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REPORT OF TRIP TO INVESTIGATE AREA AROUND
HERON ISLAND BAR IN THE POTOMAC RIVER

By

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10 July 1981

Marine Resource Report #81-8

**Report of trip to investigate area around
Heron Island Bar in the Potomac River**

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On 17 June 1981 a trip was made to Heron Island Bar to examine the bottom at the location where a two-barge tow had gone aground on 3 June. It was desired to examine the bottom to determine whether or not the grounding and the subsequent efforts of the tug "Sealevel" to push the barges off the bar had resulted in any disturbance of the bottom. The trip was made aboard the VMRC patrol boat "Stratford"; aboard were the crew, Warren H. Webb and R. D. Hopkins, A. C. Carpenter from the PRFC and Mr. Scott Marple who is the chief surveyor for the MD DNR. Mr. Paul Kendall from VIMS operated the fathometer.

Methods

Four buoys were dropped (two by us today and two on 11 June) to surround the location as remembered by eye witnesses, Mr. Webb and Mr. Hopkins - where the two-barge tow

had rested when aground. The locations of these buoys were later fixed by sextant by Mr. Marple and charted by him on a copy of Chart No. 26 (1961) "Natural Oyster Bars of St. Mary's County" (Figure 1). The area enclosed by and surrounding the buoys was crisscrossed and circled while a portable fathometer continuously recorded the profile of the bottom.

A total of ten transects was run transversely across the area defined by the buoys; these transects lay approximately in North-South lines with the North ends being the ends closer to shore (i.e. the inshore ends). Five longitudinal transects were covered along and parallel to the axis of the buoys. In addition a circle was made around the buoys at a distance of approximately 300 feet away (Figure 2).

The beginning and ending of transects were marked - on the fathometer record - in relation to the planted buoys. However, the fathometer recorded continuously - even when the boat was turning and lining up for the next transect. These portions of the transverse transects which were outside the buoyed area are labelled on the fathometer tracings as 5a, 5c, 6a, 6c, etc; the portions of the transects within the buoyed area are labelled 5b, 6b, etc. (Figures 3 through 6).

Results

The resulting traces of the bottom produced by the fathometer have been copied and included as Figures 3 through 10b. A discussion follows:

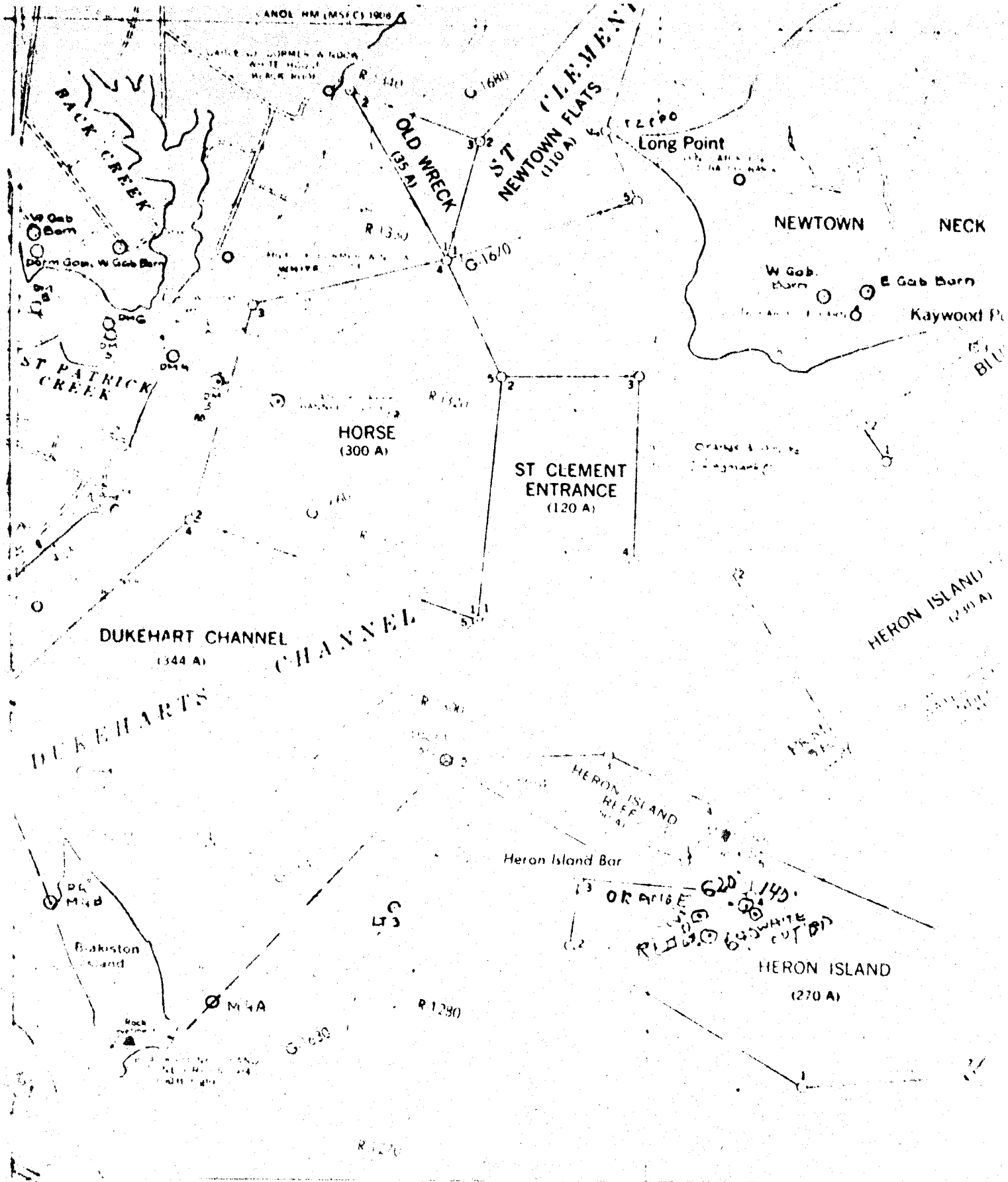


Figure 1. MD DNR Chart 26 showing the Heron Island Bar area. Locations of buoys used on 17 June 1981 and the distances between them plotted and measured by Mr. Scott Marple, Chief Surveyor for MD DNR.

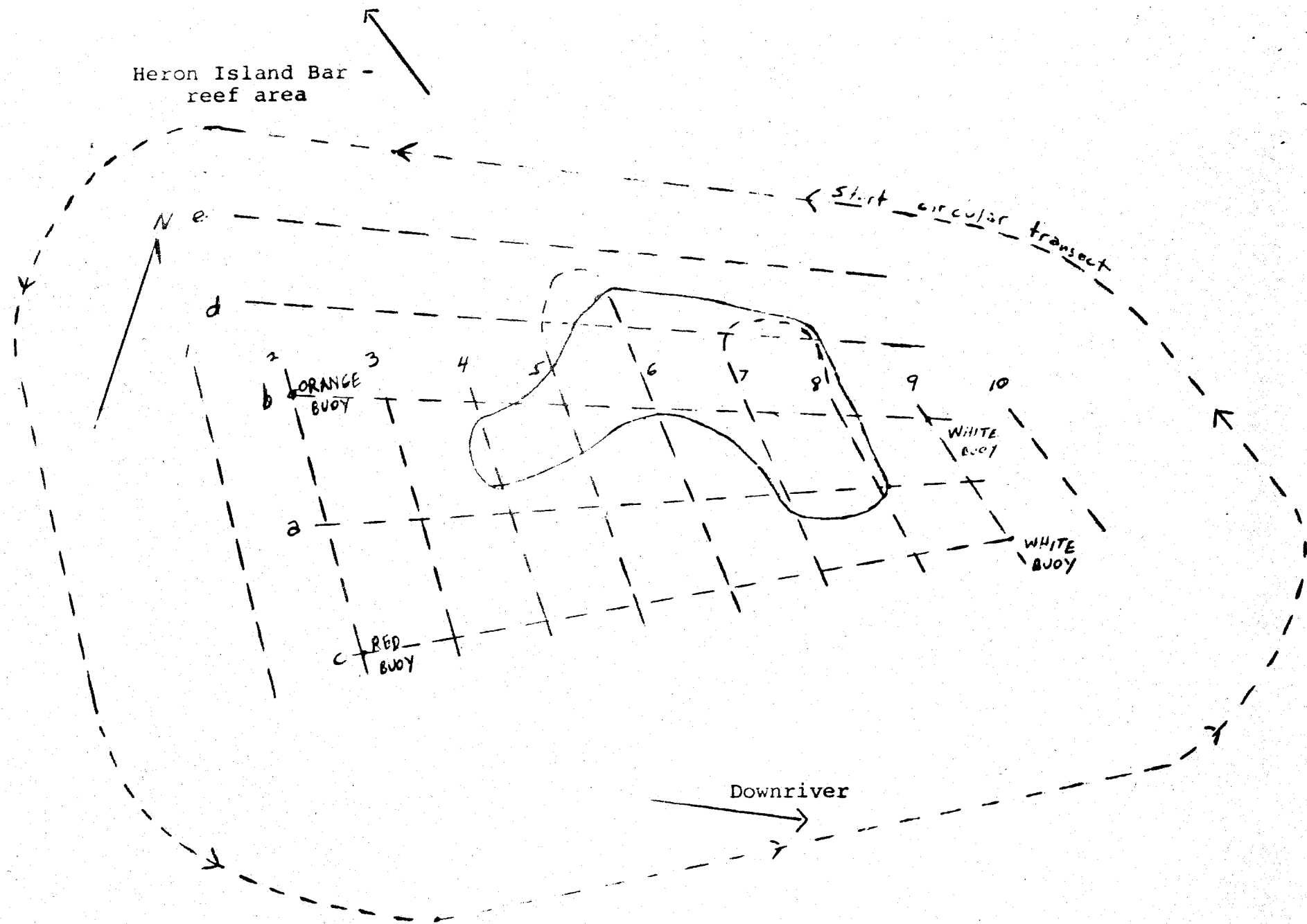


Figure 2. Key to transects covered with fathometer 6/17/81. Dashed lines represent transects. Area with irregularities enclosed by solid line. Scale: 1 inch = 129 feet.

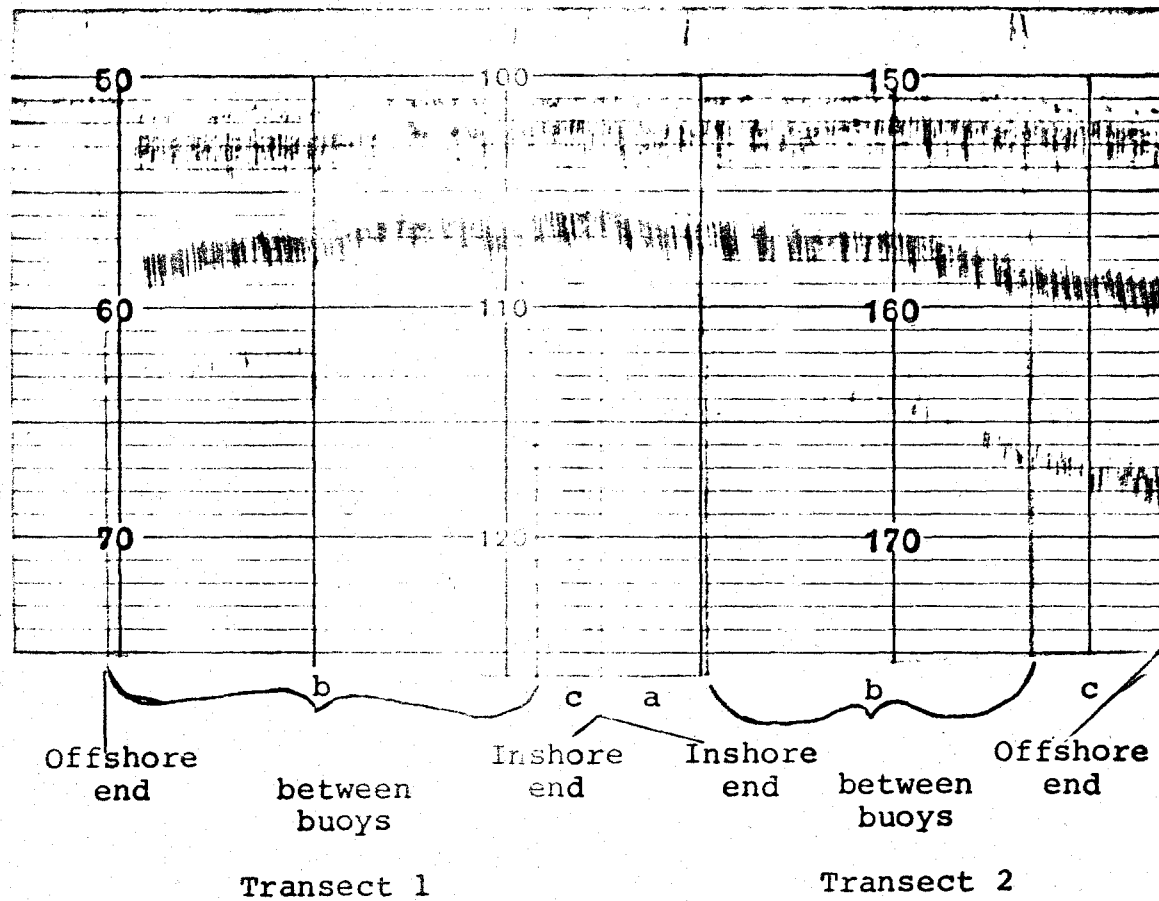


Figure 3. Fathometer tracing of the bottom along transects 1 and 2 in the Potomac River near Heron Island Bar; made 6/17/81.

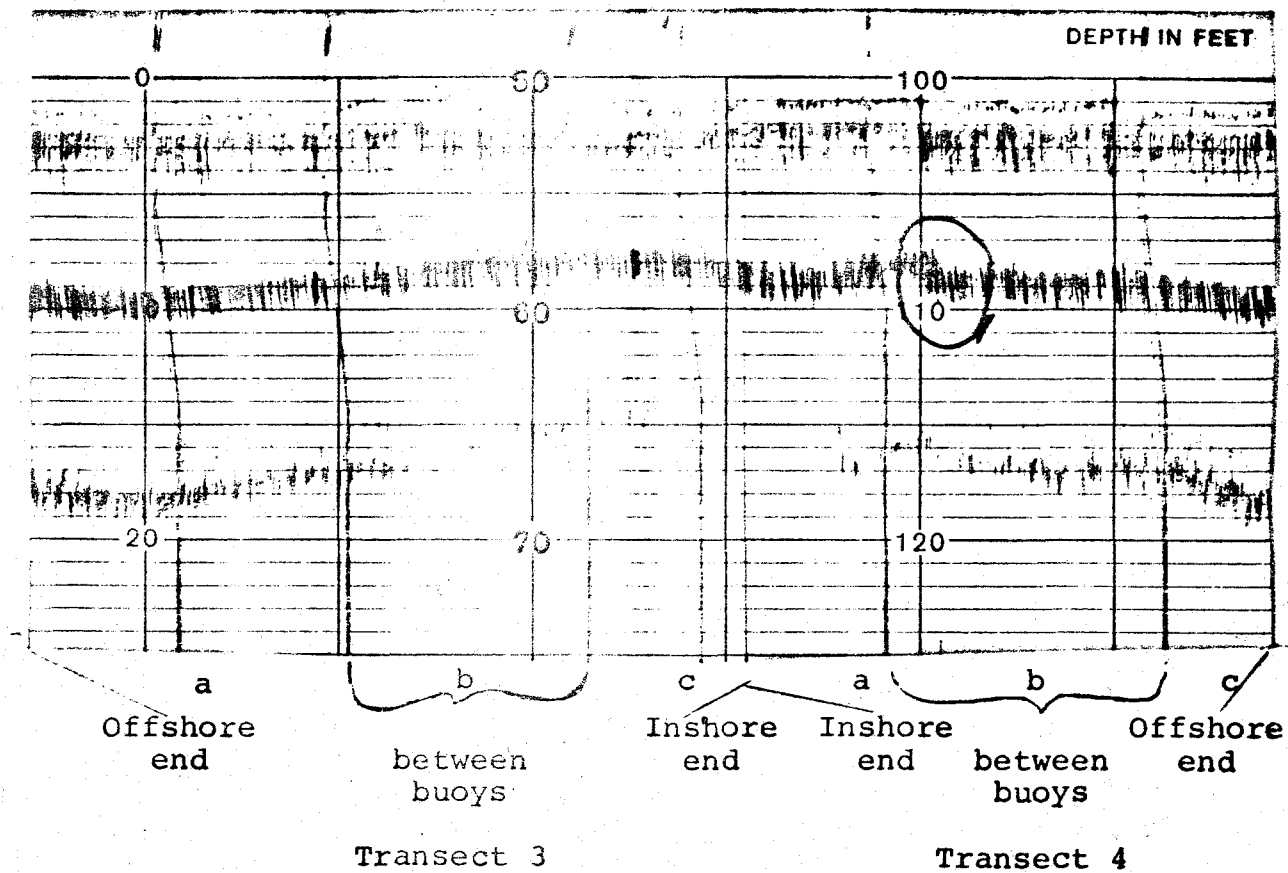


Figure 4. Fathometer tracing of the bottom along transects 3 and 4 in the Potomac River near Heron Island Bar; made 6/17/81. Circled portion is suggestion of recent disturbance.

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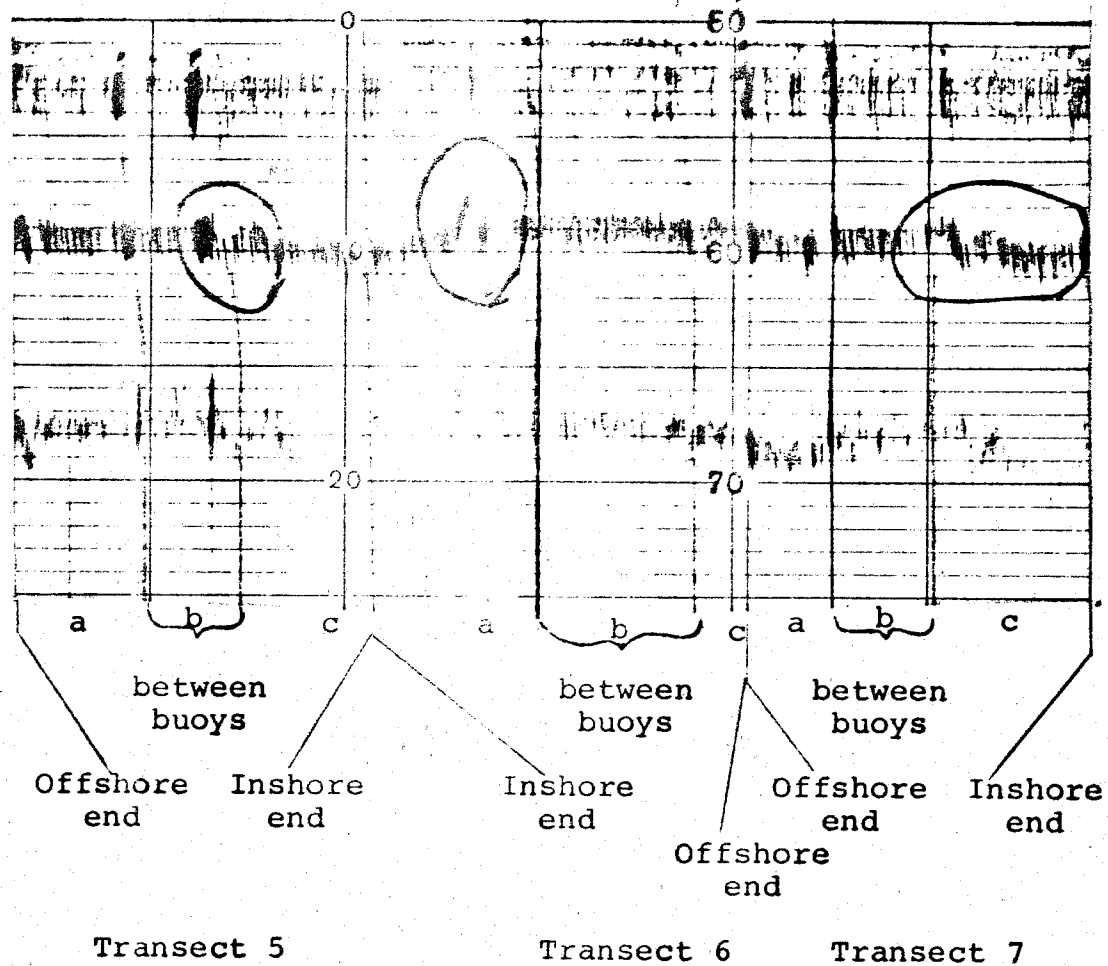


Figure 5. Fathometer tracing of the bottom along transects 5, 6 and 7 in the Potomac River near Heron Island Bar; made 6/17/81, circled portions are suggestions of recent disturbance.

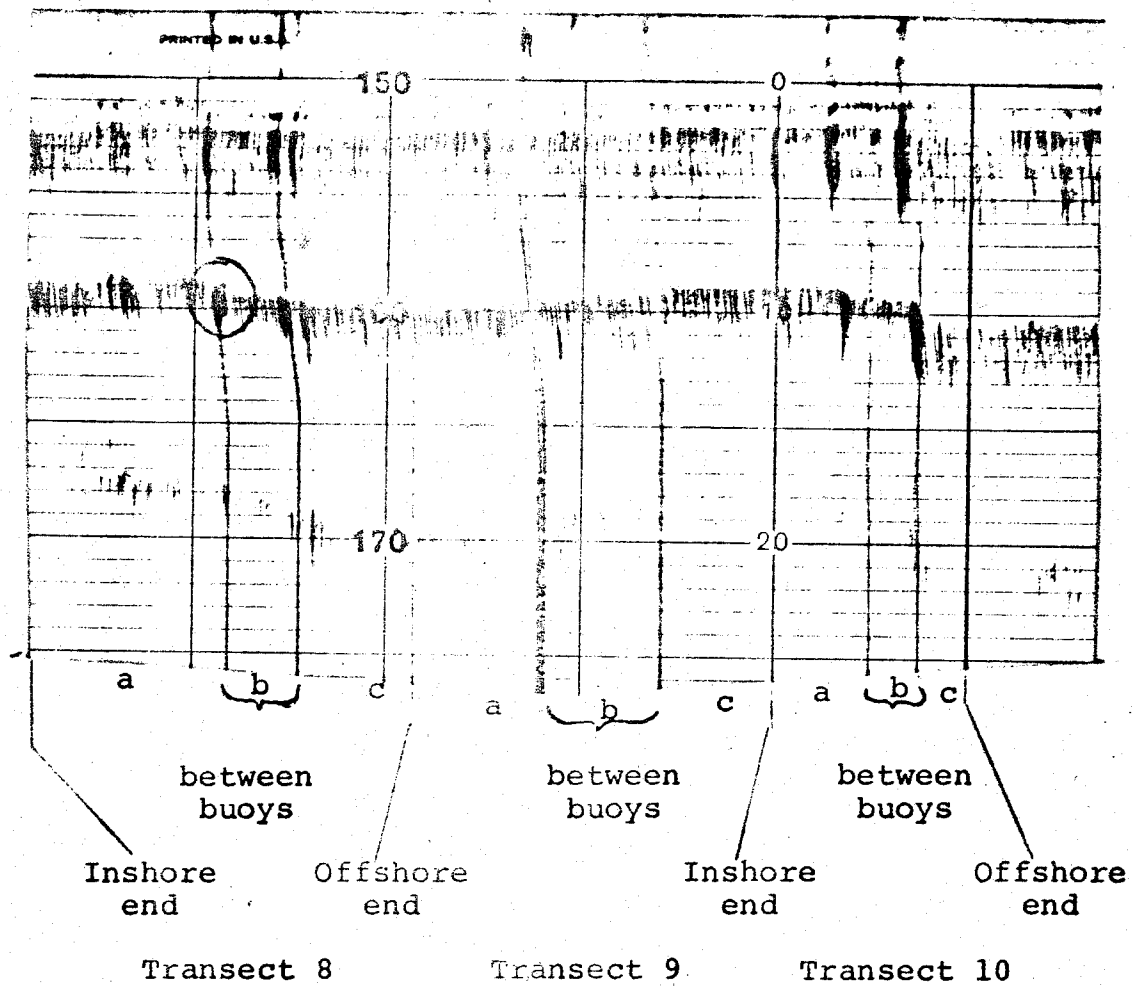


Figure 6. Fathometer tracing of the bottom along transects 8, 9 and 10 in the Potomac River near Heron Island Bar; made 6/17/81. Circled portion is suggestion of recent disturbance.

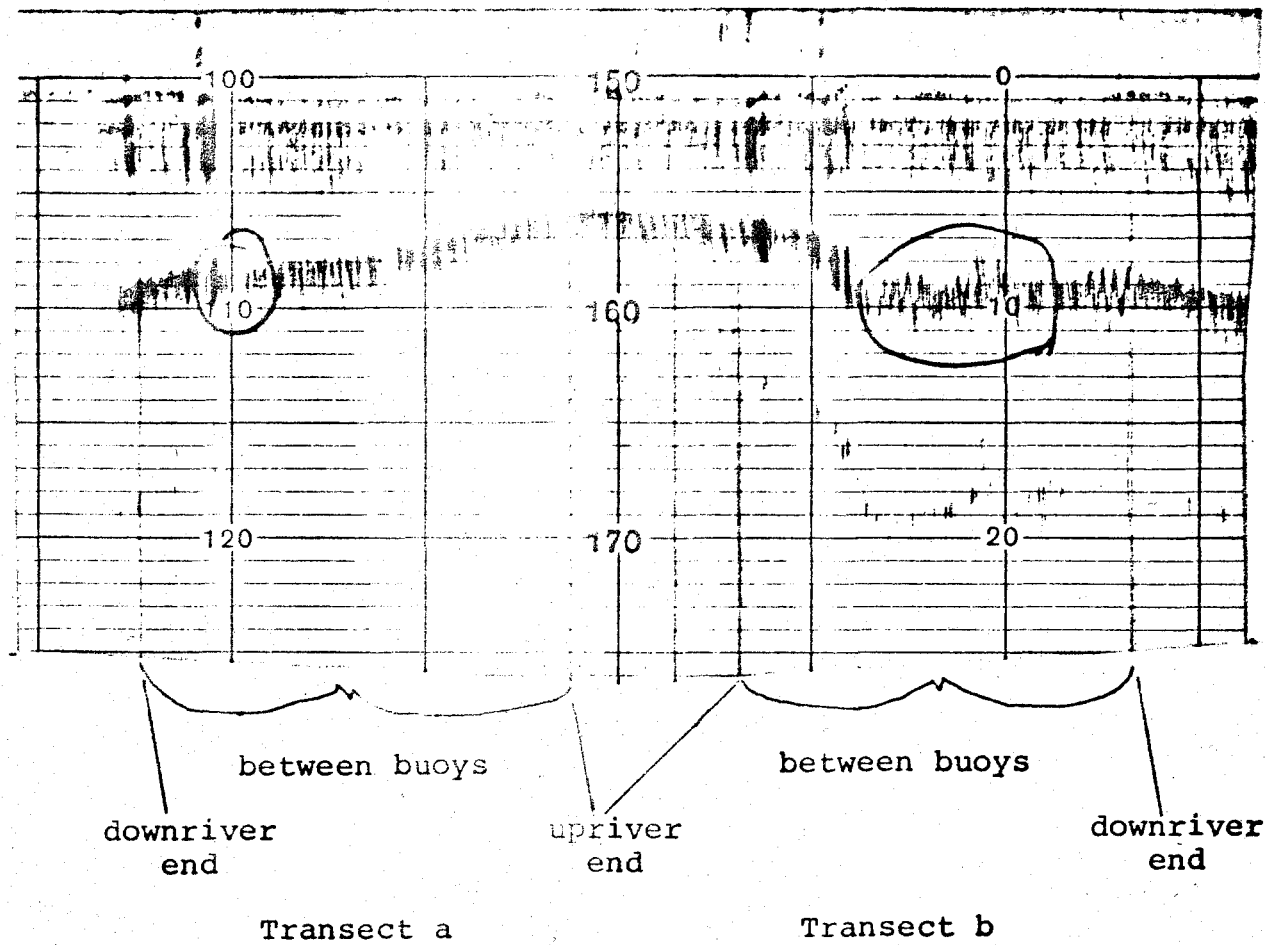


Figure 7. Fathometer tracing of the bottom along transects a and b in the Potomac River near Heron Island Bar; made 6/17/81. Circled portions are suggestions of recent disturbance.

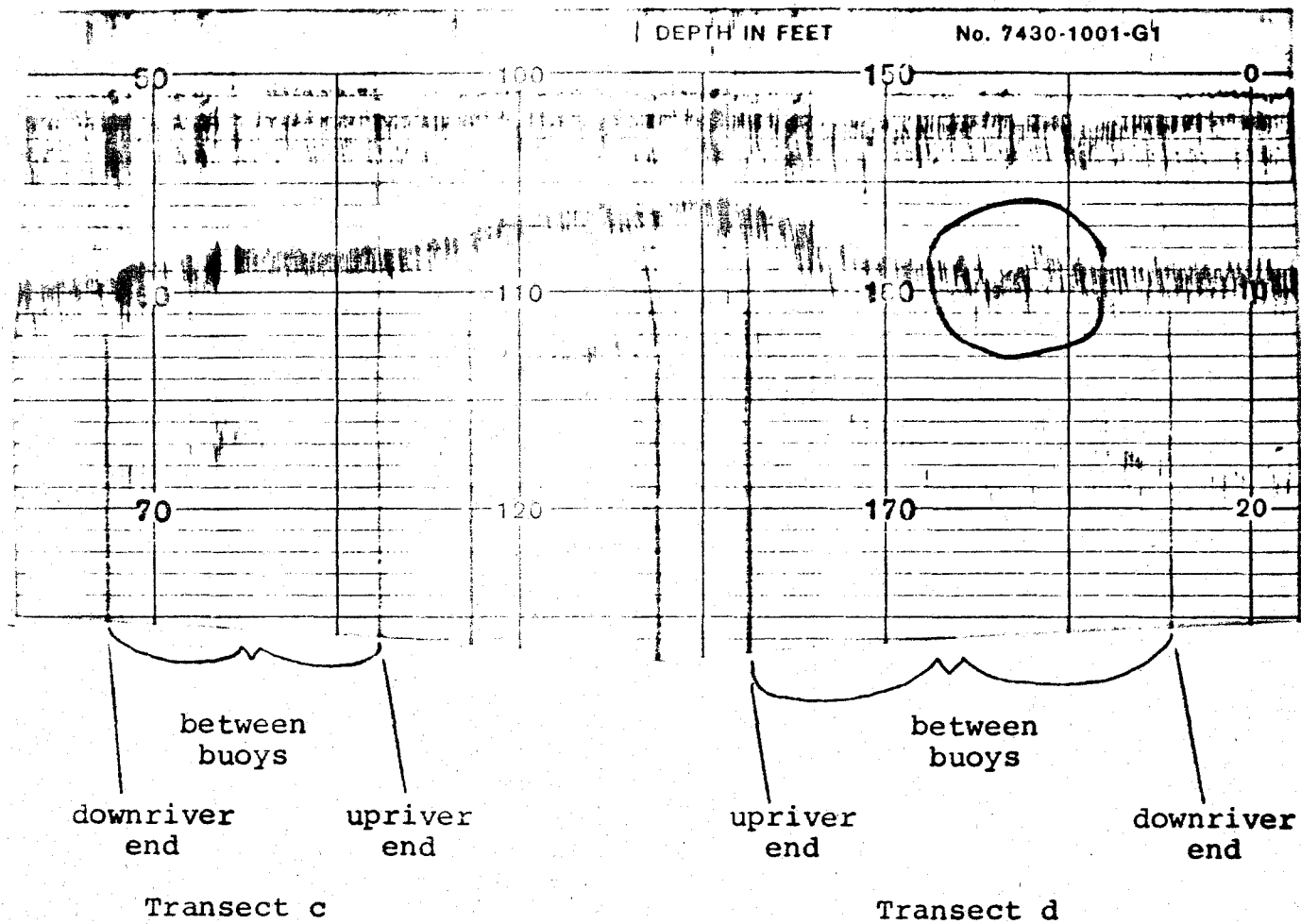


Figure 8. Fathometer tracing of the bottom along transects c and d in the Potomac River near Heron Island Bar; made 6/17/81. Circled portion is suggestion of recent disturbance.

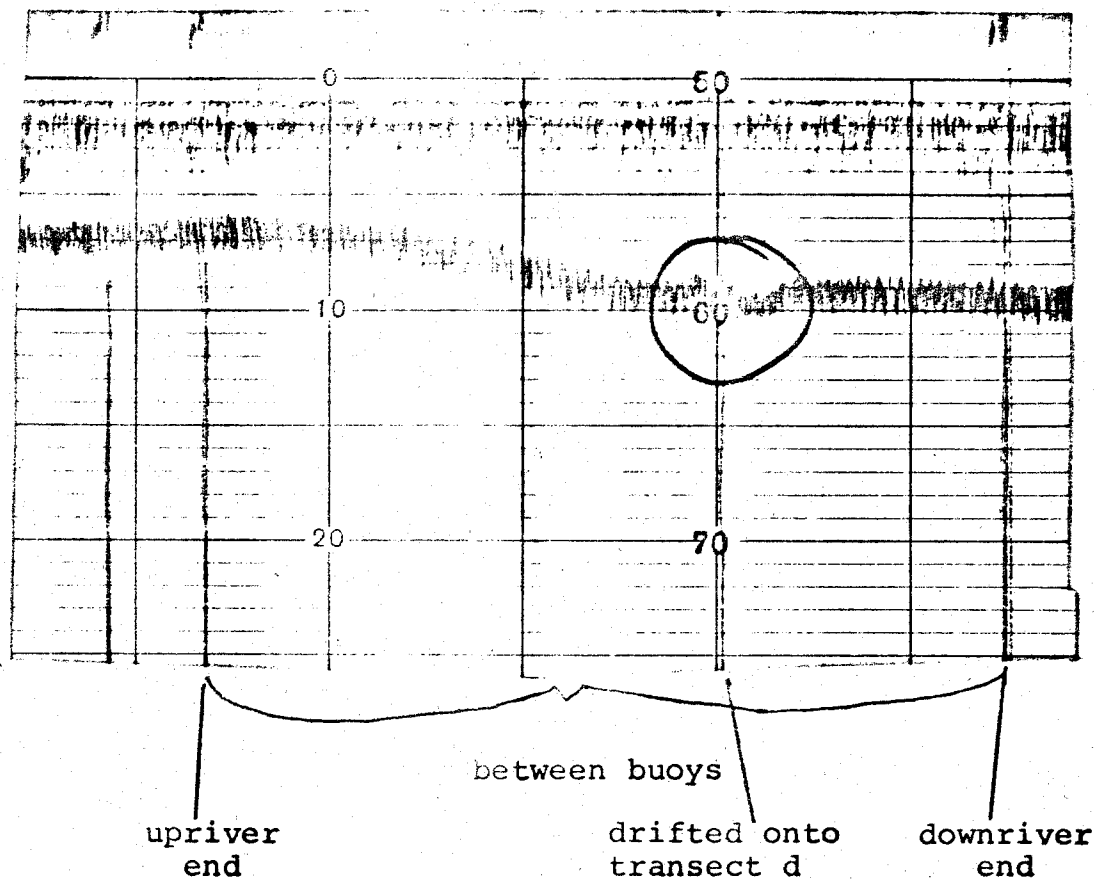


Figure 9. Fathometer tracing of the bottom along transect e in Potomac River near Heron Island Bar; made 6/17/81. Circled portion is suggestion of disturbance.

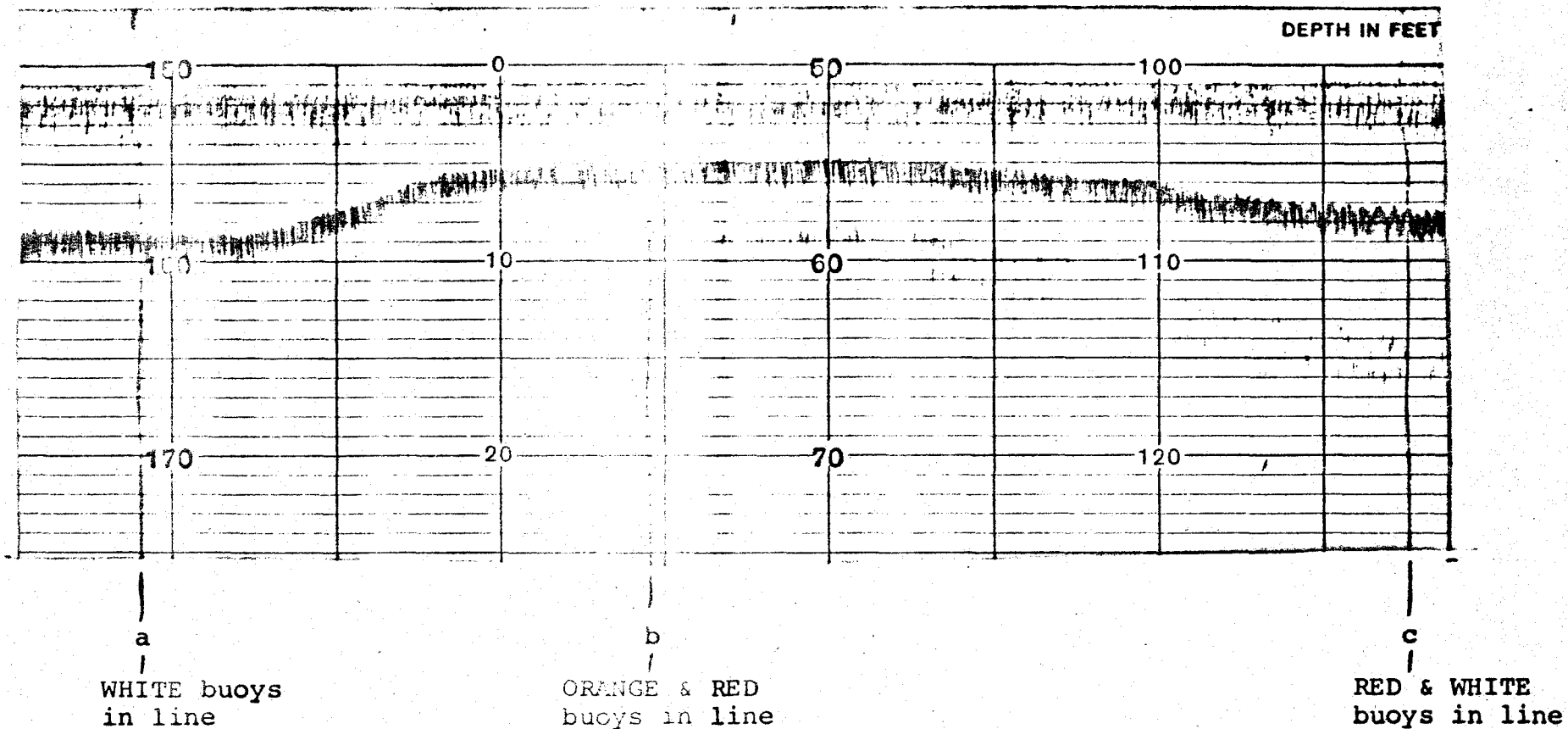


Figure 10a. Fathometer tracing of the bottom along circular transect about 300 feet from buoys near Heron Island Bar in the Potomac River; made 6/17/81.

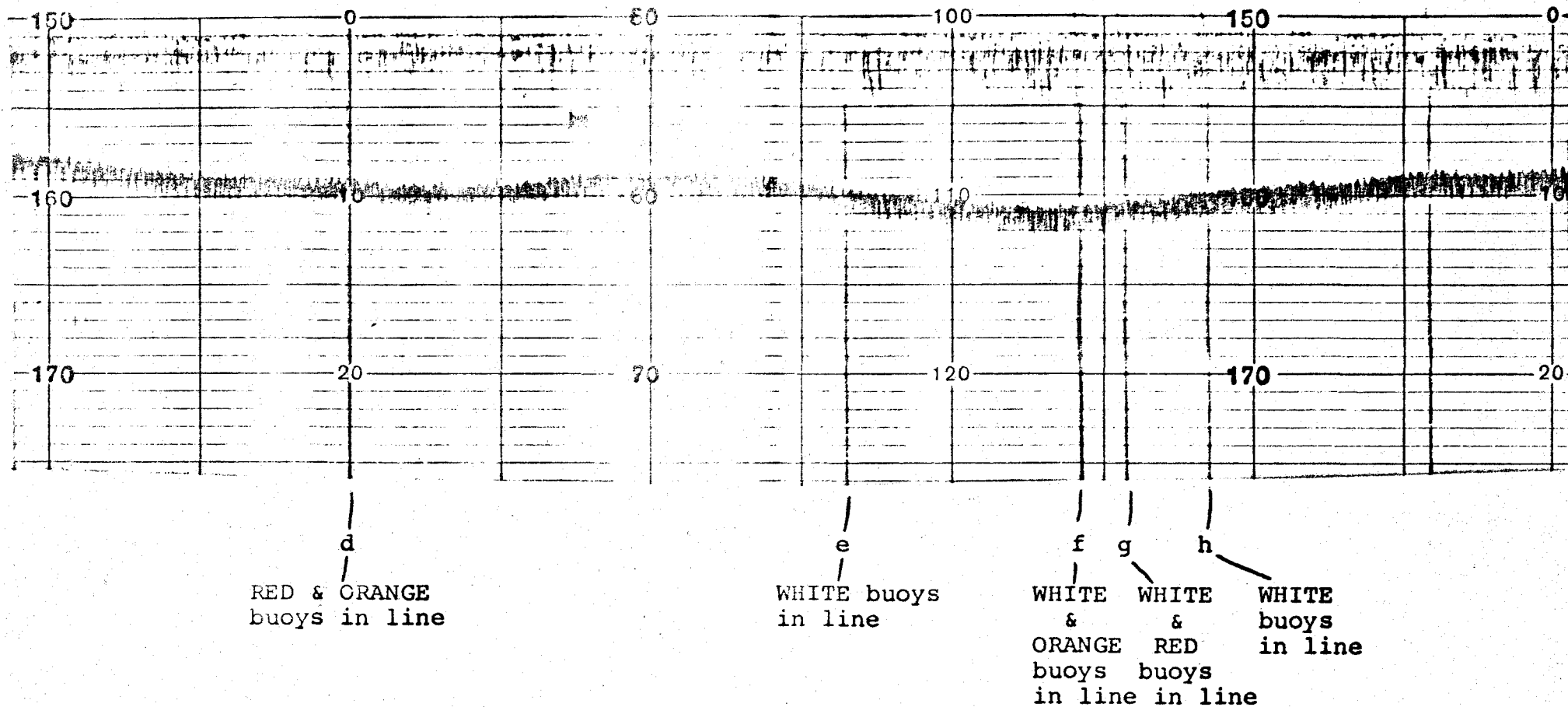


Figure 10b. Fathometer tracing of the bottom along circular transect about 300 feet from buoys near Heron Island Bar in the Potomac River; made 6/17/81.

Transect 1 - This transect was about 90 feet upriver of the buoyed location and was run from the offshore buoy to the inshore buoy (Figure 2). The trace (Figure 3) shows a smooth, even line, indicating a smooth, even bottom.

Transect 2 - This transect was along the upriver line of buoys and was run from the inshore end to the offshore end (Figure 2). A smooth even bottom was indicated by the fathometer (Figure 3).

Transect 3 - A smooth, even sloping bottom is shown on this trace (Figure 4). This transect was about 90 feet downriver of the previous transect (Figure 2).

Transect 4 - On this transect which was about 90 feet downriver of transect 3 (Figure 2) there appeared an abrupt one-foot change in the bottom near the inshore buoy (transect 4b); this alteration of the bottom occurred over a distance of 70 feet. The abruptness and magnitude of the change (which is circled in Figure 4) suggests that it was caused by a recent disturbance. The rest of the bottom appeared smooth and even.

Transect 5 - Transect 5 was run approximately 90 feet downriver of transect 4 going from the off-

shore to the inshore end (Figure 2). The trace of the fathometer is mostly smooth except at and beyond the inshore end of the transect (5b and c on Figure 5) where a depression with peaks or mounds of material on both sides was indicated. The depression is, at most, one half foot below the surrounding bottom, and the mounds or peaks are approximately one half foot above the surrounding bottom for a total difference in height of one foot from the bottom of the depression to the tops of the mounds. These features (which are circled on Figure 5) suggest a recent disturbance because of their irregularity, closeness and magnitude. We were unable to calculate the distance on the bottom over which the disturbance occurred.¹

Transect 6 - This transect was run starting at the inshore end (Figure 2). On the inshore end of this transect (6a on Figure 5) the fathometer indicated a mound which measured one to two feet high and a depression adjacent (these features

¹The recording paper's movement stalled during the running of this and a few of the other transects; this caused the trace to be shortened and the marker to lay down numerous marks on the same place, resulting in a darker spot on the paper. Despite this difficulty the traces are of value in determining whether or not the bottom was or was not disturbed; moreover, data from other traces filled in for the missing data.

are circled on Figure 5). The steep slope of the mound suggested that it was made by a recent disturbance; disturbance was suggested over 129 feet of the bottom. Over the remainder of the transect the fathometer indicated a smooth bottom.

Transect 7 - The fathometer revealed an uneven and rapidly changing bottom beginning at the inshore end of this transect and proceeding toward the reef of Heron Island Bar and downriver to the beginning of the next transect (Transect 7c on Figure 5). On this trace the bottom varied in depth from $8\frac{1}{2}$ to $9\frac{1}{2}$ feet, a difference of one foot. The tracing suggests disturbance; because of stalling in the movement of the recording paper the distance of the disturbance could not be calculated. For the remainder of the transect (7a&b) a smooth bottom was indicated.

Transect 8 - On this transect, which was about 90 feet downriver from the previous one, an abrupt change of about one half foot in the depth of the bottom was revealed near the inshore end; the remaining offshore portion (transect 8c) had a smooth bottom (Figures 2 and 6). The abrupt change in the surface of the bottom near the inshore

end of the transect suggests that it was caused by a recent disturbance. The extent of the disturbance could not be calculated due to the malfunction of the recording fathometer.

Transect 9 - This transect lay along the downriver line of buoys and was 90 feet from transect 8 (Figure 2). The fathometer trace revealed a smooth, even bottom with no sign of disturbance (Figure 6).

Transect 10 - About 90 feet downriver of transect 9 this transect was run (Figure 2). The fathometer trace shows a smooth, even bottom (Figure 6).

Transect a - This transect was run through the middle of the buoyed area, beginning at the downriver end of the area and going upriver (Figure 2). The fathometer tracing is smooth with one exception; near the downriver (from near transect 8 to near transect 7) end is a slight depression and an adjacent mound (Figure 7) which suggest a recent disturbance. The disturbed bottom continued for about 111 feet.

Transect b - Transect b was run along the inshore line of buoys beginning at the upriver end of the area (Figure 2). The tracing is rough and irregular for approximately half the length of the transect or

336 feet, which suggests that this portion of the bottom was recently disturbed (Figure 7); the remaining portions of the transect appear smooth.

Transect c - Between the two offshore buoys where this transect was run (Figure 2) the fathometer produced a tracing that was mostly smooth. The one rough area shown on the fathometer trace is not subject to interpretation since the movement of the paper stalled at that point and left no clear picture of the bottom (Figure 8).

Transect d - This transect was run approximately 90 feet inshore of the buoyed area (Figure 2). A smooth bottom is indicated for the most part; near the middle of the transect (roughly, between transects 5 and 8) is a depression and an adjacent mound. The height difference between the top of the mound and the bottom of the depression is a little less than one and a half feet (Figure 8). This feature just mentioned suggests recent disturbance; the disturbance continued for 241 feet.

Transect e - This transect was approximately 180 feet inshore of the buoyed area (Figure 2). The trace is smooth and regular except for a mound and a depression 1/2 to 2/3 of the distance along the

trace; this happened when the boat was crabbed sideways by the wind onto transect d. That portion of the trace on transect e was smooth (Figure 9).

Circular transect - This transect was run in a counter-clockwise direction around the buoyed area (Figure 2) at a distance of about 300 feet. The first part (Figure 10a) shows the tracing produced over that portion of bottom inshore of and parallel to the two inshore buoys (a to b); also shown is that portion of the bottom upriver of the buoyed area (b to c). Figure 10b shows the portions of bottom offshore (d to e) and downriver (f to h) of the buoyed area. All along the circular transect the fathometer revealed a smooth, even bottom.

Summary

In the area where barges went aground and the tug "Sealevel" attempted to remove them on 3 June 1931 a recording fathometer revealed some abrupt changes (or roughness) in the bottom. In several instances there were depressions and mounds side by side with a height difference of about one foot from the bottom of the depression to the top of the mound. The abruptness and magnitude of these features suggests a recent disturbance.

All of the previously-mentioned bottom anomalies occurred in close proximity to each other; the locations are shown on Figure 2 as a single area enclosed by the solid line. The bottom surrounding this area was smooth and even. The size of the area where disturbance was suggested was measured with a polar planimeter and found to contain 1.26 acres.