

CRUISE RESULTS

NOAA FSV Henry B. Bigelow

Cruise No. HB 08-02 (Parts I - IV) and HB 08-03 (Parts I, II)

Spring Bottom Trawl Survey and Calibration Study

Submitted to: NOAA, NEFSC

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Date: 20 January 2009



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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CRUISE PERIOD AND AREA

The HB 08-02 bottom trawl survey was conducted in 4 parts: Part I was from 9-14 March; Part II, 18-28 March; Part III, 1-11 April; and Part IV, 15-24 April. 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.

The HB 08-03 calibration study was conducted in two parts: Part I was from 14-16 May and Part II was from 28 May-8 June. The area of operation was on Georges Bank and southern New England. Station locations are shown in Figure 3.

OBJECTIVES

The objectives of the survey were to: (1) examine survey catchability difference between surveys conducted on the FSV *Henry B. Bigelow* and FRV *Albatross IV*; (2) determine the spring distribution and relative abundance of fish and invertebrate species found on the continental shelf; (3) collect acoustic data between stations; and (4) continue to test vessel and survey related equipment on the FSV *Henry B. Bigelow*.

METHODS

Operations and gear used during HB 08-02 Parts I-IV conformed with the Cruise Instructions for the Spring Bottom Trawl Survey dated 10 January 2008 and Addendum 1 dated 3 March; Addendum 2 dated 7 March; Addendum 3 dated 21 March; Addendum 4 dated 3 April; and Addendum 5 dated 25 April. Exceptions to the Cruise Instructions are as follows: HB 08-02 Part I left 5 days late due to weather and mechanical problems; HB08-02 Part II left one day late due to weather; and HB08-02 Part V was cancelled due to mechanical problems.

Operations and gear used during HB 08-03 Parts I & II conformed with the Cruise Instructions for the Spring Bottom Trawl Survey dated 10 January 2008 and Addendum 6 dated 13 May; and Addendum 7 dated 27 May.

A 20-minute survey trawl haul was made at each pre-selected station indicated on cruise charts. Additional stations during the actual operation of the cruise were added for gear testing and

alternative paired sites with NOAA FRV *Albatross IV*. The standard towing speed was 3.0 knots, speed over ground. The scope ratio used varied with depth and was determined by the new NEFSC Bottom Trawl Survey Protocol for the *Bigelow*. Sampling was conducted using a NEFSC standardized 4 seam, 3 Bridle survey trawl rigged with a rockhopper sweep. The trawl was fished using 2.2 m², 550kg, Poly Ice Oval trawl doors and 36.6 meter (20 fathom) bridles. In addition, net monitoring equipment was used to monitor trawl performance on all stations.

Direction of each tow matched that of the *Albatross IV*. Throughout the cruise, a hydroacoustic survey was conducted during transit between bottom trawl stations using the Simrad EK-60 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 studies. Bony fish were measured to the nearest centimeter (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. 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. Bottom salinity samples were obtained 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 369 stations with 29, 74, 68, 50, 23, 125 stations completed on HB 08-02 Parts I-IV and HB 08-03 Parts I & II, respectively.

Standard plankton tows were made at 68 stations. Bottom temperatures were collected at 170 stations using the CTD system. Bottom water samples for CTD calibration were taken at 54

stations.

A total of 3,370 age and growth samples were collected from 11 species (Table 1). A total of 1,046 samples were collected to support 15 internal and external investigations (Table 2).

DISPOSITION OF SAMPLES AND DATA

Age and growth 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

Wendy Gabriel, Chief Scientist ^{4,6}	Robert Johnston ³	Nancy Lee Peltier ^{1,4}
John Galbraith, Chief Scientist ⁵	Chad Keith ⁴	Richard Raynes ^{5,6}
Michael Jech, Chief Scientist ²	Nathan Keith ³	Stacy Rowe ¹
Phil Politis, Chief Scientist ^{1,3}	Nancy Logan ³	Maureen Taylor ¹
Robert Alexander ^{2,3}	Alicia Long ²	
Elizabeth Broughton ⁴	Sean Lucey ²	
Jonathan Duquette ^{5,6}	Kevin McIntosh ⁵	
Andrew Hall ⁵	William Overholtz ²	

National Marine Fisheries Service, NEFSC, Narragansett, RI

Christopher Orphanides⁵
Jerome Prezioso²
David Richardson³

National Marine Fisheries Service, NEFSC, Sandy Hook, NJ

John Rosendale^{2,4}

University of Massachusetts, Amherst, MA

Joseph Kunkel³

Contractors

Michael Ball ⁶	ITS, Woods Hole, MA
Jessica Blaylock ^{2,5}	ITS, Woods Hole, MA
Peter Canavin ⁶	ITS, Woods Hole, MA
Meredith Cavanagh ⁶	ITS, Woods Hole, MA
Ian Conboy ⁶	ITS, Woods Hole, MA
Heath Cook ^{1,4,6}	ITS, Woods Hole, MA
Joshua Cutler ¹	ITS, Woods Hole, MA
Charles Dunlap ⁶	ITS, Woods Hole, MA
Jakub Kircun ^{1,4,5,6}	ITS, Woods Hole, MA
Sarah Pierce ¹	ITS, Woods Hole, MA

Nichole Rossi⁶
Ray Shield²
John Sibunka^{2,3}
Francine Stroman¹
Melanie Underwood^{3,4,5}

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Volunteers

George Hoskin⁵
Rachel Lenrow⁶
Theresa Morton²
Michael Prezioso⁴
William Smith⁵
Laurence Reeves²
Glynn Rountree⁵
Timothy White^{3,4}

Burtonsville, MD
Ithica, NY
Warren, RI
Narragansett, RI
Charlestown, MA
Thetford Center, VT
Arlington, VA
Staten Island, NY

- ¹ 9-14 March (HB 08-02, Part I)
² 18-28 March (HB 08-02, Part II)
³ 1-11 April (HB 08-02, Part III)
⁴ 15-24 April (HB 08-02, Part IV)
⁵ 14-16 May (HB 08-03, Part I)
⁶ 28 May-8 June (HB 08-03, Part II)

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. 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 age and growth studies on NOAA FSV *Henry B. Bigelow*, Spring Bottom Trawl Survey and Calibration Study, during 9 March to 8 June 2008.

Species	Age and Growth Samples
Acadian redfish	299
American plaice	313
Atlantic cod	344
Atlantic halibut	9
Butterfish	351
Greenland halibut	1
Haddock	497
Summer flounder	401
Winter flounder	332
Witch flounder	277
Yellowtail flounder	546
TOTALS	3,370

Table 2. Miscellaneous scientific collections made on NOAA FSV *Henry B. Bigelow*, Spring Bottom Trawl Survey and Calibration Study, during 9 March to 8 June 2008.

Investigator and Affiliation	Species Sampled	Approximate Number
Michael Ball, NMFS, NEFSC, Woods Hole, MA	Atlantic cod	10 indiv.
	Goosefish	1 indiv.
Kerin Cleason, U. of Texas, Austin, TX	Various elasmobranchs	27 indiv.
Bruce Collette, NMFS, NSL, Washington, DC	Cusk	2 indiv.
John Galbraith, NMFS, NEFSC, Woods Hole, MA	Unidentified/various species	654 indiv.
Heather Haas, NMFS, NEFSC, Woods Hole, MA	Sea turtles	4 exam.
Joe Idoine, NMFS, NEFSC, Woods Hole, MA	Shrimp	11 indiv.
Francis Juanes, U. of Massachusetts, Amherst, MA	Offshore hake	14 preserved
	Silver hake	50 preserved
Michael Mangold, US Fish & Wildlife, Annapolis, MD	Atlantic sturgeon	1 exam.
Richard McBride, NMFS, NEFSC, Woods Hole, MA	Atlantic halibut	2 exam.
	Winter flounder	1 indiv.
Nancy McHugh, NMFS, NEFSC, Woods Hole, MA	Various species	11 exam.
Tom Munroe, NMFS, NSL, Washington, DC	Various flounder	112 indiv.
Kathy Sosebee, NMFS, NEFSC, Woods Hole, MA	Various skate species	4 exam.
	Various ray species	52 exam.
Michelle Staudinger, U. of Massachusetts, Amherst, MA	Various cephalopods	15 indiv.
	Spotted hake	34 indiv.
	Atlantic mackerel	30 indiv.
David Stormer, U. of Massachusetts, Amherst, MA	Bluefish	4 indiv.
Workshop, NMFS, NEFSC, Woods Hole, MA	Various species	7 indiv.

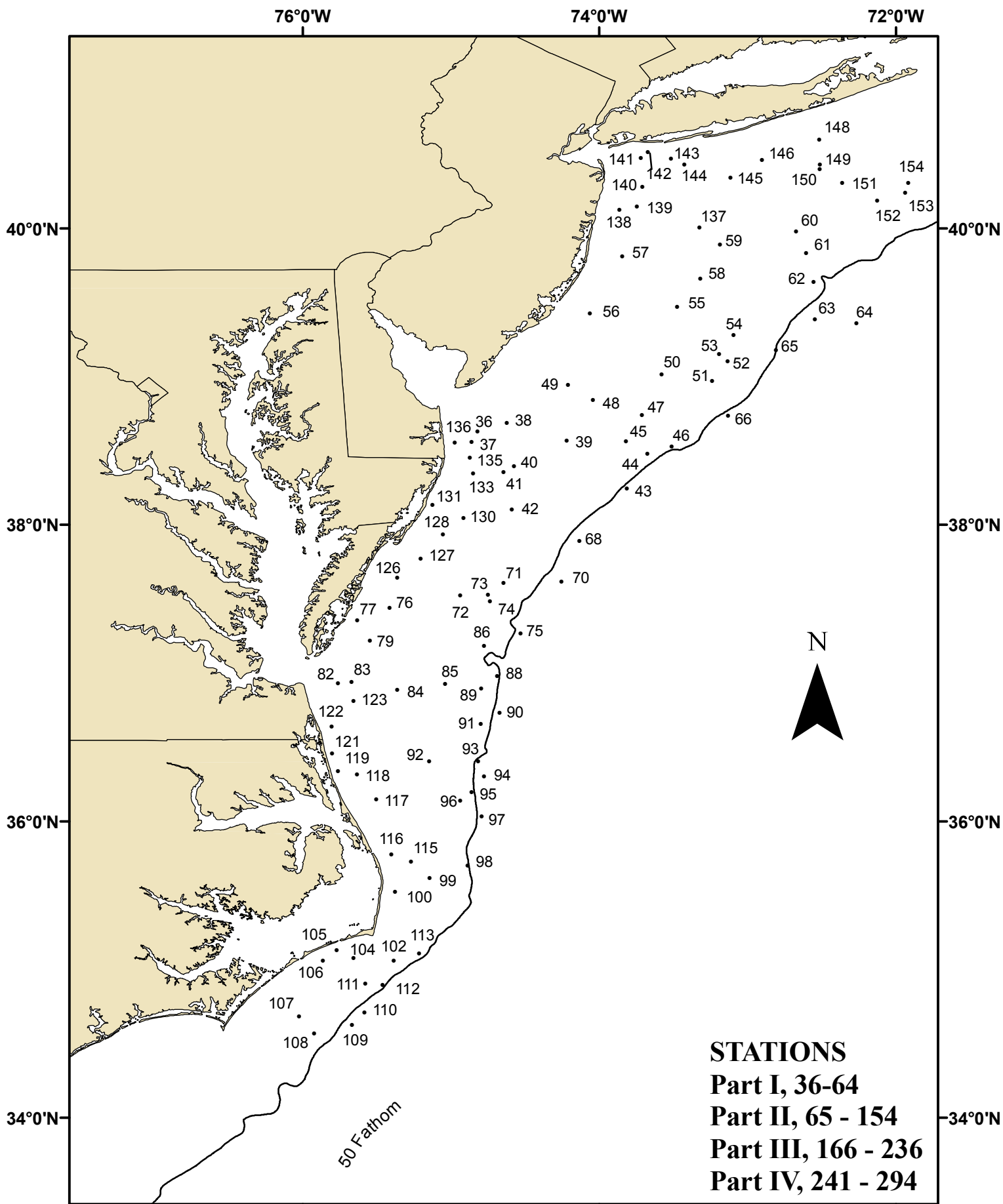


Figure 1. Trawl hauls made from NOAA FRV *Henry B. Bigelow* (08-02), during NOAA Fisheries Service, Northeast Fisheries Science Center spring bottom trawl survey, 9 March - 24 April 2008.

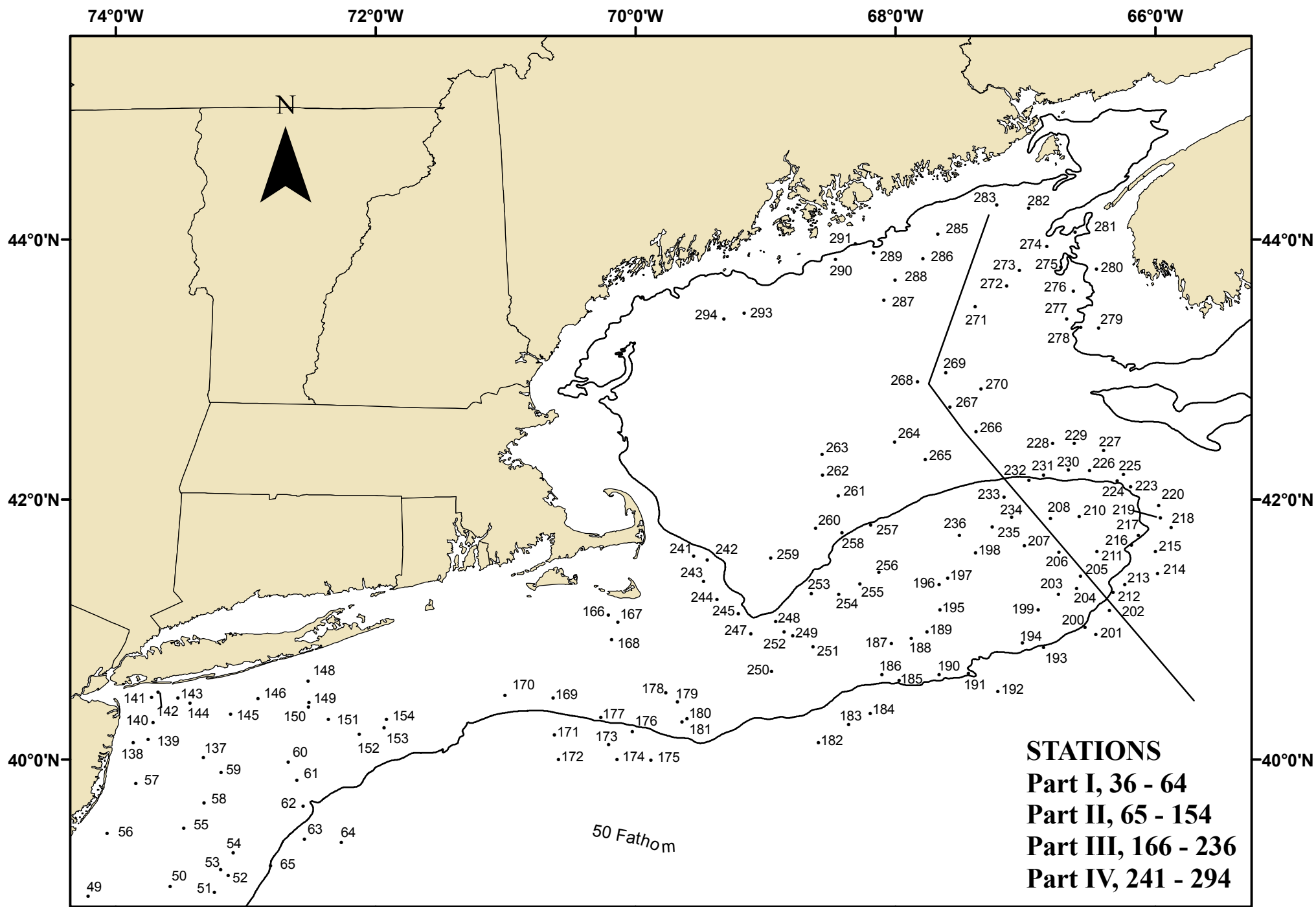


Figure 2. Trawl hauls made from NOAA FSV *Henry B. Bigelow* (08-02), during NOAA Fisheries Service, Northeast Fisheries Science Center spring bottom trawl survey, 9 March - 24 April 2008.

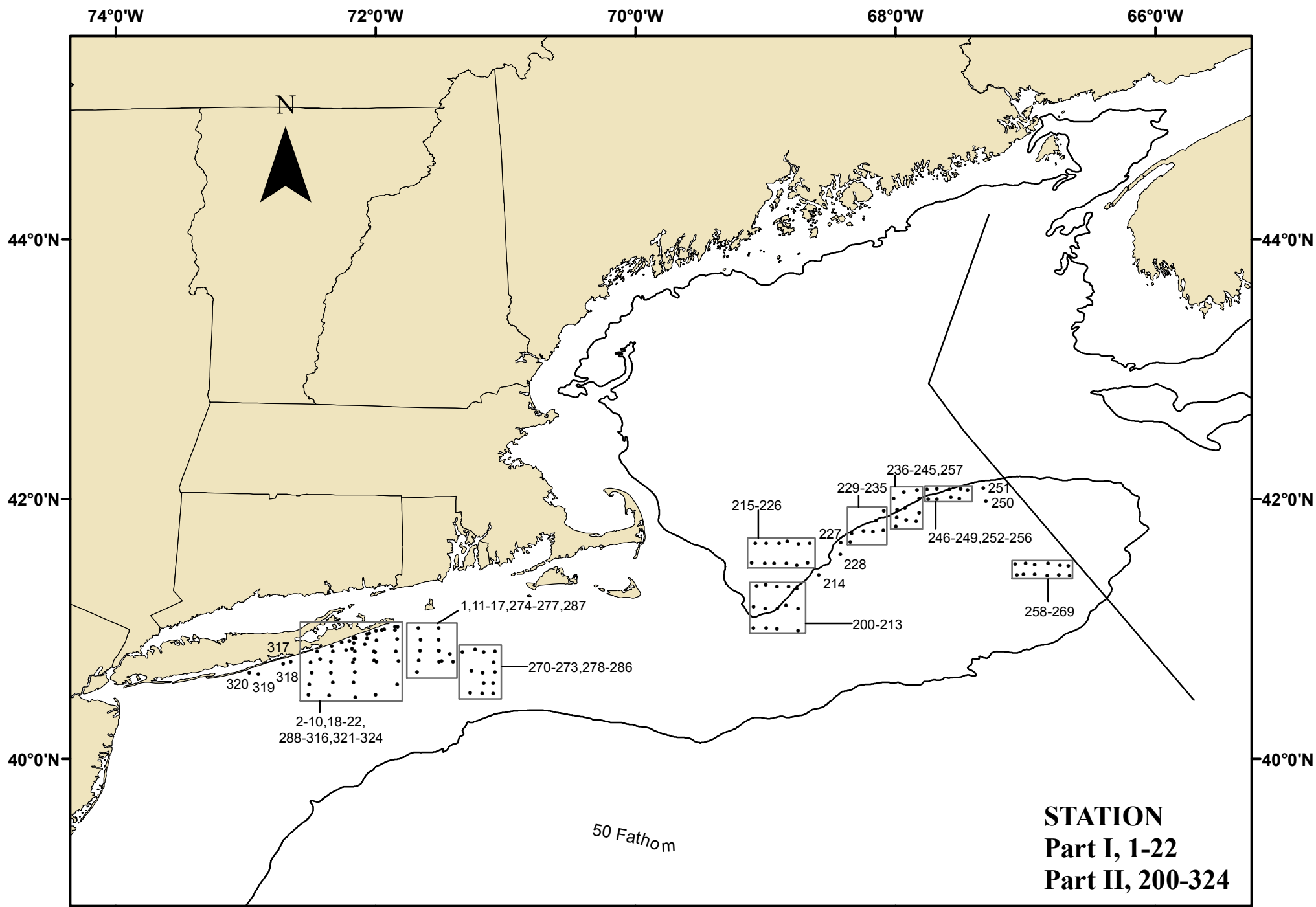


Figure 3. Trawl hauls made from NOAA FSV *Henry B. Bigelow* (08-03), during NOAA Fisheries Service, Northeast Fisheries Science Center calibration study, 14 May - 8 June 2008.