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U.S. Coast and Geodetic Survey
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U. S. COAST AND GEODETIC SURVEY,
J. C. Mendenhall, Superintendent.

State: *Conn.*

DESCRIPTIVE REPORT.

A + B + Tides.
Hydrographic, Sheets Nos. 2032,
2033, 2034, 2035.

LOCALITY:

Connecticut River.

See also Report for
Tide Sheets Nos. 2086 & 2087

1890.

CHIEF OF PARTY:

W. S. Vinal.

2032 2033-2035

To accompany report of Pearson's work,
dated November 30, 1890.

To accompany Hydrographic

Descriptive Reports A and B. Sheets Nos. 2032-2035.

DEC. 4. 1890. 001654

The channel of the Connecticut River is buoyed and lighted and is available at all tides for vessels drawing seven (7) feet of water. At several points, as north of Ely's Ferry and near Bodkin Rock, where the width of the river does not exceed 200 meters and the shores are steep and rocky, the depth of water is over eight fathoms and the current is very swift. The only unmarked dangers in the river, near the channel, are the wreck of the steamboat "Granite State" below Goodspeed's Landing and "Star" Rock near the shore at Higganum. The railroad draw bridges at Saybrook and Middletown do not seriously obstruct navigation because vessels plying up and down the river are usually towed. Above Middletown Willow Island has formed within recent years and is the result of piling rip-rap to deflect the current towards the Portland shore.

Commerce on the river is carried on principally by the New York and Hartford Transportation Company. They own a line of large passenger steamboats, running daily between the two cities, together with a number of barges and tow boats. The companies controlling the brownstone quarries at Portland and Cromwell own a number of

schooners and barges which they tow in and out of the river with their own tow boats.

Extensive granite quarries are worked near Hamburg Cove, opposite Deep River and Chester and near Maromas. During the winter, when ice obstructs the river, steamboats stop at Saybrook Point and forward passengers and freight by rail. The Shore Line division of the New York, New Haven and Hartford Rail Road crosses the river from Saybrook to Lyme and the Air Line division crosses at Middletown. The Connecticut Valley division runs near the river on its west side and connects the various post offices at Saybrook, Essex, Deep River, Chester, Hadlyme, Goodspeeds, Haddam, Higganum, Maromas, Middletown, Cromwell etc. Points on the east side of the river are connected with those on the west side by ferry boats. Steam ferries ply between Saybrook and Lyme, Hadlyme Station and Hadlyme, Tylorville or Goodspeeds Station and Goodspeeds, Middletown and Portland and between Cromwell and Gilover's Landing.

The Custom House for this Collection District is located at Hartford.

W. Irving Smeal,
 Assistant U. S. Land & Survey

To accompany report of Season's Work,
dated November 30, 1890.
Hyd. Sheets Nos. 2032 to 2035 inc
DEC. 4. 1890. 001655

Tides.

Connecticut River, Conn.

For the reduction of soundings, made in the survey of the Connecticut River in 1890, tides were observed at four stations, viz:

Essex, Chester, Higganum and Middletown.

At Essex a complete series of high water and low water observations was made, beginning 1890, August 23^d and ending Sept. 23^d 1890. The results obtained, being the mean or sixty (60) observations of each stage of the tide, were as follows:

Mean High Water = 4.395 Feet.

" Low " = 1.726 "

" Rise and Fall = 2.669 "

A gauge was placed at Chester, four and one-half miles above Essex, and another located at Higganum, nine miles above Chester. Simultaneous readings were made on the three gauges on two days, Oct. 7th and 8th 1890, the results being given within. Care was taken in observing not only the stand of the tide but also the readings on the gauges at periods of slack water. These observations were then reduced by Professor Henry Mitchell's rule, given in Appendix No. 11, U. S. Coast & Geod. Survey Report for 1870, with good results.

Comparisons were made between gauges at Higganum and Middletown, about nine miles apart, Nov. 6th and 7th 1890, the results of which are affected by a slight (falling) freshet in the river at the time. See the note appended to the reductions.

Bench Marks, to which the tide-gauges are referred, were left at each station. Illustrated descriptions of these bench-marks and localities will be found in the original and duplicate Tide Record Books, as follows:

Record Book No. 1, original and duplicate, tides at Essex, Conn.

" " " 2, " " " " Chester and Higganum.

" " " 3, " " " " Middletown, Conn.

W. Irving Tinsal,
Assistant U. S. Coast & Geod. Survey.

Comparative Readings.

1890, Oct. 7th. and 8th.

Essex Gauge

Chester Gauge

Time.	H.W.	L.W.	Half tide above Plane. a.	Time.	H.W.	L.W.	Half-tide or Mean Level. b.	Mean L.W. c.
	ft. ins.	ft. ins.			ft. ins.	ft. ins.		
								(b-a.)
6 22 P.M.	4 45			6 30	3 32			
		Half tide, 3.60				1.78	2.550	0.676
12 37 M.		2 75	1.874	1 22				
7 00 P.M.	4 45			8 00	3 40			
		Half tide, 3.30				1.20	2.300	0.726
2 00		2 15	1.574	3 00				
Plane of Reference = 1.726 feet.				Plane of Reference at Chester.				0.701

Slack, ebb to flood.

Slack, flood to ebb.

Time.	Height	Height	Diff. a.	Time.	Height	Height	Diff. b.
	at Essex. Feet.	at Chester. Feet.			at Essex. Feet.	at Chester. Feet.	
7th 12 45	2.75	1.80	0.95	7th 6 30	4.45	3.32	1.13
1 00	2.75	1.80	0.95	45	4.40	3.32	1.08
15	2.80	1.78	1.02	7 00	4.35	3.32	1.02
30	2.85	1.78	1.07	8th 7 30	4.45	3.35	1.10
8th 2 00	2.15	1.30	0.85	45	4.40	3.40	1.00
15	2.15	1.25	0.90				
30	2.15	1.25	0.90				
45	2.20	1.20	1.00				
			0.955				1.065

$\frac{1}{2}(a+b) = 1.010$ feet = difference of zeros of gauges, (elevation.)
 $\frac{1}{2}(a-b) = 0.055$ " = slope of surface at slack water.

Comparative readings.

1890, Oct. 7th. and 8th.

Chester Gauge.

Higginnum Gauge.

Time.	H.W. Ft. Hts.	L.W. Ft. Hts.	Half tide above Plane. a.	Time.	H.W. Ft. Hts.	L.W. Ft. Hts.	Half tide Mean Level b.	Mean L.W. c.
								b-a.
am								
6 45	3 32			7 40	4 10			
pm		2.55						
1 22		1 78	1.849	2 20		2 70	3.400	1.551
am								
8 00	3 40			8 30	4 10			
pm		2.30						
3 00		1 20	1.599	4 15		2 20	3.150	1.551
Plane of Reference = 0.701 feet.				Plane of Reference at Higginnum				1.551

Slack, ebb to flood.

Slack, flood to ebb.

Time.	Height at Chester. Ft.	Height at Higginnum. Ft.	Diff. a. Ft.	Time.	Height at Chester. Ft.	Height at Higginnum. Ft.	Diff. b. Ft.
am				pm			
7th 7:30	3.30	4.10	0.80	7th 1:30	1.78	2.80	1.02
45	3.25	4.10	0.85	45	1.80	2.72	0.92
8:00	3.00	4.05	1.05	2:00	1.85	2.70	0.85
				15	1.90	2.70	0.80
8th 8:15	3.40	4.10	0.70	3:00	1.20	2.35	1.15
30	3.55	4.10	0.75	15	1.27	2.30	1.10
45	3.5	4.10	0.78	30	1.27	2.25	1.05
				45	1.25	2.20	0.95
				4:00	1.35	2.20	0.85
				15	1.40	2.20	0.80
			0.821				0.947

$\frac{1}{2}(a+b) = 7.885$ feet = difference of elevation of zeros of gauges.
 $\frac{1}{2}(a-b) = 0.064$ " = slope of surface at slack water.

Comparative Readings.
1890, Nov. 6th. and 7th.

Higginson Gauge.

Middletown Gauge.

Time.	H.W. Ft. its.	L.W. Ft. its.	Half tide above Plane. a.	Time.	H.W. Ft. its.	L.W. Ft. its.	H. for Mean Level b.	Mean L.W. c.
								(b-a)
8 05 P.M.	3 43	2 94		9 00	3 30			
3 25 A.M.		2 45	1.389	4 07		2 80	3.050	1.661
8 45 P.M.	4 00	3 30		9 45	3 65			
4 10		2 60	1.749	5 15		2 78	3.215	1.466
	Plane of Reference = 1.551 feet.				Plane of Reference at Middletown			1.563

Slack, ebb to flood.

Slack, flood to ebb.

Time.	Height at Higginson	Height at Middletown	Diff. a.	Time.	Height at Higginson	Height at Middletown	Diff. b.	Notes.
6th 7:00	3.33	3.12	0.21	6th 12:30 P.M.	2.90	3.10	0.20	S = stand of tide.
30	3.40	3.20	0.20	1:00	2.72	3.02	0.30	
8:00	3.43	3.28	0.15	30	2.63	2.98	0.35	
9:00	3.43	3.30	0.13 ⁽¹⁾	2:00	2.55	2.92	0.37	S = Slack Current
7th 9:00	3.37	3.30	0.17	30	2.50	2.87	0.37 ⁽¹⁾	readings.
8:00	3.93	3.30	0.63	3:00	2.45	2.82	0.37 ⁽⁷⁾	Light freshet
30	4.00	3.50	0.50	30	2.45	2.80	0.33 ⁽⁷⁾	in river. Staff at
9:00	4.00	3.60	0.40	7th 2:00	2.40	3.15	0.25	Hartford reads
30	3.95	3.65	0.30	30	2.78	3.08	0.30	5 3/4 ft. above aver
8th 8:00	3.95	3.20	0.75	3:00	2.68	3.00	0.32 ⁽²⁾	age. Nov. 10. 1890.
30	4.10	3.48	0.62	30	2.62	2.95	0.33	
9:00	4.14	3.60	0.59	4:00	2.60	2.88	0.28	
30	4.14	3.70	0.49	30	2.60	2.82	0.22	
10:00	4.10	3.75	0.35	5:00		2.78		
			(14) 0.39	8th 3:00	2.65	2.98	0.33	
				30	2.50	2.88	0.38 ⁽³⁾	
				4:00	2.40	2.78	0.38	
				30	2.30	2.70	0.40	
				5:00	2.22	2.65	0.43	
							(18) 0.33	
							(3) 0.36	

$\frac{1}{2}(a+b) = \frac{0.17 + 0.33}{2} = 0.250$
 $\frac{1}{2}(a+b) = \frac{0.13 + 0.37}{2} = 0.250$
 $\frac{1}{2}(a+b) = \frac{0.13 + 0.36}{2} = 0.245$
 Mean = 0.248 = Feet Diff. of elevation of zeros of 17 and 18
 $\frac{1}{2}(a-b) = \frac{0.17 - 0.33}{2} = 0.080$
 $\frac{1}{2}(a-b) = \frac{0.13 - 0.37}{2} = 0.120$
 $\frac{1}{2}(a-b) = \frac{0.13 - 0.36}{2} = 0.115$
 " = 0.105 = at Slack Water.

2033

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Department of Commerce and Labor
COAST AND GEODETIC SURVEY

J C Mendenhall
Superintendent.

State: *Conn.*

DESCRIPTIVE REPORT.

Hyd C Sheet No. *2033*

LOCALITY:

Connecticut River
See SHA 2032, 2086,
and 2087.

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CHIEF OF PARTY:

W. J. Vinal

2033



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COAST AND GEODETIC SURVEY

T C Mendenhall

Superintendent.

State: *Conn.*

DESCRIPTIVE REPORT.

Hyd. Sheet No. 2034

LOCALITY:

Connecticut River

See SHA 2032, 2086

and 2087

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CHIEF OF PARTY:

W. J. Vinal

2034

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COAST AND GEODETIC SURVEY

J C Mendenhall

Superintendent.

State: *Conn.*

DESCRIPTIVE REPORT.

Hyd^c Sheet No. 2035

LOCALITY:

Connecticut River

See SHA 2032, 2086,

2087

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CHIEF OF PARTY:

W J Vinal

2035