5153

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, Director

State: Massachusetts

DESCRIPTIVE REPORT

~~Topographic~~
Hydrographic

Sheet No. 5153
Field #1

LOCALITY

Georges Bank
Southeastern Part

1931

CHIEF OF PARTY

W. E. Parker

U. S. GOVERNMENT PRINTING OFFICE: 1930

5153

Form 537
Ed. Sept., 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5153

HYDROGRAPHIC TITLE SHEET

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. 1

REGISTER NO. 5153

State Massachusetts

General locality ~~Off Cape Cod.~~ Georges Bank

Locality ~~Georges Bank.~~ Southeastern Part

Scale 1:200,000 Date of survey June - July, 1931.

Vessel Hydrographer, Oceanographer, Lydonia and Gilbert.

Chief of Party W. E. Parker.

Surveyed by W. E. Parker & L. O. Colbert.

Protracted by J. C. Tison, Jr. - E. B. Brown, Jr.,

Soundings penciled by J. C. Tison, Jr.- E.B.Brown, Jr.
E. L. Jones.

Soundings in fathoms ~~feet~~

Plane of reference M. L. W.

Subdivision of wire dragged areas by - -

Inked by

Verified by

Instructions dated April 27, 1931, & July 29, 1931. 19
Supplemental instructions of April 30 and June 25, 1931.

Remarks:

Descr. Repts.
2 Boat Sheets
11 Vols. Sdgs. {3 Bomb Records
2 Buoy Rect. + Vel. Tests
1 Cahier W.R.

DESCRIPTIVE REPORT
TO ACCOMPANY
SHEET No.1

DATE OF INSTRUCTIONS:

The work on this sheet was done under instructions dated April 27th, 1931 and changes in instructions dated July 29, 1931, supplemental instructions dated April 30 and June 25, 1931.

SURVEY METHODS:

The work on this sheet was accomplished by R.A.R. methods using two station ships and two sounding ships. The sounding was done by fathometers, the #312 and #412 types using the fast red light, slow red light and white light methods as required by the depths.

The soundings for the Hydrographer's entire season's work have been corrected for fathometer index errors deduced from frequent vertical wire comparisons. Such correction, as originally observed, is compound, containing the semi-constant fathometer error and the variable temperature-salinity error. Strictly correct practice would require the separation of these component parts. A little consideration, however, will show that the majority of the vertical-wire comparisons were made in such shoal depths as would indicate a mean temperature-salinity correction not greatly different from that applicable anywhere on the shoal. The variations in the temperature-salinity correction do not anywhere differ from this mean value more than about one half of one percent, even in the deep water soundings at the limits of the work.

In the interests of simplicity the soundings for the Hydrographer's entire season's work have been treated by the application of the single corrections deduced from the vertical wire comparisons, the temperature-

salinity effect being otherwise disregarded. The error in this method is everywhere within about one half of one percent of the depth, besides being small as compared with the uncertanties in reading the fathometer, in observing and allocating fathometer corrections, and in plotting the final reduced soundings (to whole fathoms, as required by the general instructions). It is mentioned incidentally that this method is substantially that described and advocated in report* 1931-65. Filed as Special Report 1931-No. 65 R.

DISCREPANCIES:

The crossing between the HYDROGRAPHER's line 21 to 22 "A" day and the OCEANOGRAPHER's line 65 to 66 "N" ?-K day shows a discrepancy of 80 to 100 fathoms in 500 fathoms. A slight shifting of the OCEANOGRAPHER's line which is controlled by one arc and dead reckoning would remedy this. (A day Hyd. K day Ocean) Line shifted as suggested to most probable position. R.

The crossing at 27-28 "B" (Hydrographer) with 3-4 "L" (Oceanographer) is about 15 fathoms out in 100 fathoms. It would appear that if the position of the (Oceanographer) line between 60 "N" and 5 "L" be shifted in azimuth to the westward holding position 60 "K" and 5 "L" fixed that the crossing would be improved. (B day Hyd. K day Ocean.) Line Adjusted. R

The crossing between 38-39 "G" (Hydrographer) and 59-60 "K" (Oceanographer) is about 75 fathoms out in 500 fathoms but the same reasoning as in Paragraph 1 of this section holds good. (G day Hyd. K day Ocean) Line Adjusted R

The crossing between 28-29 "H" (Hydrographer) and 121-122 "H" (Oceanographer) is about 50 fathoms out in 1000 fathoms. This is probably due to the personal equation in reading the fathometer at this depth. In drawing the 1000 fathom depth curve preference has been given to the Hydrographer's soundings as they were obtained by the slow red light method whereas the Oceanographer's were by the white light. (H day Hyd. 1000 fath. curve)

Oceanographer's soundings omitted where questioned. R

The crossing between 35-36 "H" (Hydrographer) and 5-6 "J" (Oceanographer) is about 20 fathoms out in 160 fathoms. It would appear that the Hydrographer soundings immediately after position 35 "H" were low, probably due to personal equation. Line adjusted. (H day) Hydr. (J day) Ocean

The crossing between 26-27 "A" (Oceanographer) with 32-33 "L" (Oceanographer) is about 50 fathoms off in 400 fathoms, but is probably due to a misplacement of the "L" line. Line adjusted (A day) Ocean. (L day) Ocean.

"A" day of the Oceanographer appears to be about 1 fathom too deep and "C" day (Oceanographer) is about 1 fathom too shoal wherever they run parallel to or cross other lines when using the fast red light method. (A day) Ocean. (C day) Ocean.

COMPARISON WITH PREVIOUS SURVEYS and JUNCTIONS WITH OTHER SHEETS.

The junction of this sheet with last year's work is fair especially in the shoaler depths but some of last season's lines would have to be shifted slightly to make the crossings with this season's work good in the deeper water. This is probably due to the fact that last season's lines were controlled by dead reckoning and one arc and may be misplaced at the outer or deeper ends.

"E" day (Hydrographer) of this sheet appears to be one to two fathoms shoal where it crosses "A" day (Hydrographer) sheet 2 positions about 53 to 57 "A". This may have been caused by a slipping of the fathometer dial (see special report on Fathometer) at sometime during the day as "A" day sheet 2 (H.5167) and "E" day sheet 1 (H.5153) are both the same day. Soundings omitted between 51C and 58C. Area is sufficiently developed on H.5167 (E day) Hyd. (A day) Hyd.

"F" day (Hydrographer) appears to be about 1 fathom shoal as it crosses the Oceanographer's work at the junction (F day) Hyd.

(H.5170)

F day (Hydl).

with sheet 4 from position 1 to 20 "F" Hydrographer.

Report for H.5170 will cover junction. R. (H.5170)

Other junctions with sheet 4 are good except certain poor crossings with "A" day (Oceanographer) Sheet 4 which it is believed may have been caused by faulty operation of the Oceanographer's fathometers as per notes in the record book.

A day (Ocean.)

Report for H.5170 will cover junction. R

Respectfully submitted,

Roland D. Horne

Roland D. Horne,
H. & G. Engineer,
U.S.Coast & Geodetic Survey.

STATISTICS FOR SHEET

FIELD No. 1

Vessel	Day	No. Positions	No. Soundings	Stat. Miles.
Hydrographer	A	59	535	120.0
"	B	52	492	72.8
"	C	61	556	116.6
"	D	30	313	71.0
"	E	52	533	181.0
"	F	22	282	61.0
"	G	119	1325	270.0
"	H	68	1132	154.0
"	J	68	794	161.0
Sub totals:		531	5962	1207.4
Oceanographer	A	39	217	89.6
"	B	58	268	107.0
"	C	10	153	33.0
"	D	18	170	37.0
"	E	34	303	89.6
"	F	18	212	46.6
"	G	16	199	55.2
"	H	122	1370	325.0
"	J	32	268	68.3
"	K	26	289	45.4
"	L	81	685	127.0
Sub totals:		454	4134	1023.7
Grand totals:		985	1096	2231.1

INSPECTION REPORT TO

ACCOMPANY FIELD SHEET No. 1

GEORGES BANK PROJECT

1 9 3 1

A thorough inspection was made of this sheet and the records applying to it. All discrepancies found are noted in the descriptive report.

Roland D. Horne

Roland D. Horne,
H. & G. Engineer,
U.S.Coast & Geodetic Survey.

NOTES FOR DESCRIPTIVE REPORT OF HYDROGRAPHIC SHEET NO. 1 (H-5153)

Scale 1:200,00 -- South of Georges Bank

The following notes refer to the hydrographic work of the Ship OCEANOGRAPHER on Hydrographic Sheet No. 1, H-5153, scale 1:200,000, in the area south of Georges Bank between about the 30-fathom and the 1100-fathom depth curve.

A + B days

On A and B days two lines were run by dead reckoning from deep water toward the Shoal because no distances could be obtained from the hydrophone on the GILBERT. A strong westerly current set these lines across the intended course.

K + L days

On K and L days a line was carried from Buoy Love out to 500 fathoms depth, thence in general parallel to that depth curve to the eastern limit of the work and thence directly toward the shoal water of the bank. To locate positions along this line, the LYDONIA was stationed at Buoy Zed (at 50-fathom curve) and the GILBERT at Buoy Love for the first part of the line. It was planned to shift the GILBERT to Buoy Dog for the second part of the line but fog prevented this ship from reaching the latter before the line was finished.

For the first twenty miles of this line positions were obtained; after that only one definite fix was had. First the bombs apparently failed to get across the submarine valley to the LYDONIA, and after passing beyond a 80-mile limit from the GILBERT no bomb returns were received from that ship. For the latter reason and to obtain a tie-in at the halfway mark, the line was turned away from the 500-fathom depth and run toward the LYDONIA at Buoy Zed when about midway of the distance along the 500-fathom curve from either limit of the sheet. As soon as the LYDONIA could be picked up and bearings obtained, the course was set to return directly to the 500-fathom curve. The finish of the line was made in fog too dense to pick up Buoy Dog. A marker buoy was dropped at the end of the line close to the anchored position of the GILBERT was fixed in position by bearing and logged distance to Dog about three hours later when the fog lifted. In making the adjustment to this line from the dead reckoning part of the run, bomb records were available for swinging arcs of distances from at least one station at all times. Adjustment was made between positions 40 K and 70 K and between 71 K and 81 L. A slight shifting only of the first adjustment brought a close agreement between soundings at the crossing of this line with others run previously in a different direction. The least accurately located positions in the season's work were 50 and 60 miles from the station buoys. Considering the unusual abruptness of the slope at the

K + L days.

edge of the continental shelf, it is thought that the crossing soundings are a satisfactory check on the determination of the lines.

Special attention was given to the determination of velocity of sound used for computing distances from the sounding ship to the station ship over the area of this sheet. A detailed statement of the method used will be found beginning on Page 8 of the report on "Velocity of Sound for R.A.R. Triangulation and Hydrographic Positions" by Lt. T.B. Reed. For a check on the average bottom depth and the velocity rate used for each bomb distance arc of position, reference should be made to the bomb record for the sheet. These figures will be found in the first two columns on the right hand page.

There is attached a table of corrections made to soundings on this sheet between 50 fathoms and 1300 fathoms for velocity changes due to temperature and salinity in this deep water.

SPECIAL FEATURES:

There are two submarine valleys in the southwestern section of this area. The longer and deeper one is at the western limit and additional lines should be run to determine more fully its extent. An unsuccessful attempt was made on J day to carry a sounding line up the center of this valley due to the fact that locations of positions could not be obtained frequently enough from the station ships to alter courses.

(J day) Ocean.

L. O. Colbert.

Lords -

U.S. COAST & GEODETIC SURVEY

SHIP OCEANOGRAPHER

GEORGES BANK 1931

Corrections for Temperature and Salinity to Soundings deeper then fifty fathoms on Sheet # 1.

Depth	Velocity Meters per sec.	Factor	Correction feet
Surf	1488		
20	1487		
40	1486		
60	1485	-.0087	- 3
80	1485	-.0089	- 4
100	1485	-.0091	- 6
120	1484	-.0093	- 7
140	1483	-.0095	- 8
160	1481	-.0098	-10
180	1479	-.0102	-11
200	1477	-.0107	-13
250	1475	-.0116	-18
300	1473	-.0126	-23
350	1474	-.0131	-28
400	1475	-.0135	-33
450	1476	-.0137	-37
500	1477	-.0138	-42
550	1478	-.0139	-46
600	1479	-.0139	-50
650	1480	-.0139	-54
700	1482	-.0137	-58
750	1483	-.0135	-61
800	1485	-.0133	-64
850	1486	-.0131	-67
900	1487	-.0128	-69
950	1488	-.0125	-71
1000	1490	-.0122	-73
1050	1493	-.0119	-75
1100	1497	-.0114	-76
1150	1501	-.0109	-76
1200	1505	-.0104	-75
1250		-.0099	-74
1300	-	-.0094	-74

NOTE: Velocity in meters per second taken from curve for computation of bomb velocities, Sheet # 1.

Values exterpolated beyond 1200 fathoms.

Fathometer calibrated for velocity of 820 fathoms or 1499.6 meters per second.

All velocities computed from B. A. Tables.

Computed by T.B.R.
Checked by E.B.B.
Copy ✓ by TBR

Review

Section of Field Records.
Report on Hydrographic Sheet No. 5153.
Georges Bank, Southeastern Part, Mass.
Surveyed in 1931.
Instructions dated May 17, 1930, April 27 and 30, June 25, and July 29, 1931.
(Lydonia, Oceanographer, Hydrographer).
Chief of Party - W. E. Parker.
Surveyed by W. E. P. and L. O. Colbert.
Protracted by E. B. Brown, Jr., E. L. Jones, J. E. Waugh.
Soundings plotted by E. B. Brown, Jr.
Verified and inked by G. Risegari.

1. The records conform to the requirements of the General Instructions.

2. The plan and character of the development fulfill the requirements of the General Instructions.

3. The plan and extent of development satisfy the Specific Instructions. Exceptions: Failure to comply with paragraph 45, May 17, 1930, instructions, in regard to tabulation in the descriptive report of comparisons with vertical casts; failure to get more bottom characteristics as per paragraph 48, same instructions; failure to run a crossline, vicinity of the 50 fathom curve where there is a marked irregularity as per July 29, 1931 instructions; failure to run additional lines in the several submarine valley indications and develop same as per paragraph 13, April 27, 1931 Instructions.

4. The sounding line crossings for the sheet inside of the 100 fathom curve are inadequate. At lat. 40° 40', long. 67° 25', the 50 fathom curve shows a marked extension which may be questionable. A study of the soundings on G day show that a part of the line is about two fathoms too shoal when compared with adjacent parallel lines, but no trouble was experienced with the fathometer here and the positions on the line are well controlled.

   A well determined cross line approximately parallel to the 50 fathom curve would have aided in checking this case and the other lines of the area in question.

   In other instances, such as the several open areas and submarine valleys which now appear insufficiently developed, cross lines would greatly have decreased the deficiency in the development as well as aided in determining the accuracy of the work.

5. With the exception of the submarine valley at the southwest portion of the work and the area at the northeast portion, all the depth curves can be completely drawn. These areas are well covered by adjoining sheets, the former by the 1932 work and the latter by H-5112a.

6. The junction with H. 5112a (northeast) is satisfactory. The junction with H. 5167 (north) is satisfactory. H. 5170 (north) is not yet completed. The junction will be reported when that sheet is completed.

7. Attention is called to soundings between positions 23E and 30 E (blue), and 51C and 58C (blue), lat. 41°00' long. 67°10', which appear to be too shoal and overlap H. 5167. These soundings appear to be erroneous and were not plotted. The area involving these questionable soundings is sufficiently covered by soundings on H. 5167.

   On page 2 of the descriptive report, discrepancies are listed.

   Each case was studied and adjustments were made giving consideration to the recommendations.

8. Comparison with old surveys was not considered necessary. The methods used for the control and running of the lines in the old work are not comparable with the present improved methods, apparatus, etc. It is recommended that the soundings on H. 5153 supersede the soundings of the old surveys, but to use the bottom characteristics on the latter to supplement those on H. 5153 for charting purposes.

9. With the exception of the several submarine valleys, all the important areas covered by this survey appear to be sufficiently developed by this or overlapping sheets.

10. Reviewed by G. Risegari. September 30, 1932.

Inspected: E. P. Ellis.

App. (See Inspection Note next page.

A. M. Sobieralski

~~Supplemental Report~~.

~~Attention is called to the shifting of Buoy Able of the 1931 series (Georges Bank surveys), which results in an incorrect relation of the work of this sheet and that of the overlapping work of H. 5112 a~~ See H. 5112a for plotting. ~~The shift was determined to be east - 144 meters, north - 426 meters (see note on H. 5112b), which means that the work of H. 5153 on H. 5112 a should be lowered the stated amount to make the work of H. 5153 be in correct relation with H. 5112a.~~

~~It was decided by Chief of P.R. Section not to change the already plotted adjacent soundings of H. 5153 on H. 5112 a as they was no material gain in the change. The bottom is generally uniform and the agreement would not be any better.~~

G.R. April 3, 1933.

X

Inspection Note for H-5153.

The area in the vicinity of the submarine valley in the southwestern portion of the sheet has been resurveyed in 1932 on H. 5273. The 1932 survey is on a larger scale, is more fully developed and is better controlled. Because of the weakness of some of the lines on H. 5153 as well as the use of the slow red light method on portions of the lines, the 1932 survey should supersede that portion of H. 5153 which is enclosed by a red line.

Sheet inspected by A. L. Shalowitz.

April 7, 1932.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
6 volumes of sounding records for

HYDROGRAPHIC SHEET 5153

Locality **Georges Bank (Southeastern Part), Coast of Mass.**

Chief of Party: **W. E. Parker and L. O. Colbert, in 1931**
Plane of reference is **mean low water reading**
3.3 ft. on tide staff at **Commonwealth Pier No. 5, Boston, Mass.**
18.2 ft. below B. M. **7**
Allowance made for time and range of tide on the working grounds:

Time $-1^h\ 15^m$; range 0.5 as large.

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. A. Marmer
Chief, Division of Tides and Currents.