

9423

Diag. Cht. No. 8551-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT (HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC
Field No. DA-20-2-74
Office No. H-9423

LOCALITY

State ALASKA
General Locality ORCA BAY
Locality GOOSE I. TO PORT. GRAVINA

19 74

CHIEF OF PARTY

M. H. Fleming

LIBRARY & ARCHIVES

DATE 4/21/76

☆ U.S. GOV. PRINTING OFFICE: 1975-668-353

9423

Area 6
chts
8519
8520
8551

HYDROGRAPHIC TITLE SHEET

DA-20-2-74

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.

H-9423 A & B

State Alaska

General locality Orca Bay
~~Prince William Sound~~

Locality Goose I to Port Gratina
~~Knowle's Head~~

Scale 1:20,000 Date of survey 1 June - 30 June 1974

Instructions dated 4 February 1974 Project No. OPR-999-DA-74

Vessel NOAA Ship DAVIDSON CSS-31 & Launches WZ 3039 & WZ 3040
(DA-1) (DA-2)

Chief of party Cdr. M. H. Fleming, NOAA Corps
Lt. R.D. Hopkins, Lt(jg) J. J. Kapler, Lt(jg) R.H. West, Ens. J.L. Oswald,

Surveyed by Ens. J.D. Sarb, Ens. R.W. Mercer

Soundings taken by echo sounder, hand lead, ~~port~~ Ross 5000 Finline

Graphic record scaled by Ship's Personnel

Graphic record checked by Ship's Officers

Positions verified

~~checked~~ by Bruce Alan Olmstead Automated plot by PMC Xynetics Plotter

Soundings ~~checked~~ ^{verified} by Bruce Alan Olmstead

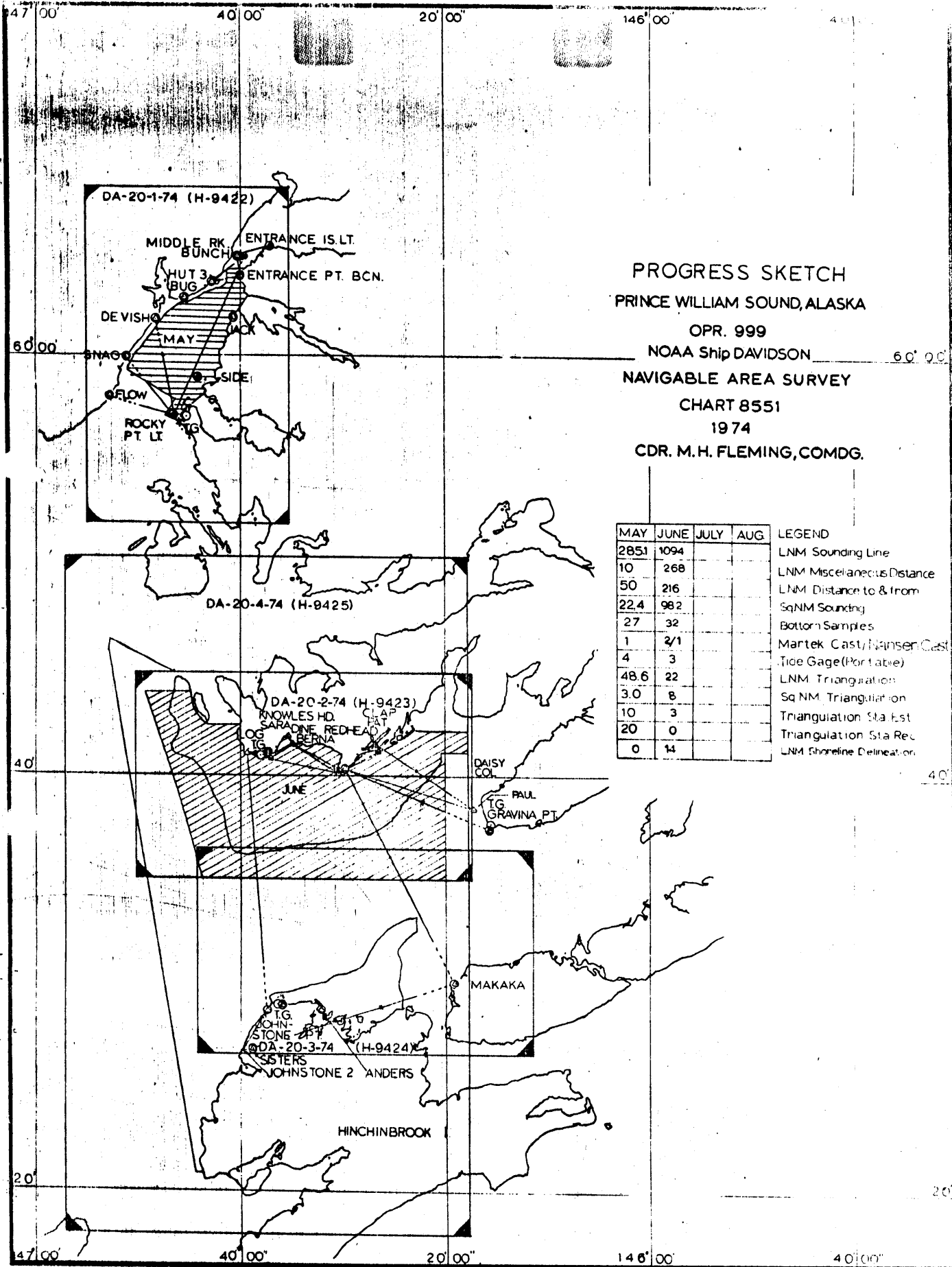
Soundings in fathoms ~~000000000000~~ MLLW

REMARKS: All times are GMT. The area covered by this sheet is coincident with that defined by the smooth sheet layout and hydrography is complete within this area. No prior field work has been accomplished on this sheet.

Applied to stds 1-1676

OK

X. W. W. 3/7/94



PROGRESS SKETCH
 PRINCE WILLIAM SOUND, ALASKA
 OPR. 999
 NOAA Ship DAVIDSON
 NAVIGABLE AREA SURVEY
 CHART 8551
 1974
 CDR. M.H. FLEMING, COMDG.

MAY	JUNE	JULY	AUG.
2851	1094		
10	268		
50	216		
22.4	98.2		
27	32		
1	2/1		
4	3		
48.6	22		
3.0	8		
10	3		
20	0		
0	14		

LEGEND

- LNM Sounding Line
- LNM Miscellaneous Distance
- LNM Distance to & from
- SqNM Sounding
- Bottom Samples
- Martek Cast/Nansen Cast
- Tide Gage (Portable)
- LNM Triangulation
- Sq NM Triangulation
- Triangulation Sta Est
- Triangulation Sta Rec
- LNM Shoreline Delineation

DESCRIPTIVE REPORT

H-9423

DA-20-2-74

ORCA BAY

A. PROJECT

This survey was accomplished in accordance with Project Instructions OPR-999-DA-74, Prince William Sound, Alaska, dated February 4, 1974, with supplemental instructions Special Investigations SP-PMC-5-DA-74, Prince William Sound, Alaska. ✓

B. AREA SURVEYED

The area surveyed is bounded on the east by $146^{\circ} 20' 00''$ W Longitude, except for a shoal development at $N 60^{\circ} 41.5'$, $146^{\circ} 18.0' W$, on the south by $N 60^{\circ} 35' 00''$ Latitude; on the west by approximately $146^{\circ} 45.0' W$ Longitude; and on the north by the north shore of Orca Bay around Knowles Head to Goose Island with the NW corner bounded by $N 60^{\circ} 44' 00''$ Latitude.

C. SOUNDING VESSEL

Three vessels were used for this survey using the following color codes on the position overlay: ✓

DAVIDSON	Brown
WZ 3039 (DA-1)	Red
WZ 3040 (DA-2)	Blue

(See Abstract of Positions)

D. SOUNDING EQUIPMENT

<u>Vessel</u>	<u>Echo-Sounding Instruments</u>
DAVIDSON	Raytheon DE-723, #1286
WZ 3039	Ross Finline 5000, Series 544 Recorder SN-1048 Ross Digitizer 6000-544 (#1053) Transmitter/Receiver Unit SN-1053 Aircraft Standards, Inc., Hydrographic Logger SN-05

 ✓

WZ 3040

Ross Fineline 5000, Series 544
Recorder SN-1053
Ross Digitizer 6000-544 (#1048) ✓
Transmitter/Receiver Unit SN-1048
Aircraft Standards, Inc., Hydrographic
Logger SN-06

The DAVIDSON used its fathometer in conjunction with bottom sampling only. ✓

WZ 3039 (DA-1) was used for the majority of the survey. No problems were experienced with the sounding system of this launch. ✓

WZ 3040 (DA-2) was used for only a small portion of the survey due to chronic RAYDIST problems. The sounding system worked well for all data acquisition by this launch. ✓

Both launches used the digitized sounding systems which are not subject to fine arc, initial, or phase error. Digitized soundings were accepted as true and correct unless they were suspected, on the basis of fathogram scanning, of being reflections from mid-water objects, such as kelp or fish. The analog initial was maintained at zero and phase checks were made twice daily. All soundings are in fathoms. TRA TC/TI correctors, velocity correctors and measured launch drafts are available in the appendix of this report. Inked soundings were reduced for predicted tides at Johnstone Point; TRA correctors were not applied. ✓

E. SOUNDING SHEET

A sounding sheet was produced in accordance with Project Instructions. The smooth sheet will be constructed and plotted by the Processing Division, Pacific Marine Center. ✓

F. STATION CONTROL

Existing triangulation stations were recovered and new triangulation was established using third order methods. (See Horizontal Control Report for Prince William Sound [OPR-999]) ✓

G. POSITION CONTROL

RAYDIST Range-Range positioning control was used for all hydrographic work. The positioning equipment used by each launch and the periods during which it was used are abstracted in the OPR-999 1974 RAYDIST Report. ✓

There were two RAYDIST stations used for this entire survey. They were established over the following triangulation:

	<u>Station</u>	<u>Latitude</u>	<u>Longitude</u>
⊙	025 Johnstone Pt RAYDIST, 1974	N 60° 28' 59.509"	146° 36' 43.192" W ✓
	026 KAYAK 1974	N 60° 31' 55.294"	147° 18' 57.589" W ✓

Daily calibrations were accomplished using a range of two signals and an angle of intersection from a third signal. This method of positioning proved to be very effective and expedient. Calibration signal data is abstracted in the List of Signals appended here-on. ✓

The electronic corrector tape is a daily average of calibrations taken prior to and after the hydrography for that period. No correctors have been applied to the positions on this sheet. (See RAYDIST Report OPR-999, Prince William Sound) ✓

H. SHORELINE

All shoreline on this sheet was provided by the DAVIDSON field edit party. (See Shoreline Delineation Report, OPR-999 (H-9423), Prince William Sound.) Since no shoreline was available from photogrammetric manuscripts, all shoreline features have been inked in red. ✓

I. CROSSLINES

There were approximately 11% crosslines to sounding lines. Agreement between crosslines and sounding lines varied according to bottom slope. Agreement was excellent for the most part with over 95% of all crossline soundings being within one fathom of the regular soundings. Some steeply sloping areas in the northwest part of the sheet had larger differences of up to three fathoms, which was quite good for rugged bottom terrain. ✓

J. JUNCTIONS

This survey junctions with:

<u>Survey</u>	<u>Scale</u>	<u>Date</u>
H-9424	1:20,000	July, 1974
H-9425	1:40,000	July, 1974

 ✓

Junction with these surveys was excellent, with 95% agreement within one fathom and the remainder with no disagreement greater than three fathoms.

K. COMPARISON WITH PRIOR SURVEYS

All Pre-Survey Review items on this sheet were investigated and developed accordingly. No discrepancies from charted Pre-Survey Review items were greater than ± 0.3 fathoms. ✓

A charted 4.0 fathom shoal at N $60^{\circ} 40.9'$, $146^{\circ} 43.3'$ W, which was not included in the Pre-Survey Review, was carefully developed and verified by divers. This shoal was found to have a least depth of 3.8 fathoms. Considering its location and the depth of surrounding water, this shoal represents a significant hazard to shipping. ✓

Comparison of soundings with prior surveys H-3816 and H-3815 revealed no definite patterns of bathymetry changes. Approximately 75% of the soundings compared were within ± 1 fathom of soundings from this survey. Some soundings differed by as much as 8-10 fathoms, but no definite patterns were obvious. (See Comparison with Prior Surveys in Venfiers Report) ✓

L. COMPARISON WITH THE CHART

The largest scale chart of the area surveyed is C&GS 8520. Soundings from present survey compared well with the chart with generally small differences as discussed in Section K. Location of shoals compared favorably with present survey data.

M. ADEQUACY OF SURVEY

This survey is considered complete as a Navigable Area Survey and adequate to supercede prior surveys for charting purposes. ✓

All fathogram field records were scanned for peaks and deeps, and changes to the original records were made where appropriate. ✓

N. AIDS TO NAVIGATION

There were no Floating Aids and only one Fixed Aid to Navigation. Goose Island Light with a published position of N $60^{\circ} 42' 48.770''$, $146^{\circ} 43' 31.201''$ W has been moved by the U.S. Coast Guard approximately 2 meters SW of its published position. Due to lack of time and clear weather, DAVIDSON was unable to locate this light. The old position will probably be sufficient for navigational purposes; but the fact that the light is no longer where published should be noted. ✓

O. STATISTICS

	<u>Total # Positions</u>	<u>Total NM</u>	
WZ 3039	5,641	1053.9	
WZ 3040	132	111.5	✓
DAVIDSON	62		

The approximate total area covered by this survey is 84.5 square miles.

P. MISCELLANEOUS

The bottom material in most of the area that is shallow enough for anchorage is composed of relatively unsorted terrigenous sediment and should hold an anchor well. The area SE of Red Head is protected from reported NW prevailing summer winds. The storm winds for this area were reported to be mostly SW to SE. ✓

This area is very rich, biologically speaking. Bottom fish are abundant and large salmon runs occur annually in all but the smallest streams. There seems to be a fairly large population of sea otters (100-150) that are semi-resident in the area from Knowles Head to Point Gravina. Many species of shore birds and sea birds feed and nest in this area. The impact of even a relatively small oil spill in this area might be considerable. ✓

Q. RECOMMENDATIONS

It is recommended that a buoy be placed on the shoal at N 60° 40.95', 146° 43.3' W. This shoal is a serious hazard to deep draft tanker navigation. ✓

R. REFERENCES TO REPORTS

Reports pertinent to this survey include the following:

Descriptive Report	H-9424	
Descriptive Report	H-9425	
Corrections to Echo Sounders	OPR-999, Prince William Sound, Orca Bay, Alaska	✓
RAYDIST Report	OPR-999, Prince William Sound	
Horizontal Control Report	OPR-999, Prince William Sound	
Shoreline Delineation Report	OPR-999 (H-9423)	

S. DATA PROCESSING PROCEDURES

No automated processing systems were used for preparation of data from this survey. Data acquisition was by methods and equipment described previously in this report. ✓

Submitted by,

R. W. Mercer

R W Mercer
LTJG, NOAA

Approved by,

R. D. Hopkins

for M H Fleming
CDR, NOAA
Commanding Officer
NOAA Ship DAVIDSON

APPENDIX

Nonfloating Aids or Landmarks for Charts

Field Tide Note

Geographic Names List

Transducer Correctors

Tape Abstract

Electronic Corrector Abstract

Daily Electronic Control Calibrations

Station List

Abstract of Positions

Oceanographic Log Sheet "M" Bottom Sediment Data

Geodetic Computations

Approval Sheet

FIELD TIDE NOTE

OPR-999-DA-74

Prince William Sound

CONTROL GAGE: CORDOVA, ALASKA

PREDICTED TIDES: Johnstone Point, Alaska

Time of all data: ~~0000~~ GMT

Local time: Alaskan Daylight Savings Time, +9 hours

Predicted tides of Johnstone Point, Hinchinbrook Island, were applied as tide correctors to soundings. These tides were obtained from the PDP8/e computer aboard NOAA Ship FAIRWEATHER, using program AM500.

There are a total of three (3) gages operating in the project area:

Gravina Point

N 60° 37.7'
146° 15.4' W

Bristol bubbler
S/N 73A234

This bubbler began operation on 22 May 1974 and is still in operating order. The gage has missed some minus tides due to orifice going dry. This problem was corrected. In addition, the clock mechanism was faulty and was replaced on 3 July 1974.

Johnstone Point

N 60° 29.0'
146° 36.7' W

Bristol bubbler
S/N 64A11033

This bubbler began operation on 22 May 1974 and has been operating in good order since. No problems with this gage excepting jammed paper.

Knowles Head

N 60° 40.9'
146° 37.2' W

Bristol bubbler
S/N 73A233

This bubbler began operating on 23 May 1974 and is still in operation. Tide staff was relocated after the first day. Good traces are being recorded at this gage.

*Used
for H-9423*

There was minimal difficulties with Johnstone Point and Knowles Head tide gages. Gravina Point tide gage presented two problems: orifice going dry and the clock mechanism being faulty. A new clock was installed and the orifice put into deeper water (3 July and 2 July 1974).

LEVELS

All gage staffs were leveled to five bench marks. Ten (10) bench marks were established (Knowles Head and Gravina Point) and five bench marks were recovered at Johnstone Point. Any staff movement will have to be verified by the leveling upon removal of these station. However, a sight inspection leads us to believe that the staffs have not moved.

RECOMMENDATIONS

Knowles Head tides be used for obtaining tide reducers for sheet H-9423 (DA- 20-2-74) as it is more reliable than Gravina Point tide gage.

For DA-20-3-74, H-9424, it is suggested that Johnstone Point tide gage be used for tide correctors.

For sheet H-9425, (DA-40-1-74), it is recommended the Knowles Head tides be used for reducers until 4July74, and the Johnstone Point gage be used for all tide correctors after that date on this sheet. Ship operations shifted from the northern to southern portion of this sheet after that date.

Johnstone Point and Knowles Head tide gages are functioning without any problems at this time. Gravina Point tide gage has been erratic for a total period of four-five days. However, it is believed that this gage will present no further problems.

H-9423

Name on Survey

	A <i>On Coast</i>	B <i>On Islands</i>	C <i>On U.S. Islands</i>	D <i>From 180° to 180°</i>	E <i>From 180° to 180°</i>	F <i>On Islands</i>	G <i>P. C. Guide</i>	H <i>Rang. Helms</i>	K <i>U.S. List</i>	
GOOSE ISLAND ✓										1
GRAVINA ISLAND										2
KNOWLES HEAD ✓										3
ORCA BAY										4
PORT GRAVINA										5
PRINCE WILLIAM SOUND ✓										6
RED HEAD										7
GRAVINA POINT ✓										8
KNOWLES BAY ✓										9
ST. MATTHEWS BAY										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26

Approved
 Chas. E. Harrington
 Staff Geographer-C51x2
 21 June 1976

Electronic Corrector Abstract

Vessel: 3039

Sheet: DA-20-2-74

DAY	TIME	FROM POSITION	SOUNDING	PATTERN 1 STA #025 CORRECTOR	PATTERN 2 STA #026 CORRECTOR	BASE LINE +/-	TIME	TO POSITION
152	194043	1074	6.2	-.04	-.03	+	003500	1237
154	203020	1238	6.8	-.25	-.12	+	005240	1342
155	180420	1343	2.1	-.29	-.22	+	005020	1509
156	190020	1510	0.9	-.26	-.27	+	004640	1671
157	181120	1672	55.3	-.12	-.12	+	002800	1833
158	174400	1834	27.5	-.21	-.12	+	183320	1868
162	195945	1869	3.6	-.28	-.15	+	010405	1955
163	174500	4001	3.3	-.19	-.10	+	005200	4208
164	174600	4209	25.5	4.09	-.04	+	005300	4444
165	014601	4445	3.3	-.01	-.06	+	051901	4520
165	140900	4521	1.6	+.06	+.13	+	160340	4578
165	182540	4579	24.2	+.02	-.04	+	010500	4750
166	030520	4751	32.6	-.15	-.05	+	041520	4789
166	133120	4790	2.0	-.07	-.03	+	160140	4871
166	175120	4872	3.5	+.18	+.11	+	235320	5033
167	180400	5034	10.4	-.26	-.22	+	001320	5189
169	180124	5190	5.0	-.32	-.19	+	002740	5343
170	024900	5344	53.8	-.21	-.14	+	062420	5412
170	133845	5413	0.6	-.25	-.07	+	160820	5503
170	175039	5504	16.8	-.19	-.08	+	004100	5682
171	030340	5683	10.1	-.18	-.09	+	061520	5740
171	135100	5741	11.1	-.31	-.22	+	161000	5838
171-172	174340	5839	10.5	-.16	-.11	+	005720	6054
176	141304	6055	2.6	-.08	-.27	+	151100	6088
176	180050	6089	21.9	-.11	-.25	+	200550	6146
177	024000	6148	14.0	-.03	-.04	+	045820	6210
177	134130	6211	23.1	-.43	-.32	+	160530	6277
177-178	194250	6278	22.5	+.62	-.03	+	001007	6380
178	021800	6380	20.7	00.0	+.19	+	042855	6461
178	134318	6462	4.0	-.24	-.17	+	160500	6574
181	022940	6575	19.3	+.23	+.13	+	042720	6681
181	182320	6681	12.7	+.17	+.03	+	201900	6715

* Changed RAYDIST set - new phase di-1 setting

Electronic Corrector Abstract

Vessel: 3040

Sheet: DA-20-2-74

DAY	TIME	FROM POSITION	SOUNDING	PATTERN 1 STA #025 CORRECTOR	PATTERN 2 STA #026 CORRECTOR	BASE LINE +/-	TIME	TO POSITION
156	205100	2002	3.0	+ .10	+ .20	+	235213	2058
157	184534	2074	1.8	+ .02	- .10	+	205309	2134
165	181243	2069	3.1	- .06	+ .07	+	003408	2220
166	180803	2221	3.3	- .13	+ .05	+	215630	2304
166	215730	2305	23.3	- .27	- .11	+	231530	2343
169	232930	2344	3.3	- .16	+ .08	+	005755	2391

STA	LATITUDE	LONGITUDE	CRT	ELEV	F. HKZ	TYPE/NAME	SOURCE
13	N 60° 41' 06.705"	146° 38' 55.561" W	139	0004		LOG, 1974	*
14	N 60° 40' 55.062"	146° 37' 17.690" W	139	0012		Knowles Head 1900, r 1974	*
15	N 60° 40' 53.928"	146° 37' 14.450" W	139	0009		SARA, 1974	*
16	N 60° 41' 45.476"	146° 35' 21.006" W	139	0020		DINE 1974	*
17	N 60° 41' 27.060"	146° 35' 02.871" W	139	0008		VERNA 1974	*
18	N 60° 40' 12.588"	146° 29' 32.567" W	139	0010		RED HEAD 1900, r 1973	**
19	N 60° 41' 07.881"	146° 25' 33.351" W	139	0005		PAT'S 1974	*
20	N 60° 41' 16.836"	146° 25' 39.569" W	139	0009		CLAP 1974	*
21	N 60° 37' 24.127"	146° 15' 06.080" W	139	0010		GRAVINA POINT LIGHT 1974	*
25	N 60° 28' 59.509"	146° 36' 43.192" W	139 254 139	0030	3306.5	JOHNSTONE POINT RAYDIST 1974	***
26	N 60° 31' 55.294"	147° 18' 57.589" W	139	0022	3306.5	KAVAK 1974	*
27	N 60° 40' 11.291"	146° 29' 58.012" W	139	0008		COL 1974	*
28	N 60° 38' 28.057"	146° 17' 24.458" W	139	0006		PAUL 1974	*
29	N 60° 40' 19.020"	146° 30' 11.695" W	139	0004		DAISY 1974	*
30	N 60° 42' 48.865"	146° 43' 31.448" W	139			GOOSE ISLAND LIGHT 1974	

* Unadjusted field computation by triangulation - traverse by Ship DAVIDSON, May-June 1974. See horizontal control report OPR-999, 1974 (Prince William Sound).

** Unadjusted third order triangulation computation by PMC field party from May 1973.

*** Eccentric Station from Point Johnstone Light 1973 and Point Johnstone 2, 1933, r 1973, both by PMC field party, May 1973 (unadjusted positions used).

ABSTRACT OF POSITIONS: H-9423

VESSEL: 3039

<u>Day</u>	<u>Positions</u>	<u>CTRL</u>	<u>S1</u>	<u>M</u>	<u>S2</u>	<u>Remarks</u>
152	1074-1237	04	025	---	026	Hydro
154	1238-1342	04	025	---	026	Hydro
155	1343-1509	04	025	---	026	Hydro
156	1510-1671	04	025	---	026	Hydro
157	1672-1833	04	025	---	026	Hydro
158	1834-1868	04	025	---	026	Hydro
162	1869-1955	04	025	---	026	Hydro
163	4001-4208	04	025	---	026	Hydro
164	4209-4444	04	025	---	026	Hydro
165	4445-4750	04	025	---	026	Hydro
166	4751-5033	04	025	---	026	Hydro
167	5034-5189	04	025	---	026	Hydro
169	5190-5343	04	025	---	026	Hydro
170	5344-5682	04	025	---	026	Hydro
171	5683-6054	04	025	---	026	Hydro
176	6055-6146	04	025	---	026	Hydro
177	6148-6380	04	025	---	026	Hydro No Pos#6147
178	6381-6574	04	025	---	026	Hydro
181	6575-6715	04	025	---	026	Hydro

ABSTRACT OF POSITIONS: H-9423

VESSEL: 3040

<u>Day</u>	<u>Positions</u>	<u>CTRL</u>	<u>S1</u>	<u>M</u>	<u>S2</u>	<u>Remarks</u>
156	2002-2068	04	025	---	026	
157	2069-2134	04	025	---	026	Dup. Pos. 2069-2134 No Pos. #2111-2116
165	2069-2220	04	025	---	026	
166	2221-2343	04	025	---	026	Choppy Seas-Strip chart wet but PM Cal.
169	2344-2391	04	025	---	026	OK

APPROVAL SHEET
HYDROGRAPHIC SURVEY
DA-20-2-74
H-9423

PRINCE WILLIAM SOUND
ORCA BAY

The field work on this survey was accomplished
under my supervision. Frequent inspections were
made of the boat sheet and other records.

for Robert D. Hopkins
Michael H Fleming
CDR, NOAA
Commanding Officer
NOAA Ship DAVIDSON CSS-31

Velocity Correction Table #1

31315274

000020 0 0000 0001 000 000000 000000

000130 0 0001 0001 000 000000 000000

000400 0 0002 0001 000 000000 000000

001500 0 0001 0001 000 000000 000000

Velocity Correction Table #2

31317274

000030	0	0000	0002	000	000000	000000
000150	0	0001	0002	000	000000	000000
000400	0	0002	0002	000	000000	000000
001040	0	0001	0002	000	000000	000000
001490	0	0000	0002	000	000000	000000
001810	0	0001	0002	000	000000	000000
002030	0	0002	0002	000	000000	000000
002200	0	0003	0002	000	000000	000000

Velocity Correction Table #3

31318174

000010	0	0000	0003	000	000000	000000
000050	0	0001	0003	000	000000	000000
000100	0	0002	0003	000	000000	000000
000490	0	0003	0003	000	000000	000000
000830	0	0002	0003	000	000000	000000
001410	0	0001	0003	000	000000	000000
001730	0	0002	0003	000	000000	000000
001900	0	0003	0003	000	000000	000000
002000	0	0004	0003	000	000000	000000

31315274

194043	0	0003	0001	152	000000	000000
000000	0	0003	0001	153	000000	000000
203020	0	0003	0001	154	000000	000000
002240	0	0003	0001	155	000000	000000
000000	0	0003	0001	156	000000	000000
000000	0	0003	0001	157	000000	000000
00010	0	0003	0001	158	000000	000000
125025	0	0003	0001	162	000000	000000
000005	0	0003	0001	163	000000	000000
235040	0	0003	0001	163	000000	000000
000030	0	0003	0001	164	000000	000000
000000	0	0003	0001	165	000000	000000
000000	0	0003	0001	166	000000	000000
180400	0	0003	0001	167	000000	000000
000000	0	0003	0001	168	000000	000000
180124	0	0003	0001	169	000000	000000
000000	0	0003	0001	170	000000	000000
002220	0	0003	0001	171	000000	000000
000000	0	0004	0002	172	000000	000000
141304	0	0004	0002	176	000000	000000
024000	0	0004	0002	177	000000	000000
000007	0	0004	0002	178	000000	000000
022940	0	0003	0003	181	000000	000000

H-9423 TRA TC/TI DA-2

31315674

205100 0 0003 0001 156 000000 000000

184534 0 0003 0001 157 000000 000000

181243 0 0003 0001 165 000000 000000

000013 0 0003 0001 166 000000 000000

232930 0 0003 0001 169 000000 000000

000000 0 0003 0001 170 000000 000000

2/17/75

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for Form 362

Tide Station Used (NOAA Form 77-12): Knowles Head

Period: May 23 - July 26, 1974

HYDROGRAPHIC SHEET: H-9423

OPR: 999

Locality: Prince William Sound, Alaska

12.7 (thru 1800 6/11)

Plane of reference (mean lower low water): 11.9 (after 1800 6/11)

Height of Mean High Water above Plane of Reference is 11.0 ft.

Remarks: Zone direct.

James R. Hubertson
for Chief, Tides Branch

HYDROGRAPHIC SURVEY STATISTICS
HYDROGRAPHIC SURVEY NO. H-9423

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION			AMOUNT
SMOOTH SHEET & 5-Overlays		2	BOAT SHEETS & Field Edit			4
DESCRIPTIVE REPORT		1	OVERLAYS			11 2
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
Manila Folders INDEX CARDS	1					1
CAHIERS	2					
VOLUMES	2 +					
Three ring INDEX binder			2 +	1		1
T-SHEET PRINTS (List) None						
SPECIAL REPORTS (List) Shoreline Delineation Report						

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				5835
POSITIONS CHECKED		5835		
POSITIONS REVISED		394		
DEPTH SOUNDINGS REVISED		1200		
DEPTH SOUNDINGS ERRONEOUSLY SPACED		0		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		0		
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		020		
JUNCTIONS		256		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		242		
SPECIAL ADJUSTMENTS		272		
ALL OTHER WORK		045		
TOTALS		835	HIT 16	
PRE-VERIFICATION BY	BEGINNING DATE		ENDING DATE	
VERIFICATION BY <i>Bruce Alan Olmstead</i> Bruce Alan Olmstead	30 August 1974		8 March 1976	
REVIEW BY <i>CC</i>	BEGINNING DATE		ENDING DATE	

D.C. Carlson 4745 6/21/76

VERIFIER'S REPORT

Registry No. H-9423

Field No. DA-20-2-74

Alaska, Prince William Sound, Knowles Head

Surveyed: June 1 - June 30, 1974

Project No: OPR-999

Scale: 1:20,000

Soundings: Ross 5000 Fineline

Control: Raydist

Chief of Party Cdr., M. H. Fleming

Surveyed by DAVIDSON's Ship's Officers

Plotted by PMC Xynetics Plotter

Verified by B. A. Olmstead

Inspected by Lt. Cdr. D. E. Nortrup,
Lt. Cdr. J. C. Albright,
Lt. Cdr. D. E. Seidel, and
A. E. Eichelberger

This sheet was constructed and plotted at the Pacific Marine Center,
Seattle, Washington. Information relating to this survey follows
as specified by Chapter 6 of the Provisional Hydrographic Manual.

I. INTRODUCTION

This survey is located along the southern coast of Knowles Head, 27 miles southwest of Valdez in the upper regions of Prince William Sound. The project limits extend from Latitude $60^{\circ}35'00''\text{N}$ to Latitude $60^{\circ}44'00''\text{N}$ Longitude $146^{\circ}17'20''\text{W}$ to Longitude $146^{\circ}50'30''\text{W}$. Specifically, this sheet covers about 11 miles of coastline and extends from the shoreline to the 50-fathom curve on the east and south and to the 100-fathom curve on the west and north.

No updated photography was available in this area during 1974. Designated a Navigable Area Survey by project instructions, the ship was not provided with Class III manuscripts. But, as a chosen anchorage area for the anticipated heavy maritime traffic, the DAVIDSON felt that land references were most essential for navigating. It was determined that a shoreline could be compiled relatively fast and sufficiently accurate by establishing offshore positions and estimating a distance to the mean high water line.

The bottom configuration is gently sloping except, for that area immediately west of Goose Island where a steeper gradient is more evident. The bottom characteristics consist primarily of green clay and mud.

II. CONTROL and SHORELINE

The origin of control is given in Part F of the Descriptive Report and the seasons Horizontal Control Report for Prince William Sound (OPR-999).

There are no Class I photogrammetric manuscripts in this area. The entire shoreline is shown in dashed red on the smooth sheet as provided by the DAVIDSON field edit party. Methods and procedures in compiling this High Water Line are described in the Shoreline Delineation Report, OPR-999.

III. HYDROGRAPHY

Depths at crossings are in good agreement.

The usual depth curves are adequately delineated except the low-water line which was not required.

The development of the bottom configuration is considered excellent.

IV. CONDITION OF THE SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the hydrographic manual except for the following; (1) Several lines of

hydrography were not plotted on the boatsheet. With these lines not plotted, holidays in the survey were readily evident to the hydrographer. So, splits, which appeared necessary, were in fact not necessary. This produced redundant hydrographic data; (2) Many positions were not logged on the master tape. Thus, insertion of positions, soundings and time data had to be entered for recompute at the preliminary phases of processing; (3) Field edit positions were not logged by the ship. Several sets of these positions were given erroneous baseline information and many individual positions were manually misplotted by 50-100 meters. Verifier rechecked raw values with Odessey Protractor when conflicts arose between plots; (4) The physical size of the sheet exceeds the specifications of the hydrographic manual; and (5) As an incidental note, the verifier felt the raw data printouts were insufficiently annotated.

V. JUNCTIONS

An adequate junction was effected with H-9425 (DA-20-4-74) on the northwest and southwest portions of this survey. The standard depth curves of 5-fathoms thru 200-fathoms inclusive were made identical and inked within the common area. H-9424 (DA-20-3-74) junctions the majority of the southern limits of this sheet at 60-70 fathom depths and involves no standard depth curves. Agreement is within 1-2 fathoms. Areas on the extreme east and north of this project have no contemporary junctional data.

Two older surveys, H-7628 (DE-4147) and H-7766 (DE-4148) are 1:40,000 visually controlled surveys which considerably overlap the contemporary hydrography. H-7766 (1948) is an unverified sheet and was used strictly for comparison. H-7628 (1947) agreed very well in most areas but fell completely apart on the southwest. Verifier felt these older surveys could possibly have been used for junctional purposes but numerous problems prevented any attempt at doing so.

VI. COMPARISON WITH PRIOR SURVEYS

H-2658 (1903) 1:20,000
H-3815 (1915) 1:20,000
H-3816 (1915) 1:20,000

The depths since these prior surveys have generally shoaled 1-3 fathoms inside the 30-fathom curve. This agreement is extremely good considering the surveying methods utilized and the subjection of this area to earthquake activity. Generally, depths have increased by 1-4 fathoms beyond the 30-fathom curve with some differences to 10 fathoms. Two areas of extreme disagreement lie at Latitude $60^{\circ} 35' 00''$ N - $60^{\circ} 38' 00''$ N Longitude $146^{\circ} 40' 30''$ W - $146^{\circ} 42' 00''$ W and Latitude $60^{\circ} 42' 00''$ N - $60^{\circ} 44' 00''$ N Longitude $146^{\circ} 45' 00''$ W -

Prior sounding lines are displaced excessively because of weak control.

146°48'00"W. Here, since the 1903 survey, present depths reveal a deepening of up to 50 fathoms. Obviously, many of the lead line soundings were misread during these prior field projects. But, this does not account for all the large discrepancies. As the differences in depth indicate, the depth curves have correspondingly shifted to depict this change. The change in most cases is small but noticeable.

A shoreline comparison shows good stability and remarkable similarity. This substantiates fairly well the method used in compiling the 1974 shoreline.

H-7766 (1948) 1:40,000 (unverified)
H-7628 (1947) 1:40,000

Generally, depths since these prior surveys have deepened 1-3 fathoms. Agreement is excellent in most cases with the exception of the following; H-7628 (1947) reveals soundings that are 20 fathoms shoaler at Latitude 60°35'00"N - 60°38'00"N Longitude 146°40'30"W - 146°43'00"W. These differences reflect the 1903 trend with H-2658. Some accountable differences are; tide correctors were not based on time and range in 1947, earthquake activity of 1964 in Prince William Sound and natural processes of bottom changes over 27 years. Also, visual methods of control over distances of 3-5 miles can at best be very approximate. H-7766 (1948) is an unverified sheet which contains a 20 fathom shoal at Latitude 60°38'18"N Longitude 146°39'48"W. This sounding is ten fathoms shoaler than the surrounding depths.

Differences exist with 1903 survey, not with H-9423

With the exception of the 20 fathom sounding on H-7766 (unverified) 1948, the present survey is adequate to supersede the prior surveys within the common area. *20 is a spurious sounding*

VII. COMPARISON WITH CHART

- A. A chart comparison was made with Chart 8520 15th Edition, January 20/73. The charted hydrography originates primarily with the five previously discussed prior surveys applied from verified and unverified smooth sheets.

Special mention is made of the following critical information for future chart application. This information to be used in compiling a data base for future hydrographic investigation. See the attached chart for additional information and clarification of the following chart comparison comments.

1. The 20 fathom sounding charted at Latitude 60°38'18"N Longitude 146°39'48"W originates with an unverified

prior survey H-7766 (1948). Two hydrographic lines of sounding data fall on each side of the shoal but indicate no feature as existing. Because this specific feature was not spoken to by the field, verifier recommends retaining on subsequent editions of the chart. See chart item "A". *Disregard 20 fms. Spurious on H-7766*

2. The 48 fathom sounding charted at Latitude $60^{\circ}40'55''N$ Longitude $146^{\circ}20'35''W$ originates with prior survey H-3816 (1915) 1:20,000. This sounding should be 38 fathoms.
3. The shoal charted at Latitude $60^{\circ}41'30''N$ Longitude $146^{\circ}19'08''W$ was further developed by the present survey and a least depth of 3^2 fathoms was found. Recommend that this least depth be shown on the next edition of the chart. See Chart Item "C".
4. The 4 fathom sounding charted at Latitude $60^{\circ}40'58''N$ Longitude $146^{\circ}43'22''W$ originates with H-7766 (1948) an unverified smooth sheet. The present survey carefully developed this area and was verified by divers. The shoal was found to have a least depth of 3^8 fathoms and should be charted. See Chart Item "D".
5. The two sunken rocks and two rocks awash charted at Latitude $60^{\circ}41'35''N$ Longitude $146^{\circ}35'45''W$ are from an unknown source and were neither proved nor disproved by the present survey. And, should be retained on the chart. See Chart Item "E".

Except as noted in the five items above, the present survey is adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

It is recommended that a buoy be placed on the shoal 3^8 fathoms at Latitude $60^{\circ}40'55''N$ Longitude $146^{\circ}43'18''W$. The location of this feature and the increase of supertanker traffic within the next few years make this shoal a danger to navigation. Of the two fixed aids to navigation; one, Goose Island Light, has been moved by the U. S. Coast Guard approximately 2 meters SW of its published position. The Ship DAVIDSON did not locate this light due to a lack of time and clear weather. With the above changes acknowledged, the charted aids adequately mark the features intended.

VIII. COMPLIANCE WITH PROJECT INSTRUCTIONS

The survey adequately complies with the project instructions.

IX. ADDITIONAL FIELD WORK

This is an excellent basic survey. Additional field work is not required with the exception of the 20 fathom sounding mentioned in Section VII, Part 1. This sounding should be listed as a Presurvey Review item during the next project operation in Prince William Sound.

Respectfully submitted,

Bruce Alan Olmstead

Bruce Alan Olmstead
Cartographic Technician
March 9, 1976

Examined and approved by,

J. S. Green

James S. Green
Chief, Verification Branch



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY, Pacific Marine Center
1801 Fairview Ave. E., Seattle, Washington 98102

Date: 31 March 1976

To: H. R. Lippold, Jr., RADM *HL*
Director

From: *Donald E. Nortrup*
Donald E. Nortrup, LCDR
Chief, Processing Division

Subject: PMC Hydrographic Survey Inspection Team Report - H-9423

This survey is a navigable area survey of Prince William Sound, Orca Bay, AK. conducted by NOAA Ship DAVIDSON in 1974 in compliance with Project Instructions OPR-999-DA-74 dated 04 February 1974. A number of minor cartographic corrections have been made to the smooth sheet as a result of the inspection process.

Although no photogrammetric shoreline compilation was available, the ship delineated the inshore features using field edit methods. This information has been applied to the smooth sheet in lieu of the shoreline.

Project Instructions for this survey specified maximum line spacing of 200 meters. The survey was conducted with 100 meter spacing to 20 fathoms, 200 meters between 20 and 50 fathoms, and 400 meters in depths exceeding 50 fathoms. Although the 400 meter spacing exceeds the maximum Project Instructions specifications, the inspection team unanimously agrees that the delineation of the bottom configuration is very good.

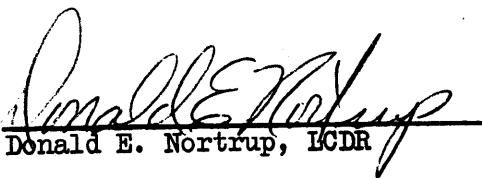
The verifier has recommended that a 20 fathom sounding from prior survey H-7766, latitude 60°38.3'N, longitude 146°39.8'W, be retained on future editions of the chart. Since H-7766 is an unverified survey the sounding has not been carried forward to the smooth sheet of this survey. The inspection team recommends that the source data for this sounding be examined and the existence of this sounding be verified before compilation of the next edition of the chart.

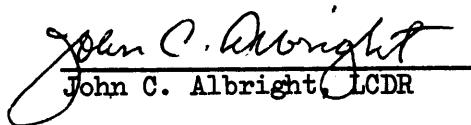
*20 fm
found to
be a spurious
sounding
disregard*

Similarly, the verifier has recommended the retention of four rocks in the vicinity of latitude 60°41.6'N, longitude 146°35.7'W. The source of these rocks is unknown. The inspection team recommends that source materials be researched to verify the existence of the rocks before compilation of the next edition of the chart.

Although major differences exist between the soundings of this survey and those of prior surveys (see Section VI, Verifier's Report), the inspection team has concluded that H-9423 is adequate to supersede all prior surveys with the possible exception of the single 20 fathom sounding mentioned above. The survey is adequate for charting.

This is a very good survey. Both the ship DAVIDSON and the verifier deserve credit for a job well done.


Donald E. Nortrup, LCDR


John C. Albright, LCDR

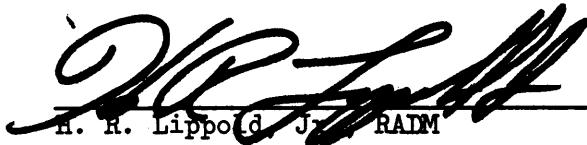

Arnold E. Eichelberger


Dean R. Seidel, LCDR

ADMINISTRATIVE APPROVAL

H-9423

The smooth sheet and reports of this survey have been reviewed and found to be complete and adequate for charting. It gives me considerable satisfaction to approve this survey.



H. R. Lippold, Jr., RADM
Director
Pacific Marine Center

4/1/76
Date

H-9423

Items for Future Presurvey Reviews

The bottom appears to be stable and little shifting of sediments is expected. Some changes in the shoreline in the east portion of the survey may occur where lagoons and inlets exist.

<u>Position Index</u>		<u>Bottom Change</u>	<u>Use</u>	<u>Resurvey</u>
<u>Lat.</u>	<u>Long.</u>	<u>Index</u>	<u>Index</u>	<u>Cycle</u>
603	1465	0	1	50 years
603	1464	1	1	50 years
603	1463	1	1	50 years
604	1465	1	1	50 years
604	1464	1	1	50 years
604	1463	2	1	50 years
604	1462	1	1	50 years



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C35x1

June 22, 1976

a. J. Patrick
TO: Chief, Marine Surveys Division
THRU: Chief, Quality Control Branch
R. H. Carstens
FROM: R. H. Carstens
Quality Evaluator

SUBJECT: Quality Control Report for H-9423 (1974), Orca Bay, Alaska

Survey H-9423 was examined with respect to data acquisition, development of least depths and bottom configuration, adequacy of junctions and sounding line crossings, cartographic presentation, smooth plotting, verification and review and, in general, was found to conform to National Ocean Survey standards and requirements.

Attention should be directed to the following:

1. The 20-fathom depth charted in latitude $60^{\circ}38.3'$, longitude $146^{\circ}39.8'$ from the unverified survey H-7766 (1948) is a spurious sounding on the graphic depth record and should be disregarded.
2. The name of the aid to navigation, Goose Island Light, for example, adequately given in the triangulation name need not be repeated.
3. Ross depth recorder 1048 produced numerous questionable traces which made interpretation particularly difficult. The interpretation of some traces could well be in error.
4. Numerous differences of as much as 50 fathoms occur with soundings from H-2658 (1903) in the vicinity of 50 to 100 fathoms on the west portion of the present survey. Because of weak control of lines on the prior survey some lines are excessively displaced. Soundings still retained on the chart from the prior survey should be replaced by present survey depths.
5. The shoreline in red estimated from positions established by electronic control provides supplementary information for charting. In general it was extremely detailed particularly with respect to inshore features. The position of the high water line, however, is dependent on distance estimates and sketching which may vary considerably in accuracy. A number of



errors were found by the verifier in the manual field plot of the shoreline. Because of this the use of the field plot to represent true conditions was of questionable value. A comparison with prior shoreline of the east portion of the survey reveals considerable change and the need for photogrammetric surveys to complete delineation of the area.

6. Development for least depths on shoals was particularly well done on this survey.

cc:
C351

REGISTRY NO. _____

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey, the following shall be completed:

CARDS CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

REGISTRY NO. _____

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

Chart 8520 15th Ed. Jan. 20/73
1:80,000

H-942315

H-2658 (1903) 1:20,000

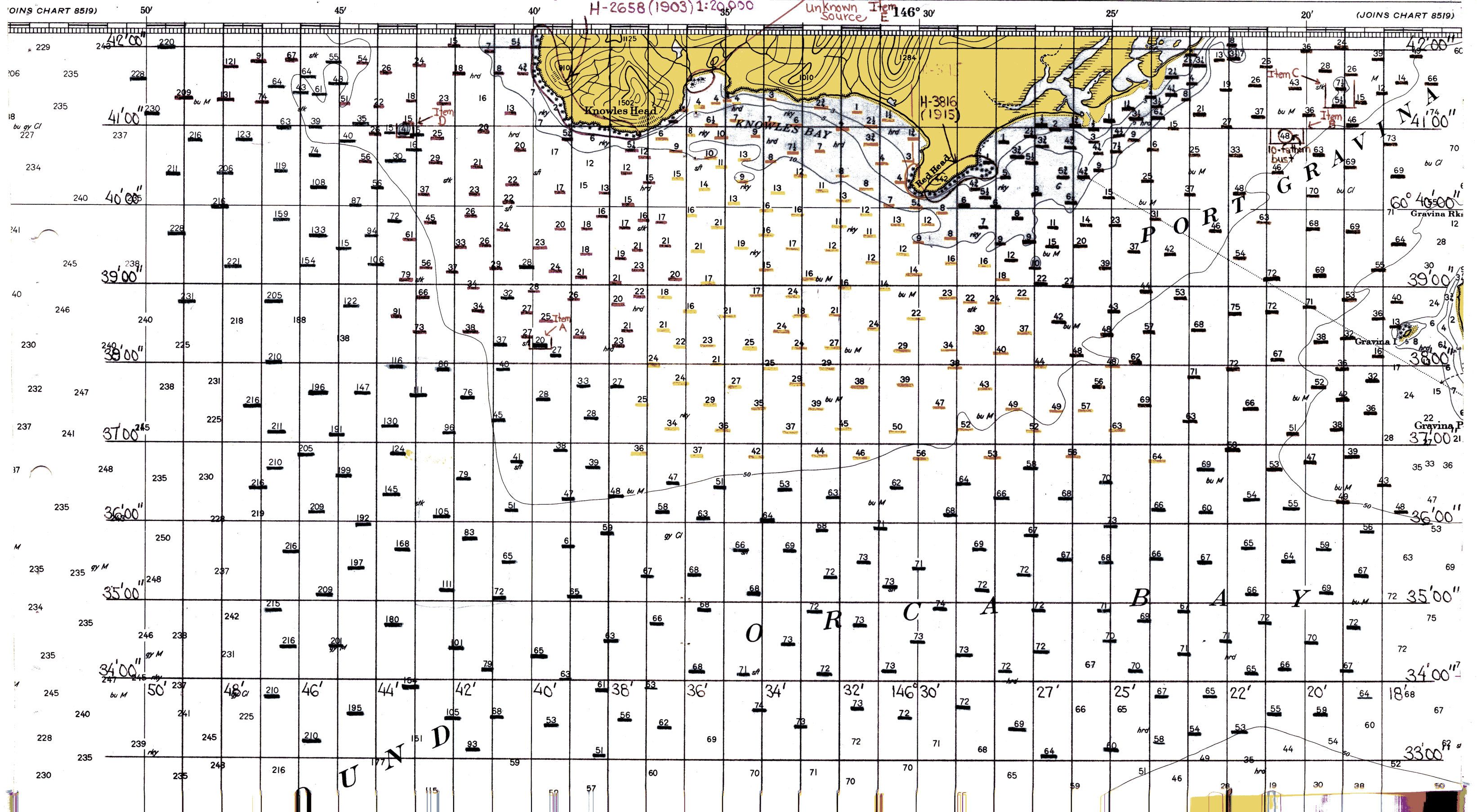
H-7766 (1948) 1:40,000 (Unverified)

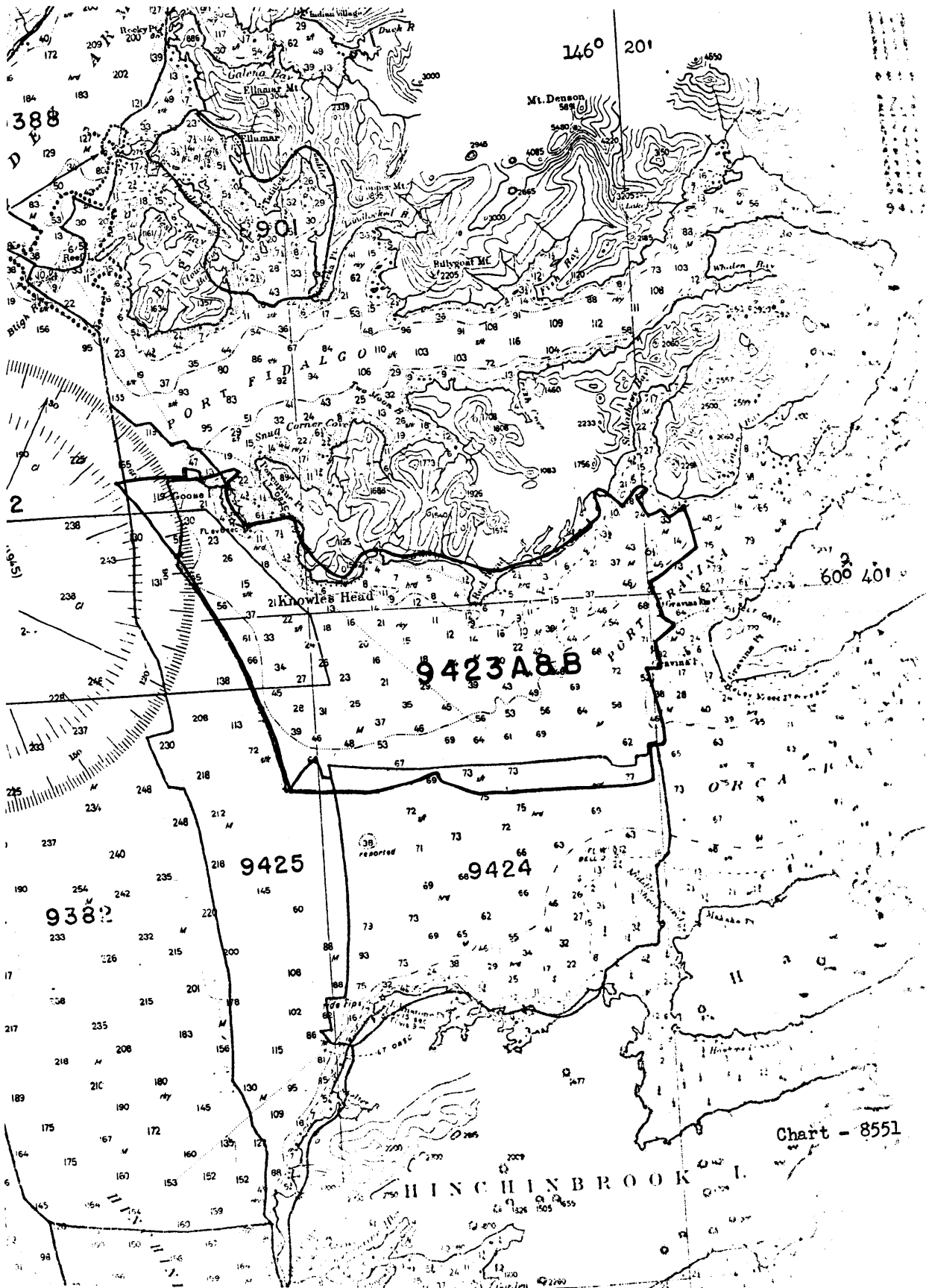
H-3815 (1915) 1:20,000

H-3816 (1915) 1:20,000

H-7628 (1947) 1:40,000

1st Ed., Feb. 1902





146° 20'

388

2

9423A&B

60° 40'

9425

9424

938?

Chart - 8551

HINCHINBROOK I.

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9423

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
8551	9/9/76	KANIS	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>Applied critical corrections only</i>
8520	11/19/76	KANIS	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>Applied critical corrections only</i>
8519	9/14/77	H.J. Brawski	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>Fully appl'd all Hydro in area of this survey</i>
8520	7/12/79	J. Bailey	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>FULLY APPLIED</i>
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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