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U. S. C. & G. SURVEY,
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Department of Commerce and Labor
COAST AND GEODETIC SURVEY

O. H. Tottmann
Superintendent.

State: *Mass*

DESCRIPTIVE REPORT.

Sydc Sheet No. *2915*

LOCALITY:

Georges Shoal

1907

CHIEF OF PARTY:

L. A. Westcott

2915

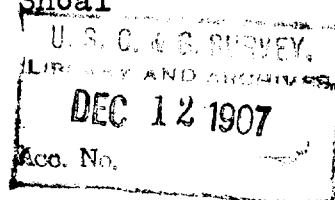
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DESCRIPTIVE REPORT.

To accompany Hydrographic Sheet of Georges Shoal

Survey by Party of Steamer Bache

Asst., L. H. Westdahl, Comdg.



1. METHOD OF SURVEY.

The determination of the position of the centre of Georges Shoal by dead reckoning, that is, by running a course or courses out from a determined position off Cape Cod, and plotting the distance run by log, was found to be impracticable owing to the strong currents which run over Georges Bank and Shoal. Recourse was in consequence taken to the several methods of determining the position of a ship at sea. A small red can Buoy (number one of the survey) was dropped on the western edge of the shoalest part of the shoal, as evidenced by the breaks and rips thereon. The Bache was anchored close to this can, and observations of the sun for latitude and longitude, were taken on several days. The best of these were used in plotting the position of this can, and this determination was found to agree very closely with the position of the centre of the shoal as shown on C. & G. S. chart #7.

As stated above, strong currents, sometimes reaching a velocity of three knots an hour, were encountered, and the problem of developing the ridge of the shoal and at the same time have some control in determining the exact position of ^{the} ship while sounding became a difficult one. Floats or rafts with flag poles mounted on them were constructed and anchored, but would stand upright for only a short time, before being carried under and out of sight by the current.

The scheme of taking a departure from the red can buoy and

(#2.)

running compass courses and patent log distances up and down over the ridge of the shoal was tried, but large errors of closure on coming back to the buoy, caused by strong currents, were found, and it was almost impossible to adjust these errors. Bad weather at this stage drove the ship back to the land and before steaming out again, a supply of fifty gallon oil barrels was taken on board, and anchors of kentledge and grate bars, the latter lashed at right angles to the kentledge were constructed. Upon arriving at the shoal and trying these barrel buoys, they were found to ride the current very well, and also with a coat of red paint on them to show up very well at a distance. These barrels therefore, were dropped at different points along the ridge of the Shoal and correspond to the Red Barrel Buoys, Numbers, 1, 2, 3, and 4, of the survey, which together with Red Can Buoy Number one were used as points or signals in determining the ships position on sounding lines. They were connected with one another and the astronomical position of Red Can Buoy Number one by compass bearings and patent log distances; the latter run by the ship at full speed to avoid as much as possible the effect of the current.

The ships Whaleboat was now lowered and manned and anchored at at the position of the Red Can Buoy, for use as a mark and also to take tidal observations with the Manometer tide gauge. The method of determining the ships position by one angle and one bearing, using two objects, in the survey the objects being barrels and the whaleboat, was used in developing the shoalest part of the ridge of Georges Shoal, and in defining the limits of the Shoal. This method was the only feasible one with

(3.)

the material at hand. Were other vessels anchored at the positions of the can and barrels, the three point method could well have been used, as they could be seen at some distance whereas the barrels and even the boat, were soon lost to sight when running a line of soundings away from them. A small boat survey of the shoal was decidedly impracticable and unsafe owing to strong currents and dangerous tide rips even in smooth weather.

2. GEORGES SHOAL, DESCRIPTIVE FEATURES.

Georges Shoal proper was found to be about 6.5 miles long in a N. N. W. - S. S. E. Magnetic direction, and to have an average width ^{of} 1.5 miles. This area was developed and lies between Red Barrels Numbers 1 and 4 of the survey. Here the rips and breaks were heaviest and more defined. The backbone of the Shoal extends further N. N. W. and S. S. E., but no marked rips or breaks were seen beyond the above limits and no shoal soundings obtained. Before commencing the survey, the BACHE circumnavigated the shoal with a view to locating the shoalest part of it, as would be *evidenced* by rips and breaks, and the area between Barrels 1 and 4 soon gave evidence of fulfilling these conditions. The tip of the shoal may be said to lie between positions 69 and 73, D day, and between 50 and 53, E day. These lines were run with the BACHE continually in a line of heavy rips, caused by a strong current setting across the ridge of the shoal. It became necessary to hold up as much as six points to keep in the line of rips and get the shoalest soundings. Depths of fifteen feet were found at several places along this ridge.

The 20 foot spot near the position of Red Barrel number 1 was

(4.)

felt over for less water, but none was found. Heavy tide rips were also experienced in the vicinity of this buoy.

The 15 foot spot at Barrel number 4 was also examined for less depths, but none were found.

Every tide rip and piece of broken water in the vicinity of Georges Shoal was examined with the lead by this party, though with the limited means at hand for determining the ships position, no angles or bearings were taken, Nothing shoaler than what is plotted on the sheet was found.

CURRENTS.

The tidal currents were found to agree closely with the time of change and direction as given in the Coast & Geodetic Survey Tide Tables. Currents were observed and recorded in volumes heretofore transmitted to the Superintendent.

A marked characteristic of Georges Shoal was that on perfectly smooth days, when the current was setting fair with the line of the ridge of the shoal, there was scarcely any evidence of the shoals existence.

Certain it is, that the BACHE ran right by and almost over the North end of the shoal without seeing it, on the occasion of dropping buoys in company with the Light House Tender "MAY-FLOWER". Yet within a few hours, when the current commenced to set across the ridge of the shoal, it gives evidence of its existence immediately by showing a long line of boiling tide rips.

WEATHER.

The weather was persistently bad. Fog and rain predominated and a clear spell was generally preceded by a North West gale,

(5.)

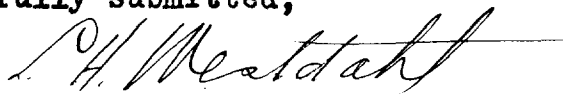
which raised a large and irregular sea, and made sounding impossible. Three fair days with smooth sea and light S. W. winds enabled the survey and tidal observations to be completed.

PLOTTING.

The work was plotted in the field and in the draughting room using a paper protractor fastened to the sheet as a compass rose for plotting bearings, and angles were laid off on the three arm protractor. A Westerly variation of $14^{\circ} 15'$ as taken from C. & G. S. chart #7 was used in connection with the ships deviation card for correcting compass bearings and courses. A copy of this deviation card is attached to the first volume of soundings, original and duplicate.

A, B, and C days are not plotted because of the previously mentioned large errors of closure to be encountered in attempting to adjust the same. It is not thought they will be necessary for defining any features of the shoal, as D and E days covered all the ground, in a more thorough manner, previously gone over by the BACHE on A, B, and C days.

Respectfully submitted,



Asst., C. & G. Survey,
Commanding, BACHE.

STATISTICS SHEET A.

2915

Date.	Letter.	Vol.	Angles.	Soundings.	Miles.	Boat.
1907.						
Aug. 9,	D	1	50	1008	63.6	Str. "Bache."
" 10,	E	2	48	452	34.6	
" 11,	F	2	0	98	9.1	
GRAND TOTAL	3	2	98	1558	107.3	

Hyd Sheet 2915 - Georges Shoal -

A new projection was made and the work
replotted in the Office -

The log-measured bases should have been
determined by duplicate runs in order
to eliminate current and wind effects -

The greater part of the work is good and
agrees remarkably well with previous
surveys - Comparatively few soundings
could not be plotted -

There seem to be few or no changes of
importance within the limits of this sheet -



3-27-08

2915

COAST & GEODETIC SURVEY.

O. H. TITTMANN, SUPERINTENDENT.

GEORGES SHOAL.
MASSACHUSETTS COAST.

U. S. C. & G. SURVEY,
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DEC 12 1907
Acc. No.

BEGUN AUG. 9, 1907.

ENDED AUG. 11, 1907.

STEAMER "BACHE."

L. H. Westdahl, Assistant, Chief of Party.

Scale 1 : 20,000

Positions plotted

by

R. F. Luce, Aid, C. & G. Survey.

*Soundings plotted by H. L. Simons
Verified by J. J. Williams
3-27-08*

Add Tide Note