

3524 & 3525

Diag. Cht. No. 1206-2

Form 504

U. S. COAST AND GEODETIC SURVEY
DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. Office No. H-3524
H-3525

LOCALITY

State MAINE & NEW HAMPSHIRE

General locality PISCATAQUA RIVER,

Locality GREAT BAY TO SALMON FALLS RIVER

1913

CHIEF OF PARTY

R. P. Strough

LIBRARY & ARCHIVES

DATE AUGUST 25, 1913.

B-1870-1 (1)

3524 & 3525

DEPARTMENT OF COMMERCE.

COAST AND GEODETIC SURVEY.

O. H. TITTMANN, SUPERINTENDENT.

MAINE AND NEW-HAMPSHIRE.

Piscataqua River and Great Bay.

A Descriptive Report to Accompany

Hydrographic Sheet No. 1.

Scale 1 to 10,000.

1913.

R.P.Strough,

Assistant, C. & G. Survey.

Chief of Party.

A Descriptive Report to Accompany Hydrographic Sheet No. 1;

PISCATAQUA, SALMON FALLS, BELLAMY, OYSTER, and EXETER RIVERS,
and GREAT BAY.

Maine and New Hampshire,

June to August, 1913.

I have the honor to submit the following report on the hydrography covered by hydrographic sheet No.1, Piscataqua River, Great Bay, and the affluent streams, Maine and New Hampshire, 1913.

LIMITS:

The work was carried from the North Western limit of Assistant W.E.Parkers work in 1903 in the Piscataqua River (3/4 mile E.S.E. of Dover Point) up the Piscataqua River to the junction of the Salmon Falls and Cochecho Rivers and up the Salmon Falls River to 1 1/2 miles above the highway and electric car bridge at South Berwick Junction. The work was carried from the aforementioned limit of Assistant W.E.Parkers work thru Little Bay, up the Bellamy River to a junction with the U.S.Army Engineers hydrographic survey of that river in 1909, up the Oyster River to the head of navigation, thru Great Bay, and up the Exeter River to about 1/10 mile north of the Stratham highway bridge to a junction with the army engineers survey of 1909. The Cochecho and Lamprey Rivers were also surveyed by the Army engineers in

1909.

METHODS:

The work was all done during July and August with a 28 foot gasoline launch, hired at Portsmouth New Hampshire. Lines were run generally in the direction of the channel at intervals of from 30 to 60 meters according to the depth, except on shoals where closer development was required. The low water limit was determined by running a line along the edge of the mud flat at low tide, at a distance of from 5 to 10 meters from the edge, following the shape of the flats and sketching in the low water limit as the work was carried on. The flats were usually covered with eel grass, making them easy to see at low tide. When the smooth sheet for this work is plotted, the boat sheet should be frequently consulted for the low water line sketched thereon. It would have been very difficult to determine the low water limit by lines across the flats at any stage of the tide on account of the eel grass. On account of the strong current prevailing at half tide it was necessary to wait for slack water in certain places and this fact greatly retarded the progress of the survey.

CONTROL:

The control for this work was obtained largely from the triangulation, some of the topographic signals from the surveys of 1900, 1908, and 1909, were recovered and used, and some were located by this party with the plane table and sextant. A list of signals used and the methods of their location is attached to and forms apart of this report.

THE PISCATAQUA AND SALMON FALLS RIVERS:

Beginning at the south eastern limit of the work near Upper Birch and proceeding up the Piscataqua River the first important feature is the mud flats off Dover Point, which is known as the middle ground. Here there are three or four detached mud flats with deep water around them. The channel is easily visible at low tide when the flats are bare, but at high tide some local knowledge is necessary as there are no aids to navigation of any kind. The narrowest portion of the channel between mud flats at this point is about 100 meters. From the middle ground to the Cocheco River the channel generally follows about the center of the river and varies from 130 to 180 meters in width and has a least depth of 10 feet at low tide. From the junction of the Cocheco and Salmon Falls Rivers up the latter stream the channel follows closely the west bank of the river as far as the South Berwick bridge. It is very narrow and has a least depth of 6 feet at low tide. There was originally a draw in the South Berwick bridge 33 feet in width but it is now closed as the only traffic on the Salmon Falls River at the present time is motor boats which run up as far as South Berwick. The height in the clear of the old draw in the South Berwick bridge is about 7 feet at high water. Above this bridge the channel gets shallow and above the first bend above the bridge it gets very narrow and shallow and is only of use to small motor boats and such craft at high tide. The Salmon Falls dam lies about 2.5 miles above the South Berwick bridge and small boats at high

The boat sheet indicates only 2 detached flats here

tide can go nearly to the dam. The hydrographic survey was discontinued about 1 1/2 miles above the bridge as the channel becomes narrow and tortuous and the work could only be done at high tide. In order for the Salmon Falls River to become of any commercial importance it would have to be dredged and a suitable draw provided in the South Berwick bridge. The soundings throughout this sheet are referred to a tide staff located at Dover Point. The Cocheco River from its junction with the Salmon Falls River to Dover has been surveyed by the U.S. Army Engineers in 1909 and blue prints of the hydrographic sheets are forwarded with this report.

LITTLE BAY:

There is a small shoal lying 300 meters E. by N. (true) from the draw signal pole in the Dover Bridge, with a least depth of 12 feet at mean low tide, rock bottom. The draw in the Dover bridge is 35 feet in width and has a depth of about 5 fathoms thru it. The draw when closed has a height of 7 1/2 feet in the clear above high water. There is a long covered span to the bridge at its southeastern end and there is more water thru here than at the draw and the height above high tide is also greater, but the current thru the covered span is as strong as at any point in the river and passing thru here should never be attempted except at slack water. Passing thru the draw toward the westward there is a small rocky shoal lying 140 meters S.S.W. from the draw signal pole and having a least depth of 7 feet on it at low tide. From this point to Goat Island, Little bay is free from shoals or obstructions of any kind. There is a greatest

depth of 13 fathoms about 1 mile above Dover bridge and a width at this point of 500 meters. At one time there was a bridge across Little Bay from the North side of Fox Point to Goat Island and from Goat Island across the North channel toward the Oyster River flag staff. The bridge is gone and there are two piers of the old bridge showing on the South side of Goat Island and one which is submerged lying 50 meters from H.W. mark on the Fox Point side and having a least depth of 4 feet at low water. There are two small rocky shoals lying to the north west of Fox Point. The nearer one being about 130 meters in an east and west direction and having a least depth of 7 feet at low water. This shoal lies about in the center of the river between H.W. marks. The other has a least depth of 8 feet and is about 80 meters in extent. It lies 250 meters from the other shoal in a northerly direction. The best course is between the two.

BELLAMY AND OYSTER RIVERS:

The hydrography was carried up the Bellamy river to a junction with the Army Engineers work. The channel is from 50 to 100 meters in width and has a general depth of from 2 to 3 fathoms, mud bottom. The channel is marked with stakes on both sides and is easily followed. The Bellamy River was dredged 1889-1896 to a width of 50 feet and a depth of 5 feet at low water from its mouth to within 200 meters of the dam at Sawyers Mills. A blue print of the Army Engineers survey is forwarded with this report. ~~The hydrography in the Oyster River was carried up as far~~ report. The hydrography in the Oyster River was carried up as far as the river is navigable for even a motor boat. The river

has never been dredged and the bottom is very regular for the first mile up the river. From this point it begins to get shallow and a motor boat can go to Durham only at high tide. There is a dam at Durham.

GREAT BAY, FOX POINT TO ADAMS POINT:

There is a rocky spit extending
Fox
250 meters off shore to the westward of Adams Point and there are several boulders with from 5 to 9 feet on them thruout its length. There is also an area of shoal water and rocks bare and awash extending off shore from the west side of Great Bay about 700 meters south of the mouth of the Oyster River. There are no aids to navigation or stakes around Fox Point and some local knowledge is necessary. Between Fox and Adams Points Great Bay is about 700 meters wide between low water marks and the water is generally from 7 to 9n fathoms deep in the center of the channel.

GREAT BAY, FOX POINT TO EXETER RIVER:

At low tide the mud flats in Great Bay extend nearly a mile from shore and are covered with eel grass. The channel varies from a width of 1/4 mile and a depth of 4 to 8 fathoms at its upper end to a width of 50 meters and a depth of 8 to 12 feet at its southern end. The channel at present is marked with stakes which are insegure and have to be replaced every spring. There is no channel extending to the Eastward toward the town of Greenland at all ezcept at high tide and then for only a small motor boat. There are several bights in the mud flats however which extend in that direction, but they are all blind channels. There is an 8 foot spot rocky bottom, lying 1

S.W. by W. from the Newington windmill tower, which is in the center of the channel and was thoroughly developed. Aside from this there are no shoals of any kind which are not bare at low water.

LAMPREY AND EXETER RIVERS:

The Lamprey river has never been dredged but was surveyed by the Army Engineers in 1909, blue prints of which survey are forwarded with this report. The entrance to Lamprey River is very narrow and tortuous and is marked only with insecure stakes. There is 10 feet to Chapmans wharf New-Mrket at high tide.

Above the R.R. bridge ~~over~~ the Exeter River varies from 40 to 60 meters in width and has a depth pf about 12 feet at low tide. The work was carried up this river to within 300 meters of the Stratham highway bridge to a junction with the Army Engineers survey of the Exeter River, Blue Prints of which survey are forwarded herewith. Certain improvements have been proposed by the army for this river, but they have not as yet been made. The height in the clear of the R.R. bridge over the Exeter River is about 5 1/2 feet at high water.

There is comparatively little traffic in this whole water system except motor boats, and a few coal barges which ply between Portsmouth, and Dover, Exeter, and NewMarket. Even for motor boats it should be necessary to have someone familiar with the river aboard, as accidents around the shoals and bridges are apt to be attended with serious results on account of the strong current. In

going up the river from Portsmouth a motor boat should pass thru the high span on the Portsmouth side of the Kittery bridge on account of the strong cross currents which set around the bridge near its center. The best place to go under the Dover bridge is at the draw as the current sets stronger at the center and toward the south side. The draw in the Exeter bridge is low and the best place to go under this bridge is thru the first span to the west of the draw.

Respectfully submitted,

R. P. Strough

Assistant, C. & G. Survey,

Chief of Party.

Washington, D.C.

August 22nd. 1913.

To the Superintendent,

C. & G. Survey.

LIST OF SIGNALS, AND METHODS OF THEIR LOCATION:

- ✓ HOP P.T. position Sheet 2958, Q.
- ✗ BUR Topography.
CAS P.T. position, Sheet 2958, O.
- ✓ SAD Topography.
- ✓ OLD Topography.
- ✓ OT Topography.
- ✓ BET Topography.
- ✓ CAN Topography.
- ✓ Ron Topography.
- ✓ PO P.T. position Sheet 2958, S.
- ✗ DRA Topography.
- ✗ Gray Topography/
- ✗ NID Topography.
- ✓ Tol P.T. position Sheet 2958, I.
- ✗ COR Topography.
- ✗ TAN Topography.
- ✗ KID P.T. position Sheet 2958, T.
- ✗ MAT Topography.
- ✗ E P.T. position Sheet 2958 E.
- ✗ D P.T. position Sheet 2958 D.
- ✓ CO Topography.
- ✓ HIC Topography.
- ✗ MAL P.T. position Sheet 2958, C.
- ✗ HO P.T. position Sheet 2958, B.
- ✗ RIP Triangulation, Geog. pos. (Yellow Cup Hor Stripes)
- ✗ LIT Topography.

- × SLAT Triangulation, Geog. pos. (Barn Cup Double Windows Grn Slats)
- ✓ **BIG** Topography.
- ✓ **TAB** Topography.
- SA Sextant angles Vol. 1, Page 60.
- × TON Triangulation, Geog. pos. (Leighton)
- × TOP Triangulation, Geog. pos. (Red Top Barn Cup Dover Pt.)
- × DO Triangulation, Geog. pos. (Dover Pt. House Cup.)
- × DRAW Triangulation, Geog. pos. (Draw Signal Pole.)
- × NEW Triangulation, Geog. pos. (Newington R.R. Sta. S.E. Chy)
- × UP Triangulation, Geog. pos. (Upper Birch)
- × REN Scaled from topographic sheet 2511, Greenacre Flag staff.
- × HILL Triangulation, Geog. pos. (Hill Windmill)
- × BEL Sextant angles Vol. 1 Page 60.
- ✓ **PAL** Topography.
- × **END** Topography.
- × FLAG P.T. position Sheet 2903, Fox Pt. Flag Staff.
- × FOX Triangulation, Geog. pos. (FOX Pt. Wind Mill)
- × ET Sextantangles, Vol 4, Page 61.
- × DOT " " " " " "
- × OY Triangulation, Geog. pos. (Oyster River flag staff)
- × UN Topography.
- × RED Triangulation.P.T. position Sheet 2903 (Cup Red Barn)
- × FAN Topography.
- × DUT "
- × PIER "
- × ROK "
- × MUT "

- ✓ DED Topography.
- ✓ JEF "
- ✓ BEA "
- ✓ RAN "
- ✓ PINE "
- ✓ GOS "
- ✓ BRICK "
- ✓ POLE "
- ✓ MON "
- ✓ ROD "
- ✓ PIC "
- ✓ PIL "
- ✓ BRIDGE "
- ✓ BAR Triangulation, Geog. pos. (White Barn Cup.)
- ✓ GAB P.T. positions Sheet 2903 (E.Gab. Barn.)
- ✓ WES P.T. positions Sheet 2903 (Cable house No. 2)
- ✓ East P.T. Positions Sheet 2903 (Cable house No.1)
- ✓ NOR Sextant angles Volule 1 , Page 60.
- ✓ CHY Sextant angles Vol. 1, Pages 60 and 61.
- ✓ GRO Pl T. positions Sheet 2904 (Adans Monument)
- ✓ BOAT Triangulation, Geog. pos. (Boat house S.W Gable.)
- ✓ MILL. TRIangulation, Geog. pos. (Newington Windmill)
- ✓ DUC Sextant angles, Vol. 3, Page 61.
- ✓ PIPE Triangulation, Geog. pos. (Frank Jones Stand Pipe)
- ✓ DEL Triangulation, Geog. pos. (Greenland tall church spire.)
- ✓ DUR Triangulation Geog. pos. (Durhan Pt. Barn Cup.)
- ✓ YEL Triangulation, Geog. pos. (Yellow Barn Cup.)

✓RAP Topography.
✓GAL "
✓BAN "
✓BIL "
✓GUS "
✓KIL "
✓LIB "
✓PUS "
✓NIG "
✓DOT "
✓POG "
✓PIN "
✓LOG "
✓TRES "
✓HIP "
✓FUD "
✓EX Plt. position. Sheet 2904, (Drawbridge)
✓RID Sextant angles Vol. 7, Page _61!
✓SIL Triangulation Geog. pos. (Silo)
✓RAT Plotted from data in description of station Stratham(~~FLG~~staff)

EXAMINATION OF HYDROGRAPHIC SHEETS
by the
DIVISIONS OF FIELD WORK AND FIELD RECORDS.

Sheet No. 3524

1. + Are numbers of hydrographic sheets adjoining limits of work shown? *No*
2. Are transferred soundings of adjacent hydrographic sheets made to show that ground has been covered? *No*
3. + Is sheet of proper size?
4. + Is sheet well laid out, no additions required?
5. Are limits of hydrography regular?
6. + Are positions of signals accentuated by light dot of black ink to assist plotting? *No*
7. + Are tidal stations plotted on sheet? *No*
8. Is area of work completely covered?
9. Are critical soundings and dangers shown distinctly? *No*
250 m. NNE of D Fox
10. + Is the control good? *Fair*
11. + Are positions of signals clearly shown?
12. Are soundings well distributed?
13. Are shoals carefully and sufficiently developed?
14. Do soundings cross satisfactorily?

- 15. Is existence or non-existence of a reported shoal determined?
.....
- 16. Is least sounding over bar probably determined by check soundings or diagonal sounding lines crossing same?
.....
- 17.+ Are projection and plotting checked?
- 18. Is the scale of this sheet sufficient to show the necessary details in the navigable channels?
- 19. +Is the shoreline shown?
- 20.+ Is there an accompanying list of plane table or sextant positions of signals?
- 21. Has sufficient attention been given to the development of channel? *Least water in channel ^{apparently} not determined just N of Lat 43-09'*
- 22. Are sufficient bottom characteristics shown?
- 23. Are sounding lines normal to coast?
- 24. Have suspicious soundings been investigated?
- 25. Are ranges or bearings given for important shoals?
- 26.. Are sailing directions given? *No*

- 27. Is the general hydrography in the entire area properly developed?
- 28. Are shallow channels for motor boats sounded?
- 29. Is there a note as to coloration of water in or near mouths of rivers and bays? .. *No*
- 30. Is there any information given as to obtaining fresh water? .. *No*
- 31. Are there proper intervals between soundings?
- 32. Are projecting points of land and reefs determined by sufficient lines with soundings at close intervals run at right angle to direction of points?
- 33. Is there sufficient data to draw depth curves?
- 34. Are shoal areas remote from shore properly developed by independent system of buoy signals placed in the vicinity of shoal?
- 35. Are soundings obtained at docks in harbor?
- 36. * Is there a full list of data effecting sheet given? .. *No*
- 37. Are description of hydrographic signals and marking of same recorded? .. *No*
- 38. Is there a list of land marks given?

- 39.+ Does descriptive report give date of instructions? *No*
- 40. Are small islets and rocks distinctly shown?
- 41. Is information relative to anchorage given?
- 42.+ Are survey methods explained sufficiently? *No*
- 43. Are geographical names given on sheet?
- 44. Are coast pilot notes given?
- 45. Is the unit of soundings given in title?
- 46. Are sufficient depth curves shown?
- 47. Are aids to navigation shown?
- 48. Are grass or kelp indications shown?
- 49. Are sailing courses shown on sheet? *No*
- 50. Is descriptive note given as to visibility of shoals? *Yes*
- 51. Are dangers fully described in descriptive report?
- 52. Is the character of reefs described on sheet?
- 53. Are beaches indicated where vessels in distress could be safely beached?
- 54. Are standard symbols used in drafting?
- 55. Is information relative to currents given?
- 56. Is there a statement as to certainty or probability of least depth over dangers given?
- 57. Is the existence of certain shoals doubtful?
- 58. Is a general description of coast given?

- 59. Is information relative to commercial importance given?
- 60. Does the descriptive report cover one or a moderate number of sheets?
- 61. Are descriptions of headlands given?
- 62. Is the nature of shoals whether coral rock or sand shown on sheet?
- 63.+ Is the position of the tide gauge well selected? Is the tidal data sufficient for the reduction of soundings over the area of the sheet?
- 64.+ Have projection lines been numbered around all the edges? ...
- 65.+ Has the geographic position of one of the triangulation points on the sheet been inked near the bottom edge of the sheet?
- 66. Was the speed of the sounding boat such as to allow vertical readings of the leadline?
- 67. Were lines of soundings run along the axis of narrow channels?
- 68. Have rocks or shoals seen from the sounding boat in passing been definitely located?
- 69. Have charted shoals reefs, or rocks been investigated?
- 70.+ Have sounding records been kept in approved form?

71. Are Wire drag surveys required?

72. Is the area between the soundings taken and the shore indicated or described as being covered by reefs, etc. as the case may be?

.....

Other Remarks

.....

.....

The forgoing points marked by a cross (+) and the following additional points are to be considered for wire drag hydrographic sheets.

73. What additional areas, if any, in the locality covered by the sheet should be dragged?

.....

74. Number of small areas inside limits of work missed by drag (few, moderate number, numerous)

75. Are shoals discovered with drag clearly shown?

76. Were shoals later covered by drag set at suitable depth?

.....

77. Are all areas missed by drag clearly shown?

78. Are overlaps ample?

79. Do effective depths conform to instructions under which the work was done?

80. If work was done before present practice as regards effective depths was adopted, should the area be re-dragged to conform to the present practice?

.....

.....

81. Are all shoals discovered shown on current issue of chart?

.....

VEC
Feb. 20, 1914.

HYDROGRAPHIC SHEET 3524.

Piscataqua River and Great Bay, New Hampshire, by

R. P. Strough in 1913.

TIDES.

RECEIVED
FEB 20 1914
ASSISTANT IN CHARGE

	Dover Point ft.
Mean low water, or plane of reference on staff	7.8
Lowest tide observed " "	7.1
Highest " " " "	14.9
Mean range of tide	6.4

H. 3524.

Piscataqua River. The hydrography appears adequate. The channel being well covered for the scale of work.

Sheet examined in Div
of Hyd'y & Top'y.