CRUISE RESULTS

NOAA Ship Henry B. Bigelow (R-225)
Cruise No. HB 12-06 (Parts I -IV) Fall
Bottom Trawl Survey

Submitted to: NOAA, NEFSC

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

The HB 12-06 Bottom Trawl Survey was conducted in four parts from 6 September to 11 November 2012: part I was from 6 – 20 September; part II, 24 September – 5 October; part III, 10 – 26 October; and part IV, 1-11 November. The area of operation was the continental shelf from Cape Lookout, NC, to the Nova Scotia Shelf, including Georges Bank and the Gulf of Maine. Station locations are shown in Figures 1 and 2.

OBJECTIVES

The objectives of the cruise 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) opportunistically test trawl gear, methods, or survey-related equipment that may benefit the trawl survey in the future; (4) collect oceanographic data, including CTD casts as well as samples of ichthyoplankton and zooplankton for relative abundance and distribution studies; (5) collect hydroacoustics data between stations.

METHODS

Operations and gear used during HB 12-06 parts I - IV conformed with the Cruise Instructions for the Fall Bottom Trawl Survey dated 14 August 2012, Addendum I dated 22 August 2012, Addendum II dated 14 September 2012, Addendum III dated 27 September 2012, and Addendum IV dated 11 October 2012. Exceptions to the Cruise Instructions were that part I and part IV were both delayed one day due to poor weather conditions; part IV also arrived two days ahead of schedule, due to successful completion of the survey.

All Survey tows were completed using the standard NEFSC bottom trawl survey protocol for the NOAA ship *Henry B. Bigelow*. A 20-minute survey trawl haul was made at each pre-selected station. The standard towing speed was 3.0 knots, speed over ground. The scope ratio used varied with depth and was determined by the NEFSC standard scope ratio table. 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 meter^2, 550 kilogram (kg), Poly Ice Oval trawl doors and 36.6 meter (20 fathom) bridles. Net-monitoring equipment was used to observe trawl performance on all stations.

Throughout the cruise, a hydroacoustic survey was conducted during transit between bottom trawl stations using the Simrad EK-60 system, as well as the ME-70 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 the newest version of the shipboard automated data entry system, Fisheries Scientific Computing System (FSCS). This system implements basket tracking techniques and uses digital scales, electronic measuring boards, touch screen displays, and barcode scanners to record data on deck; FSCS also archives the data on the ship's computer network.

Sampled fish were assigned individual identification numbers, measured, weighed to the nearest 0.001 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 also recorded.

Surface temperatures were measured using the hull-mounted temperature sensor at a depth of three meters. Temperature and conductivity profiles were made at each survey trawl station 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. 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), and a CTD was deployed at each plankton station.

RESULTS

The HB 12-06 survey sampled at 387 stations with 118, 98, 119, and 52 stations completed on parts I - IV, respectively.

Standard plankton tows were made at 107 stations. Bottom temperatures were collected at 376 stations using the CTD system. Bottom water samples for CTD calibration were taken at 81 stations.

A total of 7,323 feeding ecology and 15,179 age and growth samples were collected from 56 species (Table 1). A total of 10,313 samples were collected to support 20 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, MA 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[4], Chief Scientist[1]
Nathan Keith, Chief Scientist[2]
Robert Alexander[3]
TK Arbusto[2,4]
Larry Brady[1,3]
David Chevrier[1,2,4]
Laurel Col[2]
Kiersten Curti[3]
Joshua Dayton[1]
William Duffy[2,4]
Jonathan Duquette[3]
Chris Legualt[3]
Paul Kostovick[4]
Victor Nordahl[4]
Nancy Peltier[3]
Stacy Rowe[3]
Brian Smith[4]
Sandy Sutherland[3]
Grace Thornton[2]
Anthony Wood[2]

National Marine Fisheries, NEFSC, NSL, Washington, D.C.

Ruth Gibbons[4]

State University of New York, ESF, Syracuse, NY

Darcy Belcarce[1]

Stony Brook University, Stony Brook, NY

Caitlin Craig[1]

Teacher At Sea

Katlin Baird[1]	Cedar Grove, NJ

Volunteers

Robert Eckstein[2]	Rumson, NJ
Francis Harkins[2]	Medford, MA
Rachel Madenjian[3]	Marshfield, MA
Pamela Marsh[1]	Statesboro, GA
Emma Fowler[3]	Harwinton, CT
Neven Popovic[2]	Edgewater, MD
Onjale Scott[4]	Los Angeles, CA

Contractors

Heath Cook[2,3], Chief Scientist[4]	ITS, Woods Hole, MA
Geoff Shook[1,4], Chief Scientist[3]	ITS, Woods Hole, MA
Glenn Chamberlain[2]	ITS, Woods Hole, MA
Nicole Charriere[1,3,4]	ITS, Woods Hole, MA
Sarah Cierpich[2]	ITS, Woods Hole, MA
Robin Frede[1]	ITS, Woods Hole, MA
William Greer[4]	ITS, Woods Hole, MA
Jakub Kircun[1,3,4]	ITS, Woods Hole, MA
Christine LaFleur[1]	ITS, Woods Hole, MA
Elizabeth Ouellette[2]	ITS, Woods Hole, MA
Adam Poquette[2,3,4]	ITS, Woods Hole, MA
Megan Reynolds[1]	ITS, Woods Hole, MA
Amanda Tong[1]	ITS, Woods Hole, MA

[1] 6 – 20 September
[2] 24 September – 5 October
[3] 10 - 26 October
[4] 1-11 November

For further information contact Robert Johnston, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1097. Phone (508) 495-2061; FAX (508) 495-2115; Robert.Johnston@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 Ship *Henry B. Bigelow*, Fall Bottom Trawl Survey, during 6 September - 11 November 2012.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian Redfish	209	1206
American Plaice	282	787
American Shad	53	--
Atlantic Cod	101	395
Atlantic Croaker	61	325
Atlantic Halibut	26	28
Atlantic Herring	237	890
Atlantic Mackerel	55	128
Atlantic Menhaden	2	--
Atlantic Wolffish	1	3
Barndoor Skate	210	--
Black Sea Bass	112	479
Blackbelly Rosefish	73	--
Blueback Herring	41	--
Bluefish	74	190
Buckler Dory	56	--
Butterfish	166	854
Clearnose Skate	114	--
Cunner	23	--
Cusk	2	5
Fawn cusk-eel	76	--
Fourbeard rockling	103	--
Fourspot Flounder	312	374
Goosefish	276	615
Gulf stream flounder	172	--
Haddock	248	830
Little Skate	415	--
Longhorn Sculpin	123	--
Northern Kingfish	18	--
Northern Searobin	137	--
Ocean Pout	80	125
Offshore Hake	46	153
Pollock	66	214
Red Hake	221	801
Rosette Skate	84	--
Scup	104	454
Sea Raven	58	--
Silver Hake	564	1376
Smooth Dogfish	60	--
Smooth Skate	210	--
Spiny Dogfish	332	--
Spot	53	--
Spotted Hake	264	329

Table 1 (continued): Field observations and samples collected for age and growth studies on NOAA Ship *Henry B. Bigelow*, Fall Bottom Trawl Survey, during 6 September - 11 November 2012.

Species	Feeding Ecology Observations	Age and Growth Samples
Striped Bass	--	3
Striped Searobin	55	--
Summer Flounder	154	563
Thorny Skate	56	--
Tilefish	2	3
Tautog	3	--
Weakfish	37	193
White Hake	162	819
Windowpane	191	673
Winter Flounder	241	1100
Winter Skate	150	--
Witch Flounder	195	500
Yellowtail Flounder	157	764
TOTALS	7,323	15,179

Table 2: Miscellaneous scientific collections made on NOAA Ship *Henry B. Bigelow*, Fall Bottom Trawl Survey, during 6 September - 11 November 2012.

Investigator and Affiliation	**Samples Saved**	**Approximate Number**
Barnhill, William NMFS, NERO, Gloucester, MA	loggerhead seaturtle	3 examined
Bemis, Katherine Cornell Museum of Vertebrates, Ithaca, NY	various dragonets	11 indiv.
Burton, Michael NMFS, SEFSC, Beaufort, NC	black sea bass	151 indiv.
Chase, Peter NMFS, NEFSC, Woods Hole, MA	unidentified invertebrates	772 indiv.
Di Santo, Valentina Boston University, Boston, MA	various skates	31 fin clips
Eyler, Sheila US Fish and Wildlife Service, Annapolis, MD	Atlantic sturgeon	2 examined
Galbraith, John NMFS, NEFSC, Woods Hole, MA	unidentified/various fish	5,619 indiv.
Lucey, Seam NMFS, NEFSC, Woods Hole, MA	Atlantic cod	2 indiv.
McBride, Richard, et al. NMFS, NEFSC, Woods Hole, MA	summer flounder (female) white hake (female) yellowtail flounder (female)	78 preserved 132 preserved 72 preserved
Munroe, Thomas NMFS, National Systematics Laboratory, Washington D.C.	various flatfish	403 indiv.
Nitschke, Paul, et al. NMFS, NEFSC, Woods Hole, MA	Atlantic wolffish	1 preserved
Niziniski, Martha NMFS, National Systematics Laboratory, Washington D.C.	galatheid crab	29 bags
O'Brien, Loretta NMFS, NEFSC, Woods Hole, MA	Atlantic cod	112 indiv.
Palkovacs, Eric Duke University, Durham, NC	alewife blueback herring	157 indiv. 558 indiv.
Parsons, Kristene VIMS, Gloucester Point, VA	spiny butterfly ray smooth butterfly ray	19 indiv. 1 indiv.
Richards, Anne NMFS, NEFSC, Woods Hole, MA	northern shrimp	108 bags
Richardson, David NMFS, NEFSC, Narragansett, RI	thorny skate	67 fin clips
Rowe, Stacy, et al. NMFS, NEFSC, Woods Hole, MA	various species	454 preserved
Sosebee, Kathy NMFS, NEFSC, Woods Hole, MA	spiny dogfish (female) rays various skates	99 examined 278 examined 1077 examined
Wuenschel, Mark, et al. NMFS, NEFSC, Woods Hole, MA	black sea bass Atlantic cod (female)	17 preserved 60 preserved

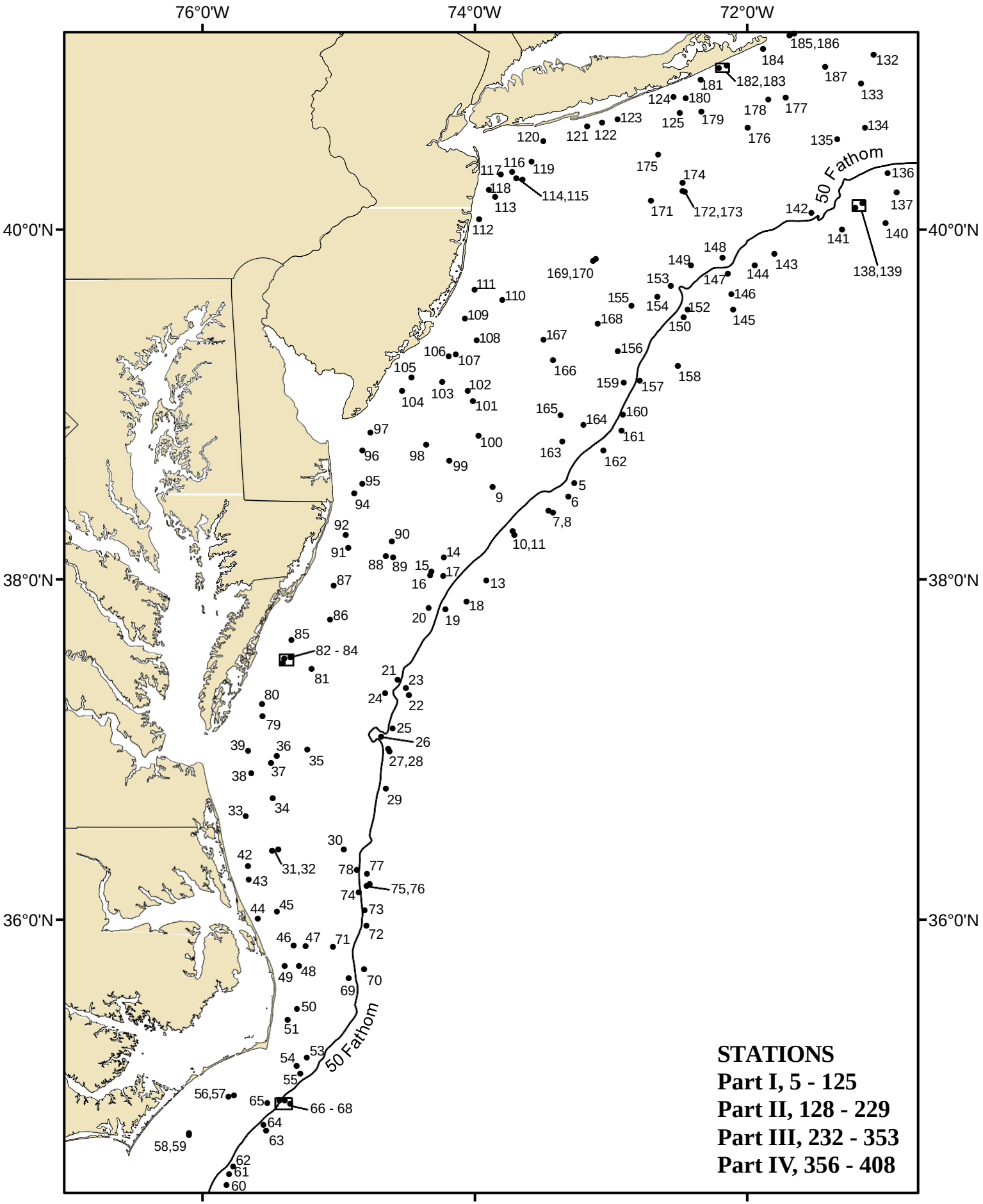

Figure 1. Trawl hauls made from NOAA Ship Henry B. Bigelow (12 - 06), during NOAA Fisheries Service, Northeast Fisheries Science Center Autumn Bottom Trawl Survey, September 6 - November 11, 2012.

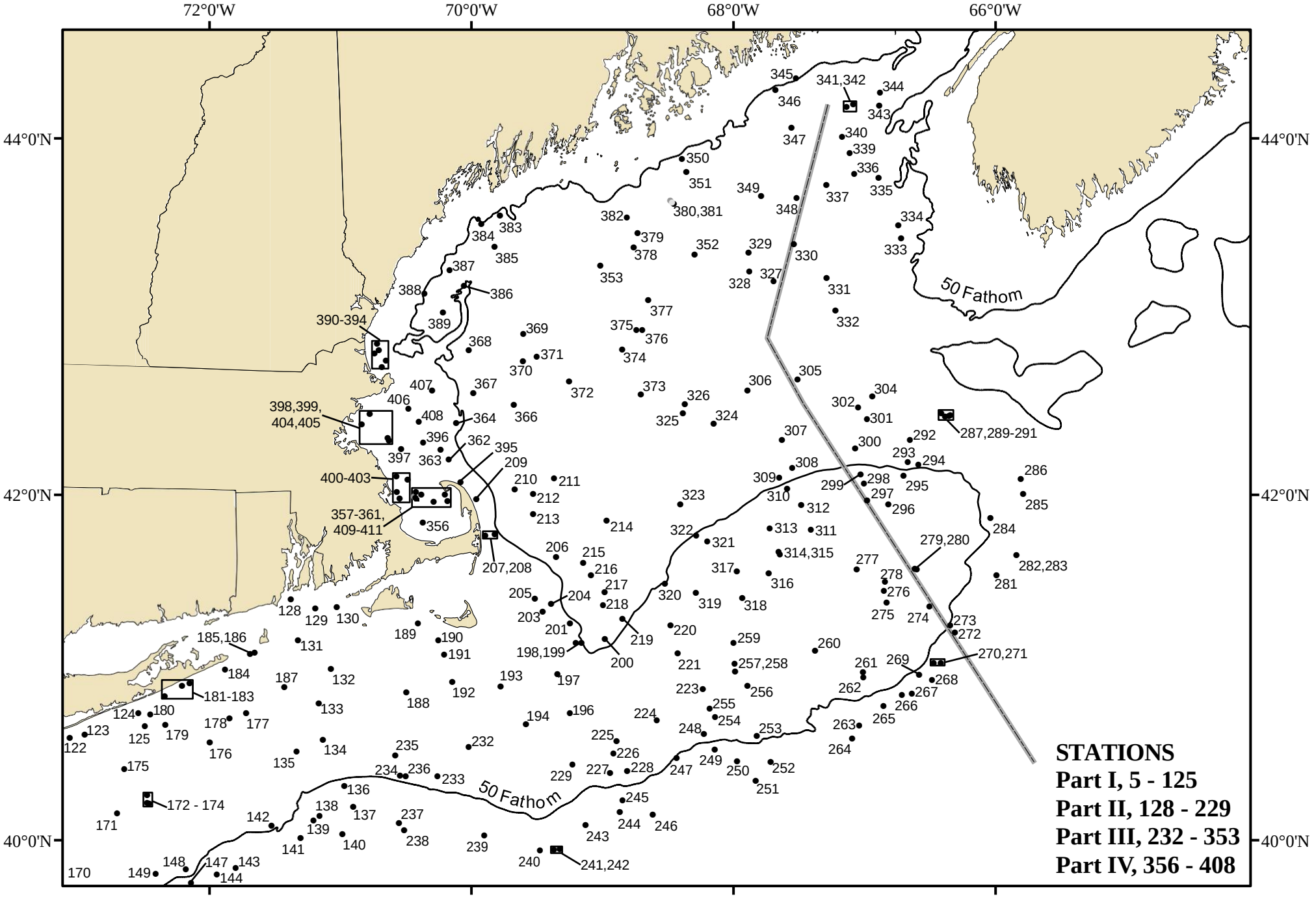

Figure 2. Trawl hauls made from NOAA Ship Henry B. Bigelow (12 - 06), during NOAA Fisheries Service, Northeast Fisheries Science Center Autumn Bottom Trawl Survey, September 6 - November 11, 2012.