7670

Diag. Cht. No. 8502-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. PF-2348 *Office No.* H-7670

LOCALITY

State Alaska

General locality Bristol Bay

Locality Nushagak Bay

194 8-'49

CHIEF OF PARTY

R.F.A.Studds and R.W.Knox

LIBRARY & ARCHIVES

DATE 27 April 1950

8-1870-1 (1)

7670

APR 2 7 1950

Form 537
Ed. Dec. 1930

REG. NO.

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.

Field No. PF-2348

REGISTER NO.

State ALASKA

General locality BRISTOL BAY

Locality NUSHAGAK BAY

Scale 1:20,000 Date of survey 13 July 1948 - 13 September 1948
2 July 1949 - 4 September 1949

Vessel Ship PATHFINDER

Chief of Party R.F.A. STUDDS - ROBERT W. KNOX

Surveyed by E.H. SHERIDAN, J.C. TRIBBLE & MAX G. RICKETTS

Protracted by G.D. SCOTT, J. J. DERMODY, R.A.RENDALL, H.P.DEMUTH

Soundings penciled by K.S.ULM

Soundings in ~~fathoms~~ feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated 20 June, 1946

Remarks:

U. S. GOVERNMENT PRINTING OFFICE

DESCRIPTIVE REPORT TO ACCOMPANY

1948-1949 FIELD WORK

HYDROGRAPHIC SURVEY H-7670

FIELD NO. PF-2348

A - PROJECT

Project No. CS-327, General Instructions dated 20 June 1946. Supplemental Instructions dated 24 March 1947, 7 April 1948 and 13 April 1949.

B - SURVEY LIMITS AND DATES

This sheet covers (1948-49) the section of Nushagak Bay from a junction with Sheet No. H-7669 at Lat. 58°-53'N. on the north to a junction with Sheet No. H-7769 (Field No. (1958) 2349) at Lat. 58°-43'N. on the south. The southern limit of this sheet was moved down to include all 1949 sounding on Sheet No. H-7769 (Field No. 2349), records of this field work having been transferred to this sheet. Review, par. 4.

The 1948 hydrography was executed during the period 13 July 1948 through 13 September 1948. The 1949 hydrography covers the period 2 July 1949 through 4 September 1949.

C - VESSELS AND EQUIPMENT

During the 1948 work, Launches Nos. 1 and 2 were operated from a shore camp at Kanakanak which had been established by the PATHFINDER. Model 808A Fathometers Nos. 46 and 61 were used. Transceiver units were mounted in the bilge of the launches alongside the keel.

Launch No. 3 of the Ship PATHFINDER was operated from a shore camp at Clarks Point Cannery for the 1949 work on this sheet. Model 808A Fathometers Nos. 61 and 68 were used, transceiver units were mounted in the bilge alongside the keel.

D - TIDE AND CURRENT STATIONS

A portable automatic tide gage was maintained at Clarks Point during both the 1948 and the 1949 work on this sheet. Tide reducers for the smooth sheet have been entered in accordance with the areas defined by PATHFINDER Special Tide Report dated 17 November 1948. Reducers for 1948 have been entered in one (1) foot intervals as approved f or that season by letter dated 8 December 1948. Reducers for 1949 have been entered in one-half ($\frac{1}{2}$) foot intervals in accordance with the PATHFINDER Special Tide Report dated 10 October 1949 which was approved 24 October 1949.

No current stations were observed during 1948-1949 in the area covered by this sheet.

E - SMOOTH SHEET

The smooth sheet was prepared aboard the Ship PATHFINDER with limits extended to cover work on the channel south of Ekuk which was done during 1949 on Field Sheet No. 2349, records of this work have been transferred to this sheet to comply with the new limits. This smooth sheet also covers the area along the west shore and the Snake River Entrance for completion during the 1950 season.

Protracting of this sheet has been distributed among the Junior Officers aboard the PATHFINDER as a part of their training in visual control hydrography. Soundings have been plotted by personnel of the Ship PATHFINDER.

F - CONTROL

Control for this sheet is from the following sources: First Order Triangulation by the Party of Lt.Comdr. Curtis LeFever in 1947; Photo Control Sheets Nos. T-9047, T-9057 and T-9058; Third Order Triangulation of 1949 for the location of Intersection Stations; and Hydrographic Signals located on this sheet combined with Sheet Field No. 2349.
H-7769 (1950)

G - SHORELINE AND TOPOGRAPHY

The shoreline for this sheet has been taken from Air Photo Control Prints Nos. T-9047, T-9048, T-9057, T-9058, T-9065 and T-9066. (1946-47)

H - SOUNDINGS

Soundings were obtained with an 808A Fathometer and recorded in feet and tenths. Fathometers Nos. 46 and 61 were used in 1948 and Nos. 61 and 68 were used in 1949. Bottom characteristics and hand-lead soundings were taken on 20-21 July 1949 while the fathometer was inoperative.

I - CONTROL OF HYDROGRAPHY

Sextant fixes were used to control the position of all sounding lines.

J - ADEQUACY OF SURVEY

A satisfactory junction has been made with Sheet H-7669 (1948-49) on the north.

Additional work required for completion is as follows:

(1) - Inshore lines and splits along eastern shore from Clarks Point to south limits of the sheet.

see note on following page

J - ADEQUACY OF SURVEY (Cont'd.)

(2) - Development of (4' and 6') spots in lumpy area Lat. 58°-51.75' to 51.90' Long. 158°-35.05' to 35.20'.

(3) - Splits along western lines of 1949 work.

(4) - Completion of western side of sheet, including Snake River.

(5) - Crosslines in the northwest and southwest portions of the 1949 work.

This add'l work done in 1950

(6) - Completion of the area south of the 1949 work to the southern limits of the sheet Lat. 58°-43', including development of channels and immediate approach in the vicinity of Ekuk Bluff.

K - CROSSLINES

Agreement of crosslines was satisfactory except for those noted below:

(1) - "b" Day, (blue), 15 July 1948 crosses 1949 work up to 7' deep, this days work appears to run deep.

(2) - "c" Day, (blue), 23 August 1948 crosses "59a" (green), 5 July 1949 with a difference of seven (7) feet which a small displacement of position for either day might cause on the steep slope at the edge of the cutbank.

(3) - "d" Day, (blue), 13 September 1948 which crosses a large number of lines of 1949 work appears to be deep throughout. This difference amounts to an average of 5 feet for a group of ten crossings examined and in the northeast sector of the sheet differences up to 10' are noted. It is admitted that some of these discrepancies may in part be due to displacement on steep slopes. Rejection of this entire day's work is recommended as the area has been covered by the 1949 work.

Review, par. 2. and 7c.

(4) - "q" Day, (red), 1 August 1949 appears to run about 3 feet deep on crossings checked.

With the exceptions of the above, the crossings average from 0 to 2 feet.

L - COMPARISON WITH PREVIOUS SURVEYS

Comparison with the 1909 survey indicates little agreement between present work and that of the previous survey. Bars and channels have shifted, particularly along the western shore.

M - COMPARISON WITH CHART

Chart 9050 based on the surveys of 1909 should be completely revised to show only the hydrographic surveys of 1948-1949. Review, par. 6.

N - DANGERS AND SHOALS

Numerous sand bars and shoal areas are found in the northern section of this sheet and these are reported to change some with the ice run-off each spring. Limits of the shoal off Ekuk Spit appear to be about the same as delineated by the 1909 survey, the tide rips off this shoal are very heavy on an ebb tide and are particularly bad when the ebb is opposed by southwest winds. Tide rips are found throughout the entire area of the sheet during a strong ebb and occur on the flood during periods of northeast wind. A (9' to 12') lumpy area is located 1.8 miles southwest of Ekuk Spit, the area is 1.3 miles long and 0.5 mile wide extending in a north-northeast direction, sand ridges are indicated on fathograms of the area. The bar area 1.5 miles south-southeast of Ekuk Light appears to be in the same position and of about the same extent as found in the 1909 survey. This area shows very sharp sand ridges on the fathograms.

O - COAST PILOT INFORMATION

Coast Pilot Information covering this area has been submitted as a separate report. During the 1949 season supply vessels for the canneries used the anchorage area 0.65 mile 285° True from the Four Tanks on the bluff back of Clarks Point, vessels anchored in 30 to 32 feet of water, bottom is fine gray sand overlaying clay, these vessels seemed to experience good holding in all types of weather. The anchorage area in 26 to 28 feet lying 1.5 miles 300° True from the highest tank at Ekuk Cannery was also used and offers more swinging room.

P - AIDS TO NAVIGATION

Nushagak Bay Light is maintained by the U. S. Coast Guard on the western toe of Ekuk Bluff. The position of the light and other Aids in Nushagak Bay have been submitted on Form No. 567.

Local buoyage is maintained by the canneries during the fishing season and mark the edge of the cut-bank along the east shore above Clarks Point and also are used to mark the set-net site of that area.

Mooring buoys are maintained during the fishing season off Clarks Point, off Ekuk Spit and south of Ekuk Bluff.

Q - LANDMARKS FOR CHARTS

Landmarks for Charts have been submitted on Form No. 567 for both the 1948 and 1949 seasons.

R - GEOGRAPHIC NAMES

Reports have been submitted for both 1948 and 1949.

S - TABULATION OF APPLICABLE DATA

(a) Attached to this report:

1. Tabulation of statistics — 1948-1949
2. Fathometer Corrections — 1949 Also H-7768
3. List of Signals — 1948-1949
4. Tidal Note — 1948-1949

(b) Reports submitted under separate cover:

1. Report on Tides, 1948 — submitted
2. Report on Fathometer Corrections, 1948 — submitted
3. Report on Tides, 1949 — submitted 10 October 1949
4. Report onFathometer Corrections, Part II-1949, See H-7768 submitted 10 November 1949
5. Geographic Names submitted 14 October 1949
6. Landmarks for Charts submitted 14 October 1949
7. Coast Pilot Information submitted 14 October 1949

Respectfully submitted,

Max G. Ricketts

MAX G. RICKETTS
Comdr., USC&GS

APPROVED AND FORWARDED:

Robert W. Knox

ROBERT W. KNOX
Comdr., USC&GS
C.O. Ship PATHFINDER

STATISTICS FOR HYDROGRAPHIC SHEET H-7670

1948-1949 SEASONS

Date 1948	Day	Launch No.	Vol.	Positions	Statute Miles Sounding Line	H.L. Sdgs.
13 July	a	1	1	11	4.2	
15 July	b	2	1	40	8.6	
25 August	c	2	1	27	5.5	
13 September	d	2	1	77	23.0	
Date 1949		Sub-Totals ------		155	41.3	
2 July	b-2349	3	1	3 (Signal Location)		
5 July	a	3	1 & 2	111	21.8	
6 July	b	3	2	54	9.6	
7 July	c	3	2	87	20.9	
9 July	d	3	2 & 3	167	35.3	
10 July	e	3	3	84	20.5	
12 July	f	3	3	100	25.8	
13 July	g	3	4	66	17.0	
14 July	h	3	4	29	6.5	
15 July	j	3	4	102	25.5	
16 July	k	3	4	23	6.5	
20 July	l	3	4	51		51
21 July	m	3	4	35		35
23 July	n	3	4 & 5	82	18.2	
26 July	p	3	5	12	2.6	
27 July	-	-	5	12 (Wharf Soundings)		11
1 August	q	3	5	115	28.3	
2 August	r	3	5 & 6	182	41.1	
9 August	s	3	6	141	30.9	
14 August	t	3	6	113	29.9	
16 August	u	3	7	143	34.6	
17 August	v	3	7 & 8	177	40.0	
18 August	w	3	8	32	7.7	
23 August	x	3	8	58	12.6	
30 August	y	3	8	79	16.0	
31 August	z	3	8	81	17.5	
1 September	aa	3	8 & 9	99	20.9	
2 September	bb	3	9	57	13.0	
4 September	cc	3	9	55	12.2	
6 July	a-2349	3	10	49	15.2	
13 July	b-2349	3	10	86	25.8	
16 July	C-2349	3	10 & 11	153	41.8	
		Sub-Totals 1949 ---		2638	597.7	97
		Totals 1948-1949 --		2793	639.0	97

AREA, 1948-1949 ---- 36.0 square statute miles.

FATHOMETER CORRECTIONS

For Sheet #2348:

	DEPTH IN FT.	VELOCITY COR. FT.	BAR CHECK COR.	TOTAL "A" SCALE COR. FT.	SCALE COR.	TOTAL "B" SCALE COR. FT.
Fath.No.61	0-10.0	0.0	0.0	0.0		
	10.5-30.0	-0.5	0.0	-0.5		
	30.5-50.0	-1.0	0.0	-1.0	-1.0	-2.0
	50.5-70.0	-1.5	0.0	-1.5	-1.0	-2.5
Fath.No.68 (For Aug.1 to 14 incl.)	0-10.0	0.0	0.0	0.0		
	10.5-30.0	-0.5	0.0	-0.5		
	30.5-50.0	-1.0	0.0	-1.0	-1.5	-2.5
	50.5-70.0	-1.5	0.0	-1.5	-1.5	-3.0
Fath.No.68 (For Aug.30 to Sept.4 incl.)	0-10.0	0.0	-0.5	-0.5		
	10.5-30.0	-0.5	-0.5	-1.0		
	30.5-50.0	-1.0	-0.5	-1.5	0.0	-1.5
	50.5-70.0	-1.5	-0.5	-2.0	0.0	-2.0

TIDAL NOTE

Sheet H-7670 (PF-2348)

1948 - 1949

NUSHAGAK BAY, ALASKA

A portable automatic tide gage was maintained at Clarks Point during the 1948 and 1949 work on this sheet. This gage was located about 2¼ miles from the north end of the sheet and 4 miles from the southern end of the sheet, soundings were taken at an extreme distance of 7 miles from this gage.

Tidal reducers have been applied in accordance with the Special Tide Reports of the Ship PATHFINDER for the years 1948 and 1949. Reducers for 1948 work were entered to "1" foot intervals while those for the 1949 work have been entered in "1/2" foot intervals.

APPROVAL SHEET

The 1949 field work on hydrographic sheet H-7670 was accomplished under my occasional supervision. The smooth sheet was plotted aboard the Ship PATHFINDER under my direct supervision. Additional work is required as listed in paragraph J of the descriptive report.

Robert W Knox

ROBERT W. KNOX
Comdr., C & GS
C.O., Ship PATHFINDER

GEOGRAPHIC NAMES

Survey No. H-7670

Name on Survey	A On Chart No.	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			(for title)							1
Bristol Bay			"	"					USGB	2
Nushagak Bay			"	"						3
										4
Flounder Flat										5
Ekuk Bluff									USGB	6
Ekuk			(settlement)							7
Clarks Point				"	(location of tide gage)					8
Clark Slough										9
Combine Flat										10
										11
										12
					Names underlined in red are approved.					13
					5-5-50		L. Heck			14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

M 234

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-7670

Records accompanying survey:

Boat sheets 4; sounding vols. 11, 24/35; wire drag vols. .....;

bomb vols. .....; graphic recorder rolls 15, 18 env./33;

special reports, etc. 1 Descriptive Report; 1 Smooth Sheet;

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

Number of positions on sheet		7963
Number of positions checked		257
Number of positions revised		3
Number of soundings revised (refers to depth only)		23
Number of soundings erroneously spaced		0
Number of signals erroneously plotted or transferred		0
Topographic details	Time	36 HRS.
Junctions	Time	30 HRS.
Verification of soundings from graphic record	Time	180 HRS.

Verification by Stephen Rose Total time 1253 HRS Date Sept. 1953

Reviewed by J.A. Dinsmore Time 56 Date 9 Dec. 1953

Spent 3 hrs. searching for "lost" fathograms which, actually, were merely misplaced in the envelopes.

S. Rose

M-2232-1

RHC

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Rev. June 1937

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~ 12 May 1950

Division of Charts: R. H. Carstens

Plane of reference approved in
11 volumes of sounding records for

HYDROGRAPHIC SHEET 7670

Locality Nushagak Bay, Bristol Bay, Alaska

Chief of Party: R. W. Knox in 1948-49
Plane of reference is mean lower low water, reading
~~ft. on tide staff~~
~~ft. below B.M.~~

3.9 ft. on tide staff (1948) at Clark Point
6.4 ft. on tide staff (1949) at Clark Point

24.8 ft. below B. M. 4A (1947)

Height of mean high water above plane of reference is 17.8 feet.

Condition of records satisfactory except as noted below:

E. C. McKay
Chief, ~~Division~~ Section of Tides ~~and Currents.~~

U. S. GOVERNMENT PRINTING OFFICE 756675

7670

Diag. Cht. No. 8502-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. PF-2348 *Office No.* H-7670

LOCALITY

State ALASKA

General locality BRISTOL BAY

Locality NUSHAGAK BAY

1948-49-50

CHIEF OF PARTY

R.F.A.Studds, R.W.Knox, R.L.Pfau, C.Pierce

LIBRARY & ARCHIVES

DATE AUGUST 21, 1951

B-1870-1 (1)

7670

Form 537
(Ed. June 1946)

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 7670

Field No. Pf 2348 & Pf 1150

State Alaska

General locality Bristol Bay

Locality Nushagak Bay

Scale ~~1/10 000~~ 1/20 000 Date of survey 13 July - 13 Sept. 1948
2 July - 4 Sept. 1949
13 May - 22 Aug. 1950

Instructions dated 20 June 1946

Vessel PATHFINDER

Chief of party R.F.A.Studds, Robert W. Knox, Ralph L. Pfau, Charles Pierce.

Surveyed by E.H.Sheridan, J.C. Tribble, M.G. Ricketts, K.S. Ulm, J.C. Bull, G.W. Moore.

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

Fathograms scaled by HVD LEB LSS JBL JNM HVK JJO'L

Fathograms checked by HPD OH JBW KSU GM GAA JCB GWM

Protracted by G.D.Scott, J.J. Dermody, R.A. Rendall, H.P. Demuth (1948&1949)
Christine N. Hillman (1950)
K.S.Ulm (1948 & 1949)

Soundings penciled by Christine N. Hillman (1950)

Soundings in ~~fathoms~~ feet at ~~MLLW~~ MLLW
and are true depth

REMARKS:

U. S. GOVERNMENT PRINTING OFFICE 693019

Form 537
(Ed. June 1946)

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 7670

Field No. Pf 2348 & Pf 1150

State Alaska

General locality Bristol Bay

Locality Nushagak Bay

Scale 1/10 000 & 1/20 000 Date of survey 13 July - 13 Sept. 1948
2 July - 4 Sept. 1949
13 May - 22 Aug. 1950

Instructions dated 20 June 1946

Vessel PATHFINDER

Chief of party R.F.A.Studds, Robert W. Knox, Ralph L. Pfau, Charles Pierce.

Surveyed by Sheridan, Tribble, Ricketts, Ulm, Bull, Moore.

Soundings taken by ~~echo sounder~~, graphic recorder, ~~hand lead, wire~~

Fathograms scaled by HVD LEB LSS JBL JNM HVK JJO'L

Fathograms checked by HPD CHS JBW KSU GM GAA JCB GWM
Scott, Dermody, Rendall, Demuth (1948&1949)

Protracted by Christine N. Hillman (1950)
K.S.Ulm (1948 & 1949)

Soundings penciled by Christine N. Hillman (1950)

Soundings in ~~fathoms~~ feet at ~~MLW~~ MLLW

REMARKS:

U. S. GOVERNMENT PRINTING OFFICE 693019

DESCRIPTIVE REPORT TO ACCOMPANY

HYDROGRAPHIC SURVEY H-7670 (Field No. 2348)

BRISTOL BAY NUSHAGAK BAY, ALASKA

1948 - 1949 - 1950

Scale 1:20,000

Robert W. Knox
Ralph L. Pfau — Chiefs of Party
Charles Pierce

PATHFINDER

Max G. Ricketts
J. C. Tribble
E. H. Sheridan
K. S. Ulm — Hydrographers
John C. Bull
Glenn W. Moore

A. Project

Project No. CS-327 General Instructions dated 20 June 1946. Supplemental Instructions dated 24 March 1947, 7 April 1948, 13 April 1949 and 25 April 1950.

B. Survey limits and dates

This (1948-49) sheet covers the section of Nushagak Bay from a junction with H-7669, (1948-49) 1:20,000 1948 at Lat. 58° -5X3' N on the north to a junction with H-7769 (1950) 1:20,000 1950, and H-7829 (1950) 1:20,000 1950, at Lat. 58° - 43' N on the south. At the northwest corner of the sheet a junction is made with H-7828, (1950) 1:20,000 1950, at Lat. 58° 52' N. Attached to this report is Sheet Layout and Tide Zones 1950 diagram. (filed with fgms.)

The 1948 hydrography was executed during the period 13 July 1948 through 13 September 1948. The 1949 work was during the period 2 July 1949 through 4 September 1949. In 1950 sounding began 13 May and was completed 22 August.

C. Vessels and Equipment

During the 1948 work, Launches 1 and 2 were operated from a shore camp at Kanakanak which had been established by the PATHFINDER. Model 808A Fathometers Nos. 46 and 61 were used. Transceiver units were mounted in the bilge of the launches alongside the keel.

Launch No. 3 of the Ship PATHFINDER was operated from a shore camp at Clarks Point Cannery for the 1949 work on this sheet. Model 808A Fathometers No. 61 and 68 were used, transceiver units were mounted in the bilge alongside the keel.

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-7670, Continued

In 1950 ship based launches 1, 3 and 4 of the PATHFINDER and the chartered launch RAVEN were used. The turning radii of the launches are about 15 meters. The turning radius of the RAVEN is estimated to be about 35 meters.

808 Fathometers were used. Numbers 52 and 68 were used in conjunction with an outboard fish on the RAVEN. Number 46 with transceiver units in the bilge alongside the keel was used in Launch 1. Numbers 68 and 74 were used in Launch 3 and numbers 46, 52 and 59 were used in Launch 4. At the beginning of the season transceivers units were mounted in the bilges alongside the keel of these launches. Later they were replaced by keel units bolted to the keel on the outside of the launches.

D. Tide and Current Stations

A portable automatic tide gage was maintained at Clarks Point during both the 1948 and the 1949 work on this sheet. Tide reducers for the smooth sheet have been entered in accordance with the areas defined by PATHFINDER Special Tide Report dated 17 November 1948. Reducers for 1948 have been entered in one (1) foot intervals as approved for that season by letter dated 8 December 1948. Reducers for 1949 have been entered in one-half ($\frac{1}{2}$) foot intervals in accordance with the PATHFINDER Special Tide Report dated 10 October 1949 which was approved 24 October 1949.

No current stations were observed during 1948 - 1949 in the area covered by this sheet.

In 1950, a portable automatic tide gage was operated at Protection Point. For a few days at the beginning of the season, 13 to 27 May, before the Protection Point gage was installed, a tide staff was read at Clarks Point and ship fathometer No. 1 was occupied. Prior to the installation of the Protection Point gage, soundings are reduced from staff readings at Clarks Point and ship fathometer No. 1. After the gage was installed soundings are reduced from observed Protection Point tides. Reference is made to PATHFINDER Tide Report for 1950. For purposes of reducing soundings the sheet is divided into 6 tide zones.

REFERENCE STATION CLARKS POINT TIDE STAFF
AND
SHIP FATHOMETER STATION NO. 1

ZONE	RATIO OF RANGE	TIME DIFFERENCE MINUTES	
		HW	LW
10	1.0	- 24	- 24
11	1.0	- 12	- 12
12	1.0	0	0
13	1.0	+ 12	+ 12
14	1.0	+ 12	+ 12

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-7670, Continued

ZONE	REFERENCE STATION PROTECTION POINT RATIO OF RANGE	TIME DIFFERENCE MINUTES HW	LW
10	1.2	0	0
11	1.2	+ 12	+ 12
12	1.2	+ 24	+ 24
13	1.2	+ 24	+ 36
14	1.2	+ 36	+ 36
15	1.3	+ 24	+ 48

Attached to this report is Sheet Layout and Tide Zones 1950, diagram. *(filed with fgms)*

Currents were observed during the period the ship anchored off Clarks Point. Lat. 58 - 50.0 Long. 158 - 36.

E. Smooth Sheet

The smooth sheet was prepared aboard the Ship PATHFINDER with limits extended to cover work on the channel south of Ekuk which was done during 1949 on Field Sheet No. 2349, records of this work have been transferred to this sheet to comply with the new limits. This smooth sheet also covers the area along the west shore and the Snake River Entrance for completion during the 1950 season.

Protracting of this sheet has been distributed among the Junior officers aboard the PATHFINDER as a part of their training in visual control hydrography. Soundings have been plotted by personnel of the Ship PATHFINDER.

The 1950 work will be plotted by the Seattle Processing Office upon the 1948 - 1949 smooth sheet that is on file there.

F. Control

Control for this sheet is from the following sources: First Order Triangulation by the Party of Lt. Comdr. Curtis LeFever in 1947; Photo Control Sheets Nos. T-9047, T-9057 and T-9058; Third Order Triangulation of 1949 for the location of Intersection Stations; and Hydrographic Signals located on this sheet combined with Sheet Field No. 2349.

In 1950, the 1948 - 1949 control was supplemented by the addition of 3 shoran stations. ANN, BOB and COY were located by triangulation, additional hydrographic signals and air photo signals. Signal CHIM was located by a traverse from Clarks Point Azimuth Mark, 1947.

Air photo signals RIT and LAD were identified on the photographs and pricked directly upon compilation sheet T-9057 (1947) and the positions scaled.

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-7670, Continued

RIT	Lat. 58° - 51' - 1391	(465) m.
	Long. 158° - 46' - 76	(886) m.
LAD	Lat. 58° - 46' - 772	(1084) m.
	Long. 158° - 46' - 324	(640) m.

A complete combined list of signals has been prepared and is included in this report.

G. Shoreline and Topography

The shoreline for this sheet was taken from reviewed Air Photo compilation sheets T-9047, T-9048, T-9057, T-9058, T-9065 and T-9066. (1947)

H. Soundings

Soundings were obtained with an 808A Fathometers and recorded in feet and tenths. Fathometers Nos. 46 and 61 were used in 1948 and Nos. 61 and 68 were used in 1949. Bottom characteristics and hand-lead soundings were taken on 20 - 21 July 1949 while the fathometer was inoperative.

In 1950 fathometer depths were recorded in feet and half feet. Thirty-three vertical cast were taken for bottom samples and for checking the fathometers. Fathometer numbers 46, 52, 59, 68 and 74 were used.

I. Control for Hydrography

In 1948, in 1949 and in part of the 1950 work sextant fixes were used to control the sounding lines. The southwest portion of the sheet as well as the 1:10,000 insert of the Clarks Point Bar were controlled by shoran.

At the ~~south~~ north west corner of the survey near the mouth of the Snake River the shoran fixes are very weak. Considerable difficulty was encountered in plotting this section in the field. The area is almost upon the prolongation of the shoran base line. Shoran corrections for the two stations ANN and BOB were not available at the time the hydrography was done. Since the cost of building and locating signals to control the area would have been considerable, it was deemed desireable to extend this hydrography by shoran despite the weak fixes.

The critical area was smooth plotted on the PATHFINDER and that hydrography that was not consistent was rejected.

J. Adequacy of Survey

A satisfactory junction has been made with Sheet H-7669 (1948-49) on the north.

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-7670, Continued

Additional work recommended in the 1949 Report (required) for completion is as follows:

(1) - Inshore lines and splits along eastern shore from Clarks Point to south limits of the sheet.

(2) - Development of (4' and 6') spots in lumpy area Lat. 58° - 51.75' to 51.90' Long. 158° - 35.05' to 35.20'.

(3) - Splits along western lines of 1949 work.

(4) - Completion of western side of sheet, including Snake River.

(5) - Crosslines in the northwest and southwest portions of the 1949 work.

(6) - Completion of the area south of the 1949 work to the southern limits of the sheet Lat. 58° - 43', including development of channels and immediate approach in the vicinity of Ekuk Bluff.

Add'l work done in 1950

In 1950 the additional work called for was done. The survey is complete and adequate for charting purposes. The northwest section is less reliable than the remainder for reasons given in paragraph I of this report.

Junctions with adjoining surveys are satisfactory. Considerable overlap is present at all junctions. Depth curves can be adequately drawn at the junctions.

K. Cross Lines

Agreement of 1948 and 1949 crosslines was satisfactory except for those noted below:

(1) - "b" day, (blue), 15 July 1948 crosses 1949 work up to 7' deep, this days work appears to run deep.

(2) - "c" day, (blue), 23 August 1948 crosses "59a" (green), 5 July 1949 with a difference of seven (7) feet which a small displacement of position for either day might cause on the steep slope at the edge of the cutbank.

(3) - "d" day, (blue), 13 September 1948 which crosses a large number of lines of 1949 work appears to be deep throughout. This difference amounts to an average of 5 feet for a group of ten crossings examined and in the northeast sector of the sheet differences up to 10' are noted. It is admitted that some of these discrepancies may in part be due to displacement on steep slopes. Rejection of this entire day's work is recommended as the area has been covered by the 1949 work.

Discrepancies resolved See Reviews pars. 2 & 7c

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-7670, Continued

(4) - "q" day, (red), 1 August 1949 appears to run about 3 feet deep on crossings checked. Review, pars. 2 & 7c.

With the exceptions of the above, the crossings average from 0 to 2 feet.

In the 1950 work crosslines are in as good an agreement as can be expected using predicted tides. Some 4 foot crossings were noted but these will no doubt be reduced with the smooth plot. Review, pars. 2 & 7c.

It is estimated that cross lines consist of 8 percent of the hydrography.

L. Comparison with prior surveys

Comparison with the 1909 survey indicates little agreement between present work and that of the previous survey. Bars and channels have shifted, particularly along the western shore.

M. Comparison with Chart Review, par. 6

Chart 9050 based on the surveys of 1909 should be completely revised to show only the hydrographic surveys of 1948 - 1949 - 1950.

N. Dangers and Shoals

Numerous sand bars and shoal areas are found in the northern section of this sheet and these are reported to change some with the ice run-off each spring. Limits of the shoal off Ekuk Spit appear to be about the same as delineated by the 1909 survey, the tide rips off this shoal are very heavy on an ebb tide and are particularly bad when the ebb is opposed by southwest winds. Tide rips are found throughout the entire area of the sheet during a strong ebb and occur on the flood during periods of northeast wind. A (9' to 12') lumpy area is located 1.8 miles southwest of Ekuk Spit, the area is 1.3 miles long and 0.5 mile wide extending in a north-northwest direction, sand ridges are indicated on fathograms of the area. The bar area 1.5 miles south-southeast of Ekuk Light appears to be in the same position and of about the same extent as found in the 1909 survey. This area shows very sharp sand ridges on the fathogram.

The wide mud flats at the west shore are cut by a narrow channel of the Snake River at Lat. 58° - 46' N. In 1910 this channel was about a mile north of its present location. The south bank of the channel is quite abrupt. The north side has a gentle rising slope. Big Sands shoal blocks direct approach into the channel.

Commercial shipping uses the Ship Channel in passing up and down the bay. Dangerous bars on both sides of this channel and the especially narrow passage at the north end of Long Sands make navigation hazardous. This passage is covered in section o of this report.

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-7670- Continued

O. Coast Pilot information

Coast Pilot information covering this area has been submitted as a separate report. During the 1949 season supply vessels for the canneries used the anchorage area 0.65 mile 285° true from the Four Tanks on the bluff back of Clarks Point, vessels anchored in 30 to 32 feet of water, bottom is fine gray sand overlaying clay, these vessels seemed to experience good holding in all types of weather. The anchorage area in 26 to 28 feet lying 1.5 miles 300° true from the highest tank at Ekuk cannery was also used and offers more swinging room.

At the north end of the Ship Channel the passage is very restricted. A special report upon this was submitted 9 November, a copy of which attached to this report.

P. Aids to Navigation

Nushagak Bay Light is maintained by the U. S. Coast Guard on the western toe of Ekuk Bluff. The position of the light and other aids in Nushagak Bay have been submitted on Form No. 567. *See C. L's 892 & 973 (1950) & 69 (1951)*

Mooring buoys are maintained during the fishing season off Clarks Point and off Ekuk Spit.

Q. Landmarks for Charts

Landmarks for charts have been submitted on the Form No. 567 for 1948, 1949 and 1950 seasons. *See C. Letters 70 (1949) & 69 (1951)*

R. Geographic Names

Reports were submitted in 1948 and 1949. No new names are recommended.

S. Tabulation of applicable data

(a) - Attached to this report:

1. Tabulation of statistics 1948-1949-1950
2. Fathometer corrections 1949
3. Fathometer corrections 1950
4. List of Signals 1948-1949-1950
5. Tidal Note 1948-1949-1950
6. Abstract of Shoran Corrections
7. Special Report, Bar, Ship Channel to Clarks Point, Nushagak Bay
8. Sheet Layout and Tide Zones 1950 *(filed w/fgms)*
9. *Initial corrections*
10. *Leadline and Bar check line corrections*

(b) - Report submitted under separate cover:

1949

1. Report on Tides, 1948 - submitted
2. Report on Fathometer Corrections, 1948 - submitted

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H-7670, Continued

3. Report on Tides, 1949 - submitted 10 October 1949
4. Report on Fathometer Corrections, Part II-1949, submitted 10 November 1949
5. Geographic Names submitted 14 October 1949
6. Landmarks for Charts submitted 14 October 1949
7. Coast Pilot Information submitted 14 October 1949

Velocity Corrections 1949 filed w/ H-7768; for 1950 filed w/ H-7770

1950

1. Report of Tides 1950
2. Report on Fathometer Corrections 1950
3. Landmarks for Charts 1950
4. Coast Pilot Information 1950
5. Shoran Report 1950

Additions were made to the 1949 Descriptive Report for this sheet which was written by Max G. Ricketts, Comdr.. An attempt has been made to make this 1950 report complete for the three seasons during which this sheet was worked upon.

Respectifully Submitted

Glenn W. Moore

GLENN W. MOORE
Lt. Comdr., USC&GSS

Approved and Forwarded

Charles Pierce

CHARLES PIERCE
Captain, USC&GS
Commanding Ship PATHFINDER

FATHOMETER CORRECTIONS

1949

For Sheet #2348:

	DEPTH IN FT.	VELOCITY COR. FT.	BAR CHECK COR.	TOTAL "A" SCALE COR. FT.	SCALE COR.	TOTAL "B" SCALE COR. FT.
Fath.No. 61	0-10.0	0.0	0.0	0.0		
	10.5-30.0	-0.5	0.0	-0.5		
	30.5-50.0	-1.0	0.0	-1.0	-1.0	-2.0
	50.5-70.0	-1.5	0.0	-1.5	-1.0	-2.5
Fath.No. 68 (for Aug.1 to 14 incl.)	0-10.0	0.0	0.0	0.0		
	10.5-30.0	-0.5	0.0	-0.5		
	30.5-50.0	-1.0	0.0	-1.0	-1.5	-2.5
	50.5-70.0	-1.5	0.0	-1.5	-1.5	-3.0
Fath.No. 68 (for Aug.30 to Sept. 4 incl.)	0-10.0	0.0	-0.5	-0.5		
	10.5-30.0	-0.5	-0.5	-1.0		
	30.5-50.0	-1.0	-0.5	-1.5	0.0	-1.5
	50.5-70.0	-1.5	-0.5	-2.0	0.0	-2.0

FATHOMETER CORRECTIONS

1950

Velocity correction abstract.

ABSTRACT OF VELOCITY CORRECTIONS

PATHFINDER 1950

DATES	May 13–22	May 26–27	June 2–19			June 20 to July 10		July 11 on
SHEETS	2348	2348	All	All	2350	All except 2350		
VESSELS	Launches	Launches	Launches	Ship	Launches	Launches	Ship	Launches
Velocity	1444.4	1457.2	1467.9	1467.9	1467.9	1475.9	1475.9	1481.7
F	-0.03683	-0.02829	-0.02116	-0.02116	-0.02116	-0.01582	-0.01582	-0.01195
@ $\frac{I}{F}$	-27.15	-35.35	-47.26	-47.26	-47.26	-63.21	-63.21	-83.68
REDUCERS FEET	TO DEPTHS FEET							
0	16½	18½	21½	25½	21½	25½	29½	30½
-½	30	36½	45	49	45	57	61	72
-1	43½	54	69	73	69	89	93	114
-1½	57	71	92	96	92	120	124	156
-2	71	89	116	120	116			
-2½	84	107						
-3	98							

LIST OF SIGNALS

SHEET H-7670 (PF-2348)

1948-1949-1950

NAME	SOURCE
ANN	ANN, 1950
ARK	CLARK, 1947
AZ	EKUK PT. AZ., 1947
BAG	Hydrographic, 1949
BIG	Hydrographic, 1950
BOB	Hydrographic, 1949
BOB	BOB, 1950
BOX	Hydrographic, 1950
BUG	Hydrographic, 1949
BUM	Hydrographic, 1949
CAN	CLARKS PT. TANKS, 1947
CHIM	Traverse, 1950
COY	COY, 1950
CUT	Air Photo, T-9047
EAST	EAST TANK EKUK, 1947
FEN	Air Photo, T-9058
FEN	Hydrographic, 1949
GUS	Hydrographic, 1949
GUY	Hydrographic, 1949
JOE	Hydrographic, 1950
KUK	EKUK PT. ANV. AID, 1947
LAD	Air Photo Location 1950
LUG	Air Photo Location 1950
MAR	Hydrographic, 1950
MUT	Hydrographic, 1949
NAB	NICHOLS HILL BEACON, 1947
OWN	Hydrographic, 1949
PAD	Hydrographic, 1949
PAL	Graphic Control, 1948
POT	Hydrographic 1950
QUAD	FOUR TANKS, 1949
RAT	Hydrographic, 1949
RAY	Hydrographic, 1949
RED	Hydrographic, 1949
RIT	Air Photo Location 1950
SAM	Hydrographic, 1949
SANTA	SANTA CLAUSE CHURCH, 1947
SHED	Air Photo, T-9058
SNAKE	SNAKE, 1947
SUP	Hydrographic, 1949
TAPE	TAPE, 1947
TENT	Hydrographic, 1947
TOP	Hydrographic, 1947
UGLY	UGLY, 1947
WAR	Graphic Control, 1948
WES	EKUK WEST TANK, 1947
WIFE	Air Photo, T-9058
WIG	Graphic Control, 1948
YES	Graphic Control, 1948

SHORAN CORRECTIONS

ABSTRACT

PATHFINDER 1950

Ship Set No.	Shore Station Name		
	ANN	BOB	COY
	Computed Zero Set		
1	99.786	99.795	99.782
2	.799	.784	.762
3	.787	.794	.806
4	.784	.790	.796

To find shoran corrections take difference between computed Zero Set and the Zero Check.

Then:

If Zero Set > Zero Check = + corr
If Zero Set < Zero Check = - corr

RESTRICTED

Refer to File
9023/CP/etb

9 November 1950

Ch L 892 (1950)

To: Director
U. S. Coast and Geodetic Survey
Washington 25, D. C.

Subject: Special Report, Bar, Ship Channel to Clarks Pt., Nushagak Bay.

Because of the importance of the ship channel to Clarks Pt., Nushagak Bay, a special report is submitted based on our 1950 Field Work.

Soundings over the bar shown on Chart No. 9052, first edition, April 1950, are based on incomplete, visually controlled hydrography done in 1949, Field Sheet 2348, scale 1/20,000 and on 1909-10 surveys.

During the field season of 1950, the hydrography over the bar was completed on visual control. In addition, closely spaced lines controlled by Shoran on a scale of 1/10,000 were run over the bar. The 1950 hydrography has not been smooth plotted but the boat sheets have been examined.

On the last day of the 1950 field season, I decided to run very closely spaced lines on visual control, scale 1/10,000, making use of the mountain range lying 23 miles behind Nushagak Bay light. The mountain range used lies just east of Warehouse Mountain (local name). The weather was excellent with light airs, smooth sea and at about slack water. Predicted tides at Clarks Pt. were used for reducers.

Six range lines were sounded using Nushagak Bay light for a front range and definite summits and saddles on the range east of Warehouse Mountain for back ranges. On the easterly and westerly range lines run reduced sounding of 10 feet and 12 feet respectively were obtained which defined the usable width of the bar. Previous hydrography verified the depth and position of these shoals on the bar. There is enclosed a copy of the smooth plot of the range hydrography on a scale of 1/10,000. From an examination of this smooth plot a range line has been selected for crossing the bar comprising Nushagak Bay light and a prominent summit on the range east of Warehouse Mountain. Sketch of this selected range is drawn on the enclosed tracing.

The least depth found on this selected range is 16 ft. at MLLW, the range line selected being located midway between the controlling

shoals of 10 to 12 ft. described in paragraph FIVE. This selected range line holds the two closely adjacent radio towers at Ekuk cannery open about 1/2 the distance between the pair of radio towers and the single tower to the westward. Present recommendations contained in Supplement to the U. S. Coast Pilot, Alaska, Part II, fifth edition (1947), Serial No. 680-2, page 38 of Supplement, holds this range open from one third to one half the distance. The azimuth of this range scaled from the 1/10,000 smooth plot is 344½° true. The Coast Pilot range is 344° true.

The characteristics of the ship channel entrance bar are as follows: The usable width of the bar measured normal to the range line is about 125 meters between the 10 and 12 foot shoals mentioned in paragraph FIVE.

The bar extends a distance of about onemile from Latitude 58° 45.7' to 58° 46.6'. One spur with 19 feet at MLLW at Latitude 56° 46.0' and another with 16 ft. at MLLW at Latitude 58° 46.5' extend across the bar.

The primary reason for recommending the use of the mountain range behind Nushagak Bay list is because the estimation of one third, one half, etc., of the distance between the pair of radio towers and the tower to the west is a difficult and not too positive procedure. The radio towers are visible in a clear atmosphere about 4½ miles from Nushagak Bay light with the aid of 7 x 50 binoculars. The use of the mountain range behind Nushagak Bay light furnishes an extremely sensitive range with its great distance of 23 miles in contrast to a distance of one mile using the radio towers as a back range object. During the 1950 field season Warehouse Mountain and the range to the east were visible frequently.

The general practice during 1949 and 1950 in crossing the bar with PATHFINDER was to select a tide phase with 8 to 10 feet at crossing and about six feet of rising tide following the crossing. However, this condition of tide occured close to times of maximum flood current and was particularly objectionable when outward bound because of the strong sets experienced and the relatively short distance available to get on range by the time the bar is reached. The last crossing the PATHFINDER made outward bound a course of 150° true was steered to make good 164° true. Outward bound over the bar the vessel must be placed on the range within a run of 0.6 miles after changing course off Ekuk Bluff.

It is my opinion that a more satisfactory period for crossing the bar is about one half hour after a higher low water, the approximate time of slack water, with five feet of tide or more, for a vessel with the draft of the PATHFINDER.

Reference Supplement to United States Coast Pilot, Alaska, Part II, Serial No. 680-2, Page 33 of Supplement.

The PATHFINDER followed the recommendation of the Coast Pilot for entering the bay from the entrance buoy to within five miles of the bar.

Subject: Special Report, Bar, Ship Channel to Clarks Pt., Nushagak Bay

Although the hydrography has been completed for this entrance channel a recommendation is deferred pending smooth plotting of shoran controlled hydrography. The range recommended in the Coast Pilot favors the west side of the channel. To place a vessel about mid channel the back range recommended, Lines 18-20, Page 33, Serial 680-2, should be shifted eastward to bring the top of the western slope on range with the bluff at Ekuk Light.

An examination of the visually controlled boat sheet hydrography over the bar in 1949 and early 1950, and the shoran controlled hydrography, shows reasonable agreement with the hydrography accomplished on the range lines discussed in this report. However, there are indications that critical shoals on the bar may shift position from one year to another.

It is recommended that Instructions for the 1951 field season call for re-running the same six range lines shown on the attachment to obtain information on seasonal change over the bar.

It is suggested that after verification and review of the hydrography covering the area of the bar and final inspection of the depths along the selected range line that Chart No. 9052 include a sketch of the mountain range behind Nushagak Bay light showing the recommended entering range.

Request is made for ten copies of the enclosed tracing.

CHARLES PIERCE
Commander, USC&GS
Commanding Ship PATHFINDER

cc: Chief, Section of Coast Pilot

ABSTRACT OF INITIAL CORRECTIONS

1950

Initial corrections were applied when the fathograms were scanned.

ABSTRACT OF LEADLINE

CORRECTIONS

VESSEL	LEADLINE READING Feet	TRUE LENGTH Feet	CORRECTION Feet	DATE
PATHFINDER	-	-	0	Throughout season
RAVEN	-	-	0	Throughout season
Launch #1 Leadline #1	10.0	10.0	0.0	29 Aug. 1950
	19.9	20.0	+ 0.1	
	29.9	30.0	+ 0.1	
	39.9	40.0	+ 0.1	
	49.8	50.0	+ 0.2	
	59.8	60.0	+ 0.2	
	69.7	70.0	+ 0.3	
	79.7	80.0	+ 0.3	
Launch #2 Leadline #2	10.0	10.0	0.0	22 May 1950
	20.0	20.0	0.0	
	30.0	30.0	0.0	
	40.0	40.0	0.0	
	50.0	50.0	0.0	
	60.0	60.0	0.0	
	5.0	5.0	0.0	9 June 1950
	10.0	10.0	0.0	
	15.0	15.0	0.0	
	20.0	20.0	0.0	
	25.0	25.0	0.0	
	30.0	30.0	0.0	
	35.0	35.0	0.0	
	37.9	38.0	+ 0.1	
	39.9	40.0	+ 0.1	
	44.9	45.0	+ 0.1	
	49.8	50.0	+ 0.2	
	54.8	55.0	+ 0.2	
	59.8	60.0	+ 0.2	
	64.8	65.0	+ 0.2	
	69.8	70.0	+ 0.2	
	74.8	75.0	+ 0.2	
	79.8	80.0	+ 0.2	
	10.0	10.0	0.0	15 Aug. 1950
	20.0	20.0	0.0	
	30.2	30.0	- 0.2	
	40.2	40.0	- 0.2	
	50.3	50.0	- 0.3	
	60.3	60.0	- 0.3	
	70.3	70.0	- 0.3	
	80.5	80.0	- 0.5	

ABSTRACT OF LEADLINE CORRECTIONS, Continued

VESSEL	LEADLINE READING Feet	TRUE LENGTH Feet	CORRECTIONS Feet	DATE
Launch #3	10.0	10.0	0.0	9 June 1950
	20.0	20.0	0.0	
	30.0	30.0	0.0	
	40.0	40.0	0.0	
	50.0	50.0	0.0	
	60.0	60.0	0.0	
	10.0	10.0	0.0	23 Aug. 1950
	20.0	19.9	- 0.1	
	30.0	29.9	- 0.1	
	40.0	40.0	0.0	
	50.0	50.0	0.0	
	60.0	60.0	0.0	
	70.0	70.0	0.0	
	80.0	80.0	0.0	
Launch #4 Leadline #4	10.0	10.0	0.0	25 May 1950
	20.0	20.0	0.0	15 Aug. 1950
	30.0	30.0	0.0	
	40.0	40.0	0.0	
	50.0	50.0	0.0	
	60.0	60.0	0.0	
	70.0	70.0	0.0	
	80.0	80.0	0.0	
	90.0	90.0	0.0	
	100.0	100.0	0.0	

ABSTRACT OF BAR CHECK LINE

CORRECTIONS

VESSEL	BAR CHECK LINE READING Feet	TRUE LENGTH Feet	CORRECTION Feet	DATE
PATHFINDER	-	-	-	-
RAVEN			0	throughout season
Launch #1 Bar check #1	10.0 20.0	10.0 20.0	0.0 0.0	23 Aug. 1950
Launch #2 Bar check #2	10.0 20.0	10.0 20.0	0.0 0.0	22 May 1950
	5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0	5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	9 June 1950
	10.0 20.0 30.0 40.0 50.0	10.0 20.0 30.0 40.0 50.0	0.0 0.0 0.0 0.0 0.0	15 Aug. 1950
Launch #3 Bar check #3	10.0	10.0	0.0	9 June 1950
	10.0	10.0	0.0	23 Aug. 1950
Launch #4 Bar check #4	10.0 20.0 30.0 40.0 50.0	10.0 20.0 30.0 40.0 50.0	0.0 0.0 0.0 0.0 0.0	15 Aug. 1950

APPROVAL SHEET

The work on H-7670 (Field PF 2348) was started in 1948, continued in 1949 and was completed in 1950.

Work was done on this sheet during August and September 1950 when I took over command of the PATHFINDER and the boat sheets were examined after each days work.

At the northwest corner of this sheet a junction was made with visually controlled hydrography off the mouth of the Snake River, which control on the junction sheet was wholly Photo-hydro. stations. The hydrography on this sheet adjacent to the junction was controlled by very weak shoran fixes. It was fully intended to re-survey this limited area using photo-hydro. stations but adverse weather in September prevented this work being done.

This weakly controlled hydrography was smooth plotted aboard applying final shoran corrections and some of the hydrography was rejected. The junction hydrography off the mouth of the Snake River and the photo compilation delineation of the cutbanks of the channel were fixed in determining the hydrography accepted or rejected. There still remains some discrepancies between the accepted hydrography and the limits of the cutbanks.

Considering the relative unimportance of this area and the probability of channel changes each spring with the ice runoff, it is not recomended that additional hydrography be accomplished in this small area when work is resumed on the west side of Nushagak Bay.

Charles Pierce

CHARLES PIERCE Capt. USC&GS
Chief of Party

See vol. 24, p. 58
S. Rose

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. 7670 FIELD NO. PF-2348
PF-1150

Alaska, Bristol Bay, Nushagak Bay

Project No. CS-327

Surveyed 1948, 1949, and 1950 Scale 1:20,000

Soundings:

808 Fathometer
Hand lead

Control:

Shoran
Sextant fixes on shore signals

Chief of Party - R. F. A. Studds, R. W. Knox, C. Pierce, and R. L. Pfau
Surveyed by - E. H. Sheridan, J. C. Tribble, M. G. Ricketts, K. S. Ulm, J. C. Bull, and G. W. Moore
Protracted by - G. D. Scott, J. J. Dermody, R. A. Rendall, H. P. Demuth, and C. N. Hillman
Soundings plotted by - K. S. Ulm and C. N. Hillman
Verified and inked by - S. Rose
Reviewed by - T. A. Dinsmore 9 December 1953
Inspected by - R. H. Carstens

1. Shoreline and Control

The origin of the shoreline and control is given in the Descriptive Report.

2. Sounding Line Crossings

Considering the sharp irregularities in much of the bottom, depths at crossings are in good agreement. Sections of several sounding lines have been rejected because of excessive differences at crossings. Differences of 2-4 ft. still exist but are to be expected on the sides of bars and where steep slopes occur.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated. The 24-ft. curve has been added to emphasize the configuration of the bottom.

The area is profusely marked by irregularly shaped shoals some of which uncover as much as 10 ft. at M.L.L.W. The offlying shoals tend to constrict the several channels leading to the ports in Nushagak River on the north. Except over the flat shoal areas, the bottom is extremely uneven. Because of strong currents and ice-gouging, the bottom is reported to be constantly changing.

4. Junctions with Contemporary Surveys

Adequate junctions were effected between the present survey and H-7669 (1948-49) on the north, H-7769 (1950) on the south and with H-7828 (1950) in Snake River on the northwest. The junction with H-7829 (1950) on the southwest will be considered in the review of that survey.

5. Comparison with Prior Surveys

H-3177 (1909) 1:20,000
H-3178 (1909) 1:20,000
H-3179 (1909) 1:20,000
H-3180 (1909) 1:40,000

These prior surveys taken together cover the area of the present survey. A comparison of the prior and present surveys reveals that radical bottom changes have taken place. Bars, shoals and channels have shifted freely. The most revealing change in bottom has taken place in the vicinity of the entrance to Snake River where the entrance channel has shifted more than a mile southward from its former position.

The prominent low-water shoal located presently in the vicinity of lat. 58°51', long. 158°37', has shifted about three-fourths of a mile southeastward from its prior position where depths of 20-23 ft. are now found.

A prior elongated shoal uncovering at M.L.L.W. in lat. 58°49.4', long. 158°37.0', has since eroded to present depths of 16-22 ft.

The deep-water channel on the northwest leading into Nushagak River has shifted as much as 500 meters westward. This is particularly exemplified in lat. 58°52.0', long. 158°38.85', where the prior low-water line is now superseded by mid-channel depths of 40 ft.

Examples of other appreciable differences between prior and present depths are given in the following comparison:

Latitude	Longitude	Prior Depth	Present Depth
58°47.5'	158°43.8'	39	-2
58°46.3'	158°43.9'	-2	32
58°47.8'	158°38.7'	9	34
58°48.75'	158°45.4'	-5	16
58°46.55'	158°32.4'	40	6

Only minor changes are noted in the extent and location of the large shoals found in the southeastern part of the surveyed area. However, in this locality, the deep-water channels have generally shoaled from 3-8 feet.

The present survey is adequate to supersede the prior surveys within the common area.

6. Comparison with Chart 9052 (Latest print date 3/17/52)

A. Hydrography

Charted hydrography originates principally with partial application of the present survey prior to verification and review. Although the dangers to navigation are adequately charted, differences between charted and present smooth-sheet depths range from 1-6 ft. in some instances.

The present survey entirely supersedes the charted information.

B. Aids to Navigation

No floating aids to navigation are charted within the limits of this survey. The charted and smooth-sheet positions of Nushagak Bay light are in agreement. Because of shifting shoals and constricted passages in the area, navigation should be done during a rising tide.

7. Condition of Survey

a. The sounding records and Descriptive Report are complete and comprehensive.

b. The smooth plotting was accurately done.

c. As previously noted in paragraph 2, portions of some sounding lines were rejected because of excessive differences (as much as 10 ft.) in depths at crossings. In such instances, the areas involved were adequately developed by other sounding lines, the depths from which furnished better agreement and improved the delineation

of the depth curves. Because of the changeable character of the bottom, soundings from the 1950 work were utilized to replace some of the 1948-49 work particularly where conflicts were found. Many apparent discrepancies at crossings resulted from the field scanner's reading only the peaks and not the deeps in jagged bottom. Rescanning portions of the fathograms during verification in the Washington Office resolved many such discrepancies.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

9. Additional Field Work

This is an excellent basic survey and no further field work is required.

Examined and Approved:

H. R. Edmonston
Chief, Nautical Chart Branch

H. Arnold Karo
Chief, Division of Charts

G. R. Fish
Chief, Section of Hydrography

Earl O. Heaton
Chief, Division of Coastal Surveys

Overlay to accompany H-7670

37' 36' 158° 35' 34'

53'

52'

58° 51'

Volume #28

Least Depth - 4 Feet
Pos. 57-58 a Day - launch #4

Least Depth - 4 Feet
Pos. 95-96 a Day - launch #4

CRITICAL DEPTHS
INKED ON S.S.

Some depths changed
after inspection of
fathograms.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. PF-1150 *Office No.*

LOCALITY

State Alaska

General locality Bristol Bay

Locality Nushagak Bay

194 50

CHIEF OF PARTY

Charles Pierce

LIBRARY & ARCHIVES

DATE

B-1870-1 (1)

Form 537
Ed. Dec. 1930

REG. NO.

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.

Field No. PF-1150

REGISTER NO.

State Alaska

General locality Bristol Bay

Locality Nushagak Bay

Scale 1:10,000 Date of survey 18-22 August, 1950

Vessel Chartered launch RAVEN

Chief of Party Charles Pierce

Surveyed by J.C. Tribble

Protracted by

Soundings penciled by

Soundings in ~~fathoms~~ feet

Plane of reference MLLW

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated 20 June 1946, 24 March 1947, 7 April 1948
13 April 1949 and 25 April 1950

Remarks:

U. S. GOVERNMENT PRINTING OFFICE

DESCRIPTIVE REPORT TO ACCOMPANY

HYDROGRAPHIC SURVEY; Field No. PF-1150 Plotted as insert on smooth sheet of H-7670

(Smooth plotted on insert of survey No. H-7670; field No. PF-2348)

Bristol Bay, Nushagak Bay, Alaska
Season 1950

Scale: 1:10,000

Ship PATHFINDER

Charles Pierce Chief of Party

Surveyed by J.C. Tribble

A. PROJECT: CS-327, original instructions dated 20 June 1946. Supplemental instructions dated 24 March 1947, 7 April 1948, 13 April 1949 and 25 April 1950.

B. SURVEY LIMITS AND DATES: This survey is a more detailed development of the most constricted portion of the ship channel, centering about 1.5 miles SSE of Ekuk Point. The survey duplicates a portion of survey No. H-7670 (field No. PF-2348) and will be smooth-plotted on an insert of survey No. H-7670. This survey(PF-1150) was assigned register No. H-7825, however it is believed that the processing office will request this register number be canceled and the survey registered as a portion of number H-7670. see note at top of pg.

C. VESSEL AND EQUIPMENT: The vessel used was the chartered launch RAVEN. 808 fathometer No. 68 was used in conjunction with an outboard fish. The turning radius of the launch was about 35 meters.

D. TIDE AND CURRENT STATIONS: A portable automatic tide gage was maintained at Protection Point, see PATHFINDER TIDE REPORT for 1950. For purposes of reducing soundings this survey is divided into two zones:-

REFERENCE STATION; PROTECTION POINT

ZONE	RATIO OF RANGE	TIME DIFF. MINUTES H.W	L.W.
10	1.2	0	0
11	1.2	12	12

See attached SHEET LAYOUT AND TIDE ZONES FOR 1950.
No current stations were occupied during this survey.

E. SMOOTH SHEET: The smooth plotting of this survey will be done by personnel of the Seattle processing office.

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY #PF-1150 CONTINUED

F. CONTROL: All control for this survey was by shoran, using the two stations Coy and Bob. Station Coy was established over the No. 2 reference mark for triangulation station CLUMP 1910, established by W.C.D. in 1910, recovered by Curtis LeFever in 1947, recovered by R.W. Knox in 1950. The geographic position of Coy was computed from azimuth and distance measured from station CLUMP 1910.

Station Bob was located by the three point fix method, using second order theodolite to observe angles. Records and computations received in Washington Office 31 January 1951.

H. SOUNDINGS: Soundings were obtained with 808 type fathometer number 68. Depths were scaled from the fathogram and recorded in sounding volumns to the nearest half foot. In scanning the fathogram and error due to the initial being off was applied and the correct depth recorded. The corrections to be applied to soundings taken on the "B" scale of this fathometer was found to be minus one foot.

I. CONTROL OF HYDROGRAPHY: ~~Ranges were run~~ To maintain as straight lines as possible ranges were run, using the two easterly radio towers at Ekuk as the rear range. Shoran fixes were taken every two minuts or less from stations Coy and Bob. The control for this survey is believed to be the best shoran control obtained during the season as the RAVEN was the only vessel working during the time of this survey and the stations were beamed directly toward the vessel. Also the distance arcs cross at nearly right angles.

J. ADEQUACY OF SURVEY: This survey is considered adequate and complete.

L. COMPARISON WITH PRIOR SURVEYS: The prior survey in this area (register No. H-3178) was made in 1909 on a scale of 1:20,000. Due to strong currents and shifting sandy bottom the comparison is not in agreement.

M. COMPARISON WITH CHART, No. 9052(50-4/3): The center line of the channel appears to be in the same location. The 1950 minimum depth is less than the chart indicates and the channel appears to be not as wide as charted. This survey shpuld be used for charting purposes as it is more detailed and on a larger scale. *See Review, par. 6.*

O. COAST PILOT INFORMATION: See section "O" of descriptive report for survey No. H-7670. In addition to the range described in the special report submitted 9 November 1950 by Captain Charles Pierce the following alternate range is submitted for use when the mountains are obscured:- using the two eastward of the three radio towers at the Libby McNeil & Libby cannery as the back range, steer so as to keep these towers showing at a point about 20 meters to the east of the tangent to Ekuk bluff. The controlling depth on this range was 17 feet at MLLW (boat sheet soundings, smooth sheet not plotted at this writing), see positions 45 to 48, "a" day of this survey. *CAL 872 (1950)*

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY #PF-1150 CONTINUED

S. TABULATION OF APPLICABLE DATA:

(a) Attached to this report;

1. Statistics.
2. Fathometer corrections**
3. List of signals.
4. Tidal note.
5. Abstract of shoran corrections**
6. Sheet layout and tide zones**
7. Approval sheet.

(b) Reports submitted under separate cover.

1. Report of tides 1950.
2. Report of fathometer corrections 1950.
3. Coast pilot information 1950.
4. Shoran report 1950.

** See report on survey No. H-7670(to which this report is attached).

Submitted by;

John C. Tribble

John C. Tribble
Lt. Comdr. C&GS

STATISTICS FOR HYDROGRAPHIC SURVEY #PF-1150

DATE 1950 Aug.	DAY LTR.	VESSEL	VOL #	POSITIONS	STAT. MILES
18	a	Raven	1	202	27.9
22	b	"	1	105	13.1
TOTALS:			1	307	41.0

LIST OF SIGNALS
Sheet PF-1150

NAME	SOURCE
	triangulation
Bob	BOB 1950
Coy	COY 1950

TIDAL NOTE

A portable automatic tide gage was maintained at Protection Point throughout the period of this survey. Reducers have been applied in accordance with Special Tide Report of the PATHFINDER for 1950. Reducers have been entered to "1" foot intervals.

APPROVAL SHEET

This survey is approved. The boat sheet was examined frequently during prosecution of the work. The survey is considered complete and adequate. No additional field work is recommended.

Because of the importance of the narrow channel crossing a bar entering Nushagak Bay to Clarks Pt. and beyond this survey was made. The 1/20,000 scale hydrographic survey completed in 1949 and 1950 was not considered adequate in detail to satisfy the requirements for proper delineation of the channel and the numerous shoals. Plotted at 1:10,000 as insert on Smooth sheet of H-7670

Further investigation of the channel was made on visual control on the last working day of the 1950 field season running range lines ; Ch. 892 (1950)

front range Nushagak Bay Light and saddles and peaks on Warehouse Mtn for rear ranges. A Special report has been submitted on this work and the hydrography plotted on tracing paper forwarded to Washington. Soundings were reduced from predicted tides. This survey should be overlaid on the smooth sheet when completed for comprison.

Charles Pierce

Charles Pierce
Captain USC&GS
Cmdg. Officer Pathfinder

Processing Office Notes.

H 7670
Pf 1150 and 2348

Nushagak Bay.

General statement.
The field surveys plotted on this sheet were made in 1948, 1949 and 1950. The work of the first two seasons was plotted by the ship's personnel. The twenty-four volumes, numbers 13 to 36, of 1950 have been plotted in the Seattle Processing Office. The smooth sheet was returned from Washington for this purpose. It is noted that statistics for 1949 do not show a volume number 12. (No vol. 12)

Shoran curves.
Fixes for the 1950 season were chiefly by the shoran method. Co-ordinates were computed for points on arcs along lines radiating from the shoran stations. The distances between the plotted points were subdivided carefully into statute mile intervals. The arcs were drawn with shoran templates. Apparently the sheet has at some time been exposed to moisture which caused warping so that the templates would not fit perfectly thruout the length of the shoran curves. The templates were fitted from point to point. The residual error is trivial.

Overlay.
Positions 18-116 a-day Launch 4 were plotted on an overlay tracing. This development verifies the shoal depths previously obtained. (critical depths inked on smooth sheet verified and)

Sheet PF 1150. (Plotted at 1:10,000 as insert on smooth sheet)
This survey is additional development of a channel intersection shown on H 7670. Pf 1150 was registered as H 7825. On request to Washington the registry number was cancelled so that the work could be plotted as a sub-plan on H 7670. The field party prepared a separate report for Pf 1150. It is bound with the report for Pf 2348 H 7670.

Economy.
In this area of big tides, tide rips and strong currents ranges were distant and sounding lines hard to maintain on a straight line. In order to fill in the space a considerable excess of mileage was run. By tracing out the shoran arcs during the 1950 season the same organization obtained adequate and more even coverage without waste of mileage run. This economy extends also to processing the records and plotting the sheet. By following the shoran arcs a much more even development was achieved in less time and at less cost.

Attention is called to the following soundings.

	ϕ	λ	Feet	ϕ	λ	Feet	
	58 43.82	158 28.1	4	58 43.64	158 39.64	6	
	42.8	30.2	4	47.7	33.35	9	
Sub-plan	46.47	32.42	5	47.8	36.22	9	
	46.46	32.40	6	48.62	37.03	9	
	46.15	32.6	5	49.21	34.81	6	
	46.23	32.93	4	49.9	38.6	5	
	46.15	33.3	3	50.37	38.13	6	
	42.85	32.1	4	50.24	37.82	6	
	~~46.62~~	~~31.63~~	~~3~~	50.98	37.75	4	
	42.84	36.33	9	51.37	37.08	-8	Hi.pt. of flat.
	45.03	37.1	1	51.93	36.16	-4	Ditto.
	44.95	37.9	11	51.36	35.66	8	
	45.2	38.7	14	51.77	35.6	7	
	45.54	39.02	12	51.78	35.2	4	
	46.4	39.78	0.5	52.7	33.6	-4	
	45.41	41.28	3	52.38	32.55	-1	

Edgar E. Smith

Edgar E. Smith
Cart. Engr. 8/8/51

While the records of 1948 and 1949 for sheet H 7670 did not pass thru the Seattle Processing Office it is believed that the field party reported their statistics for the first two seasons.

EESmith

STATISTICS FOR HYDROGRAPHIC SHEET H-7670

1948-1949 SEASONS

Date 1948	Day	Launch No.	Vol	Positions	Statute Miles Sounding Line	H.L Sdgs.
13 July	a	1	1	11	4.2	
15 July	b	2	1	40	8.6	
25 August	c	2	1	27	5.5	
September	d	2	1	77	23.0	
Date 1949		Sub-Totals		155	41.3	
2 July	b-2349	3	1	3	(Signal Location)	
5 July	a	3	1 & 2	111	21.8	
6 July	b	3	2	54	9.6	
7 July	c → 2348	3	2	87	20.9	
9 July	d	3	2 & 3	167	35.3	
10 July	e	3	3	84	20.5	
12 July	f	3	3	100	25.8	
13 July	g	3	4	66	17.0	
14 July	h	3	4	29	6.5	
15 July	j	3	4	102	25.5	
16 July	k	3	4	23	6.5	
20 July	l	3	4	51		51
21 July	m	3	4	35		35
23 July	n	3	4 & 5	82	18.2	
26 July	p	3	5	12	2.6	
27 July	-	-	5	12	(Wharf Soundings)	11
1 August	q	3	5	115	28.3	
2 August	r	3	5 & 6	182	41.1	
9 August	s	3	6	141	30.9	
14 August	t	3	6	113	29.9	
16 August	u	3	7	143	34.6	
17 August	v	3	7 & 8	177	40.0	
18 August	w	3	8	32	7.7	
23 August	x	3	8	58	12.6	
30 August	y	3	8	79	16.0	
31 August	z	3	8	81	17.5	
1 September	aa	3	8 & 9	99	20.9	
2 September	bb	3	9	57	13.0	
4 September	cc	3	9	55	12.2	
6 July	a-2349	3	10	49	15.2	
13 July	b-2349	3	10	86	25.8	
1 July	C-2349 →	3	10 & 11	153	41.8	
		Sub-Totals 1949		2638	597.7	97
		Totals 1948 - 1949		2793	639.0	97

AREA, 1948 - 1949 ---- 36.0 square statute miles

STATISTICS FOR HYDROGRAPHIC SHEET H-7670 (1950)

PATHFINDER CS-327

Vol. No.	Day Letter	Date	HL-Wire	Positions	Statute Miles
		RAVEN			
13	a	2 June	0	89	16.4
13	b	3 June	0	13	2.6
13	c	5 June	0	16	3.8
13	d	6 June	0	22	5.7
13	e	7 June	0	232	5.2
13	f	8 June	0	184	2.2
13	g	9 June	0	51	8.9
13 & 14	h	10 June	0	34	4.6
14	j	12 June	0	53	8.4
14	k	13 June	0	39	7.9
14	l	15 June	0	45	9.4
14	m	16 June	0	201	3.7
14	n	28 June	0	21	3.9
14	p	7 July	0	18	6.2
15	q	22 August	0 P.M. WORK	95	16.3
36	aa	18 August	0	202	27.9
36	bb	22 August	0 A.M. WORK	105	13.1
		Total RAVEN	0	859	146.2
		Launch No. 1			
16	b	22 May	3	153	43.0
17	c	26 May	0	134	35.4
17 & 18	d	27 May	3	162	40.2
19	f	12 August	0	49	17.0
		Total Launch No. 1 6		498	135.6
		Launch No. 3			
16	a	20 May	0	67	20.3
20	b	24 July	0	121	39.7
21	c	26 July	0	121	43.1
21	d	27 July	0	189	5.5
22 & 23	f	31 July	0	142	40.9
23	g	1 August	1	141	39.3
24	h	2 August	0	95	22.6
24	j	3 August	0	106	24.9
25	k	5 August	0	165	52.3
25 & 26	l	7 August	0	169	41.3
26	m	8 August	0	60	14.0
26 & 27	n	9 August	0	124	40.6
27	p	10 August	5	8	
		Total Launch No. 3 6		1331	384.5

STATISTICS FOR HYDROGRAPHIC SHEET H-7670 (1950)

PATHFINDER CS-327 (Continued)

Vol. No.	Day Letter	Date	HL-Wire	Positions	Statute Miles
		Launch No. 4			
18	e	26 July	2	59	17.5
20	a	10 July	0	85	18.1
22	e	28 July	0	152	46.0
28	a	13 May	0	113	20.0
28	b	15 May	0	121	24.7
28	c	16 May	0	13	2.9
28 & 29	d	19 May	0	143	27.0
29	e	20 May	0	175	31.2
29 & 30	f	22 May	0	121	23.9
30	g	27 May	0	176	34.4
30	h	31 July	0	74	29.7
30 & 31	j	1 August	2	46	7.2
31	k	2 August	1	7	2.0
31	l	3 August	1	79	26.0
31 & 32	m	5 August	1	140	52.8
32	n	7 August	3	134	43.7
32 & 33	p	8 August	2	107	29.4
33	q	9 August	3	163	46.0
33 & 34	r	10 August	2	168	44.9
34	s	11 August	2	161	30.9
34 & 35	t	12 August	2	138	37.0
35	u	14 August	0	107	29.0
		Total Launch No. 4	21	2482	624.3
		TOTAL for 1950	33	5170	1290.6
		TOTAL for 1948-1949	97	2793	639.0
		GRAND TOTAL	130	7963	1929.6

GRAND TOTAL AREA 120 square statute miles.

TIDAL NOTE

Sheet H-7670 (FF-2348)

1948 - 1949

NUSHAGAK BAY, ALASKA

A portable automatic tide gage was maintained at Clarks Point during the 1948 and 1949 work on this sheet. This gage was located about 2¼ miles from the north end of the sheet and 4 miles from the southern end of the sheet, soundings were taken at an extreme distance of 7 miles from this gage.

Tidal reducers have been applied in accordance with the Special Tide Reports of the Ship PATHFINDER for the years 1948 and 1949. Reducers for 1948 work were entered to "1" foot intervals while those for the 1949 work have been entered in "½" foot intervals.

TIDAL NOTE

1950

A portable automatic gage was maintained at Protection Point. Reducers have been applied in accordance with Special Tide Report of the PATHFINDER for 1950. Reducers have been entered to "1" foot intervals. During the short period before Protection Point gage was installed a staff was read at Clarks Point and ship fathometer station was occupied.

H 7670
Pf 2348 &
Pf 1150

Nushagak Bay

List of geographic names
penciled on smooth sheet.

NUSHAGAK BAY

COMBINE FLATS

FLOUNDER FLATS

IGUSHIK RIVER

SNAKE RIVER

CLARK SLOUGH

CLARK POINT

EKUK BLUFF

EKUK SPIT

GEOGRAPHIC NAMES

Survey No. H-7670

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
Alaska			(for title)							1
Bristol Bay			(" ")						BS-1x	2
										3
Nushagak Bay										4
Flounder Flat										5
Ekuk Bluff									BS-1y	6
Ekuk Spit										7
Clarks Point			(village)	(location of one tide gage)						8
Combine Flat										9
Clark Slough			(Pending with B. & N)							10
Snake River										11
Igushik River										12
										13
Names to be applied after inking (see chart 9052):										14
										15
Schooner Channel										16
Middle Channel										17
Ship Channel										18
Big Sands										19
Long Sands				Names underlined in red are affected. 9-28-51 L. Heck (Replaces original name list dated 5-5-50)						20
										21
										22
										23
										24
Protection Point			(location of one tide gage)							25
										26
										27

M 234

R & C

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Rev. June 1937

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~xDivisionxofxHydrographyxandxTopographyx~~ 18 September 1951

Division of Charts: R. H. Carstens

Plane of reference approved in 24
volumes of sounding records for

HYDROGRAPHIC SHEET 7670 Add. Wk.

Locality Nushagak Bay, Bristol Bay, Alaska

Chief of Party: C. Pierce in 1950
Plane of reference is mean lower low water, reading
6.0 ft. on tide staff at Protection Point
20.6 ft. below B. M. 5 (1950)

-11.9 ft. on tide staff (Inner) at Clark Point
-11.2 ft. on tide staff (Outer) at Clark Point

25.4 ft. on Fathometer at Station 1
24.6 ft. below B. M. 4A 1947

Height of mean high water above plane of reference is as follows:

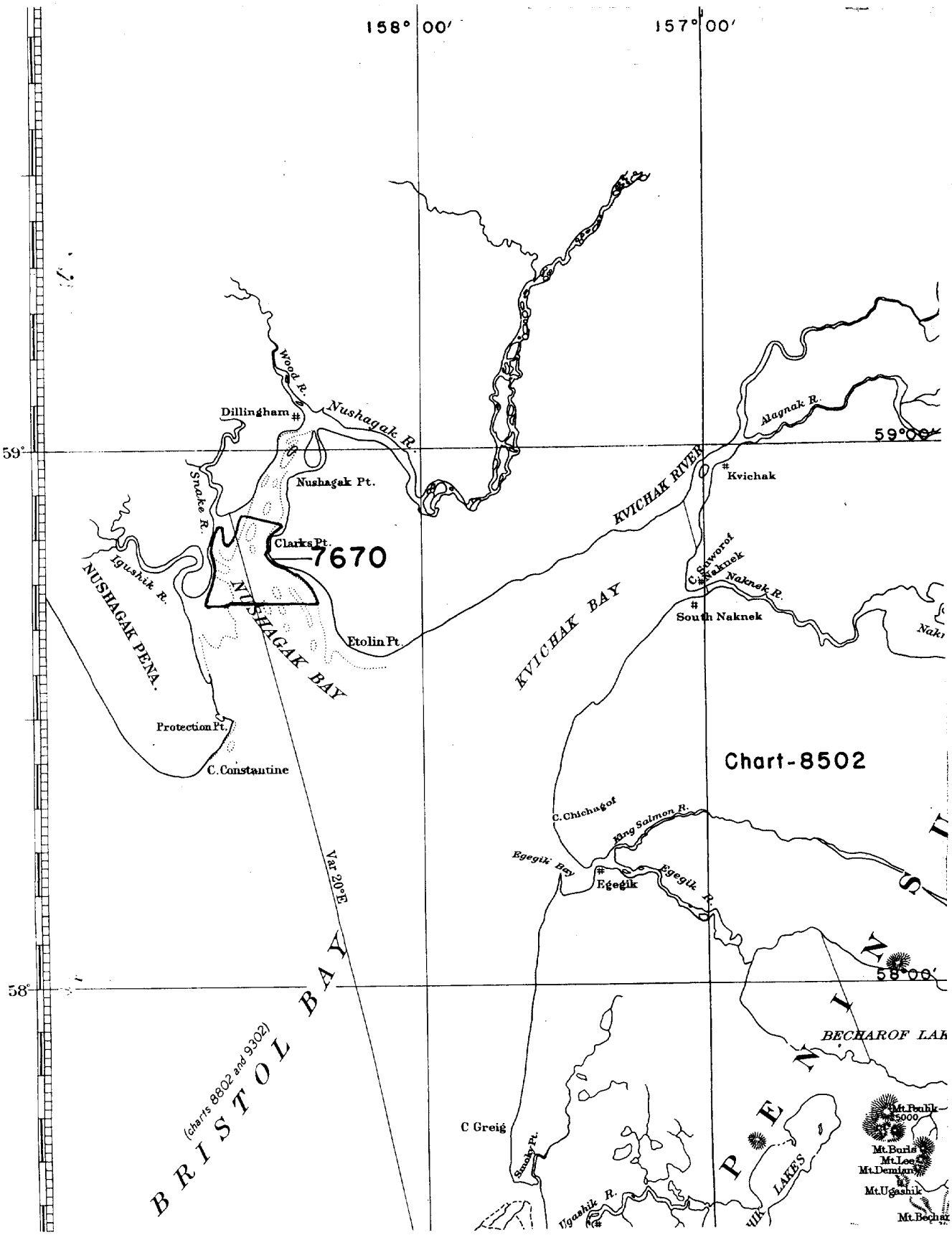
Protection Point = 15.1 feet
Clark Point = 17.8 feet

Condition of records satisfactory except as noted below:

E. C. McKay
Section
Chief, ~~Division~~ of Tides ~~and Currents.~~

8/5

U. S. GOVERNMENT PRINTING OFFICE 756675


158° 00′
157° 00′
59°
58°
59°00′
58°00′
Wood R.
Nushagak R.
Dillingham
Nushagak Pt.
Snake R.
Clarks Pt.
7670
Igushik R.
NUSHAGAK PENA.
NUSHAGAK BAY
Etolin Pt.
Protection Pt.
C. Constantine
KVICHAK BAY
KVICHAK RIVER
Alagnak R.
Kvichak
C. Goworof
Naknek
Naknek R.
South Naknek
Chart-8502
C. Chichagof
King Salmon R.
Egegik Bay
Egegik
Egegik R.
Var 20°E
(charts 8802 and 9302)
BRISTOL BAY
C Greig
Smoky Pt.
Ugashik R.
PENINSULA
BECHAROF LAKES
Mt. Peulik
Mt. Burls
Mt. Lee
Mt. Demiansky
Mt. Ugashik
Mt. Becha

NAUTICAL CHARTS BRANCH

SURVEY NO. H-7670

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
9/19/51	9052	H.W. Burgoyne	Before ~~After~~ Verification and Review Part. Applied
2-23-'61	8802	F.M. Albert	~~Before~~ After Verification and Review via cht 9052 and smooth sheet
12-20-63	9052	[illegible]	~~Before~~ Part. app'd. After Verification and Review Exam made
			few revisions of Sndg & Curves (~~[illegible]~~)
10-2-91	16322	W.J. Ohms	~~Before~~ After Verification and Review considered
			adequately applied
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.