

H11366

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-10-17-04**

Registry No. **H-11366**

LOCALITY

State **Alaska**

General Locality **Eastern Prince William Sound**

Sublocality **Vicinity of Bligh Reef**

.....
2004
.....

CHIEF OF PARTY
.....
CDR John W. Humphrey, NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET**H-11366**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 10-17-04State AlaskaGeneral Locality Eastern Prince William SoundSublocality Vicinity of Bligh ReefScale 1:10,000Date of Survey 9/09/2004 - 9/13/2004Instructions Date 7/20/2004Project No. OPR-P132-RA-04Vessel RA4 (1016), RA5 (1006), RA6 (1015)Chief of Party Commander John W. Humphrey, NOAASurveyed by Rainier PersonnelSeabeam/Elac 1180Soundings taken by echo sounder, hand lead, pole Reson SeaBat 8101, 8125Graphic record scaled by RAINIER PERSONNELGraphic record checked by RAINIER PERSONNELEvaluation by R. Shipley Automated plot by HP Design Jet 1050CVerification by E. Domingo, R. ShipleySoundings in Fathoms at MLLWREMARKS: All times are UTC.**Revisions and annotations appearing as endnotes were****generated during office processing.****As a result, page numbering may be interrupted or non-sequential.****All separates are filed with the hydrographic data.****All depths listed in this report are referenced to MLLW unless****otherwise noted. UTM Projection (zone 6).**

Descriptive Report to Accompany Hydrographic Survey H11366

Project OPR-P132-RA-04
Eastern Prince William Sound, AK

Scale 1:10,000

August – September 2004

NOAA Ship RAINIER

Chief of Party: Commander John W. Humphrey, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P132-RA-04, dated July 20, 2004, Draft Standing Project Instructions dated March 21, 2001, and NOS Hydrographic Specifications and Deliverables dated March 2003. The survey area is the vicinity of Bligh Reef in Eastern Prince William Sound. This survey corresponds to sheet D in the sheet layout provided with the Letter Instructions.

One hundred percent shallow-water multibeam (SWMB) coverage was obtained in the survey area in waters 8 meters and deeper. In 4-8 meters of water 100% SWMB coverage was obtained as much as possible and to acquire least depths over significant features or shoals, as appropriate for this survey.¹

Data acquisition was conducted from September 9 to September 13, 2004 (DN 253 to DN 257).

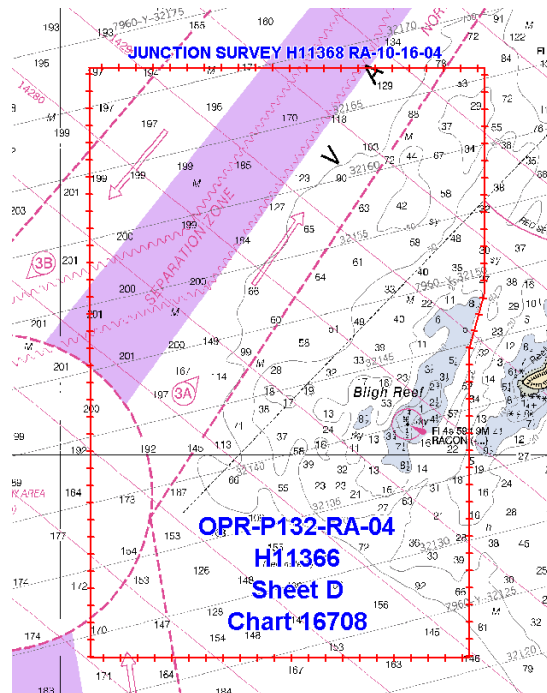


Figure 1. H11366 Survey Limits and Junctions

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-P132-RA-04 Data Acquisition and Processing Report (DAPR)*,² submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.

B1. Equipment and Vessels

Data were acquired by launches 1006 (RA5), 1016 (RA4), and 1015 (RA6). Launches 1006, 1016, and 1015 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles.

No unusual vessel configurations were used for data acquisition.³

B2. Quality Control

Crosslines

Shallow-Water Multibeam (SWMB) crosslines totaled 17.03 nautical miles, comprising 7.84% of SWMB hydrography. The mainscheme bathymetry was manually compared to the XL nadir beams in CARIS subset mode and agreed well with differences no greater than a tenth of a meter.

A statistical Quality Control Report was generated for RESON SWMB data acquired on the Lake Washington Reference Surface at the start of the season to validate launch offsets and sonar biases. A copy of this report is included in the OPR-P132-RA-04 DAPR.

A Quality Control Report was conducted using Pydro 4.9.0, and is submitted digitally in the quality control folder. This report is not submitted as a hard copy with this report due to its size (58 pages). The report was generated using checkpoints created at the intersections of mainscheme lines and crosslines surveyed by the same boat and system in survey areas of locally homogeneous seafloor. A total of 13 checkpoints were created in areas surveyed using Reson 8125 on RA4 (1016), Elac on RA6 (1015), and Elac on RA4 (1016). All checkpoint comparisons passed IHO Order One depth accuracy standards save a few beams on checkpoint numbers 11, 12, and 13. These three checkpoints do not indicate a systematic problem with any specific beams or systems, and can be attributed to areas of dynamic seafloor.

Through manual examination of the data and statistical analysis of data accuracy standards for this survey have been met.⁴

Junctions

The following contemporary survey junctions with H11366 (see Figure 1):

| <u>Registry #</u> | <u>Scale</u> | <u>Date</u> | <u>Junction side</u> |
|-------------------|--------------|-------------|----------------------|
| H11368 | 1:10,000 | 2004 | Northern |

A cursory junction comparison between H11368 and H11366 indicates differences are generally less than one-half fathom.

Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after the application of smooth tides.⁵

Data Quality Factors

Due to melting glacial ice, river runoff, and the effects of tidal currents, a sharp demarcation of water masses was often observed in Prince William Sound. This proved to be problematic in the acquisition and application of sound velocity correctors. After sound velocity correctors were applied, some lines still exhibited the characteristic "smiles" and "frowns" indicative of inaccurate sound velocity corrections.

Reson 8125 data collected with RA4 (1016) on DN 253 and Elac data collected with RA4 (1016) on DN 254 were affected by this SV problem. In an attempt to correct this problem, nearest-in-distance SVP correctors were applied to the affected data. When this action failed to solve the problem, previous-in-time SVP correctors were reapplied. Figure 2 is screen grab of representative data.

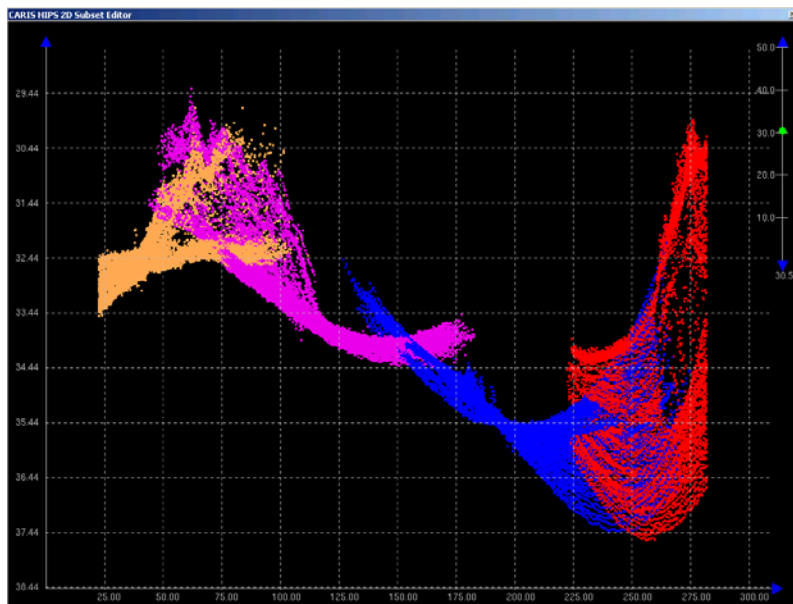


Figure 2. Reson 8125 data collected on RA4 (1016) on DN 253

Sound velocity “smiles” and some tidal offsets are apparent in data collected on DN 254 by RA5 (1006) in the shoal area east of Bligh Reef. Figure 3 is a screen grab of the data shown in 2-D subset mode in Caris HIPS and SIPS. The vertical discrepancy is thought to be the result of a local tide change over Bligh Reef, which is a shoal area surrounded by relatively deep water.

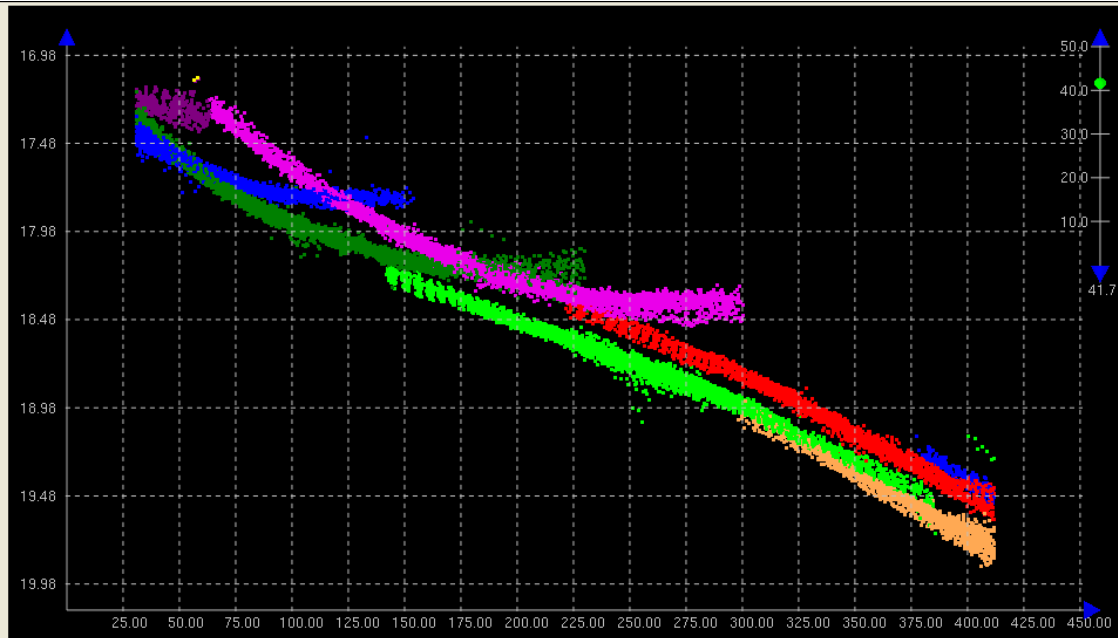


Figure 3. Lines 260-265 ran on DN 254 with RA5 (1006)

Data that did not meet IHO Order I accuracy standards were identified using the standard deviation base surface in Caris 5.4 and were manually rejected.

B3. Data Reduction

Data reduction procedures for survey H11366 conform to those detailed in the OPR-P132-RA-04 DAPR.

C. VERTICAL AND HORIZONTAL CONTROL

A summary of horizontal and vertical control for this survey follows.⁶

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. Differential corrections from U.S. Coast Guard beacon at Potato Point (298 kHz) were utilized during this survey. Launch-to-launch DGPS performance checks using U.S. Coast Guard beacon at Cape Hinchinbrook (292 kHz) as the check station were performed in accordance with Section 3.2 of the FPM.

Copies of the performance checks are included in the Supplemental Correspondence Section of this descriptive report.

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 Valdez, AK (945-4240) served as control for datum determination and as the primary source for water level reducers for survey H11366.

An historical tide station 945-4429 Point Freemantle, AK was not installed according to the *Survey Letter Instructions* since no hydrographic work was done in that area this year. After being informed by the *Center for Operational Oceanographic Products and Services* (CO-OPS) that data was not currently needed from the historical tide station 945-4346 Ellamar, Tatitlek Narrows, AK, a command decision was made not to install a gauge at that location. A gauge was installed on Busby Island (945-4374) for the purpose of providing practice to new crewmembers. The data from this tide gauge was not utilized for this survey.

All data were reduced to MLLW using unverified observed tides from station 945-4240, Valdez, AK (in accordance with the *Hydrographic Survey Letter Instructions*) using the tide file 9454240.tid and time and height correctors using the zone corrector file P132RA2004CORP.zdf.

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing. A request for delivery of final approved (smooth) tides for survey H11366 was forwarded to N/OPS1 on September 14, 2004. A copy of the request is included in Appendix IV.⁷

D. RESULTS AND RECOMMENDATIONS

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

No AWOIS items were located within the limits of H11366.⁸

D.2 Chart Comparisons

Survey H11366 was compared with charts 16700 (29th Ed.; July/04, LNM: 6/29/04, 1:200,000), 16707 (11th Ed.; Sept/04 LNM: 8/24/04, 1:40,000), and 16708 (26th Ed.; Oct/04, LNM 9/14/04, 1:80,000).

Chart 16700

Depths from survey H11366 in the northwest traffic lanes and the southern end of the sheet are generally three to eight fathoms shoaler than depths on chart 16700. In the shoal area of Bligh Reef, depths are generally in agreement or are one to two fathoms deeper than charted

on 16700. The extent of Bligh Reef shoal is charted 200-300 meters to the east of its actual position.

Chart 16707

Depths in the northwest of survey H11366, in the area of the traffic lanes, are in agreement with depths from chart 16700 within five fathoms. There are no notable differences between the surveyed depths and 16707-charted depths in the northeast area of the survey over the northern extent of Bligh Reef shoal.

Chart 16708

Depths from survey H11366 in the northwest traffic lanes and the southern end of the sheet are generally one to five fathoms shoaler than depths on chart 16708. In the shoal area of Bligh Reef, depths are generally in agreement or are one-half to one fathoms deeper than charted on 16708. The extents of Bligh Reef shoal appear to be correctly charted.

Data accuracy standards and bottom coverage requirements have been met and survey data are adequate to supersede charted data in their common areas, with the following exceptions:

Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.⁹

D.4 Dangers to Navigation

No DTONS were identified in H11366.¹⁰

D.5 Aids to Navigation

One ATON is included in survey H11366. A detached position taken during survey operations placed Bligh Reef Light (Light List #25662) in position 60°50'20.451" N, 146°53'02.300" W, 350 meters southwest of its 16700-charted position, but in agreement with its 16708-charted position.¹¹

D.6 Miscellaneous

Bottom samples were not collected during H11366.¹²

E. APPROVAL

As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fourth Edition, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2003.

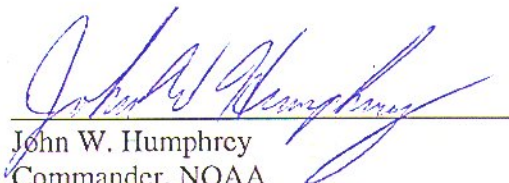
The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Survey H11366 is complete and adequate to supersede charted soundings¹³ in their common areas. No additional work is required for this survey.¹⁴

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> |
|---|------------------|---------------|
| Data Acquisition and Processing Report for OPR-P132-RA-04 | Feb. 16, 2005 | N/CS34 |
| Tides and Water Levels Package for OPR-P132-RA-04 | Feb. 15, 2005 | N/OPS1 |
| Coast Pilot Report for OPR-P132-RA-04 | Feb. 15, 2005 | N/CS26 |

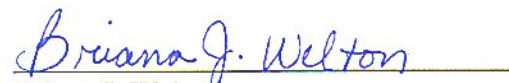
Approved and Forwarded:



 John W. Humphrey
 Commander, NOAA
 Commanding Officer

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

Survey Sheet Manager:



 Briana J. Welton
 Ensign, NOAA

Field Operations Officer:



 Kevin J. Slover
 Lieutenant, NOAA

Revisions Compiled During Office Processing and Certification

¹ Concur.

² Filed with the Project Records.

³ Concur.

⁴ Concur.

⁵ Concur with clarification. Junction comparisons were made with H11368 during office processing. Sounding and depth curves are in good agreement and a "Joins" note has been added to the smooth sheets.

⁶ A complete description of vertical and horizontal control for survey H11366 can be found in the OPR-P132-RA-04 *Horizontal and Vertical Control Report* filed with the Project Records.

⁷ Appendix IV is filed with the hydrographic records. Approved Tide Note dated May 9, 2005 is attached.

⁸ Concur.

⁹ During office processing, survey H11366 was compared to chart 16707 (12th Ed., Dec 01, 2005) and chart 16708 (27th Ed., July, 2006, 1:40,000 Inset). Concur with hydrographer's comments above.

¹⁰ Concur.

¹¹ Concur. The evaluator recommends charting using latest ATONIS information.

¹² Concur. Charted bottom samples were retained on the Hdrawing.

¹³ Insert "and features"

¹⁴ Concur with hydrographer's statements.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : May 9th, 2005

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-P139-TC-2004 OPR-P182-BA-04

HYDROGRAPHIC SHEET: H11366

LOCALITY: Vicinity of Bligh Reef, Prince William Sound, AK

TIME PERIOD: September 9 - 13, 2004

TIDE STATION USED: 945-4374 Busby Island, AK

Lat. 60 53.9'N Long. 146 46.9' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.360 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: PWS64, PWS67 & PWS72

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).

Thomas N. Mero 5/16/05

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Final Tidal Zoning for OPR-P132-RA-2004 Eastern Prince William Sound - Sheet H11366

LOBB LINE INTERPOLATOR

GENERAL EXPLANATION

LOBB LINE INTERPOLATOR: This chart uses the Lobb Line Interpolator to show tidal zones. The Lobb Line Interpolator is a method of interpolating between high and low water marks to determine the position of the tidal zone. It is based on the assumption that the tidal zone is a straight line between high and low water marks. The Lobb Line Interpolator is used to determine the position of the tidal zone at any given time. The Lobb Line Interpolator is used to determine the position of the tidal zone at any given time.

NOTES ON THIS CHART

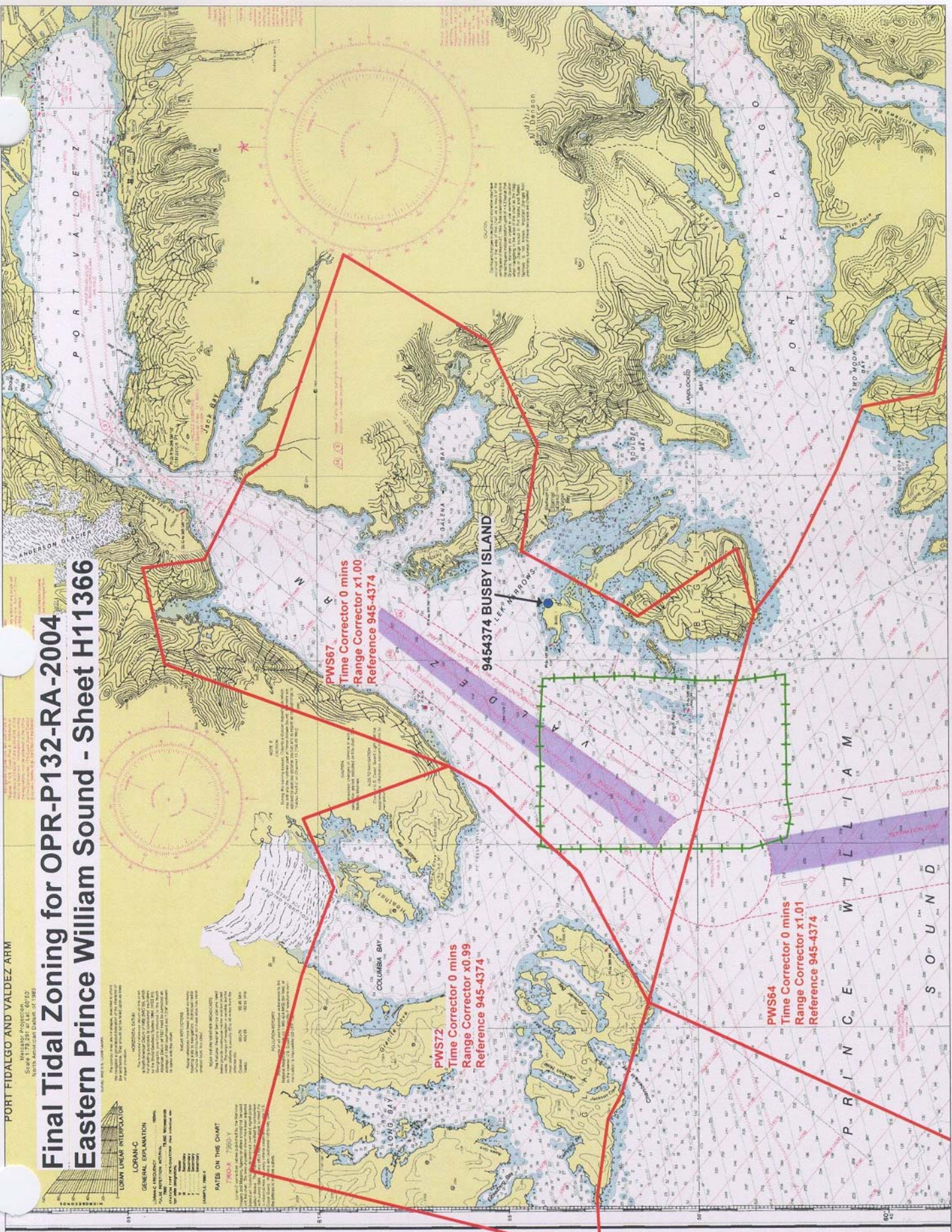
1. This chart is based on the Lobb Line Interpolator. The Lobb Line Interpolator is a method of interpolating between high and low water marks to determine the position of the tidal zone. It is based on the assumption that the tidal zone is a straight line between high and low water marks. The Lobb Line Interpolator is used to determine the position of the tidal zone at any given time.

PWS67
Time Corrector 0 mins
Range Corrector x1.00
Reference 945-4374

PWS72
Time Corrector 0 mins
Range Corrector x0.99
Reference 945-4374

PWS64
Time Corrector 0 mins
Range Corrector x1.01
Reference 945-4374

9454374 BUSBY ISLAND



Final tide zone node point locations for OPR-P132-RA-2004, H11366

Format: Tide Station (in recommended order of use)
 Average Time Correction (in minutes)
 Range Correction
 Longitude in decimal degrees (negative value denotes Longitude West)
 Latitude in decimal degrees

| | Tide Station Order | AVG Time Correction | Range Correction |
|-----------------------|-----------------------|------------------------|---------------------|
| Zone PWS64 | 945-4374 | 0 | 1.01 |
| -147.330451 60.530561 | | | |
| -147.324012 60.665001 | | | |
| -147.1433 60.855198 | | | |
| -146.791093 60.808252 | | | |
| -146.747107 60.792346 | | | |
| -146.660189 60.771173 | | | |
| -146.604574 60.759989 | | | |
| -146.592277 60.728034 | | | |
| -146.45573 60.714099 | | | |
| -146.484047 60.676438 | | | |
| -146.603222 60.486673 | | | |
| -146.751935 60.491074 | | | |
| -147.002014 60.497978 | | | |
| -147.183429 60.512725 | | | |
| -147.305728 60.531336 | | | |
| -147.330451 60.530561 | | | |
| Zone PWS67 | 945-4374 | 0 | 1.00 |
| -147.1433 60.855198 | | | |
| -147.025646 60.885186 | | | |
| -146.948102 60.925559 | | | |
| -146.928717 60.942475 | | | |
| -146.835761 61.066624 | | | |
| -146.749176 61.076016 | | | |
| -146.741526 61.049043 | | | |
| -146.666789 61.03092 | | | |
| -146.648105 61.018294 | | | |
| -146.465267 60.987839 | | | |
| -146.544989 60.924153 | | | |
| -146.637467 60.902731 | | | |
| -146.734514 60.910021 | | | |
| -146.76628 60.881842 | | | |
| -146.784771 60.8652 | | | |

-146.793773 60.859141
-146.732848 60.815648
-146.791093 60.808252
-147.1433 60.855198

Zone PWS72

945-4374

0

0.99

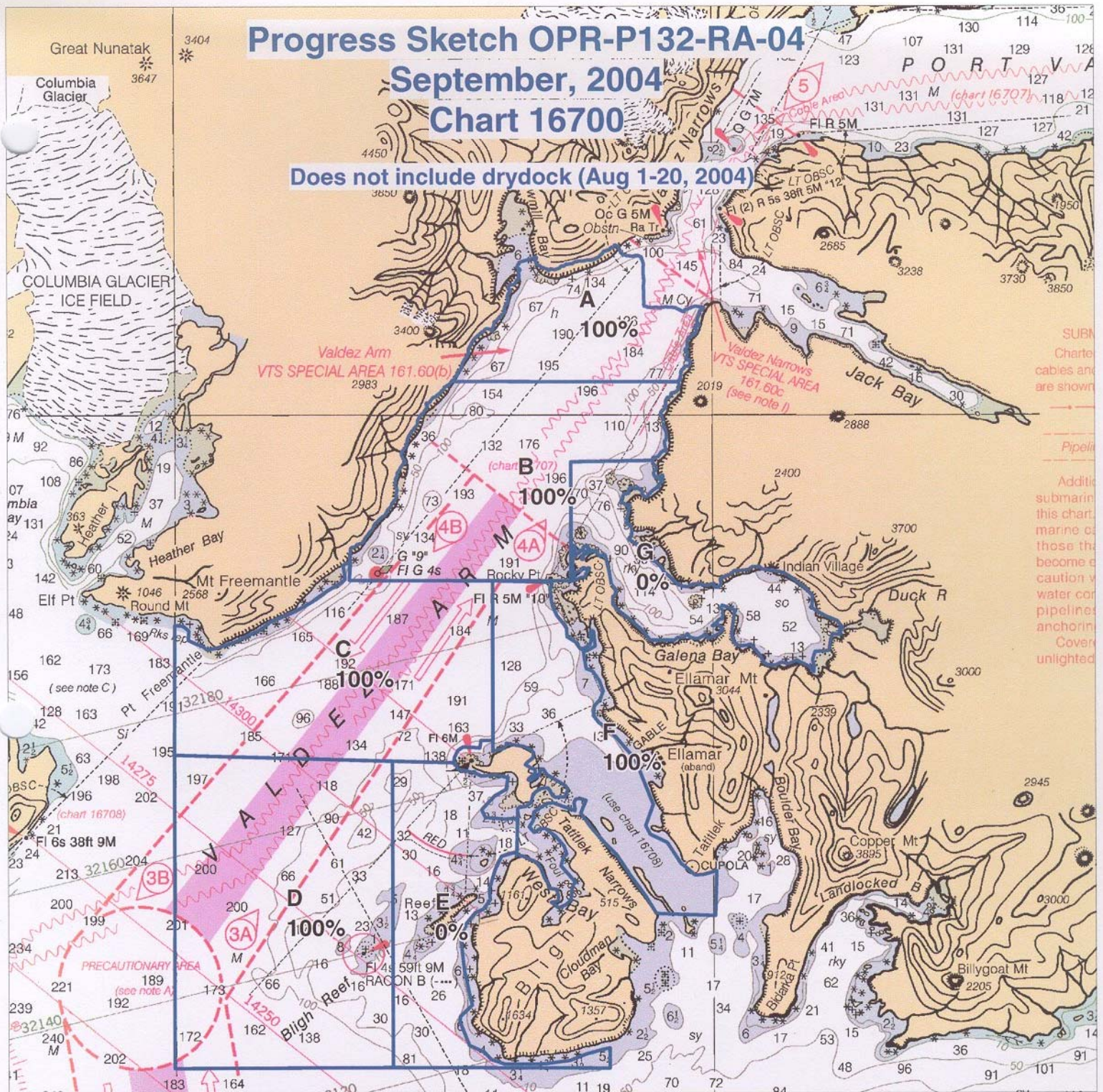
-147.373266 60.876709
-147.320454 60.878014
-147.248924 60.873126
-147.226276 60.867232
-147.1433 60.855198
-147.025646 60.885186
-146.948102 60.925559
-146.928717 60.942475
-146.976007 61.006478
-147.038628 60.993147
-147.117551 61.007309
-147.29477 61.02981
-147.373266 60.876709

Progress Sketch OPR-P132-RA-04

September, 2004

Chart 16700

Does not include drydock (Aug 1-20, 2004)




| Project | Sheet Letter | H_num | HQ_Est_SNM | CumIPercCompPrev | CumIPercCompCu | SNM_CompCurI | CumSNMcom |
|---------|--------------|--------|------------|------------------|----------------|--------------|-----------|
| P132-04 | C | H11368 | 16 | 20 | 100 | 13 | 16 |
| P132-04 | D | H11366 | 22 | 0 | 100 | 22 | 22 |
| P132-04 | E | | 9 | 0 | 0 | 0 | 0 |
| P132-04 | B | H11349 | 14 | 75 | 100 | 4 | 14 |
| P132-04 | A | H11348 | 7 | 85 | 100 | 1 | 7 |
| P132-04 | G | H11350 | 7 | 0 | 0 | 0 | 0 |
| P132-04 | F | H11351 | 10 | 65 | 100 | 4 | 10 |

| Project | Month | LNM_Hydr | LNM_MB | SV_Casts | Bottom_Samj | AWOIS_Items | Tide_Gauge_Inst | DAS | DTime equip_H | DTime_Weather_I | D_Time_other_I | Inport_H |
|----------|-----------|----------|--------|----------|-------------|-------------|-----------------|-------|---------------|-----------------|----------------|----------|
| OPR-P132 | August | 63.35 | 316.35 | 36.00 | 0.00 | 4.00 | 1.00 | 11.00 | 3.30 | 0.00 | 0.00 | 0.00 |
| OPR-P132 | September | 25.96 | 343.43 | 27.00 | 0.00 | 5.00 | 0.00 | 14.00 | 3.50 | 0.00 | 1.25 | 72.00 |

APPROVAL SHEET
H11366

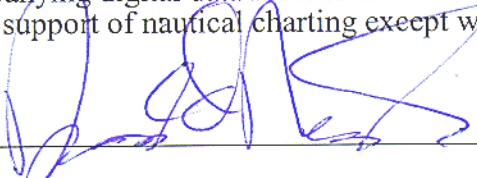
Initial Approvals:

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 disproof 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.


_____ Date: 17 March 2008

Gary Nelson
Cartographic Team Leader
Pacific Hydrographic Branch

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


_____ Date: 18 March 2008

David O. Neander
CDR, NOAA
Chief, Pacific Hydrographic Branch

