PROGRESS ON THE GEORGES BANK PROJECT

(Extract from the *Bulletin of the Association of Field Engineers* of the U. S. Coast and Geodetic Survey, N° 4, December 1931, p. 13. Prepared in the Division of Hydrography and Topography).

Field work on the Georges Bank project, started in 1930 by the parties on the *Lydonia* and *Oceanographer*, was resumed in the latter part of May, 1931, by the parties on the *Hydrographer*, *Oceanographer*, *Lydonia* and *Gilbert* and continued until the latter part of September.

Approximately one-third of the Bank proper was surveyed during the season. This included large areas having depths less than 20 fathoms. These were found to have extremely irregular bottom and required close development. It is estimated that one more season will be required to complete the project.

In general, the *Lydonia* and *Gilbert* served as magnetophone station ships while the *Hydrographer* and *Oceanographer* did the sounding. The one exception to this program was the survey, by the *Gilbert*, of Georges Shoal which was considered dangerous territory for the deeper draft ships.

While serving as magnetophone stations, the *Lydonia* and *Gilbert* accumulated a large amount of current, astronomical, water temperature, salinity and weather data, which will prove useful in the study of this important region and will undoubtedly assist in the further development of offshore survey methods.

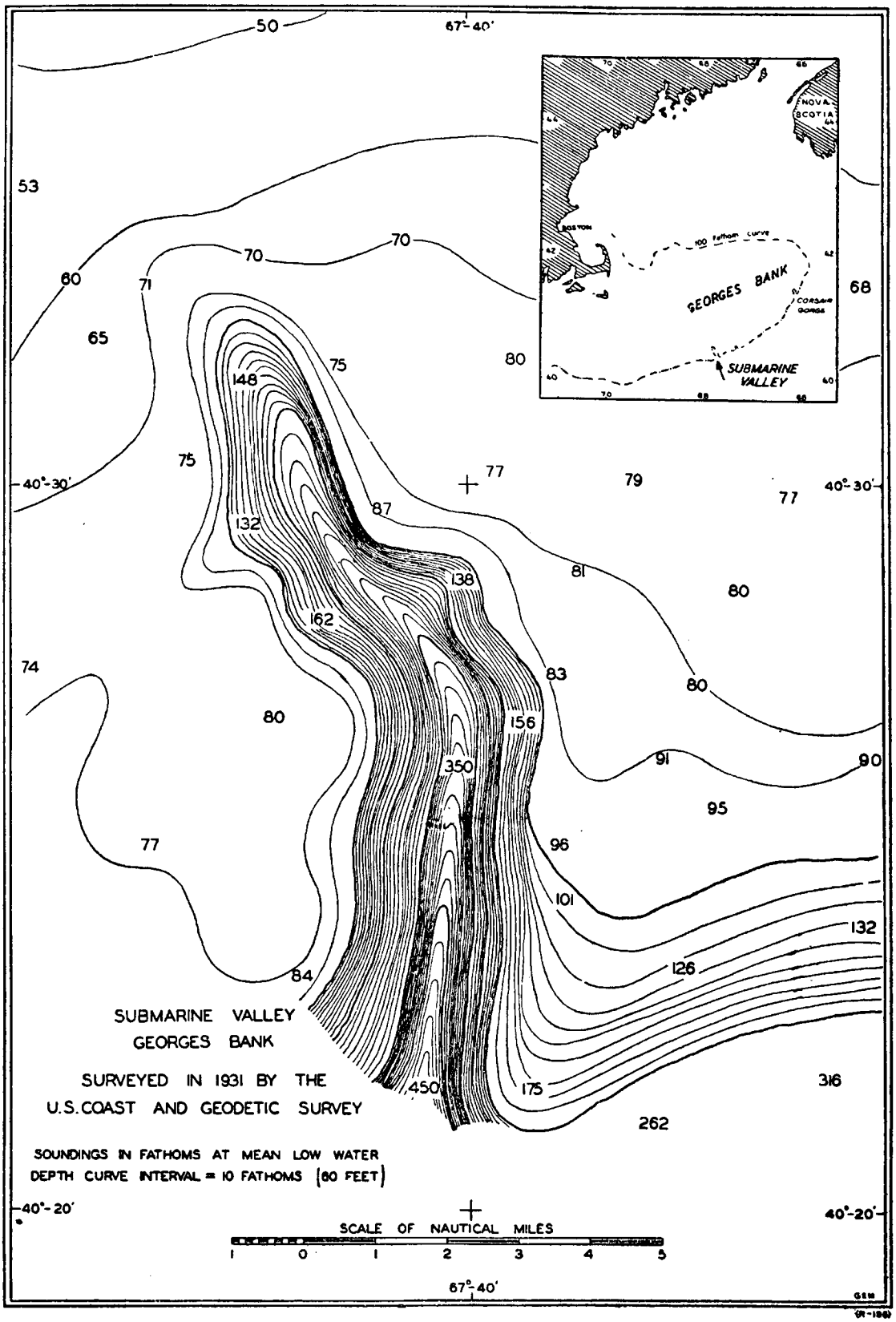
Several submarine valleys, lying in the track of trans-atlantic shipping, were found along the edge of the Continental Shelf. The outline of one of these, which is considerably larger than "Corsair Gorge", discovered during the 1930 season, is shown on an accompanying plate.

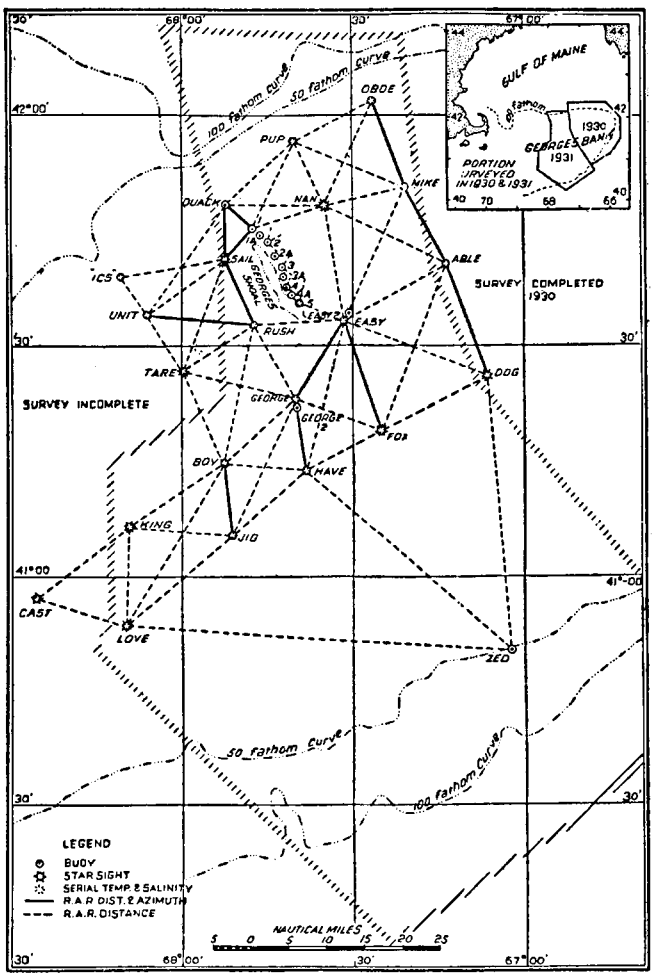
Urgent requests from fishing and shipping industries for early information concerning the results of the season's work prompted the making of a preliminary print which was compiled directly from the boat sheets of the field parties. This print, considered as a Notice to Mariners, was available for distribution in about two months after the close of the field season.

With the exception of the survey of Georges Shoal by the *Gilbert* where hand lead and three-point visual fixes on floating signals were used, practically all of the soundings were by fathometer and were controlled by R. A. R. distances from the two floating magnetophone stations. On one occasion more than 500 miles of fully controlled fathometer sounding lines were run in 24 hours of continuous fog.

The R. A. R. triangulation scheme which fixed the positions of the magnetophone stations was carried westward from buoy *ABLE*, the position of which was carried over from the previous season, to buoy *CAST* — a distance of 70 miles. The latter buoy was planted by the U. S. Lighthouse Service and will serve to carry position to next year's work. Astronomical sights taken in the vicinity of *CAST* indicate that the true position is somewhat to the westward of the position computed through the scheme. The evidence is not sufficiently conclusive, however, to warrant stretching the scheme. Any adjustment in this respect, found necessary after next year's work, can readily be made by changing the scale of the sheets.

An accompanying plate shows the scheme of R. A. R. triangulation. The individual quadrilaterals were adjusted for closure by the equal area method developed by Dr. O. S. ADAMS. The adjustment did not change any length of any side in any of the quadrilaterals by more than 35 metres, thus giving considerable weight to the accuracy of the bombed distances.


67°-40'
50
53
60
71
70
70
65
80
68
148
75
75
77
79
77
40°-30'
40°-30'
87
132
81
138
80
162
74
83
80
80
156
350
91
90
95
77
96
101
132
126
84
450
175
316
262
SUBMARINE VALLEY
GEORGES BANK
SURVEYED IN 1931 BY THE
U.S. COAST AND GEODETIC SURVEY
SOUNDINGS IN FATHOMS AT MEAN LOW WATER
DEPTH CURVE INTERVAL = 10 FATHOMS (60 FEET)
40°-20'
40°-20'
SCALE OF NAUTICAL MILES
1 0 1 2 3 4 5
67°-40'
NOVA SCOTIA
BOSTON
100 Fathom Curve
GEORGES BANK
SUBMARINE VALLEY



Triangulation of Georges Bank, 1931.

Frequent celestial azimuths were obtained through the scheme. To have attempted to hold each of these fixed would have necessitated changing the angles resulting from the length adjustment and would have required a very complicated and unwarranted adjustment. Consequently the main scheme was first computed through as a traverse holding (1) the adjusted lengths, (2) the angles resulting from the adjusted quadrilaterals and (3) the mean of three azimuths which happened to have been observed in one quadrilateral. All of the observed azimuths in the scheme were then compared with the corresponding computed azimuths and the entire scheme swung by the resulting algebraic mean of the differences. This amounted to about 7 minutes. The main scheme was then recomputed as a traverse by way of *ABLE-EASY-GEORGE-BOY-KING* and *CAST*, while stations *DOG-FOX-JIG* and *LOVE* on the south side of the scheme were computed as branches from this traverse using the mean of the two adjusted lengths obtained for each line common to two quadrilaterals.