WOODS HOLE OCEANOGRAPHIC INSTITUTION

WHOI Reference No. 60-22

YAMACRAW 11 NARRATIVE

WOODS HOLE, MASSACHUSETTS

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Woods Hole, Massachusetts

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YAMACRAW 11 NARRATIVE

By

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APPROVED FOR DISTRIBUTION Paul M. Fye

Paul M. Fye, Director

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YAMACRAW 11 NARRATIVE

USCGC YAMACRAW (W333) left Woods Hole the evening of 28 September 1958 on a three-week cruise. The plan of the cruise included several days of classified work in deep water south of Woods Hole (not reported here), a short bathymetric survey on the Blake Plateau, a stop in Jacksonville, Florida for personnel exchange, and a five-day survey in the Tongue of the Ocean, with the cruise ending at Savannah, Georgia. The track of YAMACRAW is shown in Figure 1. This was to be the last cruise of YAMACRAW for the Woods Hole Oceanographic Institution. All equipment was to be removed at Savannah, Georgia to be placed aboard USNS CHAIN (TARS 20). The scientific party leaving Woods Hole consisted of seven persons: Dr. William Richardson, Chief Scientist, Lee Davis, Paul Stimson, Richard Weller, and Charles Wilkins from WHOI; Dr. James Lafferty and Dr. George Gaines from the General Electric Company.

The first phase of the cruise was successfully carried out and YAMACRAW moved on towards the Blake Plateau arriving in that vicinity on the evening of the third of October. On the first and second of October, moderate to heavy seas were encountered by YAMACRAW, and she was running at half speed. This speed set up a severe vibration in the echo sounding chain. This vibration loosened up a support nut and the chain and echo sounding fish went to the bottom at 0930 on the second of October. Fortunately, a second unit was available and was rigged immediately; the echo sounding watch was functioning again at 1700 on the same day.

The Blake Plateau has been an area of interest to the Woods Hole Oceanographic Institution and we have been working on a rather detailed bathymetric chart of a fault zone that appears in this otherwise quite flat area. Loran coverage is good in the area which enables one to make measurements at various times, and still tie them together with a good degree of certainty. The region between 31°45'N, 77°25'W and 31°00'N, 78°05'W had not been examined, but previous records indicated the bottom would depart from flatness in that area. So eighteen hours were spent echo sounding on various courses between these two points. As anticipated, small bumps and scarps were encountered and duly recorded, to be added to the overall picture of this geological feature.

At 2030 on the fourth of October, YAMACRAW set a course for Jacksonville and arrived there on the fifth of October.

Scheduled to leave Jacksonville on the sixth of October, YAMACRAW delayed sailing one day because hurricane Janice was in the immediate area. Joining the ship at this time were John Graham, Robert Phinney, and Earl Hays from WHOI, and Robert Ward of the U. S. Naval Underwater Ordnance Station, Newport, Rhode Island. Departing from the ship were Richardson, Wilkins, Gaines and Lafferty.

Leaving Jacksonville at 1400 on 7 October, YAMACRAW met the aftermath of Janice at the river's mouth. Sea state four or five, winds over thirty kts. and dull, dirty gray weather added little enthusiasm to the beginning of the trip. However, the weather picture completely changed during the night, and the next day was bright with sea state one or two.

At 1100R we noticed a very sharp division between blue water and gray-green water. We delayed our forward progress for a few minutes by circling in and out of these two water masses. Temperature measurements for the two different areas were similar and the depth of the water was the same. The green water seemed to be carrying a great deal of particulate matter that was missing in the blue water. Several porpoise were following the ship, but they left it whenever the ship entered green water.

With echo-sounding and thermistor chain watch set, YAMACRAW steamed into the Tongue of the Ocean through the Northwest Providence Channel. The ninth of October was the first day of work in the Tongue of the Ocean. The track followed was one chosen to add bathymetric information to that previously available. This brought YAMACRAW to a point about ten miles west of the Big Wood Cay in the afternoon. Here the first sound velocimeter lowering was made. To tell the depth of the instrument accurately, a self-contained sound source was attached to the velocimeter. This sound source emits a pulse which is heard on the ship via two paths, the direct path and the bottom reflected path. The time difference between these two provides a measure of the height of the instrument above bottom.

After the lowering was completed, the echo-sounding and thermistor survey was continued, working down into the southern portion of the Tongue of the Ocean.

The morning of the tenth of October was used to make reflection and reverberation studies, followed by a sound velocimeter lowering at location S/V 2 on Figure 2. For the reflection studies, a small boat was lowered from YAMACRAW. The shooting party worked from this boat, firing half-pound charges at a depth of two and one-half, using inflated plastic bags to hold up the charges. The small boat fired charges out to a point about two miles from YAMACRAW. This enables one to determine the sound velocity in bottom materials.

In the afternoon, YAMACRAW moved to station S/V 3 on Figure 2 and repeated the morning's program at this new location. At the completion of these events a run towards Green Cay and then back towards Andros Island was made, stopping at S/V 4 for an evening sound velocimeter lowering.

This was an unfortunate choice. The lowering was made nicely, but the raising was somewhat too long. The equipment was two-blocked, the cable parted, and the sound velocimeter went to the bottom. A handsome trace of the free fall of the velocimeter was recorded (Figure 3) but the price was too high.

The rest of the night was spent in the area off Big Wood and Middle Bight Cays echo sounding and observing with the thermistor chain. In the morning we lay to off Big Wood Cay to put the small boat over for in-shore investigations.

The purpose of this in-shore work was to examine the harbor between Big Wood and Middle Bight Cays.

One of YAMACRAW's boats was lowered but the boat crew could not get it started. Somewhat in the spirit of competition, the crew of the other boat lowered their boat and took over the in-shore duties. This boat, loaded with observers and their gear, had just reached the harbor entrance when they noticed the other small boat was hanging from one davit with its stern submerged. Informed by radio that one of the falls had parted on the boat and one man had been injured, the successfully launched boat returned to the ship. YAMACRAW then steamed to Nassau to obtain medical treatment for the injured man. His injury was diagnosed as a broken shoulder blade and he remained in Nassau for air transportation home.

The prevailing easterly winds had been building up steadily and upon return to the area by the next morning, it was judged to be too rough for effective use of the small boat. We had hoped to do some close-in reflection shooting to determine bottom structure in Big Wood Cay but this was precluded by rough weather.

We then did some close-in echo sounding to determine the general shape of the bottom near Big Wood and Middle Bight Cays. This concluded, a track was laid southerly, gathering more thermistor and bathymetric data. This type of work continued until the next day when YAMACRAW had returned to the vicinity of Big Wood Cay. The wind was still 20 to 30 knots, so the shooting method was revised. Shots were fired from the forecastle of YAMACRAW, while the hydrophone was set 100 feet deep and floated away from the ship. While not as much information can be obtained with this geometry of shots, reflectivity coefficients and the general features of reverberation can be obtained. Three such stations were made and this concluded the work in the Tongue of the Ocean except for the use of the echo sounder and the thermistor chain on the way out.

Both the thermistor chain and echo sounder were operated back to Savannah, Georgia. This leg was uneventful in all respects. YAMACRAW arrived in Savannah the 16th of October. Here all of Woods Hole Oceanographic Institution's equipment was removed to be placed on the reactivated vessel USNS CHAIN.

An interesting feature of the Tongue of the Ocean was the paucity of marine life. Only a few birds were seen, and except near shore in shallow water, no marine animals were seen.

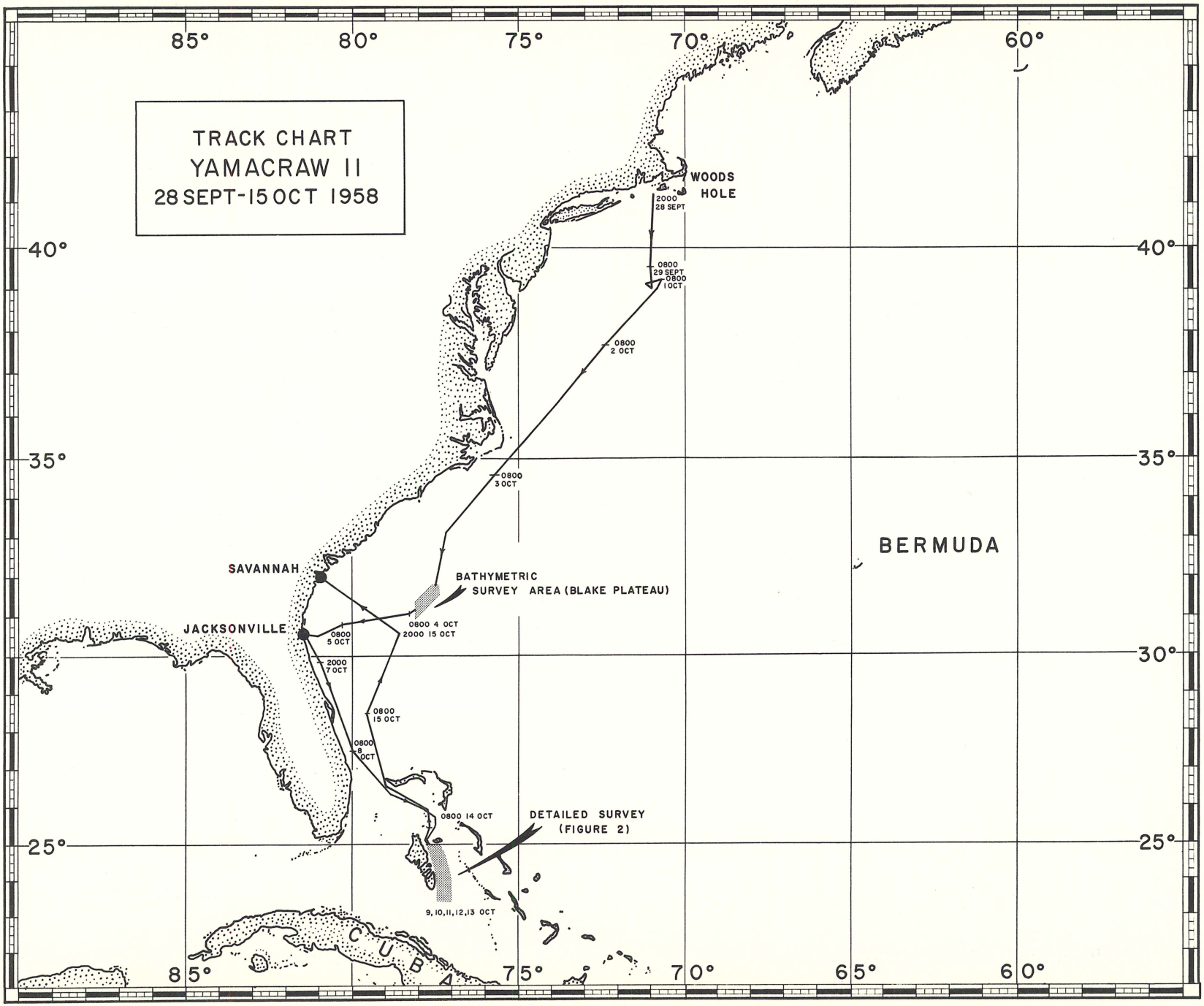
TRACK CHART
YAMACRAW II
28 SEPT-15 OCT 1958
85°
80°
75°
70°
60°
40°
35°
30°
25°
WOODS HOLE
2000 28 SEPT
0800 29 SEPT
0800 1 OCT
0800 2 OCT
0800 3 OCT
BERMUDA
SAVANNAH
BATHYMETRIC SURVEY AREA (BLAKE PLATEAU)
JACKSONVILLE
0800 4 OCT
2000 15 OCT
0800 5 OCT
2000 7 OCT
0800 15 OCT
0800 8 OCT
0800 14 OCT
DETAILED SURVEY (FIGURE 2)
9, 10, 11, 12, 13 OCT
CUBA
85°
75°
70°
65°
60°

FIG. 1

FIG. 1

FIG. 2

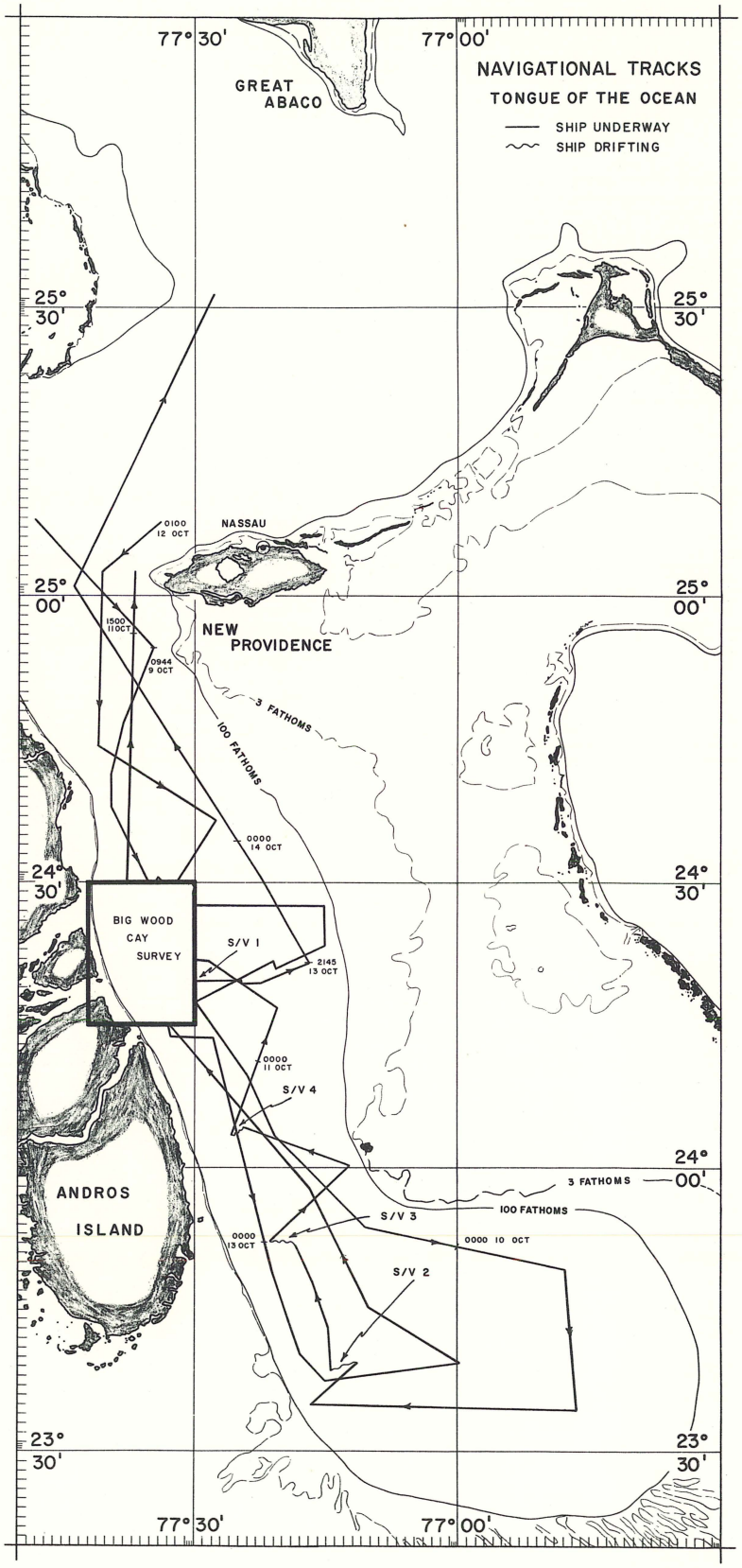
77° 30'
77° 00'
NAVIGATIONAL TRACKS
TONGUE OF THE OCEAN
SHIP UNDERWAY
SHIP DRIFTING
GREAT ABACO
25° 30'
25° 00'
24° 30'
24° 00'
23° 30'
NASSAU
0100 12 OCT
1500 11 OCT
0944 9 OCT
NEW PROVIDENCE
3 FATHOMS
100 FATHOMS
0000 14 OCT
BIG WOOD CAY SURVEY
S/V 1
2145 13 OCT
0000 11 OCT
S/V 4
ANDROS ISLAND
3 FATHOMS
100 FATHOMS
S/V 3
0000 13 OCT
0000 10 OCT
S/V 2

FIG. 2

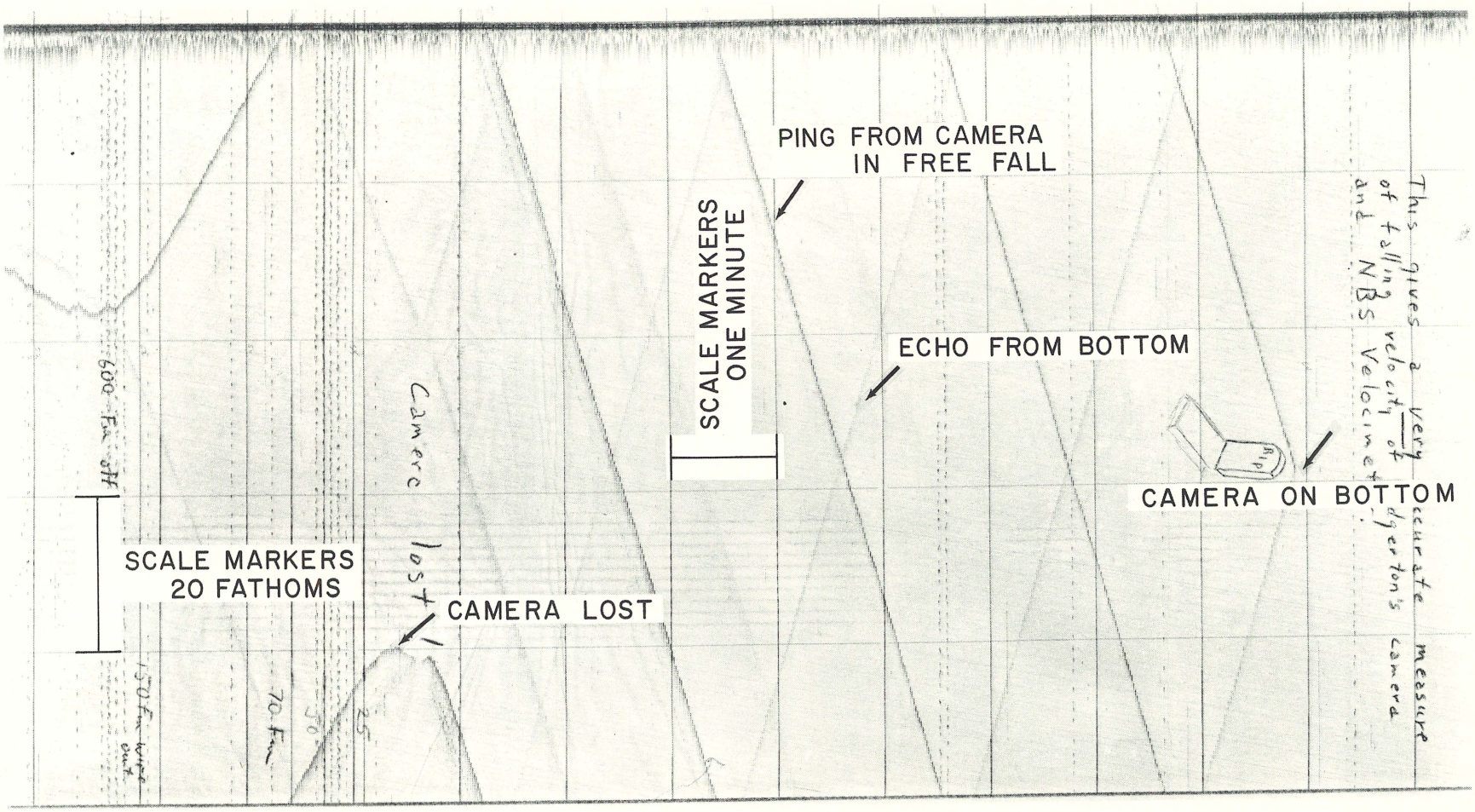

Chart from USNS YAMACRAW (WHOI) showing the free fall descent of a camera after a cable break. The velocity of the camera is 4.5 ft/sec.

FIG. 3

FIG. 3

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