

8492

Diag. Cht. No. 8002-2.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey **Hydrographic**

Field No. **B0-1259** Office No. **H-8492**

LOCALITY

State **S. E. Alaska**

General locality **Lituya Bay**

Locality

1959

CHIEF OF PARTY

H. J. Seaberg

LIBRARY & ARCHIVES

DATE **April 6, 1960**

USCOMM-DC 37022-P66

8492

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

REGISTER No. H-8492

Field No. BO-1259

State Alaska

General locality Southeast

Locality Lituya Bay

Scale 1:10,000 and 1:5,000 Date of survey July 21 - August 27, 1959
~~July and August 1959~~

Instructions dated 27 March 1959, 8 May 1959, and 15 May 1959

Vessel CS 184

Chief of party CDR H. J. Seaborg

Surveyed by LCDR L. S. Baker

Soundings taken by fathometer, ~~graphic recorder, hand lead, wire~~

Fathograms scaled by LDL, ADV, JWB, WRW, RLB, & JBS

Fathograms checked by WPJames

Protracted by WPJames

Soundings penciled by WPJames

Soundings in fathoms ~~feet~~ at ~~MLLW~~ MLLW *and are based on one true depths*
a velocity of sound of 800 fms/sec.

REMARKS:

887

DESCRIPTIVE REPORT

Hydrographic Survey BO-1259

Lituya Bay, Alaska

Special Project 1-59

1959

Scale 1:10,000, 1:~~5~~5,000

H. J. Seaborg

Chief of Party

L. S. Baker

Hydrographer

A. PROJECT:

This survey was done in accordance with Instructions for Special Project 1-59, dated 27 March 1959, and Supplemental Instructions dated 8 May and 15 May 1959.

B. SURVEY LIMITS AND DATES:

This survey covers the entire water area of Lituya Bay, the entrance channel, and an offshore investigation to the 10 fathom curve. Hydrography was in progress from 21 July to 26 August 1959.

The area covered is a resurvey of prior surveys, Registry No. 4608, dated 1926, Scale 1:20,000; and Registry No. 6582, dated 1940, Scale 1:20,000.

C. VESSELS AND EQUIPMENT:

Hydrography was accomplished from Launch CS-184 (a plastic 26 foot Navy type whaleboat), operating from the Ship BOWIE. Fathometers 57-30 and 57-25 of the 808J type were used for all soundings. It was necessary to employ a NJS striker with the 808 fathometer to operate in depths found in Lituya Bay, when the transducers were mounted on the inside of the hull.

Bar checks and phasing comparisons were taken quite frequently to obtain the required corrections. *Bar check corrections applied to 10 fms. No T₅ corr. 10 to deepest depth. Survey considered to be at 800 fms/sec.*
A pipe drag was constructed to investigate the shoaler soundings. This drag consisted of a length of 20 foot pipe, suspended from the launch at the desired depths, while the launch drifted over the shoal.

It was discovered later in the project that by switching the battery supply, a sharp change in depth occurred. The initial surge in power caused an increase in speed, giving a deeper sounding, then a gradual return to normal. The development of what appeared to be a crack in the flat bottom disclosed this trouble. From the point of discovery, to the end of the project, notes were placed in the sounding volume at each change of the batteries. An example can be seen on the fathogram for 1 day between positions 41 - 42 and 95 - 97.

D. TIDE AND CURRENT OBSERVATIONS:

A portable tide gage was installed on a large boulder on the south shore, in a small bight, about 2 miles inside the entrance. This boulder contains a 1926 Bench Mark. Drill holes indicate that the gage was located in approximately the same location as the previous gage. Predicted tides, based on Sitka, Alaska were used to reduce boat sheet soundings.

A level connection was made to two of the 1926 Bench Marks. The plane of mean lower low water is now 2.44 feet higher than the 1926 Bench Marks indicate.

The tide gage was installed on 3 July and in operation from 7 July to 27 August, but failed to record on 26 August. Hourly heights of the predicted tides for 26 August were supplied by the Washington Office, for reducing the field records.

An extensive current survey was made in the entrance to Lituya Bay. A Roberts current meter was in operation for 146 hours, about 0.35 mile inside the entrance, and an experimental photogrammetric survey was also carried out. The results of the current surveys are covered in a separate report.

E. SMOOTH SHEET:

The projection was not made at the time this report was written. See attached amendment.

F. CONTROL STATIONS:

The control stations for this survey were obtained by transfer from manuscripts T-11210 and T-11211, by sextant location, and from observed triangulation.

A complete triangulation scheme was observed, using the existing stations and new stations established. This survey was supplemented by the use of the tellurometer. A short base line was also measured.

Triangulation and tellurometer operations are covered in a more detailed report.

G. SHORELINE AND TOPOGRAPHY:

The shoreline and photogrammetric signals located are covered in a separate report.

An attempt was made to run a beach line as close to the low water line as possible. Sometimes, due to the nature of the bottom and for the safety of the launch and crew, it was necessary for the launch to keep farther off the beach than desired.

The bottom along most of the beach drops off rather sharply and good water can be carried rather close to shore.

H. SOUNDINGS:

All soundings were obtained with the 808J type fathometers employing the NJ3 type striker to operate through the hull of the plastic launch.

Some soundings over the shoals were obtained with the pipe drag.

I. CONTROL OF HYDROGRAPHY:

All hydrography was controlled by three point sextant fixes using U. S. Navy hydrographic sextants.

J. ADEQUACY OF SURVEY:

This survey is considered complete and adequate, and to supersede prior surveys. Maximum line spacing was 200 meters in depths over 20 fathoms and 100 meters in depths less than 20 fathoms. All shoals were adequately developed.

The following depth curves were drawn on the 1:10,000 portion; 5, 10, 20, 50 and 75. ~~The 75 fathom curve was drawn because of the extensive area in the 75 fathom limits.~~

K. CROSSLINES:

A minimum of 10 per cent crosslines were run.

L. COMPARISON WITH PRIOR SURVEYS:

The instructions outlined a series of lines to be run to investigate the entire water area to determine the need for a complete new survey. This investigation revealed such large discrepancies in almost every area, that it was deemed advisable to make a complete new survey.

The changes are too numerous to elaborate on in this report, only to state that the entire bay is shoaling at an extremely fast rate.

with the greatest changes being in the deeper depths. The nature of the shoaling, and the materials of the bottom samples, leads you to believe that the glacial silt is settling to the bottom, forming a heavy fluid, which then flows to the deeper depths, much the same as water will seek it's own level. The greater part of the former deeper depths now are a flat (table top) 77 fathoms. The greatest change in depth was found to be 43 fathoms, south southeast of Cenotaph Island.

M. COMPARISON WITH CHART:

Because of the extreme changes found, no comparison was made with Chart No. 8505.

N. DANGERS AND SHOALS:

The earth quake of 1958 and resulting tidal wave, left many tree stubs imbeded in the bottom of the bay and numerous trees lying at the high water line. Some stubs are in 11 fathoms of water. All visible stubs were located, or the area blocked off as being foul, but there is the danger of a ship striking a stub that is broken off below the low water line, or an existing stub rotting off and no longer visible. Ships passing into the 10 fathom curve should do so with caution.

The entrance channel to Lituya Bay is narrow and dangerous at certain stages of the tide and sea. The best time to make the entrance passage is just before slack water. A range was selected for erection by the U. S. Coast Guard. With an ebbing current and a swell from the west, breakers will form across the entire entrance. Entrance and exit should be made with caution at all times.

A Coast Pilot Report will cover this subject in more detail.

No attempt was made to locate all the trees lying at low water as they move with each extreme tide.

Not all boulders and rocks below the low water line were located because they were too numerous, rather, the area of boulders was defined and prominent boulders located.

The following shoal areas were developed.

Lat. $58^{\circ} 37' 27''$, Long. $137^{\circ} 34' 53''$, about 460 meters off shore from station DOG.

A 5.6 fathom shoal was recorded on the normal spaced sounding line in an area of 8 and 9 fathoms, and later development disclosed a 4.2 fathom. An attempt to locate a shoaler sounding while drifting with the pipe drag at 4.2 failed to make contact.

Lat. $58^{\circ} 38' 16''$, Long. $137^{\circ} 35' 45''$, about 380 meters from station BAN.

A 1.0 fathom sounding was recorded on the outer limits of a shoal off the point west of station BAN. 2.0 fathom soundings were recorded around the 1.0 fathom spot. Development at closer spaced lines failed to disclose a shoaler sounding. Later while drifting with the bar drag, a sounding 0.2 was recorded on the fathometer and the bar drag failed to disclose a shoaler sounding. *Sufficient information to determine the shoalest depth in this area was not found after rescanning the fathograms and volumes, therefore the rock originating with*

Lat. 58° 37' 26", Long. 137° 35' 36", about 700 meters from station BOX.

An 18 fathom sounding was recorded on the normal spaced sounding line in an area of 21 and 24 fathoms. Later development at closer spaced lines failed to reveal any shoaler soundings. *H-4608 (1926) was carried forward to the present survey.*

Lat. 58° 38' 42", Long. 137° 34' 20".

A 1.0 fathom sounding was disclosed from normal spacing of sounding lines on the shoal extending east, north-east from station JAN. Further development at a closer spacing failed to disclose a shoaler sounding, but when drifting with the pipe drag a sounding of 0.6 was recorded.

Lat. 58° 39' 26", Long. 137° 31' 04"^{32"}.

An 11 fathom sounding was recorded on the normal line spacing. Later development at closer spacing failed to disclose a shoaler sounding.

Some development was done in the area about 500 meters east of station MAY. This development was to define the small shoal there and to delineate the 50 fathom curve. *φ 58°46'00" N 137°30'00" E*

Rather extensive ice fields often times develop at the east end of the bay. These fields are largely the result of ice falling from Lituya Glacier. It was often necessary for the launch to seek open water to perform hydrography.

O. COAST PILOT NOTES:

New correct Coast Pilot Notes have been submitted.

P. AIDS TO NAVIGATION:

An entrance range was selected for establishment by the Coast Guard. The range is shown by signals FRONT and REAR on the smooth sheet. The Ship BOWIE made numerous passages in and out of Lituya Bay using targets erected over this range and found good water each time.

Q. LANDMARKS FOR CHARTS:

The lone tree standing on the spit should be charted. This tree is shown on the smooth sheet as station TRY.

The buildings shown on Cenotaph Island no longer exist.

See Form 567, submitted.

R. GEOGRAPHIC NAMES:

✓ No new or changes of geographic names is recommended. ✓

T. OCEANOGRAPHY:

Two oceanographic stations were observed on this project. Each station consisted of temperature and salinity observations at the standard depths. One station was located south south-east of Cenotaph Island, and one station mid-way between stations SQUARE and BAY. ✓ *NEAR ENTRANCE*

No results of the salinity observations are available, but a tabulation of the corrected temperatures is as follows. ✓

STATION NO. 1			STATION NO. 2		
Accepted			Accepted		
Depth	Protected	Un-protected	Depth	Protected	Un-protected
132 meters	6.66	7.83			
117 "	6.89	7.70			
97 "	7.16	-----			
72 "	8.61	9.60			
47 "	10.49	10.91			
50 "		10.70	50 meters	10.76	11.27
30 "	10.74	10.97	30 "	10.95	11.22
20 "	10.88	11.03	20 "	11.35	-----
10 "	11.08	-----	10 "	11.33	11.41
Surface	8.06	-----	Surface	8.22	8.25

An analysis of the temperatures obtained without the results of the salinity samples taken would lead one to believe that the deeper, colder waters are stagnant and of a greater salinity. The gradual rise in temperature to the 10 meter depth, then colder water on the surface emphasizes the effect the melting glaciers have in discharging fresh, cold water which remains on the surface. ✓

A number of bottom samples were taken both by the launch in shoal water and by the ship in the deeper depths. Those bottom samples taken by the ship were preserved for analysis by the University of Washington and the results are not yet known. In most instances, the bottom consisted of grey glacial silt, either in a soupy or semi-hard form. ✓

The waters of the bay was generally milky with glacial silt and the visibility was limited to about 10 to 12 feet. ✓

Z. TABULATION OF DATA ATTACHED TO THIS REPORT:

Statistics
Bar Checks
Phasing Comparisons
Station Names
Tide Curves

Respectfully submitted,

Leonard S. Baker
Leonard S. Baker
LCDR, C&GS

E. SMOOTH SHEET

The projection was hand ruled aboard Ship BOWIE. There were no unusual or substandard methods employed in shoreline and signal transfer. The transfer of shoreline and topographic detail has been verified in accordance with paragraph 757 in the HYDROGRAPHIC MANUAL.

The location by the Hydro party of the rock at Lat. $58^{\circ} 36' 36''$ Long. $137^{\circ} 39' 00''$ is approximate. Location was given as 30 meters to starboard, 35 seconds after position 67 f. Breakers in the area made location by detached position impossible.

Positions 3r and 50m were taken on the same snag. The location differs by 10 meters. The presents of snags at the locations given on the smooth sheet will be doubtful after a few years.

Respectfully submitted,


Wesley P. James
LTjg., C&GS
Smooth Plotter

STATISTICS

DAY	DATE	NUMBER OF POSITIONS	SOUNDING MILES	LINE	T&F MILES	MISC. MILES	TOTAL MILES
a	21 July	150	10.0		6.0	0.5	16.5
b	22 "	147	12.9		3.2	4.0	20.1
c	23 "	115	3.0		3.0	2.0	8.0
d	3 August	61	5.1		4.6	---	9.7
e	8 "	84	10.8		4.0	1.0	15.8
f	9 "	249	31.5		5.4	1.0	37.9
g	10 "	61	7.1		0.3	0.2	7.6
h	11 "	159	15.3		0.6	0.2	16.1
j	12 "	259	25.6		4.0	0.4	30.0
k	13 "	145	16.2		0.5	0.5	16.2 ⁷
l	14 "	132	17.2		0.1	0.1	17.4
m	15 "	272	23.1		3.0	1.0	27.1
n	16 "	207	16.8		4.6	1.0	22.4
p	17 "	64	4.1		5.2	0.3	9.6
q	22 "	196	18.5		8.1	0.6	27.2
r	23 "	216	18.2		6.0	0.6	24.8
s	24 "	260	27.0		7.1	0.5	34.6
t	25 "	246	24.3		11.0	2.0	37.3
u	26 "	130	2.8		23.4	0.0	26.2

31 53

BAR CHECK
PROJECT BO-1259
FATHOMETER 5730

DAY	DATE	1	2	3	4	5	6	7	8	9	10
a	21 July	0.9	1.9	2.9	3.8	4.7	5.6	6.6	7.7	8.6	9.6
		0.9	1.9	2.9	3.9	4.8	5.7	6.7	7.5	8.6	9.6
b	22 July	0.8	1.9	2.8	3.8	4.8	5.8	6.8	7.7	8.7	9.7
		-	1.8	2.8	3.8	4.9	5.8	-	7.7	8.7	9.7
c	23 July	-	-	-	-	-	-	6.8	7.6	8.6	9.7
		-	1.9	2.9	3.9	4.9	5.8	6.8	7.8	8.6	9.7
f	9 Aug.	0.9	1.7	2.8	3.7	4.7	5.7	6.6	7.7	8.6	9.6
		0.9	1.9	2.9	3.8	4.8	5.8	6.8	7.6	8.6	9.6
g	10 Aug.	0.8	1.9	2.8	3.8	4.8	5.7	6.7	7.7	8.7	9.7
		-	1.9	3.8	3.8	4.9	5.8	6.8	7.8	8.7	9.7
h	11 Aug.	0.9	1.9	2.8	3.9	4.9	5.7	6.7	7.8	8.7	9.8
		-	-	2.9	3.8	4.8	5.8	6.8	7.7	8.7	9.8
j	12 Aug.	0.9	1.8	2.7	3.8	4.8	5.7	6.7	7.7	8.6	9.6
		0.8	1.8	2.7	3.8	4.8	5.8	6.6	7.7	8.6	9.6
l	14 Aug.	0.9	1.8	2.8	3.8	4.9	5.7	6.7	7.7	8.6	9.6
		0.8	1.8	2.8	3.8	4.8	5.7	6.7	7.6	8.6	9.6
m	15 Aug.	0.9	1.8	2.8	3.9	4.8	5.7	6.7	7.7	8.7	9.7
		-	1.8	2.8	3.9	4.8	5.6	6.7	7.8	8.8	9.7
n	16 Aug.	0.8	1.8	2.8	3.8	4.8	5.8	6.6	7.6	8.5	-
		0.8	1.7	2.8	3.8	4.8	-	-	7.7	-	-
g	22 Aug.	-	-	-	-	-	5.6	6.6	7.6	8.6	9.6
		0.8	1.8	2.8	3.7	4.8	5.7	6.6	7.6	8.7	9.6

TOTAL	12.8	34.8	56.3	76.3	96.3	114.5	134.0	169.0	181.5	193.2
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AVERAGE	0.8	1.8	2.8	3.8	4.8	5.7	6.7	7.7	8.6	9.7
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CORRECTION	+ 0.2	+ 0.2	+ 0.2	+ 0.2	+ 0.2	+ 0.3	+ 0.3	+ 0.3	+ 0.4	+ 0.3
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Reductions used +0.2

Reductions used +0.3

Reductions used over 11 fms. + 0.3

As no Temp. & sal. correction were applied to deeper depths survey considered at 500 fms/sec

BAR CHECK
PROJECT BO-1259
FATHOMETER 5725

DAY	DATE	1	2	3	4	5	6	7	8	9	10
r	23 Aug.	0.7	1.7	2.7	3.7	4.6	5.5	6.4	7.3	8.2	9.1
		0.8	1.7	2.7	3.6	4.6	5.5	6.3	7.3	8.2	9.1
s	24 Aug.	0.7	1.8	2.7	3.7	4.6	5.6	6.5	7.3	8.3	
		0.7	1.7	3.7	3.8	4.7	5.6	6.5	7.4	8.3	
t	25 Aug.							6.6	7.4	8.3	9.3
		0.8	1.8	2.8	3.7	4.7	5.5	6.5	7.4	8.3	9.3
t	25 Aug.	0.7	1.7	2.6	3.5	4.5	5.4	6.3	7.2	8.1	9.0
		0.7	1.7	2.6	3.5	4.4	5.3	6.3	7.2	8.1	9.0
u	26 Aug.	0.7	1.8	2.7	3.5	4.3	5.3	6.3	7.2	8.1	9.0
		0.7	1.6	2.6	3.5	4.4	5.3	6.2	7.2	8.1	9.0
TOTAL		6.5	15.5	24.1	32.5	40.8	49.0	63.9	72.9	82.0	72.8
AVERAGE		0.7	1.7	2.7	3.6	4.5	5.4	6.4	7.3	8.2	9.1
CORRECTION		+ 0.3	+ 0.3	+ 0.3	+ 0.4	+ 0.5	+ 0.6	+ 0.6	+ 0.7	+ 0.8	+ 0.9
Corrections as shown - Over 11 fathoms + 1.0											

PHASING COMPARISONS

FATHOMETER 5730	A SCALE	B SCALE	CORRECTION
a day	51.0	51.2	0.2
	52.0	52.2	0.2
	53.0	53.4	0.4
	54.4	54.4	0.0
	55.0	55.5	<u>0.5</u>
			0.3 average
f day	52.0	52.0	0.0
	52.0	52.7	(0.7) R
	53.0	53.2	0.2
	53.2	53.6	0.4
	53.4	54.0	<u>0.5</u>
			0.3 average
J day	44.0	45.2	(1.2)R
	46.0	46.2	0.2
	46.0	46.6	0.6
	47.0	47.5	0.5
	46.5	46.9	0.4
	46.5	47.5	<u>(1.0)R</u>
			0.4 average
m day	44.7	44.8	0.1
	44.8	44.8	0.0
	45.0	46.1	(1.1)R
	47.1	49.2	(2.1)R
	49.8	51.0	<u>(1.2)R</u>
			0.0 Average)R

No correction applied for fathometer 5730

FATHOMETER 5725

t day	45.0	45.1	0.1
	45.0	45.2	0.2
	45.0	45.3	0.3
	45.2	45.5	0.3
	45.3	45.9	<u>0.6</u>
			0.3 average
u day	46.2	46.8	0.6
	46.4	46.9	0.5
	46.5	47.0	0.5
	46.6	47.0	0.4
	46.2	46.9	0.7
	46.5	47.0	<u>0.5</u>
			0.5 average

No correction applied for fathometer 5725

LIST OF SIGNALS

START 192 6
 TRY Photo
 ART "
 MOP "
 BAD "
 ANCHOR, 1959
 WET Photo
 CAN Hydro
 SOUTH BASE RM 2 1926
 LOG Photo
 JIM "
 MID BASE, 1926
 NORTH BASE, 1926
 TAP Photo
 JOY "
 COVE 2, 1926
 REAR Hydro
 FRONT "
 SQUARE, 1959
 RAT Photo
 SUN "
 TEA "
 ODD "
 WIT "
 RAG "
 ROT "
 YET "
 FAR "
 DUD "

JAN PHOTO
 COW "
 BAN "
 LAY "
 HIT "
 YOU "
 ALL "
 SUE "
 ACE "
 GILBERT, 1959
 MAY Hydro
 SAM Photo
 BEV Hydro
 JEF Photo
 MIK Hydro
 JOE Photo
 ICE, 1926
 ROCK Hydro —
 MAX Photo
 EGG "
 FAN "
 HUG "
 ZOO "
 ROCK Hydro — (Record indicates ROK)
 DIRT "
 FLAG "
 ASK "
 DIP "
 DAY Photo

YAM Photo
 VAL "
 TEX "
 PIE "
 ANN "
 NED "
 DOG "
 BOX "
 GAY "
 LUX "
 SAL "
 EAR "
 BAY, 1926
 VAT Photo
 HER "
 KID "
 FOX "
 ENTER, 1959
 HARBOR, 1959
 TURN, 1926

Hydrographic Manual

Section 4. Control & Signal Building

Paragraph 4-37 subsection c.

*"A duplication of names must be avoided
 in the same locality and shall never
occur within the limits of the
 same hydrographic sheet."*

APPROVAL SHEET

BO-1259

H-8492

During the field operations the Chief of Party exercised personal supervision of the survey work. He examined the boat sheet frequently. It would appear that the survey is complete and adequate with no additional work required.


Horace G. Conerly
CDR, C&GS

for

H. J. Seaborg
CDR, C&GS

OFFICE OF HYDROGRAPHY AND OCEANOGRAPHY

aus

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8492

FIELD NO. BO-1259

Alaska, Lituya Bay

SURVEYED: July 21, 1959, through August 27, 1959

SCALE: 1:10,000 and 1:5,000

PROJECT NO.: SP-1-59

SOUNDINGS: 808-J Fathometer,
Lead line, Pipe Drag

CONTROL: Sextant Angles
on Shore Signals

Chief of Party.....	H. J. Seaborg
Surveyed by.....	L. S. Baker
Protracted by.....	W. P. James
Soundings Plotted by.....	W. P. James
Verified and Inked by.....	J. H. Cosgrove
Reviewed by.....	G. K. Myers
.....	Date: June 16, 1969
Inspected by.....	R. H. Carstens

1. Description of the Area

The present survey covers the entire area of Lituya Bay which extends about 6 miles inland. On the seaward end La Chaussee Spit, strewn with boulders, nearly closes the bay's entrance. At the head of the bay a fiord-like cross arm reaches toward two glacier fronts--Lituya Glacier on the north and North Crillon Glacier to the southeast. Here depths of 40-70 fathoms cover the bottom.

Cenotaph Island lies roughly in the center of the main portion of the bay. North of the island a narrow water passage exists with depths about 20 fathoms. In the remaining portion of the deep basin the bottom is very even and is covered by depths of 75-78 fathoms. Sharp gradients prevail along the sides of the bay and rocks uncover along the steep shores.

Many tree stumps exist on the slopes of the bay, particularly in Anchorage Cove. Here, a gentle slope exists offshore to depths of 5-7 fathoms.

2.

The predominant bottom characteristics of this area are mud, clay, and small pebbles.

The earthquake and seismic tidal wave of July 9, 1958, in this area affected the bottom of Lituya Bay to a considerable extent. These changes are discussed in Par. 6, Comparison With Prior Surveys.

2. Control and Shoreline

The origin of control is adequately covered in Part F of the Descriptive Report.

The shoreline originates with reviewed photogrammetric manuscripts T-11210(1958-1959) and T-11211(1958-1959).

3. Hydrography

- A. Depths at crossings are in good agreement.
- B. The depth curves were adequately delineated.
- C. The development of bottom configuration and investigation of shoals is considered adequate.

3. Condition of the Survey

The plotting, sounding records, and the Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual except for the following:

- A. The sounding volumes were not signed by either the officer-in-charge or the Chief of Party.
- B. The recorder did not insert MRV (middle reed vibrating) in the sounding volumes. This statement should be recorded when an actual check is made.
- C. The direction--port or starboard, from the vessel of many features in the water area were not recorded in the sounding volumes.
- D. In a few cases speed changes were not recorded in the records.

5. Junctions

No contemporary surveys junction with the present survey on the southwest. However, present survey depths are in general harmony with charted depths.

3.

6. Comparison With Prior Surveys

H-4608 (1:5,000; 1:10,000; 1:20,000) 1926
H-6582 (1:20,000) 1940

A comparison between present and prior surveys indicated drastic changes in the general depths in Lituya Bay, mostly as a result of the 1958 earthquake. In the southwest part of the bay depths are 5-10 fathoms shoaler on the present survey in depths of 40-60 fathoms, while in the narrow passage north of Cenotaph Island little change exists in depths of 20-22 fathoms.

The deepest part of the bay portrayed by prior surveys existed south of Cenotaph Island. Here, where prior depths were 90-120 fathom soundings present 76-78 fathom depths cover the flat bottom. This is a general shoaling of about 30 fathoms.

The shoaling trend extends eastward into the head of the bay. In the north part at Gilbert Inlet 40-60 fathom soundings exist, where former 60-80 fathom depths appeared. Likewise in the southeast part at Crillon Inlet 50-70 fathom soundings occur where previous 60-80 fathom depths appeared. However, it is safe to assume from bottom samples of glacial silt obtained, that this shoaling is not entirely due to the 1958 earthquake but from large quantities of material deposited by melting of broken off icebergs from the face of the glaciers.

Present depths at the bay's entrance are about 1-1½ fathoms deeper than on H-6582. The controlling depth at the entrance range is 5 fathoms. Rocks along the sides of the entrance which are considered unchanged, have been brought forward from the prior surveys.

Comparison of the shoreline between the prior and present surveys shows generally good agreement, except in areas where the full brunt of the water wave cascaded. Here, on the north shore of Anchorage Cove, the high water line has accreted about 50-100 meters. Many dangerous snags and stumps embedded in the bottom reveal the sloughing off of trees from shore. In other small coves indenting the northern side of the bay, the high water line has accreted some 50-80 meters. At Harbor Point within the bay, the shoreline has accreted about 100-120 meters.

At Crillon Inlet the glacier front has substantially shifted into the bay.

4.

Np
The immediate vicinity of lat. $58^{\circ}39.5'$, long. $137^{\circ}31.5'$ present depths are slightly deeper than the prior 1940 work on H-6582. The 10-fms. charted in lat. $58^{\circ}39.45'$, long. $137^{\circ}31.52'$ from H-6582 is now superseded by 12 fms. At lat. $58^{\circ}39.32'$, long. $137^{\circ}31.74'$ a 13-fm. sounding has been carried forward where no soundings had been obtained on the present survey. Also, the rock awash located at lat. $58^{\circ}38.27'$, long. $137^{\circ}35.76'$ on H-4608 has been brought forward to the present survey.

With the addition of these rocks and soundings the present survey is adequate to supersede the prior surveys within the common area.

7. Comparison With Chart 8505 (latest print date 9-20-65)

A. Hydrography

The charted hydrography originates with the previously discussed surveys which require no further consideration supplemented by partial application of depths from the unverified smooth sheet of the present survey.

The present survey is adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

There are no floating aids to navigation in this area. The charted positions of the fixed aids to navigation adequately mark the features intended.

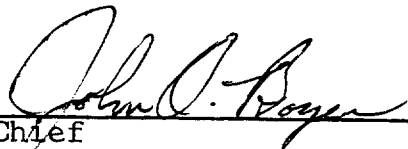
8. Compliance With Project Instructions

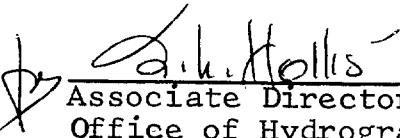
The present survey adequately complies with the Project Instructions.

9. Additional Field Work

This survey is considered to be a very good basic survey and no additional field work is recommended.

Examined and Approved:


Chief
Marine Chart Division


Associate Director
Office of Hydrography
and Oceanography

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8492...

Records accompanying survey: Smooth sheets 1...;
 boat sheets 1...; sounding vols. 8...; wire drag vols.;
 Descriptive Reports 1...; graphic recorder envelopes 5...;
 special reports, etc.

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

Number of positions on sheet		3153
Number of positions checked		185
Number of positions revised		0
Number of soundings revised (refers to depth only)		16
Number of soundings erroneously spaced		0
Number of signals erroneously plotted or transferred		0
Topographic details	Time	4
Junctions	Time	-
Verification of soundings from graphic record	Time	192
Special adjustments	Time	16

Verification by *J.H. Coe* Total time 192 Date 2/13/69

Reviewed by *George E. Myers* Time 152 Date 6/16/69

BHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~

6 May 1960

Division of Charts: R. H. Carstens

Plane of reference approved in
8 volumes of sounding records for

HYDROGRAPHIC SHEET 8492

Locality Lituya Bay, Alaska

Chief of Party: H. J. Seaborg in 1959
Plane of reference is mean lower low water, reading
4.4 ft. on tide staff at Lituya Bay
9.6 ft. below B. M. 2 (1926)

Height of mean high water above plane of reference is 8.8 feet.

Condition of records satisfactory except as noted below:

William Shapiro

Chief, Tides Branch

~~Division of Hydrography and Topography~~

