

RESOURCE SURVEY REPORT

Catch Summary

NOAA National Marine Fisheries
Service Northeast Fisheries
Science Center Sea Scallop Survey
Mid-Atlantic Bight - Georges Bank

15 May – 13 June 2019

Submitted to: NOAA, NEFSC

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Resource Survey Report

Sea Scallop Survey

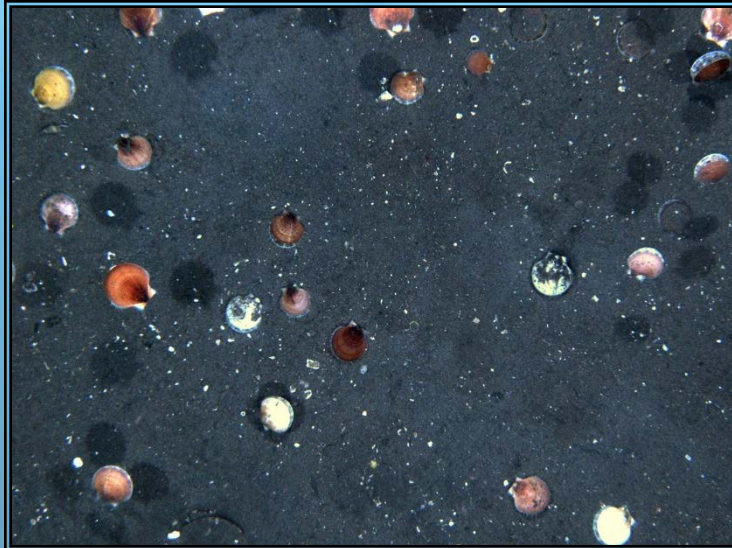
Mid-Atlantic Bight – Georges Bank

15 May – 13 June 2019

UNOLS R/V *Hugh R. Sharp*



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



Swimming sea scallops (*Placopecten magellanicus*) in a HabCam V4 image. Note the presence of round, dark shadows, which are created from the vehicle's four strobes and distinctly illustrate that some scallops are up in the water column.



A large tow of sea scallops from Station 119 on southern Georges Bank.

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Catch Summary

NOAA National Marine Fisheries Service
Northeast Fisheries Science Center

Sea Scallop Survey

Mid-Atlantic Bight - Georges Bank
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The following charts and station data indicate the distribution of sea scallops during the 2019 Sea Scallop Survey conducted aboard the UNOLS R/V *Hugh R. Sharp*. Additionally, the included appendix describes a sampling system on the scallop cruise where the Northeast Fisheries Science Center, in collaboration with the Woods Hole Oceanographic Institution, deployed a fiber-optic towed vehicle fitted with stereo cameras in proximity to standard dredge hauls for the entire survey area. For the dredging portion of the survey, fifteen-minute tows were made at a speed of 3.8 knots using a modified 8-foot, New Bedford type scallop dredge. The dredge was equipped with a 5/8 inch, 69-link-long, case-hardened sweep chain and a 2-inch ring chain bag lined with 1-1/2 inch mesh webbing to retain small scallops. The dredge frame was outfitted with a set of roller wheels on the neck. In six key rocky strata on Georges Bank, a set of rock chains was added to the dredge. For statistical purposes, stations were randomly selected and, therefore, were not always on or near scallop concentrations.

In this report, data are summarized from audited catch files generated from the Fisheries Scientific Computer System. Scallop catch is reported in numbers, bycatch is recorded in liters, and depth in fathoms. Catches are reported in three categories of shell height: less than 90 mm (greater than 40 count), greater than 90 mm (less than 40 count), and greater than or equal to 100 mm (less than 30 count). The percent composition of bycatch is also included. For further information, contact:

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- Resource Surveys Reports
- Sea Scallop Survey RSRs
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Appendix 1

The Northeast Fisheries Science Center collaborated with the Woods Hole Oceanographic Institution to integrate a stereo-optic towed vehicle (HabCam V4), which was designed to collect paired images of the sea floor for the purpose of enumerating sea scallops and other commercially important groundfish (yellowtail flounder, winter flounder, skates, etc.).

During the three survey legs, HabCam V4 was deployed throughout the scallop strata. Dredge tows would often be conducted in one direction through an area and then, after turning the vessel around, a HabCam V4 transect would be conducted through the same area. HabCam V4 imaged along a cruise track of approximately 1,319 nm in the Mid-Atlantic Bight and about 286 nm throughout part of Georges Bank. In total, roughly 2,585,168 image pairs were acquired from both the Mid-Atlantic Bight and Georges Bank.

Field Notes

In an effort to share any unique insights and observations made during the scallop survey, we have requested that certain Chief Scientists comment on any interesting events that occurred during their leg of the survey.

Leg III: HabCam Loss and Recovery

Leg III of the Scallop survey began by deploying HabCam in the Great South Channel. After about three hours of completing transects, the vehicle encountered a 25-foot-tall boulder, which caused the weak link on the vehicle to break, as designed. Recovery plans were immediately discussed and, in less than 24 hours, a plan was in place. While a commercial dive recovery team strategized from shore, scientists aboard the ship continued survey operations by completing all dredge stations on the northern edge of Georges Bank, as well as the remaining dredges in the Great South Channel (45 stations total).

Upon successful retrieval of the HabCam, scientists performed an initial damage check and minor repairs were made before redeploying the vehicle. Approximately two hours after the redeployment, communication to the vehicle was once again lost. Troubleshooting of the vehicle revealed a dead power supply inside the main electronics bottle, which forced the *Sharp* back into port so repairs on the vehicle could be made. With about 24 hours of survey time left, the plan was to head back out to complete HabCam coverage in the Great South Channel. However, bad weather prevented the ship from leaving port again.

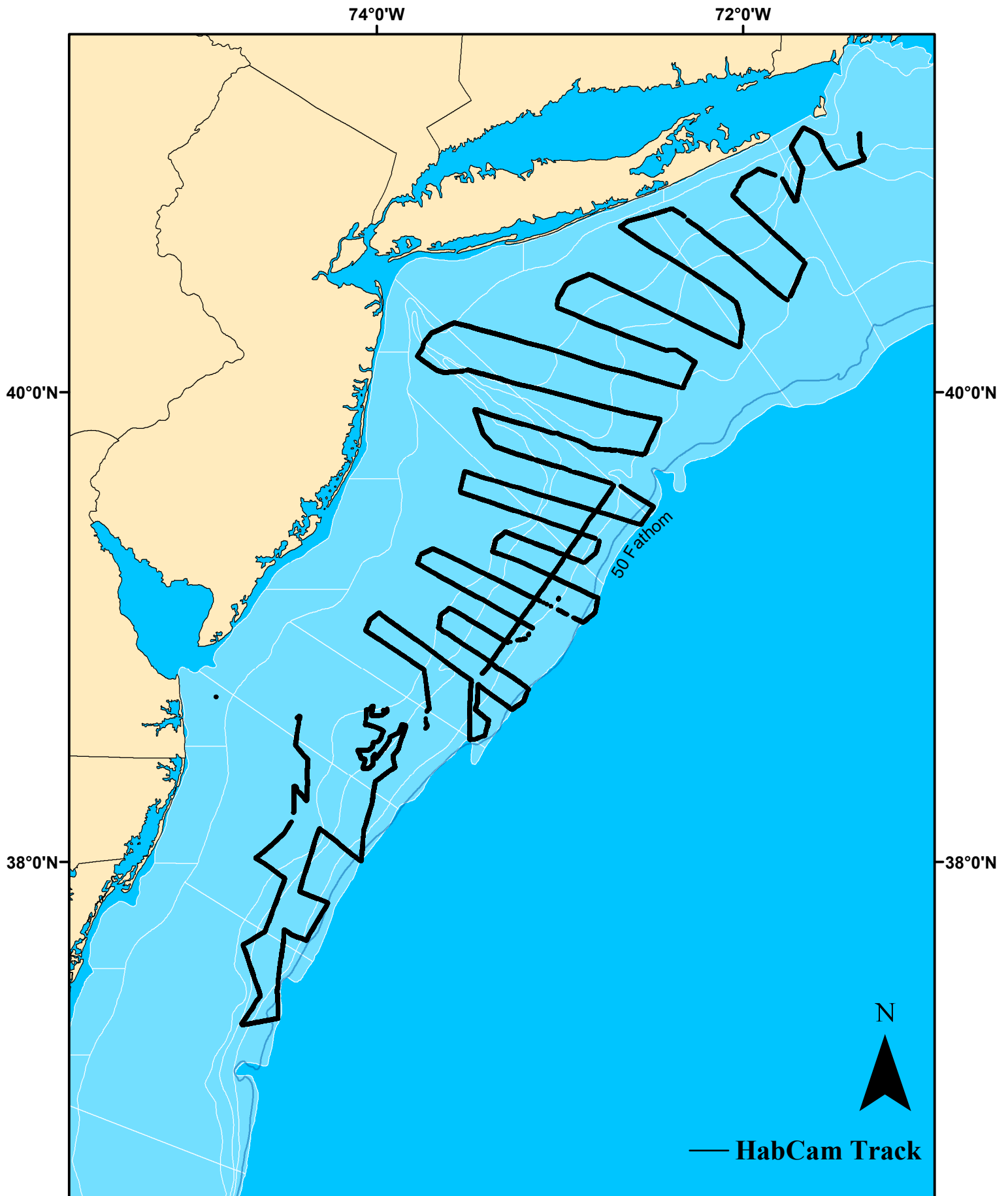


Figure 1. Approximate HabCam Mid-Atlantic Bight cruise track, as followed by UNOLS R/V *Hugh R. Sharp*, during NOAA Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019.

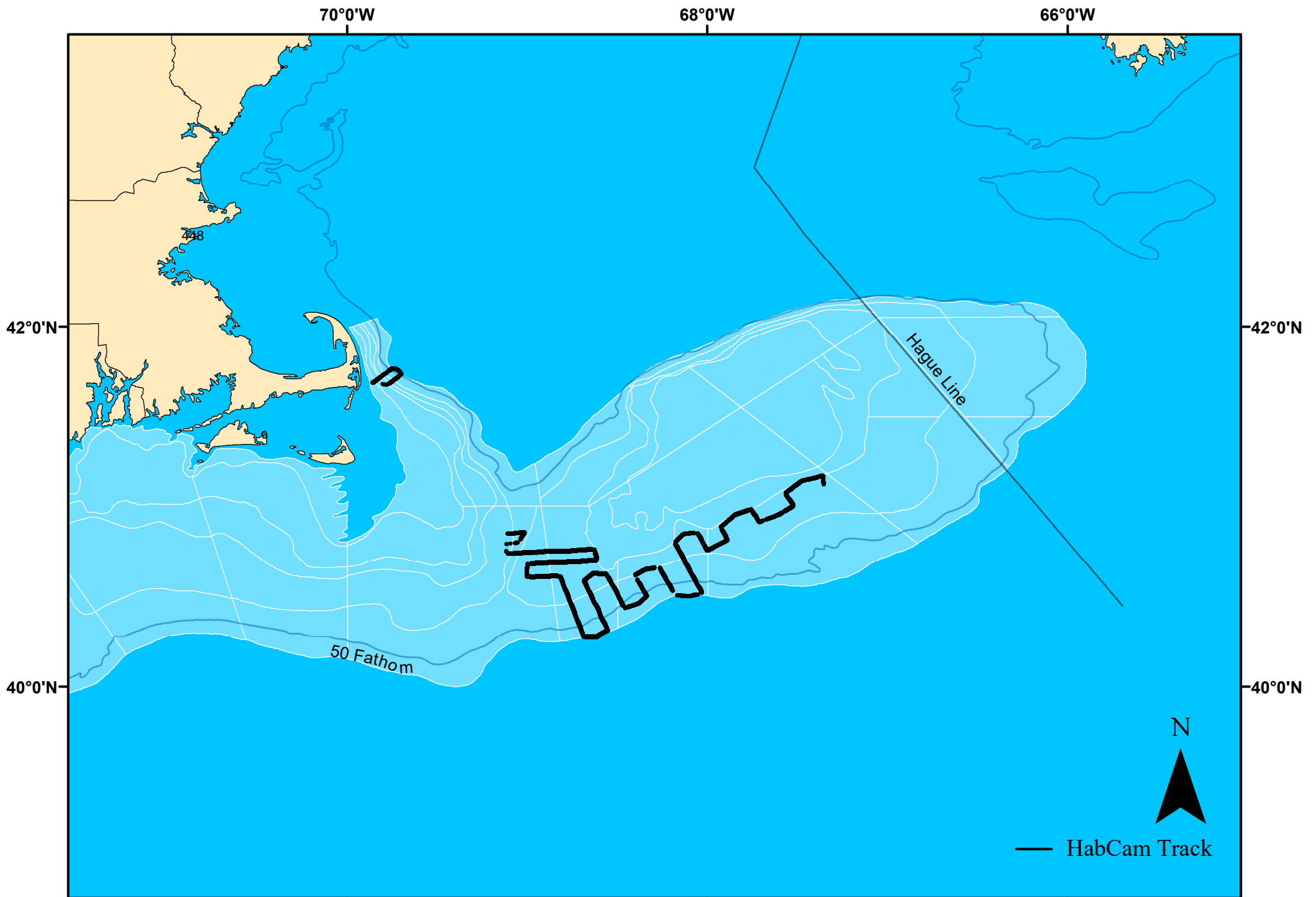


Figure 2. Approximate Georges Bank NOAA HabCam cruise track, as followed by UNOLS R/V *Hugh R. Sharp*, during NOAA Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019

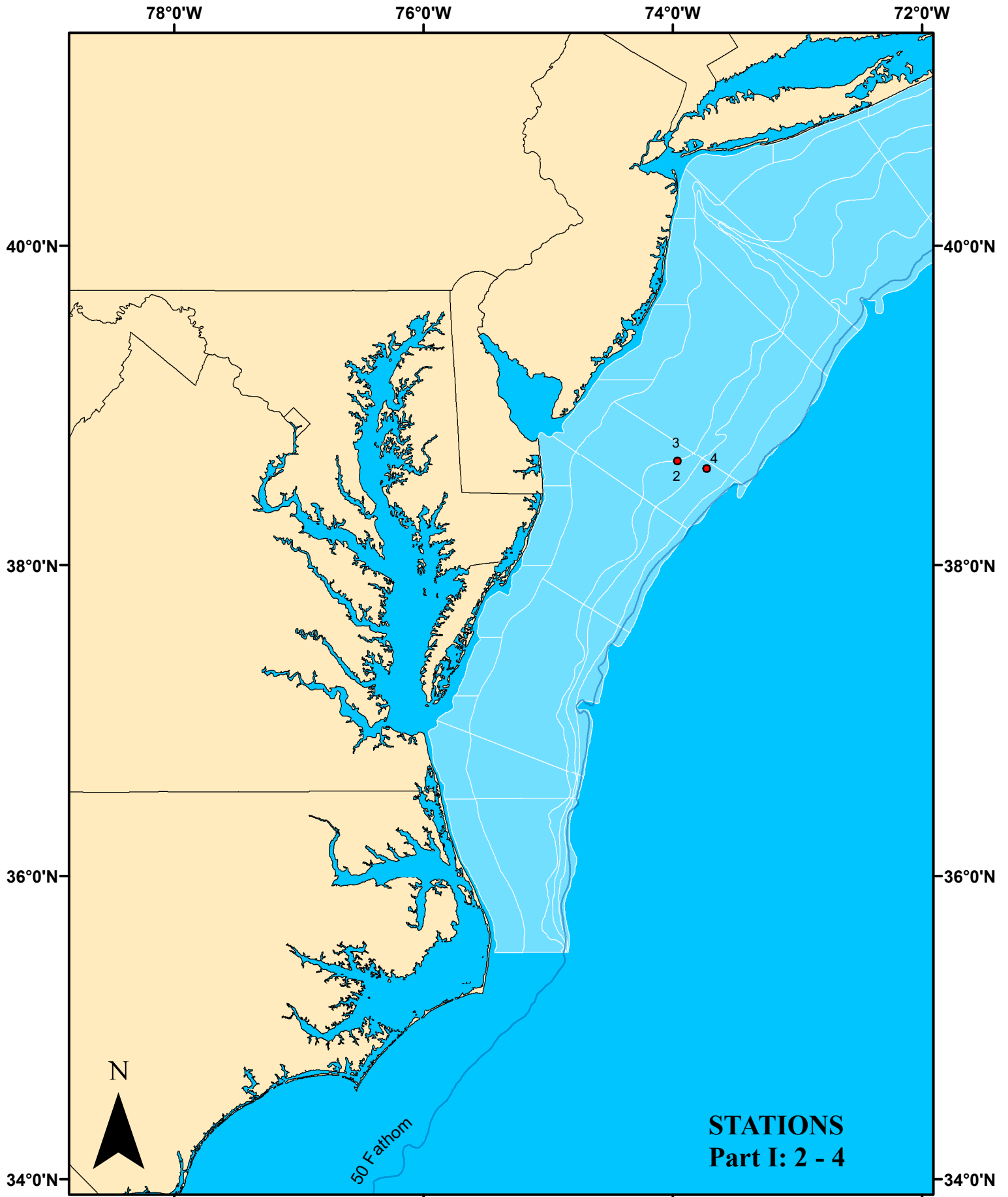


Figure 3. Dredge tows made from UNOLS R/V *Hugh R. Sharp* during NOAA Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019.

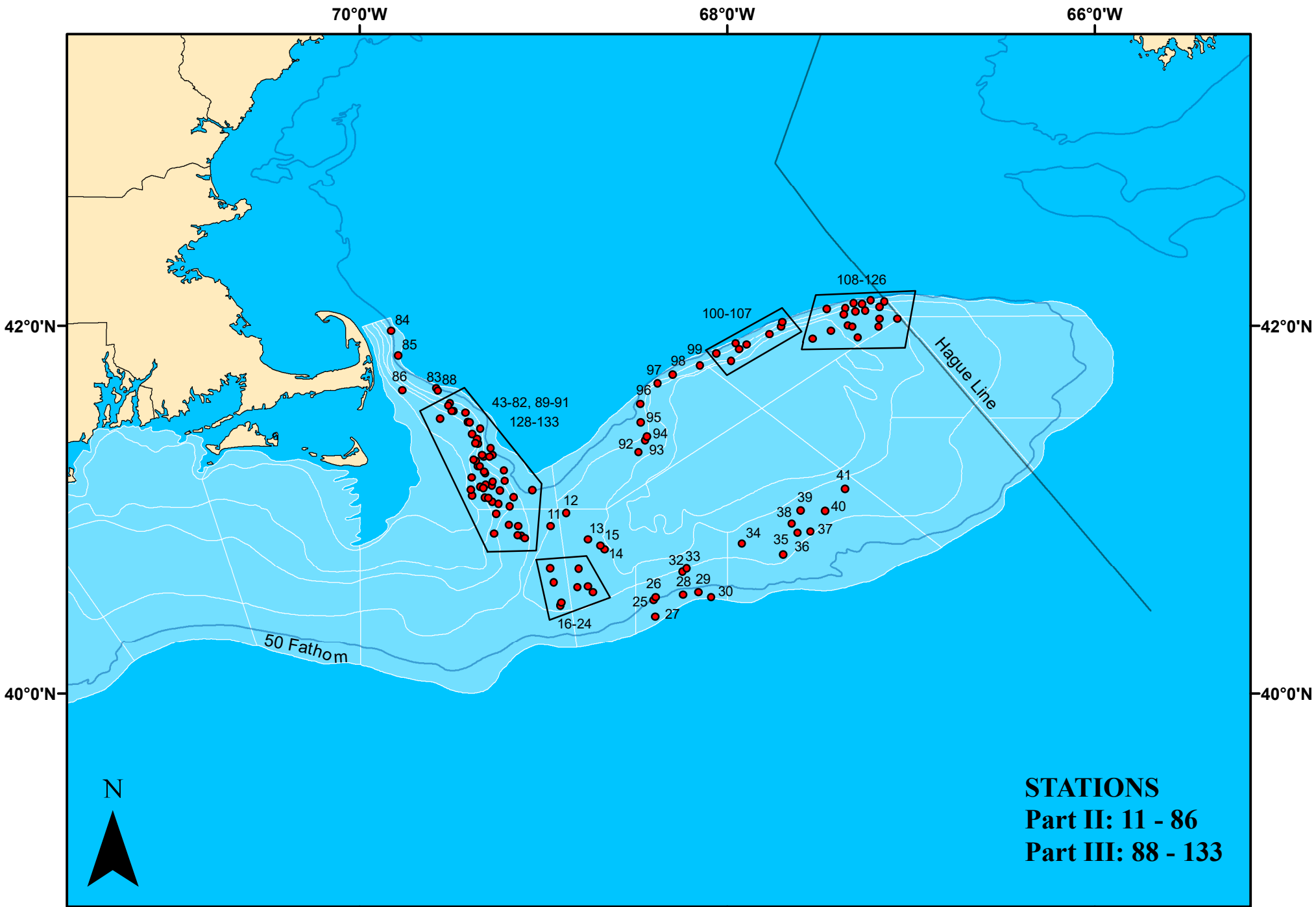


Figure 4. Dredge tows made from UNOLS R/V *Hugh R. Sharp* during NOAA Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019

**Table 1: Catch summary report from NOAA National Marine Fisheries Service,
Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019**

Station	Latitude	Longitude	Lorans TD 1	Lorans TD 2	Heading (Degrees)	Depth (Fathoms)	Total Number	Scallops <90mm	Scallops >90mm	Scallops ≥100mm	% Shell Bycatch	% Stone Bycatch	% Inverts Bycatch	Total Volume
2	3839.1	7357.9	X26752.4	Y42583.7	130	27.3	4	0	4	3	0	0	0	1381
3	3839.1	7357.9	X26752.4	Y42583.7	124	27.9	108	7	101	99	12	3	85	557
4	3836.3	7343.8	X26666.4	Y42563.6	190	32.3	376	22	354	331	25	70	5	1155
11	4054.4	6857.7	W13722.2	Y43599.4	359	42.1	218	89	129	93	40	40	20	189
12	4058.8	6852.4	W13677.9	Y43621.6	347	39.9	343	46	297	264	35	25	40	189
13	4050.2	6845.4	W13678.8	Y43563.4	347	36.1	7	4	3	2	15	5	80	189
14	4046.8	6840.1	W13666.9	Y43538.5	330	33.9	0	0	0	0	0	0	0	0
15	4048.1	6841.4	W13667.9	Y43547.4	140	33.9	0	0	0	0	20	0	80	699
16	4040.6	6848.4	W13731.4	Y43506.9	9	36.6	48	40	8	6	10	0	90	5
17	4040.8	6857.8	W13776.5	Y43515.3	346	37.7	121	72	49	48	20	0	80	561
18	4036.2	6856.6	W13788.3	Y43485.6	352	38.8	9	6	3	2	20	0	80	193
19	4028.7	6854.4	W13805.7	Y43436.8	354	41.6	97	0	97	95	20	0	80	92
20	4028.4	6854.4	W13806.9	Y43434.9	179	41.6	36	6	30	28	30	0	70	55
21	4029.5	6854.1	W13801.3	Y43441.7	15	41	127	1	126	121	30	0	70	147
22	4034.5	6848.8	W13756.9	Y43469.4	16	57.4	4	3	1	1	4	1	95	690
23	4034.8	6845.4	W13739.4	Y43468.8	14	36.1	7	6	1	1	1	1	98	649
24	4032.9	6843.8	W13739.0	Y43456.0	22	37.7	15	14	1	1	1	1	98	1109
25	4030.4	6824	W13655.6	Y43427.8	12	51.9	75	44	31	15	49	1	50	184
26	4031.3	6823.4	W13649.4	Y43432.8	213	52.5	51	23	28	16	43	2	55	143
27	4024.9	6823.5	W13674.3	Y43394.0	199	58	6	5	1	1	40	1	59	235
28	4032.1	6814.4	W13605.0	Y43432.1	205	54.7	0	0	0	0	44	1	55	143
29	4033	6809.3	W13578.4	Y43434.3	37	54.7	4	3	1	0	80	2	18	189
30	4031.3	6805.2	W13566.6	Y43421.7	61	61.2	2	2	0	0	90	5	5	235
32	4039.7	6814.5	W13575.4	Y43477.4	58	43.7	0	0	0	0	0	0	0	0
33	4040.8	6813.1	W13564.6	Y43482.9	244	43.2	164	157	7	6	20	0	80	69
34	4048.7	6755.2	W13451.5	Y43516.5	202	39.4	26	20	6	6	15	0	85	1067
35	4045.2	6741.6	W13406.6	Y43487.4	13	39.4	239	150	89	86	30	0	70	51
36	4052.3	6736.9	W13356.4	Y43524.2	22	39.4	1362	770	592	566	20	0	80	460
37	4052.8	6732.7	W13336.3	Y43524.1	9	41.6	1464	1082	382	301	45	2	53	115
38	4055.3	6738.9	W13352.2	Y43542.3	13	37.7	139	88	51	45	15	1	84	373
39	4059.6	6736	W13321.1	Y43564.1	19	37.2	6	3	3	2	14	1	85	419
40	4059.5	6728	W13287.4	Y43557.8	24	38.8	34	16	18	17	5	1	94	1339
41	4106.7	6721.5	W13228.3	Y43592.1	356	33.9	1	1	0	0	1	1	98	2535

**Table 1 (cont.): Catch summary report from NOAA National Marine Fisheries Service,
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Station	Latitude	Longitude	Lorans TD 1	Lorans TD 2	Heading (Degrees)	Depth (Fathoms)	Total Number	Scallops <90mm	Scallops >90mm	Scallops ≥100mm	% Shell Bycatch	% Stone Bycatch	% Inverts Bycatch	Total Volume
43	4051.4	6907.1	W13781.3	Y43589.1	155	41	0	0	0	0	0	0	0	0
44	4050.5	6906.1	W13779.9	Y43582.6	5	39.4	33	2	31	29	4	95	1	874
45	4051.4	6908.3	W13787.4	Y43590.2	205	39.9	361	45	316	288	35	35	30	189
46	4054.4	6908.3	W13775.4	Y43608.9	219	38.8	257	32	225	200	33	33	34	138
47	4054.9	6911.2	W13788.1	Y43614.6	220	37.2	102	19	83	74	15	80	5	143
48	4052	6916.1	W13824.6	Y43600.9	213	30.6	267	24	243	212	35	30	35	1155
49	4058.6	6915.5	W13795.3	Y43641.7	196	36.1	394	54	340	300	40	40	20	281
50	4103.9	6919.1	W13792.3	Y43678.2	152	29	112	62	50	43	35	50	15	1196
51	4102.5	6916.7	W13785.6	Y43667.1	177	31.2	497	169	328	240	40	45	15	1017
52	4101.8	6914.6	W13777.6	Y43660.7	5	33.4	695	174	521	393	65	30	5	0
53	4100.9	6910.9	W13762.3	Y43651.6	309	31.2	7	2	5	3	40	40	20	51
54	4103.9	6909.8	W13744.4	Y43669.0	96	37.2	344	239	105	91	15	75	10	465
55	4106.3	6903.6	W13702.7	Y43677.6	168	54.1	85	4	81	81	18	2	80	971
56	4109.3	6912.6	W13736.2	Y43704.9	130	36.6	38	12	26	26	10	85	5	460
57	4112.7	6912.9	W13723.4	Y43725.9	180	45.4	24	13	11	11	5	80	15	607
58	4106.1	6914.2	W13757.9	Y43686.9	183	28.4	480	256	224	173	20	70	10	460
59	4107.7	6916.8	W13764.7	Y43699.4	182	31.2	884	545	339	265	10	50	40	833
60	4108	6918.8	W13773.8	Y43703.3	355	31.2	34	23	11	11	5	85	10	138
61	4107.4	6920.6	W13785.7	Y43701.4	177	27.9	210	28	182	171	35	40	25	1707
62	4107	6919.7	W13782.7	Y43698.0	174	28.4	377	70	307	259	45	45	10	920
63	4104.5	6923.3	W13811.7	Y43686.2	169	23	22	5	17	16	1	1	98	3224
64	4106.4	6923.7	W13806.1	Y43698.4	43	23.5	2	2	0	0	3	2	95	2167
65	4110.4	6923.4	W13787.9	Y43722.9	193	24.6	132	3	129	125	75	15	10	828
66	4111.7	6918.9	W13758.8	Y43726.1	196	27.3	351	173	178	130	10	85	5	800
67	4114	6921.4	W13762.2	Y43742.9	218	30.1	111	24	87	73	20	70	10	552
68	4114	6920.8	W13759.1	Y43742.2	236	30.1	99	8	91	80	5	75	20	460
69	4115.7	6922.1	W13758.7	Y43754.1	296	30.6	31	1	30	30	30	50	20	276
70	4117.1	6919.5	W13739.0	Y43759.7	311	40.5	47	35	12	12	45	50	5	230
71	4117.6	6920	W13739.5	Y43763.3	305	39.4	60	21	39	33	70	10	20	281
72	4117.7	6916.5	W13720.6	Y43760.1	248	48.7	0	0	0	0	0	0	0	0
73	4117.2	6917.6	W13728.6	Y43758.2	53	44.8	170	122	48	37	10	10	80	322
74	4120	6917.2	W13714.3	Y43774.7	226	51.9	148	23	125	120	30	10	60	281
75	4121.5	6921.3	W13729.4	Y43788.4	215	30.1	165	95	70	69	15	5	80	230

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76	4122.9	6921.7	W13725.4	Y43797.3	60	31.2	198	135	63	62	10	80	10	189
77	4126.4	6920.6	W13704.1	Y43817.0	246	42.1	138	69	69	66	60	10	30	465
78	4128.6	6924.6	W13715.7	Y43834.9	325	30.6	105	48	57	51	40	45	15	322
79	4131.5	6925.5	W13707.5	Y43853.3	328	36.1	399	313	86	86	30	60	10	373
80	4129.6	6933.7	W13760.4	Y43852.0	359	19.7	5	4	1	1	25	45	30	253
81	4132	6929.2	W13725.3	Y43860.8	329	30.1	83	72	11	11	20	75	5	598
82	4134.6	6930.5	W13720.6	Y43878.0	323	33.9	72	34	38	34	30	30	40	373
83	4139.5	6935	W13722.9	Y43912.8	284	49.8	94	85	9	8	5	90	5	235
84	4158.3	6949.8	W13717.4	Y44043.2	130	50.9	201	177	24	17	75	5	20	327
85	4150.3	6947.4	W13741.9	Y43993.3	167	62.3	7	4	3	3	90	0	10	97
86	4138.8	6946.1	W13787.7	Y43923.3	136	21.3	164	139	25	22	80	10	10	235
88	4138.8	6934.4	W13722.8	Y43907.9	19	47	130	122	8	8	2	90	8	327
89	4132.1	6930	W13729.1	Y43862.4	335	29.5	83	57	26	23	30	60	10	603
90	4128.4	6924	W13713.4	Y43833.0	332	31.7	162	60	102	98	30	40	30	235
91	4124.6	6923.3	W13726.5	Y43809.4	24	25.7	89	59	30	30	20	40	40	156
92	4118.6	6828.9	W13477.3	Y43716.0	18	35	6	2	4	4	30	0	70	189
93	4122.6	6826.7	W13448.6	Y43736.5	21	39.9	0	0	0	0	0	0	0	0
94	4123.8	6826.2	W13440.7	Y43742.8	168	37.7	9	0	9	9	30	0	70	322
95	4128.4	6828.2	W13429.0	Y43770.7	335	47	9	1	8	8	80	0	20	230
96	4134.4	6828.3	W13401.2	Y43804.3	20	47	3	0	3	3	10	0	90	984
97	4141.2	6822.7	W13341.4	Y43835.7	342	32.3	13	0	13	13	70	0	30	147
98	4144	6817.8	W13304.3	Y43845.4	9	38.8	2	0	2	2	10	0	90	101
99	4146.9	6808.8	W13247.4	Y43851.1	24	33.9	3	0	3	3	5	0	95	1858
100	4150.9	6803.5	W13202.7	Y43866.4	22	47	648	220	428	185	40	0	60	143
101	4148.5	6758.6	W13192.2	Y43848.5	68	26.2	2	1	1	0	2	0	98	1564
102	4152.2	6756.1	W13162.1	Y43865.1	178	35	5	0	5	5	5	0	95	984
103	4154.1	6757.1	W13157.0	Y43876.1	296	48.7	105	63	42	28	60	0	40	138
104	4153.7	6753.7	W13143.6	Y43870.3	154	33.4	1	0	1	1	5	0	95	2075
105	4157.2	6746.1	W13091.5	Y43880.0	60	30.6	1	0	1	1	2	0	98	1794
106	4159.6	6742.4	W13062.7	Y43888.2	356	31.7	28	22	6	6	75	0	25	69
107	4201.1	6742	W13053.1	Y43895.3	24	45.4	22	4	18	17	2	1	97	649
108	4205.4	6727.5	W12967.9	Y43901.1	24	45.4	137	8	129	70	40	0	60	51
109	4205.7	6721.4	W12940.6	Y43896.1	351	34.4	1134	125	1009	507	60	30	10	110

**Table 1 (cont.): Catch summary report from NOAA National Marine Fisheries Service,
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Station	Latitude	Longitude	Lorans TD 1	Lorans TD 2	Heading (Degrees)	Depth (Fathoms)	Total Number	Scallops <90mm	Scallops >90mm	Scallops ≥100mm	% Shell Bycatch	% Stone Bycatch	% Inverts Bycatch	Total Volume
110	4203.7	6721.9	W12953.2	Y43886.8	246	27.9	305	130	175	107	30	35	35	649
111	4200	6720.6	W12967.1	Y43867.2	29	29	315	298	17	13	40	30	30	1426
112	4159.5	6719	W12963.1	Y43863.0	133	29	26	22	4	4	45	10	45	1840
113	4156.1	6717.3	W12973.6	Y43844.5	186	29.5	1	1	0	0	30	10	60	1932
114	4159.6	6710.4	W12927.2	Y43854.8	94	27.9	365	102	263	253	60	10	30	1610

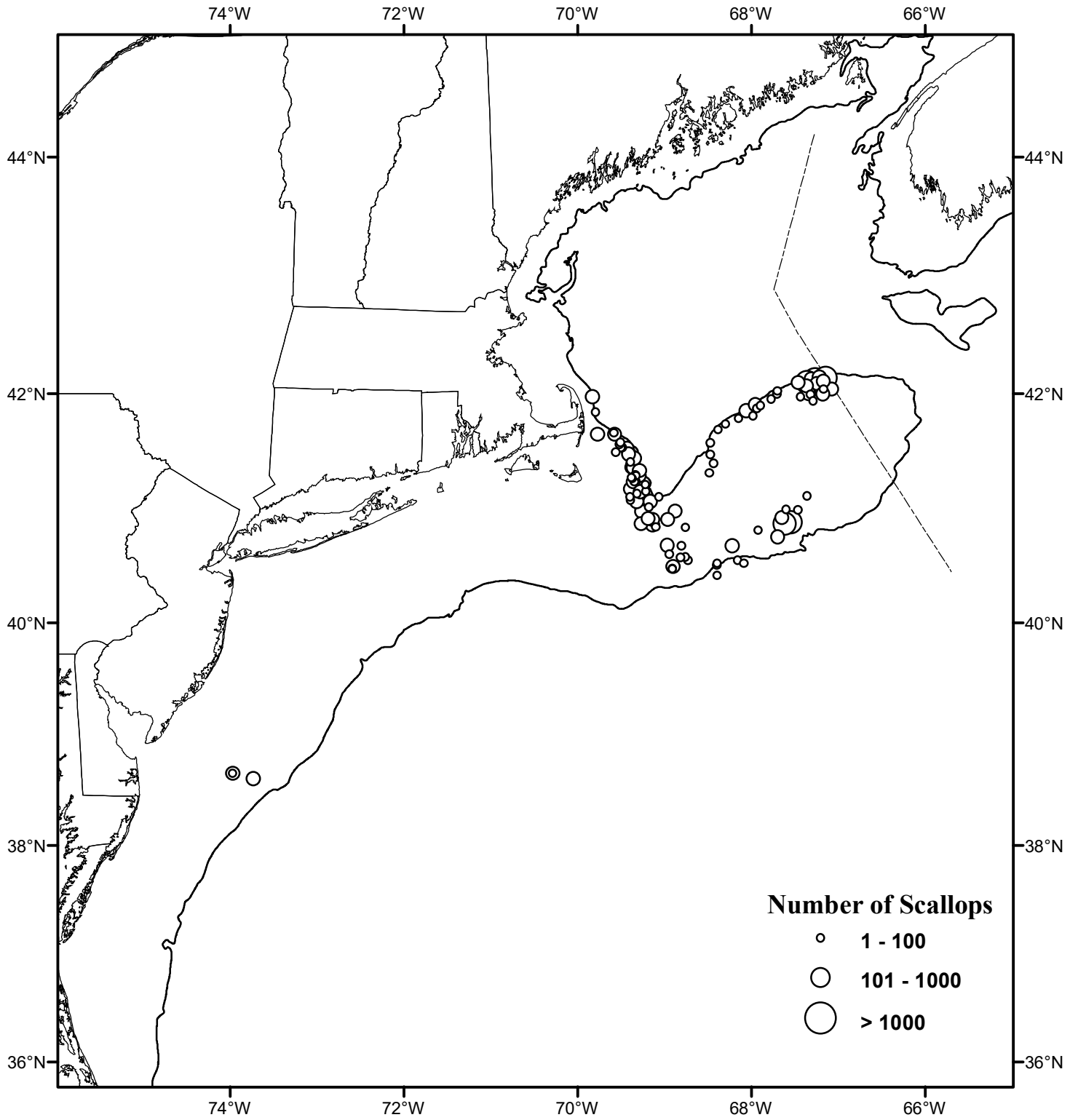


Figure 5: Total Number of Atlantic sea scallops per tow from NOAA National Marine Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019

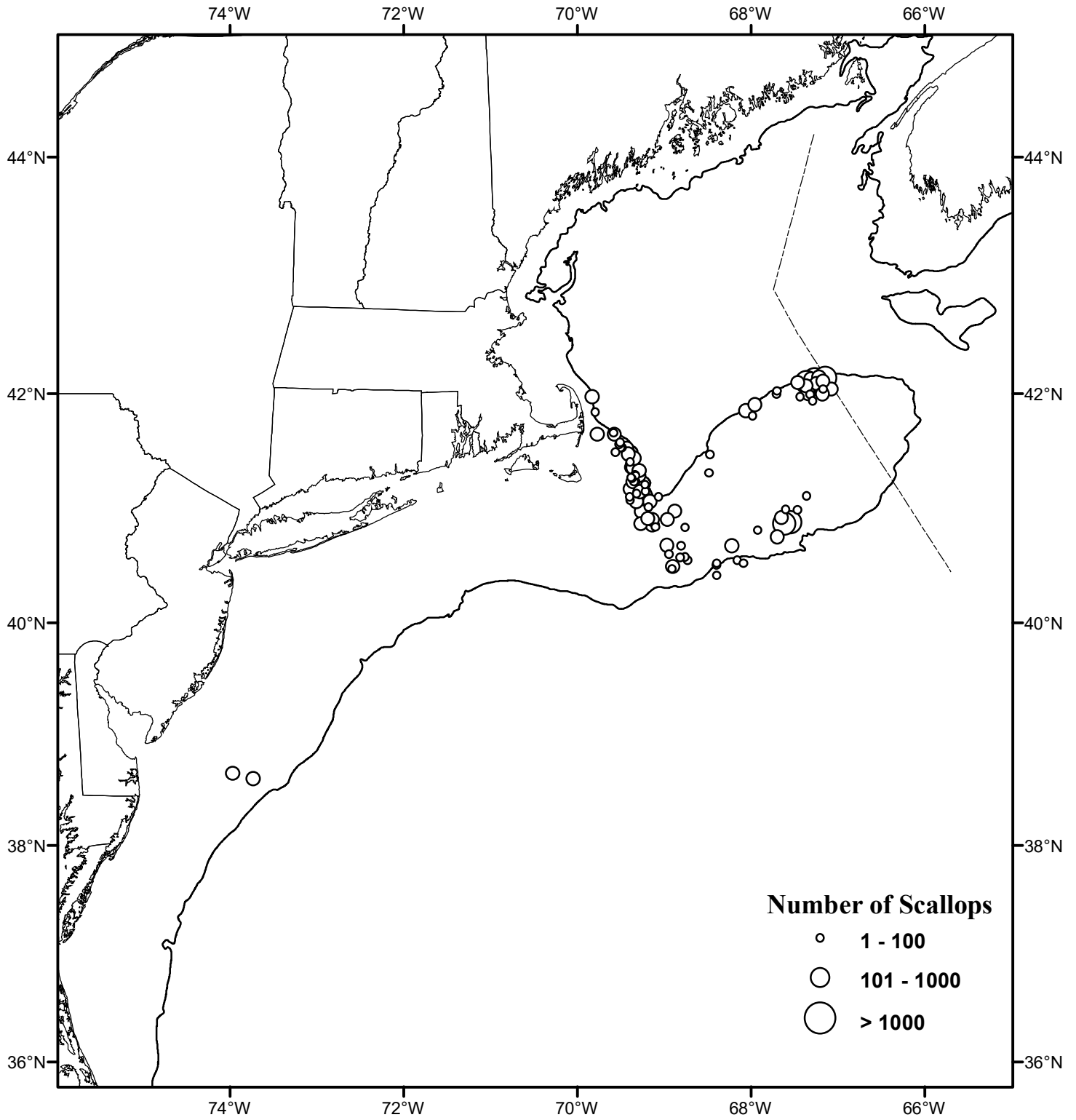


Figure 6: Number of Atlantic sea scallops per tow that are less than 90 mm from NOAA National Marine Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019

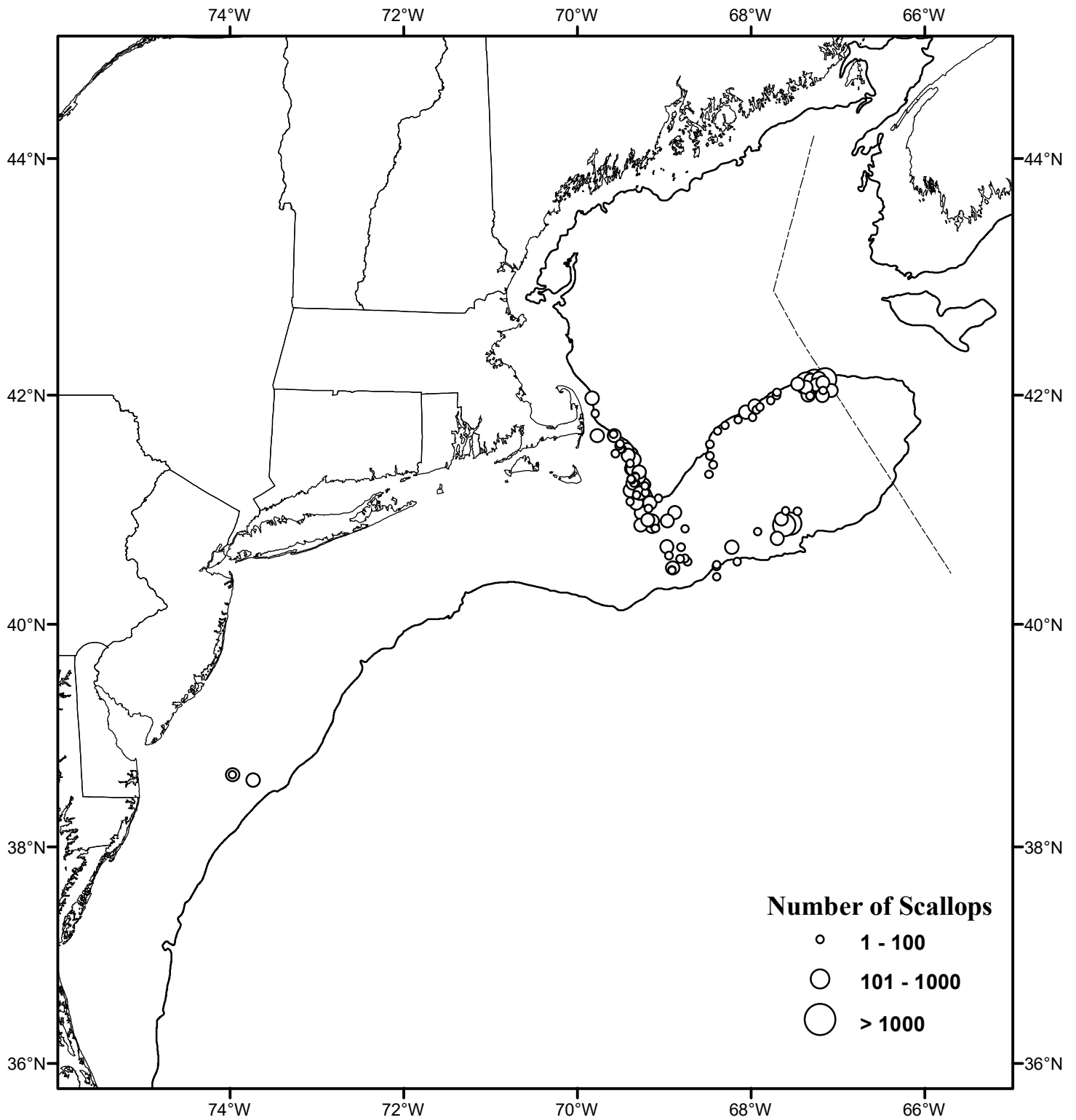


Figure 7: Number of Atlantic sea scallops per tow that are greater than 90 mm from NOAA National Marine Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019

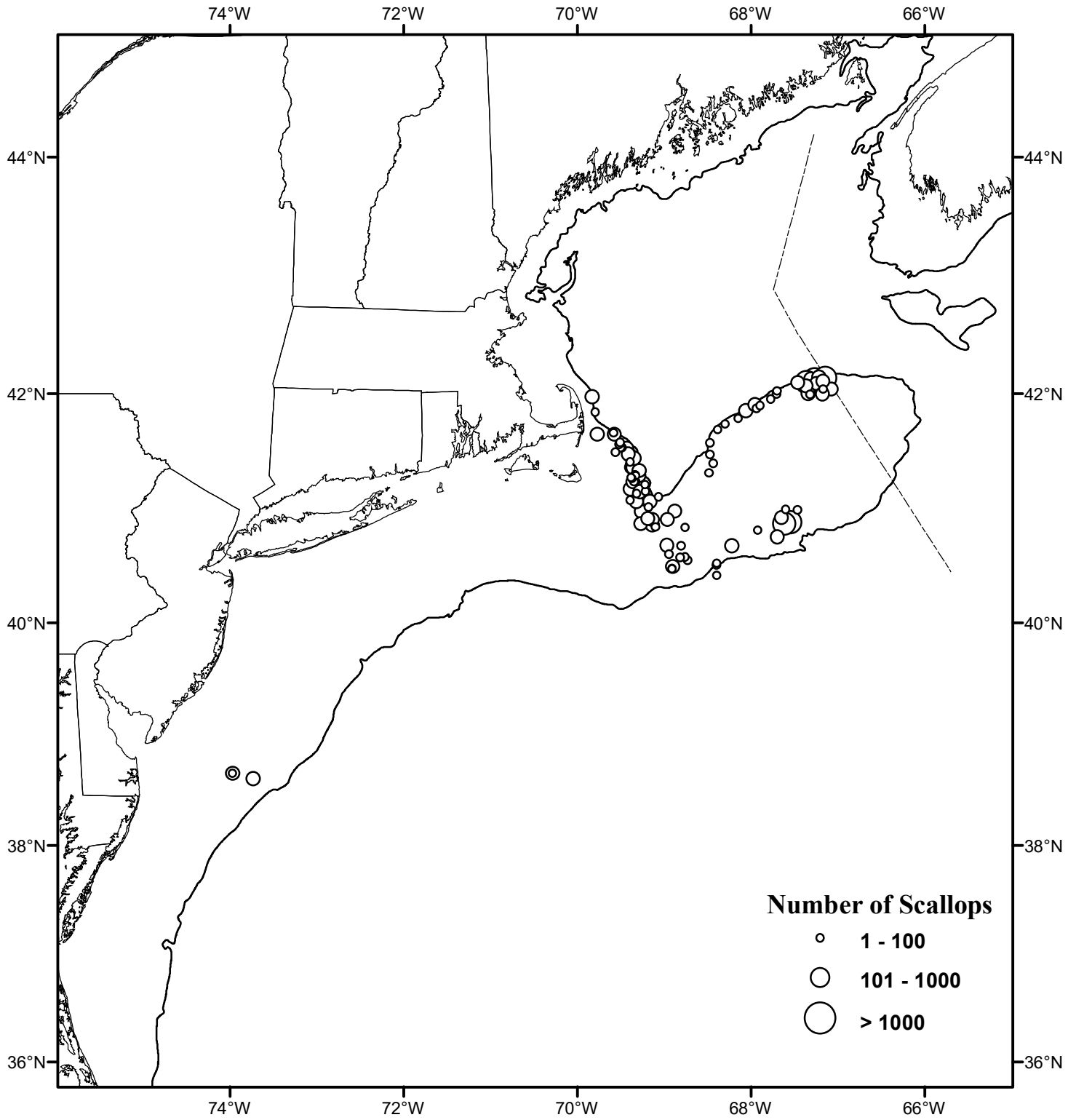


Figure 7: Number of Atlantic sea scallops per tow that are greater than or equal to 100 mm from NOAA National Marine Fisheries Service, Northeast Fisheries Science Center's summer sea scallop survey, 15 May - 13 June 2019