

H11317

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-10-19-04**

Registry No. **H-11317**

LOCALITY

State **Washington**

General Locality **Approaches to Puget Sound**

Sublocality **Protection Island and Dallas Bank**

.....
2004
.....

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

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET**H11317**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-10-19-04State WashingtonGeneral Locality Approaches to Puget SoundSublocality Protection Island and Dallas BankScale 1:10,000Date of Survey 11/02/2004 - 11/11/2004Instructions Date 3/23/2004Project No. OPR-N372-RA-04Vessel NOAA Ship Rainier launches (1016) & (1021)Chief of Party CDR John W. Humphrey, NOAASurveyed by RAINIER PersonnelSoundings taken by echo sounder, hand lead, pole Elac 1180, Reson SeaBat 8101Graphic record scaled by RAINIER PersonnelGraphic record checked by RAINIER PersonnelEvaluation by R.Shipley Automated plot by HP Designjet 1050CVerification by R.ShipleySoundings in Fathoms at MLLWREMARKS: All times are recorded in UTCUTM Zone 10Revisions and annotations appearing as endnotes were
generated during office processing.All separates are filed with the hydrographic dataAs a result, page numbering may be interrupted or non-sequential

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-N372-RA-04 Data Acquisition and Processing Report (DAPR)*¹, 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

SWMB data and sound velocity profiles were acquired by RAINIER survey launches 1016 and 1021. No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

SWMB cross lines totaled 9.28 nautical miles, comprising 8.95% of SWMB hydrography. The main scheme bathymetry was manually compared to the crossline nadir beams in CARIS subset mode and agreed well with differences averaging approximately 0.5 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-N372-RA-04 DAPR.

A Checkpoint Report was conducted using Pydro 4.9.0, and is submitted digitally in the Quality Control Folder, but is not submitted as a hard copy with this report due to its size. The report was generated using checkpoints created at the intersections of main scheme lines and cross lines in survey areas with homogeneous seafloor. A total of 20 checkpoints were created in surveyed area. All checkpoint comparisons passed IHO order one depth accuracy standards with the exceptions of checkpoints 3,5,7,16 and 20. Inadvertently, these checkpoint locations did not correspond with the intersection of a cross-line with reference surface, which in turn made the QC checkpoint statistical analysis unattainable.

Accuracy standards for this survey, determined through manual examination and statistical analysis of the data, have been met.²

Junctions

There were no junctions related to this survey.³

Data Quality Factors

On occasion, consecutive lines run in opposite directions were observed to be vertically offset. The average offset was ~0.2 meters in the vicinity of 48° 10' 22" N, 122° 56' 24" W

(figure 2). This area is located on the north end of the shoal north of Protection Island in approximately 19 meters of water. Upon further investigation it was determined that this offset was caused by turn induced heave in the POS/MV. The “lean” of a sharp turn as the survey launch is coming onto line results in what looks like heave to the POS MV (figure 3). These false heave values will dampen out in time, dependant upon user-defined parameters entered into the POS/MV’s settings. Under ideal circumstances a launch should steady up on line for several seconds before starting data acquisition. Unfortunately in the case with this shoal a series of sharp turns onto short lines caused this turn induced heave to become evident.⁴

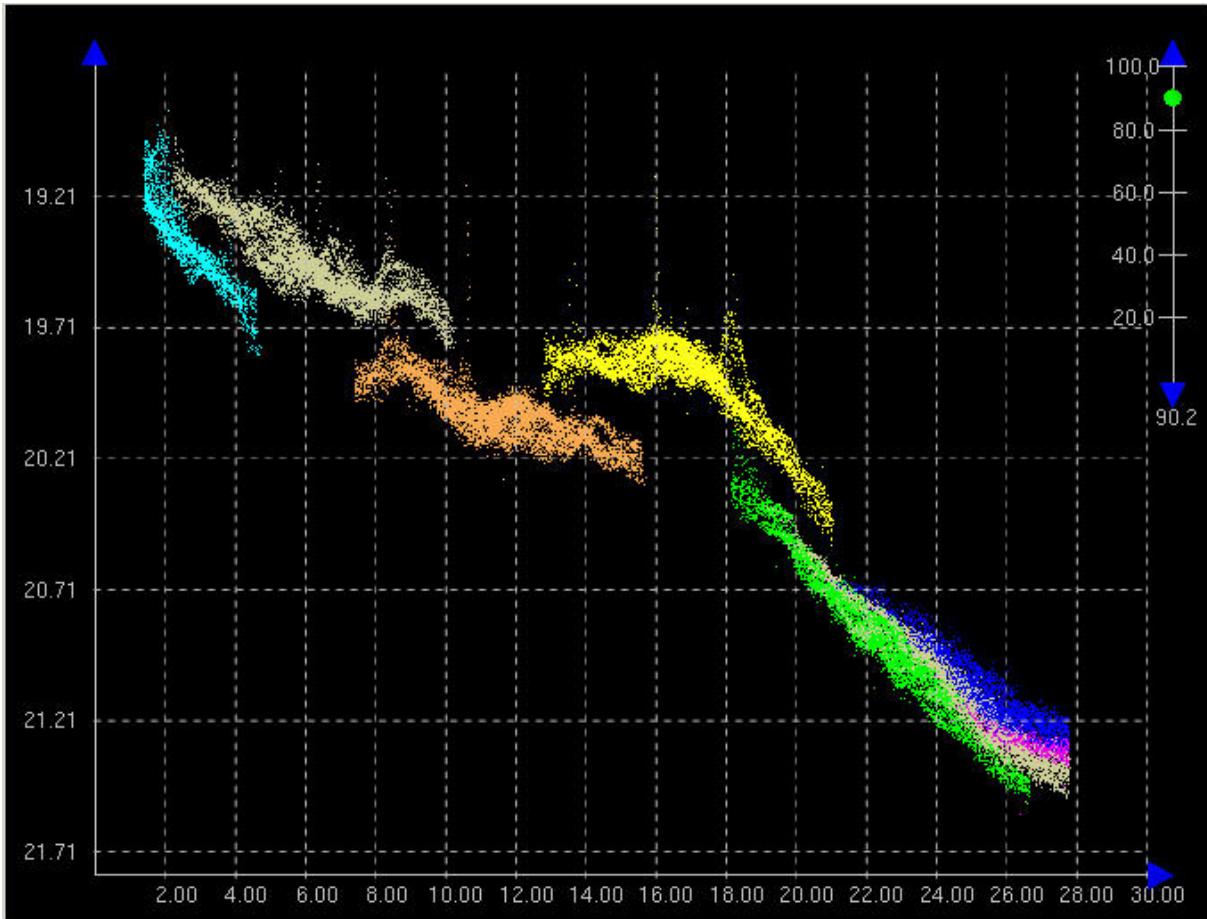


Figure 2. Data showing the minor vertical discrepancies (note alternating lines)

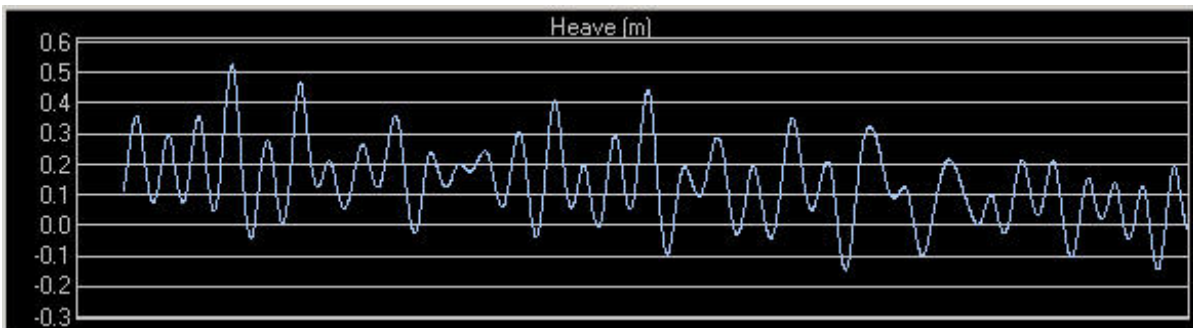


Figure 3. Attitude editor showing the minor vertical discrepancies from a above line.

B3. Data Reduction

Data reduction procedures for survey H11317 conform to those detailed in the *OPR-N372-RA-04 DAPR*.

C. VERTICAL AND HORIZONTAL CONTROL

A summary of horizontal and vertical control for this survey follows.⁵

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 Whidbey Island (302 kHz) were utilized during this survey. Launch-to-launch DGPS performance checks using U.S. Coast Guard beacon at Fort Stevens (287 kHz) as the check station were performed in accordance with Section 3.2 of the Field Procedure Manual (FPM).

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 Port Townsend, WA (944-4900), served as control for datum determination and as the primary source for water level reducers for survey H11317.

No secondary gauges were required.

All data were reduced to MLLW using unverified observed tides from station Port Townsend, WA using the tide file 9444900.tid and time and height correctors using the zone corrector file N372RA2004CORP_rev.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 H11317 was forwarded to N/OPS1 on November 24, 2004. A copy of the request is included in Appendix IV.⁶

D. RESULTS AND RECOMMENDATIONS

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

No AWOIS items were present within the survey limits for H11317.⁷

D.2 Chart Comparison

Survey H11317 was compared with chart 18471 (9th Ed.; June, 2003, 1:40,000) using the latest notice to mariners being 6/14/2003 and local notice mariners being 5/27/2003.

Chart 18471

Depths from survey H11317 agreed with charted depths for chart 18440 within one fathom with occasional differences up to three fathoms. At location 48°10'01" N 122°54'55" W; deeper depths approximately 3.2-6.5 fathoms were located along the 20-fathom contour. The depth increase can be attributed to shifting sandy bottom.

Data accuracy standards and bottom coverage requirements have been met and survey data are adequate to supersede charted data in their common areas.

Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.⁸

D.3 Shoreline

Shoreline verification was not required for survey H11317.⁹

D.4 Dangers to Navigation

No dangers to navigation (DTONs) were present in survey H11317.¹⁰

D.5 Aids to Navigation

No aids to navigation (ATONs) are located within the limits of H11317.¹¹

E. APPROVAL

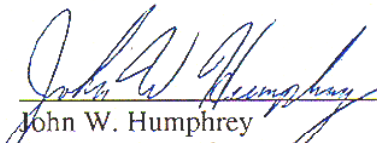
As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fourth Edition, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2004.

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.

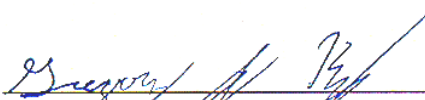
Survey H11317 is complete and adequate to supersede charted soundings in their common areas. No additional work is required for this survey.¹²

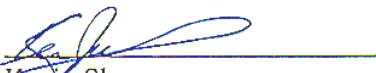
Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-N372-RA-04	11/12/2004	N/CS34

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: 
 Gregory J. King
 Hydrographic Survey Technician, NOAA

Field Operations Officer: 
 Kevin Slover
 Lieutenant, NOAA

Revisions Compiled During Office Processing and Certification

¹ Filed with the Project Records.

² Concur.

³ Concur.

⁴ A PHB review reveals the data meets IHO Order 1 specifications.

⁵ A complete description of vertical and horizontal control for survey H11317 can be found in the *OPR-N372-RA-04 Horizontal and Vertical Control Report*, filed with the Project Records.

⁶ Approved Tide Note dated April 28, 2005 is attached.

⁷ Concur.

⁸ During office processing, survey H11317 was compared to chart 18471 (10th Ed; Nov 21 2006, 1:40,000) with very good agreement.

⁹ Concur.

¹⁰ Concur.

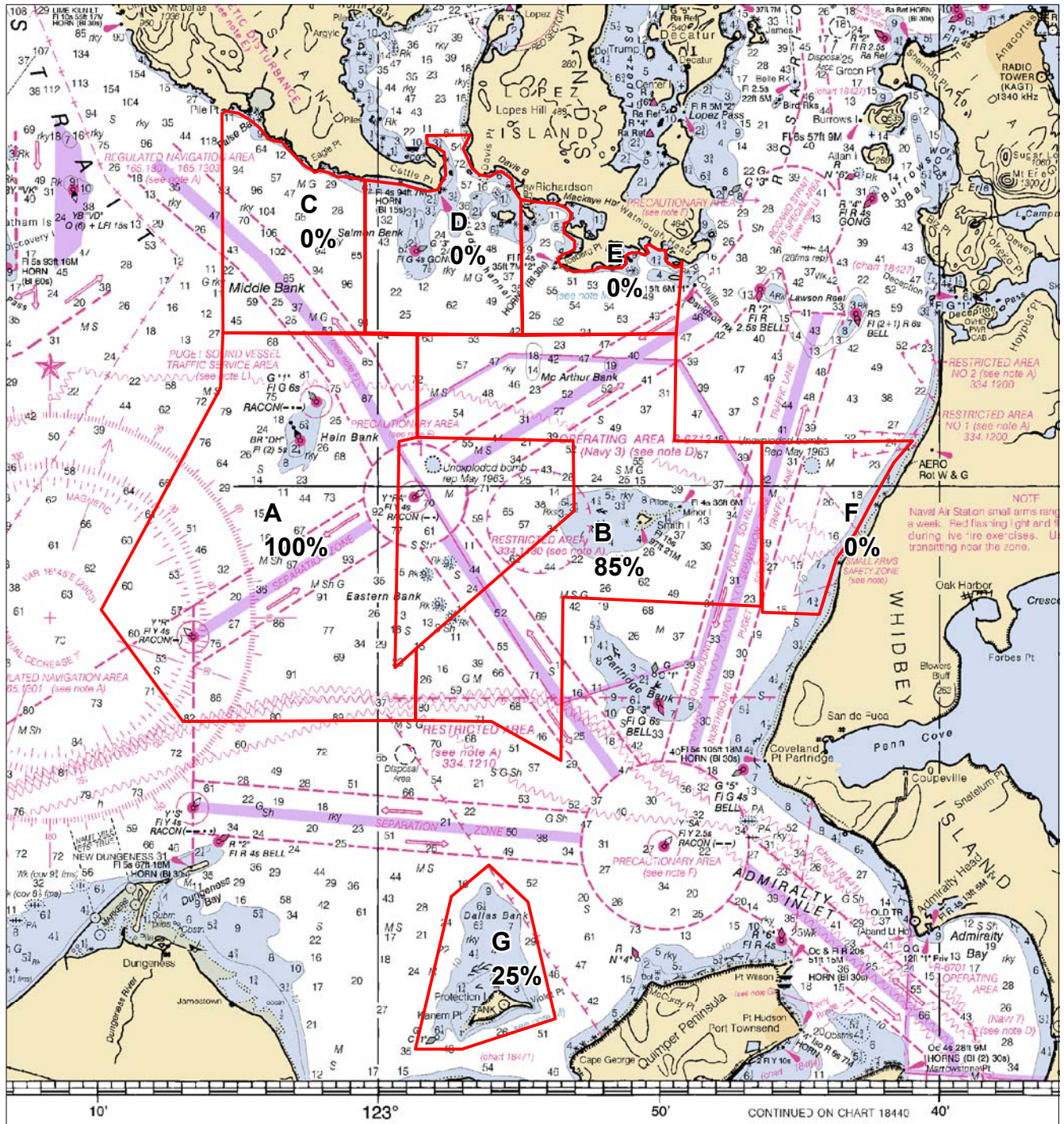
¹¹ Concur.

¹² Concur.

Progress Sketch OPR-N372-RA

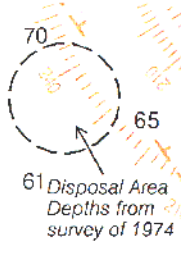
November, 2004

Chart 18400



Project	Month	LNM_Hydr	LNM_MB	SV_Casts	Bottom_Sam	AWOIS_Item	Tide_Gauge_Inst	DAS	DTime equip_H	DTime_Weather_	D_Time_other_	Inport_H
N327	April	698.31	698.31	46.00	0.00	0.00	0.00	10.00	6.75	0.00	0.00	24.00
N327	November	726.10	684.25	47.00	0.00	0.00	0.00	12.00	7.25	1.50	1.25	0.00

Project	Sheet_Letter	H_num	HQ_Est_SNM	CumIPercCompPrev	CumIPercCompCur	SNM_CompCurN	CumSNMcom
OPR-N372	C		15	0	0	0	0
OPR-N372	D		14	0	0	0	0
OPR-N372	E		8	0	0	0	0
OPR-N372	A	H11316	53	100	100	0	53
OPR-N372	F		9	0	0	0	0
OPR-N372	G	H11317	9	0	25	2	2
OPR-N372	B	H11371	45	0	85	38	38



SWMB OUTLINE

H11317 Sheet G

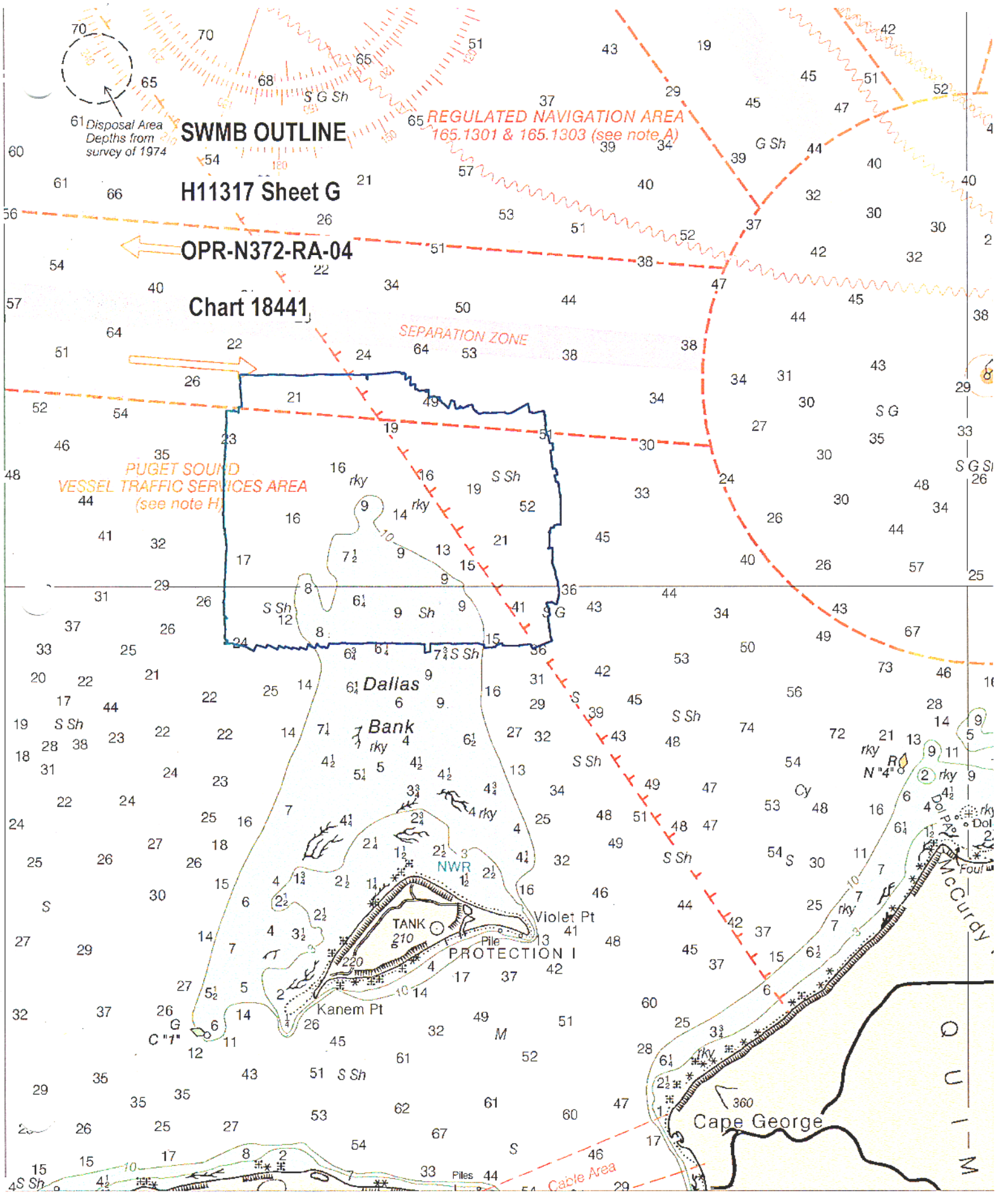
OPR-N372-RA-04

Chart 18441

REGULATED NAVIGATION AREA
165.1301 & 165.1303 (see note A)

SEPARATION ZONE

**PUGET SOUND
VESSEL TRAFFIC SERVICES AREA**
(see note H)





U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: April 28, 2005

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-N372-RA-2004
HYDROGRAPHIC SHEET: H11317

LOCALITY: Protection Island
Approaches to Puget Sound, WA

TIME PERIOD: November 2 - 11, 2004

TIDE STATION USED: 944-4900 Port Townsend, WA
Lat. 48° 06.7'N Lon. 122° 45.5'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.389 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PS89, PS91 & PS100

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 new 1983-2001 National Tidal Datum Epoch (NTDE).

Thomas V. Moore 6/6/05
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



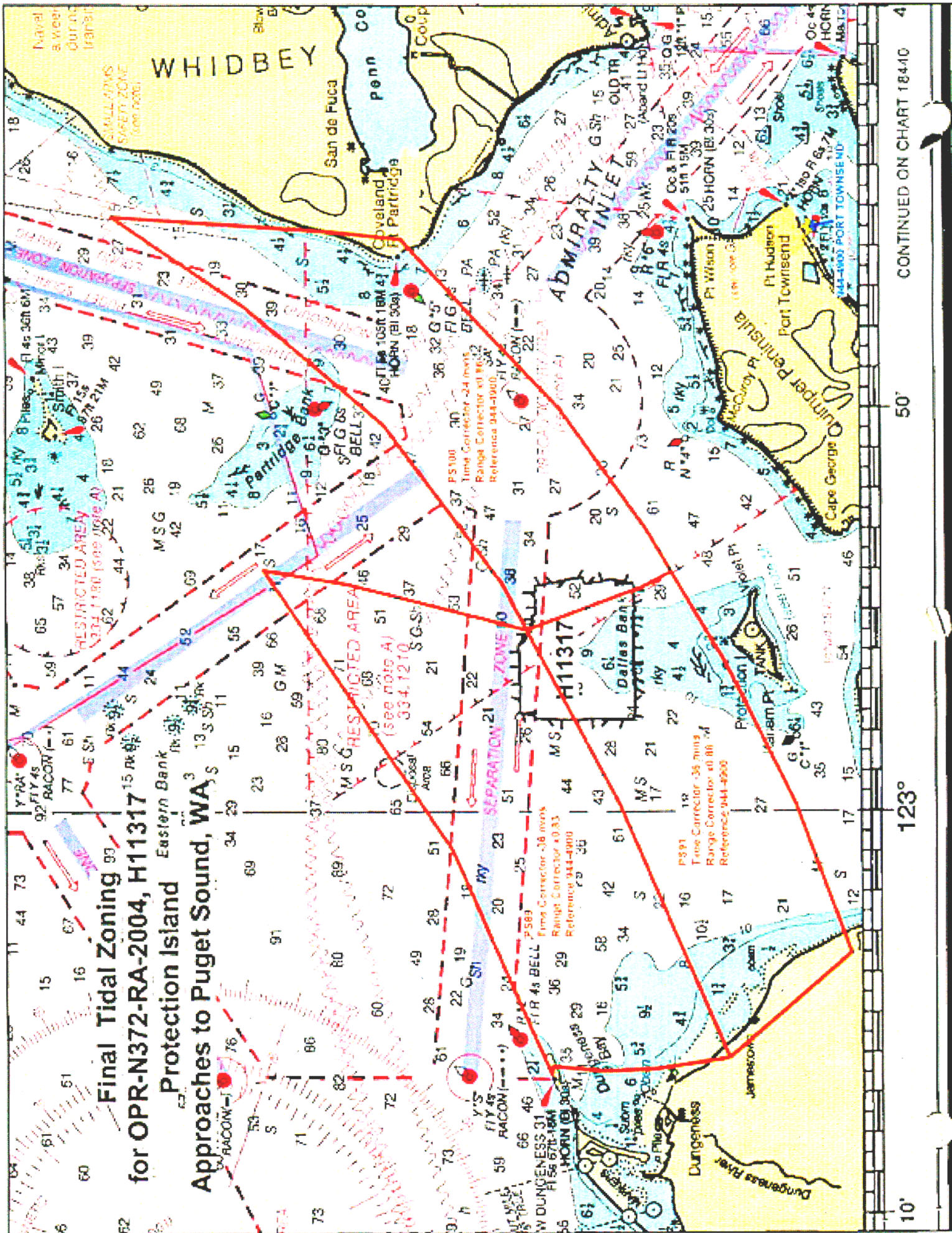
Final tide zone node point locations for OPR-N372-RA-2004, H11317

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 PS89	944-4900	-36	0.83
-122.899968 48.261473			
-122.906045 48.237829			
-122.92476 48.189261			
-122.997194 48.163835			
-123.101906 48.134294			
-123.10655 48.154426			
-123.107408 48.168372			
-123.10541 48.182505			
-123.108734 48.182947			
-123.015893 48.209859			
-122.899968 48.261473			
Zone PS91	944-4900	-36	0.86
-123.058428 48.100526			
-123.101906 48.134294			
-122.997194 48.163835			
-122.92476 48.189261			
-122.906998 48.157486			
-122.900792 48.149681			
-122.937827 48.135313			
-122.996581 48.115851			
-123.058428 48.100526			
Zone PS100	944-4900	-24	0.86
-122.883403 48.156423			
-122.900792 48.149681			
-122.906998 48.157486			
-122.92476 48.189261			
-122.905945 48.195859			
-122.840126 48.228362			
-122.791509 48.266338			
-122.75432 48.302865			
-122.760073 48.243261			
-122.763423 48.223421			
-122.797437 48.202752			

-122.833308 48.180006

-122.883403 48.156423



Final Tidal Zoning
for OPR-N372-RA-2004, H11317
Approaches to Puget Sound, WA

APPROVAL SHEET
H11317

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.

Gary E. Nelson Date: 21 Dec 2007
Gary Nelson
Chief, Cartographic Team
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.

[Signature], CDR/NOAA Date: 4 JAN 2007
Donald W. Haines
CDR, NOAA
Chief, Pacific Hydrographic Branch

