

H11354

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.

Registry No. H-11354

LOCALITY

State Alaska

General Locality Sitka Sound

Sublocality Approaches to Sitka

2004

CHIEF OF PARTY

Dean Moyles

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H11354

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 Sitka Sound

Sublocality Approaches to Sitka

Scale 1:10,000

Date of Survey 7/26/04 - 9/15/04

Instructions Date 7/9/2004

Project No. OPR-O112-KR&L-04

Vessel R/V Quicksilver, R/V Kvichak Surveyor 1 & Shoals-1000T, Skiff

Chief of Party Dean Moyles

Surveyed by Moyles, Reynolds, Orthmann, Arumugam, Lockheart, Martinez, Busey

Soundings taken by echo sounder Reson 8101, 8111 & SHOALS-1000T

Graphic record scaled by Fugro Pelagos, Inc Personnel

Graphic record checked by Fugro Pelagos, Inc Personnel

Evaluation by R. Davies

Automated plot by HP Designjet 500

Verification by Fugro Pelagos, Inc Personnel

Soundings in Fathoms and tenths

at

MLLW

REMARKS: Time in UTC. UTM Projection Zone 8

Revisions and annotations appearing as endnotes were

generated during office processing.

All separates are filed with the hydrographic data.

As a result, page numbering may be interrupted or non-sequential



A - Area Surveyed

H11354 (Sheet U), is bounded by the coordinate listing below, and encompasses the Approaches to Sitka.

The R/V Kvichak Surveyor 1 began hydrographic data collection of the deep water areas on July 26, 2004 and concluded on July 28, 2004. The R/V Quicksilver commenced data collection on August 17, 2004 and concluded on September 15, 2004.

LIDAR flights were conducted on September 1, 2004 and September 4, 2004 through to September 6, 2004.

Table 1 H11354 Survey Limits

Survey Limits ¹ Task Order # 17 H11354 Sheet U Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	57°02'15.339804" N	135°21'09.95868" W
2	56°56'17.124792" N	135°21'09.95868" W
3	56°56'17.124792" N	135°28'33.23496" W
4	57°02'15.339804" N	135°28'33.23496" W

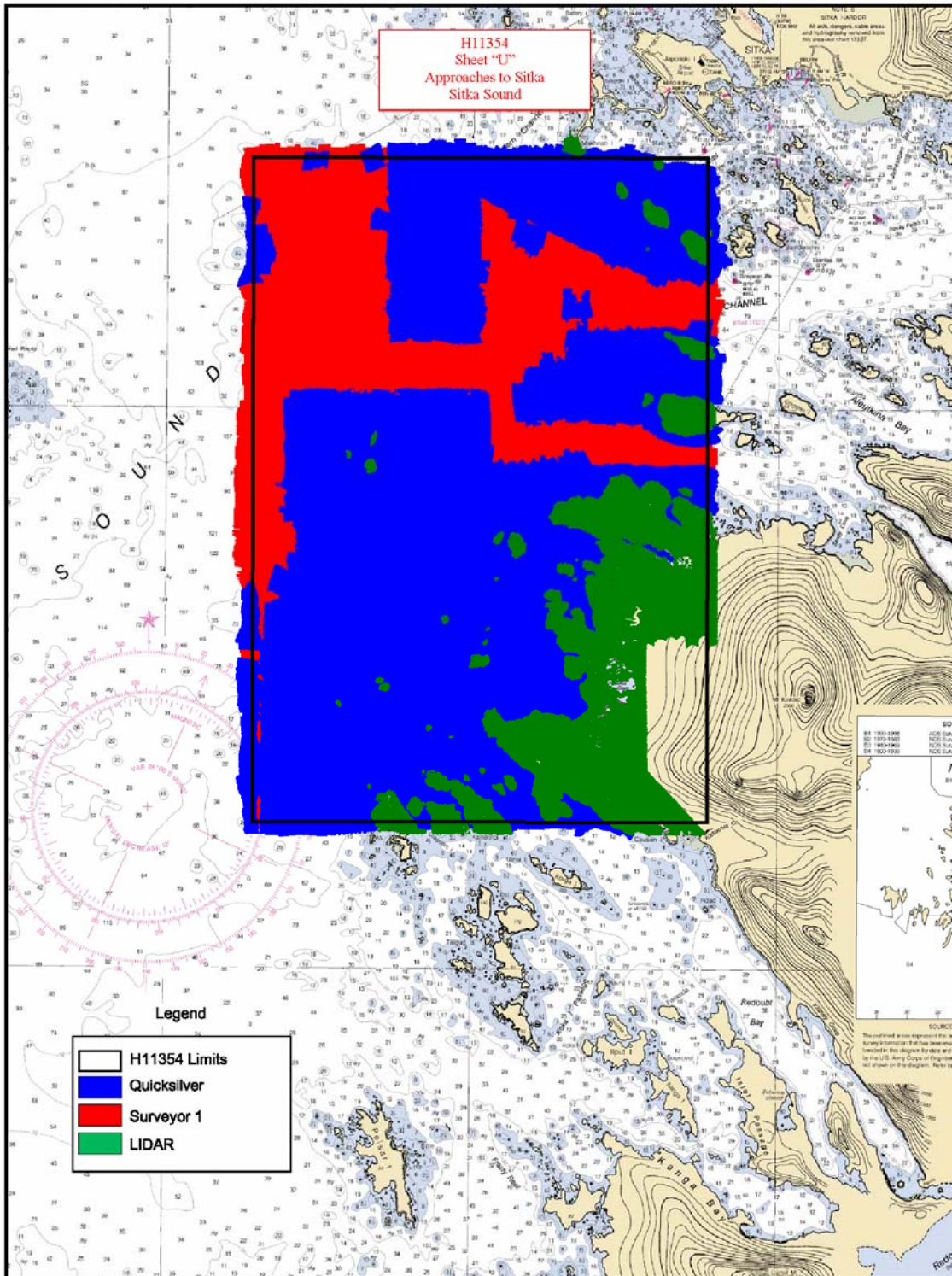


Figure 1 H11354 Survey Limits



B – Data Acquisition & Processing

Refer to the OPR-O112-KR&L-04 Data Acquisition and Processing Report² for a detailed description of all equipment, survey vessels, LIDAR suite, 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 & Platforms

Multibeam

The R/Vs Quicksilver and Kvichak Surveyor 1 acquired all multibeam sounding data for H11354. 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, 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, was used to perform 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 NOAA charts were displayed as a layer in WINFROG for reference. Soundings on submerged features were conducted with a leadline, but to assist the hydrographer in locating targets near the surf zone or areas of limited visibility, a Hummingbird Piranha Max15 fish finding sounder was added as an aid.

LIDAR

The Beechcraft King Air 90 (call sign N80Y) acquired all LIDAR data for H11354. The aircraft is 35 feet 6 inches in length with a wing span of 47 feet 10.5 inches. It was equipped with the SHOALS-1000T Bathymetric and Topographic LIDAR System. Aircraft motion was measured with an Applanix Position and Orientation System for Airborne Surveys (POS/AV), a NavCom StarFire SF2050M DGPS receiver was used for Airborne Positioning. Raw data was collected in Optech's proprietary file formats.

Refer to OPR-O112-KR&L-04 Data Acquisition & Processing Report for a complete listing of equipment and vessel descriptions.

Quality Control

Multibeam Crosslines

Quality control tielines were planned to measure 5 percent of the main scheme line length. Total crossline length surveyed was 72.25 km (39.01 nautical miles) or 6.5 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 88 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.³

- 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.

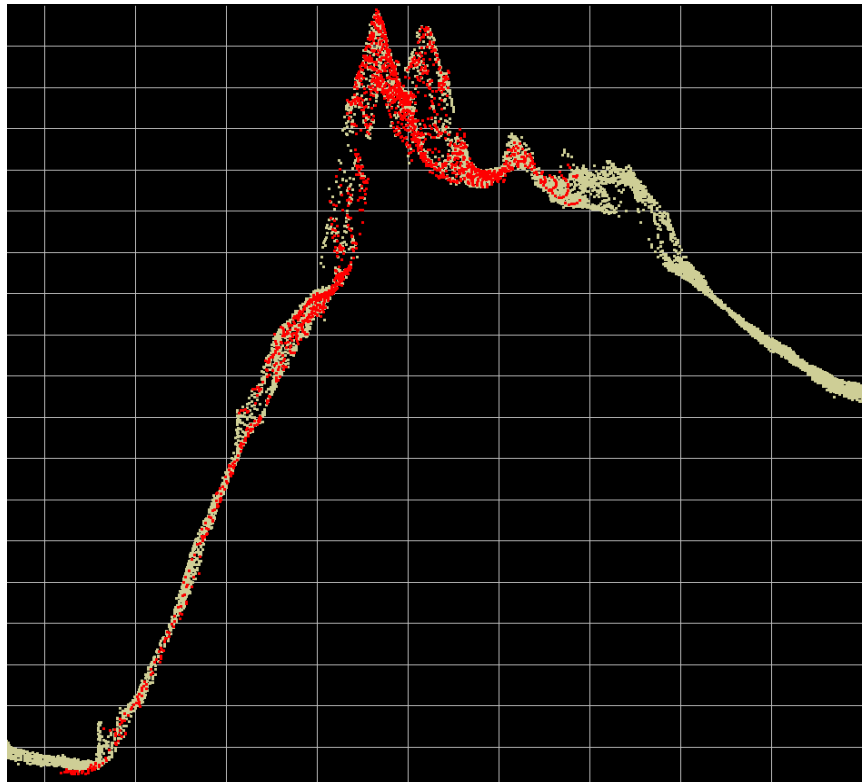
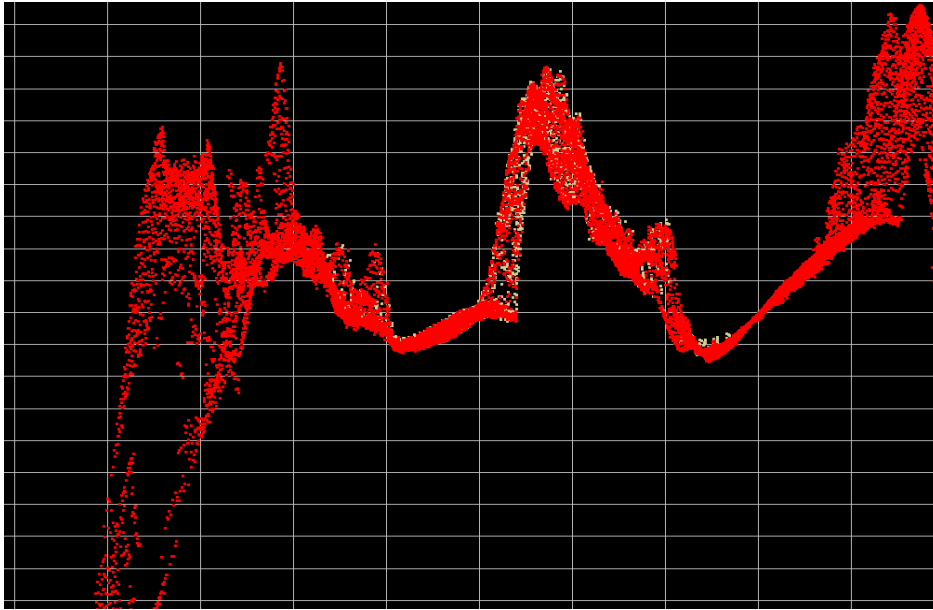


Figure 2: Profile of U02-QC008**Figure 3: Profile of U06-QC008**

LIDAR Crosslines

Three cross lines, using the bathymetry laser, were planned and acquired over the survey area. A difference analysis between the cross line and the remainder of the bathymetry lines was performed using the QC Tool in CARIS GIS.

As with the multibeam data the majority of QC Reports fell well within the required accuracy specifications. However, there were few cases where the results fell below the 95% confidence level in the QC Report and are associated with specific areas with steep slopes. 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.

Topographic data were not included because any specification for vertical accuracy must assume relatively flat bottom (due to laser footprint size in relation to the irregularity of the seafloor) and topographic data were typically over target rich or steep slope environments such as houses, vegetation, jetties, steep sloped beaches, etc.

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 = 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 sitka.cla file within CARIS will use:

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

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

Multibeam Data Quality ⁴

In general, the multibeam data quality for H11354 was excellent; there were no unusual conditions encountered.

LIDAR Data Quality ⁵

In general, the LIDAR data quality for H11354 was excellent; there were no unusual conditions encountered, but a few areas to noted are as follows:

- Due to water clarity and bottom type (evident from the orthomosaic below on the right) there were sections of Three Entrance Bay that had sparse LIDAR coverage. It should be noted that these areas are not considered to be navigationally significant.

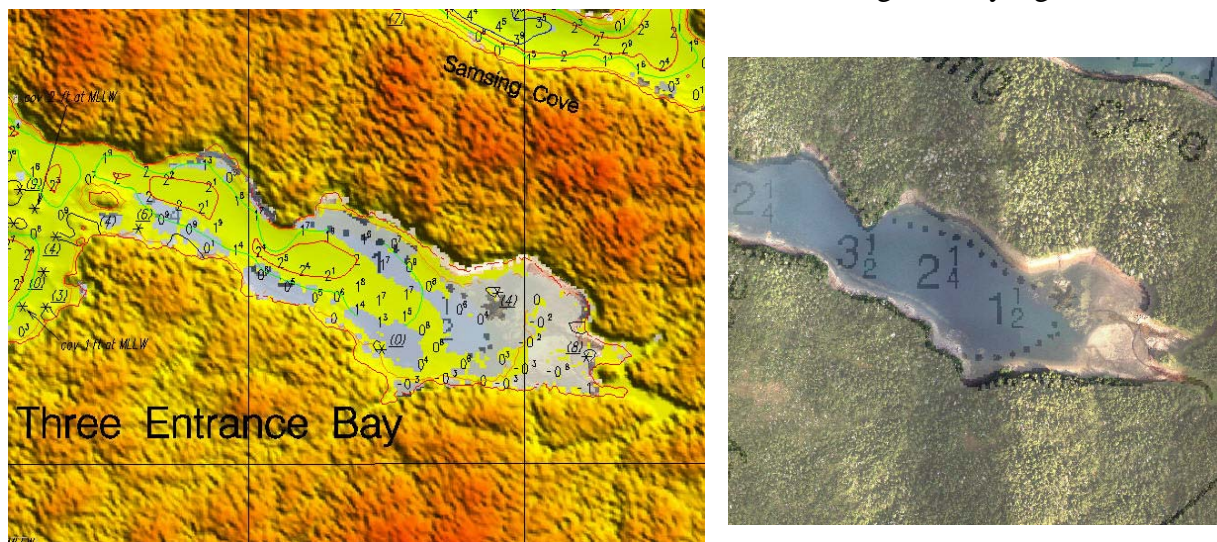


Figure 4: LIDAR Coverage (Three Entrance Bay)

- LIDAR data was limited in Mielkoi Cove because of the bottom type. It is evident from the orthomosaic below on the right that the bottom consists of mud. As stated above the area is not considered to be navigationally significant. In this area, the sea to land or transition zone was not mapped fully, hence the broken MHW line.

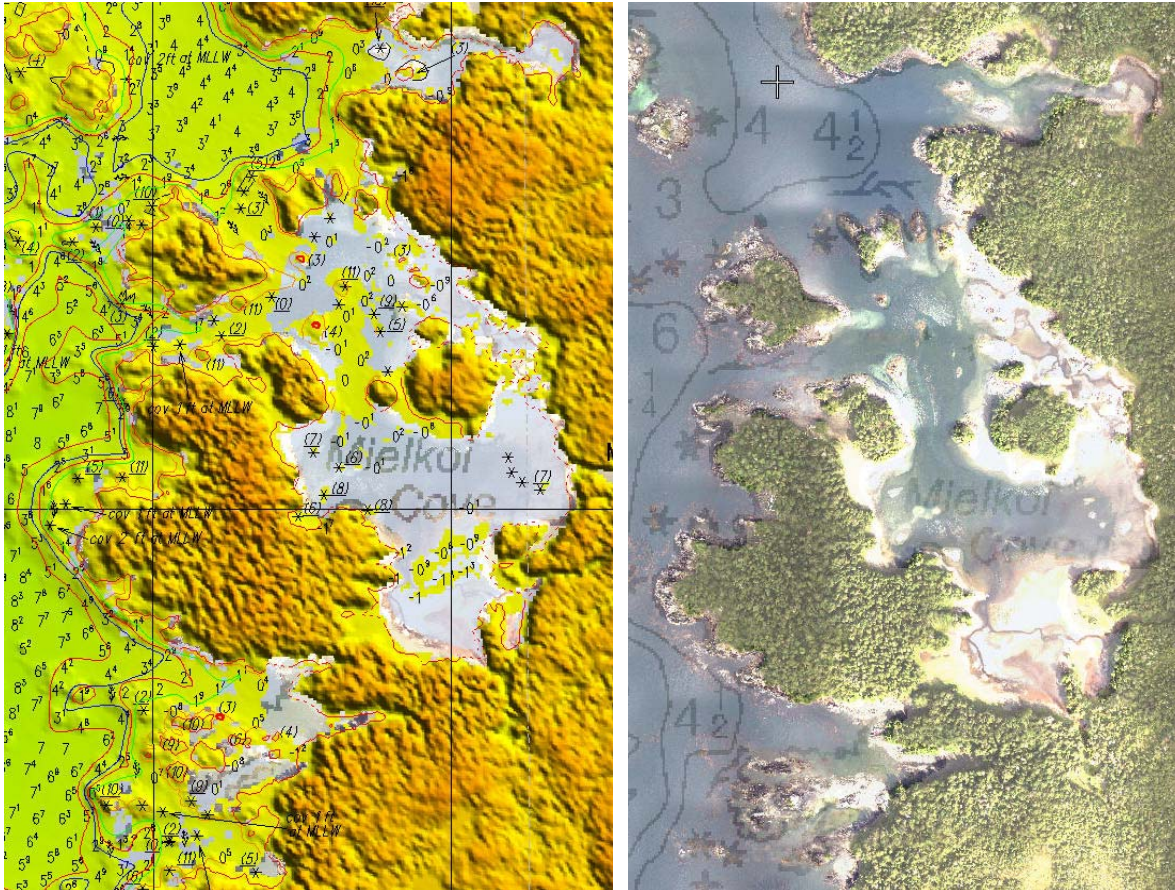


Figure 5: LIDAR Coverage (Mielkoi Cove)

- Turbidity was a factor for certain areas, namely the southern portion of Povorotni Point and the north side of Kita Island.
- Particular attention was paid to the areas around Glagohm and Kamennoi Islands, since this area had a large presence of kelp. To ensure data quality the Quicksilver acquired sounding data where it could safely navigate to provide some ground truth data. Any questionable sounding were removed from the LIDAR data set in the GCS software.

Survey Junctions

H11354 (Sheet U) was the only sheet assigned under OPR-O112-KR&L-04. There are no contemporary junctions. ⁶

Smooth Sheet Histograms

Figure 6 Histogram is for the Reson 8101 data collected from August 17, 2004 to September 15, 2004 on the Quicksilver. The histogram shows an increase on selected soundings from the outer beams (around beams 5 - 25 and 81 - 95). This is the result of surveying near the shoreline where the outer beams are mapping the shallowest areas. Also, in the majority of adjacent lines that were run, 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.

The decrease or lack of selected soundings on the outer beams is the result of deterioration of data quality on the outer beams. In most cases set filters were used to flag the outer beams as rejected, but in other cases, additional cleaning or filters were used on a line by line basis resulting in fewer selected soundings.

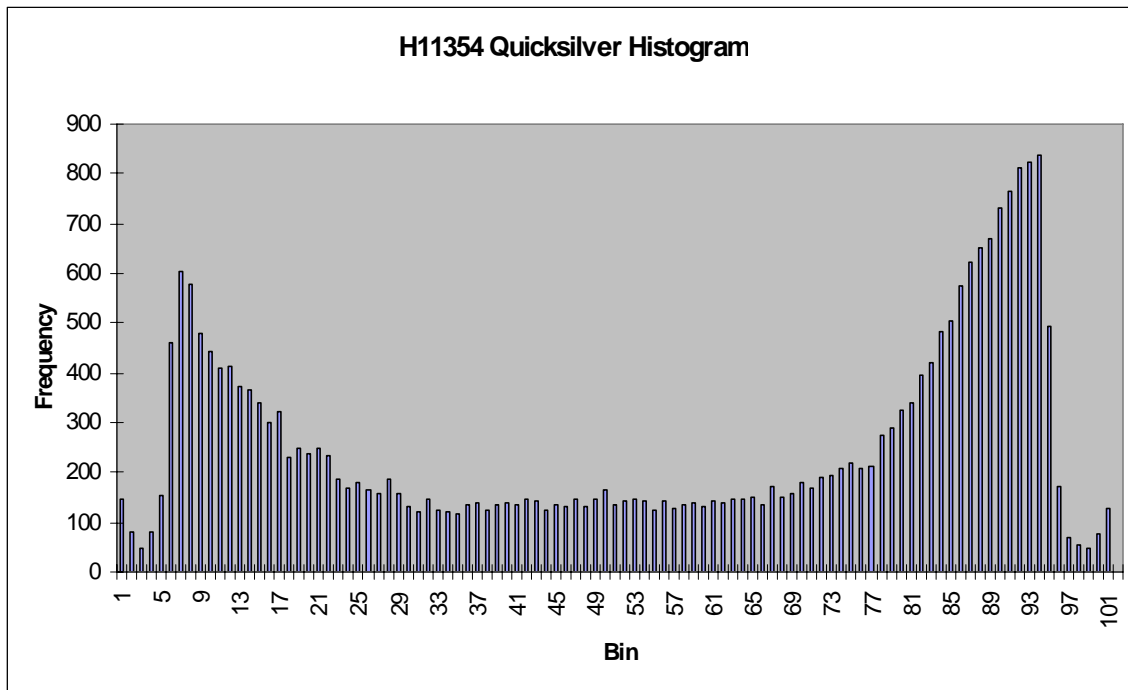


Figure 6 Histogram for 8101 (Quicksilver)

Figure 7 Histogram is for the Reson 8111 data, collected on July 26, 2004 to July 28, 2004 on the Kvichak Surveyor 1. The Surveyor 1 was utilized to conduct the deep-water portion of the sheet. The histogram is evenly distributed between beams 17 to 81, it is somewhat apparent on these examinations the transition from phase to amplitude detection method of the sonar (around beams 37 and 69).

The decrease or lack of selected soundings on the outer beams is the result of deterioration of data quality on the outer beams, especially in deep water. In most cases set filters were used to flag the outer beams were rejected, but in other cases additional cleaning or filters were used on a line by line bases resulting in fewer selected soundings.

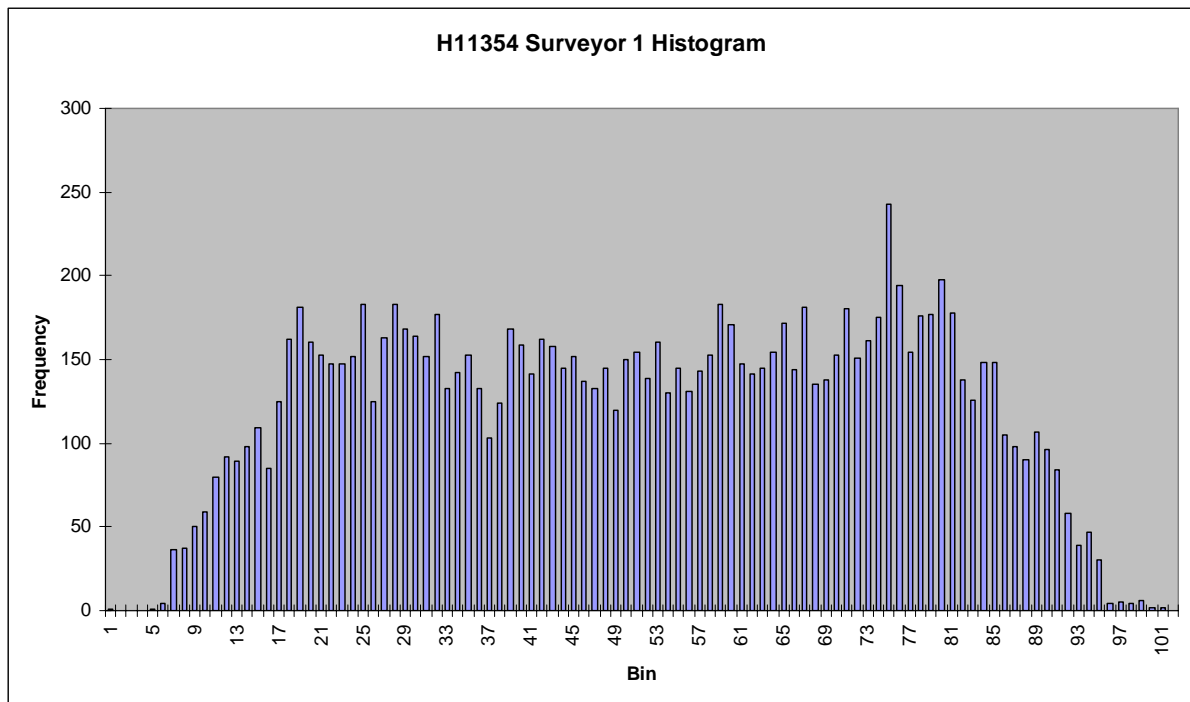


Figure 7 Histogram for 8111 Surveyor 1

Multibeam Quality Control Checks

During the hydrographic survey OPR-O112-KR&L-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 direction over a reference surface (normally the patch test site). In this case the Kvichak Surveyor 1 established a reference area prior to the arrival of the Quicksilver. 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 were 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.

LIDAR Quality Control Checks

To confirm the agreement between the multibeam data and LIDAR data sets, a reference area (with water depths ranging from 0 to 15 meters) was surveyed on the north side of Povorotni Point. The Quicksilver conducted the survey on Julian Days 232 and 233; this data was then compared against the LIDAR data collected on Julian Day 245. The data were reviewed in CARIS HIPS and Fledermaus and revealed that the two systems compared to within 10 to 15 centimeters.

Positioning system confidence checks were conducted using the POS/AV 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. Note: Flights were planned to avoid periods of high PDOP/HDOP and/or low number of available satellites.

Corrections to Echo Soundings

Refer to the OPR-O112-KR&L-04 Data Acquisition and Processing Report for a detailed description of all corrections to echo soundings. No deviations from the report occurred.

C – Horizontal & Vertical Control

Refer to the OPR-O112-KR&L-04 Horizontal and Vertical Control Report⁷ for a detailed description of the horizontal and vertical control used on this Survey. A summary of the projects 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 135°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: both on Sitka Airport property, adjacent to the runway for this purpose. Refer to the Appendix B for Horizontal Control results and procedures. ⁸

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.

For the LIDAR system, the position was determined in real time using DGPS. The primary position GPS antenna was a NovAtel 512 airborne L1/L2, which was connected to a Dual frequency NovAtel Millennium GPS card residing in the POS AV. Two differential receivers were available: a NavCom StarFire SF2050M DGPS receiver and a CSI MBX-3S Coast Guard beacon receiver. The NavCom SF2050-M received L1, L2 and L band corrections from the StarFire network; and was the primary source of differential corrections for this project. However, final positions were determined using a post-processed KGPS solution using the POSpac 4.2 processing software.



Vertical Control

All sounding data were reduced to MLLW initially using unverified tidal data from the NOAA tide station (ID #: 9451600), located in Sitka, AK.

Table 2 - Tide Gauges

Gauge	Model	Gauge Type	Location	Latitude	Longitude	Operational
9451600	AquaTrak	Acoustic	Sitka, AK	57°03'06"N	135°20'30" W	N/A

Table 3 - Final Tide Zones

Zone	Primary			
	Site	Number	Time	Range Ratio
SEA	Sitka	9451600	0	1.00
PAC295A	Sitka	9451600	0	0.99

Tidal data for a twenty-four hour period, UTC (Alaska Standard Time to UTC was +8 hours), was assembled by LCMF and e-mailed to the Sitka office at the end of every Julian Day. A cumulative file for each gauge was updated each day by appending the new data.

On September 24, 2004, LCMF issued verified tidal data from the NOAA tide gauge for OPR-O112-KR&L-04. On September 25, 2004 all multibeam sounding data were re-merged using CARIS HIPS and SIPS tide routine. On January 25, 2005, using the GCS, the tide zone file and verified tides were imported into GCS and all LIDAR sounding data were tide corrected. Verified tidal data was used for the Preliminary Smooth Sheet.

During the OPR-O112-KR&L-04, Approaches to Sitka Survey, there were no unusual conditions regarding tidal information to note. Refer to Appendix D⁹ for a more detailed description and Tidal Data.

D – Results and Recommendations

Chart Comparison

H11354 survey was compared with charts:

- 17320 1:217,828 15th Mar 6, 1999
- 17326 1:40,000 13th Aug 5, 2000 ¹⁰
- 17327 1:10,000 21st Aug 1, 2003 ¹¹

Comparison of Soundings

The soundings and contours, in general, compare well with the existing charts. Soundings from charts 17327 and 17326 coincide with the soundings from H11354 to within 2 to 3 fathoms; areas that do vary to any degree are noted separately and are as follows: ¹²

- Hydrographic survey H11354 revealed a depth of 11.8 fathoms in the vicinity of a 29 fathom sounding on chart 17326 located at 57 00 21.51 N, 135 23 39.15 W. This area was surveyed with 100% multibeam coverage. ¹³
- Hydrographic survey H11354 revealed a depth of 71 fathoms in the vicinity of a 59 fathom sounding on chart 17326 located at 57 00 09.45 N, 135 27 15.77 W. This area was surveyed with 100% multibeam coverage. ¹⁴
- Hydrographic survey H11354 revealed a depth of 40 fathoms in the vicinity of a 29 fathom sounding on chart 17326 located at 57 02 14.79 N, 135 27 22.43 W. This area was surveyed with 100% multibeam coverage. ¹⁵
- Hydrographic survey H11354 revealed a depth of 24 fathoms in the vicinity of a 12 fathom sounding on chart 17326 and 17327 located at 57 02 12.14 N, 135 23 56.56 W. This area was surveyed with 100% multibeam coverage. ¹⁶

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

Figure 8 illustrates that the contours from H11354 take on the same general shape. Differences can be associated with the following; since the contours on H11354 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. ¹⁷



Automated Wreck and Obstruction Information System

There were no AWOIS items assigned to OPR-O112-KR&L-04. ¹⁸

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H11354. ¹⁹

Dangers to Navigation

Forty-nine dangers to navigation were located during the hydrographic survey of H11354. Refer to Appendix A for Submitted Report. ²⁰

Additional Results

Additional 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 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 NOAA charts were displayed as a layer in WINFROG for reference. Soundings on submerged features were conducted with a leadline, but to aid the hydrographer in locating the shoalest point of targets near the surf zone or areas of limited visibility, a Hummingbird Piranha Max15 fish finding sounder was used. 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 notes).

Results and recommendations

The ERDAS Image V8.7 software was utilized to create the orthomosaic that was used for the mapping and verifying of shoreline features. The accuracy of the orthomosaic is apparent when viewing photos from reciprocal lines in the orthomosaic, the horizontal alignment of distinct features are well within IHO Order 1 (+5m). The positional accuracy of the orthomosaic was verified by a ground truth method via the Skiff. In areas where it was safe to navigate, the Skiff obtained horizontal positions on rocks that were clearly defined on the orthomosaic and the results were well within the IHO Order 1 specifications. ²¹



Item investigations that result in a recommendation that contradicts the LIDAR data set appear on the 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 preliminary smooth sheet, as do rocks with heights that differ significantly from the LIDAR data set.

Investigation results that confirm the LIDAR data set do not appear on the preliminary smooth sheet. For example, if a rock in the LIDAR dataset was investigated by skiff and the heights / positions did not differ significantly, the LIDAR rock would appear on the smooth sheet while the height / position obtained by skiff would not.

Each result and recommendation below refers to a Detached Position (DP) form. 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 F.²²

- Charted rock at 56 56 18.86 N, 135 26 34.6 W was not found during this survey. The rock received full multibeam and LIDAR coverage and was visited during skiff investigations. Recommend removal. See DP form JD244_02.²³
- Charted rock at 56 56 36.57 N, 135 26 38.148 W was located, but a hole in combined multibeam / LIDAR coverage indicates shoalest point not located. Skiff visited rock and fixed its height at 3 ft above MLLW. As skiff could not safely approach rock its position was estimated. Position clearly visible on orthomosaic. Recommend charting at orthomosaic position (56 56 36.36 N, 135 26 36.30 W) using skiff height, and appears as such on smooth sheet. See DP form JD244_01.²⁴
- Charted rock at 56 56 17.45 N, 135 24 49.65 W was not found during this survey. The rock received LIDAR coverage and was visited by the skiff. Skiff reported a depth of 3.8 fms at this position. Recommend removal. See DP form JD244_35.²⁵
- Charted rock at 56 56 31.33 N, 135 23 18.75 W was not found during this survey. The rock received full multibeam and LIDAR coverage and was visited by the skiff. Recommend removal. See DP form JD245_39.²⁶
- New rock at 56 56 33.33 N, 135 23 19.47 W was located by LIDAR with height of 0 ft above MLLW but skiff obtained a shoaler height of 4 ft above MLLW. Orthomosaic also indicates that skiff positioning of rock is more accurate. Recommend charting at skiff position (56 56 33.33 N, 135 23 19.47 W) with skiff height and appears as such on smooth sheet. See DP form JD245_38.²⁷
- Charted rock at 56 56 34.41 N, 135 24 29.72 W was located by LIDAR and skiff, but skiff obtained shoaler height. Orthomosaic also indicates skiff positioning on rock is more accurate. Recommend charting at skiff position (56 56 34.41 N, 135 24 29.72) with skiff height, and appears as such on smooth sheet. See DP form JD244_39.²⁸



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- Charted rock at 56 56 31.69 N, 135 25 15.01 W was not found during this survey. The rock received full multibeam and LIDAR coverage and was visited by the skiff. Recommend removal. See DP form JD244_29. ²⁹
 - Charted rock at 56 56 35.99 N, 135 24 22.31 W was not found during this survey. The rock received full multibeam and LIDAR coverage and was visited by the skiff. Recommend removal. See DP form JD244_41. ³⁰
 - Charted rock at 56 56 44.62 N, 135 25 37.84 W was not found during this survey. The rock received full multibeam and LIDAR coverage and was visited by the skiff. Recommend removal. See DP form JD244_19. ³¹
 - Charted rock at 56 56 41.72 N, 135 25 44.64 W was not found during this survey. The rock received full multibeam coverage and shoalest depth in vicinity was 5.8 fms. Recommend removal. ³²
 - Charted rock at 56 57 00.01 N, 135 23 01.82 W was located by LIDAR (2 ft above MLLW) and skiff, but skiff obtained shoaler height (6 ft above MLLW). Positions are within 1 meter, possible that LIDAR missed shoalest point. Recommend charting skiff rock and height at 56 57 00.01 N, 135 23 01.82 W, and appears as such on smooth sheet. See DP form JD242_40. ³³
 - Charted rock at 56 56 59.14 N, 135 24 10.75 W was located by LIDAR (0 ft above MLLW) and by skiff, but skiff obtained a shoaler depth (5 ft above MLLW) at a position 8.5m southeast. Orthomosaic indicates skiff positioning of shoal point is correct; recommend charting at skiff position (56 56 59.14 N, 135 24 10.75 W) with skiff height, and appears as such on smooth sheet See DP form JD243_29. ³⁴
 - Charted rock at 56 57 08.33 N, 135 25 40.25 W was located by LIDAR (1 ft above MLLW) and by skiff, but skiff obtained a shoaler depth (5 ft above MLLW) at position 15m east. Orthomosaic indicates skiff positioning of shoal point is correct; recommend charting at skiff position (56 57 08.33 N, 135 25 40.25 W) with skiff height, and appears as such on smooth sheet. See DP form JD244_48. ³⁵
 - Charted rock at 56 57 20.94 N, 135 27 09.91 W (Vasilief Breakers). A height could not be obtained from LIDAR data due to breakers. Skiff could not visit rock due to breakers. Position is apparent in orthomosaic; appears on smooth sheet at this position (56 57 21.33 N, 135 27 10.43 W) with ledge. Recommend retaining charted height of 10 ft above MLLW. ³⁶
 - New rock at 56 57 11.68 N, 135 22 58.45 W was located by LIDAR (0 ft above MLLW) and by skiff but skiff obtained a shoaler depth (2 ft above MLLW) at position 3m southwest. Possible LIDAR did not find shoalest point. Recommend charting at skiff position (56 57 11.68 N, 135 22 58.45 W) with skiff height, and appears as such on smooth sheet. See DP form JD245_32. ³⁷

- Charted rock at 56 57 11.89 N, 135 23 2.39 W was not found during this survey. The charted rock received LIDAR coverage and was investigated by the skiff. Shoalest depth in vicinity is 1.3 fms. Recommend removal. See DP form JD245_33. ³⁸
- Charted rock at 56 57 42.15 N, 135 24 55.64 W was located by skiff. Rock apparent in orthomosaic but height not obtained by LIDAR. Recommend using skiff height (2 ft above MLLW) at orthophoto position (56 57 42.50 N 135 24 56.30 W), and appears as such on smooth sheet. See DP form JD243_07. ³⁹
- Charted rock at 56 57 44.50 N, 135 23 26.08 W was not found during this survey. Full multibeam coverage found a shoalest depth of 2.5 fms at the position. Recommend removal. See DP form JD245_20. ⁴⁰
- New rock at 56 57 41.33 N, 135 23 03.10 W was observed by skiff (3 ft above MLLW) while LIDAR found the slightly deeper rock 13m north (0 ft above MLLW). Another skiff rock was located 13m northeast (DP form JD245_30) – recommend charting the seaward new rock (56 57 41.33 N, 135 23 03.10 W) and charting a ledge to include the two nearby rocks since at smooth sheet scale the three rocks cannot be portrayed. Appears as such on smooth sheet. See DP form JD245_31. ⁴¹
- Charted rock at 56 58 05.33 N, 135 23 26.48 W was not found during this survey. Partial multibeam coverage, full LIDAR, and skiff investigation indicated no rock at charted position. However, a slight shoaling is evident in orthomosaic south of charted position. Rock appears at seaward extent of shoaling on smooth sheet. Recommend removing rock as charted and chart rock at smooth sheet position (56 58 5.00 N, 135 23 26.09 W). See DP form JD245_15. ⁴²
- Charted rock at 56 58 07.75 N, 135 22 58.68 W was observed by the skiff (3 ft above MLLW). Rock is evident in orthomosaic. As skiff position was estimated it is recommended the rock be charted at orthomosaic position (56 58 07.75 N, 135 22 58.68 W) using skiff height, and appears as such on smooth sheet. See DP form JD242_31. ⁴³
- Charted rock at 56 58 21.04 N, 135 23 2.70 W was observed by skiff. Skiff obtained height of 3 ft above MHW. Recommend removing charted rock and charting islet at position from orthomosaic (56 58 21.04 N, 135 23 2.70 W), and appears as such on smooth sheet. See DP form JD242_29. ⁴⁴
- Charted rock at 56 58 39.32 N, 135 21 33.22 W was observed by LIDAR (2 ft above MLLW) and skiff. Skiff obtained a shoaler height of 4 ft above MLLW. Rock is clear in orthomosaic; recommend charting at LIDAR position (56 58 40.14 N, 135 21 32.99 W) using skiff height, and appears as such on smooth sheet. See DP form JD242_16. ⁴⁵



-
- Charted rock at 56 58 39.78 N, 135 22 49.80 W was observed by skiff with a height of 3 ft above MLLW. Rock is evident on orthomosaic; as skiff position was estimated it is recommended that rock be charted at orthomosaic position (56 58 40.13 N, 135 22 48.61 W) with skiff height and is presented as such on smooth sheet. See DP form JD242_10. ⁴⁶
 - Charted rock at 56 58 36.49 N, 135 23 7.22 W was found by LIDAR to have a height of 4 ft MHW and is a change from previously charted. Recommend removal of charted rock, and chart an islet surrounded by ledge at 56 58 35.40 N, 135 23 7.66 W and appears as such on smooth sheet. ⁴⁷
 - Charted rock at 56 58 55.97 N, 135 23 14.15 W was observed by LIDAR (cov 1 ft at MLLW) and skiff. Skiff obtained a shoaler height of 3 ft above MLLW. Rock is clear in orthomosaic; as skiff position was estimated it is recommended the rock appear at LIDAR position (56 58 56.76 N, 135 23 14.62 W) using skiff height and appears as such on smooth sheet. DP form JD242_08. ⁴⁸
 - Charted rock at 56 59 00.91 N, 135 23 19.56 W was observed by LIDAR (1 ft above MLLW) and skiff. Skiff obtained a shoaler height of 5 ft above MLLW. Rock is clear in orthomosaic; since skiff position is estimated it is recommend that it be charted at orthomosaic position (56 59 1.42 N, 135 23 18.97 W) using skiff height and appears as such on smooth sheet. See DP form JD242_05. ⁴⁹
 - Charted rock at 56 59 07.28 N, 135 22 58.43 W was not found during this survey. The rock received full LIDAR coverage and was visited by the skiff; shoalest depth in vicinity was 0.8 fms. Recommend removal. See DP form JD241_16. ⁵⁰
 - Charted rock at 57 00 04.78 N, 135 21 35.97 W was located by the skiff with height of 5 ft above MLLW. Rock is evident on orthomosaic; since skiff position is estimated it is recommended that it be charted at orthomosaic position (57 00 04.61 N, 135 21 36.56 W) using skiff height and appears on smooth sheet as such. DP form JD241_01. ⁵¹
 - Charted rock (chart 17326) at 57 00 05.05 N, 135 21 33.25 W was not found during this survey. The rock received full multibeam and LIDAR coverage and was visited by the skiff. Shoalest depth in vicinity was 7.1 fathoms. Recommend removal. DP form JD246_15. ⁵²
 - Charted rock (chart 17326) at 57 00 35.59 N, 135 21 37.54 W was not found during this survey. The rock received partial multibeam coverage, full LIDAR, and was investigated by the skiff. Shoalest depth in vicinity was 2.2 fms. Recommend removal. DP form JD246_10. ⁵³
 - New rock at 57 01 53.55 N, 135 22 34.09 W was located by LIDAR (1 ft above MLLW) and skiff but skiff obtained shoaler depth (5 ft above MLLW). Since skiff



position is estimated it is recommended the rock be charted at LIDAR position (57 01 53.55 N, 135 22 34.09 W) using skiff height and appears on smooth sheet as such.. DP form JD246_03. ⁵⁴

- Charted rock (chart 17327) at 57 01 57.49 N, 135 22 35.51 W was located by LIDAR (1 ft above MLLW) and skiff but skiff obtained shoaler depth (3 ft above MLLW). Since skiff position is estimated it is recommended the rock be charted at LIDAR position (57 01 57.49 N, 135 22 35.51 W) using skiff height and appears on smooth sheet as such. DP form JD246_02. ⁵⁵
- New rock at 57 01 56.55 N, 135 22 33.38 W was located by LIDAR (1 ft above MLLW) and skiff but skiff obtained shoaler depth (4 ft above MLLW). Since skiff position is estimated it is recommended the rock be charted at LIDAR position (57 01 56.55 N, 135 22 33.38 W) using skiff height and appears on smooth sheet as such. DP form JD246_01. ⁵⁶

Additional Notes: ⁵⁷

- The MHW and MLLW lines were created in CARIS HIPS & SIPS 5.3. The data was gridded at 5m with a 3 X 3 foot print size and contoured via CARIS Fieldsheet Editor at the appropriate intervals. The MLLW line was not interpolated manually to rectify breaks in the MLLW line. If there are areas on the smooth sheet where the MLLW is present and there are no soundings present, the soundings were either suppressed during the sounding suppression stage in CARIS or put on an excess level (level 52) in Microstation because they touched the MHW line.
- The source of the MHW line (solid red line) on the smooth sheet for H11354 is from the Shoals-1000T. ⁵⁸
- An area where the MHW was broken, the orthomosaic was used to derive the MHW and is represented by a dashed red line on the smooth sheet. ⁵⁹

Tidal Range

LCMF established the tidal range for OPR-O112-KR&L-04 to be 2.791 meters (9.156 feet or 1.526 fathoms). This value was used in determining height above MHW.

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, Multibeam Coverage and Ortho Mosaic files to calculate and display the desired information for each DP. Figure 9 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. ⁶⁰

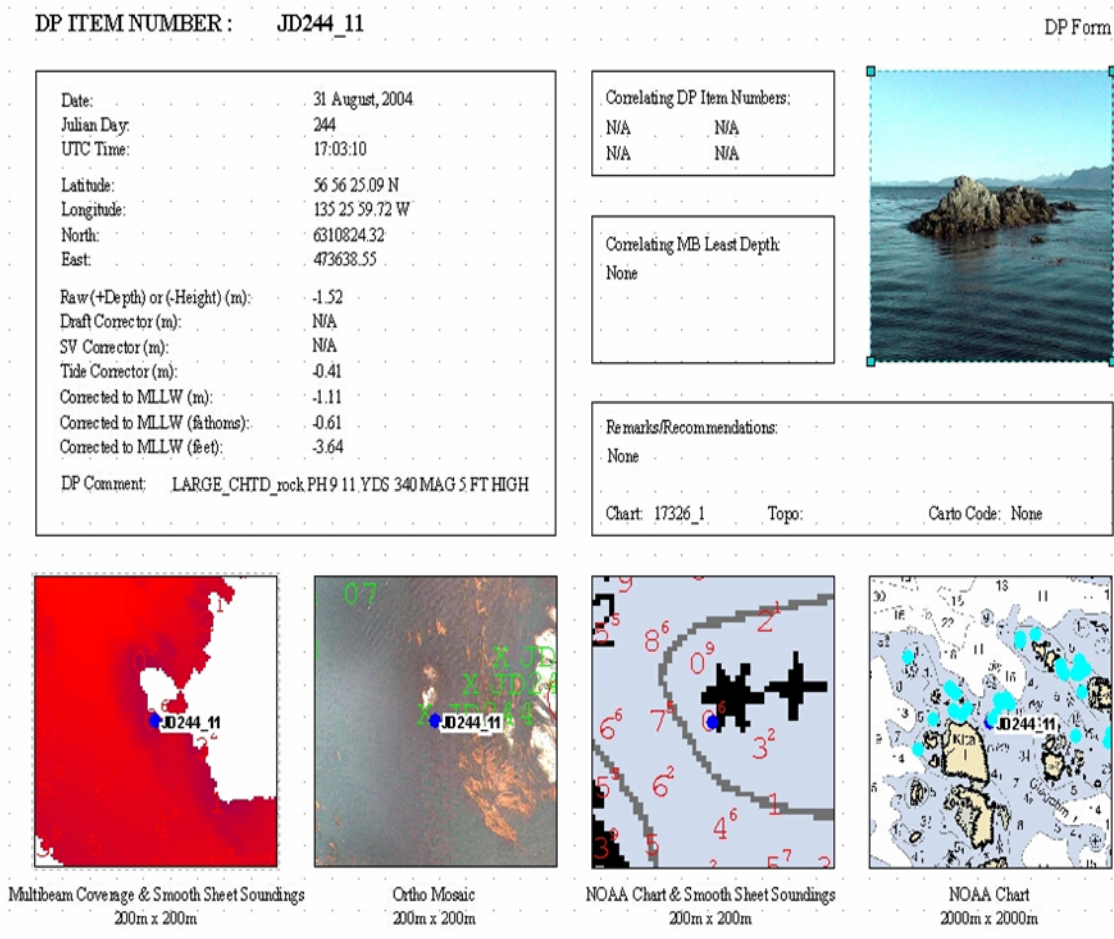


Figure 9 DP Correlator Sheet

Bottom Samples

Bottom Samples were not required under this contract. ⁶¹



Aids to Navigation ⁶²

Kulichkof Rock Buoy #2 (R “2” FI R 4s), Light List No. 24920, is an IALA starboard hand navigation buoy marking the northern boundaries of shoals and rocks in the vicinity of Kulichkof Rock. It was investigated by DP# JD258_04 in accordance with Section 7.2 of NOS Specifications and Deliverables. The characteristics described in the Light List are correct and it adequately serves the intended purpose for which it was established.

The Eckholms Fixed light (FI 6s 33ft 6M), Light List No. 24925, is a lattice structure with red and white day shapes on the Peak of Eckholm Island. This island is in the middle of a small series of islets with the western most extremity at Liar Rock. It was investigated by DP# JD240_08 in accordance with Section 7.2 of NOS Specifications and Deliverables. The characteristics described in the Light List are correct and it adequately serves the intended purpose for which it was established.

Surf Rock Fixed light (FI 4s 15ft 5M), Light List No. 24958, is a lattice structure with red and white day shapes at the top of a tall pole on Surf Rock. It was investigated by DP# JD240_01 in accordance with Section 7.2 of NOS Specifications and Deliverables. The characteristics described in the Light List are correct and it adequately serves the intended purpose for which it was established.

Makhnati Rock Buoy (R “2” FI R 2.5S WHIS), Light List No. 25000, is an IALA B starboard hand navigation buoy marking a shoal to the southwest of Makhnati Island at the entrance to the Western Channel. The spelling of the name on the rock (Maknati Rk) on chart 17326 is not consistent with the name of the island or rock (Makhnati Rk) on chart 17327 or with the information on the rock in the US Coast Pilot Volume #8 and the list of lights.⁶³ It was investigated by DP# JD240_04 in accordance with Section 7.2 of NOS Specifications and Deliverables. The characteristics described in the Light List are correct and it adequately serves the intended purpose for which it was established.

Note: The observed positions in the table below were taken from the Orthomosaic.



Table 4 - Position of Aids to Navigation

LIGHT LIST ID #	NAME	TYPE	CHARACTERISTICS	LIGHT LIST POSITION LATITUDE	LIGHT LIST POSITION LONGITUDE	OBSERVED POSITION LATITUDE	OBSERVED POSITION LONGITUDE	POSITION DIFFERENCE (LISTED -CHARTED)
24920	Kulichkof Rock Buoy #2	Lighted Buoy	Flashing Red every 4 seconds. Range 4 nautical miles.	56° 59' 54" N	135° 26' 59" W	56° 59' 54.43" N	135° 26' 59.68" W	17.57 meters, bearing 319.20°
24925	The Eckholms	Fixed Light	Flashing White every 6 seconds. Elevation 33 feet, range 6 nautical miles.	57° 00' 36" N	135° 21' 33" W	57° 00' 36.30" N	135° 21' 32.02" W	18.96 meters, bearing 60.70°
24958	Surf Rock	Fixed Light	Flashing White every 4 seconds. Elevation 15 feet, range 5 nautical miles.	57° 01' 55" N	135° 22' 35" W	57° 01' 55.21" N	135° 22' 34.97" W	6.52 meters, bearing 004.45°
25000	Makhnati Rock	Lighted Whistle Buoy	Flashing Red every 2.5 seconds. Range 4 nautical miles.	57° 02' 10" N	135° 23' 47" W	57° 02' 10.83" N	135° 23' 47.79" W	28.95 meters, bearing 332.75°



E – Approval Sheet

Approval Sheet

For

H11354

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

OPR-O112-KR&L-04 statement of work and hydrographic manual;
Fugro Pelagos, Inc. Acquisition Procedures (2004-NOAA Acquisition Procedures);
Fugro Pelagos, Inc. Processing Procedures (2004-NOAA Processing Procedures);

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

Forty-nine dangers to navigation were located during the hydrographic survey of H11354 and were submitted throughout the course of the project. ⁶⁴

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: **OPR-O112-KR&L-04**

Survey Dates: **August - September 2004**

Depths are reduced to Mean Lower Low Water using preliminary tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

Chart	Scale	Edition	Date
17320	1:217,828	16 th	Dec 1, 2003
17326	1:40,000	13 th	Aug 5, 2000

DANGER:

Feature	Depth(ft or fms)	Latitude	Longitude
Sounding	2 ½ fms	56/59/38.1 N	135/27/10.1 W

Upon submission of the above DTON, it is recommended that a DTON submitted with H11354 DTON Fugro REV13_1.doc be removed. The DTON to be removed is below:

Sounding	7 fms	56/59/36.541 N	135/27/14.754 W
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COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: OPR-O112-KR&L-04

Survey Dates: August - September 2004

Depths are reduced to Mean Lower Low Water using preliminary tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

Chart	Scale	Edition	Date
17320	1:217,828	16 th	Dec 1, 2003
17326	1:40,000	13 th	Aug 5, 2000

DANGER:

Feature	Depth(ft or fms)	Latitude	Longitude
Sounding	6 ¾ fms	56/56/29.9 N	135/26/45.5 W
Sounding	4 ¾ fms	56/57/03.4 N	135/26/49.6 W
Sounding	5 fms	56/57/47.1 N	135/26/24.2 W
Sounding	6 ½ fms	56/59/51.9 N	135/25/41.7 W
Sounding	9 fms	56/59/47.1 N	135/26/00.6 W

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: **OPR-O112-KR&L-04**

Survey Dates: **August - September 2004**

Depths are reduced to Mean Lower Low Water using preliminary tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

Chart	Scale	Edition	Date
17320	1:217,828	16 th	Dec 1, 2003
17326	1:40,000	13 th	Aug 5, 2000

DANGER:

Feature	Depth(ft or fms)	Latitude	Longitude
Sounding	6 ¼ fms	57/00/00.503 N	135/23/23.499 W
Sounding	7 fms	56/59/29.838 N	135/26/20.719 W
Sounding	5 ¼ fms	56/59/33.290 N	135/26/33.773 W
Sounding	3 ¾ fms	56/59/23.626 N	135/27/10.894 W
Sounding	7 fms	56/59/36.541 N	135/27/14.754 W
Sounding	8 fms	56/59/26.229 N	135/26/52.291 W
Sounding	9 fms	56/59/17.381 N	135/25/16.793 W
Sounding	5 ¼ fms	56/57/18.396 N	135/27/23.735 W
Sounding	2 ¼ fms	56/57/05.177 N	135/25/50.211 W

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: **OPR-O112-KR&L-04**

Survey Dates: **August - September 2004**

Depths are reduced to Mean Lower Low Water using preliminary tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

Chart	Scale	Edition	Date
17320	1:217,828	16 th	Dec 1, 2003
17326	1:40,000	13 th	Aug 5, 2000
17327	1:10,000	21 st	Aug 1, 2003

DANGER:

Feature	Depth(fms)	Latitude	Longitude
Sounding	7 ½ fms	57/01/47.651 N	135/21/09.908 W
Sounding	8 fms	57/01/53.206 N	135/21/53.441 W
Sounding	8 fms	57/01/30.260 N	135/22/06.399 W
Sounding	9 fms	57/02/09.224 N	135/23/44.755 W
Sounding	5 ¾ fms	57/00/33.277 N	135/21/47.452 W
Sounding	8 fms	57/00/37.459 N	135/21/58.014 W
Sounding	7 fms	57/00/40.505 N	135/21/53.593 W
Sounding	2 ½ fms	57/00/40.389 N	135/21/50.943 W
Sounding	¾ fms	57/00/27.697 N	135/21/25.573 W
Sounding	7 ½ fms	57/00/07.309 N	135/22/28.989 W
Sounding	9 fms	57/01/40.107 N	135/21/35.780 W
Sounding	9 fms	57/01/35.897 N	135/21/49.759 W

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: **OPR-O112-KR&L-04**

Survey Dates: **August - September 2004**

Depths are reduced to Mean Lower Low Water using preliminary tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

Chart	Scale	Edition	Date
17320	1:217,828	16 th	Dec 1, 2003
17326	1:40,000	13 th	Aug 5, 2000
17327	1:10,000	21 st	Aug 1, 2003

DANGER:

Feature	Depth(fms)	Latitude	Longitude
Sounding	6 ½ fms	57/01/58.69N	135/21/26.04 W
Sounding	10 fms	57/02/15.65 N	135/22/54.36 W
Sounding*	9 fms	57/02/17.37 N	135/22/29.72 W
Sounding	9 fms	57/02/07.80 N	135/22/39.53 W
Sounding	9 fms	57/02/03.98 N	135/22/46.28 W
Sounding	9 fms	57/02/07.54 N	135/22/32.46 W
Sounding	3 fms	57/01/51.03 N	135/22/18.03 W

*Note:

This sounding was obtained in the outer beams of the northern-most line ran in sheet U to date and was the shoalest observed. However, the shoalest depth may not yet be obtained—we will survey over this point when vessel operations recommence next week (week of September 13). This DTON will be updated if a shoaler depth is obtained.

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: **OPR-O112-KR&L-04**

Survey Dates: **August - September 2004**

Depths are reduced to Mean Lower Low Water using unverified tides.

Positions are based on the NAD83 horizontal datum.

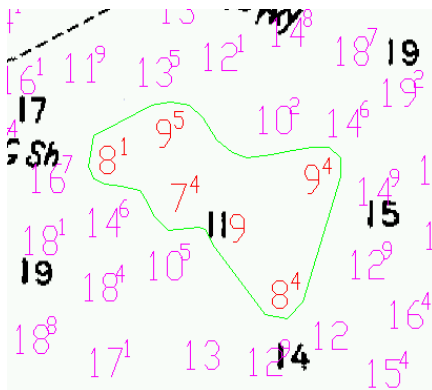
CHARTS AFFECTED:

Chart	Scale	Edition	Date
17326	1:40,000	13 th	Aug 5, 2000
17327	1:10,000	21 st	Aug 1, 2003

DANGER:

Feature	Depth(ft or fms)	Latitude	Longitude
Sounding	7 ¼ fms	57°02'07.65N	135°21'31.93W

Shoaling area in Middle Channel centered around above sounding, compared to chart 17327:



COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: State: ALASKA
 Locality: Approaches to Sitka, AK
 Sub-locality: Sitka Sound

Project Number: OPR-O112-KR&L-04

Survey Dates: August - September 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>
17320	1:217,828	15 th	Mar 6, 1999
17326	1:40,000	13 th	Aug 5, 2000

DANGER:

<u>Feature</u>	<u>Depth(ft or fms)</u>	<u>Latitude</u>	<u>Longitude</u>
Sounding	5.5 fms	56/57/25.64N	135/27/20.59W

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: **OPR-O112-KR&L-04**

Survey Dates: **August - September 2004**

Depths are reduced to Mean Lower Low Water using verified tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

Chart	Scale	Edition	Date
17320	1:217,828	16 th	Dec 1, 2003
17326	1:40,000	13 th	Aug 5, 2000

DANGER:

Feature	Depth(fms, ft)	Latitude (N)	Longitude (W)
Sounding	9 fms 4 ft	56/58/20.9	135/26/06.5

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Hydrographic Survey Registry Number: H11354

Survey Title: **State:** **ALASKA**
Locality: **Approaches to Sitka, AK**
Sub-locality: **Sitka Sound**

Project Number: **OPR-O112-KR&L-04**

Survey Dates: **August - September 2004**

Depths are reduced to Mean Lower Low Water using verified tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

Chart	Scale	Edition	Date
17320	1:217,828	16 th	Dec 1, 2003
17326	1:40,000	13 th	Aug 5, 2000
17327	1:10,000	21 st	Aug 1, 2003

DANGER:

Feature	Depth(fms, ft)	Latitude (N)	Longitude (W)
Sounding	10 fms 2 ft	57/01/58.3	135/22/15.0
Sounding	10 fms 4 ft	57/01/45.0	135/22/31.4
Sounding	8 fms	57/01/25.5	135/22/50.3
Sounding	7 fms	56/59/10.7	135/24/04.9
Sounding	10 fms 5 ft	56/59/09.8	135/25/29.1
Sounding	7 fms 4 ft	56/58/55.5	135/27/01.4
Sounding	10 fms 3 ft	56/58/46.8	135/27/16.6
Sounding	9 fms 5 ft	56/57/25.0	135/28/22.6
Sounding	10 fms 4 ft	56/56/44.4	135/27/06.3
Sounding	9 fms 5 ft	56/56/51.6	135/25/51.6

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34), at (206) 526-6836.

Danger to Navigation Report

Hydrographic Survey Registry Number: H11354

Survey Title: State: Alaska
 Locality: Approaches to Sitka
 Sub-locality: Sitka Sound

Project Number: OPR-O112-KR&L-04

Survey Dates: August 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>
17320	1:217,828	15th	03/06/99
17326	1:40,000	13th	08/05/00
17327	1:10,000	21 st	08/01/03

DANGERS:

<u>Feature</u>	<u>Depth(ft or fms)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Sounding	5 ½ fms	56° 59' 23.2"	135° 23' 20.4"

COMMENTS:

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



Appendix B - List of Geographic Names

No new geographic names in the survey were discovered. ⁶⁵

**Appendix D - Tides and Water Levels**

Abstract of Times of Hydrography for Smooth Tides

Project Number: OPR-O112-KR&L-04

Registry Number: H11354

Contractor Name: Fugro Pelagos Inc.

Date: February 12, 2005

Sheet Letter: U

Inclusive Dates: July 26, 2004 to July 28, 2004 & August 17, 2004 to September 15, 2004

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

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

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2004	231	16:34:40	23:26:04	
2004	232	00:00:42	02:17:48	
2004	232	16:17:18	21:23:36	
2004	233	16:06:10	23:59:09	
2004	234	00:00:53	01:45:45	
2004	234	15:48:51	23:49:24	
2004	235	00:02:58	02:02:42	
2004	235	15:37:41	23:55:13	
2004	236	00:01:43	01:57:44	
2004	236	15:33:27	23:50:40	
2004	237	00:02:53	02:08:15	
2004	237	15:53:34	23:56:26	
2004	238	00:03:56	02:14:28	
2004	238	15:54:23	23:58:24	
2004	239	00:00:29	02:12:32	
2004	239	15:53:44	23:45:22	
2004	240	00:08:49	02:03:48	
2004	240	15:47:49	23:54:20	
2004	241	00:17:21	02:09:35	
2004	241	15:34:29	23:58:16	
2004	242	00:05:03	02:07:52	
2004	242	15:50:54	23:50:12	
2004	243	00:00:19	02:21:26	
2004	243	17:01:41	23:54:20	
2004	244	00:00:33	02:15:55	
2004	244	19:16:22	23:49:28	
2004	245	00:01:59	02:04:10	
2004	245	17:09:57	23:23:09	
2004	246	00:02:23	00:03:29	



YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2004	246	16:08:51	16:35:26	
2004	247	16:56:24	19:17:54	
2004	258	19:19:45	22:58:23	
2004	259	15:47:30	23:05:10	

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

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2004	208	22:46:33	23:56:54	
2004	209	00:01:15	01:56:30	
2004	209	16:03:59	23:45:38	
2004	210	00:13:01	02:06:01	
2004	210	15:43:34	19:26:50	

Table 7 Abstract of Times of Hydrography for LIDAR

YEAR	DAY	START TIME (UTC)	END TIME (UTC)	COMMENTS
2004	245	21:52:00	23:59:59	
2004	246	00:00:00	04:45:00	
2004	248	18:56:00	22:35:00	
2004	249	16:03:00	21:44:00	
2004	250	00:21:00	03:08:00	



Appendix E - AWOIS

No AWOIS items were assigned under OPR-O112-KR&L-04.⁶⁶



Appendix F – DP forms and the raw field notes

DP ITEM NUMBER : JD246_10

DP Form

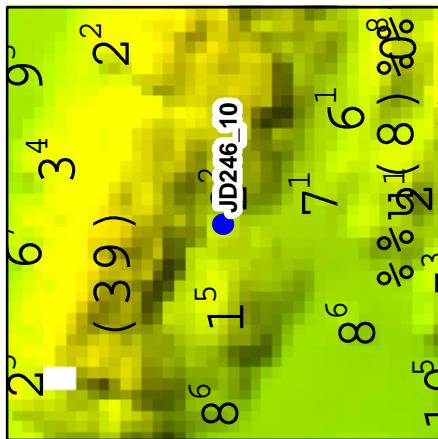
Date: 02 September, 2004
 Julian Day: 246
 UTC Time: 16:44:59
 Latitude: 57 00 35.59 N
 Longitude: 135 21 37.54 W
 North: 6318544.01
 East: 478110.71
 Raw (+Depth) or (-Height) (m): 6.10
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.15
 Corrected to MLLW (m): 5.95
 Corrected to MLLW (fathoms): 3.25
 Corrected to MLLW (feet): 19.52
 DP Comment: chtd_rock NOT FOUND shoalest dep 20ft

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

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Chrt'd Rk (57 00 35.59 N, 135 21 37.54 W) was not found. Area had full multibeam and LIDAR coverage and was investigated by Skiff. Recommend removal
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

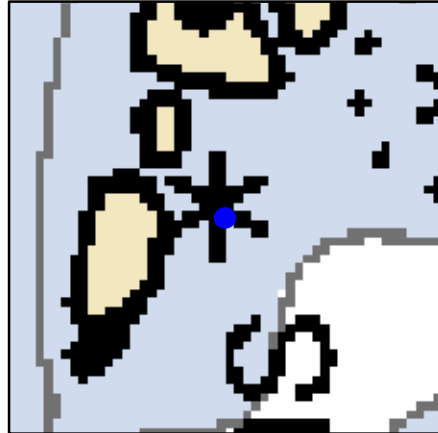


Chart
 200m x 200m

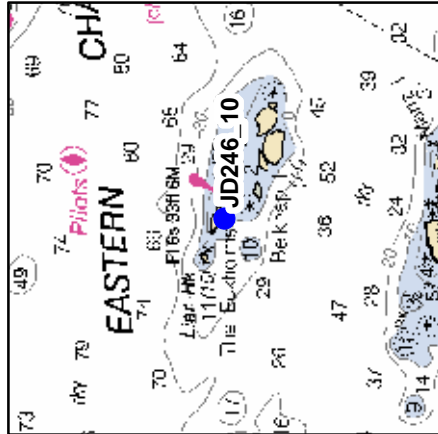


Chart
 2000m x 2000m

DP ITEM NUMBER : JD246_03

DP Form

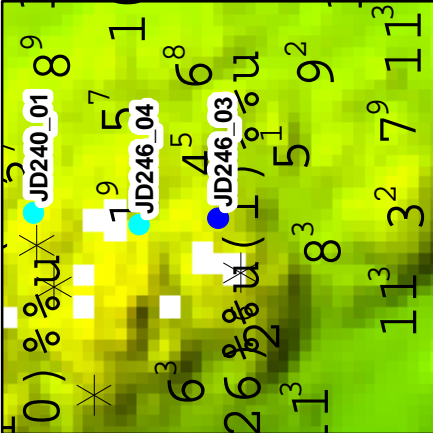
Date: 02 September, 2004
 Julian Day: 246
 UTC Time: 15:37:35
 Latitude: 57 01 53.86 N
 Longitude: 135 22 32.57 W
 North: 6320969.18
 East: 477195.54
 Raw (+Depth) or (-Height) (m): -0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.66
 Corrected to MLLW (m): -1.57
 Corrected to MLLW (fathoms): -0.86
 Corrected to MLLW (feet): -5.15
 DP Comment: chtd_rock 22yrd 245deg-mag pic04 hgt 3ft

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

Correlating MB Least Depth:
 None



Remarks/Recommendations:
 New Rk (57 01 53.55 N, 135 22 34.09 W) with Skiff Ht and ortho position.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

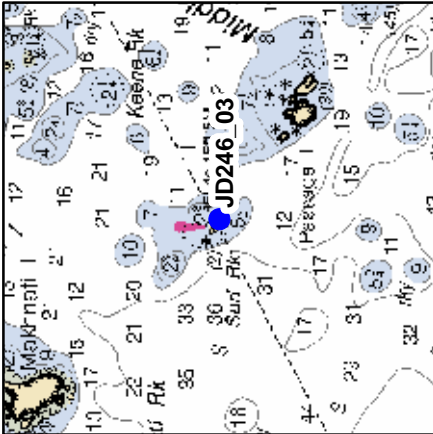


Chart
 2000m x 2000m

DP ITEM NUMBER : JD246_02

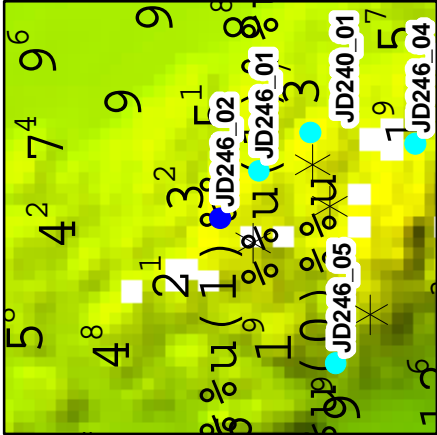
DP Form

Date: 02 September, 2004
 Julian Day: 246
 UTC Time: 15:34:05
 Latitude: 57 01 57.95 N
 Longitude: 135 22 34.82 W
 North: 6321095.92
 East: 477158.31
 Raw (+Depth) or (-Height) (m): -0.30
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.66
 Corrected to MLLW (m): -0.96
 Corrected to MLLW (fathoms): -0.52
 Corrected to MLLW (feet): -3.15
 DP Comment: chtd_rock 21yrd 180deg-mag pic03 hgt 1ft

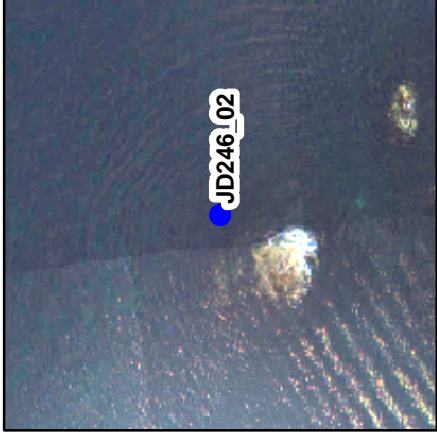
Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 Chrt'd Rk (57 01 57.49 N, 135 22 35.51 W) Appears on SS at ortho position and Skiff Ht.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

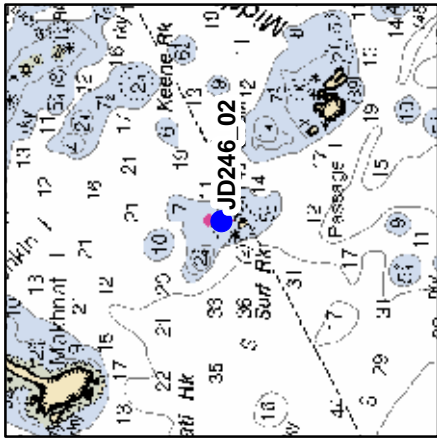


Chart
 2000m x 2000m

DP ITEM NUMBER : JD246_01

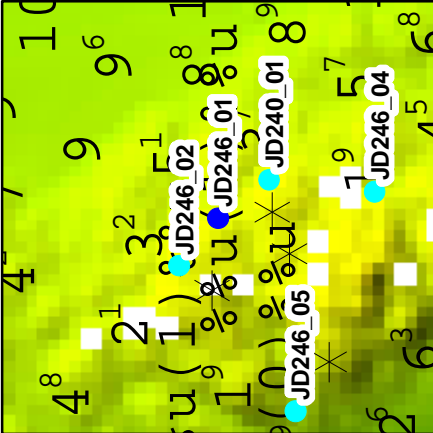
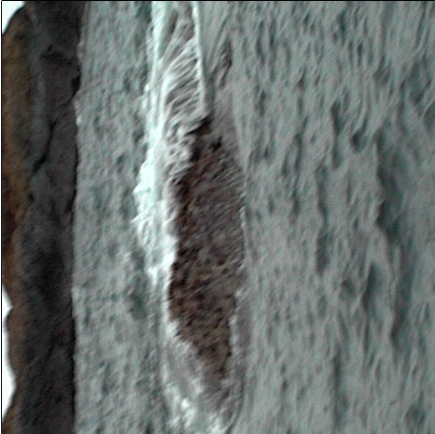
DP Form

Date: 02 September, 2004
 Julian Day: 246
 UTC Time: 15:32:43
 Latitude: 57 01 57.37 N
 Longitude: 135 22 33.52 W
 North: 6321077.99
 East: 477180.26
 Raw (+Depth) or (-Height) (m): -0.30
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.72
 Corrected to MLLW (m): -1.02
 Corrected to MLLW (fathoms): -0.56
 Corrected to MLLW (feet): -3.35
 DP Comment: chtd_rock 29yrd 160deg-mag pic01+02 hgt 1ft

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

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 New Rk (57 01 56.55 N, 135 22 33.38 W) Appears on SS at ortho position and Skiff Ht.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

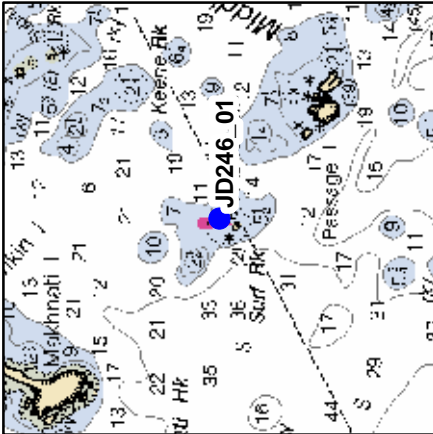


Chart
 2000m x 2000m

DP ITEM NUMBER : JD245_39

DP Form

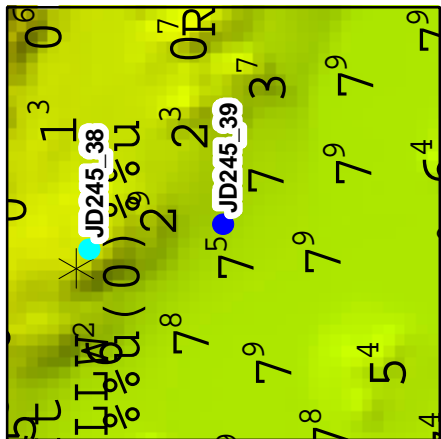
Date: 01 September, 2004
 Julian Day: 245
 UTC Time: 19:18:56
 Latitude: 56 56 31.33 N
 Longitude: 135 23 18.75 W
 North: 6311000.73
 East: 476360.31
 Raw (+Depth) or (-Height) (m): 12.19
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.75
 Corrected to MLLW (m): 11.44
 Corrected to MLLW (fathoms): 6.26
 Corrected to MLLW (feet): 37.53
 DP Comment: chtd_rock NOT FOUND shoalest dep 40ft

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

No photo available

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 Chrt'd Rk (56 56 31.33 N, 135 23 18.75 W) not found. Area had full multibeam & LIDAR coverage and was investigated by the Skiff. Recommend removal.
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

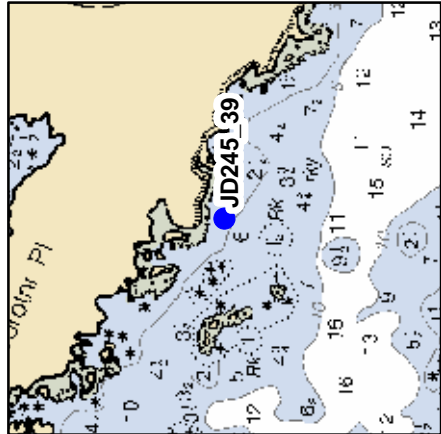


Chart
 2000m x 2000m

DP ITEM NUMBER : JD245_38

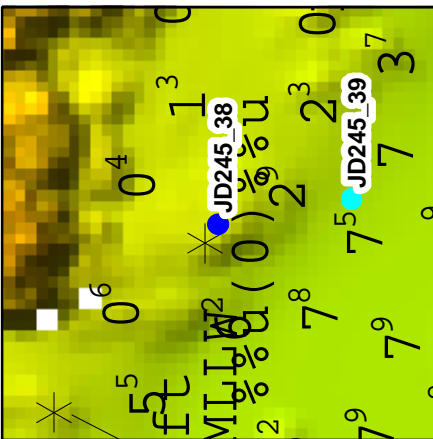
DP Form

Date: 01 September, 2004
 Julian Day: 245
 UTC Time: 19:14:05
 Latitude: 56 56 33.32 N
 Longitude: 135 23 19.46 W
 North: 6311062.58
 East: 476348.69
 Raw (+Depth) or (-Height) (m): -0.61
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.67
 Corrected to MLLW (m): -1.28
 Corrected to MLLW (fathoms): -0.70
 Corrected to MLLW (feet): -4.20
 DP Comment: unchtd_rock pic41 hgt 2ft

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

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 New Rk (56 56 33.33 N, 135 23 19.47 W). Charted with Skiff position and ht.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

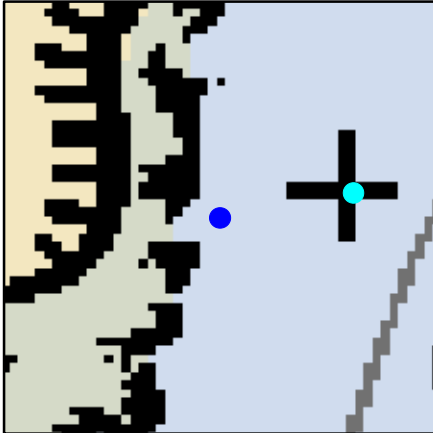


Chart
 200m x 200m

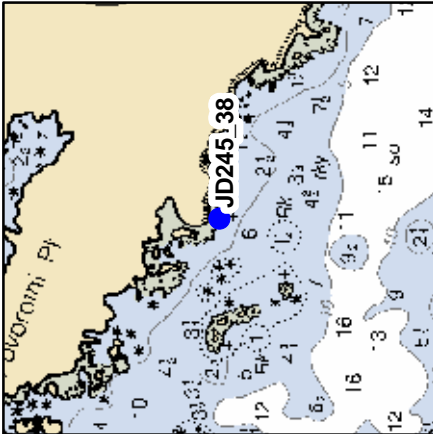


Chart
 2000m x 2000m

DP ITEM NUMBER : JD245_32

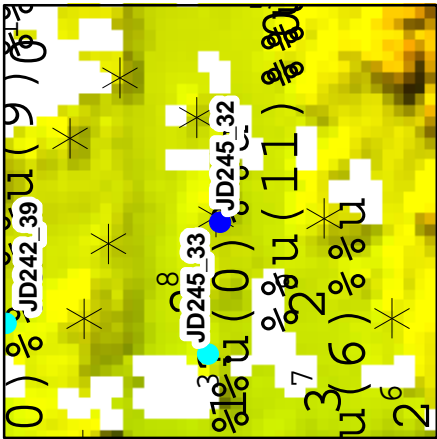
DP Form

Date: 01 September, 2004
 Julian Day: 245
 UTC Time: 18:39:32
 Latitude: 56 57 11.68 N
 Longitude: 135 22 58.45 W
 North: 6312246.43
 East: 476710.44
 Raw (+Depth) or (-Height) (m): -0.30
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.31
 Corrected to MLLW (m): -0.61
 Corrected to MLLW (fathoms): -0.33
 Corrected to MLLW (feet): -2.00
 DP Comment: unchtd_rock pic36 hgt 1ft

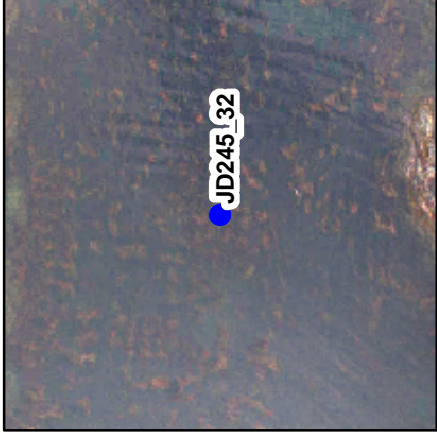
Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 New Rk (56 57 11.68 N, 135 22 58.45 W) found by Skiff.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

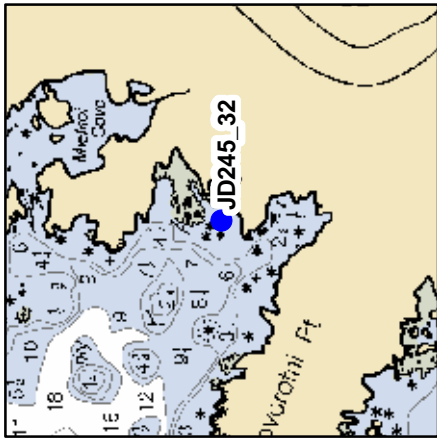


Chart
 2000m x 2000m

DP ITEM NUMBER : JD245_31

DP Form

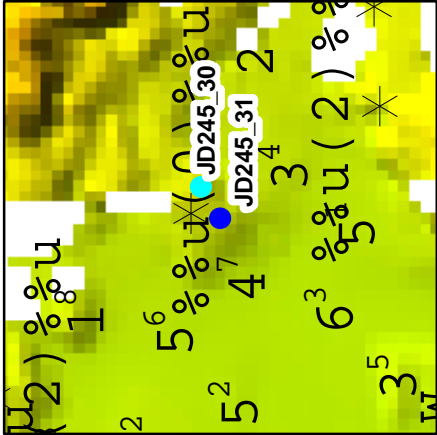
Date: 01 September, 2004
 Julian Day: 245
 UTC Time: 18:32:47
 Latitude: 56 57 41.33 N
 Longitude: 135 23 03.10 W
 North: 6313163.91
 East: 476636.93
 Raw (+Depth) or (-Height) (m): -0.61
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.18
 Corrected to MLLW (m): -0.79
 Corrected to MLLW (fathoms): -0.43
 Corrected to MLLW (feet): -2.59
 DP Comment: unchtd_rock pic35 hgt 2ft

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

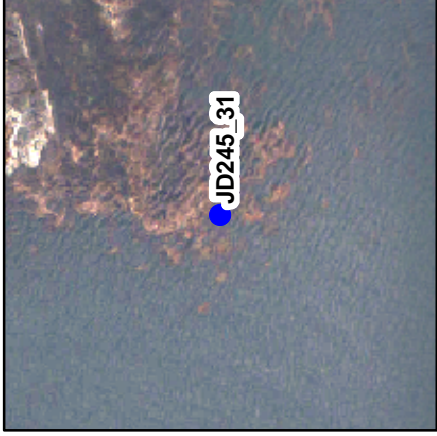
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 New rock (56 57 41.33 N, 135 23 03.10 W) was observed by skiff.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

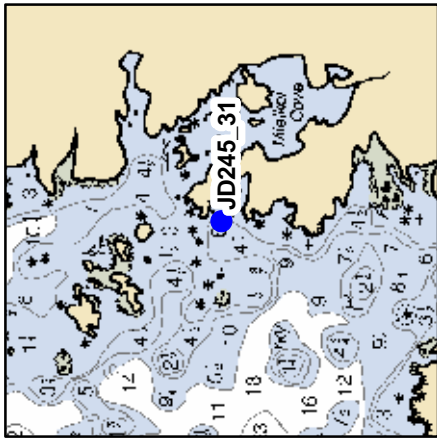


Chart
 2000m x 2000m

DP ITEM NUMBER : JD245_20

DP Form

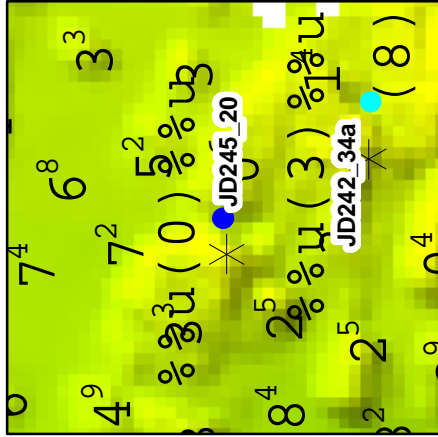
Date: 01 September, 2004
 Julian Day: 245
 UTC Time: 17:27:00
 Latitude: 56 57 45.35 N
 Longitude: 135 23 23.59 W
 North: 6313289.98
 East: 476291.53
 Raw (+Depth) or (-Height) (m): -0.30
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): -0.25
 Corrected to MLLW (m): -0.05
 Corrected to MLLW (fathoms): -0.03
 Corrected to MLLW (feet): -0.16
 DP Comment: chtd_rock 17yrd 250deg-mag pic22+23 hgt 1ft

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

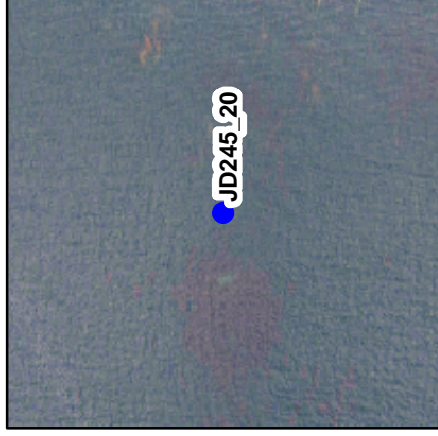
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Chrt'd Rk (56 57 44.50 N, 135 23 26.08 W) not found. Area had full multibeam coverage and was investigated by the Skiff. Recommend removal
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

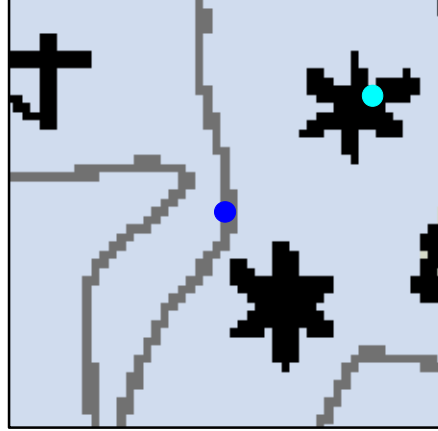


Chart
 200m x 200m

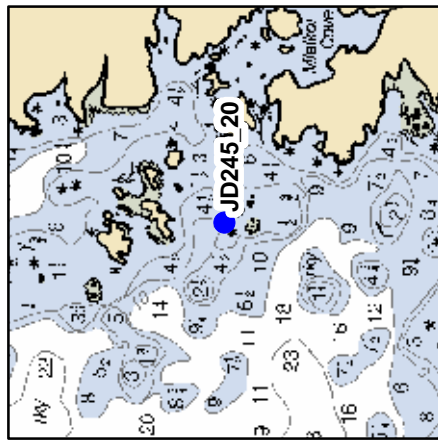


Chart
 2000m x 2000m

DP ITEM NUMBER : JD245_15

DP Form

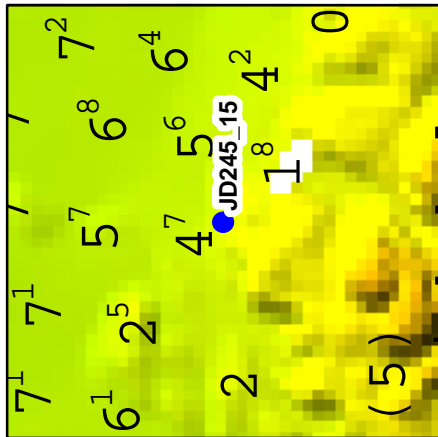
Date: 01 September, 2004
 Julian Day: 245
 UTC Time: 17:02:25
 Latitude: 56 58 05.33 N
 Longitude: 135 23 26.48 W
 North: 6313908.05
 East: 476246.21
 Raw (+Depth) or (-Height) (m): N/A
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): -0.32
 Corrected to MLLW (m): N/A
 Corrected to MLLW (fathoms): N/A
 Corrected to MLLW (feet): N/A
 DP Comment: chtd_rock NOT FOUND shoalest dep 20ft

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

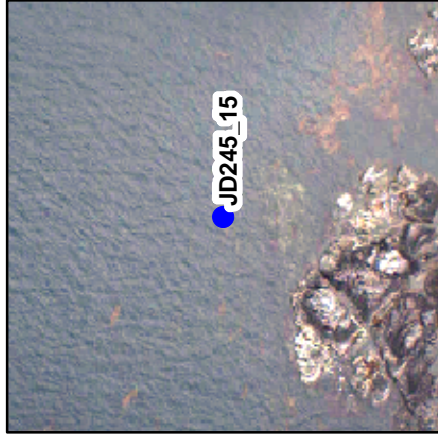
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Charted rock (56 58 05.33 N, 135 23 26.48 W) not found. A slight shoaling is evident in orthomosaic south of charted position. SS shows a Rk at seaward extent.
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

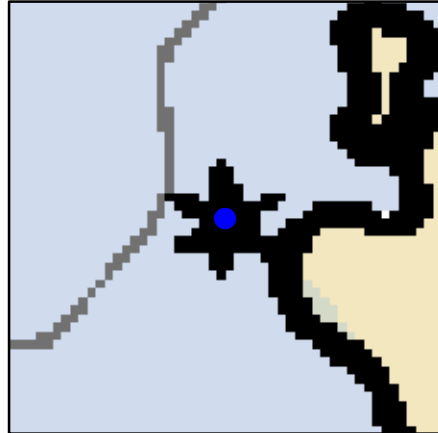


Chart
 200m x 200m

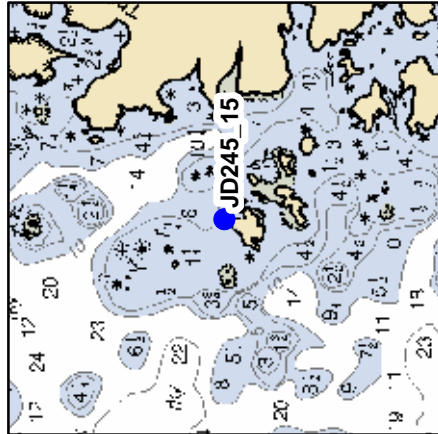


Chart
 2000m x 2000m

DP ITEM NUMBER : JD244_48

DP Form

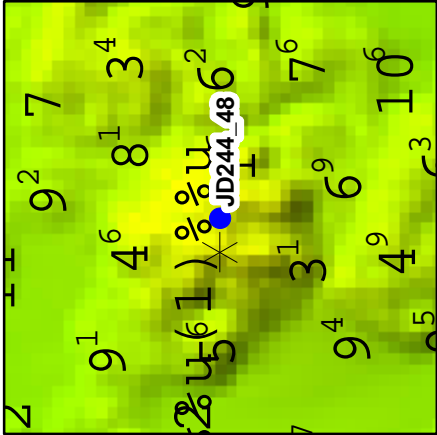
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 22:28:50
 Latitude: 56 57 08.33 N
 Longitude: 135 25 40.25 W
 North: 6312159.31
 East: 473975.99
 Raw (+Depth) or (-Height) (m): 1.83
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 3.12
 Corrected to MLLW (m): -1.29
 Corrected to MLLW (fathoms): -0.71
 Corrected to MLLW (feet): -4.23
 DP Comment: CHTD_rock 6FTDEEP 3FT SWELL

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

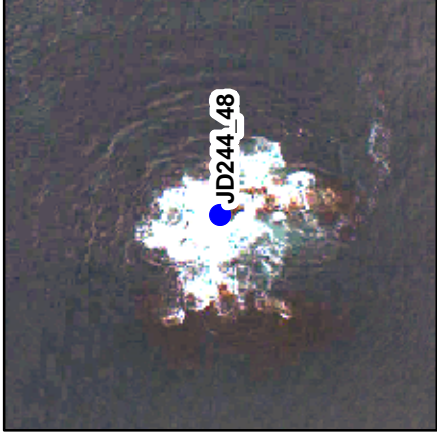
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Chrt'd Rk (56 57 08.33 N, 135 25 40.25 W) found. Used Skiff position and ht on Smooth sheet
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

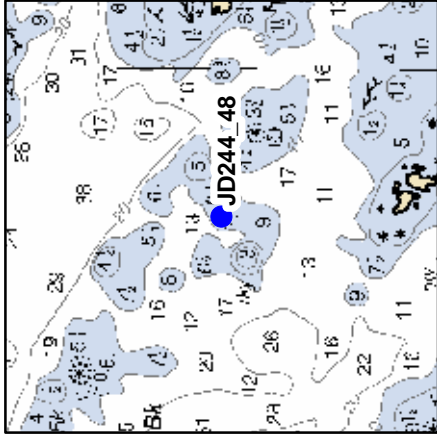


Chart
 2000m x 2000m

DP ITEM NUMBER: JD244_41

DP Form

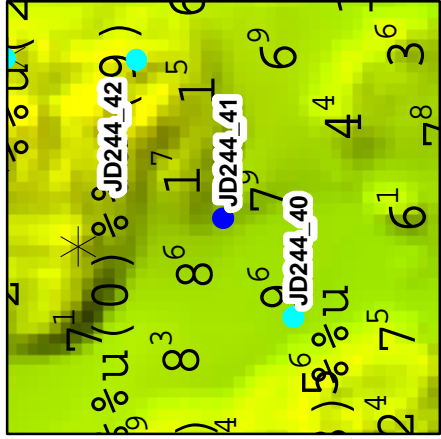
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 20:34:05
 Latitude: 56 56 35.99 N
 Longitude: 135 24 22.31 W
 North: 6311151.31
 East: 475287.01
 Raw (+Depth) or (-Height) (m): 10.97
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 2.22
 Corrected to MLLW (m): 8.75
 Corrected to MLLW (fathoms): 4.78
 Corrected to MLLW (feet): 28.71
 DP Comment: CHTD_rock NOT FND SHOALEST 36FT

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

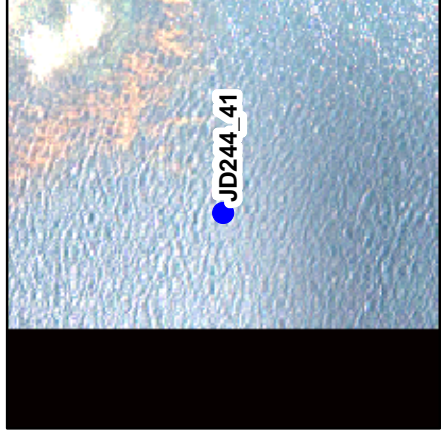
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Chrt'd Rk (56 56 35.99 N, 135 24 22.31 W) was not found. Area had multibeam and LIDAR coverage and was investigated by the Skiff. Recommend removal
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

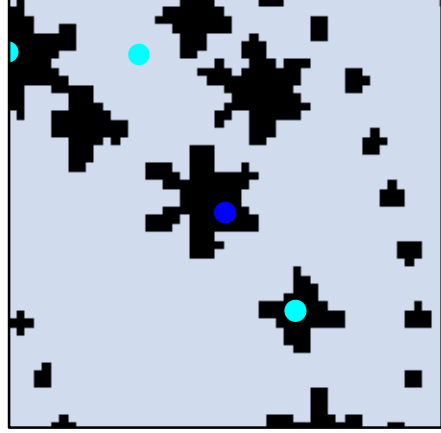


Chart
 200m x 200m

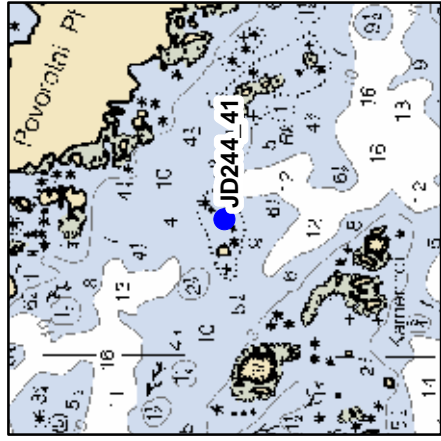


Chart
 2000m x 2000m

DP ITEM NUMBER : JD244_39

DP Form

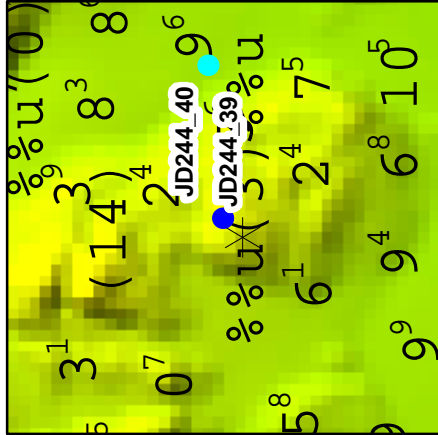
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 20:22:57
 Latitude: 56 56 34.70 N
 Longitude: 135 24 29.18 W
 North: 6311111.93
 East: 475170.56
 Raw (+Depth) or (-Height) (m): 0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 2.06
 Corrected to MLLW (m): -1.15
 Corrected to MLLW (fathoms): -0.63
 Corrected to MLLW (feet): -3.77
 DP Comment: CHARTED_rock 3FT DEEP

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

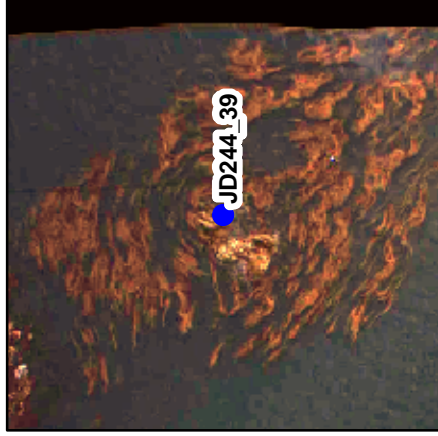
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Chrt'd Rk (56 56 34.41 N, 135 24 29.72 W) found. Chrt'd at Skiff position with Skiff Ht.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

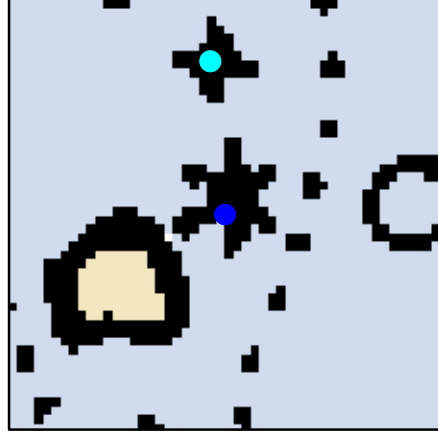


Chart
 200m x 200m

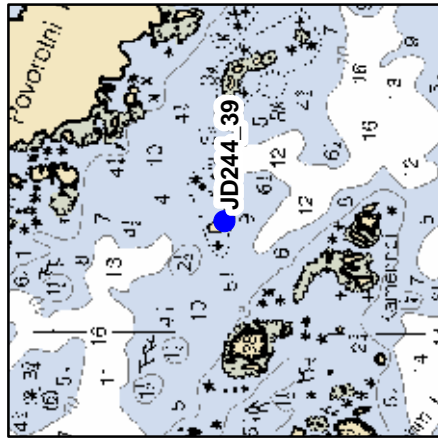


Chart
 2000m x 2000m

DP ITEM NUMBER: JD244_35

DP Form

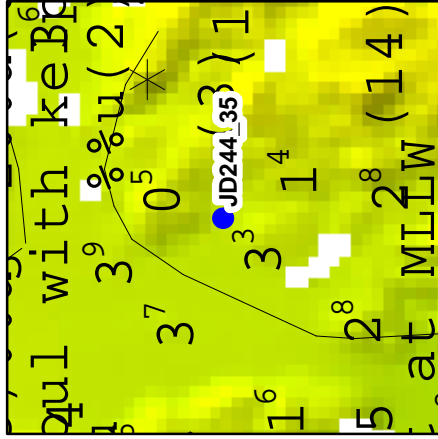
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 19:14:54
 Latitude: 56 56 17.45 N
 Longitude: 135 24 49.65 W
 North: 6310580.63
 East: 474821.46
 Raw (+Depth) or (-Height) (m): 7.92
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.99
 Corrected to MLLW (m): 6.93
 Corrected to MLLW (fathoms): 3.79
 Corrected to MLLW (feet): 22.74
 DP Comment: CHTD_rock NOT FOUND SHOALEST 26 FT

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

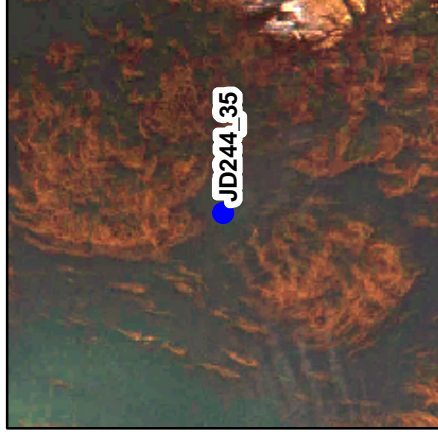
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Chrt'd Rk (56 56 17.45 N, 135 24 49.65 W) not found. Area had LIDAR coverage and was investigated by the Skiff. Recommend removal.
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
200m x 200m



Orthomosaic
100m x 100m

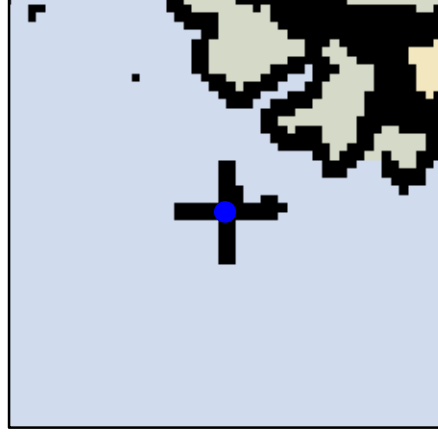


Chart
200m x 200m

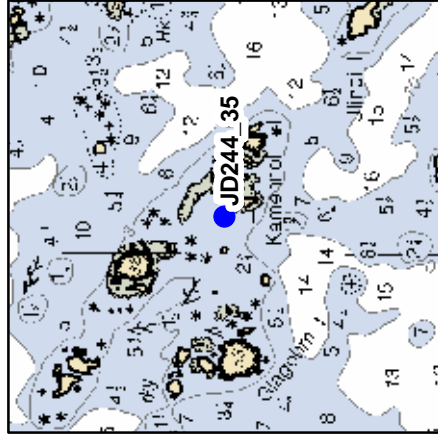


Chart
2000m x 2000m

DP ITEM NUMBER : JD244_29

DP Form

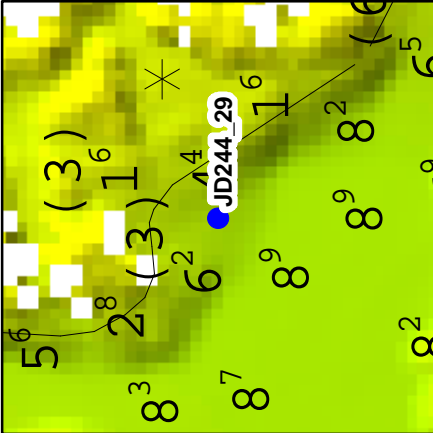
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 18:35:18
 Latitude: 56 56 31.69 N
 Longitude: 135 25 15.01 W
 North: 6311023.68
 East: 474395.50
 Raw (+Depth) or (-Height) (m): 13.41
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.49
 Corrected to MLLW (m): 12.92
 Corrected to MLLW (fathoms): 7.06
 Corrected to MLLW (feet): 42.39
 DP Comment: CHTD_rock NOT FOUND SHOALEST DEPTH 44 F

No photo available

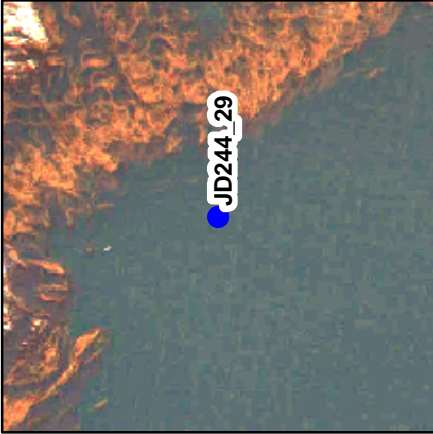
Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

Correlating MB Least Depth:
 None

Remarks/Recommendations:
 Cht'd Rk (56 56 31.69 N, 135 25 15.01 W) not found. Full Multibeam and LIDAR coverage in this area and investigated by the Skiff. Recommend removal
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
200m x 200m



Orthomosaic
100m x 100m



Chart
200m x 200m

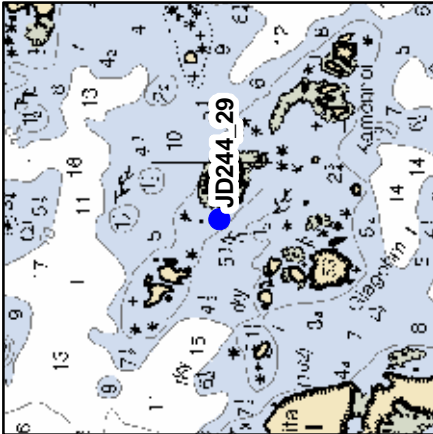


Chart
2000m x 2000m

DP ITEM NUMBER : JD244_19

DP Form

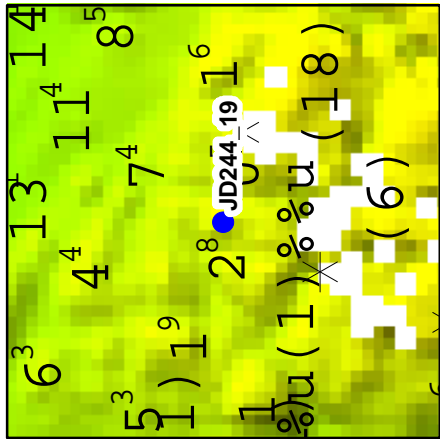
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 17:46:24
 Latitude: 56 56 44.62 N
 Longitude: 135 25 37.84 W
 North: 6311425.87
 East: 474012.26
 Raw (+Depth) or (-Height) (m): 3.05
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): -0.07
 Corrected to MLLW (m): 3.12
 Corrected to MLLW (fathoms): 1.71
 Corrected to MLLW (feet): 10.24
 DP Comment: CHTD_rock NOT FOUND SHOALEST 10 FT

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

Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Cht'd Rk (56 56 44.62 N, 135 25 37.84 W) not found. Full Multibeam and LIDAR coverage in this area and investigated by the Skiff. Recommend removal
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

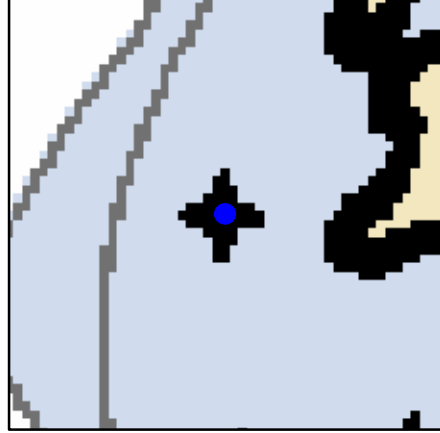


Chart
 200m x 200m

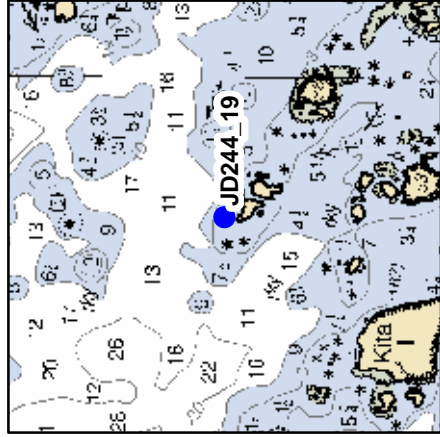


Chart
 2000m x 2000m

DP ITEM NUMBER : JD244_02

DP Form

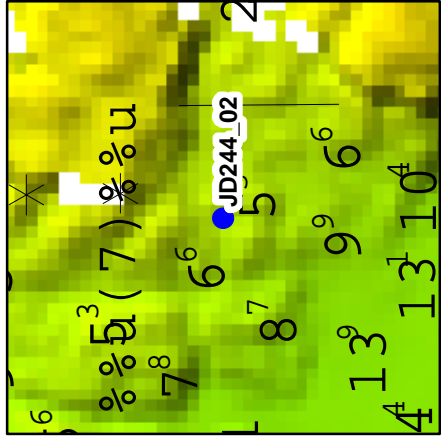
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 16:13:08
 Latitude: 56 56 18.86 N
 Longitude: 135 26 34.62 W
 North: 6310635.53
 East: 473047.52
 Raw (+Depth) or (-Height) (m): 12.19
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): -0.52
 Corrected to MLLW (m): 12.71
 Corrected to MLLW (fathoms): 6.95
 Corrected to MLLW (feet): 41.70
 DP Comment: CHTD_ROCK NOT FOUND SHOALEST DEPTH 40 F

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

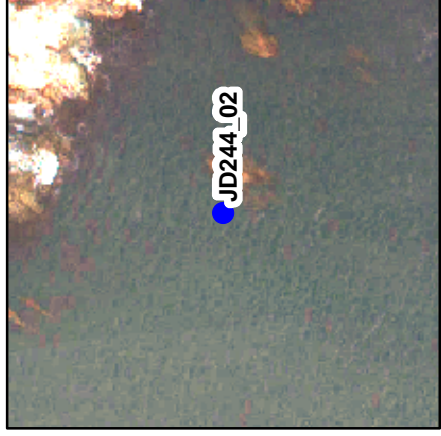
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Cht'd rk (56 56 18.86 N, 135 26 34.6 W), not found. Area had full multibeam and lidar coverage and was investigated by the Skiff. Recommend removal.
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

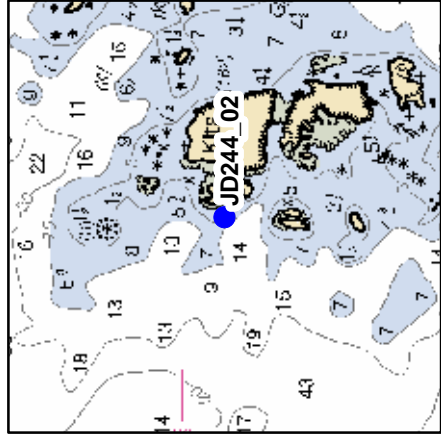


Chart
 2000m x 2000m

DP ITEM NUMBER : JD244_01

DP Form

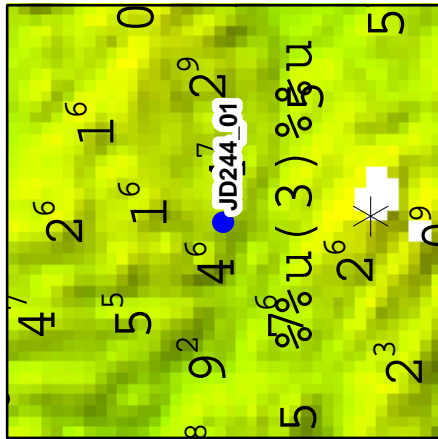
Date: 31 August, 2004
 Julian Day: 244
 UTC Time: 16:00:37
 Latitude: 56 56 39.28 N
 Longitude: 135 26 39.86 W
 North: 6311267.44
 East: 472962.99
 Raw (+Depth) or (-Height) (m): -1.22
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): -0.49
 Corrected to MLLW (m): -0.73
 Corrected to MLLW (fathoms): -0.40
 Corrected to MLLW (feet): -2.40
 DP Comment: CHTD_ROCK PHOTO1 68YDS 157MAG 4 FOOT HIGH

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

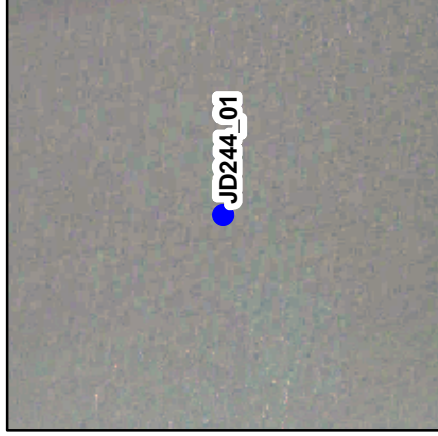
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Cht'd rk found, used ortho position and skiff height. Refer to the DR for a detailed description.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

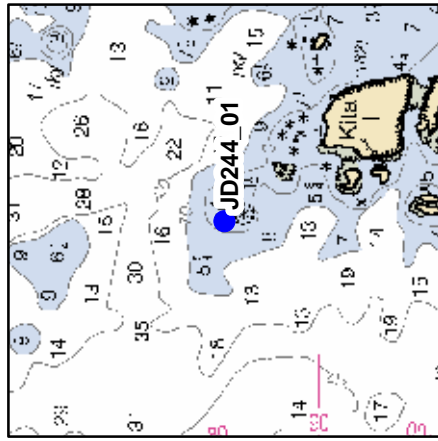


Chart
 2000m x 2000m

DP ITEM NUMBER : JD243_29

DP Form

Date: 30 August, 2004
 Julian Day: 243
 UTC Time: 20:10:25
 Latitude: 56 56 59.14 N
 Longitude: 135 24 10.75 W
 North: 6311865.90
 East: 475486.52

Raw (+Depth) or (-Height) (m): 1.00
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 2.29
 Corrected to MLLW (m): -1.29
 Corrected to MLLW (fathoms): -0.71
 Corrected to MLLW (feet): -4.23

DP Comment: chtd_rock IMDEEP

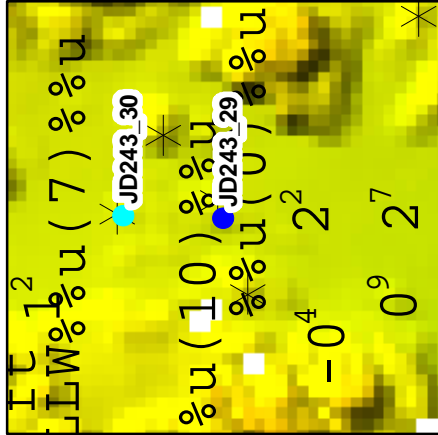
Correlating DP Item Numbers:
 N/A N/A
 N/A N/A

Correlating MB Least Depth:
 None

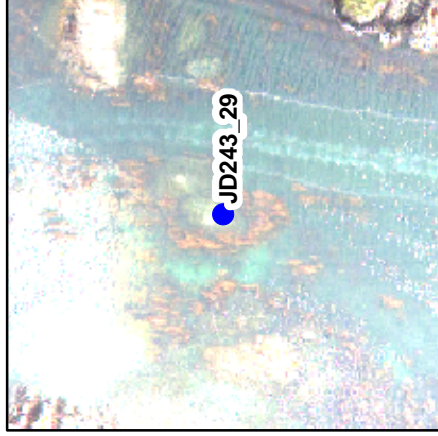
No photo available

Remarks/Recommendations:
 Charted rock (56 56 59.14 N, 135 24 10.75 W) confirmed by Skiff.

Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
200m x 200m



Orthomosaic
100m x 100m



Chart
200m x 200m

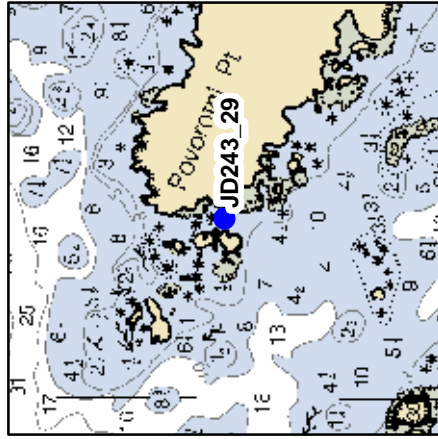


Chart
2000m x 2000m

DP ITEM NUMBER : JD243_07

DP Form

Date: 30 August, 2004
 Julian Day: 243
 UTC Time: 16:52:18
 Latitude: 56 57 41.82 N
 Longitude: 135 24 53.78 W
 North: 6313189.87
 East: 474767.52

Raw (+Depth) or (-Height) (m): -0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): -0.34
 Corrected to MLLW (m): -0.57
 Corrected to MLLW (fathoms): -0.31
 Corrected to MLLW (feet): -1.87

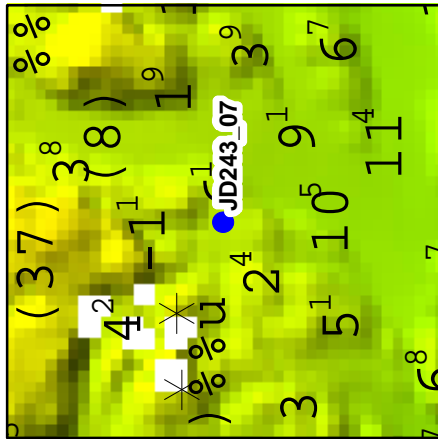
DP Comment: chtd_large_rock 47 YDS 270 MAG HT 3 FT

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

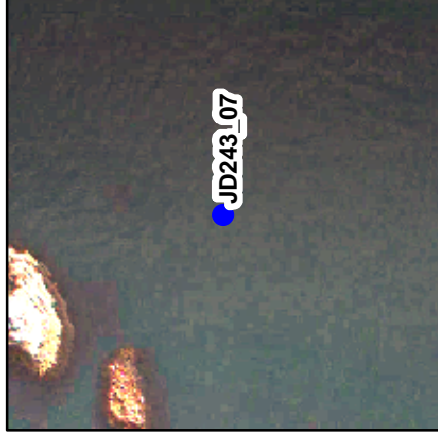
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Charted rock (56 57 42.15 N, 135 24 55.64 W) Recommend using the Skiff Ht and orthomosaic position.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

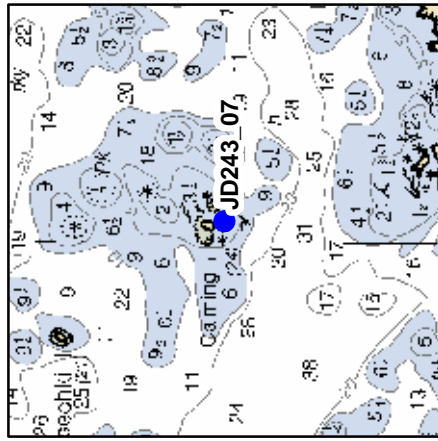


Chart
 2000m x 2000m

DP ITEM NUMBER : JD242_40

DP Form

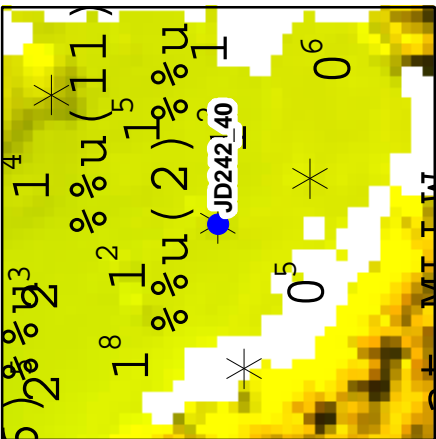
Date: 29 August, 2004
 Julian Day: 242
 UTC Time: 22:28:40
 Latitude: 56 57 00.01 N
 Longitude: 135 23 01.82 W
 North: 6311886.09
 East: 476651.35
 Raw (+Depth) or (-Height) (m): 0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 2.78
 Corrected to MLLW (m): -1.87
 Corrected to MLLW (fathoms): -1.02
 Corrected to MLLW (feet): -6.14
 DP Comment: chtd_rock shoalest dep 3ft

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

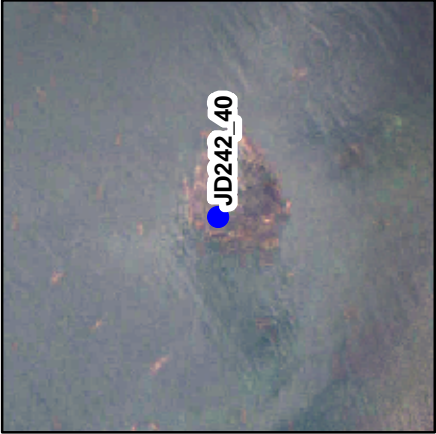
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Charted rock (56 57 00.01 N, 135 23 01.82 W) confirmed by Skiff.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

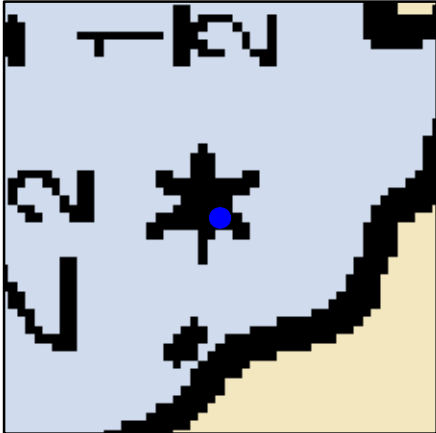


Chart
 200m x 200m

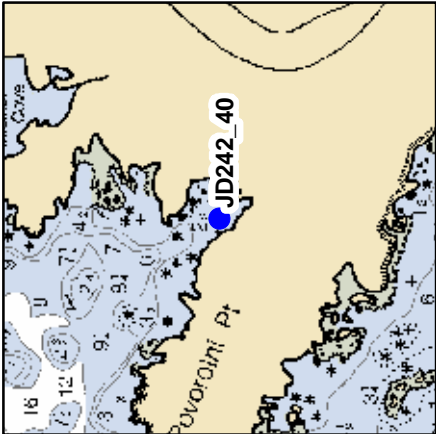


Chart
 2000m x 2000m

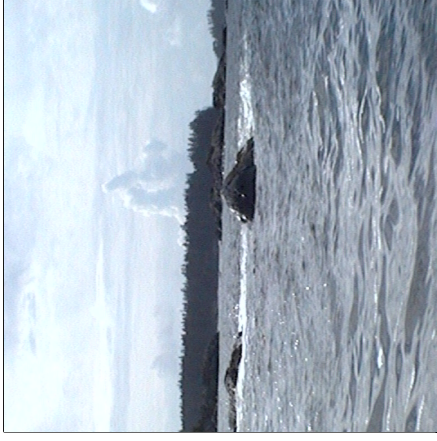
DP ITEM NUMBER : JD242_31

DP Form

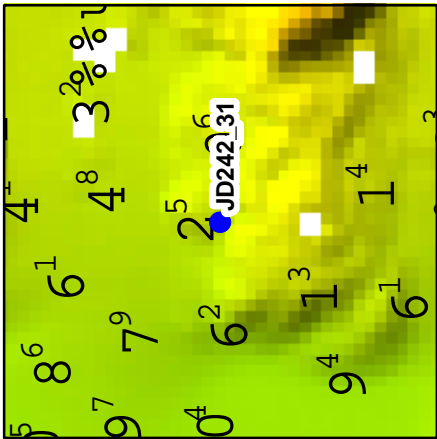
Date: 29 August, 2004
 Julian Day: 242
 UTC Time: 20:53:44
 Latitude: 56 58 08.98 N
 Longitude: 135 22 58.45 W
 North: 6314018.36
 East: 476720.37
 Raw (+Depth) or (-Height) (m): -0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 2.85
 Corrected to MLLW (m): -3.76
 Corrected to MLLW (fathoms): -2.06
 Corrected to MLLW (feet): -12.34
 DP Comment: chtd_rock 36yrd 160deg-mag pic28 hgt 3ft

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

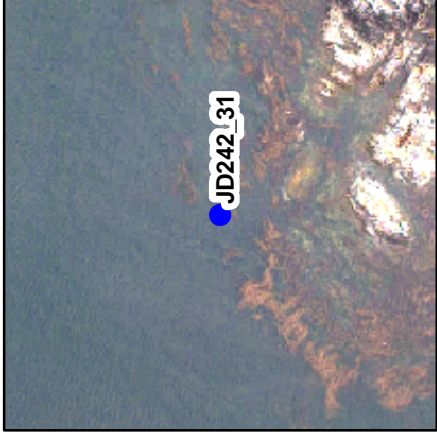
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Charted Rk (56 58 07.75 N, 135 22 58.68 W) was found and cht'ed with Skiff Ht and ortho position.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
200m x 200m



Orthomosaic
100m x 100m



Chart
200m x 200m

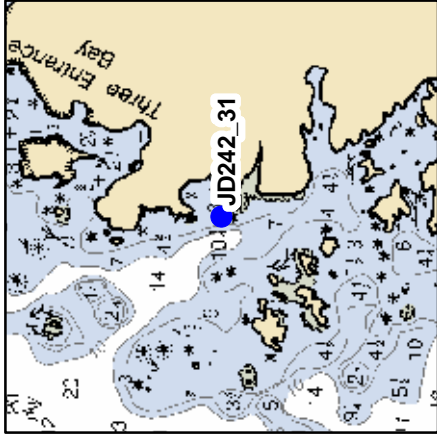


Chart
2000m x 2000m

DP ITEM NUMBER : JD242_29

DP Form

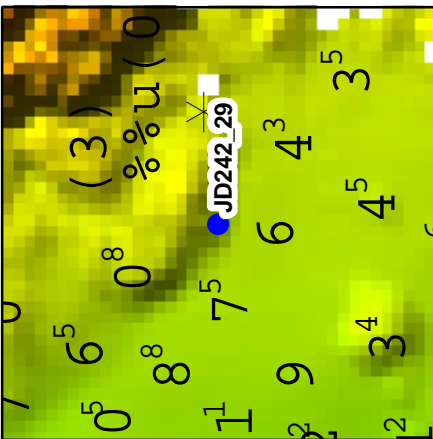
Date: 29 August, 2004
 Julian Day: 242
 UTC Time: 20:44:11
 Latitude: 56 58 20.57 N
 Longitude: 135 23 03.32 W
 North: 6314377.06
 East: 476640.00
 Raw (+Depth) or (-Height) (m): -0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 2.79
 Corrected to MLLW (m): -3.70
 Corrected to MLLW (fathoms): -2.02
 Corrected to MLLW (feet): -12.14
 DP Comment: chtd_rock 22yrd 020deg-mag pic25+26 hgt 3ft

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

Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Chtd Rk (56 58 21.04 N, 135 23 02.70 W) was found, recommend changing from rock to islet and charting at position from orthomosaic.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

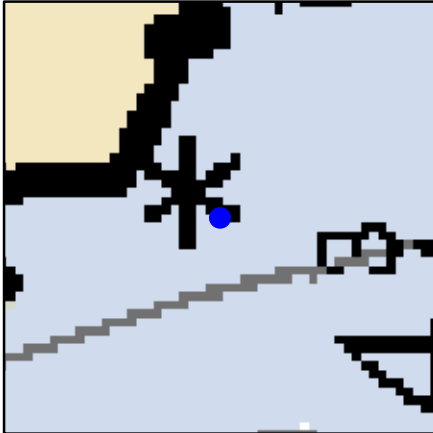


Chart
 200m x 200m

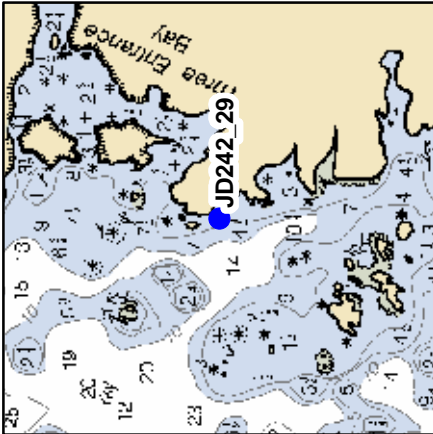


Chart
 2000m x 2000m

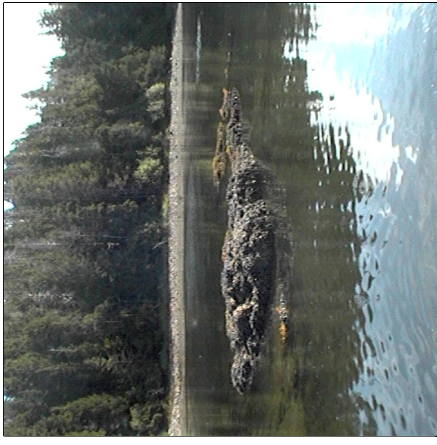
DP ITEM NUMBER : JD242_16

DP Form

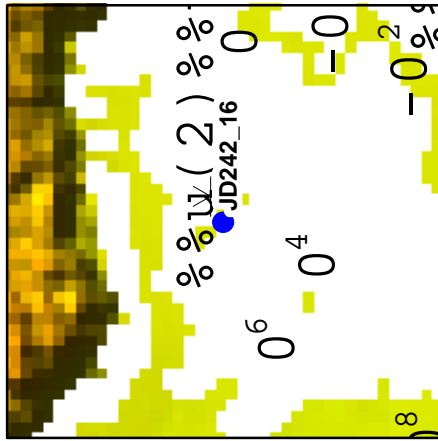
Date: 29 August, 2004
 Julian Day: 242
 UTC Time: 18:00:29
 Latitude: 56 58 39.95 N
 Longitude: 135 21 33.68 W
 North: 6314968.25
 East: 478156.89
 Raw (+Depth) or (-Height) (m): -0.30
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.90
 Corrected to MLLW (m): -1.20
 Corrected to MLLW (fathoms): -0.66
 Corrected to MLLW (feet): -3.94
 DP Comment: chtd_rock picl8 25mlong e-w hgt 1ft

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

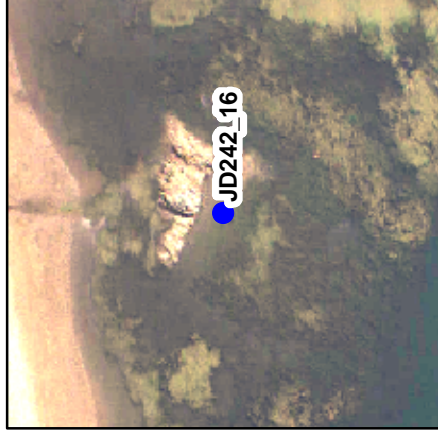
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Chtd Rk (56 58 39.32 N, 135 21 33.22 W) was found. Recommend charting at LIDAR position using skiff height.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

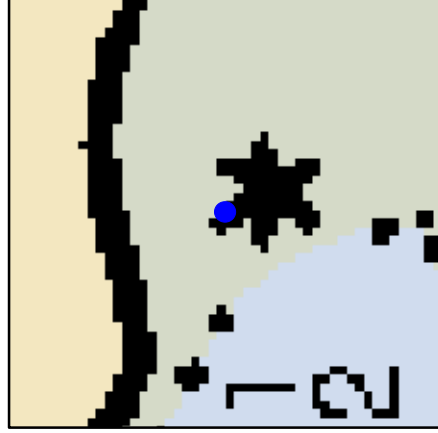


Chart
 200m x 200m

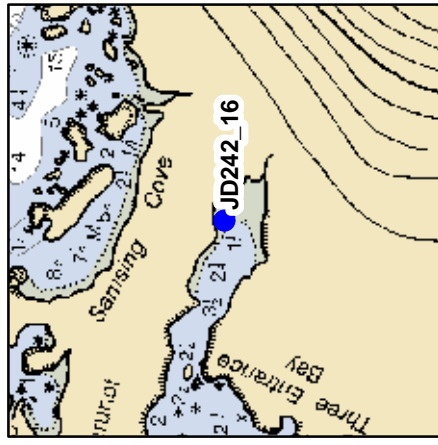


Chart
 2000m x 2000m

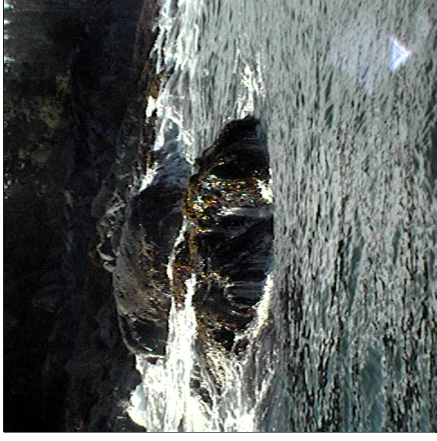
DP ITEM NUMBER : JD242_10

DP Form

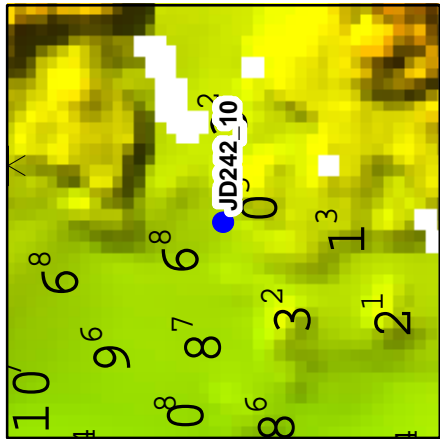
Date: 29 August, 2004
 Julian Day: 242
 UTC Time: 17:07:03
 Latitude: 56 58 40.76 N
 Longitude: 135 22 49.42 W
 North: 6315000.22
 East: 476878.34
 Raw (+Depth) or (-Height) (m): -0.61
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.17
 Corrected to MLLW (m): -0.78
 Corrected to MLLW (fathoms): -0.43
 Corrected to MLLW (feet): -2.56
 DP Comment: chtd_rock 27yrd 150deg-mag pic l3 hgt 2ft

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

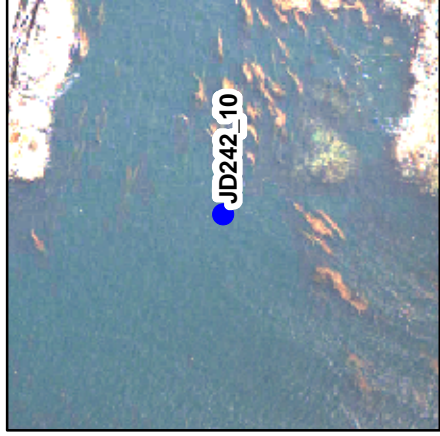
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Chtd Rk (56 58 39.78 N, 135 22 49.80 W) was observed by Skiff. Appears on SS at ortho position and Skiff Ht.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
200m x 200m



Orthomosaic
100m x 100m



Chart
200m x 200m

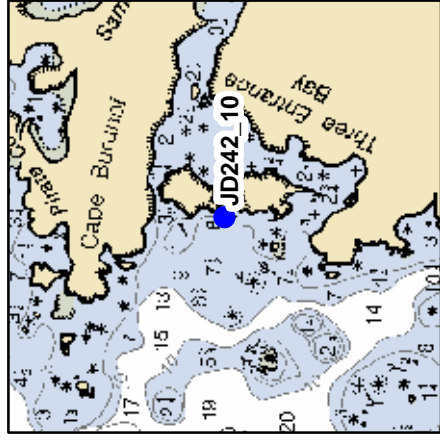


Chart
2000m x 2000m

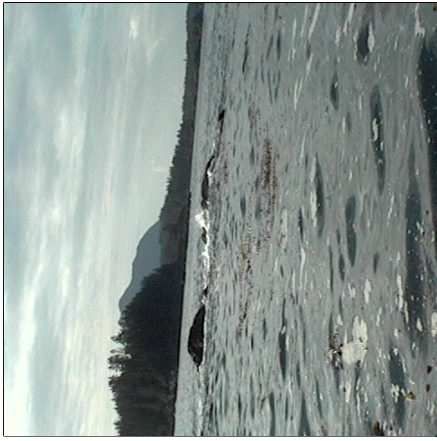
DP ITEM NUMBER : JD242_08

DP Form

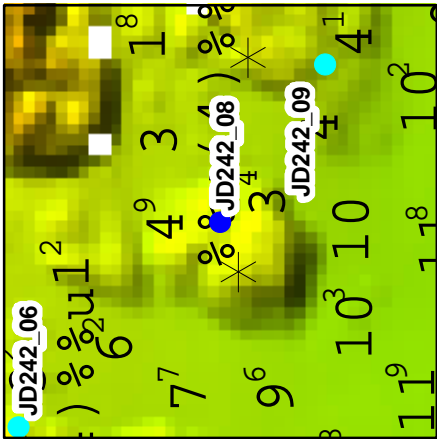
Date: 29 August, 2004
 Julian Day: 242
 UTC Time: 16:56:22
 Latitude: 56 58 57.05 N
 Longitude: 135 23 13.25 W
 North: 6315505.99
 East: 476478.81
 Raw (+Depth) or (-Height) (m): -0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.02
 Corrected to MLLW (m): -0.93
 Corrected to MLLW (fathoms): -0.51
 Corrected to MLLW (feet): -3.05
 DP Comment: chtd_rock 18yrd 200deg-mag pic10+11 hgt 3ft 25mlong

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

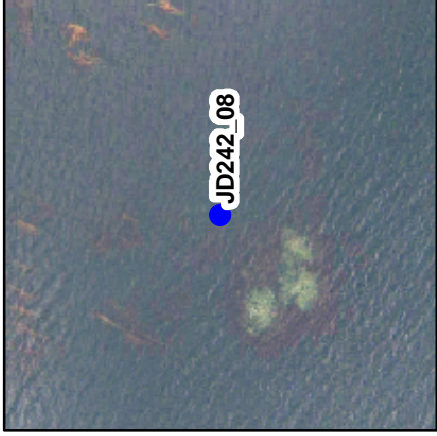
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Chrt'd Rk (56 58 55.97 N, 135 23 14.15 W) was observed by LIDAR. Appears on SS at ortho position and with Skiff Hr.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

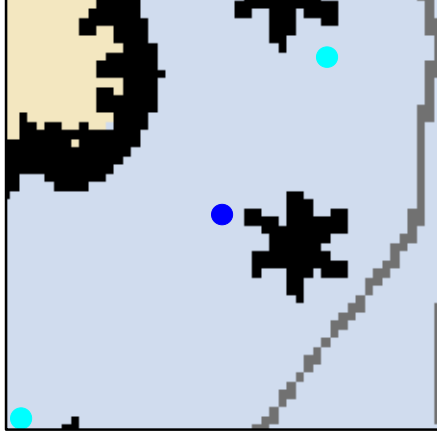


Chart
 200m x 200m

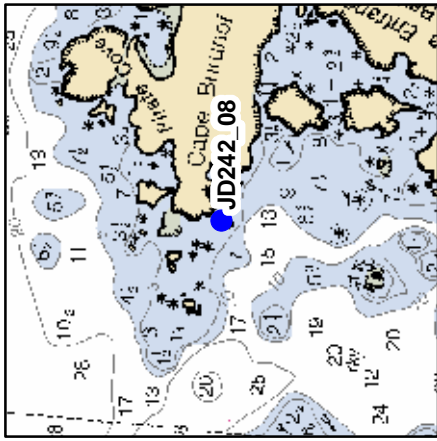


Chart
 2000m x 2000m

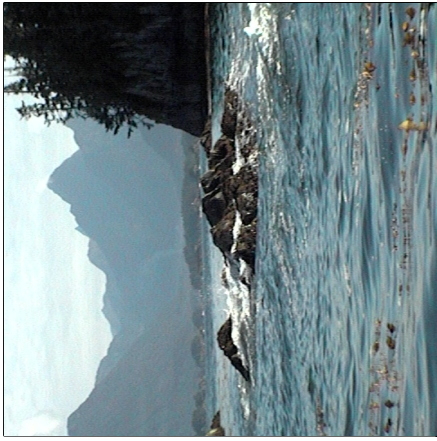
DP ITEM NUMBER : JD242_05

DP Form

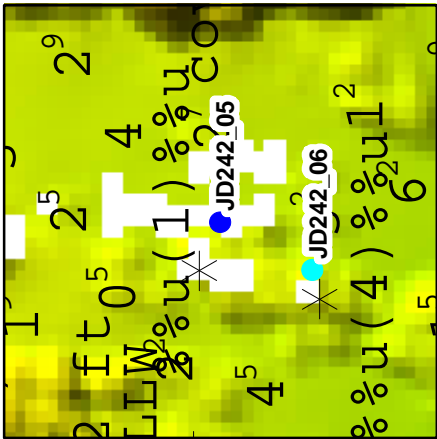
Date: 29 August, 2004
 Julian Day: 242
 UTC Time: 16:42:39
 Latitude: 56 59 01.43 N
 Longitude: 135 23 17.59 W
 North: 6315641.84
 East: 476406.34
 Raw (+Depth) or (-Height) (m): -1.52
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): -0.11
 Corrected to MLLW (m): -1.41
 Corrected to MLLW (fathoms): -0.77
 Corrected to MLLW (feet): -4.63
 DP Comment: chtd_rock 22yrd 250deg-mag pic06+07 hgt 5ft

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

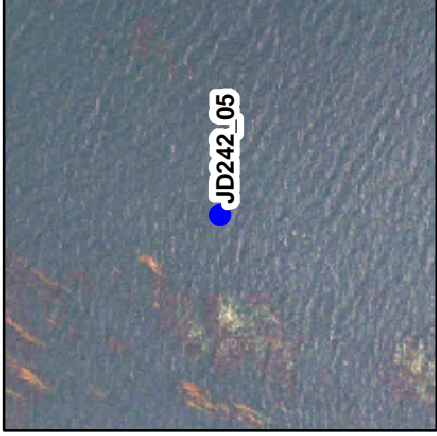
Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Chtd Rk (56 59 00.91 N, 135 23 19.56 W) was observed by LIDAR Appears on SS at ortho position and Skiff Ht.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

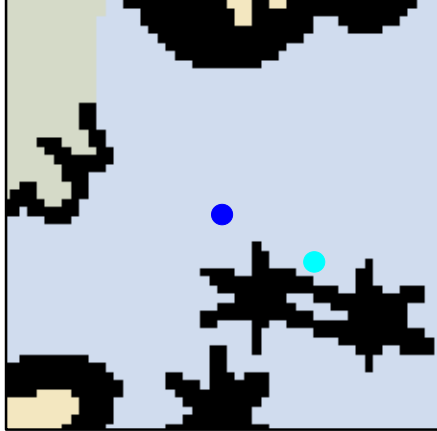


Chart
 200m x 200m

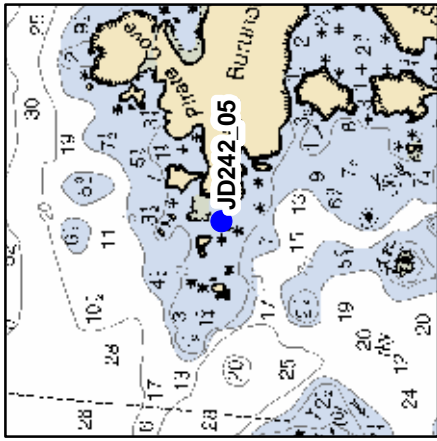


Chart
 2000m x 2000m

DP ITEM NUMBER: JD241_01

DP Form

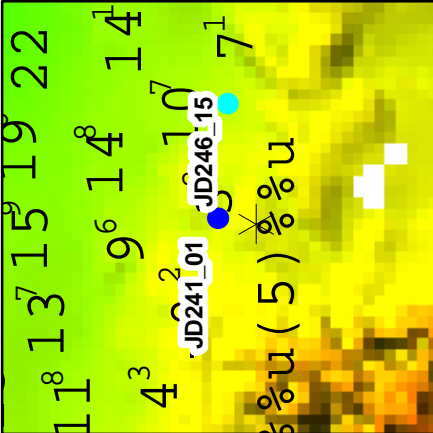
Date: 28 August, 2004
 Julian Day: 241
 UTC Time: 16:50:51
 Latitude: 57 00 05.18 N
 Longitude: 135 21 36.39 W
 North: 6317603.67
 East: 478125.09
 Raw (+Depth) or (-Height) (m): -0.91
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.43
 Corrected to MLLW (m): -1.34
 Corrected to MLLW (fathoms): -0.73
 Corrected to MLLW (feet): -4.40
 DP Comment: chtd_rock 18yrd 180deg_mag pic01 hgt 3ft

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

Correlating MB Least Depth:
 None



Remarks/Recommendations:
 Chrt'd Rk (57 00 04.78 N, 135 21 35.97 W) was located by the skiff. Appears on the SS at the ortho position and Skiff Ht.
 Chart: 17326 Topo: N/A Carto Code: 089



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m

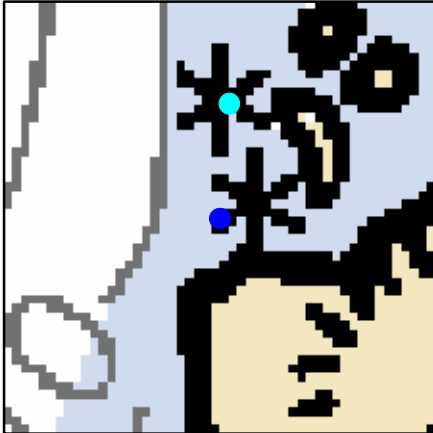


Chart
 200m x 200m

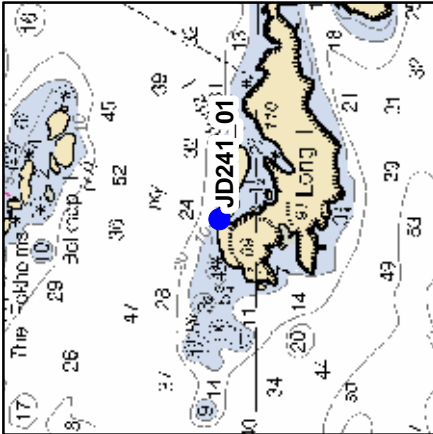


Chart
 2000m x 2000m

DP ITEM NUMBER : JD246_15

DP Form

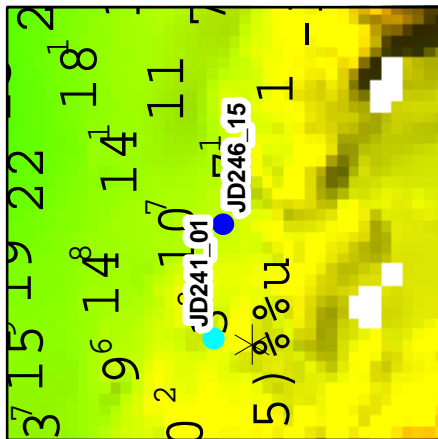
Date: 02 September, 2004
 Julian Day: 246
 UTC Time: 17:14:15
 Latitude: 57 00 05.05 N
 Longitude: 135 21 33.25 W
 North: 6317599.31
 East: 478178.01
 Raw (+Depth) or (-Height) (m): 15.24
 Draft Corrector (m): N/A
 SV Corrector (m): N/A
 Tide Corrector (m): 0.05
 Corrected to MLLW (m): 15.19
 Corrected to MLLW (fathoms): 8.31
 Corrected to MLLW (feet): 49.84
 DP Comment: chtd_rock NOT FOUND shoalest dep 50ft

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

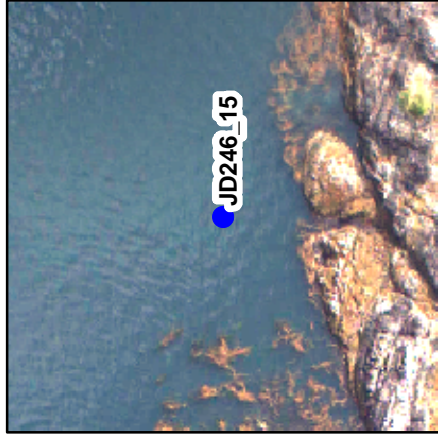
Correlating MB Least Depth:
 None

No photo available

Remarks/Recommendations:
 Chrt'd Rk (57 00 05.05 N, 135 21 33.25 W) was not found. Area had full multibeam and LIDAR coverage and was investigated by Skiff. Recommend removal
 Chart: 17326 Topo: N/A Carto Code: None



Combined Coverage w/soundings
 200m x 200m



Orthomosaic
 100m x 100m



Chart
 200m x 200m

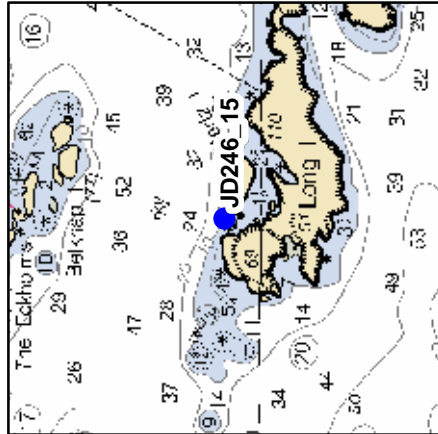


Chart
 2000m x 2000m



Revisions Compiled During Office Processing and Certification

¹ Concur with clarification. The approximate limits of hydrography are:

- ✦ Lat 57/02/18.0N and Lon 135/28/44.9W
- ✦ Lat 57/02/09.5N and Lon 135/21/02.6W
- ✦ Lat 56/56/12.9N and Lon 135/21/10.1W
- ✦ Lat 56/56/10.4N and Lon 135/28/38.6W

² Filed with the project reports.

³ Concur

⁴ Concur. H11354 is adequate to supersede all prior surveys and charted miscellaneous source data except as noted in this report and the Hdrawing.

⁵ Concur. H11354 is adequate to supersede all prior surveys and charted miscellaneous source data except as noted in this report and the Hdrawing.

⁶ H11354 junctions with:

Registry #	Scale	Date	Junction Side
H11119	1:10,000	2004	Northwest
H11120	1:10,000	2003	North
H11121	1:5,000	2002	Northeast
H11122	1:10,000	2005	East
H11124	1:10,000	2004	East
H11130	1:10,000	2004	West
H11270	1:10,000	2005	Southwest
H11429	1:10,000	2005	South

In PHB processing, H11354 was compared with surveys H11119, H11120 and H11121. The common areas showed excellent correlation, generally to within 1 fathom or less. All other junctions will be discussed in their Descriptive Reports.

⁷ Filed with the project reports.

⁸ Filed with the project reports.

⁹ Attached to this report

¹⁰ During office processing Chart 17326, 15th Edition, dated June 1, 2006 was used for comparison.

¹¹ During office processing Chart 17327, 22nd Edition, dated July 1, 2005 was used for comparison.

¹² Chart these areas as depicted on the smooth sheet.

¹³ Concur

¹⁴ Concur

¹⁵ Concur

¹⁶ Concur

¹⁷ Concur. Chart contours based on the smooth sheet as depicted on the Hdrawing.

¹⁸ Concur

¹⁹ Concur

²⁰ No additional dangers were found during office processing. All dangers submitted by the field are attached to this report.

²¹ Concur

²² Attached to this report.

²³ Concur

²⁴ Concur, chart rock uncovers 3 feet at MLLW.

²⁵ Concur, remove submerged rock.

²⁶ Concur, remove submerged rock

²⁷ Concur chart rock uncovers 4 feet at MLLW.

²⁸ Concur, chart rock uncovers 3 feet at MLLW.

²⁹ Concur, remove charted submerged rock.

³⁰ Concur, remove charted rock awash.

³¹ Concur, remove submerged rock.



- ³² Do not concur. Chart two rocks which uncover 1 foot at MLLW at the survey position. See smooth sheet and Hdrawing for depiction of the area.
- ³³ Concur, chart rock uncovers 6 feet at MLLW.
- ³⁴ Concur, chart rock uncovers 5 feet at MLLW.
- ³⁵ Concur, chart rock uncovers 5 feet at MLLW.
- ³⁶ Concur, chart rock and retain height of 10 feet at MLLW.
- ³⁷ Concur, chart rock uncovers 2 feet at MLLW.
- ³⁸ Concur, remove charted rock.
- ³⁹ Concur, chart rock uncovers 2 feet at MLLW.
- ⁴⁰ Do not concur, a rock awash was found, remove charted rock uncovers and chart rock awash at survey position.
- ⁴¹ Concur, chart rock at survey position.
- ⁴² Concur, remove charted rock and chart rock as shown on the Hdrawing and smooth sheet
- ⁴³ Concur, chart rock as shown on the smooth sheet and Hdrawing
- ⁴⁴ Concur, chart islet at survey position.
- ⁴⁵ Concur, remove charted rock and chart rock at survey position.
- ⁴⁶ Concur, remove charted rock and chart rock at survey position.
- ⁴⁷ Concur remove rock and MLLW and chart islet and ledge as shown on the smooth sheet and Hdrawing.
- ⁴⁸ Concur, remove charted rock and chart rock at survey position.
- ⁴⁹ Concur, remove charted rock and chart rock at survey position.
- ⁵⁰ Do not concur, investigation not complete to remove rock. Retain rock at charted position. No DP form was found.
- ⁵¹ Concur, remove charted ledge and chart rock and MLLW at survey position.
- ⁵² Concur, remove charted rock and chart area according to the smooth sheet and Hdrawing.
- ⁵³ Concur, remove charted rock and chart area as depicted on the smooth sheet and Hdrawing.
- ⁵⁴ Concur, chart rock and ledge as shown on the smooth sheet.
- ⁵⁵ Concur, remove charted rock and chart rock at survey position.
- ⁵⁶ Concur, chart rock at survey position.
- ⁵⁷ Not all lidar rocks were shown on the smooth sheet by the hydrographer. Additional lidar rocks located by the hydrographer were on level seven of the smooth sheet. All lidar rocks that were not located above the MHWL or on a ledge or reef were shown on the Hdrawing and are recommended to be charted.
- ⁵⁸ It is recommended that the LIDAR shoreline be used to supersede the photogrammetric shoreline within the common area of this survey. This shoreline is drawn in red on the Hdrawing.
- ⁵⁹ These areas were drawn in dashed red on the Hdrawing and should be adequate to supersede the photogrammetric shoreline.
- ⁶⁰ Attached to this report.
- ⁶¹ All bottom characteristics should be retained as charted.
- ⁶² It is recommended that all Aids to Navigation be positioned by the latest information.
- ⁶³ A discrepancy report was generated by the evaluator on 2/12/2007. A copy of the report is attached to this report.
- ⁶⁴ See attached reports
- ⁶⁵ Concur
- ⁶⁶ Concur

Subject: NOAA's Nautical Chart Product Discrepancy Report

Date: 2/12/2007

From: Russ Davies

Printed below is a tabulated listing of the contact information you provided. Any further correspondence concerning this specific report should reference the sequentially assigned report number listed in the first row of the table.

Email responses sent to you may come from nautical.charting@noaa.gov. Please make sure your spam filtering allows you to receive email from this address.

Report number	3780
Date submitted	2/12/2007
Name	Russ Davies
Organization	NOS
Email	russ.davies@noaa.gov
Daytime phone number	(206) 523 4298
Date observed	2/12/2007
Time observed	1:00 PM pacific
Affected charts	17326, 15th Edition, dated Jun. 2006
Position information	lat 57/02/03.4N, long 135/23/39.7lat
Discrepancy Description	The Geo name for Maknati Rock is spelled incorrectly. It should be Makhnati Rock. See Makhnati Island.

We will be contacting you with a resolution or feedback to the discrepancy you are reporting. If you have reported discrepancies on different types of products you will receive a separate response for each type of product.

Thank you for your interest in NOAA's Nautical Chart Products.



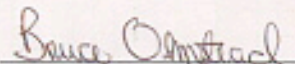
U.S. Department of Commerce
National Ocean Service

National Oceanic and
Atmospheric Administration
[Disclaimer / Privacy Policy](#)

APPROVAL SHEET
H11354

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 Olmstead
Cartographic Team
Pacific Hydrographic Branch

Date: 2/6/2007

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.


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

Date: 12 FEB 2007

