H10649

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey Multibeam/Side Scan

Field No. F

Registry No. H-10649

LOCALITY

State Massachusetts

General Locality Vineyard Sound

Sublocality Devils Bridge to Sow & Pigs

1995

CHIEF OF PARTY

Walter Simmons (SAIC)

LIBRARY & ARCHIVES

DATE August 15, 1997

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NO. H-10649
	HYDROGRAPHIC TITLE SHEET	FIELD NO. F

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State MASSACHUSETTS

General locality VINEYARD SOUND

Locality DEVILS BRIDGE TO SOW AND PIGS REEF

Scale 1:10,000 Date of survey 20 Sept - 27 Oct 1995;

Instructions dated September 30, 1994 as amended Project No. OPR-B389-CN

Vessel M/V ATLANTIC SURVEYOR

Chief of party WALTER SIMMONS

Surveyed by J. Miller, S. Ferguson, A. Gagnon, D. Allen, J. Kiernan, P. Selvitelli, R. Watson, L. Gates, E. DeAngelo; J. Case; A. Maddock; S. Cook; R. Franchuck; T. Hamel

Soundings taken by (echo sounder) hand lead, pole MULTIBEAM RESON SEABAT 9002

Graphic record scaled by Survey Personnel

Graphic record checked by Survey Personnel

EVALUATED BY.
~~Protracted by~~ GARY NELSON Automated plot by HP650 ~~J. Kiernan, J. Case~~

Verification by D. Reifsteck

Soundings in fathoms (meters) feet at MLW (MLLW) and decimeters

REMARKS: * Contract # 50-DGNC-4-00035
Contractor Name: Science Applications International Corp.;
221 Third Street; Newport, R. I. 02840;
Subcontractor Name: Ocean Surveys Inc.;
91 Shefield Street; Old Saybrook; CT 06475

SUPPLEMENTAL REPORTS ARE FILED WITH THE HYDROGRAPHIC DATA

Smooth Sheet Production Date/Time 05/15/96 09:45 Time Reference: UTC

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1976—665-661/1222 REGION NO. 6

* Marginal notes and revisions to the Descriptive Report were generated at the Pacific Hydrographic Branch during review of the Survey work.

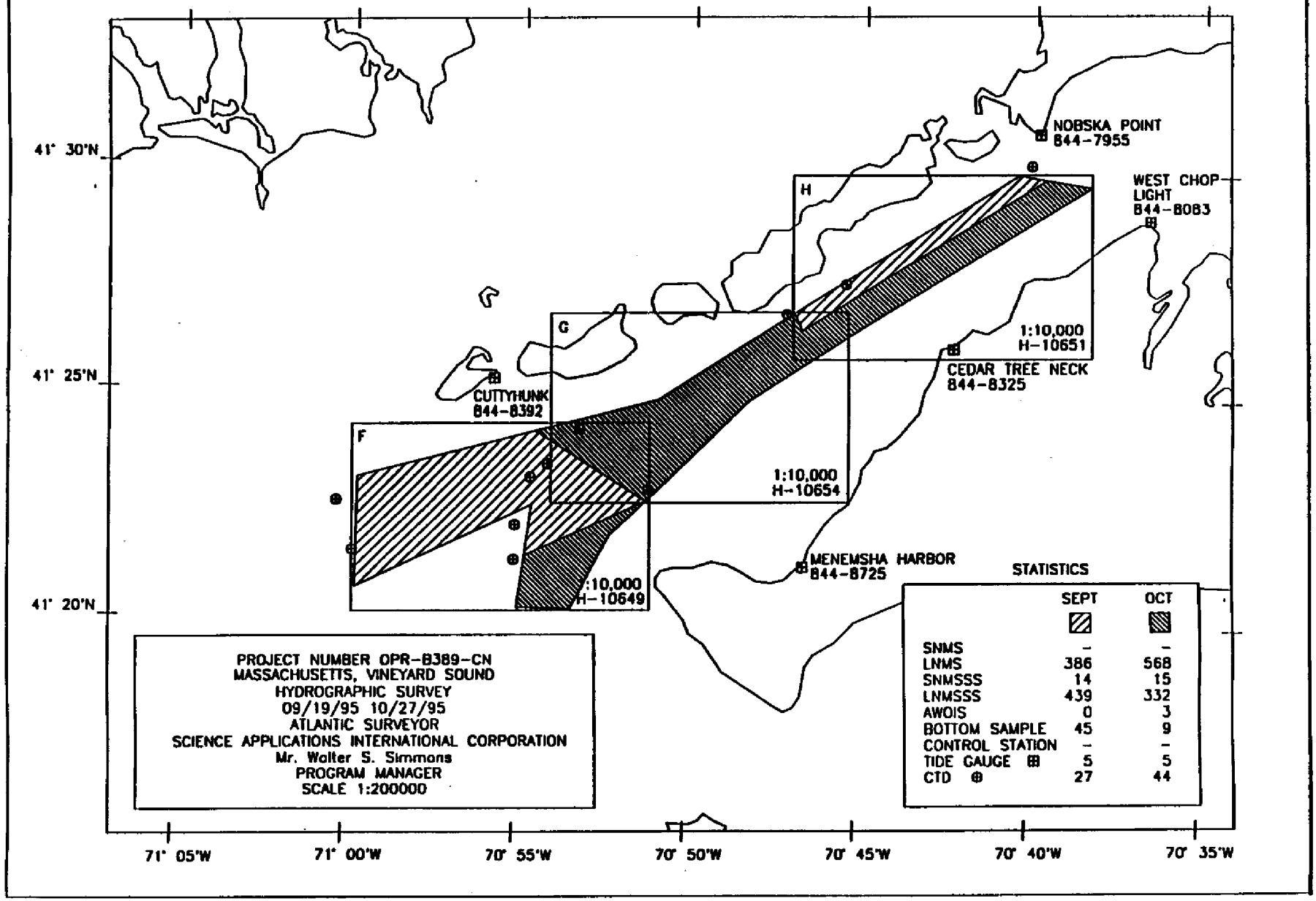
INDEX OF SHEETS

The Progress Sketch on the following page indicates:

1. Smooth Sheet Layout
2. Surveys and Registry Numbers
3. Tide Gauge Locations
4. CTD (Sound Velocity) Stations
5. Work Accomplished by Month

H-10649

PROGRESS SKETCH



Science Applications International Corporation (SAIC) warrants only that the survey data acquired by SAIC and delivered to NOAA under Contract 50-DGNC-4-00035 reflect the state of the sea floor in existence on the day and at the time the survey was conducted.

Descriptive Report to Accompany
Hydrographic Survey H-10649

A. PROJECT ✓

Project number: OPR-B389-CN

Dates of instructions:	30 September 1994	Original 50-DGNC-4-00035
	21 March 1995	Modification #1
	03 April 1995	Modification #2
	06 June 1995	Modification #3
	23 June 1995	Project limit definition, Execution Rocks
	10 July 1995	Modification #4
	07 September 1995	Modification #5
	20 October 1995	56-DGNC-6-13002

Sheet letter: F
Registry number: H-10649

Purpose: Obtain 100% multibeam sonar coverage and 200% side scan sonar coverage within the survey area limits

B. AREA SURVEYED ✓ See Eval Rpt., Section B

General locality: Vineyard Sound, Massachusetts, in the area bounded approximately by the following points:

LAT	LONG
41° 23.15' N	070° 59.25' W
41° 20.78' N	070° 59.25' W
41° 22.60' N	070° 54.10' W
41° 20.30' N	070° 54.50' W
41° 20.30' N	070° 52.90' W
41° 21.95' N	070° 51.80' W
41° 22.72' N	070° 50.75' W
41° 24.27' N	070° 53.53' W

Dates of data acquisition:

9/20/95 - 9/22/95	JD 263 - 265
9/24/95 - 9/27/95	JD 267 - 270
9/29/95 - 10/ 3/95	JD 272 - 276
10/26/95 - 10/27/95	JD 299 - 300

C. SURVEY VESSELS ✓

The M/V ATLANTIC SURVEYOR (ID# D582365) was the platform for all multibeam sonar, side scan sonar, sound velocity and bottom sampling operations. Data acquisition and post processing systems were mounted in CONEX containers which were welded in place on the aft

deck. The gyro compass was mounted in the pilot house, and the TSS-335B motion sensor was mounted on the aft end of the deck house just above the main deck.

Multibeam sounder transducers were mounted back to back on a plate at the bottom of a stainless steel pipe at the starboard waist. Bearing plates were welded to the main deck, and a stabilizing alignment bracket was welded to the side of the boat. The primary GPS navigation antenna was mounted directly above the transducer pole and the reference GPS antenna was mounted just inboard on the same mount.

The side scan sonar tow position was located at the "A" frame aft center. An armored cable on a hydraulic winch, remotely controlled at the side scan operator's station, was used for this configuration.

The vessel layout is depicted in Figures C-1, C-2, and C-3, the coordinate systems in use are shown in Figure C-4, and the vessel offsets are shown in Tables C-1 and C-2. The antenna was raised at 1200 on October 3, 1992, causing the change in configuration shown in Figure C-3 and the coordinate systems as shown in Table C-2.

The Reference Point for the entire system is located on the transducer pole at the water line. For surveys conducted September through November 1995, the transducer draft was recorded as 2.30 meters, therefore the pole was marked with the reference point at 2.30 meters. Lead line comparisons confirmed 2.30 meters as the correct draft.

As discussed in the Phase IIB Summary Report, the SAIC Integrated Hydrographic Survey System (IHSS), the RESON SeaBat multibeam system and the TSS-335B vertical reference, all have different coordinate systems, and therefore care must be taken when inputting correctors to the system. The IHSS considers "z" to be positive down, while both the RESON and TSS consider "z" positive up. Both the IHSS and TSS consider "x" positive forward, the RESON considers "x" as positive athwartships to starboard. IHSS considers "y" positive athwartships to starboard, the TSS considers "y" positive athwartships to port and the RESON considers "y" as positive forward.

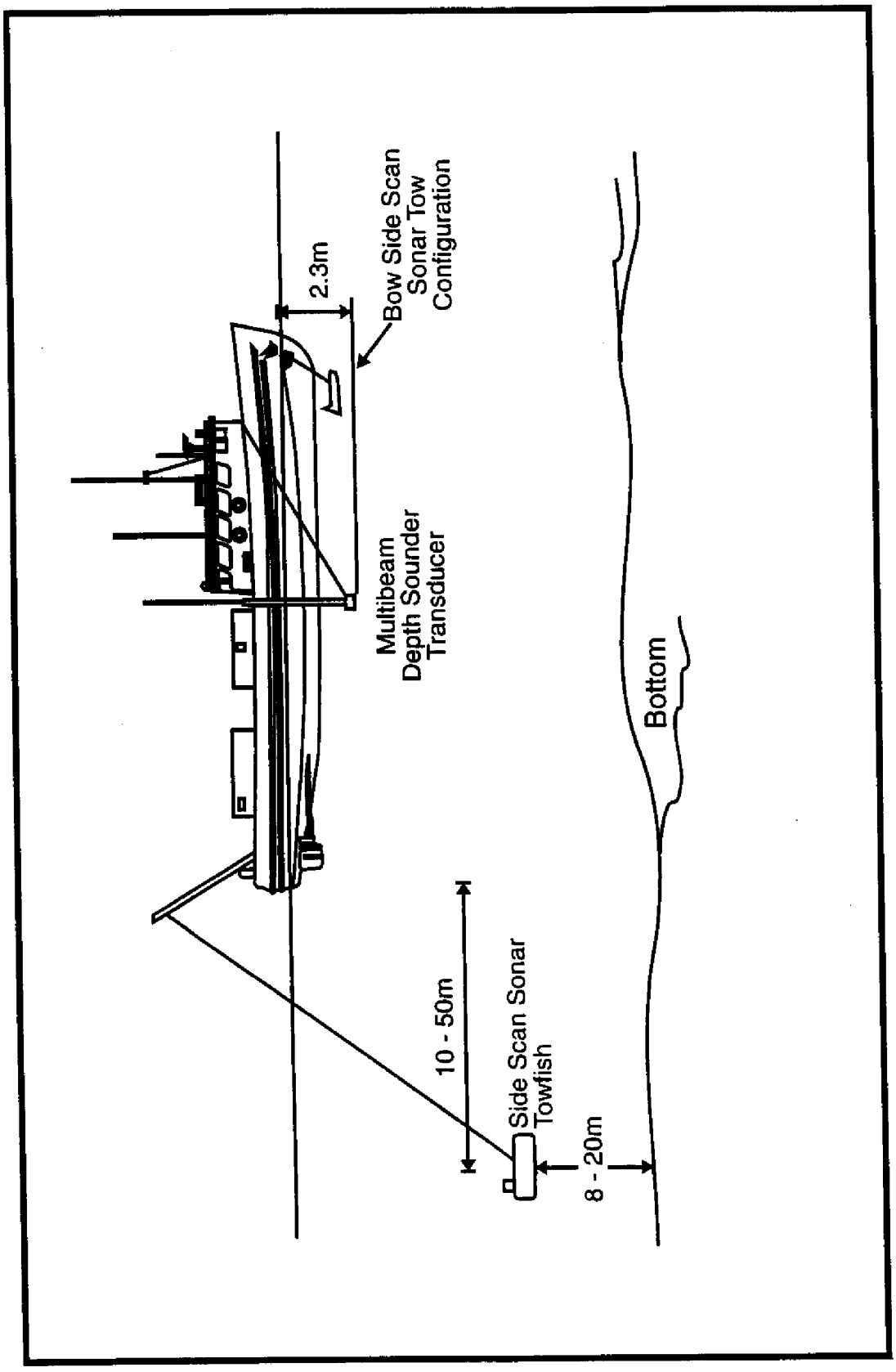


Figure C-1. Configuration of M/V Atlantic Surveyor During Survey Operations

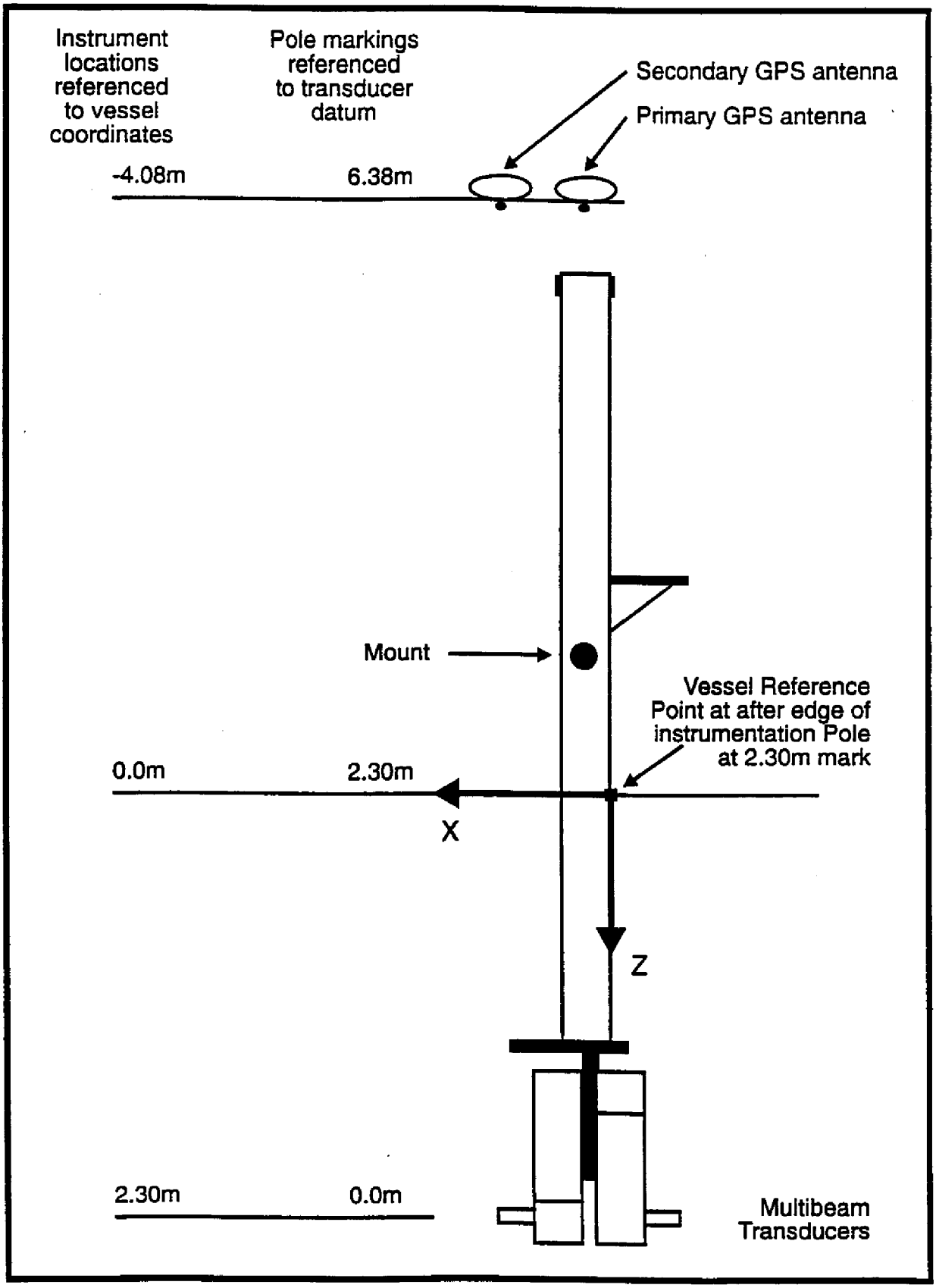


Figure C-2. Configuration of Multibeam Transducer Pole (September 19 - October 3, 1995)

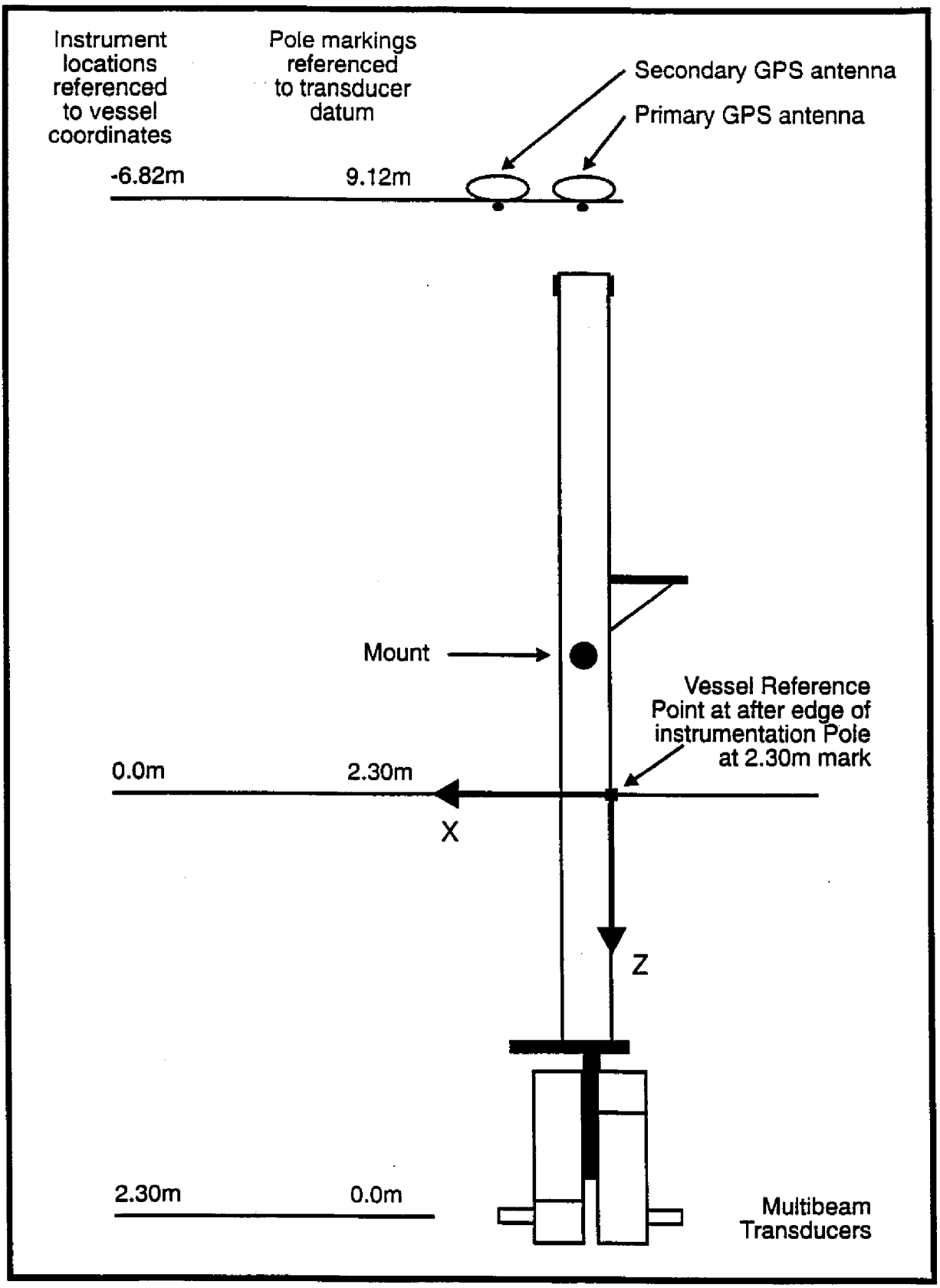


Figure C-3. Configuration of Multibeam Transducer Pole (October 3 - November 13,1995)

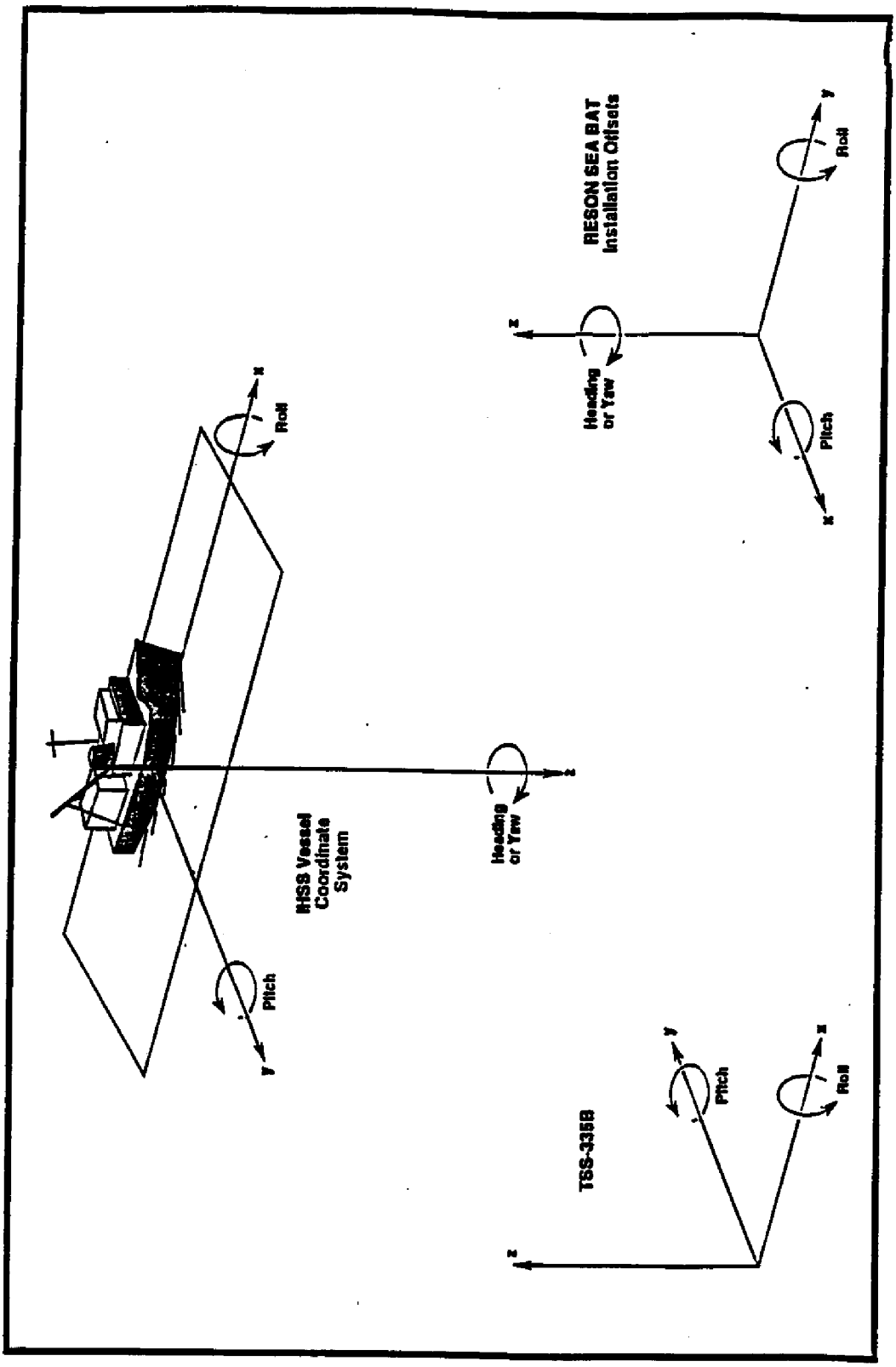


Figure C-4 Relevant IHSS Instrument Coordinate Systems

Table C-1. Antenna and Transducer Locations Relative to Vessel Reference Point Sept. 19 - Oct. 3, 1995

Sensor	Offset in IHSS	IHSS Coordinate	Offset in RESON 6042	Reson Coordinate
Multibeam	x	0	x(port)	-0.07
	y	0	y(port)	+0.11
	z	0	z(port)	-2.30
			x(stbd)	+0.07
			y(stbd)	-0.02
			z(stbd)	-2.30
Trimble 4000DS	x	0		
	y	0		
	z	-4.08		
TSS-335B	x			-3.020
	y			+3.320
	z			+1.300
Side scan Tow PT	x	-15.90		
"A" frame aft	y	-2.46		
	z	-5.18		

Table C-2. Antenna and Transducer Locations Relative to Vessel Reference Point Oct. 3 - Nov. 13, 1995

Sensor	Offset in IHSS	IHSS Coordinate	Offset in RESON 6042	Reson Coordinate
Multibeam	x	0	x(port)	-0.07
	y	0	y(port)	+0.11
	z	0	z(port)	-2.30
			x(stbd)	+0.07
			y(stbd)	-0.02
			z(stbd)	-2.30
Trimble 4000DS	x	0		
	y	0		
	z	-6.82		
TSS-335B	x			-3.020
	y			+3.320
	z			+1.300
Side scan Tow PT	x	-15.90		
"A" frame aft	y	-2.46		
	z	-5.18		

Note that offsets relative to depth measurement are input to the RESON, while those for navigation are input to the IHSS.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The following SAIC IHSS software modules were used in the real time acquisition of MULTIBEAM data.

Program	Modification Date
ap9	May 20, 1995
auto_archive	May 4, 1995
cbatdtc	May 15, 1995
cbatout	May 15, 1995
chutil	May 9, 1995
datamgr	May 4, 1995
dtc_data_display	May 4, 1995
eoscandtc	Sept. 19, 1995
eoscandtc	Sept. 23, 1995
filemgr	May 4, 1995
irig-b pdd	May 8, 1995
kfstub	May 5, 1995
klein595	May 23, 1995
mbmgr	May 18, 1995
mergeserve	May 27, 1995
messagemgr	May 4, 1995
mk32	Apr 26, 1995
navmgr	May 28, 1995
nms	May 9, 1995
ntimesrv	Apr 06, 1995
kflog	May 30, 1995
helm_display	May 28, 1995
rtkfst	Apr 29, 1995
seabird seasoft (4.210)	Feb. 23, 1995
setclock	Apr 22, 1995
sb_sssv	May 22, 1995
spmgr	May 05, 1995
stateb	May 04, 1995
strip	May 09, 1995
svpmon	May 04, 1995
swathplot	May 04, 1995
sync_os2	Apr 23, 1995
sync_ux	May 04, 1995
syscon	May 04, 1995
Teltx	May 04, 1995
telrx	May 04, 1995
timechk telrx	May 04, 1995
tr4000	May 16, 1995
tr4ref	May 16, 1995
tss335b	May 08, 1995
utilitymgr	May 04, 1995

The following Polaris Imaging and SAIC IHSS software modules were used in real time acquisition of SIDE SCAN Data.

Program	Modification Date
eoscan.exe	May 15, 1995
sonar.bin	May 15, 1995
eoscan.cfg	May 15, 1995
sonar.bin/eoscan.exe	May 17, 1995
eoscan.cfg	May 18,1995
sonar.bin/eoscan.cfg	May 19, 1995
DSP Card (Hardware), eoscan.exe	May 21, 1995
eoscan.exe, eoscan.cfg	June 13 ,1995

The following SAIC software modules were used in the processing of all data.

Program	Modification Date
appcors	May 17, 1995
applydft	July 26, 1995
applysqt	July 26, 1995
chutil	May 05, 1995
corrtarg	Sept. 18, 1995
corrtarg	Oct. 17, 1995
datamgr	May 4, 1995
datasumm	Aug. 15, 1995
examgyro	Jun 22, 1995
exammb	May 19, 1995
gsf2hdcs	May 22, 1995
gsfedit	Sept. 4, 1995
gsfupdat	June 30, 1995
MBHAT>check_cover	Sept. 19, 1995
MBHAT>check_z	Nov. 21, 1995
MBHAT> contact_dxf	Jan 5, 1996
MBHAT>cover_dxf	Nov. 16, 1995
MBHAT>feature_gsf	Nov. 16, 1995
MBHAT> get_contact	Nov. 8, 1995
MBHAT>init_sheet	July 19, 1995
MBHAT>junction	Oct. 23, 1995
MBHAT>main_x_diff	June 29, 1995
MBHAT>make_contours	Dec 22, 1995
MBHAT>make_final_contours	Nov. 3, 1995
MBHAT>makeacadpcx	July 20, 1995
MBHAT>new_select	Jan 5, 1996
MBHAT>new_ss_cover	Nov. 28, 1995
MBHAT>noaagsf	Nov. 8, 1995
MBHAT>set_eoflag	Oct. 2, 1995
MBHAT>target_dxf	Jan. 5, 1996
MBHAT>track_dxf	July 20, 1995
MBHAT>update_contact	Nov. 6, 1995
MBHAT>view3d	July 21, 1995
MBHAT>ztogsf	Oct. 5, 1995
navup	Sept. 19, 1995
rangeflt	Sept. 4, 1995
rangeflt	Oct. 5, 1995
refdraft	Sept. 20, 1995
resetflg	Sept. 18, 1995
resonflt	May 05, 1995
setsound	July 25, 1995
swathmap	May 05, 1995
tid2hmps	May 17, 1995

Throughout this descriptive report wherever software is mentioned (in bold print) the most current version of the software available was used.

E. SONAR EQUIPMENT (Side scan sonar operations)

The following side scan sonar equipment was used for the entire Sheet F survey:

- Klein 595 Side Scan Sonar Recorder, Klein Associates, Serial Number 658.
- Klein 595 Dual Frequency Towfish, Klein Associates, Serial Number 700.
- Klein 595 Dual Frequency Towfish, Klein Associates, Serial Number 894.
- Eoscan Digital Side Scan Recording and Target Analysis, Polaris Imaging, Serial Number 10270A.

The vertical beam width of the Klein 595 side scan was: 40 degrees at 3dB. A depression angle of 20 degrees was used on the tow fish. The dual frequency fish had the 500 kHz frequency disabled, and the 100 kHz frequency was used at all times. Concur

Side scan operations were conducted in water depths ranging from 8-34 meters. The side scan range was generally maintained at 100 meters for Sheet F and the side scan altitude off the bottom was maintained between 8 and 20 meters, except as noted in restricted range time periods indicated in the Sheet F Processing Report and the *fssl.p00* file. In the northwest corner of the survey, in the vicinity of the QUEEN ELIZABETH II grounding, the side scan was operated at 75 meter range with 45 meter line spacing to allow higher engine rpm for improved steerage in those areas with rotary currents. The amount of cable deployed was determined by using the 1-meter markings on the cable. As the cable length was adjusted to maintain the proper fish altitude, the operator would note the markings on the cable and enter the amount of cable deployed into the IHSS, which calculated layback and fish height, as described in the Phase IIB Summary Report.

To verify that the side scan signal reached the full extent of the slant range setting, records were checked for location of known objects at the far edge of the slant range. Sheet F analog records were of high quality and were rigorously analyzed by at least 2 operators/processors to reject suspect data.

Side-Scan Target and Feature Processing

For a full discussion of side scan processing, refer to the Phase IIB Summary Report, for complete side scan processing file listings, refer to Sheet F Processing Summary Report.

Sheet F side scan targets were collected with the **Eoscan_DTC**, September 19, 1995 and September 23, 1995 versions, both of which include layback in the record output. As discussed in the Phase IIB Summary Report, the September 23, 1995 version has a revised layback calculation. All targets were read into an Excel spreadsheet, which calculated slant range. Using the output listing from the spreadsheet, two side-scan processors reviewed each graphic record and the associated target file. Additions, corrections and deletions of target ranges, shadows, and times were agreed upon and entered into the spreadsheet. The **corr_targ** program was then run to update target positions, ranges, and heights for all targets.

Targets were correlated with multibeam features using the **get_contact** program, which produces the *ffeature* file and modifies the *ftargets.ctv* file. In all cases the positions of the targets derived from the layback calculation from either the September 19 or 23 version were sufficient for resolving targets into features. There were 2788 targets which were resolved into 1131 features for Sheet F. Each feature was reevaluated with reference to its position and relation to soundings on the smooth sheet. The *ffeature* and *ftargets.ctv* files were combined into the *fupdate.out* file using **update_contact** to provide a correlated features-to-targets listing. The *ffeatgsf.out* file was created using the **feature_gsf** program, which traces each feature to a multibeam file, ping and beam number. Although most features were processed in this manner, 25 features were traced to the corresponding multibeam depth and position using **gsfedit**. These features are indicated by an * in the *ffeatgsf.out file*. In Sheet F, 1121 features were correlated to 1xIHO multibeam depths, while 10 were correlated to 2xIHO depths.

During analysis of the features list and the smooth sheet, the hydrographer determined that not all 1xIHO significant features could be shown on the smooth sheet because of over plotting of numbers and symbols. In these cases the most critical feature or depth was carried to the smooth sheet. The following features were not plotted. CONCUR. THESE ITEMS WERE CHECKED DURING OFFICE PROCESSING AT THE PACIFIC HYDROGRAPHIC BRANCH.

Feature Number	Latitude	Longitude	Feature Depth	Feature Type	1 Or 2 x IHO	Hydrographer's Determination
97	41 22.05161N	070 58.10233W	16.32	ROCK	1	Significant non-plot
108	41 22.55854N	070 56.79468W	16.89	ROCK	1	Significant non-plot
279	41 22.64394N	070 57.61799W	17.21	ROCK	1	Significant non-plot
280	41 22.57520N	070 57.84625W	17.73	ROCK	1	Significant non-plot
312	41 22.57451N	070 57.88645W	17.70	ROCK	1	Significant non-plot
314	41 22.64318N	070 57.78366W	16.92	ROCK	1	Significant non-plot
507	41 22.80718N	070 58.18688W	15.88	ROCK	1	Significant non-plot
545	41 23.31681N	070 57.01105W	15.51	ROCK	1	Significant non-plot
550	41 23.22121N	070 57.23132W	15.43	ROCK	1	Significant non-plot
673	41 21.96568N	070 57.58908W	19.85	ROCK	1	Significant non-plot
684	41 22.22499N	070 56.73597W	18.32	ROCK	1	Significant non-plot
705	41 21.96924N	070 57.22548W	16.28	ROCK	1	Significant non-plot
760	41 22.14656N	070 57.75591W	14.40	ROCK	1	Significant non-plot
762	41 22.24535N	070 57.38438W	12.46	ROCK	1	Significant non-plot
765	41 22.40531N	070 56.91136W	17.14	ROCK	1	Significant non-plot
782	41 22.01139N	070 57.98645W	18.44	ROCK	1	Significant non-plot
798	41 22.33580N	070 56.79806W	17.32	ROCK	1	Significant non-plot
804	41 21.97769N	070 57.77374W	19.16	ROCK	1	Significant non-plot
862	41 23.01943N	070 58.41357W	16.53	ROCK	1	Significant non-plot
868	41 23.13954N	070 58.06129W	17.76	ROCK	1	Significant non-plot
892	41 23.66247N	070 56.41785W	16.53	ROCK	1	Significant non-plot
1013	41 22.25575N	070 52.47401W	17.88	ROCK	1	Significant non-plot
1116	41 23.57864N	070 57.09060W	13.73	ROCK	1	Significant non-plot
1130	41 23.41170N	070 57.69278W	11.96	ROCK	1	Significant non-plot
1133	41 23.41314N	070 57.73525W	12.41	ROCK	1	Significant non-plot
1140	41 23.37292N	070 57.81355W	12.20	ROCK	1	Significant non-plot
1161	41 22.90476N	070 59.21088W	19.82	ROCK	1	Significant non-plot
1165	41 23.00685N	070 59.20906W	17.94	ROCK	1	Significant non-plot
1170	41 23.29278N	070 58.04653W	15.15	ROCK	1	Significant non-plot
1172	41 23.16282N	070 58.40353W	14.28	ROCK	1	Significant non-plot
1183	41 23.55118N	070 57.21527W	10.96	ROCK	1	Significant non-plot
1195	41 23.28711N	070 58.21715W	11.55	ROCK	1	Significant non-plot
1207	41 23.05406N	070 59.04109W	18.45	ROCK	1	Significant non-plot
1248	41 23.10147N	070 59.11208W	19.79	ROCK	1	Significant non-plot
1255	41 23.15524N	070 58.87826W	18.34	ROCK	1	Significant non-plot
1256	41 23.21298N	070 58.75589W	16.46	ROCK	1	Significant non-plot
1265	41 23.22919N	070 58.69331W	15.56	ROCK	1	Significant non-plot
1267	41 23.09776N	070 59.23252W	18.04	ROCK	1	Significant non-plot
1272	41 23.23811N	070 58.77036W	15.37	ROCK	1	Significant non-plot
1274	41 23.24817N	070 58.75345W	15.44	ROCK	1	Significant non-plot
1276	41 23.25147N	070 58.71910W	15.03	ROCK	1	Significant non-plot
1289	41 23.69683N	070 56.36715W	17.25	ROCK	1	Significant non-plot
1292	41 23.24813N	070 58.69315W	13.87	ROCK	1	Significant non-plot
1315	41 22.37199N	070 57.21380W	13.11	ROCK	1	Significant non-plot

The hydrographer determined that many 2xIHO features were significant. However, the government elected to conduct item investigations on only three 2xIHO features. The following significant 2xIHO features are not plotted on the smooth sheet. SEE SECTION O, EVAL. RPT.

Feature Number	Latitude	Longitude	Feature Depth	Feature Type	1 Or 2 x IHO	Hydrographer's Determination
2	41 23.33255N	070 54.32908W	24.64	ROCK	2	Significant 2xIHO non-plot
7	41 22.81851N	070 55.63634W	26.31	ROCK	2	Significant 2xIHO non-plot
20	41 22.23312N	070 57.24415W	11.86	ROCK	2	Significant 2xIHO non-plot
22	41 22.24315N	070 57.26154W	11.01	ROCK	2	Significant 2xIHO non-plot
38	41 22.01574N	070 57.91760W	15.48	ROCK	2	Significant 2xIHO non-plot
42	41 22.04194N	070 57.93280W	15.73	ROCK	2	Significant 2xIHO non-plot
58	41 22.77790N	070 55.95549W	23.00	ROCK	2	Significant 2xIHO non-plot
126	41 22.75613N	070 56.51641W	19.80	ROCK	2	Significant 2xIHO non-plot
237	41 22.12829N	070 58.85797W	19.87	ROCK	2	Significant 2xIHO non-plot
302	41 22.44414N	070 58.30865W	19.30	ROCK	2	Significant 2xIHO non-plot
388	41 22.48363N	070 58.56026W	19.86	ROCK	2	Significant 2xIHO non-plot
430	41 22.36023N	070 59.03571W	20.14	ROCK	2	Significant 2xIHO non-plot
520	41 23.18110N	070 57.20789W	13.70	ROCK	2	Significant 2xIHO non-plot
624	41 23.23946N	070 57.46294W	11.33	ROCK	2	Significant 2xIHO non-plot
664	41 21.76246N	070 58.09656W	22.61	ROCK	2	Significant 2xIHO non-plot
666	41 21.79017N	070 58.24369W	23.75	ROCK	2	Significant 2xIHO non-plot
695	41 21.78135N	070 57.74992W	24.05	ROCK	2	Significant 2xIHO non-plot
741	41 21.86656N	070 56.64709W	20.69	ROCK	2	Significant 2xIHO non-plot
825	41 23.19844N	070 57.68057W	12.28	ROCK	2	Significant 2xIHO non-plot
846	41 22.80141N	070 58.80662W	18.85	ROCK	2	Significant 2xIHO non-plot
861	41 22.91901N	070 58.62867W	18.52	ROCK	2	Significant 2xIHO non-plot
890	41 23.69636N	070 56.58748W	16.44	ROCK	2	Significant 2xIHO non-plot
926	41 23.73068N	070 56.37675W	17.30	ROCK	2	Significant 2xIHO non-plot
1010	41 22.21302N	070 52.87949W	19.05	ROCK	2	Significant 2xIHO non-plot
1014	41 21.96951N	070 53.15586W	21.48	ROCK	2	Significant 2xIHO non-plot
1025	41 22.10938N	070 52.63555W	19.88	ROCK	2	Significant 2xIHO non-plot
1027	41 21.84627N	070 53.13155W	23.36	ROCK	2	Significant 2xIHO non-plot
1030	41 21.92043N	070 52.79011W	18.68	ROCK	2	Significant 2xIHO non-plot
1042	41 21.91044N	070 52.73948W	19.23	ROCK	2	Significant 2xIHO non-plot
1051	41 21.92107N	070 52.41844W	19.43	ROCK	2	Significant 2xIHO non-plot
1068	41 21.45983N	070 52.27315W	23.75	ROCK	2	Significant 2xIHO non-plot
1080	41 21.57827N	070 51.99491W	15.63	ROCK	2	Significant 2xIHO non-plot
1085	41 22.53413N	070 54.05181W	20.90	ROCK	2	Significant 2xIHO non-plot
1107	41 24.17953N	070 54.00075W	21.82	WRECK	2	Significant 2xIHO non-plot
1127	41 23.47264N	070 57.69613W	9.25	ROCK	2	Significant 2xIHO non-plot
1186	41 23.40106N	070 58.03694W	11.08	ROCK	2	Significant 2xIHO non-plot
1191	41 23.37729N	070 58.15527W	12.19	ROCK	2	Significant 2xIHO non-plot
1254	41 23.19536N	070 59.09125W	14.15	ROCK	2	Significant 2xIHO non-plot
1293	41 23.22389N	070 58.93929W	16.80	ROCK	2	Significant 2xIHO non-plot
1309	41 21.95369N	070 58.32322W	19.89	ROCK	2	Significant 2xIHO non-plot
1344	41 23.17067N	070 59.23620W	18.23	ROCK	2	Significant 2xIHO non-plot

After completion of item investigations, the target/feature correlations were redone using all multibeam data with all correctors applied. As a result, some features were judged non-significant and removed from the features list. In some cases, non-significant features had been placed on the list and were therefore removed. In other cases item investigation resulted in 1xIHO depths which showed features to be non-significant. The following features were removed from the features list as non-significant after analysis of final data: CONCUR JW

Feature Number	Latitude	Longitude	Feature Depth	Feature Type	1 Or 2 x IHO	Hydrographer's Determination
23	41 22.18560N	070 57.28559W	12.78	ROCK	1	Non-Significant
33	41 22.06942N	070 57.71255W	16.20	ROCK	1	Non-Significant
41	41 22.01451N	070 57.87091W	16.37	ROCK	1	Non-Significant
92	41 21.97517N	070 58.29951W	18.39	ROCK	1	Non-Significant
94	41 22.03575N	070 58.26703W	21.68	ROCK	1	Non-Significant
139	41 22.34363N	070 57.58316W	15.66	ROCK	1	Non-Significant
141	41 22.26466N	070 57.65105W	14.78	ROCK	1	Non-Significant
176	41 23.01988N	070 56.10085W	19.25	ROCK	1	Non-Significant
350	41 23.33370N	070 55.91434W	17.68	ROCK	1	Non-Significant
494	41 22.76468N	070 58.14244W	17.41	ROCK	1	Non-Significant
547	41 23.27319N	070 57.06714W	13.42	ROCK	1	Non-Significant
566	41 22.83636N	070 58.34489W	15.57	ROCK	1	Non-Significant
571	41 22.62902N	070 59.08623W	20.55	ROCK	1	Non-Significant
572	41 22.62017N	070 58.88072W	18.70	ROCK	1	Non-Significant
579	41 22.78359N	070 58.39782W	17.80	ROCK	1	Non-Significant
585	41 23.16801N	070 57.56782W	14.51	ROCK	1	Non-Significant
586	41 23.19345N	070 57.37407W	16.14	ROCK	1	Non-Significant
595	41 23.33524N	070 57.00872W	13.82	ROCK	1	Non-Significant
609	41 22.60563N	070 59.15870W	19.67	ROCK	1	Non-Significant
642	41 22.39530N	070 56.44252W	22.61	ROCK	1	Non-Significant
655	41 22.02969N	070 57.44893W	15.53	ROCK	1	Non-Significant
660	41 22.00129N	070 57.62605W	17.14	ROCK	1	Non-Significant
667	41 21.74830N	070 58.29476W	24.98	ROCK	1	Non-Significant
678	41 22.07131N	070 57.19262W	15.58	ROCK	1	Non-Significant
681	41 22.18403N	070 56.91980W	17.17	ROCK	1	Non-Significant
682	41 22.21365N	070 56.92784W	16.39	ROCK	1	Non-Significant
689	41 23.10865N	070 54.27940W	31.87	ROCK	1	Non-Significant
694	41 21.86883N	070 57.59759W	21.02	ROCK	1	Non-Significant
723	41 21.69376N	070 57.62682W	25.76	ROCK	1	Non-Significant
729	41 21.97436N	070 56.95021W	18.68	ROCK	1	Non-Significant
766	41 22.45178N	070 56.93855W	16.03	ROCK	1	Non-Significant
768	41 22.46595N	070 56.60539W	20.94	ROCK	1	Non-Significant
779	41 21.90783N	070 58.10100W	23.15	ROCK	1	Non-Significant
828	41 23.23402N	070 57.62281W	12.03	ROCK	1	Non-Significant
851	41 22.70532N	070 59.14020W	20.59	ROCK	1	Non-Significant
874	41 23.25417N	070 57.74038W	15.39	ROCK	1	Non-Significant
875	41 23.23923N	070 57.69689W	14.05	ROCK	1	Non-Significant
897	41 23.57089N	070 56.75095W	15.73	ROCK	1	Non-Significant
904	41 22.70160N	070 59.04972W	19.57	ROCK	1	Non-Significant

907	41 22.86606N	070 58.81865W	20.59	ROCK	1	Non-Significant
925	41 23.61623N	070 56.72150W	14.79	ROCK	1	Non-Significant
948	41 23.09556N	070 58.35703W	16.01	ROCK	1	Non-Significant
971	41 20.81189N	070 53.00393W	17.07	ROCK	1	Non-Significant
973	41 22.28218N	070 53.92751W	26.18	ROCK	1	Non-Significant
991	41 22.30084N	070 52.72496W	18.92	ROCK	1	Non-Significant
1039	41 22.00150N	070 52.52341W	21.34	ROCK	1	Non-Significant
1054	41 21.84320N	070 51.85600W	19.22	ROCK	1	Non-Significant
1067	41 21.41413N	070 52.21955W	23.20	ROCK	1	Non-Significant
1095	41 21.95095N	070 57.09156W	20.65	ROCK	1	Non-Significant
1112	41 21.93218N	070 57.93674W	20.39	ROCK	1	Non-Significant
1122	41 23.48589N	070 57.42874W	13.05	ROCK	1	Non-Significant
1136	41 23.39338N	070 57.75318W	13.82	ROCK	1	Non-Significant
1160	41 22.94109N	070 59.10730W	20.46	ROCK	1	Non-Significant
1176	41 23.33387N	070 57.75788W	14.99	ROCK	1	Non-Significant
1188	41 23.38101N	070 57.97306W	12.08	ROCK	1	Non-Significant
1194	41 23.27813N	070 58.20399W	11.91	ROCK	1	Non-Significant
1197	41 23.29995N	070 58.19820W	11.95	ROCK	1	Non-Significant
1199	41 22.97205N	070 59.25383W	20.92	ROCK	1	Non-Significant
1218	41 23.28232N	070 58.46457W	16.14	ROCK	1	Non-Significant
1257	41 23.23593N	070 58.68061W	15.93	ROCK	1	Non-Significant
1270	41 23.21860N	070 58.80781W	16.69	ROCK	1	Non-Significant
1296	41 22.34324N	070 58.13915W	16.82	ROCK	1	Non-Significant
1312	41 22.23350N	070 57.60281W	15.64	ROCK	1	Non-Significant
1318	41 22.46765N	070 57.08525W	17.18	ROCK	1	Non-Significant
1348	41 22.01120N	070 56.88958W	20.60	ROCK	1	Non-Significant
3	41 22.97497N	070 55.13373W	28.50	ROCK	2	Non-Significant
34	41 22.03980N	070 57.78284W	17.09	ROCK	2	Non-Significant
37	41 22.02281N	070 57.82098W	17.73	ROCK	2	Non-Significant
45	41 21.85390N	070 58.28005W	20.26	ROCK	2	Non-Significant
55	41 22.44393N	070 56.77685W	17.25	ROCK	2	Non-Significant
90	41 21.92608N	070 58.28858W	18.48	ROCK	2	Non-Significant
129	41 22.67818N	070 56.65330W	20.26	ROCK	2	Non-Significant
201	41 22.07697N	070 58.63260W	22.27	ROCK	2	Non-Significant
292	41 22.09327N	070 59.17185W	21.82	ROCK	2	Non-Significant
297	41 22.13225N	070 59.07178W	17.94	ROCK	2	Non-Significant
299	41 22.27402N	070 58.83368W	20.03	ROCK	2	Non-Significant
355	41 23.54165N	070 55.57323W	20.27	ROCK	2	Non-Significant
435	41 22.53065N	070 58.58529W	21.12	ROCK	2	Non-Significant
570	41 22.51077N	070 59.14505W	18.47	ROCK	2	Non-Significant
686	41 22.47817N	070 56.04542W	26.35	ROCK	2	Non-Significant
714	41 22.15782N	070 56.52086W	21.24	ROCK	2	Non-Significant
727	41 21.93773N	070 57.03796W	21.01	ROCK	2	Non-Significant
752	41 21.81212N	070 56.73438W	20.54	ROCK	2	Non-Significant
753	41 21.76966N	070 56.68864W	22.10	ROCK	2	Non-Significant
783	41 22.10086N	070 57.83842W	16.29	ROCK	2	Non-Significant
855	41 22.82994N	070 58.93807W	20.50	ROCK	2	Non-Significant
917	41 23.37003N	070 57.47336W	11.83	ROCK	2	Non-Significant
923	41 23.56260N	070 56.98695W	11.15	ROCK	2	Non-Significant
1036	41 22.00983N	070 52.54655W	21.34	ROCK	2	Non-Significant

1055	41 21.85084N	070 51.95027W	20.39	ROCK	2	Non-Significant
1091	41 22.44579N	070 54.16404W	19.80	ROCK	2	Non-Significant
1097	41 22.60809N	070 54.21825W	24.27	ROCK	2	Non-Significant
1104	41 22.48717N	070 54.30871W	23.24	ROCK	2	Non-Significant
1105	41 22.51796N	070 54.47392W	27.03	ROCK	2	Non-Significant
1201	41 22.98460N	070 59.18611W	19.45	ROCK	2	Non-Significant
1220	41 23.30453N	070 58.40977W	15.64	ROCK	2	Non-Significant
1298	41 22.01801N	070 59.07779W	22.05	ROCK	2	Non-Significant
1346	41 21.70051N	070 56.43503W	26.07	ROCK	2	Non-Significant
1347	41 21.59205N	070 56.70566W	25.23	ROCK	2	Non-Significant

Side Scan Coverage Analysis ✓

The side scan lines in Sheet F were, in general, run with a line spacing of 90 meters and a side scan range setting of 100 m, providing the required 200% side scan coverage with a 10% overlap of lines, as shown on the side scan coverage plot. In some areas the side scan lines were run at 45 meter spacing with a side scan range setting of 75 m. Side scan coverage was calculated using the **new_ss_cover** program (see Phase IIB Summary Report for discussion of parameter settings) with settings of a=23, r=33, p=30, and b=10, with the *fssl.p00* and *feos.lst* files as input.

F. SOUNDING EQUIPMENT ✓

The following components were used for acquisition of multibeam bathymetric data:

- RESON SeaBat 9002 multibeam system consisting of:
  - Three SeaBat Transducers, Serial Numbers port 332217, starboard 332202 and 214010.
  - Two SeaBat 9001 Processors, Serial Numbers 6597 and 5230
  - SeaBat 6042 Controller and Processing Unit, Serial Number 590 P0 794-387

On Julian Day 271 (Sept 28) the Starboard Transducer Head (332202) was replaced with a spare (214010). Alignment tests were run on this day and the new head was used for survey beginning on Julian Day 272 (Sept. 29).

A lead line made of Kevlar line with a 35-pound steel plate as a weight was used for checking the center beams of the multibeam echo sounder. The line was marked in feet and was calibrated against a steel tape.

G. CORRECTIONS TO SOUNDINGS ✓ SEE EVAL. RPT., SECT G.

Overall corrections to sounding and CTD configurations are discussed in the Phase IIB Summary Report. Specific Sheet F issues are discussed here.

Speed of sound

- Sea-Bird Electronics, Inc., Model 19 CTD, Serial Number 1801, Calibration Date 08 March 1995, (CTW in file names).
- Sea-Bird Electronics, Inc., Model 19 CTD, Serial Number 565, Calibration Date 11 April 1995, (CTG in file names).

Speed of sound profiles were computed from casts taken with Sea-Bird Electronics, Inc. model 19 CTD's. The primary unit was SBE19 #1801. Daily confidence checks were obtained from simultaneous casts with the primary CTD and with SBE19 #565. All profiles were computed using **SBE Term19**. Computed profiles were copied to the **IHSS** for comparison on the screen. A selected profile was applied to the system, recorded, and sent to the RESON 6042 where a refraction lookup table was computed for application of depth, angle and range correctors to the multibeam sounding data. If sounding depths exceeded the cast depth, the 6042 used the bottom of the table to extend correctors below the table. CAST DEPTHS WERE WITHIN TOLERENCE

Positions and dates of all casts are shown in Table G-1. Confidence check profiles from simultaneous casts were compared using the multibeam display program and were, in general, identical. If not satisfactory, at least one more profile was done.

Table G-1. CTD Files and Locations

CTD File Name	Confidence Check	Apply to Reson	Cast Depth (m)	Latitude North	Longitude West
ctw26301.cnv			33	41° 23.48'	70° 53.68'
ctw26303.cnv	X	X	33	41° 23.48'	70° 53.68'
ctg26304.cnv	X		33	41° 23.48'	70° 53.68'
ctw26305.cnv		X	35	41° 23.24'	70° 53.97'
ctg26401.cnv	X		33	41° 23.48'	70° 53.68'
ctw26402.cnv	X	X	33	41° 23.48'	70° 53.68'
ctw26403.cnv		X	35	41° 23.23'	70° 53.96'
ctw26501.cnv	X		34	41° 23.29'	70° 53.96'
ctg26502.cnv	X	X	34	41° 23.29'	70° 53.96'
ctw26503.cnv		X	35	41° 23.25'	70° 53.97'
ctw26504.cnv		X	35	41° 23.29'	70° 53.98'
ctw26702.cnv		X	30	41° 23.20'	70° 54.20'
ctw26703.cnv	X	X	29	41° 22.63'	70° 59.86'
ctg26704.cnv	X		29	41° 22.63'	70° 59.86'
ctw26801.cnv	X	X	34	41° 23.19'	70° 54.17'
ctg26802.cnv	X		34	41° 23.19'	70° 54.17'
ctw26902.cnv	X	X	34	41° 23.41'	70° 53.64'
ctg26903.cnv	X	X	34	41° 23.41'	70° 53.64'
ctw27001.cnv		X	28	41° 21.52'	70° 59.35'
ctw27002.cnv	X	X	34	41° 23.40'	70° 53.60'
ctg27003.cnv	X		34	41° 23.40'	70° 53.60'
ctw27201.cnv	X	X	35	41° 23.41'	70° 53.66'
ctg27202.cnv	X		35	41° 23.41'	70° 53.66'

Table G-1. CTD Files and Locations (Continued)

CTD File Name	Confidence Check	Apply to Reson	Cast Depth (m)	Latitude North	Longitude West	
ctw27203.cnv		X	31	41° 22.14'	70° 54.60'	
ctw27204.cnv	X		32	41° 21.36'	70° 54.60'	
ctg27205.cnv	X	X	32	41° 21.36'	70° 54.60'	
ctw27301.cnv		X	33	41° 20.37'	70° 54.65'	Plots outside survey limits
ctw27302.cnv		X	31	40° 20.20'	70° 53.70	
ctw27303.cnv		X	32	40° 21.30'	70° 54.70'	
ctw27401.cnv		X	32	41° 23.40'	70° 53.70'	
ctw27402.cnv	X	X	33	40° 20.24'	70° 54.60'	Plots outside survey limits
ctg27403.cnv	X		33	40° 20.24'	70° 54.60'	
ctw27501.cnv			32	41° 24.18'	70° 56.20'	
ctw27502.cnv		X	33	41° 21.45'	70° 55.97'	
ctw27504.cnv		X	21	41° 23.20'	70° 56.70'	
ctw29901.cnv	X		34	41° 23.50'	70° 53.60'	
ctg29902.cnv	X		34	41° 23.50'	70° 53.60'	
ctw29903.cnv	X	X	34	41° 23.52'	70° 53.60'	
ctg29904.cnv	X		34	41° 23.52'	70° 53.60'	
ctw29905.cnv		X	30	41° 22.30'	70° 56.00'	

Corrections determined from vertical casts

Leadline comparisons to multibeam center beam soundings were made weekly to verify the transducer draft and echo sounder instrument correctors. For each comparison, a CTD cast was taken and the sound velocity profile loaded into the **IHSS** and the **RESON 6042**. Ten leadline readings were recorded along with the UTC time of observation while the **IHSS** recorded the multibeam readings. **Exammb** was used to find the port and starboard center beam readings for the time of each leadline reading.

The results of these readings were entered into a spreadsheet along with the draft reading from the transducer pole and any squat corrector which may have been entered in the **IHSS**. The spreadsheet applied a calibration corrector to the leadline readings and converted the readings from feet to meters. It also applied correctors for the difference between the draft and 2.30 meter reference point and for any settlement and squat inadvertently left in the **IHSS** to the port and starboard multibeam readings.

Each corrected cast depth was compared to the simultaneous multibeam readings and correctors were calculated by the spreadsheet. The ten comparisons were averaged for each transducer and the standard deviations were computed. The mean of the results for six sets of comparisons resulted in a corrector of 0.006 meters for each transducer. Therefore, no instrument or draft corrector was applied to soundings for this survey.

The leadline comparisons are included in the Phase IIB Summary Report.

Static draft

At a minimum, the static draft was observed on a daily basis by reading the markings on the transducer pole while the vessel was stationary. If the static draft value changed from the previously noted value, the new value was entered into the RESON system. The static draft value was recorded at the beginning of a GSF file or whenever values in the header were changed. All results are reported in the Processing and Multibeam Data Summary.

Settlement and squat

Measurements of settlement and squat were conducted at the breakwater north of Coddington Cove, Narragansett Bay, Rhode Island on May 5, 1995, in 14 meters of water. The results were compiled into a lookup table of the vessel's engine rpm vs settlement and squat. Rpm settings were entered into the Multibeam parameters by the real time system operator, the computer applied settlement and squat correctors interpolated from the lookup table, and recorded it in the "Depth Corrector" field of the GSF data file for each ping. All results are reported in the Phase IIB Summary Report-Settlement and Squat Test.

Heave, Roll, Pitch and Heading

The following sensors were used for acquisition of Heave, Roll, Pitch and Heading data:

- TSS-335B Vertical Reference Units, Serial Numbers 001615 and 583
- Sperry MK32 Gyrocompass, Serial Number 208

The TSS-335B Vertical Reference Units and their corresponding junction boxes, were used for heave, roll, and pitch. The accuracy of the sensor is 5 percent of 1 m or 5 cm for heave; ± 0.10° dynamic accuracy for roll and pitch, and ± 0.05° static accuracy for roll and pitch. The Sperry MK32 was used for heading. The dynamic heading accuracy of the unit at 3 sigma was 0.6° times the secant of latitude.

On Julian Day 297 (Oct. 24) TSS-335B (001615) was replaced with TSS-335B (583). Alignment tests were run on this day and the new vertical reference was used for survey beginning on 298.

Occasional power fluctuations affected the Sperry MK 32 gyrocompass for periods of approximately .01 seconds. These fluctuations were identified and corrected in processing using the program **examgyro**.

Heading, roll, and pitch biases were determined in a series of tests performed in Narragansett Bay prior to the start of the survey and were redetermined each time a transducer or Vertical Reference Unit was changed. Prior to conducting any of the tests, a CTD cast was taken to determine the sound velocity profile and entered into the RESON system. In the RESON the port and starboard roll biases were initially set to +30° and -30° respectively, heading biases were initially set to 0° and 180°, and pitch biases were set to 0. The roll bias test was run first in an area with relatively flat bottom. The range scale was set to 100 meters. Three lines were run spaced 40 meters apart and each line was run in both directions. The data from parallel lines in the same direction were used for roll bias calculations for each head separately; the

ideal data set was positioned so that the depths from the center beams from a transducer were compared against the depths of the mid-swath beams. Tidal corrections were applied to all data before roll corrections were calculated using routines in the **MBHAT** software. All results are reported in the Phase IIB Summary Report.

After the roll biases were calculated and entered into the RESON system, the pitch bias test was conducted. The pitch test was conducted on multiple reciprocal runs of a single line perpendicular to a slope of approximately five degrees. The range scale of the RESON was set to 50 meters and the vessel's speed was maintained approximately constant. Pitch biases were computed by comparing runs in opposite directions. Tidal corrections were applied to all data before pitch corrections were calculated using routines in the **MBHAT** software. All results are reported in the Phase IIB Summary Report.

After measurement, calculation, and entry of the pitch bias correctors, heading bias tests were conducted. For the heading bias test 5 parallel lines were run in opposing directions so that the inner beams from a transducer head overlay the intermediate or outer beams of the same head. The heading bias was then determined by measuring the distance between equal depths and calculating the angle subtended by that distance. Tidal corrections were applied to all data before heading corrections were calculated using routines in the **MBHAT** software. All results are reported in the Phase IIB Summary Report.

Roll, pitch, and heading biases applied in H-10649 are shown in Table G-2.

Table G-2. Roll, Pitch, and Heading Bias

	Days 263-271		**Days 272-297**		**Days 299-300**	
	Port	Starboard	Port	Starboard	Port	Starboard
Roll	+29.930	-29.475	+30.146	-29.105	+29.668	-29.289
Pitch	-1.02	-1.02	-1.02	-1.02	-0.963	-0.363
Heading	+1.25	+1.25	+1.25	+1.25	+1.25	+1.25

Tide and water level correctors

Tide data were acquired using the following gauges:

- Sea Data. Model TDR-3A, Serial Numbers 224 and 518

Smooth sheet soundings were corrected for water level through application of observed data from the Cuttyhunk, MA (844-8392) station. A staff MLLW datum was computed by simultaneous comparison with Newport, RI (845-2660) and with Woods Hole, MA (844-7930) using the NOAA Form 248 method prescribed by Marmer (Tidal Datum Planes, Spec. Pub. 135, U.S. Dept. of Commerce.) The simultaneous comparison computations are included in the Phase IIB Summary Report - Tides.

The boundaries of tide zones used are listed in the Phase IIB Summary Report - Tides. Gage readings were recorded in relation to staff zero; therefore, the MLLW datum height was subtracted from gage readings before applying the time and ratio correctors.

Full data for all project water level gages are in the Phase IIB Summary Report - Tides.

H. CONTROL STATIONS SEE EVAL RPT, SECTION H

The horizontal datum used for the survey was the North American Datum (NAD) 1983. Existing horizontal control stations were used to establish a DGPS reference station at Gay Head Light to provide primary navigation control for hydrographic positioning. Station 31435 (LW5817) was used to verify the DGPS performance of the Gay Head Light station. Horizontal control data are included in the Phase IIB Summary Reports.

I. HYDROGRAPHIC POSITION CONTROL SEE EVAL RPT, SECTION I.

The following equipment was used for positioning:

- Trimble 4000 GPS Receiver, Serial Number 3504A09516
- Magnavox MX50R Differential Beacon Receiver, Serial Number 154
- Trimble 4000 GPS Receiver, Serial Number 3430A07030
- Pacific Crest Differential Beacon Receiver various Serial Numbers
- DGPS shore station [OSI], Serial Number 3433A07356

The primary hydrographic positioning control equipment was a Trimble 4000 GPS using differential correctors from the contractor established station at Gay Head Light. HDOP, number of satellites, elevation of satellites, and age of correctors were monitored so that the resulting hydrographic positioning control meets the specifications.

Positioning confidence checks were established by recording a separate (reference) Trimble DGPS using correctors from the U.S. Coast Guard station at Montauk, NY. A real time monitor raised an alarm when the two DGPS positions differed by more than 10 meters horizontally. During all times when differential correctors were being received, positioning confidence checks were well within tolerance. Concur

In daily post processing, the reference DGPS positioning was substituted for the primary DGPS positioning during those times when the reference met the specifications, but the primary did not.

J. SHORELINE

Not Applicable.

K. CROSSLINES

Crosslines constituted approximately 5% of the mainscheme length. Comparisons of all crossing data in the 1xIHO swaths, using **MBHAT** software, show that more than 99% of comparisons are within 50 centimeters over all types of bottom. Larger differences occurred in areas of steep slopes, rocks, wrecks, and obstructions. More than 89% of differences were within 20 centimeters.

Table K-1. Junction Analysis Mainscheme - Crosslines

Category	Count	Percent	Total Percent
to 10 cm	1446410	62.68	62.68
to 20 cm	628916	27.25	89.93
to 30 cm	170180	7.37	97.30
to 40 cm	39953	1.73	99.03
to 50 cm	10877	0.47	99.50
to 60 cm	3971	0.17	99.68
to 70 cm	1911	0.08	99.76
to 80 cm	1228	0.05	99.81
to 90 cm	813	0.04	99.85
to 100 cm	623	0.03	99.87
> 100 cm	2890	0.13	100.00
Total Counts = 2307772			

L. JUNCTIONS

The junction between surveys H-10654 (Sheet G) and H-10649 (Sheet F) has 94.6% of comparisons within 20 cm, 99.9% within 40 cm, and only 8 of 239,148 comparisons exceeding 60 cm. There was no positive or negative bias between the surveys. Table L-1 presents a summary of all comparisons between the two surveys. JUNCTIONS WITH H-10548 (SEE SECTION L OF THE EVALUATION REPORT) ✓

Table L-1. Junction Analysis Sheet G - Sheet F

Category	Count	Percent	Total Percent
to 10 cm	167294	69.95	69.95
to 20 cm	59160	24.74	94.69
to 30 cm	11015	4.61	99.30
to 40 cm	1446	0.60	99.90
to 50 cm	193	0.08	99.98
to 60 cm	32	0.01	100.00
to 70 cm	3	0.00	100.00
to 80 cm	2	0.00	100.00
to 90 cm	2	0.00	100.00
to 100 cm	1	0.00	100.00
> 100 cm	0	0.00	100.00
Total Counts =	239148		

M. COMPARISON WITH PRIOR SURVEYS SEE EVAL RPT, SECTION M ✓

Following completion of data processing, Survey H-10649 was compared with Surveys H-6445 (1939), and H-8905 (1966). Survey FE-379SS was not made available for comparison.

Comparison to H-6445, at a scale of 1:40,000, revealed numerous shoaler soundings that did not appear on the prior survey. The high density of multibeam soundings identified many

rocks and shoals not detected in 1939. In relatively flat areas there was excellent agreement between the surveys, however, in steep and rocky areas, the coverage and resolution of the multibeam resulted in shoaler soundings in H-10649. There were no shoal soundings in H-6445 that were not detected in H-10649; therefore, it is recommended that the entire common area of H-6445 be superseded by H-10649. Concur

Comparison to H-8905, at a scale of 1:10,000, also showed excellent agreement in areas of relatively flat bottom, but the high density of the multibeam soundings revealed far more bottom detail, with features as much as 3 meters shoaler in H-10649. Numerous shoal soundings not previously detected ranging from 8.2m to 15m were found in H-10649. In the southeast corner of the survey area (SE of a line from 41° 21.30'N, 070° 52.45'W to 41° 20.40'N, 070° 53.25'W) soundings were up to 2 meters shoaler than in H-8905. There were no shoal soundings in H-8905 that were not detected in H-10649, therefore, it is recommended that the entire common area of H-8905 be superseded by H-10649. Concur

N. COMPARISON WITH THE CHART See Eval. Rpt, Section C

Following completion of data processing, Survey H-10649 was compared with Charts 13218, 13230, and 13233.

The comparison to Chart 13218 (32nd Edition, June 26, 1993), at a scale of 1:80,000, reveals changes in the bottom caused by shifting sand and gravel areas and the additional resolution provided by the density of multibeam soundings. West of 070° 55.5'W this survey is generally shoaler than the chart by up to 3 meters (10 ft). The bottom in this area is characterized by rocks and boulders 1 to 3 meters (3-10 ft) high that are probably of glacial origin. Concur

The 32 foot (9.7 m) (Rep 1992) sounding charted in 41° 22.24'N, 070° 57.32'W was confirmed as a rock with a minimum depth of 9.7 meters (32 ft) in 41° 22.225'W, 070° 57.315'W. The 34 foot (10.3 m) (Rep 1992) sounding charted in 41° 22.21'N, 070° 57.52'W was confirmed as a rock with a minimum depth of 10.0 meters (33 ft) in 41° 22.183'N, 070° 57.48'W, with additional rocks with minimum depth of 10.0 meters (33 ft) located in 41° 22.141'N, 070° 57.622'W and in 41° 22.133'N, 070° 57.650'W. Since numerous rocks exist in this area, it is recommended that the charted sounding of 34 feet (10.3 m) in 41° 22.21'N, 070° 57.52'W be changed to a charted depth of 33 feet (10.0 m) and that the "Rep 1992" notation be removed. Concur

0.1 meters

Do not Concur. See Eval. Rep. See M.

Remove the charted 32 ft and 34 ft depths and chart 33 ft depth as found by the present survey.

The charted wreck cleared to 51 feet (15.5 m) in 41° 22.18'N, 070° 59.07'W was not found in either the 100% multibeam or 200% sidescan coverage of this survey. Instead, a feature that appears to be a rock with a depth of 15.3 meters (50 ft) was found in 41° 22.144'N, 070° 59.072'W, approximately 66 meters south of the charted wreck. Therefore, it is recommended that the wreck be removed and a sounding of 50 feet (15.3 m) be charted in 41° 22.144'N, 070° 59.072'W. Concur

RK

H-10548 (1994) also shows a 50' rk in this area. There was no identified source for charted 51 wk. Charting may have elected to carry shoaler depth information from H-10548 and leave as wreck.

83

AWOIS Item #7875 identified as a wreck, called for a search radius of 700 meters centered in 41° 24.20'N, 070° 53.06'W. Although this position was outside the area of this survey (within H-10654) a portion of the search area was within the survey coverage. Neither 100% multibeam nor 200% sidescan sonar coverage within the search radius revealed any indication

of a wreck. Feature #1107 in 41° 24.179'N, 070° 54.001'W (1309 m at 268° True from AWOIS Item #7873) was identified as a wreck on this survey. Information from a local sport diver indicated that the wreck is thought to be a Rum Runner that sank during the Prohibition Era. Feature #1107 is within the 2 x IHO portion of the multibeam swath at 21.8 meters (71 ft). The feature has little relief as indicated by the multibeam depth measurements, lack of side scan shadow and no indication of disturbance to fishing trawls observed crossing the wreck in both multibeam and side scan records. Therefore, it is recommended that the charted wreck in 41° 24.20'N, 070° 53.06'W be removed, and that a "non-dangerous" wreck with a depth of 21.8 m (71 ft) be charted in the position of Feature #1107 (41° 24.179'N, 070° 54.001'W).

* This feature plots in depths of 21.8 meters which is consistent with surrounding depths.

(Concur)

(DO NOT CONCUR.) ~~SEARCH DID NOT COVER THE ENTIRE AREA. FEATURE #1107 IS NOT IN THE SEARCH RADIUS AND IS NOT ON CHART~~ SEE EVALUATION REPORT, SECTION N, regarding Awois #7873.

Based on the comparison of H-10649 survey data with the chart, it is recommended that the entire common area of Chart 13218 be reconstructed from H-10649 survey data. Concur

Comparison to Chart 13230 (40th Edition, April 29, 1995) at a scale of 1:40,000 shows general agreement in the deeper, eastern portion of the survey, although the soundings have shifted slightly in position. In the rocky, western portion of the survey, the high density of multibeam soundings reveal many changes to the chart. The entire area west of 070° 55.5'W is strewn with rocks whose depths are generally shoaler than the charted soundings. Rocks with depths of 27 feet (8.2 m) were found in charted depths of 38 feet (11.6 m) near 41° 23.55'N, 070° 57.15'W and a sounding of 32 feet (9.8 m) was found in charted 44 feet (13.4 m) near 41° 23.13'N, 070° 57.20'W. Concur

* Both the 27Ft (Rk) and 32Ft (Rk) have been reported as dangers to navigation, and have been compiled for the next chart edition.

Based on the comparison of H-10649 survey data with the chart, it is recommended that the entire common area of Chart ~~13218~~ 13230 be reconstructed from H-10649 survey data. Concur

Comparison with Chart 13233 (14th edition, Nov 28, 1992) at a scale of 1:40,000 shows general agreement in the deep areas of the survey. In shallower water, the data from H-10649 tend to be shoaler than the chart. The 45 foot (13.7 m) sounding in 41° 22.18'N, 070° 52.79'W is in charted depths of 54 feet (16.4 m) and the 62 foot (~~18.9~~ 18.8 m) sounding found in 41° 21.95'N, 070° 52.85'W is in charted depths of 69 feet (21.0 m). Concur

* 45 foot sounding has been reported as a danger to navigation. Chart 45 Rk

Based on the comparison of H-10649 survey data with the chart, it is recommended that the entire common area of Chart ~~13218~~ 13233 be reconstructed from H-10649 survey data. Concur

O. ADEQUACY OF SURVEY

Survey H-10649 is complete and adequate to supersede all prior surveys. Concur

Data for all tracks shown on the track plot are included in the accepted survey data. The decision was made to retain all of the data to provide more 1xIHO coverage. In many cases, the extra lines were run to fill in side scan gaps and the multibeam data were recorded simultaneously.

Soundings corresponding to wrecks, rocks, and obstructions are shown in bold print on the smooth sheet so that they may be easily related to the corresponding text label. The density of soundings on this survey, while necessary to fairly depict the bottom, made it difficult to place text within the sheet. For that reason, text for features (wrecks, rocks, and obstructions), for floating aids to navigation, and for bottom characteristics are shown in reduced height bold

characters. This makes them stand out from the soundings and eases their placement. Even so, it was often necessary to deviate from the traditionally preferred placement of text.

No plot on mylar or paper can fully represent the tremendous amount of data which are available in this survey. Manipulation of and viewing of the data with a computer is much more satisfactory for many applications. In particular, the ***mbmz*** layer viewed with the **MBHAT** software gives an excellent picture of the shape and character of the bottom.

The following discussion provides guidance for evaluation of this survey against the specifications.

Multibeam

After final processing, there were six gaps in the 100% multibeam coverage. These small gaps are covered by side scan as shown below:

Center Position Latitude	Longitude	Approximate Size, (meters)	Side Scan Coverage
41° 20.86'N	070° 59.25'W	2x10	200%
41° 20.84'N	070° 59.25'W	1x4	100%
41° 20.83'N	070° 59.25'W	2x5	0.9@200%, 0.1@100%
41° 23.67'N	070° 55.41'W	1x1	300%
41° 21.29'N	070° 54.30'W	2x2	300%
41° 21.08'N	070° 59.25'W	1x3	200%

THESE AREAS WERE ALL COVERED BY SIDE SCAN. THERE WAS NO EVIDENCE OF A SIGNIFICANT FEATURE IN ANY OF THE GAPS JL

Sound Velocity Corrections

For one period of time during the survey, an incorrect sound velocity profile was applied to the multibeam data and used for depth determination. This occurred due to a design defect in the real time software that caused it to incorrectly record the name of the current sound velocity profile. At 267 05:52:38, the profile CTW26503.CNV was downloaded instead of CTW26701.CNV. This profile affected data recorded from 267 06:24:30 to 267 12:54:54. During that time, six lines were run from and to the following locations:

FROM	41° 23.47'N, 070° 52.08'W	TO	41° 20.80'N, 070° 59.25'W
FROM	41° 23.50'N, 070° 52.14'W	TO	41° 20.86'N, 070° 59.24'W
FROM	41° 23.54'N, 070° 52.19'W	TO	41° 20.91'N, 070° 59.24'W
FROM	41° 23.57'N, 070° 52.25'W	TO	41° 20.97'N, 070° 59.25'W
FROM	41° 23.60'N, 070° 52.32'W	TO	41° 21.02'N, 070° 59.25'W
FROM	41° 23.04'N, 070° 53.97'W	TO	41° 21.07'N, 070° 59.24'W

The resultant depth and position errors (Table O-1) were estimated by comparing depths as determined by the two Sound Velocity Profiles (SVP) in the SAIC error model. The model indicates that 1xIHO data recorded during this time are biased approximately 0.06 meters deep and have horizontal errors of less than 0.01m. The errors were not removed from the data.

Table O-1. Depth and Position Errors Due to Incorrect Sound Velocity Profile (Julian Day 267)

Beam Angle, deg.	Depth Error, m	Position Error, crosstrack distance, m
0	0.061 too deep	0.0
45	0.060 too deep	0.0005 too far from nadir

Examination of the junction of all these lines with crosslines revealed no detectable error suggesting that the minimal effect from Sound Velocity Profile errors predicted by the model was correct and that sounding data meet the specifications. CONCUR

Side scan

Sheet F side scan coverage was at least 200% in all areas of the survey, except at 41° 20.80'N, 070° 59.24'W on the western edge of the sheet, where 100% coverage is shown. In this area there is 200% coverage by the analog record, however, the digital Eoscan record ends at JD 268 - 17:22:21. The analog records and the 100% multibeam data were examined and no targets or features were recognized in this area. Therefore, the side scan coverage is judged to be adequate. CONCUR

The designation of wreck, rock, or obstruction was assigned to features from examination of the side scan images and the multibeam data. If a feature could not be clearly judged a wreck or a rock it was designated an obstruction. Two or more side scan processors agreed upon the designation. The hydrographer and the Government Contracting Officer's Technical Representative reviewed and approved the designations.

Contours

One meter contours were generated from 1xIHO data gridded to select the shoalest sounding in a 15 meter true cell size. This method has the potential for a small horizontal offset of contours if the shoal sounding occurs in the corner of the cell. However, it does generate contours corresponding to the least depths for the survey. Smooth sheet contours were compared to the selected soundings plotted on the smooth sheet, and were modified as necessary for a clear and safe hydrographic presentation. Shoal curves were enlarged when necessary to make them visible around the shoal sounding. Curves were also modified toward deeper water to ensure inclusion of soundings equal to the curve depth. Small deep curves were removed for clarity, but deep curves were sometimes retained on the smooth sheet even though the density of soundings precluded placing a deep sounding within them. The hydrographer felt that the shape of the bottom was more adequately defined by making use of these contours derived from the data too dense for depiction on the smooth sheet in numeric form. On small steep features the contours are too closely spaced for adequate depiction of the bottom while using contour labels. In those cases the shoalest contour label was offset with a leader pointing to the feature.
CONTOUR LINES WERE REVISED ON AN OVERLAY, BY THE PACIFIC HYDROGRAPHIC BRANCH TO CONFORM WITH THE SOUNDINGS SHOWN ON THE SMOOTH SHEET

P. AIDS TO NAVIGATION — SEE EVAL RPT., SECTION P

The only Aid to Navigation within the survey area was the Gay Head Lighted Gong Buoy "29" which was on station at 41° 21.833'N, 070° 51.789'W with the characteristics of "Fl G 4s"

and a green structure. This is in agreement with Chart 13233 and with the Light List, Volume 1, Atlantic Coast, #15605. Buoy "29" adequately serves its apparent purpose. THIS AID IS JUST OUTSIDE OF THE SURVEY AREA AND IS NOT PLOTTED ON THE SMOOTH SHEET. JL

Q. STATISTICS ✓

Survey statistics are as follows:

1530 km	Lineal kilometers of sounding lines
63 km^2	Square kilometers of hydrography
12	Days of production
0	Days of weather downtime
1	Days of mechanical, electronic or operational downtime
1	Number of tide stations
40	Number of velocity casts
0	Number of XBT drops

R. MISCELLANEOUS ✓

The area covered by H-10649 is a glacial area characterized in the southeast by sand and gravel waves which migrate during periods of strong currents and storms and in the northwest by a large rocky area with topography up to 4 meters above the ambient bottom.

S. RECOMMENDATIONS ✓

Based on comparisons with previous surveys and existing charts it is recommended that the entire common area of Charts 13218, 13230 and 13233 be reconstructed with data from this survey. Concur JL

T. REFERRAL TO REPORTS REPORTS ARE FILED WITH THE HYDROGRAPHIC DATA

- Phase I - NOAA Acquisition of Sounding Data in Western Long Island Sound, Phase I Test Results, December 3, 1994. Submitted to NOAA COTR aboard M/V Beavertail.
- Phase IIA - Phase IIA Accuracy and Alignment Tests - submitted to NOAA COTR aboard M/V Atlantic Surveyor.
- Phase IIB - Survey Report - Calibration, Horizontal Control, Real-Time and Processing Procedures
- Phase IIB - Summary Report - Tides (Tide Zoning and Tide Station Reports),
- Sheet F Processing and Multibeam Data Summary
- Sheet F Real Time Log Notebook
- Sheet F Sound Velocity Notebook

- Sheet F Processing Notebook
- Sheet F Digital Data Listing Notebook
- Sheet F Digital Data
- Sheet F Side Scan Sonar Analog Records
- Sheet F Plots

APPENDIX A:

DANGER TO NAVIGATION REPORTS

ADVANCE INFORMATION

Science Applications International Corporation
An Employee-Owned Company

November 01, 1995

Lieutenant Commander David A. Cole, NOAA
Field Manager, Contract Hydrographic Surveys
Office of Coast Survey, N/CG24x3
National Ocean Service
1315 East West Highway, SSMC3, Station 6856
Silver Spring, MD 20910

* SUPERSEDED BY DANGER TO NAVIGATION REPORT DATED JANUARY 9, 1996.

Subject: NOAA Contract 50-DGNC-4-00035: Danger to Navigation Report

Dear Lieutenant Commander Cole:

Science Applications International Corporation (SAIC) has discovered dangers to navigation on Charts 13218 and 13233 during surveys in Vineyard Sound, MA, under the subject contract. A rocky area was discovered with least depth on a rock as follows:

Feet	Latitude	Longitude
46	41 22.17539 N	070 52.79522 W

The 150 meter by 300 meter rocky area is approximately centered on the above position with the long axis oriented north-east south-west. Several rocks in the area have depths of 52 feet or less.

The listed positions are NAD 1983 and the depths are MLLW corrected using Newport, RI. observed water levels with zoning as stated in the subject contract. Depths are subject to change after post processing with local observed water levels.

A copy of a section of chart 13233 is enclosed.

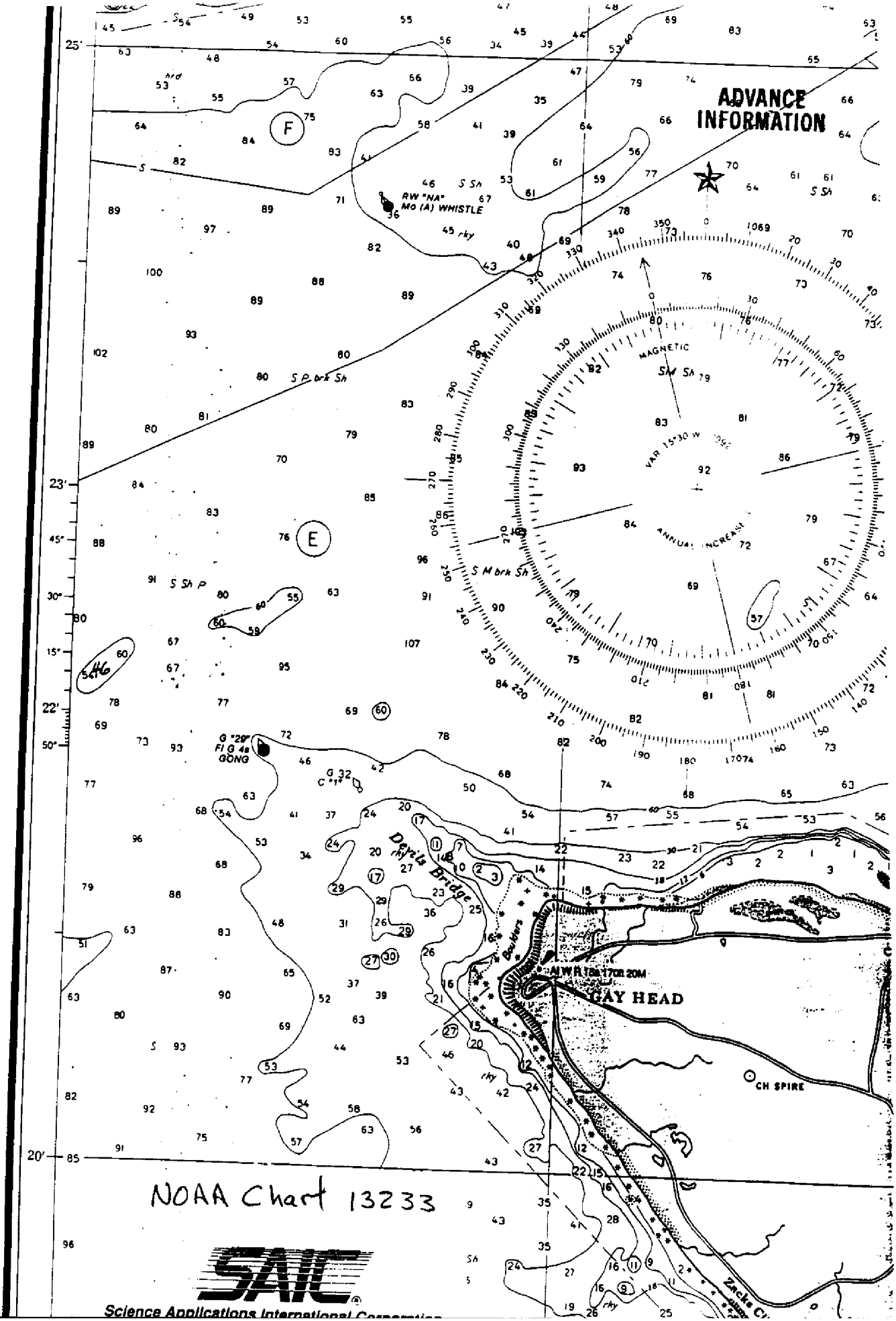
Sincerely,
Science Applications International Corporation

Walter S. Simmons
Program Manager

Enclosures

Admiral's Gate, 221 Third Street, Newport, Rhode Island 02840 Office: (401) 847-4210 FAX: (401) 849-1585

Other SAIC Offices: Albuquerque, Colorado Springs, Dayton, Falls Church, Huntsville, Las Vegas, Los Altos, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, Seattle, Tucson


ADVANCE INFORMATION
MAGNETIC
VAR 15°30 W
ANNUAL INCREASE
RW "NA" MO (A) WHISTLE
G "29" Fl G 4s GONG
Devils Bridge
Boulders
GAY HEAD
CH SPIRE
NOAA Chart 13233
SAIC
Science Applications International Corporation

ADVANCE
INFORMATION

Science Applications International Corporation
An Employee-Owned Company

January 09, 1996

Lieutenant Commander David A. Cole, NOAA
Field Manager, Contract Hydrographic Surveys
Office of Coast Survey, N/CG24x3
National Ocean Service
1315 East West Highway, SSMC3, Station 6856
Silver Spring, MD 20910

Subject: NOAA Contract 50-DGNC-4-00035
Reference: 1) Danger to Navigation Report dated November 01, 1995

Dear Lieutenant Commander Cole:

Science Applications International Corporation (SAIC) reported dangers to navigation on Charts 13218 and 13233 during surveys in Vineyard Sound, MA, via Reference 1). Having completed processing of the surveys, SAIC submits this update to Reference 1).

	Feet	Latitude	Longitude
45 Rk	(13.8m)	41 22.17538 N	070 52.79524 W

A copy of a section of survey H-10649, scale 1:10,000, is enclosed. Several rocks in the area have depths of 52 feet or less.

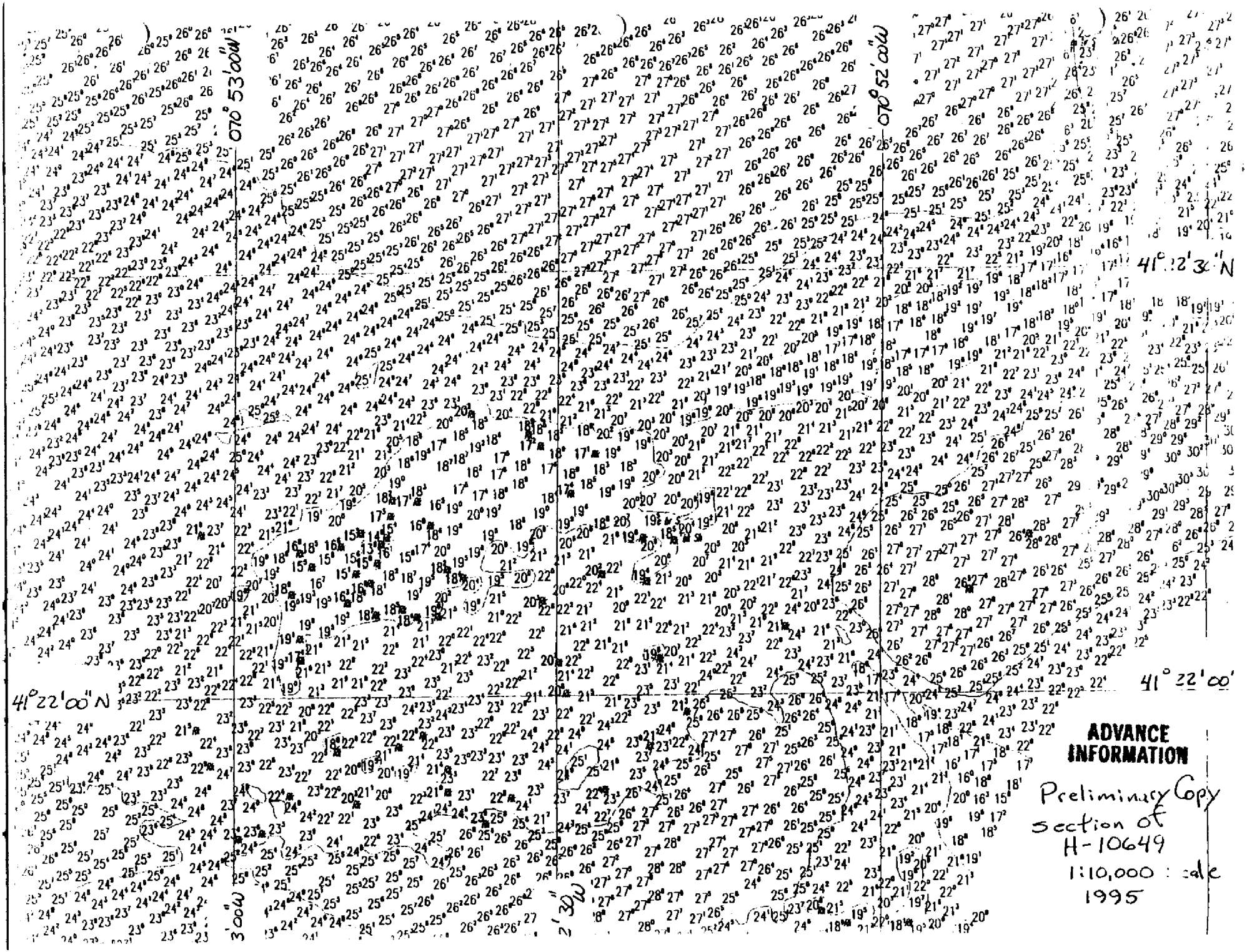
The listed positions are NAD 1983 and the depths are MLLW corrected using Cuttyhunk, MA, observed water levels with zoning correctors applied.

Sincerely,
Science Applications International Corporation

Walter S. Simmons
Program Manager

Enclosure

Admiral's Gate, 221 Third Street, Newport, Rhode Island 02840 Office: (401) 847-4210 FAX: (401) 849-1585
Other SAIC Offices: Albuquerque, Colorado Springs, Dayton, Falls Church, Huntsville, Las Vegas, Los Altos, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, Seattle, Tucson


070°53'00"W
070°52'00"W
41°22'30"N
41°22'00"N
41°22'00"
ADVANCE INFORMATION
Preliminary Copy
Section of
H-10649
1:10,000 scale
1995

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-0070

April 15, 1997

Commander (OAN)
First Coast Guard District
408 Atlantic Avenue
Boston, Massachusetts 02110-3350

Dear Sir:

During office review of hydrographic survey H-10649, one submerged obstruction and eleven submerged rocks were found and considered potential dangers to navigation affecting the following charts:

Chart	Edition/Date	Datum
13230	40th, 4/29/95	NAD 83
13218	32nd, 6/26/93	NAD 83

It is recommended that the enclosed Report of Dangers to Navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6835

Sincerely,

Kathy A. Timmons

Kathy A. Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

Enclosures

cc: NIMA
NCS/261

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10649

Survey Title: State: MASSACHUSETTS
Locality: VINEYARD SOUND
Sublocality: DEVILS BRIDGE TO SOW AND PIGS

Project Number: OPR-B389-CN

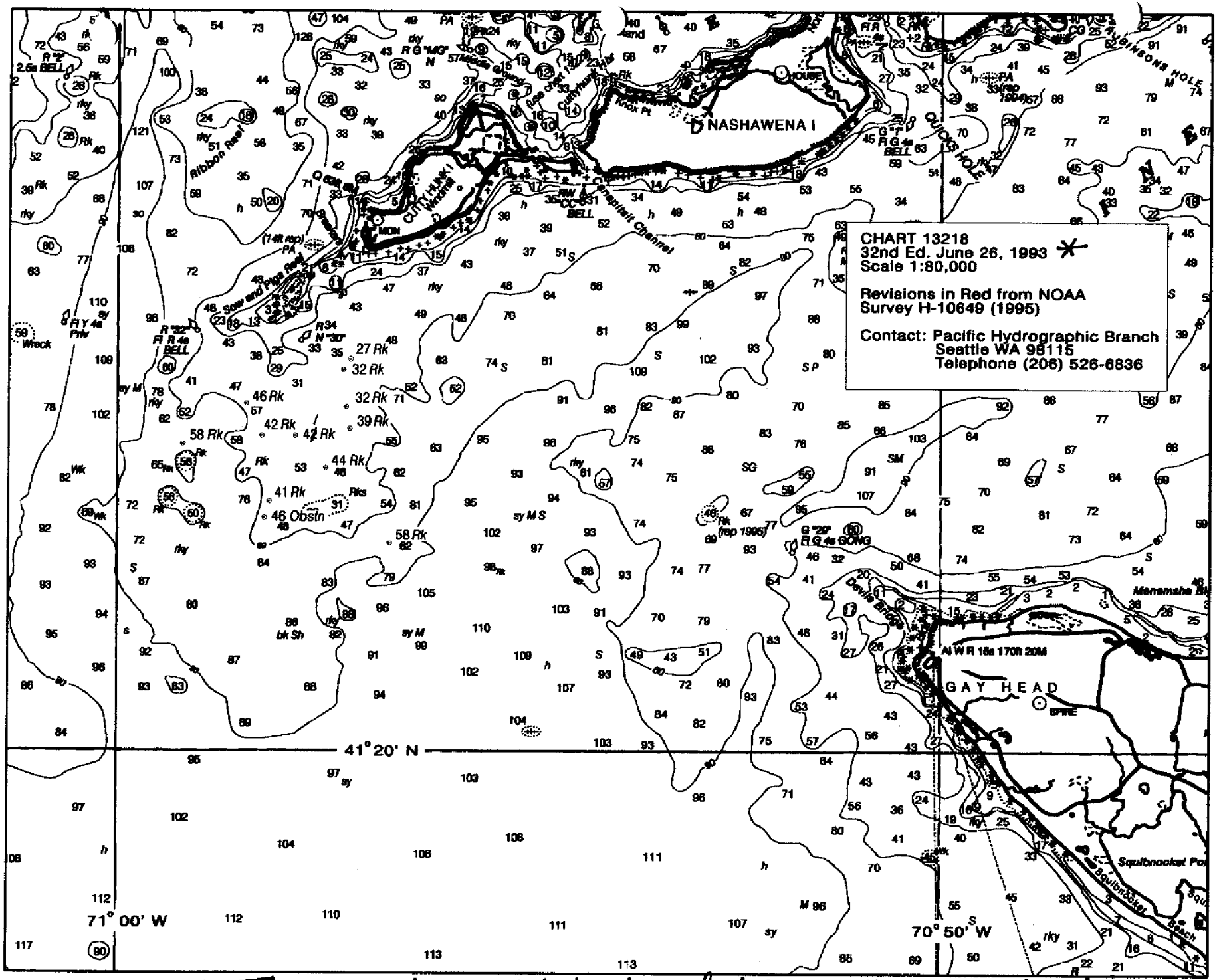
Survey Date: September 20, 1995 - October 27, 1995

Features are reduced to Mean Lower Low Water using approved tides and are positioned on NAD 83.

Charts affected: 13230 40th Edition/April 29, 1995, scale 1:40,000, NAD 83
13218 32nd Edition/June 26, 1993, scale 1:80,000, NAD 83

DANGER TO NAVIGATION	LATITUDE(N)	LONGITUDE(W)
Obstruction, subm 46 feet	41/22.11564	70/58.17602
Rock, subm 58 feet	41/21.88793	70/56.66204
Rock, subm 44 feet	41/22.56603	70/57.43907
Rock, subm 41 feet	41/22.26469	70/58.11742
Rock, subm 58 feet	41/22.79444	70/59.14866
Rock, subm 42 feet	41/22.86721	70/58.21799
Rock, subm 41 feet	41/22.86652	70/57.81340
Rock, subm 39 feet	41/22.93239	70/57.14950
Rock, subm 46 feet	41/23.15524	70/58.40759
Rock, subm 32 feet	41/23.12604	70/57.20405
Rock, subm 32 feet	41/23.46258	70/57.24578
Rock, subm 27 feet	41/23.55416	70/57.15243

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6835.



* This page does not indicate what is on the 32nd Ed. GKN.

APPENDIX B:

LANDMARKS AND NON-FLOATING AIDS TO NAVIGATION LISTS

NOT APPLICABLE

APPENDIX C:

LIST OF HORIZONTAL CONTROL STATIONS

NAME	LATITUDE	LONGITUDE	ANTENNA ELEVATION	SOURCE	DATES & TIMES (UTC) OCCUPIED
Gay Head Light (OSI offset)	41° 20 54.38790'N	070° 50 05.92574'W	52.0m	051 Survey	06 September 1995, 2232 UTC 07 September 1995, 2239 UTC
31435 (LW5817)	41° 30 55.09542'N	070° 39 20.17711'W	9.6m	Published	17 September 1995, 1358 UTC 17 September 1995, 1415 UTC
B8/9 S 819 (LW0048)	41° 20 50.27680'N	070° 50 13.19474'W	45.0m	Published	15 September 1995, 2225 UTC 15 September 1995, 2245 UTC

APPENDIX D:

LIST OF GEOGRAPHIC NAMES

NOAA FORM 76-155
(11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

SURVEY NUMBER

H-10649

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
VINEYARD SOUND	13233									1
										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
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										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

APPENDIX E:

TIDE NOTES

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Rockville, Maryland 20852

September 17,1996

MEMORANDUM FOR: LTCDR David A. Cole
Hydrographic Surveys Division

FROM: Stephen K. Gill
Chief, Tidal Analysis Branch

Michael C. O'Hargan
Chief, Sea and Estuarine Section

SUBJECT: Final Evaluation of Contract Deliverables, Project OPR-B389-

The Ocean and Lake Levels Division (OLLD), as requested, has reviewed information received from the contractor in teleconference between the contractor, yourself, and Michael O'Hargan and Stephen Gill on July 24, 1996; and, the subsequent written submission from the contractor regarding project-wide compliance issues to you dated August 16, 1996.

The additional information received during the teleconference and the written submission completes the requests for detailed information from OLLD. Major errors noted have been corrected, and missing information has been provided. OLLD now has an acceptable understanding of the contractor's procedures related to the water level field collection, data reduction, data processing, and tidal datum determination.

Based on the review of the recent information in the context of the previous evaluation of the contractor's work on tides, OLLD has estimated a worst-case uncertainty in the tide-reducers applied to the soundings for the contract of 1.0 ft. This estimate includes datum recovery of MLLW datum on the bench marks (a bias error), and uncertainties in the raw tide gauge measurements, the staff-to-gauge settings applied to the data, and the tidal zoning correctors. It is our understanding that this maximum estimated error is within the 1.6 foot (0.50 meter) specified in the contract.

OLLD will provide details of the evaluation in a subsequent in-house program evaluation document. OLLD has determined, based on the evaluation, that the tide data collected for this survey are "single purpose data" for use as tide reducer only. Accepted tidal datums, bench mark elevations, and published bench mark sheets will not be updated or produced as result of the contractor data. This limitation does not affect acceptance of the contract deliverables.

cc:

Richard Barazotto
Philip Morris
Jim Hubbard
Mike Gibson

SHEET F
TIDE NOTES

SITE	LOCATION	PERIOD
Cuttyhunk, MA	41° 25.3'N	15 September 1995
8448392	70° 55.3'W	01 November 1995

Cuttyhunk, MA
Two Sea Data TDR-3A, tide gages (S/N 224 and 518) were installed on 15 September 1995. The staff was installed and leveled on 15 September 1995. Pipes and gages were removed on 01 November 1995.

The reference stations for H-10654 were Newport, RI (845-2660) and Woods Hole, MA (844-7930).

Soundings for field sheets were corrected daily in post processing using observed water level data from NOAA station Newport, RI (845-2660). Data were acquired by cellular phone modem using the NOAA REALDATA software. Zoning correctors applied to Newport data were:

+ 24 minute time correction and a x.82 range ratio east of 71° 00.0' W and west of 70° 50.0' W
+ 42 minute time correction and a x.74 range ratio east of 70° 50.0' W and west of 70° 46.0' W
+ 54 minute time correction and a x.65 range ratio east of 70° 46.0' W and west of 70° 42.0' W

Smooth sheet soundings were corrected for water level through application of observed data from the Cuttyhunk, MA (8448392) station. A staff MLLW datum was computed at that station by simultaneous comparison with Newport, RI (845-2660) and with Woods Hole, MA (844-7930) using the NOAA Form 248 method prescribed by Marmer (Tidal Datum Planes, Spec. Pub. 135, U.S. Dept. of Commerce.) The simultaneous comparison computations are included in the Phase IIB Summary Report - Tides.

The boundaries of tide zones used are listed in the Phase IIB Summary Report - Tides. Gage readings were recorded in relation to staff zero; therefore, the MLLW datum height was subtracted from gage readings before applying the time and ratio correctors. Zoning correctors applied to the observed gage values were:

Station	Zone	Correctors			Staff MLLW Datum
		Time (h min)	Ratio	Height	
Cuttyhunk	B5	-00 06	*1.00	1.151	1.151
Cuttyhunk	B6	00 00	*1.00	1.151	1.151
Cuttyhunk	B7	00 06	*1.00	1.151	1.151

All data for all project water level gages are reported in the Phase IIB Summary Report - Tides.

* FILED WITH HYDROGRAPHIC DATA.

The on-line times for acquisition of valid hydrographic data are presented in Table E-1.

Table E-1. Abstract of Times of Hydrography

1995/263 03:20:28.49 to 1995/263 03:50:24.48
1995/263 03:58:02.08 to 1995/263 04:29:33.80
1995/263 04:40:43.85 to 1995/263 05:17:16.65
1995/263 05:46:20.91 to 1995/263 06:28:25.25
1995/263 06:41:31.13 to 1995/263 07:03:25.92
1995/263 07:06:52.63 to 1995/263 07:27:09.71
1995/263 08:49:20.64 to 1995/263 08:54:20.11
1995/263 09:33:54.53 to 1995/263 09:59:46.38
1995/263 10:09:46.89 to 1995/263 10:34:34.48
1995/263 10:45:52.26 to 1995/263 11:15:49.11
1995/263 11:24:17.40 to 1995/263 11:45:13.29
1995/263 11:56:26.01 to 1995/263 12:12:30.39
1995/263 12:36:53.51 to 1995/263 12:45:00.92
1995/263 14:22:07.47 to 1995/263 15:05:59.87
1995/263 15:52:21.02 to 1995/263 16:17:54.51
1995/263 16:25:30.07 to 1995/263 17:17:51.83
1995/263 17:21:44.47 to 1995/263 18:35:23.38
1995/263 18:45:21.74 to 1995/263 19:18:04.79
1995/263 19:20:28.10 to 1995/263 19:59:38.65
1995/263 20:06:23.55 to 1995/263 21:19:38.84
1995/263 22:15:45.98 to 1995/263 23:29:00.67
1995/263 23:37:24.53 to 1995/263 23:45:59.78
1995/264 00:24:33.45 to 1995/264 01:28:45.70
1995/264 01:33:29.14 to 1995/264 02:47:25.61
1995/264 02:52:14.75 to 1995/264 04:02:14.14
1995/264 04:24:30.17 to 1995/264 05:05:59.96
1995/264 05:23:53.21 to 1995/264 06:35:04.96
1995/264 06:40:52.98 to 1995/264 07:50:11.79
1995/264 07:57:13.35 to 1995/264 09:06:03.79
1995/264 09:12:28.55 to 1995/264 10:17:26.73
1995/264 10:25:19.77 to 1995/264 11:27:55.74
1995/264 11:32:55.48 to 1995/264 12:31:43.04
1995/264 13:17:51.75 to 1995/264 14:12:11.79
1995/264 14:16:30.34 to 1995/264 15:08:32.34
1995/264 15:14:46.73 to 1995/264 16:01:37.65
1995/264 16:19:52.53 to 1995/264 17:05:51.31
1995/264 18:15:20.11 to 1995/264 18:55:29.32
1995/264 19:11:34.14 to 1995/264 19:43:29.79

Table E-1. Abstract of Times of Hydrography (Continued)

1995/264 20:27:01.49 to 1995/264 21:45:34.65
1995/264 21:49:54.10 to 1995/264 22:03:29.98
1995/264 22:12:52.27 to 1995/264 23:14:36.77
1995/264 23:27:52.30 to 1995/264 23:30:07.49
1995/264 23:36:52.49 to 1995/264 23:51:50.64
1995/265 00:29:15.79 to 1995/265 01:34:54.93
1995/265 01:40:58.66 to 1995/265 03:01:03.75
1995/265 03:06:42.66 to 1995/265 03:21:03.57
1995/265 03:52:30.63 to 1995/265 04:31:59.84
1995/265 04:35:00.19 to 1995/265 05:00:28.33
1995/265 05:10:12.47 to 1995/265 06:33:06.04
1995/265 06:56:07.99 to 1995/265 08:17:56.05
1995/265 08:42:35.17 to 1995/265 10:03:34.09
1995/265 10:11:36.91 to 1995/265 11:33:49.90
1995/265 15:47:19.58 to 1995/265 16:07:29.86
1995/265 16:48:00.00 to 1995/265 17:12:34.83
1995/265 17:21:53.56 to 1995/265 17:45:59.87
1995/265 18:00:50.04 to 1995/265 18:23:59.84
1995/265 18:33:00.13 to 1995/265 19:00:11.37
1995/267 06:24:30.08 to 1995/267 07:27:51.08
1995/267 07:34:08.14 to 1995/267 08:38:43.29
1995/267 08:44:00.80 to 1995/267 09:47:04.66
1995/267 09:52:38.53 to 1995/267 10:54:41.99
1995/267 10:58:51.06 to 1995/267 11:59:51.05
1995/267 12:08:12.53 to 1995/267 12:54:53.24
1995/267 13:13:06.63 to 1995/267 13:28:05.22
1995/267 13:33:28.65 to 1995/267 14:34:10.51
1995/267 14:39:06.69 to 1995/267 14:53:39.82
1995/267 14:56:00.17 to 1995/267 15:40:57.09
1995/267 15:46:17.90 to 1995/267 16:45:51.41
1995/267 16:58:00.12 to 1995/267 17:10:05.05
1995/267 17:16:08.56 to 1995/267 18:07:31.08
1995/267 18:19:42.29 to 1995/267 19:18:56.50
1995/267 19:32:59.34 to 1995/267 20:30:32.77
1995/268 00:13:58.15 to 1995/268 01:08:17.90
1995/268 01:13:07.27 to 1995/268 02:07:31.16
1995/268 02:22:23.11 to 1995/268 02:49:13.32
1995/268 02:53:52.02 to 1995/268 03:22:31.84
1995/268 03:27:34.84 to 1995/268 03:56:11.40
1995/268 03:58:40.64 to 1995/268 04:26:01.07
1995/268 04:30:31.18 to 1995/268 05:00:15.29
1995/268 05:04:20.21 to 1995/268 05:31:23.46
1995/268 05:37:02.00 to 1995/268 06:06:26.27
1995/268 06:25:21.14 to 1995/268 06:53:36.08
1995/268 06:58:50.03 to 1995/268 07:24:16.11

Table E-1. Abstract of Times of Hydrography (Continued)

1995/268 07:31:16.71 to 1995/268 07:58:35.58
1995/268 08:03:16.43 to 1995/268 08:26:58.23
1995/268 08:34:08.09 to 1995/268 08:59:32.31
1995/268 09:03:49.68 to 1995/268 09:25:42.46
1995/268 09:45:08.14 to 1995/268 10:02:35.10
1995/268 10:07:24.83 to 1995/268 10:19:13.84
1995/268 10:33:49.49 to 1995/268 10:49:49.13
1995/268 10:54:37.01 to 1995/268 11:15:51.87
1995/268 11:23:04.62 to 1995/268 11:38:23.67
1995/268 11:42:59.11 to 1995/268 11:54:07.53
1995/268 11:59:51.11 to 1995/268 12:13:26.18
1995/268 12:35:03.99 to 1995/268 12:44:18.65
1995/268 12:50:28.30 to 1995/268 13:03:01.75
1995/268 13:07:23.85 to 1995/268 13:15:10.23
1995/268 13:22:21.50 to 1995/268 13:25:48.07
1995/268 13:29:30.77 to 1995/268 13:35:51.24
1995/268 13:42:50.36 to 1995/268 13:44:46.57
1995/268 13:48:58.60 to 1995/268 13:53:50.78
1995/268 14:01:12.72 to 1995/268 14:01:12.79
1995/268 14:09:17.39 to 1995/268 14:09:44.42
1995/268 14:20:24.26 to 1995/268 15:09:09.24
1995/268 15:15:55.92 to 1995/268 15:59:24.80
1995/268 16:15:23.99 to 1995/268 16:36:41.51
1995/268 16:48:24.15 to 1995/268 16:56:56.37
1995/268 17:15:55.53 to 1995/268 17:21:42.22
1995/268 17:31:36.73 to 1995/268 17:49:41.68
1995/268 18:13:28.78 to 1995/268 18:59:39.12
1995/268 19:08:00.01 to 1995/268 19:13:17.07
1995/268 19:22:10.25 to 1995/268 19:49:48.75
1995/268 19:59:58.37 to 1995/268 20:12:46.33
1995/268 20:21:30.03 to 1995/268 20:28:21.60
1995/268 21:03:46.04 to 1995/268 21:20:40.41
1995/268 21:33:54.29 to 1995/268 23:00:50.61
1995/268 23:06:45.52 to 1995/268 23:59:57.91
1995/268 23:59:57.99 to 1995/269 00:33:17.71
1995/269 23:37:20.99 to 1995/269 23:59:57.24
1995/269 23:59:57.32 to 1995/270 00:08:09.98
1995/270 00:11:39.06 to 1995/270 00:43:14.96
1995/270 00:47:36.14 to 1995/270 01:19:53.09
1995/270 01:22:06.93 to 1995/270 01:54:05.32
1995/270 01:58:37.02 to 1995/270 02:58:10.96
1995/270 03:04:21.79 to 1995/270 03:59:11.19
1995/270 04:05:50.19 to 1995/270 04:59:53.64
1995/270 05:04:30.94 to 1995/270 05:56:51.22
1995/270 06:02:43.39 to 1995/270 06:55:19.75

Table E-1. Abstract of Times of Hydrography (Continued)

1995/270 06:59:38.89 to 1995/270 07:53:15.98
1995/270 07:57:37.20 to 1995/270 08:49:15.49
1995/270 08:53:56.27 to 1995/270 09:44:59.01
1995/270 09:49:13.12 to 1995/270 10:37:37.07
1995/270 10:41:59.18 to 1995/270 11:28:37.66
1995/270 11:33:40.36 to 1995/270 12:17:04.20
1995/270 12:34:20.20 to 1995/270 13:14:05.04
1995/270 13:20:02.54 to 1995/270 13:45:59.94
1995/270 13:48:00.00 to 1995/270 13:58:26.28
1995/270 14:01:28.18 to 1995/270 14:10:40.62
1995/270 14:17:33.59 to 1995/270 14:20:11.20
1995/270 14:23:20.80 to 1995/270 14:47:51.18
1995/270 14:54:25.42 to 1995/270 15:26:48.62
1995/270 16:01:07.21 to 1995/270 17:04:20.65
1995/270 17:11:22.74 to 1995/270 18:07:29.84
1995/270 18:38:51.04 to 1995/270 18:50:16.87
1995/270 19:22:41.11 to 1995/270 19:28:21.87
1995/270 19:31:49.77 to 1995/270 19:39:45.33
1995/270 19:58:29.24 to 1995/270 20:09:16.63
1995/270 20:21:02.23 to 1995/270 20:27:26.84
1995/270 20:32:32.20 to 1995/270 20:38:34.30
1995/270 20:57:46.06 to 1995/270 21:02:12.76
1995/270 21:26:41.51 to 1995/270 21:31:59.98
1995/270 21:39:47.17 to 1995/270 21:43:29.95
1995/272 04:26:10.63 to 1995/272 04:33:48.70
1995/272 04:49:42.55 to 1995/272 06:13:59.78
1995/272 06:38:25.02 to 1995/272 06:40:55.22
1995/272 07:01:33.16 to 1995/272 07:06:20.46
1995/272 07:08:11.16 to 1995/272 07:29:21.84
1995/272 07:41:39.72 to 1995/272 07:47:38.84
1995/272 07:53:10.27 to 1995/272 07:59:34.58
1995/272 08:47:48.85 to 1995/272 09:02:40.63
1995/272 09:08:16.80 to 1995/272 09:53:16.28
1995/272 10:09:38.86 to 1995/272 10:37:44.21
1995/272 10:51:17.11 to 1995/272 10:57:34.31
1995/272 11:08:58.86 to 1995/272 11:37:22.65
1995/272 11:45:07.98 to 1995/272 12:15:52.79
1995/272 12:23:23.09 to 1995/272 12:54:30.04
1995/272 13:22:18.40 to 1995/272 13:52:49.06
1995/272 13:58:47.45 to 1995/272 14:31:51.79
1995/272 14:38:05.28 to 1995/272 15:09:44.89
1995/272 16:50:22.12 to 1995/272 17:24:15.86
1995/272 17:32:46.52 to 1995/272 18:08:13.28
1995/272 18:19:55.38 to 1995/272 18:55:40.58
1995/272 19:04:43.83 to 1995/272 19:41:51.38

Table E-1. Abstract of Times of Hydrography (Continued)

1995/272 19:49:07.09 to 1995/272 20:26:29.17
1995/272 20:32:51.55 to 1995/272 21:11:25.61
1995/272 21:18:41.61 to 1995/272 21:57:44.41
1995/272 22:04:51.30 to 1995/272 22:46:52.07
1995/272 23:59:18.24 to 1995/272 23:59:57.35
1995/272 23:59:57.42 to 1995/273 00:42:09.45
1995/273 00:51:16.69 to 1995/273 01:26:29.53
1995/273 01:34:02.12 to 1995/273 01:52:56.23
1995/273 02:19:24.63 to 1995/273 02:45:59.70
1995/273 02:54:33.72 to 1995/273 03:37:29.37
1995/273 03:43:57.08 to 1995/273 04:22:54.84
1995/273 04:32:37.48 to 1995/273 05:09:52.75
1995/273 05:16:45.94 to 1995/273 05:52:03.59
1995/273 06:00:22.99 to 1995/273 06:33:55.77
1995/273 06:41:02.58 to 1995/273 07:13:27.82
1995/273 07:23:15.20 to 1995/273 07:53:53.49
1995/273 08:01:35.56 to 1995/273 08:32:10.59
1995/273 08:40:36.51 to 1995/273 09:10:13.77
1995/273 09:18:50.06 to 1995/273 09:49:18.27
1995/273 09:55:24.06 to 1995/273 10:25:56.65
1995/273 10:33:32.57 to 1995/273 11:04:10.57
1995/273 11:08:50.74 to 1995/273 11:37:48.31
1995/273 11:47:59.10 to 1995/273 12:15:59.28
1995/273 12:20:33.83 to 1995/273 12:41:59.92
1995/273 12:45:30.18 to 1995/273 12:47:46.90
1995/273 13:13:40.80 to 1995/273 13:40:45.99
1995/273 13:46:50.00 to 1995/273 14:13:27.94
1995/273 14:19:10.96 to 1995/273 14:45:02.74
1995/273 14:51:11.50 to 1995/273 15:17:09.06
1995/273 15:24:26.57 to 1995/273 15:35:29.94
1995/273 15:40:30.04 to 1995/273 15:46:55.16
1995/273 15:54:09.09 to 1995/273 16:15:41.40
1995/273 16:22:56.21 to 1995/273 16:41:12.70
1995/273 16:49:14.03 to 1995/273 17:05:15.42
1995/273 17:11:56.17 to 1995/273 17:25:41.30
1995/273 17:33:35.81 to 1995/273 17:44:55.48
1995/273 18:11:01.07 to 1995/273 18:19:57.65
1995/273 18:28:09.93 to 1995/273 18:34:39.28
1995/273 18:42:01.80 to 1995/273 18:46:16.64
1995/273 18:52:31.32 to 1995/273 18:54:28.42
1995/273 19:03:45.88 to 1995/273 19:30:09.69
1995/273 19:44:13.63 to 1995/273 20:00:20.65
1995/273 20:08:41.83 to 1995/273 20:40:13.44
1995/273 20:46:04.42 to 1995/273 21:23:14.05
1995/273 21:32:02.78 to 1995/273 22:08:00.42

Table E-1. Abstract of Times of Hydrography (Continued)

1995/273 22:14:24.36 to 1995/273 22:50:56.52
1995/273 23:07:22.13 to 1995/273 23:39:25.44
1995/274 00:28:04.89 to 1995/274 01:08:38.34
1995/274 01:16:19.52 to 1995/274 01:46:47.74
1995/274 01:52:55.31 to 1995/274 02:25:51.06
1995/274 02:32:28.25 to 1995/274 03:03:44.16
1995/274 03:09:14.40 to 1995/274 03:38:56.11
1995/274 03:44:52.42 to 1995/274 04:15:32.19
1995/274 04:23:55.74 to 1995/274 04:51:26.80
1995/274 04:59:01.46 to 1995/274 05:26:28.38
1995/274 05:31:12.70 to 1995/274 05:57:20.52
1995/274 06:04:13.71 to 1995/274 06:29:53.38
1995/274 06:34:49.55 to 1995/274 07:00:01.38
1995/274 07:07:15.90 to 1995/274 07:32:11.13
1995/274 07:37:30.41 to 1995/274 08:02:04.61
1995/274 08:08:34.40 to 1995/274 08:33:09.79
1995/274 09:09:22.09 to 1995/274 09:32:51.71
1995/274 10:08:48.32 to 1995/274 10:32:15.27
1995/274 10:36:32.34 to 1995/274 11:00:03.15
1995/274 11:04:00.96 to 1995/274 11:25:48.37
1995/274 11:29:36.70 to 1995/274 11:51:07.53
1995/274 11:55:43.56 to 1995/274 12:16:04.76
1995/274 12:20:38.42 to 1995/274 12:40:52.81
1995/274 12:45:08.77 to 1995/274 13:04:30.95
1995/274 13:09:35.42 to 1995/274 13:29:30.85
1995/274 14:09:12.90 to 1995/274 14:36:34.78
1995/274 14:41:27.39 to 1995/274 15:00:59.94
1995/274 15:12:19.53 to 1995/274 15:21:34.48
1995/274 15:28:29.15 to 1995/274 15:53:06.61
1995/274 16:03:34.11 to 1995/274 16:12:09.95
1995/274 16:22:09.77 to 1995/274 16:37:10.44
1995/274 16:42:35.05 to 1995/274 17:05:14.31
1995/274 17:11:42.91 to 1995/274 17:34:46.46
1995/274 17:40:18.78 to 1995/274 18:02:22.19
1995/274 18:26:12.40 to 1995/274 18:48:07.51
1995/274 18:53:30.65 to 1995/274 19:15:05.02
1995/274 19:20:24.01 to 1995/274 19:41:29.06
1995/274 19:46:24.05 to 1995/274 20:07:24.65
1995/274 20:17:11.15 to 1995/274 20:21:33.10
1995/274 20:32:51.73 to 1995/274 20:54:01.82
1995/274 21:03:45.35 to 1995/274 21:24:28.48
1995/274 21:30:07.31 to 1995/274 21:50:49.85
1995/274 21:55:30.62 to 1995/274 22:15:04.95

Table E-1. Abstract of Times of Hydrography (Continued)

1995/274 22:48:22.84 to 1995/274 23:09:23.44
1995/274 23:33:00.02 to 1995/274 23:52:51.61
1995/274 23:57:47.19 to 1995/274 23:59:55.83
1995/274 23:59:56.13 to 1995/275 00:11:37.35
1995/275 00:42:11.34 to 1995/275 00:48:24.39
1995/275 00:56:05.27 to 1995/275 01:05:46.22
1995/275 01:08:47.52 to 1995/275 01:24:41.81
1995/275 01:29:10.43 to 1995/275 01:44:05.47
1995/275 01:47:43.73 to 1995/275 02:00:16.86
1995/275 02:05:12.15 to 1995/275 02:16:08.70
1995/275 02:19:53.48 to 1995/275 02:29:21.46
1995/275 02:34:17.63 to 1995/275 02:41:47.93
1995/275 02:46:22.55 to 1995/275 02:52:00.64
1995/275 02:56:18.31 to 1995/275 03:00:15.08
1995/275 03:04:49.33 to 1995/275 03:07:19.31
1995/275 03:13:57.98 to 1995/275 03:28:30.50
1995/275 03:38:49.89 to 1995/275 03:57:26.51
1995/275 04:16:12.48 to 1995/275 04:22:40.04
1995/275 04:28:59.46 to 1995/275 04:34:48.22
1995/275 04:42:41.25 to 1995/275 04:48:30.30
1995/275 04:54:33.43 to 1995/275 04:59:45.16
1995/275 05:06:01.61 to 1995/275 05:11:25.78
1995/275 05:16:38.25 to 1995/275 05:21:41.98
1995/275 05:28:16.80 to 1995/275 05:33:05.05
1995/275 05:38:21.14 to 1995/275 05:42:29.18
1995/275 05:48:33.49 to 1995/275 05:55:32.09
1995/275 06:00:12.93 to 1995/275 06:04:02.59
1995/275 06:13:20.65 to 1995/275 06:17:16.83
1995/275 06:32:22.09 to 1995/275 06:35:36.50
1995/275 06:40:50.45 to 1995/275 06:44:05.46
1995/275 06:50:03.92 to 1995/275 06:52:49.81
1995/275 06:58:20.65 to 1995/275 07:00:47.96
1995/275 07:07:32.63 to 1995/275 07:09:50.98
1995/275 07:37:25.74 to 1995/275 07:47:50.31
1995/275 07:56:25.70 to 1995/275 08:07:21.07
1995/275 08:16:34.69 to 1995/275 08:21:05.53
1995/275 09:20:36.72 to 1995/275 09:28:27.23
1995/275 09:37:40.85 to 1995/275 09:44:10.19
1995/275 10:08:34.76 to 1995/275 10:41:21.92
1995/275 12:07:22.77 to 1995/275 12:12:55.53
1995/275 12:23:42.46 to 1995/275 12:27:27.98
1995/275 12:39:32.82 to 1995/275 12:42:43.98
1995/275 12:48:02.96 to 1995/275 12:55:36.29
1995/275 13:00:57.05 to 1995/275 13:09:08.01
1995/275 13:13:52.63 to 1995/275 13:21:31.00

Table E-1. Abstract of Times of Hydrography (Continued)

1995/275 13:27:15.76 to 1995/275 13:36:18.56
1995/275 13:40:11.04 to 1995/275 13:48:32.95
1995/275 13:53:25.87 to 1995/275 14:02:39.33
1995/275 14:07:01.14 to 1995/275 14:15:34.32
1995/275 14:20:29.60 to 1995/275 14:30:05.58
1995/275 14:39:20.67 to 1995/275 14:52:30.54
1995/275 14:57:28.20 to 1995/275 15:10:57.32
1995/275 15:15:38.09 to 1995/275 15:28:41.15
1995/275 15:33:32.58 to 1995/275 15:47:35.18
1995/275 15:53:12.90 to 1995/275 16:02:59.18
1995/275 16:14:52.47 to 1995/275 16:27:41.30
1995/275 16:35:35.23 to 1995/275 16:47:38.73
1995/275 16:52:51.80 to 1995/275 17:05:20.19
1995/275 17:29:55.43 to 1995/275 17:42:52.56
1995/275 17:50:39.37 to 1995/275 18:06:37.80
1995/275 18:14:58.46 to 1995/275 18:30:40.83
1995/275 18:40:42.43 to 1995/275 19:03:23.47
1995/275 19:10:43.62 to 1995/275 19:34:27.45
1995/275 19:39:14.44 to 1995/275 20:02:13.25
1995/275 20:10:10.73 to 1995/275 20:26:06.79
1995/275 20:30:28.90 to 1995/275 20:46:14.00
1995/275 20:52:46.16 to 1995/275 21:09:07.41
1995/275 21:13:26.25 to 1995/275 21:29:35.05
1995/275 21:35:26.33 to 1995/275 21:51:01.95
1995/275 21:55:28.50 to 1995/275 22:10:14.35
1995/275 22:16:02.67 to 1995/275 22:29:27.94
1995/275 22:34:13.16 to 1995/275 22:46:32.07
1995/275 22:52:10.31 to 1995/275 23:02:38.72
1995/275 23:08:00.97 to 1995/275 23:17:55.31
1995/275 23:22:51.78 to 1995/275 23:30:48.22
1995/275 23:35:45.58 to 1995/275 23:43:12.40
1995/275 23:52:48.82 to 1995/275 23:58:23.95
1995/276 00:04:38.93 to 1995/276 00:09:36.73
1995/299 08:16:14.53 to 1995/299 08:28:02.05
1995/299 08:37:11.21 to 1995/299 08:49:23.61
1995/299 08:55:52.81 to 1995/299 09:19:31.31
1995/299 09:25:23.77 to 1995/299 09:48:18.73
1995/299 09:53:33.86 to 1995/299 10:17:57.10
1995/299 10:21:25.59 to 1995/299 10:45:52.08
1995/299 10:48:52.13 to 1995/299 11:12:27.97
1995/299 11:15:47.27 to 1995/299 11:39:25.18
1995/299 11:42:26.12 to 1995/299 12:06:57.06
1995/299 12:10:15.25 to 1995/299 12:33:40.64
1995/299 12:37:16.31 to 1995/299 13:01:06.00
1995/299 13:03:35.24 to 1995/299 13:09:38.21

Table E-1. Abstract of Times of Hydrography (Continued)

1995/299 13:24:25.10 to 1995/299 13:42:54.92
1995/299 13:45:29.78 to 1995/299 14:11:40.86
1995/299 14:15:19.41 to 1995/299 14:40:37.16
1995/299 14:45:34.22 to 1995/299 15:11:39.67
1995/299 15:17:32.13 to 1995/299 15:47:25.98
1995/299 15:50:01.73 to 1995/299 16:01:20.51
1995/299 16:11:02.56 to 1995/299 16:23:06.07
1995/299 16:27:41.80 to 1995/299 16:58:22.76
1995/299 17:03:07.97 to 1995/299 17:33:30.85
1995/299 17:37:42.89 to 1995/299 18:04:26.55
1995/299 18:13:13.20 to 1995/299 18:22:08.30
1995/299 18:36:27.05 to 1995/299 18:44:11.63
1995/299 18:48:34.33 to 1995/299 18:54:57.75
1995/299 19:09:34.05 to 1995/299 19:14:14.89
1995/299 19:18:17.44 to 1995/299 19:21:14.67
1995/299 19:26:29.21 to 1995/299 19:29:12.82
1995/299 19:36:12.53 to 1995/299 19:37:45.92
1995/299 19:43:31.56 to 1995/299 19:45:02.59
1995/299 19:56:15.29 to 1995/299 19:59:37.70
1995/299 20:09:32.79 to 1995/299 20:13:42.52
1995/299 20:17:49.89 to 1995/299 20:22:33.47
1995/299 20:30:27.99 to 1995/299 20:48:08.63
1995/299 20:52:00.51 to 1995/299 21:07:47.99
1995/299 21:12:01.80 to 1995/299 21:28:36.08
1995/299 21:36:39.18 to 1995/299 21:53:24.42
1995/299 22:00:17.62 to 1995/299 22:17:50.85
1995/299 22:38:15.16 to 1995/299 22:47:58.85
1995/299 22:51:05.41 to 1995/299 23:01:50.41
1995/299 23:04:51.34 to 1995/299 23:15:01.69
1995/299 23:18:19.80 to 1995/299 23:28:41.40
1995/299 23:31:53.30 to 1995/299 23:42:05.12
1995/299 23:45:17.31 to 1995/299 23:55:21.44
1995/299 23:58:34.22 to 1995/299 23:59:57.76
1995/299 23:59:57.83 to 1995/300 00:09:29.30
1995/300 00:20:47.63 to 1995/300 00:23:07.23
1995/300 00:43:40.44 to 1995/300 00:48:06.84
1995/300 00:52:25.09 to 1995/300 00:58:26.00
1995/300 01:01:53.89 to 1995/300 01:09:25.44
1995/300 01:13:43.10 to 1995/300 01:23:24.41
1995/300 01:27:54.52 to 1995/300 01:38:13.45
1995/300 01:42:01.79 to 1995/300 01:54:31.36
1995/300 01:58:35.10 to 1995/300 02:05:31.11
1995/300 02:08:27.60 to 1995/300 02:16:10.70
1995/300 02:19:11.71 to 1995/300 02:26:03.79
1995/300 02:30:42.19 to 1995/300 02:40:24.32

Table E-1. Abstract of Times of Hydrography (Continued)

1995/300 02:43:43.69 to 1995/300 02:50:45.25
1995/300 03:28:23.84 to 1995/300 03:35:30.21
1995/300 03:41:38.38 to 1995/300 03:47:21.21
1995/300 03:55:20.46 to 1995/300 04:02:02.25
1995/300 04:07:51.75 to 1995/300 04:13:38.72
1995/300 04:20:20.66 to 1995/300 04:26:38.45
1995/300 04:36:05.69 to 1995/300 04:37:51.23
1995/300 04:44:17.16 to 1995/300 04:46:11.59
1995/300 04:52:41.67 to 1995/300 04:54:31.65
1995/300 04:58:41.02 to 1995/300 05:00:32.19
1995/300 05:06:24.35 to 1995/300 05:08:11.67
1995/300 05:14:02.35 to 1995/300 05:15:42.55

F Features Correlated with Multibeam Source Data

DEPTHS ARE IN METERS

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
1	41 23.32628N	070 54.21986W	27.38	ROCK	1	mba95270.d01	32381	51	27.38
4	41 22.91233N	070 55.42690W	25.56	ROCK	1	mba95263.d05	17329	31	25.56
5	41 22.89679N	070 55.51389W	26.57	ROCK	1	mba95270.d01	22935	7	26.57
6	41 22.80746N	070 55.62180W	27.29	ROCK	1	mba95270.d01	29753	4	27.29
8	41 22.80804N	070 55.74596W	24.7	ROCK	1	mba95270.d01	23522	45	24.7
9	41 22.68931N	070 56.06174W	23.02	ROCK	1	mba95270.d01	24635	37	23.02
10	41 22.63601N	070 56.05222W	23.16	ROCK	1	mba95270.d01	28155	30	23.16
11	41 22.67343N	070 56.07772W	22.57	ROCK	1	mba95263.d05	18836	40	22.57
12	41 22.49077N	070 56.46690W	21.28	ROCK	1	mba95268.d01	119084	10	21.28
13	41 22.39143N	070 56.83276W	16.86	ROCK	1	mba95275.d06	21216	21	16.86
15	41 22.25459N	070 57.09708W	12.41	ROCK	1	mba95268.d01	121392	7	12.41
16	41 22.26152N	070 57.16116W	12.84	ROCK	1	mba95268.d01	95197	29	12.84
17	41 22.28152N	070 57.13147W	12.3	ROCK	1	mba95275.d06	19989	21	12.3
18	41 22.26207N	070 57.19411W	12.09	ROCK	1	mba95275.d06	19738	37	12.09
19	41 22.27412N	070 57.22373W	11.47	ROCK	1	mba95275.d06	22905	36	11.47
21	41 22.22537N	070 57.31907W	9.92	ROCK	1	mba95268.d01	69827	45	9.92
24	41 22.20065N	070 57.35066W	10.61	ROCK	1	mba95275.d06	19093	18	10.61
25	41 22.16986N	070 57.34408W	13.34	ROCK	1	mba95275.d06	16076	20	13.34
26	41 22.18108N	070 57.42121W	11.24	ROCK	1	mba95275.d06	18824	23	11.24
27	41 22.20200N	070 57.42259W	10.9	ROCK	1	mba95275.d06	23625	3	10.9
28	41 22.10488N	070 57.54088W	12.13	ROCK	1	mba95275.d06	16757	22	12.13
29	41 22.11475N	070 57.50514W	10.63	ROCK	1	mba95275.d06	16637	1	10.63
30	41 22.06105N	070 57.61416W	15.12	ROCK	1	mba95268.d01	123274	1	15.12
31	41 22.05703N	070 57.58957W	14.9	ROCK	1	mba95275.d06	10160	46	14.9
32	41 22.08193N	070 57.71437W	13.79	ROCK	1	mba95268.d01	71382	58	13.79
35	41 22.02504N	070 57.78522W	17.14	ROCK	1	mba95268.d01	97540	5	17.14
36	41 22.04997N	070 57.78176W	17.12	ROCK	1	mba95268.d01	71654	22	17.12
39	41 21.99179N	070 57.92839W	15.68	ROCK	1	mba95268.d01	72229	23	15.68
40	41 22.01403N	070 57.89032W	16.19	ROCK	1	mba95268.d01	72071	7	16.19
43	41 21.66820N	070 58.90998W	21.97	ROCK	1	mba95263.d05	41134	31	21.97
44	41 21.87570N	070 58.27145W	20.49	ROCK	1	mba95268.d01	73526	19	20.49
46	41 21.89677N	070 58.20382W	18.98	ROCK	1	mba95268.d01	73278	6	18.98
47	41 21.90955N	070 58.25224W	20.02	ROCK	1	mba95268.d01	108789	34	20.02
48	41 21.95923N	070 58.18853W	20.65	ROCK	1	mba95268.d01	83474	5	20.65
49	41 21.96266N	070 58.11329W	18.93	ROCK	1	mba95263.d05	45035	38	18.93
50	41 22.05709N	070 57.83867W	15.92	ROCK	1	mba95268.d01	110436	28	15.92
51	41 22.07650N	070 57.87218W	14.62	ROCK	1	mba95268.d01	84721	39	14.62
52	41 22.31069N	070 57.16110W	12.43	ROCK	1	mba95263.d05	49788	20	12.43
53	41 22.37405N	070 56.99296W	16.47	ROCK	1	mba95263.d05	53809	52	16.47
54	41 22.43644N	070 56.82116W	17.02	ROCK	1	mba95263.d05	54671	20	17.02
56	41 22.42887N	070 56.76424W	16.27	ROCK	1	mba95268.d01	67624	36	16.27
57	41 22.45445N	070 56.68539W	19.64	ROCK	1	mba95268.d01	67320	22	19.64
59	41 22.78817N	070 55.89676W	24.35	ROCK	1	mba95263.d05	59282	37	24.35
60	41 23.45589N	070 54.22579W	21.93	ROCK	1	mba95268.d04	72475	59	21.93
61	41 23.33295N	070 54.57021W	26.4	ROCK	1	mba95263.d05	82754	18	26.4
62	41 23.11666N	070 55.12862W	26.66	ROCK	1	mba95263.d05	85429	33	26.66
63	41 22.88334N	070 55.82995W	22.16	ROCK	1	mba95299.d01	1658	29	22.16
64	41 22.90813N	070 55.83065W	23.27	ROCK	1	mba95263.d06	20273	34	23.27
65	41 22.75923N	070 56.14201W	19.14	ROCK	1	mba95299.d01	2807	43	19.14
66	41 22.66646N	070 56.48371W	19.82	ROCK	1	mba95272.d02	19051	35	19.82
67	41 22.62780N	070 56.59224W	19.63	ROCK	1	mba95272.d02	18531	29	19.63
68	41 22.57152N	070 56.63436W	19.36	ROCK	1	mba95299.d01	4587	30	19.36
69	41 22.50915N	070 56.77386W	16.97	ROCK	1	mba95263.d05	93429	5	16.97
70	41 22.37449N	070 57.10101W	14.32	ROCK	1	mba95275.d06	30215	39	14.32

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
71	41 22.39368N	070 57.14415W	14.14	ROCK	1	mba95268.d01	139921	40	14.14
72	41 22.35099N	070 57.20959W	12.42	ROCK	1	mba95263.d05	95471	56	12.42
73	41 22.35031N	070 57.24759W	14.01	ROCK	1	mba95275.d06	35878	1	14.01
74	41 22.29910N	070 57.33721W	12.77	ROCK	1	mba95263.d05	96085	34	12.77
75	41 22.31790N	070 57.37506W	13.13	ROCK	1	mba95268.d01	138951	6	13.13
76	41 22.33104N	070 57.33745W	12.99	ROCK	1	mba95268.d01	139110	12	12.99
77	41 22.35510N	070 57.41269W	13.19	ROCK	1	mba95270.d02	7830	8	13.19
78	41 22.26261N	070 57.44376W	12.31	ROCK	1	mba95263.d05	96595	6	12.31
79	41 22.27708N	070 57.42488W	13.1	ROCK	1	mba95263.d05	96483	37	13.1
80	41 22.30881N	070 57.43502W	12.95	ROCK	1	mba95299.d03	95775	34	12.95
81	41 22.25759N	070 57.48871W	11.36	ROCK	1	mba95275.d06	34933	18	11.36
82	41 22.23908N	070 57.49894W	10.82	ROCK	1	mba95263.d05	96874	37	10.82
83	41 22.23132N	070 57.44418W	12.06	ROCK	1	mba95263.d03	51285	3	12.06
84	41 22.17957N	070 57.59689W	10.74	ROCK	1	mba95268.d01	85793	40	10.74
85	41 22.18377N	070 57.66806W	12.42	ROCK	1	mba95263.d05	97691	38	12.42
86	41 22.13875N	070 57.83733W	12.2	ROCK	1	mba95268.d01	137068	28	12.2
87	41 22.05258N	070 58.07585W	15.09	ROCK	1	mba95268.d01	136143	28	15.09
88	41 22.00106N	070 58.11374W	17.2	ROCK	1	mba95263.d03	67025	54	17.2
93	41 22.01811N	070 58.31725W	18.82	ROCK	1	mba95270.d02	4661	4	18.82
95	41 22.03740N	070 58.23316W	18.91	ROCK	1	mba95299.d03	88902	25	18.91
96	41 22.05156N	070 58.32042W	19.1	ROCK	1	mba95263.d06	61583	34	19.1
98	41 22.11635N	070 57.97727W	13.36	ROCK	1	mba95270.d07	15297	9	13.36
99	41 22.22484N	070 57.69933W	13.62	ROCK	1	mba95272.d02	13344	25	13.62
100	41 22.19456N	070 57.73219W	12.13	ROCK	1	mba95299.d03	94556	58	12.13
101	41 22.30918N	070 57.50676W	13.16	ROCK	1	mba95299.d03	85976	25	13.16
102	41 22.36990N	070 57.27545W	12.73	ROCK	1	mba95299.d03	96438	27	12.73
103	41 22.43027N	070 57.18544W	13.92	ROCK	1	mba95299.d03	84819	18	13.92
104	41 22.38371N	070 57.29553W	13.46	ROCK	1	mba95299.d03	85220	53	13.46
105	41 22.49774N	070 57.00164W	14.16	ROCK	1	mba95299.d03	84152	38	14.16
107	41 22.55628N	070 56.86131W	18.73	ROCK	1	mba95270.d02	9736	20	18.73
109	41 22.60410N	070 56.81323W	18.16	ROCK	1	mba95263.d06	54351	3	18.16
110	41 22.57712N	070 56.71702W	17.22	ROCK	1	mba95299.d03	98698	32	17.22
111	41 22.72963N	070 56.32984W	21.65	ROCK	1	mba95272.d02	19808	54	21.65
112	41 22.77843N	070 56.25234W	20.6	ROCK	1	mba95263.d03	22635	21	20.6
113	41 22.78697N	070 56.28492W	20.11	ROCK	1	mba95263.d03	22751	30	20.11
114	41 23.42385N	070 54.59663W	25.26	ROCK	1	mba95268.d04	57194	40	25.26
115	41 23.43778N	070 54.56825W	25.51	ROCK	1	mba95268.d04	57053	46	25.51
116	41 23.50253N	070 54.48122W	23.36	ROCK	1	mba95267.d03	37491	2	23.36
117	41 22.99397N	070 55.77445W	22.45	ROCK	1	mba95263.d06	49362	57	22.45
118	41 22.96276N	070 55.80290W	23.57	ROCK	1	mba95270.d02	13498	29	23.57
119	41 22.94524N	070 55.90640W	21.85	ROCK	1	mba95263.d06	49995	20	21.85
120	41 22.97584N	070 55.95250W	21.77	ROCK	1	mba95263.d06	95250	26	21.77
121	41 22.96842N	070 55.91141W	21.87	ROCK	1	mba95267.d03	32155	48	21.87
122	41 22.86201N	070 56.19954W	20.05	ROCK	1	mba95267.d03	31071	4	20.05
123	41 22.76262N	070 56.38818W	21.13	ROCK	1	mba95263.d06	52310	48	21.13
124	41 22.73085N	070 56.47910W	20.35	ROCK	1	mba95270.d07	32716	59	20.35
125	41 22.69301N	070 56.51092W	20.32	ROCK	1	mba95270.d02	10977	42	20.32
126	41 22.75613N	070 56.51641W	19.8	ROCK	2	mba95263.d06	92544	44	19.8
127	41 22.64883N	070 56.69473W	18.71	ROCK	1	mba95263.d06	53780	49	18.71
128	41 22.65318N	070 56.62957W	20.51	ROCK	1	mba95270.d02	10573	31	20.51
130	41 22.51604N	070 57.06746W	13.19	ROCK	1	mba95263.d06	55549	35	13.19
131	41 22.56563N	070 57.01368W	15.65	ROCK	1	mba95275.d06	50433	25	15.65
132	41 22.54270N	070 57.12135W	14.76	ROCK	1	mba95263.d06	89698	59	14.76
133	41 22.50731N	070 57.20067W	12.99	ROCK	1	mba95275.d06	51083	37	12.99

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
134	41 22.51673N	070 57.15704W	14.8	ROCK	1	mba95275.d06	50937	7	14.8
135	41 22.52969N	070 57.21938W	14.89	ROCK	1	mba95268.d01	8379	29	14.89
137	41 22.38723N	070 57.39863W	13.63	ROCK	1	mba95263.d06	57153	8	13.63
138	41 22.38023N	070 57.45730W	13.92	ROCK	1	mba95275.d06	46411	46	13.92
140	41 22.35305N	070 57.62793W	15.32	ROCK	1	mba95263.d06	87324	56	15.32
142	41 22.21894N	070 57.76018W	13.38	ROCK	1	mba95270.d02	6602	40	13.38
143	41 22.23582N	070 57.81826W	13.53	ROCK	1	mba95263.d06	59176	30	13.53
144	41 22.22205N	070 57.89718W	15.24	ROCK	1	mba95275.d06	44776	23	15.24
145	41 22.13473N	070 58.07245W	15.48	ROCK	1	mba95263.d06	60422	1	15.48
146	41 22.11564N	070 58.17602W	14.26	OBSTR	1	mba95275.d06	43761	26	14.26
147	41 22.09426N	070 58.21989W	18.39	ROCK	1	mba95275.d06	43593	55	18.39
148	41 21.80336N	070 59.11357W	23.85	ROCK	1	mba95263.d06	80196	50	23.85
149	41 21.74161N	070 59.24792W	23.05	ROCK	1	mba95263.d06	79503	36	23.05
150	41 21.82012N	070 59.17688W	23.81	ROCK	1	mba95264.d01	31577	20	23.81
151	41 21.88195N	070 58.97808W	22.54	ROCK	1	mba95268.d01	1927	2	22.54
152	41 21.88306N	070 58.85210W	22.99	ROCK	1	mba95267.d03	20941	21	22.99
153	41 22.02116N	070 58.51604W	22.77	ROCK	1	mba95263.d06	83127	21	22.77
154	41 22.09501N	070 58.27439W	16.39	ROCK	1	mba95267.d03	23182	35	16.39
155	41 22.16111N	070 58.15387W	15.27	ROCK	1	mba95263.d06	84865	40	15.27
156	41 22.14467N	070 58.27880W	16.63	ROCK	1	mba95268.d01	4570	35	16.63
157	41 22.22008N	070 58.10242W	12.87	ROCK	1	mba95299.d03	70004	5	12.87
158	41 22.19967N	070 58.13418W	13.27	ROCK	1	mba95268.d01	5110	29	13.27
159	41 22.20614N	070 58.06613W	12.97	ROCK	1	mba95299.d03	73743	12	12.97
160	41 22.20912N	070 58.01743W	14.72	ROCK	1	mba95263.d06	85504	14	14.72
161	41 22.24793N	070 58.02435W	13.93	ROCK	1	mba95299.d03	69719	7	13.93
162	41 22.15978N	070 57.90122W	13.68	ROCK	1	mba95299.d03	87620	26	13.68
163	41 22.27654N	070 57.90186W	15.7	ROCK	1	mba95268.d01	5941	25	15.7
164	41 22.32328N	070 57.85880W	13.64	ROCK	1	mba95264.d01	25325	51	13.64
165	41 22.26767N	070 57.82688W	13.66	ROCK	1	mba95275.d06	53376	44	13.66
166	41 22.30845N	070 57.67903W	15.3	ROCK	1	mba95267.d03	25464	24	15.3
167	41 22.32820N	070 57.69250W	15.59	ROCK	1	mba95263.d06	87020	24	15.59
168	41 22.36388N	070 57.68921W	16.39	ROCK	1	mba95263.d03	52440	30	16.39
169	41 22.44241N	070 57.55606W	17.36	ROCK	1	mba95264.d01	23837	30	17.36
170	41 22.83163N	070 56.43559W	19.71	ROCK	1	mba95268.d01	11197	37	19.71
171	41 22.86273N	070 56.41552W	17.04	ROCK	1	mba95264.d01	18298	59	17.04
172	41 22.85673N	070 56.25679W	21.35	ROCK	1	mba95263.d06	93788	35	21.35
173	41 22.89645N	070 56.24072W	18.23	ROCK	1	mba95268.d01	11874	23	18.23
174	41 23.07761N	070 56.00863W	16.14	ROCK	1	mba95299.d01	35170	25	16.14
175	41 23.08427N	070 56.09281W	16.55	ROCK	1	mba95299.d01	12581	39	16.55
177	41 23.04588N	070 56.09663W	18.43	ROCK	1	mba95299.d01	34837	35	18.43
178	41 23.06251N	070 55.97588W	18.64	ROCK	1	mba95299.d01	16622	29	18.64
179	41 22.96879N	070 56.12389W	18.89	ROCK	1	mba95264.d01	16898	56	18.89
180	41 23.02297N	070 56.20359W	18.45	ROCK	1	mba95270.d02	36031	16	18.45
181	41 23.12602N	070 55.76321W	21.64	ROCK	1	mba95268.d01	34152	39	21.64
182	41 23.65986N	070 54.21443W	24.48	ROCK	1	mba95268.d01	19016	31	24.48
183	41 24.00792N	070 53.26230W	23.67	ROCK	1	mba95268.d01	22360	4	23.67
184	41 23.58647N	070 54.46857W	22.99	ROCK	1	mba95263.d01	62114	26	22.99
185	41 22.85662N	070 56.64642W	15.84	ROCK	1	mba95270.d02	37673	49	15.84
186	41 22.83228N	070 56.74332W	14.21	ROCK	1	mba95299.d01	10238	14	14.21
187	41 22.69172N	070 56.87837W	17.72	ROCK	1	mba95264.d01	20524	21	17.72
188	41 22.76534N	070 56.95722W	15.77	ROCK	1	mba95264.d02	18986	33	15.77
189	41 22.62300N	070 57.03767W	17.57	ROCK	1	mba95299.d03	66214	25	17.57
190	41 22.63115N	070 57.09660W	15.62	ROCK	1	mba95268.d01	39090	40	15.62
191	41 22.51736N	070 57.30713W	14.69	ROCK	1	mba95299.d03	67164	59	14.69

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
192	41 22.26469N	070 58.11742W	12.75	ROCK	1	mba95299.d01	24346	23	12.75
193	41 22.29347N	070 58.10901W	13.38	ROCK	1	mba95299.d01	27542	25	13.38
194	41 22.14750N	070 58.40594W	21.8	ROCK	1	mba95268.d01	43896	7	21.8
195	41 22.15178N	070 58.52726W	21.96	ROCK	1	mba95270.d02	44524	38	21.96
196	41 22.12023N	070 58.54570W	21.84	ROCK	1	mba95264.d01	37290	59	21.84
197	41 22.08138N	070 58.50944W	22.33	ROCK	1	mba95264.d01	28444	52	22.33
198	41 21.96274N	070 58.80980W	22.54	ROCK	1	mba95264.d01	29863	28	22.54
199	41 21.94855N	070 59.09424W	23.23	ROCK	1	mba95263.d04	10004	19	23.23
200	41 22.06558N	070 58.83031W	20.91	ROCK	1	mba95264.d02	27840	32	20.91
202	41 22.33938N	070 58.02004W	17.88	ROCK	1	mba95270.d02	42737	42	17.88
204	41 22.34066N	070 57.91313W	15.47	ROCK	1	mba95299.d01	23582	31	15.47
206	41 22.38398N	070 57.90793W	16.07	ROCK	1	mba95299.d01	28321	29	16.07
207	41 22.47250N	070 57.65729W	16.43	ROCK	1	mba95270.d02	41420	23	16.43
208	41 22.51838N	070 57.69458W	15.24	ROCK	1	mba95270.d02	54448	24	15.24
209	41 22.54174N	070 57.48868W	16.16	ROCK	1	mba95270.d02	40791	8	16.16
210	41 22.96442N	070 56.43790W	20.69	ROCK	1	mba95264.d02	16586	19	20.69
211	41 22.99305N	070 56.34333W	20.23	ROCK	1	mba95264.d02	16159	36	20.23
212	41 22.98463N	070 56.26563W	18.93	ROCK	1	mba95299.d01	34199	23	18.93
213	41 23.35442N	070 55.45933W	21.66	ROCK	1	mba95270.d02	62391	6	21.66
214	41 23.29719N	070 55.54441W	21.65	ROCK	1	mba95264.d02	12398	59	21.65
215	41 23.28895N	070 55.58374W	21.25	ROCK	1	mba95264.d02	12569	35	21.25
216	41 23.17710N	070 55.94063W	17.8	ROCK	1	mba95270.d02	60716	36	17.8
217	41 23.22102N	070 55.87233W	15.96	ROCK	1	mba95264.d02	48761	31	15.96
218	41 23.21187N	070 55.99961W	17.03	ROCK	1	mba95270.d03	11725	33	17.03
219	41 23.07396N	070 56.13639W	18.34	ROCK	1	mba95264.d02	15190	6	18.34
220	41 23.11281N	070 56.13308W	17.36	ROCK	1	mba95299.d01	57667	60	17.36
221	41 22.86077N	070 56.83871W	13.63	ROCK	1	mba95264.d02	44285	27	13.63
222	41 22.84132N	070 56.81744W	14.29	ROCK	1	mba95270.d02	57540	38	14.29
223	41 22.88204N	070 56.70887W	15.89	ROCK	1	mba95270.d02	57938	40	15.89
224	41 22.87510N	070 56.76894W	14.14	ROCK	1	mba95299.d01	55400	55	14.14
225	41 22.81949N	070 56.97598W	17.14	ROCK	1	mba95264.d02	43668	31	17.14
226	41 22.64925N	070 57.21779W	15.79	ROCK	1	mba95270.d02	39777	38	15.79
227	41 22.59962N	070 57.42941W	15.4	ROCK	1	mba95264.d02	21104	32	15.4
228	41 22.56603N	070 57.43907W	13.39	ROCK	1	mba95270.d02	40595	24	13.39
229	41 22.66293N	070 57.39472W	14.64	ROCK	1	mba95264.d02	41675	36	14.64
230	41 22.67082N	070 57.43942W	15.03	ROCK	1	mba95270.d03	16837	13	15.03
231	41 22.58694N	070 57.50867W	14.35	ROCK	1	mba95270.d02	55100	33	14.35
232	41 22.57954N	070 57.59311W	14.31	ROCK	1	mba95299.d01	52450	22	14.31
233	41 22.33207N	070 58.16252W	14.52	ROCK	1	mba95299.d01	47354	37	14.52
235	41 22.17091N	070 58.82912W	16.86	ROCK	1	mba95299.d03	48028	12	16.86
236	41 22.09092N	070 58.82740W	20.45	ROCK	1	mba95270.d02	50436	33	20.45
238	41 22.02879N	070 58.88863W	22.13	ROCK	1	mba95270.d02	45773	30	22.13
239	41 22.01933N	070 59.03822W	21.74	ROCK	1	mba95270.d02	49712	55	21.74
240	41 22.47550N	070 57.96102W	19.57	ROCK	1	mba95270.d03	18723	8	19.57
241	41 22.56306N	070 57.64368W	15.99	ROCK	1	mba95264.d02	40466	29	15.99
242	41 22.67181N	070 57.31606W	15.42	ROCK	1	mba95299.d01	53473	29	15.42
243	41 22.70687N	070 57.31854W	17.09	ROCK	1	mba95299.d01	66332	32	17.09
244	41 22.75149N	070 57.21299W	17	ROCK	1	mba95270.d03	16042	34	17
245	41 22.79881N	070 57.09311W	16.96	ROCK	1	mba95270.d03	15609	7	16.96
246	41 22.91395N	070 56.77081W	15.91	ROCK	1	mba95270.d03	14488	31	15.91
247	41 22.91327N	070 56.68468W	15.7	ROCK	1	mba95299.d01	55718	30	15.7
248	41 23.13895N	070 56.15683W	17.88	ROCK	1	mba95299.d01	62144	59	17.88
249	41 23.14201N	070 56.12974W	17.7	ROCK	1	mba95299.d01	62062	34	17.7
250	41 23.84558N	070 54.35681W	22.33	ROCK	1	mba95268.d04	37948	5	22.3*

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
251	41 23.29742N	070 55.76607W	17.63	ROCK	1	mba95270.d03	10888	23	17.63
252	41 23.32416N	070 55.77410W	18.96	ROCK	1	mba95264.d02	74556	34	18.96
253	41 23.28475N	070 55.90429W	14.83	ROCK	1	mba95299.d01	80156	42	14.83
254	41 23.24787N	070 55.94271W	16.25	ROCK	1	mba95264.d02	75395	23	16.25
255	41 23.26117N	070 55.98685W	16.05	ROCK	1	mba95270.d03	37328	27	16.05
256	41 23.17904N	070 56.11496W	18.59	ROCK	1	mba95300.d01	68689	39	18.59
257	41 23.15702N	070 56.10733W	18.36	ROCK	1	mba95299.d01	61973	22	18.36
258	41 23.18140N	070 56.07129W	17.98	ROCK	1	mba95270.d03	11986	13	17.98
259	41 23.19609N	070 56.06527W	18.34	ROCK	1	mba95300.d01	68864	1	18.34
260	41 23.17367N	070 56.23535W	18.71	ROCK	1	mba95270.d03	36423	41	18.71
261	41 23.18493N	070 56.21067W	19.04	ROCK	1	mba95270.d03	36519	36	19.04
262	41 23.15033N	070 56.28343W	18	ROCK	1	mba95270.d03	36236	27	18
263	41 23.11051N	070 56.30098W	19.73	ROCK	1	mba95300.d01	68024	36	19.73
264	41 23.11192N	070 56.37847W	18.87	ROCK	1	mba95299.d01	78470	33	18.87
265	41 23.06608N	070 56.49908W	19.64	ROCK	1	mba95270.d03	35447	36	19.64
266	41 22.98603N	070 56.69623W	16.46	ROCK	1	mba95299.d01	77317	54	16.46
267	41 22.96538N	070 56.73577W	16.52	ROCK	1	mba95264.d02	79263	30	16.52
268	41 22.96956N	070 56.77536W	14.74	ROCK	1	mba95270.d03	34448	22	14.74
269	41 22.94578N	070 56.84429W	12.62	ROCK	1	mba95270.d03	34198	56	12.62
270	41 22.86795N	070 56.90998W	16.91	ROCK	1	mba95270.d03	14962	11	16.91
271	41 22.87368N	070 57.01219W	16.18	ROCK	1	mba95299.d01	76209	38	16.18
272	41 22.84797N	070 56.99636W	16.96	ROCK	1	mba95275.d06	63191	50	16.96
273	41 22.82324N	070 57.05309W	13.37	ROCK	1	mba95275.d06	63407	31	13.37
274	41 22.84473N	070 57.15981W	16.66	ROCK	1	mba95299.d01	87826	24	16.66
275	41 22.79922N	070 57.19795W	16.51	ROCK	1	mba95299.d01	75540	20	16.51
276	41 22.68920N	070 57.42622W	15.03	ROCK	1	mba95275.d06	64770	9	15.03
277	41 22.65615N	070 57.56886W	14.1	ROCK	1	mba95270.d07	22325	30	14.1
278	41 22.67383N	070 57.64118W	15.85	ROCK	1	mba95264.d03	9751	21	15.85
281	41 22.55356N	070 57.87875W	19.52	ROCK	1	mba95270.d03	30339	34	19.52
282	41 22.55661N	070 57.94953W	18.95	ROCK	1	mba95264.d03	8223	29	18.95
283	41 22.43988N	070 58.17722W	20.76	ROCK	1	mba95299.d01	72039	37	20.76
284	41 22.42271N	070 58.29509W	18.63	ROCK	1	mba95299.d01	92023	23	18.63
285	41 22.27454N	070 58.64634W	21.13	ROCK	1	mba95270.d03	27452	49	21.13
286	41 22.25064N	070 58.71679W	20.81	ROCK	1	mba95270.d03	27193	39	20.81
287	41 22.21074N	070 58.80936W	19.46	ROCK	1	mba95270.d03	26849	55	19.46
288	41 22.15728N	070 58.96934W	16.42	ROCK	1	mba95270.d03	26268	7	16.42
289	41 22.07131N	070 58.99469W	20.45	ROCK	1	mba95268.d03	92057	32	20.45
290	41 22.12442N	070 59.05082W	18.53	ROCK	1	mba95270.d03	25958	1	18.53
293	41 22.07140N	070 59.18189W	21.92	ROCK	1	mba95270.d03	25466	18	21.92
294	41 22.13337N	070 59.22674W	21.22	ROCK	1	mba95264.d03	60573	26	21.22
295	41 22.14813N	070 59.14896W	19.53	ROCK	1	mba95270.d03	69145	27	19.53
296	41 22.14406N	070 59.07214W	15.36	ROCK	1	mba95264.d03	2870	48	15.36
298	41 22.16800N	070 59.10325W	16.32	ROCK	1	mba95270.d03	68973	39	16.32
300	41 22.23952N	070 58.74214W	19.86	ROCK	1	mba95270.d03	27100	1	19.86
301	41 22.34690N	070 58.65136W	20.34	ROCK	1	mba95264.d03	57780	27	20.34
302	41 22.44414N	070 58.30865W	19.3	ROCK	2	mba95270.d03	66062	16	19.3
303	41 22.42453N	070 58.25292W	19.64	ROCK	1	mba95270.d03	28942	48	19.64
304	41 22.47036N	070 58.22694W	18.29	ROCK	1	mba95264.d03	6893	19	18.29
305	41 22.49152N	070 58.22187W	18.07	ROCK	1	mba95299.d01	93856	38	18.07
306	41 22.49237N	070 58.10855W	21	ROCK	1	mba95264.d03	7419	39	21
307	41 22.50594N	070 58.10098W	19.96	ROCK	1	mba95264.d03	7492	53	19.96
308	41 22.52893N	070 58.09229W	20.47	ROCK	1	mba95275.d06	66785	33	20.47
309	41 22.56098N	070 58.01726W	19.53	ROCK	1	mba95270.d03	64977	38	19.53
310	41 22.54129N	070 58.00241W	19.17	ROCK	1	mba95264.d03	7973	11	19.17

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
313	41 22.59257N	070 57.81443W	16.05	ROCK	1	mba95270.d03	30608	26	16.05
315	41 22.61949N	070 57.69119W	15.45	ROCK	1	mba95299.d01	73760	36	15.45
316	41 22.65882N	070 57.69950W	16.32	ROCK	1	mba95264.d03	9481	32	16.32
317	41 22.67406N	070 57.68175W	14.09	ROCK	1	mba95275.d06	68350	16	14.09
318	41 22.69782N	070 57.62895W	16.48	ROCK	1	mba95275.d06	68562	2	16.48
319	41 22.70444N	070 57.56978W	17.23	ROCK	1	mba95264.d03	10111	3	17.23
320	41 22.74736N	070 57.52071W	14.73	ROCK	1	mba95270.d03	63164	35	14.73
321	41 22.82007N	070 57.36856W	16.54	ROCK	1	mba95299.d01	96973	40	16.54
322	41 22.83384N	070 57.29078W	14.36	ROCK	1	mba95270.d03	62332	48	14.36
323	41 22.85960N	070 57.20182W	15.82	ROCK	1	mba95275.d06	70173	24	15.82
324	41 22.93239N	070 57.14950W	12.09	ROCK	1	mba95299.d02	5858	37	12.09
325	41 22.90245N	070 57.13932W	12.37	ROCK	1	mba95299.d01	97797	54	12.37
326	41 22.93298N	070 57.24214W	13.41	ROCK	1	mba95264.d04	11912	8	13.41
327	41 22.92009N	070 57.20874W	14.83	ROCK	1	mba95270.d04	9120	40	14.83
328	41 22.90235N	070 57.07970W	16.75	ROCK	1	mba95275.d06	70615	39	16.75
329	41 22.96600N	070 57.04863W	16.21	ROCK	1	mba95299.d02	5498	56	16.21
330	41 22.94789N	070 56.93976W	17.09	ROCK	1	mba95275.d06	71110	26	17.09
331	41 22.97867N	070 56.93996W	17.59	ROCK	1	mba95299.d01	98511	11	17.59
332	41 22.98476N	070 56.74500W	15.46	ROCK	1	mba95270.d03	34567	2	15.46
333	41 23.09081N	070 56.70008W	17.01	ROCK	1	mba95272.d02	24776	39	17.01
334	41 23.07446N	070 56.64370W	17.73	ROCK	1	mba95270.d03	60028	46	17.73
335	41 23.13360N	070 56.66184W	17.92	ROCK	1	mba95299.d02	23609	16	17.92
336	41 23.12729N	070 56.62003W	19.44	ROCK	1	mba95299.d02	3939	22	19.44
337	41 23.14095N	070 56.48266W	18.57	ROCK	1	mba95299.d01	100153	33	18.57
338	41 23.25679N	070 56.37198W	15.41	ROCK	1	mba95264.d04	15966	49	15.41
339	41 23.20498N	070 56.40420W	15.97	ROCK	1	mba95299.d02	3169	54	15.97
340	41 23.19395N	070 56.54234W	18.84	ROCK	1	mba95264.d04	15168	48	18.84
341	41 23.18648N	070 56.28314W	16.76	ROCK	1	mba95264.d03	16335	32	16.76
342	41 23.27324N	070 56.04024W	15.06	ROCK	1	mba95264.d03	17504	52	15.06
343	41 23.25307N	070 56.23642W	16.42	ROCK	1	mba95264.d03	45860	46	16.42
344	41 23.25482N	070 56.13876W	18.26	ROCK	1	mba95270.d03	58264	24	18.26
345	41 23.27042N	070 56.20590W	18.79	ROCK	1	mba95264.d03	45701	28	18.79
346	41 23.24908N	070 56.06321W	17.12	ROCK	1	mba95299.d01	83807	8	17.12
347	41 23.31774N	070 56.06399W	15.02	ROCK	1	mba95264.d03	45054	9	15.02
348	41 23.31804N	070 55.98494W	16.14	ROCK	1	mba95270.d03	57715	4	16.14
349	41 23.37255N	070 55.95353W	16.05	ROCK	1	mba95299.d02	1560	14	16.05
351	41 23.41980N	070 55.74539W	19.92	ROCK	1	mba95299.d01	102800	58	19.92
352	41 23.48328N	070 55.79103W	18.73	ROCK	1	mba95264.d04	18713	22	18.73
353	41 23.51343N	070 55.29096W	22.28	ROCK	1	mba95270.d03	39889	37	22.28
354	41 23.54481N	070 55.50722W	20.37	ROCK	1	mba95270.d04	15120	30	20.37
356	41 23.25223N	070 56.29224W	17.55	ROCK	1	mba95270.d04	12339	34	17.55
357	41 23.27881N	070 56.31744W	16.87	ROCK	1	mba95264.d04	16224	6	16.87
358	41 23.02633N	070 57.05968W	15.39	ROCK	1	mba95270.d04	35394	40	15.39
359	41 23.03153N	070 57.00979W	16.37	ROCK	1	mba95275.d06	73357	1	16.37
360	41 22.89207N	070 57.26316W	14.53	ROCK	1	mba95270.d04	8903	38	14.53
361	41 22.76897N	070 57.48043W	16.42	ROCK	1	mba95299.d01	96554	40	16.42
362	41 22.70553N	070 57.74683W	14.47	ROCK	1	mba95299.d02	8135	58	14.47
363	41 22.67848N	070 57.80933W	15.91	ROCK	1	mba95299.d02	8374	3	15.91
364	41 22.69100N	070 57.89790W	17.91	ROCK	1	mba95264.d04	8882	43	17.91
365	41 22.63301N	070 58.04246W	16.04	ROCK	1	mba95264.d04	8199	24	16.04
366	41 22.60378N	070 58.03862W	15.93	ROCK	1	mba95270.d04	6039	36	15.93
367	41 22.61223N	070 58.11424W	16.1	ROCK	1	mba95263.d03	54437	30	16.1
368	41 22.56854N	070 58.23492W	16.07	ROCK	1	mba95264.d04	7324	29	16.07
369	41 22.55268N	070 58.18349W	17.72	ROCK	1	mba95270.d04	5503	24	17.72

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
370	41 22.53562N	070 58.23537W	17.23	ROCK	1	mba95270.d04	5312	51	17.23
371	41 22.60443N	070 58.22379W	16.3	ROCK	1	mba95299.d02	37823	34	16.3
372	41 22.49504N	070 58.36323W	19.23	ROCK	1	mba95270.d04	4850	30	19.23
373	41 22.46217N	070 58.42187W	19.41	ROCK	1	mba95270.d04	4615	27	19.41
374	41 22.52657N	070 58.47986W	17.03	ROCK	1	mba95264.d04	53516	2	17.03
375	41 22.53935N	070 58.40052W	17.18	ROCK	1	mba95270.d04	40226	39	17.18
376	41 22.39218N	070 58.57109W	20.71	ROCK	1	mba95264.d03	57343	33	20.71
377	41 22.34118N	070 58.73177W	18.28	ROCK	1	mba95263.d03	64576	34	18.28
378	41 22.31328N	070 58.68707W	20.07	ROCK	1	mba95270.d03	67425	3	20.07
379	41 22.32907N	070 58.77650W	19.97	ROCK	1	mba95299.d03	51476	88*	20.0*
380	41 22.23689N	070 58.89787W	18.79	ROCK	1	mba95270.d03	68227	9	18.79
381	41 22.24077N	070 58.66330W	20.64	ROCK	1	mba95264.d02	88809	44	20.64
382	41 22.29243N	070 58.98999W	20.58	ROCK	1	mba95264.d04	3689	24	20.58
383	41 22.27145N	070 59.01301W	21.03	ROCK	1	mba95264.d04	3550	23	21.03
384	41 22.29000N	070 59.06958W	20.09	ROCK	1	mba95270.d04	42773	35	20.09
385	41 22.22919N	070 59.20896W	18.1	ROCK	1	mba95270.d04	43310	8	18.1
386	41 22.35023N	070 58.96730W	20.67	ROCK	1	mba95264.d04	55771	69*	20.7*
387	41 22.35387N	070 58.84268W	20.99	ROCK	1	mba95270.d04	41959	20	20.99
389	41 22.48053N	070 58.45825W	19.13	ROCK	1	mba95264.d04	6254	49	19.13
390	41 22.63101N	070 58.18586W	18.7	ROCK	1	mba95264.d04	52148	37	18.7
391	41 22.81198N	070 57.75612W	15.05	ROCK	1	mba95275.d06	78630	42	15.05
392	41 22.86914N	070 57.56376W	14.19	ROCK	1	mba95264.d04	49196	57	14.19
393	41 22.83731N	070 57.59511W	14.52	ROCK	1	mba95299.d02	35516	26	14.52
394	41 22.85987N	070 57.44299W	15.56	ROCK	1	mba95264.d04	10976	42	15.56
395	41 22.83356N	070 57.39830W	16.75	ROCK	1	mba95299.d02	6776	46	16.75
396	41 22.92871N	070 57.39838W	13.32	ROCK	1	mba95264.d04	48409	2	13.32
397	41 22.97203N	070 57.17655W	13.96	ROCK	1	mba95275.d06	73965	58	13.96
399	41 23.05001N	070 57.00744W	17.35	ROCK	1	mba95270.d04	35199	15	17.35
400	41 23.09512N	070 57.02024W	15.86	ROCK	1	mba95270.d04	53780	8	15.86
401	41 23.04865N	070 56.85810W	18.07	ROCK	1	mba95270.d04	10376	54	18.07
402	41 23.11348N	070 56.86076W	14.55	ROCK	1	mba95299.d02	32772	39	14.55
403	41 23.10434N	070 56.76651W	18.78	ROCK	1	mba95264.d04	14105	29	18.78
404	41 23.13730N	070 56.72732W	17.36	ROCK	1	mba95275.d06	72285	14	17.36
405	41 23.33998N	070 56.24963W	17.96	ROCK	1	mba95299.d02	30521	50*	17.9*
406	41 23.31456N	070 56.22315W	17.89	ROCK	1	mba95264.d04	16672	6	17.89
407	41 23.34188N	070 56.17375W	19.46	ROCK	1	mba95300.d01	58492	15	19.46
408	41 23.35581N	070 56.11094W	16.94	ROCK	1	mba95264.d04	17201	46	16.94
409	41 23.51776N	070 55.74047W	19.75	ROCK	1	mba95270.d04	30664	43	19.75
410	41 24.09578N	070 54.09224W	19.69	ROCK	1	mba95264.d04	26598	36	19.69
411	41 23.90794N	070 54.83110W	20.96	ROCK	1	mba95270.d04	61638	57	20.96
412	41 23.90735N	070 54.86550W	20.58	ROCK	1	mba95270.d04	61536	21	20.58
413	41 23.58677N	070 55.71224W	19.54	ROCK	1	mba95270.d04	58506	43	19.54
414	41 23.48051N	070 55.96322W	18.07	ROCK	1	mba95270.d04	57595	41	18.07
415	41 23.32242N	070 56.36875W	17.3	ROCK	1	mba95300.d01	53442	36	17.3
416	41 23.30444N	070 56.42804W	15.51	ROCK	1	mba95300.d01	53659	4	15.51
417	41 23.35143N	070 56.40354W	15.25	ROCK	1	mba95264.d05	14522	28	15.25
418	41 23.25314N	070 56.65541W	17.34	ROCK	1	mba95264.d05	13268	37	17.34
419	41 23.19858N	070 56.71980W	17.64	ROCK	1	mba95275.d06	82445	36	17.64
420	41 23.17314N	070 56.81659W	15.42	ROCK	1	mba95270.d04	54534	41	15.42
421	41 23.14616N	070 56.90905W	12.53	ROCK	1	mba95263.d03	25580	58	12.53
422	41 22.89420N	070 57.52293W	13.68	ROCK	1	mba95275.d06	79480	20	13.68
423	41 22.91202N	070 57.54991W	14.59	ROCK	1	mba95275.d07	3488	5	14.59
424	41 22.93686N	070 57.52569W	13.17	ROCK	1	mba95264.d05	9137	4	13.17
425	41 22.85206N	070 57.67814W	16.3	ROCK	1	mba95270.d04	51324	45	16.3

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
426	41 22.73142N	070 57.88261W	18.32	ROCK	1	mba95299.d02	36579	36	18.32
427	41 22.71109N	070 58.01743W	16.39	ROCK	1	mba95275.d06	77659	20	16.39
428	41 22.65972N	070 58.05839W	16.26	ROCK	1	mba95270.d04	38969	21	16.26
429	41 22.70114N	070 58.07322W	16.04	ROCK	1	mba95270.d04	49843	25	16.04
431	41 22.38224N	070 59.07799W	20.59	ROCK	1	mba95270.d04	83063	39	20.59
432	41 22.41382N	070 59.03090W	20.37	ROCK	1	mba95264.d05	61897	27	20.4*
433	41 22.27641N	070 59.20040W	19.07	ROCK	1	mba95270.d04	45487	37	19.07
434	41 22.53544N	070 58.80934W	16.84	ROCK	1	mba95270.d05	2117	80*	16.8*
436	41 22.68384N	070 58.38335W	14.53	ROCK	1	mba95275.d07	6416	58	14.53
437	41 22.62542N	070 58.38653W	16.92	ROCK	1	mba95299.d02	40884	51	16.92
438	41 22.61759N	070 58.43366W	18.14	ROCK	1	mba95299.d02	40736	19	18.14
439	41 22.68358N	070 58.24339W	15.77	ROCK	1	mba95299.d02	41403	51*	15.8*
440	41 22.70672N	070 58.34381W	14.53	ROCK	1	mba95270.d05	3840	38	14.53
441	41 22.74445N	070 58.25390W	15.04	ROCK	1	mba95270.d05	4183	56	15.04
442	41 22.70974N	070 58.16746W	15.99	ROCK	1	mba95299.d02	41666	9	15.99
443	41 22.76790N	070 58.05080W	16.85	ROCK	1	mba95270.d04	79196	48	16.85
444	41 22.79398N	070 58.07309W	13.76	ROCK	1	mba95275.d07	7534	38	13.76
445	41 22.80805N	070 58.13812W	16.39	ROCK	1	mba95275.d08	7506	28	16.39
446	41 22.75879N	070 57.98093W	17.34	ROCK	1	mba95275.d07	5088	28	17.34
447	41 22.79037N	070 57.87707W	16.39	ROCK	1	mba95275.d07	4712	1	16.39
448	41 22.86652N	070 57.81340W	12.75	ROCK	1	mba95299.d02	60597	36	12.75
449	41 22.86261N	070 57.75946W	15.51	ROCK	1	mba95299.d02	43100	51	15.51
450	41 22.86725N	070 57.63839W	15.33	ROCK	1	mba95270.d04	51471	2	15.33
451	41 22.94158N	070 57.65709W	15.68	ROCK	1	mba95264.d05	55340	50	15.68
452	41 22.96024N	070 57.64108W	13.97	ROCK	1	mba95275.d07	9130	49	13.97
453	41 22.96930N	070 57.58617W	15.13	ROCK	1	mba95264.d05	55001	19	15.13
454	41 23.02903N	070 57.60159W	16.23	ROCK	1	mba95299.d02	70492	7	16.23
455	41 22.99526N	070 57.48794W	15.36	ROCK	1	mba95299.d02	59440	27	15.36
456	41 22.97487N	070 57.41624W	15.83	ROCK	1	mba95264.d05	9636	55	15.83
457	41 23.00901N	070 57.41595W	15.33	ROCK	1	mba95270.d04	76876	27	15.33
458	41 23.01157N	070 57.38934W	13.15	ROCK	1	mba95270.d04	76795	35	13.15
459	41 22.99804N	070 57.35743W	14.29	ROCK	1	mba95264.d05	9909	53	14.29
460	41 23.02673N	070 57.35470W	14.33	ROCK	1	mba95270.d04	76666	7	14.33
461	41 23.03880N	070 57.24959W	12.71	ROCK	1	mba95264.d05	10401	49	12.71
462	41 23.09311N	070 57.20310W	12.56	ROCK	1	mba95299.d02	58345	32	12.56
463	41 23.12604N	070 57.20405W	9.83	ROCK	1	mba95275.d07	10732	32	9.83
464	41 23.09637N	070 57.26205W	13.61	ROCK	1	mba95275.d07	10511	34	13.61
465	41 23.06281N	070 57.26679W	13.95	ROCK	1	mba95270.d04	76341	59	13.95
466	41 23.10830N	070 57.29470W	13.12	ROCK	1	mba95270.d05	7598	31	13.12
467	41 23.08710N	070 57.29989W	13.63	ROCK	1	mba95275.d07	10381	15	13.63
468	41 23.19205N	070 56.94272W	13.53	ROCK	1	mba95299.d02	57320	43	13.53
469	41 23.22270N	070 56.82451W	18.37	ROCK	1	mba95270.d04	74752	2	18.37
470	41 23.41155N	070 56.26541W	16.3	ROCK	1	mba95299.d02	48442	35	16.3
471	41 23.56791N	070 55.93557W	15.91	ROCK	1	mba95299.d02	53449	6	15.91
472	41 23.60523N	070 55.83766W	18.71	ROCK	1	mba95299.d02	53067	18	18.71
473	41 23.84355N	070 55.25903W	20.51	ROCK	1	mba95264.d05	44007	38	20.51
474	41 23.73574N	070 55.59681W	19.13	ROCK	1	mba95270.d05	13473	51	19.13
475	41 23.67953N	070 55.69490W	19.07	ROCK	1	mba95263.d01	100649	17	19.07
476	41 23.66354N	070 55.74396W	19.11	ROCK	1	mba95299.d02	91240	25	19.11
477	41 23.63635N	070 55.85506W	18.37	ROCK	1	mba95270.d05	12585	60	18.37
478	41 23.60456N	070 55.97403W	15.39	ROCK	1	mba95299.d02	80197	35	15.39
479	41 23.48336N	070 56.27328W	18.07	ROCK	1	mba95270.d05	11147	59	18.07
480	41 23.49802N	070 56.30594W	18.7	ROCK	1	mba95264.d05	78967	18	18.7
481	41 23.43886N	070 56.38033W	17.27	ROCK	1	mba95270.d05	10763	22	17.27

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
482	41 23.37663N	070 56.51123W	16.13	ROCK	1	mba95299.d02	88486	18	16.13
483	41 23.33464N	070 56.62979W	16.14	ROCK	1	mba95299.d02	88012	23	16.14
484	41 23.36075N	070 56.68812W	15.61	ROCK	1	mba95264.d05	77091	1	15.61
485	41 23.31366N	070 56.75044W	16.37	ROCK	1	mba95275.d08	2594	32	16.37
486	41 23.29382N	070 56.74124W	16.23	ROCK	1	mba95275.d07	12389	18	16.23
487	41 23.22832N	070 56.94093W	14.48	ROCK	1	mba95270.d05	8813	35	14.48
489	41 23.21423N	070 57.07041W	10.98	ROCK	1	mba95264.d05	75226	12	10.98
490	41 23.16256N	070 57.13059W	12.82	ROCK	1	mba95270.d05	8166	26	12.82
491	41 22.85086N	070 57.90831W	14.94	ROCK	1	mba95264.d05	56545	28	14.94
492	41 22.85770N	070 57.94949W	14.2	ROCK	1	mba95270.d05	5277	16	14.2
493	41 22.82791N	070 58.01536W	15.64	ROCK	1	mba95275.d07	7766	41*	15.6*
495	41 22.78015N	070 58.18224W	15.22	ROCK	1	mba95275.d08	7682	25	15.22
496	41 22.54953N	070 58.71504W	21.77	ROCK	1	mba95264.d05	60385	22	21.77
497	41 22.44124N	070 59.10418W	18	ROCK	1	mba95299.d03	42456	40	18
498	41 22.38742N	070 59.12257W	18.36	ROCK	1	mba95264.d05	62315	26	18.36
499	41 22.51188N	070 58.96867W	20.8	ROCK	1	mba95264.d05	66043	38	20.8
500	41 22.56817N	070 58.88852W	18.37	ROCK	1	mba95270.d05	30937	58	18.37
501	41 22.58419N	070 58.83522W	20.27	ROCK	1	mba95270.d05	30752	7	20.27
502	41 22.57951N	070 58.79127W	21.06	ROCK	1	mba95264.d05	66901	33	21.06
503	41 22.69855N	070 58.53441W	17.42	ROCK	1	mba95270.d05	29649	67*	17.4*
504	41 22.72641N	070 58.45064W	18.23	ROCK	1	mba95270.d05	29341	44	18.23
505	41 22.74805N	070 58.49455W	17.43	ROCK	1	mba95299.d02	110430	51	17.43
506	41 22.78487N	070 58.25724W	15.89	ROCK	1	mba95299.d02	68204	66*	15.9*
508	41 22.79830N	070 58.20029W	14.34	ROCK	1	mba95264.d05	69706	33	14.34
509	41 22.88071N	070 58.02763W	14.29	ROCK	1	mba95270.d05	40136	36	14.29
510	41 22.89531N	070 57.90036W	15.09	ROCK	1	mba95275.d08	6670	28	15.09
511	41 22.91423N	070 57.86792W	14.35	ROCK	1	mba95264.d05	71300	36	14.35
512	41 22.97312N	070 57.80580W	15.07	ROCK	1	mba95299.d02	101868	23	15.07
513	41 22.97422N	070 57.77359W	14.35	ROCK	1	mba95299.d02	69920	23	14.35
514	41 23.06240N	070 57.48201W	12.33	ROCK	1	mba95264.d05	73233	5	12.33
515	41 23.07945N	070 57.39360W	14.44	ROCK	1	mba95275.d08	4878	4	14.44
516	41 23.14456N	070 57.29149W	15.06	ROCK	1	mba95299.d02	71582	48	15.06
517	41 23.13577N	070 57.26609W	14.09	ROCK	1	mba95264.d05	74285	97*	14.1*
518	41 23.17851N	070 57.26308W	14.58	ROCK	1	mba95299.d02	99881	28	14.58
519	41 23.18331N	070 57.23524W	11.77	ROCK	1	mba95270.d05	24716	27	11.77
521	41 23.18972N	070 57.17658W	12.73	ROCK	1	mba95299.d02	71997	20	12.73
522	41 23.19466N	070 57.14301W	12.16	ROCK	1	mba95299.d02	72097	53	12.16
523	41 23.26961N	070 56.96008W	13.02	ROCK	1	mba95299.d02	72780	39	13.02
524	41 23.41442N	070 56.64222W	16.7	ROCK	1	mba95299.d02	97712	53	16.7
525	41 23.40209N	070 56.57222W	15.66	ROCK	1	mba95264.d05	77647	48	15.66
526	41 23.42927N	070 56.56302W	16.14	ROCK	1	mba95270.d05	22225	7	16.14
527	41 23.51841N	070 56.37119W	18.29	ROCK	1	mba95299.d02	96726	26	18.29
528	41 23.53488N	070 56.16384W	17.93	ROCK	1	mba95299.d02	80896	11	17.93
529	41 23.47496N	070 56.22495W	17.28	ROCK	1	mba95264.d05	48616	6	17.28
530	41 23.58078N	070 56.13406W	17.42	ROCK	1	mba95299.d02	75836	31	17.42
531	41 23.58141N	070 56.09252W	18.21	ROCK	1	mba95264.d05	80032	44	18.21
532	41 23.61915N	070 56.03759W	18.92	ROCK	1	mba95299.d02	76199	31	18.92
533	41 23.63490N	070 55.93614W	13.92	ROCK	1	mba95264.d05	80799	30	13.92
534	41 23.66719N	070 55.91342W	17.82	ROCK	1	mba95270.d05	19832	34	17.82
535	41 23.66656N	070 55.88544W	16.48	ROCK	1	mba95299.d02	76748	14	16.48
536	41 23.69646N	070 55.81166W	17.34	ROCK	1	mba95299.d02	77029	45	17.34
537	41 23.71336N	070 55.70738W	19.01	ROCK	1	mba95264.d05	81927	40	19.01
538	41 23.89324N	070 55.32226W	19.91	ROCK	1	mba95270.d05	17646	11	19.91
539	41 23.79767N	070 55.73786W	17.85	ROCK	1	mba95300.d01	42332	25	17.85

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
540	41 23.70449N	070 55.97481W	17.57	ROCK	1	mba95270.d05	49715	49	17.57
541	41 23.59168N	070 56.18556W	18.35	ROCK	1	mba95299.d02	96048	38	18.35
542	41 23.50818N	070 56.53020W	16.86	ROCK	1	mba95300.d01	45326	6	16.86
543	41 23.44624N	070 56.61231W	16.2	ROCK	1	mba95264.d05	94553	38	16.2
544	41 23.40818N	070 56.75471W	16.47	ROCK	1	mba95299.d02	116738	24	16.47
546	41 23.32627N	070 56.99552W	13.41	ROCK	1	mba95270.d05	46153	39	13.41
548	41 23.24903N	070 57.09899W	11.74	ROCK	1	mba95263.d03	26454	2	11.74
549	41 23.20879N	070 57.16783W	12.52	ROCK	1	mba95270.d05	24466	29	12.52
552	41 23.19748N	070 57.26078W	13.55	ROCK	1	mba95264.d05	97613	51	13.55
553	41 23.13760N	070 57.47854W	14.53	ROCK	1	mba95299.d02	114178	33	14.53
555	41 23.10025N	070 57.51115W	12.54	ROCK	1	mba95264.d05	98785	27	12.54
556	41 23.10637N	070 57.59676W	14.39	ROCK	1	mba95270.d05	44085	24	14.39
557	41 23.07457N	070 57.65386W	15.47	ROCK	1	mba95270.d05	43863	58	15.47
559	41 22.93452N	070 57.97834W	17.14	ROCK	1	mba95264.d05	100977	23	17.14
560	41 22.88084N	070 58.14675W	15.23	ROCK	1	mba95299.d02	111707	58	15.23
561	41 22.87339N	070 58.17017W	15.25	ROCK	1	mba95299.d02	111623	14	15.25
562	41 22.86721N	070 58.21799W	12.89	ROCK	1	mba95270.d05	41889	55	12.89
563	41 22.84888N	070 58.27562W	13.9	ROCK	1	mba95270.d05	36379	42	13.9
565	41 22.78755N	070 58.32331W	14.05	ROCK	1	mba95299.d02	103753	46	14.05
567	41 22.77391N	070 58.48792W	17.25	ROCK	1	mba95270.d05	35661	29	17.25
568	41 22.70635N	070 58.58273W	17.79	ROCK	1	mba95264.d05	103861	55	17.79
569	41 22.66393N	070 58.72861W	17.82	ROCK	1	mba95299.d02	109500	4	17.82
573	41 22.70784N	070 58.84034W	19.55	ROCK	1	mba95264.d07	9146	32	19.55
574	41 22.73691N	070 58.59881W	16.27	ROCK	1	mba95275.d08	15150	20	16.27
575	41 22.77112N	070 58.61917W	16.64	ROCK	1	mba95270.d05	64068	39	16.64
576	41 22.81606N	070 58.52080W	17.32	ROCK	1	mba95270.d05	63705	29	17.32
577	41 22.83650N	070 58.46044W	15.88	ROCK	1	mba95270.d05	63493	80*	15.9*
578	41 22.85304N	070 58.41424W	15.13	ROCK	1	mba95270.d05	63331	27	15.13
580	41 22.82579N	070 58.36475W	14.92	ROCK	1	mba95275.d08	15967	18	14.92
581	41 22.83641N	070 58.31480W	14.5	ROCK	1	mba95270.d05	36249	37	14.5
582	41 22.91519N	070 58.22451W	15.91	ROCK	1	mba95270.d05	62651	33	15.91
583	41 22.94938N	070 58.18255W	16.76	ROCK	1	mba95275.d08	30486	48	16.76
584	41 23.07259N	070 57.70837W	16.8	ROCK	1	mba95275.d08	18241	45	16.8
587	41 23.23746N	070 57.26194W	15.23	ROCK	1	mba95275.d08	19805	18	15.23
588	41 23.24121N	070 57.23124W	15.67	ROCK	1	mba95270.d05	45347	32	15.67
589	41 23.27933N	070 57.18726W	14.33	ROCK	1	mba95264.d06	15290	9	14.33
590	41 23.27697N	070 57.13256W	15.17	ROCK	1	mba95270.d05	45685	29	15.17
591	41 23.25062N	070 57.15616W	14.44	ROCK	1	mba95299.d02	115321	21	14.44
592	41 23.32857N	070 57.08599W	15.09	ROCK	1	mba95299.d02	127219	4	15.09
593	41 23.31762N	070 57.06351W	15.36	ROCK	1	mba95264.d06	15899	39	15.36
594	41 23.29974N	070 57.09307W	14.89	ROCK	1	mba95275.d08	20391	18	14.89
596	41 23.36227N	070 57.04039W	13.69	ROCK	1	mba95270.d05	58148	20	13.69
597	41 23.41508N	070 56.95586W	16.57	ROCK	1	mba95264.d07	18397	26	16.57
598	41 23.37619N	070 56.92098W	17.64	ROCK	1	mba95264.d06	16629	16	17.64
599	41 23.36146N	070 56.86383W	13.4	ROCK	1	mba95299.d02	116349	7	13.4
600	41 23.42069N	070 56.80895W	16.04	ROCK	1	mba95264.d06	17190	45	16.04
601	41 23.47856N	070 56.68361W	16.26	ROCK	1	mba95300.d01	35992	26	16.26
602	41 23.52448N	070 56.62038W	15.69	ROCK	1	mba95300.d01	33061	26	15.69
603	41 23.55806N	070 56.52092W	16.79	ROCK	1	mba95300.d01	32679	20	16.79
604	41 23.59443N	070 56.44593W	17.89	ROCK	1	mba95300.d01	32367	48	17.89
605	41 23.77887N	070 55.86510W	16.21	ROCK	1	mba95264.d06	21887	23	16.21
606	41 23.79038N	070 55.88119W	17.2	ROCK	1	mba95268.d03	37623	28	17.2
607	41 22.62793N	070 59.18094W	19.95	ROCK	1	mba95268.d02	12014	37	19.95
608	41 22.61530N	070 59.16328W	17.98	ROCK	1	mba95275.d08	34894	38	17.98

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
610	41 22.67401N	070 58.92473W	19.89	ROCK	1	mba95275.d08	33097	60*	19.9*
611	41 22.89641N	070 58.40772W	15.78	ROCK	1	mba95275.d08	37533	34	15.78
612	41 22.90926N	070 58.28614W	16.07	ROCK	1	mba95275.d08	30858	39	16.07
613	41 22.94837N	070 58.30725W	17.78	ROCK	1	mba95268.d02	8806	18	17.78
614	41 22.96490N	070 58.32013W	18.09	ROCK	1	mba95268.d02	32062	38	18.09
615	41 22.97643N	070 58.24008W	17.5	ROCK	1	mba95268.d02	8562	33	17.5
616	41 22.97581N	070 58.12512W	14.87	ROCK	1	mba95264.d07	12566	33	14.87
617	41 22.97454N	070 58.10516W	13.73	ROCK	1	mba95275.d08	30225	32	13.73
618	41 23.06922N	070 58.00103W	16.91	ROCK	1	mba95275.d08	49973	38	16.91
619	41 23.04190N	070 57.89478W	17.67	ROCK	1	mba95270.d05	61414	8	17.67
620	41 23.09985N	070 57.88427W	16.69	ROCK	1	mba95268.d02	7307	41	16.69
621	41 23.08698N	070 57.85304W	16.22	ROCK	1	mba95264.d07	13944	7	16.22
622	41 23.12560N	070 57.80550W	15.79	ROCK	1	mba95268.d02	7035	25	15.79
623	41 23.17065N	070 57.63022W	11.57	ROCK	1	mba95264.d07	15044	39	11.57
626	41 23.31924N	070 57.21992W	12.1	ROCK	1	mba95263.d03	27024	10	12.1
627	41 23.32224N	070 57.17411W	14.65	ROCK	1	mba95275.d08	26855	10	14.65
628	41 23.36620N	070 57.12729W	11.61	ROCK	1	mba95275.d08	41983	28	11.61
629	41 23.37575N	070 57.07958W	11.52	ROCK	1	mba95264.d07	17798	34	11.52
630	41 23.47161N	070 56.83986W	14.76	ROCK	1	mba95275.d08	43053	32	14.76
631	41 23.49813N	070 56.83634W	15.26	ROCK	1	mba95268.d02	3652	35	15.26
632	41 23.48488N	070 56.84958W	14.68	ROCK	1	mba95268.d02	3713	39	14.68
633	41 23.65695N	070 56.39180W	16.85	ROCK	1	mba95268.d02	2116	12	16.85
634	41 23.73423N	070 56.20105W	17.78	ROCK	1	mba95300.d01	21498	25	17.78
635	41 23.71810N	070 56.19628W	18.51	ROCK	1	mba95300.d01	27189	43	18.51
636	41 23.37079N	070 53.98218W	27.28	ROCK	1	mba95270.d01	39124	34	27.28
637	41 22.68980N	070 55.60826W	28.27	ROCK	1	mba95267.d03	5596	28	28.27
638	41 22.64915N	070 55.87396W	25.85	ROCK	1	mba95270.d01	42833	31	25.85
639	41 22.55503N	070 56.14170W	25.14	ROCK	1	mba95270.d01	43795	6	25.14
640	41 22.48576N	070 56.26668W	23.68	ROCK	1	mba95264.d07	77860	19	23.68
641	41 22.40115N	070 56.42333W	22.57	ROCK	1	mba95267.d03	8206	20	22.57
643	41 22.33070N	070 56.74844W	15.6	ROCK	1	mba95270.d01	46006	54	15.6
644	41 22.28329N	070 56.73767W	15.63	ROCK	1	mba95267.d03	9381	22	15.63
645	41 22.26527N	070 56.87848W	16.05	ROCK	1	mba95299.d03	103795	1	16.05
646	41 22.23825N	070 56.97380W	13.84	ROCK	1	mba95299.d03	104114	80*	13.8*
647	41 22.15965N	070 57.05109W	15.06	ROCK	1	mba95267.d03	10540	29	15.06
648	41 22.16398N	070 57.08417W	14.62	ROCK	1	mba95299.d03	110369	22	14.62
649	41 22.20233N	070 57.08524W	13.86	ROCK	1	mba95270.d01	47271	1	13.86
650	41 22.14876N	070 57.21937W	12.79	ROCK	1	mba95270.d01	47779	25	12.79
651	41 22.12975N	070 57.25392W	15.51	ROCK	1	mba95299.d03	105099	12	15.51
652	41 22.06695N	070 57.38982W	15.84	ROCK	1	mba95264.d07	83200	18	15.84
653	41 22.04650N	070 57.38270W	14.82	ROCK	1	mba95299.d03	109168	38	14.82
654	41 22.02553N	070 57.47173W	15.33	ROCK	1	mba95299.d03	108824	24	15.33
656	41 22.02469N	070 57.52124W	15.21	ROCK	1	mba95264.d07	83813	39	15.21
657	41 21.98069N	070 57.53353W	17.42	ROCK	1	mba95267.d03	12298	30	17.42
658	41 21.99034N	070 57.60554W	16.11	ROCK	1	mba95264.d07	84235	30	16.11
659	41 21.99456N	070 57.63940W	17.16	ROCK	1	mba95299.d03	106456	37	17.16
661	41 21.97677N	070 57.70055W	18.05	ROCK	1	mba95270.d01	49570	56	18.05
662	41 21.96494N	070 57.75975W	18.59	ROCK	1	mba95270.d01	49769	40	18.59
663	41 21.81155N	070 58.00622W	23.26	ROCK	1	mba95267.d03	14070	19	23.26
665	41 21.75487N	070 58.16228W	24.1	ROCK	1	mba95267.d03	14642	24	24.1
668	41 21.76216N	070 58.01904W	24.41	ROCK	1	mba95267.d02	94995	27	24.41
669	41 21.82275N	070 57.89330W	21.23	ROCK	1	mba95264.d07	104369	6	21.23
670	41 21.91690N	070 57.78769W	20.98	ROCK	1	mba95264.d07	85131	11	20.98
671	41 21.94676N	070 57.71541W	19.46	ROCK	1	mba95264.d07	84774	21	19.46

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
672	41 21.90605N	070 57.60236W	21.74	ROCK	1	mba95267.d02	96466	7	21.74
674	41 21.95880N	070 57.39313W	17.25	ROCK	1	mba95270.d07	7750	50	17.25
675	41 21.95272N	070 57.49109W	15.85	ROCK	1	mba95267.d02	96879	25	15.85
676	41 22.04027N	070 57.24410W	13.87	ROCK	1	mba95267.d02	97786	42	13.87
677	41 22.06349N	070 57.24778W	14.75	ROCK	1	mba95264.d07	107386	10	14.75
679	41 22.13961N	070 57.18243W	14.43	ROCK	1	mba95264.d07	82219	33	14.43
680	41 22.10660N	070 57.05669W	16.37	ROCK	1	mba95267.d02	98495	18	16.37
683	41 22.19651N	070 56.82120W	18.23	ROCK	1	mba95267.d02	99403	54	18.23
685	41 22.27062N	070 56.65836W	19.5	ROCK	1	mba95299.d03	122937	4	19.5
687	41 22.56859N	070 55.81276W	26.52	ROCK	1	mba95267.d02	103248	23	26.52
688	41 22.66048N	070 55.64972W	28.69	ROCK	1	mba95264.d07	114766	5	28.69
690	41 22.56290N	070 55.76522W	27.62	ROCK	1	mba95265.d01	6026	53	27.62
691	41 22.42775N	070 56.12069W	25.65	ROCK	1	mba95270.d07	1795	37	25.65
692	41 22.15068N	070 56.84707W	18.82	ROCK	1	mba95270.d07	5259	20	18.82
693	41 21.94112N	070 57.44279W	17.26	ROCK	1	mba95270.d07	7991	54	17.26
696	41 21.78273N	070 57.82962W	23.02	ROCK	1	mba95265.d01	15786	27	23.02
697	41 21.73511N	070 57.99176W	25.13	ROCK	1	mba95265.d01	16522	53	25.13
699	41 21.82260N	070 57.57836W	19.3	ROCK	1	mba95265.d01	33017	38	19.3
700	41 21.87196N	070 57.41124W	22.23	ROCK	1	mba95275.d06	3005	5	22.32
701	41 21.92175N	070 57.34100W	16.94	ROCK	1	mba95265.d01	34173	4	16.94
702	41 21.96048N	070 57.32495W	17.67	ROCK	1	mba95267.d02	76704	34	17.67
703	41 21.96880N	070 57.27774W	17.8	ROCK	1	mba95267.d02	76545	41	17.8
704	41 21.97790N	070 57.34978W	16.23	ROCK	1	mba95270.d07	7533	26	16.23
706	41 22.02074N	070 57.18033W	14.13	ROCK	1	mba95299.d03	131802	46	14.13
707	41 22.03065N	070 57.10468W	16.77	ROCK	1	mba95267.d02	75920	32	16.77
708	41 22.02158N	070 57.06768W	16.44	ROCK	1	mba95265.d01	35462	57	16.44
709	41 22.01652N	070 57.01952W	17.98	ROCK	1	mba95267.d02	54019	32	17.98
710	41 22.06530N	070 57.00521W	17.95	ROCK	1	mba95300.d01	1024	33	17.95
711	41 22.03041N	070 56.92596W	18.64	ROCK	1	mba95265.d02	36226	39	18.64
712	41 22.10314N	070 56.94755W	17.25	ROCK	1	mba95267.d02	75327	40	17.25
713	41 22.36404N	070 56.11738W	26.32	ROCK	1	mba95265.d01	39926	36	26.32
715	41 21.95323N	070 57.11447W	19.22	ROCK	1	mba95275.d05	33485	19	19.22
716	41 21.95078N	070 57.15895W	18.6	ROCK	1	mba95267.d02	53483	35	18.6
717	41 21.94073N	070 57.18295W	17.48	ROCK	1	mba95267.d02	53393	38	17.48
718	41 21.79205N	070 57.43888W	22.96	ROCK	1	mba95267.d02	38910	24	22.96
719	41 21.80604N	070 57.34968W	23.27	ROCK	1	mba95265.d02	61179	58	23.27
720	41 21.82289N	070 57.34157W	23.76	ROCK	1	mba95265.d02	61251	24	23.76
721	41 21.77189N	070 57.60900W	23.76	ROCK	1	mba95265.d02	39431	60	23.76
722	41 21.72947N	070 57.75489W	25.37	ROCK	1	mba95267.d02	51185	32	25.37
724	41 21.70990N	070 57.59927W	25.16	ROCK	1	mba95263.d03	69111	52	25.16
725	41 21.66117N	070 57.60355W	25.6	ROCK	1	mba95265.d03	28547	48	25.6
728	41 21.95482N	070 56.95255W	19.64	ROCK	1	mba95265.d02	63162	69*	19.6*
730	41 22.72419N	070 54.58833W	25.76	ROCK	1	mba95265.d03	68426	18	25.76
731	41 22.00060N	070 56.74288W	21.69	ROCK	1	mba95267.d02	11085	31	21.69
732	41 21.96210N	070 56.71874W	21.18	ROCK	1	mba95267.d01	125544	49	21.18
733	41 21.94553N	070 56.67740W	21.61	ROCK	1	mba95265.d03	58773	26	21.61
734	41 21.87492N	070 57.01392W	21.1	ROCK	1	mba95265.d03	25781	37	21.1
736	41 21.64899N	070 57.55230W	26.24	ROCK	1	mba95267.d01	128450	41	26.24
737	41 21.57266N	070 57.84979W	24.44	ROCK	1	mba95265.d03	29736	22	24.44
738	41 21.83376N	070 56.92871W	20.91	ROCK	1	mba95267.d01	93227	39	20.91
739	41 22.04404N	070 56.28425W	26.12	ROCK	1	mba95265.d03	101933	54	26.12
740	41 21.88793N	070 56.66204W	17.87	ROCK	1	mba95300.d01	8869	23	17.87
742	41 21.68203N	070 57.13585W	27.17	ROCK	1	mba95272.d02	55337	32	27.17
743	41 21.74075N	070 57.05788W	27.18	ROCK	1	mba95267.d01	74870	38	27.18

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
744	41 21.60336N	070 57.41389W	26.23	ROCK	1	mba95263.d03	69874	60	26.23
745	41 21.53048N	070 57.43899W	25.24	ROCK	1	mba95267.d01	36106	10	25.24
746	41 21.84838N	070 56.53462W	18.73	ROCK	1	mba95272.d02	49145	32	18.73
747	41 21.81199N	070 56.48762W	17.98	ROCK	1	mba95268.d04	103426	36	17.98
748	41 21.91238N	070 56.49489W	18.66	ROCK	1	mba95272.d02	58492	55	18.66
750	41 21.87657N	070 56.59858W	18.13	ROCK	1	mba95272.d02	57974	45	18.13
751	41 21.81120N	070 56.69203W	19.73	ROCK	1	mba95267.d01	38860	4	19.73
754	41 21.75988N	070 56.78806W	25.58	ROCK	1	mba95272.d02	50299	39	25.58
755	41 20.89030N	070 59.16247W	25.62	ROCK	1	mba95267.d01	29606	45	25.62
757	41 21.65705N	070 57.02024W	27.4	ROCK	1	mba95272.d02	51458	1	27.4
758	41 21.89999N	070 56.30013W	25.79	ROCK	1	mba95267.d01	16079	48	25.79
759	41 22.08627N	070 57.93347W	14.55	ROCK	1	mba95268.d01	57902	26	14.55
763	41 22.37941N	070 57.19179W	13	ROCK	1	mba95268.d01	139725	39	13
764	41 22.39185N	070 56.96690W	16.36	ROCK	1	mba95263.d05	53965	24	16.36
767	41 22.51256N	070 56.63545W	17.98	ROCK	1	mba95268.d01	115308	37	17.98
769	41 22.18360N	070 57.48649W	10.16	ROCK	1	mba95275.d06	23851	39	10.16
770	41 22.20195N	070 57.51860W	10.68	ROCK	1	mba95268.d01	86078	37	10.68
771	41 22.17372N	070 57.56293W	11.1	ROCK	1	mba95275.d06	25978	23	11.1
772	41 22.15733N	070 57.54178W	12.11	ROCK	1	mba95275.d06	24070	54	12.11
773	41 22.13526N	070 57.53387W	12.02	ROCK	1	mba95275.d06	18365	47	12.02
774	41 22.11495N	070 57.61360W	13.73	ROCK	1	mba95268.d01	70993	31	13.73
775	41 22.13164N	070 57.65078W	10.14	ROCK	1	mba95263.d05	47247	4	10.14
776	41 22.01165N	070 57.84299W	16.29	ROCK	1	mba95268.d01	97742	39	16.29
777	41 21.99698N	070 57.81310W	18.12	ROCK	1	mba95268.d01	123988	37	18.12
778	41 21.92188N	070 58.12860W	20.82	ROCK	1	mba95268.d01	72993	33	20.82
780	41 21.84621N	070 58.13563W	22.39	ROCK	1	mba95268.d04	8977	40	22.39
781	41 22.03145N	070 58.04151W	17.35	ROCK	1	mba95268.d01	57477	31	17.35
784	41 22.15511N	070 57.70009W	11.19	ROCK	1	mba95275.d06	32321	30	11.19
785	41 22.20490N	070 57.56893W	11.15	ROCK	1	mba95275.d06	31846	29	11.15
786	41 22.21928N	070 57.52141W	10.79	ROCK	1	mba95275.d06	31684	10	10.79
787	41 22.41176N	070 56.75013W	17.19	ROCK	1	mba95268.d01	93653	12	17.19
788	41 22.35970N	070 56.75721W	15.76	ROCK	1	mba95268.d04	15623	30	15.76
790	41 22.28619N	070 57.01323W	13.86	ROCK	1	mba95268.d01	121083	54*	13.8*
792	41 22.08225N	070 57.53658W	13.11	ROCK	1	mba95275.d06	9959	38	13.11
793	41 22.03773N	070 57.67018W	14.6	ROCK	1	mba95268.d01	123483	31	14.6
794	41 21.83539N	070 58.25724W	22.87	ROCK	1	mba95268.d01	125624	40	22.87
795	41 21.80648N	070 58.31093W	23.3	ROCK	1	mba95268.d01	125836	21	23.3
796	41 22.12090N	070 57.70993W	13.06	ROCK	1	mba95275.d06	25428	57	13.06
797	41 22.35245N	070 57.09268W	14.06	ROCK	1	mba95275.d06	27826	43	14.06
799	41 22.11079N	070 57.44842W	13.63	ROCK	1	mba95275.d06	9647	15	13.63
800	41 22.09553N	070 57.48452W	13.09	ROCK	1	mba95275.d06	9787	3	13.09
801	41 22.09113N	070 57.43143W	14.15	ROCK	1	mba95275.d06	11667	1	14.15
802	41 22.02810N	070 57.60313W	15.34	ROCK	1	mba95275.d06	10990	34	15.34
803	41 22.01071N	070 57.67432W	17.7	ROCK	1	mba95268.d04	11196	60	17.7
805	41 22.08829N	070 58.06911W	15.13	ROCK	1	mba95272.d02	9441	31	15.13
806	41 22.18280N	070 57.75410W	13.91	ROCK	1	mba95268.d01	137420	24	13.91
807	41 22.16334N	070 57.79296W	13.25	ROCK	1	mba95268.d01	137258	41	13.25
808	41 22.26470N	070 57.58008W	14.04	ROCK	1	mba95270.d07	13207	24	14.04
809	41 22.46925N	070 56.99215W	15.33	ROCK	1	mba95299.d03	97582	55	15.33
810	41 23.53429N	070 56.87042W	15.03	ROCK	1	mba95268.d02	49001	21	15.03
811	41 23.53003N	070 56.80355W	17.28	ROCK	1	mba95268.d02	26689	3	17.28
812	41 23.49716N	070 56.86569W	15.13	ROCK	1	mba95275.d08	45764	23	15.13
813	41 23.49868N	070 56.92948W	15.27	ROCK	1	mba95275.d08	58285	50	15.27
814	41 23.43069N	070 57.08477W	12.26	ROCK	1	mba95268.d02	27664	29	12.26

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
815	41 23.48416N	070 57.15243W	8.69	ROCK	1	mba95268.d02	44407	30	8.69
816	41 23.41246N	070 57.01318W	15.95	ROCK	1	mba95275.d08	42416	45	15.95
817	41 23.45914N	070 57.06407W	13.58	ROCK	1	mba95268.d02	49684	45	13.58
818	41 23.48215N	070 56.98293W	14.36	ROCK	1	mba95275.d08	58087	30	14.36
819	41 23.31318N	070 57.25993W	12.33	ROCK	1	mba95264.d07	16909	20	12.33
820	41 23.32835N	070 57.34642W	13.53	ROCK	1	mba95268.d02	28578	10	13.53
821	41 23.28105N	070 57.49362W	12.38	ROCK	1	mba95275.d08	56159	41	12.38
822	41 23.25822N	070 57.50154W	13.4	ROCK	1	mba95275.d08	48177	60	13.4
823	41 23.24166N	070 57.59081W	11.6	ROCK	1	mba95268.d02	29413	32	11.6
824	41 23.23208N	070 57.57753W	12.23	ROCK	1	mba95275.d08	48458	29	12.23
826	41 23.20429N	070 57.71736W	12.84	ROCK	1	mba95275.d08	55389	50	12.84
827	41 23.21761N	070 57.66606W	13.08	ROCK	1	mba95268.d02	29663	39	13.08
829	41 23.11146N	070 57.77340W	13.76	ROCK	1	mba95264.d07	14325	59	13.76
830	41 23.13998N	070 57.81158W	16.02	ROCK	1	mba95275.d08	49322	49	16.02
831	41 23.07955N	070 57.93809W	14.53	ROCK	1	mba95268.d02	7505	34	14.53
832	41 23.09789N	070 57.93445W	15.88	ROCK	1	mba95275.d08	49761	22	15.88
833	41 23.08635N	070 57.97931W	16.57	ROCK	1	mba95268.d02	30827	21	16.57
834	41 23.04571N	070 58.02194W	17.52	ROCK	1	mba95268.d02	7805	34	17.52
835	41 23.05151N	070 58.05790W	16.92	ROCK	1	mba95275.d08	50148	55	16.92
836	41 23.06462N	070 58.04753W	17.17	ROCK	1	mba95268.d02	31074	34	17.17
837	41 23.04348N	070 58.14593W	18	ROCK	1	mba95275.d08	53858	20	18
838	41 23.08602N	070 58.12726W	17.12	ROCK	1	mba95268.d02	17797	24	17.12
839	41 23.00472N	070 58.20140W	17.6	ROCK	1	mba95275.d08	50659	36	17.6
841	41 22.95483N	070 58.36928W	17.3	ROCK	1	mba95268.d02	32221	29	17.3
842	41 22.92855N	070 58.48189W	17.03	ROCK	1	mba95268.d02	54621	27	17.03
843	41 22.80672N	070 58.68694W	19.45	ROCK	1	mba95268.d02	10204	60	19.45
844	41 22.76212N	070 58.77175W	19.5	ROCK	1	mba95268.d02	10557	22	19.5
847	41 22.65405N	070 59.08113W	19.8	ROCK	1	mba95268.d02	11682	1	19.8
848	41 22.58507N	070 59.25129W	20.73	ROCK	1	mba95275.d08	34592	33	20.73
849	41 22.66305N	070 59.21564W	20.36	ROCK	1	mba95268.d02	57304	59	20.36
850	41 22.70555N	070 59.16389W	19.03	ROCK	1	mba95268.d02	13935	48	19.03
852	41 22.72488N	070 59.16877W	20.32	ROCK	1	mba95268.d02	36871	29	20.32
853	41 22.71525N	070 59.07090W	19.78	ROCK	1	mba95268.d02	56771	55	19.78
854	41 22.81054N	070 58.96757W	19.53	ROCK	1	mba95268.d02	37627	32	19.53
856	41 22.85222N	070 58.83685W	20.78	ROCK	1	mba95268.d02	38104	16	20.78
857	41 22.87716N	070 58.80032W	19.84	ROCK	1	mba95268.d02	38257	22	19.84
858	41 22.89269N	070 58.68383W	19.36	ROCK	1	mba95268.d02	15721	23	19.36
859	41 22.92436N	070 58.67485W	18.98	ROCK	1	mba95263.d03	57046	19	18.98
860	41 22.78984N	070 59.00993W	19.47	ROCK	1	mba95268.d02	37464	13	19.47
863	41 23.02459N	070 58.39793W	16.14	ROCK	1	mba95268.d02	39789	21	16.14
864	41 23.03214N	070 58.27338W	16.34	ROCK	1	mba95268.d02	17251	25	16.34
865	41 23.09129N	070 58.19400W	16.53	ROCK	1	mba95268.d02	40563	59	16.53
866	41 23.11090N	070 58.15513W	16.53	ROCK	1	mba95268.d02	40716	2	16.53
867	41 23.10064N	070 58.09168W	16.01	ROCK	1	mba95268.d02	17930	48	16.01
869	41 23.11367N	070 57.99376W	17.07	ROCK	1	mba95268.d02	52900	46	17.07
870	41 23.17039N	070 57.99339W	17.53	ROCK	1	mba95268.d02	41314	46	17.53
871	41 23.17158N	070 57.92446W	16.39	ROCK	1	mba95268.d02	18563	20	16.39
872	41 23.19979N	070 57.88587W	15.82	ROCK	1	mba95275.d08	72365	1	15.82
873	41 23.23808N	070 57.85759W	16.14	ROCK	1	mba95275.d08	83218	30	16.14
876	41 23.32632N	070 57.53373W	12.15	ROCK	1	mba95275.d08	73612	15	12.15
877	41 23.32735N	070 57.50649W	11.54	ROCK	1	mba95268.d02	20148	22	11.54
878	41 23.36644N	070 57.43377W	11.14	ROCK	1	mba95275.d08	73981	34	11.14
879	41 23.39531N	070 57.35499W	11.61	ROCK	1	mba95263.d03	27660	55	11.61
881	41 23.35939N	070 57.33739W	13.06	ROCK	1	mba95268.d02	50623	55	13.06

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
882	41 23.42479N	070 57.27403W	10.68	ROCK	1	mba95275.d08	74565	44	10.68
883	41 23.43219N	070 57.24710W	10.52	ROCK	1	mba95275.d08	74658	15	10.52
884	41 23.44882N	070 57.19513W	11.33	ROCK	1	mba95275.d08	74846	34	11.33
885	41 23.44022N	070 57.16195W	11.66	ROCK	1	mba95275.d08	63890	30	11.66
886	41 23.46659N	070 57.16765W	11.34	ROCK	1	mba95275.d08	74966	2	11.34
887	41 23.61503N	070 56.79249W	16.23	ROCK	1	mba95268.d02	45707	12	16.23
888	41 23.63037N	070 56.71899W	13.59	ROCK	1	mba95268.d03	34803	3	13.59
889	41 23.63732N	070 56.65820W	14.29	ROCK	1	mba95268.d02	23340	22	14.29
890	41 23.69636N	070 56.58748W	16.44	ROCK	2	mba95268.d03	56855	51	16.44
891	41 23.69230N	070 56.37924W	16.95	ROCK	1	mba95268.d02	25187	20	16.95
893	41 23.62172N	070 56.62327W	16.91	ROCK	1	mba95268.d02	48147	36	16.91
894	41 23.58797N	070 56.67034W	14.55	ROCK	1	mba95300.d01	18113	35	14.55
895	41 23.58092N	070 56.70244W	15.17	ROCK	1	mba95275.d08	59166	18	15.17
896	41 23.55799N	070 56.78590W	15.43	ROCK	1	mba95300.d01	17724	31	15.43
898	41 23.58236N	070 56.77643W	14.42	ROCK	1	mba95275.d08	62485	57	14.42
899	41 23.39428N	070 57.13465W	12.4	ROCK	1	mba95275.d08	46775	54	12.4
900	41 23.39672N	070 57.21158W	10.17	ROCK	1	mba95275.d08	57229	31	10.17
901	41 23.35845N	070 57.29289W	13.51	ROCK	1	mba95263.d03	27363	44	13.51
902	41 23.10024N	070 58.02344W	16.42	ROCK	1	mba95268.d02	53008	36	16.42
903	41 23.01881N	070 58.23129W	16.16	ROCK	1	mba95268.d02	53738	23	16.16
905	41 22.60899N	070 59.21619W	20.01	ROCK	1	mba95268.d02	12154	22	20.01
906	41 22.75202N	070 59.16460W	19.88	ROCK	1	mba95268.d02	59567	41	19.88
908	41 22.85348N	070 58.76232W	20.39	ROCK	1	mba95268.d02	15417	22	20.39
909	41 23.00953N	070 58.48868W	16.78	ROCK	1	mba95268.d02	62003	20	16.78
910	41 23.10638N	070 58.19877W	16.27	ROCK	1	mba95275.d08	84505	18	16.27
911	41 23.03366N	070 58.43622W	17.05	ROCK	1	mba95268.d02	62206	39	17.05
912	41 23.12948N	070 58.17007W	14.61	ROCK	1	mba95268.d02	63183	54	14.61
913	41 23.14585N	070 58.07081W	17.22	ROCK	1	mba95275.d08	84030	30	17.22
914	41 23.28080N	070 57.76201W	15.62	ROCK	1	mba95268.d02	64697	12	15.62
915	41 23.29228N	070 57.69203W	13.28	ROCK	1	mba95275.d08	82625	38	13.28
916	41 23.31545N	070 57.60018W	11.83	ROCK	1	mba95268.d02	42754	48	11.83
918	41 23.41579N	070 57.35772W	11.08	ROCK	1	mba95275.d08	81431	32	11.08
919	41 23.44566N	070 57.31917W	11.04	ROCK	1	mba95268.d02	66329	57	11.04
920	41 23.46258N	070 57.24578W	9.86	ROCK	1	mba95275.d08	81027	54	9.86
921	41 23.46426N	070 57.27166W	10.3	ROCK	1	mba95268.d02	66501	45	10.3
924	41 23.60991N	070 56.84182W	14.12	ROCK	1	mba95275.d08	79584	51	14.12
927	41 23.65959N	070 56.46075W	18.47	ROCK	1	mba95268.d02	25480	10	18.47
928	41 23.18047N	070 57.78339W	17.32	ROCK	1	mba95275.d08	55155	48	17.32
929	41 23.15186N	070 57.81478W	17.26	ROCK	1	mba95268.d02	30212	35	17.26
930	41 23.14976N	070 57.96615W	17.2	ROCK	1	mba95268.d02	18402	5	17.2
931	41 22.80165N	070 58.85684W	19.05	ROCK	1	mba95268.d02	55962	33	19.05
932	41 22.67059N	070 59.12410W	20.89	ROCK	1	mba95268.d02	35087	58	20.89
933	41 22.76628N	070 59.24394W	20.9	ROCK	1	mba95268.d03	68583	26	20.9
934	41 22.79444N	070 59.14866W	17.82	ROCK	1	mba95268.d02	82044	52	17.82
935	41 22.77045N	070 59.19098W	20.28	ROCK	1	mba95268.d02	81837	37	20.28
936	41 22.88034N	070 59.14982W	19.13	ROCK	1	mba95268.d02	92550	23	19.13
937	41 22.82663N	070 59.12889W	20.22	ROCK	1	mba95268.d02	95446	23	20.22
938	41 22.84891N	070 59.02620W	19.7	ROCK	1	mba95268.d02	82574	24	19.7
939	41 22.89524N	070 59.09938W	20.47	ROCK	1	mba95268.d02	92370	12	20.47
940	41 22.85918N	070 59.05877W	20.74	ROCK	1	mba95268.d02	95753	41	20.74
941	41 22.85420N	070 58.97113W	20.91	ROCK	1	mba95268.d03	69518	26	20.91
942	41 22.86393N	070 59.00516W	20.94	ROCK	1	mba95268.d02	95948	37	20.94
943	41 22.91653N	070 58.74194W	20.09	ROCK	1	mba95268.d02	61084	51	20.09
944	41 23.01500N	070 58.54688W	17.43	ROCK	1	mba95268.d03	71084	27	17.43

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
945	41 23.04740N	070 58.61247W	17.2	ROCK	1	mba95268.d02	77136	45	17.2
946	41 23.09454N	070 58.38359W	14.31	ROCK	1	mba95275.d08	100574	27	14.31
947	41 23.12038N	070 58.39009W	15.44	ROCK	1	mba95275.d08	102054	22	15.44
949	41 23.09218N	070 58.27285W	15.41	ROCK	1	mba95268.d02	62803	46	15.41
950	41 23.18307N	070 58.32809W	14.81	ROCK	1	mba95268.d02	89500	56	14.81
951	41 23.14803N	070 58.19706W	15.3	ROCK	1	mba95268.d03	72393	7	15.3
952	41 23.12159N	070 58.25598W	15.35	ROCK	1	mba95268.d03	72165	38	15.35
953	41 23.14085N	070 58.29956W	15.51	ROCK	1	mba95268.d02	98837	27	15.51
954	41 23.17238N	070 58.25676W	15.71	ROCK	1	mba95268.d02	75873	22	15.71
955	41 23.13111N	070 58.20318W	15.64	ROCK	1	mba95275.d08	88410	55	15.64
956	41 23.15622N	070 58.16009W	15.52	ROCK	1	mba95268.d02	86022	29	15.52
957	41 23.13189N	070 58.09550W	16.28	ROCK	1	mba95268.d02	40934	58*	16.3*
958	41 23.20619N	070 58.05111W	15.51	ROCK	1	mba95268.d03	72978	32	15.51
959	41 23.20394N	070 58.11633W	15.83	ROCK	1	mba95268.d02	99613	35	15.83
960	41 23.24422N	070 58.03716W	12.96	ROCK	1	mba95268.d02	100001	26	12.96
961	41 23.26270N	070 57.97254W	14.22	ROCK	1	mba95268.d02	100259	28	14.22
962	41 23.27790N	070 57.86956W	14.26	ROCK	1	mba95275.d08	98634	36	14.26
963	41 23.35455N	070 57.65232W	10.58	ROCK	1	mba95268.d03	74538	25	10.58
964	41 23.39596N	070 57.57027W	12	ROCK	1	mba95275.d08	97528	45	12
965	41 23.39659N	070 57.50212W	10.51	ROCK	1	mba95275.d08	91055	27	10.51
966	41 23.37294N	070 57.55739W	11.7	ROCK	1	mba95275.d08	90838	46	11.7
967	41 23.42996N	070 57.44498W	12.9	ROCK	1	mba95268.d03	75366	5	12.9
968	41 23.43433N	070 57.37983W	12.03	ROCK	1	mba95275.d08	91515	24	12.03
969	41 23.46486N	070 57.30265W	10.96	ROCK	1	mba95275.d08	91825	32	10.96
970	41 23.48385N	070 57.19831W	11.52	ROCK	1	mba95275.d08	80854	37	11.52
972	41 22.29140N	070 53.99091W	25.78	ROCK	1	mba95272.d03	30534	28	25.78
974	41 22.32737N	070 53.97331W	23.01	ROCK	1	mba95274.d02	106983	20	23.01
975	41 22.32459N	070 54.00838W	23.89	ROCK	1	mba95274.d02	106864	35	23.89
976	41 22.33572N	070 54.02883W	24.06	ROCK	1	mba95272.d03	27984	4	24.06
977	41 22.35522N	070 53.99073W	22.53	ROCK	1	mba95272.d03	27782	17	22.53
978	41 22.35817N	070 53.94049W	22.99	ROCK	1	mba95272.d03	27581	22	22.99
979	41 22.07611N	070 53.64396W	20.18	ROCK	1	mba95274.d01	121609	15	20.18
980	41 22.10058N	070 53.59942W	21.03	ROCK	1	mba95274.d01	121433	36	21.03
981	41 22.07585N	070 53.78810W	25	ROCK	1	mba95274.d01	127273	53	25
982	41 22.03750N	070 53.82291W	24.9	ROCK	1	mba95272.d04	46412	6	24.9
983	41 22.03885N	070 53.73896W	23.79	ROCK	1	mba95274.d01	121953	13	23.79
984	41 21.96245N	070 53.75035W	25.36	ROCK	1	mba95272.d05	21630	32	25.36
985	41 22.05819N	070 53.58809W	22.86	ROCK	1	mba95272.d05	12448	23	22.86
986	41 22.04565N	070 53.65801W	21.31	ROCK	1	mba95272.d05	12744	56	21.31
987	41 22.02032N	070 53.62224W	23.06	ROCK	1	mba95274.d01	100722	35	23.06
988	41 21.99835N	070 53.60510W	23.79	ROCK	1	mba95272.d05	22291	35	23.79
989	41 21.96269N	070 53.60404W	24.87	ROCK	1	mba95272.d05	49063	31	24.87
990	41 22.20015N	070 53.06571W	21.84	ROCK	1	mba95272.d05	24903	32	21.84
992	41 22.22979N	070 52.74087W	17.14	ROCK	1	mba95300.d01	86199	31	17.14
993	41 22.23411N	070 52.77254W	18.25	ROCK	1	mba95274.d01	73983	16	18.25
994	41 22.33504N	070 52.65061W	20.18	ROCK	1	mba95274.d01	89026	42	20.18
995	41 22.17538N	070 52.79524W	13.87	ROCK	1	mba95274.d01	60267	52	13.87
996	41 22.18962N	070 52.78487W	14.84	ROCK	1	mba95300.d01	90323	24	14.84
997	41 22.19118N	070 52.82294W	15.33	ROCK	1	mba95272.d05	61928	48	15.33
998	41 22.15909N	070 52.80264W	15.03	ROCK	1	mba95300.d01	97335	52	15.03
999	41 22.17987N	070 52.85204W	16.6	ROCK	1	mba95272.d05	61791	15	16.6
1000	41 22.15526N	070 52.90446W	15.51	ROCK	1	mba95272.d05	61533	26	15.51
1001	41 22.17947N	070 52.91229W	16.8	ROCK	1	mba95274.d01	73464	25	16.8
1002	41 22.12946N	070 52.92877W	18.94	ROCK	1	mba95274.d01	60786	26	18.94

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
1003	41 22.09749N	070 52.79946W	18.76	ROCK	1	mba95272.d05	99629	26	18.76
1004	41 22.12975N	070 52.80970W	16.87	ROCK	1	mba95300.d01	100751	3	16.87
1005	41 22.11957N	070 52.83810W	16.32	ROCK	1	mba95300.d01	100650	43	16.32
1006	41 22.14668N	070 52.83530W	15.11	ROCK	1	mba95300.d01	97471	48	15.11
1007	41 22.31662N	070 52.55251W	18.92	ROCK	1	mba95274.d01	74785	54	18.92
1008	41 22.29405N	070 52.54984W	17.27	ROCK	1	mba95272.d05	63211	40	17.27
1009	41 22.28400N	070 52.46547W	17.16	ROCK	1	mba95300.d01	95921	19	17.16
1011	41 22.21290N	070 52.78195W	17.35	ROCK	1	mba95272.d05	62137	33*	17.4*
1012	41 22.24194N	070 52.49153W	17.41	ROCK	1	mba95274.d01	28238	35	17.41
1015	41 21.96485N	070 53.08259W	21.48	ROCK	1	mba95274.d01	42271	57	21.48
1016	41 21.91927N	070 53.05758W	22.94	ROCK	1	mba95273.d04	111820	31	22.94
1017	41 22.20204N	070 52.71996W	16.05	ROCK	1	mba95274.d01	59968	50	16.05
1018	41 22.13970N	070 52.66437W	18.43	ROCK	1	mba95272.d05	100310	55	18.43
1019	41 22.15232N	070 52.68698W	18.23	ROCK	1	mba95274.d01	28975	22	18.23
1020	41 22.07066N	070 52.92210W	19.2	ROCK	1	mba95274.d01	29799	40	19.2
1021	41 22.04926N	070 52.90781W	17.47	ROCK	1	mba95272.d05	99042	55	17.47
1022	41 22.10412N	070 52.75948W	18.51	ROCK	1	mba95272.d05	99814	52	18.51
1023	41 22.09093N	070 52.73828W	18.66	ROCK	1	mba95274.d01	43623	29	18.66
1024	41 22.10247N	070 52.69558W	19.04	ROCK	1	mba95274.d01	43784	6	19.04
1026	41 22.14757N	070 52.44652W	20.25	ROCK	1	mba95273.d04	109626	35	20.25
1028	41 21.88608N	070 52.93826W	22.46	ROCK	1	mba95273.d01	44220	28	22.46
1029	41 21.94642N	070 52.85247W	18.85	ROCK	1	mba95273.d04	92998	22	18.85
1031	41 21.88256N	070 52.82481W	20.38	ROCK	1	mba95273.d04	79812	28	20.38
1032	41 22.14176N	070 52.37317W	19.39	ROCK	1	mba95273.d01	9325	51	19.39
1033	41 22.11086N	070 52.54302W	20.38	ROCK	1	mba95273.d04	109960	31	20.38
1034	41 21.84114N	070 53.00798W	23.44	ROCK	1	mba95273.d01	43881	38	23.44
1035	41 21.84386N	070 52.97654W	23.62	ROCK	1	mba95273.d04	80415	39	23.62
1037	41 22.04219N	070 52.51504W	20.73	ROCK	1	mba95273.d01	58118	35	20.73
1038	41 22.00665N	070 52.50344W	20.85	ROCK	1	mba95273.d04	78509	1	20.85
1040	41 21.94899N	070 52.75858W	22.12	ROCK	1	mba95273.d01	56911	1	22.12
1041	41 21.95594N	070 52.73081W	22.06	ROCK	1	mba95273.d01	57048	43	22.06
1043	41 21.91603N	070 52.69233W	21.44	ROCK	1	mba95273.d01	78786	52	21.44
1044	41 21.88901N	070 52.69233W	21.04	ROCK	1	mba95273.d04	59904	45	21.04
1045	41 21.88144N	070 52.59385W	22.78	ROCK	1	mba95273.d04	45147	40	22.78
1046	41 21.85827N	070 52.62395W	23.96	ROCK	1	mba95273.d04	45289	13	23.96
1047	41 22.04856N	070 52.35544W	19.8	ROCK	1	mba95273.d01	77160	35	19.8
1048	41 21.98762N	070 52.31278W	21.35	ROCK	1	mba95273.d01	99169	39	21.35
1049	41 21.95234N	070 52.35697W	21.24	ROCK	1	mba95273.d04	44242	37	21.24
1050	41 21.88502N	070 52.44615W	22.67	ROCK	1	mba95273.d01	115312	23	22.67
1051	41 21.92107N	070 52.41844W	19.43	ROCK	2	mba95273.d04	44504	18	19.43
1052	41 22.18308N	070 51.79323W	26.46	ROCK	1	mba95273.d01	101651	37	26.46
1053	41 22.12928N	070 51.87649W	26.56	ROCK	1	mba95273.d04	42326	38	26.56
1056	41 21.74999N	070 52.10514W	20.05	ROCK	1	mba95273.d02	57797	22	20.05
1057	41 21.72407N	070 52.07203W	18.94	ROCK	1	mba95300.d01	115404	14	18.94
1059	41 21.69595N	070 51.93658W	18.22	ROCK	1	mba95273.d04	26582	22	18.22
1060	41 21.72446N	070 51.97745W	18.16	ROCK	1	mba95274.d04	41554	29	18.16
1062	41 21.65143N	070 52.32174W	24.17	ROCK	1	mba95274.d04	39188	32	24.17
1063	41 21.60197N	070 52.30030W	21.17	ROCK	1	mba95274.d04	42732	15	21.17
1064	41 21.43115N	070 52.30401W	25.08	ROCK	1	mba95274.d05	32488	59	25.08
1065	41 21.40278N	070 52.28453W	24.34	ROCK	1	mba95273.d02	116803	23	24.34
1066	41 21.37609N	070 52.26656W	25.13	ROCK	1	mba95273.d03	11029	36	25.13
1069	41 21.52154N	070 52.29441W	21.87	ROCK	1	mba95275.d04	24092	1	21.87
1070	41 21.52010N	070 52.35466W	25.21	ROCK	1	mba95274.d05	10409	22	25.21
1071	41 21.53990N	070 52.16509W	18.85	ROCK	1	mba95274.d05	14507	55	18.85

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
1072	41 21.55731N	070 52.12470W	17.82	ROCK	1	mba95274.d05	1435	58*	17.8*
1073	41 21.56159N	070 52.06391W	16.82	ROCK	1	mba95300.d01	124073	3	16.82
1074	41 21.57881N	070 52.02850W	16.19	ROCK	1	mba95300.d01	124219	1	16.19
1075	41 21.32344N	070 52.17970W	23.89	ROCK	1	mba95273.d04	24279	32	23.89
1076	41 21.34563N	070 52.21680W	23.36	ROCK	1	mba95273.d03	12243	38	23.36
1077	41 21.49276N	070 52.13506W	19.72	ROCK	1	mba95274.d05	33091	26	19.72
1078	41 21.52908N	070 52.06794W	17.46	ROCK	1	mba95274.d05	33348	29	17.46
1079	41 21.51142N	070 52.05252W	17.66	ROCK	1	mba95273.d04	25458	39	17.66
1080	41 21.57827N	070 51.99491W	15.63	ROCK	2	mba95273.d04	25899	54	15.63
1081	41 22.07974N	070 52.16406W	21.1	ROCK	1	mba95273.d04	62290	73*	21.1*
1082	41 22.18947N	070 52.33148W	18.5	ROCK	1	mba95273.d04	109237	30	18.5
1083	41 22.18577N	070 52.39091W	19.6	ROCK	1	mba95274.d01	12215	23	19.6
1084	41 22.56030N	070 54.10089W	17.05	ROCK	1	mba95275.d05	6862	50	17.05
1085	41 22.53413N	070 54.05181W	20.9	ROCK	2	mba95274.d03	2081	16	20.9
1086	41 22.50839N	070 54.07400W	17.61	ROCK	1	mba95274.d03	1968	20	17.61
1087	41 22.44600N	070 54.08734W	17.45	ROCK	1	mba95274.d02	142778	29	17.45
1088	41 22.41747N	070 54.08139W	20.61	ROCK	1	mba95272.d02	110939	21	20.61
1089	41 22.39686N	070 54.08368W	20.94	ROCK	1	mba95274.d02	125833	60	20.94
1090	41 22.42375N	070 54.15836W	20.43	ROCK	1	mba95274.d02	143021	3	20.43
1092	41 22.41131N	070 54.12502W	20.25	ROCK	1	mba95275.d05	7715	3	20.25
1093	41 22.38683N	070 54.12864W	22.73	ROCK	1	mba95275.d05	7853	7	22.73
1094	41 21.97940N	070 56.94458W	18.26	ROCK	1	mba95267.d02	37134	28	18.26
1096	41 22.48794N	070 53.90118W	23.89	ROCK	1	mba95272.d02	110051	31	23.89
1098	41 22.60406N	070 54.16933W	23.35	ROCK	1	mba95269.d01	2989	30	23.35
1099	41 22.53723N	070 54.31597W	18.79	ROCK	1	mba95270.d06	32110	40	18.79
1100	41 22.50812N	070 54.28351W	21.41	ROCK	1	mba95272.d01	25073	29	21.41
1101	41 22.48366N	070 54.38906W	24.73	ROCK	1	mba95272.d01	25528	30	24.73
1102	41 22.51748N	070 54.43586W	23.69	ROCK	1	mba95269.d01	1786	42	23.69
1103	41 22.53495N	070 54.39189W	24.43	ROCK	1	mba95269.d01	1995	39	24.43
1106	41 22.56203N	070 54.45373W	24.47	ROCK	1	mba95268.d04	95543	18	24.47
1107	41 24.17953N	070 54.00075W	21.82	WRECK	2	mba95268.d03	47894	14	21.82
1108	41 23.64969N	070 53.78205W	25.09	ROCK	1	mba95269.d02	3740	47	25.09
1109	41 22.23260N	070 57.11566W	13.16	ROCK	1	mba95275.d06	8468	33	13.16
1110	41 22.16555N	070 57.18183W	13.79	ROCK	1	mba95270.d01	47633	37	13.79
1111	41 22.16291N	070 57.24416W	12.74	ROCK	1	mba95275.d06	12419	29	12.74
1113	41 23.52477N	070 57.17865W	11.92	ROCK	1	mba95268.d03	76395	59	11.92
1114	41 23.55627N	070 57.13734W	8.19	ROCK	1	mba95275.d08	95937	38	8.19
1115	41 23.56880N	070 57.15722W	11.06	ROCK	1	mba95268.d03	58841	25	11.06
1117	41 23.58842N	070 57.02490W	13.6	ROCK	1	mba95268.d03	58394	43	13.6
1118	41 23.58885N	070 56.93667W	11.21	ROCK	1	mba95268.d02	67704	19	11.21
1119	41 23.50083N	070 57.41181W	12.48	ROCK	1	mba95275.d08	108773	31	12.48
1120	41 23.50310N	070 57.47090W	12.8	ROCK	1	mba95268.d03	59908	11	12.8
1121	41 23.46612N	070 57.38579W	13.36	ROCK	1	mba95275.d08	96851	33	13.36
1123	41 23.45628N	070 57.55128W	11.38	ROCK	1	mba95275.d08	109240	47	11.38
1124	41 23.45729N	070 57.58718W	12.2	ROCK	1	mba95268.d03	31893	37	12.2
1125	41 23.44478N	070 57.62344W	13	ROCK	1	mba95268.d02	87002	55	13
1126	41 23.40404N	070 57.60209W	11.36	ROCK	1	mba95275.d08	104960	57	11.36
1128	41 23.46406N	070 57.66483W	11.78	ROCK	1	mba95268.d03	60556	26	11.78
1129	41 23.41961N	070 57.70303W	10.07	ROCK	1	mba95275.d08	118473	29	10.07
1131	41 23.41299N	070 57.77457W	11.9	ROCK	1	mba95268.d02	107001	15	11.9
1132	41 23.42482N	070 57.77998W	11.98	ROCK	1	mba95275.d08	121357	3	11.98
1134	41 23.40512N	070 57.79440W	12.39	ROCK	1	mba95268.d02	107079	15	12.39
1135	41 23.38898N	070 57.72507W	12.92	ROCK	1	mba95275.d08	109852	10	12.92
1137	41 23.37448N	070 57.69018W	12.81	ROCK	1	mba95275.d08	104626	54	12.81

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
1138	41 23.36483N	070 57.75023W	12.87	ROCK	1	mba95268.d02	74073	35	12.87
1139	41 23.38124N	070 57.64383W	11.16	ROCK	1	mba95268.d02	101574	35	11.16
1141	41 23.37739N	070 57.83592W	11.07	ROCK	1	mba95275.d08	117958	42	11.07
1142	41 23.34660N	070 57.89674W	13.04	ROCK	1	mba95268.d02	87968	38	13.04
1143	41 23.33101N	070 57.92496W	13.21	ROCK	1	mba95268.d02	88076	55	13.21
1144	41 23.43159N	070 57.85763W	9.32	ROCK	1	mba95268.d03	61181	35	9.32
1145	41 23.41545N	070 57.92046W	10.11	ROCK	1	mba95268.d03	61397	49	10.11
1146	41 23.40772N	070 57.83182W	10.61	ROCK	1	mba95275.d08	121532	49	10.61
1147	41 23.40677N	070 57.85485W	10.86	ROCK	1	mba95268.d03	31004	40	10.86
1148	41 23.38098N	070 57.90996W	11.13	ROCK	1	mba95275.d08	121796	29	11.13
1149	41 23.24327N	070 58.18567W	12.32	ROCK	1	mba95275.d08	116610	24	12.32
1150	41 23.27560N	070 58.09839W	14.32	ROCK	1	mba95275.d08	116939	26	14.32
1151	41 23.20588N	070 58.19459W	15.72	ROCK	1	mba95268.d02	75629	72*	15.7*
1152	41 23.26688N	070 58.07448W	14.47	ROCK	1	mba95275.d08	111078	29	14.47
1153	41 22.96925N	070 58.72641W	19.3	ROCK	1	mba95268.d02	97086	39	19.3
1154	41 22.95191N	070 58.91955W	19.82	ROCK	1	mba95268.d02	91732	26	19.82
1155	41 22.95292N	070 58.85509W	20.48	ROCK	1	mba95268.d02	78049	38	20.48
1156	41 22.97255N	070 58.88294W	20.79	ROCK	1	mba95268.d02	91582	43	20.79
1157	41 23.00090N	070 58.95978W	21.15	ROCK	1	mba95268.d02	125573	54	21.15
1158	41 22.96592N	070 59.04409W	21.2	ROCK	1	mba95268.d02	125886	2	21.2
1159	41 22.91330N	070 59.18098W	17.93	ROCK	1	mba95268.d02	126388	36	17.93
1162	41 22.93871N	070 59.23846W	19.89	ROCK	1	mba95268.d02	114428	36	19.89
1163	41 23.01924N	070 59.21002W	16.46	ROCK	1	mba95268.d03	12296	30	16.46
1164	41 23.02362N	070 59.17656W	17.82	ROCK	1	mba95268.d03	12406	54	17.82
1166	41 23.31888N	070 57.97058W	13.55	ROCK	1	mba95268.d02	88227	29	13.55
1167	41 23.30820N	070 57.95876W	13.74	ROCK	1	mba95275.d08	110666	19	13.74
1168	41 23.33268N	070 58.02265W	11.8	ROCK	1	mba95275.d08	122195	52	11.8
1169	41 23.31573N	070 58.02927W	13.86	ROCK	1	mba95268.d02	107972	24	13.86
1171	41 23.15524N	070 58.40759W	14.18	ROCK	1	mba95268.d02	89791	29	14.18
1174	41 23.01223N	070 58.83375W	19.86	ROCK	1	mba95268.d02	111018	28	19.86
1175	41 23.31027N	070 57.81102W	14.78	ROCK	1	mba95275.d08	98395	60	14.78
1177	41 23.34189N	070 57.70068W	14.47	ROCK	1	mba95275.d08	98011	31	14.47
1178	41 23.34226N	070 57.65109W	11.51	ROCK	1	mba95275.d08	90490	50	11.51
1179	41 23.49007N	070 57.28039W	10.92	ROCK	1	mba95268.d03	76013	51	10.92
1180	41 23.48783N	070 57.32051W	11.74	ROCK	1	mba95275.d08	96611	20	11.74
1181	41 23.50634N	070 57.27719W	11.58	ROCK	1	mba95275.d08	96447	28	11.58
1182	41 23.55472N	070 57.19973W	10.4	ROCK	1	mba95268.d03	58992	31	10.4
1184	41 23.35847N	070 57.96603W	11.85	ROCK	1	mba95275.d08	121990	29	11.85
1185	41 23.40352N	070 57.98092W	10.47	ROCK	1	mba95268.d03	61602	11	10.47
1186	41 23.40106N	070 58.03694W	11.08	ROCK	2	mba95268.d03	61782	50	11.08
1187	41 23.37923N	070 58.01683W	12.01	ROCK	1	mba95268.d03	6917	37	12.01
1189	41 23.34048N	070 58.06591W	13.67	ROCK	1	mba95275.d08	128529	29	13.67
1190	41 23.36450N	070 58.08684W	13.28	ROCK	1	mba95275.d08	133447	36	13.28
1191	41 23.37729N	070 58.15527W	12.19	ROCK	2	mba95268.d03	62183	51	12.19
1192	41 23.33322N	070 58.14397W	13	ROCK	1	mba95268.d03	7421	21	13
1193	41 23.27675N	070 58.22046W	11.24	ROCK	1	mba95268.d02	122860	23	11.24
1196	41 23.23851N	070 58.27958W	15.75	ROCK	1	mba95275.d08	123100	35	15.75
1198	41 23.12974N	070 58.56758W	17.39	ROCK	1	mba95275.d08	124145	12	17.39
1200	41 22.97728N	070 59.23242W	18.76	ROCK	1	mba95268.d03	511	16	18.76
1202	41 22.99529N	070 59.13189W	19.52	ROCK	1	mba95268.d02	114882	32	19.52
1203	41 22.99032N	070 59.10226W	19.98	ROCK	1	mba95268.d02	114971	38	19.98
1204	41 23.02584N	070 59.07964W	19.02	ROCK	1	mba95268.d03	1065	36	19.02
1205	41 23.06470N	070 59.08376W	17.68	ROCK	1	mba95268.d03	12768	37	17.68
1206	41 23.09770N	070 58.98719W	18.77	ROCK	1	mba95268.d03	13123	5	18.77

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
1208	41 23.10419N	070 58.89048W	18.98	ROCK	1	mba95268.d03	1799	22	18.98
1209	41 23.07387N	070 58.83353W	18.88	ROCK	1	mba95268.d03	10097	18	18.88
1210	41 23.19975N	070 58.64568W	14.93	ROCK	1	mba95268.d03	2729	32	14.93
1211	41 23.16514N	070 58.62250W	15.24	ROCK	1	mba95275.d08	135368	40	15.24
1212	41 23.25414N	070 58.52977W	14.29	ROCK	1	mba95299.d03	3018	75*	14.3*
1213	41 23.22409N	070 58.58191W	14.83	ROCK	1	mba95268.d03	2968	3	14.83
1214	41 23.17842N	070 58.53609W	15.53	ROCK	1	mba95275.d08	126714	23	15.53
1215	41 23.29660N	070 58.48292W	15.12	ROCK	1	mba95299.d03	9798	21	15.12
1216	41 23.29188N	070 58.44189W	15.23	ROCK	1	mba95268.d03	15140	39	15.23
1217	41 23.31070N	070 58.44821W	15.41	ROCK	1	mba95268.d03	63216	49	15.41
1219	41 23.25459N	070 58.34599W	14.58	ROCK	1	mba95268.d03	8214	53	14.58
1221	41 23.29391N	070 58.38941W	15.75	ROCK	1	mba95268.d03	29221	4	15.75
1222	41 23.21343N	070 58.35198W	16.32	ROCK	1	mba95275.d08	123356	50	16.32
1223	41 23.24510N	070 58.42972W	15.83	ROCK	1	mba95268.d02	117607	29	15.83
1225	41 23.34649N	070 58.28270W	10.09	ROCK	1	mba95268.d03	62628	39	10.09
1226	41 23.29745N	070 58.24029W	10.87	ROCK	1	mba95268.d03	7800	36	10.87
1227	41 23.31933N	070 58.22468W	11.12	ROCK	1	mba95275.d08	133910	33	11.12
1228	41 23.32685N	070 58.26286W	11.63	ROCK	1	mba95276.d01	3564	55	11.63
1229	41 23.35067N	070 58.19753W	12.56	ROCK	1	mba95276.d01	3837	24	12.56
1230	41 23.32344N	070 58.30504W	11.96	ROCK	1	mba95268.d03	3990	9	11.96
1233	41 23.04791N	070 58.83206W	19.73	ROCK	1	mba95268.d02	125106	15	19.73
1234	41 23.11802N	070 58.94037W	18.39	ROCK	1	mba95268.d03	13302	34	18.39
1235	41 23.15428N	070 58.90128W	17.14	ROCK	1	mba95299.d03	11379	39	17.14
1236	41 23.13984N	070 58.89223W	18.03	ROCK	1	mba95299.d03	11391	34*	18.0*
1237	41 23.13092N	070 59.00389W	16.46	ROCK	1	mba95299.d03	15689	38	16.46
1238	41 23.19141N	070 58.44033W	16.36	ROCK	1	mba95268.d02	123672	3	16.36
1239	41 23.07592N	070 59.17868W	15.84	ROCK	1	mba95268.d03	22537	57	15.84
1240	41 23.05151N	070 59.18304W	16.73	ROCK	1	mba95268.d03	17719	6	16.73
1241	41 23.09979N	070 59.20820W	15.87	ROCK	1	mba95268.d03	16823	18	15.87
1242	41 23.08483N	070 59.23129W	16.84	ROCK	1	mba95268.d03	16920	32	16.84
1243	41 23.05217N	070 59.24476W	18.47	ROCK	1	mba95299.d03	14778	43*	18.5*
1244	41 23.07339N	070 59.11122W	18.97	ROCK	1	mba95299.d03	12136	27	18.97
1245	41 23.12650N	070 59.07194W	17.11	ROCK	1	mba95299.d03	24223	23	17.11
1246	41 23.09798N	070 59.03304W	18.76	ROCK	1	mba95299.d03	11868	11	18.76
1247	41 23.11039N	070 59.12955W	18.32	ROCK	1	mba95299.d03	24411	11	18.32
1249	41 23.14923N	070 59.07406W	16.32	ROCK	1	mba95268.d03	16314	20	16.32
1250	41 23.18377N	070 59.10743W	14.76	ROCK	1	mba95268.d03	80459	37	14.76
1251	41 23.15398N	070 59.14104W	16.38	ROCK	1	mba95268.d03	20602	27	16.38
1252	41 23.15140N	070 59.03754W	16.52	ROCK	1	mba95299.d03	24074	23	16.52
1253	41 23.16748N	070 59.04661W	15.26	ROCK	1	mba95299.d03	27496	40	15.26
1254	41 23.19536N	070 59.09125W	14.15	ROCK	2	mba95268.d03	80398	53	14.15
1258	41 23.25895N	070 58.59652W	16.07	ROCK	1	mba95299.d03	10272	49	16.07
1260	41 23.20373N	070 58.94868W	15.85	ROCK	1	mba95268.d03	79931	30	15.85
1261	41 23.16489N	070 58.94683W	14.67	ROCK	1	mba95268.d03	23414	58*	14.7*
1262	41 23.25772N	070 58.70570W	13.07	ROCK	1	mba95268.d03	79121	7	13.07
1263	41 23.23732N	070 58.69211W	13.78	ROCK	1	mba95268.d03	19580	45	13.78
1264	41 23.22127N	070 58.68302W	14.25	ROCK	1	mba95299.d03	10615	32	14.25
1266	41 23.25960N	070 58.65404W	15.35	ROCK	1	mba95299.d03	17014	55	15.35
1268	41 23.10299N	070 59.24347W	16.64	ROCK	1	mba95299.d03	30868	35	16.64
1273	41 23.24371N	070 58.76481W	15.37	ROCK	1	mba95268.d03	79315	40	15.37
1275	41 23.25287N	070 58.73566W	14.21	ROCK	1	mba95268.d03	79216	13	14.21
1277	41 23.16272N	070 59.00989W	14.69	ROCK	1	mba95299.d03	23980	33	14.69
1279	41 23.19103N	070 58.99426W	15.88	ROCK	1	mba95299.d03	29912	50	15.88
1280	41 23.18772N	070 59.06302W	16.12	ROCK	1	mba95268.d03	80312	8	16.12

F Features Correlated with Multibeam Source Data

Feat. #	Latitude	Longitude	Feature Least Depth	Feature Type	1 or 2 x IHO	Multibeam File Name	Ping Number	Beam Number	MB Depth
1281	41 23.12405N	070 59.21249W	17.46	ROCK	1	mba95299.d03	34076	56	17.46
1282	41 23.14333N	070 59.19013W	17.04	ROCK	1	mba95299.d03	37027	57	17.04
1283	41 23.15749N	070 59.21927W	17.79	ROCK	1	mba95268.d03	80851	9	17.79
1284	41 23.15808N	070 59.18555W	16.27	ROCK	1	mba95268.d03	80736	30	16.27
1285	41 23.23322N	070 58.87138W	16.25	ROCK	1	mba95268.d03	79658	40	16.25
1286	41 23.65703N	070 56.61150W	17.61	ROCK	1	mba95268.d02	23517	38	17.61
1287	41 23.70823N	070 56.42712W	17.86	ROCK	1	mba95268.d03	56316	42	17.86
1288	41 23.69026N	070 56.40783W	17.67	ROCK	1	mba95268.d03	35848	59	17.67
1290	41 23.72749N	070 56.34730W	17.35	ROCK	1	mba95268.d03	56040	55	17.35
1291	41 23.53438N	070 57.34773W	12.6	ROCK	1	mba95268.d03	59486	31	12.6
1294	41 23.29051N	070 57.73292W	13.9	ROCK	1	mba95268.d02	64803	15	13.9
1295	41 22.56489N	070 57.78784W	17.02	ROCK	1	mba95272.d02	30520	1	17.02
1297	41 22.38564N	070 58.19572W	18.53	ROCK	1	mba95270.d03	19600	41	18.53
1300	41 21.79270N	070 56.51004W	18.5	ROCK	1	mba95268.d04	103557	40	18.5
1301	41 21.76039N	070 56.53486W	21.31	ROCK	1	mba95270.d06	9064	11	21.31
1302	41 21.66016N	070 56.74135W	24.73	ROCK	1	mba95268.d04	131178	39	24.73
1303	41 21.75439N	070 56.44359W	20.91	ROCK	1	mba95268.d04	132562	40	20.91
1304	41 22.12151N	070 57.03702W	16.25	ROCK	1	mba95299.d03	121446	35	16.25
1305	41 22.72833N	070 56.53212W	20.16	ROCK	1	mba95267.d03	29785	32	20.16
1306	41 21.73558N	070 56.36699W	26.78	ROCK	1	mba95272.d01	31966	40	26.78
1307	41 21.72188N	070 56.44624W	22.22	ROCK	1	mba95272.d01	32304	38	22.22
1308	41 21.68979N	070 56.52558W	26.94	ROCK	1	mba95272.d01	32690	31	26.94
1310	41 22.13442N	070 57.99438W	13.93	ROCK	1	mba95270.d02	5790	20	13.93
1311	41 22.11273N	070 57.90483W	13.64	ROCK	1	mba95268.d01	136808	40	13.64
1313	41 22.26264N	070 57.51328W	12.8	ROCK	1	mba95268.d01	138366	24	12.8
1314	41 22.33973N	070 57.45821W	13.28	ROCK	1	mba95270.d02	7678	35	13.28
1317	41 22.43904N	070 57.11824W	15.32	ROCK	1	mba95263.d06	13858	4	15.32
1319	41 22.58742N	070 56.78121W	19.14	ROCK	1	mba95270.d02	10022	13	19.14
1320	41 22.79795N	070 56.21995W	21.24	ROCK	1	mba95270.d02	11994	55	21.24
1321	41 23.13841N	070 56.60235W	19.03	ROCK	1	mba95270.d04	11259	31	19.03
1322	41 23.13787N	070 56.63472W	18.28	ROCK	1	mba95270.d04	11168	26	18.28
1323	41 23.07711N	070 56.67951W	17.47	ROCK	1	mba95299.d01	99459	39	17.47
1324	41 22.96760N	070 56.89081W	17.32	ROCK	1	mba95275.d06	71286	13	17.32
1326	41 22.67382N	070 57.57872W	15.94	ROCK	1	mba95270.d03	31480	8	15.94
1327	41 22.64605N	070 57.59160W	15.65	ROCK	1	mba95272.d02	29558	23	15.65
1328	41 22.62134N	070 57.61378W	16.82	ROCK	1	mba95275.d06	65450	17	16.82
1330	41 22.58358N	070 57.70588W	17.55	ROCK	1	mba95275.d06	65799	5	17.55
1331	41 22.60241N	070 57.74230W	16.46	ROCK	1	mba95299.d01	73578	31	16.46
1332	41 22.50676N	070 57.83552W	15.94	ROCK	1	mba95299.d01	68272	36	15.94
1333	41 22.79561N	070 57.32500W	14.63	ROCK	1	mba95264.d03	11305	40	14.63
1334	41 23.30188N	070 56.36046W	16.38	ROCK	1	mba95299.d02	30924	50	16.38
1335	41 22.06200N	070 58.28058W	16.89	ROCK	1	mba95263.d06	61402	74*	16.9*
1336	41 22.29596N	070 57.87012W	13.76	ROCK	1	mba95268.d01	6072	32	13.76
1337	41 22.85859N	070 57.29242W	14.59	ROCK	1	mba95268.d03	84807	23	14.59
1338	41 22.94914N	070 57.53546W	12.61	ROCK	1	mba95299.d02	43886	31	12.61
1339	41 22.66667N	070 58.27576W	15.47	ROCK	1	mba95299.d02	41277	14	15.47
1340	41 23.34451N	070 56.65892W	15.43	ROCK	1	mba95270.d05	9810	42	15.43
1341	41 23.35286N	070 56.61026W	16.11	ROCK	1	mba95270.d05	9971	33	16.11
1342	41 22.81492N	070 58.22026W	14.08	ROCK	1	mba95270.d05	28470	15	14.08
1343	41 23.09888N	070 59.14284W	17.63	ROCK	1	mba95299.d03	24472	24	17.63
1345	41 21.78127N	070 56.31404W	26.62	ROCK	1	mba95270.d06	36586	32	26.62

* after beam number and mb depth indicates that value was determined using gsfedit

NOAA FORM 77-27(H) (9-83)

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10649

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION (Corrections)	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: ~~POS, APC, EXCESS~~	1
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	NA

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES						
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES	1		2			

SHORELINE DATA

SHORELINE MAPS (List):	NA
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	Chart 13230 40th Ed.,Chart 13233 14th Ed.,Chart 13218 32nd Ed. Chart 13229 25th Ed.

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS: VERIFICATION	AMOUNTS: EVALUATION	AMOUNTS: TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			

	TIME-HOURS: VERIFICATION	TIME-HOURS: EVALUATION	TIME-HOURS: TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET			
COMPARISON WITH PRIOR SURVEYS AND CHARTS		40	40
EVALUATION OF SIDE SCAN SONAR RECORDS		24	24
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		16	16
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS		80	80

Pre-processing Examination by: G. Nelson	*Beginning Date*: 6/2/96	*Ending Date*: 6/3/96
Verification of Field Data by: G. Nelson	*Time (Hours)*: 64	*Ending Date*: 7/27/96
Verification Check by: B. Olmstead	*Time (Hours)*: 24	*Ending Date*: 8/7/96
Evaluation and Analysis by: G. Nelson	*Time (Hours)*: 16	*Ending Date*: 6/30/97
Inspection by: B. Olmstead	*Time (Hours)*: 12	*Ending Date*: 6/30/97

EVALUATION REPORT
H-10649

A. PROJECT

The hydrographer's report contains a complete discussion of the project information.

B. AREA SURVEYED

The hydrographer's report lists the geographic coordinates outlining the survey area and lists the dates of data acquisition. The survey area is in western Vineyard Sound, Massachusetts. Depths range from 26.9 feet (8.2 meters) to 111 feet (34 meters). Bottom characteristics are rocky, mud, and broken shell.

C. SURVEY VESSELS

Survey vessel information is found in the hydrographer's report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Due to a contractor proprietary data format, final data processing and verification was accomplished using contractor supplied software and a contractor supplied HP workstation. The software, used for processing is discussed in the hydrographer's report. The final smooth sheet is an AutoCAD (version 12) drawing file submitted by the contractor. Data are plotted using a UTM projection and are depicted on a single sheet. A revision overlay was created at PHB during office processing. The overlay includes corrected contour lines and minor cartographic changes. Specifically, the revision overlay reflects the removal of depth curves, revision of depth curves to reflect plotted sounding data, junctional notes, and corrected bottom sample abbreviations.

At the time of the survey certification the format for archiving of digital data had not been formally identified. In the interim, digital data for this survey exists in SAIC's Generic Sensor Format (GSF) for multibeam survey data. In addition, the smooth sheet is filed both in the AutoCad drawing format, i.e., .dwg (extension); and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHS until data transfer protocols are developed and approved.

E. SONAR EQUIPMENT

Side scan sonar was used on survey H-10649. The side scan sonar equipment, the method of operation, and disposition of significant sonar contacts are adequately discussed in the hydrographer's report.

F. SOUNDING EQUIPMENT

Sounding equipment is discussed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

The sounding data have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for actual tide, dynamic draft and sound velocity. Roll, pitch, and heading biases were computed and applied during data acquisition. The reducers have been reviewed and are consistent with NOS specifications. Actual tide reduction is derived from Cuttyhunk, Massachusetts (844-8392). Refer to Appendix E, Tide Notes, for specific information.

H. CONTROL STATIONS

Sections H and I of the hydrographer's descriptive report contain adequate discussions of horizontal control and hydrographic positioning. The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD83. The geographic positions of all survey data are based on NAD83.

Data based on NAD27 may be referenced to this survey by applying the following corrections:

Latitude: .39279 seconds (12.118 meters)
Longitude: -1.87819 seconds (-43.649 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. The maximum allowable horizontal dilution of precision (HDOP) limit of 2.5 was used for this survey. The hydrographer's report adequately describes the methods used to insure all positions were within specifications.

J. SHORELINE

There is no shoreline within the survey limits.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10649 junctions with the following surveys:

Survey	Year	Scale	Area
H-10654	1995	1:10,000	Northeast
H-10548	1994	1:10,000	Southwest

The junction with H-10654 is complete. Soundings within the common area are in good agreement. A "Joins" note has been shown on the corrections overlay within the common area.

The junction with survey H-10548 was not formally completed since this survey was previously processed and forwarded for charting. An "Adjoins" note has been shown on the correction overlay within the common areas.

The hydrographer's report adequately discussed the junctions except for the following: There is a large common area in the junction between H-10548 and H-10649. H-10548 showed a 81' Rk at 41° 20.83'N, 70° 59.09'W. This feature is not shown on H-10649. H-10548 showed a sounding of 90' at 41° 21.59'N, 70° 56.85'W. Depths in the same area on H-10649 are 94' to 97'. The limits of the common area are listed below:

Latitude (N)	Longitude (W)
41° 23.20'	70° 59.00'
41° 23.16'	70° 59.28'
41° 20.65'	70° 59.25'
41° 22.53'	70° 54.15'
41° 21.34'	70° 54.35'
41° 21.47'	70° 54.05'
41° 22.76'	70° 53.90'
41° 20.96'	70° 59.00'

As 100% multibeam coverage and 200% side scan coverage were used on H-10649 the sounding data from H-10649 should supersede the junction surveys within the common area. Dashed lines have been placed on survey H-10548 to indicate the areas that have been superseded.

M. COMPARISON WITH PRIOR SURVEYS

H-6445 (1939) 1:40,000
H-8905 (1966) 1:10,000

The differences between the two prior surveys, H-6445 and H-8905, and H-10649 are adequately discussed in the hydrographers report, with the exception of the following:

The 31 foot sounding at 41° 23.39' N, 70° 51.81' W originates with prior survey H-8905. The present survey found depths in the area that range from 42 to 55 feet with no indication of significantly shoaler depths. Based on 100% multibeam and 200% side scan coverage over the 31 foot depth, the present survey is adequate to supersede.

FE 379 (1994) 1:10,000

Data from H-10649 are adequate to supersede prior survey FE 379 except as follows: a 31' Rk at 41° 22' 13.57"N and 70° 57' 19.19"W, located in 1994, was found to be one foot shoaler than depths from the present survey. The prior 31' Rk should remain as charted.
- the 31Rk should remain as charted on Chart 13218, 34th Ed., dated Oct 5., 1996
GKM.
8-15-97

N. ITEM INVESTIGATIONS

AWOIS item 7883 was assigned and investigated during this survey. Portions of the search radius are covered on H-10649 and on H-10654. Approximately 200 meters (15-20 %) of the northern portion of the search radius was not covered by either survey. AWOIS item 7883, a wreck, was not found where currently charted and was not found within the search radius covered by H-10649 and H-10654. It is recommended that the charted wreck at 41° 24.20' N, 70° 53.06' W be removed from the chart.

O. COMPARISON WITH THE CHART

Survey H-10649 was compared with the following charts:

Chart	Edition	Date	Scale	Datum
13230	40th	April 29, 1995	1:40,000	NAD83
13233	14th	Nov. 28, 1992	1:40,000	NAD83
13218	32nd	June 26, 1993	1:80,000	NAD83

a. Hydrography

Charted hydrography originates with miscellaneous sources, junction survey H-10548 and previously mentioned prior surveys. The prior surveys have been adequately discussed in Section M and require no further discussion. Charted miscellaneous source data have been adequately discussed in the hydrographer's report and require no further discussion.

The 2xIHO features listed on page 28 of the hydrographer's report were determined to be nonsignificant by the Contracting Officer's Technical Representative (COTR). A review of these features at PHB concurred with the COTR's evaluation.

Survey H-10649 is adequate to supersede charted hydrography within the common area of coverage.

b. Dangers to Navigation

The hydrographer reported one rocky area as danger to navigation. This danger was reported to the United States Coast Guard District #1, DMA, and N\CS261 through letters dated November 1, 1995 and January 9, 1996. Twelve dangers were identified at PHB during review of

the contractor's data. These dangers were reported to the United States Coast Guard District #1, NIMA, and N/CS 261. Copies of these reports are attached.

P. ADEQUACY OF SURVEY

Hydrography on survey H-10649 is adequate to:

a. delineate the bottom configuration, determine least depths, and draw the standard depth curves;

b. Reveal there are no significant discrepancies or anomalies requiring further investigation; and

c. Show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the contract specifications.

Survey H-10649 adequately complies with the project instructions.

Q. AIDS TO NAVIGATION

Aids to navigation are adequately discussed in the hydrographer's report.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

Geographic names were not approved by the Chief Geographer.

T. RECOMMENDATIONS

Recommendations are discussed in the hydrographer's report. This is a good hydrographic survey, no additional work is required.

U. REFERRAL TO REPORTS

Referral to reports is discussed in the hydrographer's report.

Gary C. Nelson
Cartographer

APPROVAL PAGE
H-10649

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead Date: 8/5/97
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

for [signature] Date: 8/5/97
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

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Final Approval

Approved:

[signature] Date: Aug 15, 1997
Andrew A. Armstrong III
Captain, NOAA
Chief Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10649

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
13233	4/8/97	Gary C. Nelson	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. FULL APPLICATION OF SOUNDINGS FROM SMOOTH SHEET
13230	4/8/97	Gary C. Nelson	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. FULL APPLICATION OF SOUNDINGS FROM SMOOTH SHEET
13229SC	4/8/97	Gary C. Nelson	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. FULL APPLICATION OF SOUNDINGS FROM SMOOTH SHEET
13218	4/8/97	Gary C. Nelson	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. FULL APPLICATION OF SOUNDINGS THRU CHARTS 13233, 13230
			RETAIN WORK FROM FE-379 AT 41/22/13.57N, 70/57/19.19 W
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8362 WHICH MAY BE USED.