

Northern Gulf of Maine Scallop Survey: 2019 Results



Gear

- 7ft unlined drag
- 2" rings, 4" twine top
- Rock chains

Survey Design

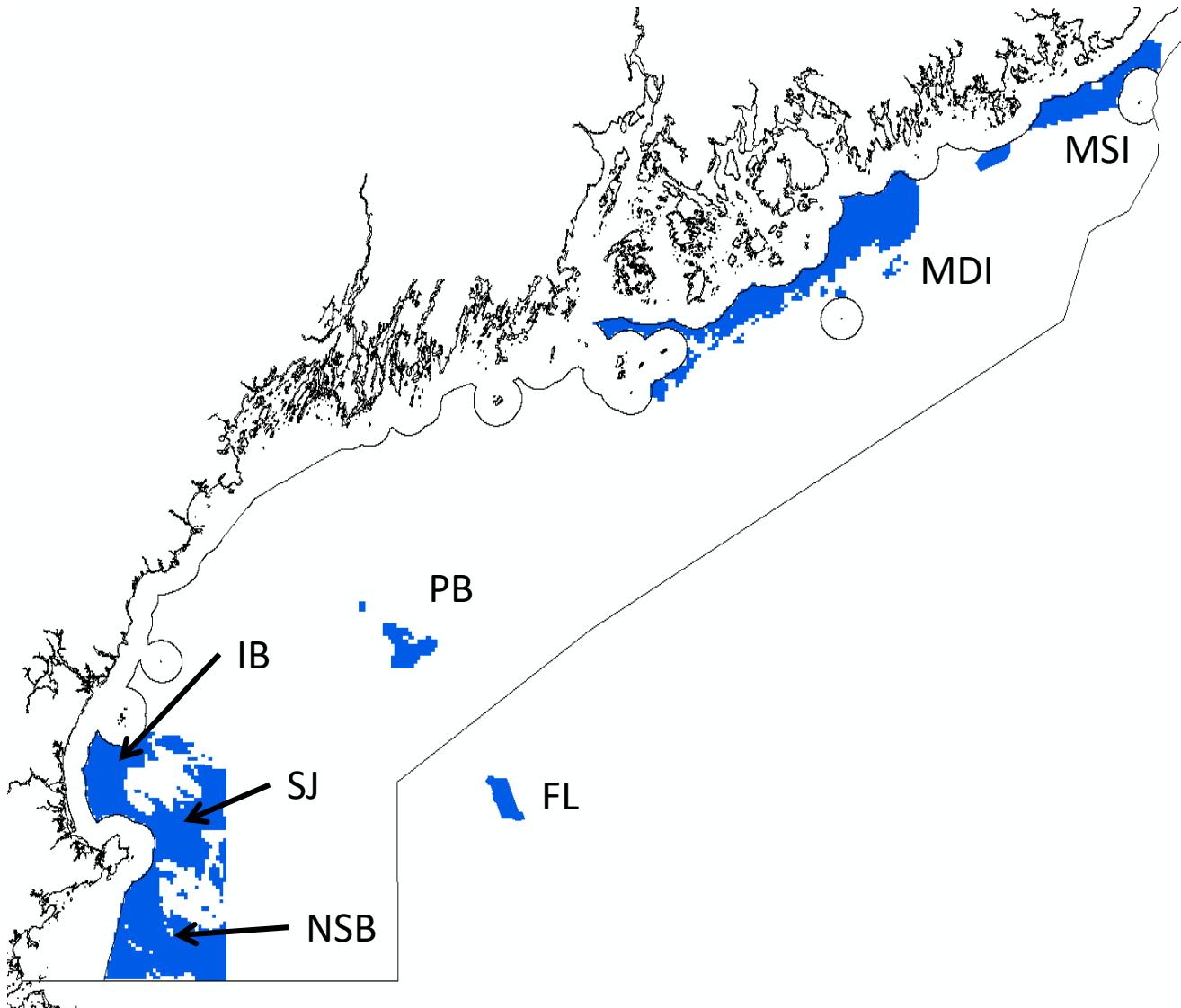
- 323 tows completed in 6 areas
- Target tow duration 5 minutes
- Random stratified design

Timing

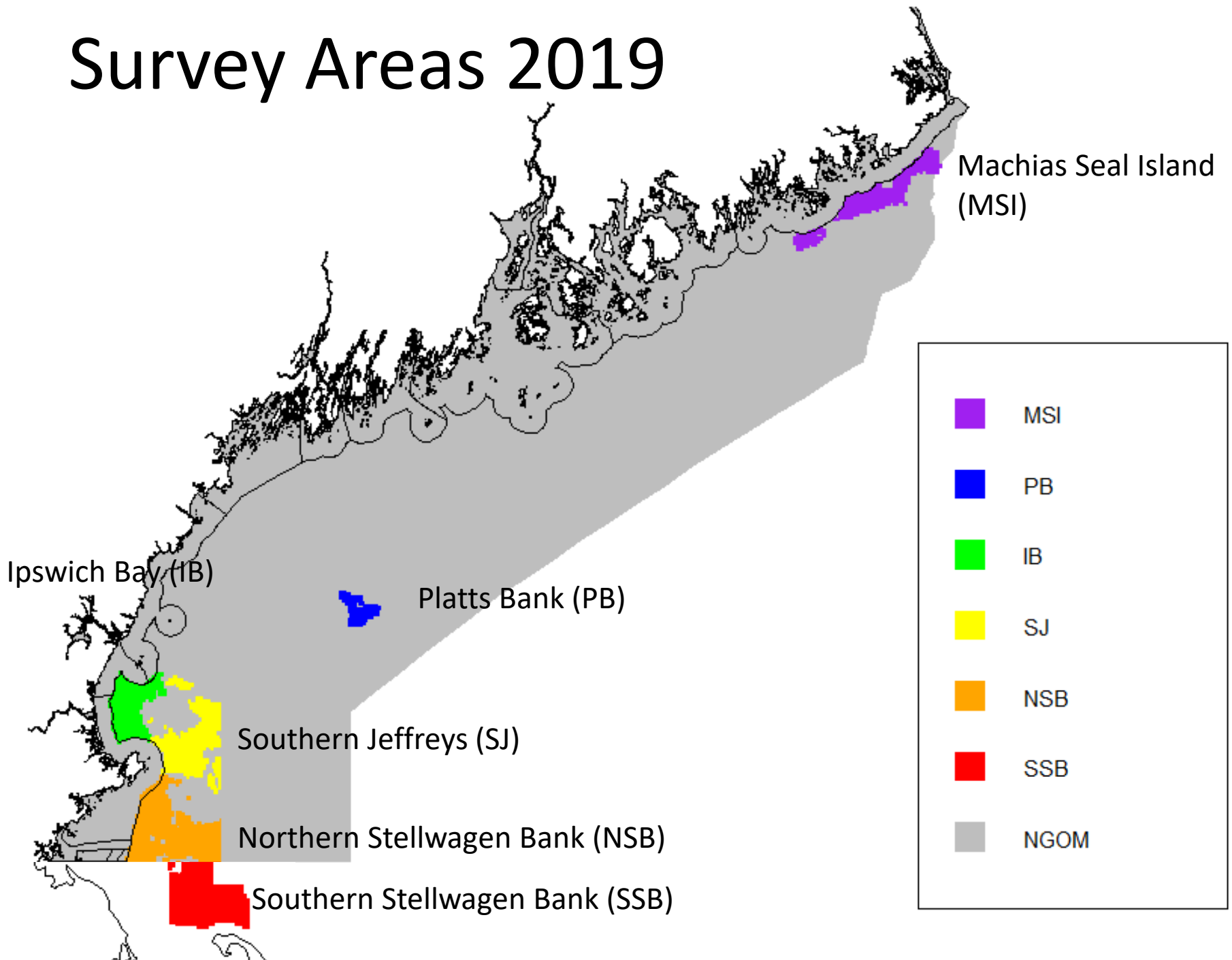
- 5/27/19 – 6/24/19
- Stellwagen Fished
4/1/19 – 4/25/19



Survey Areas 2016

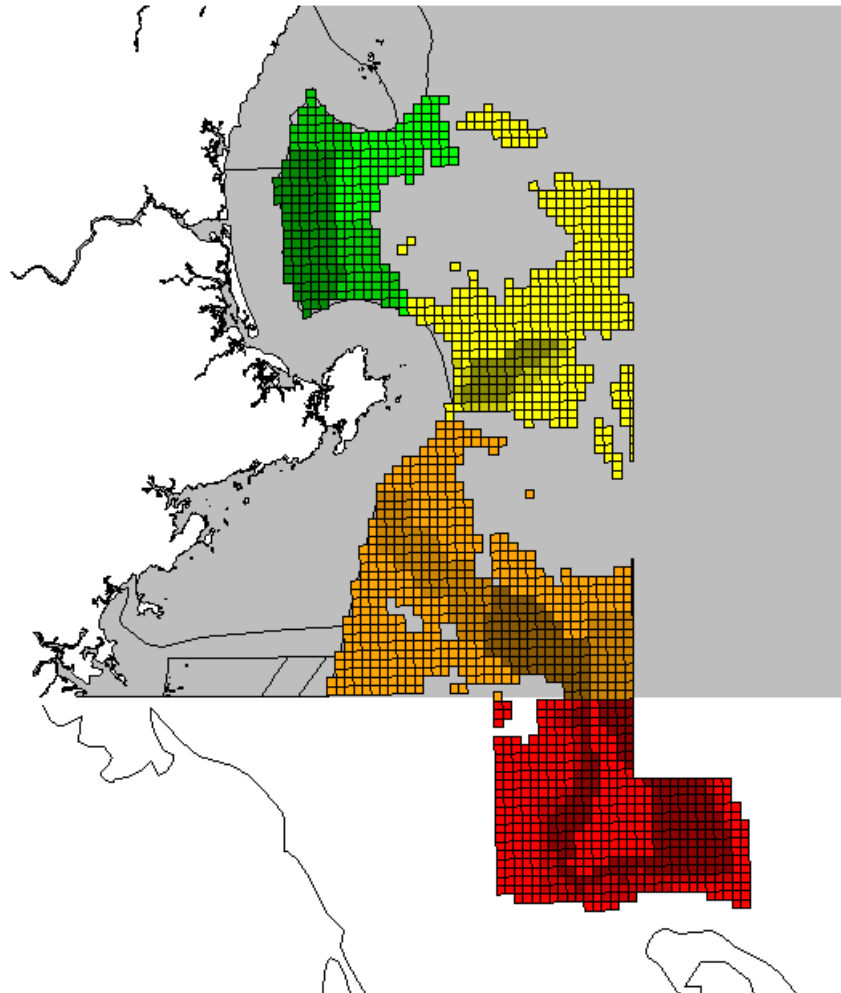














Survey Areas 2019



Substrata Area Delineation

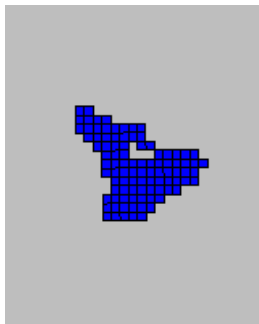
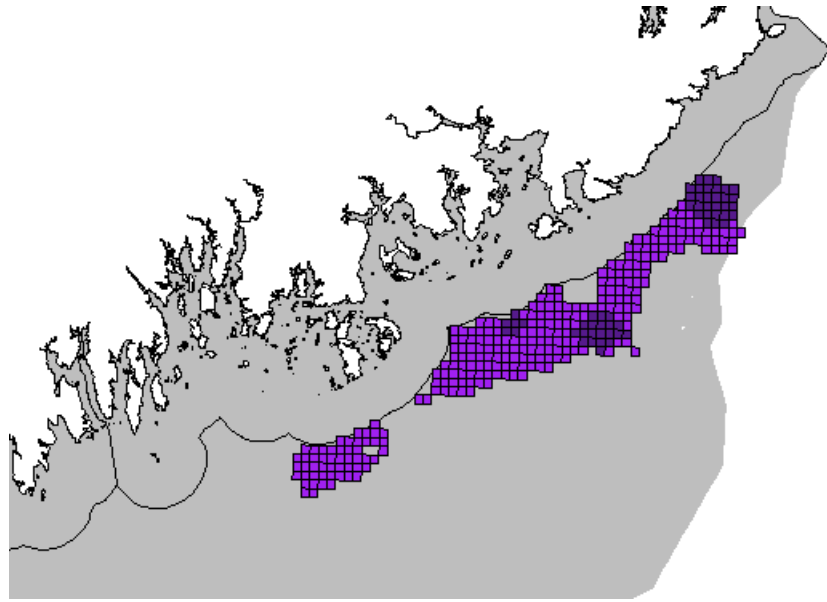
•Density substrata of southern areas were delineated using fisherman input, VTR, VMS and pervious survey data



Area	Density	Number of Cells (1 km ²)	
Ipswich Bay	High	108	
	Medium	84	
	Low	100	
Southern Jeffreys	High	40	
	Medium	25	
	Low	368	
Northern Stellwagen	High	93	
	Medium	145	
	Low	375	
Southern Stellwagen	High	175	
	Medium	71	
	Low	276	

Substrata Area Delineation

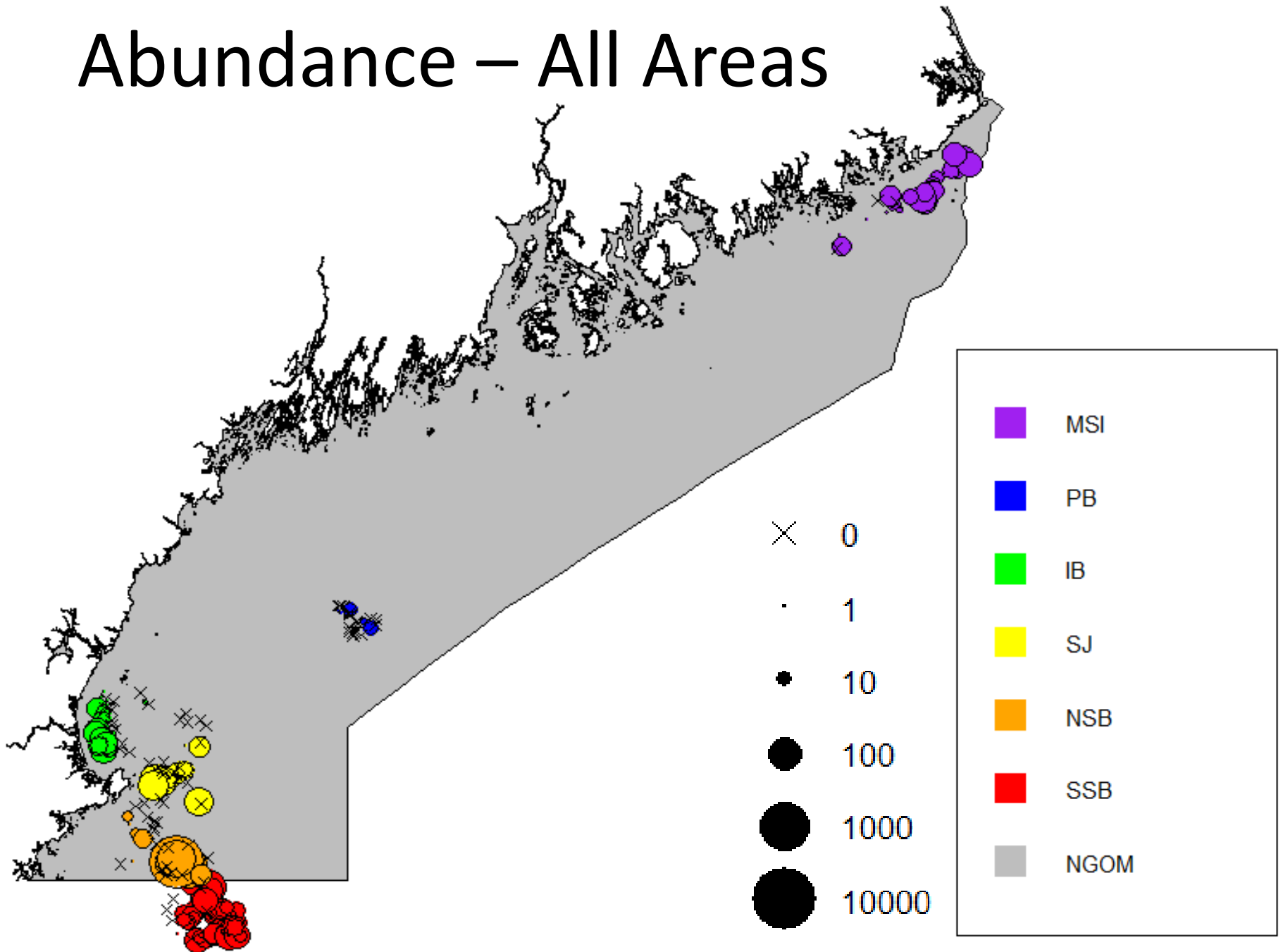
- Density substrata of southern areas were delineated using fisherman input, VTR, VMS and pervious survey data



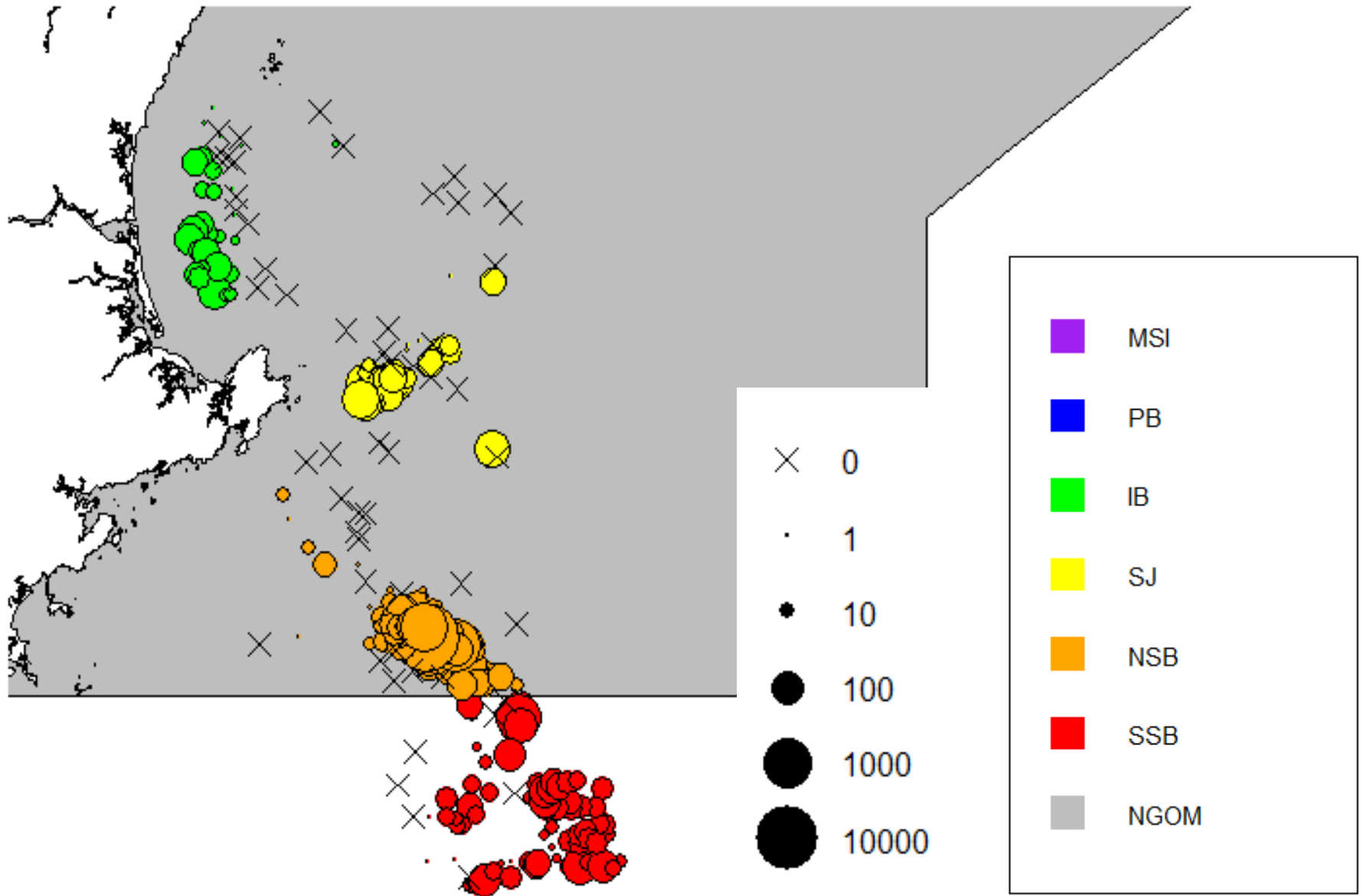
Area	Density	Number of Cells (1 km ²)	
Machias Seal Island	High	55	■
	Low	265	■

Area	Density	Number of Cells (1 km ²)	
Platts Bank	-	94	■

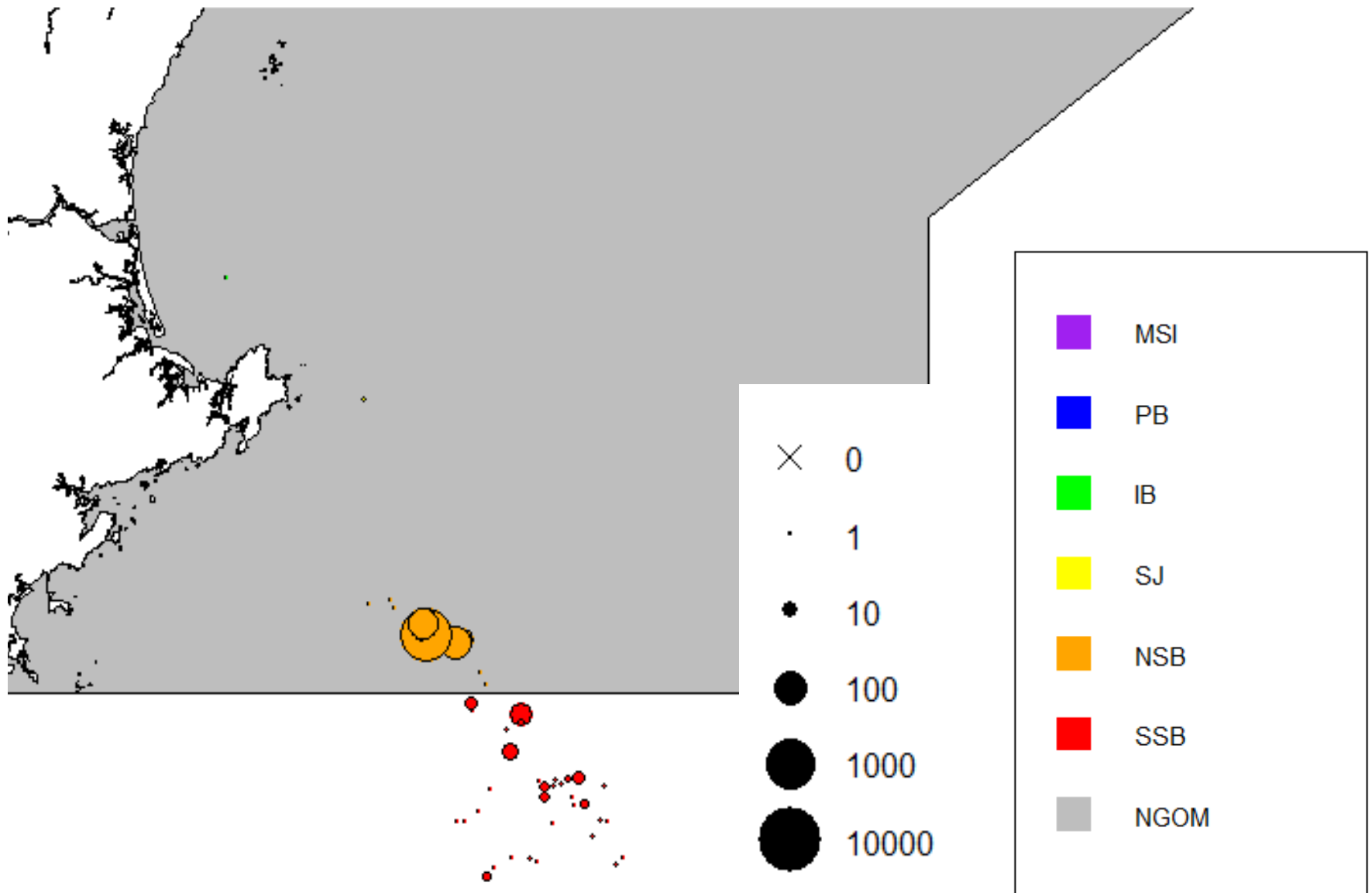
Abundance – All Areas



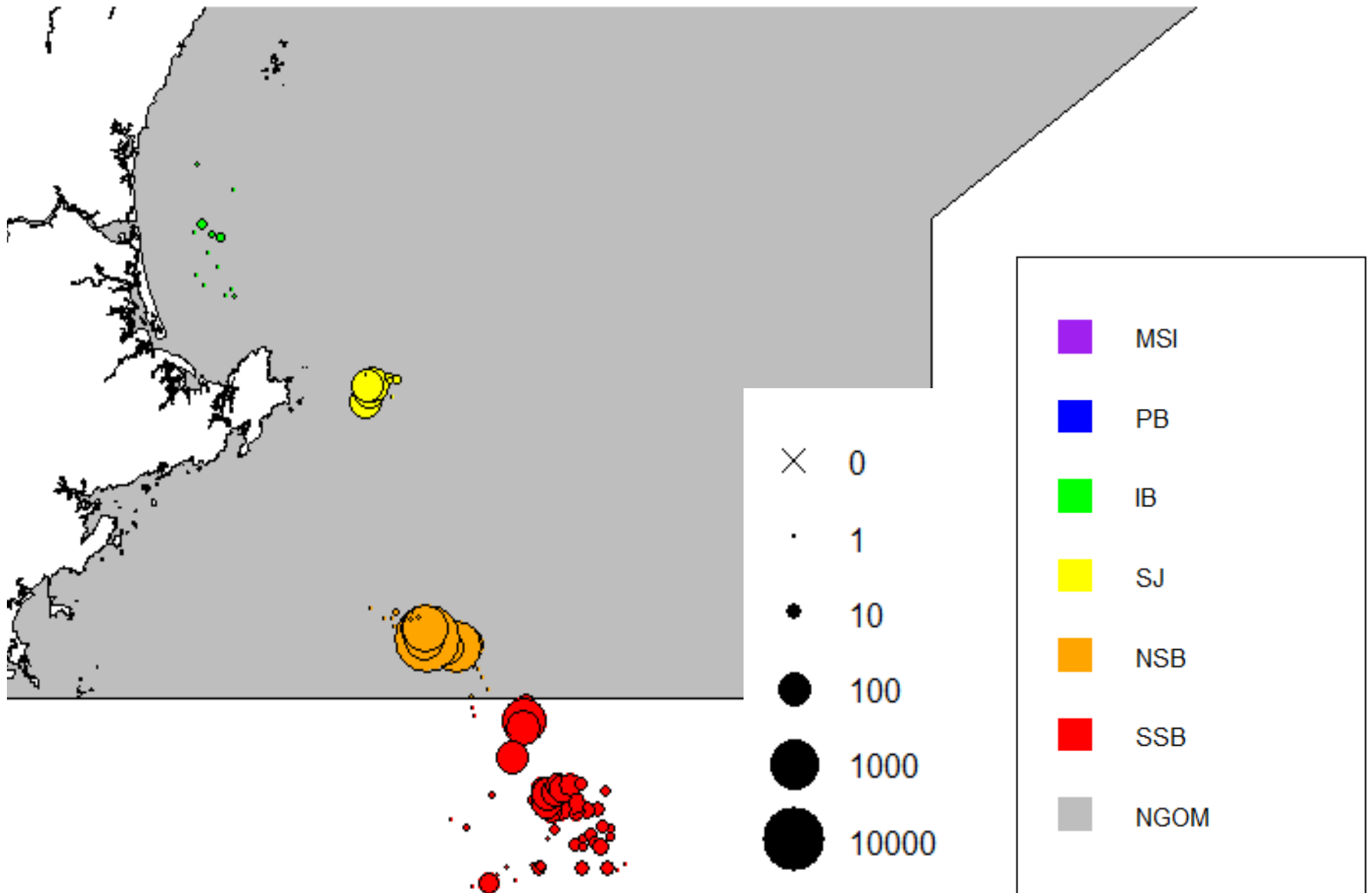
Abundance 2019 – Southern extent



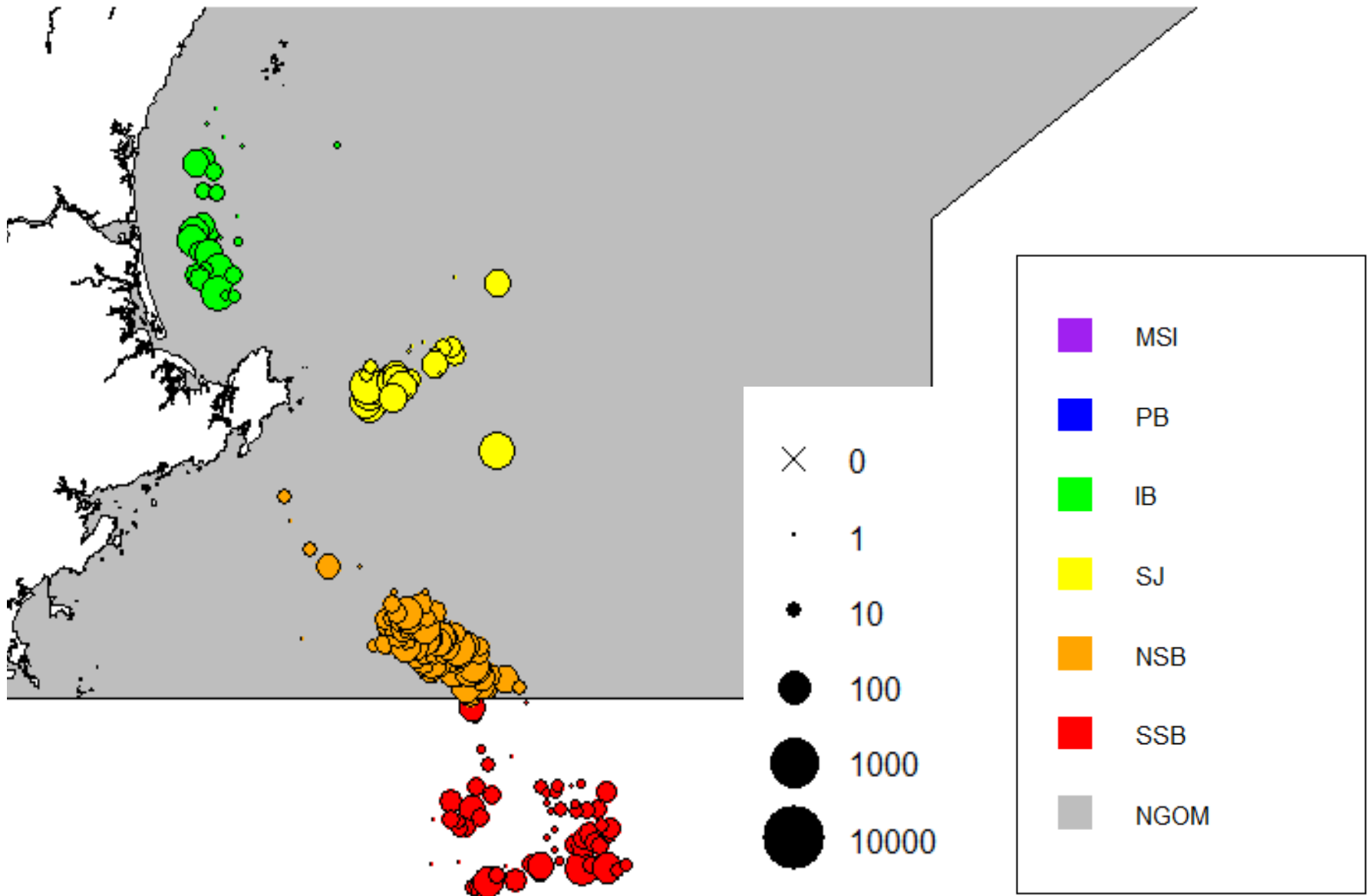
Abundance <35mm SH 2019 – Southern extent



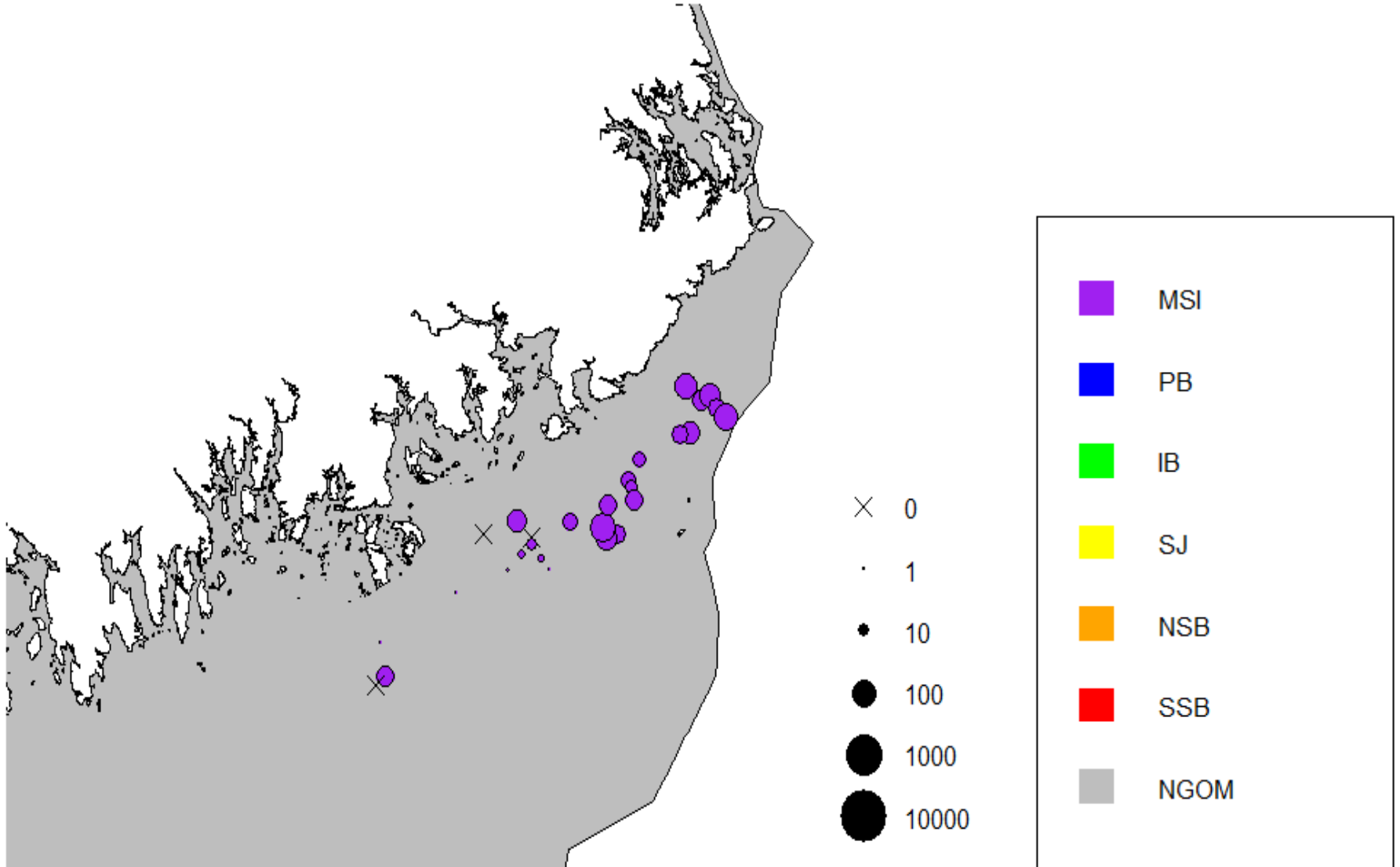
Abundance 35<75mm SH 2019 – Southern extent



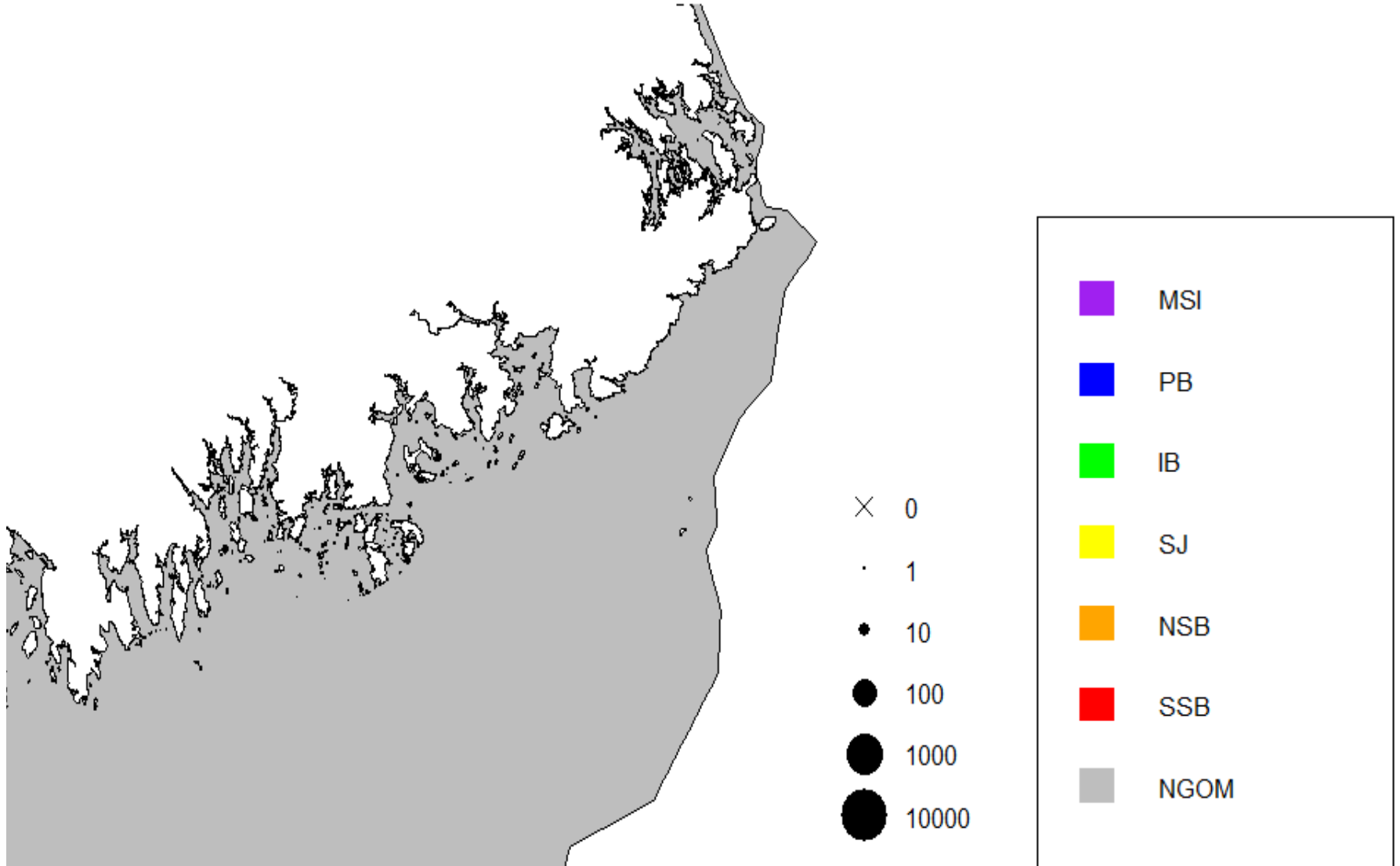
Abundance >75mm SH 2019 – Southern extent



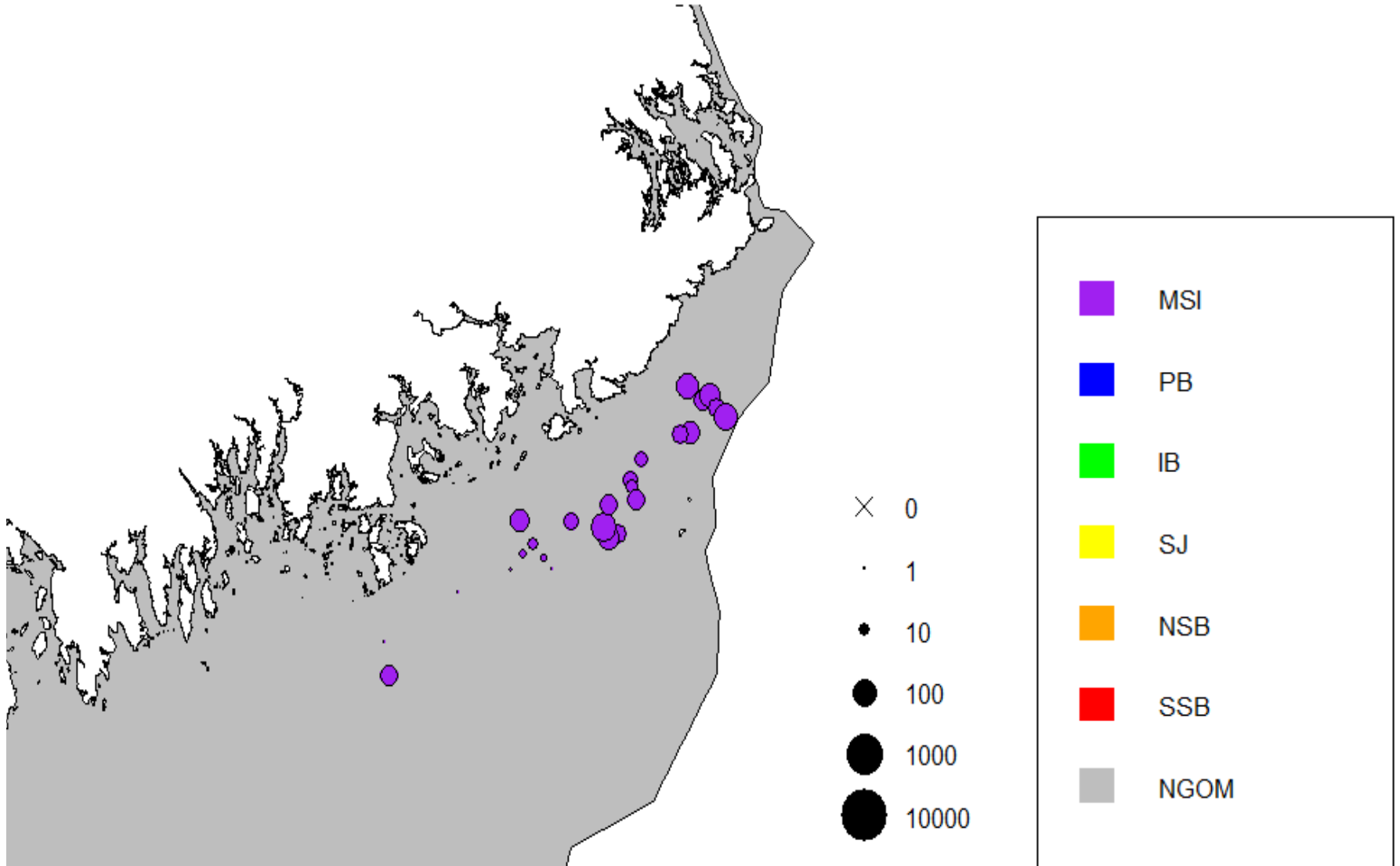
Machias Seal Island



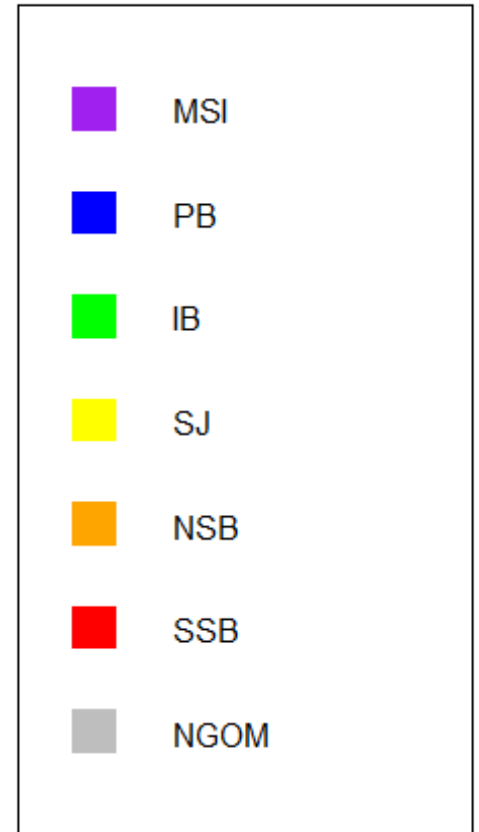
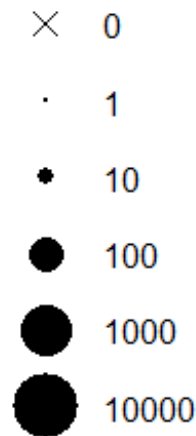
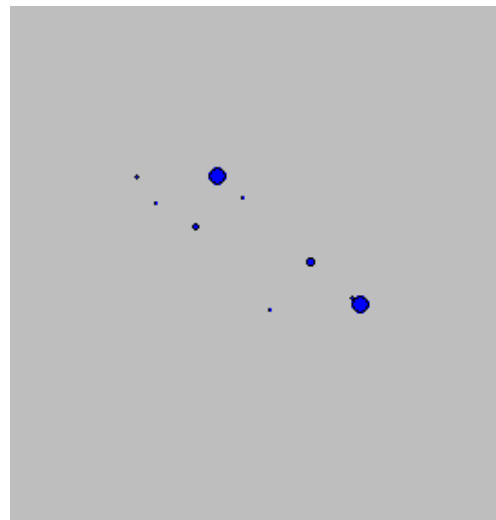
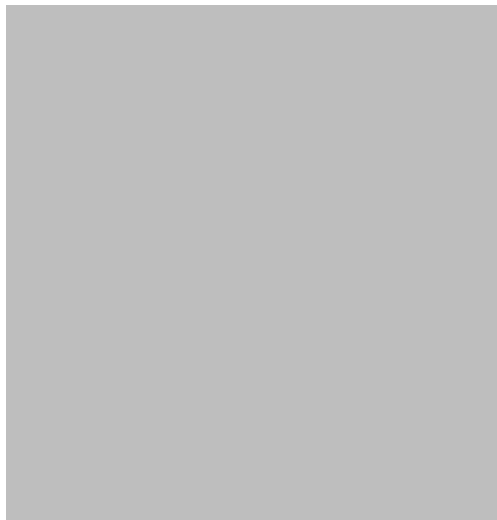
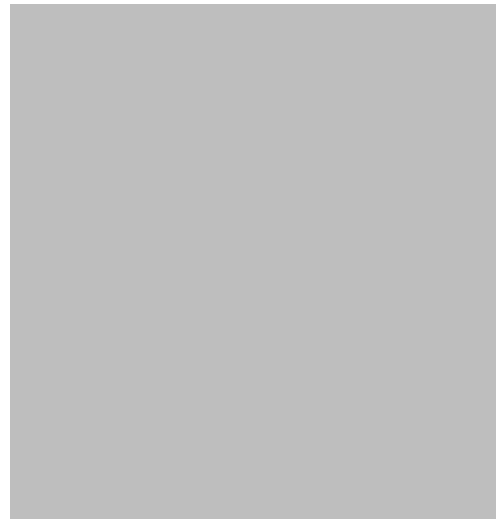
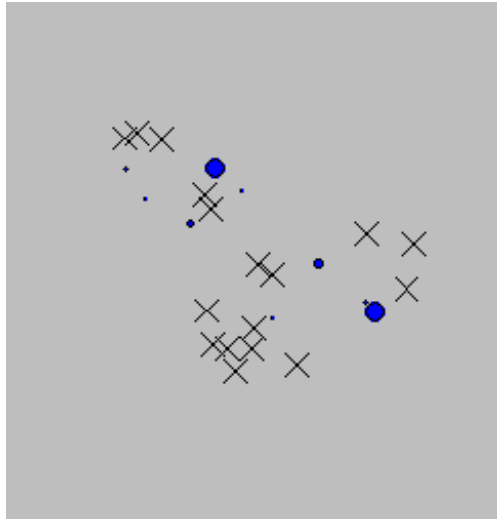
Machias Seal Island <75mm SH



Machias Seal Island >75mm SH

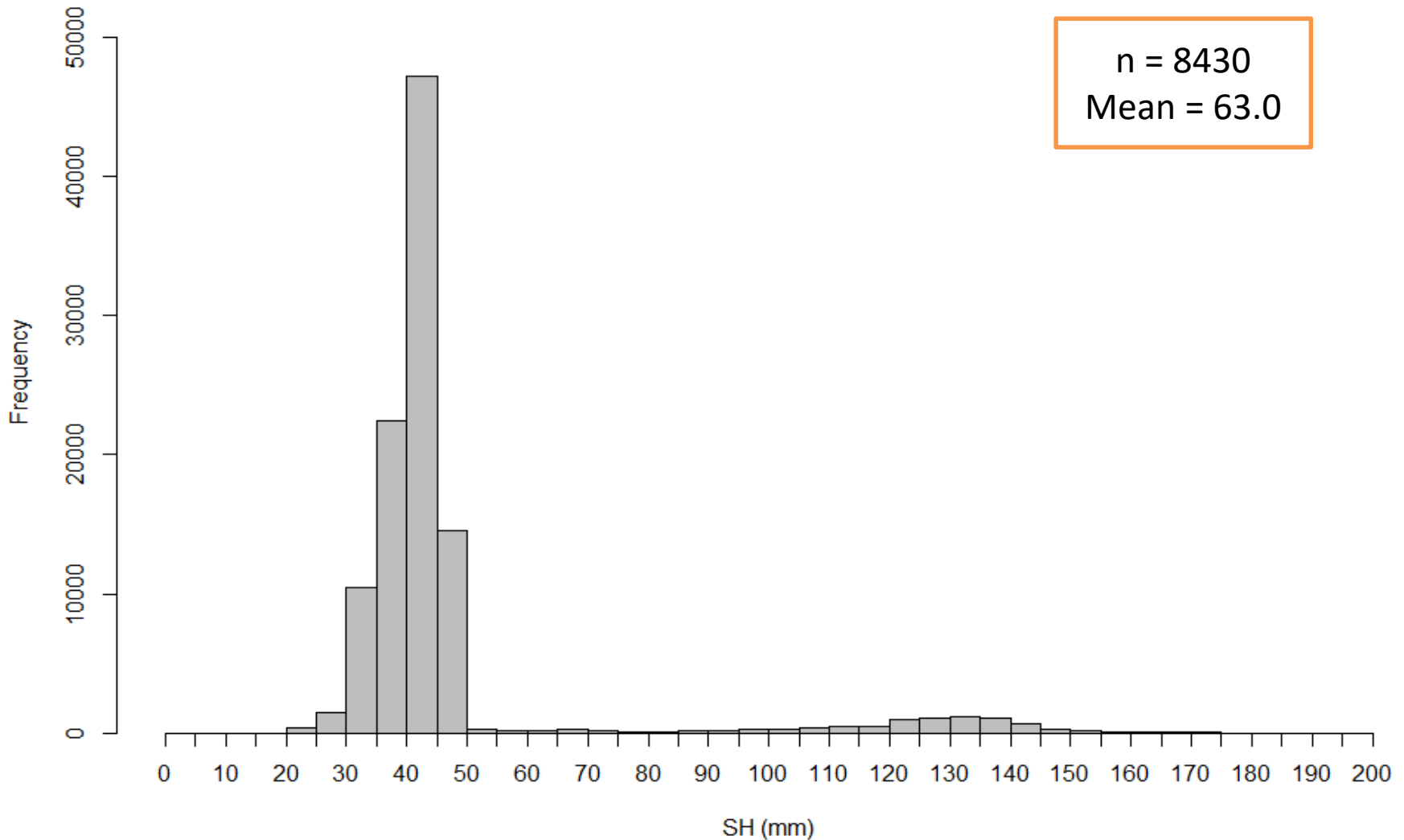


Platts Bank All SH (TopLeft), <35mm (TopRight),
35<75mm (BottomLeft), & >75mm (BottomRight)



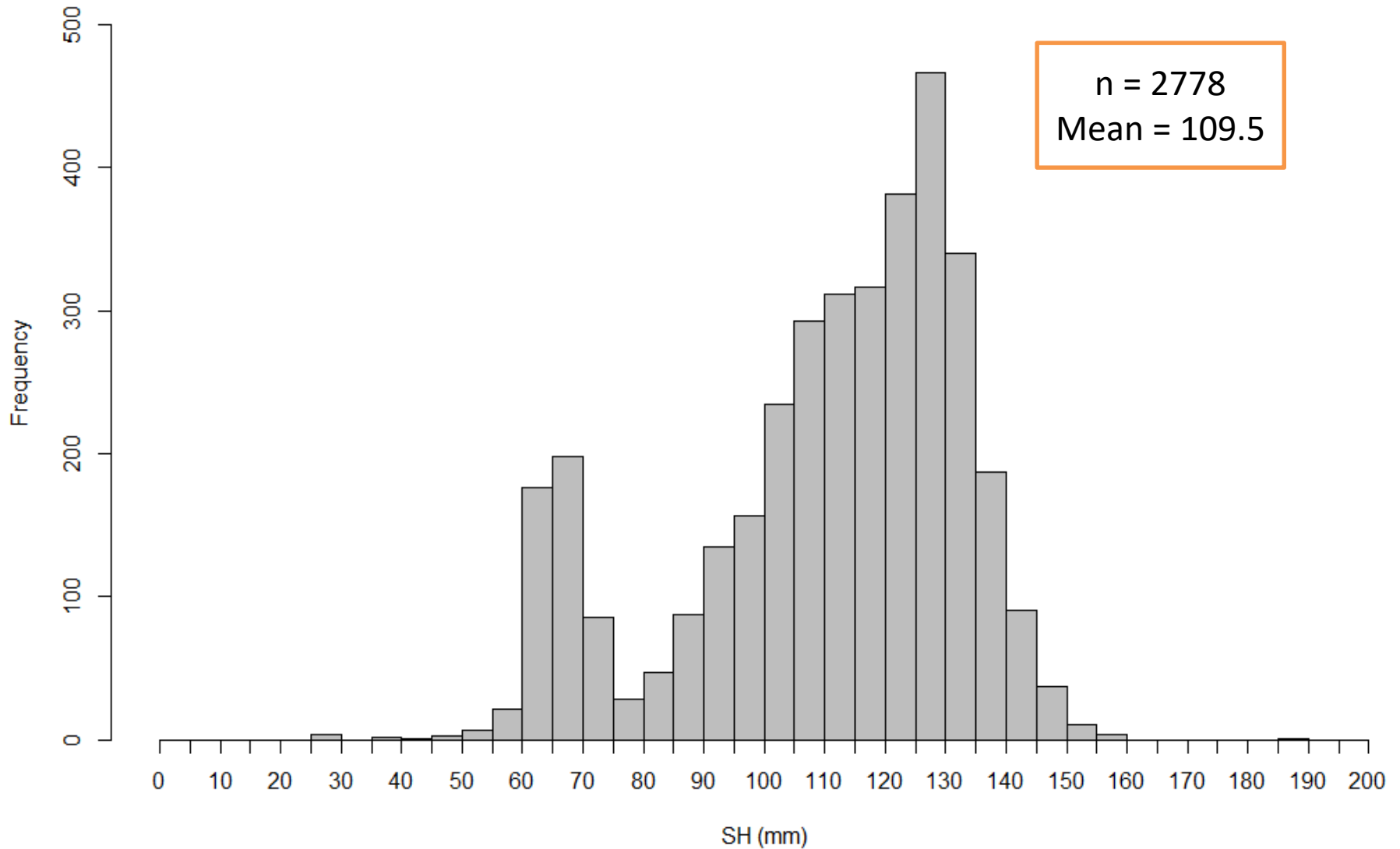
Length Frequencies, All Areas

Length Frequency (Upweighted for Tows > 100)



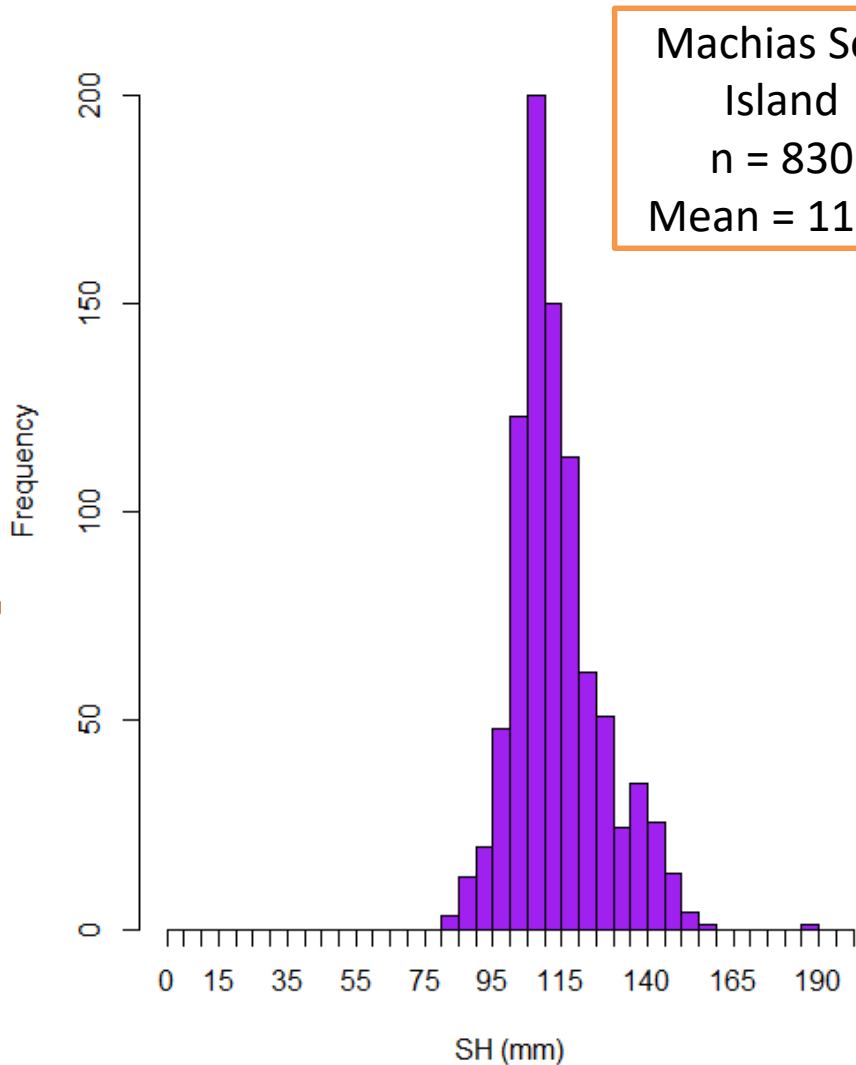
Length Frequencies, without Stellwagen

Length Frequency (Upweighted for Tows > 100)

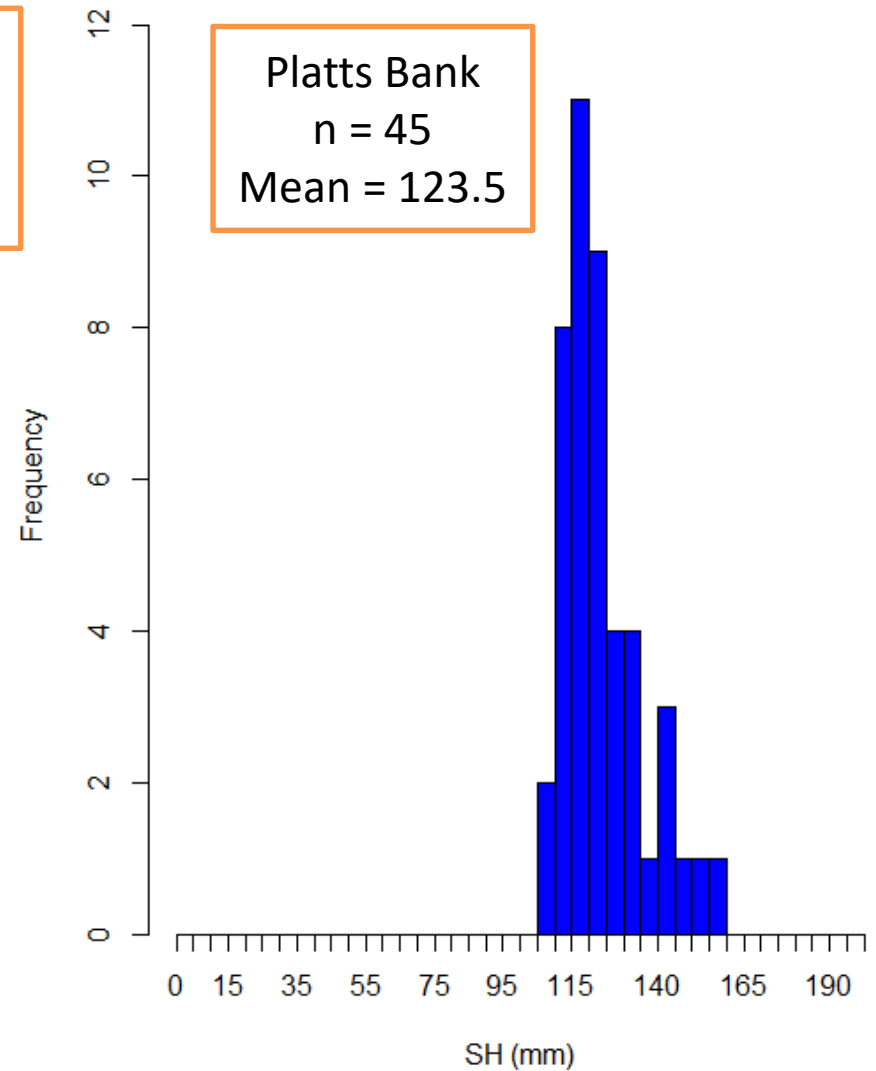


L-F: MSI & Platts Bank

Length Frequency MSI (Upweighted for Tows > 100)

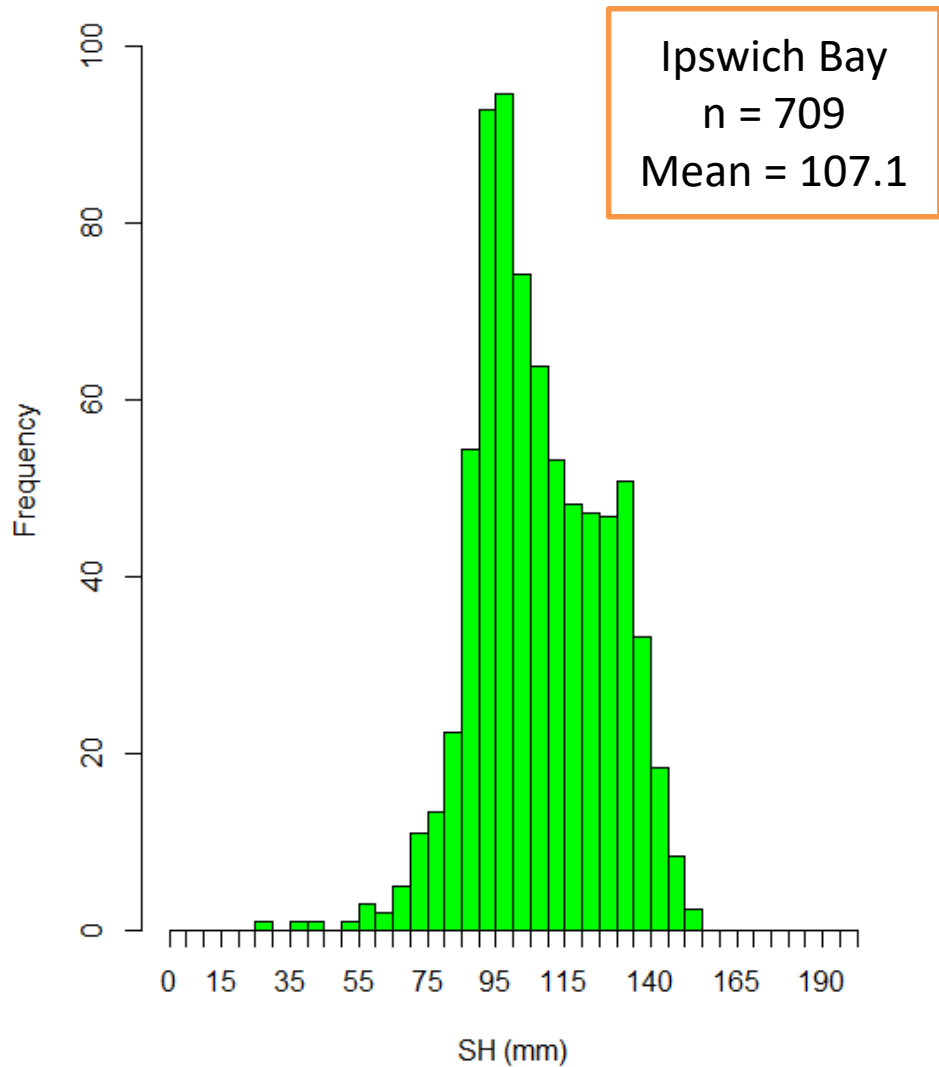


Length Frequency PB (Upweighted for Tows > 100)

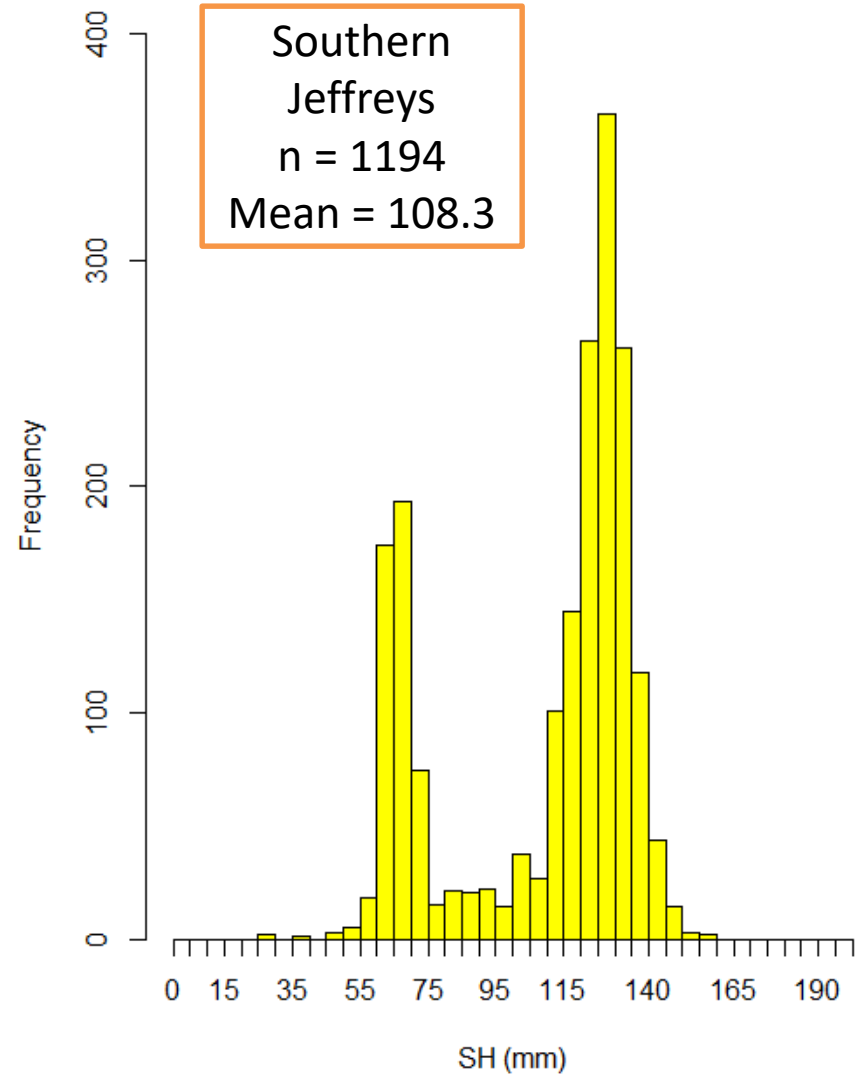


L-F: Ipswich Bay & Jeffreys

Length Frequency IB (Upweighted for Tows > 100)

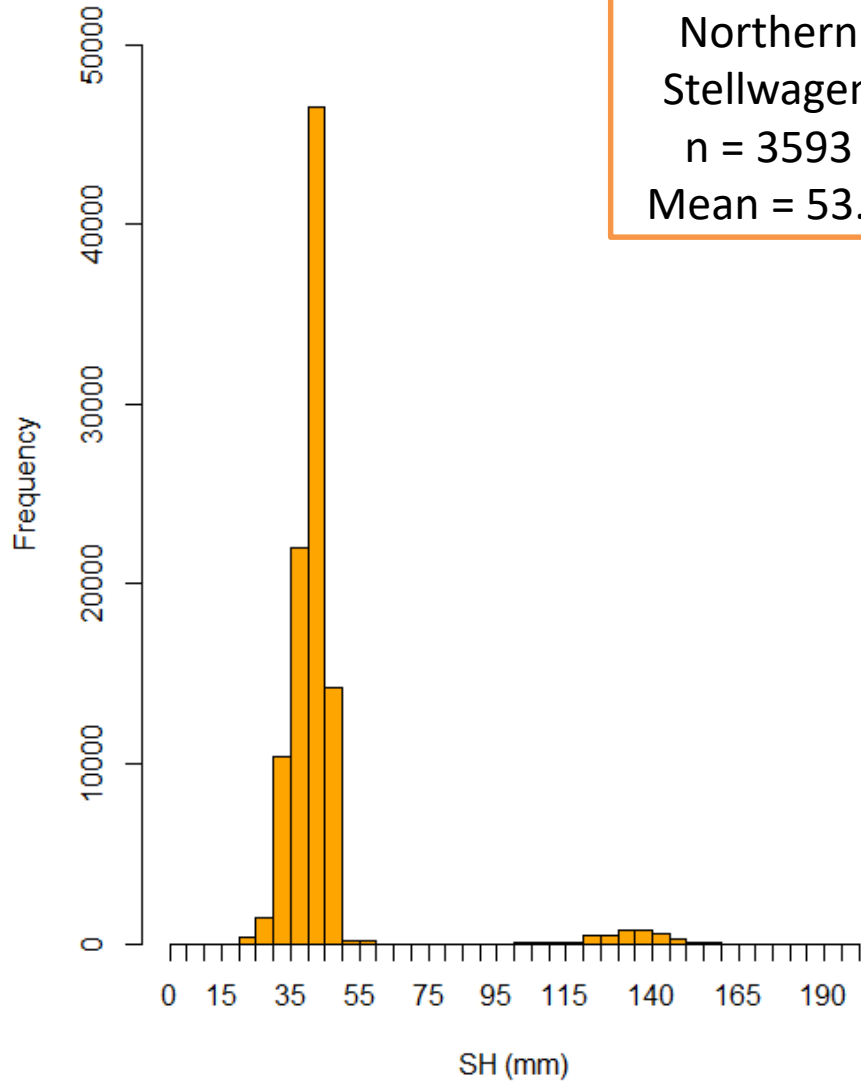


Length Frequency SJ (Upweighted for Tows > 100)

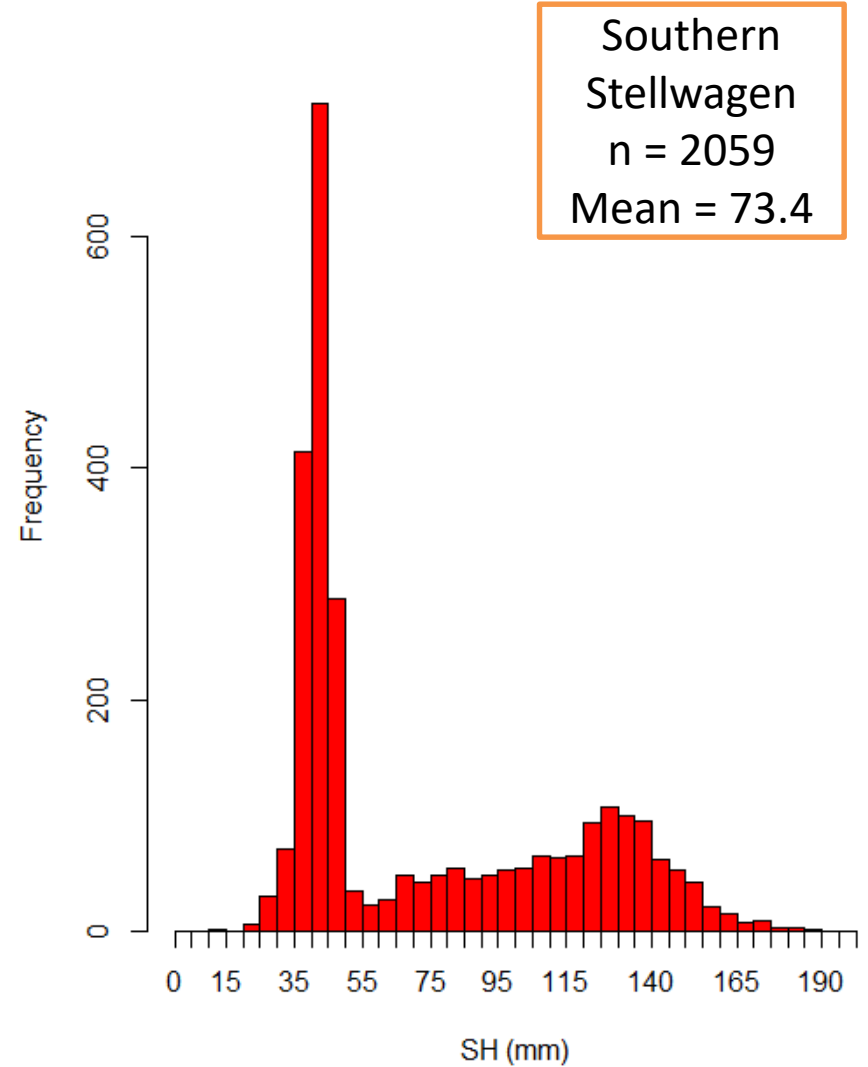


L-F: N & S Stellwagen Bank

Length Frequency NSB (Upweighted for Tows > 100)

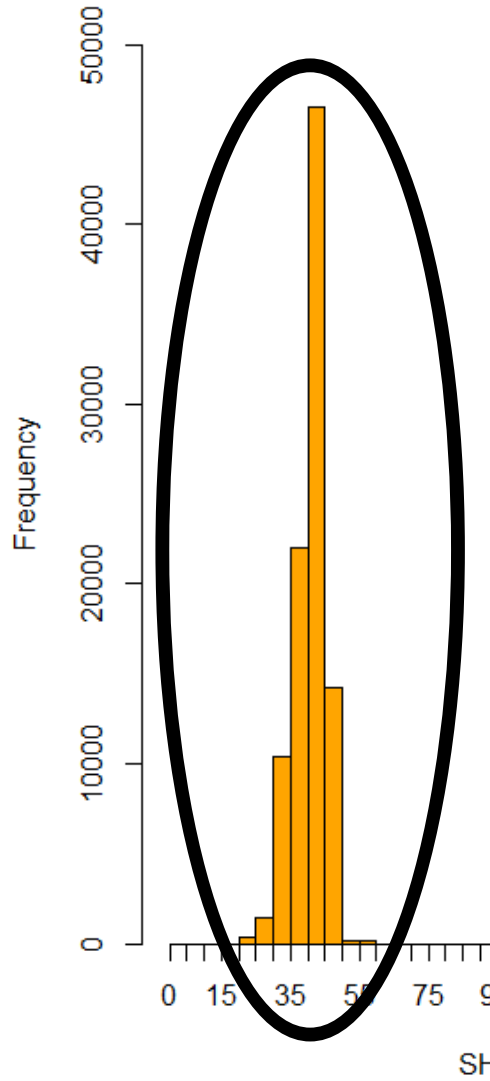


Length Frequency SSB (Upweighted for Tows > 100)



Length Frequencies

Length Frequency NSB (Upweighted for Tows > 100)

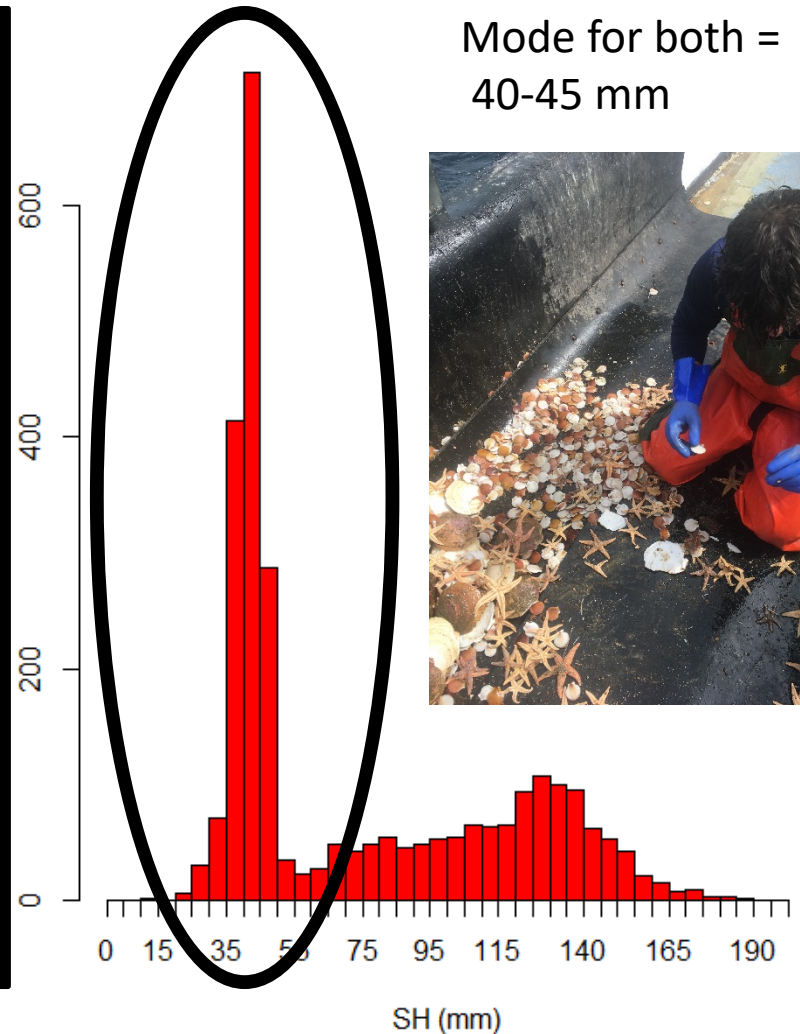


Will be undersize through winter. Some above 75mm in March 2020. These will then grow above 101.6mm in February 2021. Almost all should be over 101.6mm by June 2021*

*Based on Truesdell (2014)

Hodgdon et al. (unpublished) suggests these same dates (< 1 month difference).

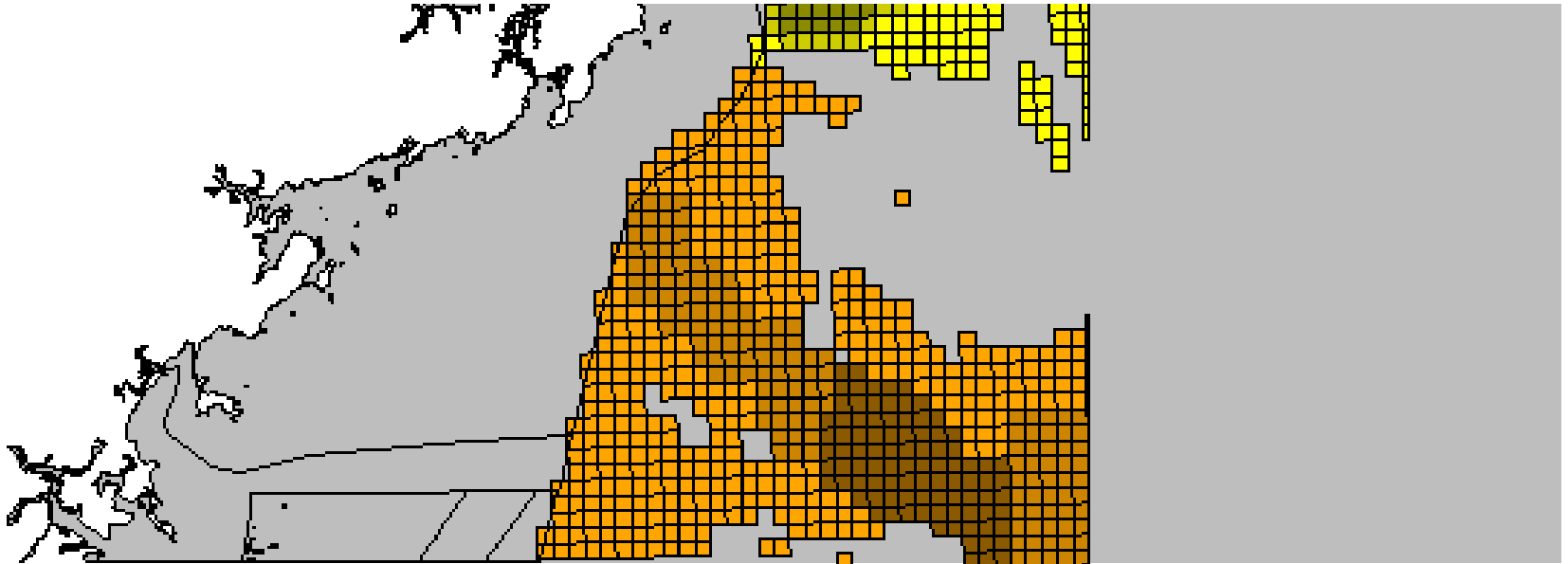
Length Frequency SSB (Upweighted for Tows > 100)



Mode for both = 40-45 mm

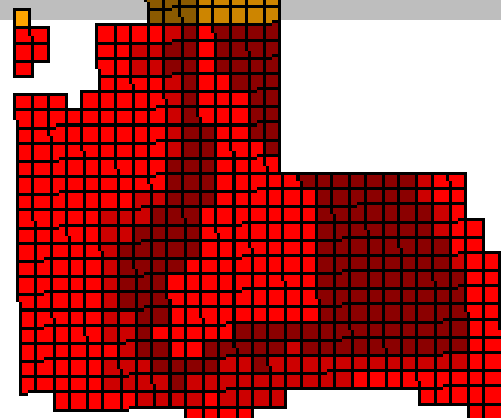
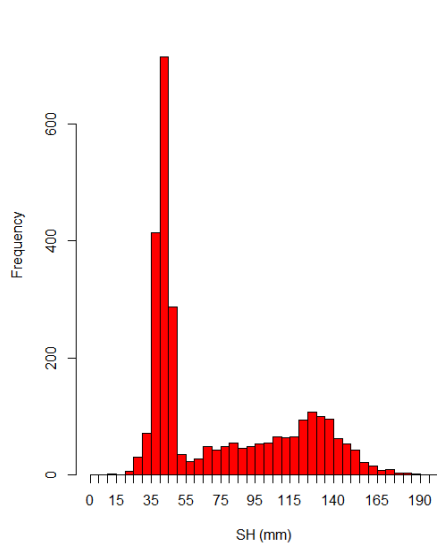
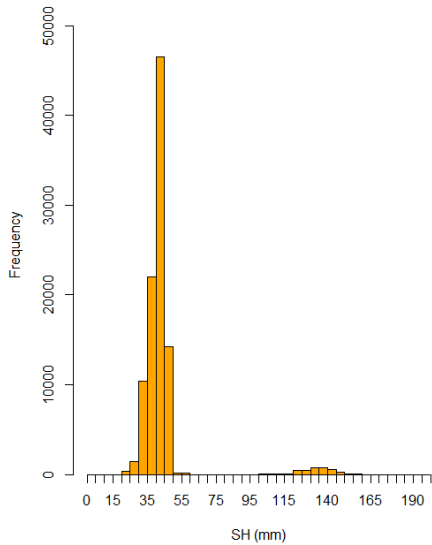


Special Comments on NSB/SSB

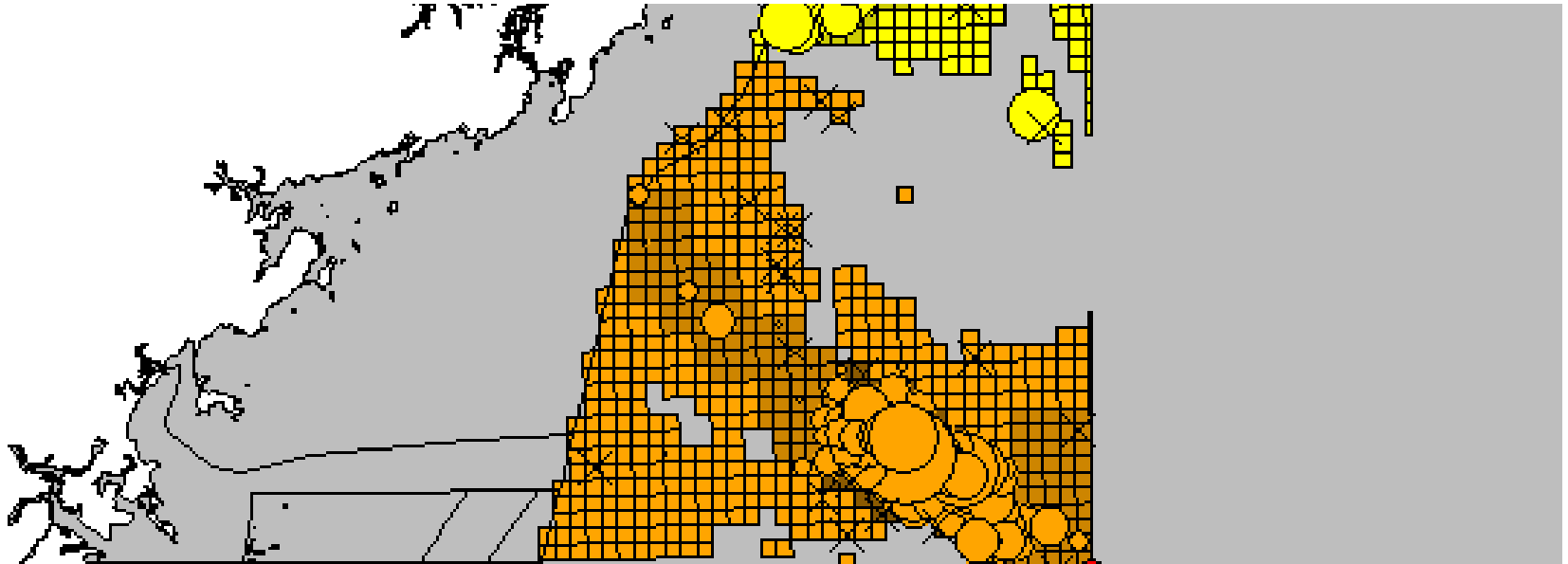


Length Frequency NSB (Upweighted for Tows > 100)

Length Frequency SSB (Upweighted for Tows > 100)

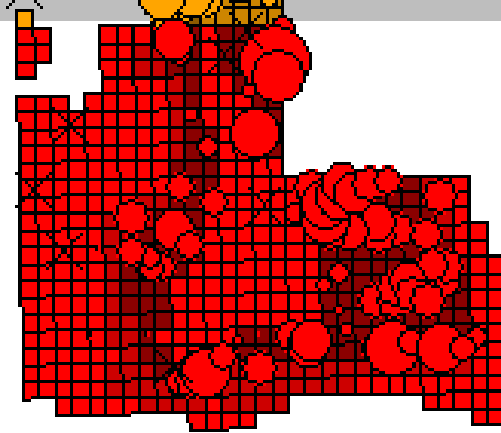
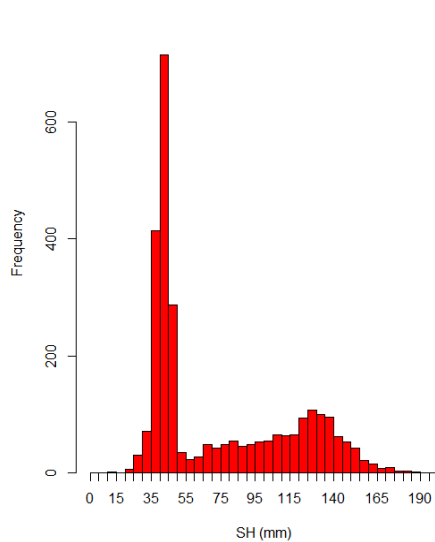
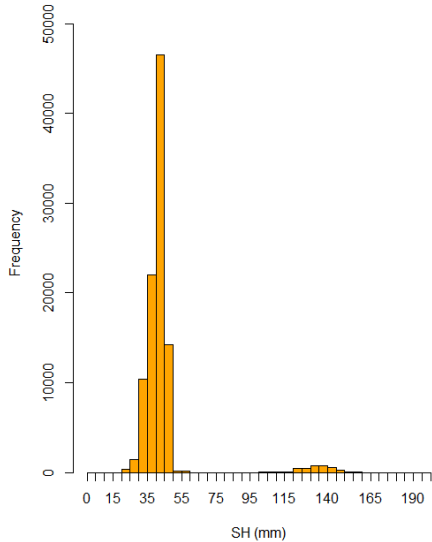


Special Comments on NSB/SSB



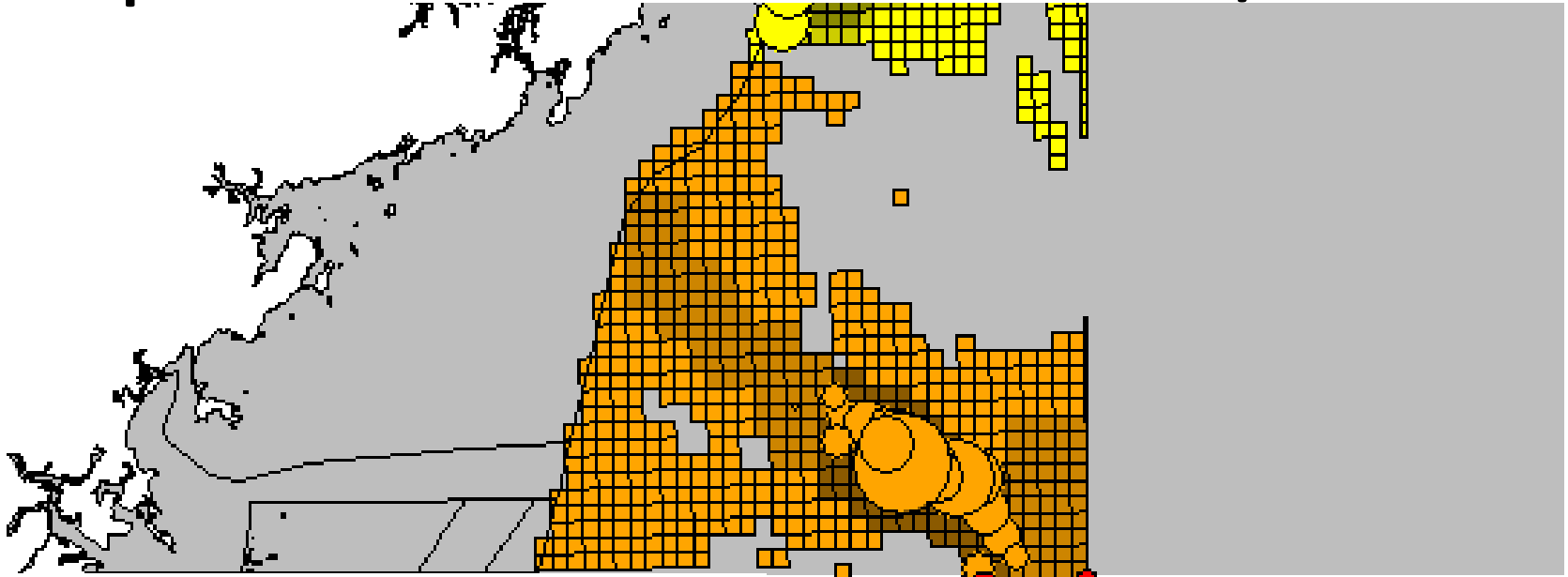
Length Frequency NSB (Upweighted for Tows > 100)

Length Frequency SSB (Upweighted for Tows > 100)



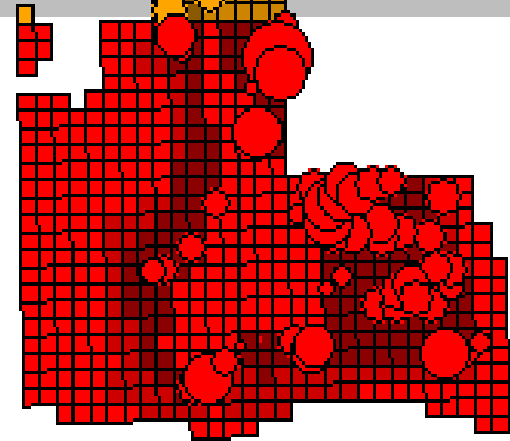
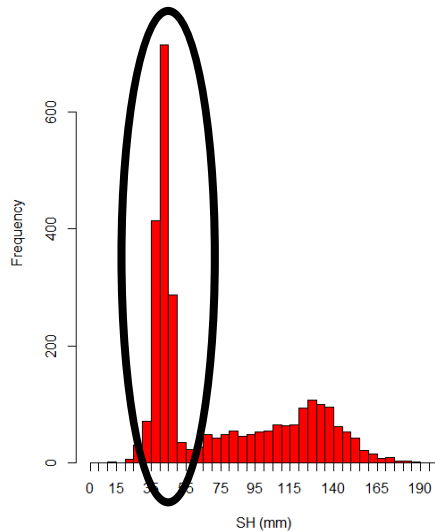
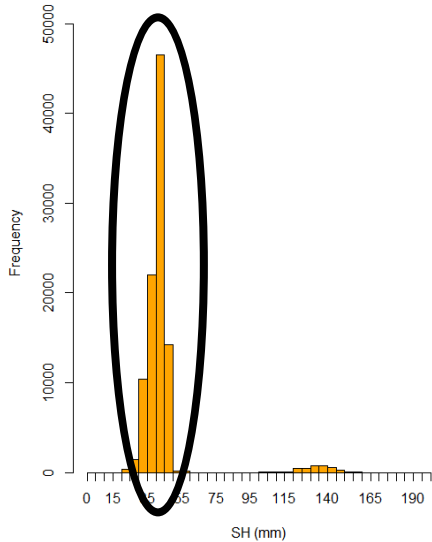
Abundance, all sizes

Special Comments on NSB/SSB*



Length Frequency NSB (Upweighted for Tows > 100)

Length Frequency SSB (Upweighted for Tows > 100)



*Only scallops below 55mm

-70.6

-70.4

-70.2

42.5



42.3

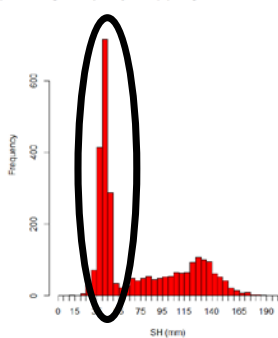
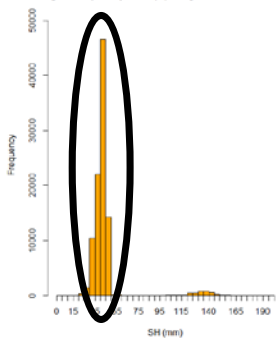
42.2

42.1

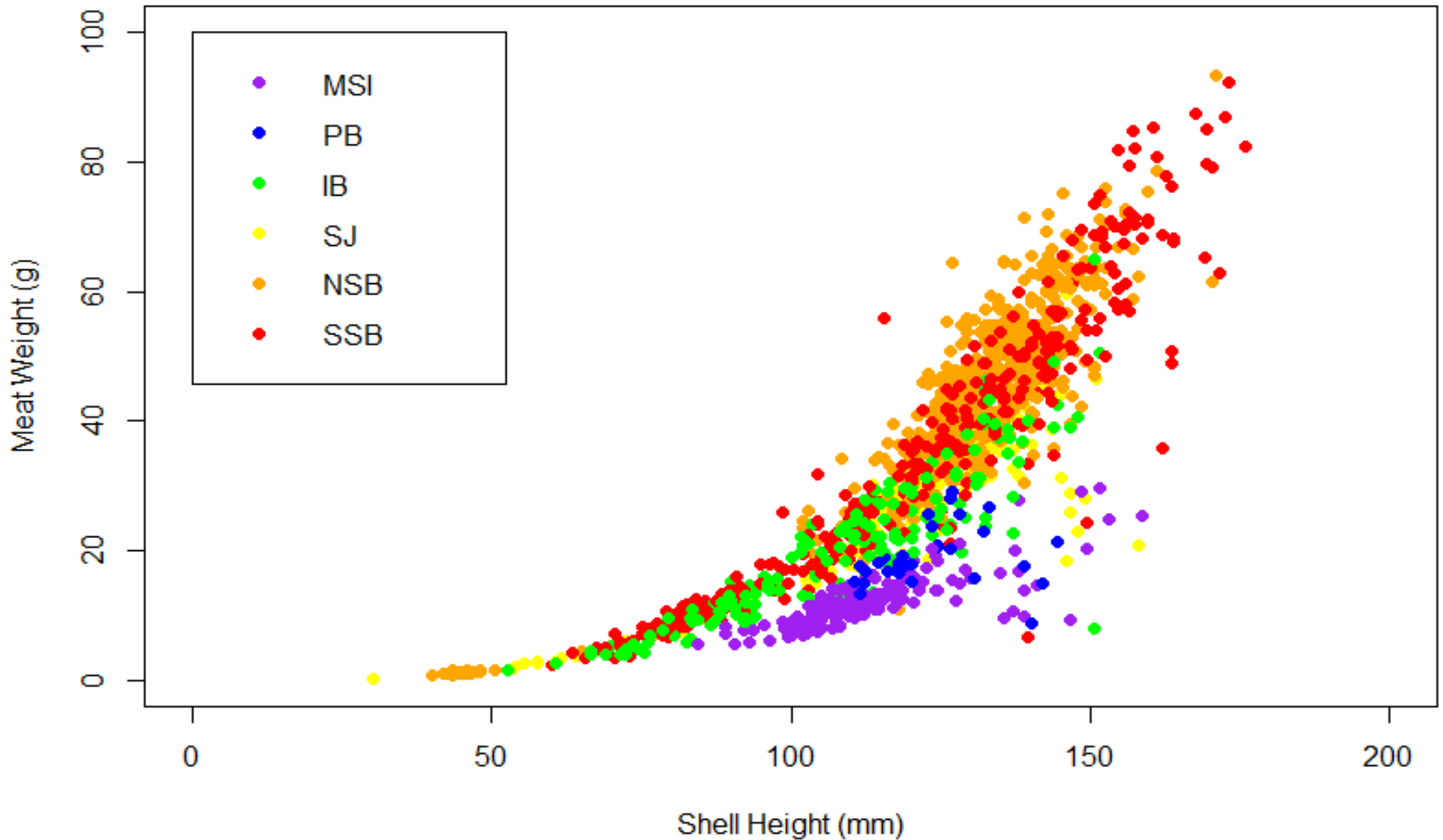
*Only scallops below 55mm

Length Frequency NSB (Upweighted for Tows > 100)

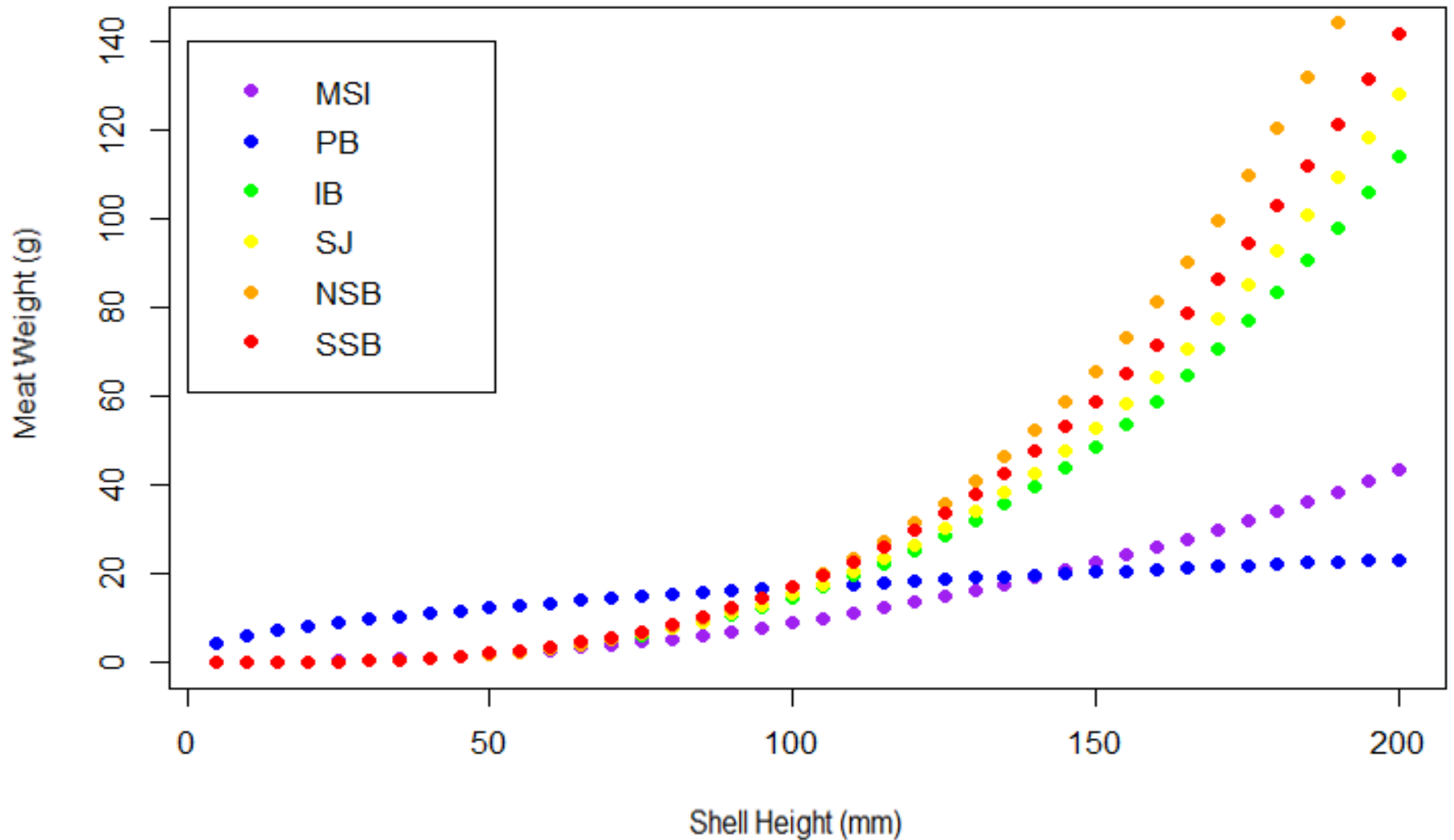
Length Frequency SBB (Upweighted for Tows > 100)



Survey Results – Shell Height/Meat Weight



Survey Results – Shell Height/Meat Weight Log-Log Regression



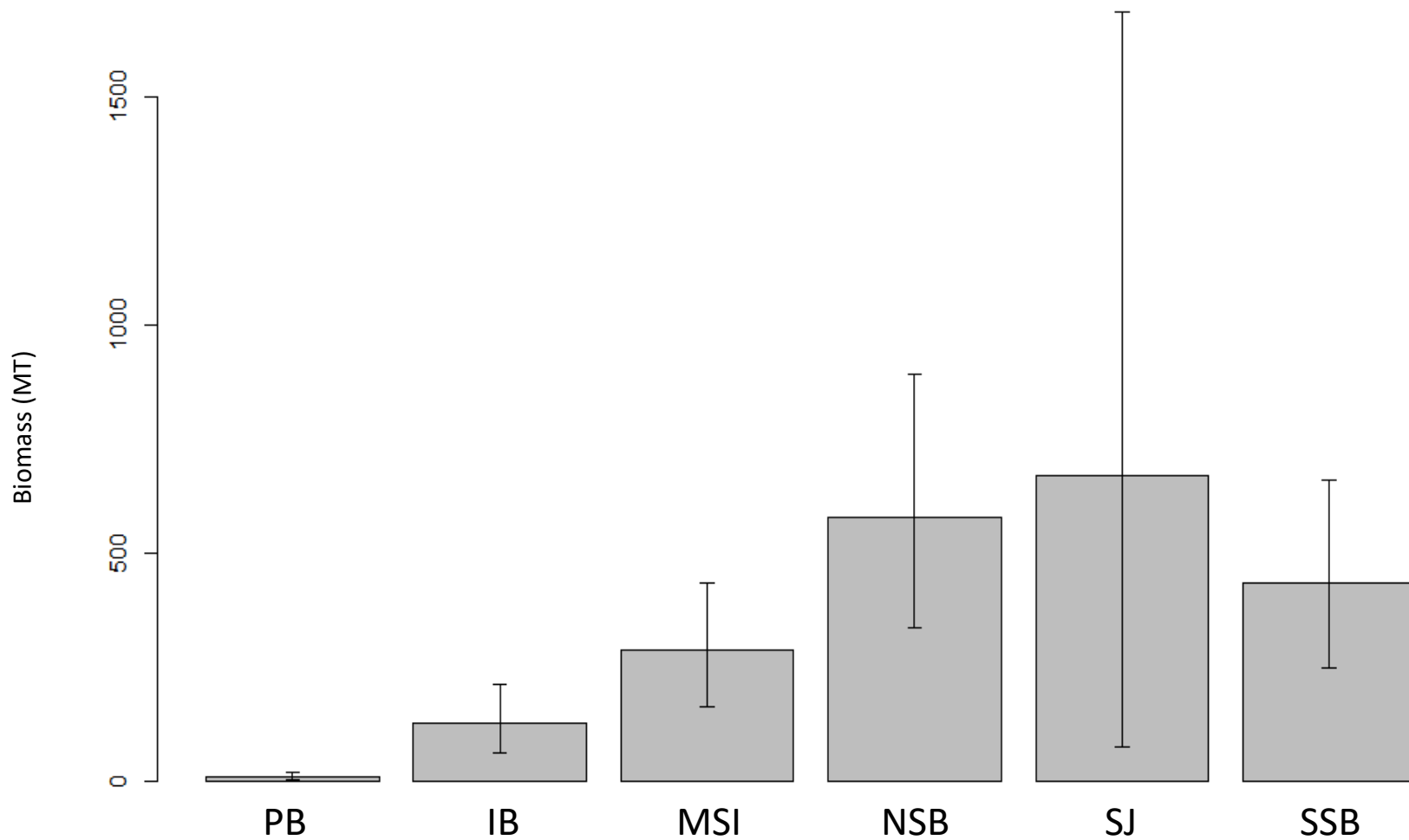
Biomass by Area (MT; SH>0; Efficiency = 0.4)

Biomass Percentile	q0.025	q0.100	q0.150	q0.200	q0.250	Mean	q0.975
Platts Bank	1.855673	3.524989	4.435533	4.983506	5.450127	8.448127	17.20432
Ipswich Bay	68.09089	85.91758	92.79549	98.61949	103.6216	135.1929	221.7568
Machias/Seal Island	161.1742	198.9943	214.1777	226.8728	238.5279	288.3608	436.4251
Northern Stellwagen Bank	348.9175	425.2718	456.0643	482.3306	506.3631	622.2645	968.4964
Southern Jeffreys	78.6183	119.849	213.6813	225.9172	240.8597	682.2055	1716.767
Southern Stellwagen Bank	278.2758	327.7369	345.4119	355.0038	363.1335	466.0781	702.5504
NGOM with Southern Stellwagen	936.9324	1161.295	1326.566	1393.727	1457.956	2202.55	4063.2
NGOM	658.6566	833.5578	981.1544	1038.724	1094.822	1736.472	3360.649

Biomass by Area (MT; SH>75.0, Efficiency = 0.4)

Biomass Percentile	q0.025	q0.100	q0.150	q0.200	q0.250	Mean	q0.975
Platts Bank	1.84346	3.446336	4.472597	5.038386	5.438771	8.454488	17.17943
Ipswich Bay	61.80872	78.95989	85.59089	91.20121	95.83075	126.6919	211.1354
Machias/Seal Island	161.0772	198.0897	212.7228	225.0339	236.3946	286.4194	434.9683
Northern Stellwagen Bank	336.4664	400.9557	429.0515	452.7891	473.9551	578.8867	892.6838
Southern Jeffreys	75.48489	114.886	207.7014	218.2179	232.9736	671.2553	1687.782
Southern Stellwagen Bank	245.8878	299.5517	312.826	321.3201	328.5324	434.4066	661.2699
NGOM with Southern Stellwagen	882.5685	1095.889	1252.365	1313.601	1373.125	2106.114	3905.019
NGOM	636.6807	796.3375	939.5391	992.2804	1044.593	1671.708	3243.749

Biomass by Area (MT; SH>75.0; Efficiency = 0.4; bootstrapped 95% CIs)



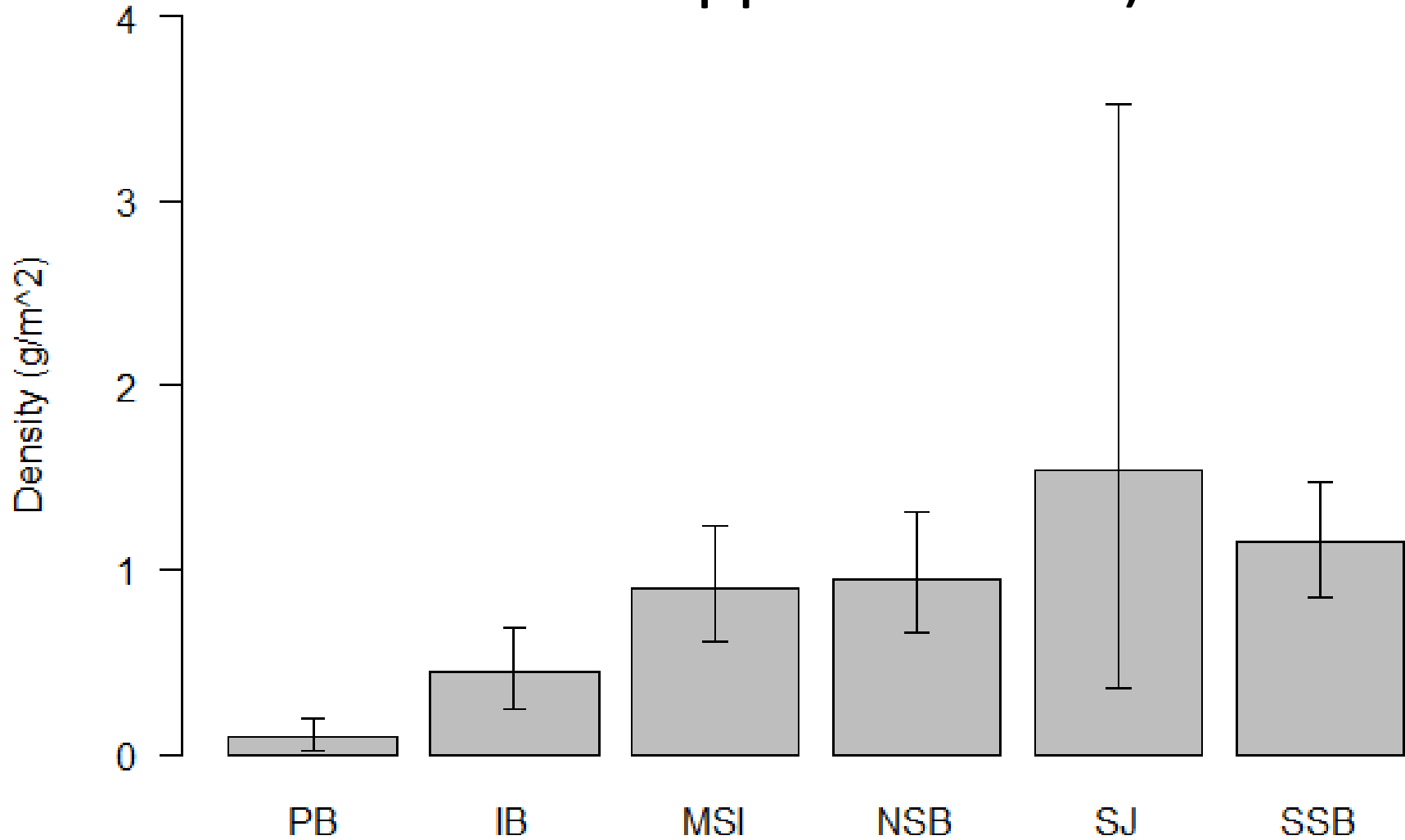
Biomass Density (g/m²; SH>0; Eff. = 0.4)

Biomass Percentile	q0.025	q0.100	q0.150	q0.200	q0.250	Mean	q0.975
Platts Bank	0.02	0.04	0.05	0.05	0.06	0.09	0.19
Ipswich Bay	0.21	0.27	0.29	0.31	0.32	0.42	0.70
Machias Seal Island	0.83	1.01	1.08	1.14	1.19	1.43	2.15
Northern Stellwagen Bank	0.46	0.55	0.59	0.62	0.66	0.85	1.41
Southern Jeffreys	0.75	1.17	1.40	1.51	1.61	2.53	4.94
Southern Stellwagen Bank	0.88	1.04	1.10	1.11	1.12	1.35	1.83
NGOM with Southern Stellwagen	0.53	0.68	0.75	0.79	0.83	1.11	1.87
NGOM	0.45	0.61	0.68	0.73	0.77	1.06	1.88

Biomass Density (g/m²; SH>75.0; Eff. = 0.4)

Biomass Percentile	q0.025	q0.100	q0.150	q0.200	q0.250	Mean	q0.975
Platts Bank	0.02	0.04	0.05	0.05	0.06	0.09	0.19
Ipswich Bay	0.24	0.30	0.33	0.36	0.35	0.44	0.68
Machias Seal Island	0.61	0.70	0.74	0.76	0.79	0.90	1.23
Northern Stellwagen Bank	0.67	0.75	0.78	0.81	0.83	0.94	1.31
Southern Jeffreys	0.36	0.51	0.59	0.66	0.74	1.46	3.53
Southern Stellwagen Bank	0.85	0.94	0.99	1.01	1.03	1.15	1.47
NGOM with Southern Stellwagen	0.47	0.52	0.55	0.58	0.60	0.72	1.14
NGOM	0.62	0.68	0.72	0.75	0.78	0.93	1.47

Biomass Density (SH>75.0; Efficiency = 0.4; bootstrapped 95% CIs)



Biomass by Area (MT; SH>75.0, Efficiency = 0.4)

Area	2012	2016	2019
Platts Bank	51	101	8
Ipswich Bay	72 (area > '16 or '19)	119	127
Machias Seal Island	59	228	286
Northern Stellwagen Bank	92 (area > '16 or '19)	1681	579
Southern Jeffreys	Part of IB, NSB	230	671
Southern Stellwagen Bank	Not surveyed	Not surveyed	434
NGOM with Southern Stellwagen	Not surveyed	Not surveyed	2106
NGOM	274	2360	1672



Acknowledgements



- This project was funded by 2019 RSA award
- Clean Sweep crew



Extra slides follow
as needed for discussion