

CRUISE RESULTS

NOAA FRV ALBATROSS IV
Cruise No. AL 01-10 (Parts I-IV)
Autumn Bottom Trawl Survey

Submitted to: NOAA, NEFSC

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CRUISE PERIOD AND AREA

The cruise period was from 4 September to 23 October. The survey was conducted in four parts: Part I was during 4-14 September; Part II, 17-28 September; Part III, 2-11 October; and Part IV, 15-23 October. The area of operation was from Cape Hatteras to the western Scotian Shelf including the Gulf of Maine. Station locations are shown in Figures 1 and 2.

OBJECTIVES

The objectives of the survey were to: (1) determine the seasonal distribution and relative abundance of fish and invertebrate species found on the continental shelf; (2) collect biological samples for age determinations and growth studies, fecundity, maturity, and feeding ecology; (3) collect hydrographic and meteorological data; (4) collect samples of ichthyoplankton and zooplankton for relative abundance and distribution studies; (5) collect data and samples for cooperative researchers and programs; (6) conduct cooperative research tows with the F/V Jason & Danielle during Part II of the survey; and (7) conduct a vessel comparison with the FRV Delaware II during Part IV of the survey.

METHODS

Operations and gear conformed with the Cruise Instructions for the autumn bottom trawl survey dated 12 July 2001 with the following exceptions: Part III departed one day later than scheduled (on 2 October) due to vessel mechanical problems; and Part IV returned to port on 23 October due to the early completion of the survey (after the FRV Delaware II returned to port due to mechanical problems).

At each pre-selected station, a 30-minute tow was made with the Northeast Fisheries Science Center (NEFSC) standardized number 36

Yankee otter trawl rigged with 41 centimeter (cm) diameter rollers, 9 meter (m) bridles, and 450 kilogram (kg) polyvalent trawl doors rigged with chain backstraps. The trawl was fished at a scope of 4:1 in water depths between 18 and 27 m; 3:1 in depths between 27 and 184 m; and 2.5:1 in depths greater than 184 m. During each tow, speed was maintained at approximately 3.5 knots, primarily determined using DGPS instrumentation and direction of each tow was generally toward the next station.

A digital data acquisition Fisheries Scientific Computer System (FSCS) was used to record the data. This system uses digital scales, electronic measuring boards, touch screen displays and bar code scanners to record data on deck and archive the data on the ship's computer network.

Sampled fish were assigned individual identification numbers, measured, weighed to the nearest 0.1 kilogram (kg), and further sampled for age and growth and feeding ecology studies. Bony fish were measured to the nearest centimeter (cm) to the end of the central caudal ray; biological samples were collected concurrently with measuring operations. Sharks and skates were measured to the end of the caudal fin (total length). Disk width was measured for rays. Lobsters were measured in millimeters (mm) from the posterior edge of the eye socket to the end of the carapace; the presence or absence of a V-notch was also noted. Crabs were measured across the carapace width (cm). Shell height was measured in (cm) for selected bivalves. Additional collections were obtained for various scientists (see Table 2). The remainder of the catch (miscellaneous invertebrates, shells, substrate, et cetera) was described by volume.

Surface temperatures were measured using the hull-mounted temperature sensor at a depth of three meters. Temperature and conductivity profiles were made using a conductivity, temperature, depth (CTD) system at every station. A bottom salinity sample was obtained twice each day to calibrate the CTD. Water samples were also taken for fluorometer calibrations.

Samples of fish eggs and larvae were collected at selected stations. Plankton sampling gear consisted of a 61 cm bongo frame fitted with 0.333 mm mesh nets. Digital flowmeters were suspended within the mouths of the bongo frame. The net was towed at 2.8-3.8 kilometers/hour (1.5-2.0 knots).

Throughout the cruise, eastern daylight time was maintained.

RESULTS

There were 340 stations occupied during the survey with 90, 116, 74, and 60 stations completed on parts I-IV, respectively. Plankton tows were made at 117 stations. Bottom temperatures were collected at all 340 stations using the CTD system. Bottom water samples for CTD calibration were taken on 41 stations. Fish data was simultaneously recorded on traditional paper logs and electronically using the FSCS data collection system. A total of 23 comparison tows were made with the FRV DELAWARE II, and 9 with the Jason & Danielle.

Tables 1 and 2 list the major samples collected for various studies.

DISPOSITION OF SAMPLES AND DATA

Age and growth samples, feeding ecology data and samples, maturity data, trawl catch data and hydrographic data will be analyzed at the NEFSC Woods Hole, Massachusetts, Laboratory. The various collections were forwarded to the individuals listed in Table 2. Resulting data will be audited, and entered into the NEFSC trawl survey database.

SCIENTIFIC PERSONNEL

National Marine Fisheries Service, NEFSC, Woods Hole, MA

John Galbraith, Chief Scientist, Parts I, III

Victor Nordahl, Chief Scientist, II

Linda Despres, Chief Scientist, IV

Larry Brady, II, IV

Elisabeth Broughton, II

John Burnett, III

Larry Jacobson, III

Charles Keith, IV

Paul Kostovick, I

William Kramer, II

Barbara Lewis, III

Kathy Mays, IV

Nancy McHugh, III

Paul Nitschke, III

Nancy Lee Peltier, III

Gary Shepherd, IV

Vaughn Silva, III

Katherine Sosebee, I

Scott Steinback, II

Sandra Sutherland, II

Susan Wigley, III

National Marine Fisheries Service, NEFSC, Highlands, NJ

John Sibunka, II

National Marine Fisheries Service, NEFSC, Narragansett, RI

Jacquelyn Anderson, I, III
 Stephen Brownell, II
 Sharon MacLean, IV

National Marine Fisheries, Service, NEFSC, Milford, CT

Robin Katersky, I

National Marine Fisheries Service, NOAA, NODC, Silver Spring, MD

Michael Ford, I

National Marine Fisheries Service, NEFSC, NMNH, Washington, DC

Martha Nizinski, I

NOAA, OMAO, Woods Hole, MA

Apryl Corey, I
 Ensign Sean Suk, IV

South Carolina Division of Natural Resources, Charleston, SC

Erin Levesque, I

Harvard University, Cambridge, MA

Christopher Kenaley, I

Chesapeake Biological Laboratory, Solomons, MD

Michael Frisk, I

Contractors

| | |
|-------------------------|--------------------------|
| Christina Bascunan, IV | ETI, Woods Hole, MA |
| Stephen Brownell, III | Narragansett, RI |
| Gregory Gorniok, IV | REMSA, Riverhead, NY |
| Kris Ohleth, IV | Plainville, NJ |
| Kevin McIntosh, III, IV | Manchester, NH |
| Anthony Morales, II | REMSA, Narragansett, RI |
| Amy Whittingham, III | ETI, Woods Hole, MA_____ |

Teacher-at-Sea, Quakertown, NJ

Irene Mortensen, III

Volunteers

| | |
|-----------------------|------------------|
| Robert Alexander, IV | Kingston, RI |
| Linda Duca, IV | Lincoln Park, NJ |
| Christopher Foster, I | Germantown, MD |
| Amanda Magliozzi, II | Woburn, MA |
| James McCann, I | Walden, NY |
| Patricia McGinn, II | Providence, RI |
| Kevin McIntosh, I, II | Manchester, NH |
| Kristin Simonsen, II | West Islip, NY |
| Kelly Spang, II | Bay Village, OH |
| Thomas Walukonis, I | Red Bank, NJ |

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 These cruise results and a Fishermen's Report for this survey can be viewed at:
[http:// www.nefsc.nmfs.gov/esb/survey.html](http://www.nefsc.nmfs.gov/esb/survey.html).

Table 1. Field observations and samples collected for feeding ecology, and age and growth studies on FRV ALBATROSS IV, Cruise 01-10, Autumn Bottom Trawl Survey, during 4 September-23 October 2001.

| Species | <u>Feeding Ecology</u> Observations | <u>Age and Growth</u> Samples |
|---------------------|--|----------------------------------|
| Acadian redfish | 302 | 608 |
| American plaice | 209 | 444 |
| American shad | 9 | - |
| Atlantic cod | 177 | 298 |
| Atlantic croaker | - | 434 |
| Atlantic halibut | 6 | 6 |
| Atlantic herring | 132 | 350 |
| Atlantic mackerel | 51 | 95 |
| Atlantic wolffish | 2 | 1 |
| Barndoor skate | 3 | - |
| Black sea bass | 82 | 144 |
| Blackbelly rosefish | 53 | 1 |
| Bluefish | 137 | 244 |
| Butterfish | 239 | 617 |
| Clearnose skate | 1 | - |
| Cunner | 14 | 1 |
| Cusk | 17 | 19 |
| Fawn cusk-eel | 18 | - |
| Fourspot flounder | 194 | 199 |
| Goosefish | 152 | 148 |

Table 1. (continued).

| Species | <u>Feeding Ecology</u> Observations | <u>Age and Growth</u> Samples |
|---------------------|--|----------------------------------|
| Haddock | 306 | 722 |
| Little skate | 205 | - |
| Longfin hake | - | 1 |
| Longhorn sculpin | 145 | 2 |
| Ocean pout | 48 | 54 |
| Offshore hake | 33 | 58 |
| Pollock | 138 | 222 |
| Red hake | 362 | 838 |
| Rosette skate | 14 | - |
| Scup | 142 | 359 |
| Sea raven | 101 | 1 |
| Silver hake | 506 | 1523 |
| Smooth dogfish | 198 | - |
| Smooth skate | 44 | - |
| Spiny dogfish | 466 | - |
| Spot | 24 | 1 |
| Spotted hake | 242 | 249 |
| Summer flounder | 246 | 420 |
| Tautog | 2 | - |
| Thorny skate | 43 | - |
| Weakfish | 129 | 622 |
| White hake | 215 | 377 |
| Windowpane | 149 | 308 |
| Winter flounder | 235 | 556 |
| Winter skate | 176 | - |
| Witch flounder | 130 | 255 |
| Yellowtail flounder | 137 | 331 |
| TOTALS | 6,234 | 10,468 |

Table 2. Miscellaneous scientific collections made on FRV ALBATROSS IV, Cruise 01-10, Autumn Bottom Trawl Survey, during 4 September-23 October 2001.

| Investigation & Affiliation | Samples Saved | Approximate Number |
|--|-------------------------------------|--------------------|
| Aquarium, NMFS, NEFSC, Woods Hole, MA | Atl. herring | 9 bags |
| Edward Baker, School of Marine Science, UMASS, Dartmouth, MA | Live Atl. wolffish | 4 indiv. |
| William Bemis, UMASS Amherst, MA | Misc. species | 50 indiv. |
| Jon Brodziak, NMFS, NEFSC, Woods Hole, MA | <i>Loligo</i> | 14 indiv. |
| John Burnett, NMFS, NEFSC, Woods Hole, MA | Misc. species for maturity workshop | 130 indiv. |
| Peter Clark, Rutgers Univ., Tuckerton, NJ | Goosefish | 17 indiv. |
| Bruce Collette, NMFS, Nat'l Systematics Lab, Washington, DC | Misc. species | 10 indiv. |
| Kevin Friedland, CMER, UMASS, Amherst, MA | Atl. sturgeon | 1 indiv. |
| Michael Frisk, Chesapeake Biological Lab, Solomons, MD | Various skates | 1142 indiv. |
| John Galbraith, NMFS, NEFSC, Woods Hole, MA | Misc. species | 98 indiv. |
| Dvora Hart, NMFS, NEFSC, Woods Hole, MA | <i>Astropecten</i> sp. | 1 sample |
| Josef Idoine, NMFS, NEFSC, Woods Hole, MA | Shrimp | 44 samples |
| Francis Juanes, UMASS, Amherst, MA | Silver hake and Offshore hake | 90 vials |

| Investigation & Affiliation | Samples Saved | Approximate Number |
|--|---|--|
| Kenneth Kessenich, Univ. School Milwaukee, Milwaukee, WI | Butterfish & various other sp. | 10 indiv. |
| Nancy Kohler, NMFS, NEFSC, Narragansett, RI | Tagged sharks | 9 indiv. |
| Paul Nitschke, NMFS, NEFSC, Woods Hole, MA | Cunner | 75 indiv. |
| Loretta O'Brien, NMFS, NEFSC, Woods Hole, MA | Atlantic cod | 208 samples |
| Eric Parent, Fisheries & Oceans, Canada | Atlantic mackerel | 10 indiv. |
| Rodney Rountree, UMASS, Amherst, MA | Striped & fawn cusk-eel | 7 indiv. |
| Cheryl Ryder, NMFS, NEFSC, Woods Hole, MA | Tagged turtle | 1 indiv. |
| Daniel Salerno, NMFS, NEFSC, Woods Hole, MA | Misc. species | 76 indiv. |
| Jean-Marie Sevigny, MLI Mont-joli, Quebec, Canada | Redfish | 12 boxes |
| Katherine Sosebee, NMFS, NEFSC, Woods Hole, MA | Spiny dogfish pup lengths/weights Various skates Various rays | 758 indiv. 1072 indiv. 79 indiv. |
| Michael Vecchione, Nat'l Systematics Lab, Washington, DC | Octopus | 1 indiv. |
| Earl Weidner, MBL, Woods Hole, MA | Goosefish | 17 indiv. |
| Charles Wenner, South Carolina DNR, Charleston, SC | Croaker Weakfish | 3 indiv. 3 indiv. |

| Investigation & Affiliation | Samples Saved | Approximate Number |
|--|------------------|-----------------------|
| Susan Wigley, NMFS, NEFSC, Woods Hole, MA | Witch flounder | 4 indiv. |
| John Ziskowski, NMFS, NEFSC, Milford, MA | American plaice | 62 indiv. |

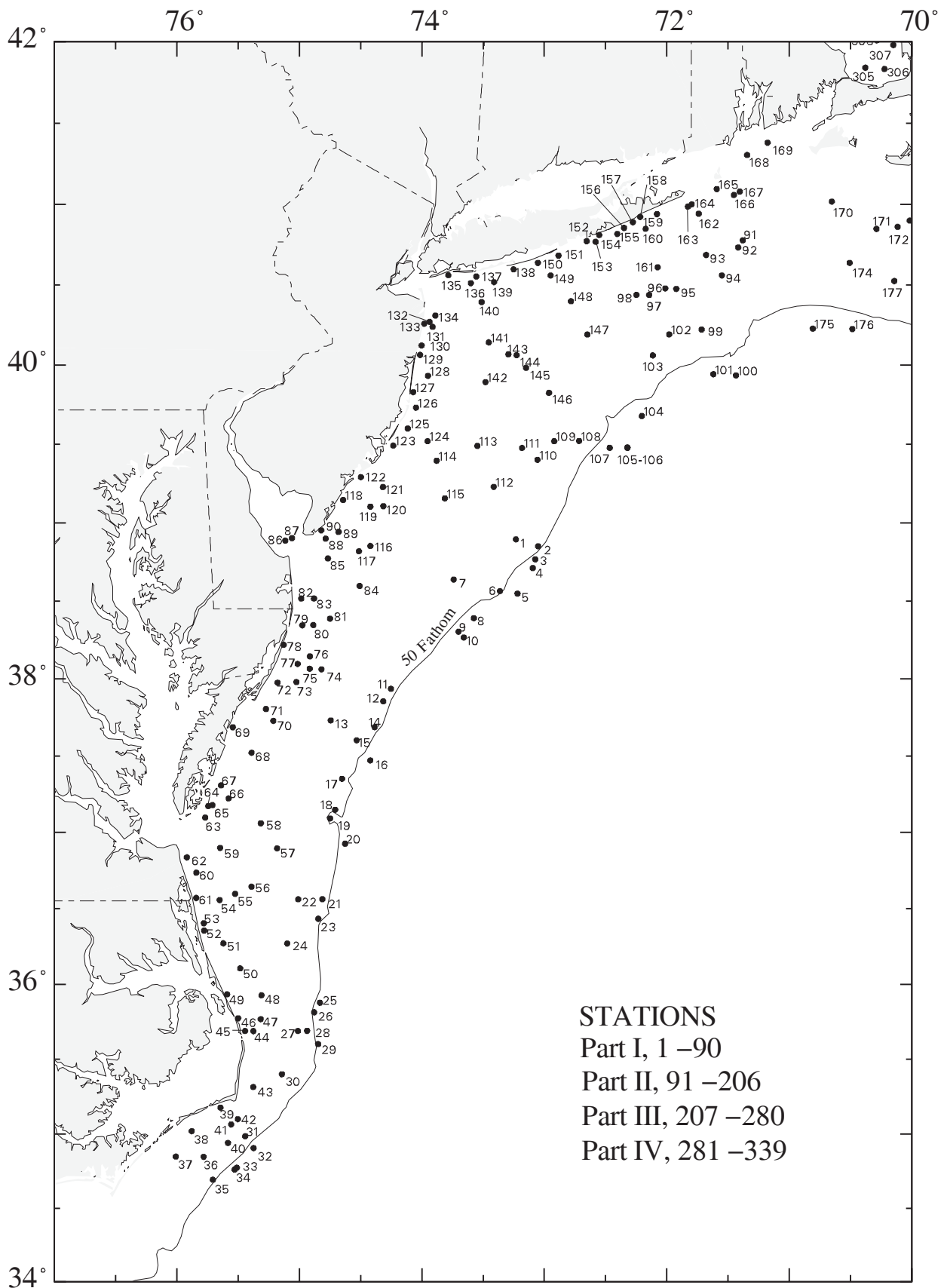


Figure 1. Trawl hauls made from the FRV ALBATROSS IV during National Marine Fisheries Service, Northeast Fisheries Science Center fall bottom trawl survey (01–10), September 4 –October 23, 2001.

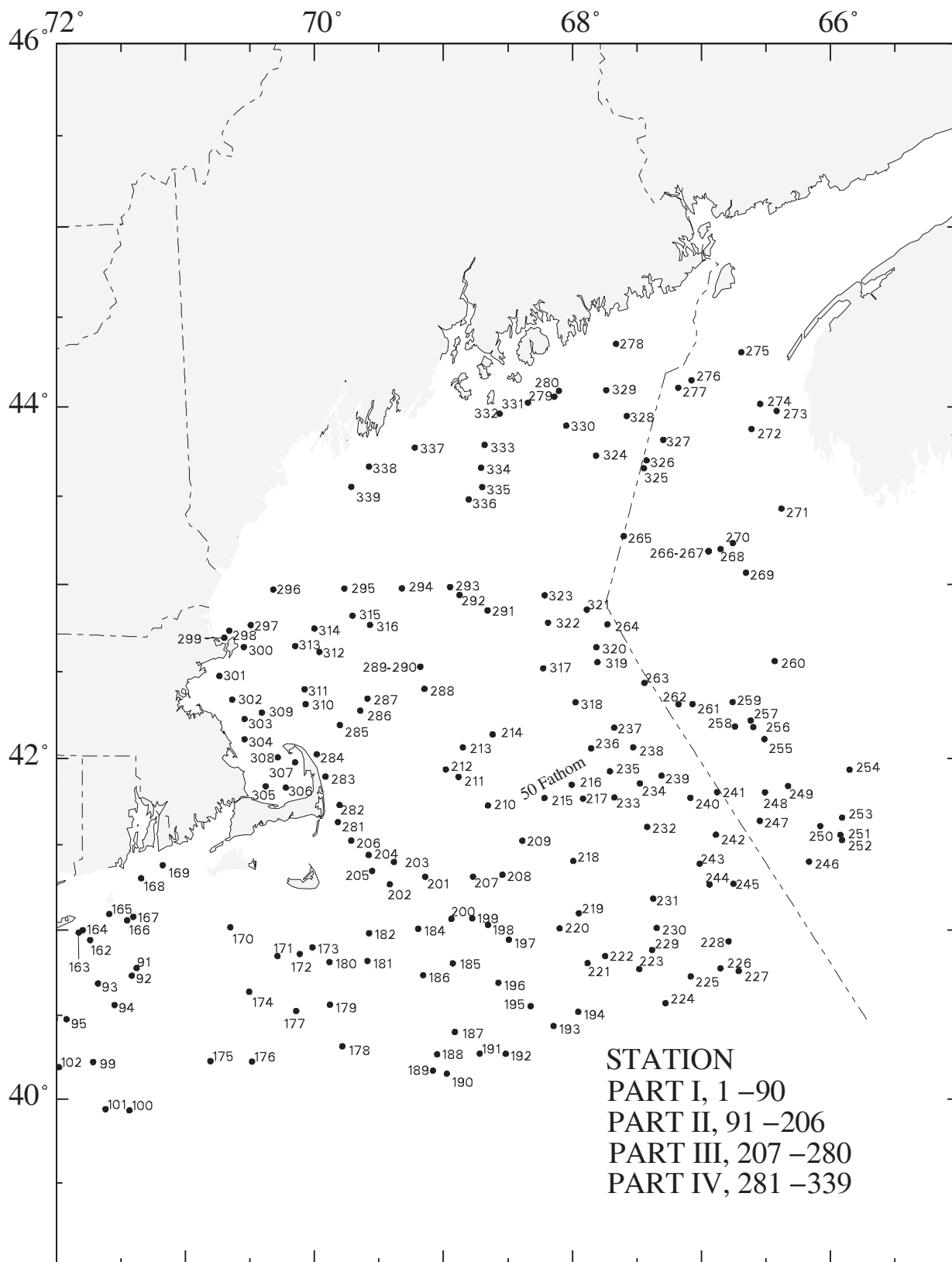


Figure 2. Trawl hauls made from the FRV ALBATROSS IV during National Marine Fisheries Service, Northeast Fisheries Science Center fall bottom trawl survey (01–10), September 4 –October 23, 2001.
Map 2 of 2