2 Tables

Table 3: Surfclam discard estimates from 1982 through 1993. A minimum size regulation was in effect from 1982 through 1990. Within two years of dropping the minimum size regulation (1993) the discard rate had dropped to zero and has remained zero since then.

	Discards						
Year	NJ	DMV	Total	Landings (mt)	Discard proportion	Catch	Size limit (mm)
1982	3,899	2,295	6,194	16,688	37.1%	22,882	140
1983	2,507	2,127	4,634	18,592	24.9%	23,226	140
1984	2,724	2,015	4,739	22,889	20.7%	27,628	133
1985	2,186	1,725	3,911	22,480	17.4%	26,391	127
1986	2,561	239	2,800	24,521	11.4%	27,321	127
1987	1,475	415	1,890	21,744	8.7%	23,634	127
1988	1,330	106	1,436	23,378	6.1%	24,814	127
1989	1,054	258	1,312	21,888	6.0%	23,200	127
1990	1,146	123	1,269	24,018	5.3%	25,287	127
1991	561	5	566	20,615	2.7%	21,181	
1992	1,020	4	1,024	21,686	4.7%	22,710	
1993	0	0	0	21,859	0.0%	21,859	

Table 4: Atlantic surfclam landings and EEZ quotas. All figures are meat weights in mt. Total landings for 1965-1981 are from NEFSC (2003) and other years were from a dealer database (CFDBS). EEZ landings for 1965-1982 are from NEFSC (2003) while later years are from a logbook database (SFOQVR). Landings for state waters are approximated as total landings - EEZ landings and may not accurately reflect state landings. Summary statistics ignore years without fishing.

Year	Total	EEZ	State	$\frac{EEZ}{Total}$	Quota
1965	19998	14968	5030	0.75	
1966	20463	14696	5767	0.72	
1967	18168	11204	6964	0.62	
1968	18394	9072	9322	0.49	
1969	22487	7212	15275	0.32	
1970	30535	6396	24139	0.21	
1971	23829	22704	1125	0.95	
1972	28744	25071	3673	0.87	
1973	37362	32921	4441	0.88	
1974	43595	33761	9834	0.77	
1975	39442	20080	19362	0.51	
1976	22277	19304	2973	0.87	
1977	23149	19490	3659	0.84	
1978	17798	14240	3558	0.8	13880
1979	15836	13186	2650	0.83	13880
1980	17117	15748	1369	0.92	13882
1981	20910	16947	3963	0.81	13882
1982	23631	16688	6943	0.71	18506
1983	23631	18592	5039	0.79	18892
1984	30530	22889	7641	0.75	18892
1985	28316	22480	5836	0.79	21205
1986	35073	24521	10552	0.7	24290
1987	27231	21744	5487	0.8	24290
1988	28506	23378	5128	0.82	24290
1989	30081	21888	8193	0.73	25184
1990	32628	24018	8610	0.74	24282
1991	30794	20615	10179	0.67	21976
1992	33164	21686	11478	0.65	21976
1993	32878	21859	11019	0.66	21976
1994	32379	21943	10436	0.68	21976
1995	30061	19627	10434	0.65	19779
1996	28834	19827	9007	0.69	19779
1997	26311	18612	7699	0.71	19779
1998	24506	18234	6272	0.74	19779
1999	26677	19577	7100	0.73	19779
2000	31093	19778	11315	0.64	19779
2001	31237	22017	9220	0.7	21976
2002	32645	24006	8639	0.74	24174

Table 4 cont.

2003	31526	24994	6532	0.79	25061
2004	26463	24197	2266	0.91	26218
2005	22734	21163	1571	0.93	26218
2006	25779	23573	2206	0.91	26218
2007	27091	24915	2176	0.92	26218
2008	25038	22510	2528	0.9	26218
2009	22283	20065	2218	0.9	26218
2010	19941	17984	1957	0.9	26218
2011	19776	18839	937	0.95	26218
2012	18378	18054	324	0.98	26218
2013	18459	18551	0	1	26218
2014	18707	18227	480	0.97	26218
2015	18284	18154	130	0.99	26218
min	15836	6396	0	0.21	13880
max	43595	33761	24139	1	26218
mean	26172	19847	6327	0.77	22309

Table 5: EEZ surfclam landings (mt meats) by stock assessment area and year. Summary statistics ignore years without fishing.

Year	SVA	DMV	NJ	LI	SNE	GBK	Other	Total
1979		12087	1099					13186
1980	64	12789	2878	17				15748
1981	568	7472	8820	87				16947
1982	1705	6679	8086	94	124			16688
1983	2226	7173	8095	263	835			18592
1984	1797	5978	11905	7	382	2765	54	22889
1985	741	7856	11245		452	2185		22480
1986	529	2853	17731	18	1223	1991	176	24521
1987	378	1303	18017		1140	907		21744
1988	558	1149	19420		1512	739		23378
1989	439	3123	16532		1361	434		21888
1990	1502	3546	17886		998	7	79	24018
1991		1634	18912	15	33		21	20615
1992		1221	20399	61	5			21686
1993		3416	18378	62	3			21859
1994		3454	18418	71				21943
1995		2752	16497		378			19627
1996		2239	17480	26	82			19827
1997		1540	16999	73				18612
1998		484	17511	117	121			18234
1999		649	18755	157	16			19577
2000		2041	17513	121	103			19778
2001		3282	17719	935	81			22017
2002	64	4489	18271	1130	52			24006
2003		1432	21669	1626	267			24994
2004		1482	19197	906	2612			24197
2005		1668	16851	759	1885			21163
2006		2773	19660	245	895			23573
2007		3073	20267	1117	458			24915
2008		3261	17517	1309	423			22510
2009		1977	14834	1798	1444	11		20065
2010		1556	11065	1181	2870	1311		17984
2011		1446	12042	409	2553	2388		18839
2012		3785	6206	307	4143	3580	33	18054
2013		3599	5359	231	4959	4403		18551
2014		3544	6063	306	5079	3236		18227
2015		2816	6179	1013	4085	4061		18154
min	64	484	1099	7	3	7	21	13186
max	2226	12789	21669	1798	5079	4403	176	24994
mean	249	2959	14118	387	1084	734	9	20570

Table 6: EEZ fishing effort (hours fished by all vessels) for surfclam, by stock assessment area and year based on logbook data. Summary statistics ignore years without fishing.

Year	SVA	DMV	NJ	LI	SNE	GBK	Other	Total
1981	1337	15839	16770	204				34150
1982	2790	18050	24635	225	136			45837
1983	4190	18805	23584	536	1130			48244
1984	2603	8972	20819	27	1264	1732	42	35459
1985	397	4687	10518		1702	2608		19912
1986	236	1630	10764	38	2516	1610	675	17469
1987	262	722	11910		3781	1006		17681
1988	322	593	13175		5274	587		19950
1989	228	1616	11794		4741	389		18768
1990	1150	2065	12437		3032		898	19582
1991		1254	17243	20	107		292	18916
1992		797	21379	67				22243
1993		2423	18232	56	15			20726
1994		1930	21495	70				23495
1995		1560	18625		1058			21243
1996		1577	20994	40	287			22899
1997		1098	20383	77				21558
1998		289	19608	134	519			20550
1999		734	18146	150	148			19179
2000		1859	16787	114	368			19128
2001		2537	18461	962	148			22107
2002	112	5505	19826	1240	62			26746
2003		2366	25017	1830	177			29390
2004		3161	26429	1252	1098			31940
2005		2660	24383	1208	1321			29572
2006		5883	27254	343	1032			34512
2007		7065	34691	1580	960			44296
2008		8154	34066	2318	541			45079
2009		5667	33521	4137	2520	12		45857
2010		4125	31847	3297	5571	492		45333
2011		3099	35335	1326	7752	975		48487
2012		7398	21751	948	11467	2044	13	43621
2013		6139	19931	869	15903	3811		46653
2014		6680	18172	1031	17165	2950		45998
2015		6623	18976	3496	15257	4387		48739
min	112	289	10518	20	15	12	13	17469
max	4190	18805	35335	4137	17165	4387	898	48739
mean	345	5297	19878	743	2871	593	51	30723

Table 7: Real and nominal exvessel prices and revenues for surfclam based on dealer data. Average price was computed as total revenues divided by total landed meat weight during each year, rather than as annual averages of prices for individual trips, to reduce effects of small deliveries at relatively high prices. The consumer price index (CPI) used to convert nominal dollars to 2009 equivalent dollars is for unprocessed and packaged fish, which includes shellfish and finfish (Eric Thunberg, NEFSC, pers. comm.).

Year	CPI	Nominal_Prices	Real_Prices	Nominal_Revenue	Real_Revenue
1982	0.45	8.94	19.87	25.19	55.98
1983	0.46	7.57	16.31	23.21	49.98
1984	0.48	8.37	17.29	33.16	68.45
1985	0.50	9.34	18.62	34.30	68.38
1986	0.51	9.20	18.00	41.84	81.89
1987	0.53	7.83	14.78	27.64	52.20
1988	0.55	7.80	14.14	28.83	52.27
1989	0.58	7.78	13.45	30.33	52.47
1990	0.61	7.66	12.56	32.39	53.16
1991	0.63	7.51	11.82	29.98	47.21
1992	0.65	7.40	11.32	31.83	48.67
1993	0.67	7.83	11.62	33.37	49.53
1994	0.69	9.82	14.22	41.24	59.69
1995	0.71	10.58	14.89	41.25	58.05
1996	0.73	10.24	13.99	38.27	52.33
1997	0.75	10.31	13.78	35.19	47.03
1998	0.76	9.19	12.09	29.20	38.43
1999	0.78	8.79	11.32	30.42	39.17
2000	0.80	9.43	11.75	38.02	47.37
2001	0.83	9.76	11.83	39.55	47.91
2002	0.84	9.45	11.26	39.99	47.68
2003	0.86	9.64	11.24	39.43	45.96
2004	0.88	9.40	10.67	32.24	36.61
2005	0.91	9.41	10.33	27.73	30.45
2006	0.94	10.08	10.72	33.69	35.85
2007	0.97	10.48	10.85	36.84	38.12
2008	1.00	10.95	10.91	35.56	35.43
2009	1.00	11.46	11.46	33.13	33.13
2010	1.02	11.70	11.50	30.25	29.75
2011	1.05	11.59	11.06	29.73	28.35
2012	1.07	12.34	11.53	29.41	27.48
2013	1.09	12.14	11.17	29.05	26.75
2014	1.10	12.20	11.06	29.61	26.83
2015	1.10	12.66	11.48	30.02	27.22

Table 8: Nominal landings per unit effort (LPUE, bushels h^{-1}) for surfclam fishing (all vessels) in the US EEZ from logbooks. LPUE is total landings in bushels divided by total hours fished. Summary statistics ignore years without fishing.

Year	SVA	DMV	NJ	LI	SNE	GBK	Other	Total
1981	55.1	61.2	68.2	55.3				64.4
1982	79.3	48	42.6	54.2	118.2			47.2
1983	68.9	49.5	44.5	63.6	95.8			50
1984	89.5	86.4	74.2	33.6	39.2	207	166.7	83.7
1985	242.1	217.4	138.6		34.4	108.7		146.4
1986	290.7	227	213.6	61.4	63	160.4	33.8	182
1987	187.1	234	196.2		39.1	116.9		159.5
1988	224.7	251.3	191.2		37.2	163.3		152
1989	249.7	250.6	181.8		37.2	144.7		151.2
1990	169.4	222.7	186.5		42.7		11.4	159.1
1991		169	142.2	97.3	40		9.3	141.3
1992		198.7	123.7	118.1				126.4
1993		182.8	130.7	143.6	25.9			136.8
1994		232.1	111.1	131.5				121.1
1995		228.8	114.9		46.3			119.8
1996		184.1	108	84.3	37.1			112.3
1997		181.9	108.2	122.9				112
1998		217.2	115.8	113.2	30.2			115.1
1999		114.7	134	135.7	14			132.4
2000		142.4	135.3	137.6	36.3			134.1
2001		167.8	124.5	126	71			129.2
2002	74.1	105.8	119.5	118.2	108.8			116.4
2003		78.5	112.3	115.2	195.6			110.3
2004		60.8	94.2	93.8	308.5			98.2
2005		81.3	89.6	81.5	185.1			92.8
2006		61.1	93.5	92.6	112.5			88.6
2007		56.4	75.8	91.7	61.9			72.9
2008		51.9	66.7	73.2	101.4			64.8
2009		45.2	57.4	56.4	74.3	118.9		56.7
2010		48.9	45.1	46.5	66.8	345.6		51.4
2011		60.5	44.2	40	42.7	317.6		50.4
2012		66.3	37	42	46.9	227.1	329.2	53.7
2013		76	34.9	34.5	40.4	149.8		51.6
2014		68.8	43.3	38.5	38.4	142.3		51.4
2015		55.1	42.2	37.6	34.7	120		48.3
min	55.1	45.2	34.9	33.6	14	108.7	9.3	47.2
max	290.7	251.3	213.6	143.6	308.5	345.6	329.2	182
mean	345	5297	19878	743	2871	593	51	102.4

Table 9: Numbers of commercial trips sampled and numbers of surfclams measured in port samples from landings during 1982-2015, by region. Numbers of trips during 1982-1999 were estimated assuming 30 individuals sampled per trip, as specified in port sample instructions.

	SVA		DMV		NJ		LI		SNE		GBK	
Year	Lengths	Trips	Lengths	Trips	Lengths	Trips	Lengths	Trips	Lengths	Trips	Lengths	Trips
1982	30	1	7756	259	7477	249			30	1		
1983	30	1	5923	197	11253	375			30	1		
1984	90	3	3066	102	12751	425			90	3	30	1
1985			1832	61	7674	256			150	5	275	15
1986	23	1	1260	42	5130	171			330	11	143	7
1987			730	24	900	30			569	19		
1988			420	14	900	30			810	27		
1989			866	29	919	31			449	15		
1990			892	30	901	30			209	7		
1991			1080	36	2272	76						
1992			1170	39	1710	57						
1993			1392	46	928	31	1127	56				
1994			119	4	900	30						
1995			720	24	510	17						
1996			1154	38	1117	37						
1997			1622	54	957	32						
1998			1560	52	690	23						
1999			1720	57	856	29						
2000			600	20	3315	111	30	1				
2001			970	33	1260	42						
2002			210	7	1111	37						
2003			60	2	2455	80	198	11				
2004			18	1	425	21	441	24				
2005			410	18	1250	62	349	18				
2006			1074	50	940	47	374	20				
2007			1582	67	1568	80	994	47				
2008			1195	55	1317	67	774	38				
2009			697	31	1148	57	1127	56				
2010			450	20	1064	49	614	30	941	43	30	1
2011			578	26	2558	119	210	10	145	7	30	1
2012	30	1	919	40	1213	58	170	8	30	1	275	15
2013			604	27	1621	75	156	8	30	1	143	7
2014			325	16	1118	51			90	3	220	11
2015			521	24	819	39			150	5	482	25
min	23	1	18	1	425	17	30	1	30	1	30	1
max	90	3	7756	259	12751	425	1127	56	941	43	482	25
mean	41	1	1279	45	2383	86	505	25	270	10	181	9

Table 10: Number of successful random tows in NEFSC clam surveys used for survey trends and efficiency corrected swept area biomass. 'Holes' (unsampled survey strata in some years) were filled by borrowing from adjacent surveys were possible (borrowed totals are negative numbers in gray shaded boxes). Holes that could not be filled have zeros in black boxes. Survey strata are grouped by region. In 2012 and later the NEFSC survey was conducted from a commercial platform using different gear, and tows were not borrowed across gear types. Starting in 2012, not all regions were sampled in each survey year. Instead the survey was conducted in either the northern or southern area. Areas intentionally not sampled are left blank in those years. 2014 was not intended to be a survey year, but some strata were sampled in order to fill holes left over from 2013. SNE was surveyed in 2013 (except stratum 96, which was surveyed in 2014), but the survey results were borowed to 2012 and not used in 2013. Survey strata not used for surfclams are not shown.

Strata	1982	1983	1984	1986	1989	1992	1994	1997	1999	2002	2005	2008	2011	2012	2013	2014	2015
SVA																	
1	-10	10	14	7	10	10	11	10	-10	0	0	0	0	0			0
2	0	0	0	-1	1	2	1	1	-1	0	0	0	0	0			0
5	4	9	13	8	8	8	7	8	-16	8	8	-17	9	8			6
6	1	1	1	1	1	1	1	1	-3	2	1	-1	0	0			0
80	-6	6	9	3	7	7	8	7	-7	0	0	0	0	0			0
81	-4	4	7	3	5	5	5	5	-10	5	-5	0	0	0			0
DMV																	
9	30	26	35	29	37	37	39	39	38	39	36	31	15	9			9
10	2	2	3	3	3	3	3	3	3	3	3	2	4	3			4
13	19	18	25	20	20	20	21	22	19	20	18	15	7	5			4
14	2	2	3	3	3	3	5	3	3	3	3	-26	23	6			8
82	1	1	1	1	1	1	1	1	2	2	-3	1	-1	0			0
83	2	2	2	2	2	2	2	2	2	2	2	2	-2	-3			3
84	4	3	3	4	4	4	4	4	3	4	4	4	4	3			3
85	6	5	4	5	5	5	5	5	5	5	3	5	5	13			16
86	2	2	3	3	3	2	3	3	3	3	3	3	5	3			3
NJ																	
17	11	11	17	12	12	12	12	14	12	12	12	12	5	5			4
18	3	3	-6	3	3	3	3	3	3	3	3	3	5	4			3
21	18	18	21	19	20	20	23	26	39	29	20	28	15	9			9
22	3	3	-6	3	3	3	5	3	3	3	3	3	5	4			3
25	9	9	13	8	9	9	9	12	8	9	9	13	8	4			24
26	2	2	-5	3	3	3	3	3	3	3	3	3	3	3			3
87	8	7	10	9	9	9	9	9	9	16	8	9	6	10			3
88	15	15	24	17	20	20	20	21	23	20	17	19	6	7			4

Table 10 cont.

89	14	15	21	15	18	17	17	19	18	18	15	18	4	5			11
90	2	2	3	2	2	2	2	2	2	2	2	1	4	3			13
LI																	
29	11	10	-20	10	10	10	10	10	11	10	10	16	10	5			2
30	7	8	-14	6	6	6	6	6	7	6	7	12	4	5			3
33	4	4	-8	4	4	4	5	4	4	4	4	10	4	4			3
34	2	2	-4	2	2	2	5	2	2	2	2	8	6	6			3
91	2	2	4	4	3	3	3	3	3	3	3	5	11	4			13
92	2	2	3	2	2	2	2	2	2	2	2	5	11	7			5
93	1	1	2	1	1	1	1	1	1	2	1	4	6	4			7
SNE																	
37	7	4	-7	3	-6	3	5	4	4	3	-3	-2	2	-2	2		2
38	3	2	-5	3	3	3	5	3	3	3	2	3	7	-6	6		2
41	6	5	7	5	6	6	6	6	5	6	6	6	4	-4	4		3
45	3	7	9	4	4	4	4	4	4	3	3	4	7	-4	4		3
46	2	5	5	3	2	3	5	3	3	2	3	3	6	-4	4		-3
47	4	3	4	2	2	4	5	4	3	1	7	4	8	-10	10		-3
94	1	2	-2	0	-1	1	2	2	-4	2	-2	-5	5	0	0		0
95	4	14	11	4	4	4	4	4	4	4	-8	4	5	-6	6		2
96	-12	12	-13	1	1	3	2	4	-4	0	-1	1	-1	-2	0	2	-5
GBK																	
54	0	-3	3	3	-6	3	3	3	-3	0	-2	2	2		-5	5	
55	3	-3	-3	3	1	3	3	3	2	2	-4	2	3		7		
57	0	0	-2	2	1	2	5	2	2	2	-4	2	11		11		
59	1	4	-5	1	2	6	5	5	4	5	-9	4	16		10		
61	8	1	-6	5	-12	7	6	6	6	6	-11	5	5		5		
65	0	0	-2	2	-4	2	4	3	-4	1	-1	-3	3		4		
67	0	-5	5	5	7	7	7	7	-7	0	-2	2	1		-9	9	
68	1	-8	7	3	6	6	5	5	-5	0	-6	6	-6		-5	5	
69	2	5	-11	6	6	6	7	6	8	-8	-4	4	1		3		
70	1	2	-6	4	-8	4	4	4	3	2	-6	4	19		9		
71	0	-2	2	3	1	2	3	3	1	2	-3	1	3		5		
72	2	-10	8	1	8	8	8	8	6	-6	-4	4	5		3		
73	1	1	-4	3	6	6	6	6	5	6	-9	3	5		7		

Table 10 cont.

74	3	-4	1	3	-7	4	4	4	3	3	-6	3	11	4	

Table 11: Trends in abundance and biomass for surfclam > 50 mm shell length during 1982-2015 based on NEFSC clam survey data. Survey values are the clams caught in the survey dredge. Stock values are the survey values adjusted to account for the selectivity of the survey dredge. Fishable values are the stock values adjusted to account for the selectivity of a commercial dredge. Figures include original plus borrowed tows. The column "N strata" includes strata sampled by tows borrowed from the previous and subsequent surveys if needed.

	Survey				**Stock**				**Fishable**						
Year	$\frac{N}{tow}$	CV	$\frac{kg}{tow}$	CV	$\frac{N}{tow}$	CV	$\frac{kg}{tow}$	CV	$\frac{N}{tow}$	CV	$\frac{kg}{tow}$	CV	N tows	Pos. tows	N strata
SVA															
1982	7.26	0.90	0.60	0.87	8.25	0.88	0.64	0.87	7.26	0.90	0.60	0.87	25	6	5
1983	12.31	0.58	0.99	0.57	15.76	0.55	1.10	0.55	12.31	0.58	0.99	0.57	30	12	5
1984	29.66	0.30	2.96	0.29	35.22	0.28	3.15	0.28	29.66	0.30	2.96	0.29	44	17	5
1986	23.69	0.72	2.50	0.72	25.07	0.70	2.58	0.71	23.69	0.72	2.50	0.72	23	13	6
1989	12.89	0.81	1.31	0.81	18.41	0.77	1.44	0.80	12.89	0.81	1.31	0.81	32	13	6
1992	30.25	0.65	2.50	0.65	35.64	0.60	2.69	0.64	30.25	0.65	2.50	0.65	33	18	6
1994	49.76	0.40	1.69	0.28	391.41	0.68	5.32	0.49	49.76	0.40	1.69	0.28	33	19	6
1997	10.80	0.43	0.47	0.45	58.99	0.77	0.93	0.48	10.80	0.43	0.47	0.45	32	14	6
1999	10.54	0.38	0.46	0.33	58.65	0.77	0.93	0.45	10.54	0.38	0.46	0.33	47	21	6
2002	19.35	0.58	1.13	0.57	32.87	0.52	1.48	0.56	19.35	0.58	1.13	0.57	15	7	3
2005	3.65	0.66	0.07	0.57	39.31	0.80	0.43	0.73	3.65	0.66	0.07	0.57	14	4	3
2008	10.30	0.29	0.24	0.29	59.70	0.39	0.89	0.31	10.30	0.29	0.24	0.29	18	11	2
2011	15.54	0.29	0.40	0.27	63.54	0.26	1.18	0.27	15.54	0.29	0.40	0.27	9	8	1
2012	80.75	0.46	3.71	0.43	119.80	0.50	4.97	0.46	80.75	0.46	3.71	0.43	8	8	1
2015	65.33	0.50	2.72	0.51	116.67	0.51	4.19	0.51	65.33	0.50	2.72	0.51	6	6	1
DMV															
1982	178.49	0.42	13.11	0.41	223.73	0.41	15.09	0.41	178.49	0.42	13.11	0.41	68	47	9
1983	61.88	0.49	5.83	0.44	75.08	0.43	6.27	0.43	61.88	0.49	5.83	0.44	61	41	9
1984	219.01	0.63	11.27	0.40	406.22	0.76	16.40	0.53	219.01	0.63	11.27	0.40	79	58	9
1986	133.56	0.39	12.28	0.36	150.01	0.37	13.00	0.36	133.56	0.39	12.28	0.36	70	53	9
1989	47.94	0.26	4.81	0.23	54.03	0.25	5.08	0.23	47.94	0.26	4.81	0.23	78	53	9
1992	42.35	0.28	4.34	0.26	54.42	0.24	4.70	0.25	42.35	0.28	4.34	0.26	77	58	9

Table 11 cont.

1994	129.67	0.23	10.93	0.22	232.77	0.21	12.77	0.20	129.67	0.23	10.93	0.22	83	66	9
1997	131.71	0.17	10.42	0.19	170.75	0.15	11.67	0.18	131.71	0.17	10.42	0.19	82	64	9
1999	55.98	0.23	4.94	0.21	62.78	0.22	5.26	0.21	55.98	0.23	4.94	0.21	78	47	9
2002	37.17	0.22	3.51	0.19	53.35	0.24	3.96	0.19	37.17	0.22	3.51	0.19	81	58	9
2005	11.19	0.27	0.92	0.24	16.62	0.24	1.06	0.23	11.19	0.27	0.92	0.24	75	45	9
2008	12.34	0.23	0.73	0.27	29.41	0.21	1.06	0.24	12.34	0.23	0.73	0.27	89	50	9
2011	51.92	0.26	2.69	0.31	123.43	0.26	3.98	0.26	51.92	0.26	2.69	0.31	66	37	9
2012	91.04	0.46	6.77	0.51	113.74	0.42	7.55	0.49	91.04	0.46	6.77	0.51	45	31	8
2015	254.95	0.23	15.75	0.21	329.20	0.25	18.36	0.22	254.95	0.23	15.75	0.21	50	32	8
NJ															
1982	65.88	0.19	6.87	0.18	80.15	0.18	7.45	0.17	65.88	0.19	6.87	0.18	85	60	10
1983	53.16	0.30	5.32	0.25	63.69	0.27	5.72	0.25	53.16	0.30	5.32	0.25	85	63	10
1984	45.90	0.18	4.84	0.18	73.87	0.22	5.41	0.18	45.90	0.18	4.84	0.18	126	86	10
1986	40.01	0.17	5.00	0.17	51.24	0.17	5.36	0.17	40.01	0.17	5.00	0.17	91	70	10
1989	41.40	0.15	4.96	0.14	51.26	0.16	5.29	0.14	41.40	0.15	4.96	0.14	99	75	10
1992	39.68	0.20	4.30	0.17	52.73	0.19	4.68	0.16	39.68	0.20	4.30	0.17	98	73	10
1994	150.16	0.16	14.50	0.17	338.76	0.37	17.67	0.17	150.16	0.16	14.50	0.17	103	85	10
1997	101.63	0.13	12.86	0.12	110.99	0.12	13.42	0.12	101.63	0.13	12.86	0.12	112	91	10
1999	58.60	0.21	7.69	0.19	70.44	0.20	8.10	0.19	58.60	0.21	7.69	0.19	120	93	10
2002	45.71	0.14	6.19	0.15	56.13	0.12	6.59	0.15	45.71	0.14	6.19	0.15	115	99	10
2005	26.90	0.16	3.28	0.16	31.83	0.15	3.49	0.16	26.90	0.16	3.28	0.16	92	73	10
2008	27.11	0.13	2.97	0.16	42.82	0.12	3.35	0.15	27.11	0.13	2.97	0.16	109	93	10
2011	25.82	0.16	2.59	0.17	37.86	0.16	2.91	0.16	25.82	0.16	2.59	0.17	61	44	10
2012	189.85	0.16	22.86	0.17	206.73	0.16	24.00	0.17	189.85	0.16	22.86	0.17	54	47	10
2015	390.53	0.35	35.31	0.30	433.68	0.35	37.63	0.30	390.53	0.35	35.31	0.30	77	63	10
LI															
1982	4.03	0.61	0.75	0.60	4.16	0.61	0.77	0.60	4.03	0.61	0.75	0.60	29	5	7
1983	0.58	0.60	0.06	0.69	0.89	0.56	0.07	0.65	0.58	0.60	0.06	0.69	29	4	7
1984	2.20	0.22	0.30	0.32	3.06	0.14	0.33	0.29	2.20	0.22	0.30	0.32	55	14	7
1986	2.30	0.45	0.33	0.57	3.05	0.38	0.35	0.54	2.30	0.45	0.33	0.57	29	8	7
1989	5.72	0.78	0.59	0.75	9.28	0.79	0.68	0.76	5.72	0.78	0.59	0.75	28	5	7
1992	8.28	0.39	0.62	0.37	12.46	0.37	0.71	0.37	8.28	0.39	0.62	0.37	28	10	7
1994	11.48	0.17	1.15	0.20	15.73	0.16	1.26	0.19	11.48	0.17	1.15	0.20	32	12	7
1997	5.62	0.59	0.69	0.62	6.21	0.57	0.72	0.62	5.62	0.59	0.69	0.62	28	6	7

Table 11 cont.

1999	12.32	0.65	1.64	0.60	17.34	0.66	1.77	0.61	12.32	0.65	1.64	0.60	30	9	7
2002	2.80	0.59	0.37	0.64	4.10	0.61	0.40	0.63	2.80	0.59	0.37	0.64	29	8	7
2005	14.04	0.47	1.91	0.47	15.73	0.44	2.00	0.46	14.04	0.47	1.91	0.47	29	9	7
2008	5.00	0.21	0.60	0.23	7.18	0.20	0.65	0.23	5.00	0.21	0.60	0.23	60	22	7
2011	14.77	0.21	1.70	0.24	24.09	0.24	1.90	0.23	14.77	0.21	1.70	0.24	52	33	7
2012	58.69	0.28	8.33	0.30	61.94	0.28	8.65	0.30	58.69	0.28	8.33	0.30	35	18	7
2015	88.61	0.26	9.06	0.17	103.03	0.27	9.70	0.17	88.61	0.26	9.06	0.17	36	29	7
SNE															
1982	14.99	0.33	2.43	0.39	18.44	0.29	2.57	0.38	14.99	0.33	2.43	0.39	42	19	9
1983	8.72	0.38	1.76	0.39	9.76	0.37	1.84	0.38	8.72	0.38	1.76	0.39	54	24	9
1984	11.65	0.34	2.33	0.34	14.12	0.31	2.44	0.33	11.65	0.34	2.33	0.34	63	26	9
1986	5.24	0.54	0.90	0.68	10.85	0.27	1.02	0.62	5.24	0.54	0.90	0.68	25	11	8
1989	5.75	0.31	0.98	0.33	7.35	0.32	1.05	0.32	5.75	0.31	0.98	0.33	29	12	9
1992	3.64	0.44	0.59	0.55	6.79	0.44	0.67	0.51	3.64	0.44	0.59	0.55	31	9	9
1994	2.96	0.45	0.44	0.50	3.92	0.41	0.48	0.49	2.96	0.45	0.44	0.50	38	11	9
1997	15.23	0.25	2.71	0.30	21.52	0.19	2.89	0.29	15.23	0.25	2.71	0.30	34	15	9
1999	6.90	0.45	1.11	0.60	12.05	0.33	1.25	0.56	6.90	0.45	1.11	0.60	34	16	9
2002	4.86	0.31	0.89	0.23	5.55	0.27	0.93	0.23	4.86	0.31	0.89	0.23	24	9	8
2005	2.95	0.14	0.46	0.21	5.54	0.18	0.52	0.19	2.95	0.14	0.46	0.21	35	14	9
2008	5.37	0.47	0.87	0.54	7.35	0.34	0.94	0.52	5.37	0.47	0.87	0.54	32	11	9
2011	3.07	0.18	0.43	0.25	5.31	0.15	0.50	0.23	3.07	0.18	0.43	0.25	45	13	9
2012	5.44	0.30	1.14	0.27	6.45	0.32	1.20	0.26	5.44	0.30	1.14	0.27	38	10	8
2015	19.11	0.71	3.16	0.68	20.54	0.71	3.30	0.68	19.11	0.71	3.16	0.68	11	6	5
GBK															
1982	3.27	0.14	0.20	0.11	10.14	0.16	0.34	0.12	3.27	0.14	0.20	0.11	22	10	9
1983	6.09	0.39	0.75	0.59	10.14	0.27	0.86	0.53	6.09	0.39	0.75	0.59	48	26	12
1984	8.56	0.34	1.13	0.46	14.48	0.23	1.28	0.43	8.56	0.34	1.13	0.46	65	31	14
1986	24.97	0.68	1.61	0.53	86.32	0.78	2.61	0.60	24.97	0.68	1.61	0.53	44	20	14
1989	30.07	0.66	3.85	0.70	35.99	0.57	4.07	0.69	30.07	0.66	3.85	0.70	75	37	14
1992	23.43	0.33	1.93	0.32	44.00	0.27	2.40	0.30	23.43	0.33	1.93	0.32	66	43	14
1994	75.85	0.33	8.57	0.38	97.98	0.29	9.33	0.36	75.85	0.33	8.57	0.38	70	47	14
1997	82.07	0.28	6.55	0.26	119.17	0.26	7.75	0.26	82.07	0.28	6.55	0.26	65	45	14
1999	53.60	0.35	5.50	0.34	69.53	0.34	6.05	0.34	53.60	0.35	5.50	0.34	59	34	14
2002	49.15	0.46	5.17	0.44	67.41	0.42	5.74	0.43	49.15	0.46	5.17	0.44	43	23	11

Table 11 cont.

2005	39.70	0.21	4.95	0.23	48.54	0.18	5.26	0.23	39.70	0.21	4.95	0.23	71	38	14
2008	39.23	0.21	4.94	0.22	44.69	0.20	5.20	0.22	39.23	0.21	4.94	0.22	45	29	14
2011	43.79	0.24	6.12	0.24	48.38	0.23	6.40	0.24	43.79	0.24	6.12	0.24	91	52	14
2013	94.62	0.53	11.24	0.51	100.10	0.53	11.69	0.51	94.62	0.53	11.24	0.51	87	33	14
SVAtoSNE															
1982	64.30	0.28	5.41	0.24	79.64	0.28	6.05	0.25	64.30	0.28	5.41	0.24	249	137	40
1983	32.23	0.26	3.20	0.22	38.87	0.23	3.44	0.22	32.23	0.26	3.20	0.22	259	144	40
1984	71.19	0.46	4.82	0.23	124.46	0.59	6.22	0.33	71.19	0.46	4.82	0.23	367	201	40
1986	47.40	0.27	4.82	0.23	55.65	0.25	5.12	0.23	47.40	0.27	4.82	0.23	238	155	40
1989	26.00	0.15	2.87	0.13	31.69	0.15	3.06	0.13	26.00	0.15	2.87	0.13	266	158	41
1992	26.93	0.17	2.72	0.15	35.23	0.15	2.96	0.15	26.93	0.17	2.72	0.15	267	168	41
1994	79.35	0.13	6.79	0.12	206.95	0.26	8.64	0.12	79.35	0.13	6.79	0.12	289	193	41
1997	62.81	0.10	6.37	0.10	83.39	0.12	6.91	0.10	62.81	0.10	6.37	0.10	288	190	41
1999	33.15	0.14	3.64	0.13	47.17	0.19	3.93	0.13	33.15	0.14	3.64	0.13	309	186	41
2002	26.21	0.11	3.05	0.11	34.87	0.12	3.32	0.11	26.21	0.11	3.05	0.11	264	181	37
2005	13.86	0.13	1.60	0.14	19.72	0.14	1.75	0.14	13.86	0.13	1.60	0.14	245	145	38
2008	13.75	0.11	1.34	0.13	25.78	0.10	1.59	0.12	13.75	0.11	1.34	0.13	308	187	37
2011	25.35	0.15	1.88	0.14	52.11	0.17	2.40	0.13	25.35	0.15	1.88	0.14	233	135	36
2012	95.65	0.15	10.46	0.15	109.13	0.15	11.13	0.14	95.65	0.15	10.46	0.15	180	114	34
2015	226.10	0.22	18.60	0.19	267.39	0.21	20.34	0.19	226.10	0.22	18.60	0.19	180	136	31

Table 12: Shell length composition data used to estimate dredge selectivity for surfclams between 2012 and 2015. Number of surfclams caught (no.) and positive stations (pos.) for the modified commercial dredge used for the NEFSC survey and a lined dredge presumed to catch all animals available. Some of the stations were targeting ocean quahog and few surfclams were captured at these sites.

SL group	Lined no.	Survey no.	Lined pos.	Survey pos.
0-10	0	0	0	0
10-20	1	0	1	0
20-30	5	0	2	0
30-40	16	0	6	0
40-50	35	0	10	0
50-60	57	0	9	0
60-70	54	2	6	1
70-80	55	11	6	4
80-90	64	44	9	4
90-100	89	142	6	5
100-110	115	212	7	5
110-120	86	193	6	4
120-130	68	221	5	4
130-140	90	277	5	4
140-150	91	308	4	4
150-160	75	289	3	3
160-170	40	164	3	2
170-180	5	18	2	2
180-190	0	4	0	1
190-200	1	0	1	0

Table 13: Numbers of surfclams in survey dredge selectivity experiments by length bin and station between 2012 and 2015. For example, 3:8 in the row corresponding to shell length (SL) bin 40−50 indicates that 3 surfclams between 40 and 50 mm were caught in the survey dredge and 8 surfclams were caught in the selectivity dredge at that station. Stations with very few total surfclams caught were ocean quahog stations, but are included for completeness.

SL bin	Sta 33	Sta 53	Sta 59	Sta 67	Sta 113	Sta 117	Sta 150	Sta 162	Sta 170
0-10	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0
10-20	0:0	0:0	0:0	0:0	0:0	0:0	1:0	0:0	0:0
20-30	0:0	0:0	0:0	0:0	0:0	0:0	2:0	0:0	0:0
30-40	3:0	4:0	0:0	1:0	1:0	0:0	4:0	0:0	0:0
40-50	7:0	6:0	1:0	1:0	5:0	0:0	8:0	1:0	1:0
50-60	10:0	8:0	4:0	1:0	26:0	1:0	3:0	0:0	0:0
60-70	2:0	2:0	12:2	0:0	30:0	0:0	7:0	0:0	0:0
70-80	1:4	1:0	12:2	0:0	38:4	0:0	2:1	0:0	0:0
80-90	5:12	3:0	1:2	0:0	39:10	0:0	11:20	1:0	0:0
90-100	5:15	2:8	0:0	0:0	51:42	0:0	26:76	2:0	3:0
100-110	4:27	7:24	0:0	0:0	62:68	0:0	35:92	2:0	4:0
110-120	3:41	5:44	0:0	0:0	47:66	0:0	24:42	6:0	1:0
120-130	6:67	5:38	0:0	0:0	49:100	0:0	7:16	0:0	1:0
130-140	8:100	21:94	0:0	0:0	55:78	0:0	5:5	0:0	1:0
140-150	16:125	51:116	0:0	0:0	22:66	0:0	2:1	0:0	0:0
150-160	27:189	44:80	0:0	0:0	4:20	0:0	0:0	0:0	0:0
160-170	16:140	23:24	0:0	0:0	1:0	0:0	0:0	0:0	0:0
170-180	4:16	1:2	0:0	0:0	0:0	0:0	0:0	0:0	0:0
180-190	0:4	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0
190-200	1:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0
0-10	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0
10-20	0:0	0:0	0:0	0:0	0:0	0:0	1:0	0:0	0:0
20-30	0:0	0:0	0:0	0:0	0:0	0:0	2:0	0:0	0:0
30-40	3:0	4:0	0:0	1:0	1:0	0:0	4:0	0:0	0:0
40-50	7:0	6:0	1:0	1:0	5:0	0:0	8:0	1:0	1:0
50-60	10:0	8:0	0:0	1:0	26:0	1:0	3:0	0:0	0:0
60-70	2:0	2:0	0:0	0:0	30:0	0:0	7:0	0:0	0:0
70-80	1:4	1:0	0:0	0:0	38:4	0:0	2:1	0:0	0:0
80-90	5:12	3:0	0:0	0:0	39:10	0:0	11:20	1:0	0:0
90-100	5:15	2:8	0:0	0:0	51:42	0:0	26:76	2:0	3:0
100-110	4:27	7:24	0:0	0:0	62:68	0:0	35:92	2:0	4:0
110-120	3:41	5:44	0:0	0:0	47:66	0:0	24:42	6:0	1:0
120-130	6:67	5:38	0:0	0:0	49:100	0:0	7:16	0:0	1:0
130-140	8:100	21:94	0:0	0:0	55:78	0:0	5:5	0:0	1:0
140-150	16:125	51:116	0:0	0:0	22:66	0:0	2:1	0:0	0:0
150-160	27:189	44:80	0:0	0:0	4:20	0:0	0:0	0:0	0:0
160-170	16:140	23:24	0:0	0:0	1:0	0:0	0:0	0:0	0:0
170-180	4:16	1:2	0:0	0:0	0:0	0:0	0:0	0:0	0:0
180-190	0:4	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0

Table 13 cont.

190-200	1:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0	0:0

SL bin	Sta 178	Sta 182	Sta 184
0-10	0:0	0:0	0:0
10-20	0:0	0:0	0:0
20-30	0:0	3:0	0:0
30-40	0:0	3:0	0:0
40-50	0:0	4:0	0:0
50-60	0:0	3:0	1:0
60-70	0:0	0:0	1:0
70-80	0:0	1:0	0:0
80-90	1:0	2:0	1:0
90-100	0:0	0:1	0:0
100-110	1:1	0:0	0:0
110-120	0:0	0:0	0:0
120-130	0:0	0:0	0:0
130-140	0:0	0:0	0:0
140-150	0:0	0:0	0:0
150-160	0:0	0:0	0:0
160-170	0:0	0:0	0:0
170-180	0:0	0:0	0:0
180-190	0:0	0:0	0:0
190-200	0:0	0:0	0:0
0-10	0:0	0:0	0:0
10-20	0:0	0:0	0:0
20-30	0:0	3:0	0:0
30-40	0:0	3:0	0:0
40-50	0:0	4:0	0:0
50-60	0:0	3:0	1:0
60-70	0:0	0:0	1:0
70-80	0:0	1:0	0:0
80-90	1:0	2:0	1:0
90-100	0:0	0:1	0:0
100-110	1:1	0:0	0:0
110-120	0:0	0:0	0:0
120-130	0:0	0:0	0:0
130-140	0:0	0:0	0:0
140-150	0:0	0:0	0:0
150-160	0:0	0:0	0:0
160-170	0:0	0:0	0:0
170-180	0:0	0:0	0:0
180-190	0:0	0:0	0:0
190-200	0:0	0:0	0:0

Table 14: Results from generalized additive model fits to selectivity data for the MCD survey. The response variable is number of surfclams caught in the survey dredge (a modified commercial dredge) compared to the number of surfclams caught in a lined dredge. The predictors are length bin (L), and a year−station (YrSta) effect. Some models included an offset based on the tow distance at each station. The s indicates a spline function and RE indicates random effects. The best model by AIC included random effects for each year−station combination in both intercept and length.

Model	AIC	BIC
s(L)+s(YrSta,RE)+s(YrSta,L,RE)	3223	3633
s(L)+s(YrSta,RE)	3594	3831
s(L)	6838	6879

Table 15: The MCD survey dredge (post 2011) selectivity coefficients estimated using the best (by AIC) selectivity model, by size bin.

Length	Selx	uci	lci	Length	Selx	uci	lci
5	0.054	0.683	0.002	101	0.787	0.807	0.765
7	0.046	0.571	0.002	103	0.804	0.823	0.785
9	0.039	0.454	0.002	105	0.818	0.835	0.800
11	0.033	0.346	0.002	107	0.829	0.845	0.811
13	0.029	0.257	0.003	109	0.837	0.852	0.820
15	0.025	0.189	0.003	111	0.843	0.858	0.826
17	0.022	0.140	0.003	112	0.847	0.863	0.830
18	0.020	0.105	0.003	114	0.850	0.866	0.833
20	0.018	0.081	0.004	116	0.853	0.869	0.835
22	0.016	0.065	0.004	118	0.855	0.872	0.836
24	0.015	0.053	0.004	120	0.857	0.874	0.837
26	0.014	0.045	0.005	122	0.858	0.877	0.838
28	0.014	0.040	0.005	124	0.860	0.879	0.839
30	0.014	0.036	0.005	126	0.862	0.882	0.840
32	0.014	0.033	0.006	128	0.865	0.886	0.842
34	0.014	0.031	0.006	130	0.868	0.889	0.844
36	0.014	0.030	0.007	132	0.871	0.893	0.846
38	0.015	0.029	0.008	134	0.875	0.897	0.848
40	0.016	0.029	0.008	136	0.878	0.901	0.851
41	0.017	0.030	0.009	137	0.882	0.905	0.854
43	0.018	0.030	0.010	139	0.885	0.908	0.857
45	0.019	0.032	0.011	141	0.888	0.912	0.859
47	0.020	0.033	0.012	143	0.891	0.915	0.861
49	0.022	0.035	0.014	145	0.893	0.917	0.862
51	0.024	0.038	0.015	147	0.894	0.919	0.862
53	0.027	0.041	0.017	149	0.895	0.921	0.862
55	0.030	0.045	0.020	151	0.895	0.922	0.861
57	0.033	0.049	0.022	153	0.895	0.923	0.859
59	0.038	0.055	0.026	155	0.894	0.923	0.857
61	0.043	0.061	0.030	157	0.893	0.922	0.853
63	0.050	0.070	0.035	159	0.891	0.922	0.849
64	0.058	0.080	0.042	160	0.888	0.921	0.844
66	0.069	0.094	0.051	162	0.885	0.920	0.839
68	0.083	0.110	0.062	164	0.882	0.919	0.833
70	0.101	0.131	0.077	166	0.880	0.918	0.827
72	0.123	0.156	0.096	168	0.877	0.917	0.822
74	0.150	0.188	0.119	170	0.875	0.916	0.817
76	0.184	0.225	0.149	172	0.873	0.916	0.813
78	0.225	0.269	0.186	174	0.873	0.917	0.809
80	0.273	0.320	0.231	176	0.873	0.918	0.808
82	0.327	0.375	0.282	178	0.874	0.920	0.807
84	0.385	0.434	0.340	180	0.877	0.923	0.808
86	0.446	0.493	0.401	182	0.880	0.927	0.809
88	0.507	0.551	0.463	183	0.884	0.931	0.811
89	0.564	0.605	0.523	185	0.889	0.937	0.814
91	0.617	0.654	0.579	187	0.895	0.942	0.817

Table 15 cont.

93	0.664	0.697	0.630	189	0.901	0.948	0.819
95	0.704	0.733	0.673	191	0.907	0.954	0.822
97	0.738	0.763	0.710	193	0.913	0.959	0.824
99	0.765	0.788	0.740	195	0.919	0.964	0.825

Table 16: Results from model fits to predict meat weight. Predictors are ln(shell length) (L), ln(depth) (D), density (ρ), and region (R). Random effects are enclosed in parentheses and are limited to station (St), year (both affecting the estimate of the intercept), and length (affecting the estimate of the length coefficient). Regional coefficients are shown. SVA is assumed to have coefficient equal to 0.

Formula	int	L	D	ρ	R	AIC	BIC
L+D+R+(L+St)+(L+Year)	-8.03 (0.05)	2.7 (0.044)	-0.16 (0.021)		X	26780	26864
L+D+Density+R+(L+St)+(L+Year)	-8.03 (0.05)	2.7 (0.044)	-0.16 (0.021)	-0.003 (0.004)	X	26781	26871
L+R+(L+St)+(L+Year)	-8.56 (0.049)	2.7 (0.044)			X	26833	26911
L+D+R+(L+St)	-8.25 (0.045)	2.73 (0.021)	-0.13 (0.022)		X	26855	26921
L+R+(L+St)	-8.68 (0.045)	2.73 (0.021)			X	26886	26946
L+D+(L+St)+(L+Year)	-8.12 (0.034)	2.69 (0.056)	-0.1 (0.019)			27237	27292
L+(L+St)+(L+Year)	-8.49 (0.03)	2.7 (0.057)				27264	27312
L+Density+(L+St)	-8.67 (0.008)	2.75 (0.021)		-0.02 (0.004)		27315	27351
L+D+(L+St)	-8.67 (0.008)	2.73 (0.021)	-0.06 (0.02)			27317	27353
L+(L+St)	-8.69 (0.008)	2.74 (0.021)				27325	27355
L+D+(St)	-8.45 (0.007)	2.73 (0.011)	-0.06 (0.019)			27744	27768
L+(St)	-8.67 (0.007)	2.73 (0.011)				27752	27770

Formula	DMV	NJ	LI	SNE	GBK
L+D+R+(L+St)+(L+Year)	0.02 (0.044)	0.03 (0.043)	-0.01 (0.045)	0.21 (0.054)	0.22 (0.049)
L+D+Density+R+(L+St)+(L+Year)	0.02 (0.044)	0.04 (0.043)	-0.01 (0.045)	0.21 (0.054)	0.22 (0.05)
L+R+(L+St)+(L+Year)	-0.03 (0.045)	0 (0.044)	-0.009 (0.046)	0.19 (0.056)	0.1 (0.049)
L+D+R+(L+St)	0.02 (0.047)	0.02 (0.046)	-0.03 (0.048)	0.18 (0.056)	0.18 (0.051)
L+R+(L+St)	-0.02 (0.047)	-0.002 (0.046)	-0.03 (0.049)	0.17 (0.057)	0.09 (0.049)
L+D+(L+St)+(L+Year)					
L+(L+St)+(L+Year)					
L+Density+(L+St)					
L+D+(L+St)					
L+(L+St)					
L+D+(St)					
L+(St)					

Table 17: Number of age samples in NEFSC clam surveys by survey year and region.

Year	SVA	DMV	NJ	LI	SNE	GBK
1978	0	199	289	0	0	0
1980	2	389	452	29	61	0
1981	45	401	641	27	38	0
1982	5	796	927	40	123	4
1983	142	422	934	6	369	0
1984	0	0	0	0	0	643
1986	64	748	1216	45	71	413
1989	60	102	566	53	42	86
1992	11	134	257	47	54	311
1994	0	299	476	0	0	0
1997	0	626	227	0	0	50
1999	0	510	496	22	50	178
2002	29	327	779	31	20	54
2005	17	322	523	21	6	0
2008	0	138	459	99	39	105
2011	26	114	133	71	15	75
2012	13	43	148	86	0	0
2013	0	0	0	0	35	58
2014	0	0	0	0	4	38
2015	32	139	362	141	12	0

Table 18: Growth curve (Von Bertalanffy) parameter estimates and standard errors for each region by year. Year and region combinations that did not provide sufficient data for model convergence are not shown. SVAtoSNE is the southern area and GBK is the northern area.

Region	Year	n	L_∞	$L_\infty se$	K	K se	t_0	$t_0 se$
SVA	1983	142	183.8	13.75	0.205	0.045	-0.266	0.451
SVA	1986	64	142.2	5.01	0.535	0.192	1.688	0.720
SVA	1989	60	136.9	3.58	0.417	0.098	0.471	0.428
SVA	1992	11	156.1	9.36	0.258	0.077	-0.565	0.608
SVA	2002	29	142.4	19.68	0.230	0.161	-1.426	1.836
SVA	2005	17	122.6	18.35	0.366	0.195	-0.191	0.443
SVA	2011	26	113.0	7.47	0.624	0.159	0.231	0.226
SVA	2012	16	112.9	5.66	0.854	0.236	0.333	0.254
SVA	2015	32	108.9	5.21	0.514	0.145	-0.096	0.463
DMV	1982	796	175.2	1.67	0.206	0.008	-0.380	0.129
DMV	1983	422	176.5	2.49	0.209	0.014	-0.494	0.220
DMV	1986	748	184.2	3.05	0.134	0.010	-1.706	0.374
DMV	1989	102	144.1	3.40	0.302	0.052	0.005	0.462
DMV	1992	134	172.7	7.27	0.159	0.027	-1.320	0.523
DMV	1994	299	149.5	1.66	0.343	0.022	0.937	0.134
DMV	1997	626	151.4	3.25	0.148	0.014	-1.972	0.395
DMV	1999	510	136.4	1.92	0.238	0.027	-0.814	0.482
DMV	2002	327	156.5	4.36	0.172	0.022	-1.567	0.445
DMV	2005	322	151.1	2.99	0.157	0.013	-1.326	0.298
DMV	2008	138	159.0	3.52	0.200	0.018	-1.012	0.221
DMV	2011	115	121.9	3.23	0.361	0.049	-0.261	0.275
DMV	2012	43	149.2	11.23	0.152	0.065	-2.528	2.166
DMV	2015	140	144.3	8.18	0.115	0.029	-4.022	1.329
NJ	1982	927	173.4	1.43	0.264	0.009	-0.244	0.087
NJ	1983	934	176.3	1.73	0.244	0.010	-0.233	0.109
NJ	1986	1216	175.6	1.87	0.177	0.008	-0.965	0.174
NJ	1989	566	162.9	2.01	0.238	0.015	0.085	0.183
NJ	1992	257	167.0	4.11	0.187	0.023	-0.922	0.432
NJ	1994	476	159.6	2.18	0.197	0.017	-1.080	0.356
NJ	1997	227	165.6	2.05	0.212	0.018	-0.546	0.291
NJ	1999	496	160.9	1.38	0.264	0.015	-0.265	0.172
NJ	2002	779	163.9	1.73	0.209	0.015	-1.338	0.279
NJ	2005	523	164.1	2.42	0.150	0.013	-1.711	0.455
NJ	2008	459	157.1	2.27	0.185	0.015	-1.317	0.306
NJ	2011	140	155.1	4.09	0.179	0.029	-1.525	0.714
NJ	2012	175	165.1	4.33	0.144	0.023	-2.964	0.882
NJ	2015	366	156.3	3.00	0.136	0.016	-3.091	0.702
LI	1982	40	156.7	1.86	0.800	0.213	2.315	0.198
LI	1986	45	165.9	3.40	0.222	0.039	-0.477	0.695
LI	1989	53	163.1	3.56	0.259	0.034	0.029	0.394
LI	1992	47	155.8	3.03	0.307	0.036	-0.492	0.314

Table 18 cont.

LI	1999	22	167.9	4.72	0.302	0.044	0.050	0.283
LI	2002	31	174.9	8.13	0.250	0.059	-0.187	0.594
LI	2005	21	160.1	7.63	0.210	0.070	-1.098	1.226
LI	2008	99	150.4	3.62	0.424	0.060	0.400	0.262
LI	2011	72	163.7	4.64	0.226	0.052	-0.534	1.015
LI	2012	86	153.4	6.15	0.269	0.066	-0.458	0.737
LI	2015	141	170.6	7.26	0.123	0.030	-4.188	1.517
SNE	1982	123	160.4	2.40	0.222	0.025	0.142	0.378
SNE	1983	369	167.9	1.66	0.265	0.023	-0.709	0.350
SNE	1986	71	163.6	2.62	0.316	0.038	1.071	0.258
SNE	1989	42	172.0	5.18	0.422	0.079	1.509	0.350
SNE	1992	54	162.4	2.30	0.203	0.024	0.086	0.317
SNE	1999	50	174.8	6.34	0.210	0.041	-0.584	0.560
SNE	2002	20	162.3	5.31	0.452	0.118	1.039	0.525
SNE	2008	39	172.9	5.14	0.161	0.033	-1.592	0.952
SNE	2013	35	169.6	4.42	0.499	0.192	2.081	0.852
SNE	2015	12	171.6	28.62	0.099	0.093	-5.357	7.271
GBK	1984	643	146.7	3.22	0.266	0.022	0.371	0.153
GBK	1986	413	149.0	3.24	0.225	0.019	-0.233	0.175
GBK	1989	86	152.8	5.20	0.197	0.040	-0.750	0.765
GBK	1992	311	148.7	2.82	0.270	0.020	0.585	0.155
GBK	1997	50	138.8	7.37	0.194	0.045	-0.507	0.683
GBK	1999	178	145.6	3.13	0.355	0.033	0.081	0.160
GBK	2002	54	143.2	4.76	0.427	0.095	1.636	0.416
GBK	2008	105	146.4	3.70	0.212	0.036	-1.018	0.550
GBK	2011	75	144.9	2.10	0.545	0.206	2.084	0.931
GBK	2013	59	136.4	3.78	0.421	0.106	0.929	0.596
GBK	2014	40	144.7	3.61	0.223	0.061	-0.645	1.299
south	1982	1891	169.9	1.00	0.239	0.007	-0.399	0.083
south	1983	1873	172.6	1.08	0.249	0.008	-0.246	0.092
south	1986	2144	176.6	1.42	0.165	0.006	-1.130	0.153
south	1989	823	159.7	1.67	0.245	0.014	-0.057	0.165
south	1992	503	164.8	2.18	0.201	0.013	-0.712	0.212
south	1994	775	152.4	1.14	0.292	0.014	0.399	0.139
south	1997	853	162.8	3.28	0.130	0.011	-2.364	0.379
south	1999	1078	150.5	1.38	0.233	0.014	-0.754	0.225
south	2002	1186	162.8	1.74	0.186	0.012	-1.646	0.247
south	2005	889	160.1	1.78	0.155	0.008	-1.337	0.213
south	2008	735	156.5	1.62	0.214	0.012	-0.899	0.179
south	2011	368	155.4	2.51	0.189	0.015	-1.176	0.280
south	2012	320	160.5	3.35	0.165	0.020	-2.275	0.578
south	2013	35	169.6	4.42	0.499	0.192	2.081	0.852
south	2015	691	159.1	3.12	0.120	0.012	-3.789	0.612
All	1982	1895	169.9	1.00	0.239	0.007	-0.394	0.083
All	1983	1873	172.6	1.08	0.249	0.008	-0.246	0.092

Table 18 cont.

All	1984	643	146.7	3.22	0.266	0.022	0.371	0.153
All	1986	2557	172.0	1.24	0.186	0.006	-0.543	0.098
All	1989	909	158.2	1.55	0.247	0.014	-0.050	0.161
All	1992	814	161.4	1.93	0.208	0.011	-0.359	0.155
All	1994	775	152.4	1.14	0.292	0.014	0.399	0.139
All	1997	903	162.0	3.14	0.132	0.011	-2.241	0.355
All	1999	1256	149.4	1.21	0.254	0.013	-0.547	0.166
All	2002	1240	162.7	1.74	0.185	0.011	-1.646	0.244
All	2005	889	160.1	1.78	0.155	0.008	-1.337	0.213
All	2008	840	154.8	1.49	0.216	0.012	-0.899	0.172
All	2011	443	152.8	1.98	0.204	0.015	-1.006	0.254
All	2012	320	160.5	3.35	0.165	0.020	-2.275	0.578
All	2013	94	151.6	3.74	0.369	0.081	0.987	0.581
All	2014	44	149.1	7.14	0.144	0.054	-2.690	2.346
All	2015	691	159.1	3.12	0.120	0.012	-3.789	0.612

Table 19: Numbers of successful random survey tows with sensor data used to evaluate the precision of the MCD survey. Tows are shown in the year they were made (with no borrowing).

Year	South	North
1997	266	57
1999	216	30
2002	251	28
2005	208	
2008	241	12
2011	221	84
2012	131	
2013	35	64
2014	1	19
2015	164	

Table 20: Models relating the proportion of positive tows in the survey to year and stratum used to evaluate the precision of the MCD survey, where C_t is catch in tow t, yr is year as a factor, and str is the stratum.

Model	Formula	Family	Link	df	AIC
glmA	$C_t = yr$	Tweedie(p=1.7)	log	9	14,060
glmB	$C_t = str$	Tweedie(p=1.7))	log	31	13,923
gamA	$C_t = s(yr, by = str)$	Tweedie(p=1.7)	log	67	14,160
gamB	$C_t = s(yr, by = str) + str$	Tweedie(p=1.7)	log	118	13,495

Table 21: Structure of SS3 models used for surfclams in the southern and northern areas.

Model aspect	South	North	Note
M	0.15	0.15	Constant for all ages and years
Age bins	0–30	0–30	
Length bins	1–20 cm	1–20 cm	
Time	1965–2015	1984–2015	
Seasons/morphs/subareas	0	0	
Commercial fleets	1	1	
Fishery selectivity	Double normal	Double normal	
Surveys (trend)	2	2	RD (trend) RD-SWAN (scale) MCD (scale and trend)
Survey selectivity RD	Double normal	Double normal	Based on field estimates
Survey selectivity MCD	Double normal	Double normal	Based on field estimates
Survey catchability (RD-SWAN)	Estimated	Estimated	Uses informative prior distribution
Survey catchability (MCD)	Estimated	Estimated	Uses informative prior distribution
Recruitment Model	Beverton-Holt	Beverton-Holt	Fixed steepness, estimated R_0 and variance (south)
Recruit dev years	1965–2015	1969–2015	
Bias Adjustment parameters	1955,1976,2008,2015,0.79	1961,1974,2006,2015,0.87	
F method	Hybrid	Hybrid	6 iterations (exact F)

Table 22: Parameters estimated internally and externally in SS3 base models for Atlantic surfclam in the southern and northern areas. Parameters listed as fixed or estimated apply to both areas. Parameters listed as estimated in one area are fixed in the other. Numbers of parameters are summarized in the last rows.

Parameter	South	North	Note
M	0.15	0.15	Fixed
Length at age 4	9.613	9.184	Estimated
Length at age 30	16.255	14.912	Estimated
Von Bertalanffy K	0.224	0.253	Fixed
CV of size at ages 5 y	0.172	0.17	Estimated in South
CV of size at age 30 y	0.088	0.077	Estimated in South
Shell length to meat weight multiplier	9e-05	0.00011	Fixed
Shell length to meat weight exponent	2.733	2.733	Fixed
Spawner recruit R_0	16.018	14.251	Estimated
Spawner recruit steepness	0.95	0.95	Fixed
Spawner recruit sd	0.861	1	Estimated
Catchability RD	0.103	0.098	Estimated (with prior)
Catchability MCD	0.738	0.661	Estimated (with prior)
Fishery selectivity peak	15.107	15.075	Estimated
Fishery selectivity top	-8.65802	-2.12929	Estimated in South
Fishery selectivity asc. width	1.638	2.199	Estimated
Fishery selectivity dec. width	1.375	0.553	Estimated in South
Fishery selectivity init	-999	-999	Fixed
Fishery selectivity final	-999	-999	Fixed
Survey (RD) selectivity Peak	8.819	9.534	Estimated in North
Survey (RD) selectivity top	-0.64891	-0.64891	Fixed
Survey (RD) selectivity asc. width	2.239	1.909	Estimated in North
Survey (RD) selectivity dec. width	2.356	2.356	Fixed
Survey (RD) selectivity init	-999	-999	Fixed
Survey (RD) selectivity final	-0.81743	-0.81743	Fixed
Survey (MCD) selectivity Peak	11	11	Fixed
Survey (MCD) selectivity top	1.1	1.1	Fixed
Survey (MCD) selectivity asc. width	2.239	2.239	Fixed
Survey (MCD) selectivity dec. width	8	8	Fixed
Survey (MCD) selectivity init	-999	-999	Fixed
Survey (MCD) selectivity final	-0.81743	-0.81743	Fixed
Initial F	0.005	0	Estimated in South
Total estimated (-recruit deviations)	13	9	
Recruit deviations	51	32	
Total estimated	64	41	

Table 23: Parameter estimates and estimated precision in a basecase model run for Atlantic surfclam in the southern area . This table shows the thirty parameters that are the least precisely determined, ranked by coefficient of variation.

name	value	std.dev	cv
Q_parm[2]	-0.30	11120.00	36566.92
recdev2015	-0.01	0.85	78.57
recdev1975	-0.02	0.53	23.84
recdev1994	-0.04	0.43	11.87
recdev1966	-0.06	0.68	11.76
recdev1965	-0.07	0.69	9.99
recdev1974	-0.06	0.51	9.10
recdev1987	0.06	0.53	8.78
recdev1984	-0.06	0.50	8.48
recdev2007	0.07	0.53	7.13
recdev1982	0.09	0.50	5.57
recdev1986	0.10	0.44	4.57
recdev2014	-0.19	0.83	4.33
recdev1968	-0.15	0.63	4.27
recdev1967	-0.16	0.67	4.19
recdev2012	0.15	0.60	3.95
selparm[2]	-8.66	28.69	3.31
recdev1973	-0.18	0.54	2.98
recdev1998	-0.13	0.34	2.67
recdev2013	-0.31	0.73	2.32
recdev1993	0.25	0.59	2.32
recdev1969	-0.29	0.62	2.14
recdev2011	-0.45	0.75	1.66
recdev1985	-0.38	0.59	1.56
recdev1972	-0.41	0.58	1.40
recdev2006	-0.30	0.41	1.35
recdev1970	-0.48	0.61	1.27
recdev1971	-0.53	0.59	1.13
recdev1983	0.35	0.38	1.09
recdev2008	0.45	0.49	1.09

Table 24: Parameter estimates and estimated precision in a basecase model run for Atlantic surfclam in the northern area. This table shows the thirty parameters that are the least precisely determined, ranked by coefficient of variation.

name	value	std.dev	cv
recdev1973	-0.06	0.42	7.09
recdev1990	-0.06	0.45	6.93
recdev2005	-0.08	0.44	5.47
recdev1989	0.12	0.37	3.19
recdev2004	-0.17	0.50	2.85
recdev1977	-0.12	0.33	2.65
recdev2006	0.18	0.43	2.40
selparm[2]	-2.13	4.89	2.30
recdev2014	-0.54	0.99	1.81
recdev2015	-0.54	0.99	1.81
recdev2013	-0.55	0.99	1.80
recdev1985	0.19	0.34	1.79
recdev1999	0.32	0.52	1.66
recdev1971	-0.35	0.52	1.46
recdev1980	0.16	0.23	1.38
recdev1991	0.42	0.51	1.21
recdev1983	0.23	0.27	1.16
recr_std2015	884760.00	1013800.00	1.15
recr_std2014	842830.00	965640.00	1.15
recr_std2013	802040.00	918190.00	1.14
recdev1978	0.23	0.25	1.10
recdev1992	0.49	0.53	1.08
recdev2002	-0.68	0.72	1.05
recr_std2012	448290.00	467970.00	1.04
recdev1982	0.23	0.23	1.00
recdev2007	-0.57	0.57	0.99
recdev1986	0.35	0.34	0.96
recr_std2001	237510.00	225330.00	0.95
recdev2003	-0.69	0.65	0.94
recdev1970	-0.64	0.60	0.93

Table 25: Likelihood profile over unfished recruitment parameter (R0). The values in the table are the differences, in likelihood units, between each profile run and the minimum likelihood for that row (likelihood component). Conflicts within the data are apparent when the minimum likelihood values (gray cells) occur in different columns for each row. That is, different likelihood components within the model were minimized at different values of R0. Because R0 is important for setting the scale of estimated biomass in the model (Relative B; last row), data conflicts around R0 tend to increase uncertainty in scale. The coloumn corresponding to the minimum total likelihood is shown in italics.

ln(R0)	14.5	15	15.5	*16.02*	16.5	17
Total	24.1	9.75	2.3	*0*	1.93	7
Parm priors	22.8	10.7	3.2	*0*	0.8	4.5
RDtrend	0	2.4	3.9	*5.1*	5.8	6
RDscale	0	0	0.1	*0.3*	0.4	0.6
ComLen	0	0.2	0.3	*0.4*	0.4	0.3
LenRD	1	0.1	0	*0.1*	0.4	0.7
LenMCD	0	0	0.2	*0.4*	0.5	0.7
AgeRD	4.9	2.2	1	*0.3*	0	0
AgeMCD	2.9	1.8	1.1	*0.6*	0.3	0
Relative B	1	1.6	2.6	*4.2*	6.4	9.5

Table 26: Likelihood profile over unfished recruitment parameter (R0). The values in the table are the differences, in likelihood units, between each profile run and the minimum likelihood for that row (likelihood component). Conflicts within the data are apparent when the minimum likelihood values (gray cells) occur in different columns for each row. That is, different likelihood components within the model were minimized at different values of R0. Because R0 is important for setting the scale of estimated biomass in the model (Relative B; last row), data conflicts around R0 tend to increase uncertainty in scale. The coloumn corresponding to the minimum total likelihood is shown in italics.

ln(R0)	12	13.00	*14*	*14.24*	15	16
Total	7.7	2.1	*0*	*0*	1.2	5.8
Parm priors	1.6	0.5	*0*	*0*	0.2	0.9
RDtrend	0	0.5	*1*	*1.1*	1.5	1.9
RDscale	141.3	52.5	*5.5*	*0.4*	0	35.7
MCD	7.7	2.3	*0.1*	*0*	0.7	4.1
ComLen	0	0.2	*0.2*	*0.3*	0.3	0.3
AgeRD	0.3	0.4	*0.3*	*0.3*	0.2	0
AgeMCD	0	0.1	*0.2*	*0.2*	0.3	0.5
Relative B	1	3.1	*8.5*	*10.9*	23	61.4

Table 27: Whole stock biomass (mt) and fishing mortality status estimates with cv and approximate 95% confidence intervals, using the current reference points from the previous assessment. The table shows the overlap between the distributions of the threshold and the terminal B (P[overlap]) and the probability of overfished status (P[overfishing]), which accounts for the correlation between the threshold and the terminal B. The current F reference point was a point estimate with no uncertainty and therefore the probability of overfishing was equal to the overlap.

	Estimate	CV	LCI	UCI	P[overlap]	P[overfishing]
SSB_{2015}	46355730	0.635	14822331	144974076	0.434	0.000
SSB Threshold	19076275	0.149	6455642	56369955		
F_{2015}	0.009	0.637	0.003	0.029	0.000	0.000
F Threshold	0.15					

Table 28: Whole stock Atlantic surfclam fishing mortality status estimates (based on recommended reference points) with cv and approximate 95% confidence intervals.

	F	CV	LCI	UCI
$\frac{F_{2015}}{F_{Threshold}}$	0.295	0.225	0.191	0.456

Table 29: Whole stock Atlantic surfclam biomass status estimates (based on recommended reference points) with cv and approximate 95% confidence intervals.

	Ratio	CV	LCI	UCI
$\frac{SSB_{2015}}{SSB_{Threshold}}$	2.54	0.696	0.74	8.71

Table 30: Projected spawning stock biomass (1000 mt) and biomass status ($\frac{SSB}{SSB_{Threshold}}$, where $SSB_{Threshold} = 0.25SSB_0$) during 2016-2025 for Atlantic surfclam in the southern, northern and combined areas. The biomass estimates from basecase models in the top panel are very uncertain and shown only to document calculation of the more reliable status ratios in the lower panel.

	Southern area			**Northern area**			**Whole stock**		
Year	Status Quo	Quota	F=FOFL	Status Quo	Quota	F=FOFL	Status Quo	Quota	F=FOFL
				SSB (1000 mt)					
2016	2937	2937	2937	396	396	396	3333	3333	3333
2017	2900	2894	2855	358	356	356	3258	3251	3212
2018	3002	2991	2914	329	325	326	3331	3316	3240
2019	2979	2963	2853	316	311	313	3295	3274	3166
2020	2983	2962	2823	309	302	305	3291	3264	3128
2021	3044	3020	2854	305	298	302	3349	3318	3156
2022	3113	3085	2897	327	319	324	3440	3404	3220
2023	3180	3149	2940	351	342	347	3531	3491	3287
2024	3243	3210	2982	375	365	371	3618	3575	3353
2025	3302	3267	3021	398	388	393	3701	3654	3414
				$\frac{SSB}{SSB_{Threshold}}$					
2016	3.24	3.24	3.24	2.04	2.04	2.04	2.57	2.57	2.57
2017	3.33	3.32	3.30	2.30	2.29	2.29	2.76	2.76	2.75
2018	3.41	3.41	3.37	2.52	2.51	2.51	2.93	2.92	2.91
2019	3.48	3.48	3.42	2.71	2.70	2.70	3.07	3.06	3.04
2020	3.55	3.54	3.47	2.87	2.86	2.86	3.19	3.18	3.15
2021	3.60	3.59	3.51	3.02	3.00	3.01	3.30	3.28	3.25
2022	3.65	3.64	3.55	3.14	3.12	3.13	3.39	3.37	3.33
2023	3.69	3.68	3.58	3.25	3.22	3.23	3.46	3.44	3.40
2024	3.73	3.71	3.60	3.34	3.31	3.32	3.53	3.50	3.46
2025	3.76	3.74	3.63	3.42	3.39	3.40	3.58	3.56	3.51

Table 31: Projected catch (landings + incidental mortality; mt) and fishing mortality status ratio $\frac{F}{F_{Threshold}}$ during 2016-2025 for Atlantic surfclam in the southern, northern and combined areas. $\frac{F}{F_{Threshold}}$ for the northern area was not possible due to a lack of the exploitation history required to generate an area specific fishing mortality threshold.

	Southern area			**Northern area**			**Whole stock**		
Year	Status Quo	Quota	F=FOFL	Status Quo	Quota	F=FOFL	Status Quo	Quota	F=FOFL
				Catch (mt)					
2016	15771	22610	68725	4562	6753	6444	20333	29363	75169
2017	15771	22610	69447	4562	6753	5917	20333	29363	75364
2018	15771	22610	69332	4562	6753	5527	20333	29363	74859
2019	15771	22610	68981	4562	6753	5279	20333	29363	74260
2020	15771	22610	68930	4562	6753	5201	20333	29363	74131
2021	15771	22610	69328	4562	6753	5288	20333	29363	74615
2022	15771	22610	70044	4562	6753	5503	20333	29363	75547
2023	15771	22610	70914	4562	6753	5793	20333	29363	76707
2024	15771	22610	71818	4562	6753	6113	20333	29363	77931
2025	15771	22610	72684	4562	6753	6431	20333	29363	79115
				$\frac{F}{F_{Threshold}}$					
2016	0.227	0.326	0.999				0.362	0.529	0.903
2017	0.222	0.319	0.999				0.372	0.546	0.903
2018	0.219	0.315	0.999				0.383	0.562	0.903
2019	0.217	0.314	0.999				0.390	0.575	0.903
2020	0.215	0.311	0.999				0.390	0.578	0.903
2021	0.212	0.307	0.999				0.384	0.570	0.903
2022	0.208	0.302	0.999				0.373	0.554	0.903
2023	0.205	0.296	0.999				0.360	0.535	0.903
2024	0.201	0.291	0.999				0.348	0.517	0.903
2025	0.198	0.286	0.999				0.336	0.499	0.903

Table 32: Cumulative probability of being in overfished status in any of the years from 2016-2025 under a variety of catch scenarios for Atlantic surfclam in the southern, northern and combined areas. Overfishing determination for the northern area was not possible due to a lack of the exploitation history required to generate an area specific fishing mortality threshold.

Catch scenario	$P[Overfished]$	$P[Overfishing]$
Southern area		
Status Quo	0.007	0.000
Quota	0.007	0.008
F=FOFL	0.009	0.529
Northern area		
Status Quo	0.107	
Quota	0.116	
F=FOFL	0.111	
Whole stock		
Status Quo	0.091	0.095
Quota	0.093	0.240
F=FOFL	0.098	0.498

Table 33: Projected stock status ($\frac{SSB}{SSB_{Threshold}}$ and $\frac{F}{F_{Threshold}}$) during 2016-2025 for Atlantic surfclam in the southern, northern and combined areas from projections based on the highest and lowest (in biomass scale) of credible sensitivity runs for each area. Overfishing determination for the northern area was not possible due to a lack of the exploitation history required to generate an area specific fishing mortality threshold.The results indicate that projected stock status is reasonably robust to biomass scale uncertainty.

	Southern area		**Northern area**		**Whole stock**	
Year	High Biomass	Low Biomass	High Biomass	Low Biomass	High Biomass	Low Biomass
			$\frac{SSB}{SSB_{Threshold}}$			
2016	3.072	2.954	1.611	2.532	2.225	2.735
2017	3.226	3.073	1.924	2.716	2.491	2.889
2018	3.350	3.169	2.196	2.875	2.712	3.018
2019	3.450	3.252	2.432	3.012	2.897	3.130
2020	3.531	3.323	2.636	3.130	3.051	3.225
2021	3.596	3.385	2.812	3.233	3.180	3.308
2022	3.650	3.438	2.964	3.321	3.289	3.379
2023	3.694	3.484	3.095	3.396	3.381	3.440
2024	3.730	3.524	3.209	3.461	3.460	3.492
2025	3.761	3.558	3.307	3.517	3.526	3.537
			$\frac{F}{F_{Threshold}}$			
2016	0.360	0.358			0.385	0.673
2017	0.358	0.353			0.402	0.702
2018	0.358	0.351			0.419	0.735
2019	0.357	0.348			0.431	0.766
2020	0.353	0.343			0.432	0.789
2021	0.346	0.336			0.422	0.798
2022	0.337	0.327			0.405	0.792
2023	0.329	0.319			0.385	0.779
2024	0.321	0.311			0.366	0.761
2025	0.314	0.304			0.349	0.744

Table 34: Estimated catch (landings + incidental mortality; mt) at the Over Fishing Limit (OFL) from 2016-2025 for Atlantic surfclam in the southern, northern and combined areas. OFL for the northern area was an approximation due to a lack of the exploitation history required to generate an area specific fishing mortality threshold.

Year	Mean	Median	CV	LCI	UCI
Southern area					
2016	70607	68733	0.23	44822	111225
2017	71299	69404	0.23	45347	112104
2018	71234	69338	0.24	45135	112424
2019	70984	68983	0.24	44472	113300
2020	71062	68909	0.25	43776	115355
2021	71633	69310	0.26	43392	118255
2022	72435	70043	0.26	43551	120475
2023	73309	70912	0.26	44159	121701
2024	74201	71836	0.26	45031	122266
2025	75029	72713	0.25	45961	122481
Northern area					
2016	7394	6447	0.56	2644	20679
2017	6789	5917	0.56	2435	18926
2018	6352	5534	0.56	2268	17793
2019	6070	5277	0.57	2150	17139
2020	6004	5205	0.57	2106	17115
2021	6111	5288	0.58	2127	17559
2022	6368	5507	0.58	2209	18355
2023	6699	5793	0.58	2331	19248
2024	7061	6114	0.58	2461	20256
2025	7425	6432	0.58	2592	21267
Whole stock					
2016	87892	75126	0.61	29278	263854
2017	88243	75432	0.61	29394	264908
2018	87709	74832	0.61	29081	264532
2019	87316	74281	0.62	28639	266210
2020	87511	74110	0.63	28309	270519
2021	88370	74625	0.64	28240	276534
2022	89700	75509	0.64	28404	283269
2023	90904	76631	0.64	28917	285766
2024	92344	77954	0.64	29510	288970
2025	93501	79083	0.63	30016	291255