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Form 504
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

State: Washington

11-5013

DESCRIPTIVE REPORT.

Hydrographic Sheet No. 4586

LOCALITY:

Strait of Juan de Fuca

Agate Bay to Port Angeles

1926

CHIEF OF PARTY:

H.A. Cotton

DESCRIPTIVE REPORT

HYDROGRAPHIC SHEET NO _____

STRAIT OF JUAN DE FUCA

AGATE BAY TO PORT ANGELES

MOTOR VESSEL NATOMA

HAROLD A. COTTON, COMMANDING

SCALE * 1:10,000 and 1:20,000

AUTHORITY

The Hydrography on this sheet was executed in accordance with the Directors Instructions to the Commanding Officer of the Motor Vessel NATOMA dated March 4th, 1926 and radio Instructions dated November 3rd, 1926.

LIMITS

This sheet includes the off shore hydrography of the south shore of the Strait of Juan de Fuca out to at least the Twenty Five fathom curve from Agate Bay on the west to Ediz Hook on the east. A few soundings taken about the wharves at Port Angeles are also shown. The work from Agate Bay to Tongue Point is shown on a scale of 1:10,000. Tongue Point to signal STACK on Ediz Hook on 1:20,000 and around Ediz Hook and in Port Angeles on 1:100,000. These three sections are plotted on one sheet for convenience. A splice piece with distance and Azimuth lines accompanies the sheet for use in verifying some fourteen positions using Δ signal MORSE on "a" day Ediz Hook work.

GENERAL DESCRIPTION

A detailed description of the topography has been given in the Descriptive report of the topographic sheets of the 1926 season Field Letters "A" Register No. _____, Field Letter "B" Register No. 66 _____, and Field Letter "C" Register No. _____.

Coast Pilot Notes have been submitted separately covering changes to the edition of 1926. The general description of the Coast Pilot is otherwise accurate and complete.

HYDROGRAPHIC FEATURES

Agate Bay, the small bight on the west side of Crescent Head is clear with a steep shingle beach.

There is a clear channel about Three Hundred Meters wide with Seven to Eight fathoms inshore from Crescent Rock. The bluff at Crescent Head just east of signal OUT has been blasted away and the debris forms a two fathom shoal which extends out about a Hundred meters from shore constricting this channel somewhat.

Inshore from signal PILE in Crescent Bay there formerly extended an old wharf which has burned. It was located by the topographer. It should be shown on the completed sheet as ruins of a wharf for there are still several stout piles broken off just below low water which would be dangerous to small vessels anchoring close up in the bight for protection from westerly seas.

HYDROGRAPHIC FEATURES

A least depth of eight feet M L L W was found on the reef off Tongue Point with the bottom visible. From Tongue Point eastward the coast is clear of offlying dangers though there are numerous detached rocks and boulders close to shore.

The small bight at the western end of Freshwater Bay is clear in its northern side and affords excellent protection for small boats in westerly weather. Piles have been driven at the head of the bight to secure log booms. The south side of the bight is very shoal and fouled by numerous boulders.

At low water the mouth of the Elwha River is passable to pulling boat only, and the river is unnavigable even to small boats.

The prevailing westerly weather has carried the sediment of the river to the eastward and formed a fan with projecting fingers giving a rather unusual shape to the ten fathom curve.

ANCHORAGES

Any swell in the Strait is usually felt in Port Crescent and the only protection is for such small craft as can anchor close up behind either point of the bay which affords a lee.

The northern part of the bight at the western end of Freshwater Bay affords good protection for vessels up to One Hundred tons in westerly weather. There is excellent holding bottom about Three Hundred yards in extent close up under the headland and behind the reef on which the small island is located.

Vessels will find fair holding bottom in gray sand but no protection anywhere in Freshwater Bay. The currents are strong from the ten fathom curve offshore.

DEPTH CHANGES

Least depths of three feet over Crescent rock and eight feet over the reef off Tongue Point at M L L W were found when the bottom was visible. The west side of Angeles Point has washed considerably especially near shore, the shape of the high water line being changed completely. The depths to the eastward of Point Angeles agree with the previous work fairly well.

The three and five fathom curves along the north shore of Ediz Hook are closer to shore than those shown on chart 6303 in most places but the changes are probably due to the additional soundings which define the curves more accurately. The reported shoaling off the end of Ediz Hook has not taken place.

DEPTH CHANGES cont.

A careful examination with the hand lead was made for the Two and Three Fourths fathom spot shown on chart 5303 in Latitude $48^{\circ} 07'$ plus 1230 meters, Longitude $123^{\circ} 27'$ plus 145 meters without finding any trace of it. Unless it is known to be due to wreckage it is recommended that it be expunged.

Some dredging has been done around the wharves at Port Angeles notably the new Port Commission Wharf. Soundings taken close to the various wharves show the depths available alongside them in 1926.

CURRENTS

Generally in the area covered by the sheet the Strait current which here exceeds four knots on spring tides is found in full strength just offshore from the ten fathom curve. The gradual protrusion of Angeles Point into the stream of this current markedly increases the flood strength along the ten fathom curve on the west side of the point. The difference is so marked that log tows always follow along this curve to take advantage of it.

There are unusually noticeable and sometimes quite strong tide rips off Crescent Rock. More moderate rips extend out to the twenty fathom curve off Angeles Point.

SURVEY METHODS AND ADJUSTMENTS

The usual bronze center hand lead line and stranded wire with registering sheave were used for sounding. Signals were from plane table traverse controlled by third order triangulation.

An error of ~~ten~~ fathoms in reading the registering sheave was made on positions Thirty One and Forty Nine "d" day Crescent Bay sheet. Sufficient soundings were taken on the same angles and in the same vicinity to prove this and the soundings have been rejected. What is considered almost certain to be an exchange of a seven for an eleven by the recorder occurred on position Ninety Eight "d" day Crescent Bay. It was not noticed by the hydrographer until after the party had left the field and the seven has been retained. On positions Fifty Three, Eighty Six and Eighty Seven "A" day NATOMA work on 1:20,000 sheet sevens were also exchanged for elevens and were later disproved by developing on positions One to Sixty "Q" day of the launch records.

The position of another object was originally transferred to the boat sheet for signal "BOW" Crescent Bay. The mistake was discovered and caused only the replotting of a few positions on the boat sheet.

On extending the hydrography from Angeles Point to Ediz Hook in accordance with the radio instructions of November 3rd, 1926 it was discovered that signal BLAZ had been located some sixty meters east of its true position. In order to take advantage of the weather and as the preceding traverse had closed satisfactorily, the sounding was done with signals still standing (using their old positions) and supplementing them by a few small signals cut in for fixes at the ends of the lines.

SURVEY METHODS AND ADJUSTMENTS cont.

A plane table traverse was made from Signal BLAZE to Signal BIGHT to locate these supplementary signals and of course did not close. Sextant cuts disclosed that the principal error was at BLAZ but as the smooth sheet is somewhat distorted, did not give a satisfactory location for the signals themselves. It was also apparent from the plotting that an adjustment made at the end of a long Traverse involving signals "DID" and "FAT" was doubtful. Accordingly a traverse was made with a tape and a Four inch theodolite between Angeles Point boundary monument and Δ signal BIGHT and extended to the westward to relocate signals DID and FAT. This traverse had to be made at high water and under many difficulties but closed with an error of 1:556 (ten meters in 5500 meters) has been adjusted and accepted for the location of the signals on the smooth sheet. This jump in the position of \odot signal BLAZ after the sounding has been done caused two gaps in the the lines in the deeper water off ~~that~~ signal. The extra expense of splitting these lines when the gaps had been discovered did not seem warranted.

A very weak theodolite location for signal "COOP", the stack of the Port Angeles Cooperage Co. Mill was found to be incorrect. The stack was relocated with theodolite directions from three stations and is now correctly shown on the smooth sheet. The position of this signal on topographic sheet field Letter "C" should be changed.

In plotting the hydrography about the wharf of the Nelson Lumber Co. and adjacent wharves it developed that they were displaced about Ten meters northwest possibly due to the incorrect plotting of a triangulation station on the topographic sheet. A theodolite station was occupied on the Nelson Lumber Co. wharf and cut in from station ANGELES 2 which was being occupied at the same time. The wharves have been shifted to agree with the computed theodolite position and the hydrography on the smooth sheet.

H. G. E.

*See Landmark letter of Dec. 15, 1926
with photo.*

TABLE OF STATISTICS.

Crescent Bay.

Date	Day Letter	Volume	Statute Miles	Positions	Soundings	Boat motor sailer
May 4	a	1	8.3	81	269	8610
" 5	b	1	12.1	140	426	"
" 6	c	1	8.6	131	400	"
" 7	d	1-2	7.5	126	148	"
" 25	n	4	3.3	66	144	"
		Area 1.9 sq.miles.	39.8	544	1387	

Tongue Point to Ediz Hook.

Date	Day Letter	Volume	Statute Miles	Positions	Soundings	Boat motor sailer
May 10	e	2	15.3	196	273	8610
" 11	f	2	22.6	213	618	"
" 12	g	3	21.2	175	481	"
" 13	h	3	7.1	35	108	"
" 14	j	3-4	22.5	189	24	"
" 18	k	4	14.6	169	413	"
" 24	m	4	23.5	146	417	"
" 25	n	4-5	10.7	65	209	"
Nov. 12	p	5	15.7	119	269	"
" 16	q	5	5.2	73	142	"
" 12	A	1	20.8	165	324	Natoma
" 13	B	1	20.4	118	309	"
" 16	C	1-2	14.0	105	232	"
		Area 18.2 sq.miles.	213.6	1708	3819	

Port Angeles and Ediz Hook

Date	Day Letter	Volume	Statute Miles	Positions	Soundings	Boat motor sailer
June 1	a	1	8.3	88	168	8610
" 4	b	1	2.5	30	68	"
" 7	c	1	4.0	72	230	"
July 10	d	1	5.0	89	294	"
Nov. 16	e	2	8.7	98	185	"
		Area 1.1 sq.miles.	28.5	377	945	

Totals For Sheet: 21.2 281.9 2629 6151

ADDRESS THE DIRECTOR
U.S. COAST AND GEODETIC SURVEY

AND REFER TO NO.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
WASHINGTON

January 27, 1927.

REPORT ON VERIFICATION OF HYDROGRAPHIC SHEET No. 4586

This sheet was well protracted but the soundings were not carefully plotted according to time intervals.

The ahead time was not recorded in the records in a large number of places.

The shore line should be changed on the top sheet to agree with this sheet.

H. R. Edmonston

H. R. Edmonston.

The 2 ^{foot} ~~fath~~ spot off Crescent bay
was found with the bottom
visible.

AND REFER TO No. 11-DFM

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

WASHINGTON February 18, 1927.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4586

Agate Bay to Port Angeles, Strait of Juan de Fuca

Surveyed in 1926

Instructions dated March 4 and November 3, 1926

Chief of Party, O. S. Reading.

Surveyed by O. S. R. and M. O. Witherbee.

Protracted by O. S. R. and C. I. Aslakson.

Soundings plotted by C. I. A.

Verified and inked by H. R. Edmonston.

1. The records conform to the requirements of the General Instructions except that the ahead times were not recorded in many instances.
2. The plan and character of development conform to the requirements of the General Instructions.
3. The plan and extent of the survey satisfy the specific instructions.
4. Comparisons of sounding line crossings and closely adjacent soundings show some differences in excess of allowable limits, but none of cartographic value nor sufficient to discredit the value of the survey.
5. The information is sufficient for drawing the usual depth curves.
6. The field plotting was completed to the extent prescribed in the General Instructions. The protracting was well done but the soundings were not carefully plotted according to time intervals.
7. The junctions with the previous surveys are adequate and show that no material changes have occurred in the area covered by the new survey.
8. No additional leadline surveying is required, but the eastern extension of Crescent Rock and the two shoal areas northwest of Tongue Rock should be dragged to obtain the minimum depths.

9. Leadline corrections appear in the sounding records on 8 days (maximum correction 4 feet in 15 fathoms). Identical errors are recorded for 6 successive lead line tests. As a phosphor bronze line was used, it is evident that the line was erroneously marked.
10. The character and scope of the surveying and field drafting are very good.
11. Reviewed by E. P. Ellis, February, 1927.

Approved:



Chief, Section of Field Records (Charts)

Chief, Section of Field Work (H. & T.)

(11)

WV 1

January 12, 1927.

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in
volumes of sounding records for

9 HYDROGRAPHIC SHEET NO.

Locality: **4586**

Chief of Party: **JUAN DE FUCA STRAITS**

Plane of reference **H_s A. Cotton**
ft. on tide staff at **MLLW**

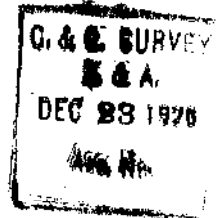
3.3		Port Angeles
2.6 ft.	do	Port Crescent

For reduction of soundings, condition of records satisfactory
except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted
3. Time meridian not given at beginning of day's work.
4. Time (whether A. M. or P. M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY



HYDROGRAPHIC TITLE SHEET

The finished Hydrographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

4586

U. S. Coast and Geodetic Survey.

Register No. 4586

State . . . Washington

General locality . . . Strait of Juan de Fuca

Locality . . Agate Bay to Port Angeles

Chief of party HAROLD A. COTTON

Surveyed by . . Q. S. Reading and M. O. Witherbee

Date of survey . . May - November 1926

Scale 1:10,000 and 1:20,000

Soundings in . . . feet

Plane of reference . . Mean Lower Low Water

Protracted by Q.S.R., C.I.A. Soundings in pencil by C.I.A. *Cotton*

Inked by Verified by

Records accompanying sheet (check those forwarded):

Des. report, 1 Tide books, _____ Marigrams, 3 Boat sheets,

2 Sounding books, _____ Wire-drag books, 1 Photographs.

1 Landmark for charts 1 Cahier Triangulation computations

Data from other sources affecting sheet

1 Cahier Traverse Computations

1 Record Traverse Angeles Point Monument to A Bight

1 Record Triangulation in Port Angeles

Remarks: