

8478

Diag. Cht. Nos. 6300-2 & 6380-2.

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. H0-3159 Office No. H-8478

LOCALITY

State Washington

General locality Strait of Georgia - South-
ern Part

Locality Patos I. to Pt. Roberts

1959

CHIEF OF PARTY

M. J. Tonkel

LIBRARY & ARCHIVES

DATE 2-16-60

8478

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-8478

Field No. HO-3159

State Washington

General locality Strait of Georgia - SOUTHERN PART

Locality PATOS I, to PT. ROBERTS
~~Southern Strait, part of Strait of Georgia~~

Scale 1:30,000 Date of survey 20 April - 15 October 1959

Instructions dated 28 October 1958

Vessel HODGSON

Chief of party Miller J. Tonkel

Surveyed by M. J. Tonkel, R. E. Williams, R. E. Alderman, R. M. Sundean

Soundings taken by fathometer, ~~graphic recorder, and lead line~~

Fathograms scaled by R. E. Alderman, R. M. Sundean, E. M. Machnik, A. M. Legako

Fathograms checked by R. E. Alderman, R. M. Sundean, E. M. Machnik, A. M. Legako

Protracted by Miller J. Tonkel, R. E. Williams, R. E. Alderman, R. M. Sundean

Soundings penciled by R. E. Alderman, J. H. Blumer

Soundings in fathoms ~~XXXX~~ at ~~XXXX~~ MLLW and are true depths

REMARKS:

(PMC)

712

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SURVEY H-8478 (Field No. HO-3159)

PROJECT CS-241
VICINITY OF GEORGIA STRAITS, WASHINGTON

DATE OF SURVEY: APRIL - OCTOBER, 1959
SCALE OF SURVEY: 1:30,000

USC&GS SHIP HODGSON, LCDR MILLER J. TONKEL, COMMANDING OFFICER

Surveyed by: LCDR Miller J. Tonkel, LCDR Robert E. Williams,
ENSIGNS Richard E. Alderman & Ray M. Sundean

A. PROJECT:

This survey was executed as part of Project CS-241 in accordance with Revised Instructions dated 28 October 1958.

B. SURVEY LIMITS AND DATES:

Survey covered all of the offshore area from the United States-Canadian Boundary at Latitude $49^{\circ} 01'$ south to Latitude $48^{\circ} 47'$ and from the western United States-Canadian Boundary east to Longitude $122^{\circ} 48'$ south of Point Whitehorn.

Field work commenced on 20 April and was completed on 15 October 1959.

This survey was joined on the south by Survey No. H-2113, scale 1:10,000, 1958, and H-8519 and H-8520, scale 1:20,000, 1960. It is joined on the southeast by Survey No. H-8322, scale 1:10,000, 1956. It is joined by contemporary survey H-8479, scale 1:10,000, 1959, around Point Roberts, Survey No. H-8480, scale 1:10,000, 1959, to the east in Boundary Bay and by Survey No. H-8481, scale 1:10,000, 1959, to the south around Alden Bank, and Survey No. H-8518, scale 1:10,000, 1960, and northeast.

Upon completion of most of the hydrography, with the exception of the Sho-ROB Sho-PAT baseline, work was held up until launch sheets H-8479 and H-8480 were complete. At that time the shoran station at Point Roberts was moved to Point Whitehorn, and the balance of the hydrography on H-8478 was completed.

C. VESSEL AND EQUIPMENT:

The survey was completed by the Ship HODGSON.

Echo sounding equipment used on the survey was 808-type fathometer No. 147 and EDO UQN fathometer No. 57-210. The EDO UQN was used on A day (5-20-59) only, and the 808 fathometer used for the balance of the survey (Reference is made to the Depth Sounding Equipment Report).

D. TIDE AND CURRENT STATIONS:

One portable automatic tide gage was maintained at the city wharf in Blaine, Washington, Latitude $48^{\circ} 59' 32''$, Longitude $122^{\circ} 45' 55''$. Another portable automatic gage was maintained at Echo Bay, Sucia Island, Latitude $48^{\circ} 45.6'$, Longitude $122^{\circ} 53.8'$. Both gages were maintained throughout the season. ✓ *Outside of survey limits*

Blaine tides were used without time or range correction for the area north of a line commencing at Point Whitehorn and running southwest to the northeast corner of contemporary survey H-8481, Latitude $48^{\circ} 50.6'$, Longitude $122^{\circ} 50.9'$, from there to the northwest corner of contemporary survey H-8481, Latitude $48^{\circ} 49.7'$, Longitude $122^{\circ} 51.7'$ and then westward to Latitude $48^{\circ} 49' 53.94''$ N, Longitude $123^{\circ} 00' 27.48''$ W. Echo Bay tides were used in the area south of this line without time or range correction. ✓

During inoperative periods of the Blaine tide gage, Echo Bay tides were used in the Blaine area with a plus 0.5 foot range correction and 0.0 time correction. ✓

Current stations were observed northeast of Skipjack Island, Latitude $48^{\circ} 45.7'$, Longitude $123^{\circ} 00.8'$; north of Parker Reef, Latitude $48^{\circ} 44.0'$, Longitude $122^{\circ} 53.6'$; west of Matia Island, Latitude $48^{\circ} 45.0'$, Longitude $122^{\circ} 52.1'$; and at the entrance to Drayton Harbor, Blaine, Washington, Latitude $48^{\circ} 59.6'$, Longitude $122^{\circ} 45.9'$. ✓ *Outside of survey limits*

E. SMOOTH SHEET:

All hydrography was plotted on a smooth boat sheet constructed before starting hydrography. The sheet was ruled by hand aboard ship. ✓

The system of using a smooth boat sheet with an overlay of mechanically grained mylar has definite disadvantages which were encountered in the field. The smooth surface presented by the mylar has no retentive qualities for holding penciled or inked notes, positions or soundings. Also, what remains of pencil notations rapidly becomes smudged and will not erase properly. This results in a very poor boat sheet overlay. Periodically throughout the season, it was necessary to reink all positions and soundings where the ink had chipped and worn away. ✓

In attempting a smooth boat sheet, the immediate application of correctors is necessary. On at least one occasion, an error was discovered in shoran calibration data and portions of one day's hydrography had to be replotted. All of which necessitates extra work. It is recommended that in areas such as this sheet covered and at the scale required, no attempt be made to use a smooth boat sheet. Fixes were taken every three to four minutes and adequate time to carefully plot each fix, as on a smooth sheet, is not available. ✓

The use of a smooth boat sheet is not as adaptable for visual plotting as for electronic control plotting. Slight adjustments in signal ✓

location necessitate complete replotting of all inshore visually controlled work. Working close inshore off the southwest corner of Point Roberts, in strong cross currents, required the use of straight visual control. In this case the shoran was of no use due to the proximity of Sho-ROB. The current and close in conditions prevented efficient use of the Sho-PAT for navigational control. The time available to plot the visual fixes was not adequate to meet smooth sheet requirements. Visually controlled hydrography off Patos Island was more adaptable to the use of shoran for control. Sho-ROB arcs were used for control while hydrography was plotted by conventional 3-point sextant fixes. It is recommended that an additional overlay be made in plotting conventional visual work. In this way, no damage will be made to the smooth boat sheet. The fixes can be plotted on the smooth boat sheet when more time is available. ✓

A holiday was discovered during final smooth checking along the western border of hydrography from a point at the extreme western terminus at United States-Canadian Boundary, Latitude $49^{\circ} 00' 08''$, Longitude $123^{\circ} 19' 17''$ and extending southeastward to Latitude $48^{\circ} 52' 43''$, Longitude $123^{\circ} 05' 42''$. This was not apparent in the field due to a misplot of the western boundary in mid-channel of Georgia Strait. It tapers from a 500 meter holiday at Latitude $49^{\circ} 00' 08''$, Longitude $123^{\circ} 19' 17''$ to no holiday at Latitude $48^{\circ} 52' 48''$, Longitude $123^{\circ} 05' 42''$. ✓

← Not
important
Dew

F. CONTROL STATIONS:

Basic control was established by GD in 1857, JSL in 1858, JJC in 1888, LCW in 1940, CP in 1941 and CWC in 1949, 1950 and 1951 (See Signal List Addenda). ✓

All visual control stations selected from aerial photographs were radially plotted on photo manuscript T-8447 at a scale of 1:10,000. The resultant positions were scaled and replotted on the 1:30,000 smooth boat sheet. ✓

G. SHORELINE AND TOPOGRAPHY:

No shoreline was transferred from photo manuscripts to smooth boat sheet. ✓

Zero fathom curves were delineated on adjacent inshore launch sheets. ✓

H. SOUNDINGS:

All depths were measured with 808 and EDO UQN fathometers. It was discovered that A day soundings were in slight variance with the balance of the hydrography. After re-evaluating all possible initial, phase and speed errors on both the 808 and EDO fathograms for A day, a plus 1.0 fathom was added to all EDO UQN soundings and a minus 1.0 fathom was subtracted from all 808 soundings for A day only. This brought the area concerned into satisfactory agreement with the adjacent hydrography. See Depth Sounding Equipment Report for details of adjustment. ✓

I. CONTROL OF HYDROGRAPHY:

Most of the hydrography was controlled by shoran stations located on the western end of Patos Island and at the light on the southwest corner of Point Roberts. As hydrography progressed, the station at Point Roberts was moved to Point Whitehorn to complete shoran controlled hydrography. A small amount of inshore visual sextant controlled hydrography was done around the southwest corner of Point Roberts and along the north side of Patos Island to complete these areas. No horizontal adjustment of any portion of the hydrography is necessary. Refer to Section Z 5c.

J. ADEQUACY OF SURVEY:

Survey is adequate and complete to supersede all prior surveys of the area. A small area in the southwest corner of the hydrography, north of Patos Island, indicates the possibility of shoaling from adjacent depths. Depths of less than 50 fathoms are noted in this area at 300 meter line spacing. No further development was made. The area will fall on the inshore 1:10,000 approved sheet covering Patos Island. It is recommended that this area be developed by the next vessel doing hydrography on that inshore sheet.

This area is adequately covered by H-8520 (1960) 1:10,000

Junctions with H-8479, H-8480 and H-8481 have been compared and are complete. Depth curves can be drawn adequately at all junctions.

K. CROSSLINES:

Approximately 7.7% crosslines have been ^urun normal to the regular scheme of hydrography. All crossings are in agreement.

L. COMPARISON WITH PRIOR SURVEYS:

The survey has been compared with prior surveys H-709, ^{1:100,000}~~1:10,000~~, 1858; ⁵H-2049, 1:20,000, 1890; H-2080, 1:20,000, 1891; and H-2079, 1:20,000, 1889. All depths are in general agreement with no noted changes in bottom configuration, ~~except Survey H-2080 at Latitude 48° 50' 30", Longitude 123° 01' 30" showed two depths of 129 and 133 fathoms which were in an area at 107 fathoms on the present survey.~~ At 48° 50' 15" Latitude, Longitude 122° 58' 50", a depth of 125-3/4 fathoms on Survey H-2080 is compared to a depth of 119 fathoms on Survey H-8478. This is an indication of the general shoaling off Saturna Island and ~~was found by the closer line spacing on H-8478.~~ ^{The present survey shows depths as great as 125 fm approx. 600 meters N.W. of this location. This difference is attributed to natural causes.}

~~The comparison described is erroneous. At the given location a comparison in depths shows agreement of 107 fm.~~

Erratic nature of sdgs. on H-2080 (1891) explains this difference. See Review Par. 6

M. COMPARISON WITH CHART:

The survey has been compared with C&GS Chart No. 6300 and Canadian Hydrographic Chart No. 3450. All depths are in general agreement.

Par. 6
Daw

N. DANGERS AND SHOALS:

There are no dangers or shoals within the limits of this survey. Adjacent contemporary surveys cover all shoal dangers to navigation.

O. COAST PILOT INFORMATION:

See separate Coast Pilot Report forwarded 12-10-59.

P. AIDS TO NAVIGATION:

The following fixed aids to navigation are located within the limits of the sheet: (all aids fall outside the limits of hydrography)

Saturna Island Light	1959 Light List No. 1975	✓
Patos Island Light	1959 Light List No. 1976	✓
Point Roberts Light	1959 Light List No. 1980	✓
International Boundary Range A Front Light	1959 Light List No. 1981	} not plotted on sheet
International Boundary Range A Rear Light	1959 Light List No. 1982	
International Boundary Range B Front Light	1959 Light List No. 1983	
International Boundary Range B Rear Light	1959 Light List No. 1984	✓

Floating Aids to Navigation are as follows:

(all aids fall outside the limits of hydrography)

Point Roberts Lighted Bell Buoy No. 4	1959 Light List No. 1979	✓
Depth 43 feet on 7-15-59 from Survey H-8479		
Latitude 48° 57.11', Longitude 122° 59.15'		
Alden Bank Lighted Bell Buoy No. 2	1959 Light List No. 1977	✓
Depth 40 feet on 9-12-59 from Survey H-8481		
Latitude 48° 47.32', Longitude 122° 49.98'		
Alden Bank Buoy No. 1	No light list number	✓
Depth 87 feet on 9-10-59 from Survey H-8481		
Latitude 48° 48.20', Longitude 122° 48.50'		

Q. LANDMARKS FOR CHARTS: ✓

None recommended.

R. GEOGRAPHIC NAMES: ✓

None recommended.

T - Y. Not used.

Z. TABULATION OF APPLICABLE DATA: ✓

1. Shoran Report
2. Fathometer Report
3. Coast Pilot Report
4. Photogrammetric Report
5. Attached Material:
 - a. Statistics
 - b. Tide Note
 - c. List of Signals
 - d. Sheet Layout
 - e. Geographic Names List
 - f. Fathometer Correction Abstract (also see Fathometer Report)
 - g. Approval Sheet

R. E. Williams

Respectfully submitted:

James H. Blumer

James H. Blumer, ENS
R. E. Williams, LCDR

STATISTICS FOR

✓ HYDROGRAPHIC SURVEY H-8478

1959

<u>Volume</u>	<u>Dayletter</u>	<u>Date</u>	<u>No. of Position</u>	<u>Nautical Miles Sounding</u>
1	A	May 20	72	44.7
1 & 2	B	21	143	64.3
2	C	29	33	15.2
2 & 3	D	30	151	73.5
3	E	31	61	28.5
3	F	June 1	70	20.9
3 & 4	G	2	166	76.9
4	H	3	51	21.2
4 & 5	J	5	192	99.5
5	K	6	69	36.0
6	L	10	209	96.5
7	M	July 8	75	32.5
7	N	9	46	10.8
7	P	10	52	13.7
7 & 8	Q	11	156	79.6
8 & 9	R	12	190	82.3
9	S	Aug 10	27	11.7
9 & 10	T	12	190	88.7
10 & 11	U	13	250	149.9
11	V	14	28	4.5
11	W	Sept 15	157	61.3
11	X	16	132	60.1
12	Y	23	142	54.9
12	Z	24	7	----
12	AA	26	24	----
12	AB	27	4	----
13	AC	27	66	14.3

Totals:	Positions	2763
	Naut. Mi. Hydro	1241.5 Naut. Mi.
	Stat. Mi. Hydro	1405.4 Stat. Mi.
	Area	109.7 Sq. Naut. Mi.

TIDE NOTE ✓

The Blaine, Washington, tide gage, Latitude $48^{\circ} 59' 32''$, Longitude $122^{\circ} 45' 55''$, was used without time or range corrections north of a line starting at Point Whitehorn and running southwest to the northeast corner of Survey No. H-8481, Latitude $48^{\circ} 50.6'$, Longitude $122^{\circ} 50.9'$, then west to Latitude $48^{\circ} 49.7'$, Longitude $122^{\circ} 51.7'$ and then southwest to Latitude $48^{\circ} 49.9'$, Longitude $123^{\circ} 00.5'$ on the United States-Canadian Boundary. The Echo Bay, Sucia Island, Washington, tide gage, Latitude $48^{\circ} 45.6'$, Longitude $122^{\circ} 53.8'$, was used without time or range correction south of this line.

During inoperative periods of the Blaine gage, the Echo Bay tides were used in the Blaine tide zone with a 0.0 time correction and a plus 0.5^{ft} range correction.

Blaine	-	MLLW on Staff 4.5 ft.
Echo Bay	-	MLLW on Staff 4.0 ft.

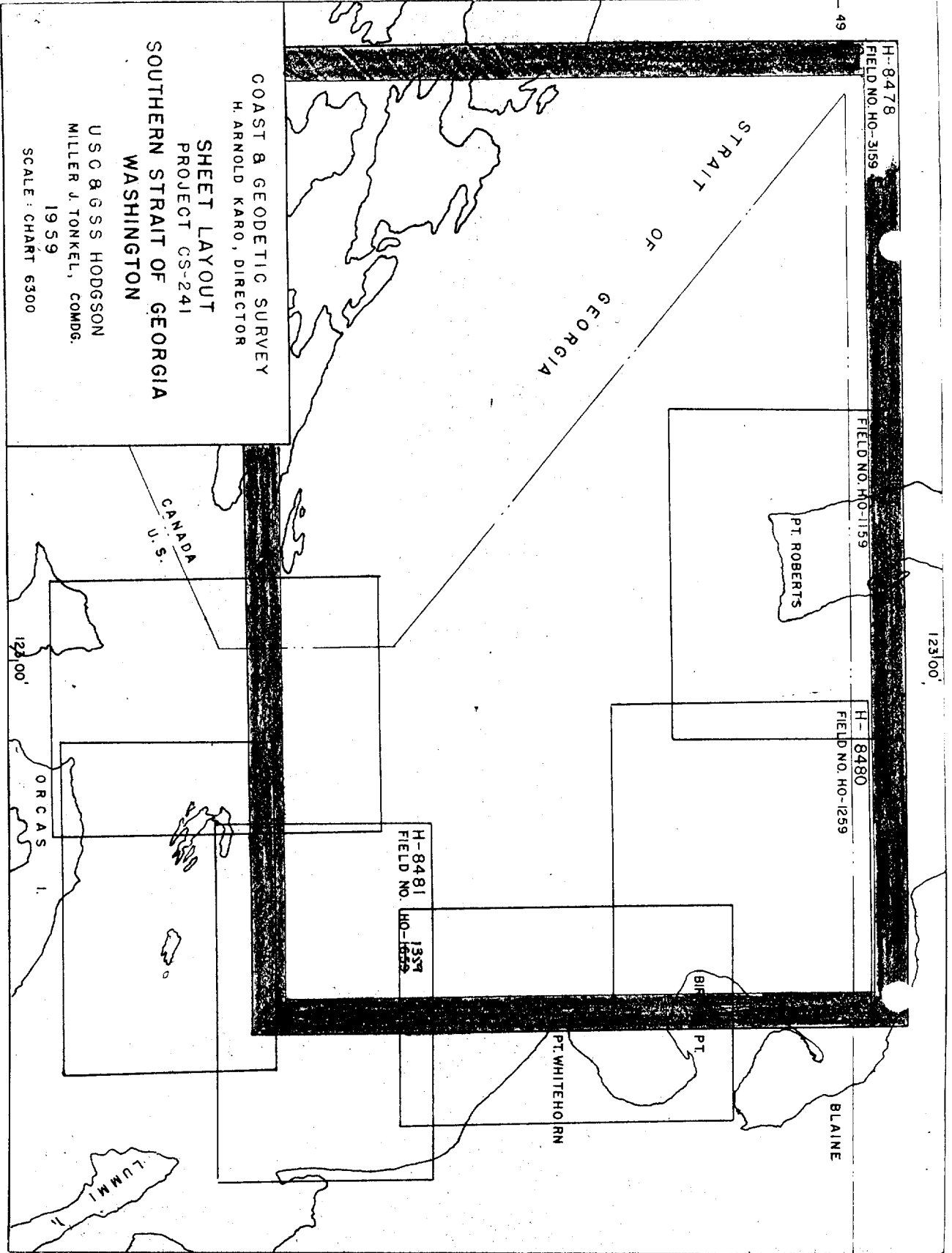
LIST OF SIGNALS ✓

And	Patos Island Light (1940)
Ark	Offshore Range Mark
Joy	T-8447
Liz	T-8447
Rob	Point Roberts Light (Pt. Roberts Lighthouse)
Sat	Saturna Is. Ea. Pt. Light HO (Canada), 1942
Tri	Trident, 1857
Vim	T-8447
Zag	T-8447

(Shoran Control)

Located by 3rd-Order Triangulation

Sho-ROB	Lat. $48^{\circ} 58' 17.62''$; Long. $123^{\circ} 04' 56.22''$
Sho-PAT	Lat. $48^{\circ} 47' 20.56''$; Long. $122^{\circ} 58' 10.22''$
Sho-WHIT	Lat. $48^{\circ} 53' 37.76''$; Long. $122^{\circ} 47' 30.66''$



H-8478
FIELD NO. HO-3159

FIELD NO. HO-1159

H-8480
FIELD NO. HO-1259

H-8481
FIELD NO. HO-1655
1357

COAST & GEODETIC SURVEY
H. ARNOLD KARO, DIRECTOR
SHEET LAYOUT
PROJECT CS-241
SOUTHERN STRAIT OF GEORGIA
WASHINGTON

U.S.C. & G.S.S. HODGSON
MILLER J. TONKEL, COMDG.
1959
SCALE: CHART 6300

123 00'

123 00'

BLAINE

PT. WHITEHORN

PT. ROBERTS

STRAIT OF GEORGIA

CANADA
U.S.

ORCAS I.

LUMMI I.

GEOGRAPHIC NAMES LIST

HYDROGRAPHIC SURVEY NO. H-8478

STRAIT OF GEORGIA

BOUNDARY BAY

✓ Echo Correctors Applied - SHIP

(From curve)

EDO-UQN No. 57-210
 H-8478, A-day
 Corr. Range
 (FEET)

+ 7.5	0.0 to 31.5
+ 8.0	81.0
+ 8.5	132.5
+ 9.0	181.5
+ 9.5	231.0
+10.0	277.5
+10.5	324.0
+11.0	369.0
+11.5	420.0
+12.0	471.0
+12.5	520.5
+13.0	570.0
+13.5	606.0

EDO-UQN No. 57-210
 H-8478, A-day
 Corr. Range
 (FATHOMS)

+ 0.1	0.0 to 15.5
+ 0.2	25.5
+ 0.3	31.0
+ 0.2	36.5
+ 0.4	56.5
+ 0.6	76.0
+ 0.8	96.0
+ 1.0	138.5

808-Type No. 147
 H-8478, A-L days
 Corr. Range
 (FATHOMS)

+ 1.7	4.5 to 14.5
+ 1.8	24.5
+ 1.9	31.0
+ 1.8	34.0
+ 2.0	53.0
+ 2.2	72.0
+ 2.4	92.0
+ 2.6	101.0
+ 2.5	122.0
+ 3.0	168.5

808-Type No. 147 - - - - -
 H-8478, M - R days
 Corr. Range
 (FATHOMS)

+ 1.7	0.0 to 9.0
+ 1.8	16.0
+ 1.9	24.0
+ 2.0	40.4
+ 2.2	57.4
+ 2.4	75.4
+ 2.6	93.4
+ 2.8	101.0
+ 3.0	154.0
+ 3.5	200.0

H-8478, S - V days
 Corr. Range
 (FATHOMS)

+ 1.7	0.0 to 6.0
+ 1.8	13.0
+ 1.9	21.0
+ 2.0	36.0
+ 2.2	53.0
+ 2.4	70.0
+ 2.6	88.0
+ 2.8	101.0
+ 3.0	146.0

H-8478, W - X days
 Corr. Range
 (FATHOMS)

+ 1.7	0.0 to 6.0
+ 1.8	14.0
+ 1.9	21.0
+ 2.0	41.0
+ 2.2	56.0
+ 2.4	72.0
+ 2.6	91.0
+ 2.8	101.0
+ 3.0	151.0

808-Type No. 147 - - - - -
 H-8478, Y - AC days
 Corr. Range
 (FATHOMS)

+ 1.7	0.0 to 7.0
+ 1.8	15.0
+ 1.9	23.0
+ 2.0	40.0
+ 2.2	57.0
+ 2.4	75.0
+ 2.6	92.0
+ 2.8	101.0
+ 3.0	152.0

APPROVAL SHEET
HYDROGRAPHIC SHEET H-8478

The hydrography on this sheet was accomplished under supervision of the Commanding Officer. The Mylar cover sheet, smooth boat sheet and the field records were examined daily. ✓


The plotting of the smooth sheet was principally accomplished by ENSIGN Richard E. Alderman and was completed by ENSIGN James H. Blumer under supervision from this command. ✓

The survey is adequate for charting and basically complete. Special reference is made to two discrepancies in the field work which were discovered during smooth plotting. Reference is made to Section E, last paragraph on page 3, and to Section J on page 4 of this report. A single line of hydrography along the International Boundary northwestward to the westernmost extremity of the sheet would have rectified this holiday. Unfortunately the error in plotting the survey limits was not discovered until quite recently during the smooth plotting. Since this holiday falls in deep water (60 - 100 fathoms), no additional hydrography is recommended. ✓

In regard to the small area described in Section 4 of this report, additional work is recommended in order to further develop the shoaler depths. At Latitude $48^{\circ} 47.9'$, Longitude $122^{\circ} 59.8'$, a sounding of 31 fathoms appears along a ridge which is surrounded by depths over 100 fathoms. This area will appear on the proposed 1:10,000 scale sheet to the south, and it is recommended that the described ridge be developed as a part of that sheet by the vessel carrying on the project in 1960. ✓

This area is adequately covered by H-8520 (1960) 1:10,000

Junctions with contemporary surveys and comparisons with prior surveys are satisfactory.


Miller J. Tonkel
LCDR, C&GS
Chief of Party

RHC

TIDE NOTE FOR HYDROGRAPHIC SHEET ✓

~~Division of Hydrography and Oceanography~~ 31 March 1960

Division of Charts: R. H. Carstens

Plane of reference approved in
13 volumes of sounding records for

HYDROGRAPHIC SHEET 8478

Locality Georgia Strait, Washington

Chief of Party: M. J. Tonkel in 1959
Plane of reference is mean lower low water, reading
4.5 ft. on tide staff at Blaine
40.5 ft. below B. M. 4 (1934)

4.2 ft. on tide staff at Echo Bay
10.2 ft. below B.M. 1 (1956)

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

- Blaine 8.6 feet
- Echo Bay 7.9 feet

Condition of records satisfactory except as noted below:

William H. Hobbs
Chief, Tides Branch
~~Chief, Division of Tides and Currents~~

GEOGRAPHIC NAMES ✓

Survey No. H-8478

Name on Survey	On Chart No. 6300		On U. S. quadrangle Maps	From local information	On local Maps	P. O. Guide or Map	Rand McNally Atlas	U. S. Light List	
	A	B							
STRAIT OF GEORGIA	✓							BGN	1
BOUNDARY PASS	✓								2
ALDEN BANK	✓	DEW							3
PATOS I.	✓	DEW							4
PT. ROBERTS	✓	DEW							5
BIRCH POINT	✓	DEW							6
TIDE STATION BLAINE	✓								7
PT. WHITEHORN	✓	DEW							8
									9
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George M. Ball
Geographic Names Section
 18 March 1960

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-8478.

Records accompanying survey: Smooth sheets ...¹.; boat sheets ..¹...; sounding vols. ..¹³...; wire drag vols.; Descriptive Reports ..¹...; graphic recorder envelopes ..⁷...; special reports, etc.

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

Number of positions on sheet	.....	2763		INSP.
Number of positions checked	.....	126	12	2
Number of positions revised	.....	8	5	2
Number of soundings revised (refers to depth only)	.....		5	
Number of soundings erroneously spaced	.....		0	
Number of signals erroneously plotted or transferred	.....		0	
Topographic details	Time	.....	27	
Junctions	Time	.....	86	
Verification of soundings from graphic record	Time	8 hours	0	1/2
Special adjustments	Time	.....	0	

Verification by *Allan S. Schugart* Total time *113 hrs* Date *10/31/63*
 Reviewed by *Frank J. Parlay* Time *126* Date *7/21/64*
George A. Rogemeyer
 Inspected by: *Dale E. Westbrook* TIME 29 hrs DATE 5 Jan. 1971
Carstens 11 603

Another important feature, Alden Bank, falls in the southeast corner of the present survey but it was surveyed on H-8481 (1959). Bottom characteristics in the survey area are predominantly soft blue mud and broken shells.

2. Control and Shoreline

The source of control is given in the Descriptive Report. There is no shoreline within the survey limits, however some shoreline from T-8447 (1950-52), T-5581(N) and T-5581(S) 1949-52, and T-1870 (1888) was added to the smooth sheet for orientation purposes.

3. Hydrography

- A. Depths at crossings are in good agreement.
- B. The usual depth curves were adequately delineated.
- C. The development of the bottom configuration and the investigation of least depths are considered adequate.
- D. The holiday along the western United States-Canadian Boundary mentioned in the descriptive report of this survey is considered unimportant since it falls in deep water (60-100 fathoms) and no additional hydrography is recommended.

4. Condition of the Survey

The field plotting, sounding records, and Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual.

5. Junctions

Adequate junctions were effected with H-8520 (1960) and H-8519 (1960) on the south, H-8481 (1959) and H-8323 (1956) on the southeast, H-8518 (1960) on the east, H-8480 (1959) on the northeast, and H-8479 (1959) on the north. On the northwest and west, the limits of this survey are the project limits at the United States-Canada Boundary; present survey depths are in harmony with charted depths along that limit.

6. Comparison with Prior Surveys

A.	H-405	(1853)	1:200,000
	H-709	(1858-59)	1:100,000

The few soundings on these small-scale early reconnaissance surveys which fall within the present survey show fair agreement with present survey depths. The larger scale and more complete delineation on the present survey qualifies it to adequately supersede these prior reconnaissance surveys within the common area.

B.	H-2079	(1889-91)	1:20,000
	H-2049	(1890)	1:20,000
	H-2080	(1891)	1:20,000

H-2079 covers the eastern portion of the present survey. A comparison between prior and present depths reveals no major change in the bottom. Some shoaling in the deeper areas is apparent, however, as a result of deposition of sediments since the prior survey.

H-2049 covers the north and northeast portion of the present survey. In numerous instances, soundings on this prior survey are substantially deeper than those on the present survey, whereas, in other instances, there are only minor differences. The erratic nature of these older soundings can be attributed to a sloping sounding wire caused by strong currents. Overall, there is good general agreement, except for an indication of minor sedimentation.

H-2080 covers the southern portion of the present survey. There are, in general, only minor differences between present and prior survey depths, except that some inconsistency was noted in the soundings on this prior survey as was also noted on H-2049.

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

7. Comparison with Chart 6380 (17th Ed., February 21, 1970)

A. Hydrography

The charted hydrography originates principally with the present survey before review and after verification. The

And

hydrography as presently charted adequately reflects the results of this survey, except that the 13-fathom sounding charted in lat. $48^{\circ}55.43'$, long. $122^{\circ}55.85'$ from the present survey before review was found to be recorded in error and is actually 16 fathoms. The 13-fathom sounding should be deleted from the chart and should be replaced in accordance with depths now shown on the present survey.

B. Aids to Navigation

No aids to navigation fall within the limits of this survey.


8. Compliance with Instructions

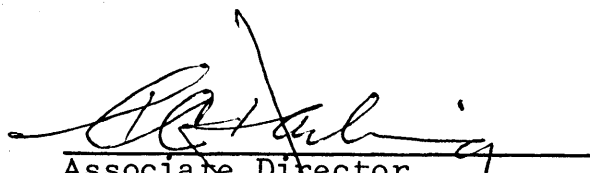
The survey adequately complies with the Project Instructions.

9. Additional Field Work

This is an excellent basic survey and no additional hydrography is recommended.

Examined and Approved:


Chief
Marine Chart Division


Associate Director
Office of Hydrography
and Oceanography

