Resource Survey Report

Atlantic Surfclam/Ocean Quahog

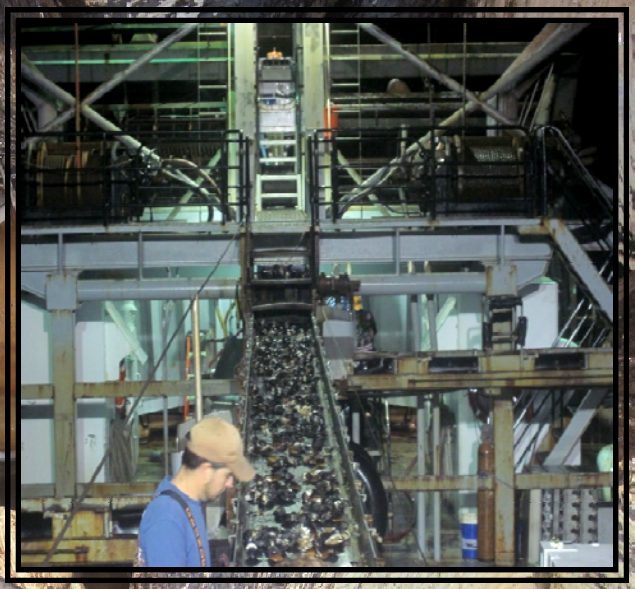
Delmarva Peninsula – Long Island

03 August - 19 August 2012

F/V *E.S.S. Pursuit*

NOAA Fisheries Service
Northeast Fisheries Science Center
Woods Hole, MA 02543

Scientists sorting a small catch off the Delmarva Peninsula



A plentiful tow of quahogs off the coast of New Jersey

Three southern quahogs (*Mercenaria campechiensis*)

Measuring the catch

RESOURCE SURVEY REPORT
Catch Summary

NOAA Fisheries Service
Northeast Fisheries Science Center

Atlantic Surfclam - Ocean Quahog Survey
Delmarva Peninsula – Long Island
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The 2012 region-wide survey for Atlantic surfclam, *Spisula solidissima*; and ocean quahog, *Arctica islandica,* was conducted in continental shelf waters from Delmarva Peninsula to Long Island aboard the F/V *E.S.S. Pursuit.* The survey, conducted by the Northeast Fisheries Science Center, provides indices of abundance and recruitment for both species.

The following charts and station data describe the distribution of surf clams and ocean quahogs during the survey. Five-minute tows were made at the speed of 3.0 knots, scope of 2:1, and with a commercial style hydraulic dredge equipped with a 13-foot wide cutting blade and a surface supplied manifold positioned on the forward end of the dredge. Survey stations were randomly selected to provide unbiased abundance measurements. Therefore, these stations were not always on or near known locations of clam concentrations.

In this report, catch quantity is recorded in numbers of clams, while depth is recorded in fathoms. Percent estimates of surf clams are also given by four categories of shell height: between 0” to 4.75", 4.76” to 5.00", 5.01” to 5.50", and greater than 5.50". Distribution plots indicate relative numbers of surf clams and ocean quahogs caught on each tow.

The data are now summarized from audited catch files generated from the Fisheries Scientific Computer System (FSCS).

For further information, contact Robert Johnston (508-495-2061), NOAA Fisheries Service, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543. To view this report in PDF, go to the Ecosystems Surveys Branch website at: **http://www.nefsc.noaa.gov/esb** and choose:

- Resource Survey Reports
  - Available RSR
    - Select season and year of interest

Field Notes

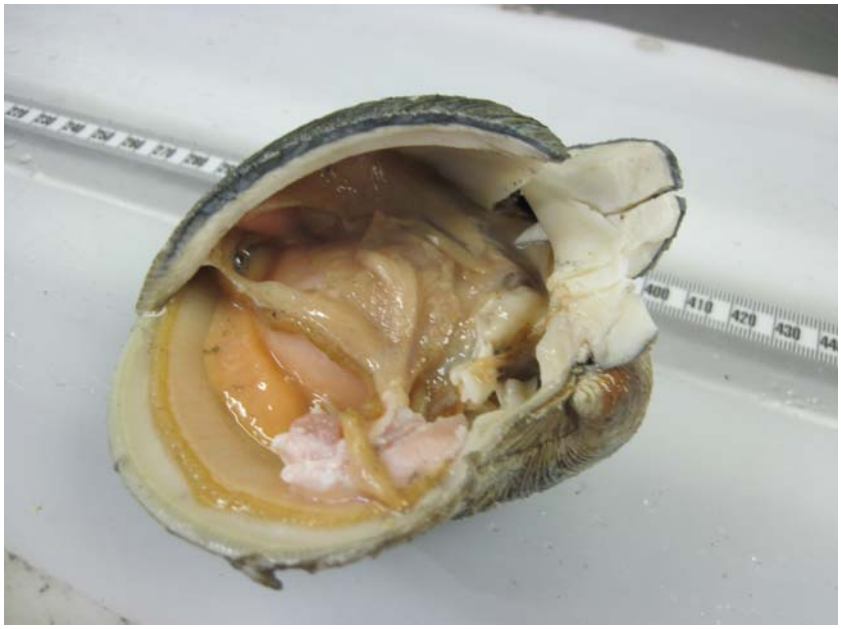
In an effort to share some of the natural history observations made during the clam survey, we have requested that the Chief Scientists on each part of the cruise comment on some of the more interesting catches that were brought aboard the F/V *E.S.S. Pursuit*.

From Clay to Clams

Leg I was initially greeted with extremely low catch rates of both ocean quahogs and Atlantic surf clams. At certain inshore stations, especially off Cape May, almost nothing appeared in the dredge except gigantic blocks of clay, confirming to all those onboard that the seafloor was currently incapable of sustaining any clams in those particular areas. Despite preliminary low numbers, however, catch weights of both quahogs and surf clams improved dramatically once we finished up our southern stations and proceeded to work our way back north towards Long Island on Legs II and III.

Through Thick and Thin

On Leg II's offshore, southern stations, we saw several tows with either one or two clams, just like our previous trip. Occasionally, however, all of these clams were southern quahogs (*Mercenaria campechiensis*). The thickness of these particular shells was astonishing, especially when compared to the clams we find up in more northern waters. Despite a drop of 30 feet into the vessel's sorting hopper, southern quahogs sustained little to no damage, where as ocean quahogs and surf clams – with their thinner shells – often sustained some kind of overall breakage.



A southern quahog that was broken
to illustrate the thick, outer shell

The Little Joys in Life

Leg III was responsible for completing a majority of the clam survey's selectivity tows. These tows, which specifically utilized the starboard dredge on the *E.S.S. Pursuit*, were conducted to capture as many small quahogs and surf clams as possible in areas of high clam concentrations. Ordinarily, such efforts would have been difficult with the large gaps between the bars of standard dredge. Therefore, one of the vessel's two dredges was lined with chicken wire before the survey, allowing for any tiny clams to remain inside the dredge after a tow. With the small clams, however, came several hundreds of pounds of substrate that had to be carefully perused for organisms. Though often time-consuming to complete, these selectivity tows were crucial to obtaining length frequency data for any recently recruited clams.

Personally, I found myself intrigued by the range of substrate in which both quahogs and surf clams occurred. In certain areas, the substrate was entirely shell, while densely compacted sand and/or gravel would often dominate other tows. This constant variation always made the selectivity tows enjoyable, as we never truly knew what exactly we'd be sorting through until the starboard dredge was hauled back onboard the vessel.

Four size ranges of ocean quahogs
from the same selectivity tow

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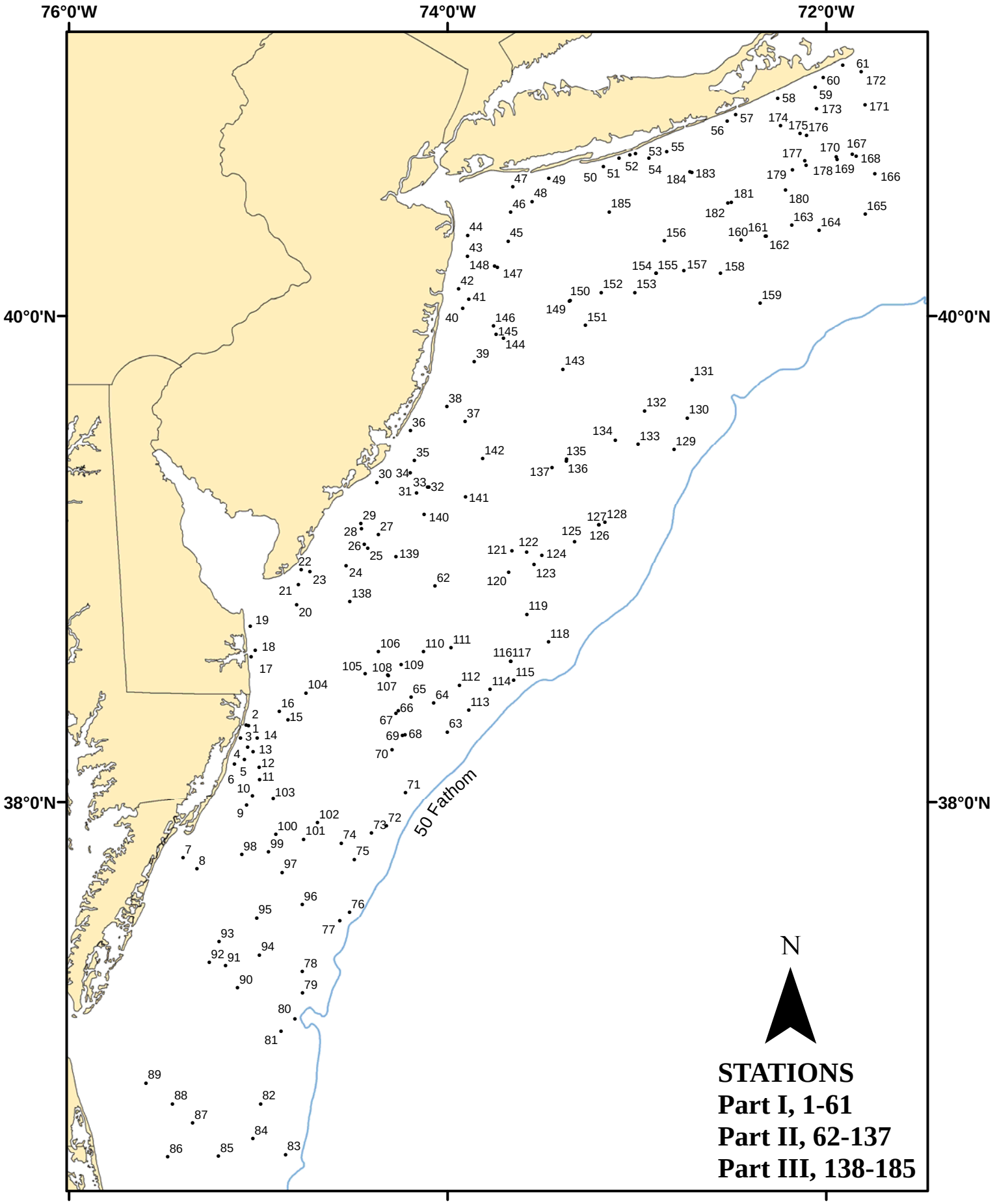

Figure 1. Dredge hauls made from F/V *E.S.S. Pursuit* during NOAA Fisheries Service, Northeast Fisheries Science Center Surfclam/Ocean Quahog survey , 03 August - 19 August 2012

2012 NOAA Fisheries Service Surf Clam -- Ocean Quahog Survey
R/V ESS PURSUIT August 03 - August 19

	Station Data							Surf Clams					Ocean Quahogs
									Percent of Survey Catch				
Survey Stratum	Station Number	Position Latitude	Position Longitude	Loran Time Delays		Heading	Depth (FM)	Catch Number	0-4.74"	4.76-5.00"	5.01-5.50"	>5.50"	Catch Number
05	0082	3643.7	7459.2	X26905.1	Y41268.8	0	14.2	585	97.9	1.5	0.5	0.0	3
05	0083	3630.8	7451.3	X26856.8	Y41153.4	0	21.3	27	100.0	0.0	0.0	0.0	1
05	0084	3634.9	7501.7	X26904.8	Y41170.4	0	13.1	324	96.3	3.1	0.6	0.0	0
05	0085	3630.4	7512.6	X26944.2	Y41096.5	0	14.2	90	98.9	0.0	1.1	0.0	0
05	0086	3630.2	7528.6	X27008.8	Y41055.4	0	14.8	1	100.0	0.0	0.0	0.0	0
05	0087	3638.8	7520.7	X26988.6	Y41167.1	0	13.1	89	100.0	0.0	0.0	0.0	0
05	0088	3643.7	7527.1	X27022.1	Y41206.0	0	12.6	45	100.0	0.0	0.0	0.0	0
05	0089	3649.0	7535.5	X27064.9	Y41246.4	0	8.7	89	100.0	0.0	0.0	0.0	0
09	0090	3713.1	7506.5	X26977.3	Y41570.4	0	17.5	386	92.7	3.6	3.6	0.0	0
09	0091	3718.8	7510.3	X27003.2	Y41626.3	0	15.9	65	93.8	3.1	3.1	0.0	0
09	0092	3719.6	7515.5	X27027.9	Y41626.0	0	13.7	25	100.0	0.0	0.0	0.0	0
09	0093	3724.8	7512.4	X27022.5	Y41689.2	0	10.9	28	96.4	0.0	3.6	0.0	0
09	0094	3721.5	7459.6	X26958.6	Y41674.8	0	21.9	5	100.0	0.0	0.0	0.0	2
09	0095	3730.8	7500.5	X26977.2	Y41775.4	0	15.3	1360	49.6	18.8	22.1	9.6	1
09	0097	3742.3	7452.4	X26956.9	Y41914.4	0	15.3	1535	72.0	14.0	9.8	4.2	0
09	0098	3746.8	7505.2	X27026.4	Y41945.9	0	13.7	11	90.9	0.0	9.1	0.0	0
09	0099	3747.4	7456.7	X26986.2	Y41964.5	0	15.9	65	76.9	12.3	9.2	1.5	0
10	0078	3717.2	7446.0	X26889.9	Y41652.3	0	27.3	90	98.9	1.1	0.0	0.0	15
10	0081	3702.1	7452.8	X26900.7	Y41477.9	0	27.3	1	100.0	0.0	0.0	0.0	13
10	0096	3734.3	7446.0	X26913.8	Y41836.8	0	24.1	306	87.3	5.2	6.5	1.0	1
11	0076	3732.3	7431.0	X26838.9	Y41839.1	0	35.0	0	0.0	0.0	0.0	0.0	134
11	0077	3730.1	7434.1	X26851.0	Y41810.7	0	33.9	0	0.0	0.0	0.0	0.0	30
11	0079	3711.9	7445.9	X26882.5	Y41595.9	0	34.4	8	100.0	0.0	0.0	0.0	69
11	0080	3705.3	7448.3	X26884.8	Y41520.9	0	32.8	1	100.0	0.0	0.0	0.0	70
13	0100	3751.9	7454.4	X26982.5	Y42017.5	0	15.9	21	85.7	0.0	14.3	0.0	0
13	0101	3750.7	7445.5	X26936.4	Y42016.3	0	20.8	2	50.0	50.0	0.0	0.0	0
13	0102	3754.8	7441.2	X26921.4	Y42066.8	0	21.9	4	25.0	0.0	25.0	50.0	1
13	0103	3800.9	7455.2	X27002.3	Y42116.4	0	13.7	3	100.0	0.0	0.0	0.0	0
13	0104	3827.2	7444.8	X26997.1	Y42419.7	0	15.3	9	88.9	0.0	11.1	0.0	1
14	0066	3822.7	7415.6	X26829.2	Y42396.5	0	26.8	1	100.0	0.0	0.0	0.0	2416
14	0067	3822.1	7416.3	X26832.2	Y42389.5	0	25.7	56	80.4	14.3	3.6	1.8	361
14	0068	3816.8	7413.4	X26808.5	Y42335.6	0	29.0	293	91.8	6.8	1.4	0.0	339
14	0069	3816.6	7414.3	X26813.2	Y42332.6	0	27.3	341	91.2	6.7	2.1	0.0	260
14	0070	3813.0	7417.5	X26825.3	Y42291.0	0	28.4	987	85.4	10.3	4.0	0.3	144
14	0074	3749.7	7433.6	X26875.4	Y42021.6	0	29.0	0	0.0	0.0	0.0	0.0	692
15	0063	3817.5	7400.0	X26736.0	Y42355.7	0	37.2	0	0.0	0.0	0.0	0.0	32
15	0071	3802.2	7413.3	X26788.2	Y42180.8	0	34.4	10	90.0	10.0	0.0	0.0	459
15	0072	3753.9	7419.3	X26808.6	Y42085.5	0	36.6	1	100.0	0.0	0.0	0.0	298
15	0073	3752.2	7424.1	X26830.9	Y42061.1	0	32.8	0	0.0	0.0	0.0	0.0	574
15	0075	3745.6	7429.5	X26849.1	Y41983.2	0	32.3	0	0.0	0.0	0.0	0.0	1956
17	0105	3831.9	7426.1	X26902.6	Y42486.9	0	23.0	1	100.0	0.0	0.0	0.0	76
17	0106	3837.5	7421.8	X26888.0	Y42550.8	0	20.8	1	0.0	0.0	100.0	0.0	355
17	0107	3831.6	7418.9	X26861.6	Y42489.2	0	24.6	0	0.0	0.0	0.0	0.0	2585
* 17	0108	3831.4	7418.7	X26860.1	Y42487.2	0	24.6	0	0.0	0.0	0.0	0.0	705
17	0109	3834.3	7414.7	X26842.2	Y42521.4	0	25.2	0	0.0	0.0	0.0	0.0	610
17	0138	3849.8	7430.9	X26963.5	Y42679.0	0	10.4	632	2.5	0.0	3.8	93.7	0
18	0064	3824.6	7404.3	X26769.1	Y42426.5	0	31.7	0	0.0	0.0	0.0	0.0	1855

2012 NOAA Fisheries Service Surf Clam -- Ocean Quahog Survey
R/V ESS PURSUIT August 03 - August 19

	Station Data							Surf Clams					Ocean Quahogs
									Percent of Survey Catch				
Survey Stratum	Station Number	Position Latitude	Position Longitude	Loran Time Delays		Heading	Depth (FM)	Catch Number	0-4.74"	4.76-5.00"	5.01-5.50"	>5.50"	Catch Number
18	0065	3826.1	7411.5	X26811.5	Y42436.3	0	26.8	441	89.1	5.9	4.8	0.2	726
18	0110	3837.5	7407.6	X26806.4	Y42560.5	0	27.9	0	0.0	0.0	0.0	0.0	1950
18	0111	3838.4	7358.8	X26756.6	Y42575.8	0	26.2	0	0.0	0.0	0.0	0.0	2478
19	0112	3829.1	7356.2	X26729.2	Y42480.2	0	27.3	8	100.0	0.0	0.0	0.0	498
19	0113	3822.9	7353.3	X26705.2	Y42418.0	0	35.0	0	0.0	0.0	0.0	0.0	600
19	0114	3828.1	7346.5	X26672.7	Y42477.3	0	35.5	0	0.0	0.0	0.0	0.0	510
19	0115	3830.3	7339.0	X26632.1	Y42505.4	0	36.6	0	0.0	0.0	0.0	0.0	147
19	0116	3835.1	7339.9	X26642.3	Y42553.8	0	34.4	0	0.0	0.0	0.0	0.0	1240
* 19	0117	3835.1	7340.0	X26642.9	Y42553.7	0	33.9	1	100.0	0.0	0.0	0.0	178
21	0062	3853.7	7403.9	X26810.2	Y42734.3	0	20.8	5	20.0	20.0	20.0	40.0	1434
21	0121	3902.5	7339.6	X26673.1	Y42834.4	0	23.5	163	90.8	3.7	4.9	0.6	212
21	0135	3925.0	7322.2	X26588.5	Y43062.7	0	23.0	170	84.1	4.1	8.2	3.5	1308
* 21	0136	3924.6	7322.3	X26588.7	Y43058.7	0	23.5	0	0.0	0.0	0.0	0.0	668
21	0137	3923.0	7326.8	X26616.9	Y43043.1	0	21.3	840	50.0	16.2	26.2	7.6	336
21	0139	3901.0	7416.3	X26898.5	Y42807.3	0	13.7	316	16.5	5.1	19.0	59.5	1
21	0140	3911.4	7407.4	X26863.1	Y42921.1	0	12.6	440	18.6	9.5	27.7	44.1	5
21	0141	3915.7	7354.3	X26787.1	Y42968.2	0	17.5	604	22.5	9.9	26.5	41.1	1
21	0142	3925.1	7348.8	X26767.4	Y43065.9	0	15.9	510	17.6	11.4	25.9	45.1	0
21	0144	3954.6	7342.2	X26777.3	Y43365.3	0	18.0	1002	22.2	13.8	16.2	47.9	100
22	0120	3857.1	7340.6	X26672.3	Y42778.8	0	25.2	194	96.9	3.1	0.0	0.0	430
22	0122	3902.2	7334.9	X26643.1	Y42832.5	0	28.4	10	90.0	0.0	10.0	0.0	98
22	0123	3859.0	7332.5	X26624.2	Y42800.7	0	26.8	137	90.5	4.4	5.1	0.0	810
22	0124	3901.3	7330.0	X26611.2	Y42824.6	0	27.3	0	0.0	0.0	0.0	0.0	1086
23	0118	3839.9	7327.9	X26576.5	Y42609.7	0	37.7	0	0.0	0.0	0.0	0.0	190
23	0119	3846.7	7334.8	X26624.5	Y42674.9	0	30.1	0	0.0	0.0	0.0	0.0	1096
23	0125	3904.7	7319.7	X26549.5	Y42861.0	0	32.3	0	0.0	0.0	0.0	0.0	1595
23	0126	3908.9	7311.9	X26503.3	Y42903.7	0	36.1	0	0.0	0.0	0.0	0.0	4606
* 23	0127	3908.9	7312.0	X26503.9	Y42903.7	0	36.1	0	0.0	0.0	0.0	0.0	386
23	0128	3909.5	7310.0	X26491.5	Y42909.8	0	34.4	0	0.0	0.0	0.0	0.0	1570
25	0143	3947.0	7323.4	X26627.8	Y43280.6	0	19.7	1660	46.1	16.3	27.1	10.5	260
25	0145	3955.5	7344.6	X26796.6	Y43375.7	0	15.9	975	6.2	6.7	16.4	70.8	3
25	0146	3957.5	7345.4	X26806.7	Y43396.4	0	15.3	960	13.3	10.4	18.3	57.9	0
25	0149	4003.5	7321.4	X26640.6	Y43440.6	0	22.4	248	91.1	5.2	3.2	0.4	1172
* 25	0150	4003.8	7321.1	X26638.9	Y43443.3	0	21.9	137	89.8	3.6	5.1	1.5	273
26	0134	3929.6	7306.8	X26488.6	Y43105.5	0	26.8	1	0.0	100.0	0.0	0.0	873
26	0147	4012.2	7345.0	X26836.9	Y43543.8	0	33.4	7	57.1	0.0	14.3	28.6	0
26	0148	4011.8	7344.1	X26829.2	Y43539.1	0	35.0	1	0.0	100.0	0.0	0.0	0
27	0129	3927.4	7248.2	X26359.4	Y43080.9	0	38.3	0	0.0	0.0	0.0	0.0	786
27	0130	3935.1	7244.0	X26334.9	Y43152.0	0	36.6	0	0.0	0.0	0.0	0.0	508
27	0132	3936.8	7257.5	X26430.8	Y43172.2	0	33.4	0	0.0	0.0	0.0	0.0	64
27	0133	3928.7	7259.6	X26438.3	Y43095.4	0	32.8	0	0.0	0.0	0.0	0.0	1060
27	0151	3957.7	7316.2	X26591.9	Y43381.2	0	0.0	0	0.0	0.0	0.0	0.0	3
29	0152	4005.7	7311.2	X26567.1	Y43454.4	0	21.3	98	84.7	9.2	6.1	0.0	1108
29	0155	4010.3	7253.8	X26440.2	Y43484.0	0	26.8	1	100.0	0.0	0.0	0.0	4249
29	0181	4027.6	7230.0	X26272.9	Y43616.3	0	24.1	1	100.0	0.0	0.0	0.0	1173
* 29	0182	4027.5	7231.1	X26281.7	Y43616.5	0	24.1	16	100.0	0.0	0.0	0.0	686
29	0183	4034.7	7242.5	X26385.5	Y43691.9	0	20.2	0	0.0	0.0	0.0	0.0	1352

2012 NOAA Fisheries Service Surf Clam -- Ocean Quahog Survey
R/V ESS PURSUIT August 03 - August 19

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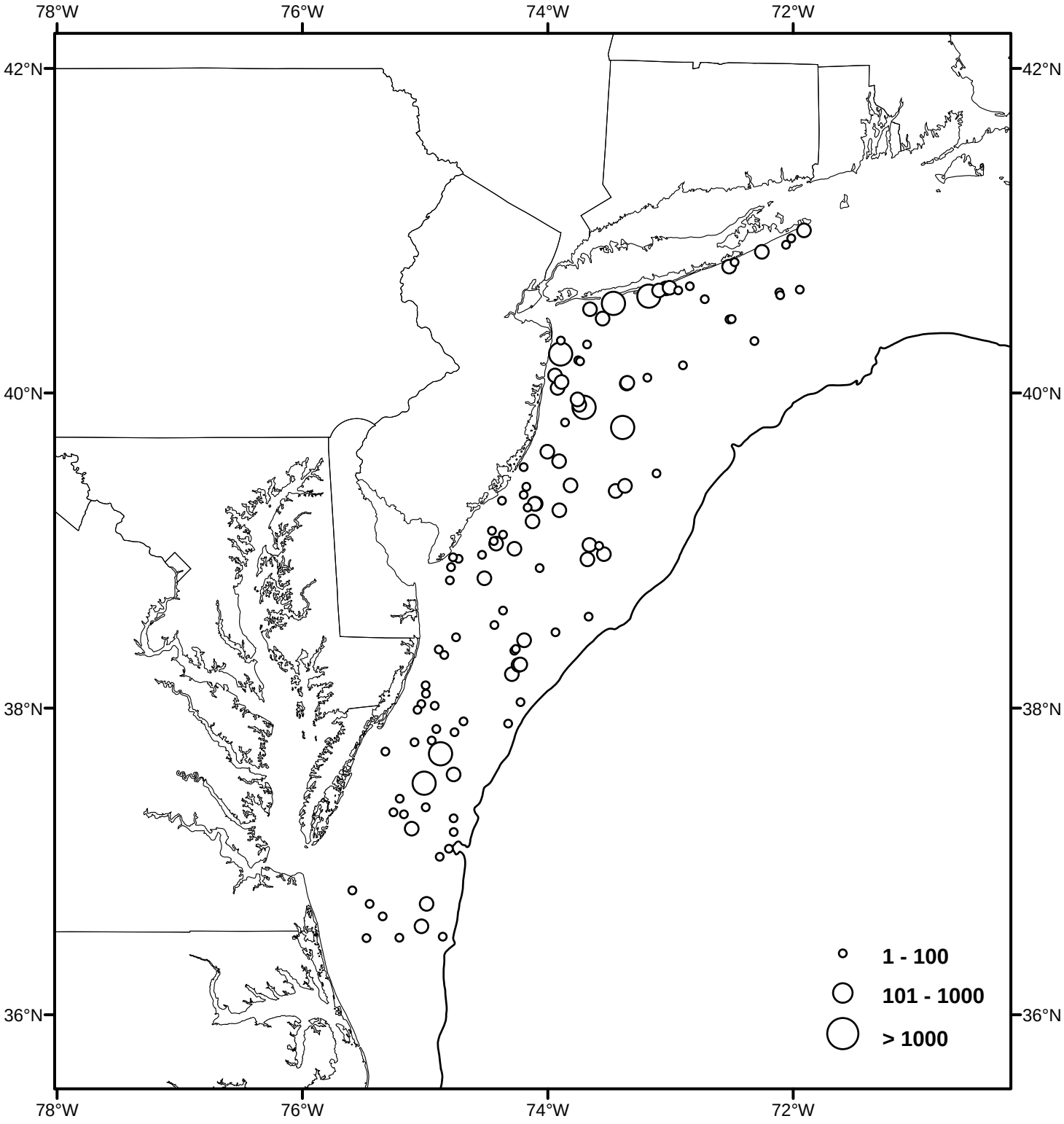
									Percent of Survey Catch				
Survey Stratum	Station Number	Position Latitude	Position Longitude	Loran Time Delays		Heading	Depth (FM)	Catch Number	0-4.74"	4.76-5.00"	5.01-5.50"	>5.50"	Catch Number
* 29	0184	4035.0	7243.1	X26391.0	Y43695.2	0	19.7	3	100.0	0.0	0.0	0.0	578
29	0185	4025.3	7308.7	X26582.1	Y43636.3	0	18.6	0	0.0	0.0	0.0	0.0	732
30	0153	4005.7	7300.6	X26486.3	Y43446.6	0	25.2	0	0.0	0.0	0.0	0.0	6409
30	0154	4010.3	7253.8	X26440.2	Y43484.0	0	26.8	0	0.0	0.0	0.0	0.0	1770
30	0156	4018.3	7251.2	X26431.0	Y43554.8	0	25.2	0	0.0	0.0	0.0	0.0	1129
30	0157	4011.0	7245.0	X26372.8	Y43483.2	0	29.0	0	0.0	0.0	0.0	0.0	3054
30	0160	4018.4	7226.9	X26238.2	Y43533.2	0	27.9	0	0.0	0.0	0.0	0.0	1296
31	0131	3944.5	7242.4	X26329.4	Y43238.7	0	36.6	0	0.0	0.0	0.0	0.0	432
31	0158	4010.3	7233.4	X26281.9	Y43467.4	0	32.8	0	0.0	0.0	0.0	0.0	9320
31	0159	4003.1	7220.9	X26181.2	Y43394.2	0	38.3	0	0.0	0.0	0.0	0.0	10
31	0161	4019.5	7219.2	X26177.9	Y43535.6	0	30.1	0	0.0	0.0	0.0	0.0	372
* 31	0162	4019.4	7218.9	X26175.5	Y43534.5	0	30.1	12	100.0	0.0	0.0	0.0	657
31	0163	4022.0	7210.8	X26112.7	Y43549.0	0	34.4	0	0.0	0.0	0.0	0.0	1816
33	0172	4059.0	7148.8	X25963.8	Y43822.5	0	17.0	0	0.0	0.0	0.0	0.0	0
33	0173	4050.2	7203.0	X26074.8	Y43772.5	0	20.8	0	0.0	0.0	0.0	0.0	206
33	0174	4046.0	7214.4	X26166.7	Y43753.2	0	23.0	0	0.0	0.0	0.0	0.0	4180
33	0175	4044.1	7208.2	X26111.4	Y43729.9	0	23.5	0	0.0	0.0	0.0	0.0	1724
33	0176	4043.7	7206.1	X26093.0	Y43724.1	0	24.1	0	0.0	0.0	0.0	0.0	434
34	0167	4038.7	7150.4	X25956.2	Y43665.2	0	29.5	0	0.0	0.0	0.0	0.0	1120
34	0168	4039.2	7151.7	X25967.4	Y43670.6	0	30.1	0	0.0	0.0	0.0	0.0	8808
34	0169	4037.9	7156.4	X26005.7	Y43665.5	0	27.3	0	0.0	0.0	0.0	0.0	1485
* 34	0170	4038.5	7156.7	X26008.7	Y43670.7	0	27.3	11	81.8	9.1	9.1	0.0	433
34	0171	4051.0	7147.6	X25943.0	Y43758.9	0	24.6	0	0.0	0.0	0.0	0.0	2538
34	0177	4036.5	7206.3	X26087.1	Y43665.4	0	27.9	1	100.0	0.0	0.0	0.0	716
* 34	0178	4037.5	7206.7	X26091.4	Y43674.1	0	27.3	2	100.0	0.0	0.0	0.0	192
34	0179	4035.4	7210.6	X26121.8	Y43661.2	0	27.3	0	0.0	0.0	0.0	0.0	1450
35	0164	4020.8	7202.2	X26043.5	Y43530.9	0	33.9	0	0.0	0.0	0.0	0.0	4296
35	0165	4024.7	7147.5	X25927.5	Y43549.2	0	38.3	0	0.0	0.0	0.0	0.0	81
35	0166	4034.4	7144.5	X25905.2	Y43624.3	0	36.1	0	0.0	0.0	0.0	0.0	62
35	0180	4030.5	7212.8	X26135.3	Y43622.7	0	29.5	0	0.0	0.0	0.0	0.0	9053
84	0007	3746.0	7523.8	X27113.5	Y41910.7	0	6.0	0	0.0	0.0	0.0	0.0	0
84	0008	3743.2	7519.4	X27087.4	Y41885.1	0	9.8	2	100.0	0.0	0.0	0.0	0
84	0009	3759.3	7503.7	X27041.9	Y42088.0	0	10.4	2	100.0	0.0	0.0	0.0	0
85	0001	3819.2	7503.8	X27081.8	Y42312.2	0	5.5	0	0.0	0.0	0.0	0.0	0
85	0002	3819.0	7503.0	X27077.2	Y42310.7	0	7.1	0	0.0	0.0	0.0	0.0	0
85	0003	3816.0	7505.6	X27084.4	Y42274.1	0	6.0	0	0.0	0.0	0.0	0.0	0
85	0004	3813.7	7503.3	X27067.9	Y42250.6	0	7.7	0	0.0	0.0	0.0	0.0	0
85	0005	3810.7	7504.4	X27067.5	Y42215.5	0	9.8	0	0.0	0.0	0.0	0.0	0
85	0006	3809.5	7507.5	X27080.8	Y42198.5	0	8.2	0	0.0	0.0	0.0	0.0	0
85	0010	3801.5	7501.8	X27036.5	Y42115.0	0	4.9	69	100.0	0.0	0.0	0.0	0
85	0011	3805.5	7459.5	X27032.5	Y42162.6	0	10.9	9	100.0	0.0	0.0	0.0	0
85	0012	3808.7	7459.7	X27039.6	Y42198.3	0	10.4	1	100.0	0.0	0.0	0.0	0
85	0013	3812.5	7501.6	X27056.8	Y42238.9	0	7.7	0	0.0	0.0	0.0	0.0	0
85	0014	3816.0	7500.3	X27057.1	Y42279.7	0	9.8	0	0.0	0.0	0.0	0.0	0
85	0015	3820.4	7450.6	X27015.0	Y42338.7	0	9.3	2	50.0	0.0	50.0	0.0	0
85	0016	3822.5	7453.3	X27033.4	Y42359.6	0	10.9	4	100.0	0.0	0.0	0.0	0
86	0017	3836.1	7502.2	X27110.1	Y42505.0	0	6.0	0	0.0	0.0	0.0	0.0	0

2012 NOAA Fisheries Service Surf Clam -- Ocean Quahog Survey
R/V ESS PURSUIT August 03 - August 19

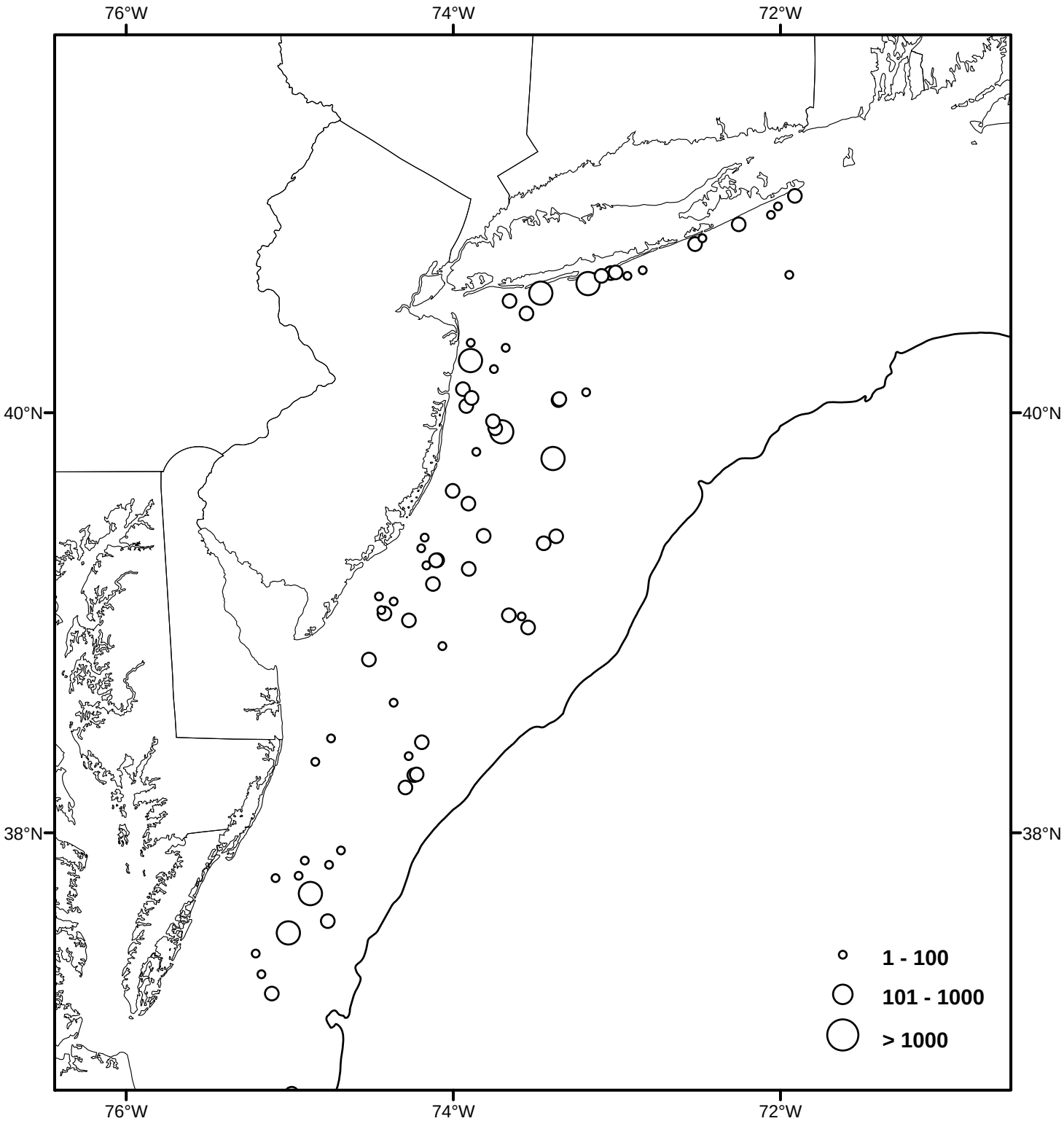
	Station Data							Surf Clams					Ocean Quahogs
		Position		Loran					Percent of Survey Catch				
Survey Stratum	Station Number	Latitude	Longitude	Time	Delays	Heading	Depth (FM)	Catch Number	0-4.74"	4.76-5.00"	5.01-5.50"	>5.50"	Catch Number
86	0018	3837.8	7500.9	X27106.9	Y42525.3	0	6.6	0	0.0	0.0	0.0	0.0	0
86	0019	3843.8	7502.5	X27129.5	Y42592.1	0	4.4	0	0.0	0.0	0.0	0.0	0
87	0020	3849.0	7447.8	X27059.2	Y42660.4	0	8.2	13	0.0	0.0	0.0	0.0	0
87	0021	3854.1	7447.3	X27067.9	Y42717.7	0	6.6	7	0.0	0.0	0.0	0.0	0
87	0022	3857.8	7446.3	X27070.7	Y42759.5	0	4.4	1	0.0	0.0	0.0	0.0	0
87	0023	3857.2	7443.6	X27053.6	Y42754.2	0	5.5	24	0.0	0.0	0.0	0.0	0
87	0024	3858.7	7432.1	X26989.1	Y42776.0	0	7.7	2	0.0	0.0	0.0	0.0	0
87	0025	3903.0	7425.2	X26956.7	Y42825.8	0	12.6	608	3.3	4.6	15.8	76.3	0
87	0026	3904.0	7426.4	X26966.0	Y42836.3	0	8.7	21	4.8	0.0	9.5	85.7	0
87	0027	3906.4	7421.9	X26943.6	Y42863.8	0	12.6	15	33.3	0.0	20.0	46.7	0
87	0028	3907.9	7427.2	X26979.3	Y42878.6	0	10.9	2	0.0	0.0	50.0	50.0	0
87	0029	3909.1	7427.4	X26983.2	Y42891.6	0	9.8	0	0.0	0.0	0.0	0.0	0
88	0030	3919.3	7422.3	X26974.0	Y43003.5	0	4.9	3	100.0	0.0	0.0	0.0	0
88	0031	3916.7	7409.8	X26888.8	Y42977.1	0	14.8	36	13.9	2.8	11.1	72.2	0
88	0032	3918.2	7405.9	X26866.7	Y42993.4	0	13.1	740	13.4	7.0	14.5	65.1	0
* 88	0033	3918.1	7406.3	X26869.1	Y42992.3	0	12.6	118	33.9	4.2	6.8	55.1	0
88	0034	3921.6	7411.7	X26911.1	Y43029.2	0	8.7	17	23.5	11.8	11.8	52.9	1
88	0035	3924.6	7410.4	X26909.0	Y43061.2	0	8.7	18	22.2	11.1	5.6	61.1	0
88	0036	3932.0	7411.7	X26933.7	Y43140.1	0	8.7	4	100.0	0.0	0.0	0.0	0
88	0037	3934.2	7354.4	X26822.1	Y43160.8	0	13.1	287	23.3	5.9	24.4	46.3	0
89	0038	3937.8	7400.2	X26869.0	Y43199.5	0	11.5	306	16.3	2.6	11.1	69.9	0
89	0039	3948.9	7351.5	X26832.1	Y43311.7	0	13.7	39	12.8	2.6	25.6	59.0	0
89	0040	4001.8	7355.2	X26887.9	Y43445.8	0	9.8	966	34.8	6.8	9.8	48.6	0
89	0041	4004.1	7353.2	X26878.8	Y43468.0	0	11.5	364	19.2	5.5	3.3	72.0	0
89	0042	4006.5	7356.4	X26908.2	Y43494.6	0	8.7	704	19.3	2.8	3.4	74.4	0
90	0043	4014.6	7353.7	X26908.5	Y43574.9	0	10.4	1044	22.4	4.0	7.5	66.1	0
90	0044	4019.6	7353.5	X26920.0	Y43625.1	0	10.4	17	94.1	0.0	0.0	5.9	0
90	0045	4018.2	7340.7	X26818.4	Y43599.6	0	12.6	2	50.0	0.0	0.0	50.0	240
91	0046	4025.2	7339.9	X26829.2	Y43667.5	0	12.0	0	0.0	0.0	0.0	0.0	4
91	0047	4031.3	7339.3	X26839.9	Y43726.1	0	8.2	844	17.5	8.5	29.9	44.1	0
91	0048	4027.8	7333.1	X26782.0	Y43685.6	0	12.0	624	9.6	3.2	14.7	72.4	69
91	0049	4033.4	7327.8	X26753.2	Y43733.1	0	7.7	1240	0.0	0.0	16.9	83.1	0
92	0050	4036.1	7310.5	X26618.8	Y43737.7	0	10.4	1112	5.0	2.2	12.9	79.9	0
92	0051	4038.3	7305.6	X26583.2	Y43751.7	0	7.1	322	11.2	3.1	18.6	67.1	0
92	0052	4039.0	7302.2	X26556.6	Y43753.8	0	6.6	430	17.7	5.6	23.3	53.5	0
* 92	0053	4039.2	7300.4	X26542.1	Y43753.3	0	8.7	183	20.8	1.6	10.4	67.2	0
92	0054	4038.3	7256.1	X26504.6	Y43740.0	0	13.7	65	21.5	12.3	33.8	32.3	284
92	0055	4039.8	7250.5	X26461.0	Y43746.3	0	14.8	2	50.0	0.0	50.0	0.0	1782
92	0056	4047.1	7231.3	X26312.4	Y43784.4	0	11.5	368	9.8	9.8	25.0	55.4	15
92	0057	4048.8	7228.6	X26292.4	Y43795.0	0	10.9	11	9.1	0.0	9.1	81.8	4
93	0058	4052.6	7215.3	X26184.6	Y43808.3	0	12.6	960	4.4	5.6	18.1	71.9	144
93	0059	4055.2	7203.4	X26085.6	Y43812.9	0	14.8	19	47.4	0.0	26.3	26.3	4968
93	0060	4057.6	7200.9	X26067.7	Y43828.3	0	12.6	35	71.4	8.6	8.6	11.4	448
93	0061	4100.5	7154.6	X26017.2	Y43842.1	0	9.3	548	13.9	5.1	24.8	56.2	2

* non-random station

NEFSC SURFCLAM AND OCEAN QUAHOG SURVEY 2012
NOAA Fisheries Service
SURF CLAMS - Number/Tow
Total Number



NEFSC SURFCLAM AND OCEAN QUAHOG SURVEY 2012
NOAA Fisheries Service
SURF CLAMS - Number/Tow
Greater Than 5 Inches



NEFSC SURFCLAM AND OCEAN QUAHOG SURVEY 2012
NOAA Fisheries Service
OCEAN QUAHOGS - Number/Tow
Total Numbers