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Diag. Cht.  
Nos.  
6300-1  
6380-1

Department of Commerce and Labor  
COAST AND GEODETIC SURVEY

Superintendent.

State: *Washington*

DESCRIPTIVE REPORT.

*Hyd* Sheet No. *2211-16*

LOCALITY:

*Strait of Juan de Fuca*  
*and Washington*  
*Sound*

~~1894~~  
~~180~~

CHIEF OF PARTY:

*Lt Lucian Fryane U.S.N.*

2211.2212.2213  
2214.2215.2216

# 2212

U.S. AND G. SURVEY  
LIBRARY AND ARCHIVES

83  
SHA  
2212  
1894

Diag. Cht. Nos. 6300-1 & <sup>Acc. No.</sup> 6450-1

Department of Commerce and Labor  
COAST AND GEODETIC SURVEY

Superintendent.

State: *Washington*

DESCRIPTIVE REPORT.

*Hyd. C.* Sheet No. 2212

LOCALITY:

*Strait of Juan de Fuca  
& Washington Sound  
See SHA 2211*

*1894*  
*190*

CHIEF OF PARTY:

*L. Flynn*

# 2212

2213

U.S. AND G. SURVEY  
LIBRARY AND ARCHIVES

Acc. No.

Diag. Cht. No. 6380-1

SHA  
2213  
1894

Department of Commerce and Labor  
COAST AND GEODETIC SURVEY

Superintendent.

State. *Washn*

DESCRIPTIVE REPORT.

*Hyd C Sheet No. 2213*

LOCALITY:

*Strait of Juan de Fuca  
& Washington Sound*

*See SHA 2211*

*1894*  
*190*

CHIEF OF PARTY:

*L. Flynn*

2213

# 2214

COAST AND GEODETIC SURVEY  
LIBRARY AND ARCHIVES

Acc. No.

Diag. Cht. No. 6380-1



**Department of Commerce and Labor**  
**COAST AND GEODETIC SURVEY**

Superintendent.

State: *Washn*

## DESCRIPTIVE REPORT.

*Hyd C* Sheet No. *2214*

LOCALITY:

*Straight of Juan de*  
*Fuca & Washington*  
*Sound*

*See SHA 2211*

*1894*  
*100*

CHIEF OF PARTY:

*L. Flynn*

# 2214

83  
SHA  
2215  
1894

# 2215

COAST AND GEODETIC SURVEY  
LIBRARY AND ARCHIVES

Diag. Chart No. 6382-1

Acc No

Department of Commerce and Labor  
COAST AND GEODETIC SURVEY

Superintendent.

State: *Washn*

## DESCRIPTIVE REPORT.

*Hyd C* Sheet No. *2215*

LOCALITY:

*Straight of Juan de Fuca  
& Washington Sound.*

*See SHA 2211*

*1894*  
*190*

CHIEF OF PARTY:

*L. Flynn*

2215  
9123

# 2216

U.S. AND G. SURVEY  
LIBRARY AND ARCHIVES

Acc. No.

Diag. Ch. No. 6380-1

83  
SHA  
2216  
1894

Department of Commerce and Labor  
COAST AND GEODETIC SURVEY

Superintendent.

State: *Wash.*

## DESCRIPTIVE REPORT.

*Sheet No. 2216*

LOCALITY:

*Strait of Juan de Fuca  
& Washington Sound  
See SHA 2211*

*1894*  
*190*

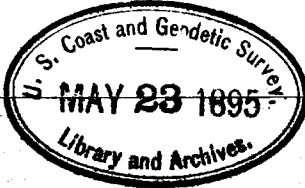
CHIEF OF PARTY:

*L. Flynn*

# 2216

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2113  
2114

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2116



U. S. COAST AND GEODETIC SURVEY.

Superintendent

State: *Washington.*

DESCRIPTIVE REPORT.

*Hydrographic* Sheets Nos. *2211,*  
*2212, 2213, 2214, 2215,*  
*2216.*

LOCALITY:

*Strait of Juan de Fuca*  
*and*  
*Washington Sound.*

*1894.*

CHIEF OF PARTY:

*St. Lucian Flynne, U. S. N.*

Descriptive Report.  
Section XI.

Hydrographic Sheets Nos. 1, 2, 4, 5, 6+7.

Straits of Juan de Fuca  
and

Washington Sound, Wash.

C. & G. Survey Str. Gedney.

Lieut. Lucian Flynn, U.S.N., Comd'g.

1894.



1.

The sheets are respectively Sheets #1, #2, #4, #5, #6, & #7. Sheets #1 and #2, scale  $\frac{1}{40,000}$ , cover the hydrography done in the Strait of Juan de Fuca. Sheets Nos. 4, 5, 6 and 7, all on a scale of  $\frac{1}{10,000}$ , cover the hydrography done in Washington Sound, Wash.

Projections for all of the foregoing work were supplied from the office. Statistics of work are appended to this report on Form 11.

The shore positions used and plotted on all the sheets were obtained <sup>from</sup> data furnished by Asst. J. J. Gilbert, C. & G. Survey, who was associated with the party during the season, excepting temporary hydrographic signals which were established by this party. A list of positions, obtained from Mr. Gilbert, and used in the plotting of the work, accompanies this report. The shore line on West Side of San Juan Channel

1.

was run in by this party as shown by dotted line; otherwise it was furnished with the projections or obtained from Asst Gilbert.

2.

The locality of the work embodied in Sheets #1 and #2 is the Eastern portion of the Strait of Juan de Fuca extending from Whidby Island to somewhat Westward of Port Angeles, Wash. This body of water having been previously surveyed, the work done by this party was in the nature of a resurvey, and filling in work that was regarded as too open.

It also includes an examination of Hein Bank, McArthur Bank, Smith Island, and the bank between Partridge Bank and Middle Bank. It is presumed that most of the information called for under Par. 2 relating to this portion of the Strait of Juan de Fuca

is already in the possession of the Office from earlier parties of the Survey. There are no special difficulties in navigating these waters. The dangers that exist are marked by aids to navigation or are themselves apparent.

The floating commerce of Puget Sound passes through these waters; it is now considerable, and is growing in importance. The Pacific Coast S. S. Co. runs a steamer every five days between San Francisco and Tacoma from either end. There is a monthly steamship service between Tacoma and China (Northern Pacific S. S. Co.); also from Vancouver to China (Canadian Pacific Ry. Co.), and several lines of steamers in local waters, also numerous sailing vessels to all parts.

The hydrography shown on sheets nos. 4, 5, 6 and 7, in Washington

Sound, is new work and is chiefly confined to the shores and harbors of San Juan and Stuart Islands.

The shores are generally quite bold, especially on the west sides of the islands named, where the 100 fathom line is close in shore.

There is a tri-weekly steamer carrying mail, passengers and freight between Seattle and the settlements in the Islands of Washington Sound, the route ending at New Whatcom. In addition an occasional steamer runs between Friday Harbor and Anacortes; also one between Roche Harbor and Victoria, B.C. Roche Harbor, on the N.W. part of San Juan Id., was the principal rendezvous of the party during the season. It is a very snug landlocked harbor, of limited extent, with good holding ground. There are

three entrances to the harbor, but the western passage is the usual one, as well as the best. The Southern passage, called Mosquito Passage, is suitable only for small, quick turning vessels, and is full of kelp patches. The Eastern Entrance is shoal and only used by light draft vessels at favorable stages of the tide. The bottom of this passage is grassy. In entering by the Western Passage a good range may be had by just opening the entrance points of Nelson Bay, so as to look across the low neck between Nelson and Open Bays, and steering for the same on a course  $S\frac{3}{4}E$  (mag.) till Split Point can be properly rounded. A photograph, showing this view, accompanied this report.

The settlement called Roche

Harbor is on the Eastern shore of the harbor and consists almost entirely of the works and other buildings of the Roche Harbor Lumber Co.

A view (photograph) of the same taken from an anchorage in the harbor is submitted. Good anchorage may be had in most parts of the harbor, the position usually taken by the "Gedney" being about midway between Pearl and San Juan Ids., with Base Island showing in the Eastern Passage.

Friday Harbor, on the S.E. part of San Juan Island, is a town of some importance, being the largest in the Islands of San Juan Co., and the County Seat. The harbor is small, but well sheltered, with good holding ground. A shoal patch lies a short distance off the N.W. shore of Brown Island. There are two entrances to this harbor, the

usual being by the Northern Passage. In entering by this passage the San Juan shore should be kept aboard. The Southern Entrance is quite narrow, and a spit makes off from the south part of Brown Id. for a short distance. This can be avoided by keeping on the San Juan Id. side of Mid Channel on entering, but it should be marked with a buoy, as the space for manœuvring is small. The steamer "Buckeye" was aground on this spit during one of the visits of the party to this place.

3+4

The aspect of the shores is mountainous, rocky and bold.

The Canal de Haro, or Haro Strait, between San Juan and Stuart Ids. and British Columbia is the usual fairway for all vessels bound from Victoria or

adjacent waters, to Nanaimo or Vancouver, or into the Gulf of Georgia. The channel is quite deep, reaching more than 200 fathoms in certain places. There are a few dangers lying on the west side of this passage, but they are marked. The lead would be of no value in these deep waters. A course by chart is easily run, having due regard for the tides, which are quite strong in this strait.

San Juan Channel, called also Middle Channel, between San Juan, Lopez and Orcas Ids., Wash. is another deep fairway between the strait of Juan and the Gulf of Georgia or the Inner Channels of British Columbia. It is not so deep as Canal de Haro, nor is it so much used. The dangers in this channel are Turn Rock



and Reid Rock, both well marked.

Spieden Channel, between Spieden and San Juan Islands, is a deep channel used mainly only by vessels that call at Roche Harbor.

The dangers in this channel are Center Reef and Danger Rock, and a shoal patch a short distance to the N<sup>o</sup> of Base Id. These dangers are marked by kelp, and the last named by a buoy. There is no difficulty in avoiding these dangers in a steamer in seeing weather.

There is a light house and fog signal on Discovery Id., B.C., at Northern Entrance to the <sup>Narrow</sup> Strait, and a post light and fog signal on Turn Pt., Stuart Id., Wash., and a post light at Cattle Point, San Juan Island within the limits of this survey.

Between Spieden and Stuart Ids. is an archipelago of islets

and reefs, and the tides in this locality are quite strong. Along the Northern shore of Spieden Island is a good, deep Channel, called New Channel in British Charts. These waters are only available for handy steamers, as the dangers are many and the tidal currents treacherous.

Indenting Stuart Island are two snug harbors, of limited size, called Reid and Perost Harbors, the former being the more desirable and free of dangers. Perost Harbor contains a reef inside the western entrance. The Eastern entrance is impracticable on account of reefs and shoals. These harbors are at present only of value as temporary anchorages.

John's Pass, between Stuart and John's Islands, is a narrow tortuous pass sometimes used by

3 + 4

Small vessels. The tide is not so strong through this channel as through Spideren and New Channels. Morse Id. shut in fully by Henry Id. forms a range for entering John's Pass from the S<sup>th</sup>.

In the navigation of the principal channels, above named, the services of a pilot are scarcely required, but may be desirable in entering the harbors or the more intricate channels. There is a pilots association at Port Townsend, Wash. While most tug - boat and steamer captains are licensed pilots.

Pilotage is not compulsory.

5 + 6

In the channels the bottom is usually rocky, and the channels themselves of a permanent character.

Fair anchorage may be had near the shores in many

places within the limits of this Survey, but the usual and best anchored are Roche and Friday Harbors, above mentioned.

The tidal currents are, as far as observable, usually fair with the channel, but there are points, as at Green Point, Spieden Id., where the tides from different channels meet and thereby swirls result. No special observations of tidal currents were made by this party.

7 + P.

An examination was made of Heien Bank, Strait of Fuca, to ascertain the least depth of water upon it. The result obtained was  $4\frac{1}{2}$  fathoms. A least depth of  $3\frac{1}{2}$  fathoms is given in the Pacific Coast Pilot, also in the British Columbia Pilot. The keel on the bank at the

Air of its examination was so thick that it was not practicable to drag for any projecting point, and the examination had to be confined to running lines of soundings in many directions over the bank. It is, therefore, possible that the least depth was not found.

Fog from the Strait of Fuca works up the San Juan Channel and Canal de Narrows and among the Islands of Washington Sound during the foggy season. It is usually not so dense, however, among the islands as in the Strait. For data regarding fog and smoke in the Strait of Fuca, reference is made to my descriptive report forwarded Jan'y 8, 1894, and a special report on same subject dated Jan'y 18, 1894. During the past season the

entire Puget Sound country was wrapped in dense smoke, caused by forest fires, for about two weeks in the month of August, which greatly interfered with survey work, as well as navigation.

9, 10 and 11.

Reference is made to my Descriptive Report, Jan'y 1894, for data under these heads.

12.

At Friday Harbor good water may be had at Warbur's Wharf from tanks that are fed by wells. The supply is somewhat limited. At most larger places in the Sound, and at Port Angeles, Strait of Juan, facilities for watering ship are good. For other data under this head, reference is made to former Descriptive Report, above referred to.

Recently the Blue Canyon

12.

Coal of New Whatcom has achieved some reputation as a steaming coal, though not generally regarded as equal to British Columbia Coal.

13.

There are several short wharves at Friday Harbor, the principal being the Cannery Wharf, where a Salmon Cannery was recently established, and the San Juan Trading Co's Wharf. There is a depth of 7 feet at low water along face of these wharves. There are two wharves at Friday Harbor belonging to the Roche Harbor Lime Co., having depths alongside of about 10 feet at low water.

14, 15 and 16.

None within the limits of this survey. A special report on docking and repairing facilities

14, 15 and 16.

in Puget Sound ports was made by me to the Hydrographic Inspector under date of Aug. 14th, 1893.

17.

A tri-weekly mail steamer carries passengers and freight between the Islands and Puget Sound Ports, the termini of the route being Seattle and New Whatcom. There are other occasional steamers plying between these places. There are no railroad or telegraph facilities in the Islands of Washington Sound.

18.

Roche Harbor is a sub-port of entry, with a deputy collector residing there. The main Custom<sup>House</sup> is established at Port Townsend. There are post offices at both Roche Harbor and Friday Harbor.



The only settlements of importance within the limits of this survey are Roche and Friday Harbors, the latter being the more important. The tri-weekly mail steamer affords the usual means of communication between the two places. The population of Roche Harbor consists mostly of the employees of the Roche Harbor Line Co., and the shipment of lime is the chief industry. There is a salmon cannery at Friday Harbor, but the main industry in this vicinity is agriculture. There is a very fertile valley, of considerable extent, back of this town, and it appears to be well cultivated.

Kelp fringes the rocky shores of the islands and the strait of

Fuca and marks all rocky shoals and reefs. It is most luxuriant in the summer months. Most of the hidden dangers in these waters are thus made manifest to the navigator but at times the kelp may be run under by the strong currents so as to be invisible at a distance. There is an extensive kelp patch extending off the western shore of Smith Id., Strait of Fuca and it is reported that boulders have been noticed in this kelp at extreme low waters. The limits of this patch are well defined and no vessel would be justified in entering it. Kelp is also quite thick on Hein Bank and Partridge Bank, Strait of Fuca and in the foul ground extending to N<sup>d</sup> and W<sup>d</sup> of Point Wilson Light House.

The small Bay in Henry Island which forms an arm of Roche Harbor to the S.W. is locally known as Nelson Bay and has been so called in this report. Westcott Creek to S. and E. of Roche Harbor is also called Westcott Bay which seems more appropriate. An arm of Westcott Bay extending to S. is locally known as English Bay or Garrison Bay as on its Eastern shore the English Garrison was established during the joint occupation of San Juan Island. The small Bay on San Juan Id., extending Eastward from the commencement of Mosquito Passage is locally called Mitchell Bay.

Very respectfully,  
Lucian Flynn

Lieut. U.S.N., Asst. Chf. Survey,  
Comdg. Str. Gedney.

ForWARDED

J. F. Mear. Lt Com'd'r, U.S.N.,  
Hydrographic Inspector C. & G. Survey.

Statistics of Field Work executed by Lucian Flynn, Lieut U.S.N.

Date of beginning field work ..... May 7<sup>th</sup>, 1895.  
Date of closing field work ..... October 18<sup>th</sup>, 1895.

RECONNAISSANCE:

Area of, in square statute miles .....  
Lines of intervisibility determined as per sketch submitted .....  
Number of points selected for scheme .....

BASE LINES:

Primary, length of .....  
Secondary, length of .....  
Beach measurements, length of .....  
Number of days employed in measurements of base .....  
Number of days employed in re-measurements .....

TRIANGULATION:

Area of, in square statute miles .....  
Signal poles erected, number of .....  
Observing tripods and scaffolds built, number of .....  
Observing tripods and scaffolds built, heights of .....  
Days occupied in opening and verifying lines of sight, number of .....  
Stations occupied for horizontal measures, number of .....  
Stations occupied for vertical measures, number of .....  
Geographical positions determined, number of .....  
Elevations determined trigonometrically, number of .....

GEODESIC LEVELING:

Elevations determined by spirit-leveling of precision, number of .....  
Lines of geodesic leveling, length of .....

LATITUDE, LONGITUDE, AND AZIMUTH WORK:

Latitude stations occupied, number of .....  
Pairs of stars observed for latitude, number of .....  
Average number of observations on a pair .....  
Longitude stations, telegraphic, number of .....  
Longitude stations, telegraphic, number of nights on which signals were exchanged .....  
Longitude stations, chronometric, etc., number of .....  
Azimuth stations, number of .....  
Number of nights of observations for azimuth .....  
Number of stars observed for azimuth .....





2213

## Geographical Position of Signals

Name	Latitude	S.W.	Longitude	S.P.
Linn Pt. Stake Light	48° 41' 20.113"	621.3 m	123° 14' 08.748"	178.9 m
Douglas	48° 44' 03.099	95.7	123° 11' 09.960	203.5
Queen	48° 34' 07.257	69.6	123° 10' 29.894	617.8
Kopet	48° 34' 33.047	1329.5	123° 10' 19.242	394.5
Open	48° 35' 00.636	19.6	123° 10' 48.276	987.4
Gravel	48° 35' 48.296	1491.8	123° 10' 35.985	737.5
Dandy	48° 41' 24.033	742.3	123° 12' 50.348	1029.9
Grassy	48° 41' 10.800	333.6	123° 12' 06.384	130.6
Pudding	48° 41' 07.995	247.0	123° 11' 20.072	410.6
Stump	48° 40' 50.402	1556.9	123° 10' 25.292	517.5
Ant	48° 40' 27.315	843.7	123° 09' 41.685	853.0
Nivity	48° 40' 07.274	70.2	123° 08' 44.306	906.6
Groove	48° 39' 30.323	936.6	123° 10' 56.884	1164.3
Flat	48° 39' 49.828	1539.1	123° 10' 09.071	185.7
John	48° 39' 58.630	1811.0	123° 09' 25.665	525.4
View	48° 38' 49.049	1515.1	123° 09' 38.092	779.9
Barren	48° 37' 21.752	671.9	123° 09' 32.363	662.8
Yough	48° 36' 57.155	1580.1	123° 10' 23.324	477.9
Barnacle	48° 36' 30.909	954.7	123° 09' 26.447	541.9
Stack (south)	48° 36' 52.842	1632.2	123° 09' 16.927	346.8
Chapel	48° 36' 33.126	1023.2	123° 08' 58.874	1206.2

## Geographical position of Signals

name	Latitude	S.M.	Longitude	S.P.
Speeder	48° 38' 01.329	41.0	123° 06' 24.099	493.4
Orcus Knob	48° 39' 40.856	1262.0	122° 59' 21.174	433.4
Splice	48° 40' 04.77	147.3	123° 04' 11.728	239.9
Gull	48° 39' 03.765	116.3	123° 05' 17.927	366.9
Flattop	48° 38' 43.626	1330.9	123° 05' 08.602	176.1
Cactus	48° 38' 53.353	1648.0	123° 07' 25.212	516.2
Sheep	48° 38' 15.398	475.6	123° 08' 00.808	16.5
Knob	48° 37' 23.542	727.2	123° 08' 14.922	305.6
Loam	48° 37' 16.148	498.8	123° 07' 28.235	578.3
Pasture	48° 37' 59.707	1844.3	123° 07' 00.939	192
Spire	48° 38' 29.060	896.1	123° 00' 58.910	1206.2
Fairview	48° 37' 27.861	860.5	123° 01' 44.72	905.8
Dick	48° 37' 06.774	2092	123° 03' 08.813	182.8
Goose	48° 35' 31.046	959.0	123° 01' 53.061	1087.4
Twist	48° 37' 10.396	321.1	123° 06' 00.684	14.0
Oral	48° 36' 15.658	483.6	123° 05' 26.201	536.9
Jones	48° 36' 43.664	1348.7	123° 02' 56.164	1150.7
Laurel	48° 36' 34.098	1053.2	123° 01' 17.934	367.5
View	48° 36' 44.072	1361.3	123° 02' 11.844	242.8
Wasp	48° 35' 57.992	1791.3	123° 01' 17.242	353.3
Down	48° 34' 55.488	1713.96	123° 03' 30.138	617.9



# Geographical Position of Signals

Name	Latitude	S.W.	Longitude	S.P.
Bamboo	48° 33' 43.704"	1349.96	123° 00' 56.289"	1154.4
Yellow	48° 35' 34.922"	1079.0	123° 01' 50.135"	1027.4
Nov	48° 35' 28.244"	872.4	123° 00' 58.462"	1198.2
Shed	48° 34' 11.244"	347.3	123° 02' 49.034"	1005.3
Lead	48° 34' 49.366"	1524.9	123° 00' 53.618"	1099.3
Swift	48° 33' 31.848"	983.7	122° 59' 10.146"	208.1
Slope	48° 33' 07.596"	234.6	123° 00' 15.258"	312.0
Yarn	48° 32' 09.001"	278.0	122° 58' 08.841"	181.37
Strong	48° 33' 06.076"	187.7	122° 58' 35.647"	731.1
Mat	48° 32' 48.79"	1507.1	122° 56' 52.833"	1083.8
Red	48° 30' 50.792"	1568.9	122° 56' 55.954"	1149.4
Crest	48° 32' 04.457"	137.7	122° 59' 36.330"	745.4
Friday	48° 32' 47.744"	1475.7	123° 00' 23.388"	479.8
Niche	48° 32' 04.010"	123.9	123° 00' 32.262"	661.9
School House <sup>Flag</sup> <del>Staff</del>	48° 32' 10.099"	311.9	123° 01' 03.855"	79.1
Church <del>Spire</del>	48° 32' 10.062"	310.8	123° 00' 58.098"	1191.9
Berry	48° 32' 27.076"	836.3	123° 00' 52.348"	1073.9
Pickle	48° 32' 15.426"	476.5	123° 00' 23.198"	475.9
Cannery Smoke Stack	48° 32' 06.834"	211.1	123° 00' 41.984"	861.3
Swim	48° 32' 04.244"	131.1	122° 59' 58.688"	1203.9
Warbass	48° 31' 54.964"	1697.8	123° 00' 07.094"	145.6

# Geographical Position of Signals

Name	Latitude	S.W.	Longitude	S.P.
Pearl	48° 36 50.357	1555.3 M	123° 09 35.856	734.6
Mussel	48° 36 19.273	595.3	123° 09 53.719	1100.6
Clover	48° 36 03.980	172.9	123° 10 07.238	148.3
Cedar	48° 36 04.458	137.7	123° 09 49.606	1016.3
Clearing	48° 35 46.738	1428.2	123° 09 55.192	1131.1
Widless	48° 35 26.128	507.1	123° 10 32.788	671.9
Part	48° 35 27.314	843.7	123° 10 11.338	232.4
Garrison	48° 35 26.431	816.4	123° 09 44.509	912.2
Cabin	48° 35 37.544	1159.7	123° 09 16.883	346.1
Stake	48° 35 22.922	708.0	123° 09 33.920	695.3
Bend	48° 35 54.785	1698.2	123° 09 08.740	179.1
Mud	48° 35 47.936	1480.7	123° 08 36.612	750.3
Sentinel	48° 38 20.713	639.8	123° 09 01.056	21.6
W. W. Tree	48° 37 27.584	852.0	123° 08 45.418	930.2
Socket	48° 35 34.998	1081.0	123° 04 38.014	779.0
Small	48° 40 54.777	1692.0	123° 01 09.450	193.4
Limestone	48° 39 17.547	542.0	123° 00 30.829	631.0
Waldron	48° 40 35.670	1101.8	123° 02 30.112	616.1
Weed	48° 38 52.632	1625.7	123° 04 34.538	707.1
Popling	48° 38 57.178	1766.1	123° 09 19.735	404.1
Purple	48° 39 26.654	823.3	123° 07 43.387	888.0

# Geographical Positions of Squalls

Name	Latitude	S.W.	Longitude	S.P.
Edwards	48° 29' 54.718	1690.2m	123° 07' 47.688	977.6m
Zero Rock	48° 31' 25.524	788.4	123° 17' 25.103	515.1
Kelp Reef	48° 32' 52.104	1609.4	123° 14' 07.491	153.7
Darey	48° 34' 09.082	280.5	123° 15' 45.973	942.5
Maple	48° 35' 19.156	591.7	123° 12' 00.361	7.4
Hallbut	48° 37' 09.772	301.8	123° 16' 07.109	145.6
Morse Id	48° 37' 27.118	837.6	123° 10' 59.314	1214.8
Low	48° 32' 36.081	1114.5	123° 09' 47.040	965.0
Gordon Head	48° 29' 34.6	1068.6	123° 18' 10.158	208.6
Granite	48° 33' 41.109	1269.3	123° 10' 26.902	557.7
Rock Pile	48° 35' 57.004	1575.5	123° 12' 02.152	44.1
Kelp	48° 36' 44.42	1063.2	123° 11' 27.790	569.4
Mosquito	48° 37' 16.157	499.1	123° 10' 45.295	937.5
Sorrel	48° 35' 11.508	355.5	123° 11' 37.813	774.9
Tom (C 1854)	48° 39' 47.247	1459.11	123° 16' 26.956	557.8
Pitch	48° 40' 13.855	428.0	123° 13' 07.089	42.6
Stuart West	48° 41' 01.650	57.0	123° 14' 08.19	165.9
Pidney	48° 36' 04.562	140.9	123° 16' 01.138	23.34
Liptop	48° 40' 22.536	696.1	123° 12' 35.840	733.3
Ridge Id	48° 37' 56.90	1757.6	123° 16' 57.270	1177.1
Yarfax	48° 41' 57.726	1783.1	123° 17' 49.346	1009.4

## Geographical Position of Signals

Name	Latitude	S.W.	Longitude	S.P.
Last	48° 31' 46.728"	1443.4	122° 59' 41.680"	855.4
Stub	48° 36' 45.54"	1406.7	123° 05' 45.89"	940.2
Black	48° 34' 47.753"	1320.6	122° 59' 50.970"	1045.0
Cant	48° 33' 47.515"	1467.7	123° 01' 21.059"	431.9
Egg	48° 34' 21.053"	959.2	122° 59' 27.637"	566.6
Limbo	48° 33' 57.608"	1779.4	122° 58' 59.374"	1217.6
Flag	48° 33' 41.158"	1271.3	122° 58' 50.016"	1025.7
Leuk	48° 32' 10.304"	318.2	122° 59' 02.967"	60.9

These positions were obtained from Capt J. J. Gilbert  
U.S.C. and used in plotting.

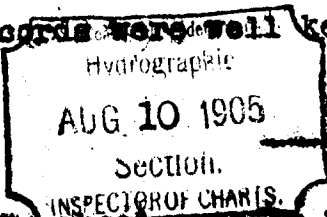
2211  
Report  
on  
Hydrographic Sheet  
No. 2212a,  
Straits of Juan de Fuca,  
Examination of Hein Bank,  
Wash.  
Assistant Dickins,  
1904.

The position numbers should be placed so as not to interfere with the soundings, and positions should be shown by a small dot instead of a circle.

From 42a to 55a (blue) the positions are doubtful on account of weak angles.

The records were well kept.

6/1/05.



H.L. Simons. (Signed).

The shoal area is well covered and the danger clearly defined. While the character of the work is not such as to develop the least water with certainty, the results meet all the requirements.

A noteworthy and commendable departure from usual practice is found in the reduction of soundings for tide. The tide correction was entered to the nearest foot for all soundings, except the one sounding that gave the least depth obtained on the shoal, where the reduction was made to tenths, which was exactly what the circumstances required. Time and labor were saved in entering and checking reducers, reducing and verifying soundings, duplicating and comparing duplicates and plotting and verifying the finished sheet. And, what is

This one sounding was reduced to tenths by Mr. Simons. G.L.F.

more important, the chance of error in each of these operations was greatly diminished.

Two points, triangulation "Discovery" and triangulation "Discovery Id. Lt.", are quite near each other on the projection, and in the record the signal used is entered "Disc" and "Discovery", which seems to indicate that triangulation "Discovery" was used, yet the plotted positions show that triangulation "Discovery Id. Lt" was the signal used in projecting.

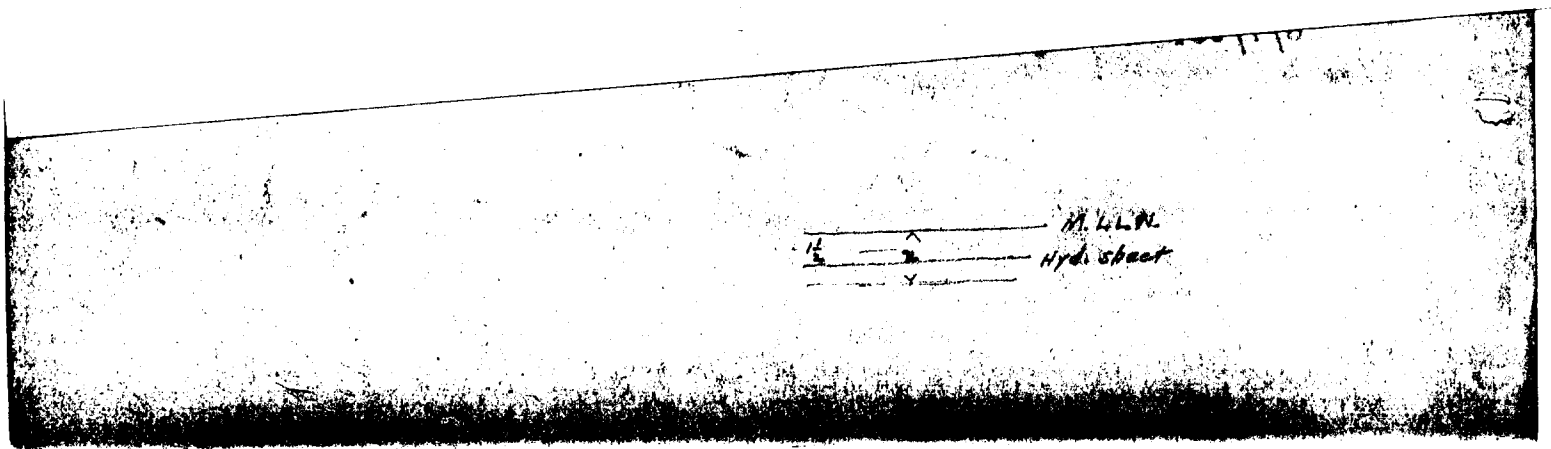
To avoid errors in identity of signals, the part of the name of the signal used in the hydrographic record should be underlined in blue ink on the smooth sheet and that abbreviation adhered to throughout the record.

Smiths Id. Lt. triangulation was used and South, tangent to Smith Id. also. The triangulation station was entered "Smith" and so was the south tangent to Smith Id. In consequence one day's work had to be plotted a second time.

In such cases the part of name of triangulation station used should have been underlined in blue ink on smooth sheet, as mentioned, and the tangent marked and given a name not easily mistaken for that of the triangulation station.

6/7/05.

J. T. Watkins. (Signed).



M. L. N.

Hyd. sheet

Charts

Jan 10, 1927

Memorandum for Hydrographic Sheets, Nos. 2213, 2214, 2215 & 2216.

Roche Harbor, Washington.

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The soundings on the above sheets are referred to a datum based on a few selected lowest low waters ~~and~~<sup>which</sup> corresponded to a reading of 1.81 feet on tide staff at Roche Harbor.

To refer them to the plane of mean lower low water add 1.5 feet to each sounding.

*H. Marmen*

Acting Chief, Division of

Tides and Currents.