

H11278

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. OPR-P183-KR-04

Registry No. H-11278

LOCALITY

State Alaska

General Locality Shumagin Islands & Vicinity

Sublocality Korovin Strait

2004

CHIEF OF PARTY

..... Dean Moyles

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H-11278

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

FIELD NO.

State Alaska

General Locality Shumigan Islands & Vicinity

Sublocality Korovin Strait

Scale 1:10,000

Date of Survey 5/4/04-6/8/04

Instructions Dated 10/10/2003

Project No. OPR-P183-KR-04

Vessel RV Quicksilver, RV Kvichak Surveyor 1 and skiff

Chief of Party Dean Moyles

Surveyed by Moyles, Reynolds, Orthman, Lydon, Mount,
Kussat, Busey, Oliver, et al

Soundings taken by echo sounder, hand lead, pole Reson 8101and Reson 8111

Graphic record scaled by Fugro Pelagos Inc. personnel

Graphic record checked by Fugro Pelagos Inc. personnel

Evaluation by B Taylor Automated plot by HP Design Jet 500

Verification by G Nelson

Soundings in Fathoms and tenths at MLLW

REMARKS: Time in UTC.

Revisions and annotations appearing as endnotes were generated during office

**processing. All separates are filed with the project data. As a result, page numbering-
may be interrupted or non-sequential.**

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LCMF

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A - Area Surveyed

H11278 (Sheet B), is bounded by the coordinate listing below, and encompasses Korovin Strait.

Hydrographic data collection began on May 4, 2004 and ended on June 8, 2004.¹

Table 1 H11278 Survey Limits

Survey Limits ² Task Order # 15 H11278 Sheet B Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	55°19'49.73" N	160°28'25.80" W
2	55°23'39.97" N	160°28'28.62" W
3	55°23'43.61" N	160°28'28.76" W
4	55°23'39.73" N	160°19'37.68" W
5	55°23'36.89" N	160°19'25.78" W
6	55°19'49.38" N	160°19'24.85" W
7	55°19'49.73" N	160°28'25.80" W

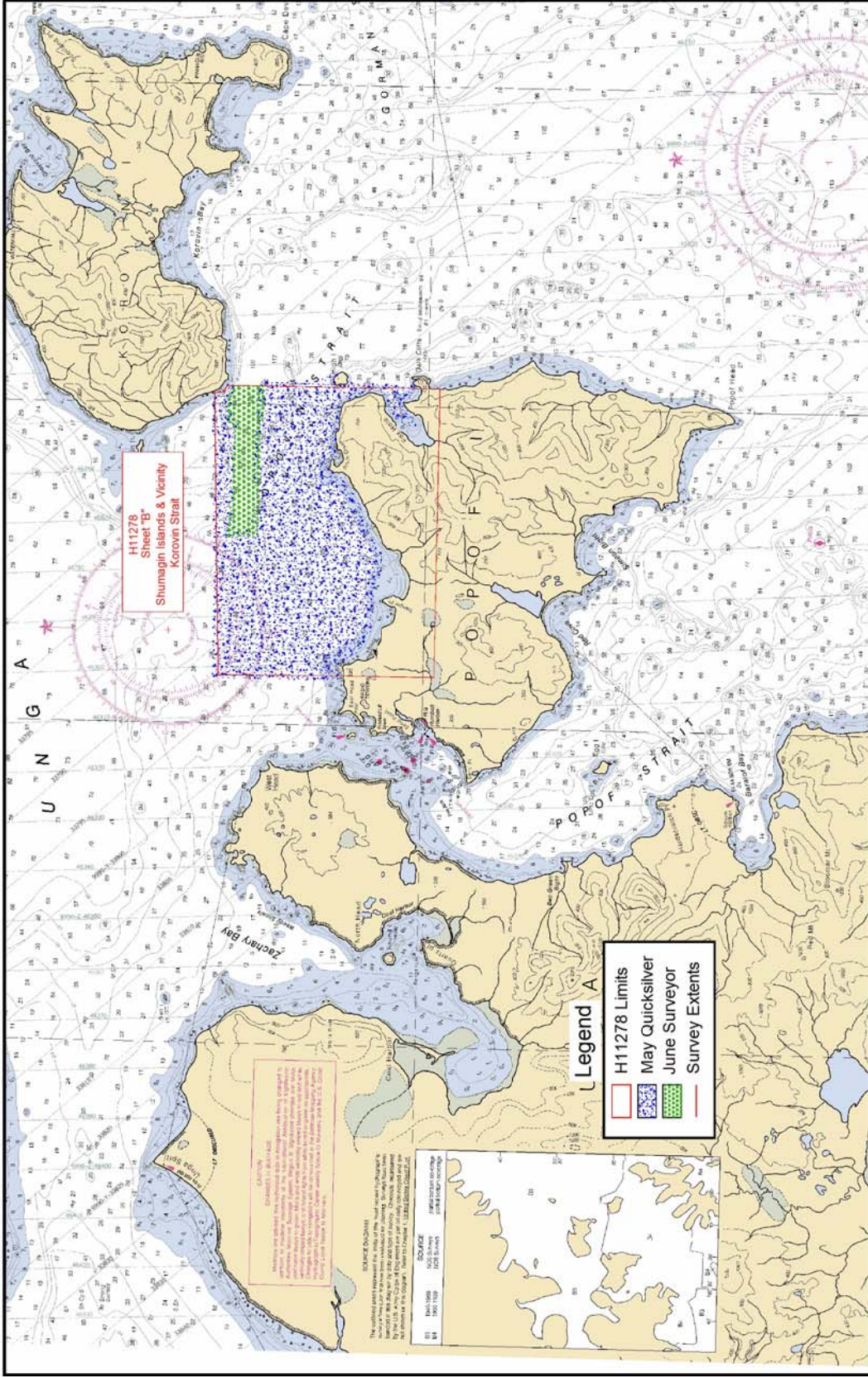


Figure 1 H11278 Survey Limits



B – Data Acquisition & Processing

Refer to the OPR-P183-KR-04 Data Acquisition and Processing Report³ for a detailed description of all equipment, survey vessels, processing procedures and quality control features. Items specific to this survey and any deviations from the Data Acquisition and Processing Report are discussed in the following sections.

Equipment & Vessels

The R/Vs Quicksilver and Kvichak Surveyor 1 acquired all sounding data for H11278. The Quicksilver, which is 32 feet in length with a draft of 3 feet, was equipped with a Reson 8101 with option 033 (pseudo SideScan) for multibeam data acquisition. The vessel was also equipped with two AML sound velocity and pressure sensors for sound velocity profiles. Vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessel (POS/MV) with XTF files logged in ISIS V 6.24.

The Kvichak Surveyor 1 is 67 feet in length, with a draft of 5.5 feet,⁴ was equipped with a Reason 8111 with option 033 (pseudo SideScan) and two AML sound velocity and pressure sensors for sound velocity profiles. Vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessel (POS/MV) with XTF files logged in ISIS V 6.24.

The DP skiff is 15 feet in length, with a draft of half a foot,⁵ was used to perform the item investigations. The skiff, owned by Kvichak Marine, was piloted by Fugro Pelagos personnel. The DP skiff could generally safely navigate in any area where it could maintain 0.5 meters of under-keel clearance, except in locations of heavy swells near shore. The skiff was equipped with a CSI GBX-PRO DGPS receiver, WinFrog v3.4.0 data acquisition system (operated on a Panasonic laptop) and a Sony digital camera. In addition, the LIDAR Smooth Sheet data and NOAA charts were displayed as a layer in WINFROG for reference. The DP skiff was not outfitted with an echosounder. However, a leadline was used to take soundings on submerged features.

Refer to OPR-P183-KR-04 Data Acquisition & Processing Report for a complete listing of equipment and vessel descriptions.

Quality Control

Crosslines

Quality control tielines were planned to measure 5 percent of the main scheme line length. Total crossline length surveyed was 30.86 km (16.67 nautical miles) or 6.4 percent of the total main scheme kilometers. Tielines that were conducted were well distributed throughout the sheet to insure adequate crossline quality control. A total of 38 tie line crossings were examined using the CARIS HIPS Q/C report.

The majority of QC Reports fell well within the required accuracy specifications. However, beams that fall below the 95% confidence level in the QC Report are associated with specific areas and conditions illustrated below. It should be noted that data at these locations are in agreement with the surrounding offset lines and are considered well within the required specifications.

- The majority of beams that fell outside of the 95 percent confidence level were located in areas having extreme steep slopes and/or rocks. The figures below show a few examples of this.

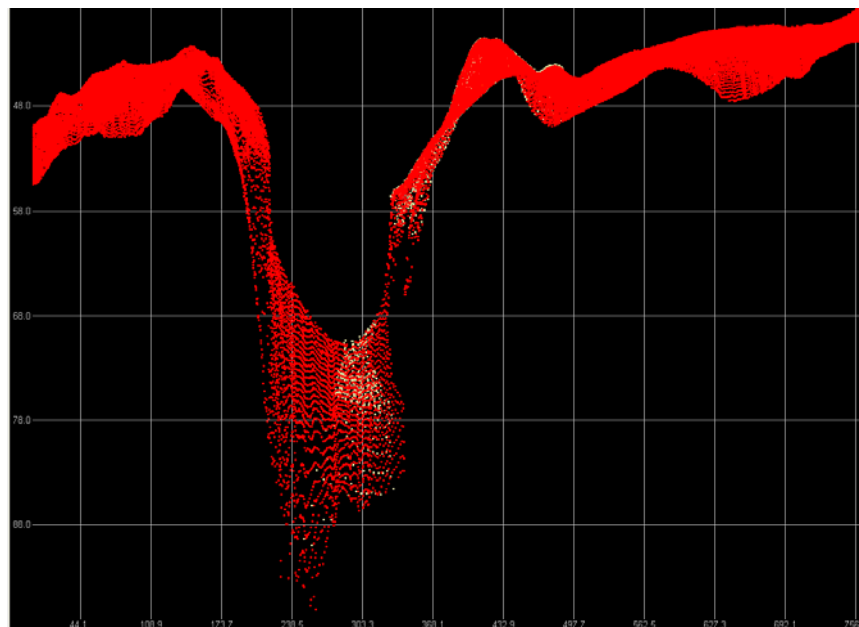


Figure 2: Profile of B02-QC004

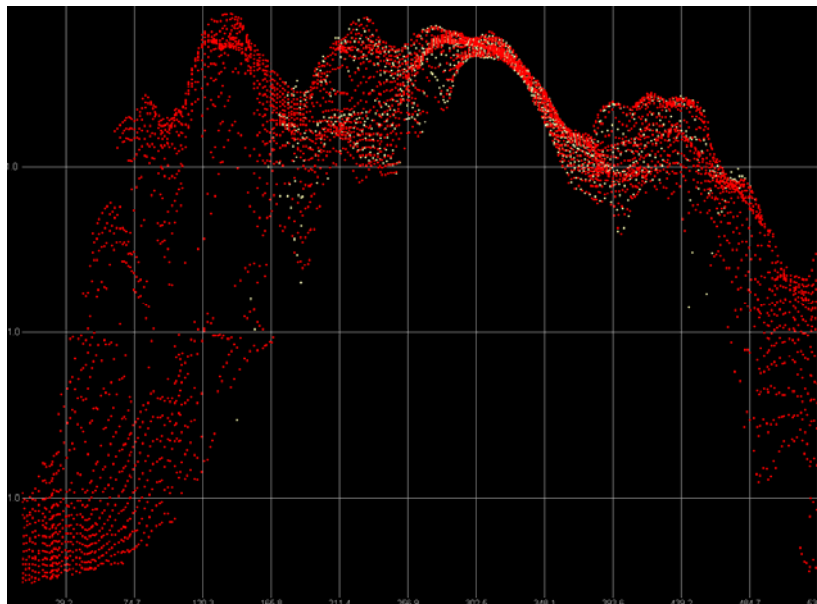


Figure 3: Profile of B02-QC006

Note: The QC reports were generated based on the given accuracy specification of:

$$\pm \sqrt{[a^2 + (b * d)^2]}$$

where, $a = 0.5$, $b = 0.013$ and $d = \text{depth}$.

However, since a variance of a difference, rather than a variance from a mean is being used, the a and b values defined in the `makehist.cla` file within CARIS will use:

$$a = 0.5 * \sqrt{2} = 0.707$$

$$b = 0.013 * \sqrt{2} = 0.018$$

Data Quality

In general, the multibeam data quality for H11278 was excellent⁶; there were no unusual conditions encountered.

As per the Statement of Work (SOW), we were required to survey to the 15m contour or to junction with the LIDAR data, whichever was shoalest. In areas where LIDAR data were not present, it was agreed upon by NOAA and Fugro Pelagos, Inc. to survey to the 4m contour. In saying this, during the H11278 survey, the area around High Island was deemed unsafe for navigation, due to the steep and over hanging cliffs; therefore data collection to the 4m contour was not achieved.

Survey Junctions⁷

H11278 (Sheet B) junctions with:

Registry #	Scale	Date	Junction Side
H11279	1:10,000	2004	West ⁸

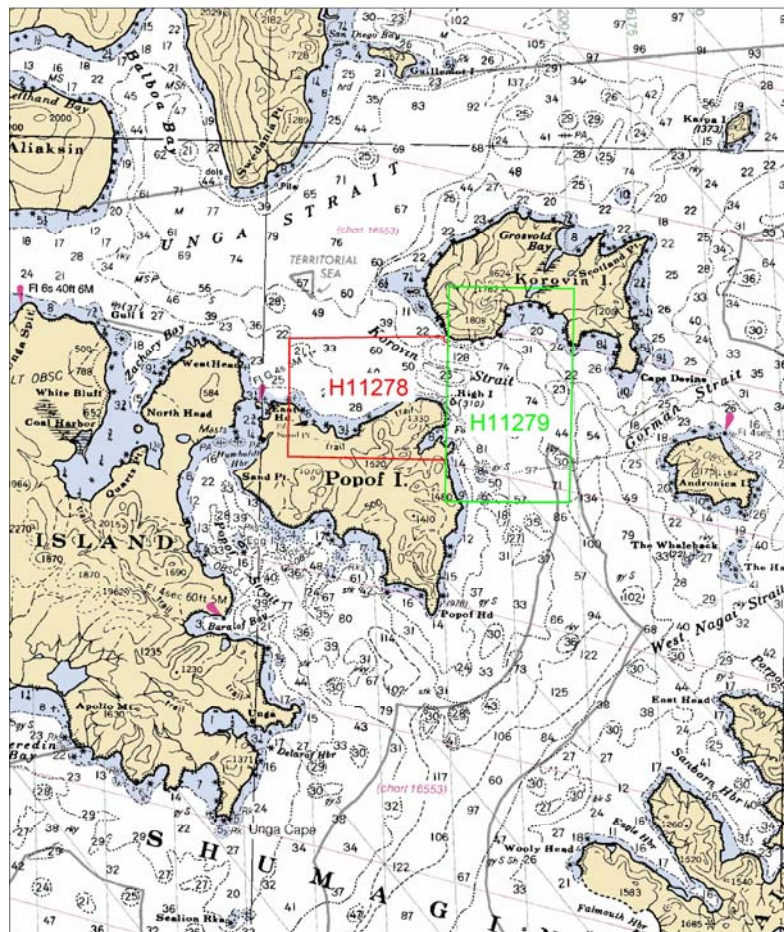


Figure 4 H11278 Survey Junctions

The surveys are in agreement along their common borders.⁹ The agreement was noted in the field using the 2 and 5 meter DTM's created for coverage verification. The conformity is also apparent in their preliminary smooth sheets.

Smooth Sheet Histograms

Figure 5 Histogram is for the Reson 8101 data collected from May 4, 2004 to June 8, 2004 on the Quicksilver. The histogram shows an increase of selected soundings from the outer beams. This is the result of surveying near the shoreline where the outer beams are mapping the shallowest areas. Also the majority of adjacent lines were run¹⁰, port beams overlapped with port beams and starboard beams overlapped with starboard beams. This makes it possible to have higher density data per square meter on the outer edges, leading to a higher chance of sounding selection on the smooth sheet. It is also apparent on these examinations the transition from phase to amplitude detection method of the sonar (around beams 37 and 65).¹¹

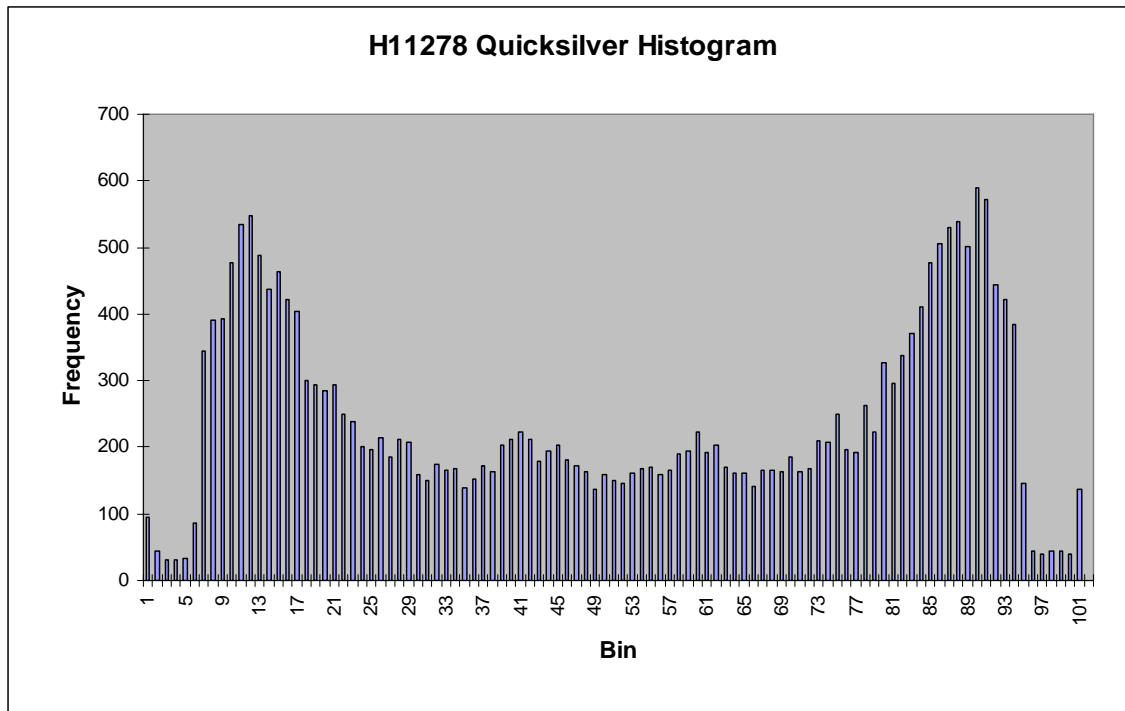


Figure 5 Histogram for 8101 (Quicksilver)

Figure 6 Histogram is for the Reson 8111 data, collected on June 2, 2004 on the Kvichak Surveyor 1. The Surveyor 1 was utilized to conduct the deep water portion of the sheet which consisted of three lines; hence the low number of selected soundings on the smooth sheet. The histogram is somewhat evenly distributed, but due to the lack of soundings¹², no trends can be identified.

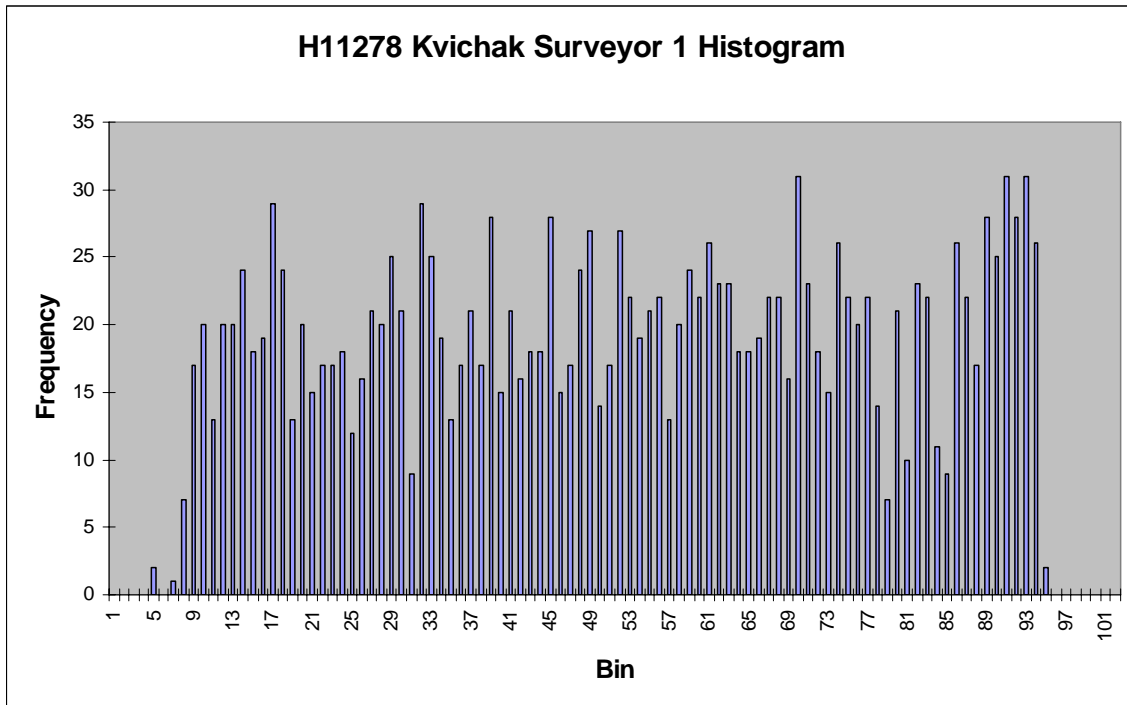


Figure 6 Histogram for 8111 (Kvichak Surveyor 1)

Quality Control Checks

During the hydrographic survey OPR-P183-KR-04 the R/Vs Quicksilver and Kvichak Surveyor 1 conducted a number of confidence checks. This usually consisted of the vessels running two lines in the opposite direction¹³ over a reference surface (normally the patch test site). The data sets collected with Reson 8101 and 8111 systems that were installed on the Quicksilver and Kvichak Surveyor 1 respectively, compared to within 2 to 5 centimeters.

Positioning system confidence checks were¹⁴ conducted on a daily basis using the POS/MV controller software. The controller software has numerous real time displays that were monitored throughout the survey to ensure the positional accuracies specified in the NOS Hydrographic Surveys Specifications and Deliverables (version March 2003) were achieved. These include, but are not limited to the following: GPS Status, Position accuracy, Receiver Status (which included HDOP) and Satellite Status. During periods of high HDOP and/or low number of available satellites survey operations were stopped.

Corrections to Echo Soundings

Refer to the OPR-P183-KR-04 Data Acquisition and Processing Report for a detailed description of all corrections to echo soundings and lead line measurements. No deviations from the report occurred.

C – Horizontal & Vertical Control

Refer to the OPR-P183-KR-04 Horizontal and Vertical Control Report¹⁵ for a detailed description of the horizontal and vertical control used on this Survey. A summary of the projects¹⁶ horizontal and vertical control follows. No deviations from the report occurred.

Horizontal Control

The horizontal control datum for this survey was the North American Datum of 1983 (NAD83), UTM (Central Meridian 159°00'00"). All raw positions were originally collected in WGS84 and transformed to NAD83 during the post-processed kinematic GPS (KGPS) routine.

It was necessary to acquire dual frequency GPS data at a known location/s on the ground so that a KGPS solution could be used for final positioning. LCMF established two local control points: one at the Anchor Inn (Fugro Pelagos processing center) and the other at Hodges Bed and Breakfast (Crew House) for this purpose. Refer to the Appendix B¹⁷ for Horizontal Control results and procedures.

Additionally, it was critical to know the elevations of the control point/s in both the processed ellipsoidal datum and the final charting datum, in this case NAD83 and MLLW respectively. The offset between these two datums was applied during post-processing to depict data in the final charting datum. It should be noted that at no time was the final data



set corrected with KGPS altitude data; only horizontal position. Altitude data were evaluated for accuracy against traditional tide zone and tide gauge methodology. The evaluation of vertical data was for experimental purposes only.

Vessel position was determined in real time using a NovAtel GPS-502 L1/L2 antenna, which was connected to a NovAtel Millennium GPS card residing in the POS/MV. The POS/MV was setup via the Diff Port to accept USCG differential corrections, which were output from a CSI MBX-3S Coast Guard beacon receiver. Note, since the pseudorange corrections received by the POS/MV are based on the NAD 83 position of the reference station antenna position, all final positions, are in all practical sense NAD 83. However, final positions were determined using a post-processed KGPS solution using the POSpac 4.1 processing software (Refer to the “2004-NOAAProcessingProcedures” document for KGPS processing procedure). Noted: On certain days, logging errors occurred at the base station/s, KGPS was not available, and conventional DGPS was used; such cases were noted on the log sheet.

Vertical Control

All sounding data were initially reduced to MLLW using unverified tidal data from the NOAA tide station located in Sand Point, AK. A sub-contractor, LCMF, also installed and operated a secondary or backup gauge (delineated in red italics below), located in the same vicinity as the NOAA gauge. The tidal data from the backup gauge was e-mailed to the Sand Point, AK office at the end of every Julian day, but was used for QC purposes only.

Table 2 - Tide Gauges

Gauge	Model	Gauge Type	Location	Latitude	Longitude	Operational
9459450	AquaTrak	Acoustic	Sand Point, AK	55°19'54"N	160°30'16" W	N/A
<i>9459450</i>	<i>H350/355</i>	<i>Digital Bubbler</i>	<i>Sand Point, AK</i>	<i>55°19'54"N</i>	<i>160°30'16" W</i>	<i>N/A</i>

Table 3 - Final Tide Zones

Zone	Primary				Secondary			
	Site	Number	Time	Range Ratio	Site	Number	Time	Range Ratio
SWA193A	Sand Point	9459450	0	1.02	<i>Sand Point</i>	<i>9459450</i>	<i>0</i>	<i>1.02</i>
SWA204A	Sand Point	9459450	0	1.00	<i>Sand Point</i>	<i>9459450</i>	<i>0</i>	<i>1.00</i>
SWA205	Sand Point	9459450	6	0.94	<i>Sand Point</i>	<i>9459450</i>	<i>6</i>	<i>0.94</i>

On August 14, 2004, LCMF issued verified tidal data from the NOAA tide gauge for OPR-P183-KR-04. On August 14, 2004 all sounding data were re-merged using CARIS HIPS and SIPS tide routine. Verified tidal data were used for the Preliminary Smooth Sheet. Refer to the Vertical and Horizontal Control Report for additional tidal information and station descriptions.¹⁸

D – Results and Recommendations

Chart Comparison¹⁹

H11278 survey was compared with charts:

- | | | | |
|---------|-----------------|------------------|--------------|
| • 500 | 1:3,500,000 | 8 th | June 1, 2003 |
| • 503 | 1:4,860,700 | 30 th | Mar 23, 2002 |
| • 16006 | 1:1,534,076 | 33 rd | Dec 23, 2000 |
| • 16011 | 1:1,023,188 | 35 th | Dec 2, 2000 |
| • 16540 | 1:300,000 | 11 th | Mar 4, 1989 |
| • 16551 | 1:80,000 | 8 th | Dec 15, 1990 |
| • 16553 | 1:80,000/20,000 | 3 rd | Sept 2, 1989 |

Comparison of Soundings

The soundings and contours, in general, compare well with the existing charts. During the comparison of soundings with Chart 16540 it was noticed that the chart seemed to be incorrectly projected, resulting in an approximate shift of 500 m to the northeast.²⁰ Therefore the soundings were primarily compared with chart 16553. Soundings from chart 16553 coincide with the soundings from H11278 to within 2 to 3 fathoms²¹; areas that do vary to any degree are noted separately and are as follows:

- The 50 fathom shoal on chart 16553 located at 55°22'46.91" N, 160° 21'45.13" W²² (413668.513 E, 6137889.837 N) as²³ migrated 350 meters to the southwest. This area was surveyed with 100% multibeam coverage.²⁴
- Hydrographic survey H11278 revealed a depth of 47 fathoms in the vicinity of a 54 fathom sounding on chart 16553 located at 55°22'29.66" N, 160° 22'12.29" W²⁵ (413179.963 E, 6137366.123 N). This area was surveyed with 100% multibeam coverage.²⁶

Others soundings that differed from the chart, were documented in a Danger to Navigation report and are listed in Appendix A Danger to Navigations²⁷.

Figure 7 illustrates that the contours from H11278 take on the same general shape, but in certain areas do deviate slightly from the existing contours on chart 16553. For instance, the 20 and 30 fathom contours on the west side of the sheet have migrated towards the shore approximately 250 meters. Since the contours on H11278 are derived from a very dense shoal biased multibeam data set and the existing charts are based on sparse single beam or lead line data sets; one would expect deviations from the existing chart or charts.²⁸

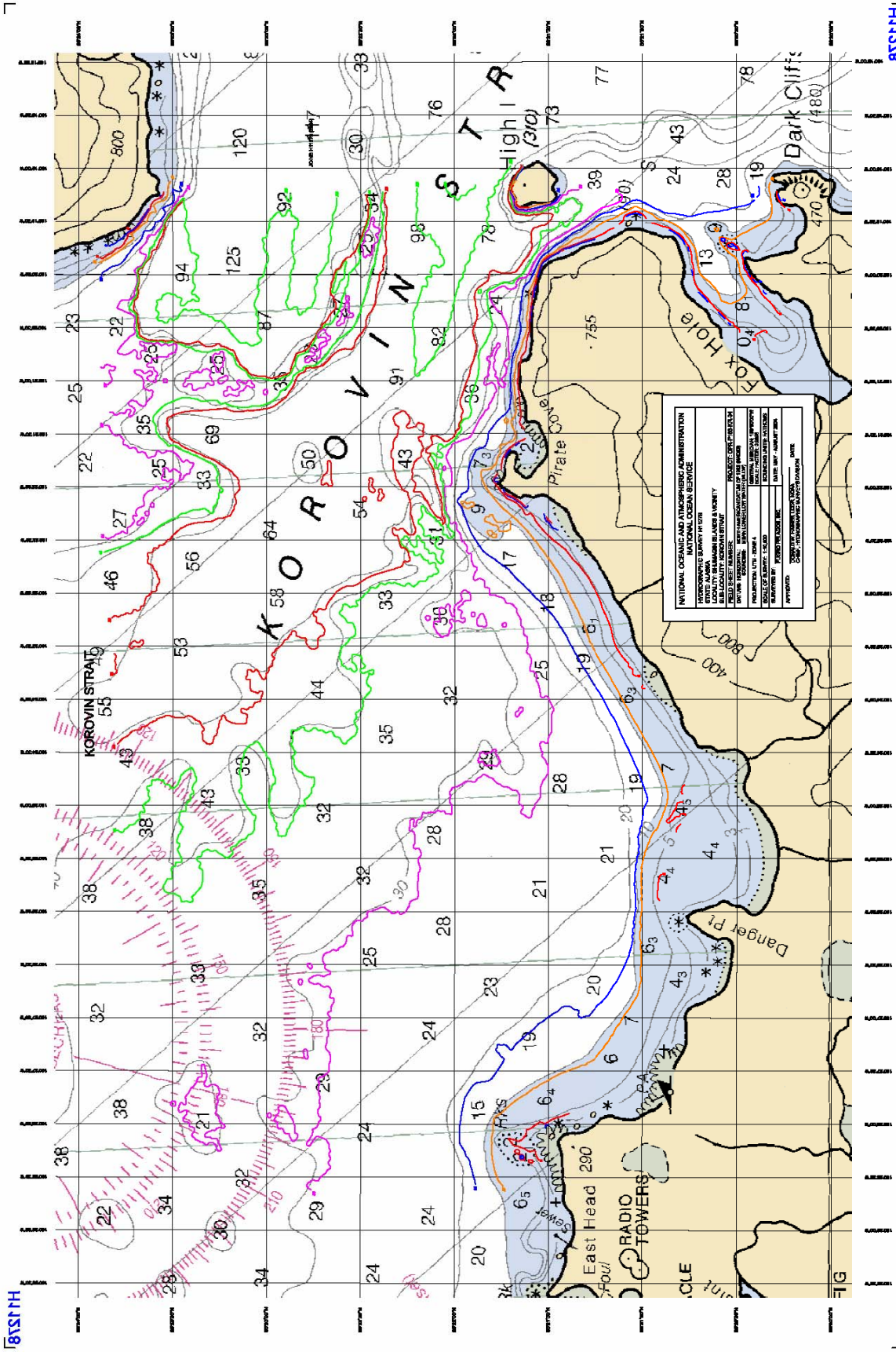


Figure 7 Comparison of Contours

Automated Wreck and Obstruction Information System

There was one AWOIS item assigned to OPR-P183-KR-04.

AWOIS Item 52984 - is described as being a beached fishing vessel with outriggers extended.

The DP Skiff made an attempt to investigate the AWOIS item, but due to safety reasons this was not achieved. This item was re-visited on June 16, 2004 @ 00:06:36 UTC by a survey ground crew.

The AWOIS item was not found at the assigned position, but rather 0.67 NM northwest of the charted or assigned position. The vessel name is the "Ray Mar Houston" and ²⁹is broken into two major pieces (noted as bow and stern) with debris scattered between the two sections. The bow position is located at 55°21'26" N 160°28'20" W and the stern at 55°21'25" N 160°28'23" W. Note: To disprove the assigned position the DP Skiff and Quicksilver visited the charted location and collected video and photos.

It's the hydrographers' recommendation that the charted wreck symbol be removed and charted at the bows surveyed position of 55°21'26" N 160°28'20" W.³⁰ It is represented this way on the H11278 smooth sheet. Refer to Appendix E³¹ for AWOIS form.



Figure 8 Bow section of the Ray Mar Houston



Figure 9 Stern section of the Ray Mar Houston



Figure 10 Photo from Quicksilver of wreckage



Figure 11 Photo from DP Skiff near the assigned position (55°20.9' N 160°27.6' W)

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H11278.³²

Dangers to Navigation

Two dangers to navigation were located during the hydrographic survey of H11278 and were submitted on June 16, 2004.³³ Refer to Appendix A for Submitted Report.³⁴

Additional ResultsAdditional Item Investigations

Additional item investigations were conducted on objects that required further action to be proven or disproved. A 15 ft skiff, referred to as DP Skiff, was used to perform the item investigations. The skiff, owned by Kvichak Marine, was piloted by Fugro Pelagos, Inc. personnel. The DP skiff could generally safely navigate in any area where it could maintain 0.5 meters of under-keel clearance, except in locations of heavy swells near shore. The skiff was equipped with a CSI GBX-PRO DGPS receiver, WinFrog v3.4.0 data acquisition system (operated on a Panasonic laptop) and a Sony digital camera. In addition, the LIDAR Smooth Sheet data and NOAA charts were displayed as a layer in WINFROG for reference. The DP skiff was not outfitted with an echosounder. However, a lead line was used to take soundings on submerged features.

Table 4, is the list of additional items for H11278 that was supplied by NOAA to investigate. This list contained a position, sounding, description and the requested action; in addition there were items that had one position assigned but had additional soundings to be investigated in the near vicinity.

Operations were planned to take advantage of the period either side of low tide and during the best possible weather conditions. The hydrographers would approach an item to be investigated and once the item was located, would maneuver to the actual target. Whenever possible, a pike pole was used to hold on target until a sounding was recorded. A fix was taken within one minute using the differentially corrected antenna extended on a pole over the actual target observed. Data logged included time, uncorrected height or depth observed to the water line, position, video/pictures of the object and a description of the target. If no target was located, a search pattern was conducted that extended to the surrounding soundings on the displayed LIDAR smooth sheet to confirm there were no actual targets in the vicinity.

DPs and their corresponding hydrographer's remarks were digitally recorded in WINFROG and digital photographs were taken of features when feasible (Refer to Appendix F for field notes³⁵).

Table 4 – H11278 Additional Investigation List³⁶

Item	Chart	LIDAR	Lat	Long	Object	Action
1	1.8	55 20 59.52 N	160 27 33.65 W	Rk		Confirm
2		55 20 35.31 N	160 26 29.29 W	Chtd Rks not found		Further Investigation
3	1.3	55 20 47.58 N	160 26 07.83 W	Rk		Confirm
	1.3	20m SW		Rk		Confirm
6	7.8	55 21 41.78 N	160 22 24.22 W	Rk		SWMB
	8.3	Close North		Rk		SWMB
	8.7	Close North		Rk		SWMB



10	0.1	55 21 01.08 N	160 19 27.76 W	Rk	Confirm
	0.7	Close North		Rk	Confirm
	1.7	Close North		Rk	Confirm
16	0.8	55 23 41.03 N	160 19 30.16 W	Rk	Confirm

Results and recommendations

Item investigations that result in a recommendation that contradicts the LIDAR data set appear on the H11278 preliminary smooth sheet. For example, a previously charted rock that was not observed by LIDAR but was found during item investigations will appear on the H11278 preliminary smooth sheet, as do rocks with heights that differ significantly from the LIDAR smooth sheet.

Investigations that result in a confirmation of the LIDAR smooth sheet do not appear on the H11278 preliminary smooth sheet. For example, a rock on the LIDAR smooth sheet whose position and height were confirmed during investigations would not appear on the H11278 smooth sheet, but does appear on the H1147B LIDAR smooth sheet.

Each result and recommendation below refers to a Detached Position (DP) form.³⁷ The DP form, created in ArcMap as described in the Shoreline Correlator Sheet section of this report, contains most of the information used in forming the recommendation including digital field notes, zoned verified tide at time of observance, and photos (if available). The DP forms can be found in Appendix F³⁸.

Item 1:

LIDAR Rk not found at 55 20 59.52 N 160 27 33.65 W. Investigated by the DP skiff on Julian day 164. Seven lead line measurements were taken at and in the vicinity of the 1.8 fm Rk LIDAR sounding and the shoalest depth found was 3.3 fms. Recommend do not chart the 1.8 fm LIDAR Rk.³⁹ DP form JD164_B1.

Item 2:

Charted rock observed. Investigated by skiff on Julian day 164; rock found with height of 2 ft MLLW. Recommend charting rock at DP position 55 20 35.26 N 160 26 29.58 W with a height of 2 ft MLLW. Appears on smooth sheet at DP position. DP form JD164_B2. Other charted rocks in the vicinity of Item 2 were not investigated and it's the hydrographers' recommendation that they should remain on the chart.⁴⁰

Item 3:

LIDAR Rks confirmed at 55 20 47.58 N 160 26 07.83 W and vicinity. The skiff visited the area on Julian day 164, investigated the reported 1.3 fm Rks, and confirmed the existence of both. Lead line soundings confirmed the LIDAR depth of 1.3 fms on the northern Rk and reported a depth of 1.4 fms on the southern Rk. Recommend charting

as reported by LIDAR with 1.3 fm depth for both.⁴¹ DP forms JD164_B3(2) and JD164_B3a(2).

Item 6:

7.8 fm LIDAR Rk positioned at 55 21 41.78 N 160 22 24.22 W was not located. The area was surveyed with 100% multibeam coverage. The shoalest depth in the area is 10.4 fms and is represented as such on the H11278 smooth sheet at 55 21 41.599 N 160 22 24.806 W. Recommend do not chart LIDAR 7.8 fm Rk. DP form JD166_B6.⁴²

8.3 fm LIDAR Rk located just north of the 7.8 fathom sounding above was confirmed by full multibeam coverage, but with depth of 8.6 fms having a position of 55 21 45.373 N 160 22 21.449 W. Recommend chart 8.6 fm Rk at multibeam location.⁴³ DP form JD166_B6a.

8.7 fm LIDAR Rk located just north of the 7.8⁴⁴ fathom sounding above was confirmed by full multibeam coverage, but with depth of 8.8 fms having a position of 55 21 48.292 N 160 22 19.429 W. Recommend chart 8.8 fm Rk at multibeam location.⁴⁵ DP form JD166_B6b.

Item 10:

0.1 fm LIDAR Rk positioned at 55 21 01.08 N 160 19 27.76 W was confirmed, but with height of 4 ft MLLW. Recommend charting rock at seaward-most extent with height of 4 ft MLLW. Appears on smooth sheet at seaward-most extent as defined by skiff investigation at 55 21 00.84 N 160 19 27.73 W. DP form JD166_B10.⁴⁶

0.7 fm LIDAR Rk located just north of the 0.1 fathom sounding above confirmed. Recommend charting as reported by LIDAR.⁴⁷ DP form JD166_B10a.

1.7 fm LIDAR Rk located just north of the 0.1 fathom sounding above was confirmed but with depth of 2.7 fms. Skiff visited area, noted dense kelp, and could not locate the rock. Multibeam coverage, however, confirmed a rock at the LIDAR position but with a depth of 2.7 fms. Recommend do not chart LIDAR 1.7 fm Rk – chart multibeam 2.7 fm Rk located at 55 21 04.865 N 160 19 27.363 W.⁴⁸ Also chart kelp. DP form JD166_B10b.

Item 16:

Drying LIDAR rock located at 55 23 41.03 N 160 19 30.16 W was confirmed but with a height of 7 ft MLLW. Recommend chart with height of 7 ft MLLW. Appears on smooth sheet at DP position 55 23 41.08 N 160 19 30.28 W with DP height. DP form JD166_B16.⁴⁹

Additional Notes:

- The source of the MHW line on the smooth sheet for H11278 is from the TENIX LADS Inc. H11147B survey of 2003.⁵⁰
- Any cartographic information on the H11278 Smooth Sheet is from the item investigations conducted by Fugro Pelagos, Inc.
- No lead line soundings are present on the smooth sheet for H11278.

Tidal Range

LCMF established the tidal range for OPR-P183-KR-04 to be 1.988 meters (6.522 feet or 1.087 fathoms). This value was used in determining height above MHW. Refer to the OPR-P183-KR-04 Horizontal and Vertical Control Report for any additional tidal information.

Shoreline Correlator Sheet

ArcMap v9.0 with the Shoreline Correlator add-on, written by the Fugro Pelagos Inc. GIS department, aided in the processing of the investigation results. The correlator utilized the Winfrog Log files to create an individual DP form for all acquired DP's. The correlator was mapped to the Log, Tide, Photos, NOAA Chart (largest scale available), LIDAR Data, Smooth Sheet Soundings and Multibeam Coverage files to calculate and display the desired information for each DP. Figure 12 shows an example of a DP form produced from the Correlator. The DP forms and the raw field notes can be found in Appendix F.⁵¹

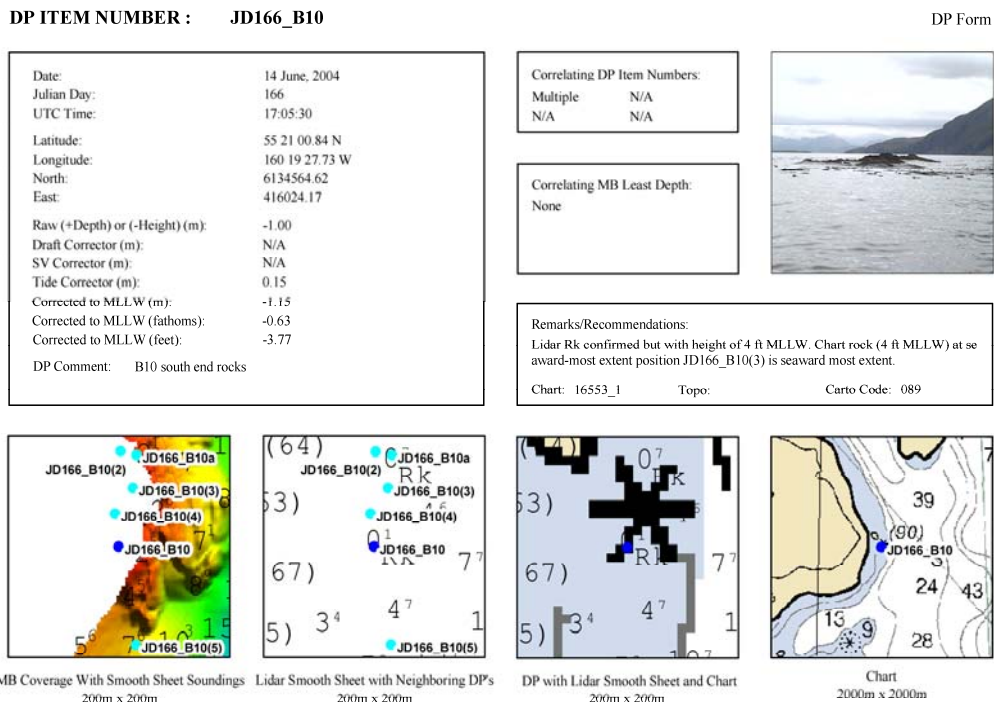


Figure 12 DP Correlator Sheet



Bottom Samples

Bottom Samples were not required under this contract.⁵²

Aids to Navigation

There were no charted aids to navigation in the survey area. No uncharted aids to navigation were found in the survey area.⁵³



E – Approval Sheet

Approval Sheet

For

H11278

Standard field surveying and processing procedures were followed in producing this survey in accordance with the following documents:

OPR-P183-KR-04 statement of work and hydrographic manual;
Fugro Pelagos, Inc. Acquisition Procedures (2004-NOAAAcquisitionProcedures);
Fugro Pelagos, Inc. Processing Procedures (2004-NOAAProcessingProcedures);
Technical Report for Tides, Sand Point Backup Tide Station Report.

The data were reviewed daily during acquisition and processing.

This report has been reviewed and approved. All records are forwarded for final review and processing to the Chief, Pacific Hydrographic Branch.

Approved and forwarded,

A handwritten signature in blue ink, appearing to read "Dean Moyles".

Dean Moyles, Fugro Pelagos, Inc.
Lead Hydrographer
Fugro Pelagos, Inc. Survey Party



Appendix A - Danger to Navigation

Two dangers to navigation were located during the hydrographic survey of H11278 and were submitted on June 16, 2004.⁵⁴



Hydrographic Survey Registry Number: H11278

Survey Title: State: Shumagin Islands & Alaska
Locality: Korovin Strait Vicinity
Sub-locality: Korovin Strait

Project Number: OPR-P183-KR-04

Survey Dates: May - June 2004

Depths are reduced to Mean Lower Low Water using unverified tides.
Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

<u>Chart</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
16553	1:80,000	3rd	09/02/89

DANGERS:

<u>Feature</u>	<u>Depth(ft or fms)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Sounding	8 fms 4 ft	55° 21' 54.4"	160° 22' 09.8"
Sounding	8 fms 3 ft	55° 21' 44.1"	160° 22' 23.9"

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6840.



Appendix B - List of Geographic Names

No new geographic names in the survey were discovered.⁵⁵

**Appendix D - Tides and Water Levels**

Abstract of Times of Hydrography for Smooth Tides

Project Number: OPR-P183-KR-04

Registry Number: H11278

Contractor Name: Fugro Pelagos Inc.

Date: December 20, 2004

Sheet Letter: B

Inclusive Dates: May 4, 2004 to June 8, 2004

Fieldwork is complete and verified tides were applied for the production of the smooth sheet.

Refer to LCMF's final verified tides report for additional information.

Table 5 Abstract of Times of Hydrography for R/V Quicksilver

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2004	125	19:53:30	23:43:26	Patch Test
2004	126	00:03:36	02:13:44	Patch Test
2004	126	18:19:25	23:56:23	
2004	127	00:03:39	02:33:16	Also worked in SHT D
2004	128	19:27:45	23:59:59	
2004	129	00:00:00	02:30:50	Also worked in SHT D
2004	130	15:43:35	23:59:59	
2004	131	00:00:00	02:10:14	
2004	131	16:11:47	23:44:30	
2004	132	00:02:21	02:09:23	Also worked in SHT K
2004	137	00:24:47	02:02:21	
2004	137	16:10:21	16:46:43	Includes Tielines
2004	146	00:50:45	02:10:37	Also worked in SHT C
2004	147	01:43:49	05:32:54	Also worked in SHT C & D
2004	150	15:51:58	17:45:31	Also worked in SHT C & K
2004	159	16:26:14	17:03:40	Also worked in SHT C & D
2004	160	16:38:46	17:14:06	Also worked in SHT C

Table 6 Abstract of Times of Hydrography for R/V Kvichak Surveyor 1

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2004	154	19:41:58	21:17:11	Also worked in SHT C



Appendix E - AWOIS

One AWOIS was assigned under OPR-P183-KR-04.⁵⁶

RECRD VESSLTERMS CHART AREA
CARTOCODE SNDINGCODE DEPTH

LAT83 LONG83 NATIVDATUM
LATDEC: LONDEC: GPQUALITY
GPSOURCE

PROJECT ITEMSTATUS SEARCHTYPE
RADIUS INIT ASSIGNED
TECNIQ

Techniqnote

History

Fieldnote POSITION DETERMINED BY: MAGELLAN MERIDIAN HANDHELD GPS WITH WAAS.
INVESTIGATION SUMMARY: THE VESSEL NAME IS THE "RAY MAR HOUSTON" AND IS BROKEN INTO TWO MAJOR PIECES WITH DEBRIS SCATTERED BETWEEN THE TWO SECTIONS. THE ITEM IS ACTUALLY LOCATED APPROXIMATLY 0.67 NM NORTHWEST OF THE CHARTED POSITION. THE DP SKIFF AND R/V QUICKSILVER VISITED THE CHARTED POSITION AND COLLECTED VIDEO AND PICTURES TO DISPROVE THE CHARTED LOCATION.
CHARTING RECOMMENDATION (HYDROGRAPHER): THE CURRENT WRECK SYMBOL SHOULD BE REMOVED AND PLACED AT THE BOWS SURVEYED POSITION.
EVALUATOR COMMENTS: Concur with clarification. Delete wreck PA and chart visible wreck as found by the present survey."/>

Proprietar

YEARSUNK

NIMANUM



Appendix F – DP forms

DP ITEM NUMBER: JD164_B1

DP Form

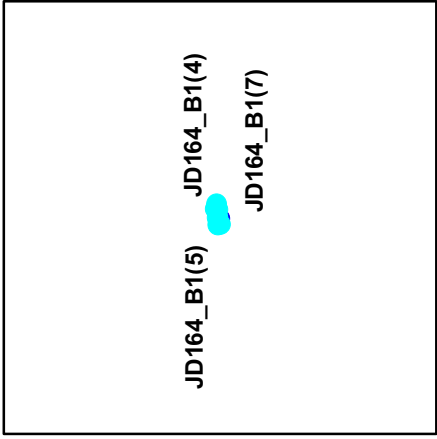
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 17:49:30
 Latitude: 55 20 59.49 N
 Longitude: 160 27 33.72 W
 North: 6134693.97
 East: 407464.03
 Raw (+Depth) or (-Height) (m): 7.60
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.18
 Corrected to MLLW (m): 6.42
 Corrected to MLLW (fathoms): 3.51
 Corrected to MLLW (feet): 21.06
 DP Comment: 7.6 metres sheet B1 Item 1

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

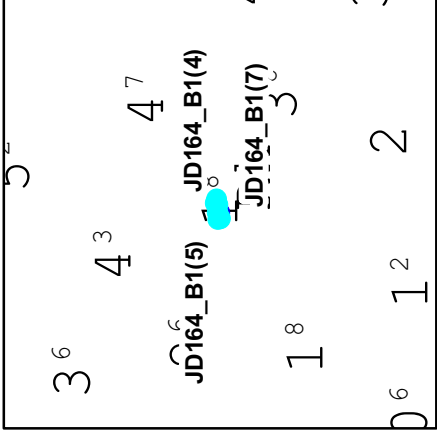
Correlating MB Least Depth:
 None

No photo available

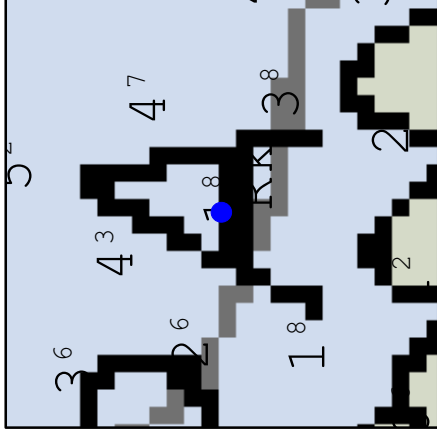
Remarks/Recommendations:
 Multiple fixes taken. 1.8 fm Rk not confirmed. Recommend do not chart lidar soundings and Rk.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings
 200m x 200m



Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

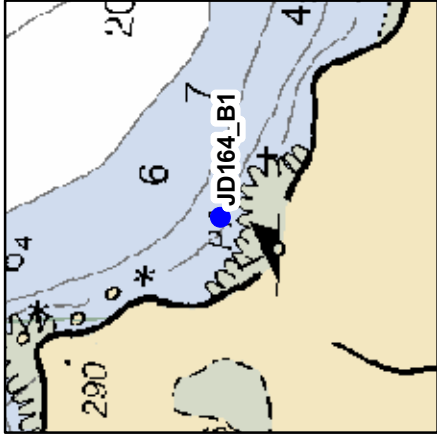


Chart
 2000m x 2000m

DP ITEM NUMBER: JD164_B1(2)

DP Form

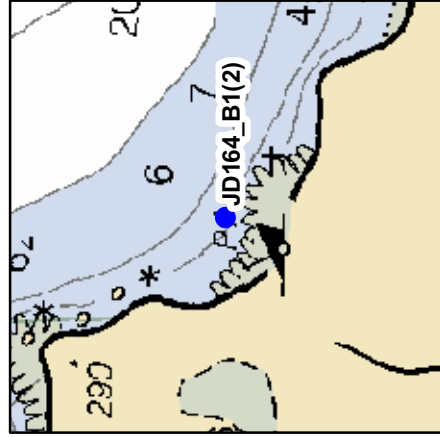
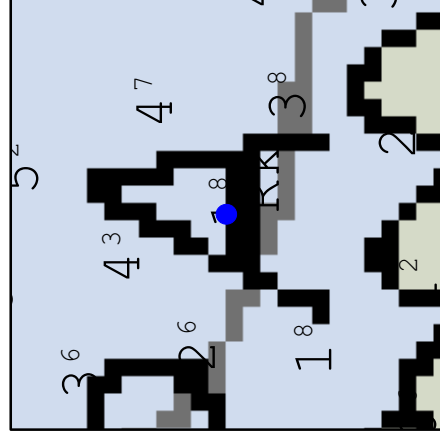
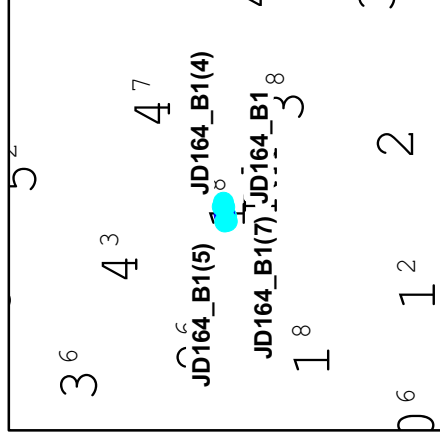
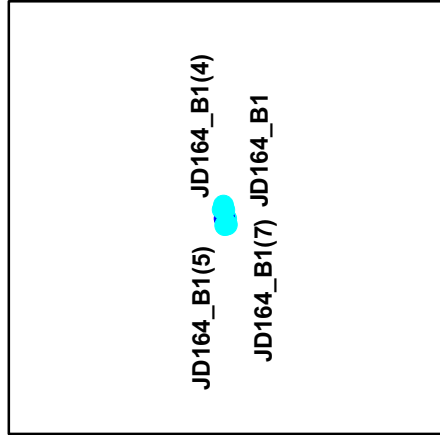
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 17:54:15
 Latitude: 55 20 59.52 N
 Longitude: 160 27 33.70 W
 North: 6134694.89
 East: 407464.37
 Raw (+Depth) or (-Height) (m): 7.30
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.20
 Corrected to MLLW (m): 6.10
 Corrected to MLLW (fathoms): 3.34
 Corrected to MLLW (feet): 20.01
 DP Comment: 7.3 m Item B1

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 See JD164_B1
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings
 200m x 200m

Lidar Smooth Sheet with Neighboring DP's
 200m x 200m

DP with Lidar Smooth Sheet and Chart
 200m x 200m

Chart
 2000m x 2000m

DP ITEM NUMBER : JD164_B1(3)

DP Form

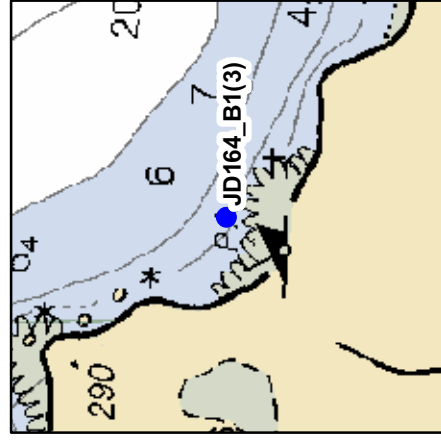
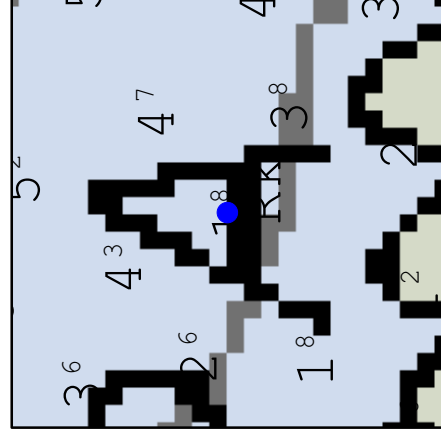
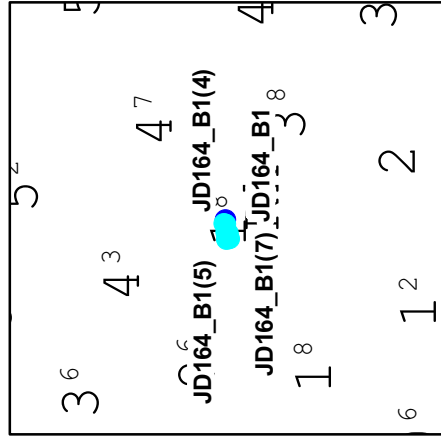
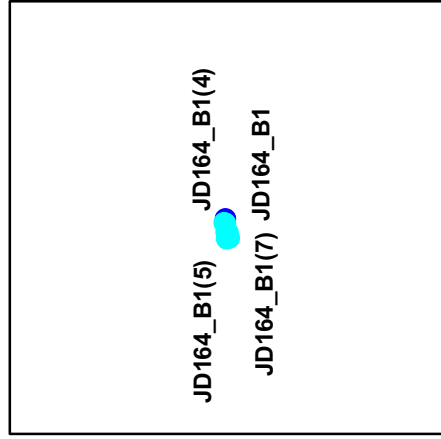
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 18:04:01
 Latitude: 55 20 59.53 N
 Longitude: 160 27 33.35 W
 North: 6134695.14
 East: 407470.51
 Raw (+Depth) or (-Height) (m): 7.60
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.24
 Corrected to MLLW (m): 6.36
 Corrected to MLLW (fathoms): 3.48
 Corrected to MLLW (feet): 20.87
 DP Comment: 7.6m B1 item

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

No photo available

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 See JD164_B1
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m

Lidar Smooth Sheet with Neighboring DP's 200m x 200m

DP with Lidar Smooth Sheet and Chart 200m x 200m

Chart 2000m x 2000m

DP ITEM NUMBER : JD164_B1(4)

DP Form

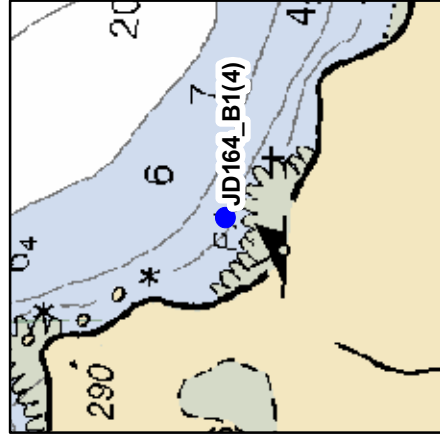
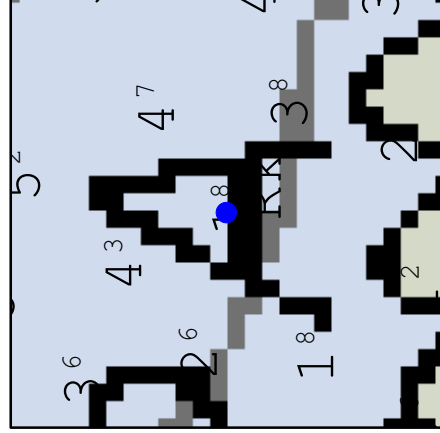
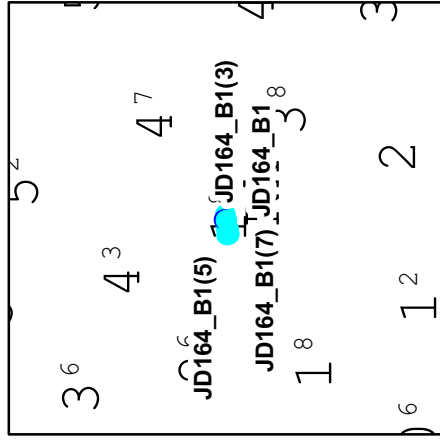
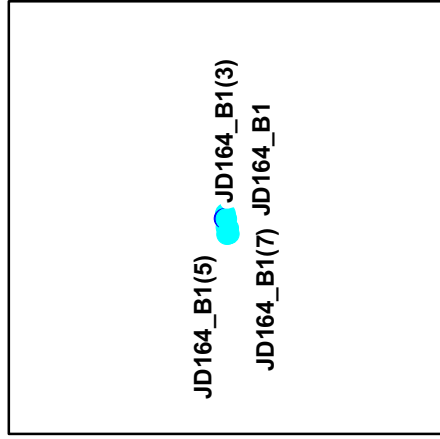
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 18:07:06
 Latitude: 55 20 59.55 N
 Longitude: 160 27 33.47 W
 North: 6134695.74
 East: 407468.51
 Raw (+Depth) or (-Height) (m): 8.90
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.24
 Corrected to MLLW (m): 7.66
 Corrected to MLLW (fathoms): 4.19
 Corrected to MLLW (feet): 25.13
 DP Comment: 8.9m B1

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 See JD164_B1
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings
 200m x 200m

Lidar Smooth Sheet with Neighboring DP's
 200m x 200m

DP with Lidar Smooth Sheet and Chart
 200m x 200m

Chart
 2000m x 2000m

DP ITEM NUMBER : JD164_B1(5)

DP Form

Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 18:15:49
 Latitude: 55 20 59.51 N
 Longitude: 160 27 33.88 W
 North: 6134694.59
 East: 407461.19
 Raw (+Depth) or (-Height) (m): 8.40
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.28
 Corrected to MLLW (m): 7.12
 Corrected to MLLW (fathoms): 3.89
 Corrected to MLLW (feet): 23.36
 DP Comment: 8.4 B1 not up and down

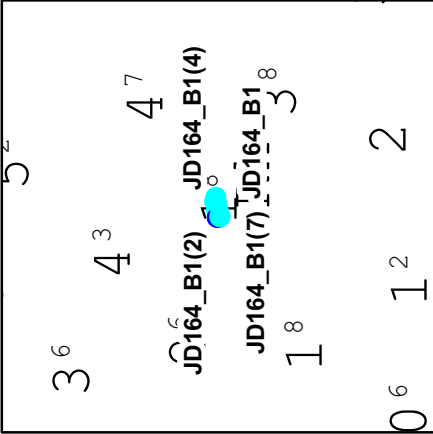
Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

Correlating MB Least Depth:
 None

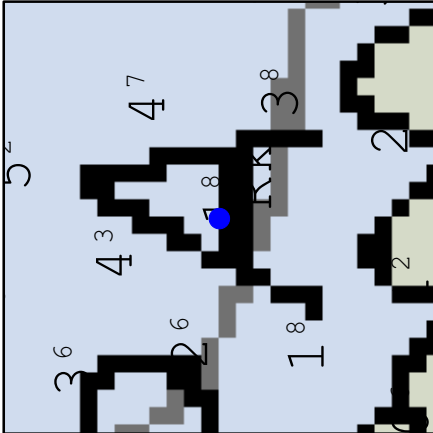
No photo available

Remarks/Recommendations:
 See JD164_B1
 Chart: 16553_1 Topo: Carto Code: None

JD164_B1(2) JD164_B1(4)
 JD164_B1(7) JD164_B1



MB Coverage With Smooth Sheet Soundings Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

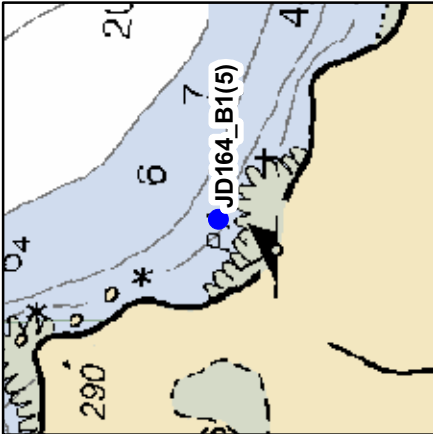


Chart
 2000m x 2000m

DP ITEM NUMBER : JD164_B1(6)

DP Form

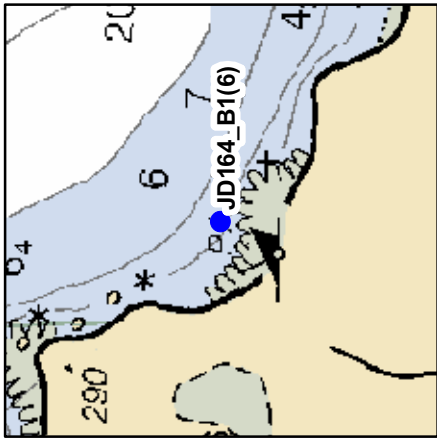
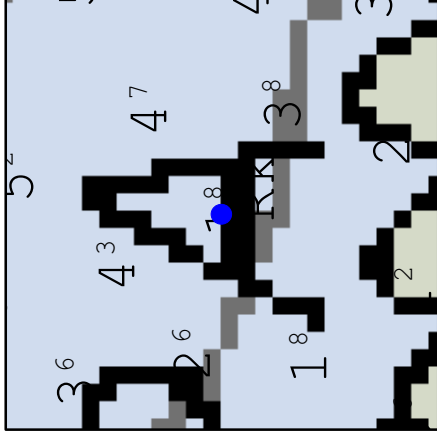
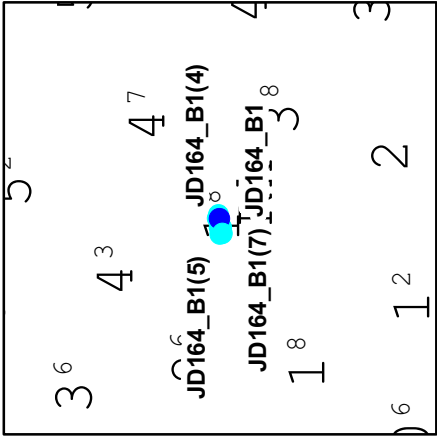
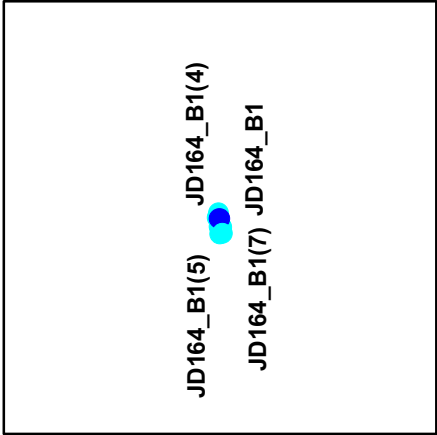
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 18:22:02
 Latitude: 55 20 59.52 N
 Longitude: 160 27 33.49 W
 North: 6134694.81
 East: 407468.17
 Raw (+Depth) or (-Height) (m): 7.70
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.30
 Corrected to MLLW (m): 6.40
 Corrected to MLLW (fathoms): 3.50
 Corrected to MLLW (feet): 21.00
 DP Comment: 7.7m B1 lo9cn

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 See JD164_B1
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings
 200m x 200m

Lidar Smooth Sheet with Neighboring DP's
 200m x 200m

DP with Lidar Smooth Sheet and Chart
 200m x 200m

Chart
 2000m x 2000m

DP ITEM NUMBER : JD164_B1(7)

DP Form

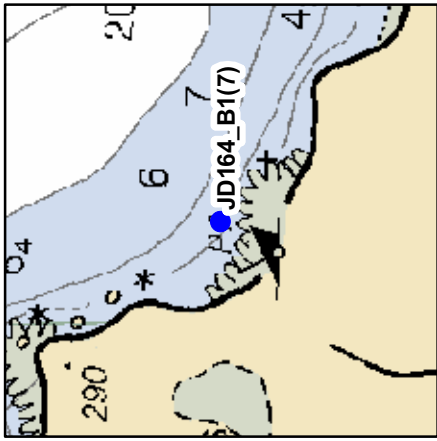
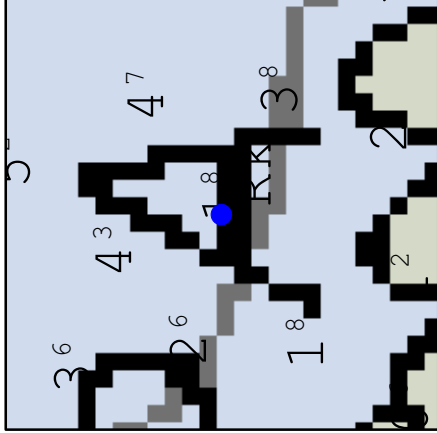
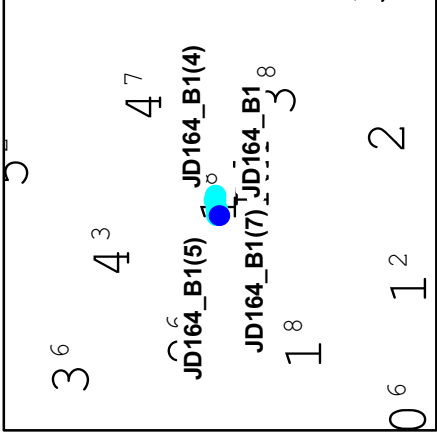
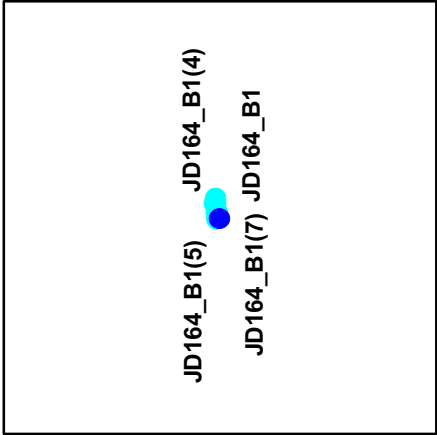
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 18:25:20
 Latitude: 55 20 59.47 N
 Longitude: 160 27 33.86 W
 North: 6134693.29
 East: 407461.48
 Raw (+Depth) or (-Height) (m): 7.50
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.30
 Corrected to MLLW (m): 6.20
 Corrected to MLLW (fathoms): 3.39
 Corrected to MLLW (feet): 20.34
 DP Comment: 7.5m B1 locn

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 See JD164_B1
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings
 200m x 200m

Lidar Smooth Sheet with Neighboring DP's
 200m x 200m

DP with Lidar Smooth Sheet and Chart
 200m x 200m

Chart
 2000m x 2000m

DP ITEM NUMBER : JD164_B2

DP Form

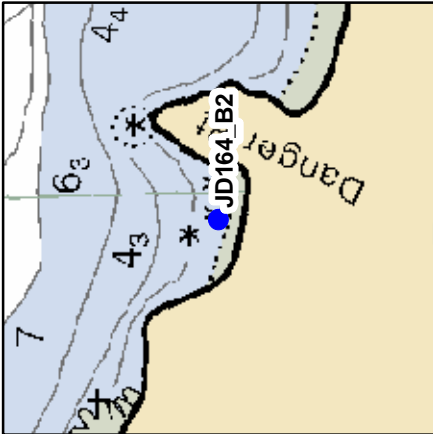
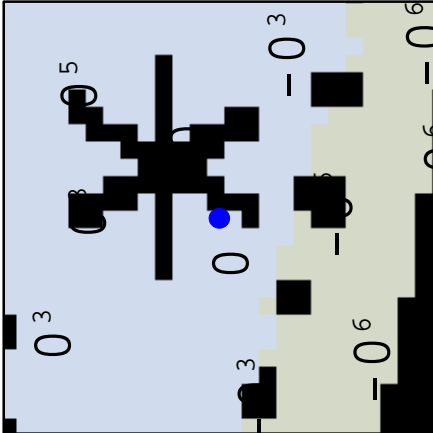
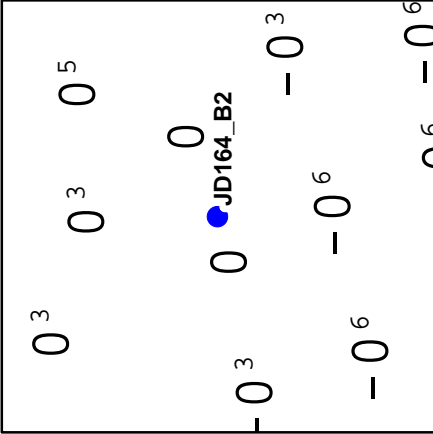
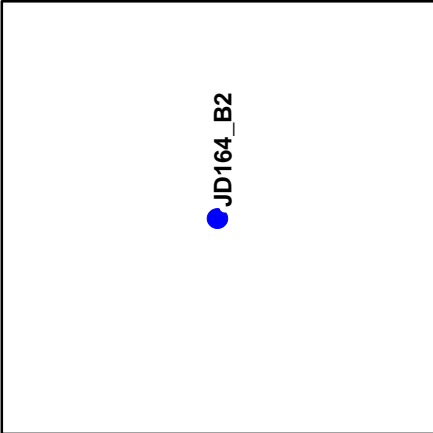
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 18:44:04
 Latitude: 55 20 35.26 N
 Longitude: 160 26 29.58 W
 North: 6133921.58
 East: 408578.17
 Raw (+Depth) or (-Height) (m): 0.70
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.37
 Corrected to MLLW (m): -0.67
 Corrected to MLLW (fathoms): -0.37
 Corrected to MLLW (feet): -2.20
 DP Comment: 0.7m RK item B2

Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

No photo available

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 Charted rock confirmed; retain as charted with height of 2 ft MLLW.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings
 200m x 200m

Lidar Smooth Sheet with Neighboring DP's
 200m x 200m

DP with Lidar Smooth Sheet and Chart
 200m x 200m

Chart
 2000m x 2000m

DP ITEM NUMBER : JD164_B3

DP Form

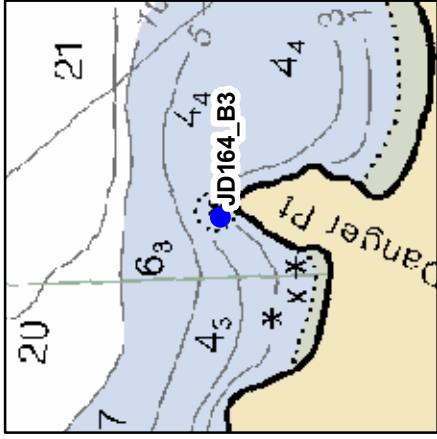
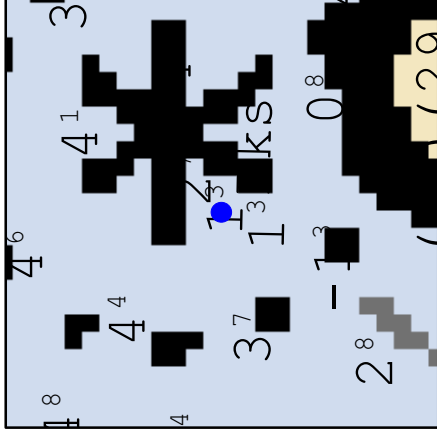
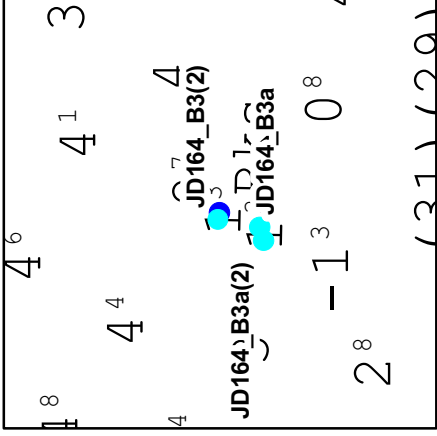
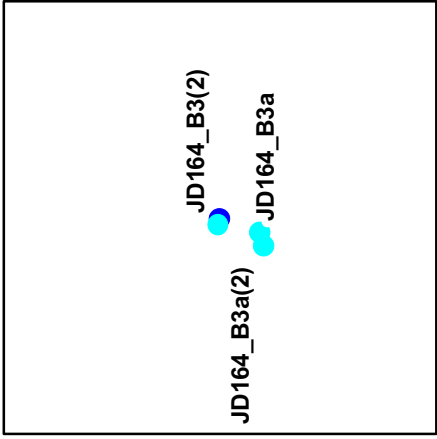
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 19:00:02
 Latitude: 55 20 47.59 N
 Longitude: 160 26 07.64 W
 North: 6134294.70
 East: 408972.54
 Raw (+Depth) or (-Height) (m): 5.00
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.41
 Corrected to MLLW (m): 3.59
 Corrected to MLLW (fathoms): 1.96
 Corrected to MLLW (feet): 11.78
 DP Comment: B3 5m

Correlating DP Item Numbers:
 JD164_B3(2) N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 See JD164_B3(2)
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m

Lidar Smooth Sheet with Neighboring DP's 200m x 200m

DP with Lidar Smooth Sheet and Chart 200m x 200m

Chart 2000m x 2000m

DP ITEM NUMBER : JD164_B3(2)

DP Form

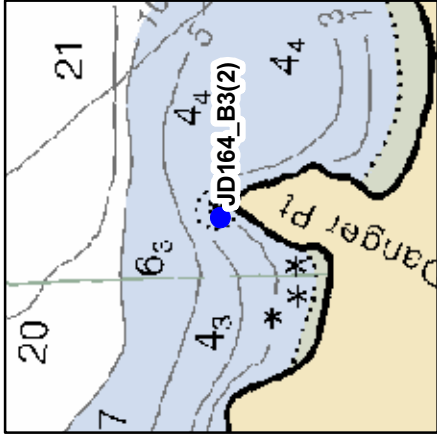
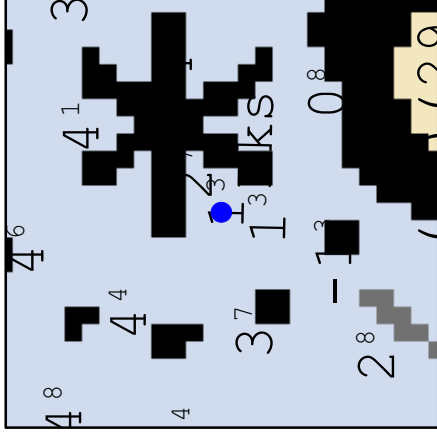
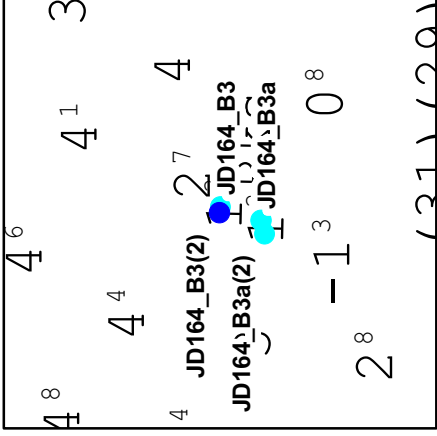
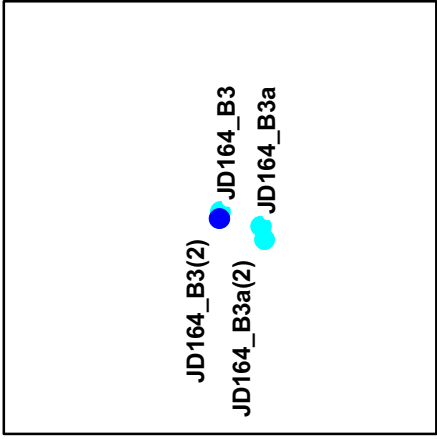
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 19:02:07
 Latitude: 55 20 47.61 N
 Longitude: 160 26 07.81 W
 North: 6134295.32
 East: 408969.59
 Raw (+Depth) or (-Height) (m): 3.80
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.41
 Corrected to MLLW (m): 2.39
 Corrected to MLLW (fathoms): 1.31
 Corrected to MLLW (feet): 7.84
 DP Comment: B3 3.8m depth

Correlating DP Item Numbers:
 JD164_B3 N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Lidar Rk confirmed. Chart at lidar position with lidar depth. Also recommend placing a kelp symbol as dense kelp was also observed here.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m

Lidar Smooth Sheet with Neighboring DP's 200m x 200m

DP with Lidar Smooth Sheet and Chart 200m x 200m

Chart 2000m x 2000m

DP ITEM NUMBER : JD164_B3a

DP Form

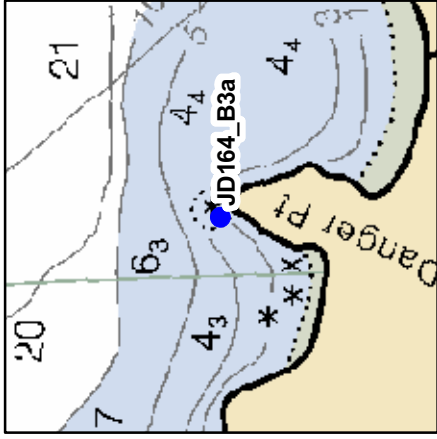
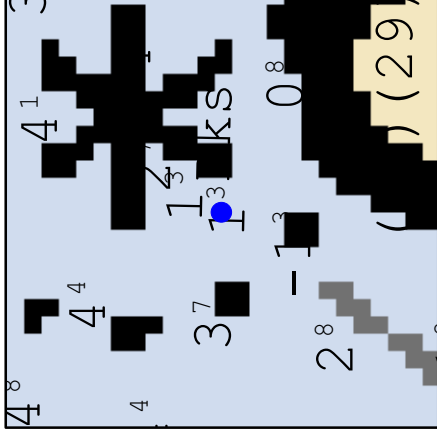
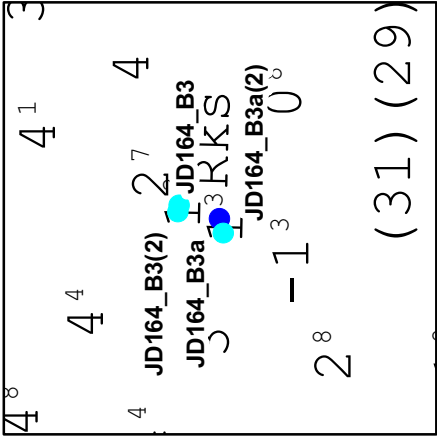
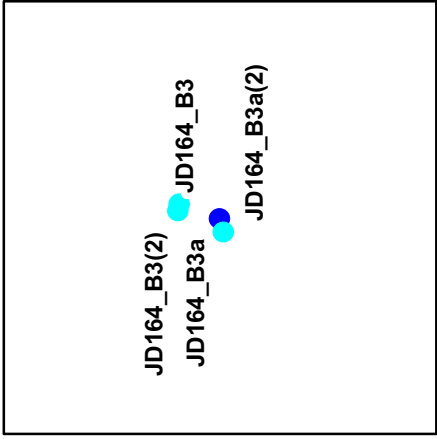
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 19:07:59
 Latitude: 55 20 46.99 N
 Longitude: 160 26 07.98 W
 North: 6134276.10
 East: 408966.13
 Raw (+Depth) or (-Height) (m): 5.35
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.43
 Corrected to MLLW (m): 3.92
 Corrected to MLLW (fathoms): 2.14
 Corrected to MLLW (feet): 12.86
 DP Comment: B3a 5.35m depth

Correlating DP Item Numbers:
 JD164_B3a(2) N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 See JD164_B3a(2)
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m

Lidar Smooth Sheet with Neighboring DP's 200m x 200m

DP with Lidar Smooth Sheet and Chart 200m x 200m

Chart 2000m x 2000m

DP ITEM NUMBER : JD164_B3a(2)

DP Form

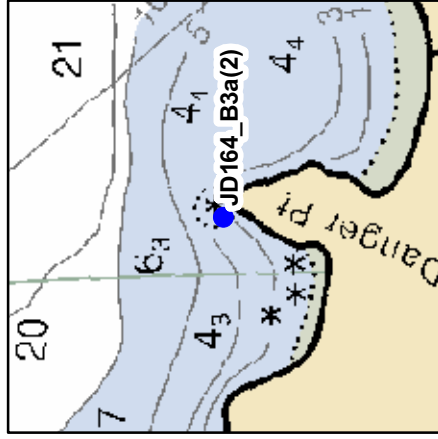
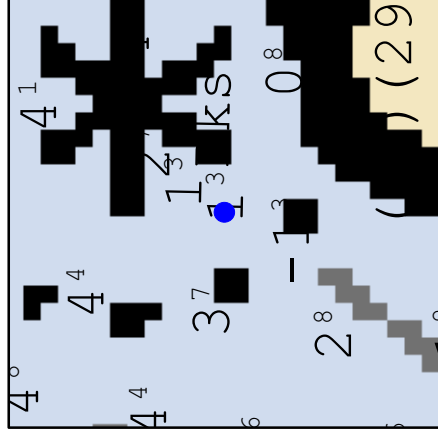
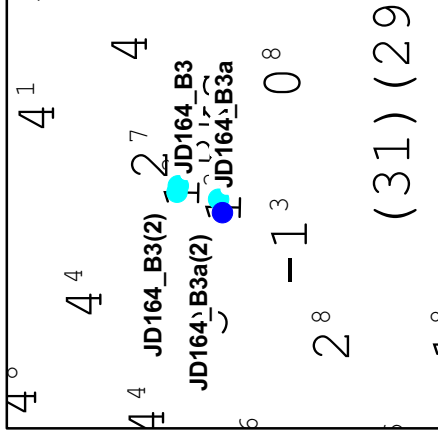
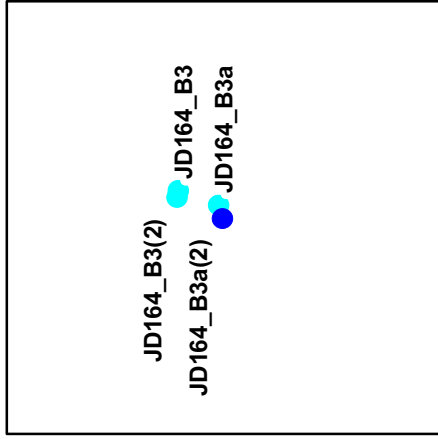
Date: 12 June, 2004
 Julian Day: 164
 UTC Time: 19:14:07
 Latitude: 55 20 46.92 N
 Longitude: 160 26 08.33 W
 North: 6134274.18
 East: 408959.85
 Raw (+Depth) or (-Height) (m): 4.10
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.44
 Corrected to MLLW (m): 2.66
 Corrected to MLLW (fathoms): 1.45
 Corrected to MLLW (feet): 8.73
 DP Comment: 4.1m B3a posn

Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Lidar Rk confirmed. Chart at lidar position using lidar depth. Dense kelp also observed here.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m

Lidar Smooth Sheet with Neighboring DP's 200m x 200m

DP with Lidar Smooth Sheet and Chart 200m x 200m

Chart 2000m x 2000m

DP ITEM NUMBER : JD166_B6

DP Form

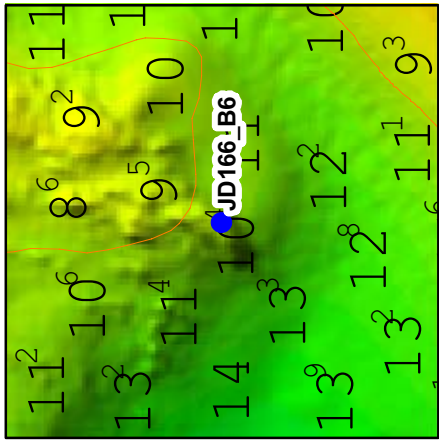
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 23:01:49
 Latitude: 55 21 41.78 N
 Longitude: 160 22 24.22 W
 North: 6135890.27
 East: 412940.79
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.48
 Corrected to MLLW (m): -1.48
 Corrected to MLLW (fathoms): -0.81
 Corrected to MLLW (feet): -4.86
 DP Comment: Multibeam coverage DP

Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

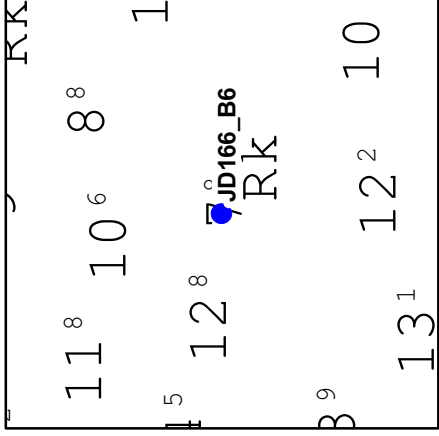
Correlating MB Least Depth:
 10.4 fathoms

No photo available

Remarks/Recommendations:
 7.8 fm lidar Rk not found by full multibeam coverage. Recommend do not chart lidar 7.8 fm Rk.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

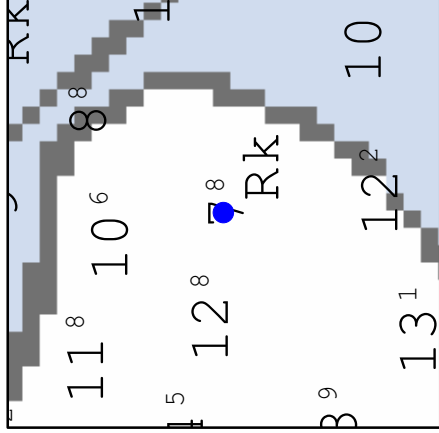
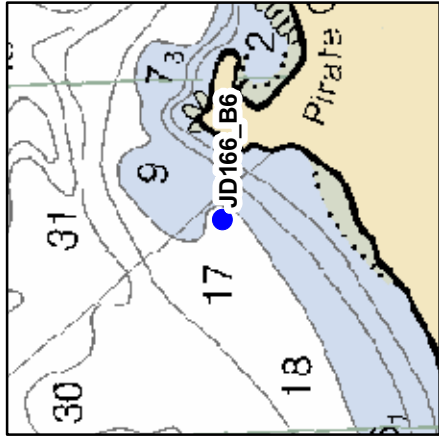


Chart
 2000m x 2000m



DP ITEM NUMBER : JD166_B6a

DP Form

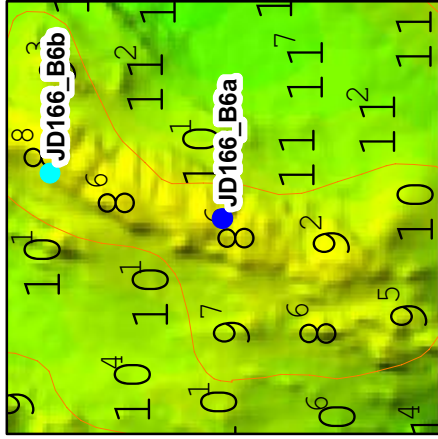
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 23:01:49
 Latitude: 55 21 45.54 N
 Longitude: 160 22 20.94 W
 North: 6136005.34
 East: 413000.83
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.48
 Corrected to MLLW (m): -1.48
 Corrected to MLLW (fathoms): -0.81
 Corrected to MLLW (feet): -4.86
 DP Comment: Multibeam coverage DP

Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

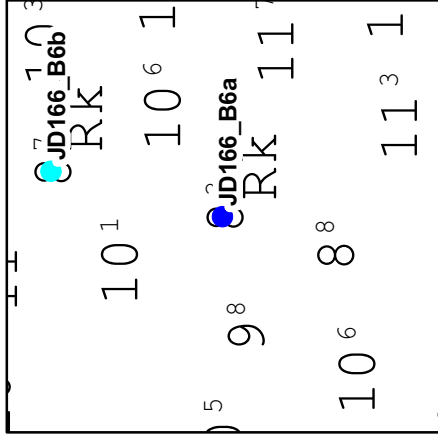
No photo available

Correlating MB Least Depth:
 8.6 fathom sounding

Remarks/Recommendations:
 Full MB coverage confirms Rk but with depth of 8.6 fms. Recommend chart 8.6 f m Rk at multibeam location.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

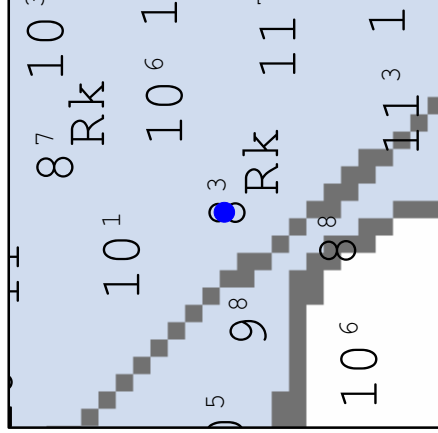
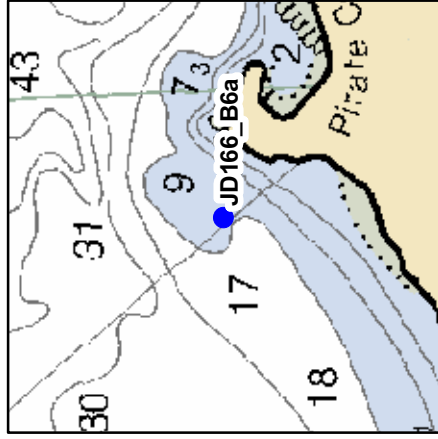


Chart
 2000m x 2000m



DP ITEM NUMBER : JD166_B6b

DP Form

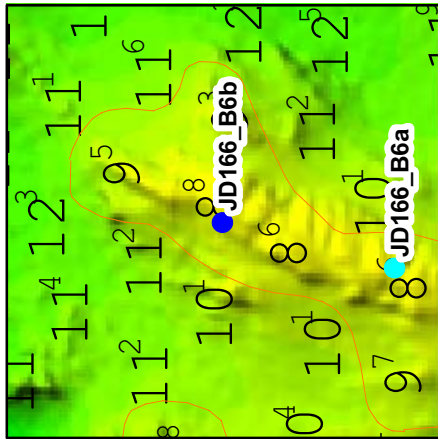
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 23:01:49
 Latitude: 55 21 48.13 N
 Longitude: 160 22 19.83 W
 North: 6136084.89
 East: 413021.95
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.48
 Corrected to MLLW (m): -1.48
 Corrected to MLLW (fathoms): -0.81
 Corrected to MLLW (feet): -4.86
 DP Comment: Multibeam coverage DP

Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

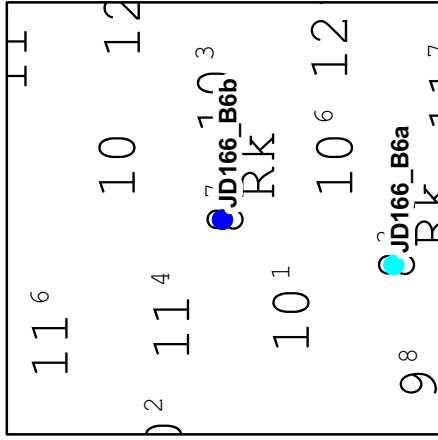
No photo available

Correlating MB Least Depth:
 8.8 fathoms

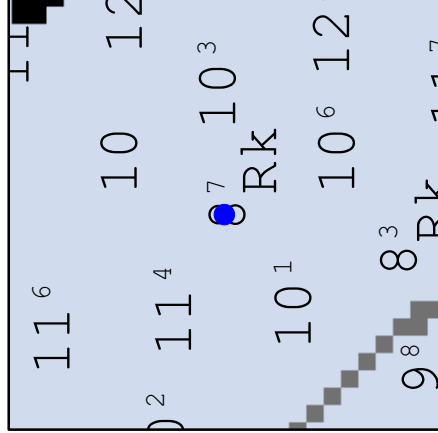
Remarks/Recommendations:
 Full MB coverage confirms Rk but with depth of 8.8 fms. Recommend chart 8.8 f m Rk at multibeam location.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m



Lidar Smooth Sheet with Neighboring DP's 200m x 200m



DP with Lidar Smooth Sheet and Chart 200m x 200m

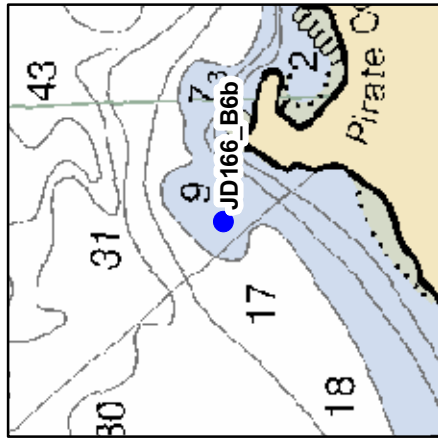


Chart 2000m x 2000m

DP ITEM NUMBER : JD166_B10

DP Form

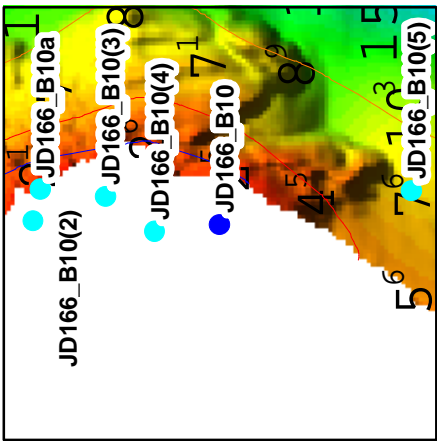
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 17:05:30
 Latitude: 55 21 00.84 N
 Longitude: 160 19 27.73 W
 North: 6134564.62
 East: 416024.17
 Raw (+Depth) or (-Height) (m): -1.00
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.15
 Corrected to MLLW (m): -1.15
 Corrected to MLLW (fathoms): -0.63
 Corrected to MLLW (feet): -3.77
 DP Comment: B10 south end rocks

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

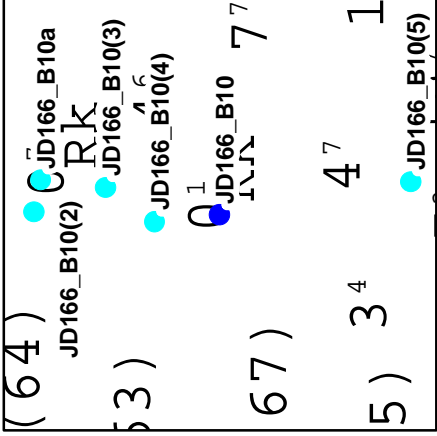
Correlating MB Least Depth:
 None



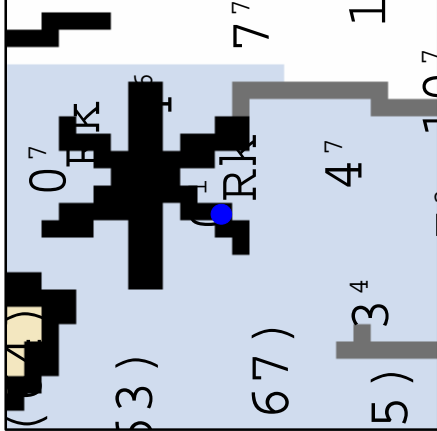
Remarks/Recommendations:
 Lidar Rk confirmed but with height of 4 ft MLLW. Chart rock (4 ft MLLW) at seaward-most extent position JD166_B10(3) is seaward most extent.
 Chart: 16553_1 Topo: Carto Code: 089



MB Coverage With Smooth Sheet Soundings 200m x 200m



Lidar Smooth Sheet with Neighboring DP's 200m x 200m



DP with Lidar Smooth Sheet and Chart 200m x 200m

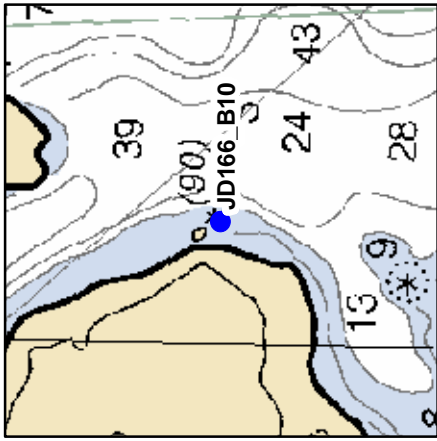


Chart 2000m x 2000m

DP ITEM NUMBER : JD166_B10a

DP Form

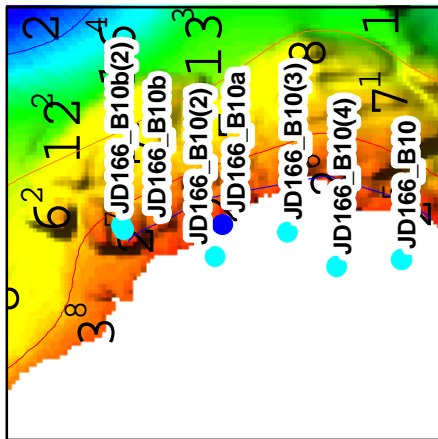
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 16:53:46
 Latitude: 55 21 03.53 N
 Longitude: 160 19 26.89 W
 North: 6134647.42
 East: 416040.55
 Raw (+Depth) or (-Height) (m): 1.30
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.10
 Corrected to MLLW (m): 1.20
 Corrected to MLLW (fathoms): 0.66
 Corrected to MLLW (feet): 3.94
 DP Comment: B10a 1.3m rock

Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

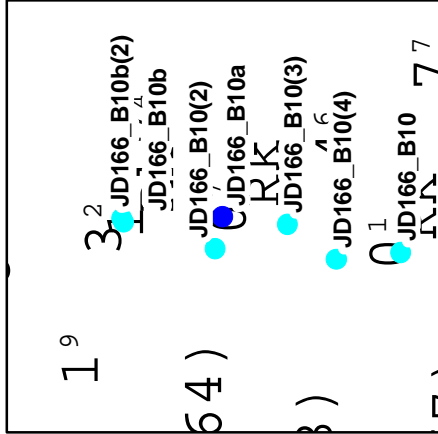
Correlating MB Least Depth:
 None

No photo available

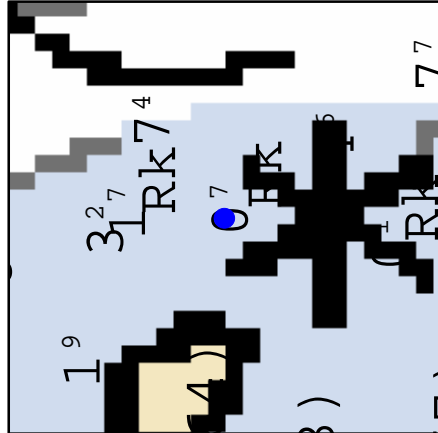
Remarks/Recommendations:
 0.7 fm lidar Rk confirmed. Recommend chart as reported by lidar.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings
 200m x 200m



Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

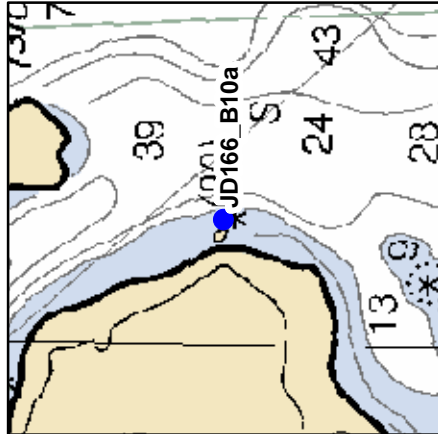


Chart
 2000m x 2000m

DP ITEM NUMBER : JD166_B10b

DP Form

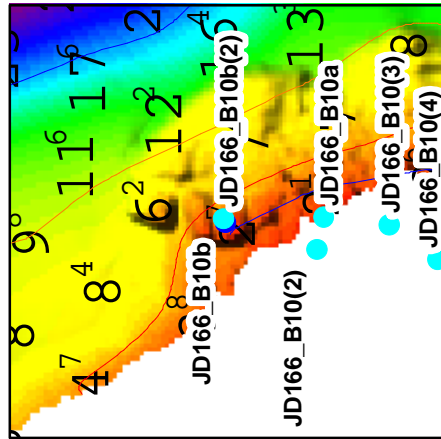
Date:	14 June, 2004
Julian Day:	166
UTC Time:	16:46:03
Latitude:	55 21 05.00 N
Longitude:	160 19 27.07 W
North:	6134692.92
East:	416038.24
Raw (+Depth) or (-Height) (m):	6.50
Draft Corrector (m):	N/A
SV Corrector (m):	N/A
Tide Corrector (m):	0.07
Corrected to MLLW (m):	6.43
Corrected to MLLW (fathoms):	3.52
Corrected to MLLW (feet):	21.10
DP Comment:	B10b 6.5m

Correlating DP Item Numbers:
JD166_B10b(2) N/A
N/A N/A

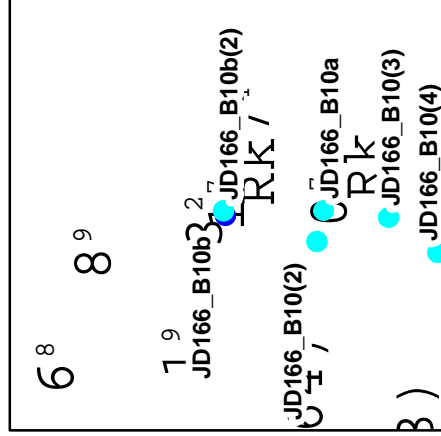
Correlating MB Least Depth:
2.7 fathoms

No photo available

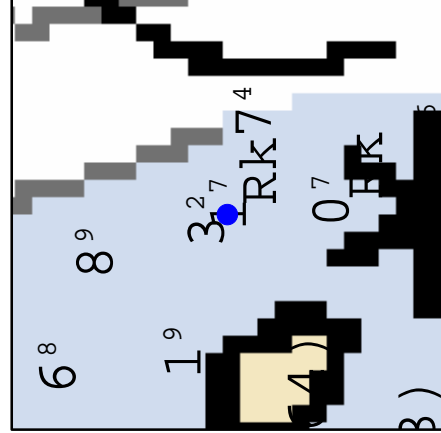
Remarks/Recommendations:
 1.7 fm lidar Rk confirmed with MB coverage but with depth of 2.7 fms. Chart with MB Rk position and depth. Skiff observed dense kelp; chart kelp.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m



Lidar Smooth Sheet with Neighboring DP's 200m x 200m



DP with Lidar Smooth Sheet and Chart 200m x 200m

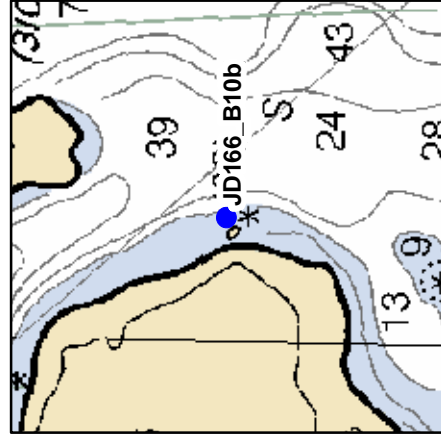


Chart 2000m x 2000m

DP ITEM NUMBER : JD166_B10b(2)

DP Form

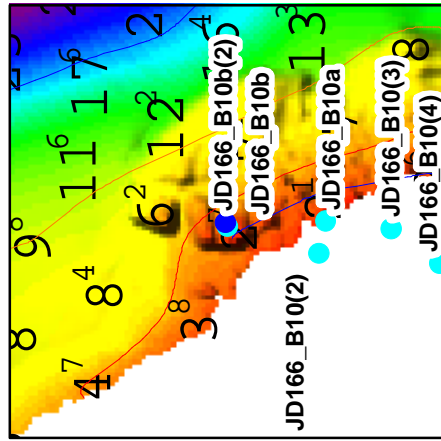
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 16:49:15
 Latitude: 55 21 05.03 N
 Longitude: 160 19 26.97 W
 North: 6134693.81
 East: 416040.05
 Raw (+Depth) or (-Height) (m): 7.50
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.07
 Corrected to MLLW (m): 7.43
 Corrected to MLLW (fathoms): 4.06
 Corrected to MLLW (feet): 24.38
 DP Comment: B10b 7.5m

Correlating DP Item Numbers:
 JD166_B10b N/A
 N/A N/A

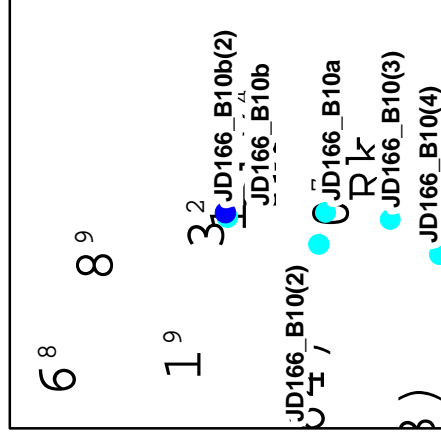
Correlating MB Least Depth:
 None

No photo available

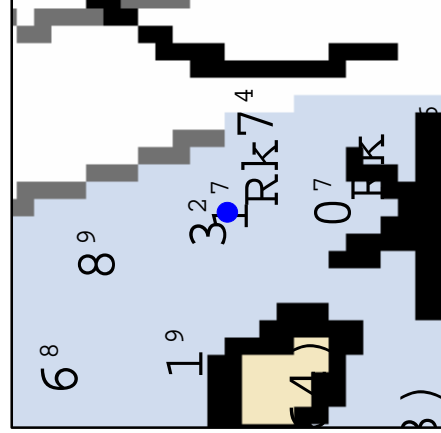
Remarks/Recommendations:
 See JD166_B10b
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m



Lidar Smooth Sheet with Neighboring DP's 200m x 200m



DP with Lidar Smooth Sheet and Chart 200m x 200m

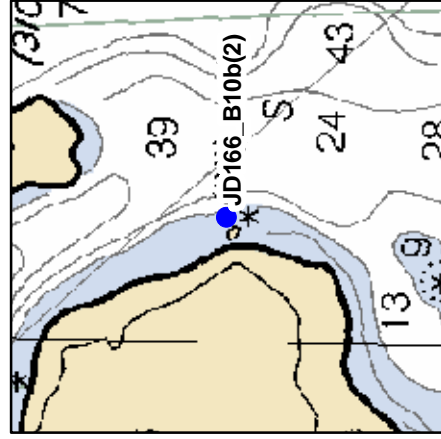


Chart 2000m x 2000m

DP ITEM NUMBER : JD166_B10(2)

DP Form

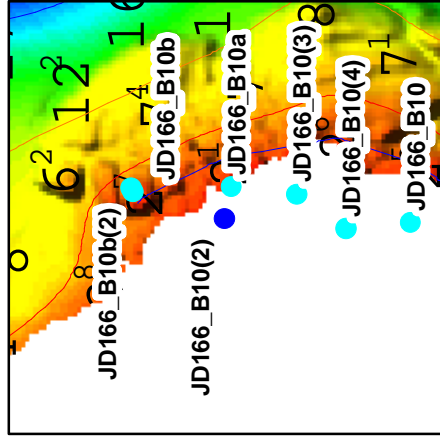
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 17:09:13
 Latitude: 55 21 03.62 N
 Longitude: 160 19 27.73 W
 North: 6134650.67
 East: 416025.81
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.15
 Corrected to MLLW (m): -0.15
 Corrected to MLLW (fathoms): -0.08
 Corrected to MLLW (feet): -0.49
 DP Comment: B10 north end

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

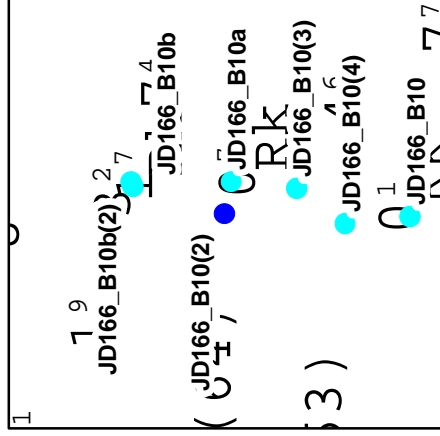
Correlating MB Least Depth:
 None

No photo available

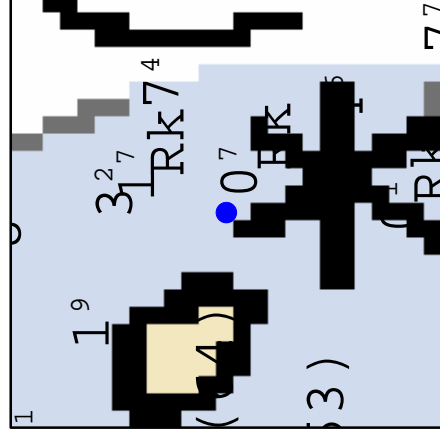
Remarks/Recommendations:
 See JD166_B10
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m



Lidar Smooth Sheet with Neighboring DP's 200m x 200m



DP with Lidar Smooth Sheet and Chart 200m x 200m

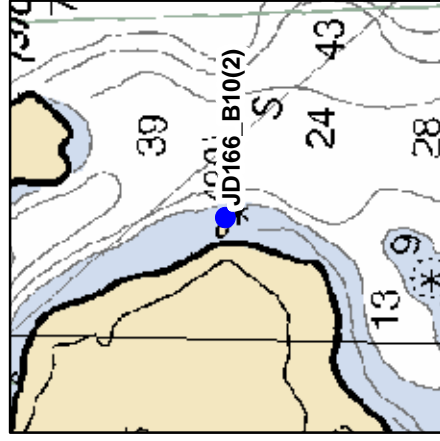


Chart 2000m x 2000m

DP ITEM NUMBER : JD166_B10(3)

DP Form

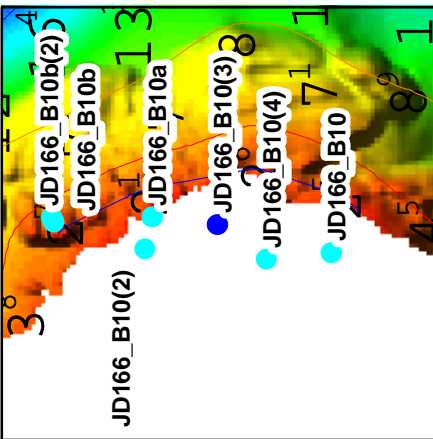
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 17:11:32
 Latitude: 55 21 02.55 N
 Longitude: 160 19 27.05 W
 North: 6134617.25
 East: 416037.12
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.18
 Corrected to MLLW (m): -0.18
 Corrected to MLLW (fathoms): -0.10
 Corrected to MLLW (feet): -0.59
 DP Comment: B10 east side

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

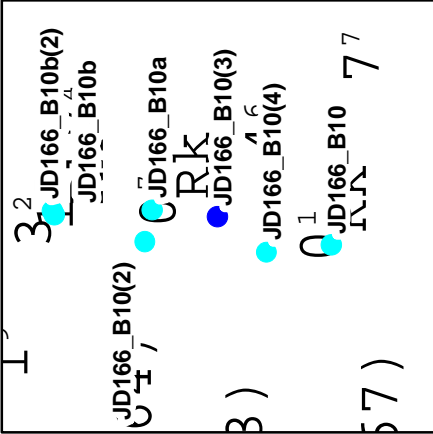
Correlating MB Least Depth:
 None

No photo available

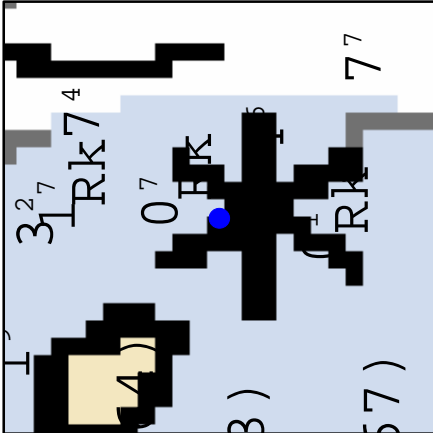
Remarks/Recommendations:
 See JD166_B10. Chart at this location.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m



Lidar Smooth Sheet with Neighboring DP's 200m x 200m



DP with Lidar Smooth Sheet and Chart 200m x 200m

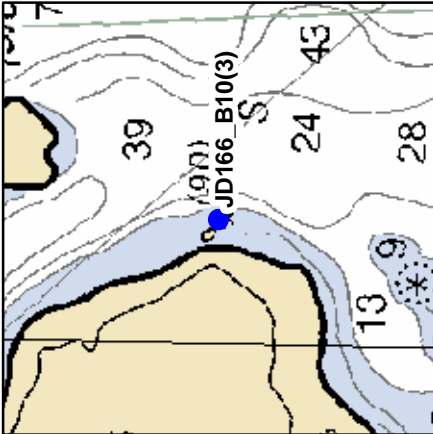


Chart 2000m x 2000m

DP ITEM NUMBER : JD166_B10(4)

DP Form

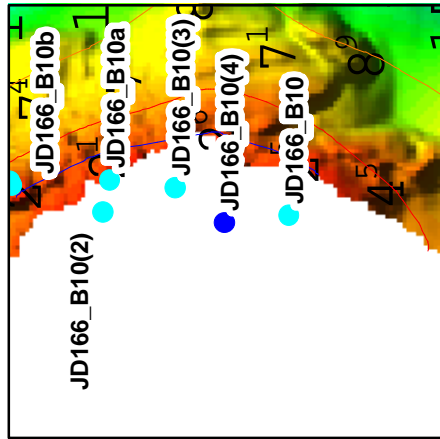
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 17:14:26
 Latitude: 55 21 01.81 N
 Longitude: 160 19 27.94 W
 North: 6134594.55
 East: 416021.04
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.18
 Corrected to MLLW (m): -0.18
 Corrected to MLLW (fathoms): -0.10
 Corrected to MLLW (feet): -0.59
 DP Comment: B10 west side

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

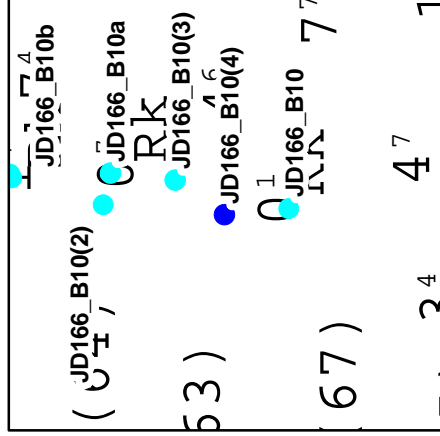
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 See JD166_B10
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

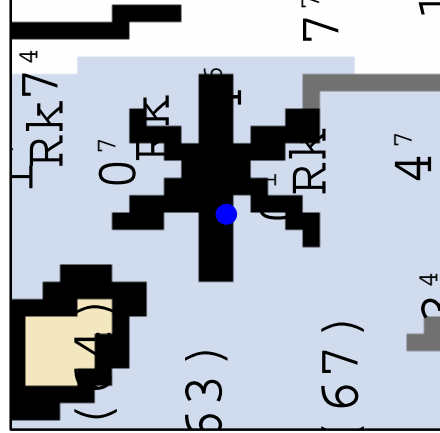


Chart
 2000m x 2000m

DP ITEM NUMBER : JD166_B10(5)

DP Form

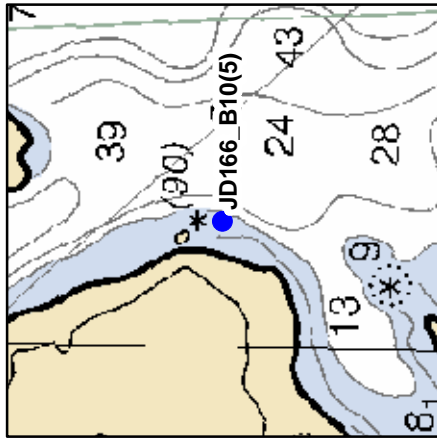
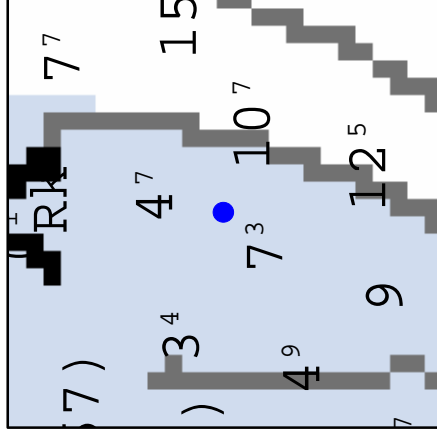
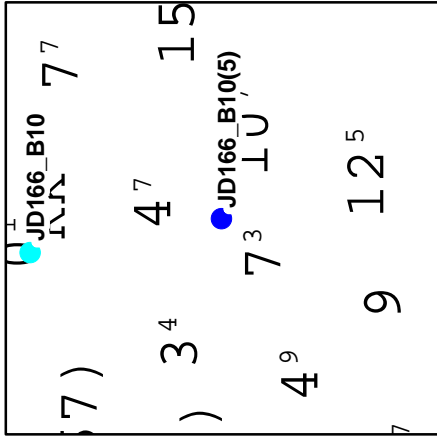
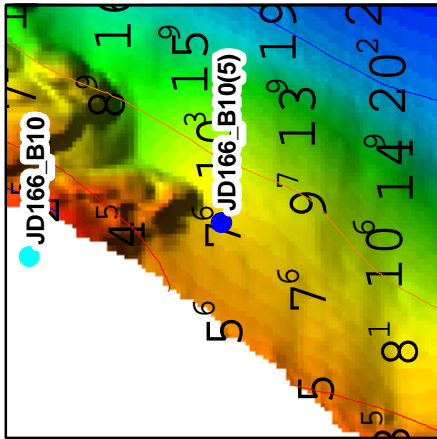
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 17:17:25
 Latitude: 55 20 57.98 N
 Longitude: 160 19 26.75 W
 North: 6134476.01
 East: 416039.72
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.18
 Corrected to MLLW (m): -0.18
 Corrected to MLLW (fathoms): -0.10
 Corrected to MLLW (feet): -0.59
 DP Comment: Photo 6 looking north

Correlating DP Item Numbers:
 Multiple N/A
 N/A N/A

Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Photo location. See JD166_B10.
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings 200m x 200m

Lidar Smooth Sheet with Neighboring DP's 200m x 200m

DP with Lidar Smooth Sheet and Chart 200m x 200m

Chart 2000m x 2000m

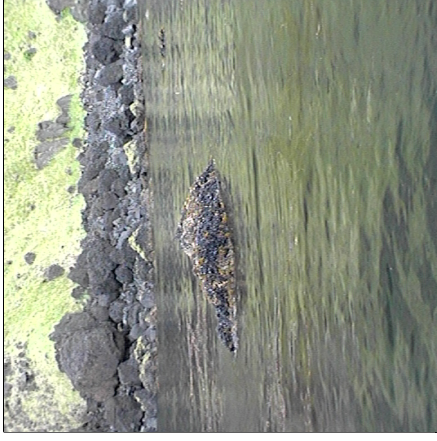
DP ITEM NUMBER : JD166_B16

DP Form

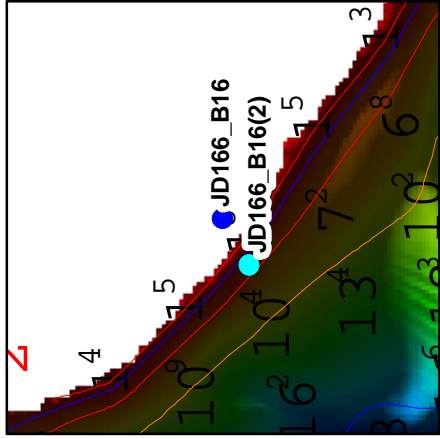
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 23:00:25
 Latitude: 55 23 41.08 N
 Longitude: 160 19 30.28 W
 North: 6139518.52
 East: 416073.54
 Raw (+Depth) or (-Height) (m): -0.50
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.48
 Corrected to MLLW (m): -1.98
 Corrected to MLLW (fathoms): -1.08
 Corrected to MLLW (feet): -6.50
 DP Comment: B16 Drying rock 0.5m

Correlating DP Item Numbers:
 JD166_B16(2) N/A
 N/A N/A

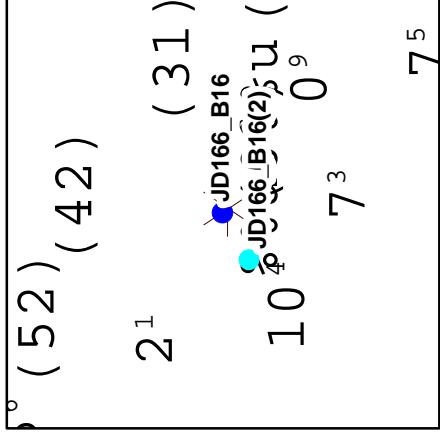
Correlating MB Least Depth:
 None



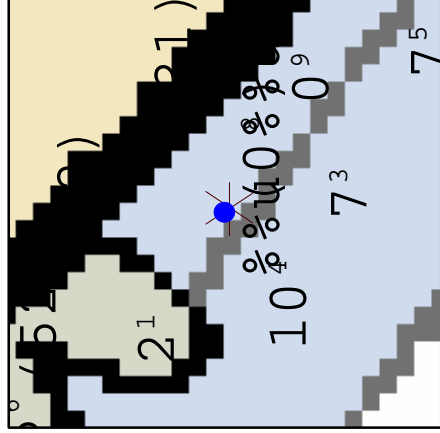
Remarks/Recommendations:
 Drying lidar rock confirmed but with height of 7 ft MLLW. Chart at DP position with DP height.
 Chart: 16553_1 Topo: Carto Code: 089



MB Coverage With Smooth Sheet Soundings Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

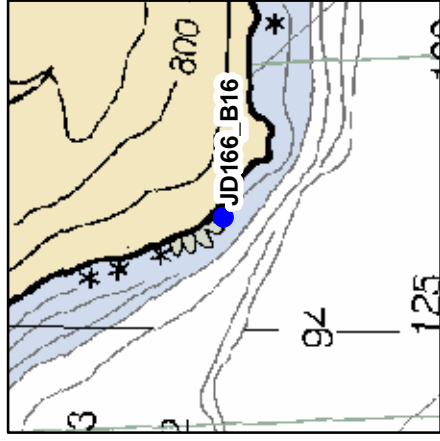


Chart
 2000m x 2000m

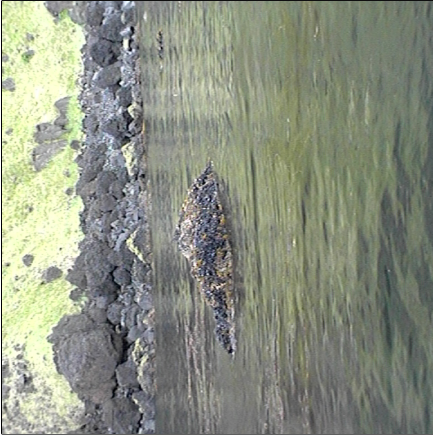
DP ITEM NUMBER : JD166_B16(2)

DP Form

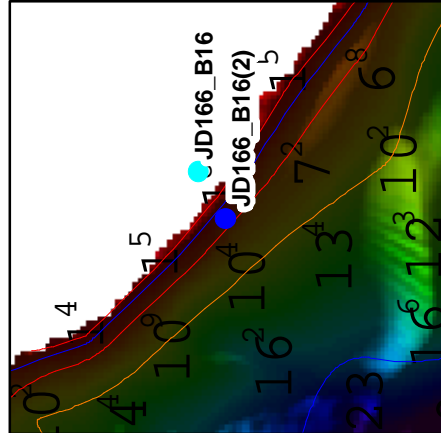
Date: 14 June, 2004
 Julian Day: 166
 UTC Time: 23:01:49
 Latitude: 55 23 40.66 N
 Longitude: 160 19 31.49 W
 North: 6139505.95
 East: 416051.97
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 1.48
 Corrected to MLLW (m): -1.48
 Corrected to MLLW (fathoms): -0.81
 Corrected to MLLW (feet): -4.86
 DP Comment: B16 photo

Correlating DP Item Numbers:
 JD166_B16 N/A
 N/A N/A

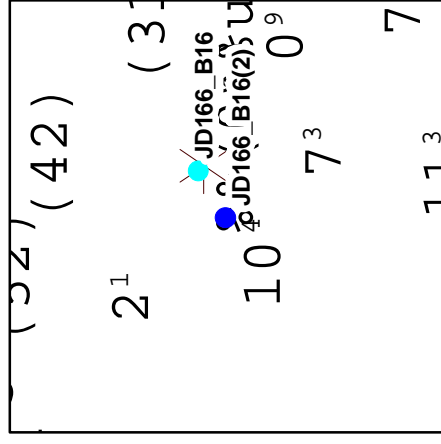
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Photo location. See JD166_B16
 Chart: 16553_1 Topo: Carto Code: None



MB Coverage With Smooth Sheet Soundings Lidar Smooth Sheet with Neighboring DP's
 200m x 200m



DP with Lidar Smooth Sheet and Chart
 200m x 200m

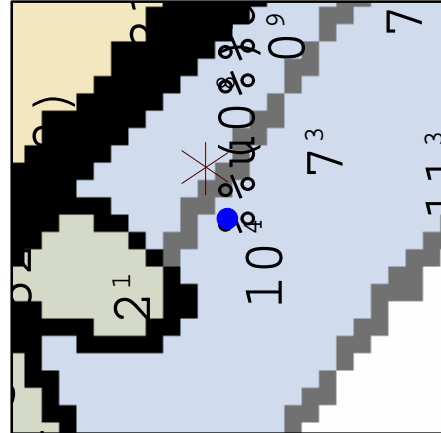
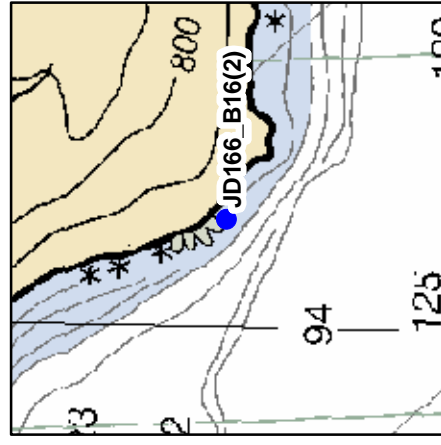


Chart
 2000m x 2000m





Revisions Compiled During Office Processing and Certification

¹ Concur.

² The approximate limits of hydrography are:

 Lat 55/23/49N and Lon 160/28/43W

 Lat 55/21/26N and Lon 160/28/43W

 Lat 55/20/16N and Lon 160/18/55W

 Lat 55/23/33N and Lon 160/19/00W

 Lat 55/23/56N and Lon 160/19/44W

³ Filed with the project reports.

⁴ Insert “and”.

⁵ Insert “and”.

⁶ Concur. H11278 is adequate to supersede all prior surveys and charted miscellaneous source data in the common areas except as noted in this report.

⁷ In addition to the junction listed below, H11278 also junctions with H11330 (2004) on the West side and LIDAR survey H11147b along the nearshore areas.

⁸ H11278 junctions with H11279 on the East side.

⁹ Concur with clarification. Generally all junctional surveys agree with H11278 to within 1 fathom, although H11278 appears deeper in some areas at the northeast junction with H11279. These differences are most likely due to the extremely steep slope in the area. A shoal sounding found by H11330 of 3 fathoms, 5 feet at approximately Latitude 55/21/36N, Longitude 160/27/45W was found to be a flyer in the data set. This erroneous depth falls in depths ranging from 6-8 fathoms on H11278 and has been removed during office processing. All surveys have been considered in compiling contours and soundings to the Hdrawing.

¹⁰ ~~Strikethrough the majority of adjacent lines were run~~, replace with “in the majority of adjacent lines run”.

¹¹ ~~Strikethrough It is also apparent on these examinations the transition from phase to amplitude detection method of the sonar (around beams 37 and 65).~~, replace with “The transition in sonar detection method from phase to amplitude (around beams 37 and 65) is also apparent in the histogram.”

¹² ~~Strikethrough lack of soundings~~, replace with “small number of soundings”.

¹³ ~~Strikethrough the opposite direction~~, replace with “opposite directions”.

¹⁴ ~~Strikethrough where~~, replace with “were”.

¹⁵ Filed with the project reports.

¹⁶ ~~Strikethrough projects~~, replace with “project’s”.

¹⁷ In the Projectwide Horizontal and Vertical Control Report, filed with the project reports.

¹⁸ Tidal range used for determination of smooth sheet elevations was 1.988m. See Project Wide Horizontal and Vertical Control Report for further information.

¹⁹ In PHB processing, H11279 was also compared with the continuous maintenance raster for Chart 16553, 5th Edition, September 2005, and continuous maintenance raster for Chart 16540, 12th Edition, January 2005.

²⁰ Concur with clarification. The shoreline on Chart 16540, 12th Edition, appears to align adequately with the smooth sheet shoreline. Several charted soundings on 16540 differ from shoal soundings depicted on 16553, 5th Edition, making the relative position of soundings on



the two charts impossible to compare. Chart soundings according to the smooth sheet and Hdrawing.

²¹ Concur with clarification. Charted soundings are frequently offset from equivalent smooth sheet positions, but agree generally to within 3 fathoms or less except in areas of steep slopes and as noted by the hydrographer below. Chart according to the smooth sheet.

²² Charted position.

²³ Replace with has.

²⁴ Concur with clarification. The shoal's least depth is 44 fathoms. Chart according to the smooth sheet.

²⁵ Charted position.

²⁶ Concur. Chart 47 fathom sounding as found during the present survey.

²⁷ ~~Strikethrough Danger to Navigations~~, replace with "Dangers to Navigation". Attached to this report.

²⁸ Concur.

²⁹ Insert "it".

³⁰ Concur with clarification. Remove charted wreck and "PA" notation at approximately Lat 55/20/54N and Lon 160/27/36W and chart visible wreck as found by the present survey..

³¹ Attached to this report.

³² Do not concur. A wreck "PA" notation is charted on 16553 at approximately Lat 55/20/54N and Lon 160/27/36W. It is associated with AWOIS item 52984, the charted wreck assigned for investigation by the hydrographer. See hydrographer's comments and endnotes under Automated Wreck and Obstruction Information System and AWOIS form attached to this report. Remove wreck "PA" from chart.

³³ Concur.

³⁴ Attached to this report.

³⁵ Filed with the hydrographic data.

³⁶ The following list was submitted by NOAA to the contractor as items to be investigated. Results of item investigations are discussed below under section Results and Recommendations. In addition, a lidar rock(awash/uncovers), shown on H11147a positioned at latitude 55/21/41.27N, longitude 160/28/10.11W was not assigned on the "Additional Investigation List" but was covered by 100% Multibeam. Office review of the Multibeam survey data found this feature to be a submerged rock with a least depth of 3.9 fathoms. The report for H11147a specifically states that the area contains kelp and there is doubt as to whether this rock exists. The evaluator recommends to chart the 3.9 fathom sounding and note Rk.

³⁷ The evaluator concurs with the hydrographer's statements in the Items listed below except as noted. Chart all areas according to the smooth sheet and Hdrawing.

³⁸ Attached to this report.

³⁹ Concur. Kelp noted in the area on both H11330 and H11147b may account for the inaccurate LIDAR sounding. Chart this area based on the survey findings.

⁴⁰ Concur

⁴¹ Do not concur. The evaluator recommends retaining the charted rock, which was not investigated. Chart according to the Hdrawing.

⁴² Concur. Refer to endnotes 44 and 45 for charting recommendations.

⁴³ Concur with clarification. The 8.6 fathom multibeam rock was submitted as a Danger to Navigation. See Danger to Navigation Report, attached to this report, for further



information. Chart 8 fathom, 3 foot sounding at smooth sheet position with *Rks* notation as depicted on the Hdrawing.

⁴⁴ Strikethrough ~~7.8~~, replace with “8.6”.

⁴⁵ Do not concur. Due to scale, do not chart rock. Chart vicinity with shoaler rocks as depicted on the Hdrawing.

⁴⁶ Concur

⁴⁷ Do not concur. Feature is located approximately 80 meters north of the rock discussed in endnote 48. Due to chart scale, do not chart rock. Chart area as depicted on the Hdrawing.

⁴⁸ Do not concur. Feature is located approximately 120 meters north of the rock discussed in endnote 48. Due to scale, do not chart rock. Chart area as depicted on the Hdrawing.

⁴⁹ Concur

⁵⁰ Concur. The evaluator recommends using the latest shoreline source data for the MHWL.

⁵¹ PDF forms are attached to this report. Raw notes are filed with the hydrographic data.

⁵² Concur.

⁵³ Concur.

⁵⁴ Concur. Chart according to the smooth sheet.

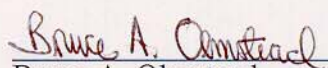
⁵⁵ Strikethrough ~~in the survey were discovered~~, replace with “were discovered in the survey area”.

⁵⁶ Concur. See hydrographer’s comments and endnotes under DR section Automated Wreck and Obstruction Information System and AWOIS form following.

APPROVAL SHEET
H11278


Initial Approvals:

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.


Bruce A. Olmstead
Cartographic Team
Pacific Hydrographic Branch

Date: 2/1/2007

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 Descriptive Report.


Donald W. Haines
CDR, NOAA
Chief, Pacific Hydrographic Branch

Date: 7 FEB 2007

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H11278

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
16553	9/13/06	G. NELSON, B. TAYLOR	Full Part Before After Marine Center Approval Signed Via APPLICATION
			Drawing No. OF SOUNDINGS AND FEATURES FROM SMOOTH SHEET.
			Full Part Before After Marine Center Approval Signed Via PARTIAL
			Drawing No. APPLICATION OF SOUNDINGS, CURVES + FEATURES FROM LIDAR SURVEY H1147B
			Full Part Before After Marine Center Approval Signed Via COMBINED ON
			Drawing No. THE SAME HDRAWING WITH H11278 SHOWN ON LEVEL 7
			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
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