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Diag. Cht. No. 1239-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. ..... *Office No.* H-3762

LOCALITY

State SOUTH CAROLINA

General locality CAPE ROMAIN TO

Locality CHARLESTON HARBOR

19~~14~~ 15

CHIEF OF PARTY

R. F. Luce

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DATE JUNE 14, 1915.

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DESCRIPTIVE REPORT TO ACCOMPANY SHEET NO. ~~Field "B"~~

LOCATION Offshore South Carolina, from Charleston to Georgetown.

AREA The work on this sheet covers an area bounded on the inshore side by a line of buoys about 14 miles offshore, and extending to 100 fm. curve offshore. The most southerly line starts at buoy "A", Lat. 32° 34' N., Long. 79° 40' W. and extends nearly S.E. to 100 fms. The most northerly line starts at Lat. 32° 57' N., Long. 79° 00' W. and extends nearly S.E. to 100 fm. curve.

The area covered is approximately 38 miles in S.E. and N.W. direction 45 miles in N.E. and S.W. direction. The total area is approximately 1700 square miles.

SURVEY METHODS

SOUNDINGS The lines are spaced 4 miles apart in general and run in S.E. & N.W. direction, normal to depth curves. The soundings were taken with hand lead to a depth of about 12 fms. when trolley was used. Soundings were taken at intervals varying from 1 minute to 5 minutes, according to depth of water and time required to bring the lead home.

The vessel ran at a speed between 4 and 5 knots until such a depth was reached that a vertical sounding could not be obtained. This usually occurred at 30 to 40 fms. It was then found expedient to run full speed 3 minutes and

leave engine idle 2 minutes, the full speed commencing when sounding was obtained. From 40 to 60 fms. soundings were taken every mile with Sigsbee Machine aft, the vessel running at full speed between soundings and coming to dead stop for each sounding. From 60 to 100 fms., similar to 40 to 60 fms., with soundings every 2 miles. Thus soundings on the line were spaced from 150 meters in shoal water to 2 miles at a depth over 60 fms.

CURRENTS In the course of the work current observations were taken every 2 hours to a depth of 25 fms., by means of Current Pole with ship lying at anchor. At a greater depth than 25 fms. it was impracticable to anchor ship, therefore a buoy was anchored at 100 fms. and observations made of the drift of ship from buoy due to wind and current; also drift of ship through water due to wind by means of the current pole. After two or three trials of this method it was found that better results were obtained by mooring a small boat to the buoy and making observations from the buoy with a current pole. Current observations were also carried on at 30 min. intervals when ship was anchored for night in a favorable locality. It was found from these observations that the direction of current rotated clockwise in general but was greatly influenced by the wind.

WIND The general direction of wind in July and August was S.W. In September and later the prevailing winds were from N.E. The leeway of ship due to wind and sea was estimated

by officer on watch, based upon Anemometer readings. Anemometer readings were taken to cover period ship was underway. At each current station stop-watch readings were taken to obtain actual wind velocity at time currents were observed.

DETERMINATION OF POSITION Each line was started from a sextant angle fix and was run in to another fix. Courses were laid out with proper allowance for observed current and estimated leeway with current stations as stated above. Time sights were taken upon the Sun, Planets and Stars but results in general, although as good as time sights usually are, were of little or no value in location of line, the line of position being liable to an error of 1 or 2 miles.

The error of closure of 9 lines ranged from 0.5 miles to 4.3 miles, and the average error of closure was 2.2 miles.

LOG TESTS The logs were tested by running at various speeds over a known distance in both directions to eliminate effects of wind, sea, and current. Tests were carried on under as favorable weather conditions as possible and in localities little affected by current. From these tests curves were constructed representing per-cent correction to each log. This correction was applied to log readings before plotting.

SWINGING SHIP All the compasses were compared by swinging ship in Lower Anchorage of Charleston Harbor at frequent intervals during the field season. The sun was used for comparison. The deviation was found to be fairly constant and of small amount and was used in plotting.

PLOTTING OF LINES In plotting the lines on fair sheet it was found best to plot all current observations of one line using one initial and to pass a curve through the points. Instead of using a mean current for full distance between current stations, the distance was divided into 2, 3, or 4 parts depending upon diversity of currents and the current arc was likewise divided into the same number of segments and the resultant of each segment applied to each part. Thus the course and log distance was plotted and corresponding current and leeway corrections applied.

Respectfully submitted,

R. F. Luce

Commanding Str. "BACHE"
U.S.Coast and Geodetic Survey.

Statistics for "off-shore" Hydrographic Sheet No. B.

Date	Letter	Volume	Positions	Soundings	Miles	Vessel
July 21,1914	A	1	12	134	15.2	"Bache"
" 22, "	B	1	25	92	29.6	"
" 27, "	E	1	33	221	25.2	"
" 28. "	F	1	16	29	16.3	"
" 31, "	H	1	16	144	12.4	"
Aug. 1, "	J	1	32	105	27.4	"
" 7, "	M	1	19	101	19.9	"
" 8, "	N	1	24	43	17.8	"
" 10, "	P	1	18	172	18.2	"
" 13, "	Q	1-2	28	64	27.0	"
Sept. 1, "	Y	2	21	150	20.8	"
" 2, "	Z	2	59	209	62.3	"
" 21, "	H'	2	21	222	18.9	"
" 22, "	J'	2	83	395	79.6	"
" 23, "	K'	2	48	185	32.9	"
" 24, "	L'	2-3	81	269	61.3	"
Totals--			536	2535	484.8	

Square Miles of area : July------- 310

August----- 520

September-- 850

Total-- 1680

VEC
July 13,1915

L.P.S.

HYDROGRAPHIC SHEET 3762.

Cape Romain to Charleston Harbor, South Carolina,

by Asst. R. F. Luce in 1914.

TIDES.

	Cape Romain ft.
Mean Low Water, or plane of reference on staff	2.4
Lowest tide observed " "	1.3
Highest " " " "	8.9
Mean range of tide	4.6

Hyd. Sheet No 3762

This work is all "off-shore" and is run entirely by dead reckoning. The lines are several miles apart and there are no crossings.

Such portions of these lines as fall within the limits of Hyd 3761, have been shown on that sheet and the soundings plotted on them. The soundings on these lines are not precisely the same on both sheets as the larger scale of Hyd. 3761, allowed the plotting of more soundings. On this scale it is only possible to show a small portion of the soundings actually taken.

All the data used for plotting the lines run by dead reckoning was compiled in a pamphlet, marked "Data for plotting dead reckoning lines" and filed in the archives. This was very valuable in testing the plotting of the lines and it is suggested that it be used as a standard form and other parties doing work of this character be required to turn in a similar one.

R. L. Johnston

H. 3762. South
Offshore sheet North Carolina. O. K.

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

No. 205
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