

Bluefish 2018 Stock Assessment Update
Data Update Through 2017

Coastal/Pelagic Working Group
Northeast Fisheries Science Center
National Marine Fisheries Service

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Fishery Data

Commercial and recreational landings and recreational discards were updated for bluefish through 2017. Commercial discards are considered minimal for bluefish and are not included in this data update.

Reported commercial landings for bluefish were 1,873 MT (4.13 million lbs) in 2017 (Tables 1 and 2, Figure 1), which was 48% of the 2017 commercial quota (3,875 MT, 8.54 million lbs). Estimated recreational fishery landings were 4,649 MT (10.25 million lbs) in 2017 (Table 2, Figure 2), which was 106% of the 2017 recreational harvest limit (4,379 MT, 9.65 million lbs). Estimated recreational fishery discards were 2,857 MT (6.30 million lbs) and total recreational catch for 2017 was 7,506 MT (16.55 million lbs; Table 2, Figure 2). Total fishery catch for bluefish in 2017 was equal to 9,379 MT (20.68 million lbs; Table 2), which was 100% of the 2017 ABC (9,363 MT, 20.64 million lbs).

The commercial length frequency distribution of bluefish in 2017 was similar to the previous two years. There is a dominant peak at around 36cm with smaller extended peak of larger fish beginning at 51cm. (Figure 3). The recreational length frequency distribution of bluefish in 2017 is spread out, not showing the bi-modal distribution seen in previous years (Figure 4). Typically, the bulk of the discard lengths come from the American Littoral Society tagging program. However, these data were not available in time and this omission may be affecting the total recreational length frequency distribution. For this update, Volunteer Angler Survey (VAS) data from CT, RI, and NJ, as well as minimal information from MRIP, were used for the recreational discard lengths. The length frequency distribution of the total catch is presented in Figure 5.

Mean weight at age for bluefish remained steady for younger ages in 2017, decreased for ages 3, 4, and 5, and increased for ages 6+ when compared to 2016 values (Table 3, Figure 6). Final catch-at-age for both the commercial and recreational fishery are presented in Tables 4 and 5, respectively.

Surveys

A recreational catch-per-unit-effort index was updated for 2017 from the MRIP intercept data (Table 6, Figure 7). In addition, seven fishery-independent indices were updated through 2017. The NEFSC fall Bigelow index was not calculated for this update due to insufficient data.

In the fall of 2017 vessel repairs caused a significant delay in the survey, and as a result most of the southern survey strata were not sampled. The Age-0+ fishery-independent indices that were updated include the New Jersey ocean trawl survey, the Connecticut Long Island Sound trawl survey, the NEAMAP fall inshore trawl survey, and the North Carolina Pamlico Sound independent gillnet survey (Tables 7 to 11, Figures 8 to 12). Young-of-year indices included the SEAMAP fall trawl survey and a composite index developed from state seine indices from New Hampshire to Virginia (Tables 12 and 13, Figures 13 and 14). All indices except the NJ ocean trawl survey showed a decrease from 2016 values.

Table 1. 2017 Commercial bluefish landings (mt) by state groupings used in length expansions.

Year	State			Total
	ME - VA	NC	SC-FL	
1985	4201	1634	289	6124
1986	4560	1562	531	6653
1987	3806	2069	705	6580
1988	4278	2286	599	7164
1989	2793	1493	455	4741
1990	3685	2077	490	6251
1991	3710	1778	673	6162
1992	3424	1288	495	5207
1993	3040	1227	543	4810
1994	3072	809	424	4305
1995	2034	1366	229	3629
1996	2655	1497	62	4214
1997	2165	1816	129	4110
1998	2258	1327	155	3740
1999	1921	1253	157	3331
2000	2058	1526	64	3648
2001	2039	1845	63	3946
2002	2025	1055	37	3117
2003	1740	1574	45	3359
2004	1885	1707	56	3648
2005	1844	1122	71	3037
2006	1852	1146	45	3043
2007	2283	909	76	3268
2008	1767	763	57	2586
2009	1959	1096	97	3152
2010	1601	1463	143	3207
2011	1482	862	111	2456
2012	1810	347	81	2238
2013	1382	515	65	1961
2014	1247	916	69	2232
2015	1443	364	95	1902
2016	1313	521	94	1928
2017	1051	700	121	1872

Table 2. Commercial landings, recreational landings, recreational discard loss, and total catch for bluefish from Maine to Florida, 1985 to 2017.

Year	Commercial Landings (mt)	Commercial Landings (000 lbs)	Recreational Landings (mt)	Recreational Discard (mt): 0.15 * B2	Recreational Catch (mt)	Total Landings (mt)	Total Catch (mt) (no comm. discards)
1985	6124	13501	23821	599	24420	29945	30544
1986	6653	14668	42133	1544	43677	48786	50330
1987	6580	14507	34769	1615	36384	41349	42965
1988	7164	15793	21873	1146	23019	29037	30183
1989	4741	10453	17808	989	18797	22549	23539
1990	6251	13782	13860	929	14789	20111	21041
1991	6162	13584	14967	1194	16161	21129	22322
1992	5207	11479	11011	979	11990	16218	17197
1993	4810	10604	9204	1013	10217	14014	15026
1994	4305	9491	7049	1128	8177	11354	12482
1995	3629	8000	6489	1003	7492	10118	11121
1996	4214	9289	5328	1010	6338	9542	10552
1997	4110	9061	6487	1287	7774	10597	11884
1998	3740	8244	5595	999	6594	9335	10334
1999	3331	7343	3744	1191	4935	7075	8265
2000	3648	8042	4811	1675	6486	8459	10134
2001	3946	8700	6001	1857	7858	9947	11805
2002	3117	6871	5158	1448	6606	8275	9722
2003	3359	7405	5958	1331	7289	9317	10648
2004	3648	8043	7179	1761	8940	10827	12588
2005	3037	6697	8225	1915	10140	11262	13178
2006	3043	6708	7663	1860	9523	10706	12566
2007	3268	7204	9608	2653	12261	12875	15528
2008	2586	5701	8573	2443	11016	11159	13602
2009	3152	6950	6161	960	7121	9313	10274
2010	3207	7071	8184	2409	10593	11391	13800
2011	2456	5414	5965	2856	8821	8421	11277
2012	2238	4933	4846	2383	7229	7084	9467
2013	1961	4324	6980	2281	9261	8941	11222
2014	2232	4920	4620	2961	7581	6852	9813
2015	1902	4192	6451	1623	8074	8353	9976
2016	1928	4251	4220	2141	6361	6148	8289
2017	1873	4130	4649	2857	7506	6522	9379

Table 3. Bluefish mean catch weight at age (kg) from 1985 to 2017

Year	Age						
	0	1	2	3	4	5	6+
1985	0.122	0.570	1.321	2.295	3.549	4.591	6.679
1986	0.093	0.585	1.323	2.266	3.369	4.392	6.160
1987	0.093	0.610	1.307	2.184	3.508	4.454	6.105
1988	0.159	0.588	1.126	2.314	3.094	3.960	5.743
1989	0.118	0.633	1.575	2.969	3.566	4.256	5.752
1990	0.152	0.503	1.192	2.372	3.971	4.389	6.208
1991	0.101	0.268	1.110	2.077	3.362	4.163	5.765
1992	0.070	0.462	1.036	2.113	3.192	4.278	5.843
1993	0.149	0.465	1.126	2.343	2.920	4.022	6.110
1994	0.104	0.482	1.073	2.095	3.360	4.147	6.641
1995	0.167	0.527	1.018	2.202	3.452	4.499	5.932
1996	0.129	0.621	1.010	1.793	2.927	4.356	5.563
1997	0.099	0.488	1.019	1.967	2.758	3.687	5.734
1998	0.132	0.508	0.881	2.609	3.703	4.036	6.201
1999	0.136	0.472	0.917	2.396	3.676	4.008	6.292
2000	0.163	0.414	0.856	2.869	3.602	3.859	6.207
2001	0.126	0.408	0.981	2.704	3.999	4.204	5.918
2002	0.128	0.504	1.092	1.901	2.736	3.637	5.066
2003	0.095	0.524	1.117	1.845	2.651	3.666	4.919
2004	0.112	0.484	1.281	2.149	2.866	3.632	4.754
2005	0.166	0.536	0.937	2.227	3.402	4.322	5.402
2006	0.122	0.491	0.934	1.811	2.756	3.126	4.076
2007	0.153	0.417	0.960	1.539	2.168	3.707	4.280
2008	0.164	0.475	1.279	1.921	3.141	3.560	4.871
2009	0.154	0.411	1.141	1.311	2.605	3.381	4.581
2010	0.120	0.373	1.014	0.938	2.500	3.689	5.175
2011	0.132	0.356	0.916	0.995	1.812	4.115	5.370
2012	0.114	0.368	0.843	1.133	2.580	4.188	5.464
2013	0.147	0.437	0.996	1.786	2.636	3.779	5.804
2014	0.142	0.413	0.963	1.873	2.891	3.873	5.144
2015	0.196	0.436	0.851	2.046	3.379	3.996	5.208
2016	0.143	0.447	0.983	2.019	3.615	4.362	5.652
2017	0.094	0.422	0.849	1.830	3.181	4.324	5.930

Table 4. Bluefish commercial catch at age (000s) from Maine to Florida, 1985 to 2017.

Year	Age							Total
	0	1	2	3	4	5	6+	
1985	607.2	3297.1	432.6	168.2	82.3	151.6	359.0	5098.0
1986	599.0	2297.6	729.8	197.2	295.0	285.6	278.0	4682.2
1987	209.2	1837.1	793.3	696.3	157.7	179.1	240.6	4113.2
1988	173.8	905.6	476.5	221.2	433.2	345.4	497.9	3053.5
1989	655.4	1505.7	163.6	182.6	193.9	326.1	162.0	3189.3
1990	1354.6	1267.6	2827.6	215.4	80.8	155.8	114.2	6016.1
1991	468.9	5026.4	425.3	16.1	48.9	62.9	798.6	6847.2
1992	89.1	8150.2	1014.7	95.6	24.8	24.4	71.0	9469.7
1993	571.9	1238.2	3001.7	74.2	31.6	22.1	86.9	5026.5
1994	34.1	1388.3	359.0	51.4	157.6	229.4	300.0	2519.8
1995	296.3	3761.3	704.0	7.0	6.5	49.3	132.2	4956.6
1996	178.7	1126.9	726.0	317.6	137.9	88.4	266.0	2841.5
1997	112.7	1096.9	509.7	183.2	134.2	75.2	402.9	2514.8
1998	192.4	2383.4	1360.2	178.4	31.3	120.6	82.9	4349.1
1999	495.0	1549.9	1106.4	183.4	15.4	124.3	129.6	3604.0
2000	284.4	2736.9	1013.6	143.5	20.7	283.5	46.5	4529.0
2001	68.7	851.7	1445.4	300.9	40.8	303.3	67.4	3078.2
2002	52.6	1575.1	708.4	136.7	137.7	123.0	149.8	2883.3
2003	37.8	966.4	704.2	222.7	168.2	142.5	176.6	2418.5
2004	30.9	1216.6	790.2	225.4	119.0	183.1	191.0	2756.4
2005	225.4	787.9	1112.0	224.7	167.0	90.4	55.5	2662.9
2006	143.2	924.6	563.3	352.2	133.2	159.6	251.9	2528.1
2007	242.7	648.4	1006.8	233.5	187.0	108.0	250.8	2677.2
2008	137.7	470.7	744.1	279.5	137.1	116.4	124.0	2009.6
2009	50.2	417.6	585.7	558.4	152.5	89.8	232.2	2086.4
2010	46.5	338.0	513.2	514.7	275.1	151.1	220.5	2059.1
2011	40.0	294.3	461.3	557.6	288.0	75.9	166.4	1883.5
2012	59.8	301.3	625.3	498.6	163.5	47.1	119.1	1814.7
2013	190.3	536.9	729.6	241.4	96.4	57.5	64.2	1916.2
2014	259.9	848.2	608.6	134.9	130.7	79.2	116.0	2177.4
2015	141.8	394.7	556.5	78.7	68.8	67.7	115.5	1423.8
2016	48.5	557.5	497.5	133.7	35.2	40.4	84.5	1397.4
2017	35.7	258.9	801.7	111.8	82.5	31.0	79.5	1401.0

Table 5. Bluefish recreational catch at age (000s) from Maine to Florida, 1985 to 2017.

Year	Age							Total
	0	1	2	3	4	5	6+	
1985	5731.8	6903.4	3542.6	915.2	631.9	461.2	1665.5	19851.5
1986	5466.7	3977.4	6494.3	2917.3	1517.4	1176.6	3084.5	24634.1
1987	4225.1	3783.6	3732.0	4642.1	1906.8	1012.2	1923.2	21225.0
1988	1319.6	1482.5	1260.3	1077.1	1589.0	913.6	1662.9	9305.0
1989	4945.8	2582.7	1582.1	571.3	370.8	902.3	1500.0	12454.9
1990	1665.4	5356.3	1462.8	430.2	259.5	469.5	1160.7	10804.3
1991	4111.3	2583.2	3827.4	545.5	233.5	288.8	1376.4	12966.0
1992	714.7	2178.3	1941.2	1641.0	433.9	219.2	788.3	7916.6
1993	757.7	1603.9	1178.6	935.7	1123.7	134.8	616.8	6351.3
1994	1569.6	2567.8	559.3	554.0	384.2	420.0	632.9	6687.7
1995	702.7	2869.9	923.3	326.9	289.3	341.2	553.3	6006.6
1996	933.4	1353.1	907.3	540.1	262.1	196.6	647.9	4840.6
1997	1146.8	2477.1	902.0	352.4	221.3	229.1	943.0	6271.7
1998	644.5	1458.6	1180.9	951.5	154.1	132.0	380.2	4901.9
1999	1333.1	1290.4	1041.7	560.3	150.4	88.0	261.4	4725.2
2000	418.8	2817.0	1583.9	975.0	226.2	295.6	244.2	6560.8
2001	1161.9	2780.0	2271.4	1117.9	163.7	318.1	380.8	8193.7
2002	445.6	3448.6	1505.1	327.2	138.7	202.3	433.1	6500.6
2003	580.0	2564.5	2447.6	689.9	311.1	304.8	504.6	7402.6
2004	554.0	4020.8	2485.3	783.0	329.7	407.6	484.1	9064.5
2005	1986.7	1844.5	3043.6	1623.1	521.9	391.8	398.2	9809.8
2006	1922.3	2258.7	1704.0	1307.1	388.5	571.6	743.5	8895.8
2007	1283.8	2187.9	3189.1	1501.6	1397.2	413.8	651.5	10624.9
2008	1290.9	1997.7	2616.8	1076.4	541.8	428.4	705.7	8657.7
2009	390.1	1509.2	1906.0	1520.6	479.7	188.9	467.3	6461.8
2010	961.7	1480.8	1758.8	1471.2	935.2	442.4	548.5	7598.5
2011	1028.3	1503.0	1199.5	1219.4	607.0	388.9	559.7	6505.9
2012	1537.6	1283.6	1407.6	1195.5	759.9	212.7	414.4	6811.4
2013	1342.6	1269.9	1674.8	1144.3	619.6	305.4	299.6	6656.2
2014	2290.1	2134.0	1275.6	736.1	343.2	240.0	306.4	7325.4
2015	778.5	1607.4	1207.6	472.0	374.8	350.6	484.1	5275.0
2016	1444.2	1888.8	932.3	469.1	150.6	130.6	389.0	5404.6
2017	1128.8	535.1	735.8	242.9	207.0	161.0	791.1	3801.7

Table 6. MRIP recreational catch per angler trip by age for bluefish from Maine to Florida, 1985 to 2017. Index was predicted from a Generalized Linear Model with a negative binomial transformation.

Year	Age							Total	SE
	0	1	2	3	4	5	6+		
1985	0.475	0.564	0.286	0.075	0.052	0.037	0.134	1.623	0.084
1986	0.373	0.269	0.438	0.197	0.102	0.080	0.209	1.668	0.087
1987	0.334	0.296	0.289	0.357	0.150	0.079	0.150	1.655	0.085
1988	0.137	0.155	0.132	0.113	0.166	0.096	0.174	0.973	0.050
1989	0.527	0.271	0.167	0.060	0.038	0.095	0.157	1.315	0.064
1990	0.143	0.517	0.215	0.069	0.046	0.062	0.170	1.222	0.060
1991	0.281	0.206	0.371	0.067	0.031	0.028	0.193	1.177	0.057
1992	0.057	0.198	0.188	0.252	0.066	0.034	0.131	0.926	0.045
1993	0.066	0.147	0.133	0.094	0.154	0.026	0.121	0.741	0.037
1994	0.144	0.293	0.076	0.108	0.058	0.082	0.126	0.887	0.044
1995	0.071	0.352	0.163	0.067	0.052	0.044	0.111	0.860	0.043
1996	0.099	0.212	0.174	0.152	0.084	0.050	0.193	0.964	0.050
1997	0.114	0.314	0.194	0.098	0.083	0.092	0.222	1.117	0.058
1998	0.083	0.224	0.216	0.247	0.045	0.035	0.095	0.945	0.050
1999	0.228	0.313	0.271	0.245	0.063	0.037	0.127	1.284	0.068
2000	0.048	0.390	0.281	0.281	0.115	0.085	0.098	1.298	0.071
2001	0.094	0.376	0.479	0.280	0.066	0.083	0.115	1.493	0.077
2002	0.046	0.507	0.343	0.091	0.045	0.047	0.106	1.185	0.063
2003	0.049	0.330	0.438	0.145	0.089	0.081	0.143	1.275	0.066
2004	0.059	0.472	0.477	0.152	0.085	0.085	0.114	1.444	0.075
2005	0.204	0.181	0.405	0.276	0.083	0.076	0.097	1.322	0.070
2006	0.177	0.258	0.305	0.311	0.088	0.125	0.154	1.418	0.076
2007	0.108	0.232	0.404	0.200	0.174	0.079	0.111	1.308	0.068
2008	0.161	0.213	0.431	0.175	0.120	0.077	0.111	1.288	0.068
2009	0.068	0.201	0.320	0.282	0.103	0.041	0.134	1.149	0.062
2010	0.096	0.141	0.361	0.230	0.171	0.092	0.111	1.202	0.062
2011	0.167	0.182	0.210	0.263	0.141	0.129	0.190	1.282	0.069
2012	0.188	0.199	0.279	0.258	0.234	0.065	0.134	1.357	0.072
2013	0.150	0.151	0.399	0.269	0.148	0.072	0.056	1.245	0.068
2014	0.220	0.247	0.357	0.261	0.102	0.060	0.075	1.322	0.072
2015	0.167	0.344	0.259	0.101	0.080	0.075	0.104	1.130	0.061
2016	0.339	0.444	0.219	0.110	0.035	0.031	0.091	1.270	0.067
2017	0.359	0.170	0.234	0.077	0.066	0.051	0.252	1.210	0.065

Table 7a. NEFSC bluefish indices by age using fall inshore strata and re-transformed log_e stratified mean number per tow, 1985 to 2008 (FV. Albatross IV).

Year	Age							Total	CV
	0	1	2	3	4	5	6+		
1985	15.340	1.946	0.239	0.126	0.036	0.012	0.038	17.74	0.145
1986	38.843	1.505	0.171	0.085	0.051	0.036	0.057	40.75	0.427
1987	5.639	1.247	0.126	0.192	0.102	0.045	0.095	7.45	0.311
1988	30.041	0.189	0.027	0.031	0.074	0.036	0.069	30.47	0.572
1989	90.171	0.953	0.046	0.019	0.015	0.032	0.036	91.27	0.188
1990	5.911	3.291	0.009	0.016	0.007	0.023	0.064	9.32	0.222
1991	15.294	0.333	0.109	0.048	0.009	0.001	0.001	15.80	0.232
1992	16.062	1.662	0.056	0.051	0.010	0.005	0.019	17.87	0.069
1993	1.625	0.189	0.075	0.020	0.045	0.013	0.011	1.98	0.209
1994	11.100	1.129	0.025	0.026	0.054	0.035	0.010	12.38	0.117
1995	6.801	2.449	0.057	0.013	0.011	0.033	0.023	9.39	0.190
1996	9.124	1.417	0.170	0.092	0.019	0.017	0.023	10.86	0.232
1997	4.757	0.448	0.315	0.138	0.010	0.005	0.023	5.69	0.156
1998	9.509	0.777	0.108	0.123	0.000	0.000	0.000	10.52	0.320
1999	22.926	1.452	0.077	0.103	0.000	0.000	0.012	24.57	0.324
2000	2.843	1.555	0.152	0.029	0.000	0.013	0.000	4.59	0.232
2001	17.817	1.274	0.286	0.046	0.000	0.008	0.003	19.43	0.147
2002	16.009	2.347	0.058	0.054	0.011	0.024	0.003	18.51	0.057
2003	32.926	2.582	0.160	0.001	0.010	0.018	0.024	35.72	0.171
2004	5.423	4.845	0.230	0.050	0.011	0.007	0.026	10.59	0.136
2005	34.503	0.684	0.133	0.151	0.040	0.056	0.019	35.59	0.065
2006	22.979	1.405	0.636	0.155	0.037	0.048	0.005	25.27	0.143
2007	12.428	2.214	0.533	0.026	0.014	0.004	0.008	15.23	0.128
2008	10.939	1.717	0.397	0.088	0.026	0.013	0.025	13.20	0.178

Table 7b. 2009 to 2017 (FV. H.B. Bigelow)

Year	Age							Total	CV
	0	1	2	3	4	5	6+		
2009	3.515	5.294	1.392	0.635	0.151	0.042	0.043	11.07	0.489
2010	3.872	2.078	0.384	0.378	0.176	0.057	0.088	7.03	0.228
2011	5.639	1.993	0.292	0.295	0.150	0.032	0.039	8.44	0.157
2012	2.571	1.370	0.689	0.441	0.080	0.013	0.009	5.17	0.203
2013	2.699	0.264	0.040	0.019	0.018	0.004	0.002	3.05	0.581
2014	2.631	1.199	0.047	0.020	0.012	0.001	0.000	3.91	0.239
2015	0.940	0.529	0.046	0.000	0.000	0.000	0.000	1.51	0.219
2016	1.204	0.697	0.036	0.003	0.001	0.000	0.000	1.94	0.178
2017	***No index: because of survey delays, southern strata were not sampled for the fall survey								

Table 8. Bluefish survey indices by age from the New Jersey trawl survey from 1990 to 2017 (stratified geometric mean number per tow).

Year	New Jersey				SE
	0	Age 1	2	Total	
1990	1.437	0.084	0.001	1.523	0.349
1991	1.087	0.010	0.014	1.111	0.131
1992	1.561	0.237	0.025	1.823	0.249
1993	0.844	0.037	0.032	0.913	0.095
1994	2.238	0.008	0.002	2.248	0.252
1995	3.163	0.153	0.058	3.374	0.335
1996	1.835	0.077	0.007	1.919	0.184
1997	0.901	0.025	0.010	0.937	0.196
1998	1.013	0.153	0.077	1.243	0.247
1999	0.637	0.103	0.013	0.752	0.193
2000	0.493	0.092	0.035	0.619	0.084
2001	0.293	0.028	0.063	0.384	0.100
2002	2.762	1.068	0.027	3.857	0.274
2003	2.676	0.070	0.019	2.764	0.239
2004	1.546	0.448	0.249	2.243	0.213
2005	3.606	0.130	0.098	3.833	0.216
2006	2.760	0.078	0.025	2.863	0.277
2007	3.307	0.585	0.148	4.040	0.322
2008	2.888	0.082	0.011	2.981	0.315
2009	1.624	0.029	0.005	1.657	0.193
2010	0.868	0.018	0.008	0.894	0.237
2011	4.562	0.835	0.020	5.417	0.377
2012	2.732	0.195	0.044	2.972	0.241
2013	1.269	0.020	0.000	1.290	0.341
2014	3.155	0.268	0.010	3.433	0.195
2015	1.382	0.073	0.001	1.456	0.154
2016	1.825	0.080	0.001	1.907	0.167
2017	4.287	0.193	0.000	4.480	0.431

Table 9. Bluefish survey indices by age from the CT Long-Island Sound Trawl Survey from 1985 to 2017 (stratified geometric mean number per tow).

Year	Age							Total	CV	
	0	1	2	3	4	5	6+			
1985	16.978	0.952	0.627	0.246	0.146	0.022	0.039	19.010	0.614	
1986	10.822	1.184	1.170	0.189	0.128	0.088	0.079	13.660	0.551	
1987	12.167	1.006	0.508	0.384	0.132	0.058	0.065	14.320	0.499	
1988	14.265	0.211	0.490	0.137	0.170	0.125	0.091	15.490	0.560	
1989	24.998	0.575	0.460	0.042	0.020	0.068	0.087	26.250	0.612	
1990	19.367	2.970	0.928	0.163	0.128	0.122	0.202	23.880	0.484	
1991	28.494	1.279	3.267	0.121	0.056	0.050	0.164	33.430	0.399	
1992	18.871	1.760	2.789	1.324	0.182	0.063	0.232	25.220	0.451	
1993	16.776	0.110	1.032	0.321	0.566	0.030	0.084	18.920	0.529	
1994	30.523	0.762	0.241	0.162	0.137	0.169	0.065	32.060	0.524	
1995	21.696	1.962	0.597	0.055	0.045	0.041	0.065	24.460	0.529	
1996	19.805	0.220	0.413	0.247	0.013	0.025	0.077	20.800	0.578	
1997	36.592	0.602	0.477	0.074	0.067	0.028	0.060	37.900	0.496	
1998	29.871	0.973	0.379	0.159	0.011	0.004	0.014	31.410	0.521	
1999	41.878	2.892	0.224	0.203	0.050	0.008	0.056	45.310	0.395	
2000	17.281	2.026	1.072	0.148	0.001	0.028	0.015	20.570	0.585	
2001	21.472	1.126	1.403	0.184	0.020	0.011	0.024	24.240	0.429	
2002	14.007	3.788	0.638	0.094	0.019	0.079	0.124	18.750	0.508	
2003	27.338	0.425	0.603	0.073	0.021	0.032	0.038	28.530	0.523	
2004	21.452	5.515	1.456	0.331	0.068	0.163	0.145	29.130	0.483	
2005	17.769	0.087	0.655	0.207	0.088	0.045	0.038	18.890	0.613	
2006	14.244	0.487	0.547	0.288	0.064	0.008	0.023	15.660	0.601	
2007	27.262	1.984	0.719	0.428	0.110	0.068	0.089	30.660	0.574	
2008	11.831	0.562	1.086	0.367	0.119	0.153	0.162	14.280	0.508	
2009	15.686	0.520	0.432	0.812	0.297	0.068	0.295	18.110	0.475	
2010				mechanical issues						
2011	10.208	0.234	0.210	0.174	0.164	0.046	0.063	11.100	0.655	
2012	14.342	0.268	0.185	0.129	0.081	0.022	0.034	15.060	0.571	
2013	8.889	0.032	0.411	0.185	0.089	0.040	0.064	9.710	0.603	
2014	18.138	0.211	0.069	0.063	0.067	0.042	0.021	18.610	0.569	
2015	8.252	0.022	0.060	0.013	0.022	0.032	0.019	8.420	0.744	
2016	8.503	1.598	0.425	0.575	0.066	0.021	0.062	11.250	0.658	
2017	7.929	0.040	0.030	0.034	0.010	0.000	0.007	8.050	0.795	

Table 10. Bluefish survey indices by age from the NEAMAP Inshore Trawl Survey from 2007 to 2017 (stratified geometric mean number per tow).

Year	Age							Total	CV
	0	1	2	3	4	5	6+		
2007	3.878	0.318	0.063	0.015	0.009	0.004	0.002	4.290	0.076
2008	4.779	0.362	0.055	0.020	0.007	0.003	0.003	5.230	0.073
2009	5.095	0.090	0.024	0.013	0.004	0.002	0.002	5.230	0.068
2010	3.081	0.112	0.028	0.027	0.019	0.007	0.006	3.280	0.080
2011	3.471	0.439	0.052	0.047	0.005	0.003	0.004	4.020	0.072
2012	5.174	0.413	0.087	0.043	0.009	0.001	0.003	5.730	0.062
2013	3.617	0.054	0.023	0.012	0.002	0.000	0.002	3.710	0.082
2014	2.505	0.189	0.009	0.007	0.004	0.005	0.002	2.720	0.093
2015	3.221	0.149	0.002	0.001	0.002	0.002	0.002	3.380	0.071
2016	4.301	0.394	0.002	0.001	0.001	0.000	0.001	4.700	0.080
2017	4.569	0.046	0.001	0.001	0.001	0.001	0.000	4.620	0.068

Table 11. Bluefish survey indices by age from the NC Pamlico Sound Gillnet Survey from 2001 to 2017.

Year	Age							Total	SE
	0	1	2	3	4	5	6+		
2001	0.130	2.995	2.157	0.000	0.000	0.000	0.000	5.282	0.570
2002	0.127	2.861	1.290	0.009	0.000	0.000	0.000	4.286	0.570
2003	0.163	1.837	2.739	0.031	0.000	0.007	0.000	4.777	0.590
2004	0.162	2.993	1.991	0.047	0.000	0.000	0.000	5.192	0.730
2005	1.084	2.239	3.021	0.038	0.009	0.000	0.009	6.399	0.880
2006	0.532	2.972	1.854	0.441	0.096	0.050	0.111	6.057	0.970
2007	0.439	2.326	4.776	0.808	0.043	0.006	0.050	8.448	1.050
2008	1.213	2.886	2.307	0.227	0.012	0.029	0.037	6.710	0.740
2009	0.375	2.040	1.475	1.960	0.288	0.059	0.133	6.330	0.710
2010	0.469	1.571	1.356	1.845	0.392	0.044	0.003	5.680	0.580
2011	0.241	0.946	1.648	2.041	0.921	0.045	0.045	5.887	0.890
2012	0.206	1.113	1.615	0.909	0.163	0.008	0.044	4.058	0.520
2013	1.689	1.652	1.900	0.393	0.052	0.008	0.008	5.702	0.870
2014	0.741	2.282	1.291	0.105	0.004	0.003	0.016	4.441	0.500
2015	0.430	1.031	1.154	0.120	0.008	0.003	0.020	2.766	0.320
2016	0.001	1.176	2.746	0.227	0.002	0.002	0.000	4.154	0.720
2017	0.248	0.782	2.212	0.175	0.022	0.029	0.116	3.583	0.500

Table 12. SEAMAP Inshore trawl survey index for Age-0 bluefish from 1989 to 2017.

Year	Age 0	CV
1989	3.307	0.50408
1990	0.112	0.367886
1991	1.290	0.593679
1992	0.933	0.87238
1993	0.130	0.341276
1994	1.084	0.349111
1995	0.678	0.402328
1996	0.482	0.241391
1997	0.059	0.490054
1998	0.162	0.873772
1999	0.608	0.45056
2000	0.169	0.358003
2001	1.374	0.403755
2002	0.785	0.307955
2003	2.607	0.560615
2004	0.470	0.310982
2005	2.775	0.29657
2006	0.453	0.520533
2007	0.764	0.46794
2008	1.297	0.275843
2009	4.411	0.322063
2010	1.633	0.299091
2011	0.615	0.396699
2012	0.639	0.456195
2013	0.413	0.499522
2014	0.193	0.616233
2015	0.832	0.368894
2016	0.565	0.343857
2017	0.159	0.4122

Table 13. Composite seine survey index for Age-0 bluefish from 1985 to 2017.

Year	Age 0	CV
1985	1.334	0.715
1986	0.905	0.751
1987	2.081	0.566
1988	1.252	0.441
1989	2.153	0.434
1990	1.309	0.431
1991	1.403	0.434
1992	0.571	0.500
1993	0.279	0.480
1994	0.569	0.488
1995	0.436	0.438
1996	0.681	0.481
1997	1.381	0.468
1998	0.727	0.478
1999	1.860	0.526
2000	0.656	0.431
2001	1.084	0.422
2002	0.580	0.397
2003	0.468	0.427
2004	0.930	0.414
2005	1.164	0.381
2006	1.100	0.399
2007	0.987	0.405
2008	1.284	0.390
2009	0.503	0.442
2010	0.793	0.396
2011	0.608	0.422
2012	0.701	0.410
2013	1.080	0.402
2014	0.821	0.331
2015	0.722	0.418
2016	0.721	0.414
2017	0.456	0.454

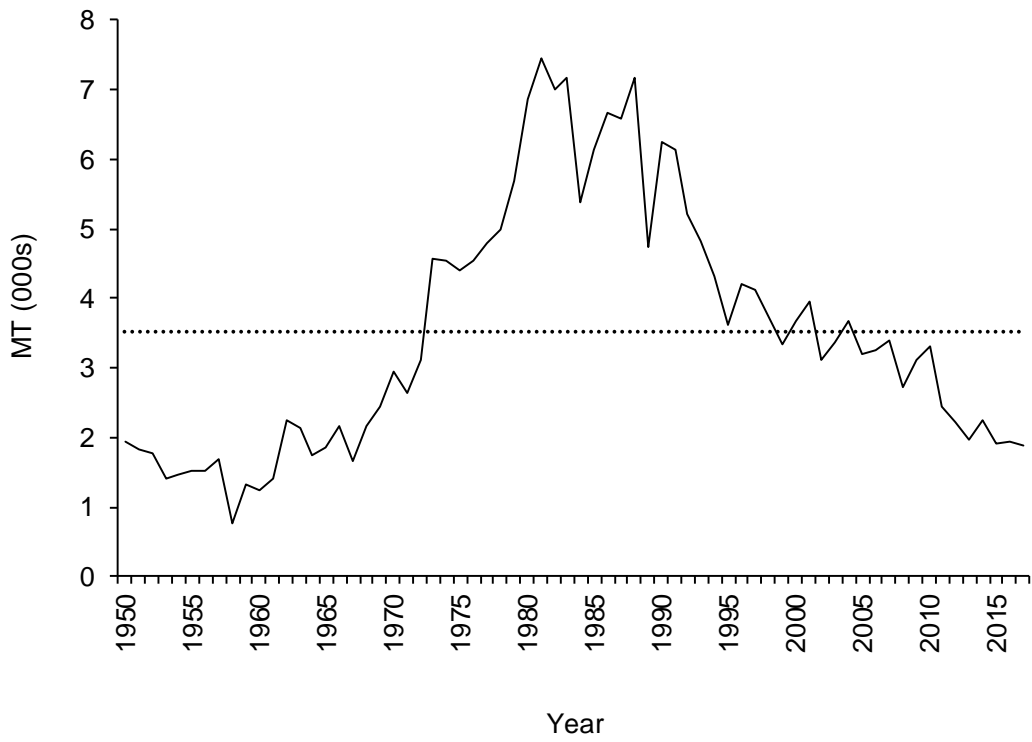


Figure 1. Times series of bluefish commercial landings (mt) along the Atlantic coast from 1950 to 2017. Dotted line represents the time-series average of 3,511 MT.

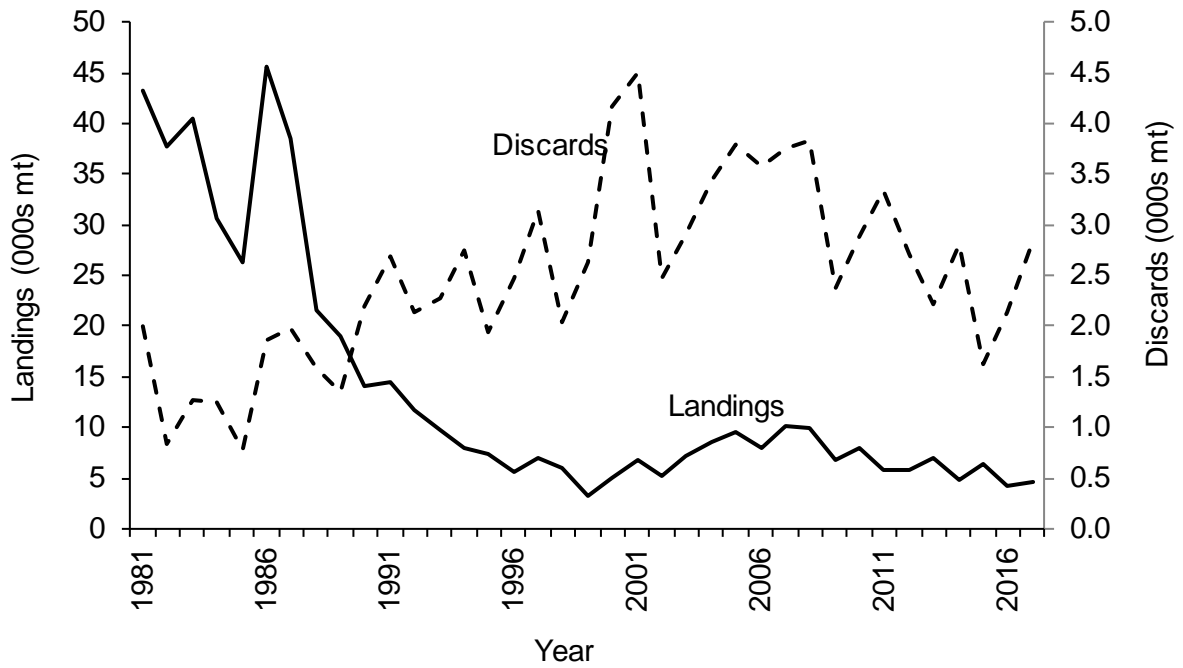


Figure 2. Recreational landings (mt) and recreational discards (MRIP B2 estimates*0.15) from Maine to Florida, 1981 to 2017.

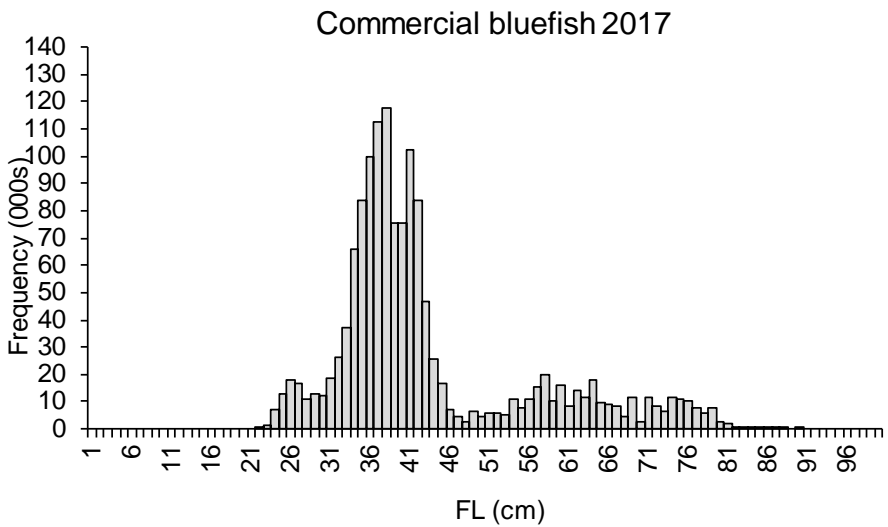
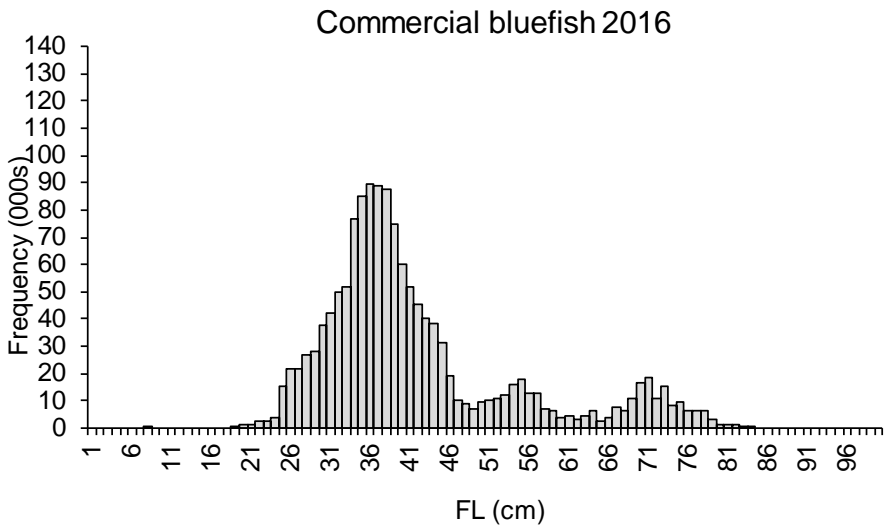
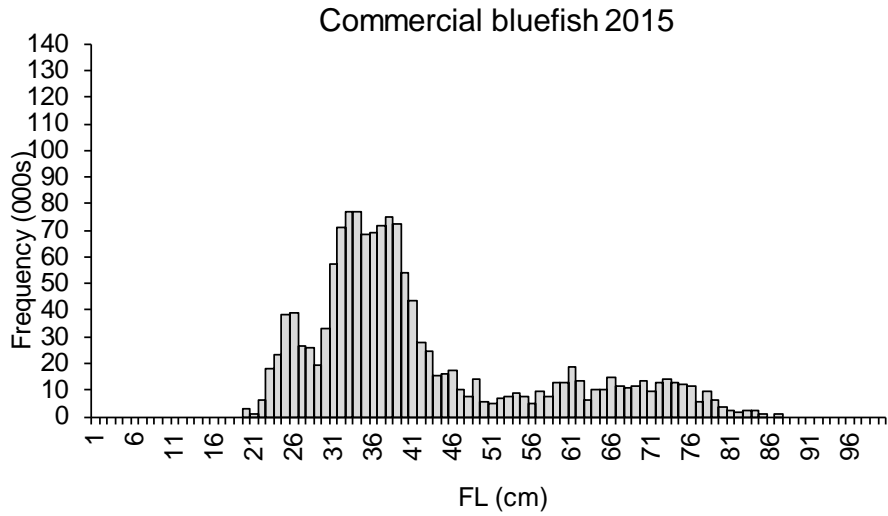


Figure 3. Length frequency distribution of commercial bluefish landings from Maine to Florida, 2015 to 2017.

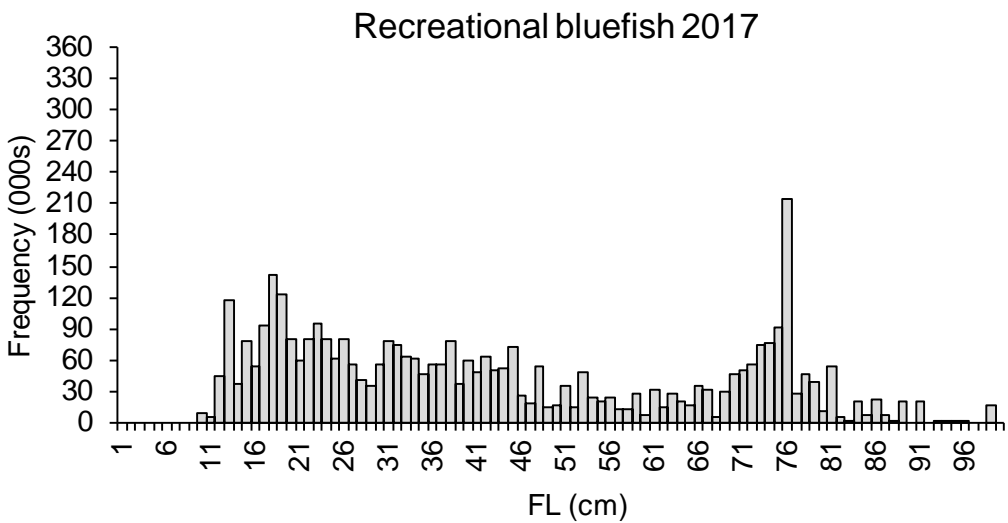
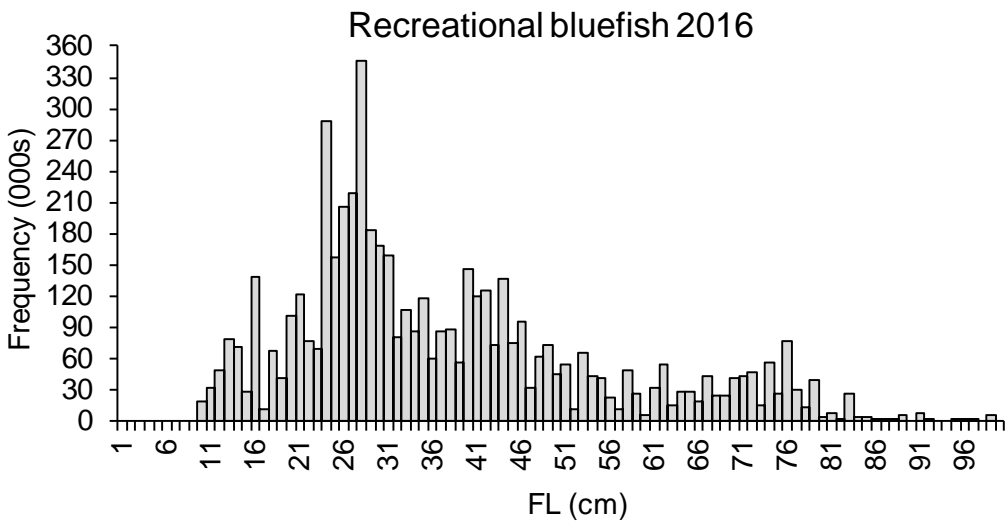
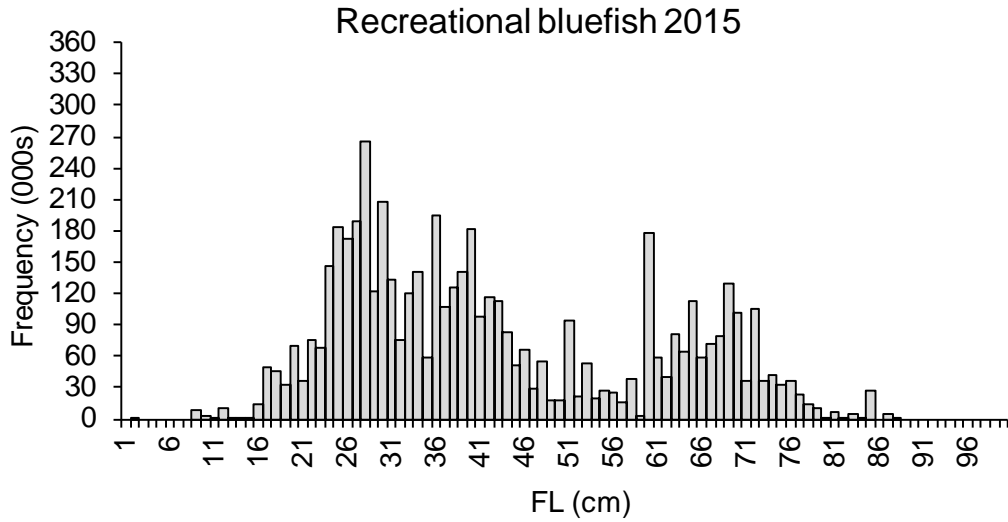


Figure 4. Length frequency distribution of recreational bluefish landings from Maine to Florida, 2015 to 2017.

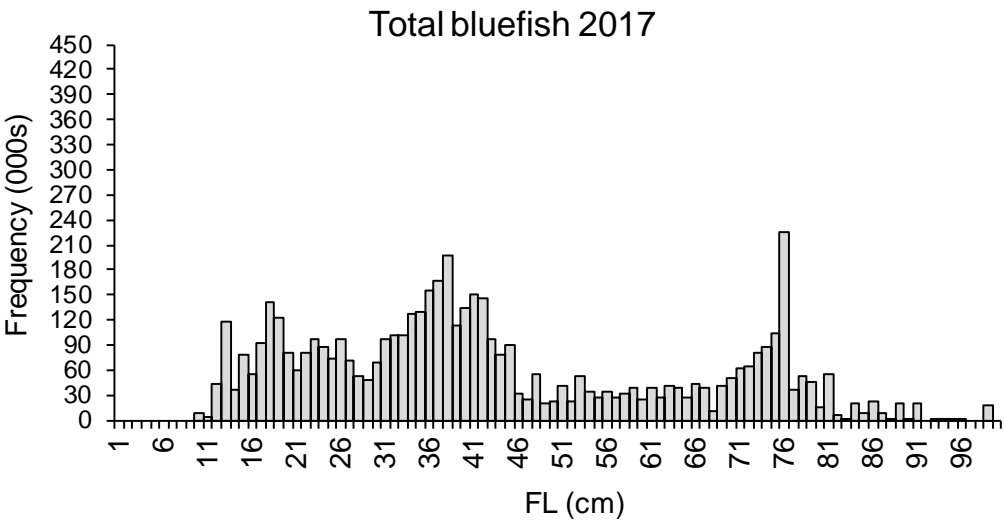
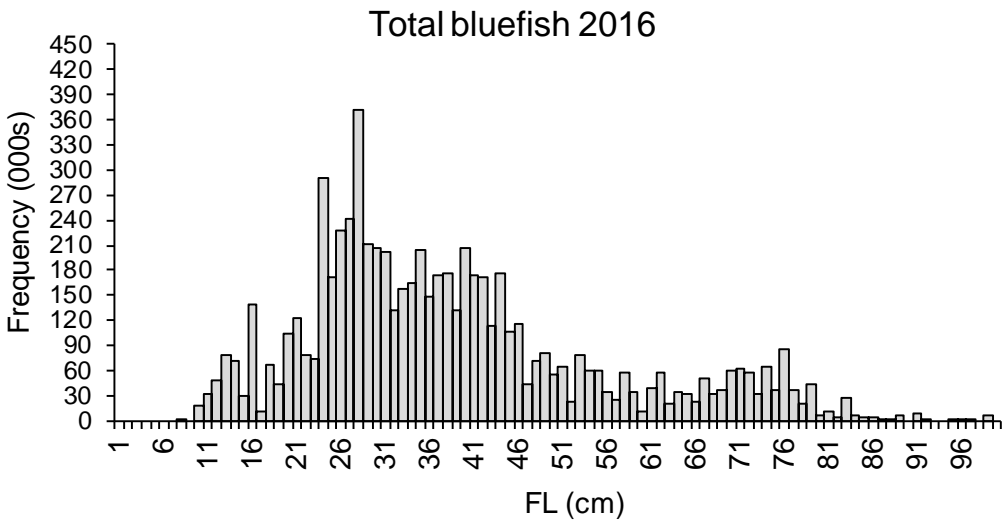
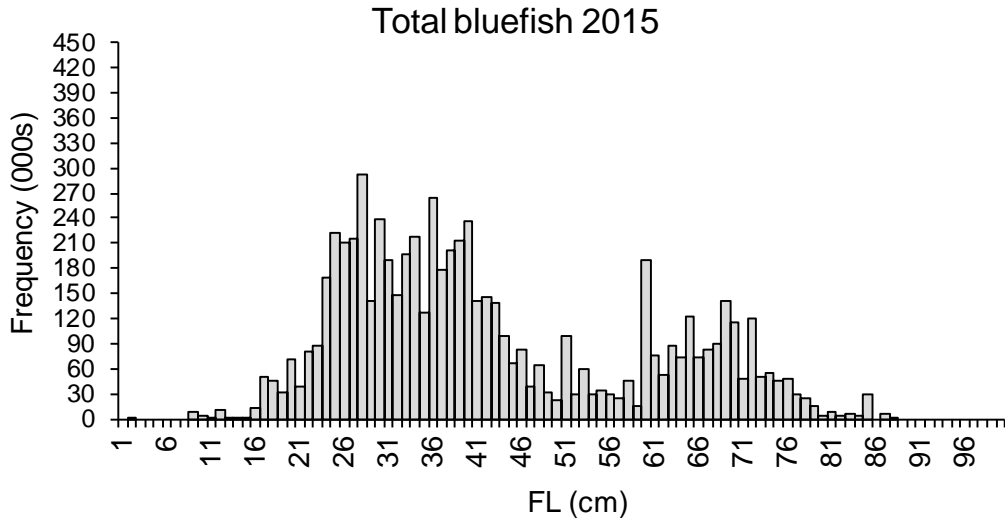


Figure 5. Length frequency distribution of total bluefish landings from Maine to Florida, 2015 to 2017.

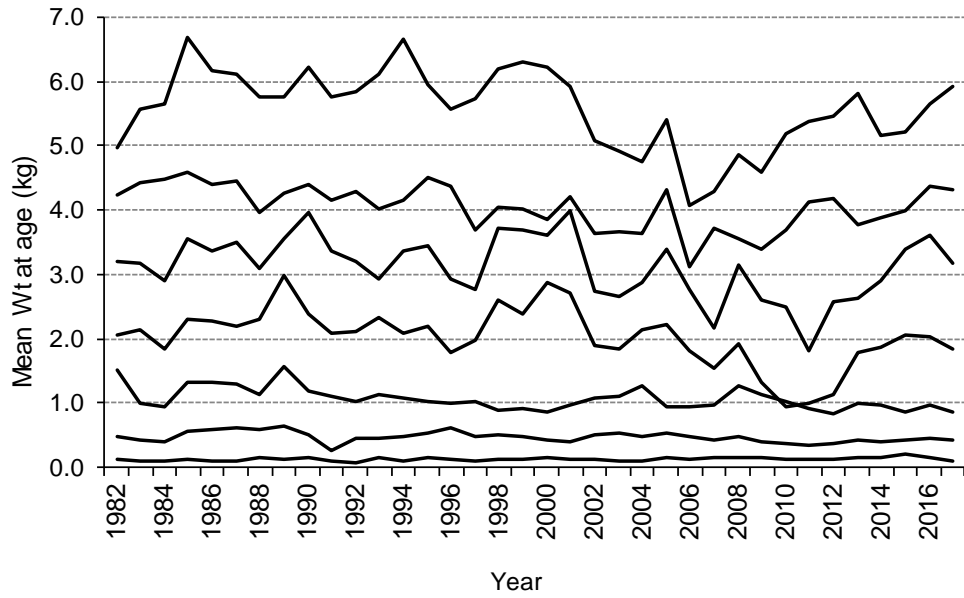


Figure 6. Bluefish mean weights (kg) at ages for age 0 (bottom) to age 6+ (top) from 1982 to 2017.

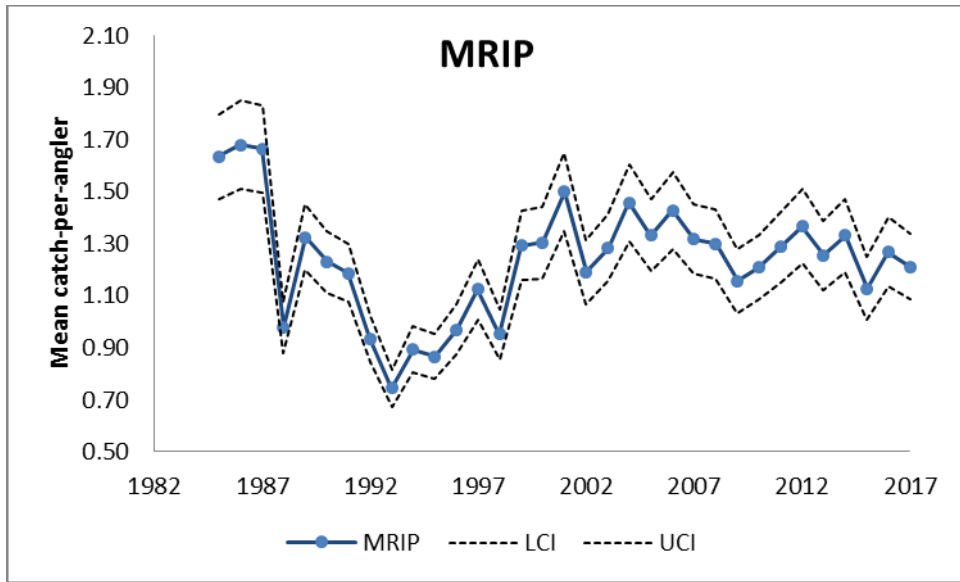


Figure 7. MRIP catch-per-angler for bluefish from 1985 to 2017.

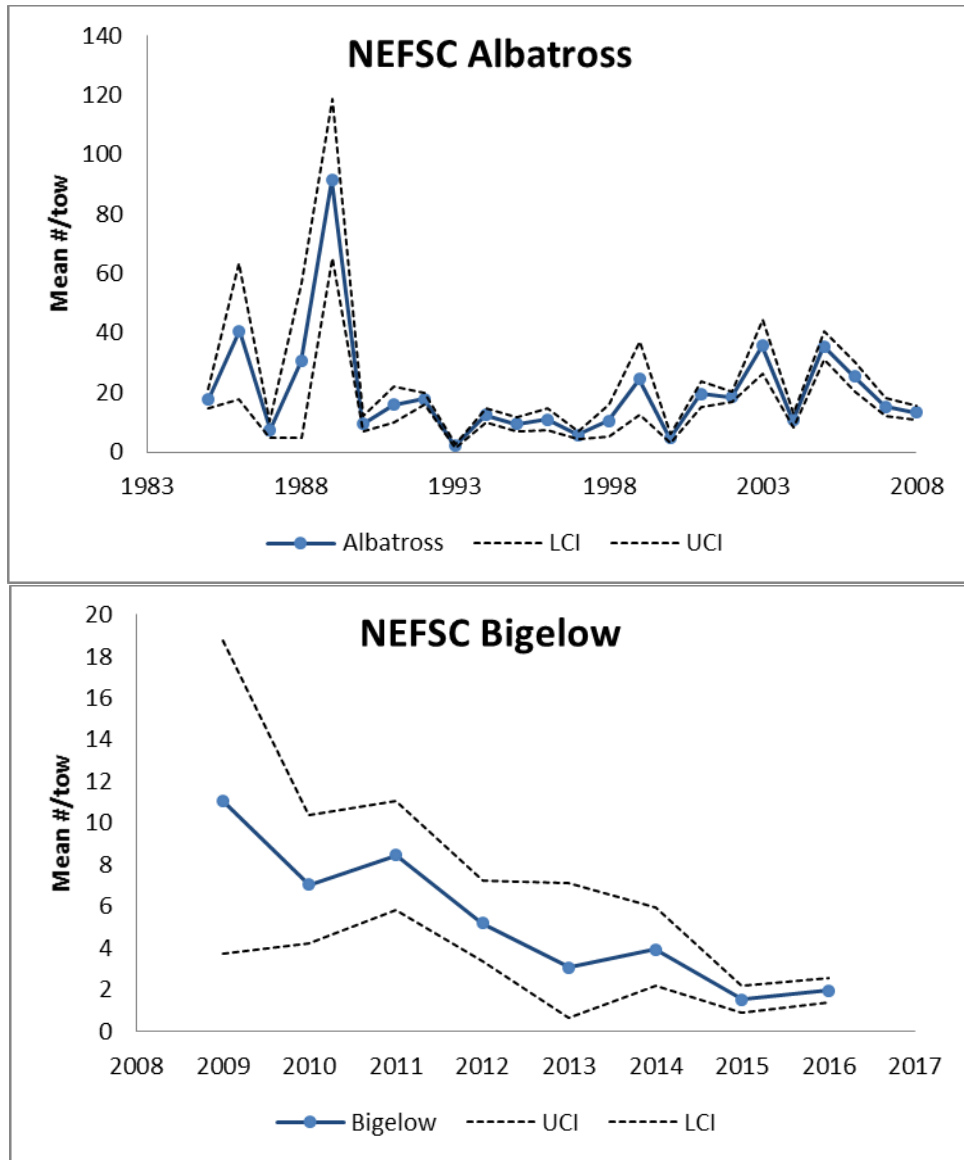


Figure 8. NEFSC Trawl survey indices for bluefish: Albatross from 1985 to 2008 and Bigelow from 2009 to 2017. *No survey index for 2017 due to mechanical issues.

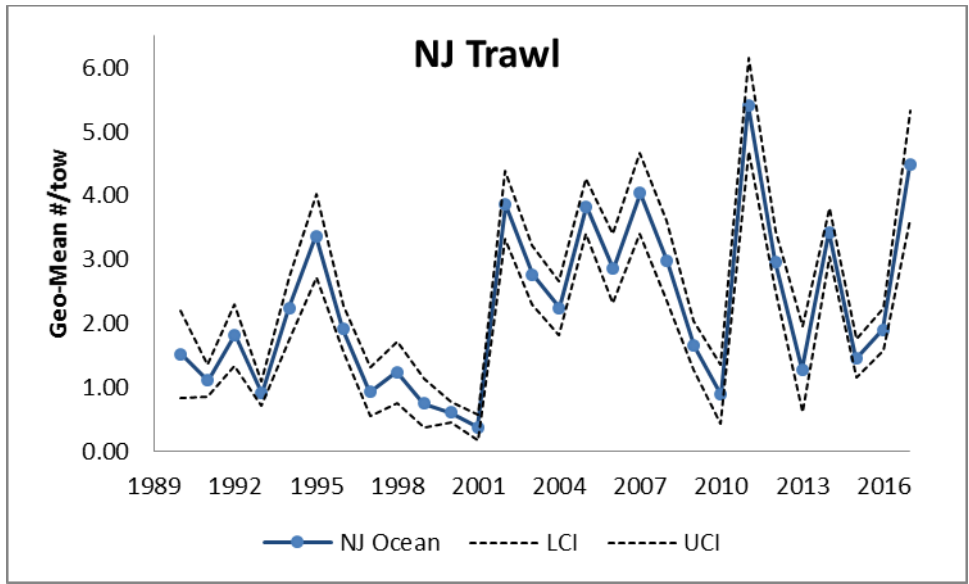


Figure 9. NJ Ocean trawl survey index for bluefish from 1990 to 2017.

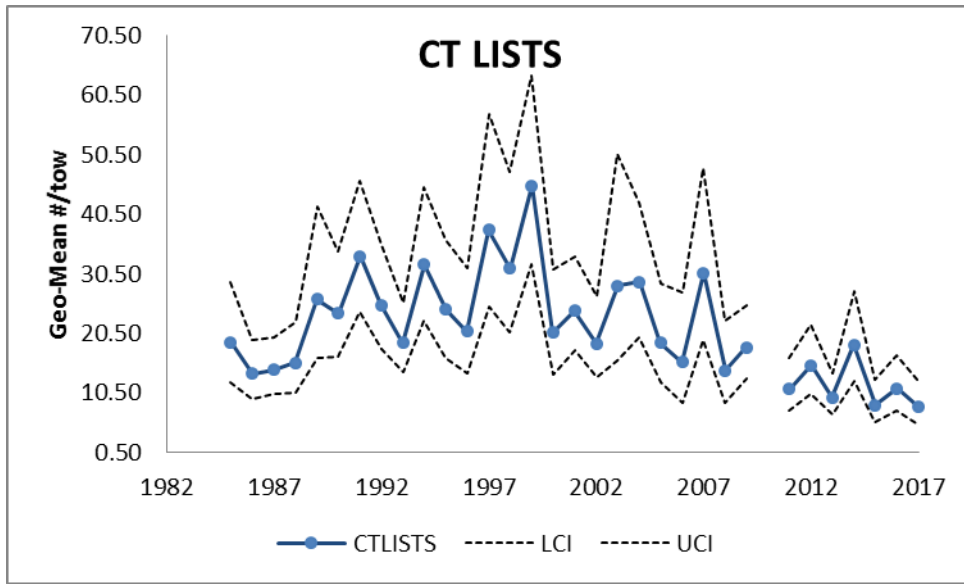


Figure 10. Connecticut Long-Island Sound Trawl survey index for bluefish from 1985 to 2017.

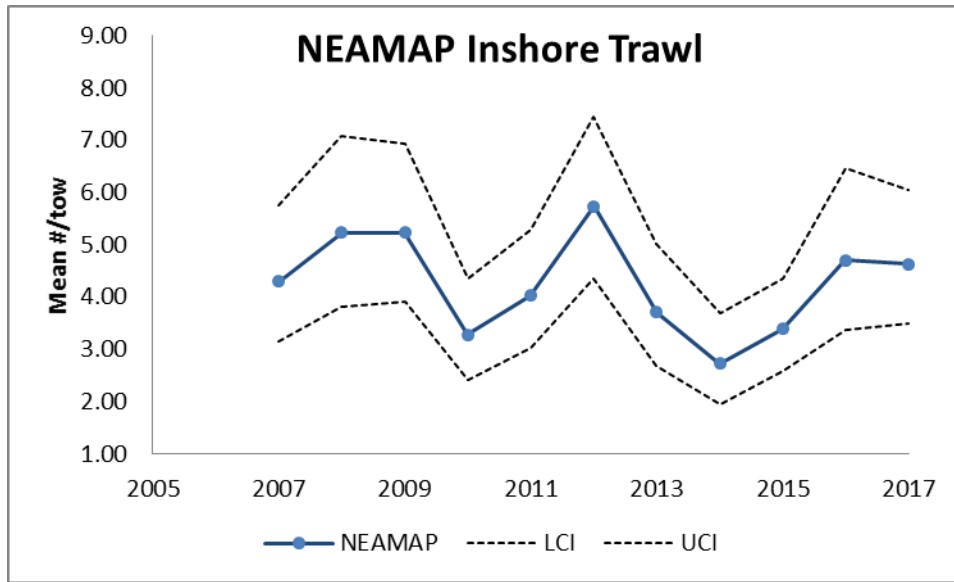


Figure 11. NEAMAP Inshore trawl survey for bluefish from 2007 to 2017.

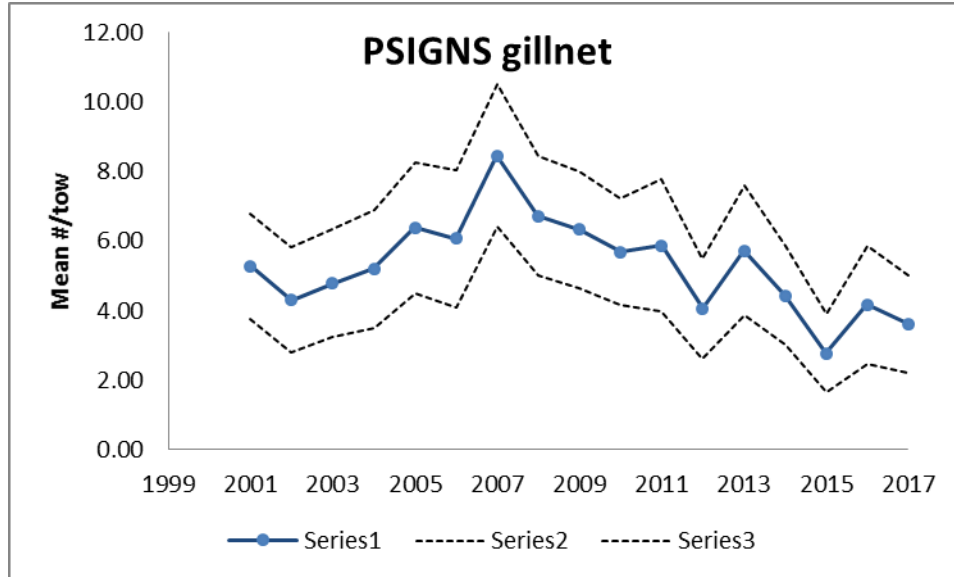


Figure 12. Pamlico Sound Independent Gillnet survey index for bluefish from 2001 to 2017.

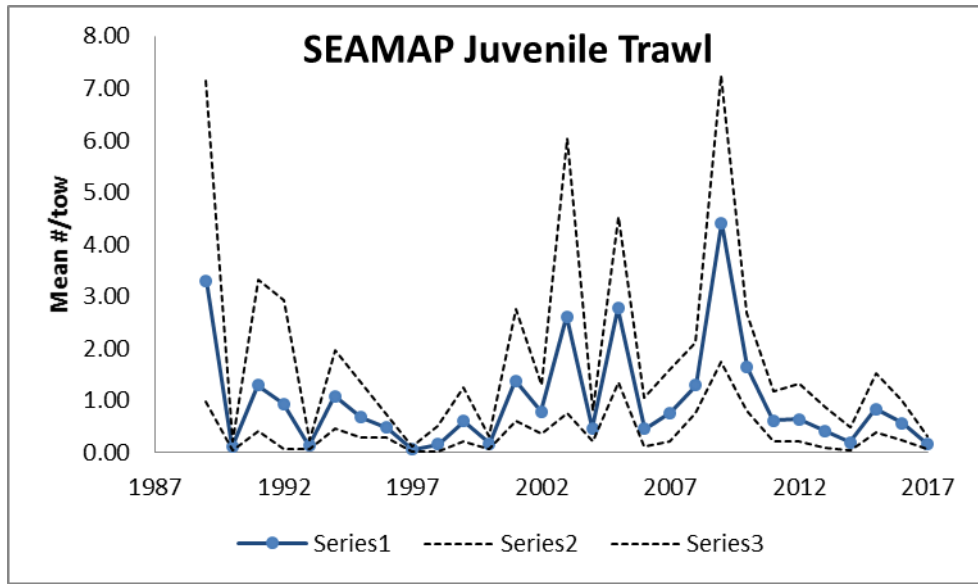


Figure 13. SEAMAP juvenile trawl survey index for bluefish from 1989 to 2017.

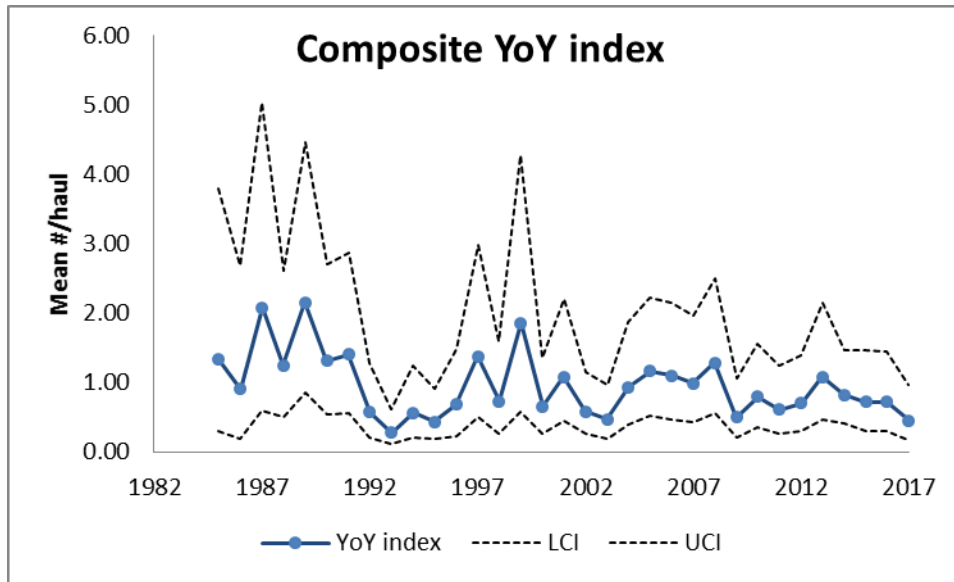


Figure 14. Composite young of the year seine index for bluefish from 1985 to 2017.