



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

January 29, 2013

CRUISE RESULTS

NOAA Ship *Henry B. Bigelow* (R-225)
Cruise No. HB 12-01 (Parts I - IV)
Spring Bottom Trawl Survey

CRUISE PERIOD AND AREA

The HB 12-01 Bottom Trawl Survey was conducted in four parts from 28 February 2012 to 4 May 2012: part I was from 28 February – 7 March and 11 – 15 March; part II, 19 – 29 March; part III, 2 – 20 April; part IV, 24 April – 4 May. 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 and relative abundance 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 and bongo tows at select stations; (5) collect acoustic data along cruise tracks, as well as test and conduct preliminary survey operations with acoustic systems, including the EK-60 and ME-70.

METHODS

Operations and gear used during HB 12-01 parts I-IV conformed with the Cruise Instructions for the Spring Bottom Trawl Survey dated 14 February 2012, Addendum I dated 17 February 2012, Addendum II dated 16 March 2012, Addendum III dated 22 March 2012, and Addendum IV dated 10 April 2012. Exceptions to the Cruise Instructions were that part I was interrupted due to mechanical issues with the ship.

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 meter², 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). A CTD was deployed at each plankton station.

RESULTS

The HB 12-01 survey sampled at 376 stations with 75, 90, 136, and 75 stations completed on parts I-IV, respectively.

Standard plankton tows were made at 106 stations. Bottom temperatures were collected at 374 stations using the CTD system. Bottom water samples for CTD calibration were taken at 76 stations.

A total of 9,899 feeding ecology and 17,264 age and growth samples were collected from 56 species (Table 1). A total of 7,983 samples were collected to support 22 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 ¹ , Chief Scientist ³	Sarah Emery ²
Nathan Keith ² , Chief Scientist ⁴	Sarah Geichas ²
Victor Nordahl, Chief Scientist ²	Charles Keith ³
Philip Politis, Chief Scientist ¹	Paul Kostovick ¹
Robert Alexander ¹	Heidi Marotta ²
TK Arbusto ²	Michael Palmer ⁴
Cristina Bascuñán ²	Nancy Peltier ¹
Larry Brady ^{1,3}	Richard Raynes ⁴
Peter Chase ²	Eric Robillard ⁴
David Chevrier ^{1,3,4}	Stacy Rowe ²
Laurel Col ⁴	Brian Smith ¹
Joshua Dayton ^{1,3}	Grace Thornton ⁴
William Duffy ^{1,3}	Mark Wuenschel ³
Jonathan Duquette ^{1,4}	

National Marine Fisheries Service, NERO, Gloucester, MA

Carly Bari⁴

Department of Fisheries & Oceans, NB, Canada

Jamie Emberly⁴

U.S. Department of Justice, Washington D.C.

Alice Ren³

U.S. Department of State, Rochester, NH

Andrew Coppa⁴

Virginia Institute of Marine Science, Gloucester Point, VA

Evan McOmber²

Volunteers

Christopher Burns³ Narragansett, RI

Contractors

Nicole Charriere ^{1,2,4}	ITS, Woods Hole, MA
Benjamin Church ³	ITS, Woods Hole, MA
Heath Cook ^{1,3,4}	ITS, Woods Hole, MA
Giovanni Gianesin ¹	ITS, Woods Hole, MA
Kara Gibbons ³	ITS, Woods Hole, MA
Jakub Kircun ^{1,2,3}	ITS, Woods Hole, MA
Christine LaFleur ³	ITS, Woods Hole, MA
Adam Poquette ^{2,3,4}	ITS, Woods Hole, MA
Kathryn Roy ⁴	ITS, Woods Hole, MA
Geoff Shook ^{1,2,4}	ITS, Woods Hole, MA
Christopher Tholke ²	ITS, Woods Hole, MA
Emilee Towle ²	ITS, Woods Hole, MA

¹ 28 February – 7 March , 11 – 15 March

² 19 – 29 March

³ 2 – 20 April

⁴ 24 April – 4 May

Table 1: Field observations and samples collected for age and growth studies on NOAA Ship *Henry B. Bigelow*, Spring Bottom Trawl Survey, during 28 February to 4 May 2012.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian Redfish	280	953
American Plaice	383	1079
American Shad	99	--
Atlantic Cod	234	879
Atlantic Croaker	14	33
Atlantic Halibut	35	37
Atlantic Herring	406	1514
Atlantic Mackerel	216	595
Atlantic Menhaden	6	--
Atlantic Wolffish	23	29
Barndoor Skate	169	--
Black Sea Bass	54	282
Blackbelly Rosefish	46	--
Blueback Herring	113	--
Bluefish	6	9
Buckler Dory	39	--
Butterfish	219	1064
Clearnose Skate	87	--
Cunner	26	--
Cusk	8	8
Fawn cusk-eel	50	--
Fourbeard rockling	89	--
Fourspot Flounder	274	307
Goosefish	296	629
Gulf stream flounder	192	--
Haddock	379	1199
Little Skate	494	--
Longhorn Sculpin	266	--
Northern Kingfish	7	--
Northern Searobin	94	--
Ocean Pout	209	284
Offshore Hake	91	123
Pollock	54	153
Red Hake	465	991
Rosette Skate	38	--
Scup	62	183
Sea Raven	125	--
Silver Hake	954	1481
Smooth Dogfish	63	--
Smooth Skate	257	--
Spiny Dogfish	565	--
Spot	3	--
Spotted Hake	260	292

Table 1 (continued): Field observations and samples collected for age and growth studies on NOAA Ship *Henry B. Bigelow*, Spring Bottom Trawl Survey, during 28 February to 4 May 2012.

Species	Feeding Ecology Observations	Age and Growth Samples
Striped Bass	41	42
Striped Searobin	34	--
Summer Flounder	245	622
Tautog	2	--
Thorny Skate	92	--
Tilefish	2	2
Weakfish	10	29
White Hake	232	712
Windowpane	251	665
Winter Flounder	366	1232
Winter Skate	256	--
Witch Flounder	340	742
Yellowtail Flounder	278	1094
TOTALS	9,899	17,264

Table 2: Miscellaneous scientific collections made on NOAA Ship *Henry B. Bigelow*, Spring Bottom Trawl Survey, during 28 February to 4 May 2012.

Investigator and Affiliation	Samples Saved	Approximate Number
Badger, Daniel New England Aquarium, Boston, MA	various species	56 indiv
Bemis, Katherine Cornell Museum of Vertebrates, Ithaca, NY	various dragonets	19 indiv.
Bemis, William Cornell University, Ithaca, NY	lumpfish	2 indiv.
Burton, Michael NMFS, SEFSC, Beaufort, NC	black sea bass	8 indiv.
Canavin, Peter NMFS, NEFSC, Woods Hole, MA	various species	453 indiv
Chase, Peter NMFS, NEFSC, Woods Hole, MA	unidentified invertebrates	173 indiv
Di Santo, Valentina Boston University, Boston, MA	little skate	34 fin clips
Galbraith, John NMFS, NEFSC, Woods Hole, MA	unidentified/various fish	2274 indiv.
Keith, Charles, et al. NMFS, NEFSC, Woods Hole, MA	Atlantic wolffish	23 indiv.
Lindsay, Evan Univ. of Maryland, Eastern Shore, Princess Ann, MD	goosefish (female)	28 preserved
Mangold, Michael US Fish & Wildlife Service, Annapolis, MD	Atlantic sturgeon	5 examined
Mataronas, Sandra NMFS, NEFSC, Narragansett, RI	Atlantic torpedo	3 indiv.
McBride, Holly NMFS, NEFSC, Woods Hole, MA	various species	133 indiv.
McBride, Richard, et al. NMFS, NEFSC, Woods Hole, MA	winter flounder (female) yellowtail flounder (female)	102 preserved 100 preserved
Munroe, Thomas NMFS, National Systematics Laboratory, Washington DC	smallmouth flounder	528 indiv.
Niziniski, Martha NMFS, National Systematics Laboratory, Washington DC	galatheid crabs	23 bags
O'Brien, Loretta NMFS, NEFSC, Woods Hole, MA	Atlantic cod	227 indiv
Palkovacs, Eric Duke University, Durham, NC	alewife blueback herring	1010 indiv. 247 indiv.
Richards, Anne NMFS, NEFSC, Woods Hole, MA	goosefish	34 indiv.
Rowe, Stacy, et al. NMFS, NEFSC, Woods Hole, MA	various species	419 preserved
Sosebee, Kathy NMFS, NEFSC, Woods Hole, MA	spiny dogfish (female) rays various skates	489 examined 69 examined 1376 examined
Wuenschel, Mark, et al. NMFS, NEFSC, Woods Hole, MA	Atlantic cod (female) black sea bass haddock (female)	87 preserved 37 preserved 24 preserved

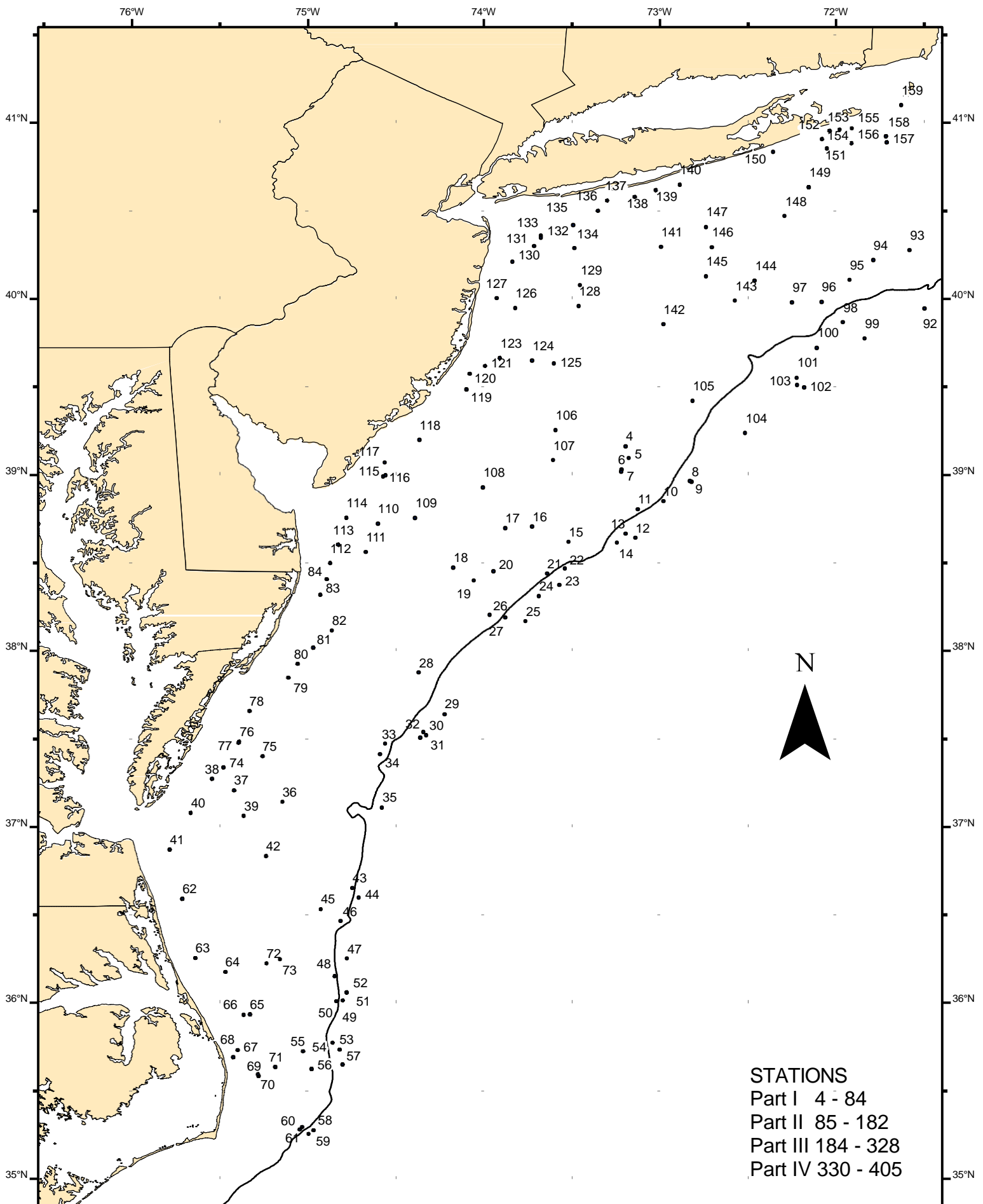


Figure 1 - Trawl hauls made from NOAA Ship *Henry B. Bigelow* (12-01), during NOAA Fisheries Service, Northeast Fisheries Center Spring Bottom Trawl Survey, 28 February - 4 May 2012

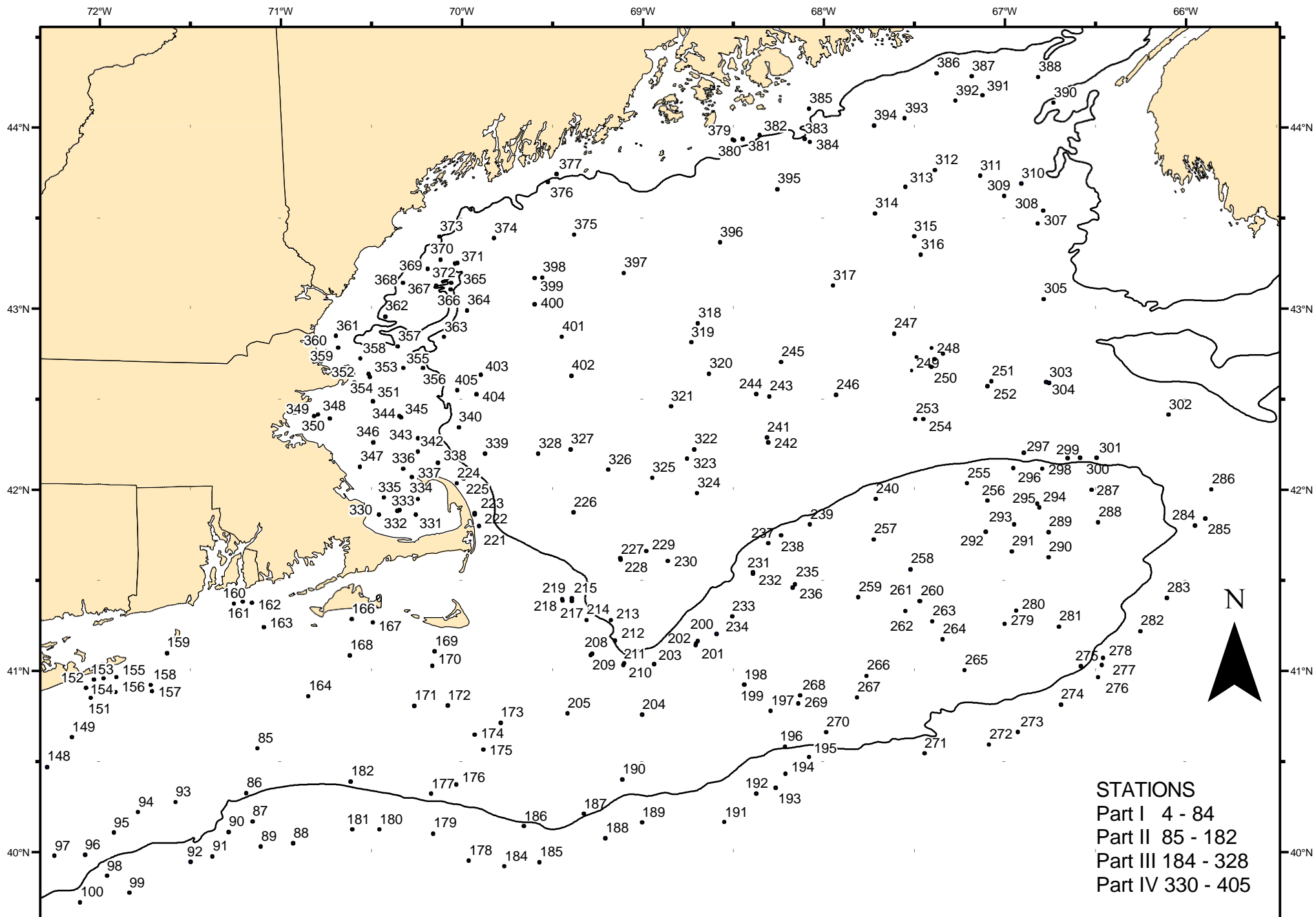


Figure 2 - Trawl hauls made from NOAA Ship *Henry B. Bigelow* (12-01), during NOAA Fisheries Service, Northeast Fisheries Center Spring Bottom Trawl Survey, 28 February - 4 May 2012