

RV Langseth Data Reduction Summary

MGL1004

Honolulu, HI – Honolulu, HI

FINAL

V1.0, 2010-09-14

Lamont-Doherty Earth Observatory, Columbia University

Tues Sept 14 14:00:00 2010

Date	Julian Date	Time	Port
2010-07-15	2010-196	0000 UTC, 1400L	Honolulu, Hawaii
2010-09-14	2010-257	1400 UTC, 0800L	Honolulu, Hawaii

Prepared by:

David Ng

IT/Navigation

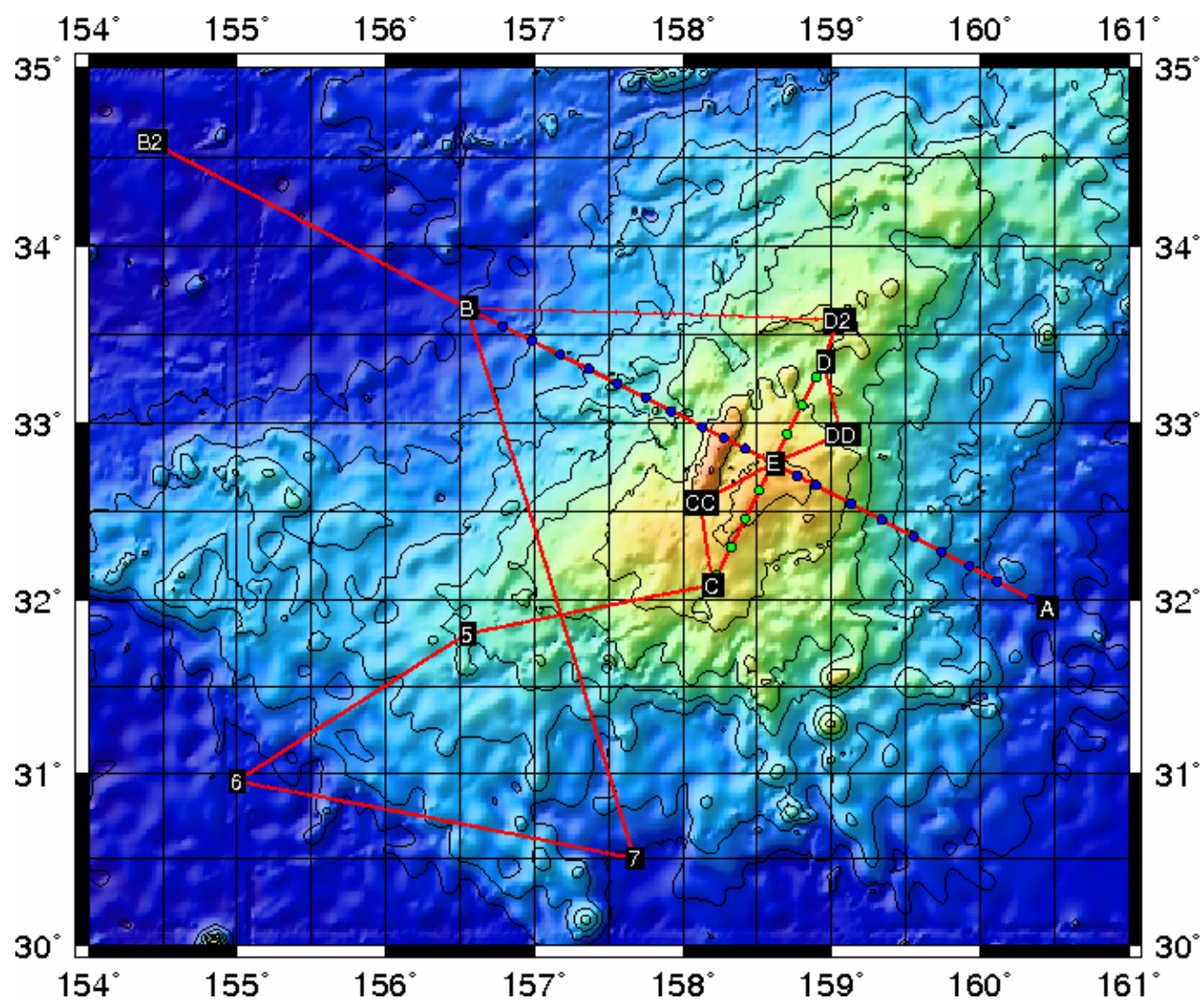
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Please refer to the Langseth Data Report Supplement for information regarding data formats.

Figure 1 – Final Cruise Track Plan



I. Background and Scientific Objectives

R/V *Marcus G.Langseth* MGL-1004 formed the major data acquisition phase of the NSF-funded project, "Geophysical Constraints on Mechanisms of Ocean Plateau Formation from Shatsky Rise, Northwest Pacific" (OCE-0926611). Deciphering the origins of large oceanic plateaus is a critical element for understanding mantle dynamics and its relation to terrestrial magmatism, and Shatsky Rise was chosen as a high-priority target because it provides a unique tectonic setting to distinguish between various models proposed for the formation of oceanic plateaus. The purpose of this survey was to provide critical missing information on (1) the thickness, velocity structure, and composition of the Shatsky Rise crust, and (2) the history of magmatic emplacement and later tectonic development of the Rise. This was planned to be achieved by acquiring seismic data along two refraction lines over the TAMU massif, which represents the early, most voluminous phase of the Rise construction, and over 3,000 km of reflection lines covering both the TAMU and ORI massifs, the latter of which corresponds to the intermediate phase of the plateau evolution.

Figure 2 – Cruise Track

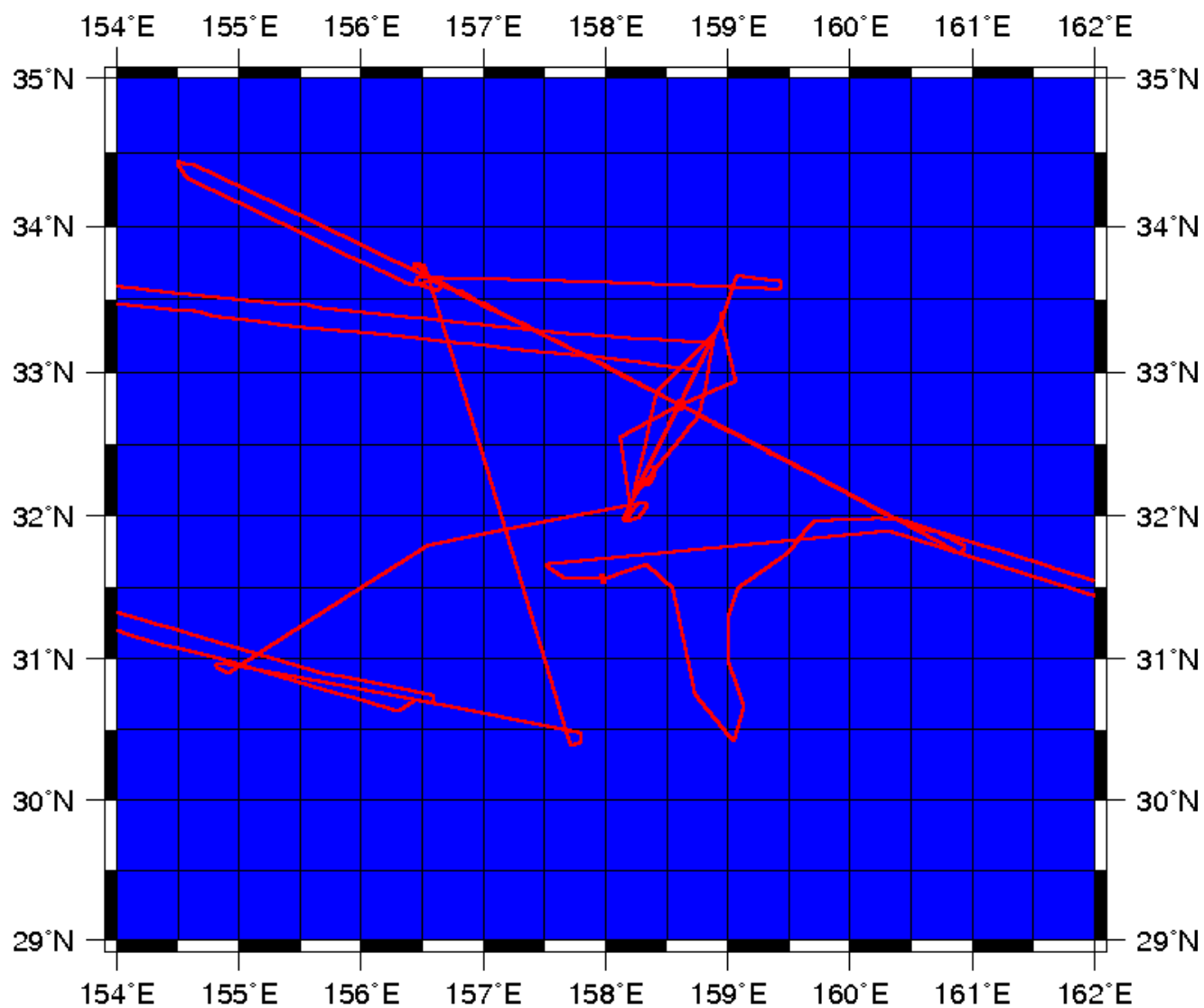


Figure 3 – Source & Multibeam Survey Area

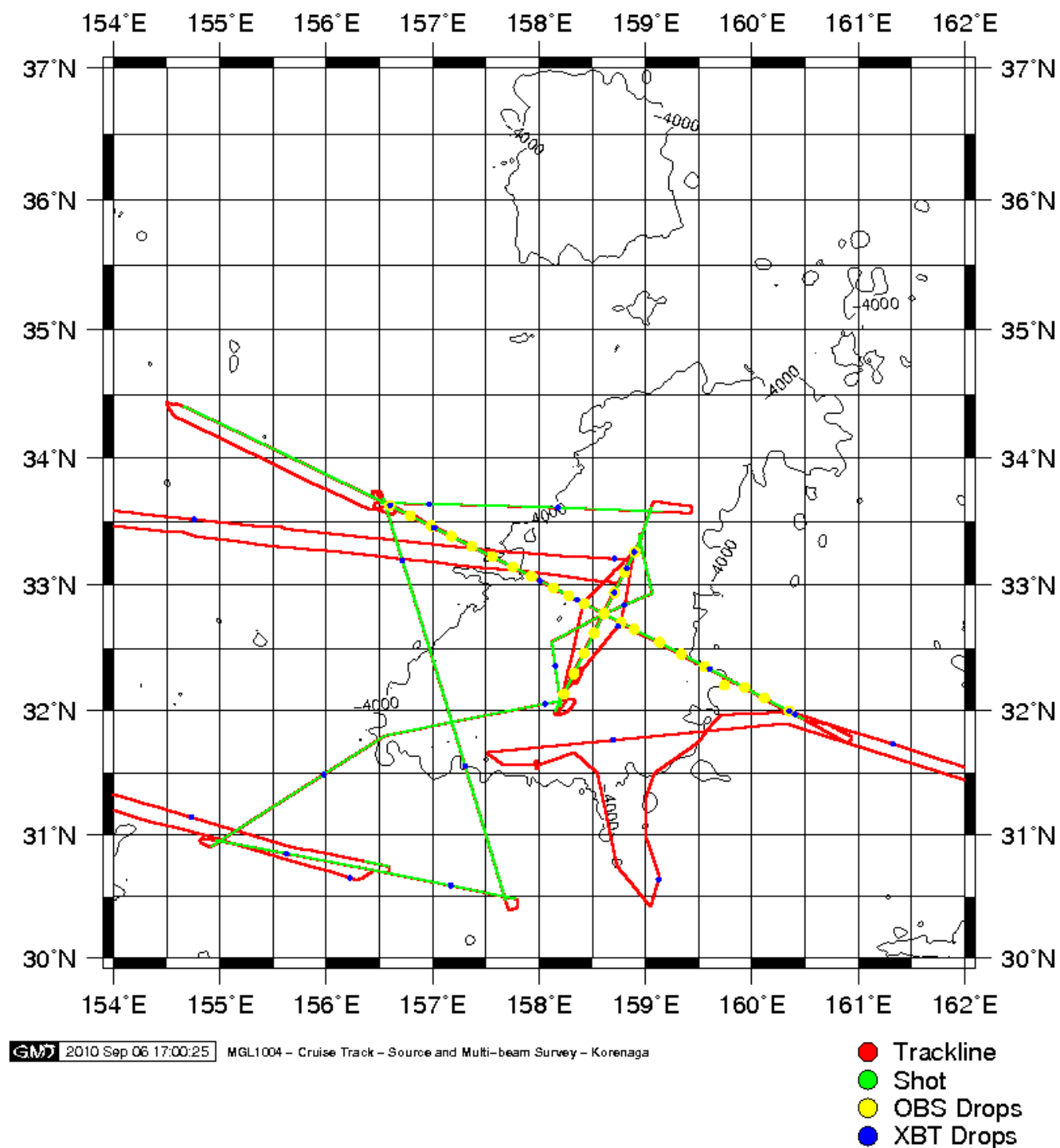


Figure 4 - OBS Deployment Plan

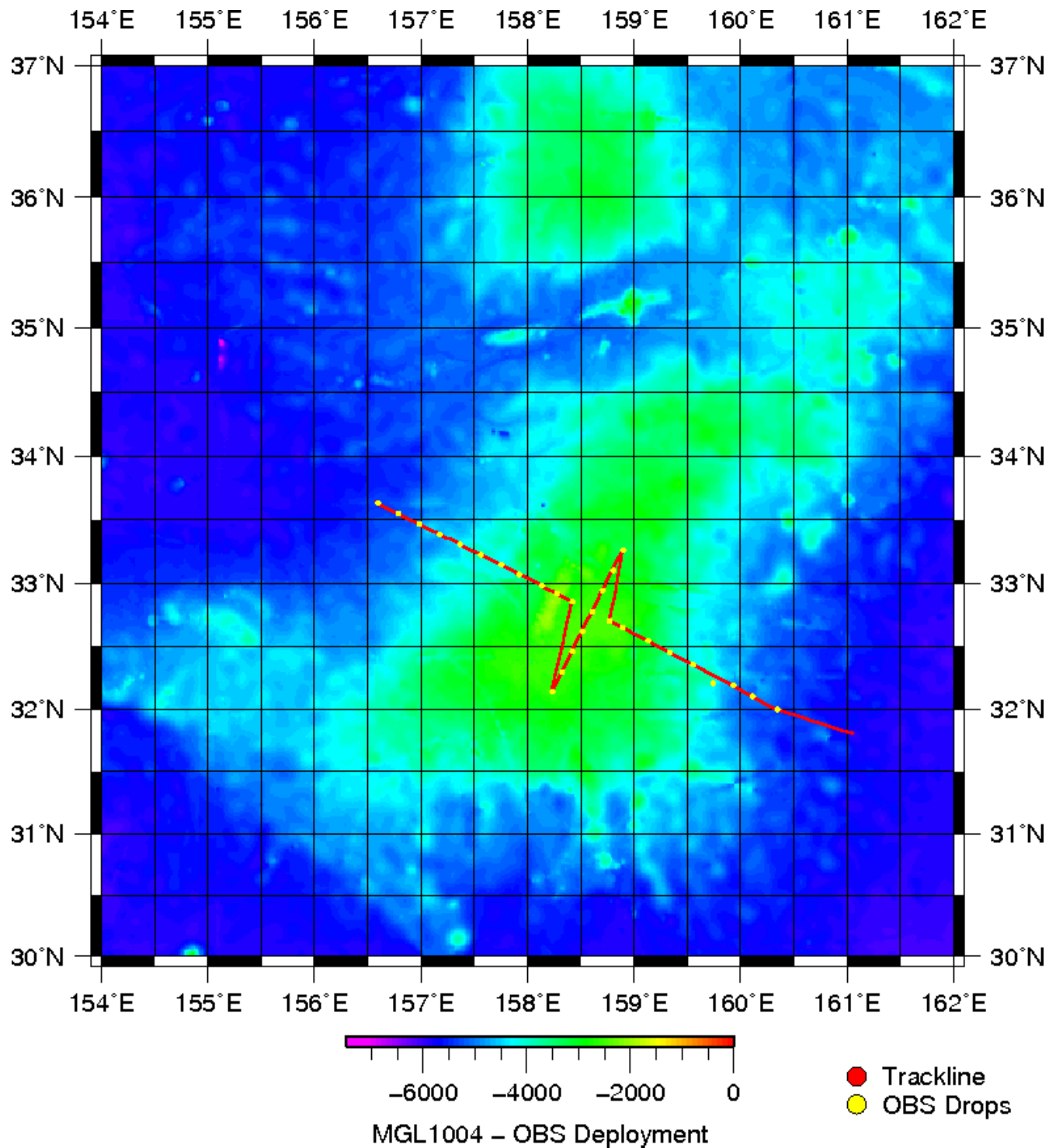


Figure 5 - OBS Recovery Plan

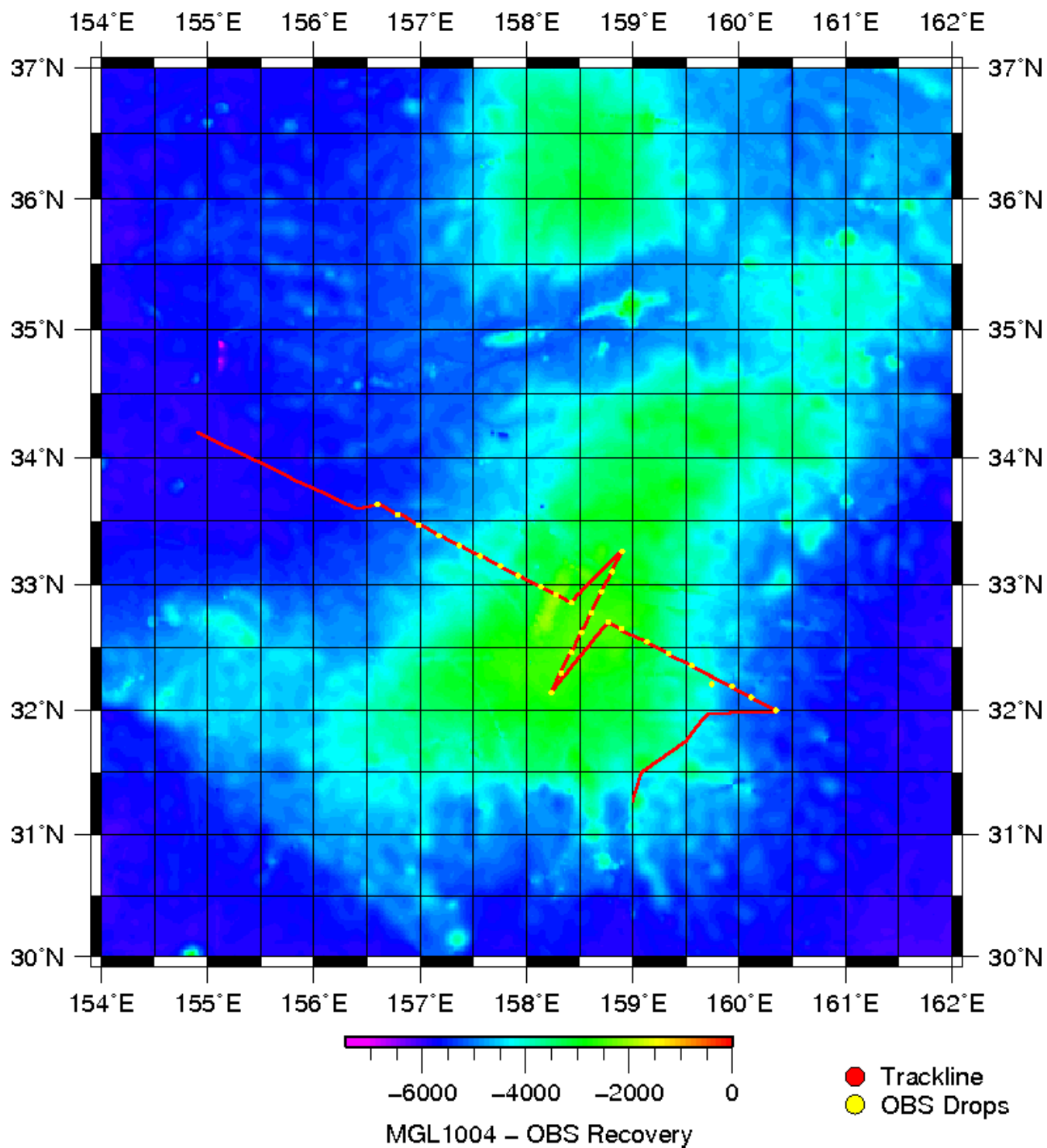


Figure 6 – Multibeam Survey over Shatsky Rise

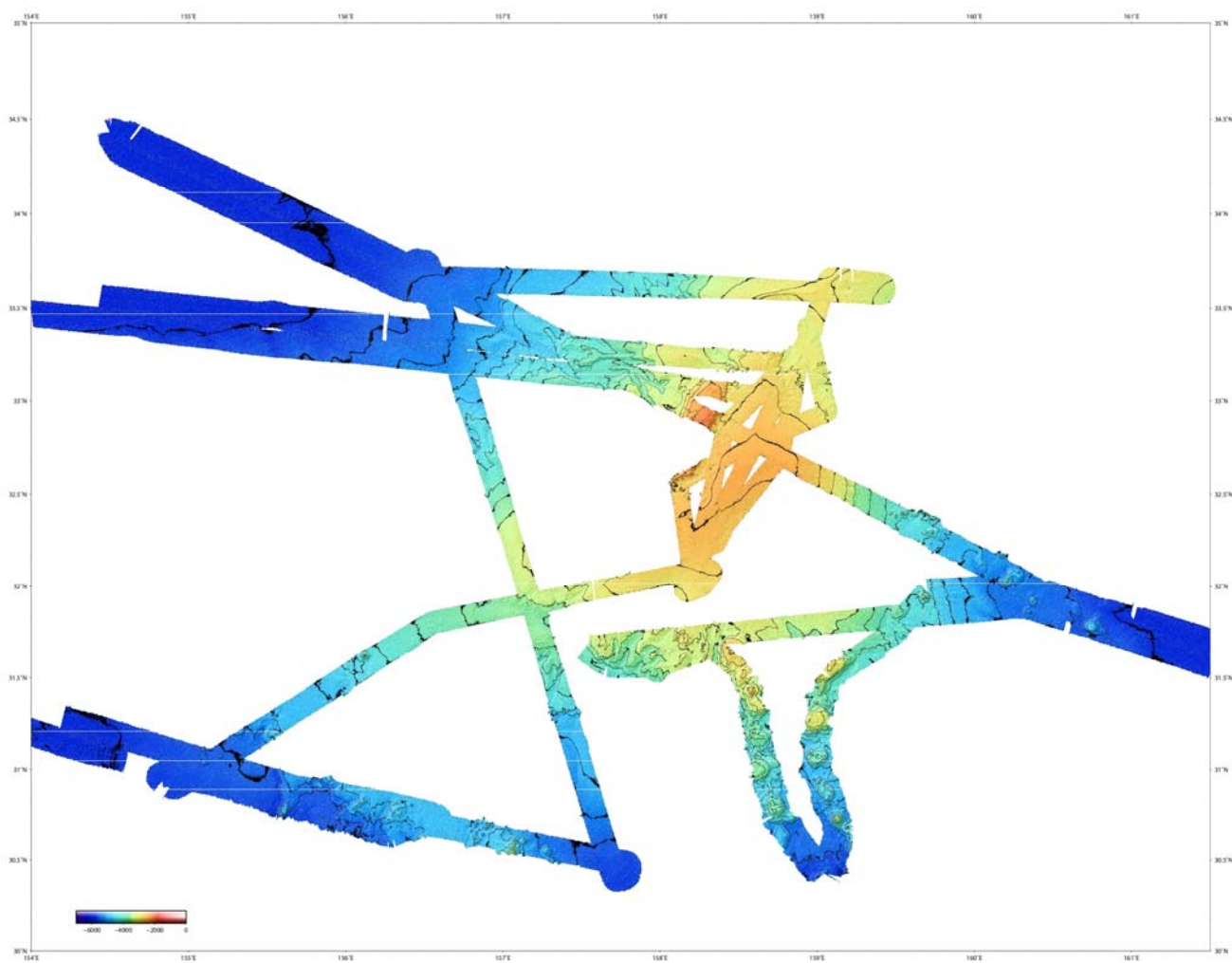
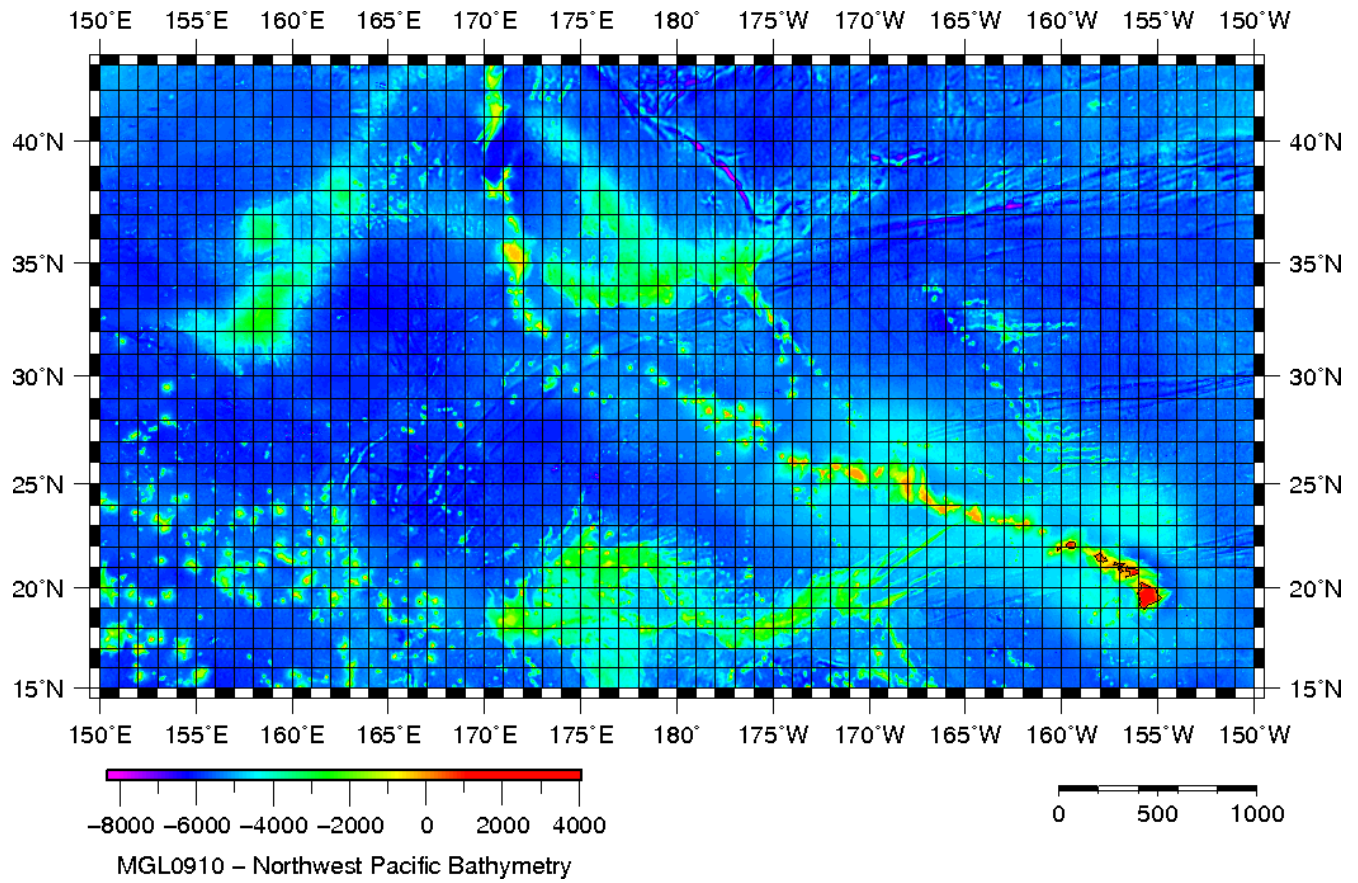


Figure 7 – Northwest Pacific Ocean Topography & Bathymetry



II. Personnel

Shipboard Technical Staff

1	Robert Steinhaus	Chief Science Officer
2	David Martinson	Chief Navigation
3	Bern McKiernan	Watch Leader/Chief Acquisition
4	Mike Tatro	Watch Leader/Acquisition
5	Michael Zhang	Chief IT
6	David Ng	IT/Nav Leader
7	Tom Spoto	Chief Sound Source Mechanic
8	Robbie Gunn	Sound Source Mechanic
9	Carlos Gutierrez	Sound Source Mechanic
10	Tim Finn	Sound Source Mechanic

Ship's Crew

1	Mark Landow	Captain
2	Patrick O'Leary	Chief Mate
3	Breckenridge Crum	2 nd Mate
4	Rachel Widerman	3 rd Mate
5	Jason Woronowicz	Bosun
6	George Cereno	AB
7	Ricardo Redito	AB
8	Ben Nadler	AB/OS
9	Jeromie Webster	OS
10	Nicky Applewhite	OS
11	Al Karlyn	Chief Engineer
12	Peter Chizmar	1 st Asst. Engineer
13	Ryan Vetting	2 nd Asst. Engineer
14	Trevor Lapham	3 rd Asst. Engineer
15	Jack Schwartz	Electrician
16	Fernando Uribe	Oiler
17	Jack Billings	Oiler
18	Meagan Fahey	Oiler
19	Hervin Fuller	Steward
20	Michael Duffy	Cook

OBS Techs

1	Peter Lemmond	OBS Tech	WHOI
2	Dave Dubois	OBS Tech	WHOI
3	Tim Kane	OBS Tech	WHOI
4	Jimmy Elsenbeck	OBS Tech	WHOI

MMO

1	Claudio Fossati	MMO
2	Joseph Beland	MMO
3	Amanda Dubuque	MMO
4	Diana Anthochiw	MMO

Science Party

1	Jun Korenaga	Chief Scientist	Yale University
2	William Sager	Co-chief Scientist	Texas A&M
3	Jackie Floyd	Scientist	Yale University
4	Chris Paul	Grad Student	Texas A&M
5	Kelly Brooks	Grad Student	Texas A&M
6	Kai Gao	Grad Student	Texas A&M
7	Tolulope Olugboji	Grad Student	Yale University
8	Dan'l Lewis	Grad Student	Texas A&M
9	Duayne Rieger	Grad Student	Yale University
10	Jinchang Zhang	Grad Student	Texas A&M

III. Instrumentation Summary

All science instruments aboard the Langseth are listed in the science_sensors spreadsheet in the docs section of the cruise archive. Summary notes on operation during this cruise are listed below. Seismic equipment is not listed here; refer to Part IV for the seismic summary. Other instruments not listed were not in operation.

For details on the data formats and interpretation notes, see Appendix A, Data Formats, included on the cruise archive.

Instrument Data Files

Instrument	Description	Data Set	Data Outputs	Files	Interval
FE700	Furuno FE700 Echosounder	Full	serial logs	MGL-bath01.*	1s
EM120	Kongsberg EM120 Multibeam Sonar	Full	raw output to file	See below	variable
			centerbeam serial logs	MGL-bath02.*	variable
DS50	Furuno DS50 Doppler Speedlog	Full	serial logs	MGL-slog01.*	1s
XBT	Sippican MK21 XBT Launcher	52 Drops	raw output to file	See below	n/a
			converted output to file	See below	n/a
WX1	RM Young 5103 Weather Bird and Translator	Full	serial logs	MGL-wx01.*	1s
			mwv conversion	MGL-mwv01.*	1s
TSG	SeaBird SBE23 Thermosalinograph	Full	raw serial logs	MGL-tsg.*	1s
			converted data	MGL-tsgconv.*	1s
CNAV	C&C Tech. CNAV 2000 DGPS Receiver	Full	serial logs	MGL-cnav.*	1s
CNAV3050	C&C Tech. CNAV 3050 DGPS Receiver	Full	serial logs	MGL-cnav3050.*	1s
MAG01	GeoMetrics 882 Magnetometer	On Deploy	serial logs	MGL-mag01.*	1s
BGM	Bell Aerospace BGM-3 Gravimeter	Full	serial logs	MGL-vc01.*	1s
GYRO	Simrad GC80 Gyrocompass/AD100	Full	serial logs	MGL-gy01.*	1s
POSMV	Applanix POSMV Integrated Nav System	Full	serial logs	MGL-posmv.*	1s
SEAPATH	Kongsberg SeaPath Integrated Nav System	Full	serial logs	MGL-seapath.*	1s
STU	Sercel Streamer Tension	None	serial logs	MGL-stu1.*	15s
TAGGER	Spectrum Instruments intelligent reference TM-4	Full	serial logs	MGL-tagger01.*	shot
			filtered logs	MGL-shot01.*	shot
MICROSV	Applied Microsystems Sound Velocity Pod Unit	Full	serial logs	MGL-microsv01.*	1s
MICROSV	Applied Microsystems Sound Velocity USS Unit	Full	serial logs	MGL-microsv02.*	1s
SBE38	SeaBird SBE38 Pod Thermometer	Full	serial logs	MGL-sbe38	1s
PCO2	LDEO PCO2 System	Full	serial logs	MGL-pco2	~180s

All timestamps in this report are presented using UTC time and day of year in order to avoid confusion with local time changes.

Science Navigation Instrumentation

FE700

Logging interval: 1 second

File id: bath01

The FE700 only operated to 800m depth. The echosounder is normally switched off before the unit goes out of depth.

Interruptions greater than twenty seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:23:17:41.7870		Logging officially started
2010:199:05:02:09.5513 2010:199:05:03:25.7006	Missing data	Reason not specified
2010:199:05:03:26.5637 2010:199:05:04:45.5731	Missing data	Reason not specified
2010:199:05:08:42.6494 2010:199:05:10:00.6678	Missing data	Reason not specified
2010:199:05:15:14.6286 2010:199:05:16:33.5901	Missing data	Reason not specified
2010:199:05:16:41.5483 2010:199:05:20:27.6612	Missing data	Reason not specified
2010:199:05:23:16.7065 2010:199:05:24:32.7118	Missing data	Reason not specified
2010:199:05:25:42.6760 2010:199:05:27:05.5357	Missing data	Reason not specified
2010:199:05:28:24.5450 2010:199:05:31:02.5959	Missing data	Reason not specified
2010:199:05:32:18.6003 2010:199:05:33:39.7029	Missing data	Reason not specified
2010:199:05:33:41.5409 2010:199:05:34:54.5891	Missing data	Reason not specified
2010:199:05:34:58.5843 2010:199:16:05:39.4512	Missing data	Reason not specified
2010:199:17:50:37.7078		Logging officially ended

bath01 data sample:

bath01	2008:220:13:45:42.0681	\$SDDBT,,,,,,
bath01	2008:220:13:45:42.0690	\$SDDBS,,,,,,
bath01	2008:220:13:45:42.0691	\$SDDPT,,0006.6*49
bath01	2008:220:13:45:42.1482	\$PFEC,Alarm,0,0*6F
bath01	2008:220:13:45:42.1483	\$PFEC,xdr,FORE,050*79

EM-122 Mutibeam

The EM122 multibeam sonar was operated throughout the cruise. The system is designed for deeper water, and does not track ground well in less than 50m of water.

EM122 swath data is saved to the cruise archive under MGL1004/multibeam. Center beam depth is recorded separately to serial log. MicroSV (microsv01) probe in the pod supplied sound velocity to the EM122.

Logging interval: variable with water depth

File id: bath02

Interruptions greater than one hundred and twenty seconds are displayed in the following table.

Log Date	Event	Comment
2010:199:03:03:10.7817		Logging officially started
2010:199:03:59:25.4650 2010:199:04:02:14.8044	Missing data	Reason not specified
2010:199:06:17:57.5072 2010:199:06:37:09.2463	Missing data	Reason not specified
2010:199:06:46:47.2147 2010:199:06:59:55.4531	Missing data	Reason not specified
2010:199:07:15:52.7077 2010:199:07:42:03.1203	Missing data	Reason not specified
2010:199:07:57:40.6023 2010:199:08:06:56.0005	Missing data	Reason not specified
2010:199:08:22:43.0610 2010:199:09:15:18.6806	Missing data	Reason not specified
2010:199:09:15:34.5484 2010:199:09:25:12.4490	Missing data	Reason not specified
2010:199:09:26:48.4397 2010:199:10:56:27.4415	Missing data	Reason not specified
2010:199:11:02:42.3111 2010:199:12:05:05.3244	Missing data	Reason not specified
2010:199:12:46:09.3769 2010:199:15:08:10.8143	Missing data	Reason not specified
2010:199:15:43:48.3772 2010:199:16:42:51.8540	Missing data	Reason not specified
2010:199:16:45:20.6477 2010:199:17:04:38.5905	Missing data	Reason not specified
2010:199:17:04:38.5905 2010:199:17:26:00.4996	Missing data	Reason not specified
2010:199:17:26:00.4996 2010:199:17:43:45.9461	Missing data	Reason not specified
2010:199:19:44:08.9755 2010:199:19:52:50.6033	Missing data	Reason not specified
2010:200:03:51:29.2196 2010:200:03:57:11.3166	Missing data	Reason not specified
2010:202:14:06:52.9456 2010:202:14:54:09.9886	Missing data	UPS power failure
2010:206:00:50:44.6580 2010:206:01:02:04.5437	Missing data	Secured for BIST test
2010:207:04:58:40.8426 2010:207:05:07:39.8092	Missing data	Secured for BIST test
2010:208:00:12:17.6177 2010:208:00:19:49.9445	Missing data	Secured instrument for OBS deployment
2010:208:03:50:42.2124 2010:208:04:11:24.9169	Missing data	Secured instrument for OBS deployment
2010:208:05:41:26.3214 2010:208:05:50:28.1032	Missing data	Secured instrument for OBS deployment

2010:208:07:04:39.4570	2010:208:07:14:36.5312	Missing data	Secured instrument for OBS deployment
2010:208:08:30:17.1573	2010:208:08:39:43.5872	Missing data	Secured instrument for OBS deployment
2010:208:09:57:35.7169	2010:208:10:06:17.6679	Missing data	Secured instrument for OBS deployment
2010:208:11:32:49.9284	2010:208:11:43:25.8333	Missing data	Secured instrument for OBS deployment
2010:208:13:07:42.5858	2010:208:13:18:31.9503	Missing data	Secured instrument for OBS deployment
2010:208:14:51:05.1426	2010:208:14:58:17.9706	Missing data	Secured instrument for OBS deployment
2010:208:15:54:20.6389	2010:208:16:03:27.1449	Missing data	Secured instrument for OBS deployment
2010:208:19:28:20.8252	2010:208:19:35:00.5727	Missing data	Secured instrument for OBS deployment
2010:208:20:58:34.9433	2010:208:21:05:58.8348	Missing data	Secured instrument for OBS deployment
2010:208:21:16:18.2289	2010:208:22:12:34.3321	Missing data	Power failure on rack 4
2010:208:22:23:08.9456	2010:208:22:33:53.8798	Missing data	Secured instrument for OBS deployment
2010:209:01:23:43.5563	2010:209:01:31:33.9519	Missing data	Secured instrument for OBS deployment
2010:209:02:51:37.6197	2010:209:03:03:25.5571	Missing data	Secured instrument for OBS deployment
2010:209:04:26:35.5059	2010:209:04:36:53.7952	Missing data	Secured instrument for OBS deployment
2010:209:05:56:51.4383	2010:209:06:11:08.4881	Missing data	Secured instrument for OBS deployment
2010:209:10:16:06.0666	2010:209:10:25:18.0801	Missing data	Secured instrument for OBS deployment
2010:209:11:24:29.6923	2010:209:11:35:06.4534	Missing data	Secured instrument for OBS deployment
2010:209:12:32:35.6208	2010:209:12:39:44.5611	Missing data	Secured instrument for OBS deployment
2010:209:14:01:07.9247	2010:209:14:08:12.9526	Missing data	Secured instrument for OBS deployment
2010:209:15:21:10.4964	2010:209:15:28:58.9206	Missing data	Secured instrument for OBS deployment

2010:209:16:41:30.0950	2010:209:16:47:32.0189	Missing data	Secured instrument for OBS deployment
2010:209:17:54:39.4874	2010:209:18:03:48.7506	Missing data	Secured instrument for OBS deployment
2010:209:19:15:29.5796	2010:209:19:25:08.1272	Missing data	Secured instrument for OBS deployment
2010:209:20:51:11.4768	2010:209:20:58:39.3371	Missing data	Secured instrument for OBS deployment
2010:209:22:09:39.3274	2010:209:22:17:49.7147	Missing data	Secured instrument for OBS deployment
2010:209:23:27:56.9255	2010:209:23:35:33.2384	Missing data	Secured instrument for OBS deployment
2010:210:22:49:25.2359	2010:210:22:56:36.0007	Missing data	Secured for BIST test
2010:212:23:38:36.8886	2010:212:23:46:00.0229	Missing data	Secured for BIST test
2010:214:03:19:45.6151	2010:214:03:27:30.8885	Missing data	Secured for BIST test
2010:215:00:39:29.6649	2010:215:00:48:03.7184	Missing data	Secured for BIST test
2010:215:19:06:06.5120	2010:215:19:15:48.6784	Missing data	Secured instrument to test out 12kHz Knudsen
2010:217:10:43:05.1600	2010:217:11:11:17.2829	Missing data	Reason not specified
2010:217:18:47:59.2001	2010:217:18:56:44.1090	Missing data	Secured for BIST test
2010:218:15:07:33.0618	2010:218:15:14:57.6238	Missing data	Secured for BIST test
2010:219:18:11:09.3590	2010:219:18:18:57.2918	Missing data	Secured for BIST test
2010:220:18:39:08.6168	2010:220:18:50:24.9275	Missing data	Secured for BIST test
2010:221:18:10:24.9809	2010:221:18:17:34.7642	Missing data	Secured for BIST test
2010:222:23:19:53.4657	2010:222:23:28:06.3308	Missing data	Secured for BIST test
2010:223:21:47:20.2586	2010:223:21:57:56.3667	Missing data	Secured for BIST test
2010:224:18:26:36.1117	2010:224:18:35:54.4036	Missing data	Secured for BIST test
2010:225:15:14:13.8684	2010:225:15:29:20.9372	Missing data	Secured for BIST test
2010:226:13:23:48.0452	2010:226:13:31:05.5998	Missing data	Secured for BIST test
2010:227:12:15:51.3326	2010:227:12:25:56.9124	Missing data	Secured for BIST test
2010:228:16:38:22.2898	2010:228:17:47:03.8733	Missing data	Secured for BIST test
2010:228:23:10:28.0942	2010:228:23:18:09.6159	Missing data	Secured for BIST test
2010:229:16:28:02.9154	2010:229:16:35:53.8465	Missing data	Secured for BIST test
2010:230:17:37:37.9189	2010:230:17:48:44.4504	Missing data	Secured for BIST test
2010:231:17:56:46.0859	2010:231:20:47:19.8612	Missing data	Secured to turn on FE700 near rendezvous

			point
2010:231:21:12:41.1064	2010:231:21:19:50.0248	Missing data	Secured for BIST test
2010:232:16:57:40.1295	2010:232:18:33:01.2600	Missing data	Secured for BIST test
2010:232:18:42:08.3975	2010:232:18:49:29.5264	Missing data	Secured for BIST test
2010:233:17:03:23.6056	2010:233:17:10:39.0940	Missing data	Secured for BIST test
2010:234:13:21:20.0280	2010:234:13:28:36.1597	Missing data	Secured for BIST test
2010:235:12:43:50.6480	2010:235:12:51:08.5859	Missing data	Secured for BIST test
2010:236:06:06:33.1327	2010:236:06:50:48.5581	Missing data	Secured for BIST test
2010:237:13:45:01.8952	2010:237:13:52:28.7134	Missing data	Secured for BIST test
2010:238:04:26:33.8271	2010:238:04:46:34.0357	Missing data	Instrument locked up
2010:238:21:39:00.3681	2010:238:22:01:25.5067	Missing data	Instrument locked up
2010:239:03:55:36.1817	2010:239:04:04:34.8230	Missing data	Instrument locked up
2010:239:04:50:43.7052	2010:239:04:59:14.9952	Missing data	Secured for BIST test
2010:240:15:01:12.4711	2010:240:15:31:54.4520	Missing data	Secured for BIST test
2010:241:18:22:07.0993	2010:241:18:36:56.9558	Missing data	Secured for BIST test
2010:242:08:39:56.0190	2010:242:10:45:12.3397	Missing data	Secured instrument for OBS recovery
2010:242:11:47:21.1702	2010:242:13:43:02.4849	Missing data	Secured instrument for OBS recovery
2010:242:14:57:38.1538	2010:242:17:04:25.4905	Missing data	Secured instrument for OBS recovery
2010:242:18:25:01.8552	2010:242:20:03:35.9107	Missing data	Secured instrument for OBS recovery
2010:242:21:17:23.9575	2010:242:22:52:36.7278	Missing data	Secured instrument for OBS recovery
2010:243:00:03:02.8984	2010:243:01:40:50.3526	Missing data	Secured instrument for OBS recovery
2010:243:02:49:29.2735	2010:243:04:26:51.7550	Missing data	Secured instrument for OBS recovery
2010:243:05:36:39.7152	2010:243:07:21:52.1183	Missing data	Secured instrument for OBS recovery
2010:243:08:36:12.0069	2010:243:10:16:12.5878	Missing data	Secured instrument for OBS recovery
2010:243:11:03:49.8140	2010:243:12:33:59.3982	Missing data	Secured instrument for OBS recovery
2010:243:13:34:23.9024	2010:243:14:49:53.1480	Missing data	Secured instrument for

			OBS recovery
2010:243:18:25:56.4823	2010:243:19:48:59.2524	Missing data	Secured instrument for OBS recovery
2010:243:20:56:17.8406	2010:243:22:10:38.9431	Missing data	Secured instrument for OBS recovery
2010:244:01:27:42.6654	2010:244:02:25:49.3728	Missing data	Secured instrument for OBS recovery
2010:244:03:32:07.0155	2010:244:04:26:35.9755	Missing data	Secured instrument for OBS recovery
2010:244:05:31:20.5423	2010:244:06:41:22.8599	Missing data	Secured instrument for OBS recovery
2010:244:07:44:12.3469	2010:244:08:44:54.3451	Missing data	Secured instrument for OBS recovery
2010:244:09:16:52.5285	2010:244:09:46:50.8158	Missing data	Secured instrument for OBS recovery
2010:244:09:47:06.5244	2010:244:10:54:43.4158	Missing data	Secured instrument for OBS recovery
2010:244:15:39:21.7781	2010:244:16:45:21.8832	Missing data	Secured instrument for OBS recovery
2010:244:17:37:31.3611	2010:244:19:14:44.5155	Missing data	Secured instrument for OBS recovery
2010:245:04:52:46.0150	2010:245:06:25:08.2162	Missing data	Secured instrument for OBS recovery
2010:245:07:29:16.3324	2010:245:09:10:21.2912	Missing data	Secured instrument for OBS recovery
2010:245:10:12:14.4437	2010:245:12:19:46.9694	Missing data	Secured instrument for OBS recovery
2010:245:13:43:35.9799	2010:245:15:29:04.4867	Missing data	Secured instrument for OBS recovery
2010:246:17:38:01.4600	2010:246:17:51:22.1189	Missing data	Secured for BIST test
2010:247:03:34:17.0469	2010:247:03:42:17.3837	Missing data	Secured for BIST test
2010:247:08:23:54.9698	2010:247:08:33:06.3568	Missing data	Secured to reload previous survey
2010:247:12:53:46.9367	2010:247:13:01:06.4408	Missing data	Secured to transfer data
2010:248:10:01:28.6211	2010:248:10:24:43.2918	Missing data	Secured for BIST test
2010:248:10:38:24.6327	2010:248:10:40:49.6410	Missing data	Restarted SIS
2010:248:10:40:49.6410	2010:248:10:54:26.4627	Missing data	Restarted SIS
2010:249:07:35:21.7679	2010:249:07:52:11.5560	Missing data	Secured for BIST test

			and changing survey
2010:250:10:24:28.8390	2010:250:10:52:25.5246	Missing data	Secured for BIST test
2010:251:10:44:36.7342	2010:251:11:13:55.5458	Missing data	Secured for BIST test
2010:252:09:14:42.5654	2010:252:09:30:55.6559	Missing data	Secured for BIST test
2010:253:09:04:16.2926	2010:253:09:21:53.7905	Missing data	Secured for BIST test
2010:254:09:03:45.8367	2010:254:09:19:42.1973	Missing data	Secured for BIST test
2010:255:03:39:34.8616	2010:255:03:56:55.7480	Missing data	Secured for BIST test
2010:255:23:59:55.2633			Logging officially ended

Bath02 data format

bath02	2008:192:00:00:12.6663	\$KGDPT,2938.25,0.0,12000.0*4a
bath02	2008:192:00:00:30.3301	\$KGDPT,2954.08,0.0,12000.0*4f
bath02	2008:192:00:00:46.5831	\$KGDPT,2958.32,0.0,12000.0*4a
bath02	2008:192:00:01:03.0606	\$KGDPT,2954.18,0.0,12000.0*4e

DS50 Speedlog

File id: slog01

Logging interval: 1 second

The Furuno DS-50 is a Doppler speed log. It was in operation for the length of the cruise.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:01.3540		Logging officially started
2010:208:21:16:24.3888	2010:208:21:22:56.6045	Missing data
2010:216:05:54:10.1115	2010:216:10:08:39.1401	Missing data
2010:237:00:58:04.9864	2010:237:00:58:31.0926	Missing data
2010:237:01:01:33.3914	2010:237:01:02:27.1687	Missing data
2010:255:23:59:59.4240		Logging officially ended

Slog01 data format:

slog01	2008:231:00:00:00.0744	\$VDVHW,,T,,M,09.68,N,17.93,K*4C
slog01	2008:231:00:00:00.1906	\$VDVBW,009.68,000.09,A,009.68,000.09,V*46
slog01	2008:231:00:00:00.1908	\$VDVLW,0005960.30,N,0005960.30,N*5F

RMYoung Integrated Weather

File id: wx01

Logging interval: 1 second

The weather station is used to log wind speed, direction, air temperature, and barometric pressure. The unit was functioning during the cruise. See also mwv01 below.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:00.0849		Logging officially started
2010:208:21:16:24.5798 2010:208:21:22:32.5593	Missing data	Power failure on rack 4
2010:255:23:59:59.0030		Logging officially ended

File id: mwv01

Logging interval: 1 second

The weather station is used to log wind speed, direction, air temperature, and barometric pressure. The wx01 strings are converted in real-time to produce mwv strings for the DP. The mwv output is strictly a derivative of the w01 output. See also the wx01 description above.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:00.0849		Logging officially started
2010:208:21:16:24.5798 2010:208:21:23:37.5611	Missing data	Power failure on rack 4
2010:255:23:59:59.0030		Logging officially ended

Mwv01 data sample:

mwv01 2008:231:00:00:00.5173	6.1	6.6	6.6	8.8	354	321	5	0.0	0.0	0.0
0.0 355 355	0	*****	*****	*****	*****	8	8	8	1009.7	
mwv01 2008:231:00:00:01.5172	5.9	6.6	6.6	8.8	353	321	5	0.0	0.0	0.0
0.0 355 355	0	*****	*****	*****	*****	8	8	8	1009.6	
mwv01 2008:231:00:00:02.5190	6.3	6.6	6.6	8.8	354	321	5	0.0	0.0	0.0
0.0 355 355	0	*****	*****	*****	*****	8	8	8	1009.8	

CNAV

File id: cnav

Logging interval: 1 second

The C-NAV is a global satellite-based differential receiver. This is the best individual receiver currently on the ship. This system was operational during the cruise.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:00.0009		Logging officially started
2010:208:21:16:24.7568 2010:208:21:21:49.5997	Missing data	Power failure on rack 4
2010:238:00:30:34.8932 2010:238:00:30:45.8507	Missing data	Reason not specified
2010:238:00:30:46.1867 2010:238:00:31:00.9383	Missing data	Reason not specified
2010:255:23:59:59.9620		Logging officially ended

Cnav data format:

```
cnav 2008:231:00:00:00.6936  
$GPGGA,000000.00,1434.94372,N,10444.85748,W,2,8,1.1,15.52,M,-20.60,M,9,0108*65  
cnav 2008:231:00:00:00.7137 $GPVTG,006.5,T,,M,9.64,N,17.85,K*53
```

GC80 Gyrocompass

The GC80 gyrocompass is installed on the bridge and used for ship and seismic navigation.

File id: gy01

Logging interval: 1 second

The GC80 gyrocompass operated normally.

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:00.1258		Logging officially started
2010:208:21:16:24.7749 2010:208:21:22:13.4770	Missing data	Power failure on rack 4
2010:255:23:59:59.0780		Logging officially ended

Gy01 data format:

```
gy01 2008:231:00:00:00.4110 $PTKM,HEALM,0000,0,G1*09  
gy01 2008:231:00:00:00.6395 $HEHDT,005.8,T*22  
gy01 2008:231:00:00:00.6396 $HEROT,-005.25,A*34
```

gy01	2008:231:00:00:01.6394	\$HEHDT,005.7,T*2D
gy01	2008:231:00:00:01.6395	\$HEROT,-004.53,A*34

POSMV Integrated Nav

The POS/MV is a receiver that uses CNAV input in addition to its own antennae, an inertial sensor and optional RTG, WTC, or WAAS corrections and a Kalman filter to produce a smooth navigation output and very accurate heading.

The PosMV operated normally during the cruise.

File id: posmv

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:00.4859		Logging officially started
2010:208:21:16:24.2628 2010:208:21:22:20.9771	Missing data	Power failure on rack 4
2010:217:02:13:44.0536 2010:217:02:14:09.0076	Missing data	Disconnected to configure instrument
2010:233:03:18:30.2688 2010:233:03:26:28.1073	Missing data	Reason not specified
2010:238:00:49:48.0948 2010:238:00:50:56.4107	Missing data	Reason not specified
2010:239:03:31:36.8852 2010:239:05:13:42.5441	Missing data	Reason not specified
2010:255:23:59:59.3250		Logging officially ended

Posmv data format:

posmv	2008:231:00:00:00.0885	\$INGGA,235959.842,1434.95002,N,10444.85734,W,2,,1.1,12.71,M,,9.0,0108*2E
posmv	2008:231:00:00:00.0889	\$INHDT,15.0,T*11
posmv	2008:231:00:00:00.2047	\$INVTG,7.0,T,,M,9.7,N,17.9,K*46
posmv	2008:231:00:00:00.3208	\$INGST,235959.842,,0.9,0.9,0.0,0.9,0.9,2.5*51
posmv	2008:231:00:00:00.4411	\$PASHR,235959.842,15.05,T,-
		0.58,0.48,0.15,0.069,0.069,0.045,2,0*05
posmv	2008:231:00:00:00.4412	\$INZDA,235959.0000,17,08,2008,,*73

SeaPath Integrated Nav

The Kongsberg Seapath is an integrated navigation system. It was in operation for the length of the cruise.

Logging interval: 1 second

File id: seapath

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:00.5749		Logging officially started
2010:199:03:55:20.8111 2010:199:03:56:17.6716	Missing data	Restarted instrument due to erroneous speed reading
2010:208:21:16:24.7018 2010:208:21:21:58.7618	Missing data	Power failure on rack 4
2010:210:04:24:07.5987 2010:210:04:28:13.3695	Missing data	Reason not specified
2010:244:09:41:50.9992 2010:244:09:42:31.1928	Missing data	Instrument crashed and reset
2010:255:23:59:59.8370		Logging officially ended

Seapath data format:

seapath	2008:231:00:00:00.0504	\$INZDA,235959.99,17,08,2008,,*73
seapath	2008:231:00:00:00.1686	
		\$INGGA,235959.99,1434.953109,N,10444.859147,W,2,08,1.1,-
		16.30,M,,M,1.0,0291*70
seapath	2008:231:00:00:00.1687	\$INVTG,5.97,T,,M,9.7,N,,K,D*03
seapath	2008:231:00:00:00.1688	\$INHDT,5.82,T*1A

Spectrum Instruments TDM-4 Event Logger

The Event logger time stamps time-break triggers from DigiShot in all fire modes.

File id: tagger1

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:195:00:00:00.0322		Logging officially started
2010:203:00:32:44.2903 2010:203:00:32:55.1838	Missing data	Reason not specified
2010:203:04:48:29.6984 2010:203:04:48:56.5906	Missing data	Reason not specified
2010:220:00:08:37.2685 2010:220:00:10:14.9537	Missing data	Reason not specified

2010:238:00:24:00.0408	2010:238:00:25:47.0633	Missing data	Reason not specified
2010:255:23:59:59.8625			Logging officially ended

Tagger1 data format:

tagger1	2008:231:00:00:00.0383	#51,08182008,0000001
tagger1	2008:231:00:00:00.2027	#79,00000000
tagger1	2008:231:00:00:00.2948	#68,2
tagger1	2008:231:00:00:00.3689	#70,0
tagger1	2008:231:00:00:00.4010	#56,-00000
tagger1	2008:231:00:00:00.4210	#72,FF

Geometrics 882 Magnetometer

The Geometrics 882 magnetometer is towed behind the ship. Raw serial output is logged using LDS. Deployment is dependent upon seismic operations. See the deployment notes below. Except where noted, the source was not deployed when the magnetometer was at 300m, and the source was deployed when the magnetometer was at 100m.

Magnetometer Deployment Notes

Time	Event
2010:199:03:17:00.0000	Maggie deployed
2010:200:18:46:00.0000	Maggie recovered for inspection
2010:200:18:52:00.0000	Maggie redeployed
2010:202:21:14:00.0000	Maggie recovered for inspection
2010:202:21:21:00.0000	Maggie redeployed
2010:204:20:27:00.0000	Maggie recovered for inspection
2010:204:20:32:00.0000	Maggie redeployed
2010:208:02:55:00.0000	Maggie recovered
2010:209:23:43:00.0000	Maggie deployed
2010:212:00:45:00.0000	Maggie recovered
2010:212:02:39:00.0000	Maggie redeployed
2010:214:22:10:00.0000	Maggie recovered
2010:217:12:01:00.0000	Maggie deployed
2010:220:05:30:00.0000	Maggie recovered for inspection
2010:220:05:35:00.0000	Maggie redeployed
2010:221:19:19:00.0000	Maggie recovered due to tangle on string 1
2010:221:19:21:00.0000	Maggie power secured
2010:223:09:24:00.0000	Maggie deployed
2010:228:00:11:00.0000	Maggie recovered
2010:228:06:28:00.0000	Maggie deployed
2010:228:21:52:00.0000	Maggie recovered
2010:229:01:02:00.0000	Maggie power secured
2010:232:21:13:00.0000	Maggie deployed
2010:232:21:14:00.0000	Maggie powered on
2010:235:01:06:00.0000	Maggie recovered

2010:235:03:50:00.0000	Maggie deployed
2010:241:18:28:00.0000	Maggie recovered
2010:241:21:33:00.0000	Maggie deployed
2010:242:08:56:00.0000	Maggie recovered
2010:245:15:51:00.0000	Maggie deployed
2010:249:19:58:00.0000	Maggie recovered for inspection
2010:249:20:12:00.0000	Maggie deployed
2010:257:16:22:00.0000	Maggie recovered and secured

Logging interval: 1 second

File id: mag01

Interruptions greater than ten seconds are displayed in the following table.

Log Date	Event	Comment
2010:197:20:15:47.4618		Logging officially started
2010:202:14:08:12.4678 2010:202:14:08:23.3543	Missing data	UPS power failure
2010:202:14:09:52.5172 2010:202:14:10:03.3767	Missing data	UPS power failure
2010:202:14:10:40.3542 2010:202:14:10:51.3678	Missing data	UPS power failure
2010:202:14:11:04.4693 2010:202:14:11:15.3678	Missing data	UPS power failure
2010:202:14:11:17.3639 2010:202:14:11:27.3813	Missing data	UPS power failure
2010:202:14:11:29.3774 2010:202:14:18:22.0115	Missing data	UPS power failure
2010:208:21:16:24.6218 2010:208:21:24:42.5709	Missing data	Power failure on rack 4
2010:212:02:11:58.9728 2010:212:02:23:35.5382	Missing data	Pulled instrument in due to medical emergency
2010:213:08:23:07.9722 2010:213:08:23:48.9710	Missing data	Reason not specified
2010:228:00:16:43.4590 2010:228:06:28:23.4536	Missing data	Recovered for hardware check/transit
2010:255:23:59:59.8180		Logging officially ended

Mag01 data sample:

mag01	2008:185:09:45:58.1820	\$107714.673,0042,0024,0110,3533,1143
mag01	2008:185:09:46:01.0333	\$ 63703.933,0042,0024,0110,3533,1143
mag01	2008:185:09:46:04.0330	\$ 44031.029,0042,0027,0110,3533,1143

SBE-23 Thermosalinograph

The Seabird TSG output is logged by LDS to the “tsg” set. Output is also converted in real-time and

recorded to the “tsgconv” data set.

File id: tsg

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

2010:198:22:36:47.7174		Logging officially started
2010:208:21:16:16.3655 2010:208:21:22:56.3225	Missing data	Power failure on rack 4
2010:230:03:38:50.5206 2010:230:03:39:41.5269	Missing data	Power cycled to debug external temp sensor
2010:252:16:05:03.5751 2010:252:16:05:43.5678	Missing data	Secured instrument due to pump failure
2010:252:16:17:23.5760 2010:252:16:39:54.5796	Missing data	Secured instrument due to pump failure
2010:255:23:59:54.1458		Logging officially ended

tsg data sample:

tsg	2008:231:00:00:01.9179	B479CB5528A6D6ABFB2D
tsg	2008:231:00:00:11.9187	B474CB5428A799ABBB2D
tsg	2008:231:00:00:21.9176	B46FCB5328A70CAB8B2D

File id: tsgconv

Logging interval: 1 second

2010:198:22:36:47.7174		Logging officially started
2010:208:21:16:16.3655 2010:208:21:22:56.3225	Missing data	Power failure on rack 4
2010:230:03:38:50.5206 2010:230:03:39:41.5269	Missing data	Power cycled to debug external temp sensor
2010:252:16:05:03.5751 2010:252:16:05:43.5678	Missing data	Secured instrument due to pump failure
2010:252:16:17:23.5760 2010:252:16:39:54.5796	Missing data	Secured instrument due to pump failure
2010:255:23:59:54.1458		Logging officially ended

tsgconv data sample:

tsgconv	2008:231:00:00:01.9179	B479CB5528A6D6ABFB2D	1531.59	28.85	24.35	5.53
33.74						

tsgconv	2008:231:00:00:11.9187	B474CB5428A799ABBB2D	1531.61	28.85	24.36	5.53
33.74						
tsgconv	2008:231:00:00:21.9176	B46FCB5328A70CAB8B2D	1531.60	28.85	24.35	5.53
33.74						

BGM-3 Gravimeter

File id: vc01

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

2010:195:00:00:00.6339		Logging officially started
2010:208:21:16:24.7149	2010:208:21:22:06.6849	Missing data
2010:255:23:59:59.4480		Logging officially ended

Applied Microsystems MicroSV Pod Unit

File id: microsv01

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

2010:195:00:00:00.9702		Logging officially started
2010:208:21:16:24.6892	2010:208:21:29:50.0174	Missing data
2010:255:23:59:59.2484		Logging officially ended

Applied Microsystems MicroSV USS Unit

File id: microsv02

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

2010:195:22:57:17.0246		Logging officially started
2010:200:04:11:14.6783	2010:200:09:54:58.0351	Missing data
2010:201:16:13:04.3782	2010:201:16:15:45.5673	Missing data
		Interface problem; power cycle fixed problem
		New splice on cable, power cycle fixed

			problem
2010:208:21:16:23.8218	2010:208:21:23:19.7619	Missing data	Power failure on rack 4
2010:217:20:27:13.7302			Logging officially ended

Seabird SBE38 Temperature Probe Pod Unit

File id: sbe38

Logging interval: 1 second

Interruptions greater than ten seconds are displayed in the following table.

2010:195:22:57:17.0246		Logging officially started	
2010:208:21:16:24.4408	2010:208:21:23:06.5566	Missing data	Power failure on rack 4
2010:255:23:59:59.7130			Logging officially ended

LDEO PCO2 System

The LDEO PCO2 system output is logged by LDS to the “pco2” set.

The atmospheric gas flow was secured during the cruise as condensation in the wet lab clogged the system. See below for more information.

File id: pco2

Logging interval: ~180 seconds

Interruptions greater than three hundred seconds are displayed in the following table.

2010:198:22:06:06.0291			Logging officially started
2010:206:18:28:35.5942	2010:206:18:38:58.3263	Missing data	Secured instrument to replace nitrogen tank
2010:208:18:34:01.6285	2010:208:18:48:10.2837	Missing data	Secured instrument to fix gas flows and filters
2010:208:21:15:37.5241	2010:208:21:26:55.5472	Missing data	Power failure on rack 4
2010:210:17:52:32.0417	2010:210:18:05:21.3895	Missing data	Secured instrument to fix gas flows and filters
2010:252:16:17:26.0896	2010:252:16:43:43.0029	Missing data	Secured instrument due to pump failure
2010:255:23:59:04.6361			Logging officially ended

Mk21 XBT System

Files: *.RDF, *.EDF

58 XBT drops were made during this cruise. Refer to the MGL1004_Expendable_Drops.xls spreadsheet in the operations directory of the cruise archive.

IV. Seismic Summary

A. Acquisition Parameter Table

Acquisition Parameter Table	
AcquisitionParameterID	MGL1004_ACQ01
FieldActivityID	MGL1004
ReceiverType	Ocean-Bottom Seismometer
SourceType	Airgun
Acquisition System Name	WHOI OBS
Acquisition System Type	OBS
Seismic_Nav_System	C-Nav 3050 primary
Survey_datum	WGS84
Navigation Reference Point	Fore/Aft+4.87 m, Stb/pt +8.055 m, vertical +14.5 m Keel, centerline, frame 0 (rudder posts) waterline
NRP to source	198m
Source_to_Near_Channel	N/A
Number_of_channels_recorded	N/A
Number_of_cables	0
Number_of_channels_each_cable	N/A
Channel_length	N/A
Cable_length	N/A
Cable_spacing	N/A
Near_Channel_Number	N/A
Cable_depth	N/A
Number_sources	1
Sub-arrays_per_source	4
Alternate_Shooting	No
Source_separation	N/A
Sub-array_separation	6.0m
Source_volume	6600 cu in
Source_pressure	2000 psi nominal
Source_make,model	Bolt 1500LL & 1900LL
Source_number	36 + 4 spare
Source_depth	12m
Shot_control	Distance
Shot_Interval	160m
Sample_interval	N/A
Record_length	N/A
Compass_birds	N/A
Recording_delay	N/A

Acquisition Parameter Table	
AcquisitionParameterID	MGL1004_ACQ02
FieldActivityID	MGL1004
ReceiverType	Source & Streamer/Ocean-Bottom Seismometer
SourceType	Airgun

Acquisition System Name	WHOI OBS
Acquisition System Type	OBS
Seismic_Nav_System	C-Nav 3050 primary
Survey_datum	WGS84
Navigation Reference Point	Fore/Aft+4.87 m, Stb/pt +8.055 m, vertical +14.5 m Keel, centerline, frame 0 (rudder posts) waterline
NRP to source	198m
Source_to_Near_Channel	172m
Number_of_channels_recorded	468
Number_of_cables	1
Number_of_channels_each_cable	468
Channel_length	12.5m
Cable_length	6000m
Cable_spacing	N/A
Near_Channel_Number	468
Cable_depth	9.0m
Number_sources	1
Sub-arrays_per_source	4
Alternate_Shooting	No
Source_separation	N/A
Sub-array_separation	6.0m
Source_volume	6600 cu in
Source_pressure	2000 psi nominal
Source_make,model	Bolt 1500LL & 1900LL
Source_number	36 + 4 spare
Source_depth	9m
Shot_control	Distance
Shot_interval	50.0m
Sample_interval	2ms
Record_length	16s
Compass_birds	DigiCourse 5011
Tail_buoy_Positioning	PosNET
Recording_delay	0

B. Seismic Overview

The primary objectives of the cruise were survey lines in a 2D survey block using one source with four sub-array set up deployed by Lamont-Doherty Earth Observatory.

Physical Configuration

The towing configuration for the air guns and streamers is detailed in the document titled *MGL1004_TowConfig.doc*.

Offsets

All antenna and in-water offset drawings are in the file *MGL1004_TowOffsets.xls*

Spectra

Spectra was used for all timing and navigation during the cruise. Shotlogs were generated from spectra header logs, P190 and P294 files using shotlog processing code contained on the archive in /supplemental/code/shotlog.

V. Client Instrumentation

28 OBS instruments were deployed and recovered. No OBS data was received by the Langseth technical staff.

VI. RV Langseth Gravity Tie Information

The Gravimeter was tied before and after the cruise at the tie point located at the pier in Astoria.

Date / Time	Ship Location	Reference Location	Mistie
2010-07-17T17:34	Honolulu, HI, UH Marine Center 21 18.962 N 157 53.180 W	Waikiki, HI, Outside Army Museum 21 16.758 N 157 50.044 W	
2010-09-14T17:57	Honolulu, HI, UH Marine Center 21 18.971 N 157 53.170 W	Waikiki, HI, Outside Army Museum 21 16.766 N 157 50.055 W	

Please refer to the documents located under MGL1004/docs/gravity_tie for detailed records.

VII. Archive Contents

Key files are bolded.

MGL1004/docs	Cruise documents and logs
MGL1004/docs/config/spectra/survey	Spectra configuration archive
MGL1004/docs/elog	Cruise elog
MGL1004/docs/map	Cruise maps, track map
MGL1004/docs/operations/	Operations documents
MGL1004/docs/operations/Daily_Reports	Cruise Daily Reports from Tech-in-charge
MGL1004/docs/operations/NavLogs	Seismic navigation logs (spectra)
MGL1004/docs/operations/ObsLogs	Seismic acquisition logs (gun controller)
MGL1004/docs/operations/MGL1004_B15_line_log_multi_channel_seismics.xls	Master line log table
MGL1004/docs/permits	Clearance Documents
MGL1004/docs/waypoints	Waypoint files
MGL1004/docs/personnel	Personnel rosters, org chart, bunk and phone lists
MGL1004/docs/reports	Cruise Report and supplemental docs
MGL1004/docs/reports/MGL1004_DataReport_v1.0.doc	This file
MGL1004/docs/offsets/MGL1004_TowOffset.xls	Seismic tow drawings
MGL1004/docs/screencaps	Screen captures
MGL1004/docs/tapelogs	Backup tape index / log files
MGL1004/processed	Processed data
MGL1004/processed/obsip_shotlogs	Original Spectra shot time files
MGL1004/processed/shotlogs	Spectra shot log files in CSV format
MGL1004/processed/svp	Sound velocity profiles
MGL1004/raw	Raw data
MGL1004/raw/knudsen	Raw Knudsen sub-bottom profiler data
MGL1004/raw/multibeam	Raw EM122 data
MGL1004/raw/serial	Underway serial data: gps, tsg, weather, etc.
MGL1004/raw/spectra/P1	Spectra underway p190
MGL1004/raw/spectra/P2	Raw seismic navigation, p294
MGL1004/raw/XBT	Raw XBT data