4633a
4633b

4633a
4633b

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. ..... Office No. 4633a&b

LOCALITY

State Washington

General locality Cape Disappointment

Locality -ment - Columbia River to Grays Harbor

1926

CHIEF OF PARTY

T. J. Maher

LIBRARY & ARCHIVES

DATE .....

8-1870-1 (1)++

In a sandy-bottom area, there is a 54 fathom sounding at 46°18.5' N., 124°34' W., and a 62 fathom sounding about 1/2 mile northward. These two soundings are pressure tube soundings, and are bracketed by three vertical-cast soundings of 77 fathoms.

Sonic soundings were also used in this survey. The Chief of Party questioned validity of some of the sonic soundings, as at test locations in depths less than 100 fathoms, several listeners varied as much as 30 to 50 fathoms from the actual depth.

Tube soundings were obtained by pairs of pressure tubes, the reading from one being used to check the other. A recheck of the records confirmed the soundings shown on the smooth sheet.

The 54 and 62 fathom soundings were not mentioned in the D.R., and the 54 fathoms has been used in charting since 1929 (see Chart 6002). Though the 54 and 62 appear questionable considering the adjoining depths and the type of bottom in this area, no additional specific data is available to reject prior judgement in accepting the soundings.

Lacking information to the contrary, depths must remain as shown on the smooth sheet.

Samuel Carstens
C.B.S. per R.H.C. 9/16/68

This expert judgement appears to be the only acceptable one for nautical charting. I would, however, recommend these two soundings not be considered as valid for bathymetric mapping at 1:250,000 scale. All the sandy bottom characteristics in this terrace area would tend to disprove the existence of such outcrops.

C324 McAlinden
9-24-68

See attached letters for reason issue was posed at this time. Jmca

ADDRESS ONLY THE DIRECTO
BUREAU OF COMMERCIAL FISH

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES
WASHINGTON, D.C. 20240

AUG - 2 1968

Memorandum

To: Administrator, Environmental Science Service Administration

From: Director, Bureau of Commercial Fisheries

Subject: Request for Plastic Overlay of C&GS Chart No. 6002

The United States Government has an agreement in force with the Soviet Union relating to fishery problems of mutual concern in the Northeastern Pacific Ocean. Under this agreement, the Soviet Government agreed to adopt measures necessary to ensure that their vessels will not fish in certain areas off Oregon and Washington to avoid conflicts with U.S. fishermen who have traditionally fished these areas. One such area lies between 46°10'N. and 47°00'N. where the Soviet Union agreed to remain outside of the waters marked by the 110-meter isobath, which corresponds to a depth of 60 fathoms.

Our Bureau is working very closely with the Coast Guard in maintaining surveillance over the Soviet fishing operations in the Pacific Northwest to ensure that the provisions of this agreement are observed. However, we are encountering some difficulty in maintaining proper surveillance since we lack a chart showing the 60-fathom curve.

We wish to have made a plastic overlay of Coast and Geodetic Survey Chart No. 6002 showing the 60-fathom contour between 46°10'N. and 47°00'N. west to latitude 124°40'W. In the event such an overlay is not available, we wish to have Chart No. 6002 marked with the 60-fathom line in the aforementioned area.

Should there be any cost involved in fulfilling our request, we shall be glad to arrange for payment. Your prompt assistance to this matter will be greatly appreciated.

Acting Director
for H. E. Crowther

C32(

AUG 16 1968

Chart mailed 8-19-68

C32

Memorandum

To: Director, Bureau of Commercial Fisheries

From: Administrator, Environmental Science Services Administration

Subject: Request for C&GS Chart No. 6002

In response to your August 2, 1968, request, our Marine Chart Division will compile and display a 110-meter (60-fathom) isobath on a current paper copy of Chart 6002. This chart should be forwarded to you no later than August 15.

The best possible interpretation of available existing data will be used. The prime data source will be basic hydrographic surveys accomplished in 1936, more than 40 years ago. This information is considered adequate for compiling nautical charts designed for surface navigation; however, it may be lacking in some aspects when used for other purposes.

Your memorandum implies that the requested isobath may be used as a definitive boundary for an existing international agreement relating to fishery problems. I would appreciate being advised of this, and similar situations, that might place added requirements on our surveying and mapping efforts.

(Signed) John W. Townsend, Jr.

For Robert M. White

C32JOBoyer:8/8/68

DISPATCHED AUG 16 1968

In a sandy-bottom area, there is a 54 fathom sounding at 46°18.5' N., 124°34' W., and a 62 fathom sounding about 1/2 mile northward. These two soundings are pressure tube soundings, and are bracketed by three vertical-cast soundings of 77 fathoms.

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C.B.S. per R.H.C. 9/16/68

4633a and 4633b

Form 504

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

....., *Director*

4633a and 4633b

U. S. C. & G. SURVEY
L. R. A.
Acc. No.

State: Washington

DESCRIPTIVE REPORT

~~*Topographic*~~
Hydrographic } *Sheet No.* 1 and 1a { 4633a / 4633b

LOCALITY

Cape Disappointment
Columbia River to Grays
Harbor

1926

CHIEF OF PARTY

T.H. Maher

GOVERNMENT PRINTING OFFICE

T

U. S. COAST AND GEODETIC SURVEY,

Col. E. Lester Jones, Director.

DESCRIPTIVE REPORT TO ACCOMPANY SHIPS OFFSHORE HYDROGRAPHIC

SHEETS 1 & 1a.

RADIO ACCOUSTIC SOUND RANGING.

COAST OF WASHINGTON.

1926.

U.S.C. & G.S.S. "GUIDE",

Thos. J. Maher, Cheif of Party.

DEPARTMENT OF COMMERCE
U.S. COAST & GEODETIC SURVEY
Col.E.Lester Jones, Director.

DESCRIPTIVE REPORT
to accompany

SHEETS 1a & 1b
Columbia River to Grays Harbor,
1926

Thos. J. Maher, Chief of Party.

This sheet was protracted entirely by Lieut. E. H. Bernstein, he being the senior and best available officer for that work, this being the first application of radio acoustic ranging over a large area. While engaged on the field work numerous difficulties developed which could not be foreseen nor anticipated; the causes of some are as follows;- mechanical difficulties in the apparatus, particularly in the metronomes due to corrosion of pivots, bearings and springs; the failure of the sound to always follow a straight path, possibly on account of shoals or banks. These difficulties are shown by the wavy appearance of some of the plotted lines.

Unreliable radio operators also caused trouble. In one instance radio dashes were received from one station which gave positions which seemed somewhat erratic but still possible. After running a couple of hours on a straight course an abrupt change was made which positions from this station did not indicate. An investigation made the next day indicated that the hydrophone at that station had been out of operation during the entire period and that the operator was estimating time intervals and operating the metronome by hand, using the dash sent from the ship as his initial timing point.

For hydrographic work radio acoustic ranging cannot yet be considered as accurate as visual fixes. Changes have been made in the method of sending out dashes which greatly increase the accuracy of the operations but that does not affect work which has been done.

Considering the requirements of navigation and the accuracy with which charts should be made it appears to me that the use of two stations only is entirely inadequate as there is no check of any kind upon the work except a close agreement with dead reckoning. When two stations only are used the assumption is made that the velocity of sound is constant; this assumption is presumably correct though the evidence supporting it is no stronger than the evidence which indicates variations. For distances up to five or ten miles errors due to variations would be negligible but when distances range from fifty to two hundred miles there should be some evidence to show that the variations are not negligible .

If three stations are used any inaccuracies or variations can be immediately detected. The velocity of sound need not be measured over a known base, as the positions of three stations are known. We therefore have three distances and three angles.

Assuming that the ship is at a position "Y"; when the bomb is fired time intervals taken for the sound to travel to the three stations can be obtained from the chronographic tape; these three intervals, multiplied by a factor X (velocity of sound) give the distances

to the stations. There will only be one point on this chart where three intersecting lines will have the ratios of the time intervals. The three point problem may be solved and from the ratios the velocity of sound may be determined.

In this work, sound was used for horizontal control; it was also used to determine the depth. For horizontal control the operation was almost entirely mechanical, and errors which arise therein are constant. The accuracy with which the depths were obtained depended entirely upon the acuteness of hearing of the observer. Experience here as well as in the Navy has shown that very few are physically qualified to act as listeners. During the entire period of my command of this ship I have had only three officers whose work I considered reliable. On one occasion I had three officers at the sonic in the radio room at the same time; the ship was stopped with no way on her; one observer obtained soundings which practically agreed with the vertical cast, the others obtained soundings which varied thirty to fifty fathoms from the actual depth. I have called attention time after time in preceding reports to the necessity for having men detailed who have the proper acuteness of hearing for this work, and until this is done or the method discarded different results will be obtained by different observers.

Where lines cross and soundings do not check there are few occasions where I would hesitate about attributing the discrepancy to personal equations of the observers, in other words the errors lie in the vertical rather than in the horizontal ordinates. In some instances crossings were checked by vertical casts and in reply to possible enquiries as to why all discrepancies were not so checked I can make the following answer: By taking two different observers of the unselected, untrained men whom I have to choose from I can get discrepancies at almost every sounding and only two procedures could be followed, logically - do not cross lines - or check every sounding.

Almon A. Vincent, the chief radio operator of the Steamer GUIDE, submitted to me a method which would make the operation of the sonic entirely mechanical and which would eliminate entirely the personal equation of an observer.

A gully with rather steep sides makes out from the mouth of the Columbia River. In this area soundings were spaced very closely together. The irregularity of the sonic soundings is attributed partly to echoes from the sides. Numerous up and down soundings were taken in this area.

TIDES.

All tidal reductions have been referred to the open ocean as it was possible to maintain a staff at the mouth of the Columbia River.

Guages were maintained during the season at the following points; At Tongue Point, by the Washington office; at Fort Stevens, by the U.S. Engineers; at Fort Canby, by the Steamer GUIDE. Soundings are referred for tidal corrections principally to the Fort Stevens guage with the corrections for the time and range as obtained from comparative readings on the North Jetty staff.

This report consists of three parts;- The foregoing remarks by myself; a report on the method of plotting and general remarks relative to the work by Lieut. E. H. Bernstein; a memorandum relative to the tides by Ensign Francis B. Quinn.

One sheet was used in the field. When smooth plotting was considered difficulty was experienced in getting a paper with a minimum of distortion. The distance of mountain peaks, far to the southward of the working grounds of this party, which had to be used for occasional visual control made the use of a large sheet necessary. In smooth plotting the difficulty due to distortion was overcome by plotting on two sheets. The work could not be subdivided in the field on account of the remote visual control.

Thos. J. Maher,
Commanding Steamer GUIDE.

TJM/h

DESCRIPTIVE REPORT
to accompany

HYDROGROGRAPHIC SHEET "1" and "1-A"

AUTHORITY: Orders to Thos. J. Maher, Chief of Party, Ship GUIDE, dated April 17, 1926.

LIMITS: Sheet "1"; between latitudes 46° 10' to 46° 50', longitudes 124° 18' to 124° 50'; and latitudes 46° 50' to 47° 00', longitudes 124° 30' to 124° 50'.

Sheet "1-A"; latitudes 46° 10' to 47° 00', longitudes 124° 50' to 125° 50'.

SCALE: The work is plotted on the scale 1:120,000.

METHODS OF SURVEY:

Survey of ares embraced by both sheets, was made by radio acoustic sound ranging control, with a few fixes of visual control.

Soundings in depths above 100 fathoms were made by the sonic sounding method. In depths below this, sounding was done by Rude-Fisher tubes. Sonic soundings were frequently taken between 80 and 100 fathoms but the area was also covered by up and down soundings.

VELOCITY OF SOUND IN SEA WATER:

A tabulation of positions, which determined the position of the ship by visual fixes, with simultaneous bomb distances, for the determination of the velocity of sound in sea water, and giving the date and position number, is attached to this report.

From this table it appeared that there was no warranted need of using different sound velocities for different times of the year. The mean value, of 1473 feet per second, was accordingly used throughout. In this connection it is of note that the Ship PIONEER working simultaneously with the Ship GUIDE in adjacent areas, adopted 1472½ feet per second as the mean value for their season.

HYDROPHONES POSITIONS:

Stations were established at North Head and off Westport, Washington.

Fixes determining the various positions of the hydrophones were plotted on launch smooth sheets, "A" and "D", on the scale 1: 20,000. These positions were transferred tothe ship sheets.

A note book, giving data on the record kept of the

two hydrophones, is submitted with the sheets.

RELIABILITY OF WORK:

In general, bombs fixes were obtained at half hour intervals. With favorable results, this furnished rigid control, considering the reliability of the R.A.R. method. Very frequently only one distance was obtained; however in general, sufficient control was furnished by the method, to leave little doubt as to the correct position of the ship, on final plotting.

Whenefer the positions were not openly and plainly contradictory to each other, the R.A.R. positions were accepted as fixed and the course and log run between these fixes adjusted. Although the courses so adjusted, were not always ideally and absolutely consistent, the variation or vaccilation, was not so great but that in most cases, data given by the R.A.R. method could be accepted, making it necessary to neglect only such distances as were most obviously faulty. In the sounding records parenthesis are drawn around the distances which were neglected.

An analysis is given in the following table of "N" day, to discover the reliability of the taff rail log in comparison with the engine revolutions, on straight way runs between stops and turns.

TIDES:

See report for sheet "3" of this season.

CURRENTS:

A cahier of current records for this season has been forwarded to the Division of Tides & Currents.

The general trend of the currents inshore is northerly, while offshore the drift at night show a southerly set.

See also the descriptive reports accompanying launch sheets, for this season.

Respectfully submitted.

E. H. Bernstein

E. H. Bernstein
H. & G. E., C. & G. Survey.

DETERMINATION OF SOUND VELOCITIES.

Date	Position	Day	WESTPORT Distance	Time	Velocity	NORTH HEAD Distance	Time	Velocity	Mean
June									
22	12	A	6442	-----	--------	1795.5	14.34	(1502.510)	depths
	14	"	6495	-----	--------	1915	15.12	(1519.841)	60
	16	"	6462	52.78	1469.193	1936	15.63	(1422.393)	to
	17	"	6469	52.60	1475.817	1987	15.95	(1494.921)	82 fms.
	25	"	6571	53.81	1465.378	2560	21.05	(1459.382)	
	30	"	6743	54.89	1474.148	2970	24.66	(1445.25)	
				Mean	1471.134			1475.517	1473.326
Sept									
15	110	V	5504	44.98	1468.386	1220	9.96	1469.879	
	112	"	5504	45.05	1466.104	1278	10.47	1464.756 -- x	
	113	"	5436	44.35	1470.845	1226	10.33	(1424.201) - x	50 fms
	117	"	5259	42.86	1472.422	1267	10.25	1483.318	depths
	115	"	5343	44.00	(1484.455)	1272	10.28	(1484.825)	
	118	"	5161	42.18	1468.278	1282	10.33	1477.638	
	119	"	5088	41.49	1471.583	1287	10.48	1473.660	
	120	"	5002	43.83	(1369.)	1315	13.66	(1551.92) - x	
				Mean	1469.6031			1471.483	1470.543
Sept									
17	82	X	4612	37.75	1466.066	1285	-----	-----	
	83	"	4610	37.47	1476.381	1251	10.30	(1457.281)	30 fms.
	84	"	4559	37.15	1472.086	1182	9.82	(1444.400)	
	86	"	4608	36.97	(1495.699)	1092	9.30	(1409.632)	depths
	87	"	4546	36.62	(1489.677)	1140	9.55	(1432.467)	
	88	"	4483	36110	(1490.194)	1195	9.98	(1436.873)	
				Mean	1481.684			1442.753	1462.218
October Sept									
29	40	AN	2890	23.57	1471.361	2786	22.55	1482.572	33 fms.
	47	"	2509	20.21	(1489.757)	3125	25.31	1481.627	33
	50	"	2699	21.76	(1488.419)	2948	23.78	(1487.636)	32
	54	"	2841	22.96	(1484.843)	2772-	-----	----	31
	105	"	2454	-----	----	3082.5	25.06	1476.057	29
	106	"	2502	-----	----	3034	24.80	1474.009	29
	107	"	2584.5	20.90	1483.923	2947.5	23.96	1476.210	28
111	XXX	"	2791.5	22.46	(1491.451)	2740	22.35	1471.141	28
	108	"	2620	21.14	(1487.228)	2910	23.69	1474.397	28
			TOTAL (23)		11789.239	TOTAL (25)		11717.250	
				Mean	1477.793		Mean	1468.690	

GRAND MEAN OF 48 - - - - - - - 1473.05

N - DAY

p.s.c. course	Pos.	Difference Log.	Revolu'ns	R-dist.	Differnce
157°	1	.92	----	.87	.05
"	2	1.80	0563	1.76	.04
"	3	1.65	1138	2.63	.02
"	4	2.55	1704	3.50	.00
"	5	3.50	2274	4.39	-.02
"	6	4.37	2841	5.25	-.02
"	7	5.23	3400	6.18	-.08
"	8	6.10	4004	6.77	(.23)
"	9	7.00	4378	7.51	.04
"	10	7.55	4858	8.25	.00
"	11	8.25	5349	9.32	-.19
"	12	9.13	6035	10.23	-.21
"	13	10.02	6620	10.49	(.43)
"	14	10.92	6782	10.87	(.31)
"	15	11.18	7039	~~10.87~~ 11.57	.00
"	16	11.57	7490	-- --	---
	17	---	---	-- --	---
	18	---	---	-- --	---
	19	Factor 1423			1497
	20	---	---	R/P/M = 669	
	21	---	---	-- --	---
262°	22	.35	~~655~~	~~.58~~	~~.29~~
"	23	.87	355	.58	.29
"	24	1.78	963	1.58	.20
332°	30	Factor 1475 =		1475	1.42
				R/P/M = 679	
"	31	.82	525	.80	.02
"	32	1.78	1142	1.75	.03
"	33	2.69	1842	2.82	-.13
"	34	3.50	2348	3.59	-.09
"	35	4.42	2893	4.42	.00
"	36	4.87	3181	4.87	.00
		Factor 1530			1635
				R/P/M/= 613	

R.P.Mile Actual	Factors to convert revolus. with true miles.
	157°psc
669	1497
593	1690
565	1773
615	1628
514	1520
611	1640
656	1525
7)4223	7)4273
603	1612 average
	332°
613	1635
633	1583
783	1279
656	1525
4)2685	4)2022
671	1505
	262°
679	1475 average
	93°
608	1645
	64°
600	1667
	245°
586	1705
6)3747	
624.5 Average R.P.Mile.	

Several matters are revealed by this table:

First, that the values given by the log, differ from those given by revolutions by negligible amounts, and can be considered to consistently agree.

Second, that results computed by using engine revolutions per mile, or factor for converting engine revolutions into distance give consistent values.

In general, it might be said, that the R.A.R. fixes are consistent, giving a marvelous method of control, but openly not precisely exact, yet with such a kind of variation that it is impossible to say which values should be accepted, and which rejected, all of them being very good but yet not absolutely consistent.

The determination of the cause of this 'wobbling', and making corrections for the disturbing element seems to be the problem. Whether it is that the sound wave richochets from the water surface to the bottom, and that the main sound wave front travels direct, so that sometimes the main wave front, and at other times, the later zig-zagging wave, actuates the hydrophone, or that perhaps it is a second or even third reverberation of the sound that actuates the hydrophone at yet other times, seems to require solution.

The above thought is prompted by the general fact, evidenced in the foregoing table, that if one station gives a slightly exaggerated distance, the other does also, and vice versa, and so eliminates the possibility of having a poor visual determination of the fix, for a given case.

COMPASS DEVIATIONS:

Compass courses were regularly checked by comparisons between the steering and standard compasses. However the compass course plays a minor role in the R.A.R. method, as compared with the P.D.R. method.

The Ship was swung for compass deviation on October 4,1926, on the working grounds. The deviations to be used are entered in the various sounding records. However this swing was not made under favorable conditions and the courses made good on long runs showed that the deviations obtained for the swing made on February 5, 1926, off the California Coast, still held good. The deviations from this swing therefore should be used.

P.S.C. COURSE.	POST.:	LOG.	REVOL.:	R-DIST.:	DIFF.:	
332	36	-	-	-	-	
	37	.58	472	.71		
	38	1.51	993	1.51	0.0	
330	39	1.98	-	-	-	
	40	2.88	1881	2.85	+ 0.03	
	41	3.78	2484	3.77	0.01	
	42	4.45	2923	4.43	.02	
	43	5.43	3588	5.43	0.00	
	44	563	Factor 1.514		5.67	
					1583	633 R.P.M.
155	48	-	-	-	-	
	49	.60	-	-	-	
	50	.87	574	.87	.00	
	51	1.49	974	1.48	+ .01	
	52	2.29	1497	2.27	+ .02	
	53	3.17	2083	3.17	.00	
	54	3.45	2271	3.45	.00	
	55	4.92	2647	4.02	.00	
			Factor 1.518		4.04	
					1525	656 R.P.M.
155	55	-	-	-	-	
	56	.82	540	.815	.00	
	57	1.70	1130	1.71	- .01	
	58	2.60	1725	2.61	- .01	
	59	3.52	2324	3.52	.00	
	60	4.42	2920	4.41	+ .01	
	61	5.32	3509	5.30	+ .02	
	62	6.20	4090	6.18	+ .02	
	63	6.32	4180	6.32	0.00	
			Factor 1512		7.07	
					1690	593 R.P.M.
93	67	-	-	-	-	
	68	.84	555	.85	- .01	
	69	1.76	1156	1.78	- .02	
	70	2.46	1615	2.48	- .02	
	71	2.93	1915	2.96	- .03	
	72	3.64	2375	3.64	.00	
	73	4.94	2963	4.56	+ [.38]	
	74	5.48	3567	5.48	.00	
	75	6.41	4169	6.42	- .01	
	76	7.06	4593	7.06	.00	
			Factor 1538		7.55	
					1645	608 R.P.M.

p.s.c. course	Pos.	log	Revolu'ns	R-dist.	difference	
158°	77	---	----	----	----	
	78	0.60	----	----	-----	
	79	.90	611	.92	.02	
	800	1.82	1207	1.83	-.01	
	81	2.74	1811	2.75	-.01	
	82	3.65	2408	3.65	.00	
	83	3.92	2584	3.92	.00	
	84	4.44	2926	4.44	0.00	
	Factor 1517				5.18	
					1775	565 r.p.m.
	85	.59	382	.58	.01	
	86	1.49	981	1.49	.00	
	87	2.40	1572	2.40	.00	
	88	3.31	2168	3.30	.01	
	89	3.93	2474	2.76	(.17)	
	90	4.68	3064	4.67	.01	
	91	5.60	3662	5.59	.01	
	92	6.49	4268	6.51	-.02	
	93	7.41	4871	7.42	-.01	
	94	8.32	5473	8.35	.03	
	95	8.61	5650	8.61	0.00	
	Factor 1525				9.20	
					1628	615 r.p.m.
160°	96	---	----	p----	----	
	97	.90	591	.90	.00	
	98	1.82	1192	1.81	.01	
	99	2.72	1791	2.72	.00	
	100	3.65	2396	3.64	.01	
	101	3.92	2580	3.92	0.00	
	Factor 1520				5.02	
					1520	514 r.p.m.
165°	104	----	----	----	----	
	105	----	----	----	----	
	106	.93	595	.90	.03	
	107	1.84	1200	1.82	.02	
	108	2.07	1353	2.06	.01	
	109	2.86	1804	2.74	(.12)	
	110	3.27	2143	3.27	0.00	
	Factor 1520				3.52	
					1640	611 r.p.m.

p.s.c. course	Pos.	Log.	Revolu'ns	R-dist.	difference	
64°	113	0.76	462	.73	.03	
	114	1.23	752	1.19	.04	
	115	2.11	1321	2.10	.01	
	116	2.61	1659	2.63	-.02	
	117	3.11	1961	3.11	0.00	
	~~118~~	Factor = 1586			3.27	
					1667	600 r.p.m.
332°	121	----	------	---n	----	
	122	.44	338	.51	-.07	
	123	1.35	909	1.38	-.03	
	124	222	1484	2.25	-.03	
	125	3.16	2059	3.12	.04	
	126	3.69	2433	3.69	.00	
	127	4.12	2715	4.12	0.00	
	Factor = 1518				3.47	
					1279	783 r.p.m.
336°	146	----	----	----	----	
	147	0.57	354	.55	.02	
	148	1.45	939	1.45	.00	
	149	2.37	1533	2.36	.01	
	150	3.27	2125	3.28	-.01	
	151	4.17	2715	4.18	-.01	
	152	457	2977	4.58	-.01	
	153	4.92	3191	4.92	0.00	
	Factor = 1542				4.86	
					1525	656 r.p.m.
245°	158	----	----	----	----	
	159	.04	----	----	----	
	160	.60	426	.63	-.03	
	161	1.46	1004	1.48	-.02	
	162	2.36	1596	2.35	.01	
	163	3.24	2193	3.24	0.00	
	Factor = 1476				3.74	
					1705	586 r.p.m.
332°						

U.S.COAST & GEODETIC SURVEY SHIP "GUIDE"
Coast of Washington, Season 1926.
Statistics, Sheet No.1

Date		Letter	Vol.	Position	Soundings	Miles Stat.	Vessel
June	22	A	1	78	141	47.0	Ship
	23	B	1	127	230	112.6	"
	24	C	1	44	72	41.0	"
July	23	D'	1a	115	179	73.9	"
	29	E'	1a&1b	143	271	85.0	"
June	24	C	2	121	192	111.0	"
	25	D	2	183	300	176.9	"
	29	E	3	(NOT USED)			
July	2	F	3	155	240	133.0	"
	7	G	3	65	106	48.7	"
	8	H	3 & 4	168	279	135.4	"
	9	J	4	127	197	99.5	"
	12	K	5	113	162	94.7	"
	13	L	5	178	266	140.3	"
	14	M	5 & 6	181	286	145.0	"
	15	N	6	177	294	136.7	"
	16	P	7	54	90	36.3	"
	19	Q	7	70	110	54.2	"
	20	R	7	140	201	88.6	"
	22	S	7 & 8	100	165	53.7	"
	23	T	8	14	19	7.2	"
August	5	U	8	106	160	74.5	"
	6	V	8 & 9	104	162	60.1	"
	10	W	9	112	137	51.9	"
	11	X	9	138	208	66.7	"
	12	Y	10	153	251	82.0	"
	13	Z	10	121	196	71.2	"
	18	A-A	11	106	161	52.5	"
	19	A-B	11	162	241	82.6	"
	25	A-C	12	103	178	40.7	"
	26	A-D	12	164	279	69.9	"
	27	A-E	13	173	251	76.8	"
	31	A-F	13	97	179	49.6	"
Sept.	8	A-G	14	87	170	55.0	"
	9	A-H	14	130	207	75.9	"
	10	A-J	15	70	173	50.7	"
	29	A-K	15	12	27	8.2	"
Octob.	5	A-L	15 & 16	115	192	65.7	"
	6	A-M	16	109	138	68.9	"
	7	A-N	16	64	172	43.2	"
	21	A-P	17	14	31	6.6	"
	27	A-Q	17	95	113	55.0	"
	28	A-R	17	(NOT USED)			
Novem.	1	A-S	17	41	72	25.9	"

Statistics, Sheet No.1, (continued

Date		Letter	Vol.	Position	Soundings	Miles Stat.	Vessel
Novem.	2	A-T	17	(NOT USED)			
	3	A-U	18	40	74	12.0	Ship
	4	A-V	18	54	145	38.2	"
	17	A-W	18 & 19	149	268	92.4	"
	18	A-X	19	125	235	70.7	"
	19	A-Y	19 &20	178	357	95.8	"
	23	A-Z	20	53	102	32.0	"
	24	B-A	20	75	146	48.3	"
Decem.	6	B-B	21	44	64	22.9	"
	7	B- C	21	169	347	112.0	"
	8	B-D	22	184	351	108.4	"
	9	B-E	22 & 23	167	326	115.3	"
	10	B-F	23	74	183	53.0	"
	TOTAL	**********		5941	10097	3780.9	

TIDE REDUCERS FOR FIELD SHEETS "1" and "1a".
U.S.C. & G.S.S. "GUIDE"

Field Season
1926

Thos.J.Maher, H & G. E., Commanding.

EXPLANATION OF CURVES IN THIS CAHIER.

The curves in this cahier were used in the "reduction of soundings" in 25 sounding volumes covering the offshore hydrographic work of the Steamer GUIDE off the coast of Washington during the field season of 1926. The sounding volumes are marked "Sheet 1",in red, and are numbered 1 - 23 inclusive, 1a and 1b.

The tides at the North Jetty of the Columbia River were accepted as being equivalent to open ocean conditions in that vicinity, the staff being located about 500 meters from the ocean end of the Jetty.

The red curve, in each case, represents the tide at the North Jetty.

The blue curve, used on the last two days in place of the red curve, represents the tide at the North Jetty staff.

The black curves represent the tides obtained from the observer at Point Adams, (Fort Stevens), Oregon.

The yellow curves represent the tides obtained from the Washington office for Astoria, (Tongue Point), Oregon.

SIMULTANEOUS COMPARISONS MADE. A "simultaneous comparison" of tides was made with Fort Stevens as the standard station and North Jetty as the subordinate station. A similar comparison was made with Tongue Point as the standard station and Fort Stevens as the subordinate station.

DATA USED IN PLOTTING CURVES. When actual observations were taken at the North Jetty Staff, these were plotted, using the datum (MLLW = 1.00) obtained by comparison with Fort Stevens. One (1.00) foot was subtracted from each observation when plotting.

When no observations were taken at North Jetty, the tides at Fort Stevens were plotted and a North Jetty curve constructed, applying the difference in time and range between the two stations.

For the first four days, when no observations were available from either N orth Jetty of Fort Stevens, the tides were plotted for Tongue Point and corrected to conditions at North Jetty. For this purpose, the data in the two above mentioned "Simultaneous comparisons" was used.

USE OF CURVES. The reducers to MLLW (in feet) and their corresponding times were then tabulated from the curves, using the 0.2 marks as the change points from the lesser to the greater reducers (i.e. -0.8 to

0.2 = 0.0 feet; 0.2 to 1.2 = 1.0 feet; 1.2 to 2.2 = 2.0 feet; etc.).
These reducers were then entered in the sounding volumes above mentioned.

NOTE. See other two cahiers labeled "Ship Sheet 3" and "Launch RICHARD 'M' SHeets "A","B","C", and "D", respectively.

DATA SENT TO THE OFFICE WITH THESE CAHIERS.

Sounding records, 55 volumes as follows:

"Sheet 1" 1-23 inclusive, 1a and 1b.
"Sheet 3" 1-17 inclusive.
"Sheet A" 1-4 inclusive.
"Sheet B" 1-3 inclusive.
"Sheet C" 1-3 inclusive.
"Sheet D" 1-3 inclusive.

Tide staff records:

North Jetty - 5 volumes, (September 3 to September 29).
1 roll plotted from observations of staff.

Tide guage records:

Fort Canby - 54 sheets from portable automatic guage. (August 28 to December 14).

Point Adams (Fort Stevens) 5 large sized sheets of profile paper with tides copied from U.S.E. guage. (July 12 to December 10).

Toke Point, Willapa Bay 1 roll from automatic guage. (October 23 to November 11).

Leveling Records:

I Noth Jetty, entrance to Columbia River, Washington.
1 Fort Canby, Washington. (Cape Dissappointment).
1 Toke Point, Willapa Bay, Washington.
1 Fort Stevens, Columbia River, Oregon.

Description of Tide Station:

Toke Point, Willapa Bay; two sheets by E.H. Bernstein.

Tabulations, Hourly Heights:

North Jetty, 2 sheets.
Fort Stevens, 12 sheets.
Tongue Point, 22 sheets. (photostatic copies).
Willapa Bay, 2 sheets.

High and Low Waters:

North Jetty, 1 sheet.
Fort Stevens, 4 sheets.
Fort Canby, 1 sheet.

Comparative Readings:

Willapa Bay, Toke Point, 2 sheets.

Computations, Simultaneous Comparisons:

(1) Fort Stevens with Tongue Point.
(2) North Jetty with Fort Stevens.

MLLW on 1926 Tide Staff at Toke Point, Willapa Bay, 1 sheet.

Francis B. Quinn,
Aid, U.S.C. & G. Survey.

Forwarded, approved:

Thos. J. Maher,
H & G E, U.S.C. & G. Survey.

May 27, 1927.

EaR

(11)

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in
25 volumes of sounding records for

HYDROGRAPHIC SHEET 4635a and 4655b

Locality: Washington Coast, North of Columbia River Entrance.

Chief of Party: T. J. Maher in 1926.

Plane of reference is M L L W

2.5
-0.2 ft. on tide staff at Tongue Point
0.8 ft. ------do---------- Ft. Stevens
North Jetty

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.

G Parker

Chief, Division of Tides and Currents.

Action of Field Records

Report on Hydrographic sheet No H6333
Chief of Party. T. J. Maher
Surveyed by — Field Party
Protracted by — E. H. Bernstein
Soundings plotted by — V. M. Gibbens
Verified and inked by — H.S.M.

1 The records conform to the requirements of the general instructions.
2 The plan and character of the development fulfil the requirements of the general instructions
3. The plan and extent of the development satisfy the specific instructions, except in regard to paragraph 14 (inst. Apr. 17, 1926) (see remarks #10)
4. The sounding line crossings are adequate
5. The manual depth curves can be completely drawn
6. The field plotting was completed to the extent prescribed in the general instructions.
7 With the exception of some necessary shifts in lines due to erroneous plotting the office draftsman did not have to do revising of the drafting work done by the field party.
8. The junctions with adjacent sheets are satisfactory

9. No further surveying is required to fully develop important areas within the limits of the sheet.

10. Remarks.

(a) While this survey demonstrates to a marked degree the great value of R.A.R. control in offshore surveying, several difficulties were encountered in verifying the sheet. The R.A.R method was, where ever possible, supplemented by visual fixes from shore stations and, in those instances there was, in some cases, disagreement. This may have been due to two things; the impossibility, under present conditions, of obtaining fixes with R.A.R that are absolutely accurate, and the fact that all visual fixes obtained were weak because of great distances to shore check objects (20 miles in many cases) and poor visibility, and extremely small angles. In most cases of disagreement the R.A.R. fixes were accepted in preference to the visual fix because the former method showed the best apparent solution to the problem.

b. Attention is called to the paragraph 14 of the specific instructions, which was not followed exactly by the field party. Distances of the

work from the control or some other cause not mentioned in the report may have been the reason for this deviation. Paragraph 14 reads: "Projections for showing the above work shall be as follows: From the inshore limits to the fifty fathom curve, scale 1:40,000. From the fifty fathom curve to the one hundred fathom curve, scale 1:60,000. From the one hundred fathom curve to the one thousand fathom curve, scale 1:120,000." The entire survey was plotted on a scale of 1:120,000, and as a result some difficulty was experienced in plotting the close development between the inshore work and the one hundred fathom curve by the R.A.R. control method. If the instructions could have been followed, better results in plotting would undoubtedly have been obtained.

c. Signal ○ scar on the chart was plotted as a hydrographic signal by the office draftsman. Signal scar was used by the field party for a portion of the visual fix control but no signal of that name could be located on the smooth sheet by the surveyor. An examination disclosed the following:

The signal appears plotted in red on the Boat Sheet

but could not be identified as a Topographic signal. It is apparently hydrographic signal ⊙ Slide as used on H-4636 which was transferred to this sheet as signal ⊙ Oscar by the office draftsman. Indications are that they are one and the same.

11. Rating of work.
    a. Character and scope of surveying - Good
    b. Field drafting - Good

12 Reviewed by - H. MacEwen

Respectfully submitted

April 29, 1929

O.K. ARMS. May 16, 1928.

Action of Field Records.

Report on sheet No H-4633
Surveyed in 1926
Chief of Party. — T. J. Mather
Surveyed by - Field Party.
Protracted by — E. H. Bernstein
Soundings plotted by - - V. M. gibbens.
Verified and inked by — H. E. MacEwen

1. The records conform to the requirements of the general instructions.
2. The plan and character of the development fulfil the requirements of the general instructions.
3. The plan and extent of the development satisfy the specific instructions
4. The sounding line crossings are adequate.
5. The usual depth curves can be completely drawn.
6. The field plotting was completed to the extent prescribed in the General instructions.
7. The office draftsman did not have to do any of the drafting done by the field party.
8. The junctions with adjacent sheets are satisfactory.

H. 4633 b

9. No further surveying is required to fully develope important areas within the limits of this sheet.

10. Rating of work
(a) Character and scope of surveying — Excellent
(b) Field drafting — Excellent.

11. Reviewed by — H. Edmasten

Respectfully submitted.

April 29, 1929

O.K. Ams.

Form 537
11—5812

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 4633a

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. 1a

REGISTER NO. 4633a

State Washington

General locality ~~Southern Coast~~ Cape Disappointment

Locality Columbia River to Grays Harbor.

Scale 1:120,000 Date of survey June to December, 1926

Vessel Ship GUIDE

Chief of Party Thos. J. Maher

Surveyed by Thos. J. Maher

Protracted by E. H. Bernstein

Soundings penciled by V. M. Gibbens

Soundings in fathoms ~~feet~~

Plane of reference MLLW

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated April 17, 1926, 192

Remarks: Same data accompanies this sheet as Sheet #1.

25	volumes	Sounding Records. - 4633a and 4633b
2	"	Angles
1	Cahier	Tide Curves GPO
5	volumes	Tides at North Jetty.
5	sheets	U.S.E. Tides, Fort Stevens.
1	roll	Tides, Toke Point, Willapa Bay.
2	rolls	Fort Canby Guage, August 29 to December 14, 1926.
1		Descriptive Report.
1	cahier	Simultaneous Observations, Fort Canby, Fort Stevens.

(over)

1	cahier	Tides, High and Low Water, Fort Canby.
1	cahier	Simultaneous Observations, Fort Stevens and Tongue Point.
1	cahier	Hourly Heights, Toke Point.
1	"	" " Fort Canby.
1	"	" " North Jetty.
1	"	" " Fort Stevens.
1	"	High and Low Tides, Fort Stevens.
1	"	" " " " North Jetty.
7	volumes	Bomb Computations. — Registered - 4633a and 4633b
5	boxes	Chronograph Tape Records.

Form 537
11—5812

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

C. & G. SURVEY
L. & A.
APR 14 1927
Acc. No.

REG. NO. 4633b

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. 1

REGISTER NO. 4633b

State Washington

General locality ~~Southern coast~~ Cape Disappointment

Locality Columbia River to Grays Harbor - Offshore

Scale 1:120,000 Date of survey May 23 - Dec. 21, 1926

Vessel GUIDE

Chief of Party Thos. J. Maher

Surveyed by Thos. J. Maher

Protracted by E. H. Bernstein

Soundings penciled by V. M. Gibbens

Soundings in fathoms ~~feet~~

Plane of reference MLLW

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated April 17, 1926

Remarks: 25 vols. soundings. 1 cahier tube reduction curves. 1 cahier tide reduction curves. 1 description report.

GPO

NAUTICAL CHARTS BRANCH

SURVEY NO. 4633 b.

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
7/17/47	5022	Pisegari	~~Before~~ After Verification and Review
6/6/62	6002	Lt Haldane N. Jones	~~Prelim Appl~~. Before ~~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
			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.