H11042

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-10-02-01

Registry No. H11042

LOCALITY

State Washington

General Locality Puget Sound

Sublocality **Nisqually Reach**

2001

CHIEF OF PARTY

Commander D.R. Herlihy, NOAA

LIBRARY & ARCHIVES

DATE July 11, 2002

NOAA FORM 77-28
(11-72)

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

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-11042

STRUCTIONS -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-10-02-01

State **Washington**

General Locality **Puget Sound**

Sublocality **Nisqually Reach**

Scale **1:10,000** Date of Survey **March 21 - 22, 2001**

Instructions Date **March 14, 2001** Project No. **S-N902-RA**

CHANGE NO. 1, dated 3/26/2001

Vessel **NOAA Ship RAINIER and launches**

Chief of Party **Commander D. R. Herlihy, NOAA**

Surveyed by **Ship personnel and physical scientists from Pacific Hydrographic Br.**

Soundings taken by echo sounder, hand lead, pole **Reson 8101**

Graphic record scaled by **N/A**

Graphic record checked by **N/A**

Evaluation by **Dennis Hill** Automated plot by **HP Designjet 1050C**

Verification by **Elias Domingo**

Soundings in **Fathoms** at **MLLW**

REMARKS: **Time in UTC.**

Revisions and annotations appearing as footnotes were generated during office processing.

All depths listed in this report are referenced to mean lower low water unless otherwise noted.

AWOIS ✓ & SURF ✓ by MBH on 5/10/02

Descriptive Report to Accompany Hydrographic Survey H11042

Project OPR-S-N902-RA-01[1] Puget Sound Earthquake Response
Scale 1:10,000
March 2001
NOAA Ship RAINIER
Chief of Party: Commander Daniel R. Herlihy, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-S-N902-RA-01[2], dated March 9, 2001[3], and the Draft Standing Project Instructions dated
March 8, 1998. The survey area is located in Nisqually Reach, WA. The survey's northern limit is latitude 47°08'39"N[4] and the southern limit is latitude 47°06'41"N[5]. The survey's western limit is longitude 122°46'16"W[6] and the eastern limit is longitude 122°38'44"W[7].

This survey is part of an emergency response to a United States Geological Survey (USGS) request for hydrography in Puget Sound, Washington following the February 28, 2001 magnitude 6.8 earthquake near Olympia, Washington.

Data acquisition was conducted from March 21 to 22, 2001 (DN 080 to 081).

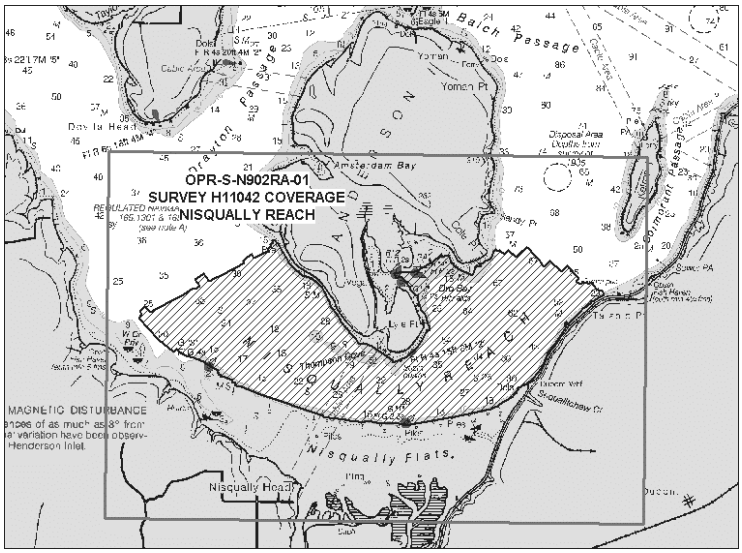

Figure 1. H11042 Survey Limits

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-S-N902-RA-01 Data Acquisition and Processing Report* 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 RAINIER and her survey launches (vessel numbers 2120, 2121, 2123, 2124 and 2126). RAINIER was used to acquire shallow-water and intermediate-depth multibeam soundings and sound velocity profiles. Vessels 2121, 2123, 2124 and 2126 were used to acquire shallow-water multibeam soundings and sound velocity profiles.

B2. Quality Control

Crosslines

SWMB crosslines totaled 6.02 nautical miles, comprising 8.8% of multibeam hydrography. The Quality Control Report (CARIS HIPS) for the checkline file averaged 93.04%, with a depth tolerance factor of 0.013, which conforms to International Hydrographic Organization Order 1 specifications detailed in Special Publication S-44, Edition 4, as well as NOS Hydrographic Surveys Specifications and Deliverables Manual. See Appendix V for the detailed reports.

Junctions

No contemporary surveys junction with H11042.

Data Quality Factors

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

B3. Data Reduction

Data reduction procedures for survey H11042 conform to those detailed in the *OPR-S-N902-RA-01 Data Acquisition and Processing Report.*

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11042 can be found in the *OPR-S-N902-RA-01 Vertical and Horizontal Control Report* submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

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 US Coast Guard Beacons at Whidbey Island, WA and Robinson Point, WA were the sources of differential correctors.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *OPR-S-N902-RA-01 Horizontal and Vertical Control 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 Seattle, WA (944-7130) will serve as control for datum determination.

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 H11042 was forwarded to N/OPS1 on April 14, 2001 in accordance with FPM 4.8.

D. RESULTS AND RECOMMENDATIONS

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

One AWOIS item was located within the limits of survey H11042. Investigation methods, results, and charting recommendations have been entered into the Microsoft Access AWOIS database and are submitted with the digital data. Printouts of the AWOIS Database forms are included in Appendix VI of this report.

D.2 Chart Comparison

Survey H11042 was compared with chart 18448 (31st Ed.; May 22, 1999 1:80,000). Survey soundings agreed within one fathom of the chart. Notable differences are addressed below.

In the vicinity of a charted 15-fathom sounding at 47°08'17.9"N, 122°41'13.1"W, the present survey revealed a depth of 11.7 [8] fathoms. This area was covered by 100% SWMB.

In the vicinity of a charted 64-fathom sounding at 47°07'56.3"N, 122°40'55.6"W, the present survey revealed depths between 57 and 62 fathoms. This area was covered by 100% SWMB.

Sand waves between 3 and 8 meters high were found throughout Nisqually Reach. It is the nature of these sand waves to migrate with the currents and therefore the surveyed soundings could be subject to change. However, since the soundings from Survey H11042 are shoal-biased, they will reflect the tops of the sand waves and will still be an accurate guide to the shoalest soundings in the survey area. [9]

D.3 Shoreline

The shoreline was not investigated during survey H11042. Shoreline shown on the Final Field Sheet is from chart 18448, and is for orientation purposes only.

D.4 Dangers to Navigation

No dangers to navigation were found in survey H11042.

D.5 Aids to Navigation

Aids to navigation were not investigated during survey H11042.

D.6 Miscellaneous

This survey was conducted at the request of the U.S. Geological Survey (USGS) to determine if the earthquake of February 28, 2001 caused underwater landslides throughout Puget Sound. Preliminary sounding data, fully processed and corrected for observed tides, have been supplied to Dr. James V. Gardner of USGS. Contact information can be found in the OPR-S-N902-RA-01[10] Letter Instructions.

Bottom samples were not collected.

E. APPROVAL

As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition, the Hydrographic Survey Guidelines, the Field Procedures Manual, and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2001.

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 H11042 is complete and adequate to supersede charted soundings in their common areas. No additional work is required for this survey. [11]

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

Title	**Date Sent**	**Office**
Data Acquisition and Processing Report for OPR-S-N902-RA-01	25 May, 2001	N/CS34
Horizontal and Vertical Control Report for OPR-S-N902-RA-01	25 May, 2001	N/CS34

Approved and Forwarded:

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

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

Survey Sheet Manager:

Mark T. Lathrop
Physical Scientist, NOAA

Field Operations Officer:

Edward J. Van Den Ameele
Lieutenant, NOAA

1 PHB Revision - Correct project number to S-N902-RA
2 PHB Revision - Correct project number to S-N902-RA
3 PHB Revision - Correct date to March 14, 2001 and add CHANGE No. 1, dated March 26, 2001
4 PHB Revision - 47°08'45"
5 PHB Revision - 47°06'40"
6 PHB Revision - 122°46'20"
7 PHB Revision - 122°38'40"
8 PHB Revision - 11.4 to 11.6 MLLW based on verified tides
9 PHB Revision - Concur
10 PHB Revision - Correct project number S-N902-RA
11 PHB Revision - Concur

DESCRIPTIVE REPORT APPENDICES

I. Danger to Navigation Reports
II. List of Geographic Names
III. Progress Sketch
IV. Tides and Water Levels
V. Supplemental Survey Records and Correspondence
VI. AWOIS Forms (from Access Database)

I. Danger to Navigation Reports

- Not applicable

Descriptive Report to Accompany Hydrographic Survey H11042

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Scale 1:10,000
March 2001
NOAA Ship RAINIER
Chief of Party: Commander Daniel R. Herlihy, NOAA

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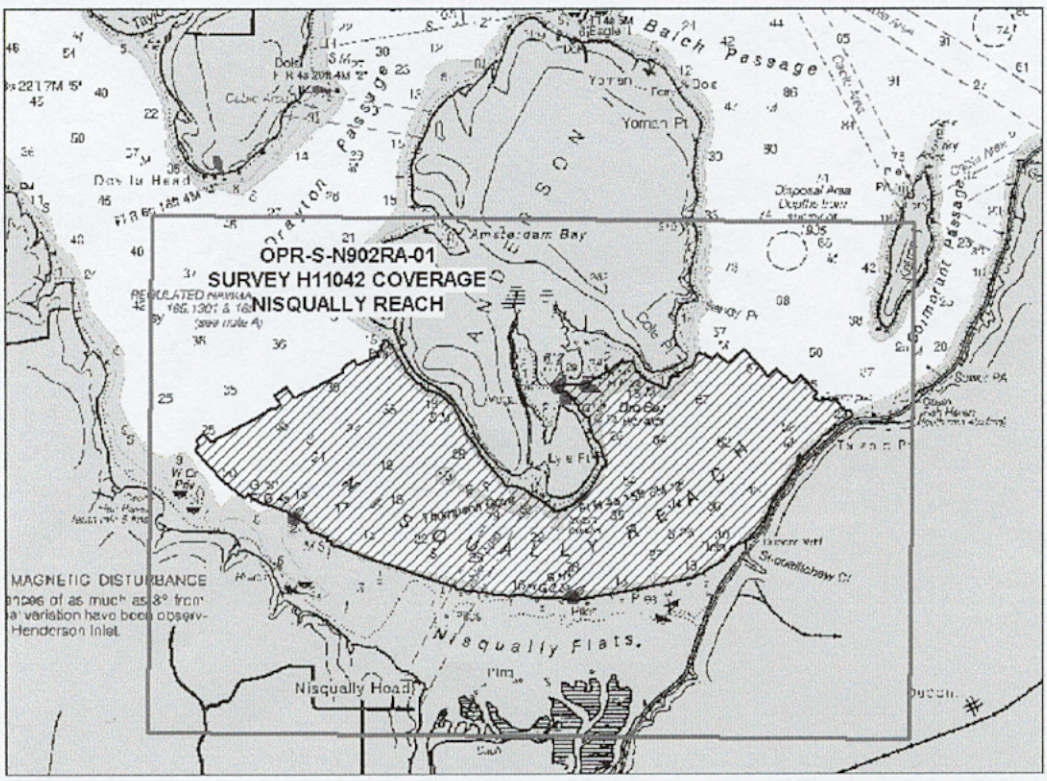

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Approved and Forwarded: Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

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

Survey Sheet Manager: Mark T. Lathrop

Mark T. Lathrop
Physical Scientist, NOAA

Field Operations Officer: E. J. Van Den Ameele

Edward J. Van Den Ameele
Lieutenant, NOAA

9 PHB Revision -- Concur

II. List of Geographic Names

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-11042

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO 18448	B ON PREVIOUS SURVEY NO	C ON U S QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P O GUIDE OR MAP	G RAND MCNALLY ATLAS	H U S LIGHT LIST	K	
AMSTERDAM BAY	X		X							1
ANDERSON ISLAND	X		X							2
COLE POINT	X		X							3
DRAYTON PASSAGE	X		X							4
DUPONT POINT	X		X							5
KETRON ISLAND	X		X							6
LYLE POINT	X		X							7
MCALLISTER CREEK	X		X							8
NISQUALLY FLATS	X		X							9
NISQUALLY HEAD	X		X							10
NISQUALLY REACH	X		X							11
NISQUALLY RIVER	X		X							12
ORO BAY	X		X							13
PUGET SOUND (title)	X		X							14
SANDY POINT	X		X							15
SEQUALITCHEW CREEK	X		X							16
TATSOLO POINT	X		X							17
THOMPSON COVE	X		X							18
TREBLE POINT	X		X							19
VEGA (ppl)	X									20
WASHINGTON (title)	X		X							21
										22
			Approved:							23
			Chief Geographer AUG 6 2001							24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

III. Progress Sketch

- Chartlets showing areas of VBES and MB
- Final Progress Sketch

Progress Sketch

S-N902-RA
(Earthquake Response)
Puget Sound
WASHINGTON

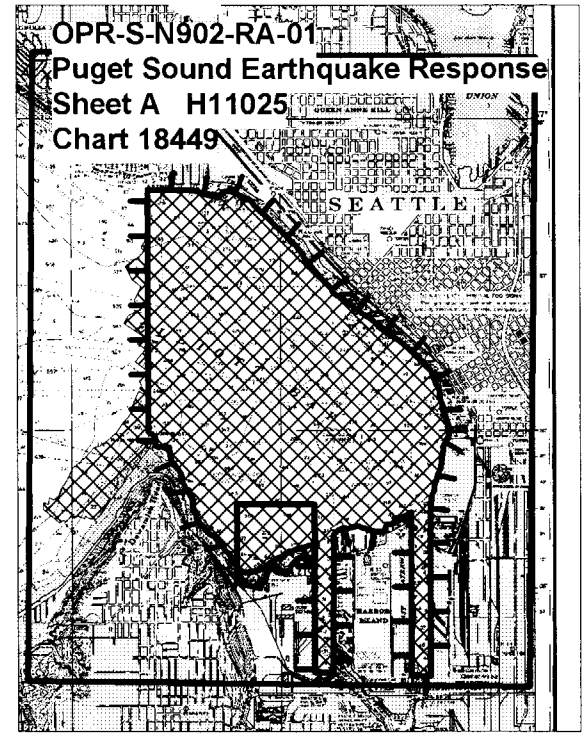
March 2001

Chart 18449
Chart 18448
Chart 18474

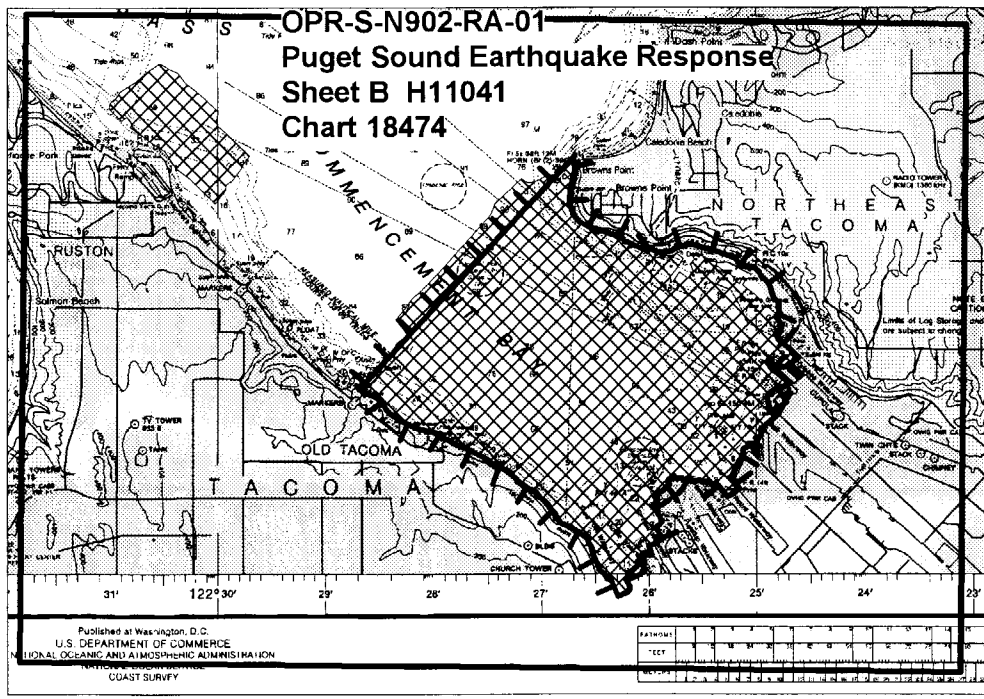
NOAA Ship RAINIER
CDR D. R. Herlihy
Commanding

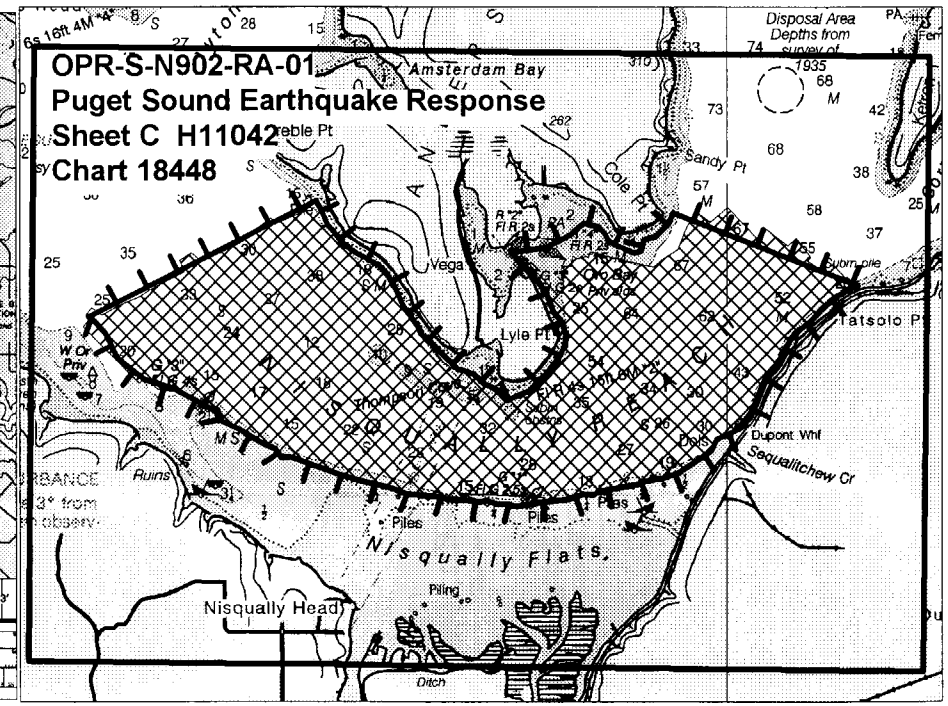
legend

March



Accomplished	March
LNM Singlebeam	0
LNM Multibeam	332.72
SQ NM Singlebeam	0
SQ NM Multibeam	13.32
Total SQ NM	13.32
SV Casts	41
Bottom Samples	0
AWOIS Invest.	1
Tide gauges	0
Control station	0
Down time (hr)	8
Days at Sea	6





IV. Tides and Water Levels

- Request for Approved Tides

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations
Marine Operations Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

NOAA Ship RAINIER
April 14, 2001

TO: NOAA, National Ocean Service/CO-OPS
Chief, Requirements and Development Division

FROM: Commander Daniel R. Herlihy, NOAA
Commanding Officer

SUBJECT: Request for Approved Tides/Water Levels for H11042

Please provide the following data:

1. Approved Tides/Water Level Note
2. Approved Six-minute Heights for Days of Hydrography
3. Six-minute Heights digital data
4. Final Zoning in MapInfo and .MIX format

Transmit to:

NOAA, NOS, N/CS34
Pacific Hydrographic Branch
7600 Sand Point Way NE
BIN C15700, Bldg 3
Seattle, WA 98115-0070

This is required for processing of hydrographic survey H11042, Project OPR-S-N902-RA-01, Puget Sound, Washington. Digital and hardcopy MapInfo files showing survey areas and Abstract of Times of Hydrography are included with this request.

Tide/water level data are required within 90 days of receipt of this request. If this schedule cannot be met, please advise: Chief, Pacific Hydrographic Branch, N/CS34, telephone (206) 526-6835.

Attachments

cc: N/CS34

Starting & Ending Times of Hydrography

OPR-S-N902-RA-01
Registry: H11042
Sheet C
RA-10-02-01

	Day	Time	Year
Start	080	17:06:08	2001
End	081	20:04:23	2001

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 28, 2001

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: S-N902-RA-2001
HYDROGRAPHIC SHEET: H11042

LOCALITY: Puget Sound, WA
TIME PERIOD: March 21 - 22, 2001

TIDE STATION USED: 944-6484 Tacoma, Commencement Bay, WA
Lat. 47° 16.0'N Lon. 122° 24.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.339 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PS197 & PS198.

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.

Thomas P. Mero 6/29/01

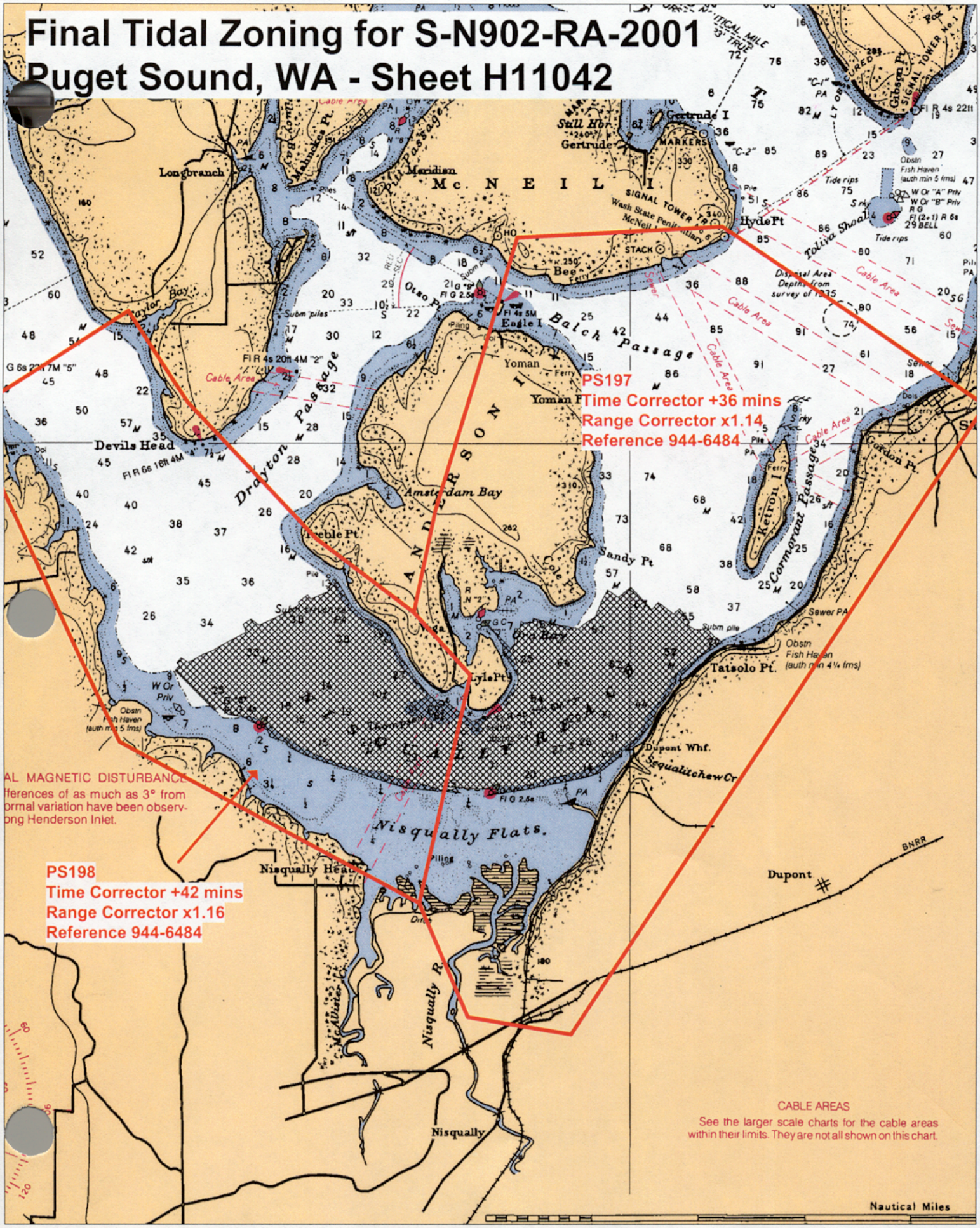
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for S-N902-RA-2001,
Sheet H11042.

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

	Tide Station Order	AVG Time Correction	Range Correction
Zone PS197	944-6484	+36	1.14
-122.645715 47.200645			
-122.692521 47.198894			
-122.701267 47.178568			
-122.711272 47.156188			
-122.716353 47.140012			
-122.703331 47.130174			
-122.715166 47.094376			
-122.703931 47.076415			
-122.680219 47.073717			
-122.585027 47.172605			
-122.645715 47.200645			
Zone PS198	944-6484	+42	1.16
-122.703331 47.130174			
-122.715166 47.094376			
-122.784084 47.11965			
-122.81951 47.171068			
-122.782017 47.187333			
-122.768132 47.172962			
-122.738818 47.151572			
-122.716353 47.140012			
-122.703331 47.130174			

Final Tidal Zoning for S-N902-RA-2001
Puget Sound, WA - Sheet H11042



V. Supplemental Survey Records and Correspondence

- Quality Control Reports

Quality Control Report for file : H11042_ra1_ra6

Elevation Range is : -125.081(m) -1.077(m)

Total number of 3D points used: 404285

Starting Time: 21-MAR-2001 23:31:39.32
Ending Time: 22-MAR-2001 20:01:10.84

Minimum tidal reduction: 1697 (mm)
Maximum tidal reduction: 3070 (mm)

User#	Total	Max(+)	Max(-)	Mean	Std.	3dm(%)	5dm(%)	1%(%)	1.6%(%)
7	3	0.150	0.000	0.136	0.0125	100.0	100.0	0.0	0.0
8	20	0.871	0.000	0.220	0.1774	85.0	95.0	0.0	10.0
9	292	0.938	-0.172	0.121	0.1450	95.2	98.3	21.6	34.9
10	2117	1.270	-0.438	-0.020	0.1904	90.6	98.5	41.8	58.7
11	4770	4.789	-2.528	0.044	0.4962	78.4	88.8	46.3	63.2
12	4963	3.550	-2.356	0.043	0.4631	76.5	89.2	45.9	64.1
13	4991	3.477	-2.385	0.039	0.4332	77.5	90.0	47.5	65.4
14	5001	3.299	-2.043	0.037	0.4060	78.5	90.6	48.8	66.6
15	5003	3.186	-1.802	0.033	0.3748	79.6	91.3	48.7	68.8
16	5006	2.960	-1.899	0.030	0.3649	80.7	91.3	48.9	69.1
17	5012	2.579	-1.840	0.028	0.3539	81.3	91.7	49.7	69.5
18	5013	2.251	-1.942	0.020	0.3353	81.9	92.4	50.2	69.6
19	5009	2.283	-2.076	0.013	0.3297	82.3	92.8	50.2	69.5
20	5010	2.511	-2.247	0.008	0.3201	82.8	93.3	50.3	69.6
21	5016	2.373	-1.994	0.011	0.3129	82.5	93.8	50.6	70.4
22	5033	2.370	-2.050	0.021	0.3218	82.7	93.7	50.8	70.6
23	5022	2.025	-1.938	0.023	0.3128	82.1	93.2	51.1	70.8
24	5039	1.745	-2.003	0.023	0.3051	81.9	93.3	51.2	70.4
25	5028	2.642	-1.933	0.024	0.3055	81.4	93.1	51.0	70.6
26	5025	2.250	-1.678	0.029	0.3083	81.6	92.9	50.4	70.4
27	5022	2.050	-1.546	0.035	0.3074	81.2	92.8	51.3	70.2
28	5017	2.042	-1.507	0.036	0.3063	81.3	92.6	50.8	70.0
29	5013	2.279	-1.569	0.036	0.3050	81.1	92.9	51.4	70.2
30	5010	2.062	-1.672	0.033	0.3007	80.9	93.4	51.1	69.7
31	5008	2.004	-1.740	0.032	0.2993	81.4	93.4	51.7	70.1
32	5000	2.000	-1.663	0.032	0.3036	81.6	93.5	51.7	69.6
33	4996	2.109	-1.614	0.032	0.3082	81.5	93.5	52.1	69.3
34	4997	1.994	-1.677	0.029	0.3049	81.3	93.3	51.4	68.9
35	4992	1.686	-1.857	0.026	0.3000	81.8	93.4	51.8	69.1
36	4996	1.676	-2.158	0.021	0.3016	82.4	92.8	51.8	68.5
37	4990	1.713	-2.305	0.019	0.3059	81.5	92.7	51.6	67.9
38	4986	1.683	-2.238	0.016	0.3058	81.7	92.5	52.1	68.0
39	4984	1.690	-2.354	0.015	0.3012	82.1	93.3	52.6	67.5
40	4978	1.678	-2.452	0.015	0.3006	82.8	93.6	52.5	67.6
41	4980	1.694	-2.464	0.014	0.3000	83.2	93.6	52.4	67.9
42	4980	1.691	-2.505	0.014	0.2982	83.3	93.8	52.3	67.2
43	4981	1.715	-2.297	0.014	0.2945	83.7	93.4	52.7	67.3
44	4985	1.706	-2.012	0.012	0.2926	83.9	93.5	53.1	67.5
45	4986	1.691	-1.930	0.012	0.2930	84.3	93.5	53.0	67.4
46	4982	1.681	-1.823	0.012	0.2937	84.4	93.0	53.2	67.3
47	4980	1.715	-1.872	0.013	0.2934	84.5	92.9	53.4	67.5
48	4986	1.686	-1.836	0.015	0.2922	83.8	92.6	54.3	68.0
49	4984	1.713	-1.957	0.019	0.2913	83.5	92.9	54.4	67.4
50	4988	1.724	-2.090	0.023	0.2924	84.6	93.5	55.4	68.0
51	4987	1.769	-2.375	0.024	0.2959	85.1	93.3	55.3	68.5
52	4987	1.730	-2.430	0.028	0.3027	84.6	93.3	55.0	68.6
53	4987	1.719	-2.224	0.028	0.3093	84.9	92.9	54.5	68.0
54	4990	1.743	-2.075	0.027	0.3109	84.9	93.2	54.3	68.7

55	4990	1.725	-2.279	0.027	0.3098	84.7	93.4	54.7	68.7
56	4991	1.885	-2.291	0.026	0.3119	84.5	93.4	54.3	68.8
57	4985	1.827	-2.388	0.025	0.3063	84.5	93.5	53.9	69.2
58	4986	2.134	-2.443	0.024	0.3036	84.1	93.7	53.7	68.6
59	4981	2.205	-2.315	0.021	0.3027	84.4	93.8	53.8	68.7
60	4982	2.115	-2.288	0.013	0.3143	83.9	93.3	53.3	69.0
61	4975	1.999	-2.229	0.010	0.3215	83.9	93.1	52.6	68.9
62	4977	1.753	-2.361	0.006	0.3267	83.5	92.6	52.5	69.1
63	4978	1.783	-2.213	0.006	0.3275	83.1	92.2	52.2	68.3
64	4973	1.830	-1.944	0.005	0.3266	82.8	92.3	51.9	68.9
65	4974	1.834	-1.846	0.001	0.3273	82.2	92.2	51.2	69.1
66	4973	1.811	-1.838	-0.004	0.3267	81.3	92.3	51.3	69.2
67	4975	1.862	-1.775	-0.009	0.3286	80.7	92.4	51.0	68.9
68	4972	1.832	-2.064	-0.011	0.3298	80.2	92.2	50.6	69.4
69	4970	1.848	-2.157	-0.014	0.3377	80.0	91.4	50.7	69.2
70	4978	1.864	-2.341	-0.020	0.3562	80.3	91.3	50.5	68.4
71	4976	1.893	-2.538	-0.022	0.3744	80.3	91.6	50.4	68.3
72	4974	1.898	-2.419	-0.016	0.3810	80.6	91.4	50.9	68.1
73	4975	1.894	-2.859	-0.009	0.3739	80.5	91.4	50.8	67.8
74	4975	1.896	-2.857	-0.009	0.3746	80.4	91.2	51.3	67.3
75	4967	1.871	-3.300	-0.016	0.3914	80.8	91.3	51.1	67.3
76	4967	1.843	-3.494	-0.027	0.3964	80.4	90.8	51.3	67.4
77	4970	1.840	-3.550	-0.030	0.3837	79.9	90.4	51.1	67.3
78	4971	1.850	-3.433	-0.033	0.3896	79.4	90.3	51.3	68.0
79	4973	1.846	-3.616	-0.047	0.4145	79.6	89.9	50.7	68.3
80	4977	1.883	-3.386	-0.060	0.4324	79.8	90.5	50.4	68.4
81	4980	1.863	-3.427	-0.075	0.4383	79.6	90.4	50.1	69.1
82	4986	1.875	-3.893	-0.082	0.4502	79.8	90.8	50.9	69.3
83	4992	1.880	-3.655	-0.086	0.4610	80.2	90.6	51.7	70.2
84	4989	1.893	-3.292	-0.084	0.4578	80.4	90.8	50.9	70.2
85	4995	1.910	-3.256	-0.086	0.4644	80.4	90.3	51.0	69.9
86	4987	1.880	-3.234	-0.092	0.4623	78.9	89.9	49.1	70.0
87	4984	1.901	-2.875	-0.101	0.4584	76.9	89.3	47.9	68.6
88	4980	1.887	-2.903	-0.114	0.4635	75.0	87.5	46.1	67.3
89	4978	1.862	-3.028	-0.135	0.4857	74.6	86.0	44.5	66.3
90	4928	1.859	-3.443	-0.136	0.4822	75.4	85.5	44.7	66.3
91	2544	1.200	-3.102	-0.078	0.3221	87.7	94.3	40.0	64.8
92	370	0.500	-1.477	0.076	0.1919	93.0	98.9	27.3	47.0
93	41	0.261	-0.476	0.073	0.1424	97.6	100.0	43.9	61.0
94	1	0.000	-0.330	-0.330	0.0000	0.0	100.0	100.0	100.0

_Classification report 1 of 3

IHO statistics a/b are : 0.250 0.007

User#	Total	# fail	% fail	# pass	% pass
7	3	0	0.00	3	100.00
8	20	3	15.00	17	85.00
9	292	41	14.04	251	85.96
10	2117	362	17.10	1755	82.90
11	4770	1229	25.77	3541	74.23
12	4963	1319	26.58	3644	73.42
13	4991	1297	25.99	3694	74.01
14	5001	1204	24.08	3797	75.92
15	5003	1145	22.89	3858	77.11
16	5006	1088	21.73	3918	78.27
17	5012	1026	20.47	3986	79.53
18	5013	1004	20.03	4009	79.97
19	5009	969	19.35	4040	80.65
20	5010	952	19.00	4058	81.00
21	5016	904	18.02	4112	81.98
22	5033	905	17.98	4128	82.02
23	5022	950	18.92	4072	81.08

24	5039	966	19.17	4073	80.83
25	5028	951	18.91	4077	81.09
26	5025	936	18.63	4089	81.37
27	5022	951	18.94	4071	81.06
28	5017	955	19.04	4062	80.96
29	5013	953	19.01	4060	80.99
30	5010	936	18.68	4074	81.32
31	5008	940	18.77	4068	81.23
32	5000	936	18.72	4064	81.28
33	4996	926	18.53	4070	81.47
34	4997	950	19.01	4047	80.99
35	4992	937	18.77	4055	81.23
36	4996	924	18.49	4072	81.51
37	4990	940	18.84	4050	81.16
38	4986	916	18.37	4070	81.63
39	4984	894	17.94	4090	82.06
40	4978	899	18.06	4079	81.94
41	4980	876	17.59	4104	82.41
42	4980	868	17.43	4112	82.57
43	4981	862	17.31	4119	82.69
44	4985	856	17.17	4129	82.83
45	4986	831	16.67	4155	83.33
46	4982	822	16.50	4160	83.50
47	4980	814	16.35	4166	83.65
48	4986	811	16.27	4175	83.73
49	4984	801	16.07	4183	83.93
50	4988	770	15.44	4218	84.56
51	4987	774	15.52	4213	84.48
52	4987	815	16.34	4172	83.66
53	4987	785	15.74	4202	84.26
54	4990	800	16.03	4190	83.97
55	4990	779	15.61	4211	84.39
56	4991	786	15.75	4205	84.25
57	4985	794	15.93	4191	84.07
58	4986	808	16.21	4178	83.79
59	4981	807	16.20	4174	83.80
60	4982	845	16.96	4137	83.04
61	4975	839	16.86	4136	83.14
62	4977	873	17.54	4104	82.46
63	4978	906	18.20	4072	81.80
64	4973	904	18.18	4069	81.82
65	4974	946	19.02	4028	80.98
66	4973	967	19.45	4006	80.55
67	4975	977	19.64	3998	80.36
68	4972	1019	20.49	3953	79.51
69	4970	1030	20.72	3940	79.28
70	4978	1033	20.75	3945	79.25
71	4976	1046	21.02	3930	78.98
72	4974	1022	20.55	3952	79.45
73	4975	1012	20.34	3963	79.66
74	4975	1030	20.70	3945	79.30
75	4967	1005	20.23	3962	79.77
76	4967	1028	20.70	3939	79.30
77	4970	1042	20.97	3928	79.03
78	4971	1063	21.38	3908	78.62
79	4973	1058	21.27	3915	78.73
80	4977	1036	20.82	3941	79.18
81	4980	1030	20.68	3950	79.32
82	4986	1031	20.68	3955	79.32
83	4992	1019	20.41	3973	79.59
84	4989	1013	20.30	3976	79.70
85	4995	1009	20.20	3986	79.80
86	4987	1065	21.36	3922	78.64

87	4984	1158	23.23	3826	76.77
88	4980	1274	25.58	3706	74.42
89	4978	1310	26.32	3668	73.68
90	4928	1254	25.45	3674	74.55
91	2544	377	14.82	2167	85.18
92	370	51	13.78	319	86.22
93	41	3	7.32	38	92.68
94	1	0	0.00	1	100.00

_Classification report 2 of 3

IHO statistics a/b are : 0.500 0.013

User#	Total	# fail	% fail	# pass	% pass
7	3	0	0.00	3	100.00
8	20	1	5.00	19	95.00
9	292	3	1.03	289	98.97
10	2117	21	0.99	2096	99.01
11	4770	397	8.32	4373	91.68
12	4963	378	7.62	4585	92.38
13	4991	351	7.03	4640	92.97
14	5001	306	6.12	4695	93.88
15	5003	290	5.80	4713	94.20
16	5006	286	5.71	4720	94.29
17	5012	269	5.37	4743	94.63
18	5013	245	4.89	4768	95.11
19	5009	240	4.79	4769	95.21
20	5010	229	4.57	4781	95.43
21	5016	205	4.09	4811	95.91
22	5033	201	3.99	4832	96.01
23	5022	178	3.54	4844	96.46
24	5039	168	3.33	4871	96.67
25	5028	165	3.28	4863	96.72
26	5025	182	3.62	4843	96.38
27	5022	184	3.66	4838	96.34
28	5017	175	3.49	4842	96.51
29	5013	189	3.77	4824	96.23
30	5010	176	3.51	4834	96.49
31	5008	178	3.55	4830	96.45
32	5000	188	3.76	4812	96.24
33	4996	185	3.70	4811	96.30
34	4997	180	3.60	4817	96.40
35	4992	181	3.63	4811	96.37
36	4996	171	3.42	4825	96.58
37	4990	188	3.77	4802	96.23
38	4986	197	3.95	4789	96.05
39	4984	192	3.85	4792	96.15
40	4978	188	3.78	4790	96.22
41	4980	202	4.06	4778	95.94
42	4980	215	4.32	4765	95.68
43	4981	217	4.36	4764	95.64
44	4985	203	4.07	4782	95.93
45	4986	206	4.13	4780	95.87
46	4982	221	4.44	4761	95.56
47	4980	207	4.16	4773	95.84
48	4986	213	4.27	4773	95.73
49	4984	199	3.99	4785	96.01
50	4988	196	3.93	4792	96.07
51	4987	203	4.07	4784	95.93
52	4987	217	4.35	4770	95.65
53	4987	238	4.77	4749	95.23
54	4990	245	4.91	4745	95.09
55	4990	238	4.77	4752	95.23

56	4991	236	4.73	4755	95.27
57	4985	231	4.63	4754	95.37
58	4986	201	4.03	4785	95.97
59	4981	187	3.75	4794	96.25
60	4982	178	3.57	4804	96.43
61	4975	190	3.82	4785	96.18
62	4977	197	3.96	4780	96.04
63	4978	218	4.38	4760	95.62
64	4973	229	4.60	4744	95.40
65	4974	214	4.30	4760	95.70
66	4973	220	4.42	4753	95.58
67	4975	230	4.62	4745	95.38
68	4972	226	4.55	4746	95.45
69	4970	228	4.59	4742	95.41
70	4978	257	5.16	4721	94.84
71	4976	292	5.87	4684	94.13
72	4974	304	6.11	4670	93.89
73	4975	287	5.77	4688	94.23
74	4975	267	5.37	4708	94.63
75	4967	312	6.28	4655	93.72
76	4967	327	6.58	4640	93.42
77	4970	323	6.50	4647	93.50
78	4971	331	6.66	4640	93.34
79	4973	349	7.02	4624	92.98
80	4977	363	7.29	4614	92.71
81	4980	357	7.17	4623	92.83
82	4986	346	6.94	4640	93.06
83	4992	335	6.71	4657	93.29
84	4989	346	6.94	4643	93.06
85	4995	373	7.47	4622	92.53
86	4987	393	7.88	4594	92.12
87	4984	428	8.59	4556	91.41
88	4980	440	8.84	4540	91.16
89	4978	475	9.54	4503	90.46
90	4928	521	10.57	4407	89.43
91	2544	107	4.21	2437	95.79
92	370	4	1.08	366	98.92
93	41	0	0.00	41	100.00
94	1	0	0.00	1	100.00

Classification report 3 of 3

IHO statistics a/b are : 1.000 0.023

User#	Total	# fail	% fail	# pass	% pass
7	3	0	0.00	3	100.00
8	20	0	0.00	20	100.00
9	292	0	0.00	292	100.00
10	2117	0	0.00	2117	100.00
11	4770	121	2.54	4649	97.46
12	4963	109	2.20	4854	97.80
13	4991	83	1.66	4908	98.34
14	5001	81	1.62	4920	98.38
15	5003	67	1.34	4936	98.66
16	5006	58	1.16	4948	98.84
17	5012	55	1.10	4957	98.90
18	5013	51	1.02	4962	98.98
19	5009	56	1.12	4953	98.88
20	5010	53	1.06	4957	98.94
21	5016	63	1.26	4953	98.74
22	5033	70	1.39	4963	98.61
23	5022	67	1.33	4955	98.67
24	5039	54	1.07	4985	98.93

25	5028	58	1.15	4970	98.85
26	5025	57	1.13	4968	98.87
27	5022	51	1.02	4971	98.98
28	5017	40	0.80	4977	99.20
29	5013	51	1.02	4962	98.98
30	5010	54	1.08	4956	98.92
31	5008	48	0.96	4960	99.04
32	5000	51	1.02	4949	98.98
33	4996	52	1.04	4944	98.96
34	4997	47	0.94	4950	99.06
35	4992	50	1.00	4942	99.00
36	4996	45	0.90	4951	99.10
37	4990	50	1.00	4940	99.00
38	4986	53	1.06	4933	98.94
39	4984	54	1.08	4930	98.92
40	4978	59	1.19	4919	98.81
41	4980	59	1.18	4921	98.82
42	4980	59	1.18	4921	98.82
43	4981	58	1.16	4923	98.84
44	4985	57	1.14	4928	98.86
45	4986	55	1.10	4931	98.90
46	4982	57	1.14	4925	98.86
47	4980	54	1.08	4926	98.92
48	4986	54	1.08	4932	98.92
49	4984	52	1.04	4932	98.96
50	4988	58	1.16	4930	98.84
51	4987	65	1.30	4922	98.70
52	4987	67	1.34	4920	98.66
53	4987	66	1.32	4921	98.68
54	4990	70	1.40	4920	98.60
55	4990	70	1.40	4920	98.60
56	4991	80	1.60	4911	98.40
57	4985	72	1.44	4913	98.56
58	4986	64	1.28	4922	98.72
59	4981	66	1.33	4915	98.67
60	4982	67	1.34	4915	98.66
61	4975	72	1.45	4903	98.55
62	4977	74	1.49	4903	98.51
63	4978	72	1.45	4906	98.55
64	4973	63	1.27	4910	98.73
65	4974	73	1.47	4901	98.53
66	4973	66	1.33	4907	98.67
67	4975	56	1.13	4919	98.87
68	4972	54	1.09	4918	98.91
69	4970	53	1.07	4917	98.93
70	4978	56	1.12	4922	98.88
71	4976	53	1.07	4923	98.93
72	4974	60	1.21	4914	98.79
73	4975	66	1.33	4909	98.67
74	4975	67	1.35	4908	98.65
75	4967	66	1.33	4901	98.67
76	4967	63	1.27	4904	98.73
77	4970	55	1.11	4915	98.89
78	4971	66	1.33	4905	98.67
79	4973	75	1.51	4898	98.49
80	4977	77	1.55	4900	98.45
81	4980	91	1.83	4889	98.17
82	4986	101	2.03	4885	97.97
83	4992	120	2.40	4872	97.60
84	4989	122	2.45	4867	97.55
85	4995	123	2.46	4872	97.54
86	4987	123	2.47	4864	97.53
87	4984	124	2.49	4860	97.51

88	4980	137	2.75	4843	97.25
89	4978	157	3.15	4821	96.85
90	4928	145	2.94	4783	97.06
91	2544	25	0.98	2519	99.02
92	370	1	0.27	369	99.73
93	41	0	0.00	41	100.00
94	1	0	0.00	1	100.00

Quality Control Report for file : H11042_ra0_ra3_ra4

Elevation Range is : -127.772(m) -30.050(m)

Total number of 3D points used: 572660

Starting Time: 21-MAR-2001 19:22:30.87
Ending Time: 22-MAR-2001 20:02:12.63

Minimum tidal reduction: 1883 (mm)
Maximum tidal reduction: 3070 (mm)

User#	Total	Max(+)	Max(-)	Mean	Std.	3dm(%)	5dm(%)	1%(%)	1.6%(%)
12	8	1.705	-2.169	-0.333	1.2699	12.5	37.5	62.5	87.5
13	1190	2.764	-7.269	0.039	0.8483	50.0	69.6	71.0	88.8
14	2230	3.534	-3.860	0.183	0.8650	44.3	59.7	68.8	88.3
15	2604	3.697	-6.137	0.161	0.8469	46.8	61.9	71.9	88.4
16	4987	3.103	-4.335	0.011	0.7087	51.8	70.4	76.3	90.9
17	5404	4.799	-4.759	0.057	0.7458	52.4	69.6	74.9	89.0
18	5505	3.954	-3.486	0.117	0.7068	54.0	70.4	76.6	89.5
19	5556	3.934	-4.065	0.030	0.7497	51.5	68.8	76.4	90.7
20	5625	5.424	-4.403	0.092	0.7502	51.8	68.4	75.7	90.6
21	5661	5.404	-4.401	0.150	0.7176	54.9	70.8	77.0	91.9
22	5651	6.548	-4.031	0.057	0.7902	51.2	68.0	75.2	90.1
23	5709	4.666	-3.694	0.107	0.7457	53.3	69.6	76.0	91.2
24	5680	4.661	-3.735	0.192	0.7095	53.7	70.8	77.3	91.7
25	5736	5.222	-4.127	0.062	0.7464	54.7	71.2	77.5	91.1
26	5748	5.117	-3.403	0.156	0.7089	55.1	71.8	78.3	91.6
27	5739	4.438	-3.461	0.219	0.6633	58.2	72.7	79.4	92.3
28	5758	4.534	-3.834	0.022	0.6919	53.2	71.6	79.0	92.7
29	5774	4.581	-4.585	0.078	0.6901	55.5	72.2	79.4	92.6
30	5781	4.918	-4.903	0.155	0.6606	59.7	73.8	79.7	93.1
31	5804	4.896	-5.685	-0.002	0.6722	56.6	73.3	82.1	93.0
32	5814	4.581	-3.639	0.071	0.6354	59.6	75.1	82.3	93.8
33	5823	5.608	-4.660	0.105	0.6417	57.6	73.7	81.0	93.9
34	5820	5.002	-4.325	-0.042	0.6282	55.5	74.2	83.0	93.7
35	5829	7.365	-4.428	0.030	0.6566	59.6	74.8	82.6	93.8
36	5823	6.680	-5.370	0.095	0.6681	60.9	75.5	82.3	94.5
37	5827	5.509	-3.284	-0.010	0.6321	56.6	75.0	82.8	93.5
38	5832	7.308	-3.133	0.079	0.6420	59.5	76.7	82.9	94.7
39	5819	6.153	-3.638	0.154	0.6596	60.0	75.3	81.1	93.7
40	5810	6.622	-3.930	0.007	0.6376	56.7	74.3	82.2	94.6
41	5789	6.320	-4.010	0.083	0.6320	59.7	74.6	82.7	94.2
42	5800	5.116	-3.330	0.134	0.6258	57.3	73.3	81.0	93.7
43	5806	5.951	-4.440	0.044	0.6242	54.1	72.6	80.7	93.7
44	5818	5.745	-3.772	0.083	0.6390	55.8	72.9	80.8	93.0
45	5816	6.586	-3.715	0.141	0.6248	55.2	73.5	80.6	93.5
46	5812	7.530	-3.280	0.050	0.5725	57.4	75.7	84.4	94.9
47	5812	6.165	-3.491	0.072	0.5905	56.8	75.5	83.4	94.5
48	5801	5.450	-3.376	0.149	0.5931	58.5	74.5	81.4	93.9
49	5801	6.982	-4.036	0.001	0.5839	57.3	75.9	84.2	95.1
50	5810	6.509	-3.282	0.053	0.5592	60.3	77.2	84.4	94.9
51	5816	6.174	-4.178	0.143	0.6044	57.3	75.1	82.8	93.8
52	5803	6.607	-4.850	-0.021	0.5727	58.1	76.8	85.7	95.1
53	5797	6.606	-3.454	0.046	0.5820	58.9	77.4	84.4	94.7
54	5788	4.953	-3.845	0.131	0.5732	57.7	76.0	81.8	94.6
55	5812	4.081	-3.161	-0.108	0.5499	53.8	75.3	85.1	94.6
56	5823	7.412	-3.014	-0.044	0.5706	57.0	75.6	85.6	95.0
57	5790	5.287	-3.933	0.026	0.5948	57.4	74.8	83.8	94.1
58	5790	4.700	-3.873	-0.158	0.5623	49.3	72.4	84.3	94.9
59	5800	5.682	-4.804	-0.095	0.6167	51.9	72.0	81.6	93.9

60	5782	3.303	-3.736	-0.006	0.6249	50.5	71.1	80.8	93.6
61	5758	3.892	-5.401	-0.175	0.6124	47.0	70.1	80.5	93.4
62	5730	4.396	-4.307	-0.105	0.6193	50.7	72.4	81.4	93.7
63	5704	4.836	-4.477	-0.021	0.6314	49.8	70.3	80.4	93.4
64	5753	3.956	-4.210	0.046	0.6578	53.9	72.0	79.4	92.2
65	5759	4.192	-4.369	0.106	0.6521	57.0	72.7	79.6	92.5
66	5734	4.523	-5.591	0.085	0.6505	56.9	74.1	81.1	92.6
67	5791	4.136	-5.025	0.134	0.6400	55.3	72.3	79.0	92.0
68	5771	3.730	-4.783	0.111	0.6569	55.6	72.2	79.3	91.6
69	5785	4.970	-6.876	0.074	0.6612	55.0	73.8	81.3	92.7
70	5782	4.179	-4.038	0.139	0.6115	55.8	73.5	79.0	91.5
71	5796	3.435	-4.303	0.103	0.6210	57.0	73.8	80.6	92.4
72	5796	4.069	-4.586	0.060	0.6047	59.5	75.8	82.6	93.4
73	5807	4.752	-4.158	0.028	0.6227	54.5	73.8	82.0	92.6
74	5798	3.435	-4.114	0.042	0.6435	55.9	74.4	80.9	91.9
75	5779	3.876	-6.384	0.029	0.6317	55.5	73.5	81.3	93.0
76	5799	4.309	-3.756	0.021	0.6026	55.7	73.9	81.6	93.0
77	5806	3.279	-4.068	-0.006	0.6018	56.8	73.9	81.6	92.5
78	5820	3.315	-4.254	-0.022	0.6144	55.5	73.9	81.7	93.7
79	5808	4.063	-5.454	-0.001	0.6004	57.5	75.1	81.8	94.0
80	5816	3.173	-6.179	-0.018	0.5944	56.7	74.2	81.0	93.6
81	5818	4.032	-3.060	-0.044	0.5805	56.4	73.4	80.7	93.3
82	5816	3.506	-3.870	0.019	0.5998	57.2	75.6	81.9	93.2
83	5825	3.031	-4.349	-0.012	0.6101	58.0	73.6	79.9	92.4
84	5812	3.906	-3.664	-0.053	0.6107	57.0	73.6	81.8	92.1
85	5825	2.784	-4.277	0.028	0.5972	58.4	74.8	81.1	92.8
86	5812	3.489	-3.941	0.009	0.6016	59.0	75.2	80.9	92.5
87	5805	2.830	-4.021	-0.036	0.5899	57.0	73.7	81.4	93.0
88	5829	2.339	-4.834	0.046	0.5996	57.0	74.5	81.2	92.8
89	5817	3.383	-4.334	0.024	0.5961	57.4	74.4	81.4	92.7
90	5819	3.112	-5.021	-0.028	0.5711	56.2	74.6	82.7	93.0
91	5837	2.941	-4.504	0.011	0.5890	55.1	73.9	81.1	93.8
92	5827	3.220	-4.452	-0.024	0.5719	56.8	74.2	82.4	93.7
93	5830	3.012	-3.385	-0.052	0.6006	53.2	72.2	81.1	93.5
94	5823	3.527	-5.470	0.032	0.6310	55.1	74.7	80.0	93.7
95	5828	3.578	-6.475	-0.001	0.6400	56.0	73.6	80.6	92.5
96	5817	4.118	-5.751	-0.059	0.6194	54.5	72.9	81.1	92.9
97	5816	3.571	-4.186	0.093	0.6281	54.4	71.6	78.8	91.9
98	5820	3.168	-3.619	-0.022	0.6064	54.7	71.6	81.0	92.0
99	5811	2.885	-3.423	-0.074	0.6479	50.0	69.5	78.4	91.6
100	5823	2.963	-4.294	0.145	0.6675	54.3	70.6	76.2	91.3
101	5801	2.963	-3.274	0.025	0.6668	51.9	69.7	77.3	91.8
102	5795	3.814	-4.084	-0.046	0.6736	51.6	69.9	76.4	92.0
103	5788	3.539	-4.708	0.091	0.7041	52.7	70.4	76.0	91.0
104	5756	3.948	-3.218	0.012	0.6863	51.8	70.6	75.7	91.2
105	5731	3.343	-5.939	-0.045	0.7156	49.7	68.5	76.6	90.6
106	5753	4.175	-4.206	0.058	0.7661	49.1	67.5	75.1	88.8
107	5725	3.387	-4.427	-0.044	0.7740	48.9	66.9	74.5	89.9
108	5705	3.194	-4.254	-0.105	0.7681	45.4	64.9	73.3	88.7
109	5728	6.382	-4.773	0.058	0.7823	49.6	67.7	74.1	89.6
110	5706	3.500	-4.725	-0.045	0.7781	45.8	63.6	71.2	88.6
111	5687	6.001	-5.707	-0.100	0.7665	44.2	65.1	72.3	88.7
112	5615	6.148	-3.965	0.023	0.7941	44.0	63.4	70.4	87.5
113	4913	4.810	-3.844	-0.028	0.7634	41.0	63.0	68.3	88.3
114	1984	8.838	-2.689	0.074	0.8443	44.4	66.2	67.0	88.3
115	316	3.222	-1.444	0.424	1.0063	36.7	52.5	51.3	77.8
116	42	2.963	-0.451	0.411	0.9748	38.1	61.9	66.7	85.7

_Classification report 1 of 3

IHO statistics a/b are : 0.250 0.007

User#	Total	# fail	% fail	# pass	% pass
=====	=====	======	======	======	======

12	8	4	50.00	4	50.00
13	1190	367	30.84	823	69.16
14	2230	798	35.78	1432	64.22
15	2604	887	34.06	1717	65.94
16	4987	1445	28.98	3542	71.02
17	5404	1613	29.85	3791	70.15
18	5505	1539	27.96	3966	72.04
19	5556	1600	28.80	3956	71.20
20	5625	1640	29.16	3985	70.84
21	5661	1593	28.14	4068	71.86
22	5651	1685	29.82	3966	70.18
23	5709	1597	27.97	4112	72.03
24	5680	1560	27.46	4120	72.54
25	5736	1519	26.48	4217	73.52
26	5748	1492	25.96	4256	74.04
27	5739	1441	25.11	4298	74.89
28	5758	1510	26.22	4248	73.78
29	5774	1454	25.18	4320	74.82
30	5781	1400	24.22	4381	75.78
31	5804	1332	22.95	4472	77.05
32	5814	1285	22.10	4529	77.90
33	5823	1371	23.54	4452	76.46
34	5820	1248	21.44	4572	78.56
35	5829	1271	21.80	4558	78.20
36	5823	1285	22.07	4538	77.93
37	5827	1261	21.64	4566	78.36
38	5832	1218	20.88	4614	79.12
39	5819	1335	22.94	4484	77.06
40	5810	1270	21.86	4540	78.14
41	5789	1302	22.49	4487	77.51
42	5800	1366	23.55	4434	76.45
43	5806	1378	23.73	4428	76.27
44	5818	1416	24.34	4402	75.66
45	5816	1374	23.62	4442	76.38
46	5812	1215	20.91	4597	79.09
47	5812	1218	20.96	4594	79.04
48	5801	1344	23.17	4457	76.83
49	5801	1184	20.41	4617	79.59
50	5810	1143	19.67	4667	80.33
51	5816	1268	21.80	4548	78.20
52	5803	1065	18.35	4738	81.65
53	5797	1123	19.37	4674	80.63
54	5788	1259	21.75	4529	78.25
55	5812	1148	19.75	4664	80.25
56	5823	1129	19.39	4694	80.61
57	5790	1209	20.88	4581	79.12
58	5790	1260	21.76	4530	78.24
59	5800	1351	23.29	4449	76.71
60	5782	1464	25.32	4318	74.68
61	5758	1472	25.56	4286	74.44
62	5730	1375	24.00	4355	76.00
63	5704	1480	25.95	4224	74.05
64	5753	1450	25.20	4303	74.80
65	5759	1425	24.74	4334	75.26
66	5734	1363	23.77	4371	76.23
67	5791	1467	25.33	4324	74.67
68	5771	1434	24.85	4337	75.15
69	5785	1332	23.03	4453	76.97
70	5782	1415	24.47	4367	75.53
71	5796	1370	23.64	4426	76.36
72	5796	1266	21.84	4530	78.16
73	5807	1308	22.52	4499	77.48
74	5798	1349	23.27	4449	76.73

75	5779	1335	23.10	4444	76.90
76	5799	1318	22.73	4481	77.27
77	5806	1319	22.72	4487	77.28
78	5820	1351	23.21	4469	76.79
79	5808	1261	21.71	4547	78.29
80	5816	1328	22.83	4488	77.17
81	5818	1396	23.99	4422	76.01
82	5816	1312	22.56	4504	77.44
83	5825	1383	23.74	4442	76.26
84	5812	1328	22.85	4484	77.15
85	5825	1351	23.19	4474	76.81
86	5812	1321	22.73	4491	77.27
87	5805	1335	23.00	4470	77.00
88	5829	1347	23.11	4482	76.89
89	5817	1345	23.12	4472	76.88
90	5819	1274	21.89	4545	78.11
91	5837	1371	23.49	4466	76.51
92	5827	1348	23.13	4479	76.87
93	5830	1375	23.58	4455	76.42
94	5823	1383	23.75	4440	76.25
95	5828	1380	23.68	4448	76.32
96	5817	1359	23.36	4458	76.64
97	5816	1491	25.64	4325	74.36
98	5820	1383	23.76	4437	76.24
99	5811	1532	26.36	4279	73.64
100	5823	1654	28.40	4169	71.60
101	5801	1622	27.96	4179	72.04
102	5795	1632	28.16	4163	71.84
103	5788	1654	28.58	4134	71.42
104	5756	1630	28.32	4126	71.68
105	5731	1667	29.09	4064	70.91
106	5753	1701	29.57	4052	70.43
107	5725	1794	31.34	3931	68.66
108	5705	1873	32.83	3832	67.17
109	5728	1765	30.81	3963	69.19
110	5706	1950	34.17	3756	65.83
111	5687	1919	33.74	3768	66.26
112	5615	1994	35.51	3621	64.49
113	4913	1816	36.96	3097	63.04
114	1984	756	38.10	1228	61.90
115	316	158	50.00	158	50.00
116	42	18	42.86	24	57.14

_Classification report 2 of 3

IHO statistics a/b are : 0.500 0.013

User#	Total	# fail	% fail	# pass	% pass
12	8	2	25.00	6	75.00
13	1190	131	11.01	1059	88.99
14	2230	328	14.71	1902	85.29
15	2604	358	13.75	2246	86.25
16	4987	526	10.55	4461	89.45
17	5404	632	11.70	4772	88.30
18	5505	629	11.43	4876	88.57
19	5556	598	10.76	4958	89.24
20	5625	633	11.25	4992	88.75
21	5661	538	9.50	5123	90.50
22	5651	678	12.00	4973	88.00
23	5709	615	10.77	5094	89.23
24	5680	597	10.51	5083	89.49
25	5736	608	10.60	5128	89.40
26	5748	622	10.82	5126	89.18

27	5739	584	10.18	5155	89.82
28	5758	537	9.33	5221	90.67
29	5774	508	8.80	5266	91.20
30	5781	478	8.27	5303	91.73
31	5804	470	8.10	5334	91.90
32	5814	409	7.03	5405	92.97
33	5823	429	7.37	5394	92.63
34	5820	410	7.04	5410	92.96
35	5829	401	6.88	5428	93.12
36	5823	401	6.89	5422	93.11
37	5827	415	7.12	5412	92.88
38	5832	352	6.04	5480	93.96
39	5819	423	7.27	5396	92.73
40	5810	364	6.27	5446	93.73
41	5789	385	6.65	5404	93.35
42	5800	420	7.24	5380	92.76
43	5806	413	7.11	5393	92.89
44	5818	425	7.30	5393	92.70
45	5816	412	7.08	5404	92.92
46	5812	299	5.14	5513	94.86
47	5812	348	5.99	5464	94.01
48	5801	375	6.46	5426	93.54
49	5801	308	5.31	5493	94.69
50	5810	308	5.30	5502	94.70
51	5816	383	6.59	5433	93.41
52	5803	286	4.93	5517	95.07
53	5797	339	5.85	5458	94.15
54	5788	318	5.49	5470	94.51
55	5812	330	5.68	5482	94.32
56	5823	286	4.91	5537	95.09
57	5790	366	6.32	5424	93.68
58	5790	328	5.66	5462	94.34
59	5800	396	6.83	5404	93.17
60	5782	415	7.18	5367	92.82
61	5758	420	7.29	5338	92.71
62	5730	409	7.14	5321	92.86
63	5704	399	7.00	5305	93.00
64	5753	469	8.15	5284	91.85
65	5759	453	7.87	5306	92.13
66	5734	441	7.69	5293	92.31
67	5791	481	8.31	5310	91.69
68	5771	495	8.58	5276	91.42
69	5785	430	7.43	5355	92.57
70	5782	489	8.46	5293	91.54
71	5796	489	8.44	5307	91.56
72	5796	392	6.76	5404	93.24
73	5807	451	7.77	5356	92.23
74	5798	506	8.73	5292	91.27
75	5779	434	7.51	5345	92.49
76	5799	431	7.43	5368	92.57
77	5806	453	7.80	5353	92.20
78	5820	392	6.74	5428	93.26
79	5808	372	6.40	5436	93.60
80	5816	416	7.15	5400	92.85
81	5818	429	7.37	5389	92.63
82	5816	417	7.17	5399	92.83
83	5825	490	8.41	5335	91.59
84	5812	489	8.41	5323	91.59
85	5825	428	7.35	5397	92.65
86	5812	476	8.19	5336	91.81
87	5805	420	7.24	5385	92.76
88	5829	427	7.33	5402	92.67
89	5817	434	7.46	5383	92.54

90	5819	434	7.46	5385	92.54
91	5837	400	6.85	5437	93.15
92	5827	394	6.76	5433	93.24
93	5830	426	7.31	5404	92.69
94	5823	412	7.08	5411	92.92
95	5828	493	8.46	5335	91.54
96	5817	457	7.86	5360	92.14
97	5816	521	8.96	5295	91.04
98	5820	513	8.81	5307	91.19
99	5811	551	9.48	5260	90.52
100	5823	578	9.93	5245	90.07
101	5801	529	9.12	5272	90.88
102	5795	546	9.42	5249	90.58
103	5788	618	10.68	5170	89.32
104	5756	570	9.90	5186	90.10
105	5731	628	10.96	5103	89.04
106	5753	669	11.63	5084	88.37
107	5725	671	11.72	5054	88.28
108	5705	714	12.52	4991	87.48
109	5728	644	11.24	5084	88.76
110	5706	747	13.09	4959	86.91
111	5687	730	12.84	4957	87.16
112	5615	750	13.36	4865	86.64
113	4913	637	12.97	4276	87.03
114	1984	250	12.60	1734	87.40
115	316	78	24.68	238	75.32
116	42	6	14.29	36	85.71

_Classification report 3 of 3

IHO statistics a/b are : 1.000 0.023

User#	Total	# fail	% fail	# pass	% pass
12	8	0	0.00	8	100.00
13	1190	20	1.68	1170	98.32
14	2230	50	2.24	2180	97.76
15	2604	44	1.69	2560	98.31
16	4987	77	1.54	4910	98.46
17	5404	78	1.44	5326	98.56
18	5505	79	1.44	5426	98.56
19	5556	124	2.23	5432	97.77
20	5625	123	2.19	5502	97.81
21	5661	68	1.20	5593	98.80
22	5651	98	1.73	5553	98.27
23	5709	80	1.40	5629	98.60
24	5680	78	1.37	5602	98.63
25	5736	107	1.87	5629	98.13
26	5748	63	1.10	5685	98.90
27	5739	52	0.91	5687	99.09
28	5758	71	1.23	5687	98.77
29	5774	84	1.45	5690	98.55
30	5781	66	1.14	5715	98.86
31	5804	106	1.83	5698	98.17
32	5814	71	1.22	5743	98.78
33	5823	67	1.15	5756	98.85
34	5820	76	1.31	5744	98.69
35	5829	73	1.25	5756	98.75
36	5823	68	1.17	5755	98.83
37	5827	71	1.22	5756	98.78
38	5832	59	1.01	5773	98.99
39	5819	55	0.95	5764	99.05
40	5810	80	1.38	5730	98.62
41	5789	49	0.85	5740	99.15

42	5800	75	1.29	5725	98.71
43	5806	73	1.26	5733	98.74
44	5818	57	0.98	5761	99.02
45	5816	74	1.27	5742	98.73
46	5812	64	1.10	5748	98.90
47	5812	77	1.32	5735	98.68
48	5801	65	1.12	5736	98.88
49	5801	74	1.28	5727	98.72
50	5810	68	1.17	5742	98.83
51	5816	72	1.24	5744	98.76
52	5803	81	1.40	5722	98.60
53	5797	71	1.22	5726	98.78
54	5788	62	1.07	5726	98.93
55	5812	83	1.43	5729	98.57
56	5823	63	1.08	5760	98.92
57	5790	65	1.12	5725	98.88
58	5790	72	1.24	5718	98.76
59	5800	73	1.26	5727	98.74
60	5782	81	1.40	5701	98.60
61	5758	86	1.49	5672	98.51
62	5730	103	1.80	5627	98.20
63	5704	96	1.68	5608	98.32
64	5753	125	2.17	5628	97.83
65	5759	113	1.96	5646	98.04
66	5734	105	1.83	5629	98.17
67	5791	111	1.92	5680	98.08
68	5771	101	1.75	5670	98.25
69	5785	94	1.62	5691	98.38
70	5782	81	1.40	5701	98.60
71	5796	100	1.73	5696	98.27
72	5796	101	1.74	5695	98.26
73	5807	87	1.50	5720	98.50
74	5798	90	1.55	5708	98.45
75	5779	95	1.64	5684	98.36
76	5799	75	1.29	5724	98.71
77	5806	82	1.41	5724	98.59
78	5820	98	1.68	5722	98.32
79	5808	92	1.58	5716	98.42
80	5816	74	1.27	5742	98.73
81	5818	81	1.39	5737	98.61
82	5816	87	1.50	5729	98.50
83	5825	75	1.29	5750	98.71
84	5812	97	1.67	5715	98.33
85	5825	70	1.20	5755	98.80
86	5812	73	1.26	5739	98.74
87	5805	75	1.29	5730	98.71
88	5829	62	1.06	5767	98.94
89	5817	63	1.08	5754	98.92
90	5819	62	1.07	5757	98.93
91	5837	58	0.99	5779	99.01
92	5827	49	0.84	5778	99.16
93	5830	72	1.23	5758	98.77
94	5823	84	1.44	5739	98.56
95	5828	81	1.39	5747	98.61
96	5817	82	1.41	5735	98.59
97	5816	42	0.72	5774	99.28
98	5820	60	1.03	5760	98.97
99	5811	78	1.34	5733	98.66
100	5823	69	1.18	5754	98.82
101	5801	79	1.36	5722	98.64
102	5795	95	1.64	5700	98.36
103	5788	80	1.38	5708	98.62
104	5756	79	1.37	5677	98.63

105	5731	86	1.50	5645	98.50
106	5753	127	2.21	5626	97.79
107	5725	145	2.53	5580	97.47
108	5705	165	2.89	5540	97.11
109	5728	159	2.78	5569	97.22
110	5706	141	2.47	5565	97.53
111	5687	123	2.16	5564	97.84
112	5615	120	2.14	5495	97.86
113	4913	108	2.20	4805	97.80
114	1984	46	2.32	1938	97.68
115	316	24	7.59	292	92.41
116	42	6	14.29	36	85.71

VI. AWOIS Forms (from Access Database)

RECRD 52262 VESSLTERMS OBSTRUCTION CHART 18448 AREA N

CARTOCODE 0067 SNDINGCODE DEPTH 0

NATIVLAT	47/07/18.00	NATIVLON	122/42/00.00	convert	NATIVDATUM	6	
LAT83	47/07/17.34	LONG83	122/42/04.47	Update GP	GPQUALITY	Poor	
	47 7 17.34		122 42 4.47		GPSOURCE	Direct	
LATDEC	47.121483333333	LONDEC	122.70124166667				

PROJECT OPR-N210 ITEMSTATUS Assigned SEARCHTYPE Full

RADIUS 300 INIT MBH ASSIGNED 10/20/95

TECNIQ S4, BD, DI, SD

Techniqnote

History

HISTORY
CL1350/76--DIRECTOR OF CARTOGRAPHY, NATIONAL DEFENCE ¦ HEADQUARTERS, OTTAWA, ONTARIO, CANADA; REPORT BY THE HMCS ¦ CHIGNECTO THAT DISCUSSIONS WITH LOCAL FISHERMEN INDICATED THAT ¦ MANY JUNK AUTOMOBILES HAVE BEEN DEPOSITED OFF LYLE POINT. ¦ (ENTERED 10/95 BY MBH)
H9682/77--SP-PMC-2-DA-77, NOAA SHIP DAVIDSON; ITEM ASSIGNED FOR ¦ INVESTIGATION. AREA DEVELOPED BY 22-METER SPACED SOUNDING LINES. ¦ NOTHING FOUND. RECOMMENDED TO BE RETAINED AS CHARTED AND ¦ ACCOMPLISHING WIRE DRAG TO RESOLVE. (ENTERED 10/95 BY MBH)
H10714/96--OPR-N210-PHP; OBSERVED FOUR SEPERATE CONTACTS ¦ RANGING IN HEIGHTS ABOVE THE BOTTOM FROM 2.3 TO 3.9 METERS DURING ¦ SIDE SCAN SONAR INVESTIGATIONS OF THIS ITEM. THE CONTACTS WERE ¦ NOT POSITIONED BY THE HYDROGRAPHER AND THE EVALUATOR RECOMMENDED ¦ RETAINING AS CHARTED THE ITEM. THE HYDROGRAPHER NOTED THAT THE ¦ OBSTRUCTIONS FOUND WERE NON-DANGEROUS. (UPDATED 10/97 BY MBH)

Fieldnote

INVESTIGATION

DATES(S): 3/21-22/2001 (DN:80-81)

VN: 2121, 2126 TIME: CONTINUOUS DURING SURVEY OPERATIONS

INVESTIGATION METHODS USED: (IE DI, 200% SIDE SCAN SONAR, ECHO SOUNDER) 100% SWMB WITH 100% SSS IMAGERY

SURVEYED POSITION: LAT. LON.

POSITION DETERMINED BY: DIFFERENTIAL GPS

INVESTIGATION SUMMARY: THIS AREA WAS COVERED BY 100% SWMB WITH SIDE SCAN IMAGERY. NO OBSTRUCTIONS WERE DETECTED IN THE SEARCH READIUS.

CHARTING RECOMMENDATIONS (HYDROGRAPHER): REMOVE FROM CHART

EVALUATOR COMMENTS: CONCUR

REFERENCE: YEARSUNK SYSTEMNUM 10363

Print Record

NOAA FORM 77-27(H)
(9-83)

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER
H11042

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES						
ENVELOPES	1					1
VOLUMES						
CAHIERS						
BOXES						

SHORELINE DATA

SHORELINE MAPS (List):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List):

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	*EVALUATION*	*TOTALS*
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			

	TIME-HOURS		
	VERIFICATION	*EVALUATION*	*TOTALS*
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET			51
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT			4
GEOGRAPHIC NAMES			
OTHER (Chart Compilation)			
USE OTHER SIDE OF FORM FOR REMARKS — TOTALS			55

Pre-processing Examination by	*Beginning Date*	*Ending Date*
Verification of Field Data by Elias Domingo	*Time (Hours)* 51	*Ending Date*
Verification Check by	*Time (Hours)*	*Ending Date*
Evaluation and Analysis by Dennis Hill	*Time (Hours)* 4	*Ending Date* 03/07/2002
Inspection by CDR John E. Lowell, Jr., NOAA	*Time (Hours)* 1	*Ending Date* 4/24/02

U.S. GOVT. PRINTING OFFICE 1983: 764-008/6061

APPROVAL SHEET
H-11042

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.

Dennis Hill Date: 3-7-02
Dennis Hill
Cartographic Team Leader

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.

John E. Lowell, Jr. Date: 4/29/02
John E. Lowell, Jr.
Commander, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Samuel P. DeBow, Jr. Date: July 11, 2002
Samuel De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. ________

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
18449	2/4/02	[illegible]	Full Part Before After Marine Center Approval Signed Via full application of
			Drawing No. soundings & features from the smooth sheet
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.