CRUISE RESULTS

NOAA Ship Henry B. Bigelow (R-225)
Cruise No. HB 11-05 (Parts I -V)
Fall Bottom Trawl Survey

Submitted to: NOAA, NEFSC

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Date: January 28, 2013

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
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January 28, 2013

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CRUISE PERIOD AND AREA

The HB 11-05 Bottom Trawl Survey was conducted in five parts from 9 September 2011 to 15 November 2011: part I was from 9 – 22 September; part II, 26 September – 6 October; part III, 11 – 21 October; part IV, 25 October – 4 November; and part V, 7 – 15 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 11-05 parts I-V conformed with the Cruise Instructions for the Fall Bottom Trawl Survey dated 12 August 2011, Addendum I dated 30 August 2011, Addendum II dated 22 September 2011, Addendum III dated 30 September 2011, Addendum IV dated 11 October 2011, Addendum V dated 3 November 2011. Exceptions to the Cruise Instructions were that part I was delayed three days due to poor weather conditions, and part II arrived one day early, also due to poor weather conditions.

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 caught species. 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 11-05 survey sampled at 367 stations with 113, 89, 65, 47, and 53 stations completed on parts I-V, respectively.

Standard plankton tows were made at 103 stations. Bottom temperatures were collected at 353 stations using the CTD system. Bottom water samples for CTD calibration were taken at 83 stations.

A total of 8,060 feeding ecology and 16,374 age and growth samples were collected from 55 species (Table 1). A total of 9,599 samples were collected to support 21 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

Peter Chase, Chief Scientist[2]
John Galbraith[3], Chief Scientist[1]
Kevin McIntosh[3], Chief Scientist[5]
Philip Politis[5], Chief Scientist[3]
Robert Alexander[2,3]
TK Arbusto[2,4]
Nicole Bartlett[5]
David Chevrier[1,3,5]
Laurel Col[4]
Joshua Dayton[1,5]
Linda Despres[5]
William Duffy[1]
Jonathan Duquette[5]
Sarah Emery[2]
Chad Keith[5]
Paul Kostovick[1]
Heidi Marotta[2]
Joseph Mello[1]
Victor Nordahl[4]
Eric Robillard[4]
Stacy Rowe[3,5]
Brian Smith[4]
Sandy Sutherland[3]
Kris Tholke[5]
Grace Thornton[3]

National Marine Fisheries, ASFC, Seattle, WA

Alison Vijgen[2]
Heather Kenney[2]

National Marine Fisheries, NEFSC, Sandy Hook, NJ

John Rosendale[3]

National Marine Fisheries, NWFSC, Seattle, WA

Alicia Billings[4]

National Marine Fisheries Service, NERO, Gloucester, MA

Alyssa Pandolfi[1]

National Marine Fisheries, OSF, Silver Spring, MD

Rosa Gonzales[2]
Teresa Turk[2]

University of Massachusetts, Amherst, MA

Joseph Kunkle[4]

Volunteers

Brian Farless[4]	Somerville, MA
Neven Popovic[4]	Edgewater, MD
Jennifer Porcheddu[2]	Broad Channel, NY
Brendan Woerner[1]	Colonia, NJ

Contractors

Geoff Shook[2,3,5], Chief Scientist[4]	ITS, Woods Hole, MA
Bruce Beagley[4]	ITS, Woods Hole, MA
Frank Capitanio[1]	ITS, Woods Hole, MA
Nicole Charriere[1,4,5]	ITS, Woods Hole, MA
Sarah Cierpich[3]	ITS, Woods Hole, MA
Heath Cook[1,2,3,5]	ITS, Woods Hole, MA
William Greer[4]	ITS, Woods Hole, MA
Kevin Jackson[2]	ITS, Woods Hole, MA
Loren Kellogg[1]	ITS, Woods Hole, MA
Jakub Kircun[1,2,4,5]	ITS, Woods Hole, MA
Christine LaFleur[1]	ITS, Woods Hole, MA
Adam Poquette[3,4,5]	ITS, Woods Hole, MA
Stephen Sutton[1,2]	ITS, Woods Hole, MA
Chris Tholke[3]	ITS, Woods Hole, MA
Emilee Towle[3]	ITS, Woods Hole, MA

[1] 9 – 22 September
[2] 26 September – 6 October
[3] 11 – 21 October
[4] 25 October – 4 November
[5] 7 - 15 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 9 September to 15 November 2011.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian Redfish	243	847
American Plaice	241	763
American Shad	25	--
Atlantic Cod	168	750
Atlantic Croaker	75	304
Atlantic Halibut	23	22
Atlantic Herring	190	653
Atlantic Mackerel	79	193
Atlantic Wolffish	21	23
Barndoor Skate	192	--
Black Sea Bass	74	263
Blackbelly Rosefish	84	--
Blueback Herring	28	--
Bluefish	91	263
Buckler Dory	57	--
Butterfish	206	1650
Clearnose Skate	97	--
Cunner	22	--
Cusk	11	10
Fawn Cusk-eel	55	--
Fourbeard rockling	84	--
Fourspot Flounder	273	310
Goosefish	263	656
Gulf stream flounder	125	--
Haddock	445	1316
Little Skate	404	--
Longhorn Sculpin	160	--
Northern Kingfish	30	--
Northern Searobin	135	--
Ocean Pout	105	136
Offshore Hake	128	132
Pollock	55	184
Red Hake	315	578
Rosette Skate	76	--
Scup	102	664
Sea Raven	91	--
Silver Hake	704	1116
Smooth Dogfish	75	--
Smooth Skate	234	--
Spiny Dogfish	334	349
Spot	32	--
Spotted Hake	300	346

Table 1 (continued): Field observations and samples collected for age and growth studies on NOAA Ship *Henry B. Bigelow*, Fall Bottom Trawl Survey, during 9 September to 15 November 2011.

Species	Feeding Ecology Observations	Age and Growth Samples
Striped Bass	1	1
Striped Searobin	56	--
Summer Flounder	148	568
Tautog	3	--
Thorny Skate	89	--
Tilefish	2	2
Weakfish	56	303
White Hake	243	858
Windowpane	193	699
Winter Flounder	261	1119
Winter Skate	191	--
Witch Flounder	185	493
Yellowtail Flounder	180	803
TOTALS	8,060	16,374

Table 2: Miscellaneous scientific collections made on NOAA Ship *Henry B. Bigelow*, Fall Bottom Trawl Survey, during 9 September to 15 November 2011.

Investigator and Affiliation	Samples Saved	Approximate Number
Barnhill, William NMFS, NERO, Gloucester, MA	loggerhead turtle	1 examined
Canavin, Peter NMFS, NEFSC, Woods Hole, MA	various species	165 indiv
Chase, Peter NMFS, NEFSC, Woods Hole, MA	unidentified invertebrates	141 indiv
Czesny, Serguisz, et al. Illinois Natural History Survey, Zion, IL	alewife	59 indiv.
Di Santo, Valentina Boston University, Boston, MA	little skate	65 fin clips
Galbraith, John NMFS, NEFSC, Woods Hole, MA	unidentified/various fish	4752 indiv.
Jekielek, Phoebe University of Maine, Orono, ME	Atlantic herring	326 indiv.
Keith, Charles, et al. NMFS, NEFSC, Woods Hole, MA	Atlantic wolffish	21 indiv.
Koske, Amy University of Massachusetts, Amherst, MA	various species	60 indiv.
Lichti, Deborah Lake Michigan Biological Station, IL	alewife	50 gillrakers
Mangold, Michael US Fish & Wildlife Service, Annapolis, MD	Atlantic sturgeon	2 examined
McBride, Holly NMFS, NEFSC, Woods Hole, MA	white hake	12 indiv.
McBride, Richard, et al. NMFS, NEFSC, Woods Hole, MA	summer flounder	84 preserved
Munroe, Thomas NMFS, National Systematics Laboratory, Washington DC	smallmouth flounder	58 indiv.
Niziniski, Martha NMFS, National Systematics Laboratory, Washington DC	galatheid crab *Hippasteria* starfish	100 bags
O'Brien, Loretta NMFS, NEFSC, Woods Hole, MA	Atlantic cod	162 examined
Palkovacs, Eric Duke University, Durham, NC	alewife blueback herring	830 indiv. 310 indiv.
Richards, Anne NMFS, NEFSC, Woods Hole, MA	northern shrimp	103 bags
Rowe, Stacy, et al. NMFS, NEFSC, Woods Hole, MA	various species	282 preserved
Sosebee, Kathy NMFS, NEFSC, Woods Hole, MA	spiny dogfish (female) rays various skates	221 examined 338 examined 1365 examined
Wuenschel, Mark, et al. NMFS, NEFSC, Woods Hole, MA	black sea bass Atlantic cod (female)	55 preserved 37 preserved

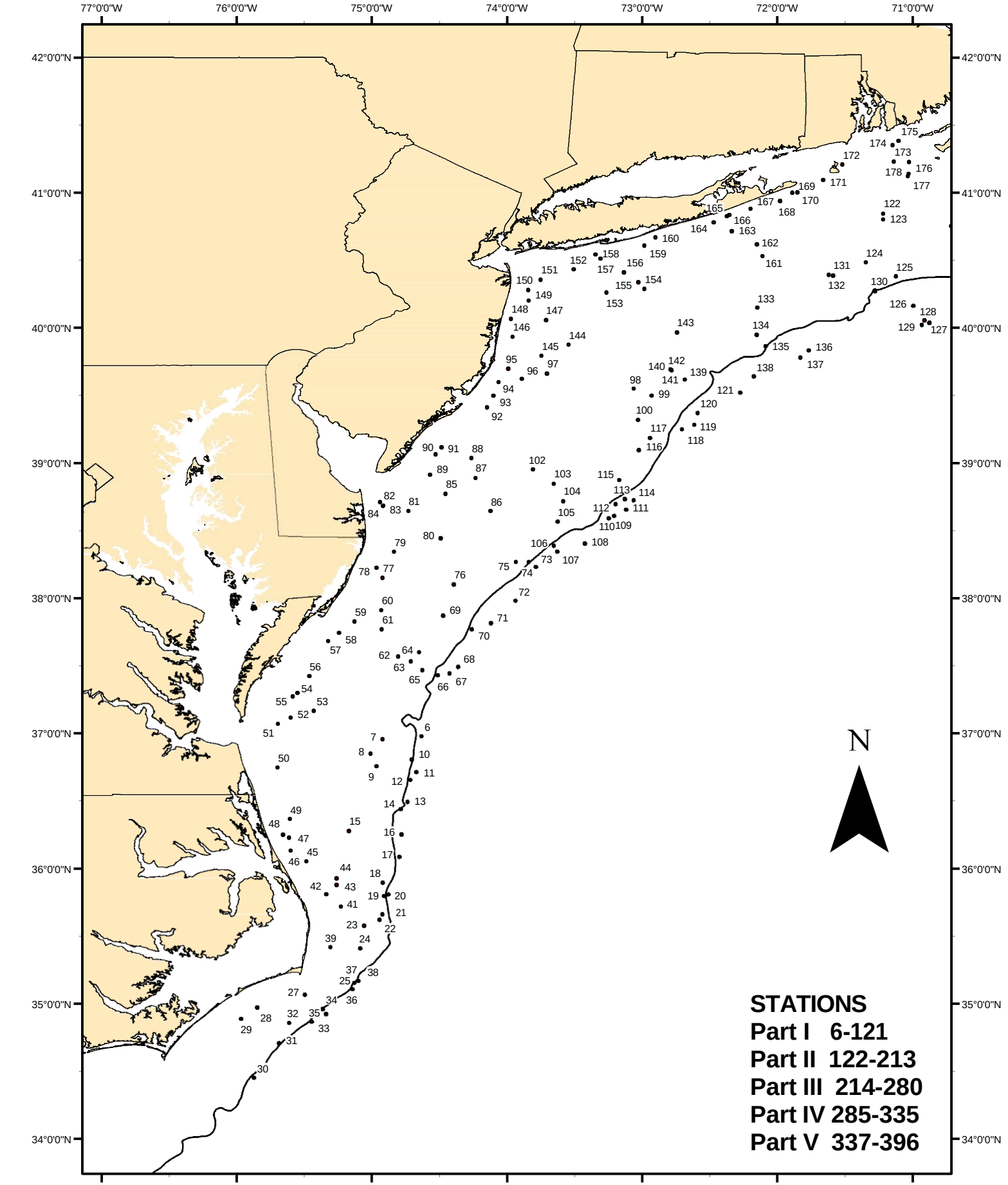

Figure 1 - Trawl hauls made from NOAA Ship *Henry B. Bigelow* (11-05), during NOAA Fisheries Service, Northeast Fisheries Center Fall Bottom Trawl Survey, 9 September - 15 November 2011

Map 1 of 2

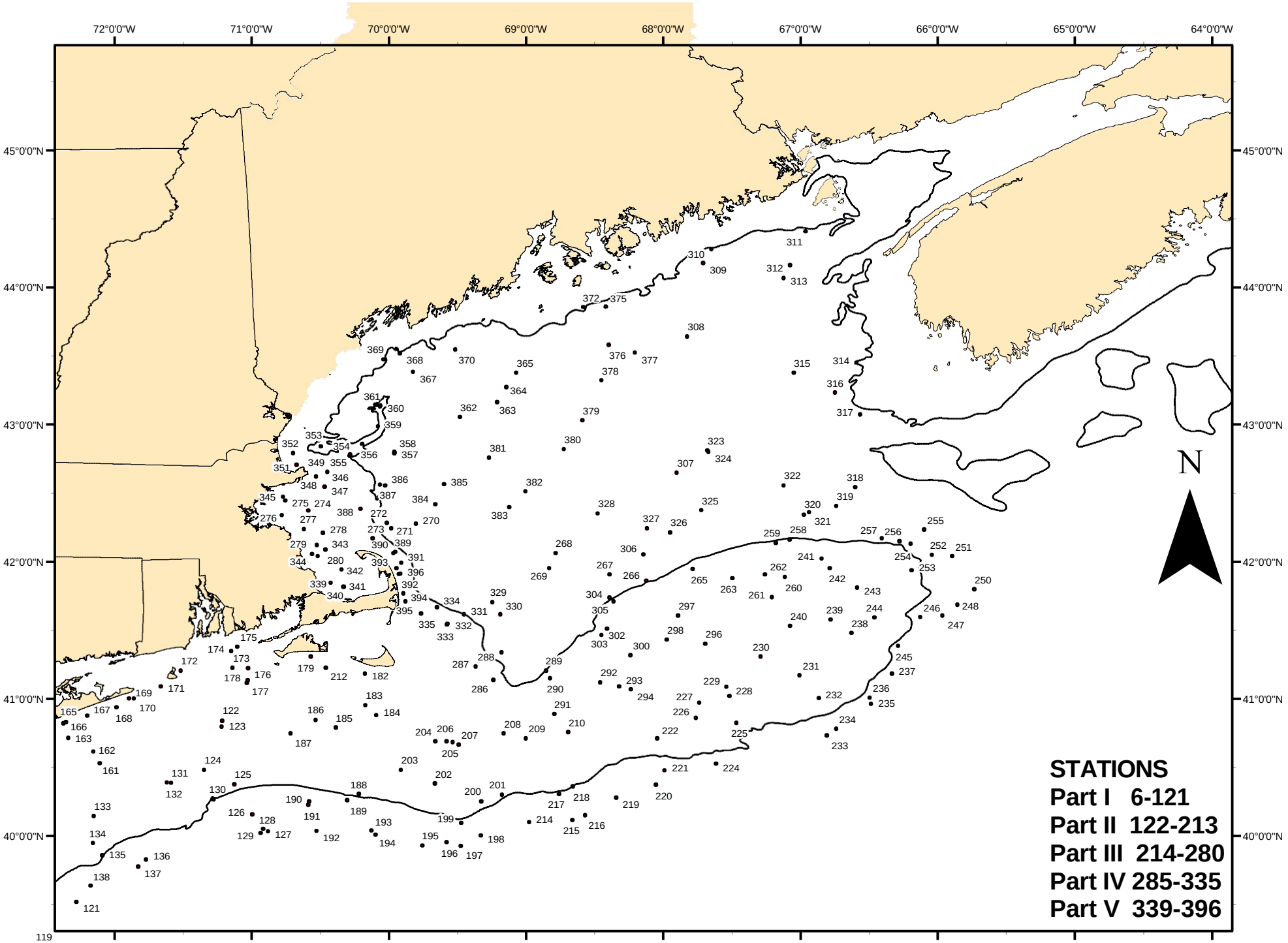

Figure 2 - Trawl hauls made from NOAA Ship *Henry B. Bigelow* (11-05), during NOAA Fisheries Service, Northeast Fisheries Center Fall Bottom Trawl Survey, 9 September - 15 November 2011

Map 2 of 2