

H12081

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. RA-40-05-09
Registry No. H12081

LOCALITY

State Alaska
General Locality Pavlof Islands
Sublocality South of Wosnesenski Island

2009

CHIEF OF PARTY

..... Captain Donald W. Haines, NOAA

LIBRARY & ARCHIVES

DATE

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION		REGISTRY No H12081
HYDROGRAPHIC TITLE SHEET		
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: RA-40-05-09
State <u>Alaska</u>		
General Locality <u>Pavlof Islands</u>		
Sub-Locality <u>South of Wosnesenski Island</u>		
Scale <u>1:40,000</u>		Date of Survey <u>June 18, 2009 - July 18, 2009</u>
Instructions dated <u>5/4/2009</u>		Project No. <u>OPR-P184-RA-09</u>
Vessel(s) <u>RA1 (1101), RA2 (1103), RA4 (2801), RA5 (2802), RA3 (2803), RA6 (2804), RAINIER (S221)</u>		
Chief of party <u>Captain Donald W. Haines, NOAA</u>		
Surveyed by <u>RAINIER Personnel</u>		
Soundings by <u>Reson SeaBat 7125, Tilted Reson SeaBat 8125, Knudsen 320M</u>		
SAR by <u>Andrew Clos</u>		Compilation by <u>Katie Reser</u>
Soundings compiled in <u>Fathoms</u>		
REMARKS: <u>All times are UTC. UTM Zone 4N.</u>		
<u>The purpose of this survey is to provide contemporary surveys to update</u>		
<u>National Ocean Service (NOS) nautical charts.</u>		
<u>Revisions and end notes in red were generated during office processing.</u>		
<u>Page numbering may be interrupted or non sequential.</u>		
<u>All pertinent records for this survey, including the Descriptive Report, are archived at the</u>		
<u>National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.</u>		

Descriptive Report to Accompany Hydrographic Survey H12081

Project OPR-P184-RA-09
Pavlof Islands, Alaska
South of Wosnesenski Island
Scale 1:40,000
June – July 2009
NOAA Ship *Rainier* (s221)
Chief of Party: Captain Donald W. Haines, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions OPR-P184-RA-09 dated May 4, 2009 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is South of Wosnesenski Island, Alaska, one of the easternmost islands in the Pavlof Island chain, approximately 350 nautical miles southwest of Kodiak Island. This survey corresponds to sheet “F” in the sheet layout provided with the Project Instructions. OPR-P184-RA-09 responds to increasing freighter and passenger traffic in the Pavlof Islands through waters that have not been charted since the 1930’s, or not at all.

Complete multibeam echosounder (MBES) coverage was achieved in the survey area in waters 8 meters and deeper. In depths less than 8 meters additional MBES coverage was acquired to identify least depths over significant features or shoals, as appropriate for this survey. Additional multibeam coverage was achieved in water depths between 8 and 4 meters that meet or exceed the project instruction requirements. Total mileage acquired by each vessel and system is referenced in Table 1.

Data Acquisition Type	Hull Number with Mileage (nm)							Total
	1101	1103	2801	2802	2803	2804	S221	
VBES (main scheme)	-	-	-	-	-	-	-	-
MBES (main scheme)	8.24	-	293.98	271.55	141.19	57.89	-	772.87
SSS (main scheme)	-	-	-	-	-	-	-	-
Crosslines	-	-	-	32.08	-	20.45	-	52.54
Developments	-	-	-	-	-	-	-	-
Shoreline	-	7.05	-	-	-	-	-	7.05
Bottom Samples	-	-	-	-	-	-	14	14
Total Number of Items Investigated	6	-	-	-	-	-	-	6
Total Area Surveyed (sq. nm)	-	-	-	-	-	-	-	45.86

Table 1: Statistics for survey H12081

Limited Shoreline Verification was performed for the survey area seaward of the Navigable Area Limit Line (NALL) for H12081, as per section 3.5.5 of the Field Procedures Manual

¹ NOS Hydrographic Surveys Specifications and Deliverables (April 2009), OCS Field Procedures Manual for Hydrographic Surveying (April 2009), and all Hydrographic Surveys Technical Directives issued through the dates of data acquisition.

April 2009 (FPM). Shoreline features were given S-57 attribution and included for submission in Notebook HOB files.

Data acquisition was conducted from June 18 to July 18, 2009 (DN 169 to 199).

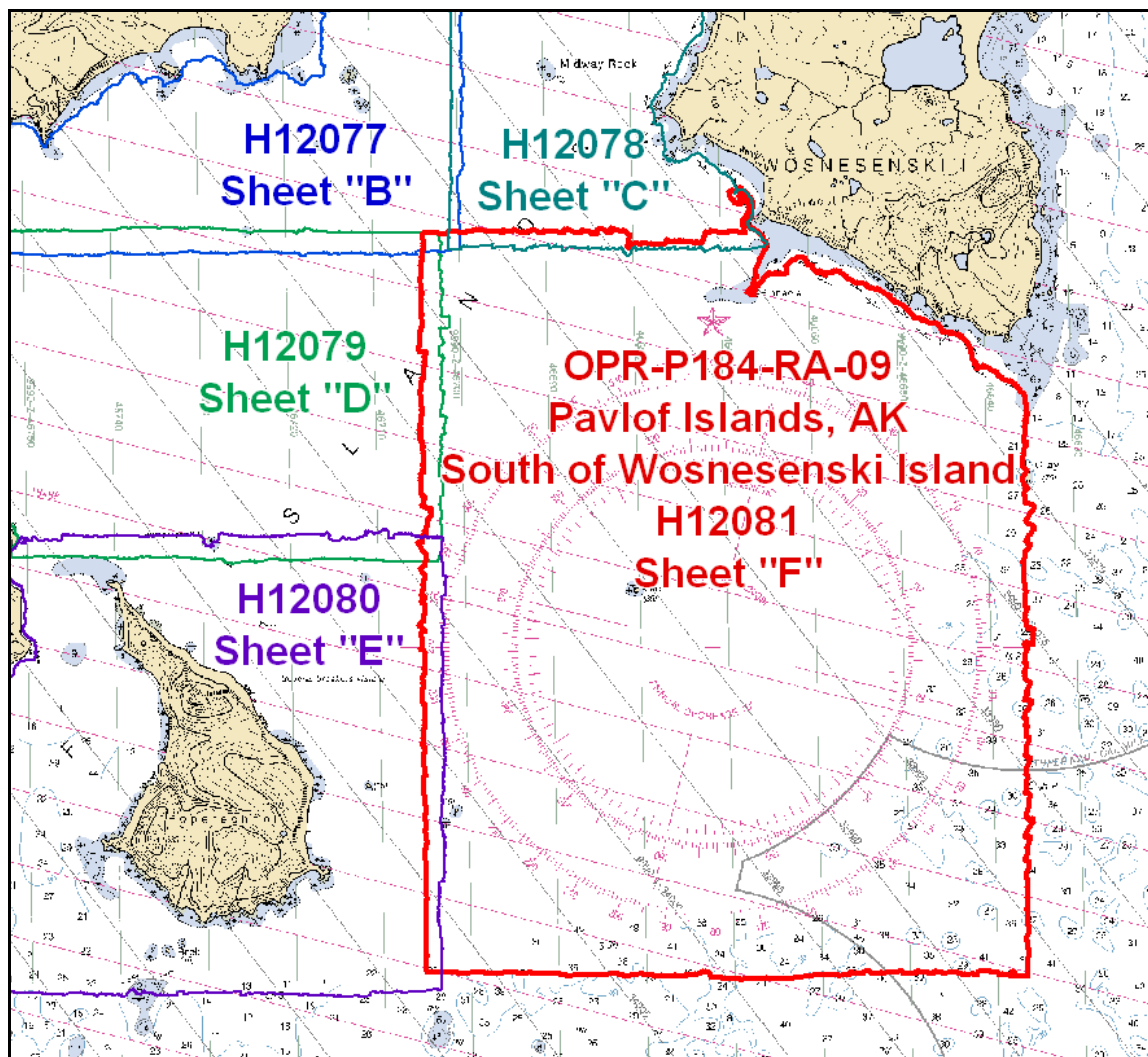


Figure 1: H12081 Survey Outline and Junctions

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-P184-RA-09 Data Acquisition and Processing Report* (DAPR), submitted under separate cover. Items specific to this survey, and any deviations from the DAPR are discussed in the following sections.

Final Approved Water Levels have been applied to this survey. See Section C. for additional information.

B.1. Equipment and Vessels

Data for this survey were acquired by the following vessels:

Hull Number	Name	Length (ft)	Draft (ft)	Acquisition Type
S221	<i>Rainier</i>	231	15.5	Bottom Samples
1101	RA-1	29	2	Reson 8125 Multibeam Echosounder
1103	RA-2	29	2	Knudsen 320M Vertical Beam Echosounder Detached Positions
2803	RA-3	29	3.5	Reson 7125 Multibeam Echosounder
2801	RA-4	29	3.5	Reson 7125 Multibeam Echosounder
2802	RA-5	29	3.5	Reson 7125 Multibeam Echosounder
2804	RA-6	29	3.5	Reson 7125 Multibeam Echosounder

Table 2: Data acquisition vessels and systems for H12081

Sound speed profiles were measured in accordance with the Specifications and Deliverables using SEACAT SBE-19 and 19+ profilers and the Brooke Ocean Technology Moving Vessel Profiler.

Multibeam vessel navigation and attitude data were measured and recorded using Applanix POS/MV 320 systems, version 4. Vertical Beam echosounder navigation and attitude data were measured using a Trimble DSM212L GPS receiver and a TSS MAHRS system.

A complete description of survey vessels, hardware, and software systems is included in the *OPR-P184-RA-09 DAPR*.

No unusual vessel configurations were used for data acquisition.

B.2. Quality Control**B.2.a. Crosslines**

Multibeam Echosounder (MBES) crosslines totaled 52.54 nautical miles, comprising 6.80% of main scheme MBES hydrography. The mainscheme bathymetry was manually compared to the crossline nadir beams in CARIS subset mode. Comparison yielded excellent agreement with no discernable offsets.¹

A statistical Quality Control Report has been conducted on representative data acquired with each system used on this survey. Results of these tests are included in the updated 2009 *Rainier* Hydrographic System Readiness Review package submitted with this survey.

B.2.b. Final Uncertainty

Uncertainty values of submitted, finalized grids are calculated in CARIS using the “Greater of the Two” of total propagated uncertainty and standard deviation (scaled to 95%). An “IHOness” attribute layer was created for H12081’s finalized combined surface (H12081_FinalCombined_4m) in CARIS HIPS for analysis. Throughout the majority of the survey area, uncertainty values for H12081 fall below the IHO levels as described in the NOS Specifications and Deliverables.² The exception to these results occurred along the very near-shore areas when using the tilted Reson 8125 sonar configuration; refer to OPR-P184-RA-09 Data Acquisition and Processing Report for specifics.³

B.2.c. Junctions

Survey H12081 junctions with H12077, H12078, H12079, and H12080, which are sheets B, C, D, and F of the same project, respectively.⁴ The area of overlap between the sheets was reviewed in CARIS Subset Editor for consistency and data were found to be in excellent agreement with no discernable offsets.⁵ The sheet limits and area of overlap for all sheet junctions are shown in Figure 1.

Junction Survey	Survey Scale	Date of Survey	Survey Location
H12077	1:40,000	August 2009	Northwest
H12078	1:40,000	August 2009	North
H12079	1:40,000	August 2009	West
H12080	1:40,000	August 2009	West

Table 3: Junction Surveys

B.2.d. Quality Control Checks

MBES quality control checks were conducted as discussed in the quality control section B of the DAPR.

B.2.e. Data Quality FactorsSound Speed Artifacts from Malfunctioning Surface Sound Velocimeter

Multibeam echosounder acquired with 1101 (RA-1) tilted Reson 8125 displayed several momentary sound velocity ‘blowouts’ where the vessel’s Digibar surface sound velocimeter was not reading the proper surface sound speed. This recurring problem with the Digibar grew worse near the end of the Pavlof Island project and was finally corrected when the faulty Digibar was replaced. Because this sonar uses surface sound speed input for beam forming, it was impossible to correct this data. To compensate, the Hydrographer, where possible, rejected soundings obviously in error from the outer beams.⁶ See figure 2 below.

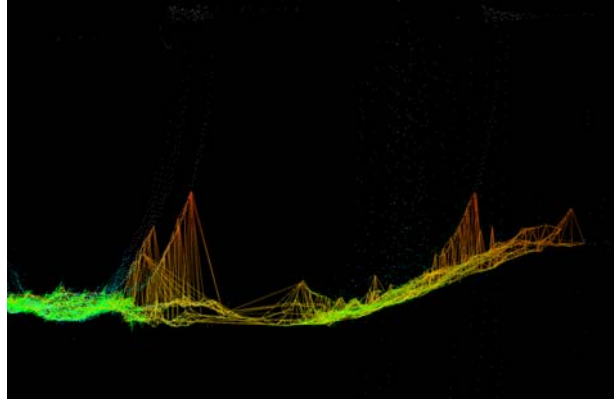


Figure 2: Sound velocity artifact resulting from a malfunctioning surface sound velocimeter viewed in CARIS HIPS subset mode with the 1 meter reference surface overlaid

B.2.f. Object Detection and Coverage Assessment

The south shore of Wosnesenski Island was found to be foul with kelp, which prevented the acquisition of complete multibeam to the 8 m curve. The Hydrographer recommends this area be charted as foul with kelp as noted in the final features file.⁷

In water deeper than 80m there are several areas, mainly in field sheets H12081_C and H12081_E, full bottom coverage was not achieved. Due to the flat nature of the bottom and depth of these areas, small holidays left in this area were deemed low priority and were not filled in. These areas of incomplete coverage are centered mainly in the south and central western region of the sheet, between 55° 03' N – 55° 08' N, and 161° 25' W – 161° 31' W, highlighted with red squares in Figure 3 below. For holidays larger than 3 nodes across, the corresponding multibeam backscatter side scan was examined and no navigationally significant items were found; additionally, the least depths were represented.⁸

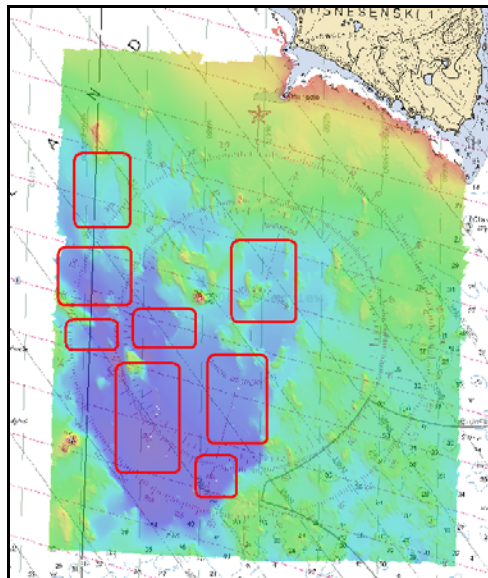


Figure 3: Areas where full bottom coverage was not achieved, highlighted with red boxes, overlaid on the finalized and combined 4 meter surface (H12081_FinalCombined_4m)

Data density for survey H12081 met the 5 sounding per node density requirement with 98.7% of nodes having greater than 5 contributing soundings.⁹ This requirement was waived in depths greater 100 meters after consultation with HSD Operations Branch and Pacific Hydrographic Branch (see email correspondence in Appendix V). See Figure 4 below.

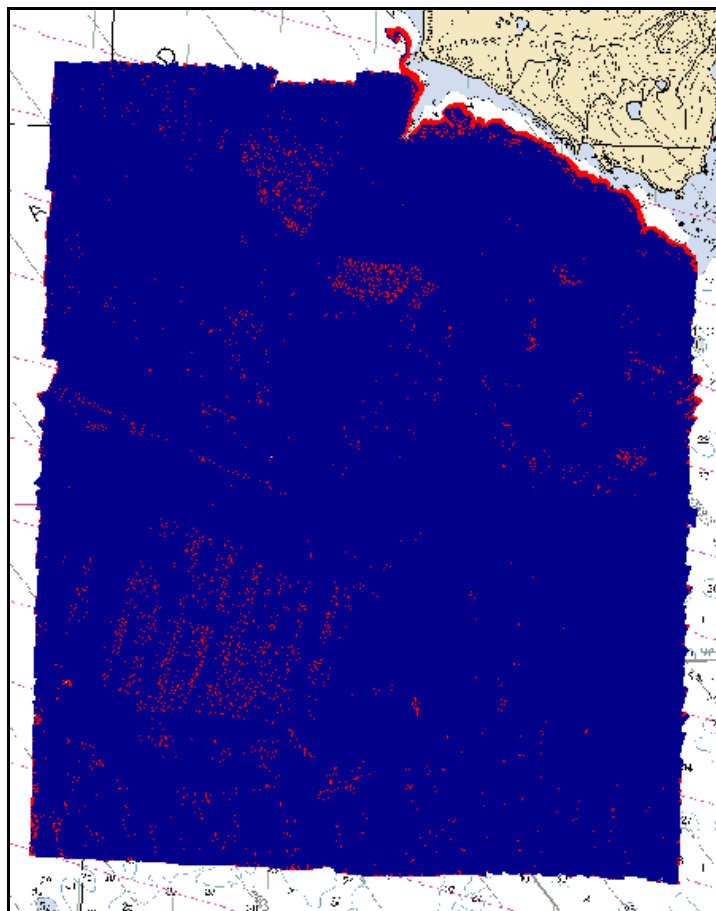


Figure 4: Density coverage for H12081 from the finalized and combined 4 meter surface (H12081_FinalCombined_4m); red indicates nodes with less than 5 pings per grid node, blue indicates 5 pings or more per grid node.

B.2.g. Unusual Conditions

No unusual conditions were encountered during the survey that affected the expected accuracy and quality of survey data.

B.3. Corrections to Echo soundings

Data reduction procedures for survey H12081 conform to those detailed in the *OPR-P184-RA-09 DAPR*.

B.4. Data Processing

Data processing procedures for survey H12081 conform to those detailed in the DAPR. Data were processed initially using CARIS HIPS & SIPS v6.1, Service Pack 2, and Hotfix 8. Additional processing details regarding Total Propagated Uncertainty (TPU/TPE) and CUBE Surfaces and Parameters utilized, along with any deviations from the processing procedures outlined in the DAPR are discussed below.

TPU VALUES:

The survey specific parameters used to compute TPU in CARIS for H12081 are listed in Table 4.

Tide values:	Measured	0.01 m	Zoning	0.12 m
Sound Speed Values:	Measured	0.50 m/s	Surface	As per DAPR

Table 4: Survey Specific CARIS TPU Parameters

Many BASE surfaces were used in processing H12081. Final BASE surface resolutions and depth ranges were set according to Table 5 below, with field sheets smaller than 25×10^6 nodes. CUBE surfaces were processed with a parameter set corresponding to each resolution as per HTD 2009-2. The CUBE parameter XML file is included with the data deliverables. The submission Field Sheet and BASE Surface structure are shown in figures 5 through 9.

Depth Range (m)	Resolution (m)
0-23	1
20-52	2
46-115	4
103-350	8

Table 5: Depth range and surface resolutions for H12081

In addition, the higher resolution BASE surfaces listed below were added in the particularly rocky areas south of Wosnesenski Island to ensure that all features were accurately portrayed in the bathymetric model. This practice reduced the number of designated soundings required.

Soundings and contours were generated in CARIS HIPS from the final combined BASE surface for field unit review purposes. They are included for reference only and are not intended as a deliverable.

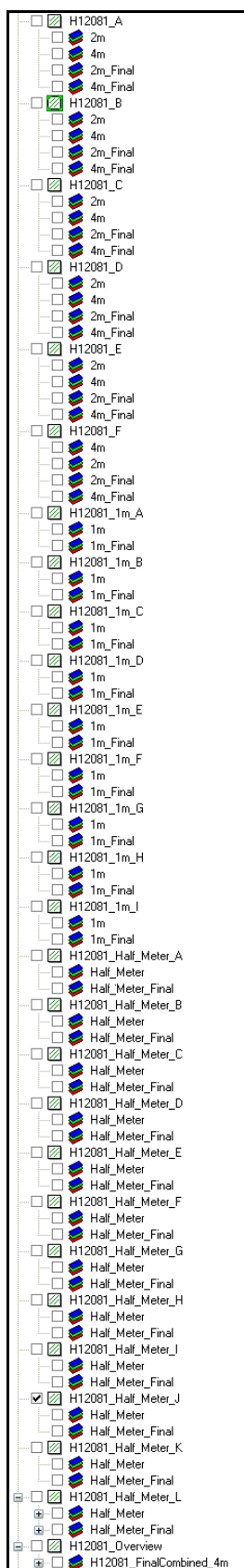


Figure 5: Field sheets and BASE surfaces submitted with H12081

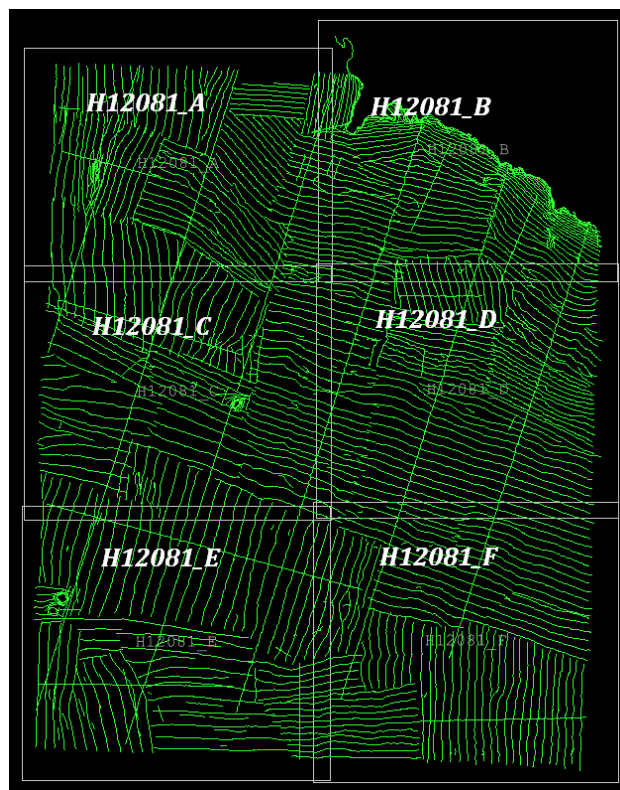


Figure 6: H12081 2 and 4-meter resolution field sheet layout

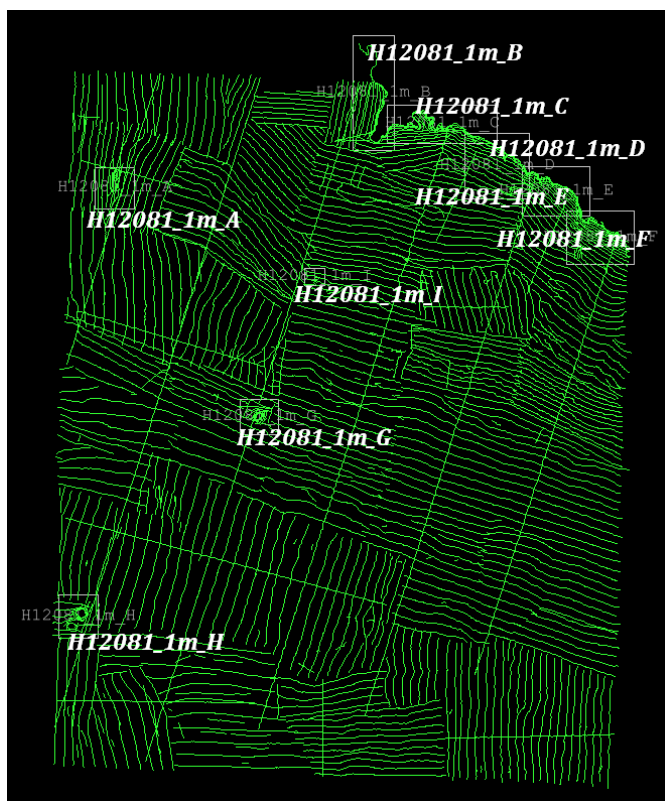


Figure 7: H12081 1-meter resolution field sheet layout

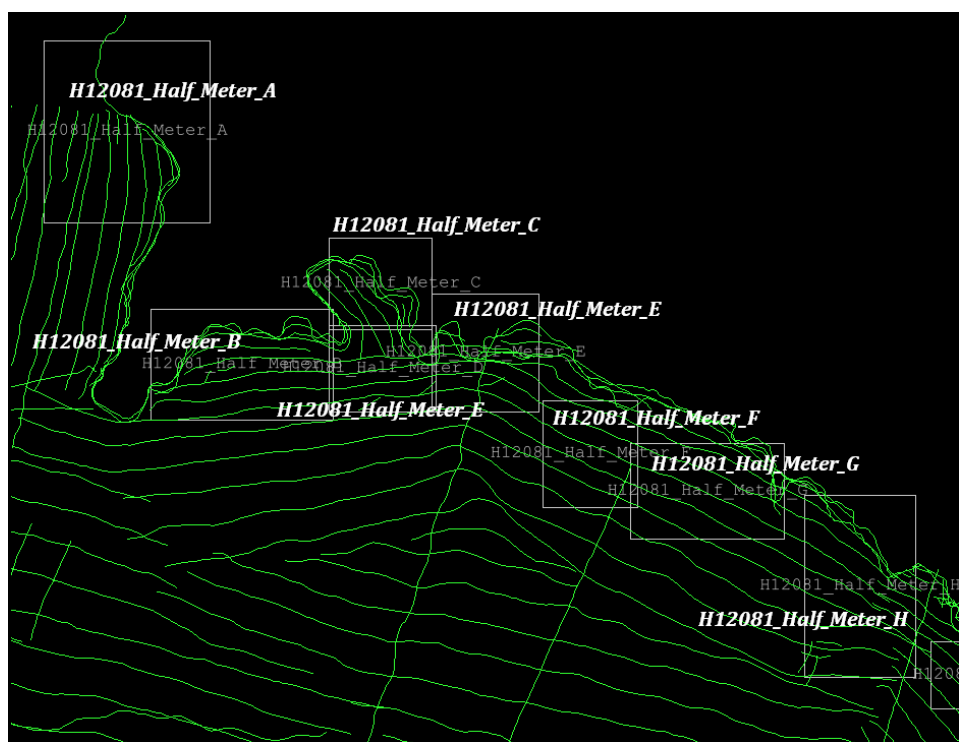


Figure 8: Western H12081 half meter resolution field sheet layout

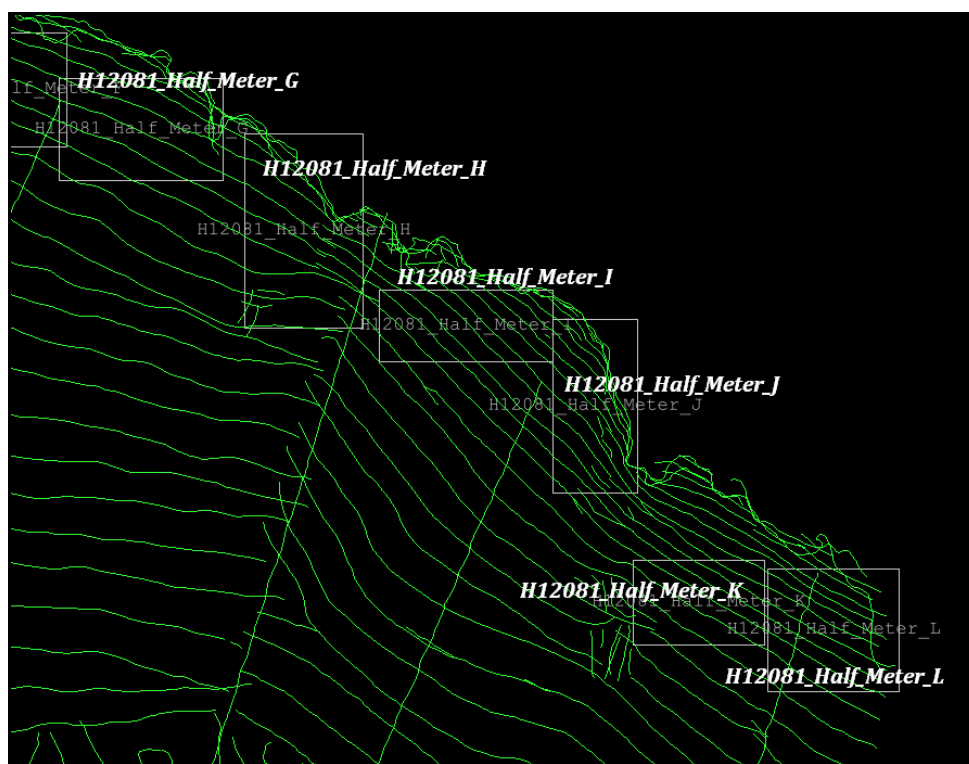


Figure 9: Eastern H12081 half meter resolution field sheet layout

C. VERTICAL AND HORIZONTAL CONTROL

Project OPR-P184-RA-09 did not require static GPS observations or other horizontal control work, and all tide corrections were generated from CO-OPS maintained tide stations. Thus, no Horizontal and Vertical Control Report will be submitted.

C.1. Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. The differential corrector beacons utilized for this survey are given in Table 6.

Location	Frequency	Operator	Priority
Cold Bay	289 kHz	USCG	Primary

Table 6: Differential Corrector Sources for H12081

C.2. Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Sand Point, AK (945-9450) served as control for datum determination and as the primary source for water level reducers for survey H12081.

No tertiary gauges were required.

As per the Project Instructions, all data were reduced to MLLW using the final approved water levels from the Sand Point, AK station (954-9450) by applying tide file 9459450.tid and time and height correctors through the zone corrector file P184RA2009CORP.zdf. **It will not be necessary for the Pacific Hydrographic Branch to reapply the final approved water levels to the survey data during final processing.**

The request for Final Approved Water Levels for H12081 was submitted to CO-OPS on July 31, 2009 in accordance with the Field Procedures Manual (FPM), dated April 2009. The Final Tide Note was received on September 11, 2009.¹⁰ This documentation is included in Appendix IV.

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Chart comparison procedures were followed as outlined in section 4.5 of the FPM and section 8.1.3-D.1 of the HSSDM, utilizing CARIS HIPS software program.

Survey H12081 was compared with the following charts:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
16549	1:80,000	15 th Ed, July 2003	10/24/2009
16551	1:80,000	10 th Ed; Apr 2008	10/24/2009

Table 8: Charts compared with H12081

The majority of area H12081 was previously unsurveyed and devoid of charted depths, except for the southern and eastern edges of the survey area. Despite the age of the data contributing to chart 16549 and 16551, most charted depths within 1 fathom of survey soundings.¹¹ Major discrepancies between the charted depths and survey soundings can be attributed to the increased bottom coverage of MBES methods; the greatest errors were found in areas with dynamic bottom characteristics where steep slopes were present around features. Four such areas were discovered¹²:

1. Approximate position 55° 06'N 161° 20'W:
A 25 fm survey sounding was found over a charted 31 fm depth.
2. Approximate position 55° 06'N 161° 21'W:
Two survey soundings were found to be 2-3 fm deeper than charted.
3. Approximate position 55° 03'N 161° 24'W:
Several charted depths were found to be incorrect in this dynamic location. Three charted depths were 1-4 fm deeper than surveyed. One charted depth was 4 fm shoaler than surveyed.
4. Approximate position 55° 03'N 161° 22'W:
A 28 fm survey sounding was found over a charted 34 fm depth.

In the area around position 55° 03'N 161° 28'W a cluster of five survey soundings are 1-2 fm shoaler than charted. The seafloor surrounding these soundings was flat and gently sloping.

See Figure 10 below for a graphical comparison of survey soundings with charted depths. Each red dot overlaid on the charted depth indicates the survey sounding was shoaler than the charted depth by 1 fm or more. A blue dot indicates the survey sounding was found to be deeper than the charted depth by 1 fm or more. A green dot indicates general agreement between the charted depth and survey sounding within 1 fm.

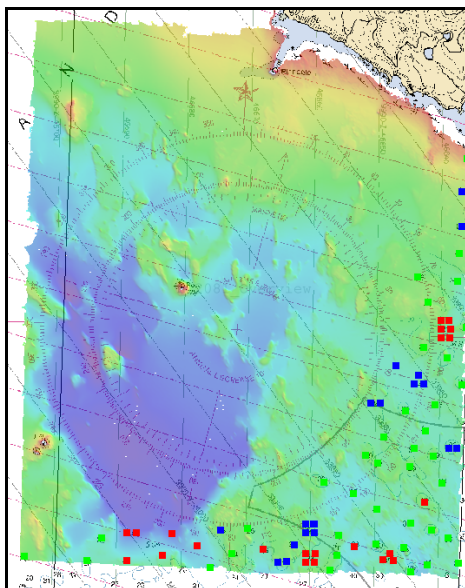


Figure 10: Comparison of survey soundings with charted depths from chart 16551 for field sheet H12081FinalCombined_4m of survey H12081. Red dots indicate shoaling, blue indicate soundings deeper than charted, and green indicate chart-survey agreement.

In the unsurveyed area of the chart two significant shoal soundings were discovered with surroundings areas of relatively deep depths. The first survey sounding was an 8 fm sounding, with approximate position 55 09.3' N 161 29.9' W, surrounded by soundings in the 10-20 fm range or deeper. Immediately to the north, a 5 fm DTON (Danger to Navigation) was discovered (noted in section D.1.d.). See Figure 11 below. The second sounding, at approximate position 55 08.5' N 161 26.1' W, was recorded at 9.5 fm and surrounded by 20-35 fm soundings. See Figure 12 below. Both of these shoal soundings correspond with significant rocky outcroppings, which are frequent throughout the survey.¹³

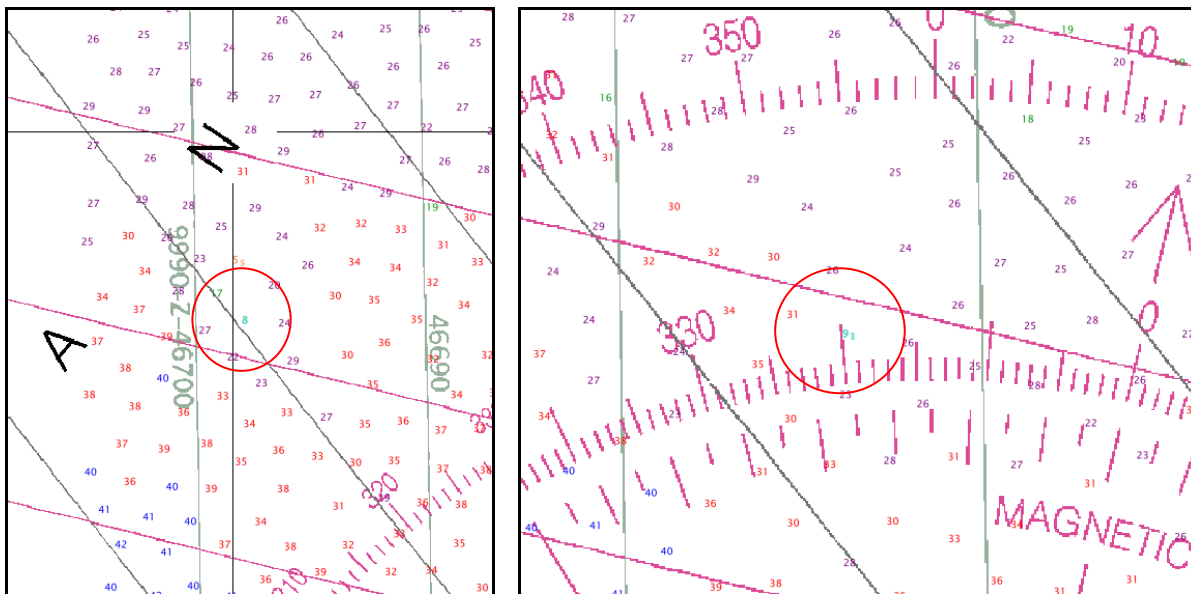


Figure 11 (left): 8 fm shoal sounding, highlighted in a red circle.
Figure 12 (right): 9.5 fm shoal sounding, highlighted in a red circle.

Charted contours agreed with survey soundings in general, but contours in the southwestern corner of the survey area are incorrect due to the sparse data acquired in the previous survey (see Figure 13 below). The Hydrographer recommends updating all contours with digital data from survey H12081.¹⁴

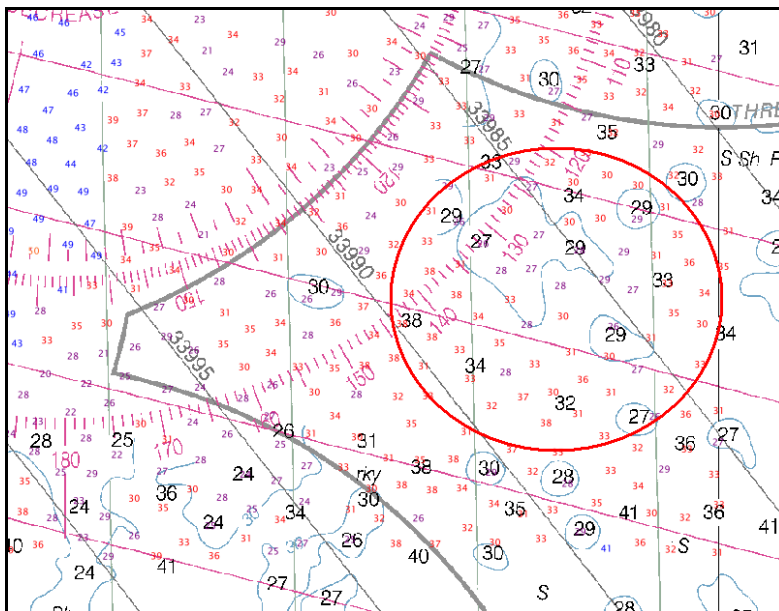


Figure 13: Contour lines, highlighted with red circles, in the southeastern portion of survey H12081 on chart 16551 which should be updated to include survey sounding acquired between charted depths.

The mean lower-low water (MLLW) water line on the western side of the pinnacle south of Wosnesenski Island is charted incorrectly, extending farther offshore than the actual intertidal zone. Survey soundings 30m and deeper were recorded in the charted intertidal region seen in Figure 14 below. The Hydrographer recommends updating the MLLW line as per digital data.¹⁵

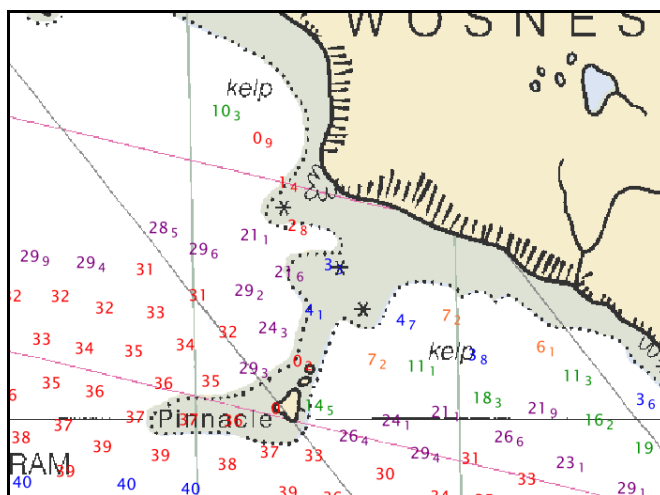


Figure 14: MLLW contour on the western side of the pinnacle incorrectly charted. This contour should be updated with MBES data.

The intertidal zone on chart 16549 is charted incorrectly. The placement of the MLLW line is correct, except for as stated above, but the area between MLLW and mean high water (MHW) is tinted blue, instead of green. The contrast between charts 16549 and 16551 is shown below in Figures 15 and 16. The Hydrographer recommends adjusting the tint of 16549's chart to green.¹⁶

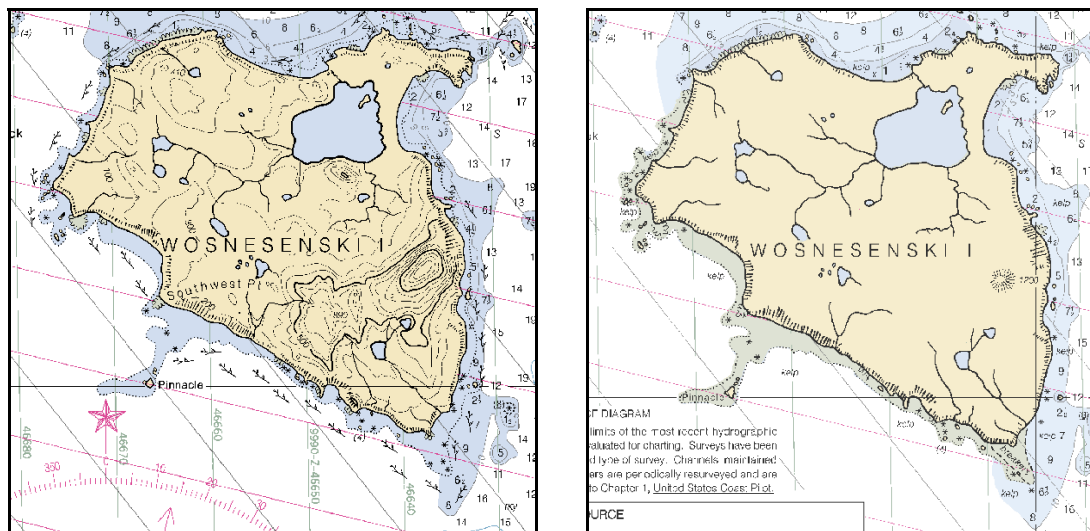


Figure 15(left): Intertidal zone charted incorrectly with blue tint on chart 16549.

Figure 16 (right): Intertidal zone charted correctly with green tint on chart 16551.

The Hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area.¹⁷

D.1.b. Automated Wreck and Obstruction Information System (AWOIS) Items

No AWOIS items were located within the survey limits of H12081.¹⁸

D.1.c. Other Investigated Features

Additional Items

No additional charted items were investigated and no other features were located on survey H12081.

D.1.d. Dangers to Navigation

Two (2) Dangers to Navigation (DTONs) were found on survey H12081, and reported to the Marine Chart Division via email on 11 December, 2009.¹⁹ The original DTON submission package is included in Appendix I.

D.2. Additional Results

D.2.a. Shoreline Verification

Shoreline Source

Limited shoreline verification was accomplished using the composite source file (CSF) provided with the project instructions. The CSF has been created using the latest ENC's, most recent aerial photogrammetry, and prior hydrographic surveys. Prior survey features within the CSF are for reference. This composite source was printed on paper "boat sheets" and displayed in CARIS Notebook and/or Hypack for field verification.

Shoreline Verification

Limited shoreline verification was conducted near predicted low water in accordance with the Specifications and Deliverables and FPM sections 6.1 and 6.2. Detached positions (DPs) acquired during shoreline verification were recorded and S-57 attributed in CARIS Notebook. These indicate revisions to features and features not found in the provided CSF. In addition, annotations describing shoreline were recorded on the hard copy plots of the CSF as described above.

All shoreline data is submitted in CARIS Notebook HOB files. The session H12081_Notebook contains the following:

HOB File	Purpose and Contents
H12081_Composite_Source.hob	Original Source Data as provided for project OPR-P184-RA-09 and filtered to the limits of survey H12081.
H12081_Reference.hob	Survey outline and limit lines, and AWOIS item positions and radii.
H12081_Final_Features.hob	Composite source data modified by the field to best represent the shoreline at survey scale. This includes the addition of new features and modification of source features. This file retains all features neither verified nor disproved by this survey.
H12081_Disprovals.hob	Composite source items that were deleted or modified in position or geographic type.

Table 10: List and Description of Notebook HOB files

Source Shoreline Changes and New Features

Significant kelp growth was present on the south side of Wosnesenski Island that prevented near-shore acquisition. A buffer was established outside the area foul with kelp. This buffer is depicted in the H12081_Final_Features.hob file. The Hydrographer recommends charting these foul kelp areas as defined in the H12081_Final_Features.hob file.²⁰

Chart 16549 notes breakers within the intertidal zone at the southwestern corner of Wosnesenski Island. Multiple rocks and breakers were noted in agreement with the CSF during shoreline acquisition. The Hydrographer recommends charting rocks and breakers per H12081_Final_Features.hob.²¹

Recommendations

The Hydrographer recommends that the shoreline as depicted in the Notebook HOB files supersede and complement shoreline information compiled on the composite source file and charts as described above.²²

D.2.b. Prior Survey Comparison

Prior survey comparison was not performed.

D.2.c. Aids to Navigation

No Aids to Navigation were located within the survey limits of H12081.²³

D.2.d. Overhead Features

There are no overhead features within the limits of survey H12081.²⁴

D.2.e. Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of H12081, and none were detected by the survey.²⁵

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H12081, and none were observed to be operating in the area.²⁶

D.2.g. Bottom Samples

Fourteen (14) bottom samples were acquired in the eastern half of survey area H12081.²⁷ These samples were placed over uncharted areas. All bottom samples have been included in the H12081_Final_Features.hob file in the CARIS Notebook session.

Due to time constraints, no bottom samples were taken near-shore due to the rocky nature of the seafloor seen in the bathymetry.

D.2.h. Other Findings

There were no other findings for survey H12081.

E. APPROVAL

As Chief of Party, field operations for hydrographic survey H12081 were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports. The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual (April 2009 edition), Field Procedures Manual (April 2009 edition), Standing and Project Instructions, and all HSD Technical Directives issued through July 2009. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Hydrographic Systems Readiness Review Package	<i>Under separate cover</i>	N/CS34
Data Acquisition and Processing Report for OPR-P184-RA-09	January 12, 2010	N/CS34
Coast Pilot Report for OPR- P184-RA-09	<i>To be submitted</i>	N/CS26
Tides and Water Levels Package for OPR-P184-RA-09	July 31, 2009	N/OPS1

Approved and Forwarded:



Donald W. Haines, CAPT/NOAA
I am approving this document
2010.01.19 07:54:40 -08'00'

Captain Donald W. Haines, NOAA
Commanding Officer, NOAA Ship *Rainier*

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

Survey Sheet Manager:



Christine L. Schultz
I am the author of this document
2010.01.14 17:09:57 -08'00'

Lieutenant (junior grade) Christine L. Schultz, NOAA
Junior Officer, NOAA Ship *Rainier*

Chief Survey Technician:



James B Jacobson
I have reviewed this document
2010.01.14 16:08:50 Z

James B. Jacobson
Chief Survey Technician, NOAA Ship *Rainier*

Field Operations Officer:



Brent Pounds
I have reviewed this document
2010.01.14 07:11:05 -09'00'

Lieutenant Brent J. Pounds, NOAA
Field Operations Officer, NOAA Ship *Rainier*

Revisions and Corrections Compiled During Office Processing and Certification

¹ Concur.

² Concur.

³ The very nearshore areas are covered by a new foul area delineated by the field and therefore no very nearshore soundings were selected for charting.

⁴ A common junction was made with H12077, H12078, H12079, and H12080, all of which have already been compiled.

⁵ Concur.

⁶ After rejecting the outer beams on data exhibiting sound speed errors, the remaining data is adequate to supersede charted data in the common area.

⁷ Concur with clarification. Chart foul areas as depicted in the HCell.

⁸ Concur. The holidays were examined and no navigationally significant features were discovered based on the data surrounding the holidays. The larger holidays have been preserved in the HCell and depths should be charted as depicted in the HCell.

⁹ Concur.

¹⁰ See attached Tide Note dated September 3, 2009.

¹¹ Concur.

¹² Chart depths as depicted in the HCell.

¹³ Chart depths as depicted in the HCell.

¹⁴ Concur.

¹⁵ Concur with clarification. Chart foul areas as depicted in the HCell.

¹⁶ Concur with clarification. Recommend that chart 16549 be updated based the appearance of 16551 and update foul areas as depicted in the HCell. Update charted coastline based on the latest available GC shoreline.

¹⁷ Concur.

¹⁸ Concur.

¹⁹ Both reported DTONs have been applied to the charts and both are included in the HCell.

²⁰ Chart foul areas as depicted in the HCell.

²¹ Do not concur. The latest editions of charts 16549 and 16551 used for compilation show no indication of breakers within the survey area. Additionally, there were no features or notes indicating the presence of breakers in the submitted feature file. Chart foul areas as depicted in the HCell.

²² Concur with clarification. The submitted hob files were used in the compilation of HCell H12081. During compilation, some modifications were made to accommodate chart scale. Chart features as depicted in the HCell.

²³ Concur.

²⁴ Concur.

²⁵ Concur.

²⁶ Concur.

²⁷ Eleven bottom samples are included in the HCell. Three bottom samples were excluded because they fell within rocky seabed areas that were delineated during compilation. Four charted bottom samples have been blue noted to be removed.

H12081 Danger to Navigation Report

Registry Number: H12081
State: Alaska
Locality: Pavlof Islands
Sub-locality: South of Wosneseneski Island
Project Number: OPR-P184-RA-09
Survey Dates: 07/08/2009 - 07/16/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16551	10th	04/01/2008	1:80,000 (16551_1)	NGA NTM: None (04/11/2009) USCG LNM: None (04/07/2009) CHS NTM: None (03/27/2009)
16549	15th	07/01/2003	1:80,000 (16549_1)	[L]NTM: ?
16540	12th	01/01/2005	1:300,000 (16540_1)	[L]NTM: ?
16011	37th	11/01/2007	1:1,023,188 (16011_1)	[L]NTM: ?
16006	35th	04/01/2008	1:1,534,076 (16006_1)	[L]NTM: ?
513	7th	06/01/2004	1:3,500,000 (513_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Rock	11.38 m	55° 08' 55.9" N	161° 21' 01.5" W
1.2	Rock	10.58 m	55° 09' 30.0" N	161° 29' 57.1" W

1 - Danger To Navigation

1.1) Profile/Beam - 126/4 from h12081 / 2803_reson7125_hf_512 / 2009-189 / 003_2013**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 55° 08' 55.9" N, 161° 21' 01.5" W
Least Depth: 11.38 m (= 37.32 ft = 6.220 fm = 6 fm 1.32 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.968 m ; **TVU (TPEv)** ± 0.277 m
Timestamp: 2009-189.20:13:58.736 (07/08/2009)
Survey Line: h12081 / 2803_reson7125_hf_512 / 2009-189 / 003_2013
Profile/Beam: 126/4
Charts Affected: 16549_1, 16551_1, 16540_1, 16011_1, 16006_1, 500_1, 513_1, 530_1, 50_1

Remarks:

Dangerous rock outcropping.

Hydrographer Recommendations

Chart DtoN based on position and attribution in this report.

Cartographically-Rounded Depth (Affected Charts):

6 ¼fm (16549_1, 16551_1, 16540_1, 16011_1, 16006_1, 530_1)

11.4m (500_1, 513_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20090718
SORIND - US,US,nsurf,H12081
VALSOU - 11.376 m
WATLEV - 3:always under water/submerged

Feature Images

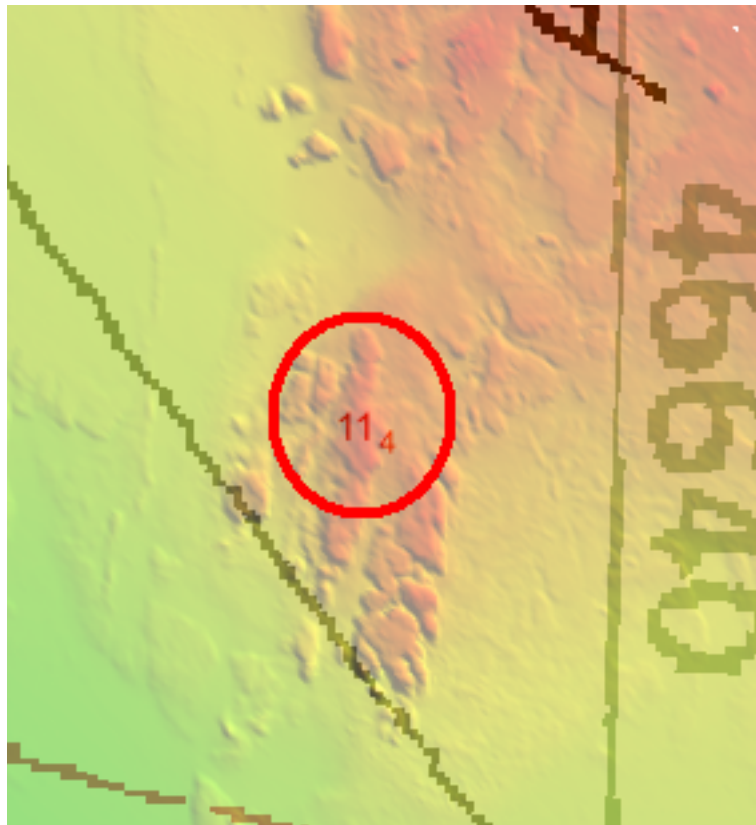


Figure 1.1.1

1.2) Profile/Beam - 507/285 from h12081 / 2804_reson7125_hf_512 / 2009-197 / 000_2156

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 09' 30.0" N, 161° 29' 57.1" W
Least Depth: 10.58 m (= 34.71 ft = 5.785 fm = 5 fm 4.71 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.961 m ; TVU (TPEv) ± 0.265 m
Timestamp: 2009-197.21:57:42.572 (07/16/2009)
Survey Line: h12081 / 2804_reson7125_hf_512 / 2009-197 / 000_2156
Profile/Beam: 507/285
Charts Affected: 16549_1, 16551_1, 16540_1, 16011_1, 16006_1, 500_1, 513_1, 530_1, 50_1

Remarks:

Dangerous rock outcropping.

Hydrographer Recommendations

Chart DtoN based on position and attribution in this report.

Cartographically-Rounded Depth (Affected Charts):

5 $\frac{3}{4}$ fm (16549_1, 16551_1, 16540_1, 16011_1, 16006_1, 530_1)

10.6m (500_1, 513_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20090718
SORIND - US,US,nsurf,H12081
VALSOU - 10.580 m
WATLEV - 3:always under water/submerged

Feature Images

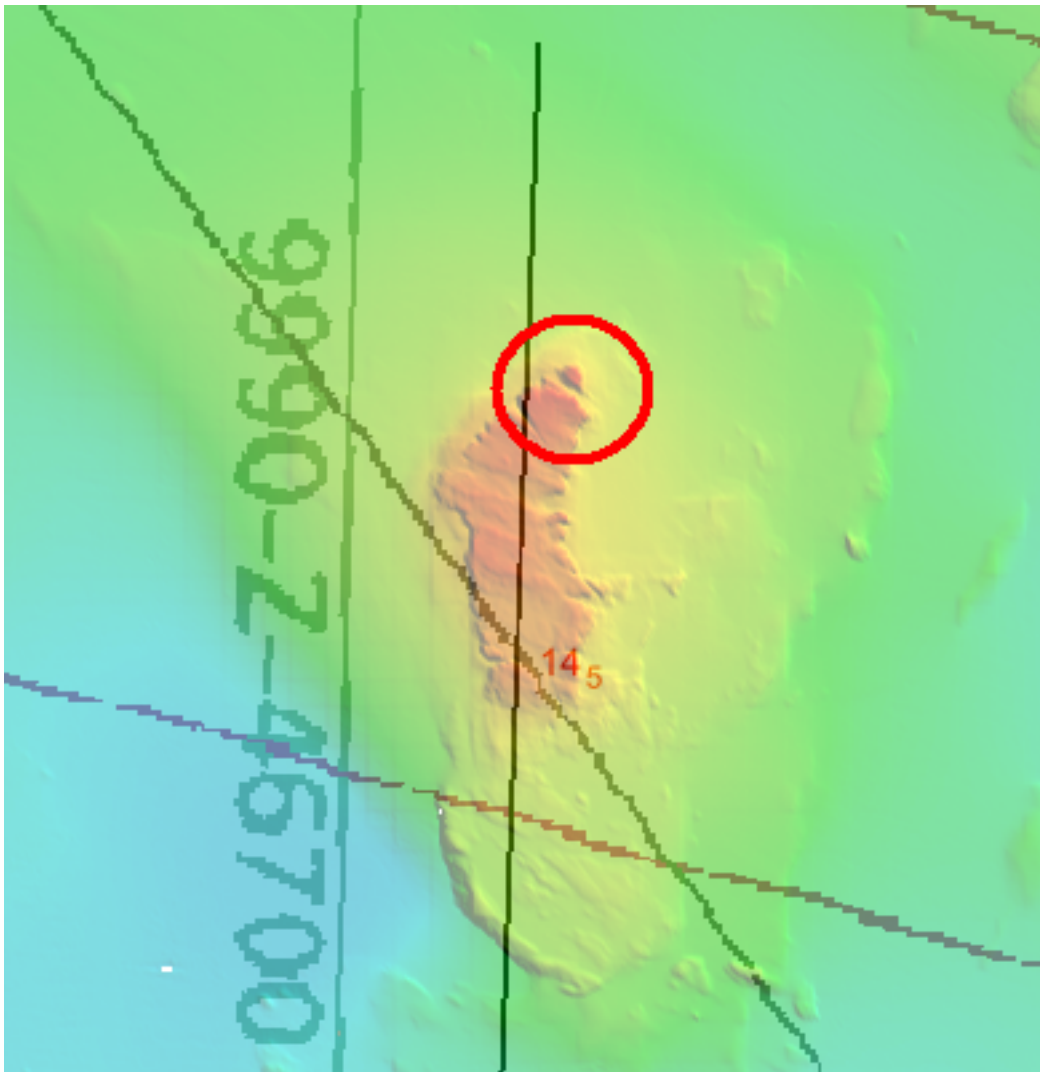


Figure 1.2.1



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : September 3, 2009

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P184-RA-2009
HYDROGRAPHIC SHEET: H12081

LOCALITY: South of Wosneseneski Island, AK
TIME PERIOD: June 19 - July 19, 2009

TIDE STATION USED: 945-9450 Sand Point, AK
Lat. 55° 19.9'N Long. 160° 30.3' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.988 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SWA205

Refer to attachments for zoning information.

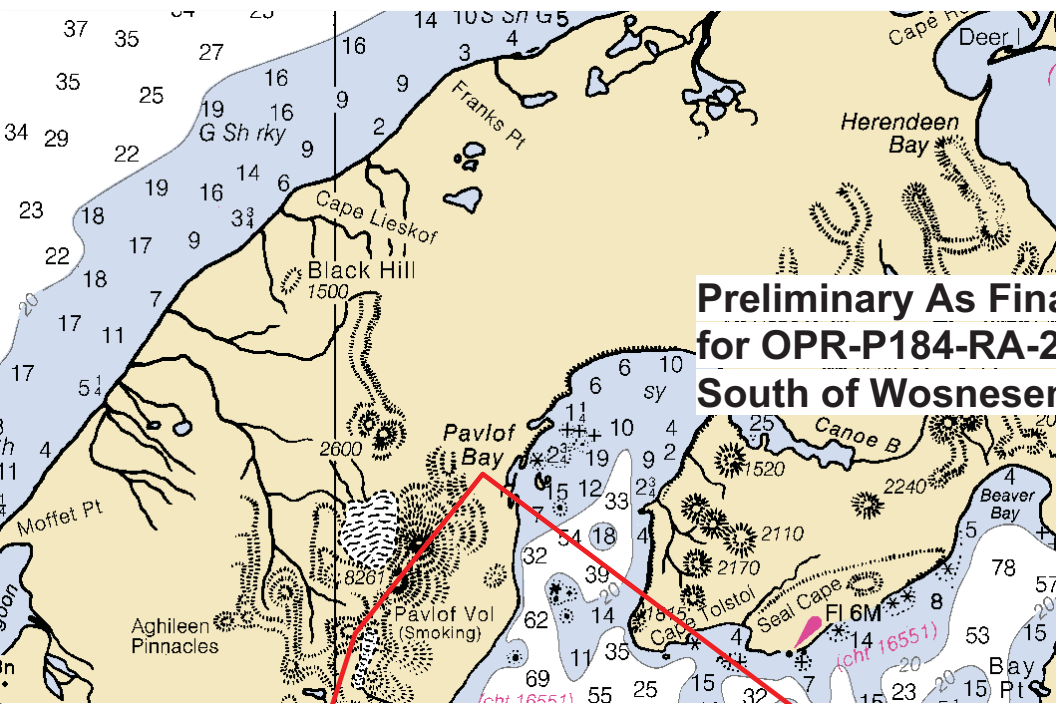
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Peter J. Stone

Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/
NOS, email=peter.stone@noaa.gov, c=US
Date: 2009.09.11 15:37:59 -04'00'

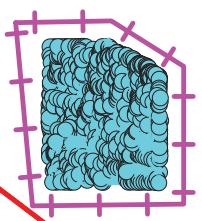
CHIEF, OCEANOGRAPHIC DIVISION





**Preliminary As Final Tidal Zoning
for OPR-P184-RA-2009 H12081
South of Wosnesneski Island, AK**


945-9450 SAND POINT



**SWA205
Time Corrector 0 mins.
Range Corrector x0.94
Reference 945-9450**

H12081 HCell Report
Katie Reser, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H12081 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March, 2010.
HCell Reference Guide: Version 2.0, 22 February, 2010.

2. Compilation Scale

Depths and features for HCell H12081 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16549	1:80,000	16 th	03/01/2010	05/22/2010
16551	1:80,000	10 th	04/01/2008	09/11/2010

The following ENC's were also used during compilation:

Chart	Scale
US4AK55M	1:80,000

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from a 4-meter multibeam combined surface in CARIS BASE Editor. A shoal-biased selection was made at 1:15,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
-5	10	3
10	20	4
20	50	4.5
50	500	5

In CARIS BASE Editor soundings were manually selected from the high density sounding layers (SS) and imported into a new layer (CS) created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology.

4. Depth Contours

Depth contours at the intervals on the largest scale chart are included in the *_SS HCell for MCD raster charting division to use for guidance in creating chart contours. The metric and fathom equivalent contour values are shown in the table below.

Chart Contour Intervals in Fathoms	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on H12081_SS.000
0	0.0000	0.2286	0.125	0
3	5.4864	5.715	3.125	3
5	9.144	9.373	5.125	5
10	18.288	18.517	10.125	10
20	36.576	37.948	20.750	20
30	54.864	56.2356	30.750	30
40	73.152	74.5236	40.750	40
50	91.44	92.8116	50.750	50

With the exception of zero contours included in the *_CS file, contours have not been de-conflicted against shoreline features, soundings and hydrography, as all other features in the *_CS file and soundings in the *_SS have been. This may result in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_QUAL, COALNE, DEPCNT and SBDARE objects should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

5. Meta Areas

The following Meta object areas are included in HCell H12081:

M_QUAL

The Meta area objects were constructed on the basis of the limits of the hydrography.

6. Features

Features addressed by the field units are delivered to PHB where they are de-conflicted against the hydrography and the largest scale chart. These features, as well as features to be retained from the chart and features digitized from the Base Surface, are included in the HCell. The geometry of these features may be modified to emulate chart scale per the HCell Reference Guide on compiling features to the chart scale HCell.

7. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue notes
COALNE	GC coastline
DEPCNT	Zero contours
LNDARE	Islets and islands
LNDELV	Heights on islets/islands
M_QUAL	Data quality meta object
OBSTRN	Obstruction areas
SBDARE	Ledges, reefs, rocky seabed areas and bottom samples
SOUNDG	Soundings at the chart scale density
UWTROC	Rocks

The *_SS HCell contains the following Objects:

DEPCNT	Generalized contours at chart scale intervals
SOUNDG	Soundings at the survey scale density

8. Spatial Framework

8.1 Coordinate System

All spatial map and base cell file deliverables are in an LLDG geographic coordinate system, with WGS84 horizontal, MHW vertical, and MLLW (1983-2001 NTDE) sounding datums.

8.2 Horizontal and Vertical Units

DUNI, HUNI and PUNI are used to define units for depth, height and horizontal position in the chart units HCell, as shown below.

Chart Unit Base Cell Units:

Depth Units (DUNI):	Fathoms and feet
Height Units (HUNI):	Feet
Positional Units (PUNI):	Meters

During creation of the HCell in CARIS BASE Editor and CARIS S-57 Composer, all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, so precision is less. Units and precision are shown below.

BASE Editor and S-57 Composer Units:

Sounding Units:	Meters rounded to the nearest millimeter
Spot Height Units:	Meters rounded to the nearest decimeter

See the HCell Reference Guide for details of conversion from metric to charting units, and application of NOAA rounding.

9. Data Processing Notes

There were no significant deviations from the standards and protocols given in the HCell Specification and HCell Reference Guide.

10. QA/QC and ENC Validation Checks

H12081 was subjected to QA checks in S-57 Composer prior to exporting to the metric HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to chart units and NOAA rounding applied. dKart Inspector was then used to further check the data set for conformity with the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and warnings and errors investigated and corrected unless they are MCD approved as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

H12081_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:80,000
H12081 _SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:15,000
H12081 _DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H12081 _Outline.gml	Survey outline
H12081 _Outline.xsd	Survey outline

11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.2	Creation of soundings and bathy-derived features, meta area objects, and blue notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.0	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.
Northport Systems, Inc., Fugawi Marine ENC Ver.3.1.0.435	Independent inspection of final HCells using a COTS viewer.

12. Contacts

Inquiries regarding this HCell content or construction should be directed to:

Katie Reser
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206-526-6864
katie.reser@noaa.gov

APPROVAL SHEET
H12081

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell compiled per the latest OCS HCell Specifications.

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disproval of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

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