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Form 504 Rev. April 1935	
DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY	
DESCRIPTIVE REPORT	
<del>Hydrographic</del> Hydrographic	Reg. No. H-6576 Sheet No. 2240
U. S. COAST & GEODETIC SURVEY LIBRARY AND ARCHIVES MAY 9 1941 Acc. No. ....	
State Southeast ALASKA	
LOCALITY	
GLACIER BAY	
MUIR INLET	
1934	
CHIEF OF PARTY	
Benjamin H. Rice	

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REG. NO. H6576

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. 2240

REGISTER NO. H-6576

State Southeast, ALASKA

General locality GLACIER BAY

Locality MUIR INLET

Scale 1:20 000 Date of survey June 20-Sept. 9, 1940

Vessel WESTDAHL

Chief of Party Benjamin H. Rigg

Surveyed by Benjamin H. Rigg, J. C. Bose, William F. Deane

Protracted by M. C. Parsons

Soundings penciled by M. C. Parsons

Soundings in fathoms ~~500~~

Plane of reference M. L. L. W.

Subdivision of wire dragged areas by

Inked by A. R. STIRNI

Verified by A. R. STIRNI

Instructions dated March 10, 1938, April 19, 1939, 19

Remarks: smooth sheet & plotting by Seattle Processing Office.

# DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SHEET (FIELD) NO. 2240

REGISTER NO. H-6576

WESTDAHL

PROJECT HT-221  
Season of 1940

Benjamin H. Rigg,  
Chief of Party.

## INSTRUCTIONS:

The survey was made in accordance with Instructions from the Director dated March 10, 1938 and Supplemental Instructions dated April 19, 1939.

## LIMITS:

The area covered by this sheet lies between Lat.  $58^{\circ} 44.6'$  and Lat.  $58^{\circ} 59'$ , and between Long.  $136^{\circ} 00'$  and  $136^{\circ} 12'$ . It is that branch of Glacier Bay known as Muir Inlet, which extends from Sebree Island to the face of Muir Glacier. However, on account of dense floe ice, and large bergs, the hydrography could not be carried to the face of the glacier but stopped about two miles south of it.

## SURVEY METHODS:

Standard methods were used for measuring depths and fixing positions.

Triangulation stations and topographic signals located by planetable were used for obtaining three-point fixes.

Soundings in areas close to the shore and on shoals were taken from a launch; those in deeper water were taken by the WESTDAHL.

In depths of about 10 fathoms or less the launch party used a wire-centered leadline with a 12 pound lead; in greater depths, soundings were taken by means of a stranded wire and twenty-five

pound lead, operated by a power driven sounding machine.

Most of the soundings obtained by the WESTDAHL were taken with the Dorsey Fathometer **III**. However, the failure of the rotary converter on September 7th rendered the fathometer inoperative and soundings taken on two subsequent days, September 8 and 9, 1940, were taken with the ship's sounding machine, using stranded wire and a 35 pound lead.

A separate report on the operation of the fathometer has been submitted. The fathometer corrections determined for the 1940 season are given in the following tables:

Depth in fathoms	Corrections in feet
0 - 1 5/6	0
2 - 9 5/6	-1
10 - 17 5/6	-2
18 - 25 5/6	-3
26 - 33 5/6	-4
34 - 41 5/6	-5
42 - 49 5/6	-6
50 - 56 5/6	-7
57 - 64 5/6	-8
65 - 72 5/6	-9
73 - 80 5/6	-10
81 - 87 5/6	-11
88 - 99 5/6	-12

Depth in fathoms	Correction in fathoms
100 - 105	-2
106 - 148	-3
149 - 197	-4
198 - 225 +	-5

DISCREPANCIES:

There are no discrepancies in positions and no discrepancies of appreciable amount between soundings. However, this report is written before the smooth sheet has been plotted and is based on the soundings appearing on the boat sheet, which have not had fathometer corrections applied to them and for which the tide reducers were computed from predicted tides. However, it is believed that no disagreement between soundings exists except that resulting from steeply sloping bottom.

DANGERS:

Caroline Shoal (Lat.  $58^{\circ} 46.5'$ , Long.  $136^{\circ} 07.5'$ ) is a gravel bank, of glacial moraine origin, which is just awash at average high tide. It bares <sup>awash MLLW</sup> 17 feet at MLLW. The northern edge is usually marked by a group of grounded icebergs.

There is a shoal with a least depth of 9 fathoms in Lat.  $58^{\circ} 46.7'$ , Long.  $136^{\circ} 03.15'$ , southeast of Garforth Island. Half an hour was spent in drift sounding and searching for the least depth. See Vol. 3, Page 27, Position 39K.

Two rocks awash lie a short distance off the bold point on the west shore of Muir Inlet in Lat.  $58^{\circ} 54.35'$ , Long.  $136^{\circ} 06.4'$ . They both bare two feet at MLLW. See Vol. 4, Page 3 and 4.

There is a shoal with a least depth of  $3 \frac{5}{6}$  fathoms at the entrance to CUSHING ARM, in Lat.  $58^{\circ} 56.75'$ , Long.  $136^{\circ} 08.0'$ . See Vol. 5, Pages 66 and 67, Positions 57 and 58p. Twenty minutes were spent in drift sounding. Ice bergs frequently ground on this shoal. Some large ice bergs were aground on a part of the shoal while the launch party was looking for the least depth. The hydrographer feels certain that the least depth was found because the grounded bergs drew so much water that they must have grounded in a depth greater than 6 fathoms.

Approximately in the middle of CUSHING ARM, Lat.  $58^{\circ} 56.1'$ , Long.  $136^{\circ} 09.95'$ , is a reef which bares  $\frac{9}{8}$  feet at MLLW. It is shown on Topographic Sheet Register No. T-6758. This reef is almost always surrounded by grounded ice bergs.

The channel between Muir Island and the east shore of Muir Inlet, Lat.  $58^{\circ} 57.6'$ , Long.  $136^{\circ} 07.0'$  is foul and passage should not be attempted.

#### CHANNELS:

Muir Inlet itself can be considered a channel. Deep water exists in midchannel throughout, with a controlling depth of about 33 fathoms between Caroline Shoal and Garforth Island. Muir Inlet is a glacial fiord and contains depths up to about 175 fathoms.

There is a narrow channel west of Caroline Shoal, running in a north and south direction. The controlling depth in midchannel is about <sup>10</sup>~~seven~~ fathoms. Passage through this channel should not be attempted without local knowledge because a foul area extends eastward for a considerable distance from the low point on which trian-

gulation station LINE 1939 is located.

There is a channel between Garforth Island and the east shore of Muir Inlet. The controlling depth, north of the island, is six fathoms. There is much kelp in the shoalest part of this channel.

There is deep water in Adams Inlet about as far eastward as Long.  $136^{\circ} 01'$ . East of this line the bottom shoals rapidly and the bottom rises to the low water line so abruptly that a vessel going too far might ground without warning even if taking frequent soundings.

CUSHING ARM contains the reef previously mentioned. Vessels going into this inlet should favor the north shore. CUSHING ARM is usually so filled with large bergs and small growlers that navigation is usually difficult. Discharges of large masses of ice from the face of Cushing Glacier set up waves and surges which make it dangerous for small boats to stay very close to either shore in the upper reaches. All craft navigating this and other ice filled waters should be on the alert in passing close to large bergs, as these masses of ice turn over or disintegrate at intervals, sometimes very suddenly.

#### ANCHORAGES:

Small craft can anchor in the cove on the west side of Sebree Island. Holding ground is good and ice seldom drifts in. However, this cove is exposed to southerly winds.

Vessels can anchor in the north-eastern corner of the navigable part of Adams Inlet. The WESTDAHL anchored a few times in Lat.  $58^{\circ} 51.2'$ , Long.  $136^{\circ} 01.1'$ . One objectionable feature of this anchorage is the fact that Adams Inlet has strong currents, especially at ebb

tide. At ebb tide, the combined effect of the tidal current and the glacial torrent discharging into the inlet causes ice bergs to travel with considerable velocity and a vessel struck by such a berg might suffer serious damage. Small bergs from Adams Glacier are carried into Adams Inlet by the stream and large bergs, from other glaciers and floating in Muir Inlet, frequently drift into Adams Inlet. See also D.R.T-6757 (1940) "Ice Conditions"

There is a fairly good anchorage in the bight between triangulation stations PLATEAU 1939 and DENSON 1939, in Lat.  $58^{\circ} 54.65'$ , Long.  $136^{\circ} 07.45'$ , which was used often by the WESTDAHL while working in Muir Inlet. The area in which the depth is suitable for anchoring is rather small but holding ground is good. Ice bergs drift into this bight but in small numbers, considering the proximity of Muir and Cushing Glaciers. Bergs that drift in do not travel with dangerous velocity. This anchorage is not very good during strong South-east winds, which, in addition to causing choppy waves would bring in ice in larger quantity. In entering this bight when coming from the north or in leaving it when going to the northern part of Muir Inlet, care must be taken to avoid the rocks just east of the bold point at triangulation station PLATEAU 1939. These rocks have been described in the section of this report dealing with dangers.

Small fishing boats can anchor in the small cove east of Muir Island, Lat.  $58^{\circ} 57.6'$ , Long.  $136^{\circ} 06.25'$ . This cove is narrow and shoal but it was always found free of ice during the summer.

Another cove in which small vessels can find anchorage is situated in Lat.  $58^{\circ} 58.55'$ , Long.  $136^{\circ} 06.5'$ . This cove has more



swinging room than the last named cove but floe ice frequently drifts in.

COMPARISON WITH PREVIOUS SURVEYS:

There is no previous survey.

GEOGRAPHIC NAMES:

Muir Inlet, Adams Inlet, Caroline Shoal, Sebree Island, and Garforth Island are well established names and appear on the C. & G. S. Chart of Glacier Bay, No. 8306.

A few new names were recommended by the topographer. See descriptive reports for Topographic Sheets C, D, and E. (Register No. T-6756, (1940) T-6757, and T-6758) and section in season's report dealing with the subject of geographic names.

STATISTICS:

Stat. miles of sounding lines - - -	442.8	173.0	Fathometer
		21.6	Wire (ship)
		185.5	Wire (launch)
		0.0	Hand Lead (ship)
		62.7	Hand Lead (launch)
Number of positions - - - - -	3543	939	ship
		2604	launch
Number of soundings - - - - -	12332	3895	Fathometer
		389	Wire (ship)
		4829	Wire (launch)
		6	Hand Lead (ship)
		3213	Hand Lead (launch)
Area, square statute miles - - - -	37.1		

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TIDAL DATA:

Tide reducers for the area covered by this sheet were obtained from records by a portable automatic tide gauge maintained on the west shore of Muir Inlet from July 12 to September 14, 1940, in Lat.  $58^{\circ} 54.8'$ , Long.  $136^{\circ} 06.6'$ .

M. L. L. W. corresponds to 4.9 ft. on the tide staff

Highest tide observed -- 24.3 ft., September 5, 1940

Lowest tide observed -- 0.0 ft., July 25, 1940

COAST PILOT INFORMATION:

Navigation in Muir Inlet is not difficult, except for ice bergs discharged from the glaciers and ice floes resulting from the disintegration of the bergs. Ice conditions vary with the seasons. They also vary from day to day with winds and tidal currents. Northerly winds and southerly currents tend to carry the ice southward out of Muir Inlet.

A vessel should stay in midchannel; by so doing, no depth less than about 33 fathoms will be encountered.

Other information is contained elsewhere in this report under the headings of Dangers, Channels, and Anchorages.

Respectfully submitted,

*J. C. Bose*  
J. C. Bose,  
H. & G. Engr.

Approved and forwarded,

*Benjamin H. Riggs*  
Benjamin H. Riggs,  
H. & G. Engr.  
Chief of Party

*Forwarded May 1, '94*

Commodore in Charge,  
Seattle Processing Office.

RAC  
HLE

# TIDE NOTE FOR HYDROGRAPHIC SHEET

Coastal Surveys

May 27, 1941

Division of ~~Hydrography and Topography~~

✓ Division of Charts: Attention: Mr. H. R. Edmonston.

Plane of reference approved in  
11 volumes of sounding records for

HYDROGRAPHIC SHEET 6576

Locality Muir Inlet, Glacier Bay, Southeast Alaska

Chief of Party: B. H. Rigg in 1940

Plane of reference is mean lower low water reading

4.9 ft. on tide staff at Muir Inlet ✓

22.4 ft. below B. M. 1

Height of mean high water above plane of reference is 15.5 feet.

Condition of records satisfactory except as noted below:

*P. Schurman*

*Atty*

Chief, Division of Tides and Currents.

## GEOGRAPHIC NAMES

Survey No. **H6576**

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.
<u>Adams Inlet</u>									1
<u>Caroline Shoal</u>									2
<u>Cushing Arm</u>									3
<u>Cushing Point</u>									4
<u>Garforth Island</u>									5
<u>Glacier Bay</u>									6
<u>McBride Arm</u>									7
<u>Muir Inlet</u>									8
<u>Muir Island</u>									9
<u>Sebree Island</u>									10
<u>Caroline Pt.</u>									11
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Names underlined in red approved  
by L. Heck on 8/7/41

Approved names only - 8306.

## Remarks

## Decisions

1		585360 USB-0
2		585360
3	✓ Do not ink pending U.S. G.B. decision	
4	✓ " " " "	
5		585360
6		U.S. G.B.
7	✓ " " " "	"
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Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H6576**

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

Number of positions on sheet	.3543.
Number of positions checked	.47..
Number of positions revised	.....
Number of soundings recorded	.12.332
Number of soundings revised	..12..
Number of soundings erroneously spaced	...17...
Number of signals erroneously plotted or transferred	.....

Date: *July 24 1941*

Verification by *A. R. STIRNI*

Time: <sup>140</sup>  
~~135~~ hours

Review by *Harold W. Murray*

Time: *8 hrs.*

HYDROGRAPHIC SURVEY NO. **H6576**

Smooth Sheet                      One

Boat Shoet                      One

Records; Sounding 11 Vols., Wire Drag \_\_\_\_\_ Vols., Bomb \_\_\_\_\_ Vols.

Descriptive Report **Yes**

Title Sheet **Yes**

List of Signals      Yes    (in volume #1)

Landmarks for Charts (Form 567) **Yes**

Statistics **Yes**

Approved by Chief of Party **Yes** \_\_\_\_\_

Recoverable Station Cards (Form 524) **None**

Special Chart for Lighthouse Service  
(Circular Nov.30, 1933)

Hydrography: Total Days \_\_\_\_\_; Last Date \_\_\_\_\_

Remarks \_\_\_\_\_

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# MEMORANDUM

## IMMEDIATE ATTENTION

SURVEY  
DESCRIPTIVE REPORT  
~~PHOTO STATOOL~~

No. H 6576

~~XXXX~~

received May 9, 1941  
registered May 9, 1941  
verified  
reviewed  
approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25	✓	HBC	Pages 3 to 7; page 9
26			
30			
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62			
63			
82			
83			
88			
90			

RETURN TO

82	T. B. Reed
----	------------

✓ HBC

VERIFIER'S REPORT OF HYDROGRAPHIC SURVEY NO. H **H6576**

Verified and Inked by *A. R. STIRNI*

Date *July 24, 1941*

1. The descriptive report was consulted and appropriate action taken. ✓
2. Soundings originating with the survey and mentioned in the descriptive report have been verified, including latitude and longitude. ✓
3. All references to survey sheets mentioned in the descriptive report include the registry number and year. ✓
4. Geographic names of hydrographic features are in slanting lettering and of topographic features in vertical lettering. ✓
5. All items effecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken. ✓
6. All positions verified instrumentally were check marked in the sounding records. ✓
7. All critical soundings are clear and legible. ✓
8. The metal protractor has been checked within the last three months. ✓
9. The protracting and plotting of all bad crossings were verified. ✓
10. All detached positions locating critical soundings, rocks or buoys were verified. ✓
11. The boat sheet was compared with the smooth sheet. ✓
12. The spacing of soundings as recorded in the records was closely followed. ✓
13. The bottom characteristics were shown on outstanding shoals. ✓
14. The reduction and plotting of doubtful soundings were checked. ✓

15. The transfer of contemporary topographic information was carefully examined. ✓
16. All junctions were transferred. ✓
17. The notation "JOINS H " was added for all contemporary adjoining or overlapping sheets now registered. ✓
18. The depth curves have been drawn to include the significant depths. ✓
19. All triangulation stations and transfer of topographic and hydrographic signals were checked by the field party. ✓
20. Heights of rocks were checked against range of tide. ✓
21. Rocks transferred from topographic survey have a dotted curve where shown thereon. ✓
22. Unnecessary pencil notes have been removed. ✓
23. Objects on which signals are located and which fall outside of the low water line have been described on the sheet. ✓
24. The low water line and delineation of shoal areas have been properly shown (see letter of October 20, 1934).  
*Zero sounding line was inked in yellow prematurely thru mis understanding.* ✓
25. Degree and minutes values and symbols have been checked. ✓
26. Source of shoreline and signals (When not given in report).  
*T-6756 (1940)      T-6757 (1940)      T-6758 (1940)* ✓
27. Depth curves were satisfactory except as follows: ✓

28. Sounding line crossings were satisfactory except as follows: ✓

29. Junctions with contemporary surveys were satisfactory except as follows: ✓

30. Condition of sounding records was satisfactory except as follows: ✓

31. The protracting was satisfactory except as follows: ✓

32. The field plotting of soundings was satisfactory except as follows: ✓

33. Notes to reviewer:

DIVISION OF CHARTS

SURVEYS SECTION

REVIEW OF HYDROGRAPHIC SURVEY NO. 6576 (1940) FIELD NO. 2240

S. E. Alaska, Glacier Bay, Muir Inlet  
Surveyed June - September 1940, Scale 1:20,000  
Instructions dated March 10, 1938, April 19, 1939 (WESTDAHL)

Soundings: Hand Lead,  
Machine, and Dorsey  
Fathometer No. III

Control: Visual Fixes on Shore  
Signals

Chief of Party - Benjamin H. Rigg  
Surveyed by - B. H. Rigg, J. C. Bose, and W. F. Deane  
Protracted by - H. C. Parsons  
Soundings plotted by - H. C. Parsons  
Verified and inked by - A. R. Stirni  
Reviewed by - Harold W. Murray, July 30, 1941  
Inspected by - H. R. Edmonston

1. Shoreline and Signals

The shoreline and signals originate with 1940 plane table surveys T-6756, T-6757 and T-6758.

2. Sounding Line Crossings

General agreement of sounding line crossings is excellent.

3. Depth Curves

The usual depth curves may be satisfactorily drawn.

4. Junctions with Contemporary Surveys

- a. The junction on the south with H-6575 (1940) is excellent.
- b. The junction with other field work will be considered when it is received in the office.

5. Comparison with Prior Surveys

No prior surveys have been made by this Bureau in this area.

6. Comparison with Chart 8306 (New Print date 9-30-40)

Charted hydrography originates with Chart Letter 473 of 1936 and consists of a single reconnaissance fathometer line run in midchannel by the U. S. Coast Guard. Horizontal control is by bearings on natural objects and the corrections for fathometer and tides are approximate. Several miscellaneous soundings are charted in Lat.  $58^{\circ} 49'$  and are shown on the standard of chart 8306 in 1910.

Agreement of the above soundings with the present survey is only fair and the soundings should be superseded. The charted line of sunken rocks in Lat.  $58^{\circ} 46.5'$ , Long.  $136^{\circ} 08'$  is a generalized representation and should be superseded.

7. Compliance with Instructions for the Project

The survey complies with the instructions for the project.

8. Condition of Survey

- a. The sounding records are neat and legible.
- b. The protracting and plotting of soundings are satisfactory.
- c. The Descriptive Report is clear and comprehensive and satisfactorily covers all matters of importance.

9. Additional Field Work Recommended

This is an excellent survey and no additional field work is necessary.

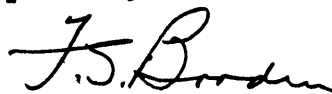
10. Superseded Surveys

No prior surveys have been made in this area by this Bureau.

Examined and approved:



Chief, Surveys Section



Chief, Division of Charts



Chief, Section of Hydrography



Chief, Division of Coastal Surveys

Applied to cht. 8202 via 8306 2-M.D. May 1942  
10 fm curve applied to cht. 8306 8/31/42 HFL

Fully app'd hydro to new Chts. 17318-17319-SC  
only to areas not ~~supp~~ superseded by  
contemporary coverage. 7/6/79 James Graham