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EXPLORATION FOR SCHOOLING PELAGIC FISHES IN THE MIDDLE ATLANTIC BIGHT

by

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An exploration for schooling pelagic fishes was conducted in the waters of the continental shelf between Cape Hatteras and Block Island during the period February 9 - May 14, 1969.

Fish schools detected by sonar were small and transitory. Rough seas, especially in February and March, make two-boat purse seining of doubtful practicality. The investigation, a joint undertaking of BCF, Haynie Products Co., Inc. and VIMS, was designed and managed by VIMS.

The exploration was conducted from the menhaden vessel W. T. JAMES JR. under charter to VIMS. The 187 foot, 500 ton JAMES was equipped with a Simrad SK3 sonar and CK2 scope. A skiff, powered by an outboard motor, was equipped with a Simrad Basdic. Fishing gear was a purse seine 250 fathoms long and 1500 meshes (1.5 inch stretched) deep rigged as is usual for menhaden purse seines. The net was fished by the technique standard in the menhaden industry in which half of the net is set from each of 2 purse boats traveling in a semi-circle around a school. The purse boats were 37 feet l.o.a. and 10 feet wide, powered by diesel engines,

and were equipped with hydraulic masts and booms, and Marco model 29A power blocks to handle the net.

Different portions of the Mid-Atlantic Bight were explored in 7 cruises of approximately 10 days duration each. Cruise tracks were developed in response to the prevailing weather as each cruise progressed. To the extent allowed by the weather, the entire shelf was examined, but little time was spent in water deeper than 40 fathoms. Each cruise track is plotted in Figures 1-7 and the locations of small schools and dispersed fish are shown.

In February and early March the major concentration of fish was at depths of 15 to 30 fathoms between Cape Hatteras and Cape Henry. A secondary concentration occupied water of 10 to 15 fathoms between Parramore Banks (37° 30' N) and Jack's Spot (38° 10' N). Fish were detected by sonar but usually not caught because they were not schooled or because rough seas precluded setting the net. However, both the behavior of the fish and our scanty observations of the catches by foreign trawlers indicated that they were mostly herring and mackerel. A fleet of 75 to 125 or more Russian and Polish trawlers fished these concentrations and followed the migrating herring and mackerel during March, April and May as they moved northeasterly along the 30 fathom curve. The foreign fleet apparently had good information concerning the whereabouts of fish. We found by steaming through and around the fleet that the distribution of trawlers on the surface very closely approximated the distribution of fish beneath the surface. Usually

the fish were in a band 5 to 10 miles wide and 30 to 50 miles long in depths of 25 to 35 fathoms.

Purse seining was practical only twice each day when fish were schooled briefly. At other times they were too dispersed to be caught in a purse seine. For an hour or slightly longer prior to dawn fish were schooled and the schools were in suitable position to be caught by seining. However, with the first light of dawn, the schools broke up and the fish settled to the bottom individually and in small groups. In late afternoon fish regrouped into schools which stayed deep in the water until sunset when they rose rapidly to the surface and dispersed. Thus fish were schooled and in suitable position to be caught in purse seines for two periods each of two hours or less out of each 24 hours. During the 20 or more hours that fish were not available to a purse seine, they appeared to be suitably positioned for capture with a universal trawl.

Since fish remained schooled only briefly, it was necessary to set the net quickly. Our technique was to first locate a school with the sonar and then send the basdic-equipped skiff to relocate the school and stay above it serving as a target for the purse boats to set the net around. Unfortunately relocation of the school by the basdic operator in the skiff was time-consuming despite radio communication between the pilot house of the ship and the basdic operator in the skiff. Seemingly setting the seine from purse boats would be more efficient. On several occasions schooled fish dispersed while the basdic operator was attempting to position the skiff over them. Dispersal seemed to be in

response to changing light intensity rather than to the presence of the skiff, since we also observed dispersal of schools at dawn and dusk when the skiff was not overboard.

Perhaps schooling behavior would be somewhat different in the absence of a large trawler fleet. Schools might be larger and they might maintain their integrity better. The largest school detected in 1969 was about 60 yards wide, but in 1966 and 1967 when only 25 or fewer foreign trawlers were working, we detected several schools larger than 50 yards and one of at least 6.5 miles extent.

The field program in 1969 was aimed at finding resources that could be harvested by the menhaden fleet during its off-season and was therefore terminated in mid-May when menhaden fishing usually begins. Information acquired from various sources, mostly Coast Guard-BCF surveillance flights, suggests that herring become more vulnerable to purse seines in May and June. An observer sighted schools of fish, probably herring, south of Long Island in mid-May. Near the first of June the U.S.S.R. added to its fleet about 40 purse seiners which fished on Georges Bank.

Sea conditions are important to the success of a purse-seining operation. Purse boats are not suited to the rough seas characteristic of winter. In February seas were calm enough to operate purse boats on only 20% of the scheduled work days. In March 40% of the days were suitable. As spring progressed conditions improved. In April 60% of the days were suitable and in May 70%. These percentages reflect the fact that it was often possible to

work near shore when seas were too rough in deeper water. Working conditions were less favorable along the 30 fathom curve where fish were most abundant.

COMMENTS ON CRUISES

Cruise 1, February 10-19. Seas were too rough for purse boat operation when the three small schools were detected; therefore, the identity of the fish is unknown. About 20 foreign vessels were fishing in 15 fathoms NE of Cape Henry on 15 February.

Cruise 2, February 24-March 5. No sets attempted. Foreign fleet of more than 100 trawlers worked between Cape Hatteras and Cape Henry.

Cruise 3, March 10-19. On three mornings schools dispersed before we were able to set the net. A set on a remnant of a school off Parramore Island caught nothing. We suspect that the fish were anchovies which escaped through the meshes of the net; however, larger fish might have escaped by sounding. A Polish fleet of 1 factory vessel and about 12 medium trawlers was sighted near Jack's Spot. The large Russian fleet was working in 20 to 30 fathoms off Oregon Inlet and to the north.

Cruise 4, March 24-April 2. Several small schools at 39° 15 N, 73° 19' W were identified as herring by setting on remnant of a school which broke up at dawn. Catch was 57 herring ranging in fork length from 8 inches to 11 inches. The Russian fleet was trawling in 30 to 40 fathoms from the offing of Currituck Light to beyond Norfolk Canyon.

Cruise 5, April 8-13. Schools detected were mostly too deep to set on. One set at the edge of Hudson Canyon failed to catch fish despite a good showing on the basdic. Perhaps the fish were anchovies, which could escape by swimming through the meshes

of the net. Sonar malfunction caused early termination of cruise. Russian trawlers were working in 30 fathoms off Atlantic City.

Cruise 6, April 21-30. A set on one of the small schools off Block Island (41° 13' N, 71° 17' W) caught herring ranging from 7 to 8 inches long. A set off Currituck Light (36° 23' N, 75° 45' W) caught a small number of round herring which ranged in fork length from 6 to 7 inches.

Cruise 7, May 5-14. High winds twice prevented work in the area south and east of Long Island where we had intended to search. Two sets near False Cape (36° 35' N, 75° 50' W) yielded 126 thousand menhaden.

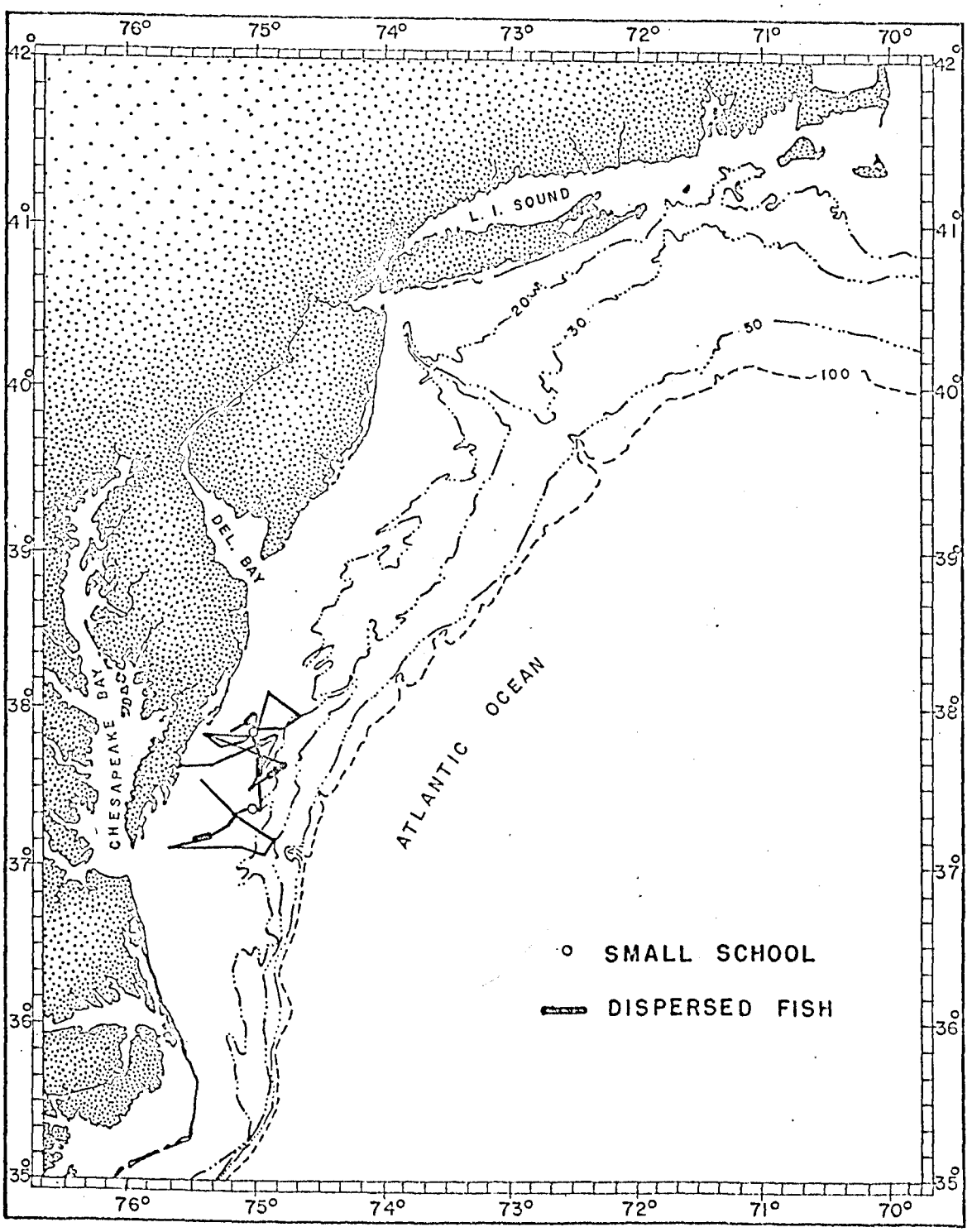

Fig. 1. Cruise 1, February 10-19

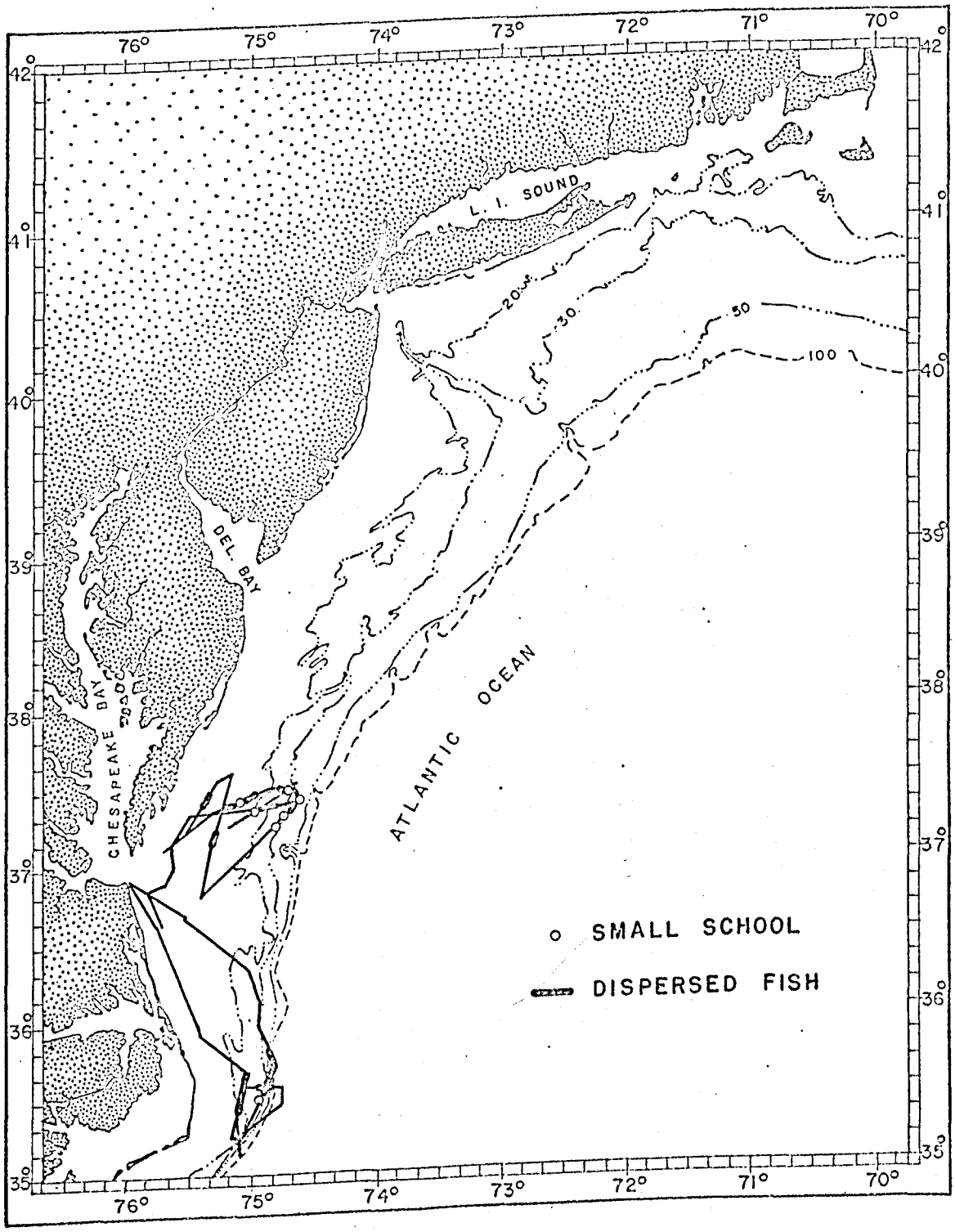

Fig. 2. Cruise 2, February 24-March 5

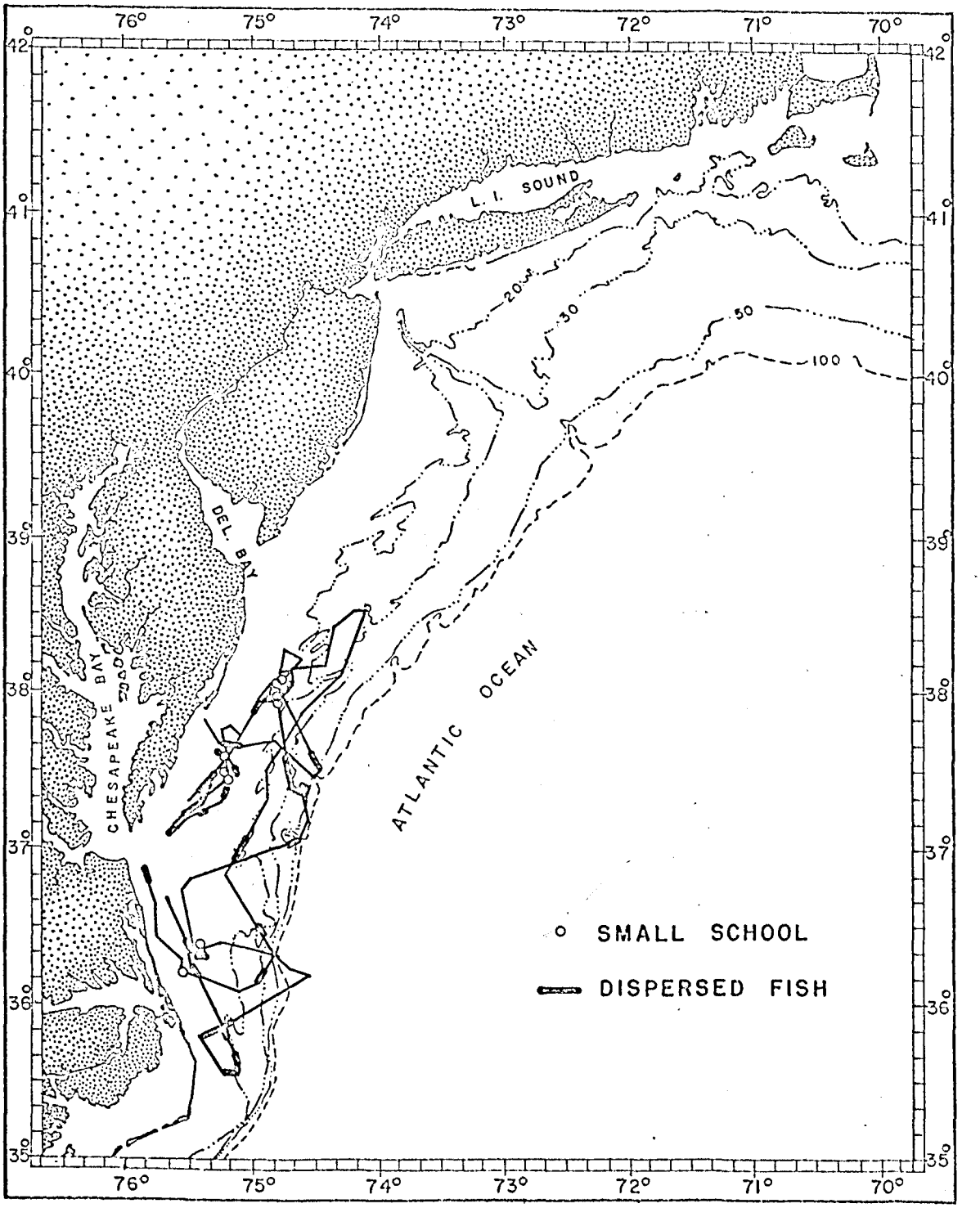

Fig. 3. Cruise 3, March 10-19

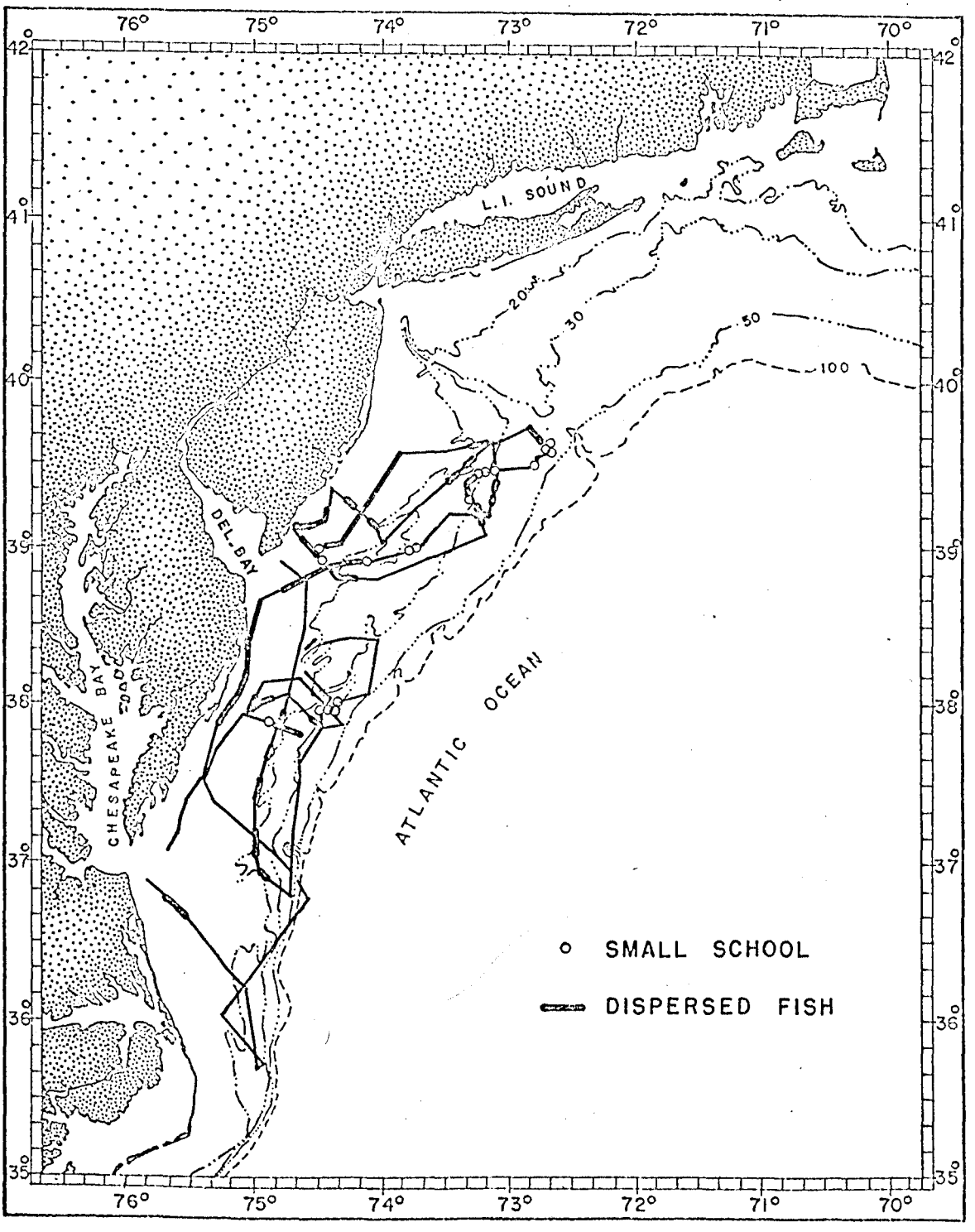

Fig. 4. Cruise 4, March 24-April 2

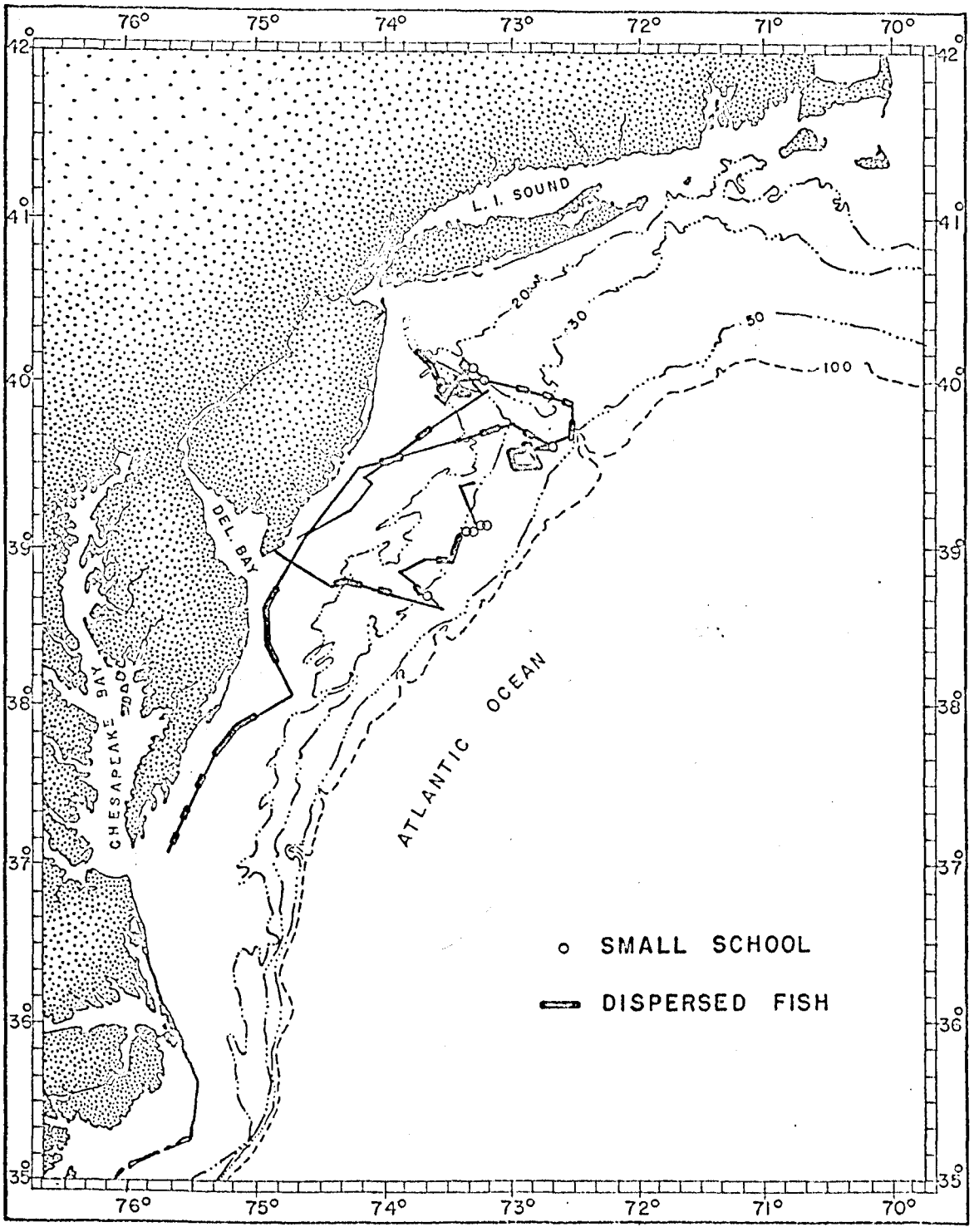

Fig. 5. Cruise 5, April 8-13

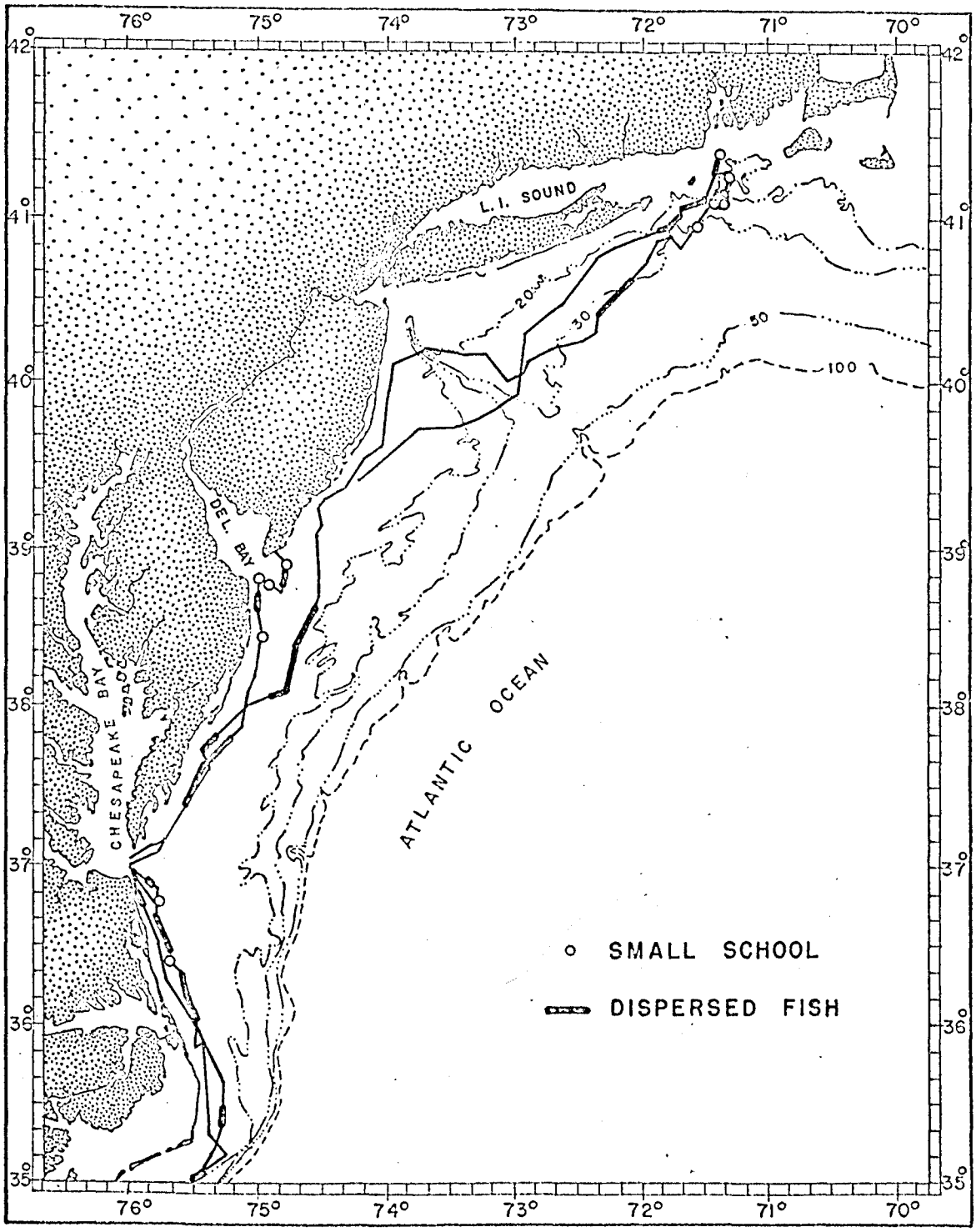

Fig. 6. Cruise 6, April 21-30

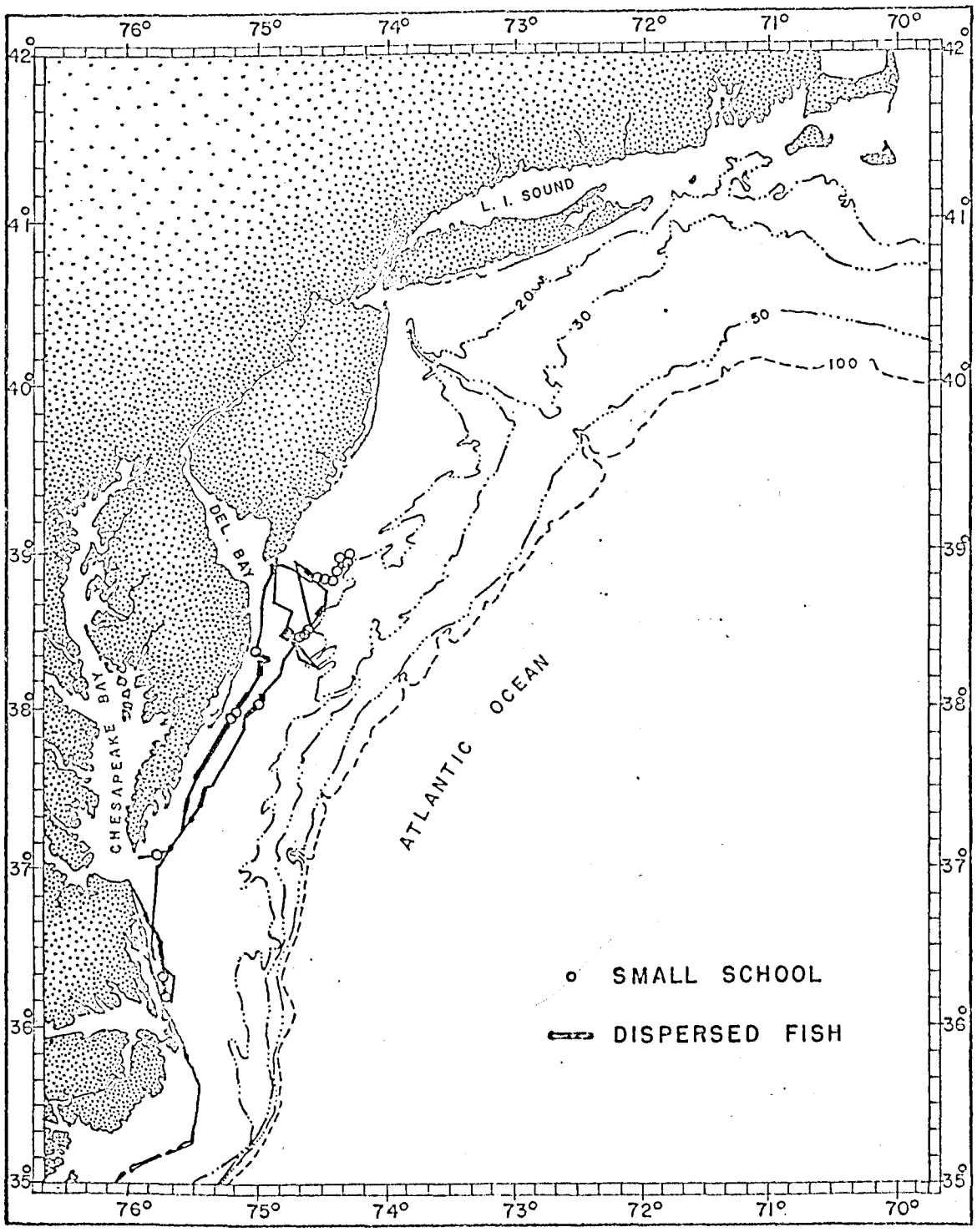

Fig. 7. Cruise 7, May 5-14.