CRUISE RESULTS

NOAA FSV Henry B. Bigelow
Cruise No. HB 09-05 (Parts I - V)
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.

Date: April 14, 2010

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

April 14, 2010

CRUISE RESULTS

NOAA FSV *Henry B. Bigelow*
Cruise No. HB 09-05 (Parts I - V)
Autumn Bottom Trawl Survey

CRUISE PERIOD AND AREA

The HB 09-05 bottom trawl survey was conducted in 5 parts: part I was from 12 – 24 September; part II, 28 September – 7 October; part III, 19 – 23 October; part IV, 27 October – 6 November; and part V, 9 – 19 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, 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 HB 09-05 parts I-V conformed with the Cruise Instructions for the Autumn Bottom Trawl Survey dated 18 August 2009, Addendum I dated 31 August, Addendum II dated 23 September, Addendum III dated 30 September, Addendum IV dated 16 October, and Addendum V dated 5 November. Exceptions to the Cruise Instructions were: part I departed three days late due to bad weather; part II arrived one day early due to weather; and part V was extended two extra days to complete the survey.

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 new NEFSC Bottom Trawl Survey Protocol for NOAA FSV *Henry B Bigelow*. Sampling was conducted using a NEFSC standardized 400 x 12, 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.

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 shipboard automated data entry system, Fisheries Scientific Computing System (FSCS). 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 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. 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 HB 09-05 survey sampled at 381 stations with 111, 92, 30, 74, and 74 stations completed on parts I-V, respectively.

Standard plankton tows were made at 99 stations. Bottom temperatures were collected at 375 stations using the CTD system. Bottom water samples for CTD calibration were taken at 77 stations.

A total of 9,711 feeding ecology and 15,121 age and growth samples were collected from 56 species (Table 1). A total of 9,235 samples were collected to support 30 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, Chief Scientist[1, 5]	Elisabeth Broughton[4]	Lauren Marcinkiewicz[2]
Kevin McIntosh[5], Chief Scientist[3]	Peter Chase[4]	Victor Nordahl[2, 5(9 – 11 Nov.)]
Philip Politis[2], Chief Scientist[4]	David Chevrier[1, 4, 5]	Mike Palmer[4]
Stacy Rowe[5], Chief Scientist[2]	Linda Despres[5]	Nancy Peltier[4]
Robert Alexander[3, 5]	William Duffy[3]	Kris Tholke[2]
Takashi Arbusto[4]	Sarah Emery[2]	Grace Thornton[2]
Larry Brady[1, 3, 5]	Sean Lucey[2]	Tiffany Vidal[2]
Ayeisha Brinson[2]	Shad Mahlum[2, 3, 4]	Mark Wuenschel[3]

Knauss Sea Grant Fellowship, NOAA Headquarters, Silver Spring, MD
Brycen Swart[1]
Ben Laws[2]

National Marine Fisheries Service, NEFSC, Milford, CT
April Croxton[1]

National Marine Fisheries Service, NERO, Gloucester, MA
Jason Berthiaume[5]
Aja Peters-Mason[4]

National Marine Fisheries Service, NEFSC, Sandy Hook, NJ
Ehren Habeck[1]

National Marine Fisheries Service, NSL, Washington, DC
Ruth Gibbons[1]
Jennifer Hauck[4]

Volunteers

Beth Brocato[1]	ARMADA teacher, Narragansett, RI
Patrick Connors[1]	Ridgefield, CT
Laura Dingmon[3]	Hood River, OR
Grant Emde[4]	Cohasset, MA
Joe Gattozi[4]	Bridgton, ME
Thomas Harvey[3]	Falmouth, MA
James Patterson[3]	New Bedford, MA
Keiichi Uchida[1, 3]	Tokyo, Japan

Lauren Watka[2]	Sagamore Beach, MA

Contractors

Frank Capitanio[1]	ITS, Woods Hole, MA
Sarah Cierpich[3]	ITS, Woods Hole, MA
Ian Conboy[3]	ITS, Woods Hole, MA
Heath Cook[1, 4, 5]	ITS, Woods Hole, MA
Joshua Cutler[2, 3, 5]	ITS, Woods Hole, MA
Corrin Flora[2]	ITS, Woods Hole, MA
Jakub Kircun[1, 3, 5]	ITS, Woods Hole, MA
John McConnaughey[5]	ITS, Woods Hole, MA
Stephanie Palker[1]	ITS, Woods Hole, MA
Geoff Shook[1, 4, 5]	ITS, Woods Hole, MA
Chris Tholke[3]	ITS, Woods Hole, MA
Brian Westell[5]	ITS, Woods Hole, MA

[1] 12 – 24 September
[2] 28 September – 7 October
[3] 19 – 23 October
[4] 27 October – 6 November
[5] 9 – 19 November

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) 495-2115; 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*, Autumn Bottom Trawl Survey, during 12 September to 19 November 2009.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian Redfish	251	1033
American Plaice	243	797
American Shad	10	---
Atlantic Cod	169	834
Atlantic Croaker	99	264
Atlantic Halibut	14	15
Atlantic Herring	227	938
Atlantic Mackerel	45	147
Atlantic Wolffish	13	16
Barndoor Skate	227	---
Black Sea Bass	130	325
Blackbelly Rosefish	95	3
Blueback Herring	27	---
Bluefish	119	185
Buckler Dory	45	---
Butterfish	380	1244
Chub Mackerel	2	---
Clearnose Skate	293	---
Cobia	1	---
Cunner	34	---
Cusk	5	6
Fawn Cusk-Eel	90	---
Fourbeard Rockling	40	---
Fourspot Flounder	335	331
Goosefish	288	550
Gulf Stream Flounder	234	---
Haddock	338	735
Little Skate	679	---
Longhorn Sculpin	165	---
Northern Kingfish	20	---
Northern Searobin	181	---
Ocean Pout	108	114
Offshore Hake	123	139
Pollock	22	70
Red Hake	410	423
Rosette Skate	134	---
Scup	198	526
Sea Raven	93	---
Silver Hake	761	1,019
Smooth Dogfish	167	---
Smooth Skate	253	---
Spiny Dogfish	375	342
Spot	51	---
Spotted Hake	347	305
Striped Searobin	72	---

Species	Feeding Ecology Observations	Age and Growth Samples
Summer Flounder	219	595
Tautog	9	---
Thorny Skate	111	---
Tilefish	4	4
Weakfish	51	127
White Hake	292	996
Windowpane	165	415
Winter Flounder	289	1,119
Winter Skate	191	---
Witch Flounder	203	442
Yellowtail Flounder	264	1,062
TOTALS	9,711	15,121

Table 2. Miscellaneous scientific collections made on NOAA FSV *Henry B. Bigelow*, Bottom Trawl Survey, during 12 September to 19 November 2009.

Investigator and Affiliation	Samples Saved	Approximate Number
Aquarium, NMFS, NEFSC, Woods Hole, MA	live fish	5 indiv
	freeze fish	14 indiv
Jonathan Breton, U. of MA, Dartmouth, MA	yellowtail flounder	26 indiv
Michael Burton, NMFS, Beaufort, NC	black sea bass	196 indiv.
Bruce Collette, NMFS, Smithsonian, Washington, DC	various species	193 indiv
Michael Fine, VA Commonwealth U., Richmond, VA	various species cusk eel	36 indiv
John Galbraith, NMFS, NEFSC, Woods Hole, MA	unidentified/various species	4754 indiv.
Guest	various species	37 indiv.
Dvora Hart, NMFS, NEFSC, Woods Hole, MA	sea stars	153 indiv
Heather Haas, NMFS, NEFSC, Woods Hole, MA	leatherback turtle	2 photos
Lisa Hendrickson, NMFS, NEFSC, Woods Hole, MA	longfin squid	11 examined
	shortfin squid	55 examined
Fiona Hogan, U. of MA, Darmouth, MA	various skates	159 indiv
Joseph Idoine, NMFS, NEFSC, Woods Hole, MA	northern shrimp	53.6 kg
Francis Juanes, U. of MA, Amherst, MA	offshore hake	40 preserved
Chad Keith, NMFS, NEFSC, Woods Hole, MA	atlantic wolffish	8 examined
	atlantic wolffish	10 indiv.
	atlantic wolffish	8 preserved
Nancy Kohler, NMFS, NEFSC, Narragansett, RI	various sharks	30 tagged
Jason Link/Brian Smith, NMFS, NEFSC, Woods Hole, MA	various species	281 preserved
Mike Mangold,US Fish & Wilodlife Service, Annapolis, MD	atlantic sturgeon	2 examined
Richard McBride, NMFS, NEFSC, Woods Hole, MA	various flounders	166 examined
	gonads, various species	135 preserved
	black sea bass	4 indiv.
Nancy McHugh, NMFS, NEFSC, Woods Hole, MA	various species	4 examined
Joseph Mello, NMFS, NEFSC, Woods Hole, MA	atlantic angel shark	17 indiv.
Kevin, Meyer, NMFS, NEFSC, Woods Hole, MA	various species	194 indiv.
Loretta O'Brien, NMFS, NEFSC, Woods Hole, MA	atlantic cod	288 examined
Michael Palmer, NMFS, NEFSC, Woods Hole, MA	various species	405 examined
Kathy Sosebee, NMFS, NEFSC, Woods Hole, MA	various skates	1140 examined
	various rays	435 examined
	spiny dogfish	98 examined
Michelle Staudinger, U. of MA, Amherst, MA	various cephalopods	6 indiv.
Keiichi Uchida, Tokyo U. of Marine Science & Technology, Tokyo, Japan	conger eel	49 indiv.
	snake eel	1 indiv.
Byron White, NMFS, NLS, Washington, DC	blackbelly rosefish	65 indiv.
Shayla Williams, NMFS, NEFSC, Sandy Hook, NJ	summer flounder	2 indiv
Workshop, NMFS, NEFSC, Woods Hole, MA	various species	65 indiv.
Mark Wuenschel, NMFS, NEFSC, Woods Hole, MA	various gadids	51 examined
	gonads, various gadids	90 preserved

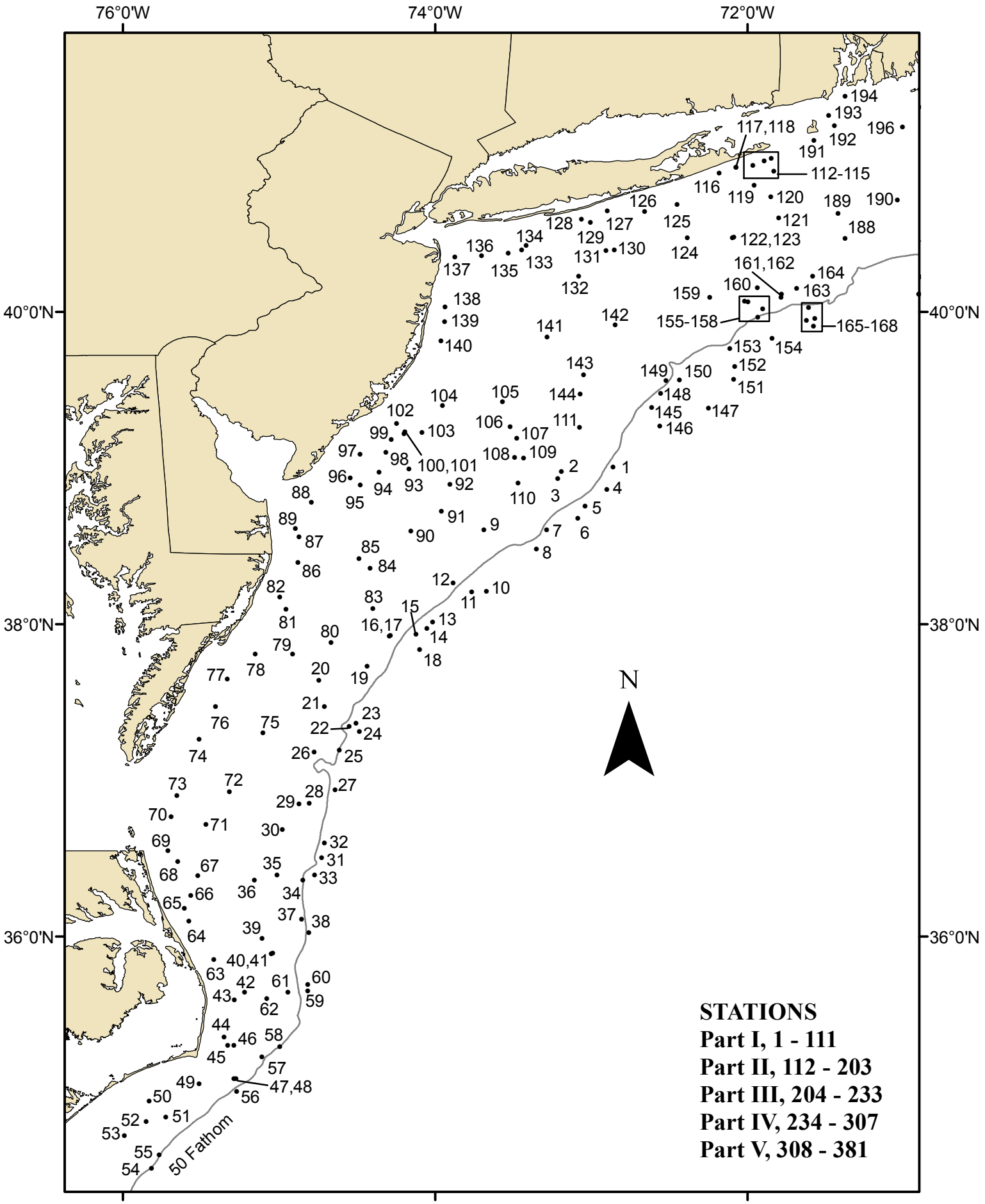

Figure 1. Trawl hauls made from NOAA FSV *Henry B Bigelow* (09-05), during NOAA Fisheries Service, Northeast Fisheries Science Center autumn bottom trawl survey, 12 September - 19 November 2009.

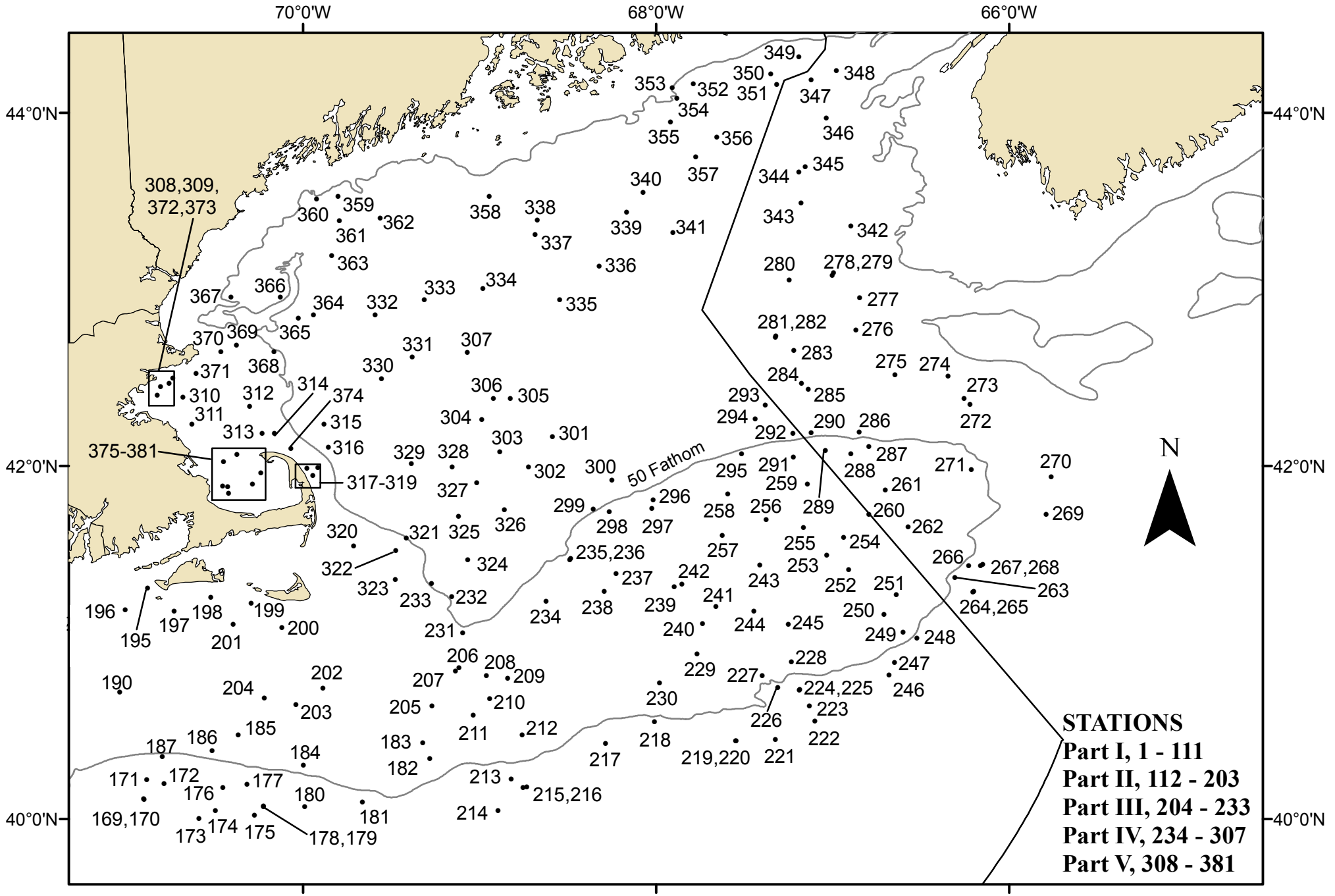

Figure 2. Trawl hauls made from NOAA FSV *Henry B Bigelow* (09-05), during NOAA Fisheries Service, Northeast Fisheries Science Center autumn bottom trawl survey, 12 September - 19 November 2009.