

# CRUISE RESULTS

F/V E.S.S. Pursuit  
(Contracted Survey Vessel)  
Cruise No. EP 14-01 (Parts I-II)  
Surfclam and Ocean Quahog Survey

**Submitted to:** NOAA, NEFSC

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### CRUISE PERIOD AND AREA

The EP 14-01 Surfclam and Ocean Quahog Survey cruise period was from 6 - 15 August 2014 and was conducted in two parts: Part I was from 6 – 9 August 2014 and Part II was from 11 - 15 August 2014. The area of operation was from Long Island to Georges Bank. This survey was considered phase three of a three year surfclam and ocean quahog survey. Approximate station locations are shown in Figure 1.

### OBJECTIVES

The objectives of the survey were to: (1) determine the distribution, relative abundance and obtain biological data for surfclams (*Spisula solidissima*) and ocean quahogs (*Arctica islandica*); (2) collect dredge performance readings on each dredge haul by deploying a set of archiving, multi-sensor sampling devices attached to the commercial clam dredge; (3) collect adductor muscle meat weights and shells from surfclams and ocean quahogs on a subset of station locations; (4) conduct a series of selectivity tows between a lined dredge and a newly constructed industry built selectivity dredge to characterize the smaller surfclams and ocean quahogs not retained in the commercial-sized gear.

### METHODS

A five minute dredge tow was made at each randomly pre-selected station indicated on electronic cruise charts. The standardized towing speed was set between a range of 3.0 to 3.5 knots, speed over ground, and the scope ratio was approximately 2:1. Sampling was conducted using a standardized, commercial-sized hydraulic jet dredge, equipped with a 156 inch (13 foot) wide cutting blade with 1 3/8 inch round bar spacing inside the dredge. The adjustable dredge cutting blade depth setting was varied by depth between 3.5 and 4.5 inches at 90 feet of depth. This was determined prior to arrival on station. The clam industry operationally reduces the blade depth to 3.5 inches for depths greater than 90 feet to increase capture rates and avoid breakage of quahogs. The cutting blade depth is increased to 4.5 inches for dredge hauls shallower than 90 feet for the larger sized surfclams. The dredge was supplied with water from a ship mounted surface supplied pump. The vessel surface pump was set to 145 psi and 1800 RPM for most

tows and monitored by the vessel operator. Catch was deposited into hoppers that delivered it up and over a shaker table with 0.73 inch spacing. After the shaker table, catch was deposited onto a second conveyor that brought the catch to the scientists for sorting into component species (surfclams, ocean quahogs, sea scallops, and southern quahogs). Because of the design, placement, and sequence of conveyors and shaker table on the back deck of the commercial platform, the residual catch (miscellaneous invertebrates, shells, substrate, et cetera) was discarded and not enumerated.

All catch and biological data were recorded using the shipboard automated data entry system, Fisheries Scientific Computing System (FSCS 1.6). This system uses digital scales, electronic measuring boards (Ichthysticks), and touch screen displays to record data, in addition to archiving the data on a shipboard database. On the commercial platform, NEFSC installed its own Scientific Computer System (SCS) utilizing the data from the ship's GPS and sounder. After each tow, the catch was sorted by species and weighed using motion compensated digital scales. Further subdivision was made into broken and live categories and clappers for surfclams and quahogs. Representative length frequencies, measured to the nearest millimeter (mm), were collected for surfclams, ocean quahogs, southern quahogs, and sea scallops. Sampled species were assigned individual identification numbers, measured, weighed to the nearest 0.001 kilogram (kg) and further sampled for age and growth studies. Biological samples were collected concurrently with measuring operations (Table 1). Weights and total numbers were not recorded for bycatch fish and invertebrate species other than those mentioned above. The remainder of the catch (miscellaneous invertebrates, shells, substrate, et cetera) was discarded and not enumerated.

Additionally, the remainder of the survey was dedicated to conducting selectivity dredge hauls utilizing a standard dredge (duplicate to the primary standard dredge) lined with a 1 inch hexagonal liner (chicken wire) and a newly constructed commercial dredge with 0.73 inch round bar spacing (no liner) for the purpose of comparing the capture rates of small surfclams and quahogs (comparative selectivity experiments).

At the first site we deployed the new selectivity dredge for ten dredge hauls varying the dredge haul duration, alternate blowback positions, and bar spacing settings. The selectivity dredge had the ability to adjust the bar spacing between  $\frac{3}{4}$  and 2 inches. The blade depth was set at 3.5 inches based on depth and catch was pushed across a new shaker table cover. The covered shaker table improved efficiency of sorting. The second site compared the new selectivity dredge (14 dredge hauls) to the original selectivity dredge with the 1 inch hexagonal liner (11 dredge hauls). Dredge haul duration was kept constant at 45 seconds for the original selectivity dredge, but varied for the selectivity dredge hauls. Blade depth was kept at 3.5 inches for both dredges. The shaker table was covered for all processing. The third site repeated the comparisons from site 2, but at a surfclam blade depth setting for both dredges (4.5 inches) between the original selectivity dredge and the new selectivity dredge.

## RESULTS

The survey successfully sampled at 89 stations, with 30 random stations to complete the standard survey and 59 stations selectivity comparison dredge hauls to complete on Parts I and II, respectively. There were three selectivity sites comparing the standard selectivity dredge with the 1 inch hexagonal lined dredge against the newly constructed commercial dredge with adjustable bar spacing.

A total of 54 age and growth samples were collected from Atlantic surfclams (Table 1). A total of 251 samples were collected to support three investigators (Table 2).

### DISPOSITION OF SAMPLES AND DATA

Age and growth samples, as well as trawl catch data, will be analyzed at the NEFSC Woods Hole, Massachusetts Laboratory. Resulting data will be audited, edited, and loaded into the NEFSC survey database.

### SCIENTIFIC PERSONNEL

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

Larry Brady<sup>1</sup>  
Jonathan Duquette<sup>1</sup>  
Daniel Hennen<sup>2</sup>  
Victor Nordahl<sup>2</sup>

#### National Marine Fisheries Service, NSL, Washington, DC

La'Shaun Willis<sup>1</sup>

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#### Chesapeake Bay Governor's School for Marine and Environmental Science, Tappahannock, VA

Sara Beam<sup>1</sup>

#### McGill University, Montreal, Quebec, Canada

Michael Saminski<sup>2</sup>

#### Shanghai Ocean University, Shanghai, China

Yan Chen<sup>1</sup>

#### University of Massachusetts at Dartmouth, New Bedford, MA

Alexa Kretsch<sup>1</sup>  
Avis Lynn Francis<sup>2</sup>

#### University of Southern Mississippi, Ocean Springs, MS

Kelsey KuyKendall<sup>1,2</sup>

Virginia Institute of Marine Science, Gloucester Point, VA  
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Volunteers

Michael Whiteside<sup>2</sup>  
Nascimento Matura<sup>2</sup>

Linwood, NJ  
New Bedford, MA

<sup>1</sup> 6 – 9 August 2014

<sup>2</sup> 11 – 15 August 2014

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Table 1: Field observations and samples collected for age and growth studies on contracted F/V *E.S.S. Pursuit*, Surfclam and Ocean Quahog Survey, during 6 – 15 August 2014.

Species	Age and Growth Samples
Atlantic surfclam	54

Table 2: Miscellaneous scientific collections made on F/V *E.S.S. Pursuit*, Surfclam and Ocean Quahog Survey, during 6 – 15 August 2014.

Investigator and Affiliation	Species Sampled	Approximate Number
Hennen, Daniel NMFS, NEFSC, Woods Hole, MA	ocean quahog	51 meats examined
Mann, Roger Virginia Institute of Marine Science, Gloucester Point, VA	Atlantic surfclam	36 meats examined
	ocean quahog	22 frozen
Munroe, Daphne Rutgers University, Williamstown, NJ	ocean quahog, broken	106 frozen whole
	Atlantic surfclam, broken	36 frozen whole

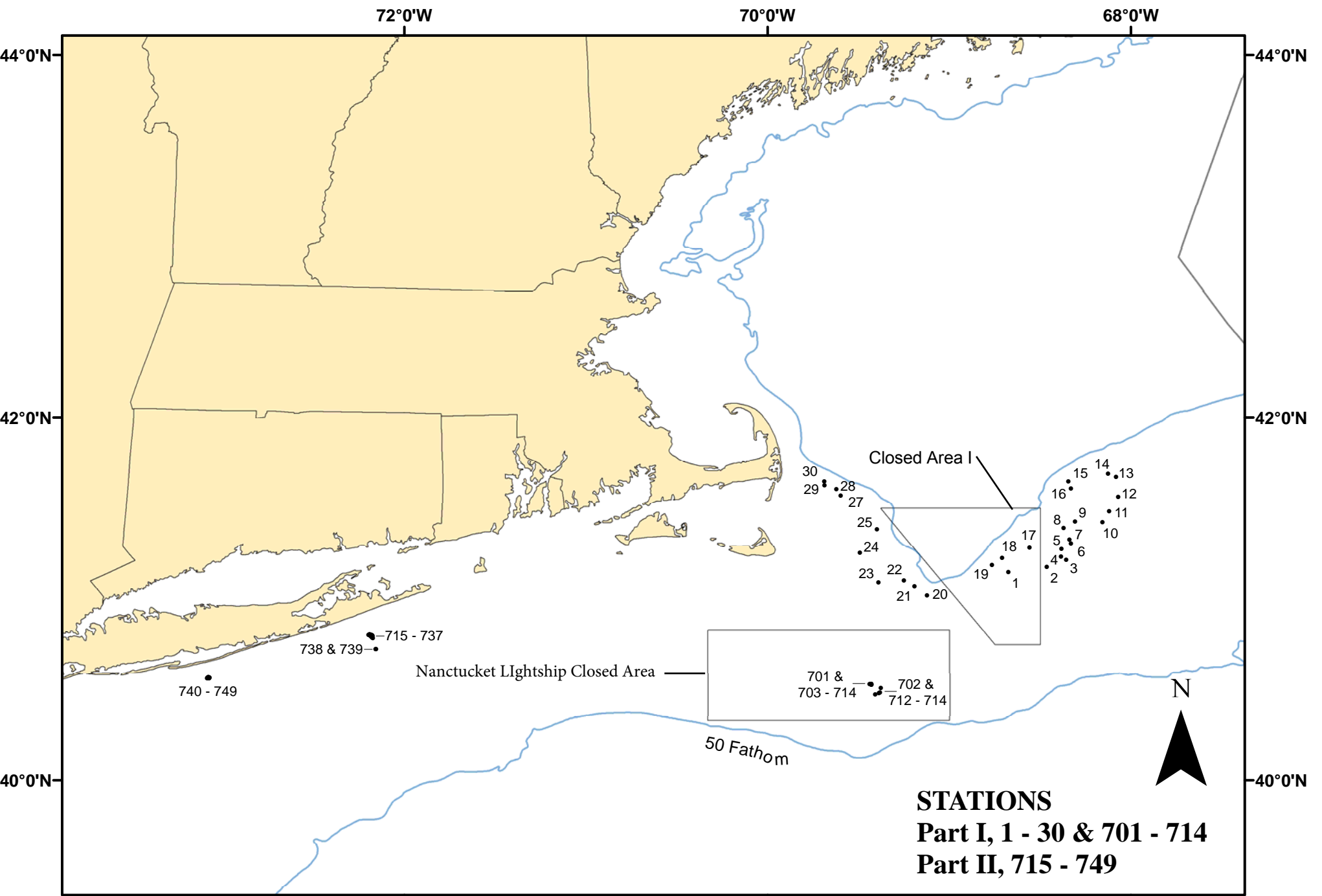


Figure 1. Dredge hauls made from F/V *E.S.S. Pursuit* during NOAA Fisheries Service, Northeast Fisheries Science Center's Surfclam / Ocean Quahog Survey, 6 August - 15 August 2014