

2019 Drop Camera Scallop Survey Short Report

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1.0 2019 SURVEY BIOMASS ESTIMATES

Table 1. Total biomass estimates from the 2019 SMAST drop camera survey by Scallop Area Management Simulator (SAMS) zone. Stations were 2.8 km apart for SAMS zones aligned with scallop access areas (grey) and CL2-North, stations in all other zones were 5.6 km apart. Meat weights were estimated following the 65th SARC shell-height to meat-weight formula except in NLS SAMS areas where an equation from the Virginia Institute of Marine Science was used. Biomass estimates were rounded to the nearest 50 tons.

SMAST Drop Camera							
Georges Bank	NumMill	BmsMT	SE	MeanWt	Avg. SH (mm)	Sc per m ²	Stations
CL2-North	184	5,950	1,600	32.2	101.9	0.40	59
NF	57	1,000	380	17.6	88.2	0.03	54
CL1-Sliver	154	3,500	800	22.7	98.4	0.19	104
CL1-Access	36	1,050	200	29.4	96.2	0.03	158
CL1-Access Area Total		4,550					
GSC	439	6,150	1,000	14.0	72.2	0.10	149
NLS-North	122	4,700	700	38.4	114.6	0.12	135
NLS-West	838	13,450	6,300	16.0	95.0	0.57	190
NLS-South-Shallow	305	4,650	3,400	15.3	91.9	1.13	35
NLS-South-Deep	4,839	49,700	8,900	10.3	86.8	6.27	100
NLS-South Total		54,350					
Mid-Atlantic							
BI	47	1,100	300	22.7	99.5	0.06	25
LI	501	9,400	950	18.8	90.9	0.04	407
NYB	464	7,050	1,300	15.1	81.7	0.12	126
HCS	580	10,200	800	17.6	93.8	0.15	496
ET-Open	888	18,050	1,200	20.3	97.1	0.33	349
ET-Flex	771	19,650	2,700	25.5	111.2	0.43	231
MA Access Area Total		47,900					
DMV	89	350	100	4.2	42.7	0.03	110

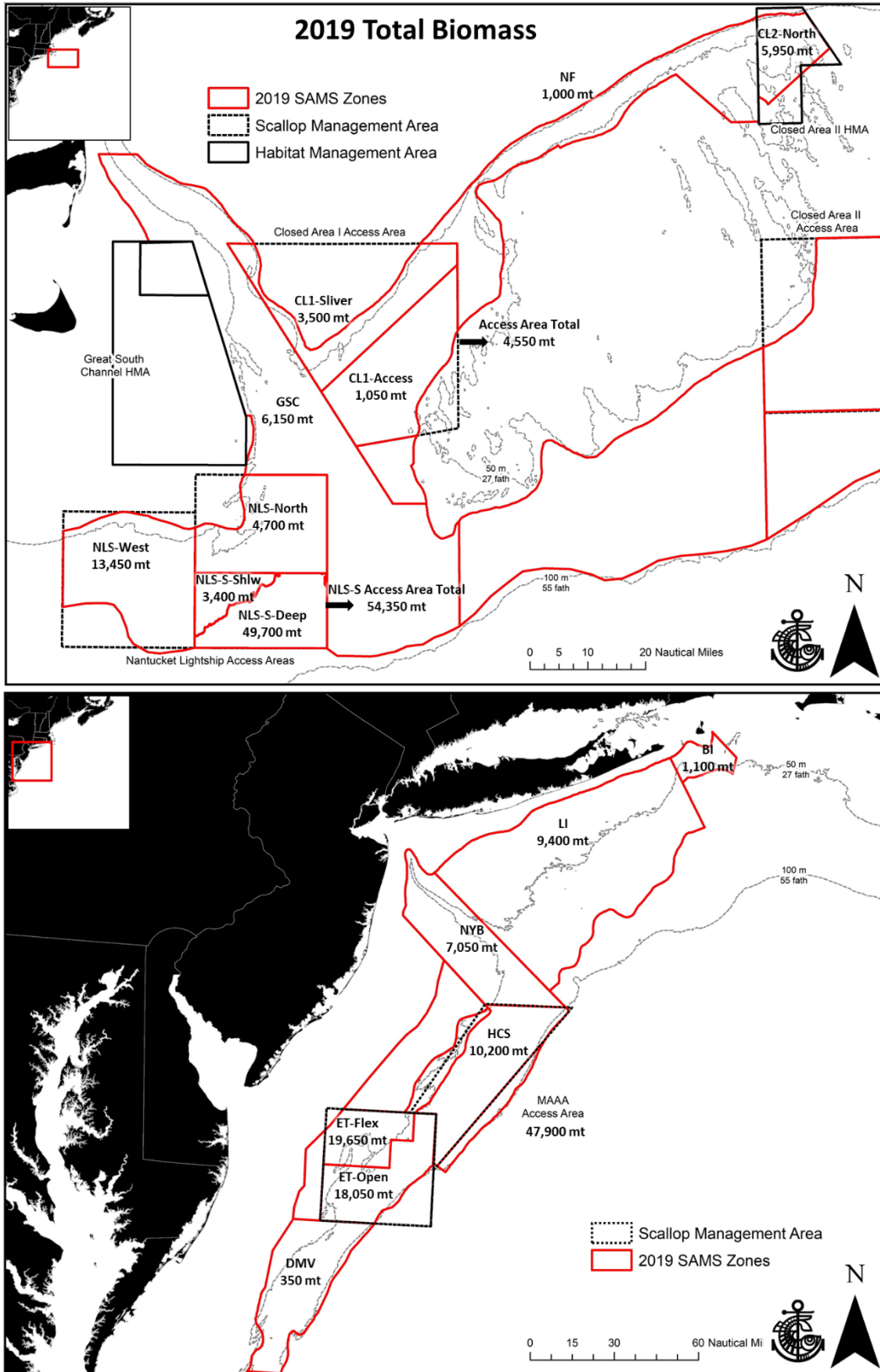


Figure 1. 2019 SMAST drop camera total biomass estimates on Georges Bank and the Mid-Atlantic by Scallop Area Management Simulator (SAMS) zone.

Table 2. Total biomass estimates from the 2019 SMAST drop camera survey in the Nantucket Lightship area using the 65th SARC or the 2016-2019 Virginia Institute of Marine Science (VIMS) shell-height to meat-weight formulas.

Area	65 th SARC		VIMS	
	BmsMT	MeanWt	BmsMT	MeanWt
NLS-North	5,000	40.8	4,700	38.4
NLS-West	19,550	23.3	13,450	16.0
NLS-South-Shallow	6,450	21.1	4,650	15.3
NLS-South-Deep	51,000	10.5	49,700	10.3

2.0 FIGURES OF SURVEY COVERAGE

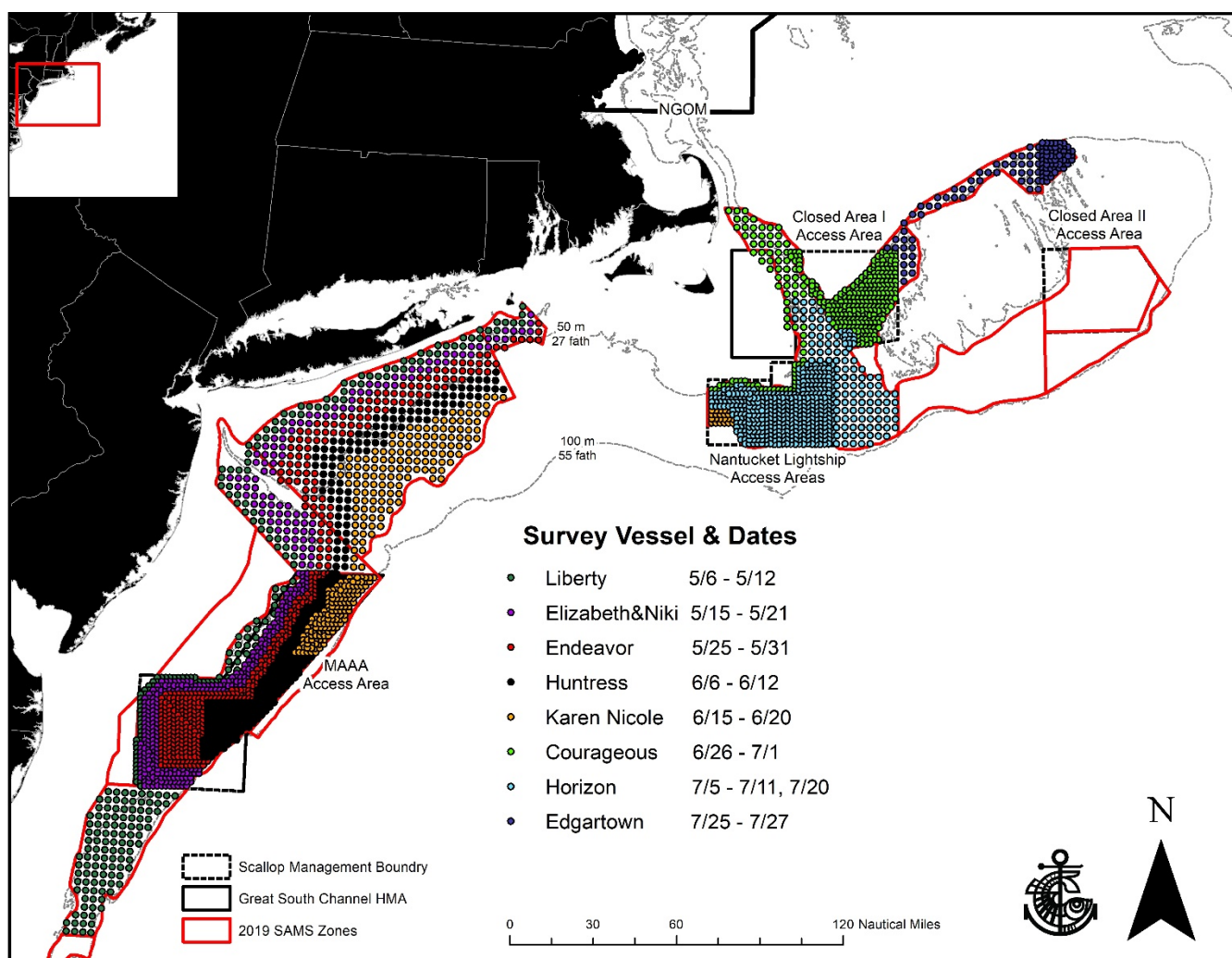


Figure 2. 2019 SMAST drop camera survey locations by vessel and dates. Stations were 2.8 km or 5.6 km apart.

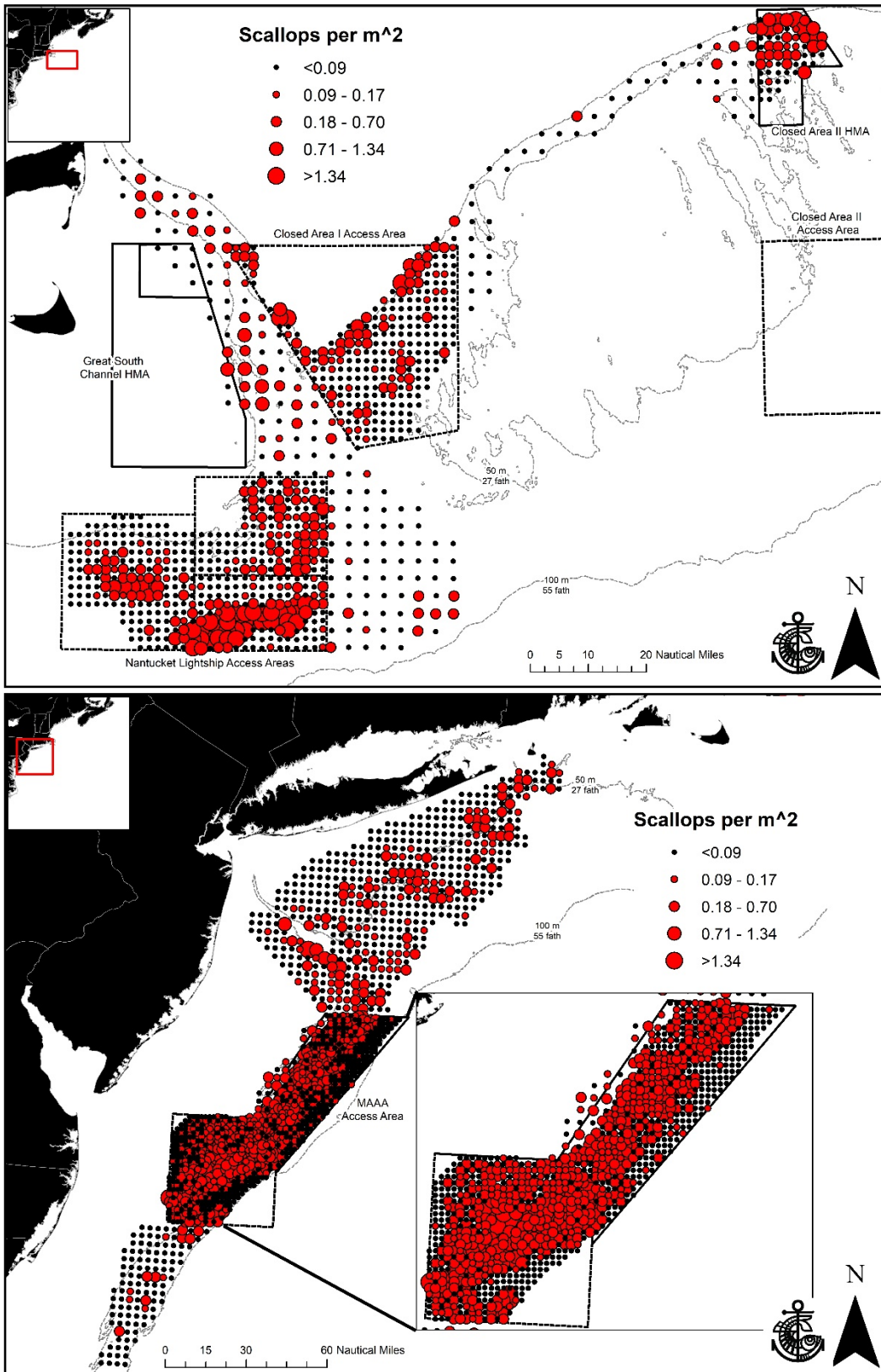


Figure 3. Overall scallop density at 2019 SMAST drop camera survey stations on Georges Bank and the Mid-Atlantic based on digital still camera observations.

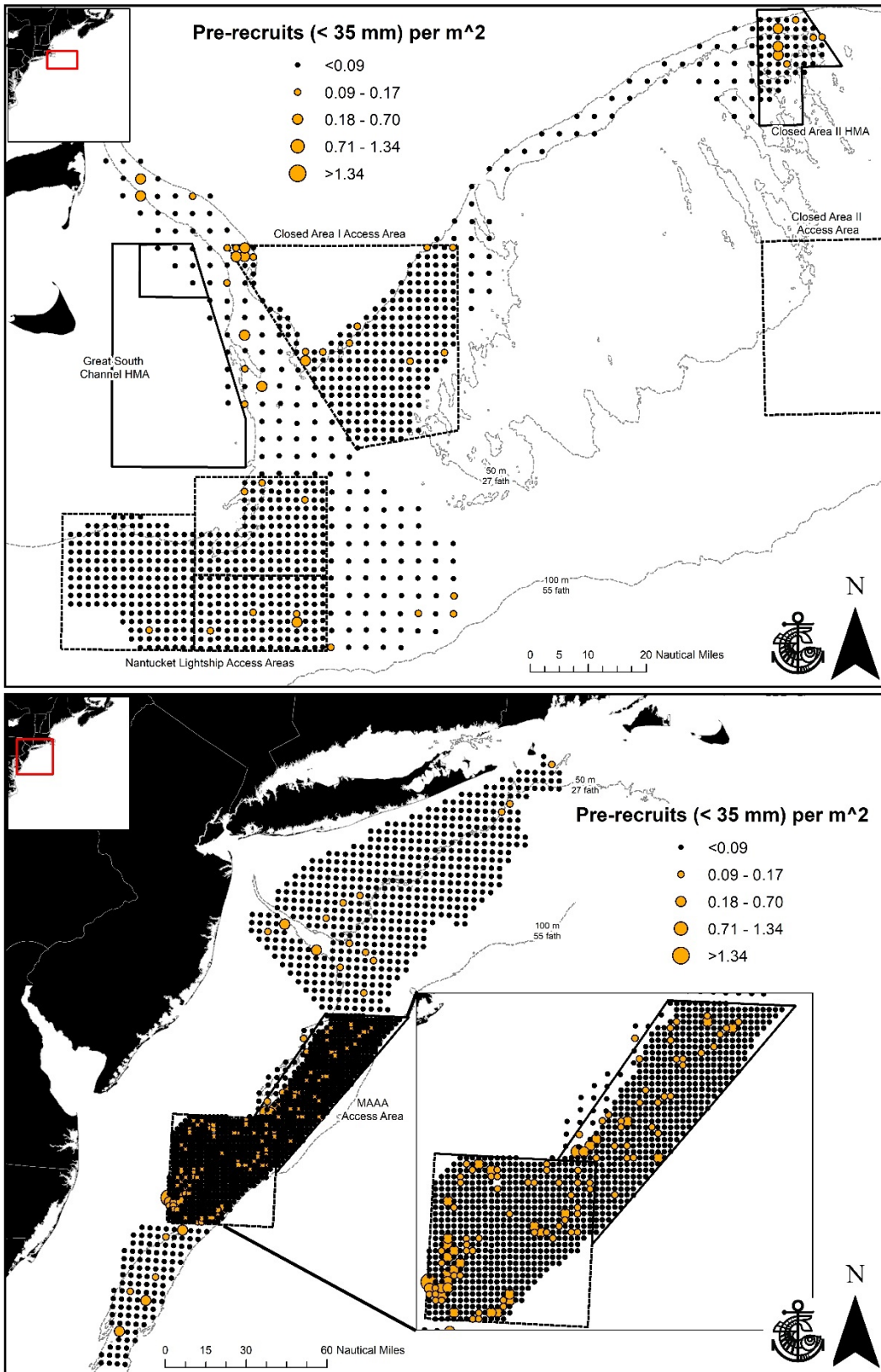


Figure 4. Pre-recruit scallop density at 2019 SMAST drop camera survey stations on Georges Bank and the Mid-Atlantic based on digital still camera observations.

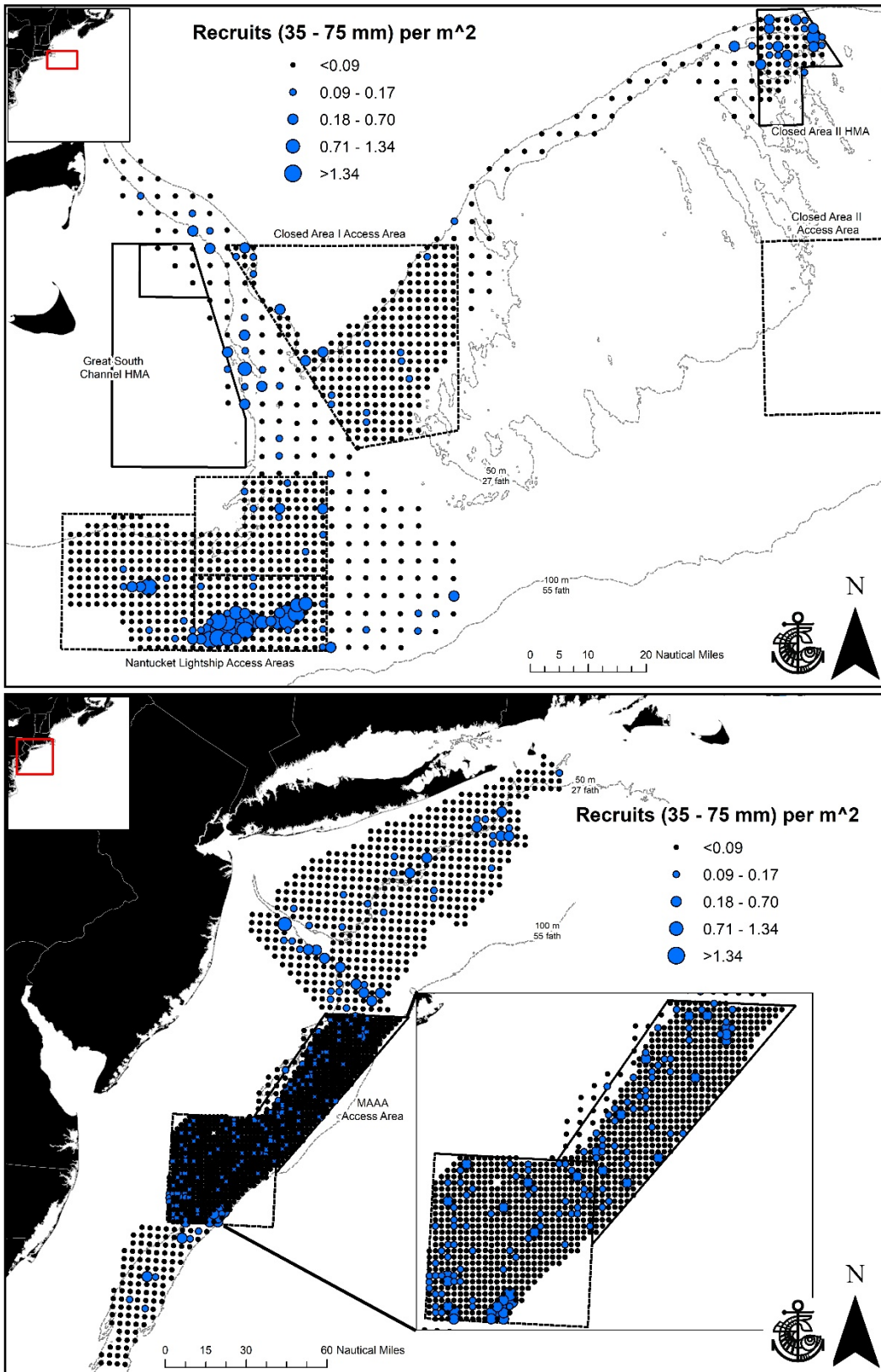


Figure 5. Recruit scallop density at 2019 SMAST drop camera survey stations on Georges Bank and the Mid-Atlantic based on digital still camera observations.

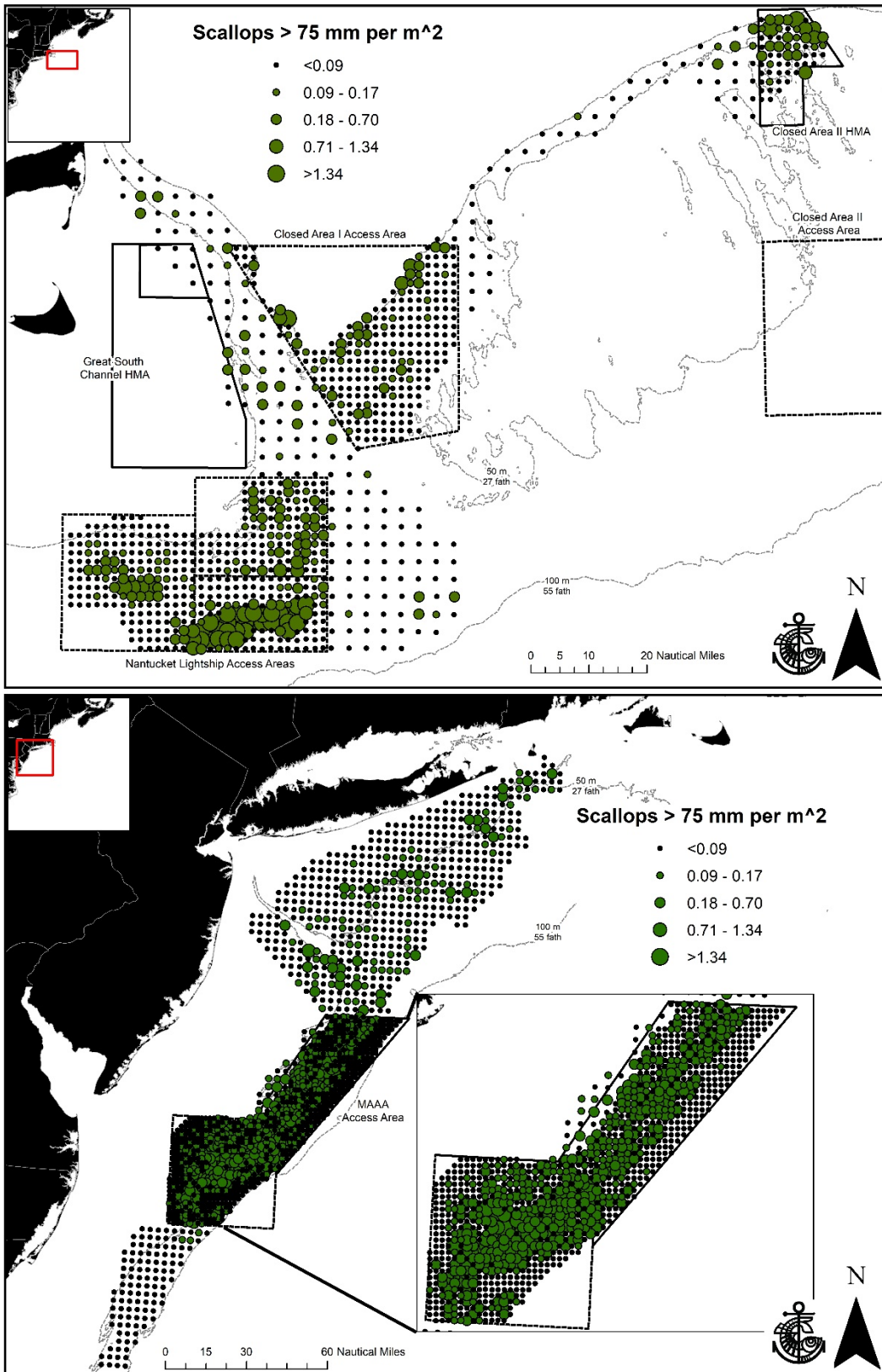


Figure 6. Scallops over 75 mm density at 2019 SMAST drop camera survey stations on Georges Bank and the Mid-Atlantic based on digital still camera observations.

3.0 LENGTH FREQUENCY PLOTS BY SAMS AREA

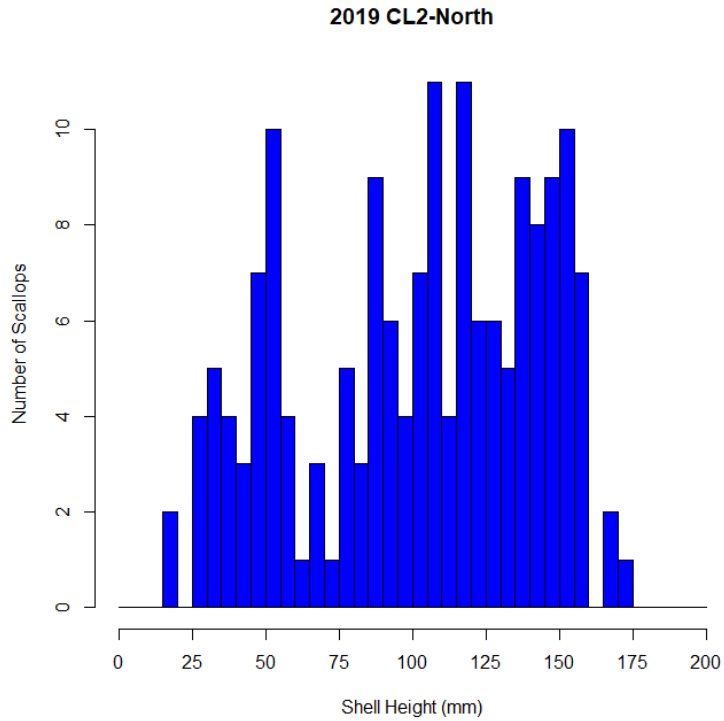


Figure 7. Shell height distribution of scallops in the CL2-North SAMS zone from SMAST drop camera digital still images. The average shell height was 101.9 mm and 167 scallops were measured.

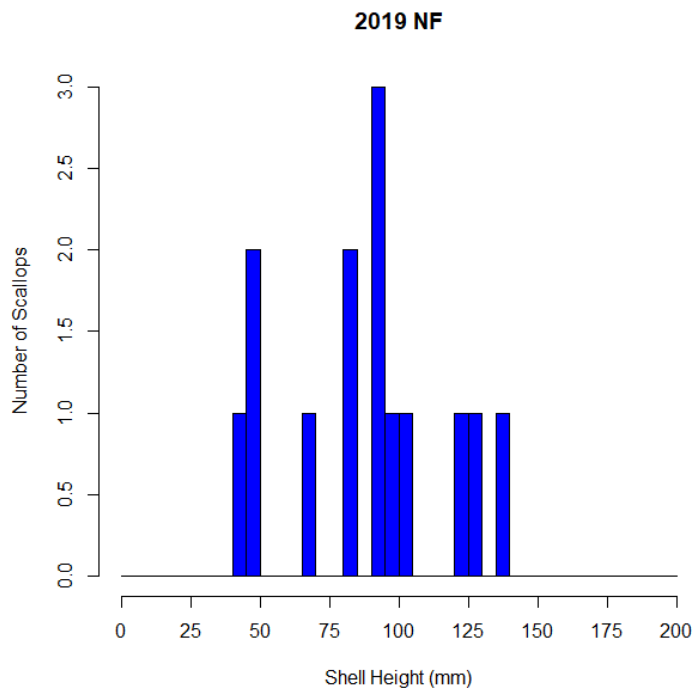


Figure 8. Shell height distribution of scallops in the NF SAMS zone from SMAST drop camera digital still images. The average shell height was 88.2 mm and 14 scallops were measured.

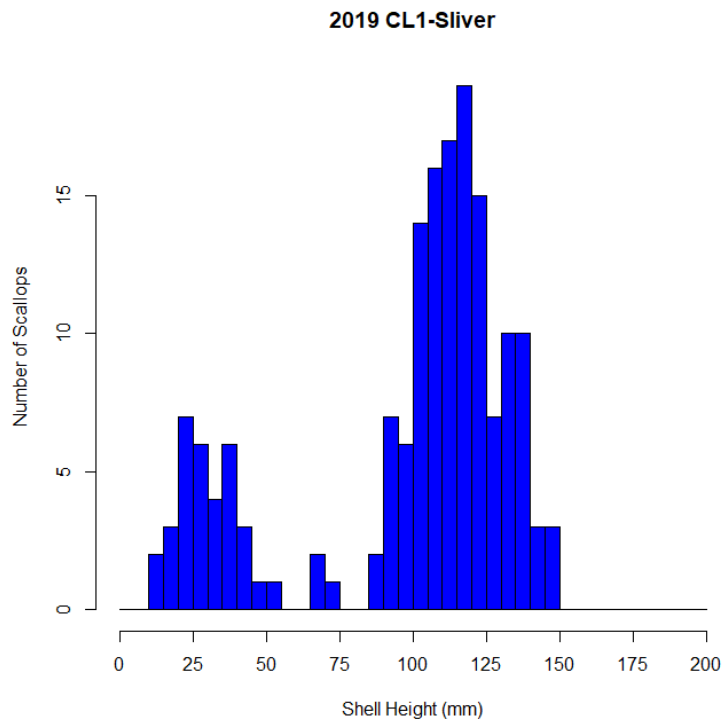


Figure 9. Shell height distribution of scallops in the CL1-Sliver SAMS zone from SMAST drop camera digital still images. The average shell height was 98.2 mm and 165 scallops were measured.

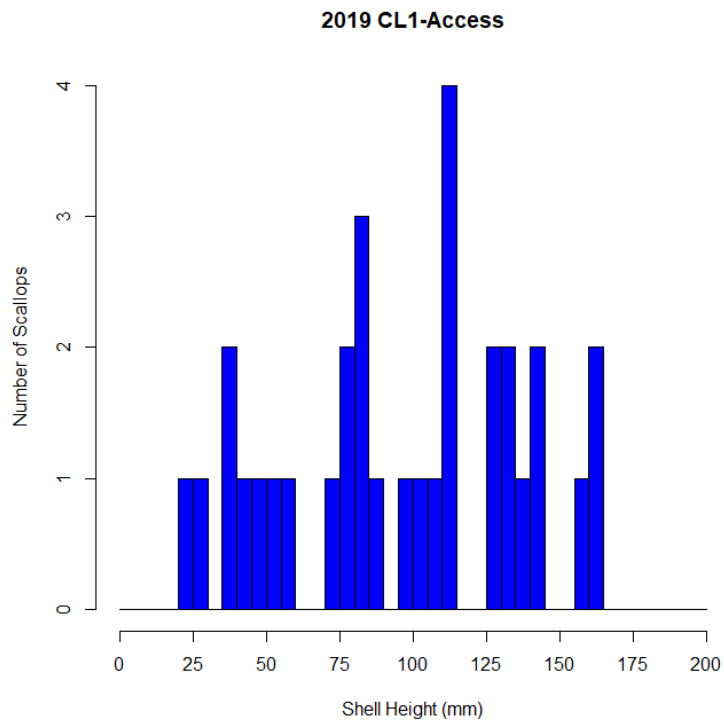


Figure 10. Shell height distribution of scallops in the CL1-Access SAMS zone from SMAST drop camera digital still images. The average shell height was 96.2 mm and 32 scallops were measured.

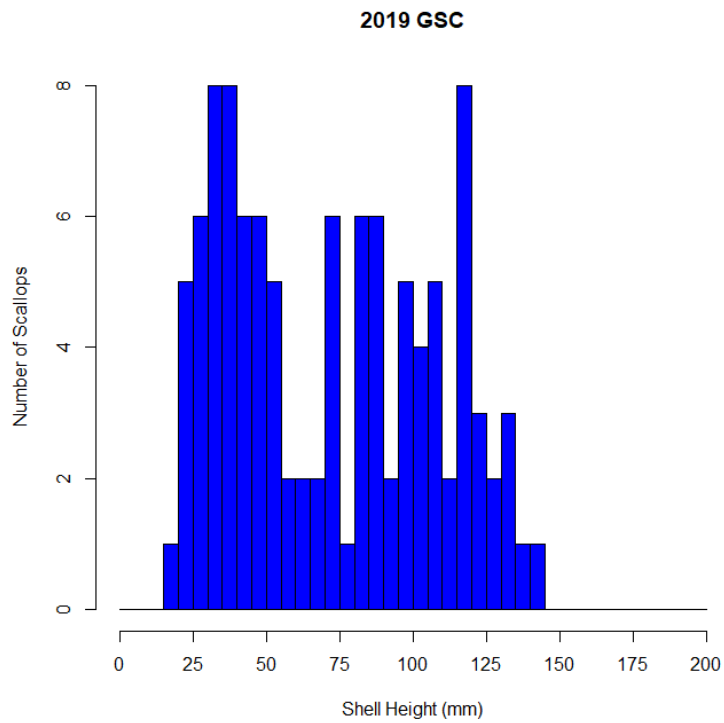


Figure 11. Shell height distribution of scallops in the GSC SAMS zone from SMAST drop camera digital still images. The average shell height was 72.2 mm and 106 scallops were measured.

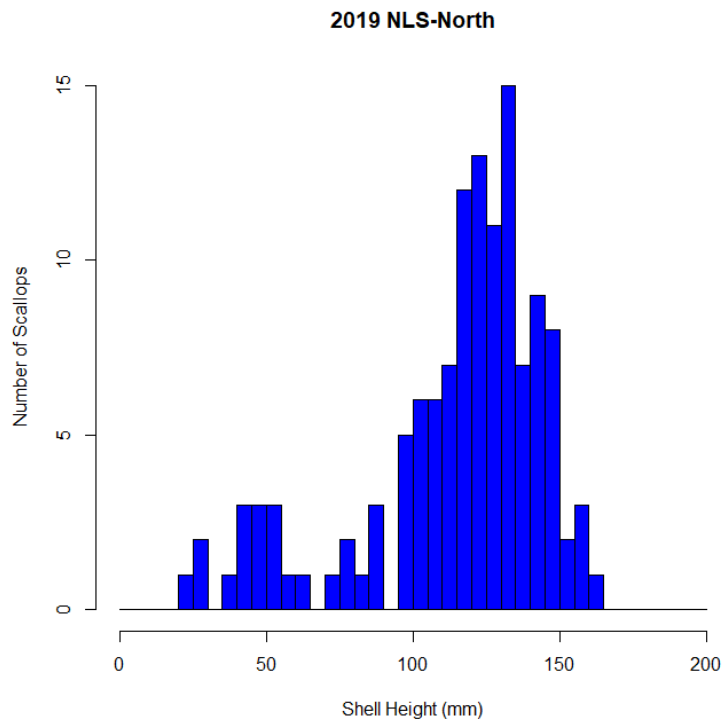


Figure 12. Shell height distribution of scallops in the NLS-North SAMS zone from SMAST drop camera digital still images. The average shell height was 114.6 mm and 127 scallops were measured.

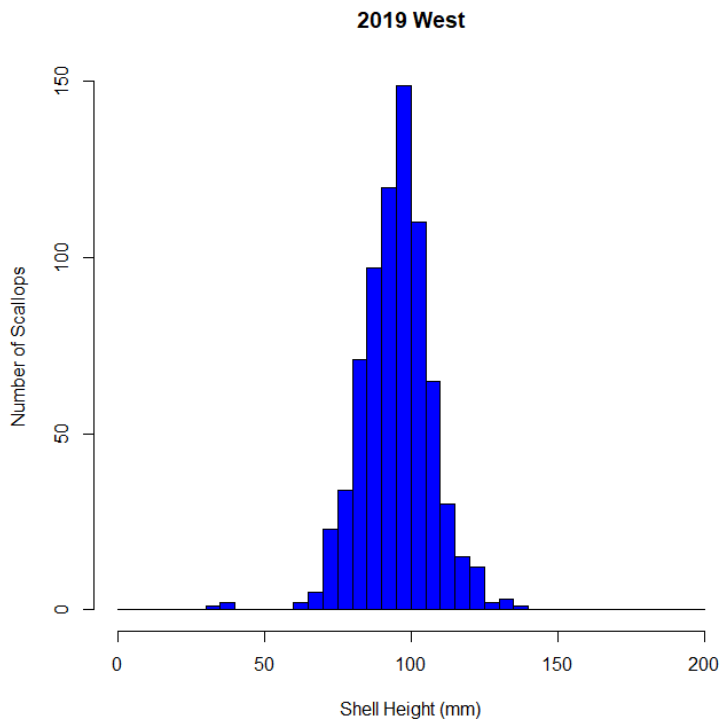


Figure 13. Shell height distribution of scallops in the NLS-West SAMS zone from SMAST drop camera digital still images. The average shell height was 95.0 mm and 742 scallops were measured.

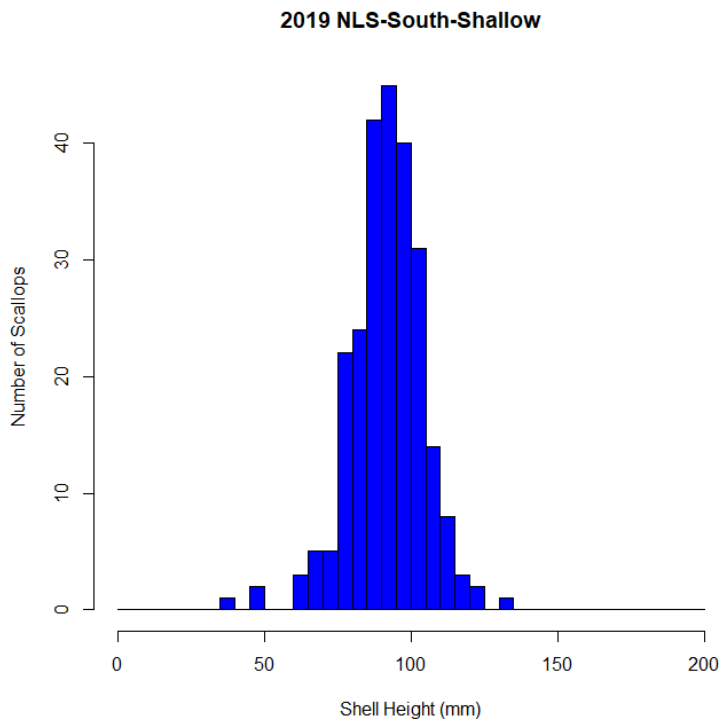


Figure 13. Shell height distribution of scallops in the NLS-South-Shallow SAMS zone from SMAST drop camera digital still images. The average shell height was 91.9 mm and 248 scallops were measured.

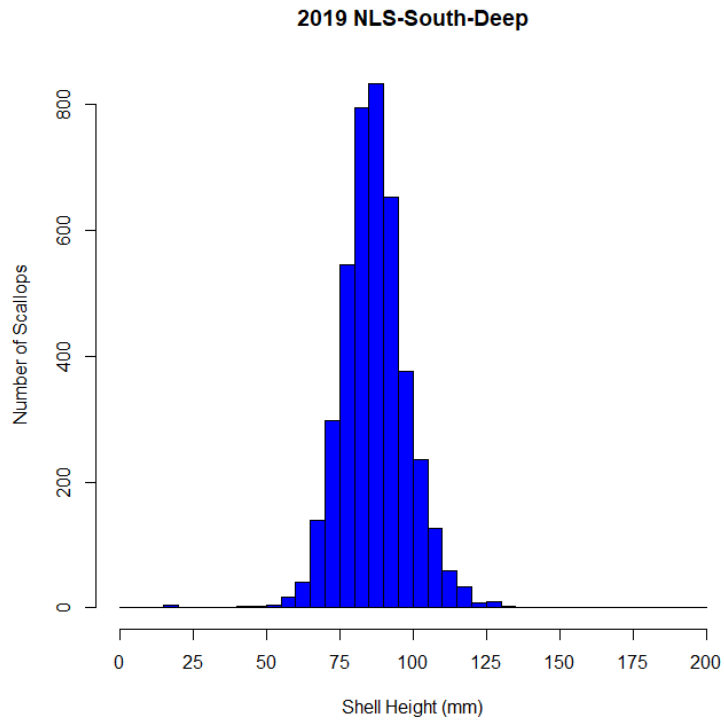


Figure 14. Shell height distribution of scallops in the NLS-South-Deep SAMS zone from SMAST drop camera digital still images. The average shell height was 86.8 mm and 4,185 scallops were measured.

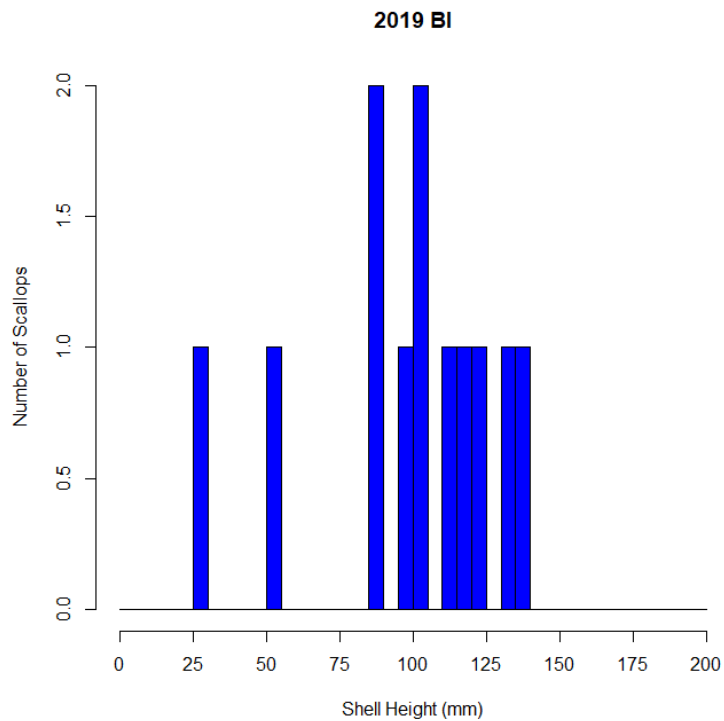


Figure 15. Shell height distribution of scallops in the BI SAMS zone from SMAST drop camera digital still images. The average shell height was 99.5 mm and 12 scallops were measured.

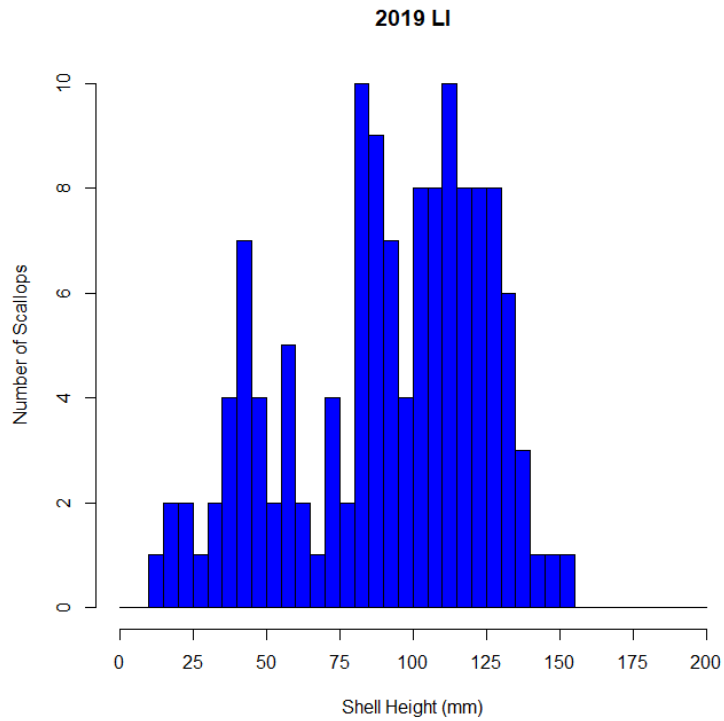


Figure 16. Shell height distribution of scallops in the LI SAMS zone from SMAST drop camera digital still images. The average shell height was 90.1 mm and 131 scallops were measured.

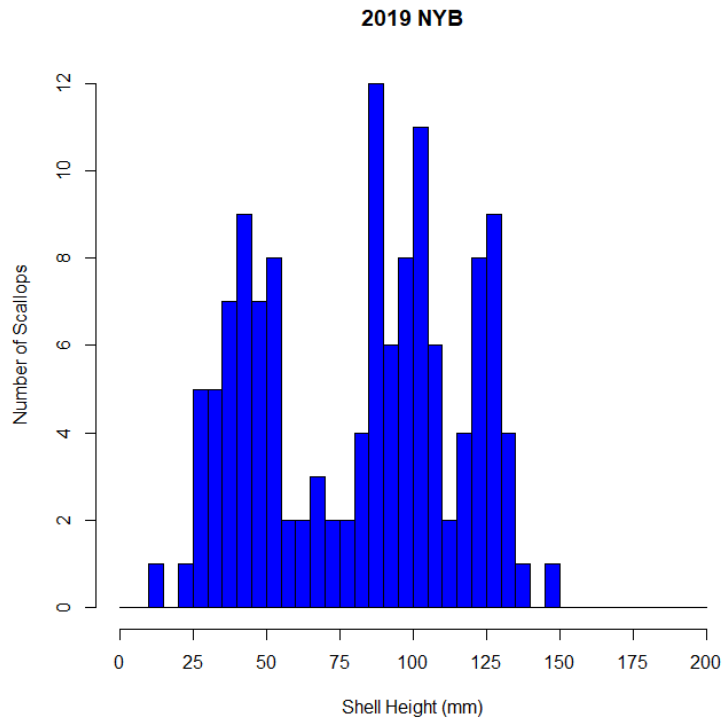


Figure 17. Shell height distribution of scallops in the NYB SAMS zone from SMAST drop camera digital still images. The average shell height was 81.7 mm and 130 scallops were measured.

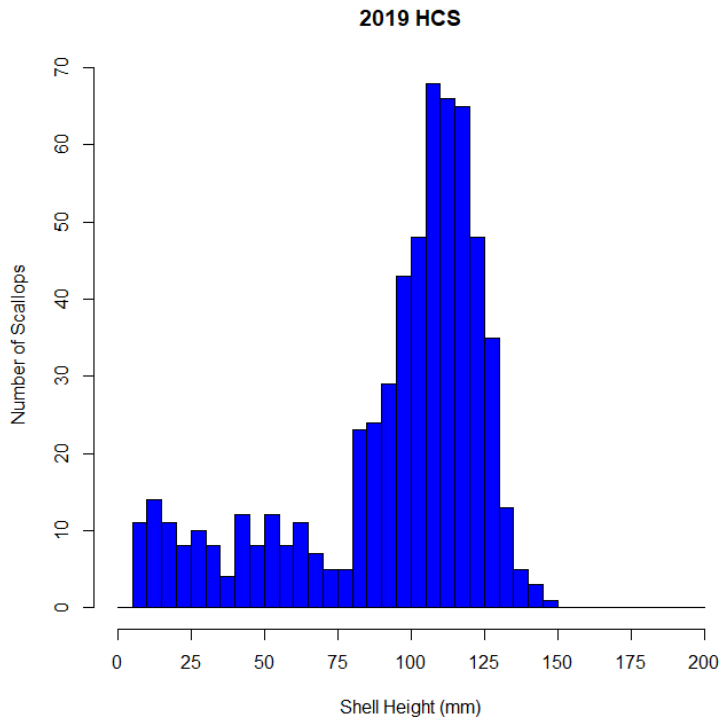


Figure 18. Shell height distribution of scallops in the HCS SAMS zone from SMAST drop camera digital still images. The average shell height was 93.8 mm and 605 scallops were measured.

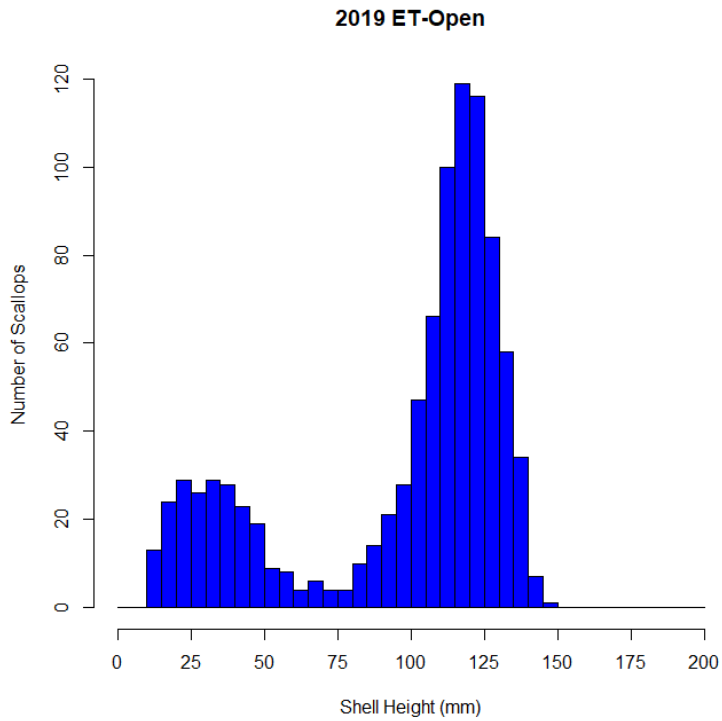


Figure 19. Shell height distribution of scallops in the ET-Open SAMS zone from SMAST drop camera digital still images. The average shell height was 97.1 mm and 931 scallops were measured.

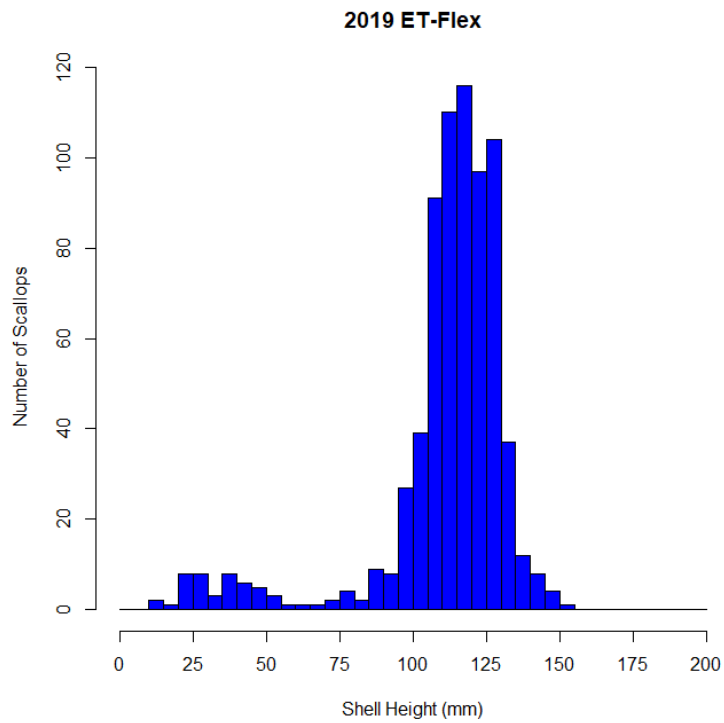


Figure 20. Shell height distribution of scallops in the ET-Flex SAMS zone from SMAST drop camera digital still images. The average shell height was 111.2 mm and 718 scallops were measured.

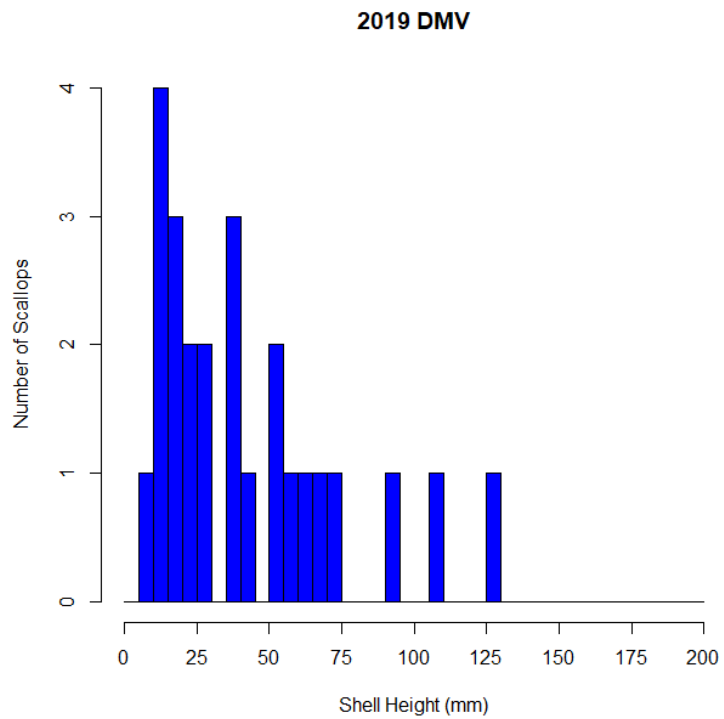


Figure 21. Shell height distribution of scallops in the DMV SAMS zone from SMAST drop camera digital still images. The average shell height was 42.7 mm and 25 scallops were measured.

4.0 SPECIAL COMMENTS

No exceptional recruitment was observed in any areas surveyed, but there were some areas with noteworthy amounts. On Georges Bank, there were high density patches of pre-recruit and recruit sized scallops in the northwest portion of the CL1-Sliver, the center of GSC and the CL2-North SAMS areas (Figures 4,5,7,9,11). The aggregation in the GSC represents a moderate density of small scallops that were first observed last year as pre-recruit and this year as recruit sized. In the Mid-Atlantic there is a spattering of pre-recruit scallops throughout the Mid-Atlantic Access Area (MAAA) with a concentration in the southern ET-Open and northern DMV SAMS areas.

The Nantucket Lightship area continues to contain the majority of scallop biomass on Georges Bank. Most of this biomass is now within the NLS-South-Deep SAMS area. A substantial increase in shell height was observed in this area, departing from the 2017-2018 growth observations (Figure 22). Similarly no change in scallop density was observed despite a large decrease in density between 2017 and 2018 (Figure 23). The NLS-West experienced a large decline in density and biomass (Figure 22). Heavy fishing pressure was exerted in this area, but the decline is not explained by fishery removals. The 2019 projected biomass was about 40,000 mt, more than double our estimate (Table 1, Figure 1). This is unlikely a result of high natural mortality due to the stability in other NLS areas (Figure 23). This suggests higher than anticipated incidental and discard mortality, which may be relevant to decisions regarding the NLS-South-Deep SAMS area.

Unlike the NLS- West, the MAAA biomass results were similar to projections (Table 1; HCS, ET-Open, and ET-Flex combined projection was 54,300 mt). However, a substantial portion of the biomass is still located in the southern portion of the ET-Open where large scallops have grown and remained unfished. In addition, there is a notable amount of recruit sized and smaller scallops present in the area; 25% of the scallops in ET-Open are 75 mm or less (Figures 4, 5, 19). Continued precaution when allocating or projecting effort to the MAAA should be considered.

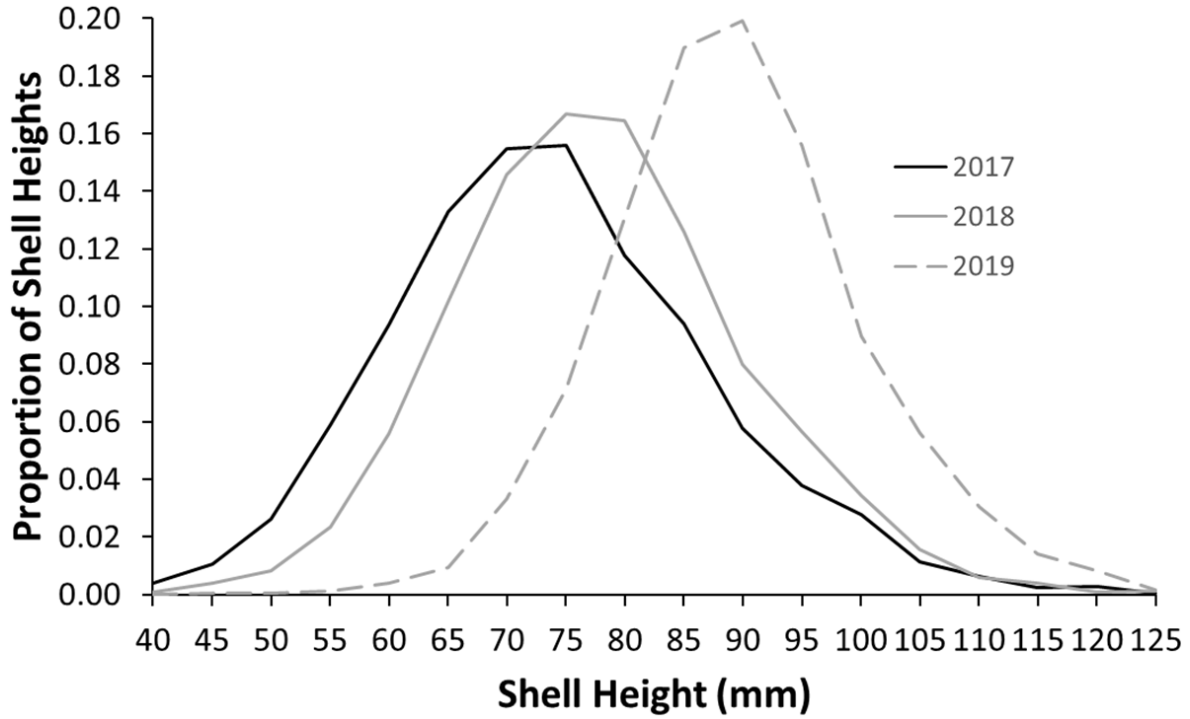


Figure 22. Shell height distribution of scallops in the NLS-South-Deep SAMS zone from 2017-2019.

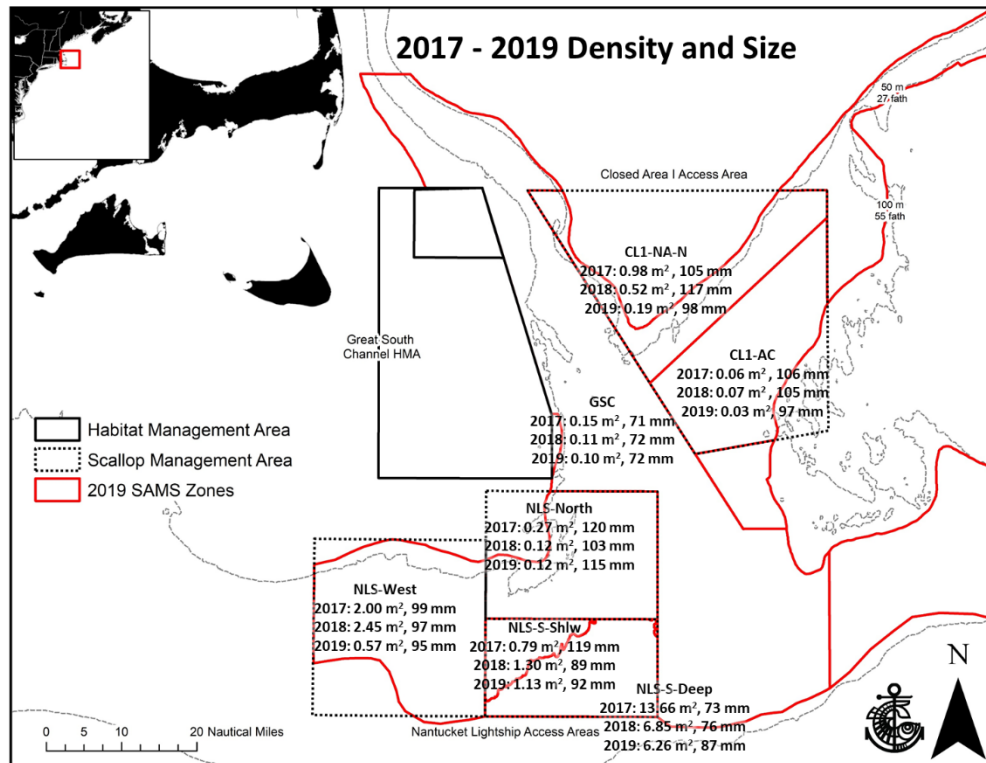


Figure 23. Average scallop density and shell height by year in SAMS areas surveyed from 2017-2019 with the SMAST drop camera.

5.0 EXPLOITABLE BIOMASS ESTIMATES FOR 2018 (CURRENT FY)

Table 3. Total biomass estimates from the 2019 SMAST drop camera survey by Scallop Area Management Simulator (SAMS) zone. Stations were 2.8 km apart for SAMS zones aligned with scallop access areas (grey) and CL2-North, stations in all other zones were 5.6 km apart. Meat weights were estimated following the 65th SARC shell-height to meat-weight formula except in NLS SAMS areas where an equation from the Virginia Institute of Marine Science was used. Biomass estimates were rounded to the nearest 50 tons.

SMAST Drop Camera			
Georges Bank	Exploitable BmsMT	SE	MeanWt
CL2-North	4,950	1,350	49.6
NF	600	250	30.3
CL1-Sliver	2,750	600	30.7
CL1-Access	850	150	49.3
CL1-Access Area Total	3,600		
GSC	3,800	600	32.3
NLS-North	4,100	600	47.1
NLS-West	6,200	2,900	18.9
NLS-South-Shallow	1,900	1,400	18.5
NLS-South-Deep	15,750	2,850	12.8
NLS-South Total	17,650		
Mid-Atlantic			
BI	750	200	30.9
LI	6,500	650	29.6
NYB	4,450	800	27.7
HCS	7,050	550	24.2
ET-Open	14,300	950	27.9
ET-Flex	15,700	2,150	28.6
MA Access Area Total	37,050		
DMV	150	50	23.3

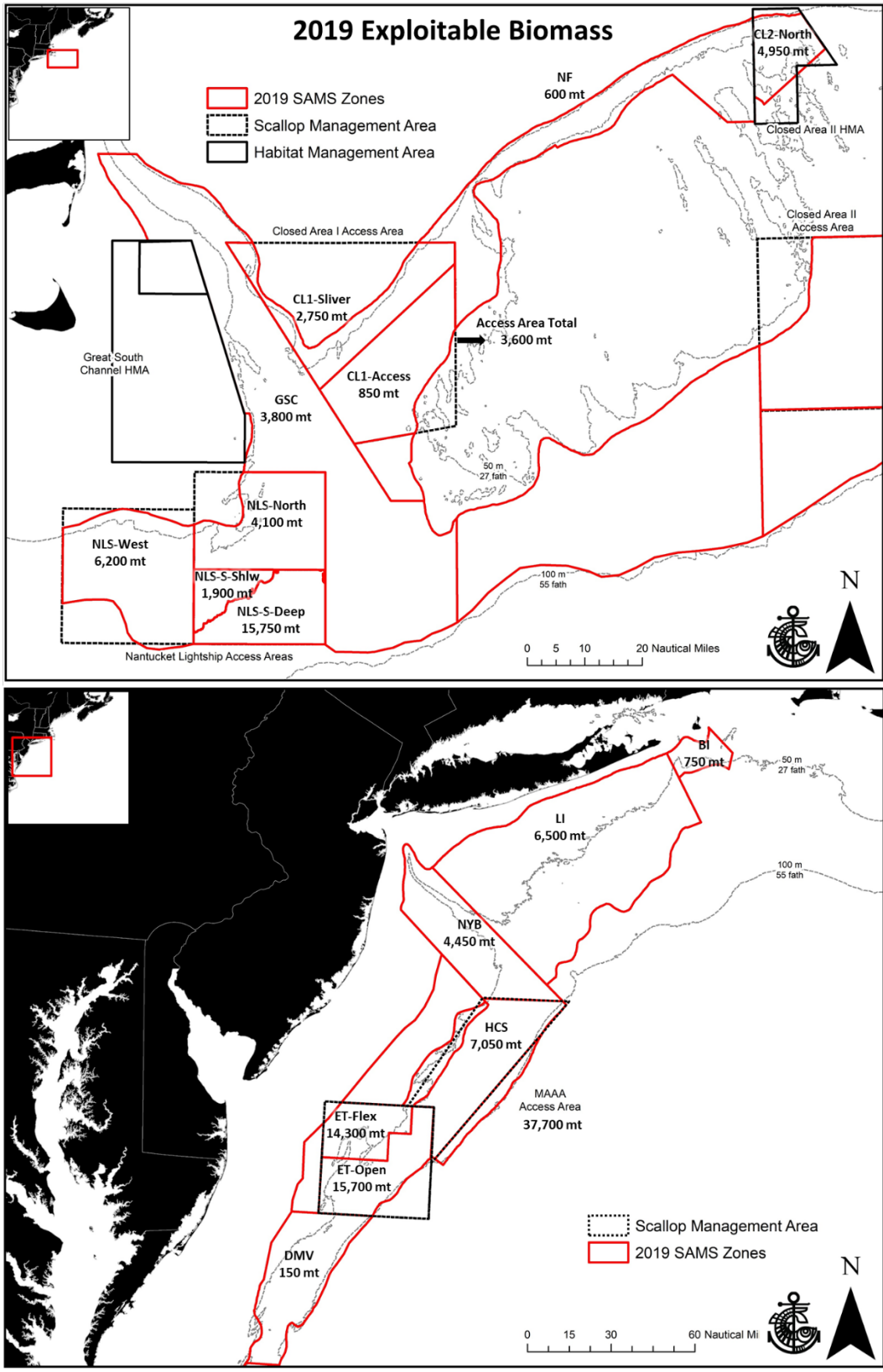


Figure 24. 2019 SMAST drop camera total biomass estimates on Georges Bank and the Mid-Atlantic by Scallop Area Management Simulator (SAMS) zone.