



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

20 January 2009

## CRUISE RESULTS

NOAA FRV *Delaware II*  
Cruise No. DE 08-07 (Parts I-III)  
Surf Clam and Ocean Quahog Survey

### CRUISE PERIOD AND AREA

The cruise period was from 30 June to 7 August 2008. The DE 08-07 surf clam and ocean quahog survey was conducted in three parts: Part I was from 30 June-10 July; Part II, 15-25 July; and Part III, 28 July-7 August. The area of operation was on the continental shelf from Southern Virginia (Delmarva) to Georges Bank. Station locations are shown in Figures 1, 2 and 3.

### OBJECTIVES

The objectives of the survey were to: (1) determine the distribution, relative abundance and biological data for surf clams (*Spisula solidissima*) and ocean quahogs (*Arctica islandica*); (2) collect dredge performance readings on each dredge haul utilizing an archiving deployed multi-sensor sampling device attached to the clam dredge; (3) conduct approximately ten setup sites for a commercial survey; (4) reoccupy selected sites from the 2005 clam survey; (5) collect sediment grab samples at commercial set up sites; (6) collect meat weights, gonad weights and shells from surf clam and ocean quahogs on a subset of station locations; and (7) collect additional biological samples for other programs including red tide sampling by the Food and Drug Administration.

### METHODS

Operations and gear used during DE 08-07 Parts I-III conformed with the Cruise Instructions for the Surf Clam and Ocean Quahog Survey dated 18 April 2007 and Addendum 1 dated 25 June 2008; Addendum 2 dated 9 July; and Addendum 3 dated 21 July. Exceptions to the Cruise Instructions are as follows: Part I arrived one day early due to mechanical problems, and Part II left one day late due to mechanical problems.

A 5-minute clam dredge tow was made at each pre-selected station indicated on cruise charts. The towing speed was at 1.5 knots, speed over ground. The scope ratio was 2:1. Sampling was conducted using a NEFSC standardized hydraulic jet dredge. The dredge was equipped with a 60-inch blade and powered with an electric submersible pump positioned on the dredge frame. A Survey Sensor Package (SSP) was used to monitor the performance of the hydraulic clam dredge, recording incline, ambient and manifold pressures, surface and bottom temperatures, GPS location, and pump voltage.

A commercial survey set up site was conducted at sites where two bushels of surf clams or quahogs were collected from the dredge tow. Five tows were made parallel to the original station tow, and a sediment grab sample was taken after the fourth and fifth tows. These set up sites will be used later for a commercial depletion study.

After each tow, the catch was sorted by species and weighed using motion compensated digital scales. Representative length frequencies were collected for surf clams, ocean quahogs, sea scallops and southern quahogs. 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 species were assigned individual identification numbers, measured, weighed to the nearest 0.001 kilogram (kg) and further sampled for age and growth studies. Shell lengths were measured to the nearest millimeter (mm) for surf clams, ocean quahogs, sea scallops and southern quahogs. Biological samples were collected concurrently with measuring operations (Table 1). Weights and total numbers were recorded for all fish species and select invertebrate species. 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.

## RESULTS

The survey sampled at 453 stations with 169, 150 and 134 stations completed on DE 08-07 Parts I-III, respectively. There were 14 depletion study set up sites, with an associated total of 70 dredge hauls and 28 grab samples.

A total of 895 age and growth samples were collected from two species (Table 1). A total of 5,340 requested samples were collected to support 4 internal and external investigations (Table 2).

## DISPOSITION OF SAMPLES AND DATA

Age and growth samples, and trawl catch 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 survey database.

## SCIENTIFIC PERSONNEL

### National Marine Fisheries Service, NEFSC, Woods Hole, MA

Sean Lucey, Chief Scientist <sup>2, participant 3</sup>	Robert Johnston <sup>3</sup>	Chris Pickett <sup>1, 2</sup>
Victor Nordahl, Chief Scientist <sup>1, 3</sup>	Chad Keith <sup>2</sup>	Richard Raynes <sup>1</sup>
Lizamonet Abney <sup>2</sup>	Alicia Long <sup>1</sup>	
TK Arbusto <sup>1, 2, 3</sup>	Shad Mahlum <sup>2, 3</sup>	
Stephanie Floyd <sup>1</sup>	Yasha McDonald <sup>3</sup>	

### FDA, Silver Spring, MD

Stacey Etheridge<sup>2</sup>

### Contractors

Heath Cook <sup>2</sup>	ITS,	Woods Hole, MA
Joshua Cutler <sup>2</sup>	ITS,	Woods Hole, MA
Jakub Kircun <sup>1, 2, 3</sup>	ITS,	Woods Hole, MA
Francine Stroman <sup>1</sup>	ITS,	Woods Hole, MA
Melanie Underwood <sup>3</sup>	ITS,	Woods Hole, MA

### Teacher at Sea Program

Laurie Degenhart <sup>2</sup>	Kirkwood,	MO
Lisha Hylton <sup>1</sup>		Leesville, SC
Tiffany Risch <sup>3</sup>	Narragansett,	RI
Lisbeth Uribe <sup>3</sup>	New	York, NY

### Volunteers

Sharon Benjamin <sup>1</sup>	Old	Bethpage, NY
Benjamin Broder-Oldach <sup>3</sup>	Cincinnati,	OH
Christi Cartwright <sup>1</sup>	Litchfield,	NH
Mark Harris <sup>1</sup>		Kaysville, UT
Kira Lopez <sup>1</sup>		Virginia Beach, VA
Kathleen McCole <sup>3</sup>	Newark,	DE
Caitlin McGarigal <sup>2</sup>	Shutesbury,	MA
Amy Nau <sup>3</sup>	Chapel	Hill, NC
Anna Priester <sup>3</sup>	Cape	May, NJ
Christina Senft <sup>2</sup>	Groton,	CT
Russell Soulard <sup>1</sup>		Malden, MA
Joseph Trynosky <sup>2</sup>	Manasquan,	NJ

<sup>1</sup> 30 June-10 July

<sup>2</sup> 15-25 July

<sup>3</sup> 28 July-7 August

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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](mailto: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 FRV *Delaware II*, Surf Clam and Ocean Quahog Survey, during 30 June to 7 August 2008.

Species	Age and Growth Samples
Atlantic surfclam	881
Ocean quahog	14
TOTALS	895

Table 2. Miscellaneous scientific collections made on NOAA FRV *Delaware II*, Surf Clam and Ocean Quahog Survey, during 30 June to 7 August 2008.

Investigator and Affiliation	Species Sampled	Approximate Number
Stacey Etheridge, FDA, Silver Spring, MD	Atlantic surfclam	403 preserved
	Ocean quahog	1,245 preserved
	Sea scallop	120 preserved
John Galbraith, NMFS, NEFSC, Woods Hole, MA	Unidentified/various species	30 indiv.
Larry Jacobson, NMFS, NEFSC, Woods Hole, MA	Atlantic surfclam	954 exam./33 indiv.
	Atlantic surfclam, A&G sample	852 bags
	Ocean quahog	1,680 exam.
	Ocean quahog, A&G samples	4 bags
	Southern quahog	4 exam.
Sean Lucey, NMFS, NEFSC, Woods Hole, MA	Sea scallop, A&G samples	2 bags
	Atlantic surfclam	3 stations exam.
	Ocean quahog	10 stations exam.

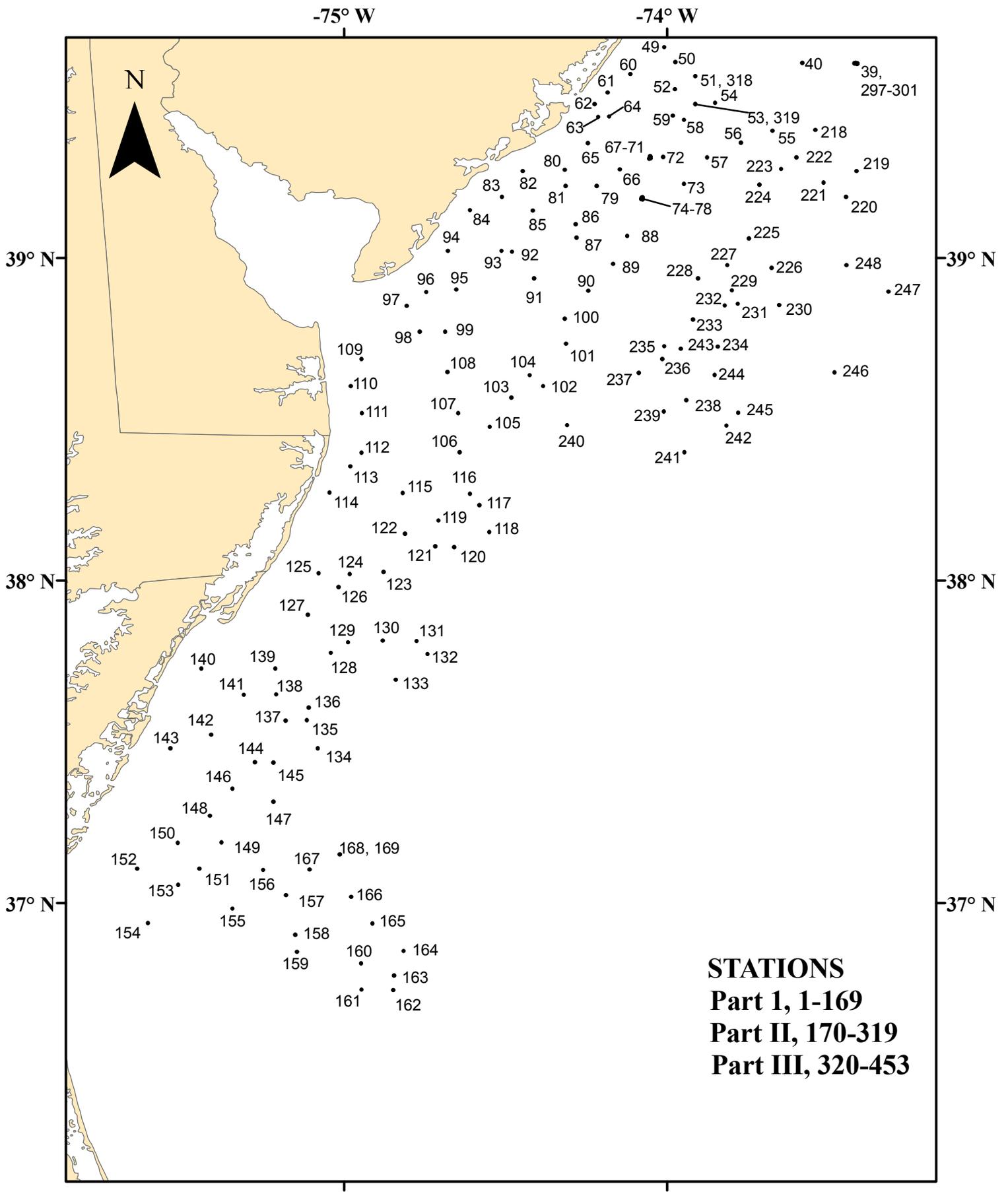


Figure 1. Dredge hauls made from NOAA R/V Delaware II (08-07), during NOAA Fisheries Service, Northeast Fisheries Science Center surfclam/ocean quahog survey 30 June - 7 August 2008.

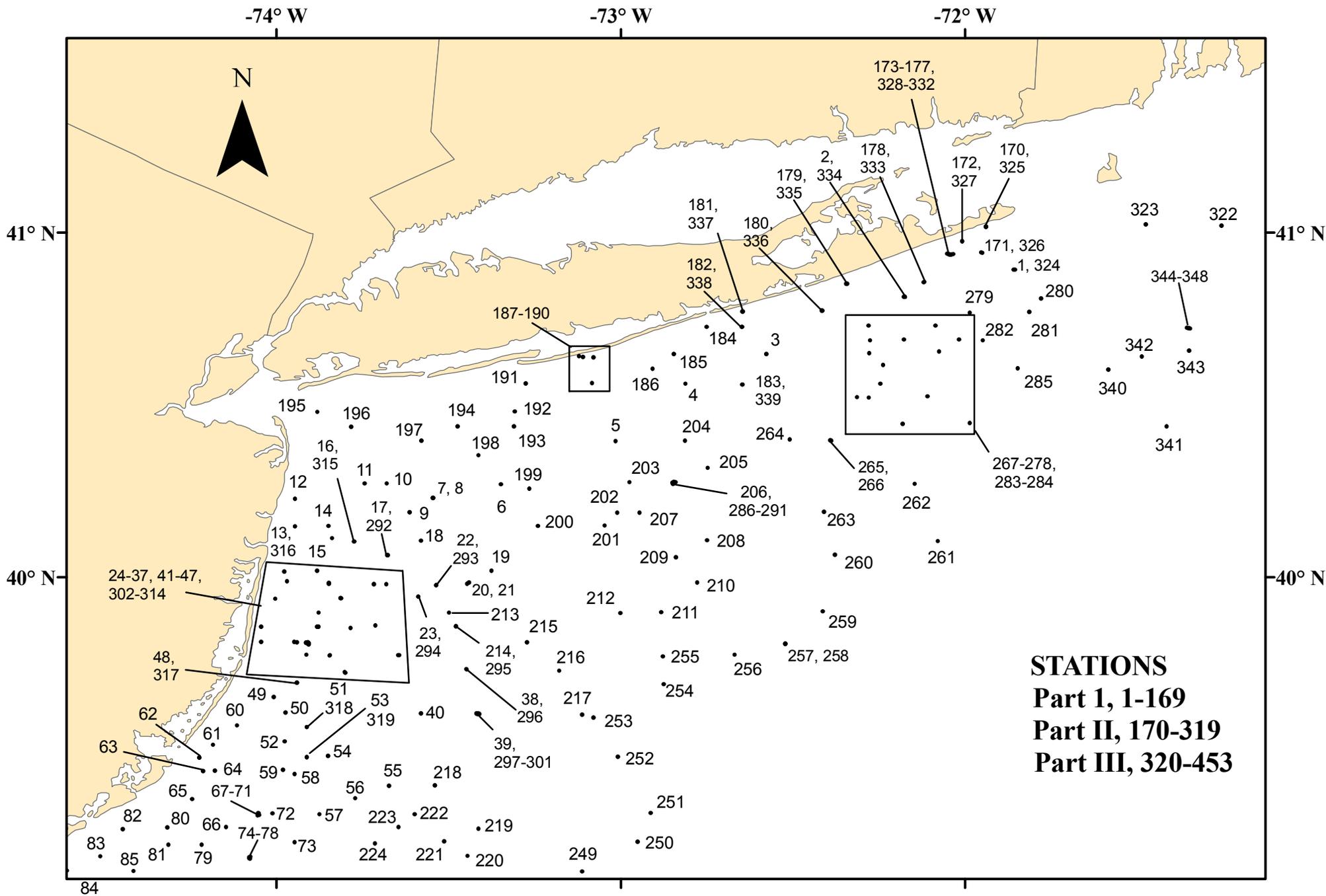


Figure 2. Dredge hauls made from NOAA R/V Delaware II (08-07), during NOAA Fisheries Service, Northeast Fisheries Science Center surfclam/ocean quahog survey 30 June - 7 August 2008.

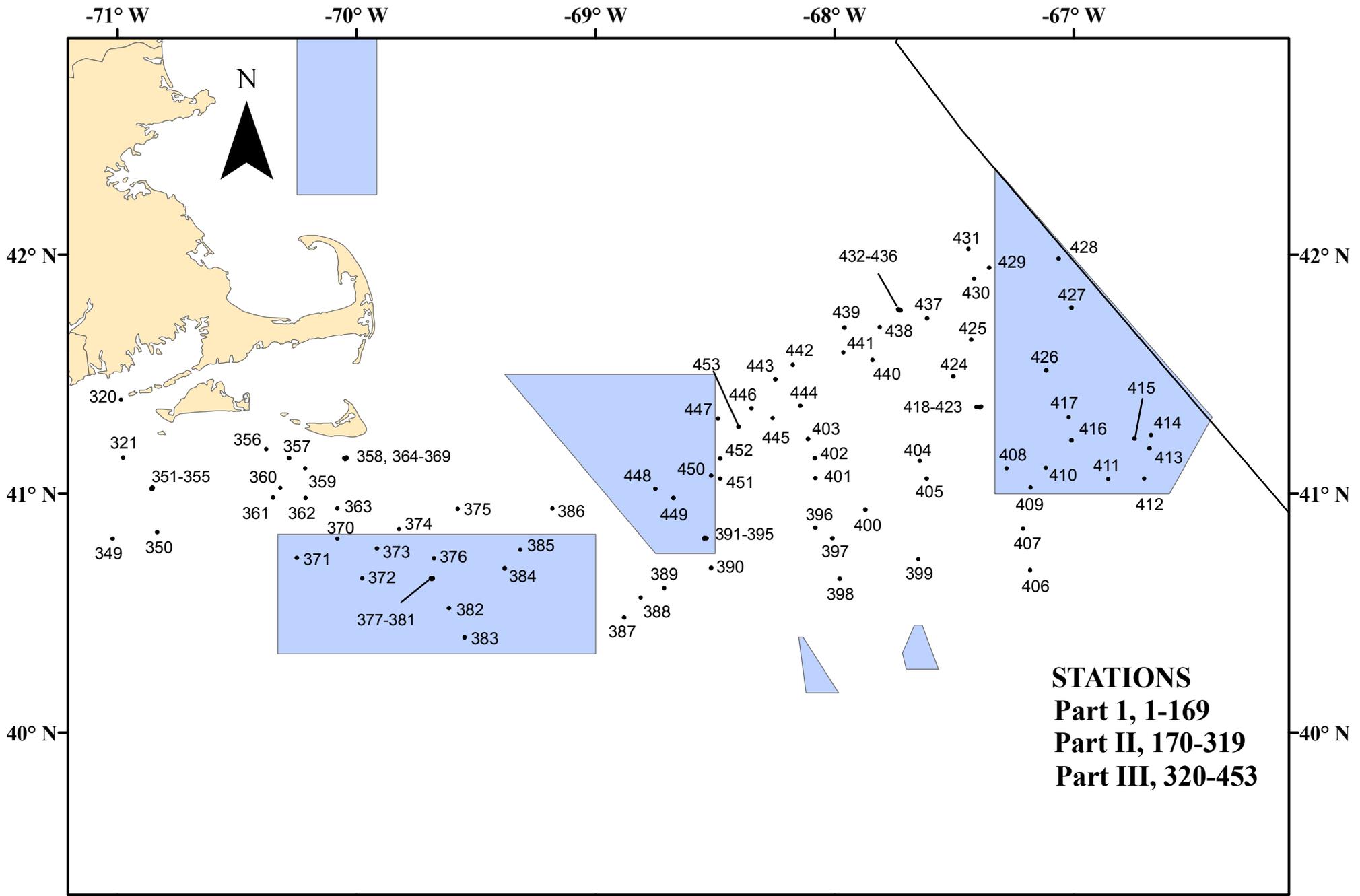


Figure 3. Dredge hauls made from NOAA R/V Delaware II (08-07), during NOAA Fisheries Service, Northeast Fisheries Science Center surfclam/ocean quahog survey 30 June - 7 August 2008.