4639

Form 504

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

State: OREGON

11—5613

DESCRIPTIVE REPORT.

~~Hydrographic~~ Sheet No. 4639

LOCALITY:

Columbia River
~~Northern Oregon~~

Cape Falcon to Columbia R. Offshore
~~South of Columbia River Entrance~~

1926

CHIEF OF PARTY:

R. F. Luce

4639

DESCRIPTIVE REPORT

To Accompany Hydrographic Sheet "A" Northern Oregon.

AUTHORITY

The work on this sheet was executed in accordance with instructions from the Director, U. S. Coast & Geodetic Survey to the Commanding Officer of the Str. PIONEER dated April 17, 1926.

GENERAL DESCRIPTION

The work covered by this sheet represents the offshore hydrography of the Coast of Oregon immediately south of the Columbia River. It includes the area between the 100fathom and the 1,000fathom curves, and extends from parallel 46°-11' to parallel 45°-40'. The area north of parallel 46°-11' was surveyed by the Str. GUIDE at the same time that this area was being covered by the Str. PIONEER. The area to the southward remains to be surveyed.

The general nature of the coast is described in descriptive reports accompanying topographic sheets and inshore hydrographic sheets.

LANDMARKS

Except in very clear weather, objects and mountain peaks ashore were not visible from the area covered by Sheet "A". However, under favorable conditions such prominent landmarks as Saddle Mountain, Onion Peak, Neahkahnie Mountain, Lookout Mountain, the Astoria Memorial Column on Coxcomb Hill, and a prominent peak to the northward of Neahkahnie Mountain,--called High--could easily be seen and identified.

In exceptionally clear weather such distant peaks as Mount Rainer and Mt. St. Helens, each more than 120 miles away, could be seen.

OUTLYING DANGERS AND ISLANDS

There are no outlying dangers or islands in the area covered by Sheet "A".

CURRENTS

Experience in running east and west soundings lines proved that it was necessary to apply considerable leeway to offset a southeasterly current. This current, which seems to depend on the prevailing northwesterly wind for its strength and direction, is not of uniform intensity, but exists in a series of bands of varying widths and shifted locations. No current observations were taken, but experience with these currents leads one to the conclusion that the average strength is about one knot, and the average direction southeasterly.

CONTROL AND METHODS

Control for this area was entirely by means of radio acoustic ranging. Two hydrophone stations were employed, the northern one, KGAL, being located in 10 fathoms of water about $1\frac{1}{2}$ miles offshore in latitude 46°-05', and the southern one, KGAM, being located in 10 fathoms of water about 1 mile offshore in latitude 45°-45'. The distance between hydrophone stations was approximately 20 miles.

The general plan of development was by means of a system of east and west sounding lines spaced $1\frac{1}{2}$ miles apart between the 100 and 300 fathom curves and 3 miles apart outside the 300 fathom curve, with additional sounding lines in localities where the configuration of the bottom was irregular. This condition was experienced in the southeastern portion of the area covered, where considerable irregularity occurs in the vicinity of the 100 fathom curve.

All soundings were taken with the sonic sounding apparatus, which was occasionally checked against vertical casts. Soundings were taken at $2\frac{1}{2}$ minute intervals, the ship operating at full speed or approximately 10 knots. Bombs were fired for positions at approximately 25 minute intervals.

CONFIGURATION OF BOTTOM

With the exception of a 300 fathom bank in latitude 45°-57' and and longitude 124°-57', and a long ridge with less than 700 fathoms over it, and lying outside the 900 fathom curve, the bottom is not especially irregular. Outside of the 1000 fathom curve and near the southern limits of the sheet, soundings of less than 900 fathoms were obtained. The bottom in this vicinity slopes rather gently, and gives little evidence of a bank of importance. This area was not further developed.

Inasmuch as the area covered by this sheet is all open ocean area and very deep, and soundings all taken with the sonic sounding apparatus, tide reducers were not applied to the soundings. Such reducers would rarely if ever have exceeded 1% of the depth.

Numerous velocity tests were taken at various times and at various points along the coast to determine the velocity of sound in sea water.

Accurate visual fixes to triangulation stations were taken simultaneously with the firing of bombs, and from the tests taken, the velocity of sound in sea water determined. A value of 1472.5 meters per second was finally adopted.

A table showing all of the velocity tests and the computations for the determination of the value adopted are attached to this report. Copies of tables used to facilitate the plotting of bomb positions are also submitted. These are all based on a velocity of 1472.5 meters per second.

AIDS TO NAVIGATION

There are no aids to navigation in the area covered by this sheet.

REMARKS

Inasmuch as the sonic soundings lose some of their accuracy in depths of 100 fathoms and less, the 100 fathom curve was transfered to this sheet from the adjoining inshore sheets. This curve agrees quite well with the sonic soundings, except near the southern limits of the sheet, where the bottom is very uneven.

Attention is invited to the fact that a 100 fathom sounding outside the 100 fathom curve is shown on chart 5902. This sounding was plotted on sheet "C", and its existence seems to be corroborated by the sonic soundings taken in this vicinity. Just south of this sounding, there seems to be a little submarine valley about 40 fathoms deeper than the surrounding depth.

Herman Odessey
H. & G. Engineer

Date Position	Time	NHAL Distance	Velocity	Time	NGAM Distance	Velocity	Remarks
6/22 52D	5.45	7124	R	25.75	37924	1472.8	Till 64-14 Sy Cape 104-56
64D	4.32	6512	1461.1	25.79	37824	1466.5	Till 65-17 Sy Cape 108-50
66D	3.83	5668	1479.9	25.64	37768	1473.0	Till Sy Cape
68D	3.18	4630	1456.0	25.61	37668	1470.8	Till 66-38 Sy Cape 117-58
94D	9.63	14262	1481.0	27.66	40116	1450.3	Sharp 52-51 Sy Cape 79-17
6/24 11A	19.19	28400	1479.9	31.96	46509	1455.2	Sharp 31-32 Saddle Wood 10-49
14A	20.97	30688	1463.4	33.22	48856	1470.6	Sharp (Plots Saddle off line) Wood
16A	25.11	37163	1480.0	35.95	52136	1450.2	Sharp 26-61 Saddle Wood 9-30
7/2 99J	13.14	19368	1474.0	32.20	47610	147[illegible].6	Till 58-36 Astor North 65-24
101J	13.76	19548	1420.5	33.47	48176	14[illegible].7	Till Astor North
103J	14.48	21400	1477.9	33.70	48462	1438.0	Till Astor North
105J		23260		33.59	49300	1476.5	Till 24-12 Astor North 29-23
7/23 1st Test	15.06	22034	14631				Hill 52-44 Mack North 60-31

Date Position	Time	KGAL Distance	Velocity	Time	KGAM Distance	Velocity	Remarks
7/25 2nd Test	14.50	21128	1457.1				Hill Mack North
3rd Test	13.81	20656	1495.7				Hill Mack North
7/30 77V	13.78	20022	1455.0	13.70	20056	14[illegible].9	White Till Mack
78V	13.47	19624	1456.9	13.45	19644	1460.5	White Till Mack
80V	13.11	19068	1454.5	13.07	19188	1468.1	White Till Mack
83V	13.25	18776	1417.1				White 99–44 Till Mack 47–47
105V	11.36	16820	1480.6	31.12	45874	1474.1	Mack 30–11 Navy North 52–39
106V	11.56	17102	1479.4	31.59	46590	1474.8	Mack Navy North
107V	11.78	17488	1484.5	32.15	47480	1476.8	Mack Navy North
108V	12.02	17794	1480.4	32.65	48152	1475.0	Mack Navy North
109V	12.31	18192	1477.8	33.16	48888	1474.3	Mack 26–42 Navy North 62–18
8/4 46M	39.16	57390	1465.5	34.27	50400	1470.7	Mount 24–16 Slip Wood 9–22
49M	37.63	55172	1466.2	32.78	48232	1471.4	Mount Slip Wood

Date Position	Time	KGAL Distance	Velocity	Time	KGAM Distance	Velocity	Remarks
9/3 77B'	20.77	30344	1460.9				Falcon 79-53 Hay Isle 28-49
78B'	20.63	30244	1466.0				Falcon Hay Isle
79B'	20.52	30116	1467.6				Falcon Hay Isle
80B'	20.48	29976	1463.7				Falcon Hay Isle
82B'	20.36	29836	1465.4				Falcon 98-05 Hay Isle. 29-16
9/7 13A'				19.18	28248	1472.8	Mount 47-07 Slip Wood 20-12
14A'	19.49	28504	1462.5	19.55	28792	1472.7	Mount Slip Wood
9/9 99C'	21.14	30592	1447.1	21.33	31392	1471.7	Carlton 42-20 Slip Wood 19-12
9/17 17E'	25.82	37840	1465.6	19.52	28840	1477.4	Mount 44-13 Till Wood 9-56
9/20 70D'	22.26	32828	1474.8	6.37	9352	1468.1	Falcon 38-42 White Till 75-05
71D'	22.37	32916	1471.4		9636		Falcon White Till
72D'	22.44	33020	1471.5	6.78	9902	1460.6	Falcon White Till
73D'	22.47	33096	1472.9	6.96	10230	1469.8	Falcon White Till
74D'	22.55	33186	1471.7	7.17	10508	1465.5	Falcon White Till

Date Position	KOAL Time	Distance	Velocity	KOAM Time	Distance	Velocity	Remarks
9/20 75D'	22.56	33292	1476.7	7.37	10834	1470.0	Falcon 31-17 White Till 68-37
9/22 34G'	33.00	47848	1449.9	27.60	40544	1469.0	Mount 30-52 Slip Wood 10-05
9/23 25H'	32.53	47704	1456.5	27.51	40632	1477.0	Foley 14-09 Flat Wood 34-25
27H'	32.83	48328	1472.1		41400		Foley Flat Wood
29H'	34.02	49912	1467.1	29.18	43162	1479.1	Foley Flat Wood
30H'	34.32	50360	1467.4	29.50	43628	1478.9	Foley 13-36 Flat Wood 33-27
9/24 33J'	34.85	51072	1465.5	27.90	41144	1474.7	Foley 15-04 Flat Wood 32-02
34J'	35.11	51480	1466.2	28.17	41576	1475.9	Foley Flat Wood
35J'				28.45	42016	1476.8	Foley Flat Wood
36J'	35.75	52424	1466.4	28.83	42480	1473.5	Foley Flat Wood
37J'	36.10	52920	1465.9	29.14	43008	1475.9	Foley 14-45 Flat Wood 30-49

(Hydrophone at KOAM relocated and new location used beginning 9/20/36)

Determination of Sound Velocity, Oregon Coast, 1926.

Date.	Time.	Rejectd.	All obs.	Very good	Best Obs.	Time.	Rejectd.	All Obs.	Very Good	Best Obs.
	MOG A L.					K O A N.				
6/22	5.49					25.75		72.8	72.8	72.8
	4.52	81.1				25.79		66.6	66.6	66.6
	[illegible]	79.3				25.54		73.0	73.0	73.0
	[illegible]	88.0				26.61		70.8	70.8	70.8
	9.63		81.0			27.66		80.3		
6/24	19.19		79.9			31.96		55.2		
	20.97		63.4			33.22		70.6		
	25.11		80.0			35.95		50.2		
7/ 2	13.14		74.0	74.0	74.0	32.20		78.6	78.6	78.6
	13.76	20.8				32.47		83.7		
	14.48	77.9				33.70	38.0			
	------					33.39		76.5	76.5	76.5
7/23	15.06		63.1			------				
	14.60		57.1			------				
	13.81		95.7			------				
	13.78		53.0			13.70		63.9		
7/30	13.47		56.9			13.46		60.5		
	13.11		54.5			13.07		58.1		
	13.25	17.1				------				
	11.36		80.6	80.6		31.12		74.1	74.1	74.1
	11.56		79.4	79.4		31.59		74.8	74.8	74.8
	11.78		84.5	84.5		32.15		76.8	76.8	76.8
	12.02		80.4	80.4		32.69		73.0	73.0	73.0
	12.31		77.8	77.8		33.16		74.3	74.3	74.3
8/4	39.16		65.5	65.5		34.27		70.7	70.7	
	37.63		66.2	66.2		32.78		71.4	71.4	
9/3	20.77		60.9	60.9		------				
	20.63		66.0	66.0		------				
	20.52		67.6	67.6		------				
	20.48		63.7	63.7		------				
	20.36		65.4	65.4		------				
9/7	------					19.18		72.8	72.8	
	19.49		62.5	62.5		19.55		72.7	72.7	
9/9	21.14	47.1				21.33		71.7		
9/17	25.82		65.6	65.6		19.52		77.4	77.4	
9/20	22.26		74.8	74.8	74.8	6.37		68.1		
	22.37		71.4	71.4	71.4	------				
	22.44		71.5	71.5	71.5	6.78		60.6		
	22.47		72.9	72.9	72.9	6.96		69.8		
	22.55		71.7	71.7	71.7	7.17		65.5		
	22.56		75.7	75.7	75.7	7.37		70.0		
9/22	33.00	49.9				27.60		69.00		
9/23	32.53		66.5	66.5		27.51		77.0	77.0	
	32.85		72.1	72.1		------				
	34.02		67.1	67.1		29.18		79.1	79.1	
	34.32		67.4	67.4		29.50		78.9	78.9	
9/24	34.85		65.5	65.5		27.90		74.7	74.7	
	35.11		66.2	66.2		28.17		75.9	75.9	
	------					28.45		76.8	76.8	
	35.75		66.4	66.4		28.83		73.5	73.5	
	35.10		65.9	65.9		29.14		75.9	75.9	
SUM		3129.3	2719.8	2035.2	512.0		2803.3	2765.3	1788.1	811.3
No. Obs.		47	39	29	7		40	39	24	11
Average.		66.58	69.74	70.18	73.14		70.08	70.91	74.50	73.75
			Means of BOTH STATIONS				68.18	70.33	72.14	73.52

ADOPTED VALUE. 1472.5 meters per second.

SOUND VELOCITY TABLES 1472.5 Meters per second.

	0	10	20	30	40	50	60	70	80	90	
0		14725.0	29450.0	44175.0	58900.0	73625.0	88350.0	103075.0	117800.0	132525.0	0
1	1472.5	16197.5	30922.5	45647.5	60372.5	75097.5	89822.5	104547.5	119272.5	133997.5	1
2	2945.0	17670.0	32395.0	47120.0	61845.0	76570.0	91295.0	106020.0	120745.0	135470.0	2
3	4417.5	19142.5	33867.5	48592.5	63317.5	78042.5	92767.5	107492.5	122217.5	136942.5	3
4	5890.0	20615.0	35340.0	50065.0	64790.0	79515.0	94240.0	108965.0	123690.0	138415.0	4
5	7362.5	22087.5	36812.5	51537.5	66262.5	80987.5	95712.5	110437.5	125162.5	139887.5	5
6	8835.0	23560.0	38285.0	53010.0	67735.0	82460.0	97185.0	111910.0	126635.0	141360.0	6
7	10307.5	25032.5	39757.5	54482.5	69207.5	83932.5	98657.5	113382.5	128107.5	142832.5	7
8	11780.0	26505.0	41230.0	55955.0	70680.0	85405.0	100130.0	114855.0	129580.0	144305.0	8
9	13252.5	27977.5	42702.5	57427.5	72152.5	86877.5	101602.5	116327.5	131052.5	145777.5	9
	0	10	20	30	40	50	60	70	80	90	

Example:—

Net time = 36.53 Sec

53010.0
780.4

53790.4 M. = Distance.

TABLE OF CORRECTIONS TO CHRONOGRAPH TIMES

ship's speed in knots

Length of fuse in seconds	5	6	7	8	9	10
10	.0173	.0207	.0242	.0276	.0311	.0346
15	.0259	.0311	.0362	.0415	.0466	.0518
20	.0345	.0414	.0484	.0557	.0622	.0692
25	.0438	.0518	.0604	.0691	.0778	.0854
30	.0518	.0622	.0725	.0829	.0934	.1038
35	.0604	.0726	.0846	.0968	.1088	.1201
40	.0691	.0829	.0968	.1106	.1244	.1382

Example:

Ship proceeding at speed of 5 knots
Bomb fired with 25 second fuse

Time of bomb from chronograph tape - - -0.56
Fuse correction from table - - - - - - -0.04
Correction 0.52

This 0.52 seconds is subtracted from the final time on the chronograph tape to obtain the net time.

STATISTICS - SHEET NO. A.

DATE - 1926		LETTER	VOL.	POSITIONS R.A.R.	POSITIONS VISUAL	SOUNDINGS SONIC	SOUNDINGS TUBE	SOUNDINGS WIRE	MILES STATUTE	VESSEL
Sept.	1	A	1	26	29	178			101.0	Str. PIONEER
	2	B	1	21	39	208		1	110.2	Str. PIONEER
	13	C	1	27	37	225			114.7	Str. PIONEER
	14	D	2	30	57	336			163.5	Str. PIONEER
	15	E	2	19	32	204			104.0	Str. PIONEER
	29	F	2-3	17	27	155			77.5	Str. PIONEER
	30	G	3	8	14	79			37.0	Str. PIONEER
Oct.	3	H	3	25	40	225			117.7	Str. PIONEER
	5	J	3	14	19	119		2	58.8	Str. PIONEER
TOTALS - - -				187	294	1729		3	884.4	

F.J.H.

Copy for Records Section.

June 16, 1927.

11

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in
3 volumes of sounding records for

HYDROGRAPHIC SHEET 4659

Locality: OFF OREGON COAST

Chief of Party: R. F. Luce, 1926
Plane of reference is
ft. on tide staff at

Tide reducers omitted - less than one percent of depth

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.T. Rude

Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
WASHINGTON February 21, 1928.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4639

Cape Falcon to Columbia River-Offshore, Oregon.

Surveyed in 1926

Instructions dated April 17, 1926.

Chief of Party, R. F. Luce.

Surveyed by R. F. Luce.

Protracted and soundings plotted by H. Odessey.

Verified and inked by G. Risegari.

1. The records conform to the requirements of the General Instructions where such instructions can be applied to sonic work.

2. The plan and extent of development satisfy the specific instructions.

3. The sounding line crossings where they run are satisfactory. Exception: Poor crossing in lat. 45-43 long. 124-40. A.L.S.

4. The usual field plotting was done by the field party. The positions were plotted by means of radio acoustic ranging with log distances and courses in between. No gross errors were found. throughout the work.

5. The junction with H. 4638 appears to be adequate. The other inshore adjoining sheet, H. 4636, is not completed at this date and will be taken up by the verifier of that sheet.

6. A number of sonic soundings under 100 fathoms were retained after a discussion by the Chief of Field Work and the Asst. Chief of Field Records, though a rule to the contrary has been adopted. These particular soundings appear very probable and to be a valuable aid in establishing the identity of shoaler bottom curves which compare favorably with adjoining sheets with wire soundings.

All sonic soundings of 100 fathoms or under were later rejected as per authority of Chief of Field Records Section.

G. Risegari May. 19, 1929

Attention should be called to the fact that the small intersecting lines determining a R. A. R. position were both inked in green and should have been in green and red to correspond to their respective acoustic station.

7. Character and scope of field work - good.
Draftsmanship - good.

8. Reviewed by G. Risegari, January, 1928.

Sheet inspected by A. L. Shalauf.

Approved:

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Chief, Section of Field Records (Charts)

____

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

Form 537

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

4639

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.

U. S. Coast and Geodetic Survey.

Register No. 4639

State Oregon

General locality ~~Northern Oregon~~ Columbia River

Locality ~~South of Columbia River Entrance~~ Cape Falcon to Columbia River - Offshore

Chief of party R. F. Luce

Surveyed by R. F. Luce

Date of survey Sept. 1 - Oct. 5, 1926

Scale 1 - 120,000

Soundings in Fathoms

Plane of reference Mean Lower Low Water

Protracted by Herman Odessey Soundings in pencil by Herman Odessey

Inked by . . . . Verified by . . . .

Records accompanying sheet (check those forwarded):

Des. report, ✓ X Tide books, ... Marigrams, X Boat sheets, no B.S. received

3 X Sounding books, ... Wire-drag books, ... Photographs.

Data from other sources affecting sheet . . . .

1 Vol. R.A.R.-Lags for season - Registered 4636 - applying to 4635, 4636, 4637 and 4639

Bomb records (in envelopes) and 2 small volumes - Scaled Bomb distances - in bundle marked 4635 to 4639 incl.

Remarks:

B.S. filed 4635 and 4636 a

NAUTICAL CHARTS BRANCH

SURVEY NO. ________

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
7/17/47	5022	Risegari	~~Before~~ After Verification and Review
	~~6002~~	~~[illegible]~~	
6/6/62	6002	H. Holden H. Jones	~~[illegible]~~. 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

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.