

# 4909

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Form 504 Ed. June, 1928	
DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY E. Lester Jones, Director	
C. & G. SURVEY L. & A. JUL 8 1929 Acc. No.	
State: South Carolina	
DESCRIPTIVE REPORT	
<del>Topographic</del> Hydrographic	Sheet No. 7 4909
LOCALITY	
<del>Cooper River</del>	
<del>Vicinity of Charleston</del>	
Cooper River, Woods Pt. to Moreland	
1928	
CHIEF OF PARTY	
R. F. A. Studds	

U. S. GOVERNMENT PRINTING OFFICE: 1928

# 4909

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SHEET NO. 7

Sept. 7 to Nov. 7, 1928.

Cooper River, Vicinity of Charleston, S.C.

Launch ELSIE

R.F.A. Studds, in Charge.

Instructions dated December 17, 1927; June 20, 1928.

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INTRODUCTION:

This is the first of three sheets on a scale of 1:10,000 covering a survey of the Cooper River. The sheets begin at a junction with the limit of H 2189 in the vicinity of Woods Point and extend to the Seaboard Air Line Railroad bridge in the West Branch of the Cooper River and to Quimby Creek in the East Branch of the Cooper River.

The three sheets join each other and are laid out so that they include the creeks bordering the river.

This sheet extends from Woods Point to Moreland and includes the portion of Back River between its entrance and Latitude 33° 00'.

GENERAL:

Charleston was used as a base for supplies. This was too distant from the working grounds, however, so a berth and storeroom were obtained at the Port Terminal Dock in North Charleston. The Launch either anchored on the working grounds or returned to this berth at night.

With the exception of a few channel lines which were run by the ELSIE, sounding was done from small boats.

SURVEY METHODS:

CONTROL was furnished from a scheme of third-order triangulation extended up the Cooper and Back Rivers from the line Field-Goose Creek in the vicinity of North Charleston. Hydrographic signals were located by theodolite cuts from the main scheme, the cuts being plotted directly on the hydrographic sheet.

TOPOGRAPHY executed on Sheet "C", which covers this area, was

confined to a delineation of the shoreline of the Cooper and Back Rivers.

Creeks and reaches, tributary to the rivers, were not surveyed by the topographic party, but were sketched in by the party on the hydrographic launch. This was in accordance with paragraph 7, Supplemental Instructions, 10-LE, dated June 20, 1928. A pencil note on the smooth sheet indicates the shoreline surveyed in this manner.

The shoreline of Foster Creek was sketched by the hydrographic party as far as "fixes" were available. The remainder of the creek was transferred from the Geological Survey map, "Melgrove Quadrangle", and is shown dotted on a subplan.

HYDROGRAPHY: In general, the area was covered by a system of cross-lines and diagonal lines, supplemented by lines run parallel to the axes of the rivers and creeks. These latter lines were run with the current in the rivers in order to obtain the best results.

In some creeks, the narrow width permitted running the lines parallel to the axes only.

Soundings taken in Foster Creek, beyond the limit of fixed positions, were located by noting the time abeam recognizable features, such as bends, points, etc., as shown on the dotted shoreline transferred from the Geological Survey map.

In Cooper River and Back River, shoal indications and channels were developed. In the tributary creeks and reaches only sufficient soundings were taken that would indicate the depths. No effort was made to develop any channel or shoal.

TIDES: For the reduction of soundings in the area on this sheet, a portable automatic tide gauge was installed in the Cooper River at Red Bank Landing and compared to the primary tide station at Charleston, S. C.

Readings for the reduction of soundings were taken directly from the gauge for the lower portion of the surveyed area and for the upper portion, a time correction of 25' later than the Red Bank Landing gauge and a ratio of ranges of .93 was used.

#### COMPARISON WITH PREVIOUS SURVEYS:

An adequate junction was made with the soundings shown on Hydrographic Sheet H2189.

The shoreline sketched in by the hydrographic party and so designated by pencil notes, was compared to the shoreline shown on the Geological Survey Quadrangle "Melgrove". Considerable difference was noted and because of the lack of uniformity in the differences, it is believed that the Geological Survey is in error.

#### RESULTS:

It is believed that the survey of Cooper River and Back River has sufficiently covered the area so that an adequate chart can be made of the depths.

Several shoals were discovered and developed, the one in Latitude 32° 58.5', Longitude 79° 55', with a least depth of 2' on it, being the most dangerous. The more important shoals are indicated on the smooth sheet by a pencilled arrow.

23' is about the maximum draft for the portion of the Cooper River included in the area of this sheet, the controlling depth being just east of the entrance to Back River. This draft is more than adequate for the type of boats using this river.

A number of poor crossings exist, and all are believed to be either the fault of the leadsman in reading his line one fathom wrong or are due to the uneven and steep bottom of the river.

The poor crossings and the probable causes are as follows:

The first sounding after position 10A appears to have been read one fathom too short. *sounding omitted, covered by other line.*

The first sounding before position 62J appears to have been read one fathom too short. *plotted as recorded*

The first sounding before position 95R and the third sounding after Position 30U differ by 5' and it appears that one of them may be in error one fathom. The latter sounding has been checked by the recorder while the former one was not, which leads to the belief that the sounding on R day may have been read one fathom too short. *Sounding on R day plotted*

The first sounding before position 98S appears to have been read one fathom too short. *sounding rejected*

The sounding on position 228S appears to have been read one fathom too deep.

The first sounding before position 17U of 15' plots on a 20' sounding which is the third sounding before Position 11U. This latter sounding was checked by the recorder while the former was not, which leads to the belief that the former may have been read one fathom too short. However, the steepness of the river bottom in this locality may account for the difference between the two depths. No note has been entered in the sounding record giving the opinion of the Chief of Party concerning these two soundings, as, if either are plotted, the depth curves will not be affected materially.

The sounding on 82U appears to have been read one fathom too short. *plotted as recorded*

It is noted that all of the foregoing questionable soundings, except those mentioned as having been checked, were not checked by the recorder. The practice was for the recorder to ask the leadsman to check his reading if changes in consecutive soundings appeared questionable. When this was done a check mark was made after the sounding. The officer taking left angle usually checked the reading of the lead and it is noted that most of the soundings in question were the ones on positions or just before or after the position, at which times the officers were engaged in taking angles. These facts, together with the soundings lying close by the doubtful ones, substantiate the various assumptions made concerning the soundings.

Depths in the reaches and creeks are believed to be sufficient for all purposes for which the creeks would be used. Search was made for a channel in Slack Reach, south of Saunders Creek, but none could be found.

NAMES:

The names of the various rivers, creeks, and reaches were obtained from the Geological Survey map "Melgrove Quadrangle" and seem to be names in general use.

CONCLUSION:

Marshland borders the Cooper River for the major portion of the area on this sheet. There are no settlements along the river banks and no landmarks.

The extent of regular traffic on the river consists of a tug, towing 2 barges, which makes three round trips weekly from Quimby Creek to Charleston, and several small freight boats which do not run on schedule. The river is occasionally used by yachts, especially during the hunting season.

The tidal current is so strong in the river that boats seldom run against it. The usual practice for the tug and barges is to tie up to piling and wait for a favorable tide.



R.F.A. Studds,  
Jr. H & G E,  
USC&G Survey.

Forwarded:



R.F.A. Studds,  
Chief of Party,  
USC&G Survey.

STATISTICS FOR HYDROGRAPHIC SHEET, FIELD NO. 7

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Date	Letter	Volume	Positions	Soundings	Miles, statute
1928					
Sept. 7	A	1	75	241	5.8
9	B	1	60	180	4.6
12	C	1	98	369	7.2
13	D	1	69	283	5.7
14	E	1	59	316	4.5
15	F	2	82	484	6.2
26	G	2	126	317	7.0
27	H	2	203	687	14.0
28	J	3	119	520	19.9
29	K	3	60	187	4.8
Oct. 3	L	3	130	302	7.9
4	M	3	21	116	4.2
5	N	3	12	60	1.8
19	P	3,4	83	215	7.1
22	Q	4	150	295	9.0
23	R	4	135	381	8.2
25	S	4,5	233	566	13.8
26	T	5	74	170	4.5
31	U	5	87	234	10.6
Nov. 7	V	5	16	73	1.6
TOTALS.....			1892	5996	148.4
Area.....			4.0 sq. st. miles.		

HYDROGRAPHIC SHEET

-No. 7-

TIDAL DATA

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Four portable automatic gauges were established in the Cooper River to govern the survey shown on the three hydrographic sheets. Comparisons were made with the primary tide station at Charleston and values were obtained for lunitidal intervals and ranges for each of the gauges. Because of the large differences between these values, time corrections and ratios of ranges between gauges were applied to some portions of the rivers.

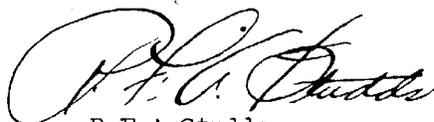
For the reduction of soundings on Sheet 7, a gauge was established at Red Bank Landing in Latitude  $32^{\circ} 57.3'$  and Longitude  $79^{\circ} 55.8'$ .

Readings were taken directly from the gauge for the area south of a point just above the entrance to Back River. For the portion of the sheet north of this point, a time correction of 25' later and a ratio of ranges of .93 was used.

The mean difference in lunitidal intervals between the Red Bank Landing gauge and the primary tide gauge at Charleston was 77', the interval being greater at Red Bank Landing. The difference in ranges between the two gauges was 0.3, the range being greater at Charleston.

Data for the gauge at Red Bank Landing is as follows:

	Referred to zero of staff	Referred to Plane of Reference
Highest tide observed	9.8	8.5
Mean High Water	6.2	4.9
Mean tide level	3.8	2.5
Mean Low Water	1.3	0.0
Lowest tide observed	0.4	-0.9



R.F.A. Studds,  
Chief of Party,  
USC&G Survey.

H Y D R O G R A P H I C      S H E E T

-No. 7-

STATEMENT OF CHIEF OF PARTY

(in accordance with Paragraph 174, Special Publication 143)

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This sheet and its accompanying records have been inspected and are approved.

It is noted that the shoreline on this sheet, as determined by both the topographic and hydrographic parties, does not agree with the shoreline as shown on the Geological Survey map, "Melgrove Quadrangle", and the differences are such that the only conclusion is that the Geological Survey shoreline is in error. No land features were surveyed by the present party, and therefore, in the compilation of the chart, it is suggested that the inner limit of the topographic features shown on the Geological Survey map, e. g. marsh, woods, etc., be held rigid and the feature extended or retracted at the river edge as the condition might be.



R.F.A. Studds,  
Chief of Party,  
USC&G Survey.

# Section of Field Records

Ecm

August 28, 1929.

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in  
5 volumes of sounding records for

HYDROGRAPHIC SHEET 4909

Locality: Cooper River, S. C.

Chief of Party: R. F. A. Studs in 1928

Plane of reference is mean low water, reading

1.3 ft. on tide staff at Red Bank Landing

~~1.3 ft. on tide staff at Red Bank Landing~~  
8.4 ft. on tide staff at Dean Hall

Allowance made for time and range

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks:

*H. Hammer*  
Acty Chief, Division of Tides and Currents.

## Section of Field Records

Report on Sheet No. 4909  
Chief of Party R.F.A. Stodds  
Protracted by R.A. Earle  
Verified and Inked by J.T. Walker

Surveyed in 1928  
Surveyed by R.F.A. Stodds  
Soundings plotted by  
R.A. Earle

The sounding records were poorly kept. Some of the figures and writing were practically illegible. The beginnings and endings of sounding lines were not described - making it necessary in many cases to protract the first position in order to find it.

The protracting was excellent. None of the positions were off far enough to change.

The soundings were plotted, in pencil, according to time. Some of the soundings were spread out at the beginning of lines when they were inked in. This was to allow for inability of the launch to attain immediate full speed.

The drafting conformed to General Instruction for field work.

Mr. Earle, who protracted the positions  
and penciled the soundings, is to be  
commended for the accuracy and neatness  
of his work.

Reviewed by

Respectfully submitted  
J. Walker.  
10/9/29

Section of Field Records  
Report on Hyd. Sheet No. 4909  
Cooper River, Vicinity of Charleston, S. C.  
Surveyed in 1928

Original Instructions dated Dec. 17, 1927 (Lieut. R. F. A. Studds)  
Supplemental Instructions dated June 20, 1928 " "

Chief of Party - R. F. A. Studds  
Surveyed by - R. F. A. Studds  
Protracted and plotted by - R. A. Earle  
Verified and inked by - J. T. Walker

1. The records conform to the requirements except that the beginnings and endings of sounding lines were not described and in some cases the figures were not plain.
2. The plan and character of development conform to the requirements of the General Instructions

3. The plan and extent of the survey satisfy the specific instructions, except that paragraph 8 of the supplemental instructions calls for the omission of soundings in the creeks.
4. In general the sounding line crossings are satisfactory. There are some poor crossings, most of which are listed in the descriptive report. Investigation of these showed that most of these disagreements occurred on the edge of the river channel, where there is considerable slope, and perfect agreement can hardly be expected. An 18 foot sounding, just before position 98s, was rejected, as the chief of party thought the lead was read one fathom short, and the evidence of three other lines supported this contention.
5. The information is sufficient for drawing the usual depth curves, except in some of the minor creeks.
6. The junction with the old sheet, H. 2189, is satisfactory and the junction with the contemporary sheet, H. 4910, is also satisfactory.
7. The usual amount of field plotting was

very well done by the field party.

8. Character and scope of surveying - very good.

With the exception of the single line in Foster Creek, shown on the sub-plan, all the work on this sheet is controlled by three point fixes. Cooper River and part of Back River have been closely covered and shoal development is considered sufficient.

9. No additional work is necessary.

Reviewed by P. L. Johnston

Oct. 22, 1929.

There is uncertainty regarding the names Yellow House Cr. and Sanders Cr. This has been referred to Mr. Bawn for action by the Geographic Board  
E. P. Ellis.

See Geographic Board decisions June 4, 1930

The line in Foster Creek while <sup>3 m h.</sup> sufficient for the scale of the chart, can be considered only reconnaissance A. M. Sobieralski

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REG. NO.  
4909

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 7

REGISTER NO. 4909

State South Carolina

General locality ~~Vicinity of Charleston~~

Locality Cooper River, Woods Pt. to Moreland

Scale 1:10,000 Date of survey Sept. 7 to Nov. 7, 1928

Vessel Launch ELSIE

Chief of Party R. F. A. Studds

Surveyed by R. F. A. Studds

Protracted by Robert A. Earle

Soundings penciled by Robert A. Earle

Soundings in ~~notations~~ feet

Plane of reference Mean Low Water

Subdivision of wire dragged areas by --

Inked by J.T. Walker

Verified by J.T.W.

Instructions dated Dec. 17, 1927; June 20, 1928, 19

Remarks: Sheet 1 of 3 sheets Cooper River

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 4909

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet . 1892  
Number of positions checked . 491  
Number of positions revised . . . 0  
Number of soundings recorded . 5996  
Number of soundings revised . . . 7  
Number of signals erroneously  
plotted or transferred . . . . . 0

Date: - October 9, 1929 -  
Cartographer: - J. V. Walker -