0.5	2	4.1	6.1
1000	5500	0.2	5	10	15
2000	8000	0.1	7.6	15.2	22.8

Table 5. Calculated ping rate and along track EM 302 sounding density, two profiles per ping. Reference: Kongsberg Product description, Kongsberg document 302675 Rev B, Date 14/06/06, p. 15.

Reference: Kongsberg Product Description: EM 302 MultibeamEchosounder

Appendix H: Acronyms

- ASCII – American Standard Code for Information Interchange
- ACUMEN - Atlantic Canyons Undersea Mapping Expeditions
- AUV – autonomous underwater vehicle
- BIST – built in system test
- CDR – Commander
- CO – Commanding Officer
- CTD – conductivity, temperature, depth
- dB - decibel
- CW – continuous wave
- D2 - ROV Deep Discoverer
- DEG - degrees
- DNP – do not process
- DO - dissolved oxygen
- DP - dynamic position(ing)
- ECS – Extended Continental Shelf
- ERT – Earth Resources Technology Inc.
- ET – Electronics Technician
- EX – NOAA Ship *Okeanos Explorer*
- FM – frequency modulated / modulation

- FT - feet
- FTP – file transfer protocol
- IFREMER - Institutfrançais de recherche pour l'explotation de la mer
- GB - gigabytes(s)
- KB - kilobytes(s)
- kHz – kilohertz
- km – kilometer
- kts – knots
- LT – Lieutenant
- LSS - light scattering sensor
- m - meters
- MB – multibeam sonar
- MB – megabytes(s)
- NCDDC – National Coastal Data Development Center
- NEFSC – North East Fisheries Science Center
- NGDC – National Geophysical Data Center
- NMEA – National Marine Electronics Association
- NOAA – National Oceanic and Atmospheric Administration
- NODC – National Oceanographic Data Center
- NOPP – National Ocean Partnership Program
- OER – NOAA Office of Ocean Exploration and Research
- OMAO – NOAA Office of Marine and Aviation Operations
- OPS – Operations Officer
- ORP - oxygen reduction potential
- ROV – remotely operated vehicle
- RPM - rotations per minute
- RX - receive
- SBP – subbottom profiler
- SCS – scientific computer system
- SIS – Seafloor Information System
- SVP – sound velocity profile
- TRU – transceiver unit
- TSG - thermosalinograph
- TX - transmit
- UCAR – University Corporation for Atmospheric Research
- UPS – uninterruptable power supply
- USBL – ultrashort baseline
- USGS – United States Geological Survey
- UTC - Coordinated Universal Time
- VA - Virginia
- WD – water depth
- WHOI – Woods Hole Oceanographic Institution
- XBT – expendable bathythermograph
- XO – Executive Officer

Appendix I: Weather Log

This weather log is provided to provide environmental conditions related to multibeam data quality.

EX-13-04 Leg 1 Weather Log								
Local Date	Local Time	UTC Time	UTC Date	Wind Direction (deg)	Wind Speed (kts)	Wave Height (ft)	Swell Direction (deg)	Swell Height (ft)
6/11/2013	0800	1200	6/11/2013	320	3	0-1	NA	NA
6/11/2013	1100	1500	6/11/2013	260	13	2-3	200	2-4
6/11/2013	1400	1800	6/11/2013	NA	NA	NA	NA	NA
6/11/2013	1700	2100	6/11/2013	210	20	3-4	130-190	3-4
6/11/2013	2000	0000	6/12/2013	220	22	3-4	210	4-5
6/11/2013	2100	0100	6/12/2013	225	21	3-4	210	3-4
6/11/2013	2200	0200	6/12/2013	220	22	3-4	210	3-4
6/11/2013	2300	0300	6/12/2013	215	25	3-4	210	3-4
6/12/2013	0200	0600	6/12/2013	240	20	2-3	200	3-5
6/12/2013	0500	0900	6/12/2013	250	16	2-3	210	4-5
6/12/2013	0800	1200	6/12/2013	265	19	2-3	210	4-5
6/12/2013	1100	1500	6/12/2013	260	20	3-4	220	5-7
6/12/2013	1400	1800	6/12/2013	260	18	2-3	220	5-7
6/12/2013	1700	2100	6/12/2013	270	22	2-3	230	4-5
6/12/2013	2000	0000	6/13/2013	275	23	2-3	240	4-5
6/12/2013	2300	0300	6/13/2013	270	19	2-3	240	4-5
6/13/2013	0200	0600	6/13/2013	285	19	3-4	240	4-5
6/13/2013	0500	0900	6/13/2013	290	18	3-4	230	4-5
6/13/2013	0800	1200	6/13/2013	290	12	2-3	310/000	2-3
6/13/2013	1100	1500	6/13/2013	340	5	0-1	020/225	1-2
6/13/2013	1400	1800	6/13/2013	95	11	0-1	220	1-2
6/13/2013	1700	2100	6/13/2013	130	22	0-1	270	2-3
6/13/2013	2000	0000	6/14/2013	090	22	2-3	160	3-4
6/13/2013	2300	0300	6/14/2013	060	26	2-3	090	3-4
6/14/2013	0200	0600	6/14/2013	065	27	3-4	090	4-5
6/14/2013	0500	0900	6/14/2013	035	35	4-5	NA	3-4
6/14/2013	0800	1200	6/14/2013	020	37	4-5	040/100	4-5
6/14/2013	1100	1500	6/14/2013	030	39	3-4	050/350	4-6
6/14/2013	1400	1800	6/14/2013	020	25	2-3	050	4-5
6/14/2013	1700	2100	6/14/2013	010	14	2-3	060/170	3-4
6/14/2013	2000	0000	6/15/2013	285	7	1-2	080	3-4
6/14/2013	2300	0300	6/15/2013	260	8	1-2	080	3-4
6/15/2013	0200	0600	6/15/2013	215	10	1-2	210	3-4
6/15/2013	0500	0900	6/15/2013	290	8	1-2	050	4-5
6/15/2013	0800	1200	6/15/2013	335	9	1-2	050/310	3-4
6/15/2013	1100	1500	6/15/2013	285	6	1-2	050/320	3-4
6/15/2013	1400	1800	6/15/2013	290	9	0-1	040/320	3-4/2-3

EX-13-04 Leg 1 Weather Log								
Local Date	Local Time	UTC Time	UTC Date	Wind Direction (deg)	Wind Speed (kts)	Wave Height (ft)	Swell Direction (deg)	Swell Height (ft)
6/15/2013	1700	2100	6/15/2013	290	11	0-1	030/340	3-4/2-3
6/15/2013	2000	0000	6/16/2013	290	8	0-1	050/350	2-3
6/15/2013	2300	0300	6/16/2013	265	10	0-1	050/350	2-3
6/16/2013	0200	0600	6/16/2013	270	9	0-1	050/340	2-3/1-2
6/16/2013	0500	0900	6/16/2013	285	9	0-1	290/030	3-4/3-4
6/16/2013	0800	1200	6/16/2013	290	5	< 1	NA	2-3
6/16/2013	1100	1500	6/16/2013	230	8	0-1	210/330	2-3/1-2
6/16/2013	1400	1800	6/16/2013	260	10	0-1	220	2-3
6/16/2013	1700	2100	6/16/2013	180	13	1	230	4
6/16/2013	2000	0000	6/17/2013	195	15	1	200	3-4
6/16/2013	2300	0300	6/17/2013	190	17	0-1	200	2-3
6/17/2013	0200	0600	6/17/2013	200	19	1-2	200	2-3
6/17/2013	0500	0900	6/17/2013	210	24	2-3	200	4-5
6/17/2013	0800	1200	6/17/2013	215	26	2-4	210	4-5
6/17/2013	1100	1500	6/17/2013	210	26	2-4	210	4-5
6/17/2013	1400	1800	6/17/2013	225	24	2-3	210	5-6
6/17/2013	1700	2100	6/17/2013	220	20	2-3	210	4-5
6/17/2013	2000	0000	6/18/2013	240	21	3-4	210	7-8
6/17/2013	2300	0300	6/18/2013	230	16	3-4	210	4-5
6/18/2013	0200	0600	6/18/2013	250	26	2-3	210	4-5
6/18/2013	0500	0900	6/18/2013	245	20	3-4	230	5-6
6/18/2013	0800	1200	6/18/2013	210	21	3-4	230	5-7
6/18/2013	1100	1500	6/18/2013	225	18	3-4	210	5-7
6/18/2013	1400	1800	6/18/2013	225	16	2-3	210	4-6
6/18/2013	1700	2100	6/18/2013	220	15	2-3	200	4-5
6/18/2013	2000	0000	6/19/2013	215	14	2-3	220	3-4
6/18/2013	2300	0300	6/19/2013	200	15	2-3	220	3-4
6/19/2013	0200	0600	6/19/2013	180	22	2-3	210	4-5
6/19/2013	0500	0900	6/19/2013	190	22	2-3	210	4-5
6/19/2013	0800	1200	6/19/2013	215	31	4-6	210	6-8
6/19/2013	1100	1500	6/19/2013	210	28	5-7	190	8-10
6/19/2013	1400	1800	6/19/2013	200	21	4-5	200	10-12
6/19/2013	1700	2100	6/19/2013	325	18	4-5	210	10-11
6/19/2013	2000	0000	6/20/2013	355	21	4-6	210	10-12
6/19/2013	2300	0300	6/20/2013	030	15	3-5	210	7-9
6/20/2013	0200	0600	6/20/2013	000	23	3-4	210	3-4
6/20/2013	0500	0900	6/20/2013	005	26	2-3	200	7-8
6/20/2013	0800	1200	6/20/2013	040	19	2-3	020/310	6-8
6/20/2013	1100	1500	6/20/2013	070	21	2-3	020	5-7

EX-13-04 Leg 1 Weather Log								
Local Date	Local Time	UTC Time	UTC Date	Wind Direction (deg)	Wind Speed (kts)	Wave Height (ft)	Swell Direction (deg)	Swell Height (ft)
6/20/2013	1400	1800	6/20/2013	070	20	2-3	020	5-7
6/20/2013	1700	2100	6/20/2013	060	18	2-3	030	4-
6/20/2013	2000	0000	6/20/2013	055	18	1-2	050	3-5
6/20/2013	2300	0300	6/20/2013	080	16	1-2	040	2-4
6/21/2013	0200	0600	6/21/2013	080	13	1-2	040	3-4
6/21/2013	0500	0900	6/21/2013	070	15	1-2	110	2-3
6/21/2013	0800	1200	6/21/2013	075	14	1-2	080	2-3
6/21/2013	1100	1500	6/21/2013	085	15	1-2	060	2-3
6/21/2013	1400	1800	6/21/2013	105	10	1-2	000/120	2-3
6/21/2013	1700	2100	6/21/2013	100	11	1-2	050	2-3
6/21/2013	2000	0000	6/22/2013	105	11	1-2	060	2-3
6/21/2013	2300	0300	6/22/2013	090	12	1-2	060	2-3
6/22/2013	0200	0600	6/22/2013	120	10	1-2	050	2-3
6/22/2013	0500	0900	6/22/2013	070	15	0-1	090/130	2-3
6/22/2013	0800	1200	6/22/2013	115	13	1-2	090	2-3
6/22/2013	1100	1500	6/22/2013	120	12	1-2	110	2-3
6/22/2013	1400	1800	6/22/2013	120	11	1-2	050	2-3
6/22/2013	1700	2100	6/22/2013	080	6	1-2	120	1-2
6/22/2013	2000	0000	6/23/2013	080	12	1-2	120	1-2
6/22/2013	2300	0300	6/23/2013	115	11	1-2	120	2-3
6/23/2013	0200	0600	6/23/2013	270	16	1-2	120/060	2-3
6/23/2013	0500	0900	6/23/2013	265	12	1-2	120	2-3
6/23/2013	0800	1200	6/23/2014	65	3	1-2	110	2-3
6/23/2013	1100	1500	6/23/2015	145	7	1-2	110	2-3
6/23/2013	1400	1800	6/23/2016	150	11	1-2	120	2-3
6/23/2013	1700	2100	6/23/2017	180	5	0-1	120	2-3
6/23/2013	2000	0000	6/24/2018	225	12	0-1	120	2-3
6/23/2013	2300	0300	6/24/2018	225	13	1-2	270	2-3
6/24/2013	0200	0600	6/24/2018	285	16	1-2	270	2-3
6/24/2013	0500	0900	6/24/2018	285	17	1-2	230	2-3
6/24/2013	0800	1200	6/24/2018	285	15	1-2	265	2-3
6/24/2013	1100	1500	6/24/2018	260	17	1-2	270	2-3
6/24/2013	1400	1800	6/24/2018	250	21	1-2	270	2-3
6/24/2013	1700	2100	6/24/2018	270	28	2-3	240	2-3
6/24/2013	2000	0000	6/25/2013	260	20	2-3	270	2-3
6/24/2013	2300	0300	6/25/2013	255	26	2-3	270	3-4
6/25/2013	0200	0600	6/25/2013	265	27	2-3	270	4-5
6/25/2013	0500	0900	6/25/2013	280	24	2-3	260	4-5
6/25/2013	0800	1200	6/25/2013	265	22	1-3	300	2-4

EX-13-04 Leg 1 Weather Log								
Local Date	Local Time	UTC Time	UTC Date	Wind Direction (deg)	Wind Speed (kts)	Wave Height (ft)	Swell Direction (deg)	Swell Height (ft)
6/25/2013	1100	1500	6/25/2013	290	23	1-3	290	3-4
6/25/2013	1400	1800	6/25/2013	290	24	2-3	270	4-5
6/25/2013	1700	2100	6/25/2013	285	28	2-3	280	4-5
6/25/2013	2000	0000	6/26/2013	260	19	2-3	240	4-5
6/25/2013	2300	0300	6/26/2013	240	19	2-3	240	4-5
6/26/2013	0200	0600	6/26/2013	220	15	1-2	230	4-5
6/26/2013	0500	0900	6/26/2013	220	13	1-2	240	3-4
6/26/2013	0800	1200	6/26/2013	240	18	1-2	220/280	2-3
6/26/2013	1100	1500	6/26/2013	240	17	1-3	250	3-4
6/26/2013	1400	1800	6/26/2013	245	20	2-3	230/280	4-5
6/26/2013	1700	2100	6/26/2013	230	19	2-3	240	4-5
7/8/2013	2000	0000	7/9/2013	230	18	1-2	220	2-3
7/8/2013	2300	0300	7/9/2013	245	20	1-2	210	1-3
7/9/2013	0200	0600	7/9/2013	240	16	1-2	220	2-3
7/9/2013	2000	0000	7/10/2013	205	12	1-2	210	1-3
7/10/2013	2300	0300	7/10/2013	215	15	1-2	210	1-3
7/10/2013	0200	0600	7/10/2013	220	14	1-2	210	1-3
7/10/2013	2100	0100	7/11/2013	215	20	1-3	200	2-3
7/11/2013	0000	0400	7/11/2013	215	16	1-3	210	2-4
7/11/2013	0300	0700	7/11/2013	215	22	2-3	210	3-5
7/11/2013	2100	0100	7/12/2013	180	15	1-2	190	1-3
7/12/2013	0000	0400	7/12/2013	230	11	1-3	200	2-4
7/12/2013	0300	0700	7/12/2013	250	10	2-4	200	3-5
7/12/2013	2100	0100	7/13/2013	160	5	<1	200	1-2
7/13/2013	0000	0400	7/13/2013	210	9	0-1	200	1-3
7/13/2013	0300	0700	7/13/2013	200	9	0-1	220	2-3
7/13/2013	0600	1000	7/13/2013	190	9	<1	210	2-3
7/13/2013	2000	0000	7/14/2013	180	6	<1	210	1-3
7/14/2013	2300	0300	7/14/2013	190	10	-	-	-
7/14/2013	0200	0600	7/14/2013	250	8	0-1	230	1-3
7/14/2013	0500	0900	7/14/2013	250	8	<1	140	1-2
7/14/2013	2200	0200	7/15/2013	325	5	--	-	-
7/15/2013	0100	0500	7/15/2013	280	9	0-1	220	1-2
7/15/2013	0400	0800	7/15/2013	290	14	0-1	110	1-2
7/15/2013	2300	0300	7/16/2013	265	5	-	-	-
7/16/2013	0200	0600	7/16/2013	280	6	0-1	27	1-3
7/16/2013	0500	0900	7/16/2013	245	8	0-1	260	1-3
7/16/2013	2300	0300	7/17/2013	010	5	<1	330/260	1-2
7/17/2013	0200	0600	7/17/2013	010	9	0-1	240	1-2

EX-13-04 Leg 1 Weather Log								
Local Date	Local Time	UTC Time	UTC Date	Wind Direction (deg)	Wind Speed (kts)	Wave Height (ft)	Swell Direction (deg)	Swell Height (ft)
7/17/2013	0500	0900	7/17/2013	016	13	0-1	050	1-2
7/17/2013	2200	0200	7/18/2013	230	8	<1	100/160	1
7/18/2013	0100	0500	7/18/2013	225	12	1-2	-	-
7/18/2013	0400	0800	7/18/2013	230	12	1-2	240	0-1
7/18/2013	2200	0200	7/19/2013	220	15	1-2	250	1-3
7/19/2013	0100	0500	7/19/2013	235	15	1-3	230	2-3
7/19/2013	0400	0800	7/19/2013	230	21	1-3	230	2-3
7/19/2013	2300	0300	7/20/2013	222	20	1-3	230	2-4
7/20/2013	0200	0600	7/20/2013	230	19	2-3	230	2-4
7/20/2013	0500	0900	7/20/2013	245	22	2-3	230/190	3-5
7/20/2013	2100	0100	7/21/2013	250	30	2-4	240	5-7
7/21/2013	0000	0400	7/21/2013	220	20	2-4	240	6-8
7/21/2013	0300	0700	7/21/2013	250	22	2-4	240	6-8
7/21/2013	0600	1000	7/21/2013	240	20	2-4	240	6-8
7/21/2013	2100	0100	7/22/2013	310	2	0-1	240	1-2
7/22/2013	0000	0400	7/22/2013	165	7	0-1	230	2-3
7/22/2013	0300	0700	7/22/2013	270	8	0-1	230	3-Feb
7/22/2013	0600	1000	7/22/2013	275	2	0-1	210	0-1
7/22/2013	2200	0200	7/23/2013	185	10	<1	175	1-3
7/23/2013	0100	0500	7/23/2013	165	11	0-1	210	1-3
7/23/2013	0400	0800	7/23/2013	210	13	0-1	210	2-4
7/23/2013	2300	0300	7/24/2014	225	20	1-3	240/195	3-4
7/24/2014	0200	0600	7/24/2014	225	23	1-3	220	3-5
7/24/2014	0500	0900	7/24/2014	255	18	1-2	200	3-5
7/24/2014	2000	0000	7/25/2014	205	10	1-2	195/260	2-4
7/25/2014	2300	0300	7/25/2014	025	15	<1	195/250	1-2