

# CRUISE RESULTS

NOAA Ship ALBATROSS IV  
Cruise No. AL 06-08 (Parts I-IV)  
Autumn Bottom Trawl Survey

**Submitted to:** NOAA, NEFSC

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; INTERNET [Russell.Brown@noaa.gov](mailto:Russell.Brown@noaa.gov).

**Date:** 4 January 2007



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Northeast Fisheries Science Center  
166 Water Street  
Woods Hole, MA 02543-1026

4 January 2007

## CRUISE RESULTS

NOAA Ship ALBATROSS IV  
Cruise No. AL 06-08 (Parts I-IV)  
Autumn Bottom Trawl Survey

### CRUISE PERIOD AND AREA

The cruise period was from 5 September to 26 October 2006. The survey was conducted in four parts: Part I was from 5-22 September; Part II, 25 September – 5 October; Part III, 11-20 October; and Part IV, 23-26 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, relative abundance, and biodiversity 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; and (6) conduct a hydroacoustic survey between stations.

### METHODS

Operations and gear used during Parts I-IV conformed with the Cruise Instructions for the Autumn Bottom Trawl Survey dated 10 July 2006 and Addendum 1 dated 28 August; Addendum 2 dated 25 September; Addendum 3 dated 28 September; Addendum 4 dated 16 October. Exceptions to the Cruise Instructions are as follows: Part 2 arrived one day early due to a broken trawl wire, Part 3 left one day late due to wire measuring, and Part 4 arrived one day early upon completion of the survey.

A 30-minute tow was made at each survey station using a Northeast Fisheries Science Center (NEFSC) standard number 36 Yankee otter trawl rigged with 41 centimeter (cm) diameter rubber rollers, 9 meter (m) bridles. NEFSC standardized 450 kilogram (kg) polyvalent trawl doors rigged with chain backstraps were used. The trawl was fished at a scope of 4:1 in depths between 18 and 27 m; 3:1 in depths between 28 and 183 m; and 2.5:1 in depths of 184 m and greater. Towing

speed was maintained at approximately 3.8 knots using DGPS instrumentation. Direction of each tow was generally toward the next station. Throughout the cruise, a hydroacoustic survey was conducted during transit between bottom trawl stations using the Simrad EK-500 system.

After each tow, the catch was sorted by species and weighed using motion compensated digital scales. Representative length frequencies were collected for all species caught. All catch and biological data were recorded using shipboard automated data entry systems. The Fisheries Scientific Computing System (FSCS) was used to record all biological data. This system uses digital scales, electronic measuring boards, touch screen displays and barcode scanners to record data on deck and archives the data on the ship's computer network.

Sampled fish were assigned individual identification numbers, measured, weighed to the nearest 0.001 kilogram (kg) and further sampled for age and growth and feeding ecology studies. Bony fish were measured to the nearest cm to the end of the central caudal ray (fork length); biological samples were collected concurrently with measuring operations (Table 1). 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 (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, and 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 to estimate water volume filtered. The net was towed at 2.8-3.8 kilometers/hour (1.5-2.0 knots). A CTD was deployed at each plankton station.

## RESULTS

The survey sampled at 367 stations with 163, 108, 72, and 24 stations completed on parts I-IV, respectively.

Standard plankton tows were made at 114 stations. Bottom temperatures were collected at all stations using the CTD system. Bottom water samples for CTD calibration were taken at 59 stations.

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, edited, and loaded into the NEFSC trawl survey database.

### SCIENTIFIC PERSONNEL

#### National Marine Fisheries Service, NEFSC, Woods Hole, MA

John Galbraith, Chief Scientist <sup>1</sup>	David Chevrier <sup>1</sup>	Michael Palmer <sup>4</sup>
Linda Despres, Chief Scientist <sup>2</sup>	William Duffy <sup>4</sup>	Sarah Pregracke <sup>4</sup>
Stacy Rowe, Chief Scientist <sup>3</sup>	Charles Keith <sup>4</sup>	Nina Shepherd <sup>2</sup>
Peter Chase, Chief Scientist <sup>4</sup>	Nathan Keith <sup>3</sup>	Brian Smith <sup>3</sup>
Larry Brady <sup>1,3</sup>	Alicia Long <sup>1,2</sup>	Grace Thornton <sup>3,4</sup>
Robert Alexander <sup>4</sup>	Sean Lucey <sup>2</sup>	

#### National Marine Fisheries Service, NEFSC, Sandy Hook, NJ

Peter Plantamura<sup>4</sup>  
John Sibunka<sup>3</sup>

#### National Marine Fisheries Service, NEFSC, Narragansett, RI

Jerome Prezioso<sup>2</sup>

#### National Marine Fisheries Service, NEFSC, Milford, CT

Lisa Milke<sup>2</sup>

#### National Marine Fisheries Service, NERO, Gloucester, MA

Mark Grant<sup>2</sup>  
Michael R. Johnson<sup>2</sup>  
Douglas Potts<sup>2</sup>

#### National Marine Fisheries Service, NERO, FSO, Hamilton, VA

Steven Ellis<sup>1</sup>

#### National Marine Fisheries Service, NSL, Washington, DC

La'Shaun Willis<sup>1</sup>

#### South Carolina Division of Natural Resources, Charleston, SC

Erin Levesque<sup>1</sup>

#### University of Massachusetts, Amherst, MA

Joseph Kunkel<sup>3</sup>

#### University of Washington, Seattle, WA

Zachary Baldwin<sup>1</sup>  
Brian Langseth<sup>1</sup>

Contractors

Wesley Dukes<sup>1</sup>  
Lara Jarvis<sup>1,3,4</sup>  
Laurel Col<sup>3</sup>  
Jakub Kircun<sup>1,2,3</sup>  
Katey Marancik<sup>2</sup>  
Kris Ohleth<sup>2,3,4</sup>  
Kris Tholke<sup>2</sup>  
Tiffany Vidal<sup>1,2,3</sup>

ITS, Woods Hole, MA  
ITS, Woods Hole, MA  
ITS, Woods Hole, MA  
ITS, Woods Hole, MA  
ITS, Woods Hole, MA  
ITS, Woods Hole, MA  
ITS, Woods Hole, MA  
ITS, Woods Hole, MA

Volunteers

Chuck Blend<sup>4</sup>  
Walter Buble<sup>4</sup>  
Deborah Daniel<sup>4</sup>  
Laura Dingmon<sup>4</sup>  
Melissa Hamilton<sup>3</sup>  
Emma Hazard<sup>1</sup>  
Elizabeth Methratta<sup>3</sup>

Beverly, MA  
Durham, NH  
Laurel, MD  
Bingen, WA  
San Francisco, CA  
Surrey, England  
Philadelphia, PA

<sup>1</sup> 5 - 22 September

<sup>2</sup> 25 September - 5 October

<sup>3</sup> 11 - 20 October

<sup>4</sup> 23 - 26 October

---

For further information contact Russell Brown, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1097. Phone (508) 495-2380; FAX (508) 495-2380; [Russell.Brown@noaa.gov](mailto:Russell.Brown@noaa.gov). The Resource Survey Report for this survey and the cruise results can be viewed at: <http://www.nefsc.noaa.gov/esb/>.

Table 1. Field observations and samples collected for feeding ecology, and age and growth studies on NOAA Ship ALBATROSS IV, Autumn Bottom Trawl Survey, during 5 September to 26 October 2006.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian redfish	256	860
American plaice	249	703
American shad	19	-
Atlantic cod	170	477
Atlantic croaker	204	1315
Atlantic halibut	8	8
Atlantic herring	151	675
Atlantic mackerel	21	29
Atlantic menhaden	4	-
Barndoor skate	59	-
Black sea bass	49	165
Blackbelly rosefish	38	3
Blueback herring	9	-
Bluefish	197	538
Buckler dory	5	-
Butterfish	388	1078
Clearnose skate	48	-
Cunner	19	-
Cusk	7	7
Fawn cusk-eel	83	-
Fourbeard rockling	40	-
Fourspot flounder	162	260
Goosefish	78	113
Gulf Stream flounder	147	-
Haddock	339	871
Little skate	247	1
Longhorn sculpin	136	-
Northern kingfish	18	-
Northern searobin	91	-
Ocean pout	43	43
Offshore hake	19	19
Pollock	46	108
Red drum	-	3
Red hake	320	447
Rosette skate	8	-
Scup	219	590
Wreckfish	10	-
Sea raven	116	-
Silver hake	412	1341
Smooth dogfish	152	-
Smooth skate	38	1
Spiny dogfish	380	699
Spot	106	-
Spotted hake	237	244
Striped sea bass	23	23
Striped searobin	89	-

<b>Species</b>	<b>Feeding Ecology Observations</b>	<b>Age and Growth Samples</b>
Summer flounder	183	354
Tautog	6	-
Thorny skate	37	-
Weakfish	230	1393
White hake	157	343
Windowpane	283	417
Winter flounder	240	523
Winter skate	118	-
Witch flounder	139	170
Yellowtail flounder	216	573
TOTALS	7,069	14,394

Table 2. Miscellaneous scientific collections made on NOAA Ship ALBATROSS IV, Autumn Bottom Trawl Survey, during 5 September to 26 October 2006.

Investigator and Affiliation	Samples Saved	Approximate Number
Aquarium, NMFS, NEFSC, Woods Hole, MA	Loligo squid	75 bags
	Atlantic herring	8 bags
	Shrimp	6 bags
	Misc. live species	7 indiv.
Chuck Blend, Gordon College, Wenham, MA	Various species	44 indiv.
Karen Bolles, NMFS, NEFSC, Woods Hole, MA	Atlantic herring	127 indiv.
Jay Burnett, NMFS, Woods Hole, MA	Various species	68 indiv.
Rita Castilho, Univ. of Algarve, Portugal	Conger eel	11 indiv.
	Silver anchovy	1 indiv.
Peter Chase, NMFS, NEFSC, Woods Hole, MA	Various species	625 indiv.
Bruce Collette, NMFS, NSL, Washington, DC	Various species	581 indiv.
Jim Craddock, WHOI, Woods Hole, MA	Various species	30 indiv.
Sheila Eyler, U.S. Fish and Wildlife, Annapolis, MD	Atlantic sturgeon	6 tagged
John Galbraith, NMFS, NEFSC, Woods Hole, MA	Unidentified / various species	631 indiv.
Johnathan Hare, NMFS, EPD, Narragansett, RI	Summer flounder	5 indiv.
	Windowpane	9 indiv.
Lee Harris, FAO Canada, St. Andrews, New Brunswick	Cusk	2 indiv.
Karsten Hartel, MCZ, Harvard University, Boston MA	Various sea bass	2 indiv.
Josef Idoine, NMFS, NEFSC, Woods Hole, MA	Shrimp	69 bags
Charles Keith, NMFS, NEFSC, Woods Hole, MA	Atlantic hagfish	30 indiv.
Nancy Kohler, NMFS, NEFSC, Narragansett, RI	Sandbar shark	8 tagged
	Thresher shark	1 tagged
William Kramer, NMFS, NEFSC, Woods Hole, MA	Ocean pout	2 indiv.
Joseph Kunkel, UMASS, Amherst, MA	Various decapods	24 preserved
Kathy Lang, NMFS, NEFSC, Woods Hole, MA	Various species gonad	6 preserved
Erin Levesque, SCDNR, Charleston, SC	Atlantic croaker	26 indiv.
Jason Link/Brian Smith, NMFS, NEFSC, Woods Hole, MA	Various species	268 preserved
Sean Lucey, NMFS, NEFSC, Woods Hole, MA	Various fish ovaries	71 indiv.
Shawn McCafferty, Wheaton College, Norton, MA	Spiny dogfish	60 indiv.
	Northern searobin	1 indiv.
Nancy McHugh, NMFS, NEFSC, Woods Hole, MA	Various species	57 exam.
David Mountain, NMFS, NEFSC, Woods Hole, MA	various species	100 indiv.
Tom Munroe, NMFS, NEFSC, NSL, Washington, DC	Various flatfishes	138 indiv.
Martha Nizinski, NMFS, NSL, Washington, DC	Various crustaceans	207 indiv.
Loretta O'Brien, NMFS, NEFSC, Woods Hole, MA	Atlantic cod	201 exam.
Anne Richards, NMFS, NEFSC, Woods Hole, MA	Goosefish illicium	64 indiv.
Steven Searcy, UMASS, Dartmouth, MA	Blueback herring	1 indiv.
George Sedberry, SCDNR, Charleston, SC	Wreckfish	20 indiv.
Katherine Sosebee, NMFS, NEFSC, Woods Hole, MA	Various skate species examined	648 indiv.
	Vaiious rays species examined	355 exam.
	Female spiny dogfish	396 exam.
Fred Wenzel, NMFS, NEFSC, Woods Hole, MA	Various cephalopods	34 indiv.
Susan Wigley, NMFS, NEFSC, Woods Hole, MA	Witch flounder	2 indiv.
John Ziskowski, NMFS, NEFSC, Milford, CT	American plaice	449 indiv.



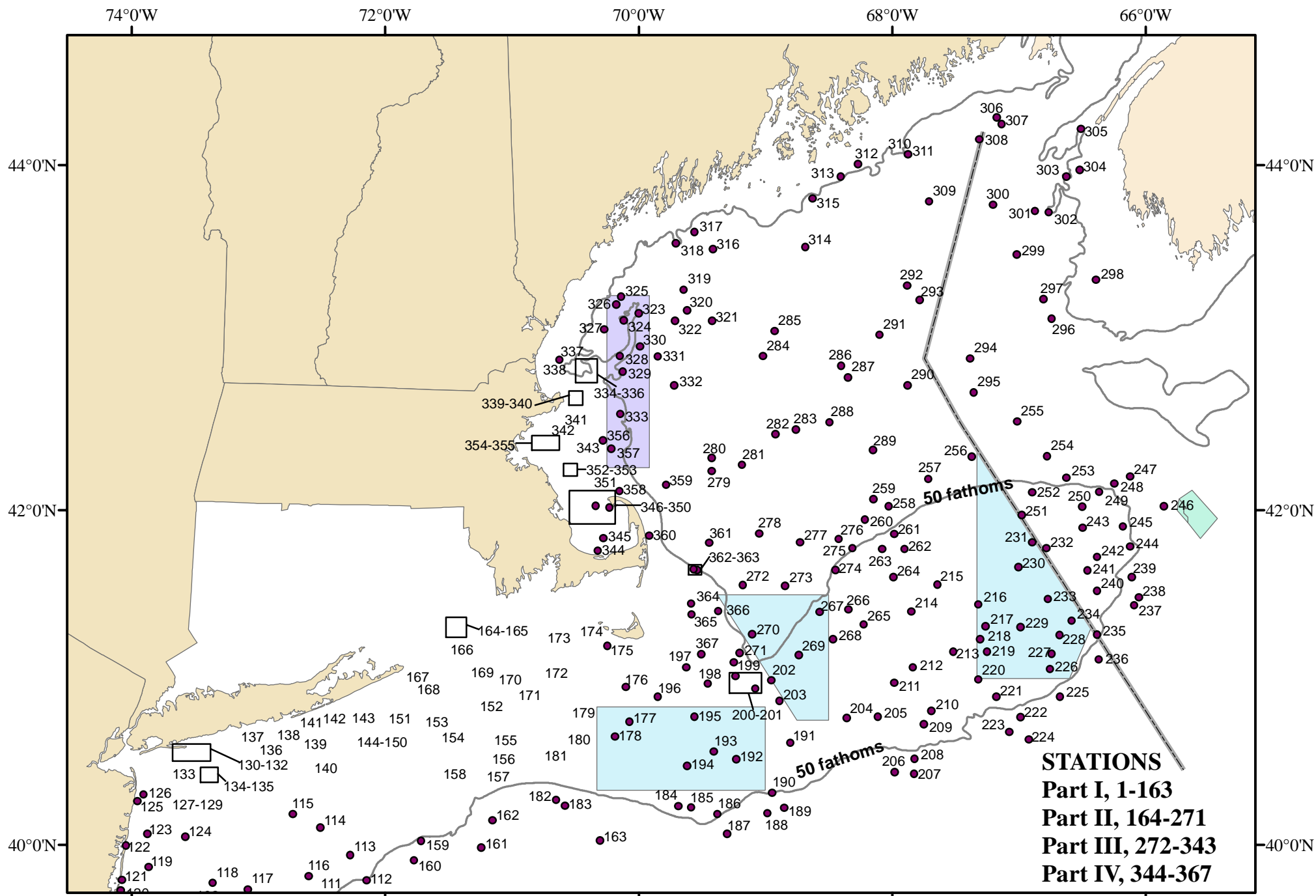


Figure 2. Trawl hauls made from NOAA Ship ALBATROSS IV (06 - 08), during NOAA Fisheries Service, Northeast Fisheries Science Center fall bottom trawl survey, September 5 - October 26, 2006.

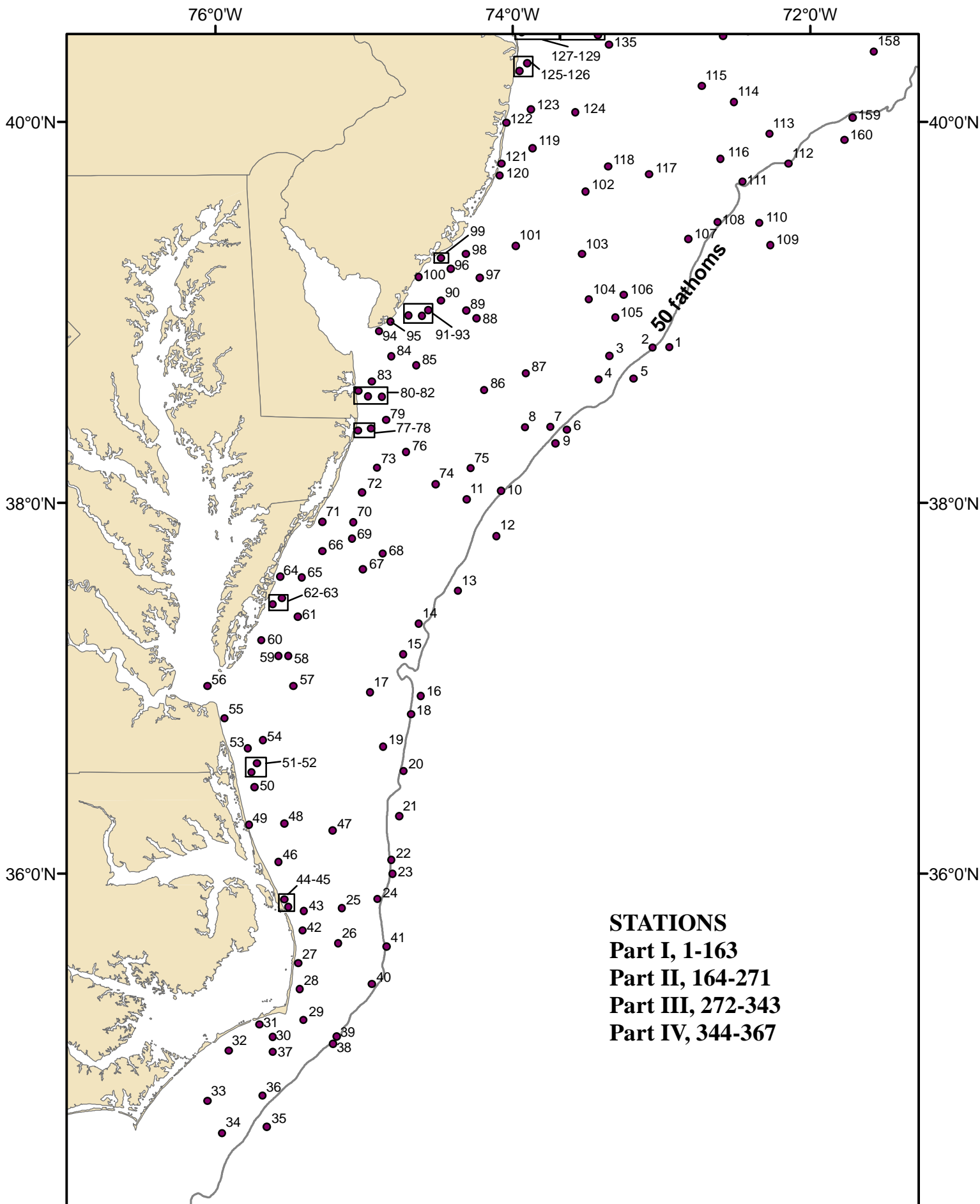


Figure 2. Trawl hauls made from NOAA Ship ALBATROSS IV (06 - 08), during NOAA Fisheries Service, Northeast Fisheries Science Center fall bottom trawl survey, September 5 - October 26, 2006.