

3 January 2003

## CRUISE RESULTS

NOAA FRV ALBATROSS IV  
Cruise No. AL 02-04 Parts (I-IV)  
Spring Bottom Trawl Survey

### CRUISE PERIOD AND AREA

The cruise period was from 5 March to 25 April 2002. The cruise was conducted in four parts: Part I was from 5-15 March; Part II, 18-29 March; Part III, 4-12 April; Part IV, 15-25 April. The area of operations was from Cape Hatteras to the Gulf of Maine. Station locations are shown in (Figures 1 and 2).

### OBJECTIVES

The objectives of the cruise were to: (1) determine the spring distribution, relative abundance and biodiversity of fish and invertebrate species; (2) collect biological samples for studies of age and growth relationships, fecundity, maturity and feeding ecology; (3) collect hydrographic and meteorological data; (4) make collections of data and samples for cooperative researchers and programs; (5) collect continuous hydroacoustic data; and (6) conduct vessel comparison tows with the Delaware II.

### METHODS

Operations and gear used during Parts I-IV conformed with the Cruise Instructions for the Spring Bottom Trawl Survey dated 7 December and ADDENDUM NUMBER 1 dated 4 March; ADDENDUM NUMBER 2 dated 11 March; ADDENDUM NUMBER 3 dated 1 April; ADDENDUM NUMBER 4 dated 15 April 2002 with the following exceptions: 1) Part I left one day late due to inclement weather. 2) The ALBATROSS returned to Woods Hole 6 March due to a Fisheries Scientific Computer System (FSCS) computer-related problem and resumed the survey on the evening of 6 March. 3) The Albatross IV returned again to Woods Hole on 7 March due to mechanical problems. Vessel resumed the survey the next afternoon, 8 March. 4) Part III left 4 April due to two days of weather related delays. 5) Part IV returned to port on the evening of 25 April after completing of the survey.

A 30-minute tow was made at each station with a Northeast Fisheries Science Center (NEFSC) standardized number 36 Yankee otter trawl that was rigged with 41 centimeter (cm) diameter rubber rollers, 36 floats, and 9 meter (m) bridles. NEFSC standardized 450 kilogram (kg) polyvalent trawl doors with chain backstraps were used. The trawl was fished at a scope of 4:1 in waters between 18 and 27 m deep, 3:1 in waters between 27 and 184 m deep, and 2.5:1 in depths greater than 184 m. Speed was determined primarily using DGPS instrumentation. Direction of the tow was generally toward the next station.

A digital data acquisition system (FSCS) was used to record the data. This system uses digital scales, electronic measuring boards, touch screen displays and barcode scanners to record data on deck and archives the data in the ship's computer network.

At each station, the total catch of each species was weighed to the nearest 0.1 kg. 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 3 meters. Temperature and conductivity profiles were made using a conductivity, temperature, depth instrument (CTD) system. 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 flow meters were suspended within the mouths of the bongo frame to estimate water volume filtered. The net was towed at 2.8-3.8 kilometers/hour (1.5-2.0 knots).

## CRUISE RESULTS

The survey occupied 331 stations with 74, 92, 83, and 82 stations completed on parts I-IV, respectively. A total of 134 vessel comparison paired tows were completed with the Delaware II on parts III and IV.

Standard plankton tows were made at 117 stations. Bottom temperatures were collected at all stations using the CTD system. Bottom water samples for CTD calibration were taken on 36 stations. Catch data was simultaneously recorded on traditional paper logs and electronically using the FSCS data collection system.

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

## DISPOSITION OF SAMPLES AND DATA

Age and growth samples, feeding ecology data, 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, edited, and entered into the NEFSC trawl survey database.

## SCIENTIFIC PERSONNEL

National Marine Fisheries Service, NEFSC, Woods Hole, MA

John Galbraith, Chief Scientist<sup>1</sup>, Participant<sup>2, 3</sup>

Frank Almeida, Chief Scientist<sup>2</sup>

Linda Despres, Chief Scientist<sup>3</sup>

Nancy McHugh, Chief Scientist<sup>4</sup>, Participant<sup>1</sup>

Lawrence Brady<sup>1, 2, 4</sup>

Jon Brodziak<sup>3</sup>

John Burnett<sup>4</sup>

Peter Chase<sup>1, 3</sup>

Charles Keith<sup>1, 4</sup>

William Kramer<sup>2</sup>

Christopher Legault<sup>3</sup>

Jason Link<sup>2</sup>

Ralph Mayo<sup>4</sup>

Stacy Rowe<sup>1, 3</sup>

Nina Shepherd<sup>3, 4</sup>

Vaughn Silva<sup>1</sup>

Brian Smith<sup>4</sup>

Katherine Sosebee<sup>1</sup>

Sandy Sutherland<sup>2, 3</sup>  
Mark Terceiro<sup>1</sup>

National Marine Fisheries Service, NEFSC, Narragansett, RI  
Jacquelyn Anderson<sup>1</sup>, (5-7 March),<sup>3</sup>  
Sharon MacLean<sup>4</sup>

National Marine Fisheries Service, NEFSC, Highlands, NJ  
John Sibunka<sup>1, 4</sup>

National Marine Fisheries Service, NEFSC, Milford, CT  
David Veilleux<sup>2</sup>

National Marine Fisheries Service, NWFSC, Seattle, WA  
Tonya Builder<sup>1</sup>

National Marine Fisheries Service, NWFSC, Newport, OR  
Teresa Turk<sup>1</sup>

NOAA, NESDIS, Silver Spring, MD  
Michael Ford<sup>2</sup>

NOAA, OMAO, MOC, Woods Hole, MA  
John Crofts<sup>1, 4</sup>  
Sean Suk<sup>3</sup>  
Jeffrey Taylor<sup>2</sup>

University of Massachusetts, Amherst, MA  
Joseph Kunkel<sup>4</sup>

University of Maine, Orono, ME  
Davin O'Connell<sup>2</sup>

New York Aquarium, NY  
Amy Drohan<sup>2</sup>

USDA, Eastport, ME  
Stephen Ellis<sup>4</sup>

Contractors

Linda Craig<sup>4</sup>  
Julien Goulet<sup>3</sup>  
Kendra Kinnan<sup>4</sup>  
Kevin McIntosh<sup>2, 4</sup>  
Daniel Salerno<sup>2</sup>  
Elise Watson<sup>3</sup>  
Amy Whittingham<sup>1</sup> (8-15 March),<sup>3</sup>

East Hampton, MA  
North Kingstown, RI  
New Bedford, MA  
Woods Hole, MA  
Marshfield, MA  
Woods Hole, MA  
Woods Hole, MA

Teacher-at-Sea Program  
Janna Greenhalgh<sup>2</sup>

Westerly, RI

Volunteers

Anne Beaudreau<sup>3</sup>  
Caleb Machak<sup>4</sup>

Newburyport, MA  
Quincy, MA

<sup>1</sup> = 5-15 March  
<sup>2</sup> = 18-29 March  
<sup>3</sup> = 4-12 April  
<sup>4</sup> = 15-25 April

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For further information contact: Russell Brown, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1097. Telephone (508) 495-2380; FAX (508) 495-2258; Email: *Russell.Brown@noaa.gov*. The Fishermen's Report for this survey can be viewed at <http://www.nefsc.noaa.gov/esb/fishermens%20reports.htm> and the cruise results can be viewed at [http://www.nefsc.noaa.gov/esb/cruise\\_report.htm](http://www.nefsc.noaa.gov/esb/cruise_report.htm).  
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Table 1. Field observations and samples collected for feeding ecology, and age and growth studies on FRV ALBATROSS IV, Cruise 02-04 (I-IV), Spring Bottom Trawl Survey, during 5 March - 25 April 2002.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian redfish	122	345
Alewife	1	-
American plaice	416	588
American shad	55	1
Atlantic cod	247	574
Atlantic croaker	-	53
Atlantic halibut	5	5
Atlantic herring	281	1071
Atlantic mackerel	181	431
Atlantic wolffish	2	11
Barndoor skate	2	-
Blackbelly rosefish	26	-
Black sea bass	68	208

Table 1. (continued).

Species	Feeding Ecology Observations	Age and Growth Samples
Blueback herring	65	-
Bluefish	11	20
Butterfish	141	322
Clearnose skate	11	-
Cusk	19	19
Fawn cusk-eel	29	-
Fourspot flounder	204	205
Goosefish	125	173
Haddock	302	666
Little skate	338	-
Longhorn sculpin	240	1
Ocean pout	188	184
Offshore hake	43	43
Pollock	77	135
Red hake	356	396
Rosette skate	5	-
Sandbar shark	1	-
Scup	60	143
Sea raven	148	-
Silver hake	562	1395
Smooth dogfish	103	-
Smooth skate	53	-
Spiny dogfish	633	-
Spot	10	-
Spotted hake	184	349
Striped bass	127	127
Summer flounder	177	245
Tautog	1	-
Thorny skate	39	-
Weakfish	36	110
White hake	130	309
Windowpane	208	296
Winter flounder	505	797
Winter skate	137	-
Witch flounder	252	337
Yellowtail flounder	311	858
TOTALS	7,240	10,417

Table 2. Miscellaneous scientific collections made on FRV ALBATROSS IV, Cruise 02-04 (I-IV), Spring Bottom Trawl Survey, during 5 March - 25 April 2002.

Investigator & Affiliation	Samples Saved	Approximate Number
Aquarium, NMFS, NEFSC, Woods Hole, MA	Atl. herring	38 indiv.
	Shrimp	26 indiv.
	Misc. live species	33 indiv.
William Bemis, Univ. of MASS, Amherst, MA	Various species	70 indiv.
Jon Brodziak, NMFS, NEFSC, Woods Hole, MA	<i>Loligo</i>	161 indiv.
Peter Chase, NMFS, NEFSC, Woods Hole, MA	Various species for maturity workshop	122 indiv.
Peter Clarke, Rutgers Univ., Tuckerton, NJ	Goosefish	26 indiv.
Bruce Collette, NMFS Nat'l Systematics Lab Washington, DC	Various species	13 indiv.
Michael Frisk, Chesapeake Biological Lab, Solomons, MD	Various skates	1161 indiv.
John Galbraith, NMFS, NEFSC, Woods Hole, MA	Misc. species	79 indiv.
Vincent Guida, NMFS, NEFSC, Highlands, NJ	Various species	10 indiv.
Devora Hart, NMFS, NEFSC, Woods Hole, MA	Spiny dogfish	1 indiv.
	<i>Astropecten sp.</i>	1 sample
Josef Idoine, NMFS, NEFSC, Woods Hole, MA	Shrimp	72 samples
Francis Juanes, Univ. of MASS. Amherst, MA	Atlantic cod	15 indiv.

Table 2. (continued)

Investigator & Affiliation	Samples Saved	Approximate Number
Charles Keith, NMFS, NEFSC, Woods Hole, MA	Hagfish	34 indiv.
Joseph Kunkel, Univ. of MASS, Amherst, MA	Lobster American shad	100 indiv. 6 indiv.
Sharon MacLean, NMFS, NEFSC, Narragansett Lab, Narragansett, RI	Silver hake	1 indiv.
Nancy McHugh, NMFS, NEFSC, Woods Hole, MA	Various species	321 indiv.
Paul Nitschke, NMFS, NEFSC, Woods Hole, MA	Cunner	31 indiv.
Loretta O'Brien, NMFS, NEFSC, Woods Hole, MA	Atlantic cod	311 indiv.
Rodney Rountree, Univ. of MASS, Amherst, MA	Fawn cusk-eel	6 indiv.
Katherine Sosebee, NMFS, NEFSC, Woods Hole, MA	Various skates Spiny dogfish Atl. torpedo ray	1001 indiv. 588 indiv. 1 indiv.
Sean Suk, Univ. of New Hampshire, Durham, NH	Various skates	104 indiv.
Michael Tork, NMFS, NEFSC, Woods Hole, MA	Various species	318 indiv.
Earl Weidner, MBL, Woods Hole, MA	Goosefish	1 indiv.
Susan Wigley, NMFS, NEFSC, Woods Hole, MA	Witch flounder	2 indiv.



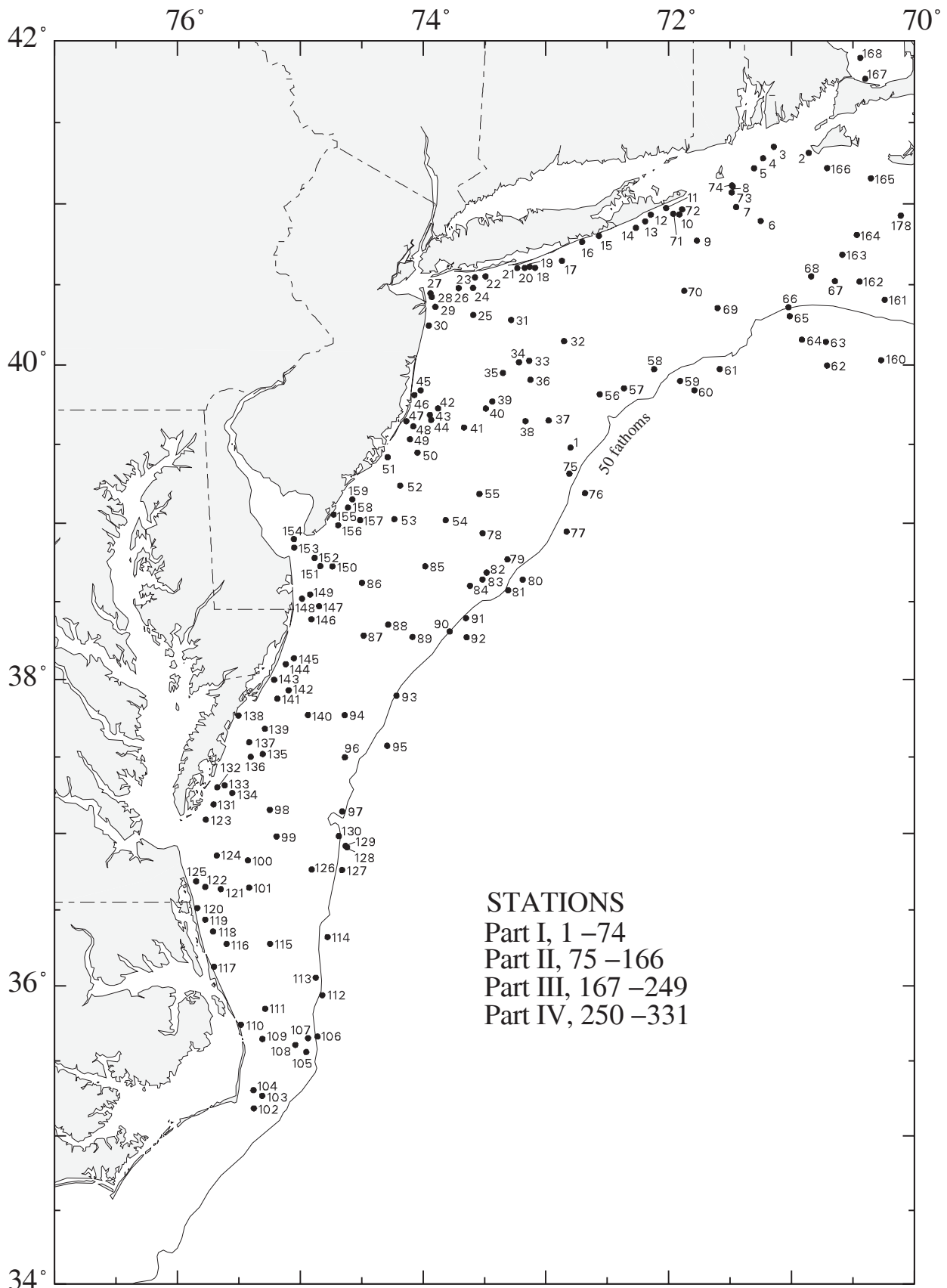


Figure 1. Trawl hauls made from R/V ALBATROSS IV (02 – 04), during National Marine Fisheries Service, Northeast Fisheries Science Center spring bottom trawl survey, March 5 – April 25, 2002.

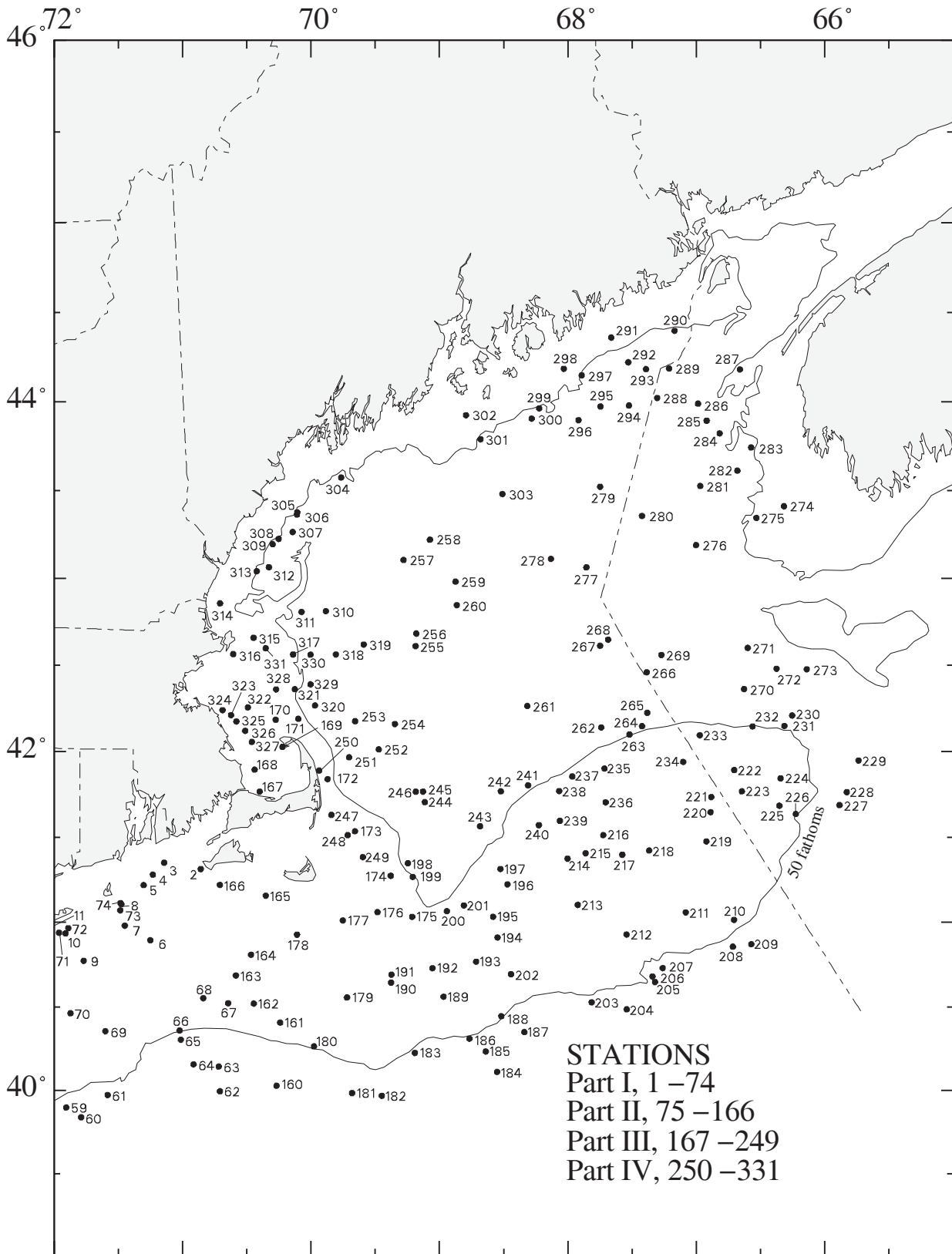


Figure 2. Trawl hauls made from R/V ALBATROSS IV (02 – 04), during National Marine Fisheries Service, Northeast Fisheries Science Center spring bottom trawl survey, March 5 – April 25, 2002.