31 March 2003

CRUISE RESULTS

NOAA FRV ALBATROSS IV
Cruise No. AL 02-10 (Parts I-IV)
Autumn Bottom Trawl Survey

CRUISE PERIOD AND AREA

The cruise period was from 3 September to 25 October. The survey was conducted in four parts: Part I, 3-14 September; Part II, 16-27 September; Part III, 30 September-11 October; and Part IV, 15-25 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; (6) conduct a vessel comparison with the FRV Delaware II during Part IV of the survey; (7) observe net performance using video equipment, and record trawl net performance using various electronic sensors to determine how uneven lengths of cable affect the performance of the standardized trawl.

METHODS

Operations and gear conformed with the Cruise Instructions for the autumn bottom trawl survey dated 15 August 2002 and ADDENDUM 1 dated 30 August; ADDENDUM 2 dated 16 September; ADDENDUM 2a dated 24 September; ADDENDUM 3 dated 26 September; and ADDENDUM 4 dated 15 October with the following exceptions:

- During Part II on 24 September,the Albatross IV returned

to Woods Hole to exchange several scientists for commercial fishing industry representatives. The vessel left 24 September and returned on 27 September.

- Part IV returned one day earlier than scheduled due to the completion of the survey.

A 30-minute tow was made at each survey station using a 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 3.8 knots, 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.

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 (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).

RESULTS

There were 334 stations occupied during the survey with 83, 80, 89, and 82 stations completed on parts I-IV, respectively. At six stations during Part II, the NEFSC's third wire video system which uses a CCD low-light video camera mounted on a pan-and-tilt unit was deployed and video footage was collected. At these stations, the standard scope ratio and speed was utilized and different warp offsets were set out, viewed and recorded. The duration of these tows varied. Plankton tows were made at 121 stations. Bottom temperatures were collected at all stations using the CTD system. Bottom water samples for CTD calibration were taken on 60 stations. Selected fish data was recorded on 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 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,[1] -Participant,[3]
Henry Milliken, Chief Scientist,[2]
Peter Chase, Chief Scientist,[3] -Participant,[1]
Linda Despres, Chief Scientist,[4]
Larry Brady,[1, 3]
Russell Brown,[2] (9/24-27)
John Burnett,[3]
James Hardage,[3]
Andrew Kitts,[2]
Paul Kostovick,[4]
Nancy McHugh,[1,2] (9/24-27)
Chris Pickett,[3, 4]
Stacy Rowe,[1, 4]
Nina Shepherd,[2, 3, 4]

Vaughn Silva,[3]
Personnel list (continued).

Scott Steinback,[2]
Michelle Thompson,[1]

National Marine Fisheries Service, NEFSC, Highlands, NJ
John Sibunka,[1]

National Marine Fisheries Service, NEFSC, Narragansett, RI
Jacquelyn Anderson,[1, 3]

National Marine Fisheries Service, NOAA, NESDIS,Silver Spring, MD
Michael Ford,[2] (9/16-24)

National Marine Fisheries Service, NWFSC, Seattle, WA
Vanessa Tuttle,[4]

NOAA, OMAO, Woods Hole, MA
Apryl Corey,[1]

South Carolina Division of Natural Resources, Charleston, SC
Erin Levesque,[1]

University of Massachusetts, Amherst, MA
Joseph Kunkel,[4]
Colin Little,[1]

Atlantic States Marine Fisheries Commission, Washington, DC
Heather Stirratt,[1]

School of Marine Science, Orono, ME
Kristin Kuhn,[2] (9/16-24)

Stony Brook University, Stony Brook, NY
Mary Hunsicker,[2] (9/16-24)
Michelle Staudinger,[2] (9/16-24)

University of Georgia, Athens, GA
Michael MacNeil,[3]

University of Pennsylvania, Philadelphia, PA
Claudia Jones,[3]

General Contractors

Robert Alexander,[4]	Greenhill, RI
Laurel Col,[2] (9/16-24)	Woods Hole, MA
Justus Conant,[3, 4]	Cotuit, MA

Ellen Johnson,[4]	Robbinston, ME
General contractors (continued).	
Christopher Kenaley,[4]	Cambridge, MA
Kris Ohleth,[1, 2]	Washington, DC
Kevin McIntosh,[2]	ETI, Woods Hole, MA
Anthony Morales,[3]	REMSA, Narragansett, RI
Brian Smith,[2, 4]	ETI, Woods Hole, MA
Fishermen (9/24-27)	
Anthony Fernandez,[2]	Portsmouth, NH/Kittery, ME
Stephen Lee,[2]	Berwick, ME
James Luvgren,[2]	Brick, NJ
Samuel Novello,[2]	Gloucester, MA
James Odlin,[2]	Bethel, ME
Matthew Stommel,[2]	Woods Hole, MA
Volunteers	
Carmine Destefano,[2] (9/16-24)	Pittsfield, MA
Christopher Foster,[3]	Chevy Chase, MD
Sean Lucey,[4]	Stewartsville, NJ
Stuart MacDonald,[2] (9/16-24)	Sharon, MA
Jacqueline Stent,[1]	Hampton Bays, NY
Robert Withee,[4]	Brookline, NH

[1] = Part I
[2] = Part II
[3] = Part III
[4] = Part IV

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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; INTERNET *Russell.Brown@noaa.gov*. A 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/survey.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 02-10, Autumn Bottom Trawl Survey, during 3 September-25 October 2002.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian redfish	191	559
American plaice	343	493
American shad	28	-
Atlantic cod	154	473
Atlantic croaker	-	430
Atlantic halibut	7	8
Atlantic herring	164	680
Atlantic mackerel	39	80
Atlantic sharpnose shark	1	-
Barndoor skate	11	-
Black sea bass	115	256
Blackbelly rosefish	34	2
Blueback herring	19	-
Bluefish	134	250
Butterfish	297	776
Cobia	3	-
Cunner	8	-
Cusk	11	12
Fawn cusk-eel	85	-
Fourspot flounder	233	255
Goosefish	156	216
Haddock	229	609
Hickory shad	2	-
Ling unclasified	1	13
Little skate	270	-
Longhorn sculpin	140	2
Ocean pout	35	29
Offshore hake	24	24
Pollock	109	199
Red hake	336	404
Rosette skate	19	-
Scup	226	607
Sea raven	108	-
Silver hake	484	1693
Smooth dogfish	166	-
Smooth skate	29	-
Spiny dogfish	405	-
Spot	50	-
Spotted hake	247	248

Striped bass	44	69

Table 1. (continued).

Species	Feeding Ecology Observations	Age and Growth Samples
Summer flounder	274	452
Tautog	10	1
Thorny skate	33	-
Weakfish	190	725
White hake	159	375
Windowpane	222	345
Winter flounder	438	640
Winter skate	170	-
Witch flounder	164	222
Yellowtail flounder	225	310
TOTALS	6,842	11,457

Table 2. Miscellaneous scientific collections made on FRV ALBATROSS IV, Cruise 02-10, Autumn Bottom Trawl Survey, during 3 September-25 October 2002.

Investigation & Affiliation	Samples Saved	Approximate Number
Aquarium, NMFS, NEFSC, Woods Hole, MA	*Loligo*	137 bags
	Live species	81 indiv.
William Bemis, UMASS Amherst, MA	Various species	271 indiv.
Jon Brodziak, NMFS, NEFSC, Woods Hole, MA	*Loligo*	288 indiv.
Peter Chase, NMFS, NEFSC, Woods Hole, MA	Misc. species	29 indiv.
	Maturity workshop	169 indiv.

Table 2, (continued).

Investigation & Affiliation	Samples Saved	Approximate Number
Bruce Collette, NMFS, Nat'l Systematics Lab, Washington, DC	Various species	37 indiv.
Brandon Eleby, South Carolina DNR, Charleston, SC	Scup	219 indiv.
Isaure Deburon, College of Charleston, SC	Atl. croaker	22 indiv.
John Galbraith, NMFS, NEFSC, Woods Hole, MA	Misc. species	827 indiv.
Dvora Hart, NMFS, NEFSC, Woods Hole, MA	*Astropecten* sp.	1+boxes
Mary Hunsicker, Stony Brook University, Stony Brook, NY	*Illex*	4 bags
Josef Idoine, NMFS, NEFSC, Woods Hole, MA	Shrimp	63 bags
Francis Juanes, UMASS, Amherst, MA	Offshore hake	17 vials
Charles Keith, NMFS, NEFSC, Woods Hole, MA	Hagfish	17 indiv.
Christopher Kenaley, MCZ Cambridge, MA	Goosefish	1 indiv
Kenneth Kessenich, Univ. School Milwaukee, Milwaukee, WI	Various species	34 indiv.
Nancy Kohler, NMFS, NEFSC, Narragansett, RI	Tagged sharks	25 indiv.
Irving Kornfield, Univ. of Maine, Orono, ME	Cod tissue	77 samples

Table 2. (continued).

Investigation & Affiliation	Samples Saved	Approximate Number
Joseph Kunkel, UMASS Amherst, MA	Amer. plaice, Atl. softpout, Amer. lobster	39 indiv.
Philip LeBlanc, Mass. Academy of Math & Science Worcester, MA	Various species	30 indiv.
Nancy McHugh, NMFS, NEFSC, Woods Hole, MA	Various species	994 indiv.
Paul Nitschke, NMFS, NEFSC, Woods Hole, MA	Cunner	48 indiv.
Loretta O'Brien, NMFS, NEFSC, Woods Hole, MA	Atlantic cod	651 samples
Pablo Presa, Univ. of Spain, Vigo, Spain	Offshore hake	5 vials
Rodney Rountree, UMASS, Amherst, MA	Fawn cusk-eel	16 indiv.
Cheryl Ryder, NMFS, NEFSC, Woods Hole, MA	Tagged turtles	2 indiv.
Katherine Sosebee, NMFS, NEFSC, Woods Hole, MA	Various rays Various skates	307 indiv. 1003 indiv.
Scott Steinback, NMFS, NEFSC, Woods Hole, MA	Misc. species Morse Pond School	1 box
Michael Tork, NMFS, NEFSC, Woods Hole, MA	Various species	432 indiv.
Susan Wigley, NMFS, NEFSC, Woods Hole, MA	Witch flounder	13 indiv.
John Ziskowski, NMFS, NEFSC, Milford, MA	American plaice Winter flounder	318 indiv. 2 indiv.

Figure 1. Station locations made from the FRV ALBATROSS IV, during National Marine Fisheries Service, Northeast Fisheries Science Center autumn bottom trawl survey, (02-10),3 September-25 October, 2002.
Map 1 of 2

Figure 2. Station locations made from the FRV ALBATROSS IV, during National Marine Fisheries Service, Northeast Fisheries Science Center autumn bottom trawl survey, (02-10),3 September-25 October, 2002.
Map 2 of 2