

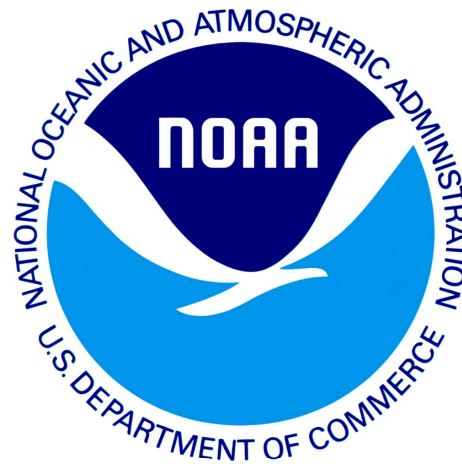
2021 Scallop Survey Short Report

Habcam

Prepared by:

Northeast Fisheries Science Center

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1 2021 SURVEY BIOMASS ESTIMATES

Table 1.1. Summary of 2021 Habcam estimates for scallops larger than 40 mm shell height using combined data from NEFSC and CFF. SARC 65 SH-MW equations were used to estimate meat weights for all SAMS areas. MeanWt is estimated using NumMill/BmsMT. #PerM² is estimated using NumMill/Area. NLS-North, CL1-Access, and CL1-South were not covered by the NEFSC Habcam survey this year. GSC was only partially surveyed by NEFSC Habcam, see Table 1.2 for the estimates in GSC-North and GSC-South. Due to the exceedingly low number of scallops measured in ET-Open, ET-Flex, and DMV (Table 4.3), NEFSC was unable to provide model-based estimates for these areas, designed-based estimates of stratified means by image were provided instead.

SAMS Area	NumMill	BmsMT	BmsMTSE	MeanWt	AvgSize	#PerM ²	#Annotated
Georges Bank							
CL1-Sliver	113	1387	224	12.3	84.30	0.14	1731
CL2-North	282	7371	103	26.1	95.1	0.64	3705
CL2-Southeast	283	3947	429	13.9	82.2	0.11	1616
CL2-Southwest	397	9970	682	25.1	105.5	0.36	768
CL2-Ext	890	14724	829	16.6	91.0	0.64	937
NLS-South	1285	19995	1207	15.6	95.4	2.05	1601
NLS-West	17	400	171	23.9	99.3	0.01	6972
NF	296	4295	361	14.5	86.3	0.16	6949
SF	707	11398	729	16.1	96.5	0.17	2287
Mid-Atlantic							
Block Island	32	815	66	25.5	103.8	0.04	368
Long Island	613	13463	269	22.0	99.4	0.05	4112
NYB	332	4919	851	14.8	86.9	0.07	1868
MAB Inshore	52	1479	130	28.5	116.1	0.01	1171
HCSAA	206	4453	239	21.6	107.3	0.05	1966
ET-Open	97	1664	272	17.2	92.4	0.04	1529
ET-Flex	32	677	190	21.1	103.3	0.02	862
DMV	13	163	80	12.3	83.6	0	1508

Table 1.2. Summary of 2021 Habcam estimates for scallops larger than 40 mm shell height for GSC. SARC 65 SH-MW equations were used to estimate meat weights for these areas.

SAMS Area	NumMill	BmsMT	BmsMTSE	MeanWt	AvgSize	#PerM ²	#Annotated
GSC-North	141	3024	394	21.5	88.4	0.10	3077
GSC-South	66	1396	209	21.1	99.0	0.03	5724

2 FIGURES OF SURVEY COVERAGE

The 2021 NEFSC Dredge/Habcam survey took place in Georges Bank South (NLS and GSC-South for Habcam) from June 8th to 17th and Georges Bank North (GSC-North, CL1-Sliver, NF, and CL2-North for Habcam) from June 26th to July 3th. The center completed 708 nm of Habcam tracks in Georges Bank, collected 2,504,492 image pairs, and manually annotated 43,693 images (Figure 2.1). Habcam survey in the Mid-Atlantic was solely conducted by CFF (Figure 2.3). Twenty geostatistical models were constructed to produce the spatial count and biomass estimates of scallops for part of Georges Bank and part of Mid-Atlantic for 2021.

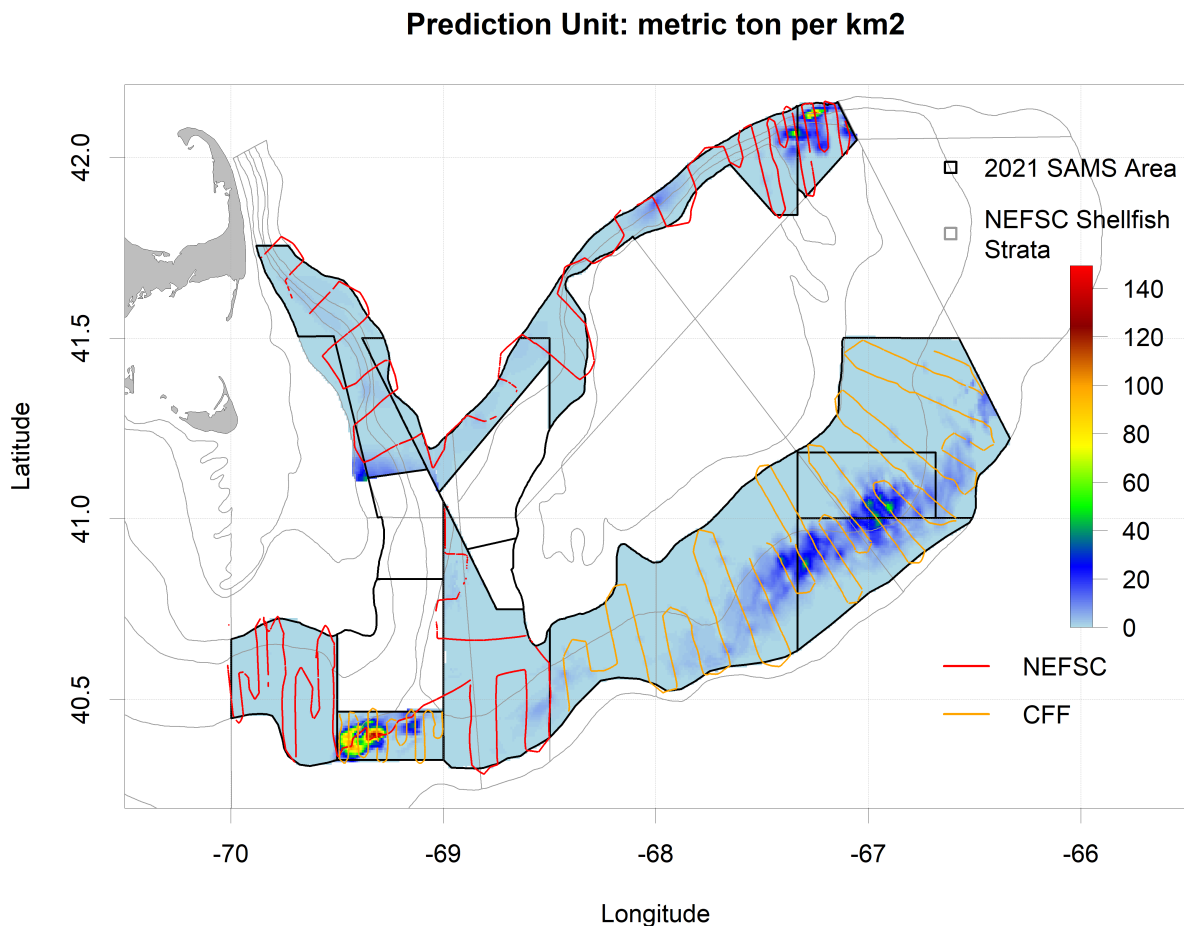


Figure 2.1. The 2021 Habcam survey tracks conducted by NEFSC and CFF, along with 2021 Habcam biomass estimates for 40+ mm scallops for part of Georges Bank.

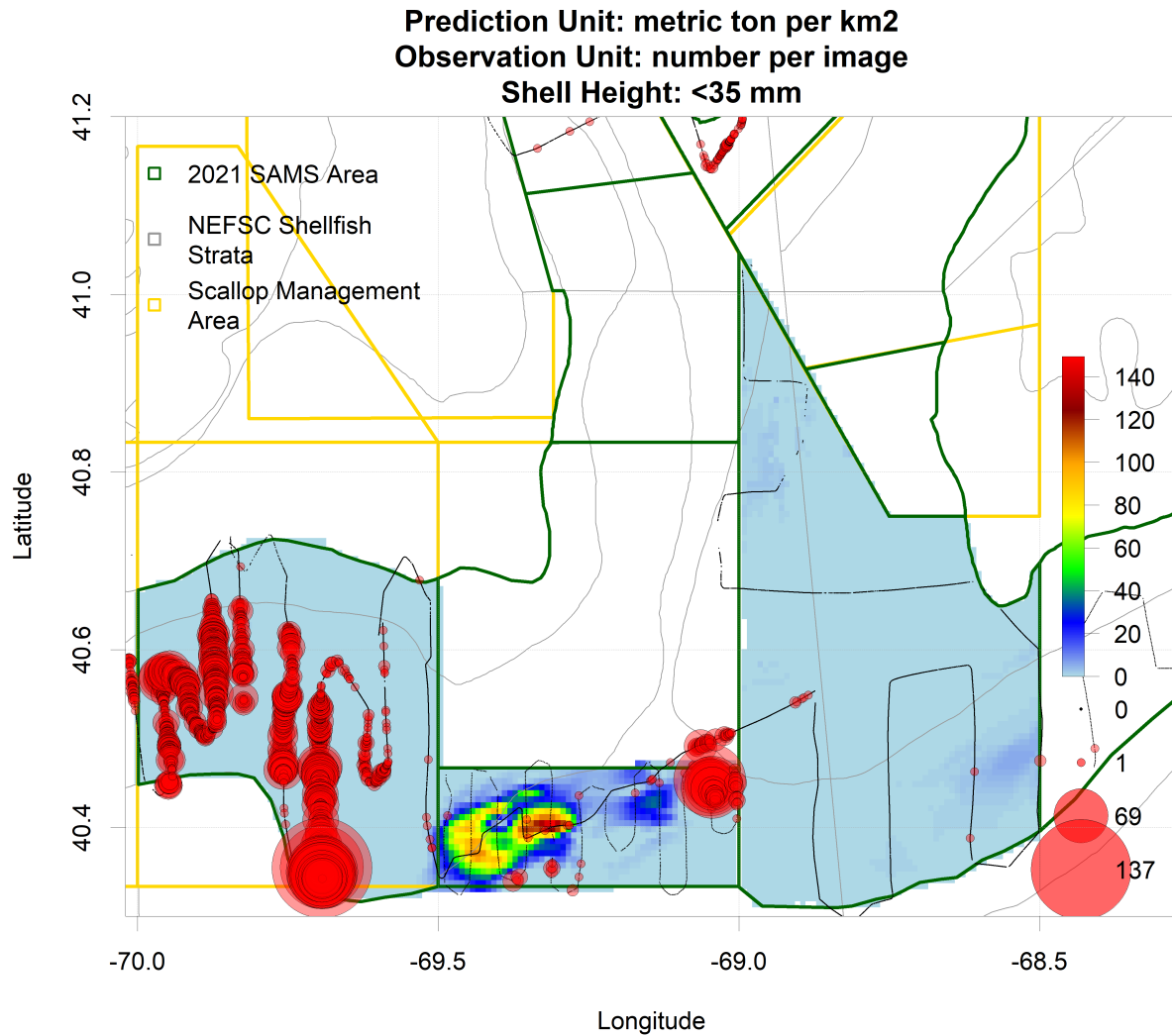


Figure 2.2. The 2021 Habcam biomass estimates for 40+ mm scallops and Habcam observations (number per image) by size classes for part of Georges Bank.

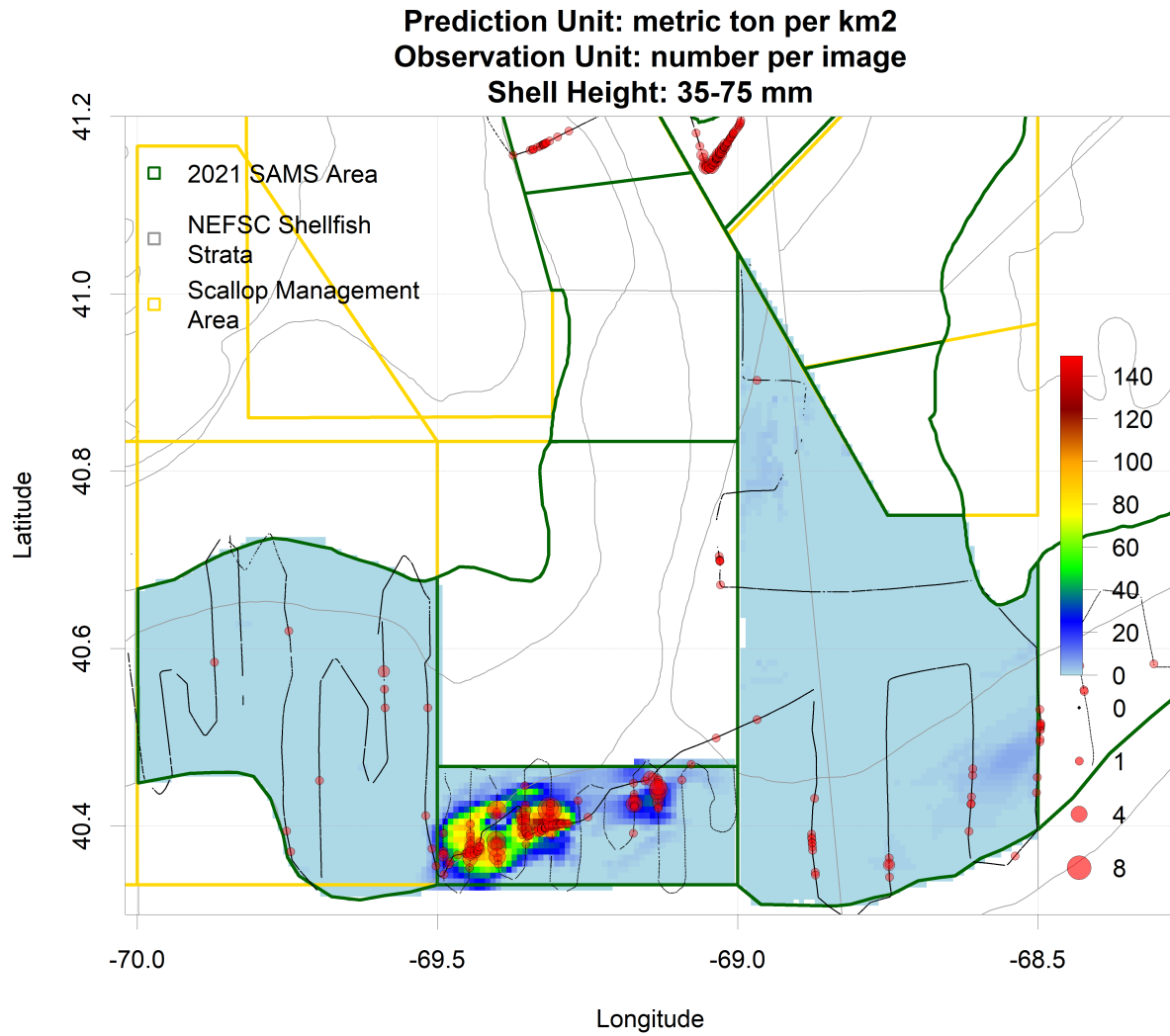


Figure 2.2. Continued.

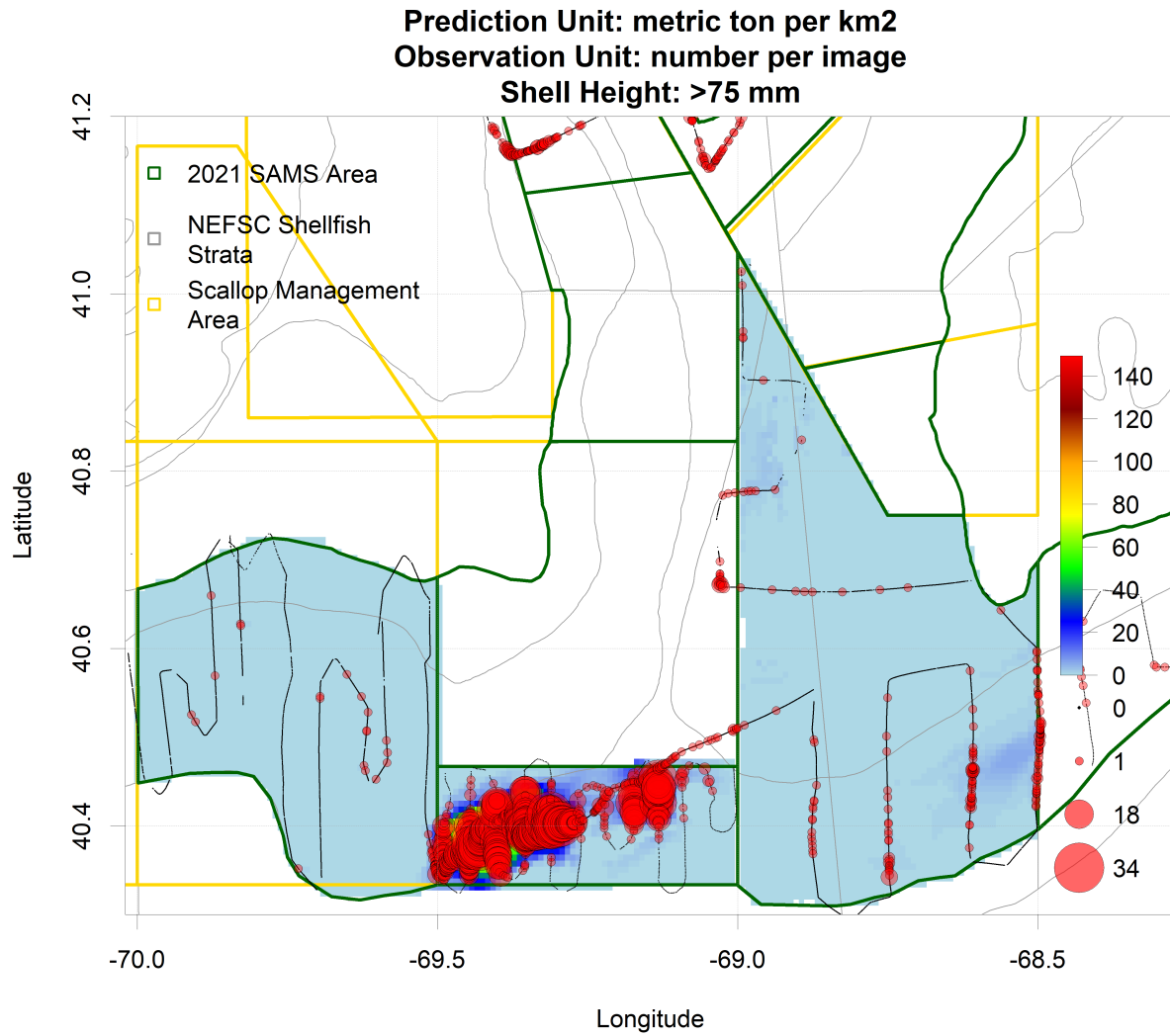


Figure 2.2. Continued.

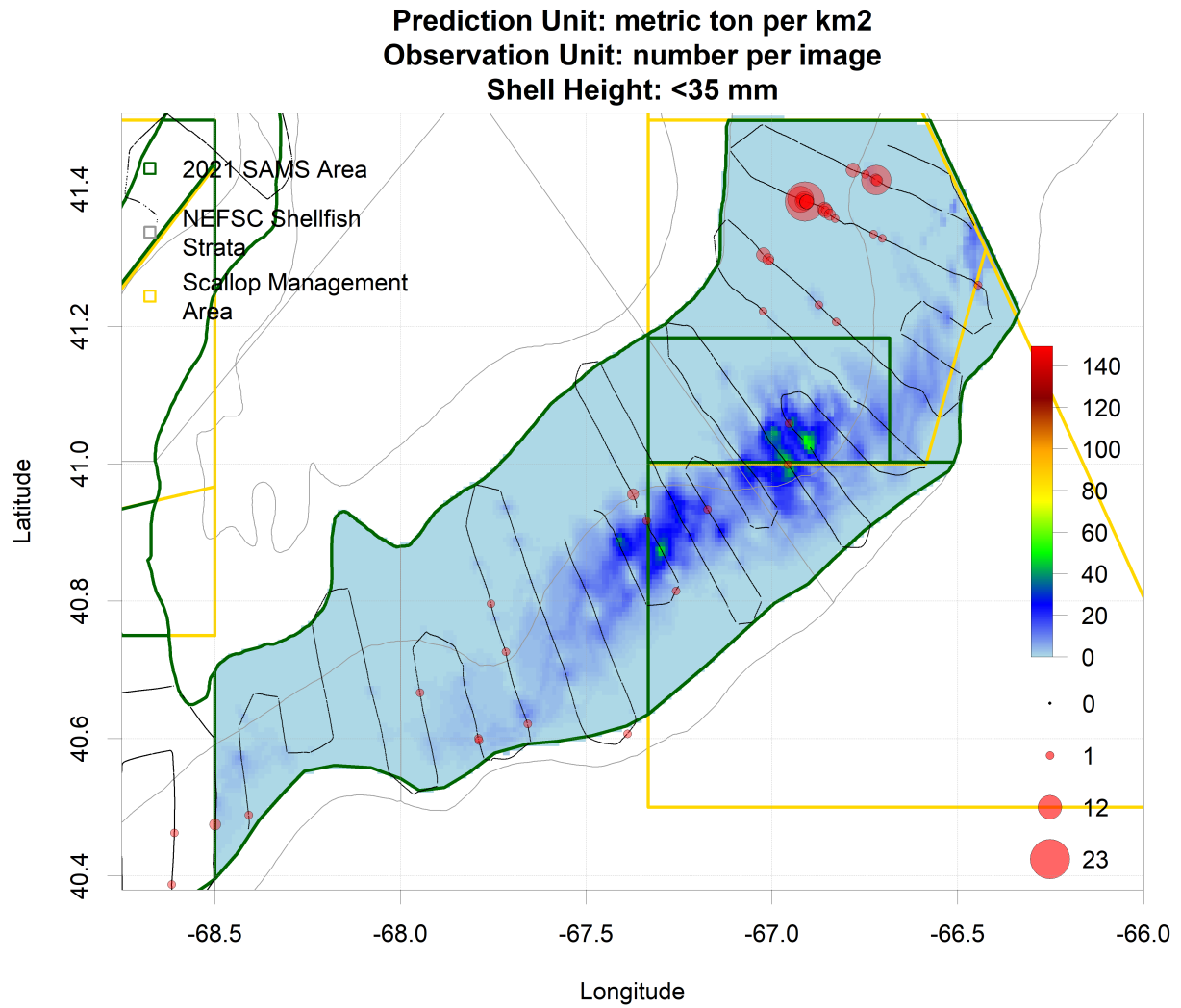


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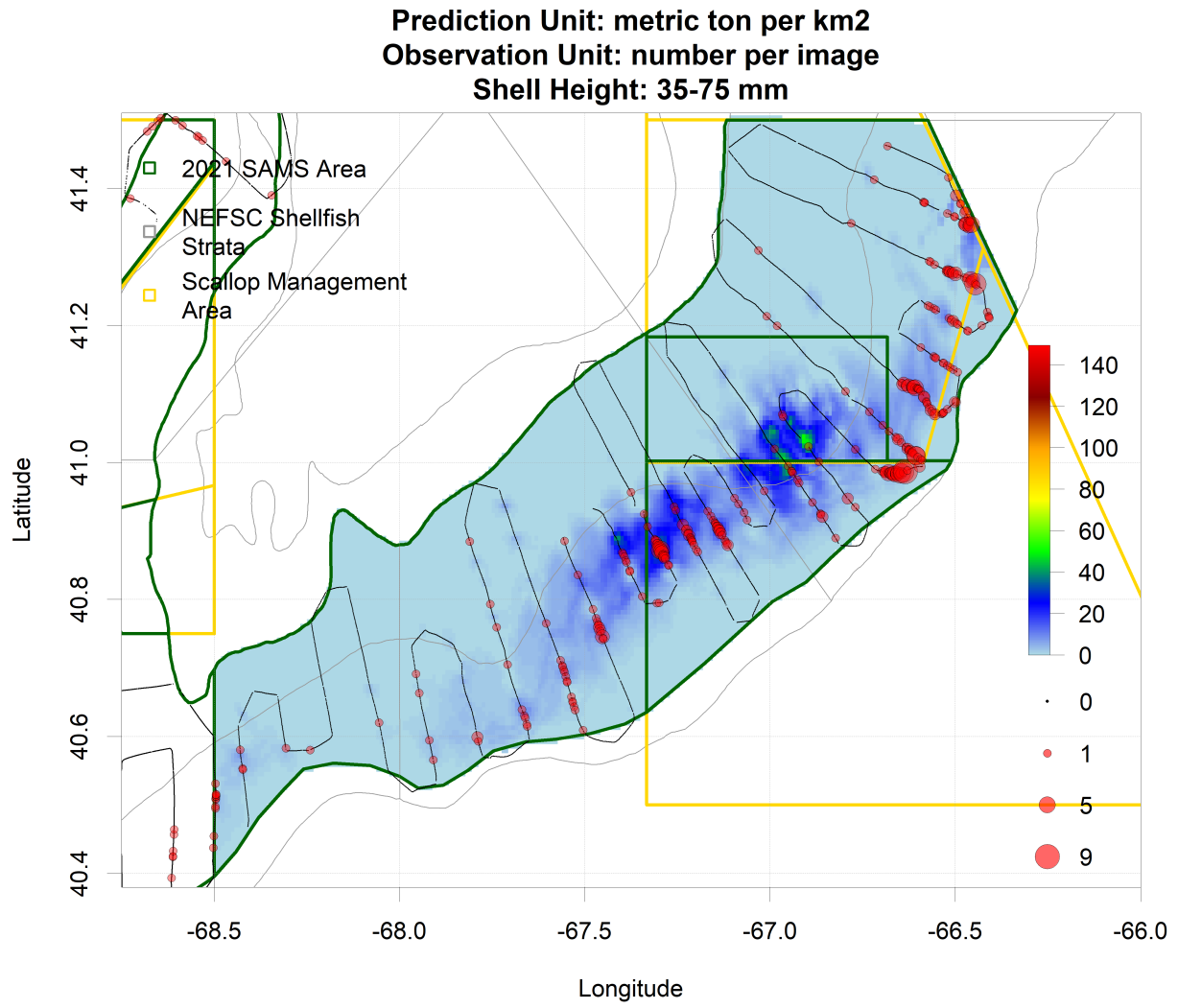


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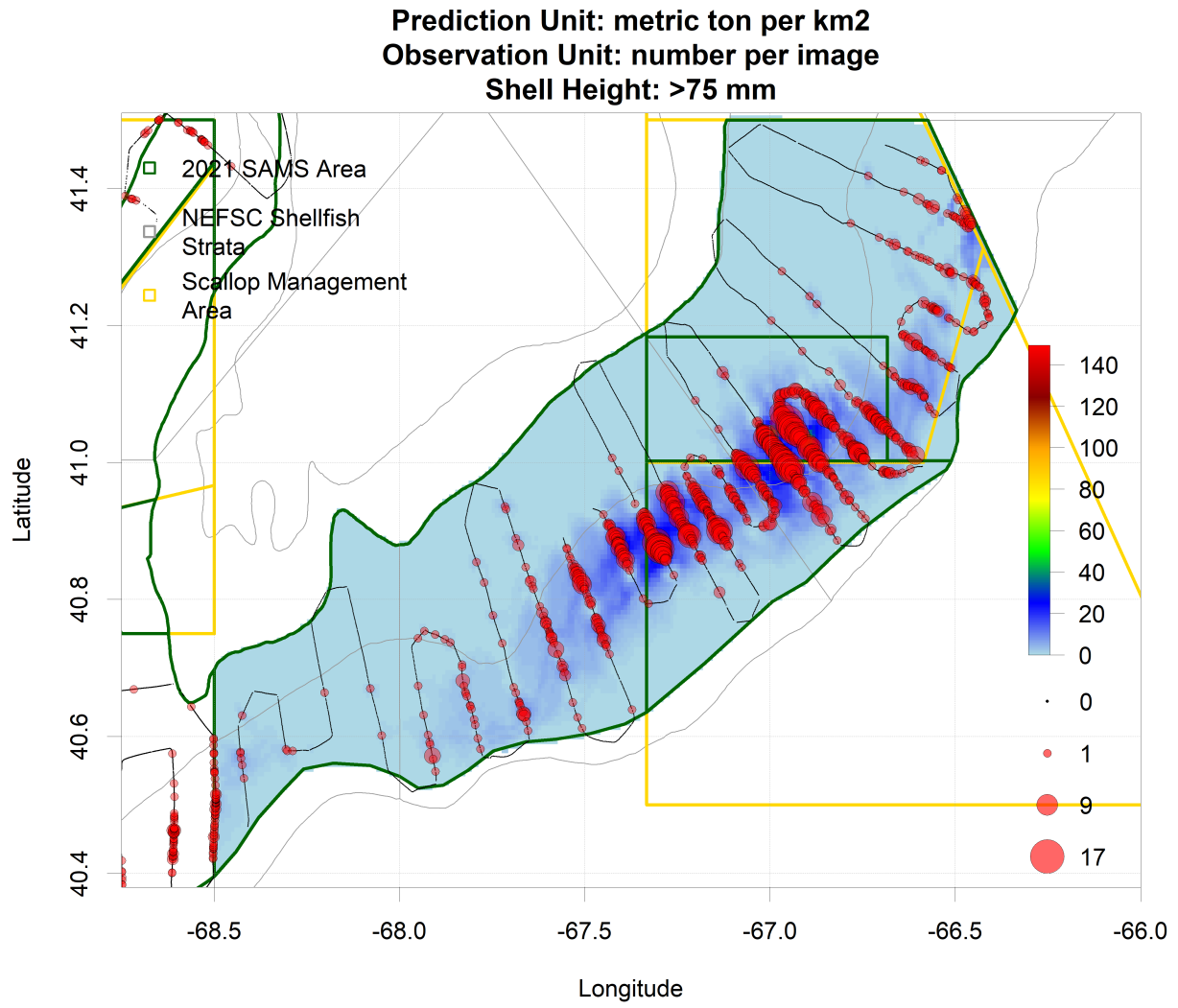


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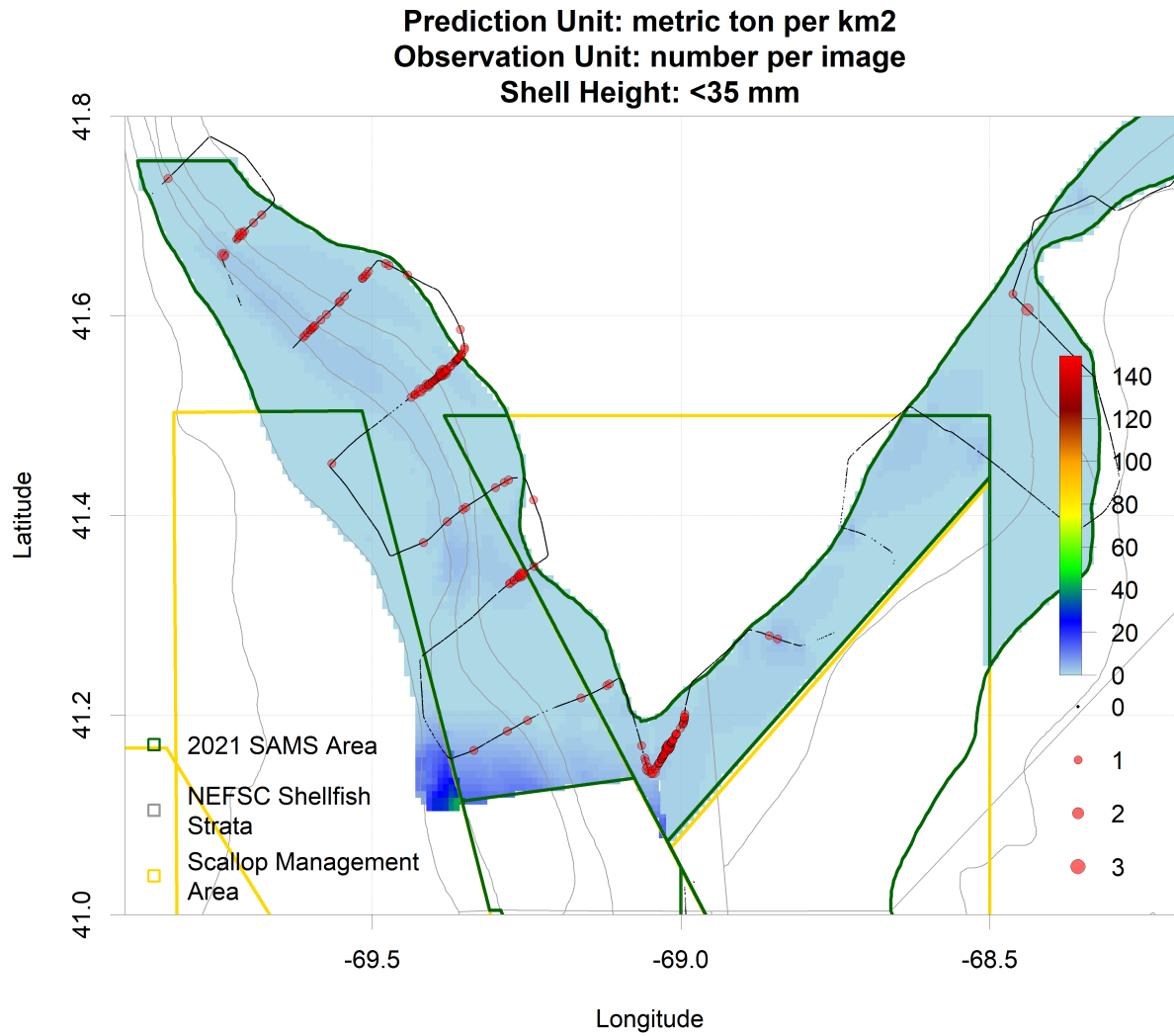


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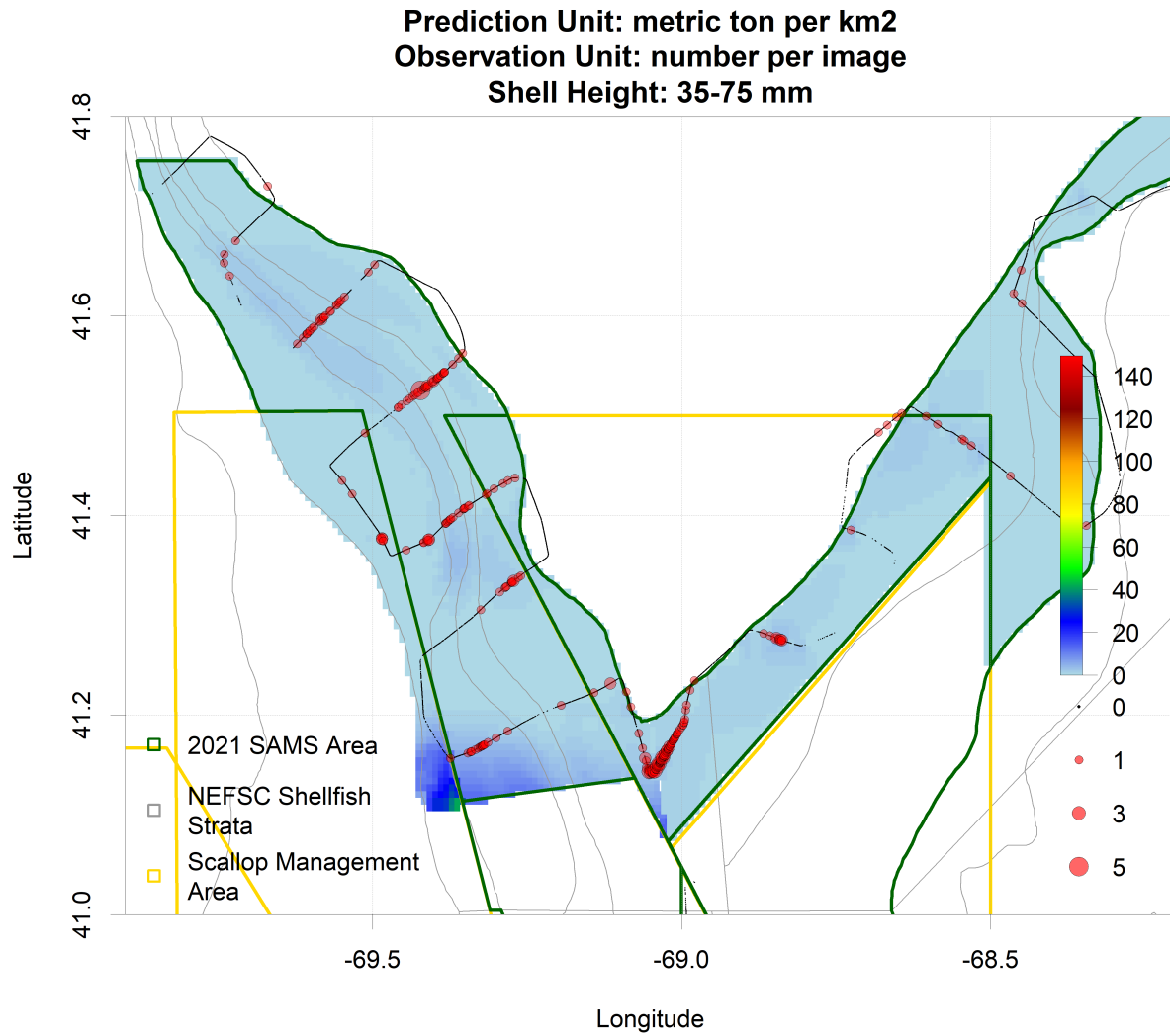


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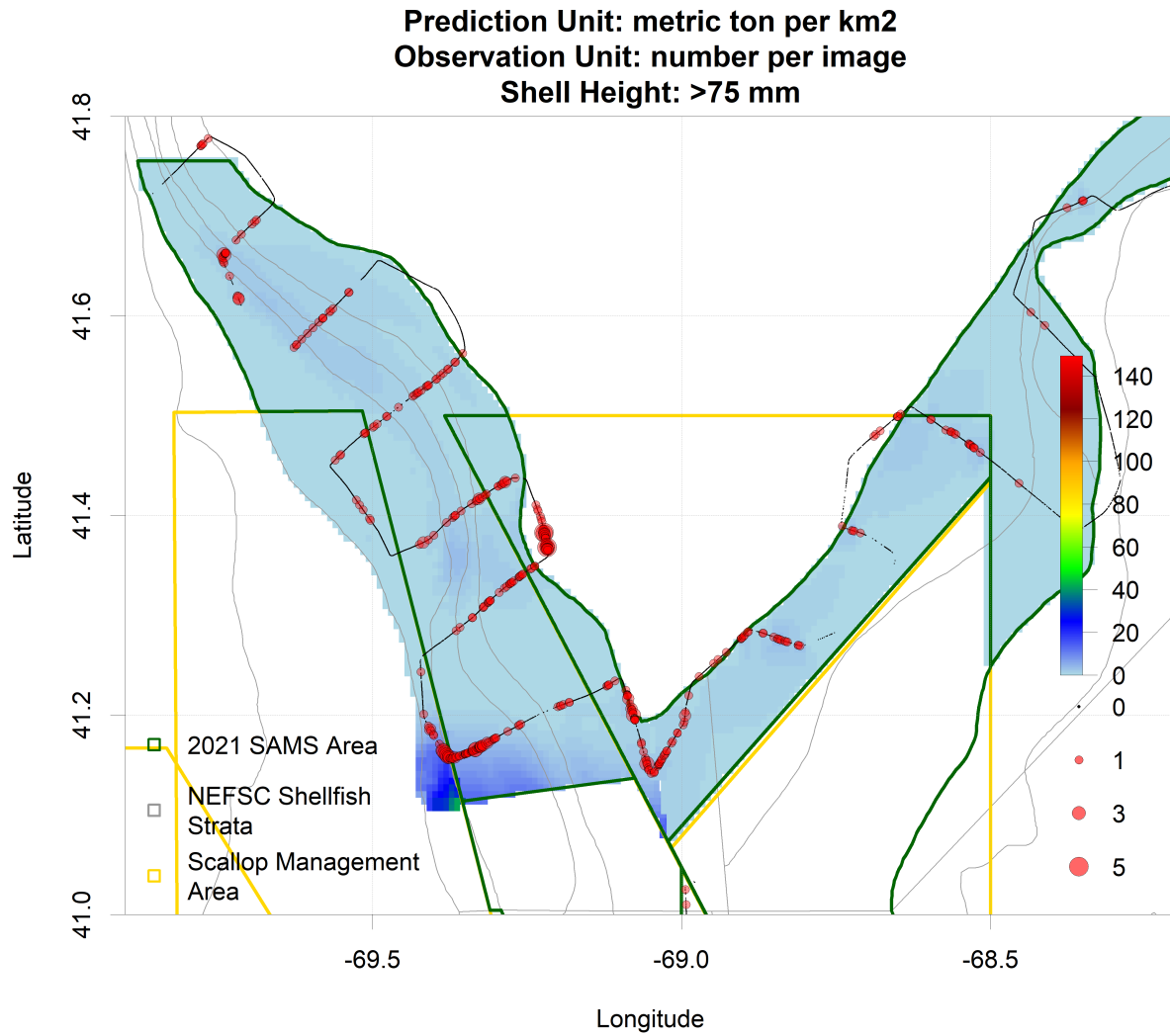


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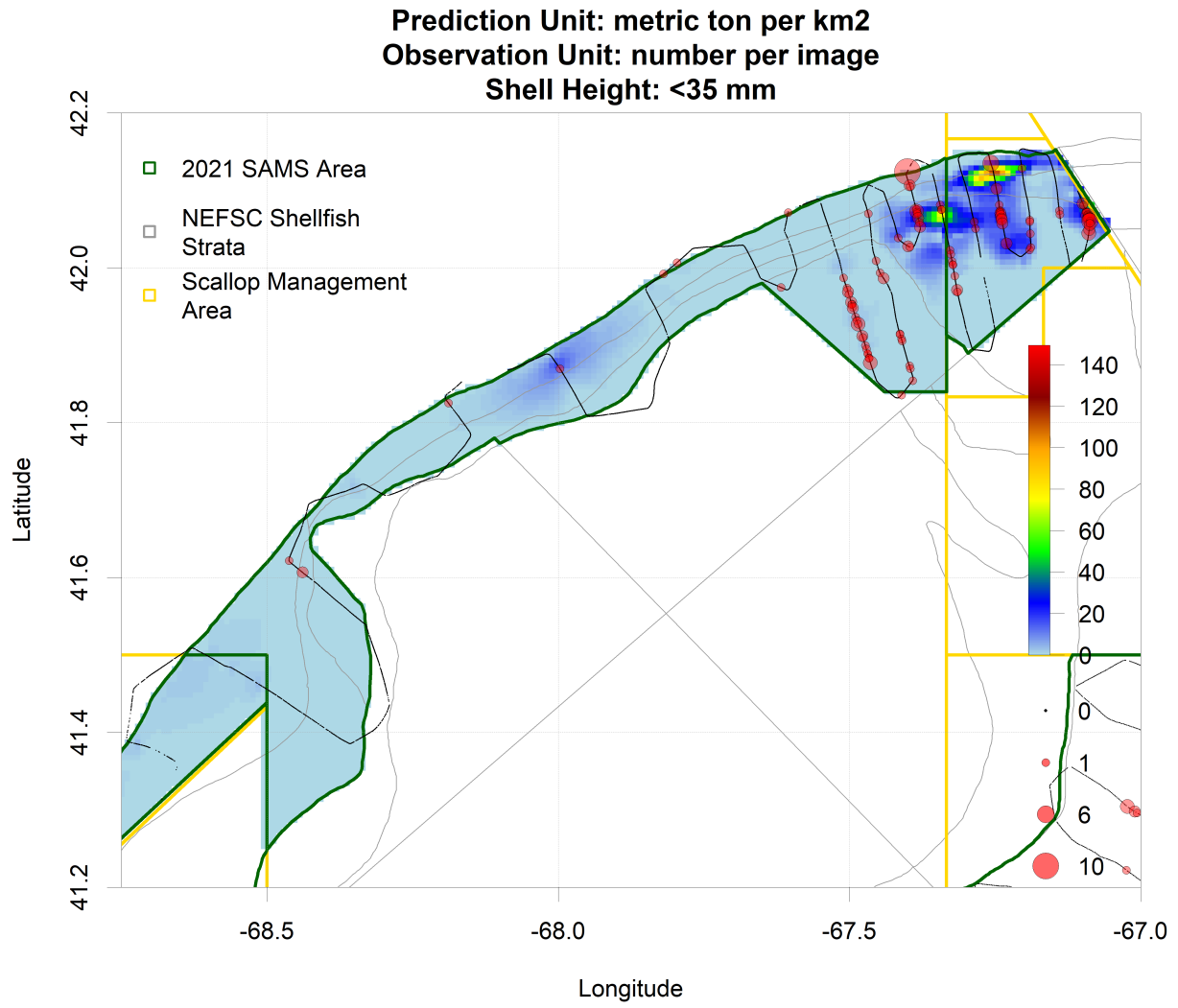


Figure 2.2. Continued.

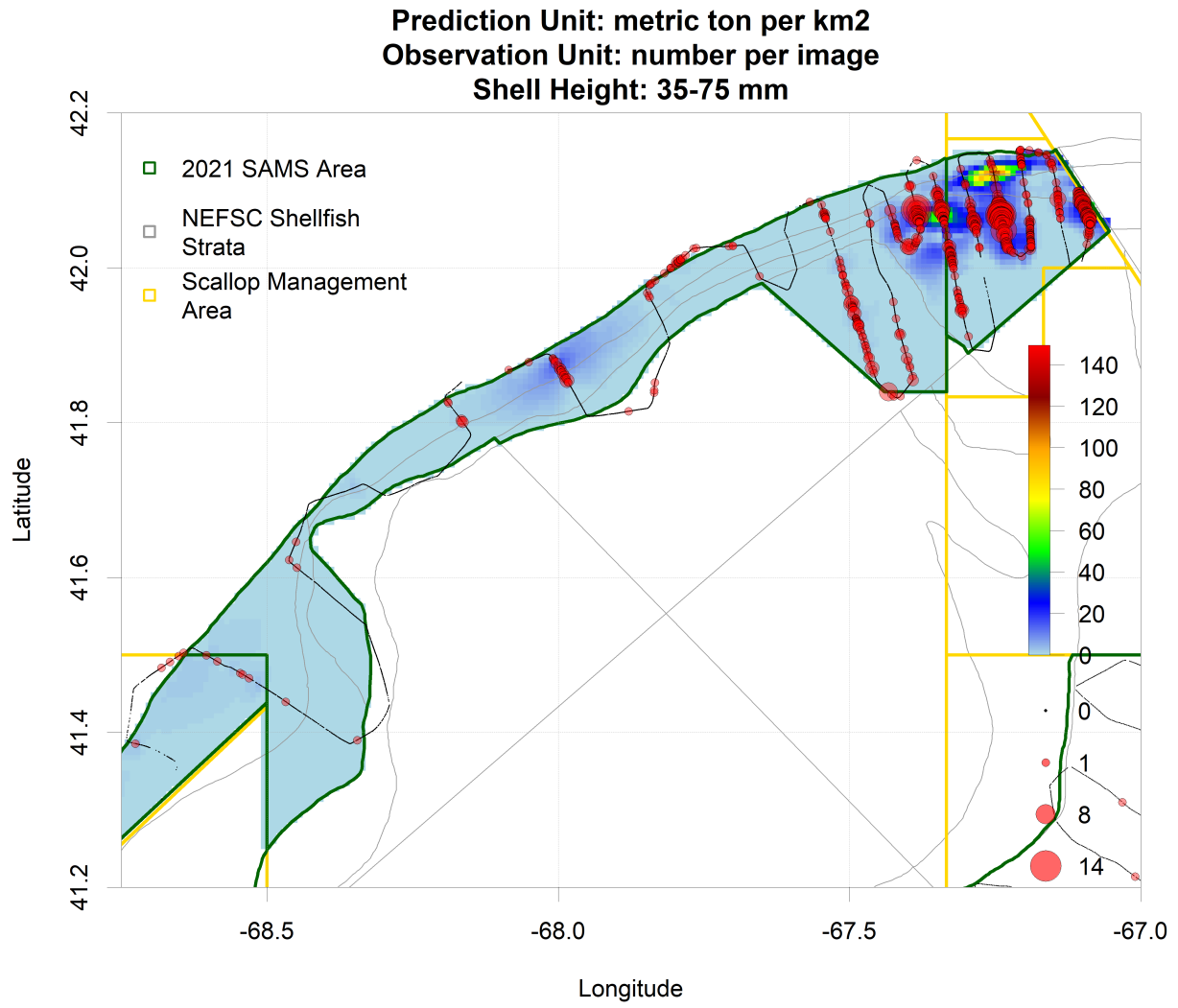


Figure 2.2. Continued.

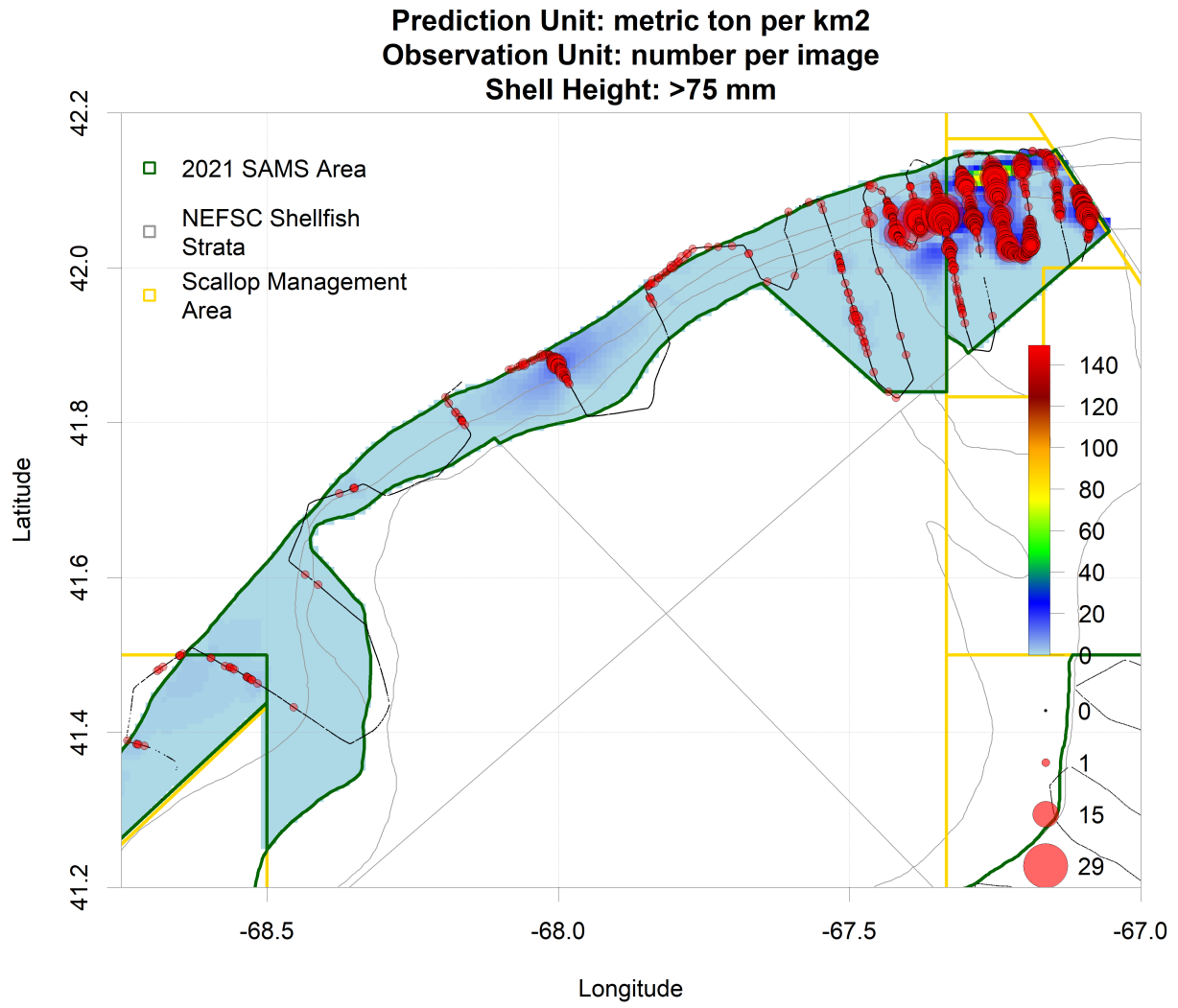


Figure 2.2. Continued.

Prediction Unit: metric ton per km2

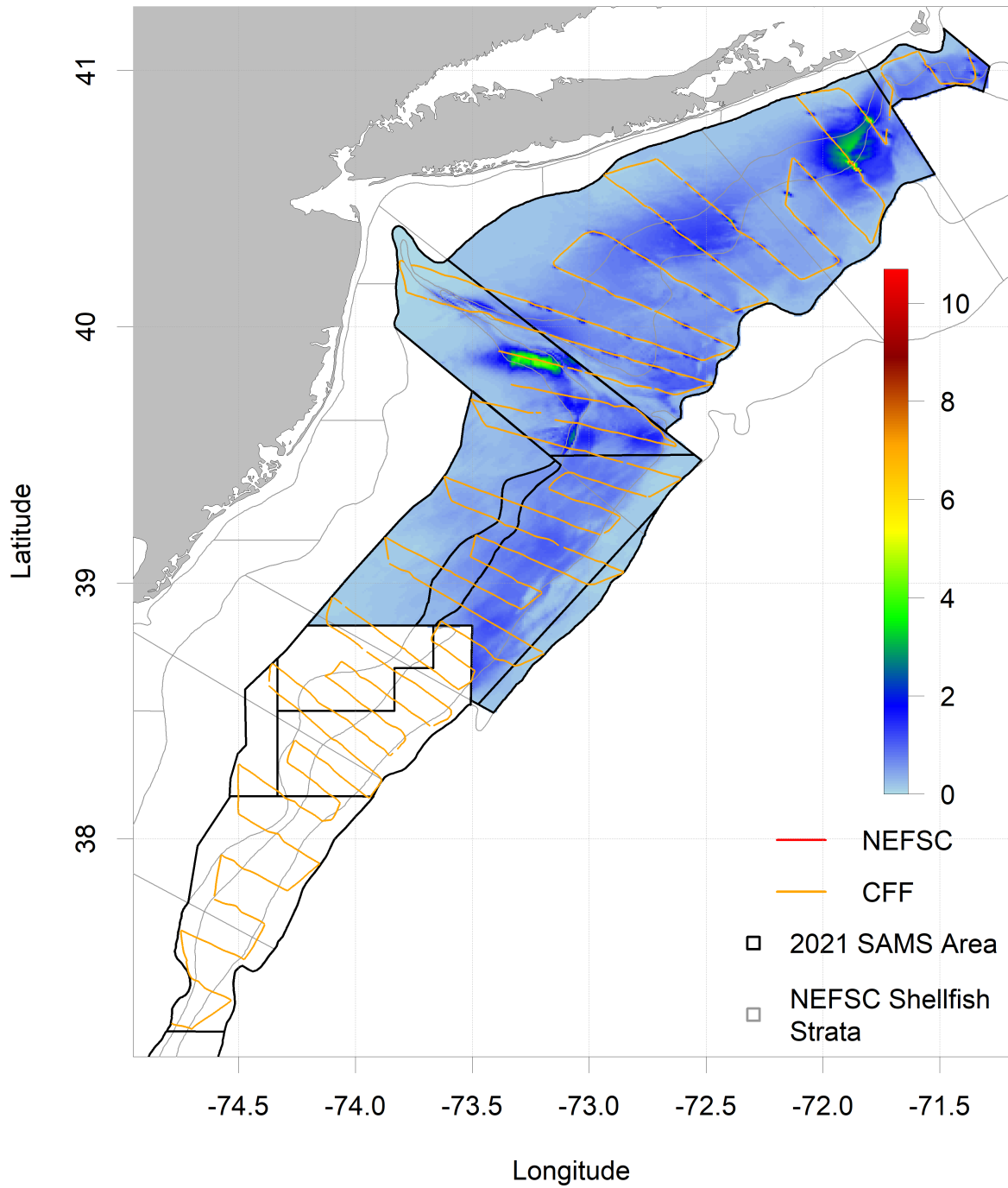


Figure 2.3. The 2021 Habcam survey tracks conducted by CFF, along with 2021 Habcam biomass estimates for 40+ mm scallops for part of Mid-Atlantic.

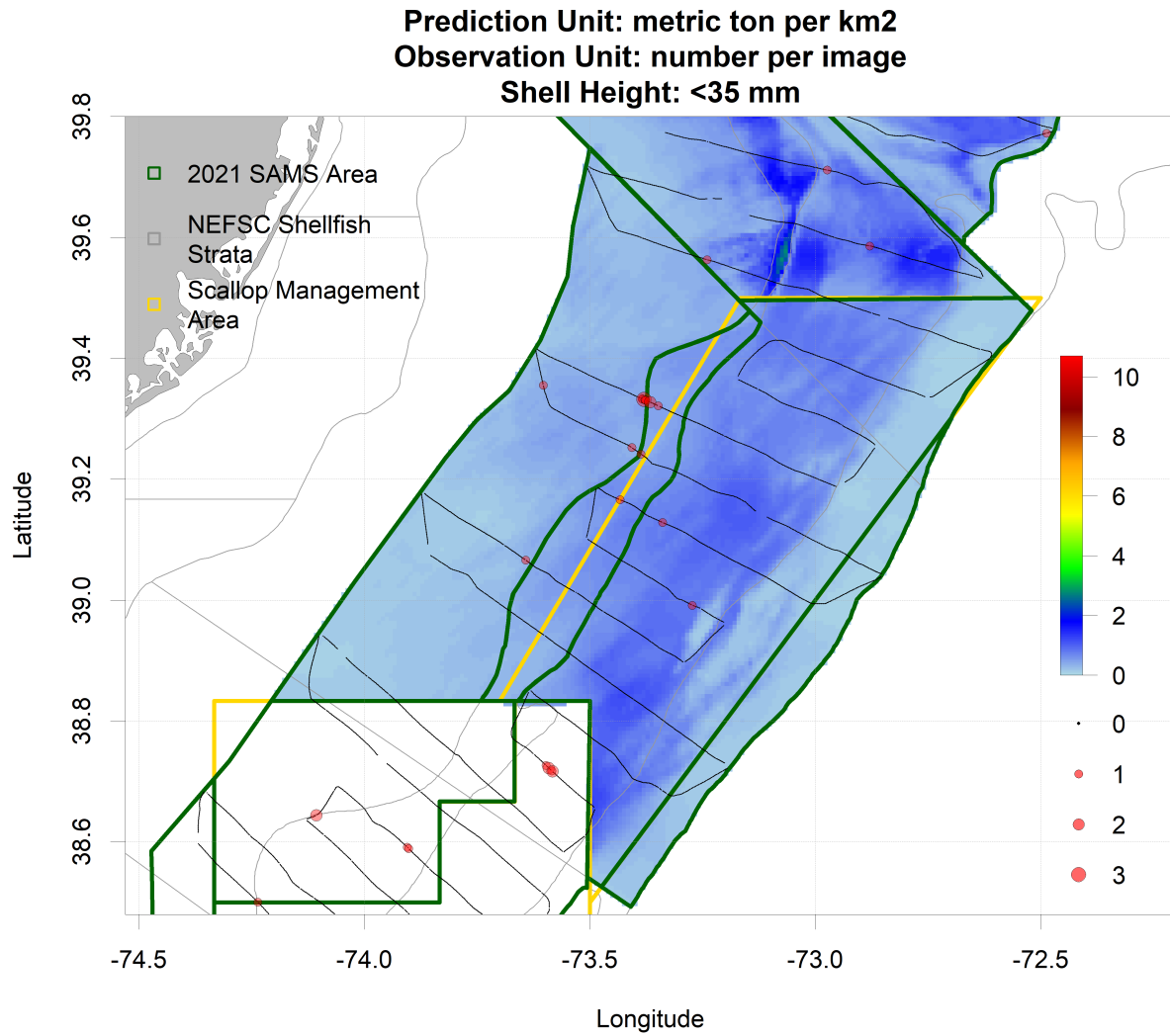


Figure 2.4. The 2021 Habcam biomass estimates for 40+ mm scallops and Habcam observations (number per image) by size classes for part of Mid-Atlantic.

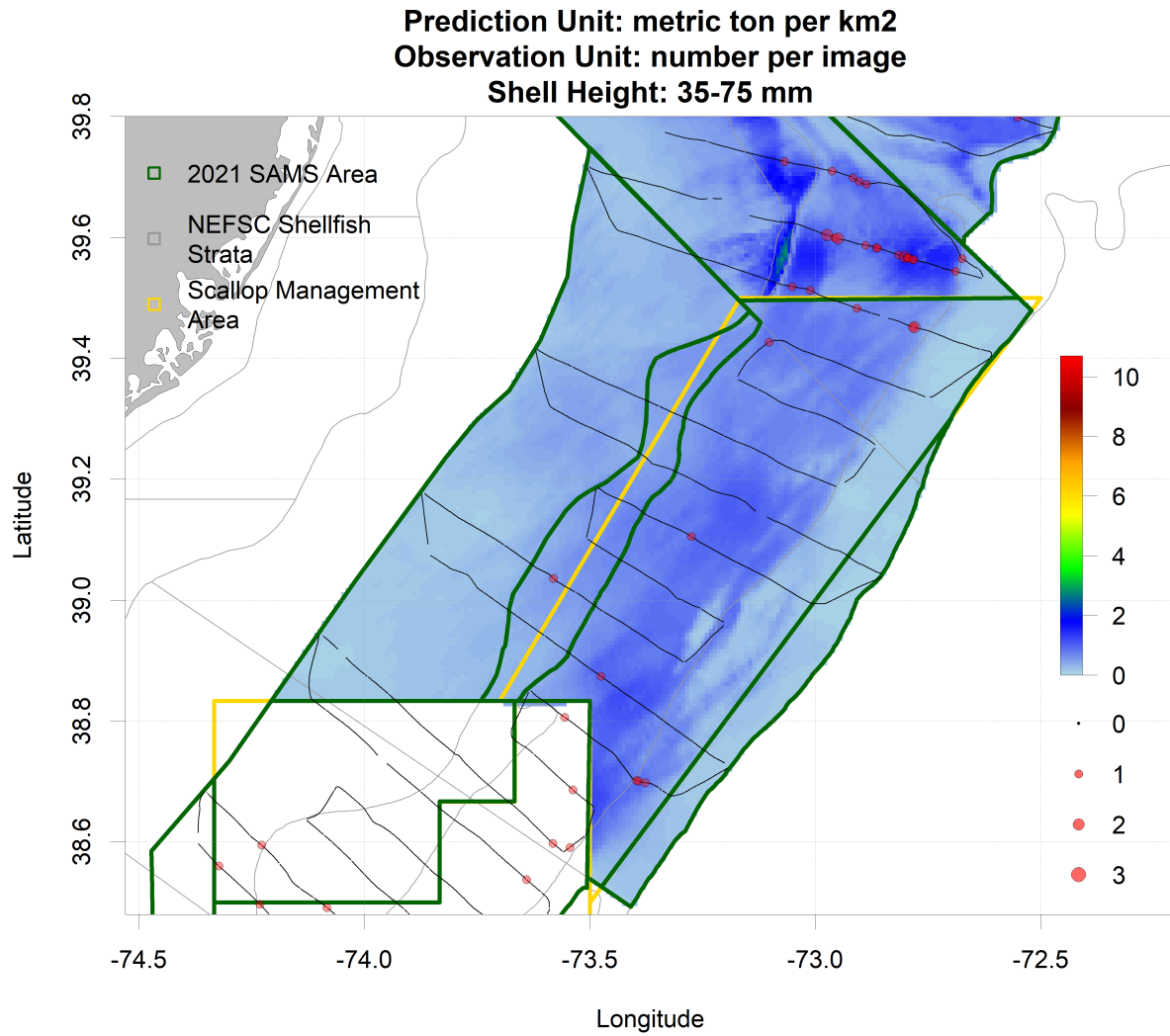


Figure 2.4. Continued.

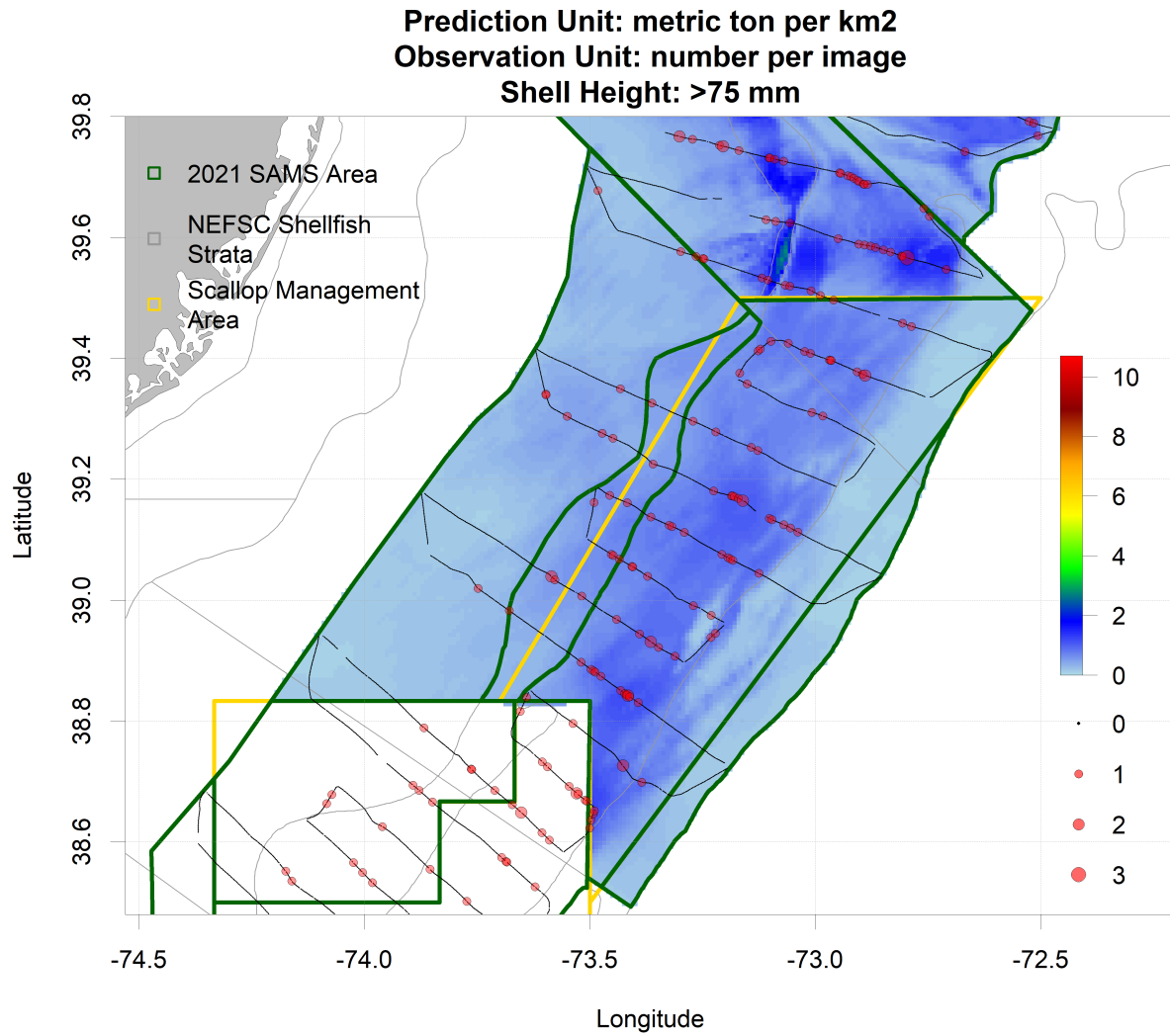


Figure 2.4. Continued.

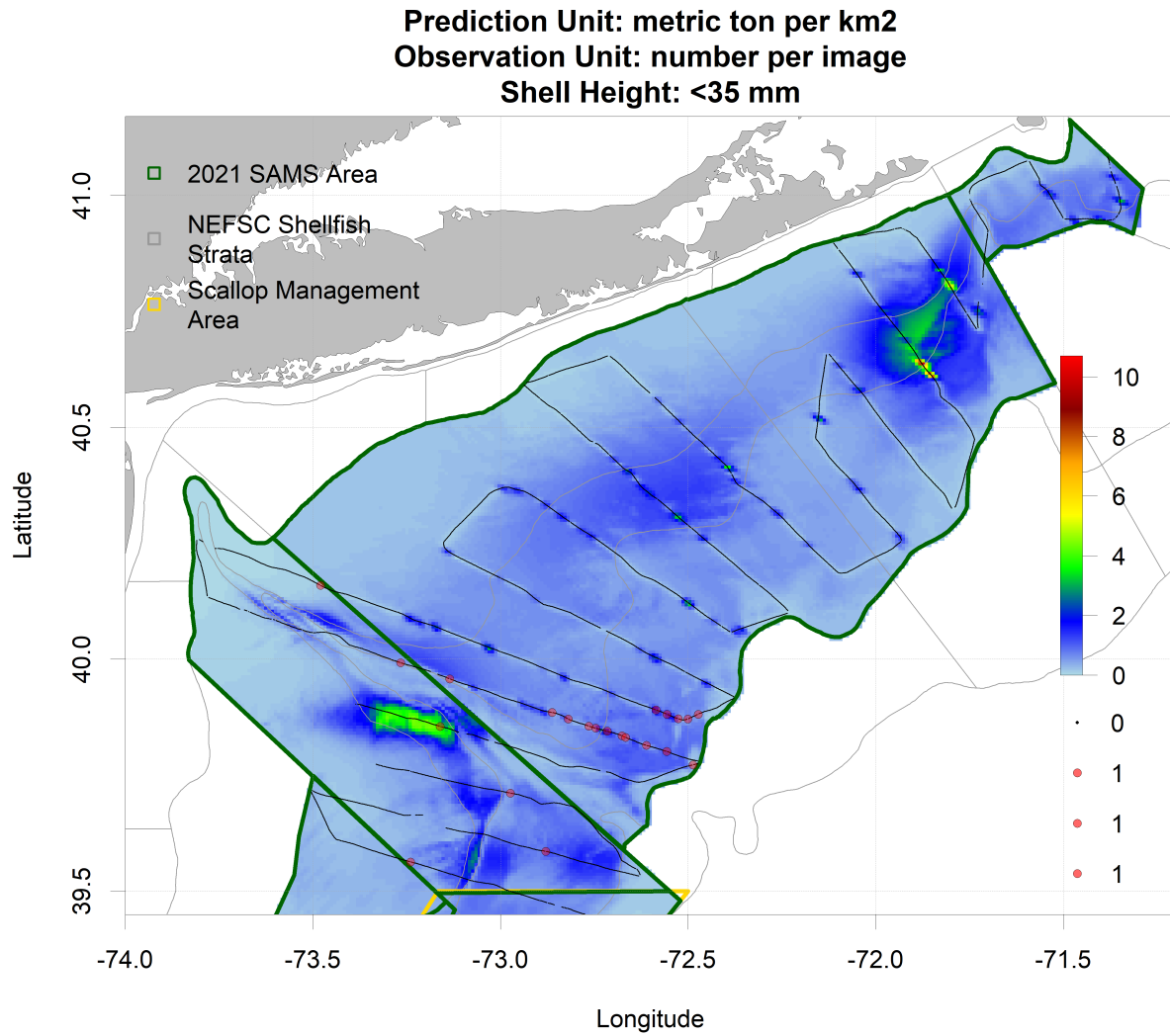


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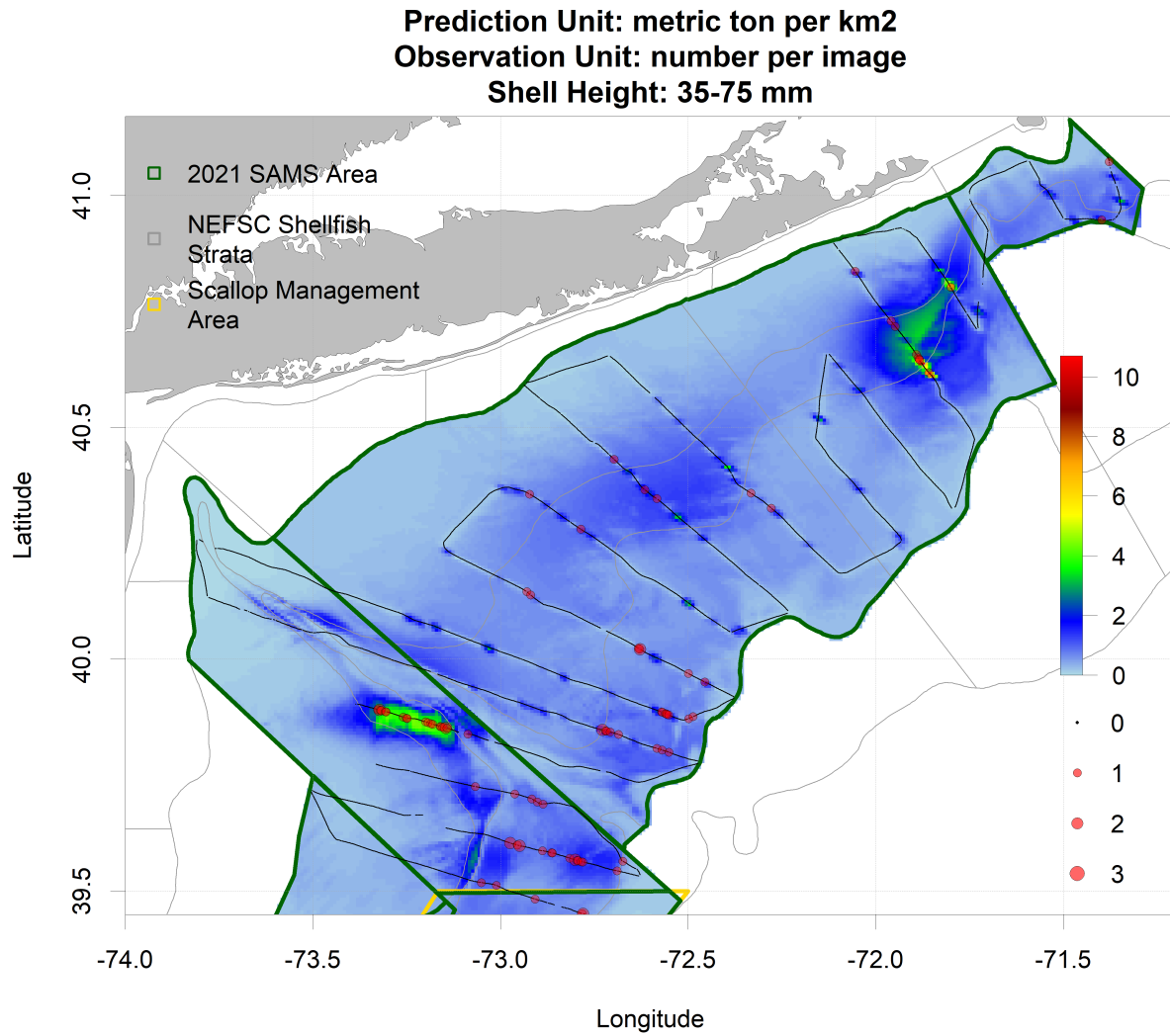


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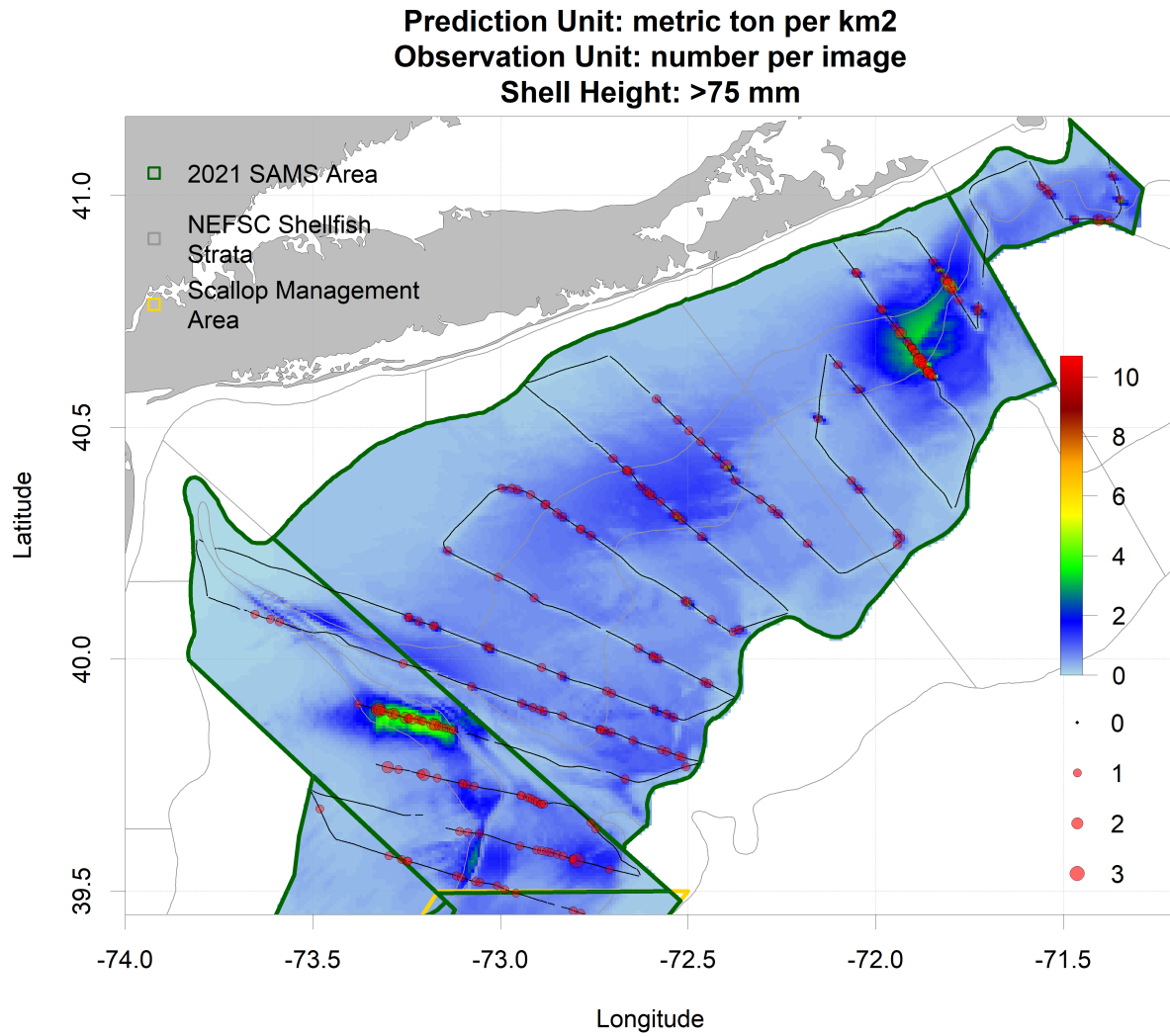


Figure 2.4. Continued.

3 LENGTH FREQUENCY PLOTS BY SAMS AREA

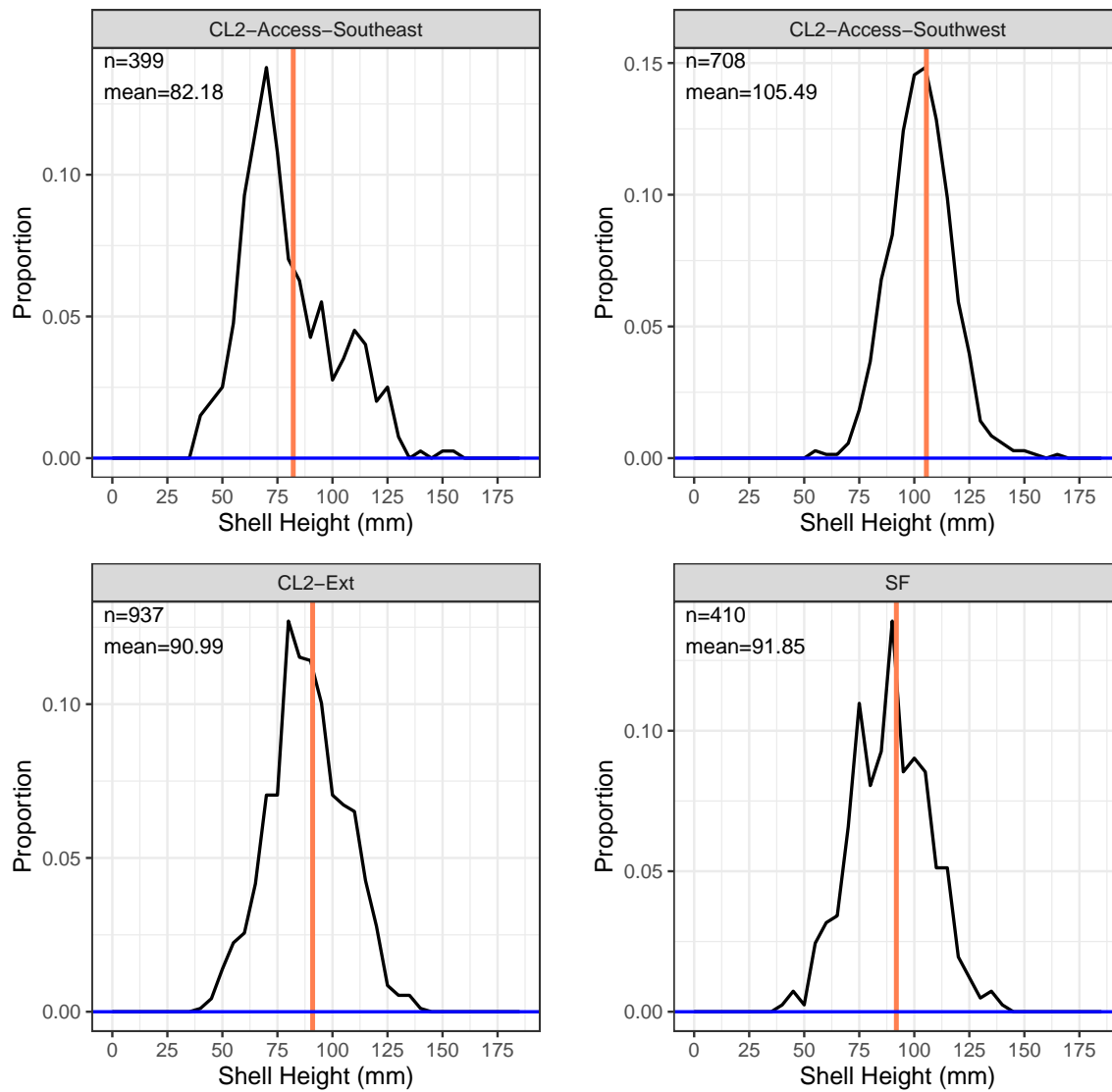


Figure 3.1. The 2021 Habcam size frequencies, mean shell height, and its sample size by SAMS area for 40+ mm scallops using combined data from NEFSC and CFF for part of Georges Bank.

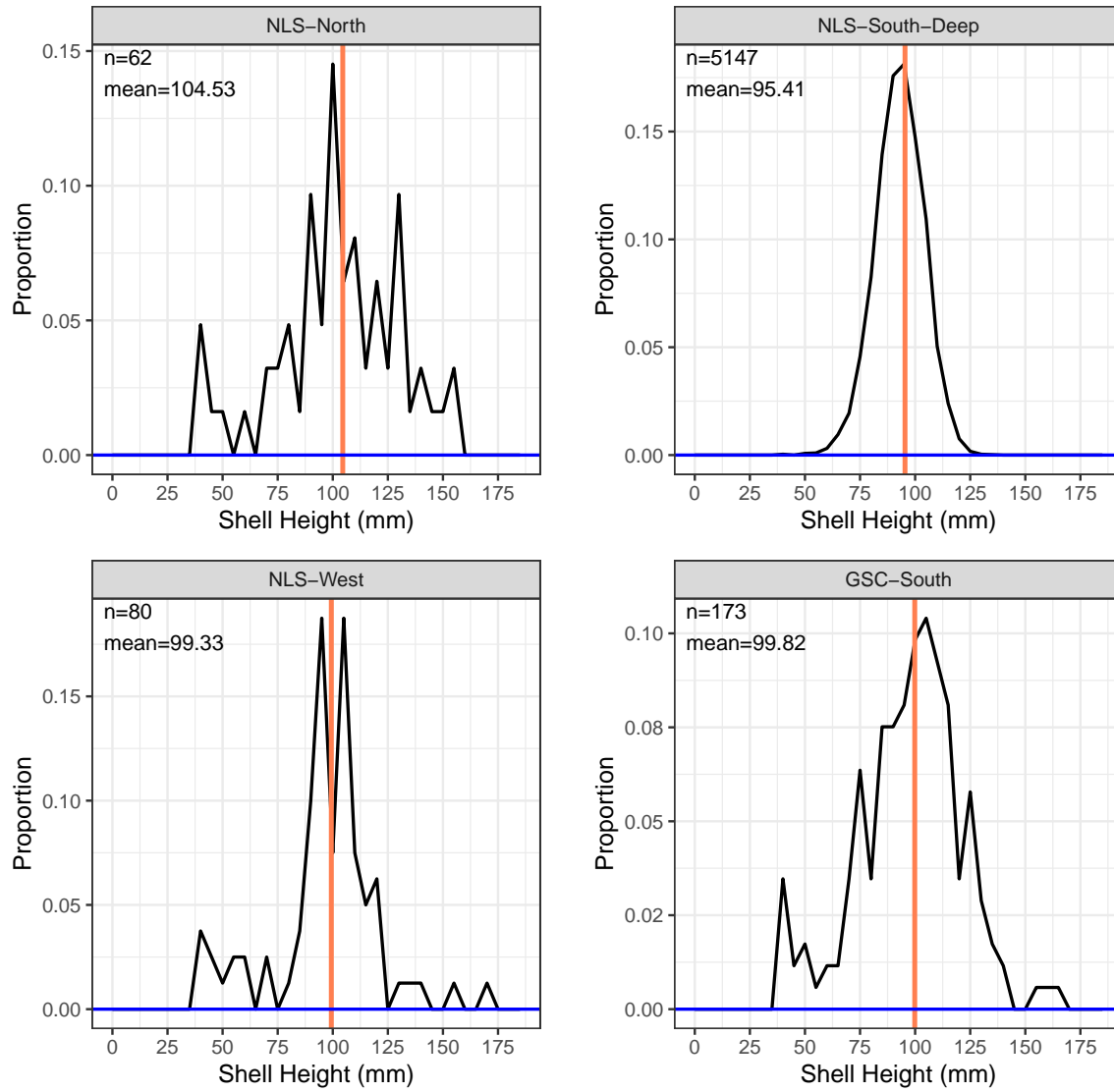


Figure 3.1. Continued.

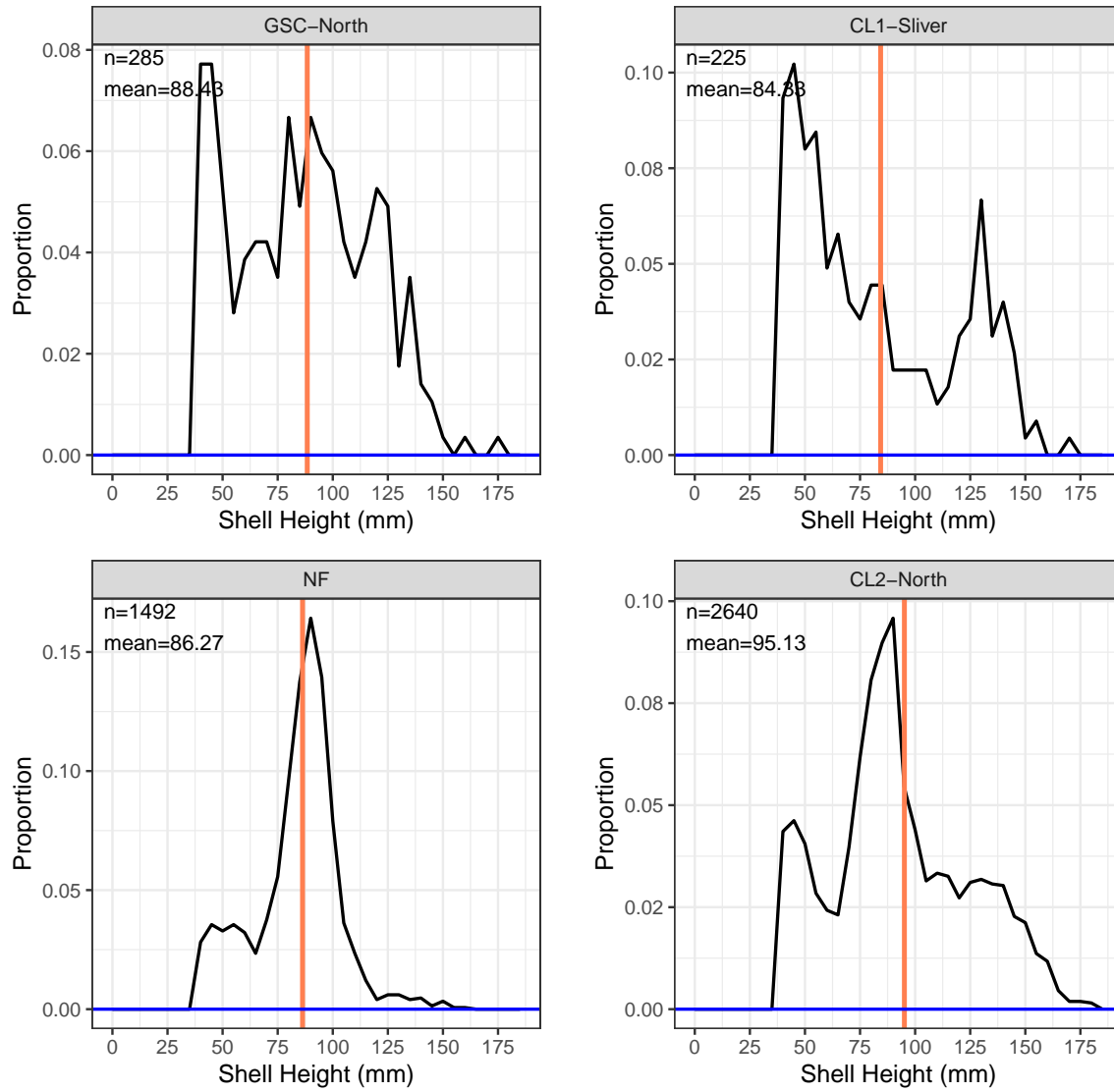


Figure 3.1. Continued.

4 SPECIAL COMMENTS

4.1 Comparison of NLS-South biomass estimates

The 2021 Habcam biomass estimate in NLS-South using SARC 65 SH-MW equation is 13.32% higher than the estimate using VIMS 2016-2021 equation (Table 4.1).

Table 4.1. Comparison of 2021 Habcam biomass estimates (40+ mm) using VIMS 2016-2021 and SARC 65 SH-MW equations for NLS-South. Percent difference was calculated using biomass estimates $(\text{SARC 65} - \text{VIMS})/(\text{SARC 65})$.

SAMS Area	BmsMT (VIMS)	BmsMT (SARC 65)	%Diff
NLS-South	19995	17333	13.32

4.2 Count estimates of <35 mm scallops in NLS

The 2021 Habcam survey observed scallop seeds throughout NLS-West and NLS-South (Figure 4.1). The mean number per m^2 of <35 mm scallops from images with positive counts are 5.43 per m^2 in NLS-West and 9.05 per m^2 in NLS-South. A total of over 3 billion of <35 mm scallops is estimated for these areas from the Habcam survey data (Table 4.2).

Table 4.2. Summary of 2021 Habcam count estimates for scallops smaller than 35 mm shell height for NLS.

SAMS Area	NumMill	NumMillSE	#PerM ²	#Annotated
NLS-South	388	27	0.62	1601
NLS-West	2746	71	1.88	6972

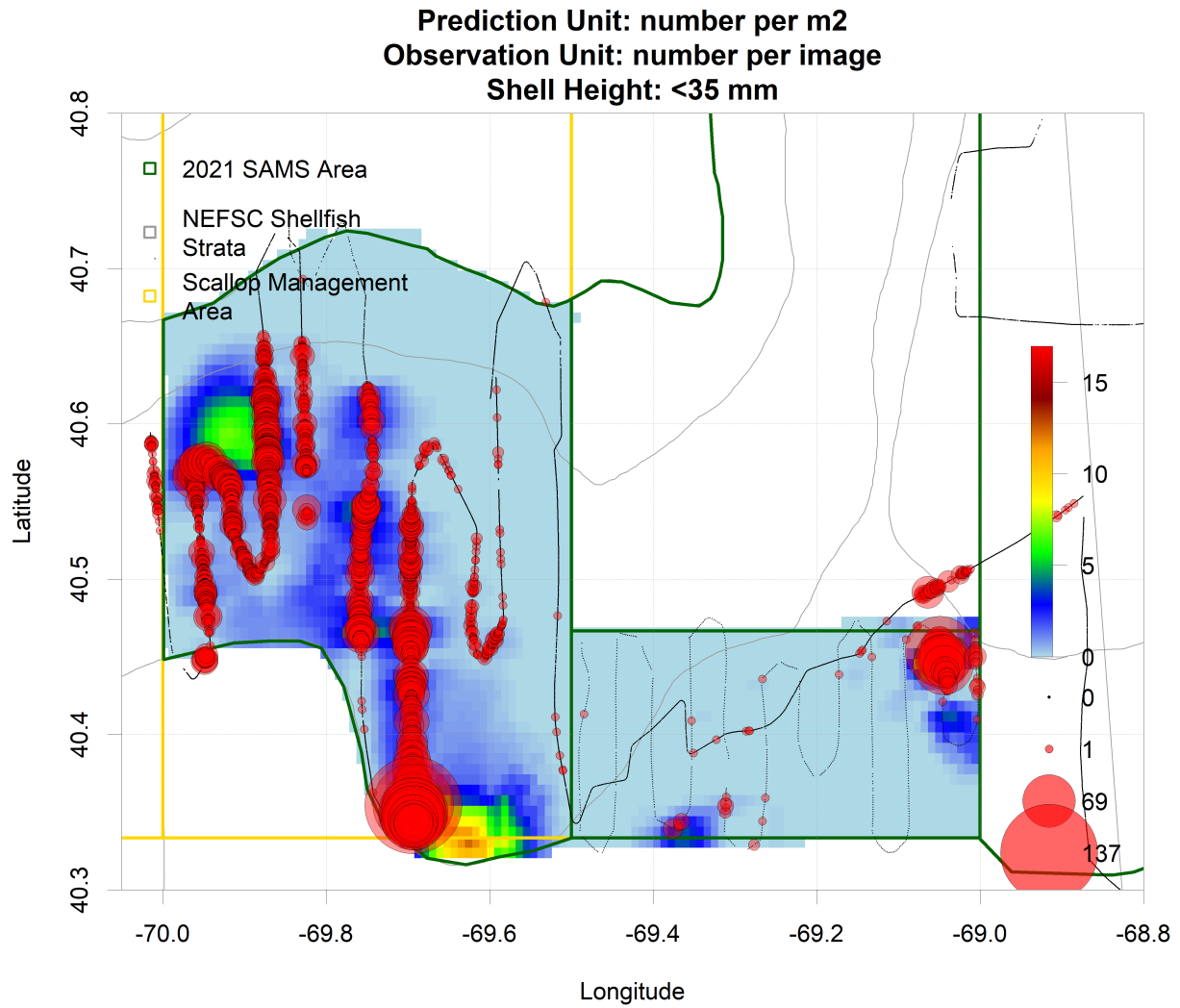


Figure 4.1. The 2021 Habcam count estimates and observations (number per image) for <35 mm scallops in NLS.

4.3 2021 Habcam annotation rate by SAMS

Table 4.3. Summary of 2021 Habcam annotation rate for scallops larger than 40 mm shell height using combined data from NEFSC and CFF. #PosImage is number of images with positive scallop counts. %PosImage is calculated using #PosImage/#Annotated. #ScallopAnnotated is total number of scallop annotated. Avg#ScallopPerImage is averaged number of scallops in the images with positive scallop counts.

SAMS Area	#Annotated	#PosImage	%PosImage	#ScallopAnnotated	Avg#ScallopPerImage
Georges Bank					
CL1-Sliver	1731	191	11.03	225	1.18
CL2-Access-Southeast	1616	248	15.35	399	1.61
CL2-Access-Southwest	768	244	31.77	708	2.90
CL2-Ext	937	360	38.42	937	2.60
CL2-North	3705	1115	30.09	2640	2.37
GSC-HMA	1058	40	3.78	58	1.45
GSC-North	3077	251	8.16	285	1.14
GSC-South	5724	153	2.67	173	1.13
NF	6949	595	8.56	1492	2.51
NLS-North	838	51	6.09	62	1.22
NLS-South	1601	776	48.47	5147	6.63
NLS-West	6972	67	0.96	80	1.19
SF	2287	273	11.94	410	1.50
Mid-Atlantic					
BI	368	9	2.45	10	1.11
DMV	1508	6	0.40	6	1.00
ET-Flex	862	18	2.09	18	1.00
ET-Open	1529	59	3.86	66	1.12
HCS	1966	87	4.43	94	1.08
LI	4112	161	3.92	181	1.12
MAB-Nearshore	1171	12	1.02	13	1.08
NYB	1868	110	5.89	135	1.23

4.4 2021 Suvey spatial count estimates

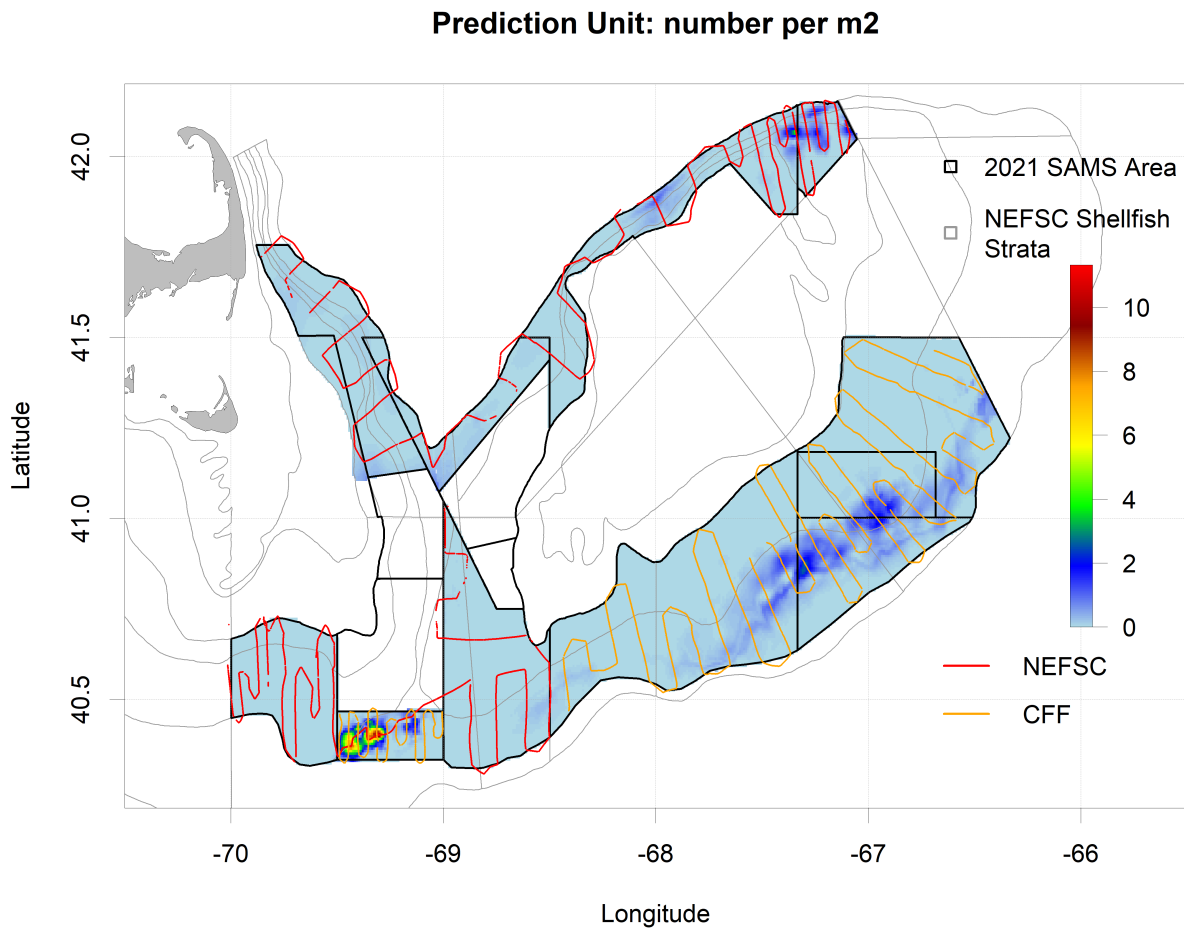


Figure 4.2. The 2021 Habcam survey tracks conducted by NEFSC and CFF, along with 2021 Habcam count estimates for 40+ mm scallops for part of Georges Bank.

Prediction Unit: number per m2

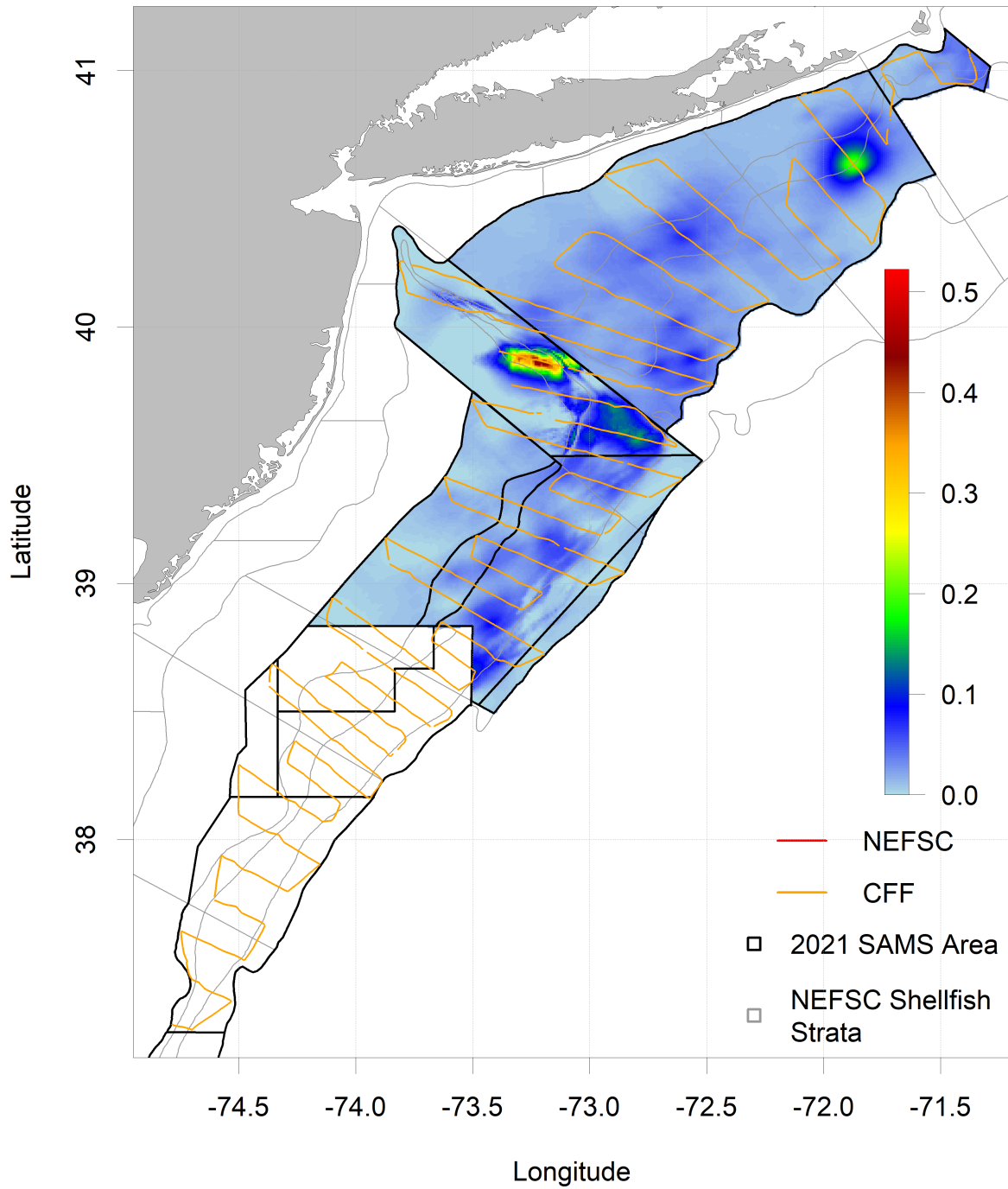


Figure 4.3. The 2021 Habcam survey tracks conducted by CFF, along with 2021 Habcam count estimates for 40+ mm scallops for part of Mid-Atlantic.

5 EXPLOITABLE BIOMASS ESTIMATES FOR 2021 (CURRENT FY)

Table 5.1. Summary of 2021 Habcam estimates for exploitable scallops using combined data from NEFSC and CFF. SARC 65 SH-MW equations were used to estimate meat weights for all SAMS areas. Yochum and DuPaul 4-inch ring selectivity was used for exploitable cutoff. No estimates for exploitable scallops were provided for ET-Open, ET-Flex, and DMV.

SAMS Area	ExNumMill	ExBmsMT	ExBmsMTSE	ExMeanWt
Georges Bank				
CL1-Sliver	39.6	1022.9	165.5	25.8
CL2-North	124.8	5203.4	72.9	41.7
CL2-Southeast	77.2	1924.4	209.3	24.9
CL2-Southwest	252.4	7128.4	487.7	28.2
CL2-Ext	344.0	7930.2	446.5	23.1
NLS-South	580.7	10483.1	633.0	18.1
NLS-West	9.2	279.9	119.5	30.3
NF	96.9	2015.9	169.7	20.8
SF	346.0	7657.1	490.0	22.1
Mid-Atlantic				
Block Island	19.2	645.0	52.3	33.6
Long Island	337.5	10265.6	204.9	30.4
NYB	120.2	2840.6	491.6	23.6
HCSAA	138.7	3589.3	192.6	25.9
MAB Inshore	37.0	1284.3	112.7	34.7

Table 5.2. Summary of 2021 Habcam estimates for exploitable scallops using combined data from NEFSC and CFF for GSC. SARC 65 SH-MW equations were used to calculate meat weights for these areas. Yochum and DuPaul 4-inch ring selectivity was used for exploitable cutoff.

SAMS Area	ExNumMill	ExBmsMT	ExBmsMTSE	ExMeanWt
GSC-North	56.6	2156.4	280.6	38.1
GSC-South	36.2	1022.2	153.3	28.2