

H10846

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-10-19-98
Registry No. H-10846

LOCALITY

State Alaska
General Locality Southwest Prince William Sound
Sublocality Smith Island and Vicinity

1998

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

LIBRARY & ARCHIVES

DATE JAN 9 2007

HYDROGRAPHIC TITLE SHEET

H-10846

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-10-19-98

State Alaska

General locality Southwest Prince William Sound

Locality Smith Island and Vicinity

Scale 1:10,000 Date of survey 9/19/98 - 10/26/98

Instructions dated July 10, 1998* Project No. OPR-P139-RA

Vessel RA-1(2121), RA-2(2122), RA-3(2123), RA-4(2124), RA-5(2125)
RA-5(2126)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by RAINIER Personnel

Soundings taken by Multibeam, DSF-6000N, Knudsen 320M, IDSSS MB, Reson 8101 MB

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: B. Mihailov Automated plot by HP Design Jet 650

Verification by E. Domingo, M. Bigelow, R. Mayor, D. Doles, B. Mihailov

Soundings in fathoms ~~feet~~ at ~~MLLW~~ MLLW and tenths

REMARKS: All times are UTC, revisions and marginal notes in black
were generated during office processing. All separates are
filed with the hydrographic data, as a result page numbering
may be interrupted or non-sequential. All depths listed in
this report are referenced to mean lower low water unless
otherwise noted.

SURF & AWAS 11/10/99

* Change 1 dated September 8, 1998

MLR

PROGRESS SKETCH

OPR-P139-98
Prince William Sound, AK
October

Capt A. D. Anderson
Commanding

Chart 16705_1

	July
	Aug
	Sept
	Oct

Sheet E
13.80 sq nm
100%

Sheet D
7.97 sq nm
100%

Sheet U
17.50 sq nm
100%

Sheet V
16.78 sq nm
100%

Sheet W
126.9 sq nm
100%

Sheet X
28.49 sq nm
100%

Sheet
21.18 sq nm
100%

Sheet Y
17.53 sq nm
100%

Sheet F
10.15 sq nm
100%

Sheet AA
12.92 sq nm
100%

Sheet AB
24.50 sq nm
100%

Sheet G
10.67 sq nm
100%

Accomplished	July	Aug	Sept	Oct
LNM Hydro	618.57*	969.99	2045.14	1676.19
LNM SSS	0	0	0	0
SQ NM	17.16	20.95	63.92	195.69
AWOIS Invest.	0	6	2	6
Other Invest.	0	1 dive	3 dives	5 dives
LNM Multibeam	86.5	310.01**	429.9**	1113.9**

Sheet	Reg No	Started	Percent	Completed	Submitted	SQNM
G	H-10827	7/25	100	9/15		10.67
F	H-10829	7/28	100	9/15		10.15
E	H-10826	7/21	100	10/9		13.80
D	H-10838	8/23	100	9/6		7.97
Y	H-10837	8/21	100	10/14		17.53
U	H-10840	9/6	100	10/7		17.50
AA	H-10841	9/8	100	10/13		12.92
V	H-10843	9/10	100	10/19		16.78
W	H-10849	9/24	100	10/28		126.9
X	H-10846	9/19	100	10/26		28.49
AB	H-10847	9/21	100	10/26		24.50
Z	H-10855	10/21	100	10/28		21.18

Does not include SWMB
** Includes both SWMB & IDSSS

Downtime_Type	July	Aug	Sept	Oct
Weather - Hr	0	20	0	22
Mechanical -Hr	0	7	22	8
Electronic -Hr	0	7	0	0

Descriptive Report to Accompany Hydrographic Survey H-10846

Field Number RA-10-19-98

Scale 1:10,000

January 1999

NOAA Ship RAINIER

Chief of Party: Captain Alan D. Anderson, NOAA

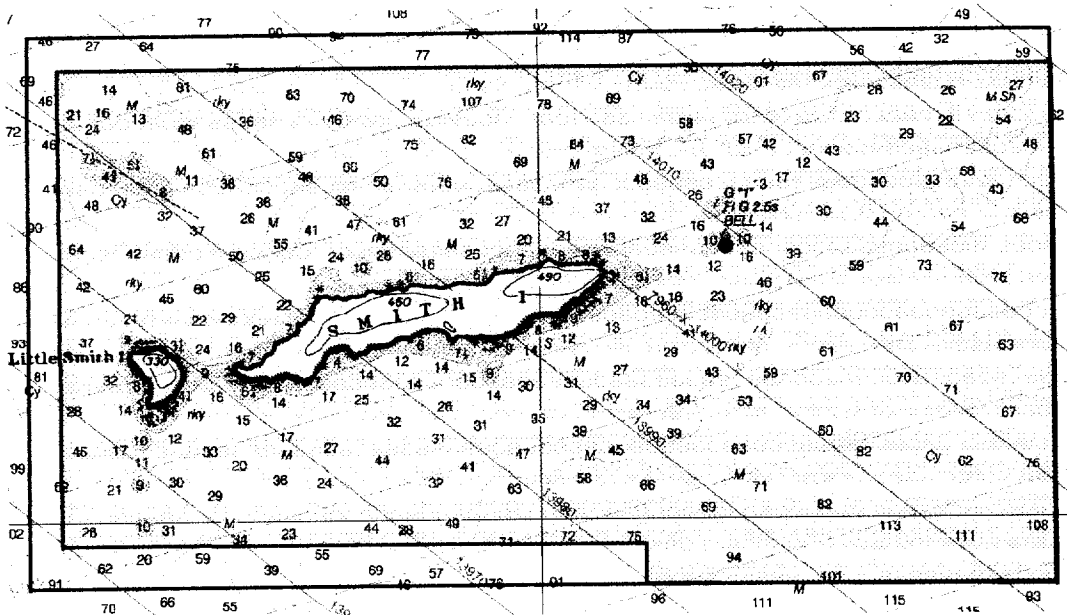
A. PROJECT ✓

This basic hydrographic survey was completed in the southwest portion of Prince William Sound, Alaska as specified by Project Instructions OPR-P139-RA dated July 10, 1998 and change #1 dated September 8, 1998. Survey H-10846 corresponds to sheet X as defined in the sheet layout. This survey will provide data to supersede prior surveys performed from 1905 through 1949 and will affect Charts 16700 and 16705. Requests for hydrographic surveys and updated charts in this area have been received from the National Imagery and Mapping Agency (NIMA), the U.S. Coast Guard, the Southwest Alaska Pilot's Association, cruise ship lines, and local fishermen.

Significant changes in depths and shoreline may have occurred in the project area as a result of the earthquake of March 27, 1964. *Concur*

B. AREA SURVEYED. ✓ *See Eval Rpt., Section B.*

The survey area is Smith Island. The survey's northern limit is latitude 60-33-20.09 N. the survey's southern limit is ^{60-29-29.69 N.} 60-29-29.69 N. The western limit is ^{147-27-10.13 W} 147-27-10.13 W and the eastern limit is ^{147-12-20.51 W} 147-12-20.51 W. Survey limits are shown below on a detail of Chart 16705.



Frequent commercial and recreational marine traffic was observed transiting north of Smith Island. Data acquisition was conducted from September 19 to October 26, 1998 (DN 262 to 299).

C. SURVEY VESSELS ✓

Data were acquired by RAINIER survey launches (vessel numbers 2121, 2122, 2123, 2124, 2125 and 2126) as noted in the Survey Information Summary print out appended to this report.

This project included the use of a new vessel configuration. Launches 2121, 2123, and 2126 were recently configured with a Reson SeaBat 8101 Shallow Water Multibeam (SWMB) system. (See Section F., Sounding Equipment, for details.) The center of the launch keels were cut and modified to house the transducers. The originally installed DSF-6000N single beam transducers remained installed as before.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

Single beam echosounder data were acquired using HYPACK version 7.1a from Coastal Oceanographics and processed using Hydrographic Processing System (HPS). Shallow water multibeam (SWMB) echosounder data were acquired using the Reson SeaBat 8101 with ISIS version 3.41 and processed using CARIS software. Raster image and shoreline data in MapInfo facilitated charted and prior survey comparisons. Final Detached Positions and soundings based on predicted tides were saved in MapInfo 4.5 format. A complete listing of software for HYPACK and HPS is included in Appendix VI. ✱

E. SONAR EQUIPMENT ✓

Side Scan Sonar (SSS) equipment was not used on this survey. However, it should be noted that the Reson Seabat 8101 SWMB system provides a low-resolution digital SSS record of the SWMB swath. This SSS imagery is primarily used to aid in final processing of the SWMB depth data but can also be used to provide imagery of features such as wrecks, rocks, and obstructions. ✱ Concur

F. SOUNDING EQUIPMENT ✓

Two different categories of echosounder systems were used and are described below. The individual system(s) chosen for use in a given area were decided at the discretion of the Hydrographer using the guidance stated in the Project Instructions and depended upon the limitations of each system, the bottom topography, the water-depth, and the ability of the platform vessel to safely navigate the area.

1. Launch Singlebeam (VN 2122, 2124, 2125):

The singlebeam sounding instruments for this survey were the Raytheon DSF-6000N and Knudsen 320M, which are dual frequency (100 kHz, 24 kHz), digital recording singlebeam fathometers with analog paper traces. Soundings were acquired in meters using the High + Low, high frequency digitized setting, but in depths over 300 meters, low frequency was scanned in place of the high when the fathometer lost its high frequency trace. Serial numbers are included in the Separates. ✱ Singlebeam launches were used to collect mainscheme hydrography and to perform all shoreline verification.

2. Launch Shallow Water Multibeam (SWMB) (VN 2121, 2123, 2126):

The Reson SeaBat 8101 is a multibeam echosounder system that measures relative water depths across a wide swath perpendicular to the vessel's path. The Reson SeaBat 8101 ensonifies the seafloor with a 150° swath consisting of 101 individual 1.5° x 1.5° beams. The system was designed to meet International Hydrographic Organization standards to measure the seafloor at a maximum range of 320 meters. The system's maximum depth range under actual field conditions has proven to be much less. RAINIER has discovered that maximum attainable depths are approximately 80-150 meters, depending on sea conditions

✱ Filed with the hydrographic records.

and bottom topography. Serial numbers are included in the Separates. *SWMB launches were used to collect full-bottom coverage of select areas identified during singlebeam hydrography, generally all areas determined to be less than 60 meters deep that could safely be investigated without the risk of damaging the SWMB transducer. SWMB launches were not use for shoreline verification due to the extremely high risk of damaging the SWMB transducers on submerged rocks. *Concur*

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Sound Velocity Correctors:

Sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated January 27, 1998, and (S/N 2543), calibrated January 10, 1998 and (S/N 2477), calibrated February 6, 1998. Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.1 (1997), in accordance with Field Procedures Manual (FPM) section 2.1.2 and Hydrographic Survey Guideline (HSG) No. 69. For singlebeam launches, sound velocity correctors were applied to the raw sounding data in HPS and for SWMB launches, they were applied in Caris during post-acquisition processing. *Concur*

Vessel Offset Correctors ✓

The following table shows when the vessel offset correctors used for this survey were last measured:

Vessel No.	Date of static draft and transducer offset measurements	Method of Settlement and Squat Measurement	Date of Settlement and Squat Measurement	Location of Settlement and Squat Measurement
2121	March 26, 1998	OTF	July, 1998	Shilshole, WA
2122	March 26, 1998	Rod leveling	June 11, 1998	Shakan Strait, AK
2123	March 26, 1998	OTF	July, 1998	Shilshole, WA
2124	March 26, 1998	Rod leveling	June 11, 1998	Shakan Strait, AK
2125	March 26, 1998	Rod leveling	June 21, 1998	Chilkat Inlet, AK
2126	March 26, 1998	OTF	July, 1998	Shilshole, WA

OTF - ON the Fly

Settlement and squat correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2, using FPM Fig. 2.4, and are included with project data for OPR-P139-RA-98. All offset tables contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables # 1-6 correspond to the last digit of the vessel number. For singlebeam launches, offset tables were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB launches, offsets were applied during Caris post-acquisition processing. *Concur*

The offset tables are included with project data for OPR-P139-RA-98. *Concur*

Predicted Tidal Correctors: ✓

The Oceanographic Products and Services Division, User Services Branch (N/CS41), through N/CS31, provided predicted tides for the project on diskette for the Cordova reference station (945-4050). The predicted tides at Cordova were adjusted with the following time and height correctors for use on this survey in accordance with Project Instructions, Section 5.9, Zoning, and entered into HPS.

For Launch Singlebeam soundings, HPS tide tables were applied to raw sounding data during shipboard processing in HPS. *Concur*

For Launch SWMB soundings, six-minute interval predicted tide data from the Cordova reference station (945-4050) were imported directly into CARIS (without adjusting for zoning) from commercial Tides and Currents software and applied to raw sounding data during shipboard processing in CARIS. *Concur*

* filed with the hydrographic records.

Real Tidal Correctors: ✓

The operating tide stations at Cordova (945-4050) and Valdez (945-4240) served as control for datum determination. A Next Generation Water Level Measurement System (NGWLMS) Aquatrak is the only sensor at these stations. Consequently, RAINIER was not required to inspect or perform leveling of these stations.

The following Sutron 8200 Bubbler tide stations were established for this project in order to provide information on zoning, tidal datums (reducers), and harmonic constants for predictions:

Station name	Station Number	GOES XMTR	Type of gauge	Date Established	Date Removed
Seal Island	945-4564	Yes	30-day	8-5-98	10-30-98
Snug Harbour	945-4662	No	30-day	8-5-98	10-30-98

Refer to the Field Tide Notes and supporting data in Appendix V* for individual gauge performance and level closure information. Raw waterlevel data from these gauges has been forwarded to N/CS41 in accordance with HSG 50 and FPM 4.7 where it will be processed into final approved (smooth) tides. 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 to the Pacific Hydrographic Branch has been forwarded to N/OES23 in accordance with FPM 4.8. *Approved tide note, dated March 25, 1999 is attached to this report.*

H. HYDROGRAPHIC POSITION CONTROL ✓

The horizontal datum for this project is NAD 83. Station ROCK was used to verify and establish local geodetic control for this survey. See the OPR-P139-RA-98 Horizontal Control Report for more information.

All soundings were positioned using differential GPS (DGPS). The VHF differential reference station at SEAL or TUFT was the primary source for differential correctors for this survey. The USCG beacons located at Cape Hinchinbrook, AK, Kenai, AK, and Potato Point, AK were used when the VHF reference station was unavailable.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two different DGPS base stations while the launches were rafted together with their GPS antennae within 2-3 meters of each other. RAINIER also used SHIPDIM, version 2.2R (April 1996) with a Trimble Centurion P-code receiver and an Ashtech sensor (both differentially-corrected) to monitor the performance of the USCG Beacon. Periodic comparisons and occasional performance checks were logged with the SHIPDIM system. Some outliers were noted, but none indicated systematic or continuous errors in the beacons. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-P139-RA-98. *Concur*

I. SHORELINE ✓ *See Eiel Rpt., section J.*

N/NGS3 did not supply photogrammetric shoreline so the charted shoreline and features were traced in MapInfo and imported into Hypack for field verification.

Limited shoreline verification was conducted in accordance with the Project Instructions and FPM 6.2. For this survey, the NALL (Navigable Area Limit Line) was defined by the limit of safe navigation of a survey launch during a period of extreme low (negative) tide. The NALL runs at a distance of 5-50 meters offshore of the apparent low water line. Depths along the NALL are generally 2-15 m MLLW. Features seen offshore of the NALL were positioned with the launch's DGPS by taking Detached Positions. Features seen inshore of the NALL were not positioned. *Concur*

* filed with the hydrographic records.

Field features were compared to an enlargement of charts 16700 24th ed. and 16705 17th ed. There was general agreement between the charted shoreline and what the hydrographer found on this survey. There are, however, numerous differences (approximately 28) when analyzing the present features such as rocks, islets, ledges, and reefs. The differences fall into three categories: mis-charted rocks, uncharted features, and mis-named charted features. The launches disproved mis-charted rocks by taking fixes at the charted locations at negative tide levels and observing the surrounding water for indications of rocks near the surface. It is likely that these rocks were either mis-positioned initially or moved by the cartographer for representation purposes. The reason for the discovery of numerous uncharted features is uncertain. It is possible that portions of the initial survey were performed during positive tides when the rocks were submerged or this area has risen since the initial survey, due to the effects of the 1964 earthquake, exposing new rocks. The mis-named charted features were likely the result of the different perspectives of the hydrographer and the digitizer. Discrepancies between charted and field shoreline should thus be resolved in favor of the field work as shown on the final field Detached Position and Bottom Sample plot provided to PHB. Handwritten notes and features shown on the accompanying SHORELINE NOTES plot are the hydrographer's representation of the features seen in-shore of the NALL while slowly transiting along the shore, and are intended to aid chart compilation. *Shoreline verification has been analyzed during office processing and shown on the Smooth Sheet as warranted.* Concur

The following is a list of all Detached Positions taken on new features. It is recommended that they be added to the chart:

Fix	Remark (raw depth in meters)	Latitude North	Longitude East	Depth (m) corrected	Notes Smooth Sheet
20068	Rk, new rng 4.0m brg 060M (0.0)m 20068	60:31:44.565✓	147:22:16.991✓	0.0	* (1)
20071	Rk, new rng 5.5m brg 150M (0.5)m 20071	60:31:41.497✓	147:23:20.064✓	-0.6	* (3)
20073	Rk, new rng 3.5m brg 065M (1.5)m 20073	60:31:37.880✓	147:23:21.467✓	-1.6	* (?)
20074	Rk, new W rng 3.5m brg 075M (0.5)m 20074	60:31:32.715✓	147:23:28.066✓	-0.7	excessed
20075	Rk, new E rng 4.5m brg 075M (0.5)m 20075	60:31:32.157✓	147:23:28.363✓	-0.7	* (4)
20076	Ldg, new rng 4.5m brg 120M (3.0)m 20076	60:31:28.401✓	147:23:34.965✓	-3.2	ledge (12)
20077	Rk, new rng 4.5M brg 130M (3.0)m 20077	60:31:21.233✓	147:23:53.710✓	-3.3	* Excess for ledge
20078	Ldg, new rng 4.0m brg 100M (3.0)m 20078	60:31:20.433✓	147:23:54.998✓	-3.3	ledge (12)
20079	Ldg, new rng 5.5m brg 150M (2.0)m 20079	60:31:11.367✓	147:24:18.335✓	-2.3	ledge (2)
20081	Ldg, new rng 4.0m brg 140M (4.0)m 20081	60:31:11.127✓	147:24:30.344✓	-4.4	ledge (5)
20085	Rk, new rng 6.0m brg 105M (0.3)m 20085	60:31:08.038✓	147:24:34.659✓	-0.8	* (5)
40201	Islet, new rng 3.5m brg 130M (8.0)m 40201	60:31:52.233✓	147:20:37.712✓	-8.4	Ruins of the Coast Guard Dock* Islet (16)
40208	Rk, new rng 1.5m brg 080M 1.5m 40208	60:31:52.752✓	147:20:36.188✓	1.7	08 RK
40219	Rk, new rng 3.5m brg 135M (3.0)m 40219	60:31:52.886✓	147:20:19.080✓	-3.3	(10) *
40230	Rk, new rng 3.5m brg 150M (2.5)m 40230	60:31:56.818✓	147:19:55.099✓	-2.8	* (8)
40232	Rk, new rng 4.2m brg 165M (0.7)m 40232	60:31:54.220✓	147:20:04.903✓	-1.0	* (3)
40254	Rk, new rng 4.5m brg 190M (0.35)m 40254	60:31:56.202✓	147:19:03.889✓	-0.6	* (!)
40268	Rk, new rng 4.5m brg 240M AWASH 40268	60:31:48.779✓	147:18:37.474✓	-0.2	* (0)
40269	Rk, new rng 4.0m brg 240M (1.0)m 40269	60:31:46.193✓	147:18:39.299✓	-1.2	* (9)
40317	Rk, new rng 4.5m brg 200M 1.0m 40317	60:31:14.419✓	147:20:33.830✓	1.4	05 RK
40337	Rk, new rng 4m brg 000M 0.8m 40337	60:31:17.706✓	147:21:08.865✓	1.2	cov 2ft
40339	Rk, new rng 4.5m brg 035M (0.5)m 40339	60:31:17.611✓	147:21:01.930✓	-0.7	* (3)
40340	Rk, new rng 3.5m brg 015M (0.8)m 40340	60:31:14.836✓	147:20:40.101✓	-1.0	* (4)
49246	Rk, new rng 4m brg 200M .5m 49246	60:30:57.853✓	147:25:20.337✓	-2.6	* (10)
50550	Rk, new rng 6m brg 220M (3)m 50550	60:31:11.224✓	147:25:15.953✓	-3.3	* (10)
50558	Reef, new rng 5m brg 210M (0.5)m 50558	60:31:04.065✓	147:25:11.467✓	-0.7	(2) Reef
50607	Rk, new rng 6m brg 340M (1.5)m 50607	60:30:59.758✓	147:23:31.048✓	-1.7	* (5)
60949	Rk, new rng 5.0m brg 150M (0.5)m 60949	60:31:46.559✓	147:20:51.063✓	-3.4	* (13)

* See photographs on following page.



*Inshore ruins of an old Coast Guard Dock in existence in 1949 from Prior H-7765 looking southeast.



*Offshore ruins of the old Coast Guard Dock, looking southeast.

The following is a list of all Detached Positions taken on features that are shown on the chart:

Fix	Remark (raw depth in meters)	Latitude North	Longitude East	Depth (m) corrected	Notes <i>smooth sheet</i>
20066	Rk, chd rng 5.5m brg 150M (2.5)m 20066	60:31:45.013✓	147:22:02.774✓	-2.5	* (9)
20067	Rk, chd rng 5.5m brg 165M (3.0)m 20067	60:31:44.370✓	147:22:12.461✓	-3.0	* (11)
20069	Rk, chd rng 5.5m brg 165M (4.0)m 20069	60:31:42.756✓	147:23:14.297✓	-4.0	New position
24309	Rk, chd rng 4.5m brg 300M 0.5m 24309	60:31:17.928✓	147:20:37.097✓	-3.6	* (13)
21424	Rk, chd rng 2.0m brg 300M (1.0)m 21424	60:31:19.227✓	147:21:54.338✓	-4.1	New position
40253	Rk, chd rng 4.7m brg 180M (2.0)m 40253	60:31:57.090✓	147:19:05.970✓	-2.2	* (7)
40295	Rk, chd rng 4.5m brg 320M (2.0)m 40295	60:31:30.449✓	147:19:37.148✓	-2.2	* (7)
40338	Rk, chd rng 5.0m brg 340M (1.7)m 40338	60:31:16.508✓	147:20:57.523✓	-1.9	* (6)
40341	Buoy, chd green rng 3.8m brg 340M 40341	60:32:00.250✓	147:17:16.689✓	-	Green Buoy, BELL "1"

15k + (4)
 * (6)

The following is a list of all Detached Positions taken on features that are shown incorrectly on the chart. There were five charted rocks disproved during H-10846. All five of these charted rocks have a rock within the vicinity and the hydrographer believes that the charted rocks were mis-positioned. It is recommended that their current charted feature be changed and depicted as follows: *CONCUR*

Fix	Remark (raw depth in meters)	Latitude North	Longitude East	Depth (m) corrected	Notes <i>smooth sheet</i>
20070	Rk, chd disproval 7.3m 20070	60:31:43.492 ✓	147:23:17.074 ✓	7.6	New position- #20069
20072	Rk, chd disproval 3.0m 20072	60:31:39.113 ✓	147:23:20.348 ✓	3.4	New position- #20073
20080	Ldg, chd rk rng 3.5m brg 080M (8.0)m 20080	60:31:11.405 ✓	147:24:25.880 ✓	-8.4	Chd rk is ledge <i>ledge</i>
40202	Rk, disproval 7.2m 40202	60:31:51.109 ✓	147:20:40.622 ✓	7.3	New position- #40201
40231	Rk, disproval 12.3m 40231	60:31:58.152 ✓	147:19:57.060 ✓	12.5	New position- #40230
40255	Ldg, chd rk rng 5.5m brg 215M (4.5)m 40255	60:31:53.854 ✓	147:19:02.886 ✓	-4.7	Chd rk is ledge <i>ledge (4)</i>
40294 40925	Rk, chd disproval 7.7m 40294	60:31:29.375 ✓	147:19:43.270 ✓	8.0	Search radius ~50m, water vis. ~4m
50536	Islet, chd rng 15m brg 120M (25)m 50536	60:31:17.027 ✓	147:26:04.473 ✓	-26.6	New position

Islet(4)
** (7)*
Islet(16)
** (8)*
** (1)*
Islet (65)

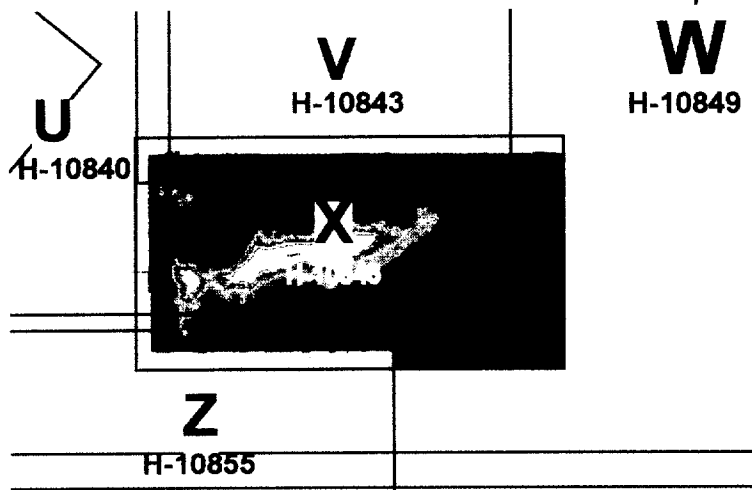
J. CROSSLINES ✓

Crosslines agreed very well with mainscheme hydrography. Depths generally agreed within one to three meters. There were a total of 41.15 nautical miles of crosslines, comprising 8.7% of mainscheme hydrography.

K. JUNCTIONS ✓ *See Ensl Report, Section L.*

The following contemporary surveys junction with H-10846:

Registry #	Scale	Date	Junction side
H-10843	1:10,000	1998	North
H-10840	1:10,000	1998	West
H-10855	1:10,000	1998	South
H-10849	1:40,000	1998	East/Southeast



Soundings on these 1998 surveys were found to be in good agreement, generally matching within one to three meters. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum. *Concur*

L. COMPARISON WITH PRIOR SURVEYS ✓ *See Eval Rpt., Section M.*

The following prior surveys share common area with H-10846:

Registry #	Scale	Date	Area covered
H-7765	1:20,000	1949	North of Smith I
H-5421	1:20,000	1933	Southeast of Smith I
H-3321	1:20,000	1911	North of Little Smith to Smith I
H-2741	1:40,000	1911	Entire Survey
H-2807 a & b	1:100,000	1905	Entire Survey

Prior surveys H-7765, H-5421 and H-3321 each cover small portions of the present survey H-10846, while prior survey H-2807 covers the entire area of H-10846 survey. The soundings, features and shoreline from these priors agree well with the present survey. Prior survey H-2741 was illegible so there was no (*CONCUR*) comparison. Prior survey H-3321 does not include Smith Island shoreline, and has a few depths that are not in agreement. Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey. There are numerous isolated areas where shoaler soundings were discovered because of the increased sounding densities from this survey. Several of these shoals were reported as Dangers to Navigation. (See Section N)

Representative samples of selected soundings from the prior surveys are compared with the current survey.

The following are examples of H-10846 soundings north of Smith Island that are considered good matches with prior H-7765:

Prior Survey Registry Number	Fix Number H-10846	Prior Depth (fathoms)	H-10846 Depth * (fathoms-corrected)	Geographic Survey Position
H-7765	81646	4.6	4.36 ✓	60-32-35.58 N 147-26-21.21 W ✓
	46376	61	60.1 ✓	60-32-39.67 N 147-24-15.35 W ✓
	60037	70	69.2 ✓	60-33-03.23 N 147-19-06.82 W ✓
	45543	63	62.4 ✓	60-31-44.31 N 147-15-30.92 W ✓
	96862	16	15 ✓	60-32-11.21 N 147-17-31.84 W ✓
	61235	68	67.1 ✓	60-33-19.62 N 147-21-31.28 W ✓

The prior survey H-5421 had soundings generally within one to three fathoms of survey H-10846, with a few exceptions. The differences may be due to the priors positioning system, since survey H-10846 soundings match well with survey H-10849.

Prior Survey Registry Number	Fix Number H-10846	Prior Depth (fathoms)	H-10846 Depth * (fathoms-corrected)	Geographic Survey Position
H-5421	40753	108	121.8 ✓	60-29-50.67 N 147-12-48.29 W ✓
	55999	103	111 ✓	60-29-38.0 N 147-15-51.32 W ✓
	56007	101	115.5 ✓	60-29-30.25 N 147-15-44.92 W ✓
	44630	120	105.6 ✓	60-29-41.94 N 147-14-46.15 W ✓

* Corrected for approved tides.

Prior survey H-3321 covers only a small area north of Little Smith Island and does not include any shoreline, and is also in generally good agreement, within 2 to 30 feet of H-10846.

Prior Survey Registry Number	Fix Number H-10846	Prior Depth (feet)	H-10846 Depth * (feet-corrected)	Geographic Survey Position
H-3321	53274	409	396 (CC FMS)	60-32-45.01 N 147-22-14.16 W ✓
	83546	185	167 (28 FMS)	60-32-48.97 N 147-25-38.48 W ✓
	82655	177	160 (26 FMS)	60-32-18.57 N 147-26-04.56 W ✓
	81565	47	44 (7.3 FMS)	60-32-45.34 N 147-26-40.2 W ✓
	46519	331	327 (54 FMS)	60-32-56.95 N 147-24-02.21 W ✓
	81083	199	165 (27 FMS)	60-32-58.11 N 147-26-27.59 W ✓

Prior survey H-2807 covers the entire survey and matches within one fathom. The priors include a rough sketch of the shoreline.

Prior Survey Registry Number	Fix Number H-10846	Prior Depth (fathoms)	H-10846 Depth * (fathoms-corrected)	Geographic Survey Position
H-2807 a	62860	71	67.1 ✓	60-30-14.12 N 147-17-49.46 W ✓
	40982	66	64.4 ✓	60-30-35.32 N 147-12-53.77 W ✓
	45099	57	55 ✓	60-31-51.52 N 147-15-11.17 W ✓
H-2807 b	95191	13	8.9 ✓	60-30-20.13 N 147-26-01.29 W ✓
	10058	12	11.1 ✓	60-31-05.62 N 147-21-22.09 W ✓
	44204	52	50.4 ✓	60-32-25.74 N 147-14-25.38 W ✓
	44118	94	92.2 ✓	60-30-00.04 N 147-14-26.33 W ✓
	96583	11	9.67 ✓	60-32-11.63 N 147-17-11.71 W ✓
	53093	52	51.6 ✓	60-32-12.57 N 147-22-01.14 W ✓
	82143	8	7.82 ✓	60-32-37.41 N 147-26-43.54 W ✓
	94490	20	18.6 19.7 ✓	60-31-05.74 N 147-26-23.41 W ✓

* Corrected for approved tides.

M. ITEM INVESTIGATIONS ✓

No AWOIS items were assigned on this survey. *CAVEUR*

N. COMPARISON WITH THE CHART ✓ See Eval Rpt., section O.

Chart 16700
24th Ed. Jan. 11, 1992
Scale: 1:200,000

Chart 16705
MARCH 27, 1999
18th Ed. Sept. 27, 1997
Scale: 1:80,000

The survey was compared with Chart 16700 and 16705 and was in good agreement, generally within one fathom. Areas of significant differences are listed as DTON's. An exception is a 20 fathom depth from Chart 16705 located at approximately 60-30-24.98N 147-24-29.13 W, south of Smith Island, compared with a ~~25.8~~ ^{22.8} fathom sounding from survey H-10846 in which there was 100% SWMB coverage. The Hydrographer believes that the 20-fathom depth on Chart 16705 is an erroneous depth and should be changed. In general, soundings on the contemporary survey agree, or are shoaler by several fathoms. It is recommended that soundings from survey H-10846 supersede all prior, and charted soundings. Final sounding comparisons will be made at PHB after reduction to final vertical datum. *CAVEUR*

** Two 20.8 fathom depths were located on the present survey approximately 200 meters north; latitude 60/30/31N, longitude 147/24/33 W.

Dangers to Navigation ✓

Six dangers to navigation were reported to the Seventeenth Coast Guard District for H-10846. Copies of the correspondence can be found in ~~Appendix I~~ of this report.
attached to

O. ADEQUACY OF SURVEY ✓ See Eval Rpt., section P.

Survey H-10846 is complete and adequate to supersede prior soundings and features in their common areas. As a general rule, areas shoaler than 70 meters were ensonified with SWMB producing 100% bottom coverage. Care was taken to conduct all shoreline investigations during times of negative tides.

P. AIDS TO NAVIGATION ✓

The following navigational aid was within the survey area. It was located by a detached position. The lighted bell is charted adequately on chart 16700 and 16705. Refer to Section Q, in the Appendices for more information on the discrepancy between the charted position and the surveyed position.

<u>Name</u>	<u>Light List No.</u>	<u>Survey H-10846 Position</u>
Smith Island Lighted Bell, Buoy 1	25830	60-32-00.250 N 147-17-16.689 W

Q. STATISTICS ✓

Refer to the Survey Information Summary attached to this report.

R. MISCELLANEOUS ✓

Bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. No unusual tidal currents or magnetic variations were found during this survey. Concur

S. RECOMMENDATIONS ✓

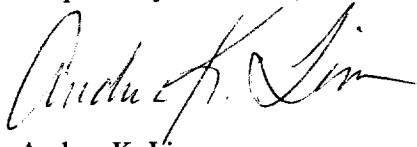
It was observed that large cruise ships and vessels often transit off the north side of Smith Island. It is recommended that the charted sounding density in this area north of Little Smith Island be increased in order to better define the shoal area to the north of Little Smith Island. Also, the hydrographer recommends designating anchorages north of Smith Island at approximately ^{long}60-31-36 N ^{long}147-24-18 W, south of Smith Island at about ^{long}60-30-54 N ^{long}147-22-24 W and southwest at ^{long}60-31-06 N ^{long}147-19-30 W. Concur
Added anchorage symbols to HDWG

T. REFERRAL TO REPORTS ✓

The following supplemental reports contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-P139-RA-1998 Horizontal Control Report	November 1, 1998	N/CS34
Project related data for OPR-P139-RA	Incremental	N/CS34

Respectfully Submitted,



Andrea K. Lim
Senior Survey Technician, NOAA

Approved and Forwarded,



Alan D. Anderson
Captain, NOAA
Commanding Officer

List of Horizontal Control Stations ✓

NAME	STATE	TYPE	LATITUDE	LONGITUDE	SITEID	DEC_LAT	DEC_LON
CAPE HINCHINBROOK	AK	USCG Beacon	60 14 18	146 38 48	894	60.23833333	146.64666667
DUKE	AK	DGPS Flyaway	60 15 37.38949	147 18 05.97751	n/a	60.26038597	148.30166042
KENAI	AK	USCG Beacon	60 40 06	151 21 00	896	60.66833333	151.35000000
MATE	AK	DGPS Flyaway	60 17 54.17878	147 54 46.44082	n/a	60.29838299	147.91290023
POTATO POINT	AK	USCG Beacon	61 03 24	146 41 48	895	61.05666667	146.69666667
QUAKE	AK	DGPS Flyaway	60 22 56.96011	147 50 19.81757	n/a	60.38248892	147.83883821
ROCK	AK	DGPS Flyaway	60 39 13.43485	147 55 58.32527	n/a	60.65373190	147.93286813
SEAL	AK	DGPS Flyaway	60 25 47.07484	147 24 56.82688	n/a	60.42974301	147.41578524
TUFT RESET	AK	DGPS Flyaway	60 37 05.94517	147 29 09.09347	n/a	60.61831810	147.48585930

p
Section Q: Descriptive Report Insert ✓

Name of Aid: Smith Island Lighted Bell Buoy
Light List #: 25830

Method of Positioning GPS: DGPS: Other: _____

Positioning Information

	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Charted Pos.	60-32-00.82 N	147-17-14.06
Survey Pos.	60-32-00.250	147-17-16.689

	<u>Easting</u>	<u>Northing</u>
Charted Pos.	41680.1	59465.4
Survey Pos.	41640.1	59447.6

Difference between Charted and Surveyed Position: Distance: 44 meters
(Bearing from Surveyed to Charted Position) Bearing: 66 deg T

Characteristics Flashing Green, 2.5 sec
Do characteristics match Light List? Yes No NA
If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes No
If no, why not? _____

New/Uncharted Aids (if information is known or easily obtained)

Date Est: _____
Maintained By: Coast Guard Private? Yes No
Is aid seasonally maintained? Yes No
Frequency of Maintenance: _____

Apparent Purpose: _____

Other Information: Published position: 60 32.0, 147 17.3



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

NOAA Ship RAINIER
 November 10, 1998

Commander (mon)
 Seventeenth Coast Guard District
 Post Office Box 25517
 Juneau, Alaska 99802-5517

**ADVANCE
 INFORMATION**

Dear CDR Hamblett:

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic surveys in southwestern Prince William Sound, Alaska. The dangers are shown graphically on the attached chartlets and are listed below by chart without duplication. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

The following dangers to navigation affect chart 16701, 17th edition, 1998, 1:81,436, chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Position #</u>	<u>Depth (m)</u>	<u>Survey #</u>
Shoal	3.6	60:25:47.509	147:35:29.870	98193	6.7	H-10837
Shoal	9.9	60:24:18.109	147:40:18.955	23534	18.2	H-10841
Shoal	7.5	60:22:18.056	147:35:55.819	26835	13.8	H-10841
Shoal	3.8	60:23:30.991	147:34:49.821	40575	7.1	H-10841
Rock	0.4	60:24:53.088	147:37:07.565	45754	0.7	H-10841
Shoal	10.0	60:24:30.646	147:36:24.056	46254	18.4	H-10841
Rock	0.2	60:23:54.311	147:34:07.379	47199	0.4	H-10841
Shoal	4.9	60:23:32.613	147:35:57.377	47777	9.0	H-10841
Shoal	3.6	60:23:22.716	147:36:49.759	48006	6.6	H-10841
Shoal	5.7	60:24:20.069	147:38:08.923	53097	10.5	H-10841
Shoal	3.7	60:24:28.412	147:39:29.949	21112	6.9	H-10841
Shoal	5.9	60:24:20.931	147:33:36.670	46490	10.9	H-10841
Rock Awash	-0.6	60:22:57.526	147:42:19.292	21421	-1.1	H-10841
Shoal	6.2	60:22:50.318	147:36:06.033	27776	11.4	H-10841
Shoal	6.9	60:26:05.397	147:22:28.544	40436	12.6	H-10847
Shoal	2.0	60:25:39.547	147:23:33.973	41620	3.6	H-10847
Shoal	6.5	60:25:16.938	147:23:48.111	43496	12.0	H-10847
Shoal	6.7	60:30:24.298	147:26:00.596	51036	12.3	H-10846
Shoal	7.5	60:30:10.133	147:25:53.909	51068	13.8	H-10846
Shoal	6.0	60:30:46.134	147:23:49.449	51823	6.0	H-10846
Shoal	8.2	60:30:58.745	147:20:42.597	24322	15.1	H-10846
Rock Awash	0.0	60:31:48.779	147:18:37.474	40268	0.0	H-10846
Shoal	6.0	60:32:06.203	147:16:59.527	30495	11.1	H-10846




ADVANCE INFORMATION

The following dangers to navigation affect chart 16705, 17th edition, 1997, 1:80,000, and chart 16700, 25th edition, 1996, 1:200,000.

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Position #</u>	<u>Depth (m)</u>	<u>Survey #</u>
Shoal	4.8	60:26:54.003	147:33:39.497	103551	8.8	H-10837
Shoal	2.0	60:27:03.600	147:37:44.481	92942	3.7	H-10837
Shoal	2.3	60:28:10.662	147:37:19.334	45757	4.2	H-10837
Shoal	2.7	60:29:22.063	147:35:34.292	103697	5.0	H-10837
Shoal	4.3	60:30:22.427	147:34:57.878	94321	8.0	H-10837
Rock	1.1	60:30:47.308	147:36:04.709	61731	2.0	H-10837
Shoal	3.7	60:31:15.045	147:34:29.242	51785	6.7	H-10837
Rock	1.8	60:31:27.814	147:37:02.670	73709	3.3	H-10837
Rock Awash	0.0	60:27:58.387	147:39:49.513	20078	0.0	H-10837
Rock Awash	-0.3	60:29:30.686	147:40:21.799	20636	-0.5	H-10837

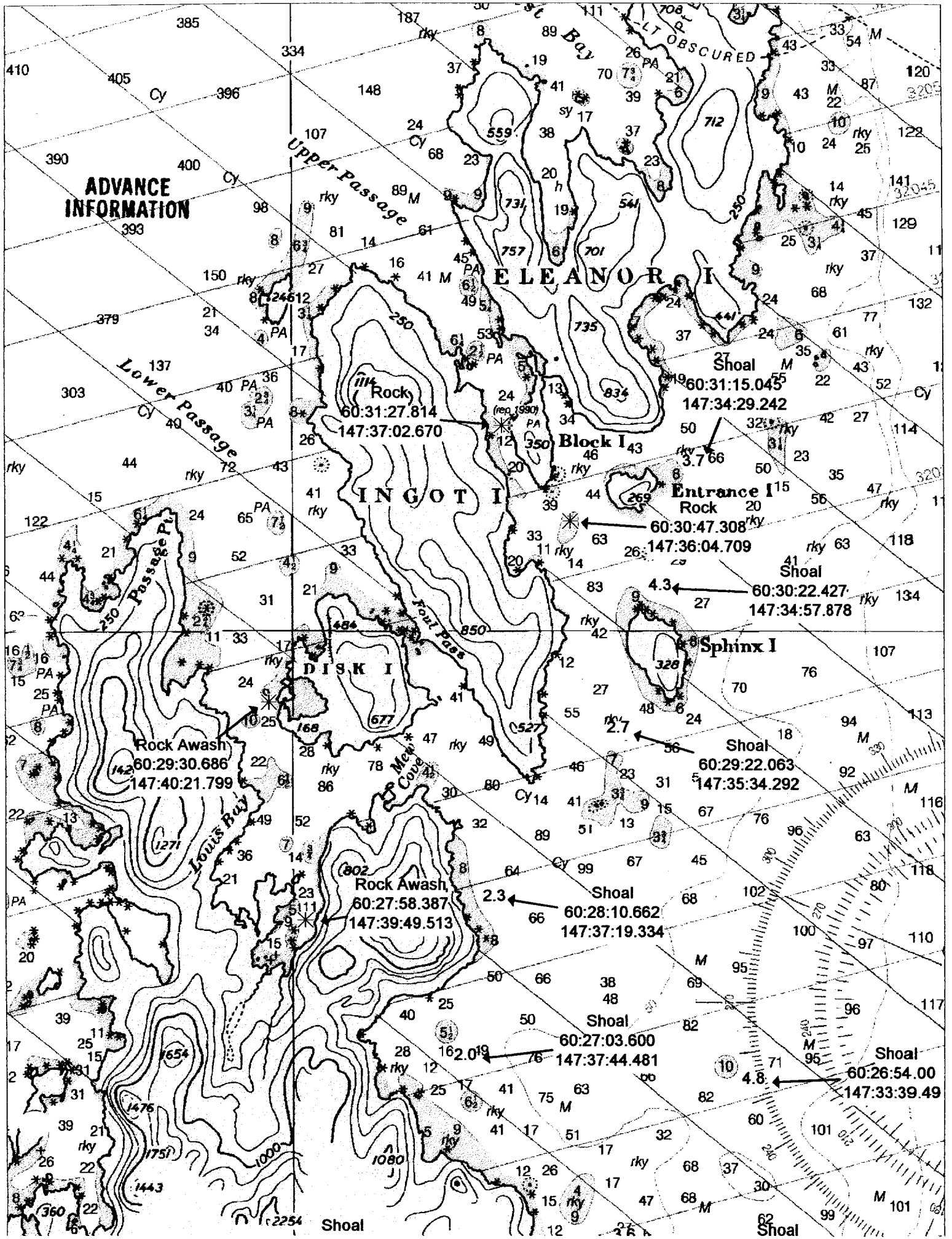
This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-P139-RA-98 and Danger to Navigation message RA-11-98. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

Sincerely,


Alan D. Anderson
Captain, NOAA
Commanding Officer

Attachment

cc: NIMA
PMC
N/CS261
N/CS34



ADVANCE INFORMATION

Upper Passage
Lower Passage

ELEANOR I.
INGOT I.
DISK I

Block I
Entrance I
Sphinx I

Rock Awash
Louis Bay

Rock Awash

Shoal

Shoal

Shoal

Shoal

Shoal

Shoal

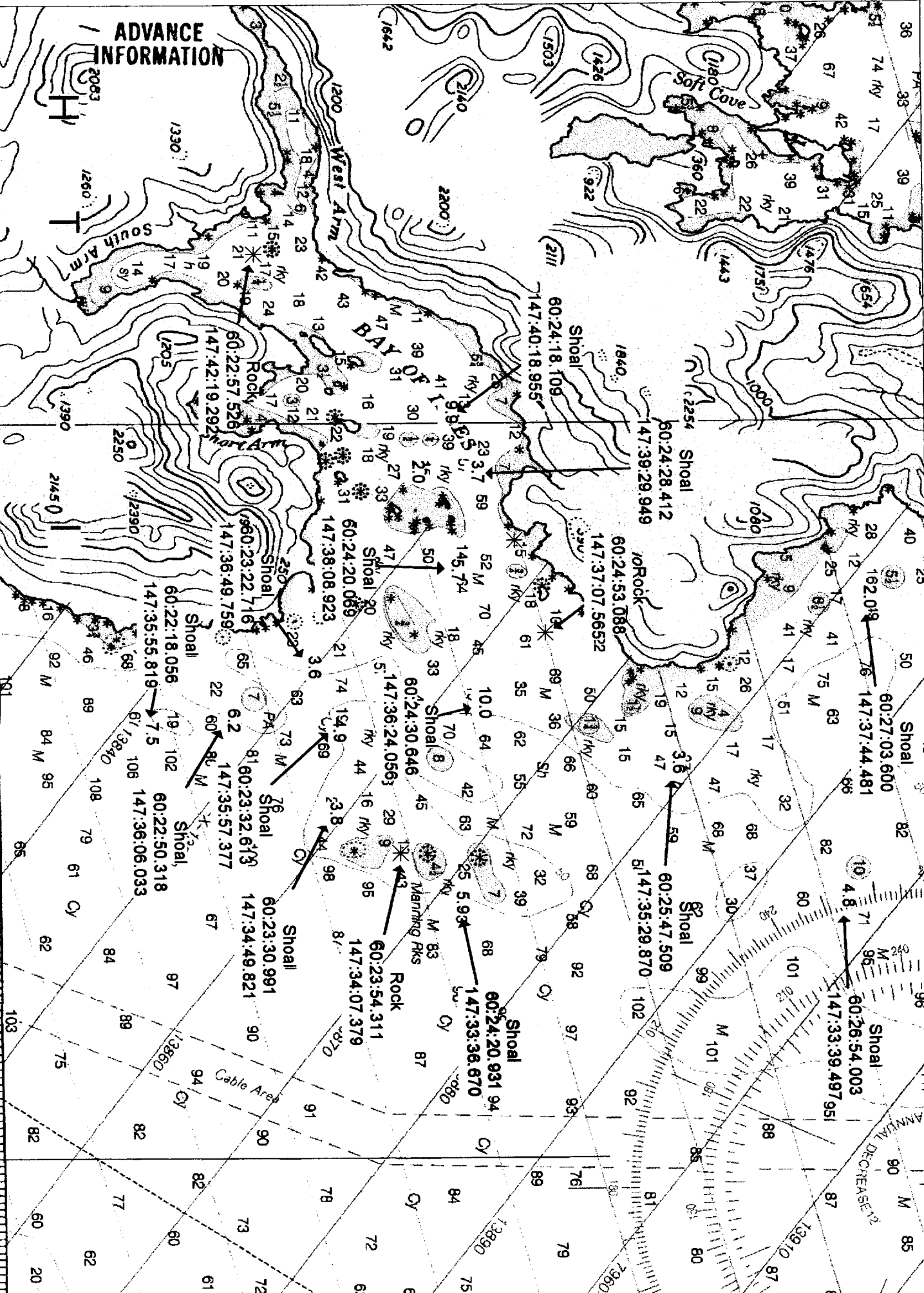
ADVANCE INFORMATION

45'

40'

35'

141 0'



ANNUAL DECREASE 1.2

ADVANCE INFORMATION

Little Smith I

SMITH I

Rock Awash

Pennsylvania Rk

Seal I

Shoal
60:30:24.298
147:26:00.596

Shoal
60:30:10.133
147:25:53.909

Shoal
60:30:46.134
147:23:49.449

Shoal
60:30:58.745
147:20:42.597

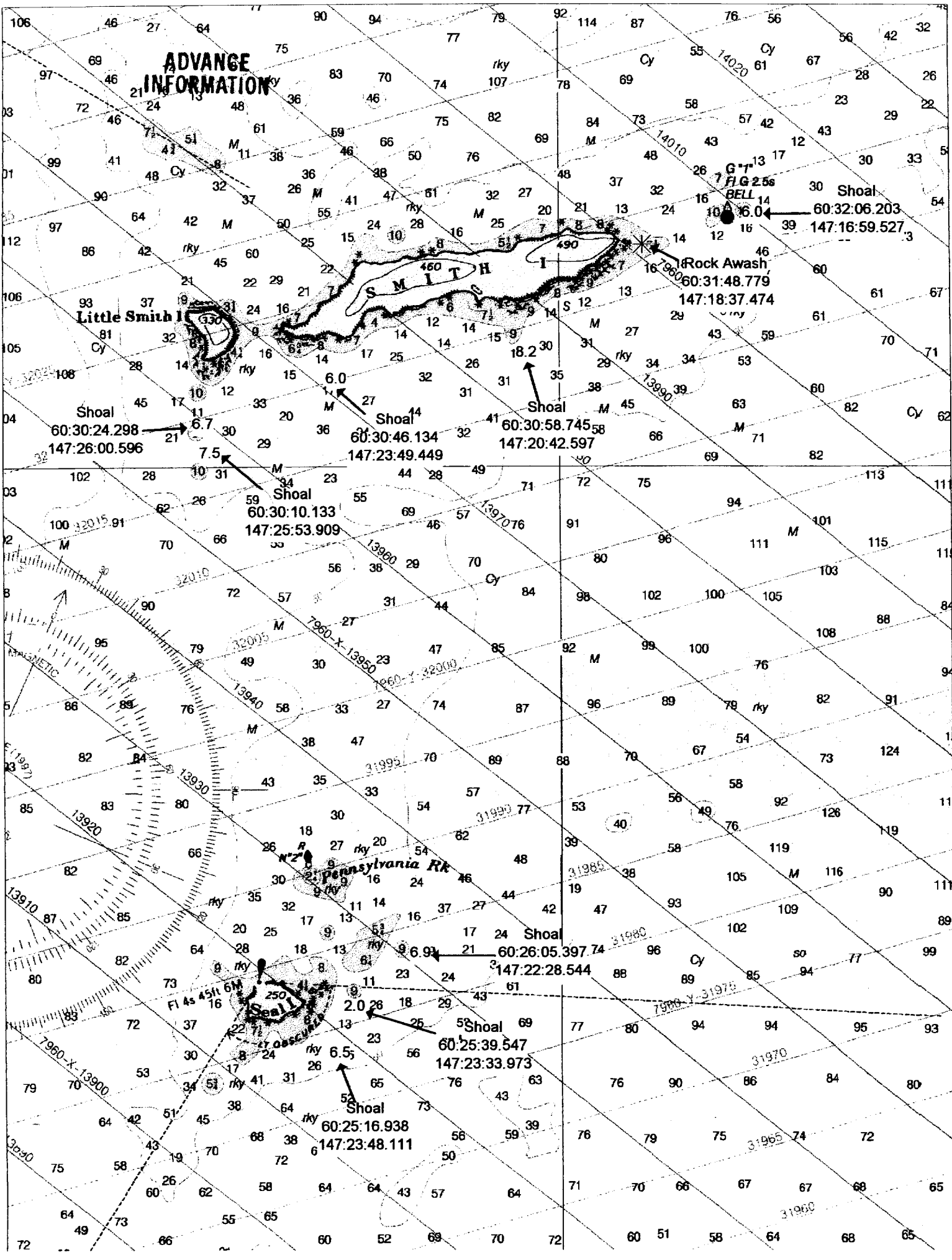
60:32:06.203
147:16:59.527

60:31:48.779
147:18:37.474

Shoal
60:26:05.397
147:22:28.544

Shoal
60:25:39.547
147:23:33.973

Shoal
60:25:16.938
147:23:48.111





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

NOAA Ship RAINIER
November 23, 1998

MEMORANDUM FOR: CDR James Gardner
Chief, Pacific Hydrographic Branch

THROUGH: RADM John Albright
Director, Pacific Marine Center

FROM: *Alan D. Anderson*
CAPT Alan D. Anderson
Commanding Officer

SUBJECT: Survey Data Transmittal Delay

There will be a delay in the transmission of survey data for project OPR-P139-RA-98. The transmission of data will exceed four weeks from completion of fieldwork. This is the second of two memorandums discussing the delay in submission of survey data and covers the remaining surveys that were conducted by RAINIER during the Prince William Sound project in the summer and fall of 1998.

The surveys affected are H-10843 (RA-10-18-98), H-10849 (RA-40-01-98), H-10846 (RA-10-19-98), H-10847 (RA-10-20-98), and H-10855 (RA-10-21-98). There are numerous reasons for this delay including, but not limited to, use of untested software for the acquisition of data, lack of experienced personnel, and the need to efficiently use the vessels as acquisition platforms while processing data already collected.

The four-week submittal of survey data recommendation noted in the Field Procedures Manual (FPM) does not reflect knowledge of current data acquisition and processing timelines. As you know, the shallow water multibeam (SWMB) systems allow for extremely large data sets to be collected in a very short amount of time. The processing of these data sets takes a much longer amount of time than does the processing of single beam data. In fact, the ratio of time processing SWMB data to time collecting SWMB data is 6:1. In comparison, the ratio of processing single beam data to the collection of single beam data is 1:3. The FPM should be updated to recognize the larger amount of time needed to process SWMB data by the field units. It is recommended that the FPM be changed to allow eight weeks for the submittal of survey data from the date of fieldwork completion.

The anticipated transmittal date for the above-mentioned surveys is late-December 1998 or early January 1999.



APPROVAL SHEET

for

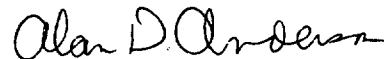
H-10846

RA-10-19-98

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fifth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1998.

The field sheet and accompanying records have been examined 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.

Approved and Forwarded,



Alan D. Anderson
Captain, NOAA
Commanding Officer
NOAA Ship RAINIER



TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 25, 1999

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-P139-RA-98

HYDROGRAPHIC SHEET: H-10846

LOCALITY: Prince William Sound, AK
Smith Island

TIME PERIOD: Sep 02 - Oct 26, 1998

TIDE STATION USED: 945-4050 Cordova, AK
Lat. $60^{\circ} 33.5'N$ Lon. $145^{\circ} 45.2'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.529 meters

TIDE STATION USED: 945-4240 Valdez, AK
Lat. $61^{\circ} 07.5'N$ Lon. $146^{\circ} 21.7'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.389 meters

TIDE STATION USED: 945-4564 Seal Island, AK
Lat. $60^{\circ} 25.8'N$ Lon. $147^{\circ} 25.3'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.310 meters

TIDE STATION USED: 945-4652 South Arm, Knight Island, AK
Lat. $60^{\circ} 21.9'N$ Lon. $147^{\circ} 41.7'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.320 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS8, PWS37 & PWS37A.

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.



Note 2: Use tide data from the appropriate station for each zone according to the order in which they are listed in the Tidezone corrector files (note: this may not be the same order as presented on the Tide Note). For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available. All zones within a survey sheet may not have the same order of applicable tide stations.

Thomas N. New 3/25/99

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR P139-RA-98,
Sheet H-10846.

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

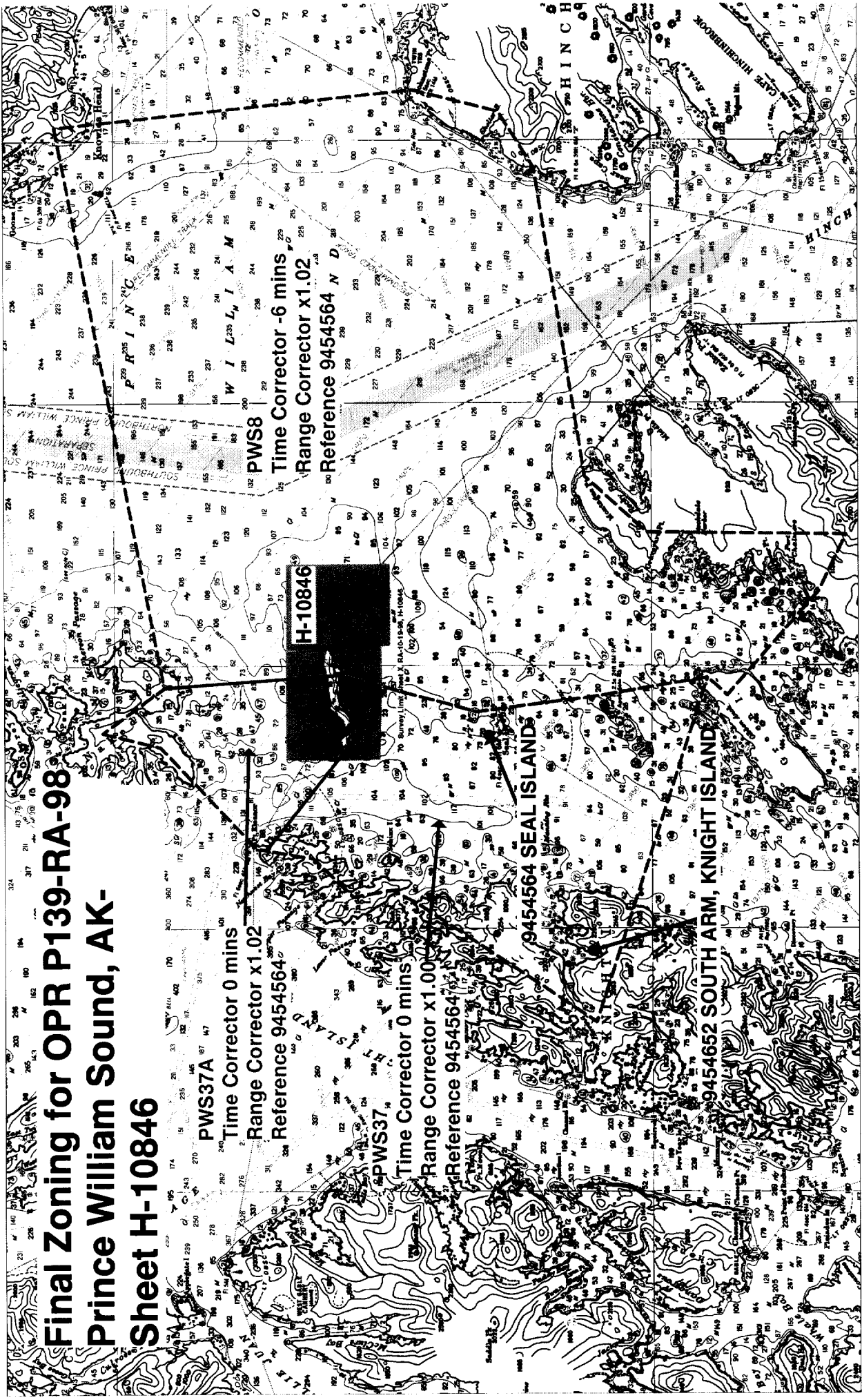
	Tide Station Order	AVG Time Correction	Range Correction
Zone PWS8			
-147.166932 60.206678	9454564	-6	1.02
-147.164575 60.330933	9454240	-6	0.99
-147.093352 60.369491	9454050	-6	0.95
-146.701487 60.401			
-146.630054 60.423082			
-146.602861 60.476793			
-146.64982 60.699661			
-147.360641 60.632173			
-147.344431 60.522683			
-147.391163 60.437636			
-147.373205 60.367377			
-147.348 60.293559			
-147.37047 60.281064			
-147.239884 60.224039			
-147.166932 60.206678			
Zone PWS37			
-147.348 60.293559	9454564	0	1.00
-147.373205 60.367377	9454652	0	1.00
-147.391163 60.437636	9454240	0	0.97
-147.344431 60.522683	9454050	0	0.93
-147.381578 60.52174			
-147.401054 60.514056			
-147.428357 60.514658			
-147.567302 60.56881			
-147.578232 60.539507			
-147.626594 60.514644			
-147.618284 60.490075			
-147.634898 60.474627			

-147.667831 60.449911
-147.785618 60.363112
-147.348 60.293559

Zone PWS37A

-147.4175 60.67054	9454564	0	1.02
-147.435879 60.634506	9454240	0	0.99
-147.564875 60.574827	9454050	0	0.94
-147.567302 60.56881			
-147.428357 60.514658			
-147.401054 60.514056			
-147.381578 60.52174			
-147.344431 60.522683			
-147.360641 60.632173			
-147.4175 60.67054			

Final Zoning for OPR P139-RA-98 Prince William Sound, AK- Sheet H-10846



Survey Information Summary

Project: OPR-P139-RA **Project Name:** PRINCE WILLIAM SOUND
Instructions Dated: 7/10/98 **Project Change Info:**

Change #	Dated
1	9/8/98

Sheet Letter: X **Registry Number:** H-10846
Sheet Number: RA-10-19-98

Survey Title: Smith Island

Data Acquisition Dates: **From:** 19-Sep-98 262 **To:** 26-Oct-98 299

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2121		1						
2122	3	2			1	3		
2123		1						
2124	5	2		1	1	2		
2125	4	3			1	1	1	
2126	2					1		

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
6		248	289	60/29/55	249-259
				147/30/55	
9		261	294.2	60/30/20	260-264
				147/31/15	
10		265	286.2	60/30/18	265-278
				147/31/36	
12		281	276.6	60/29/50	279-lbh
				147/14/35	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS8	0 hr 0 min	0.96
PWS37	0 hr 0 min	0.94

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-4564	SEAL ISLAND	8/5/98	10/30/98
945-4662	SNUG HARBOR	8/5/98	10/30/98

Statistics Summary

Type	Total:
BS	14
DP	45
MS	474.63
S/L	9.09
SPLIT	273.08
SWMB	117.99
XL	41.15

Percent XL:	8.7%
SQNM:	28.49

GEOGRAPHIC NAMES

H-10846

Name on Survey	Source of Information											
	A PILOT CHART NO. 16705	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			
ALASKA (title)	X		X									1
LITTLE SMITH ISLAND	X		X									2
PRINCE WILLIAM SOUND	X		X									3
SMITH ISLAND	X		X									4
												5
												6
												7
												8
												9
												10
												11
												12
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												22
												23
												24
												25

Dennis J. Romesburg
APR 9 1999

HYDROGRAPHIC SURVEY STATISTICS

H-10846

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		NA
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		NA
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	1				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

SHORELINE DATA					
SHORELINE MAPS (List): NA					
PHOTOBATHYMETRIC MAPS (List): NA					
NOTES TO THE HYDROGRAPHER (List): NA					
SPECIAL REPORTS (List): NA					
NAUTICAL CHARTS (List): 16705, 18th Ed., 3/27/99					

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	100		100	
COMPARISON WITH PRIOR SURVEYS AND CHARTS				
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT				
GEOGRAPHIC NAMES		40	40	
OTHER* (Chart Compilation)		45	45	
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	177.50	85	262.50

Pre-processing Examination by M. Bigelow, J. Ferguson, D. Hill	Beginning Date 02/22/99	Ending Date 3/10/99
Verification of Field Data by E. Domingo, D. Doles, B. Mihailov	Time (Hours) 177.50	Ending Date 10/7/99
Verification Check by B. Olmstead	Time (Hours) 4	Ending Date 10/13/99
Evaluation and Analysis by B. Mihailov	Time (Hours) 40	Ending Date 10/8/99
Inspection by B. Olmstead	Time (Hours) 6	Ending Date 10/19/99

EVALUATION REPORT

H-10846

A. PROJECT

The hydrographer's report contains a complete discussion of the project information.

B. AREA SURVEYED

The survey area is adequately described in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted. A page-size plot of the charted area depicting the specific limits of supersession accompanies this report as an Attachment 1.

The bottom consists mainly of mud. Generally, depths range from the Mean Lower Low Water (MLLW) line to 126 fathoms.

C. SURVEY VESSELS

The hydrographer's report contains adequate information relating to survey vessels.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Field acquisition and processing of survey data has been adequately discussed in the hydrographer's report, section D. Office processing was accomplished using Hydrographic Processing System (HPS), CARIS/HIPS, the Multibeam Support Vax System, and MicroStation 95.

Processed digital data for this survey exists in the standard HPS format, a database format using the .dbf extension. In addition, the smooth sheet drawing is filed in the MicroStation format, i.e., dgn extension. Copies of these files have been forwarded to the Hydrographic Surveys Division and a backup copy retained at PHB. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

The data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

Side Scan Sonar equipment was not used on this survey.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately addressed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

Soundings and elevations below Mean High Water (MHW) have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, static draft, dynamic draft (settlement and squat), and sound velocity. Additional reducers for multibeam survey data include corrections for heave, pitch and roll. These reducers have been reviewed and are consistent with NOS specifications.

Predicted tides were used for reduction of soundings during field processing. During office processing, soundings and elevations have been reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW) as appropriate with verified tide correctors obtained from the Center for Operational Oceanographic Products and Services (CO-OPS). During office processing, tide reductions were derived from the following tide gage; Skagway, AK, 945-2400.

H. CONTROL STATIONS

Section H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude:	-1.171 seconds	(-36.243 meters)
Longitude:	6.588 seconds	(105.135 meters)

Two prior surveys in common with the present survey are plotted on the Valdez datum. To convert from the Valdez datum to NAD 83, the user must apply +8.28 seconds to the latitude and -21.12 seconds to the longitude.

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations.

The quality of several positions exceeded limits in terms of HDOP during single beam data collection. These positions are isolated and occur randomly throughout the survey area. A review of the data, however, suggests that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable.

During shallow water multibeam (SWMB) data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. The final positions are provided by the POS-MV, which combines the DGPS position with inertial navigation information. In the event that the differential GPS corrector signal is lost, the POS-MV will continue to provide positions based on inertial navigation. Data was analyzed during processing to ensure it contains no significant errors. However, SWMB was collected for test purposes only and was not incorporated as a part of the final plotted data set.

During intermediate depth multibeam data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on the IDSSS and Trimble displays, and data are not collected when HDOP exceeds 3.75. In the event that the differential GPS corrector signal is lost, a switch to P-Code is made automatically by the receiver. Although P-Code accuracy is less accurate than DGPS (maximum of 15 meters), it

is an acceptable limit of accuracy for a survey of 1:10,000 scale. Data was analyzed during office processing and found to contain no significant errors.

DGPS performance checks were conducted in the field and found adequate.

NAD 83 is used as the horizontal datum for plotting and position computations.

Additional information concerning specific control system type, calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

J. SHORELINE

Shoreline shown on the smooth sheet in brown originates from Chart 16705, 18th Edition, dated March 27, 1999 and is for orientation purposes only. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet. The results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

Rocks depicted on the shoreline were identified in the field and many were found to be high points or extensions of reefs and ledges.

Further discussions concerning shoreline noted during this survey is included in the hydrographer's report, section I.

There was one MHW revision on this survey. The new feature is an islet positioned at latitude 60/31/52.52(N), longitude 147/20/38.77(W) and has been shown in red on the smooth sheet.

The results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10846 junctions with the following surveys:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10840	1998	1:10,000	West
H-10843	1998	1:10,000	North
H-10849	1998	1:40,000	Northeast/South/Southeast
H-10855	1998	1:10,000	South-Southwest

The junctions with surveys H-10840, H-10843 and H-10849 and H-10855 are complete. The examination reveals good agreement between soundings and standard depth curves. A few soundings have been transferred from these junction surveys to better portray the common area. A "Joins" note has been added to the smooth sheet were applicable.

M. COMPARISON WITH PRIOR SURVEYS

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-2807	1905	1:100,000
H-2741	1911	1:40,000
H-3321	1911	1:20,000

These prior surveys have been superseded by survey work conducted in the 1933 and 1949 and do not require further discussion.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-5421	1933	1:20,000
H-5430	1933	1:20,000
H-7765	1949	1:20,000

These prior surveys cover the entire area of the present survey. Comparison with these prior surveys were made using a digital copy. The registration of prior surveys H-5421 and H-5430 was accomplished by selecting common points and matching grid points. Legibility of the digital files was satisfactory.

The present survey depths reflect a consistently shallower trend of 1-3 fathoms with the prior work except in the areas of new discovered shoal areas and/or in areas better bottom definition around existing shoals. In these areas, the present survey found depths shallower from 2-4 fathoms. Aside from the effects of frequent earthquake activity around the area, the differences in depths are methods, including the relative accuracy of data acquisition process employed during this survey. Several rocks and kelp symbols located around both Smith and Little Smith Island have been transferred to the present survey in color from prior survey H-5430. These features fall near or inshore of the NALL line and were not specifically addressed by the hydrographer. Additional information regarding prior survey comparison is found in the hydrographer's report, section L.

A more thorough coverage of the area utilizing the shallow water multibeam system (SWMB) has revealed significant shoal depths not detected during the earlier prior surveys. Additional information regarding prior survey comparison is found in the hydrographers report, section L.

In accordance with the Hydrographic Guideline No. 39, the effect of the 1964 Prince William Sound earthquake were considered in the comparison of this survey. Prince William Sound experienced a bottom uplift of 4-32 feet during the 1964 earthquake. However, due to the depths of water and the differences in data acquisition methods, no reasonable adjustment value for prior soundings could be determined.

Except as noted above, the present survey is adequate to supersede the prior survey in the common area.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey.

O. COMPARISON WITH CHART

Survey H-10846 was compared with the following chart:

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
16705	18th	March 27, 1999	1:80,000

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys. The prior surveys have been adequately addressed in section M of the evaluation report and in the hydrographer's report, section N.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges, and reefs. The recommended charting disposition of

specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features.

Survey H-10846 is adequate to supersede charted hydrography within the common area.

b. Dangers to Navigation

Six dangers to navigation was discovered during survey operations and reported to the USCG on July 27, 1998. No additional dangers to navigation were found during office processing. A copy of the report is attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10846 is adequate to:

- a. Delineate the bottom configuration, determine least depths, and draw the required depth curves;
- b. Reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. Show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1998 Edition.

The field unit submission of survey data exceeded the four week period from the completion of fieldwork as required in the Field Procedures Manual (FPM). However, the Chief of Party submitted a written explanation for the delay indicating the anticipated transmittal date to the Chief, Pacific Hydrographic Branch, through the Director, Pacific Marine Center. A copy of the letter dated November 23, 1998 is attached. Fieldwork for survey H-10846 was completed October 26, 1998 and received for office processing on February 22, 1999.

Several charted items were discussed in section I of the hydrographer's report. The appropriate place to discuss these items is in Section N, Comparison with Chart. Reference the Field Procedures Manual, Figure 5-3, Descriptive Report Checkoff List, Item 4.

Q. AIDS TO NAVIGATION

There is one floating aid to navigation within the survey area. This aid was positioned and adequately serves the intended purpose. See the hydrographer's report, section P, and section P, descriptive report insert, (attached) for additional information.

There were no features of landmark value located and/or recommended for charting.

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

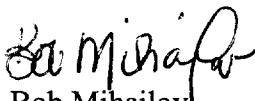
Miscellaneous information is adequately discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

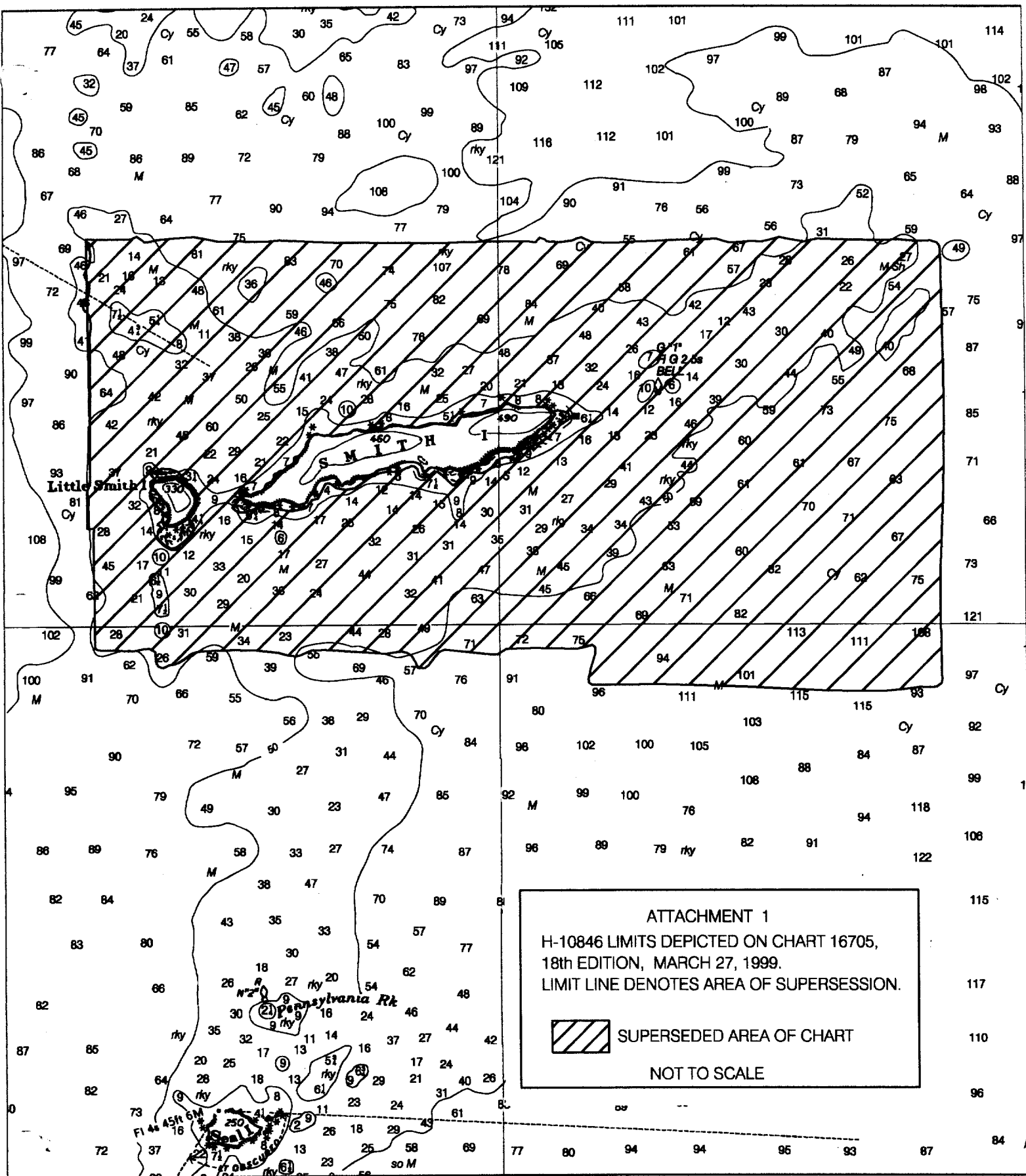
T. RECOMMENDATIONS

This is a good hydrographic survey. No additional work is recommended. Additional information is found in the hydrographer's report, section S.

U. REFERRAL TO REPORTS

Referral to reports is adequately discussed in the hydrographer's report.


Bob Mihailov
Cartographer



APPROVAL SHEET
H-10846

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disapproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead

Bruce A. Olmstead
Senior Cartographer, Cartographic Team
Pacific Hydrographic Branch

Date: 10/19/99

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 Evaluation Report.

James C. Gardner

James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

Date: 10-26-99

Final Approval

Approved:

Samuel P. De Bow

Samuel P. De Bow
Captain, NOAA
Chief, Hydrographic Surveys Division

Date: January 9, 2000

