

Chub Mackerel Survey Data Summary

MICHELE L. TRAVER AND CHRIS THOLKE

NOAA FISHERIES, NORTHEAST FISHERIES SCIENCE CENTER

The NEFSC multispecies bottom trawl survey has no records of chub mackerel in the spring survey, but the species is periodically encountered during the autumn survey. The autumn survey index is sparse with many years where the species was not detected and no overall pattern in the time series. The stratified mean number per tow has been very low, with a spike in 1996 at 28.87 no/tow, with the corresponding stratified weight per tow of 3.04 kg/tow. The next high point was in 2014 with 0.95 kg/tow. The number of positive tows is mostly in the southern strata, along southern New England and mid-Atlantic bight (Figures 1-7, Tables 1-3).

DRAFT

Figure 1. NEFSC bottom trawl survey strata in the northwest Atlantic.

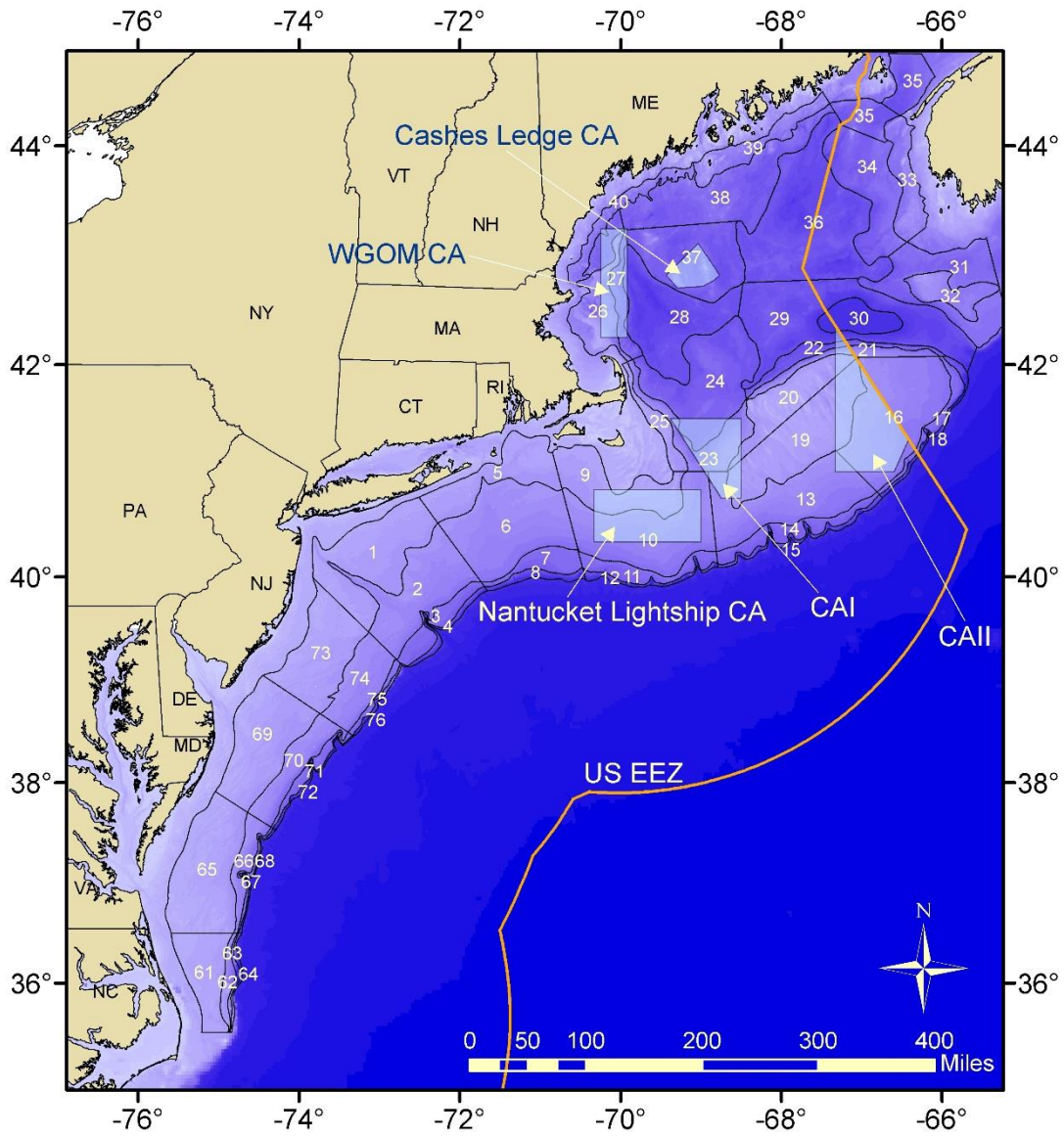
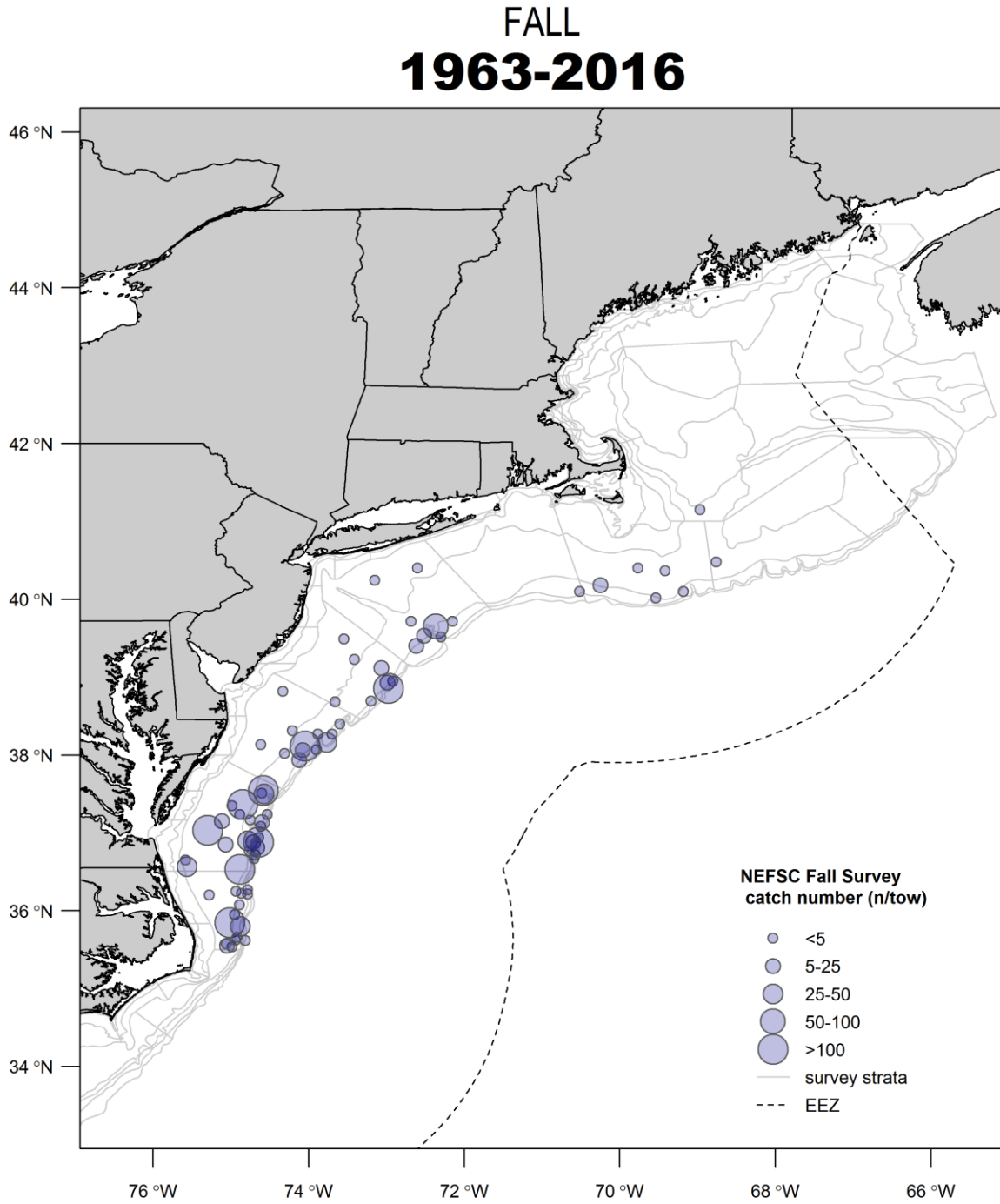


Figure 2. Survey distribution plots for chub mackerel, NEFSC fall survey catch number per tow 1963-2016.



DRAFT

Figure 3. Survey distribution plots for chub mackerel, NEFSC fall survey catch weight per tow (kg) 1963-2016.

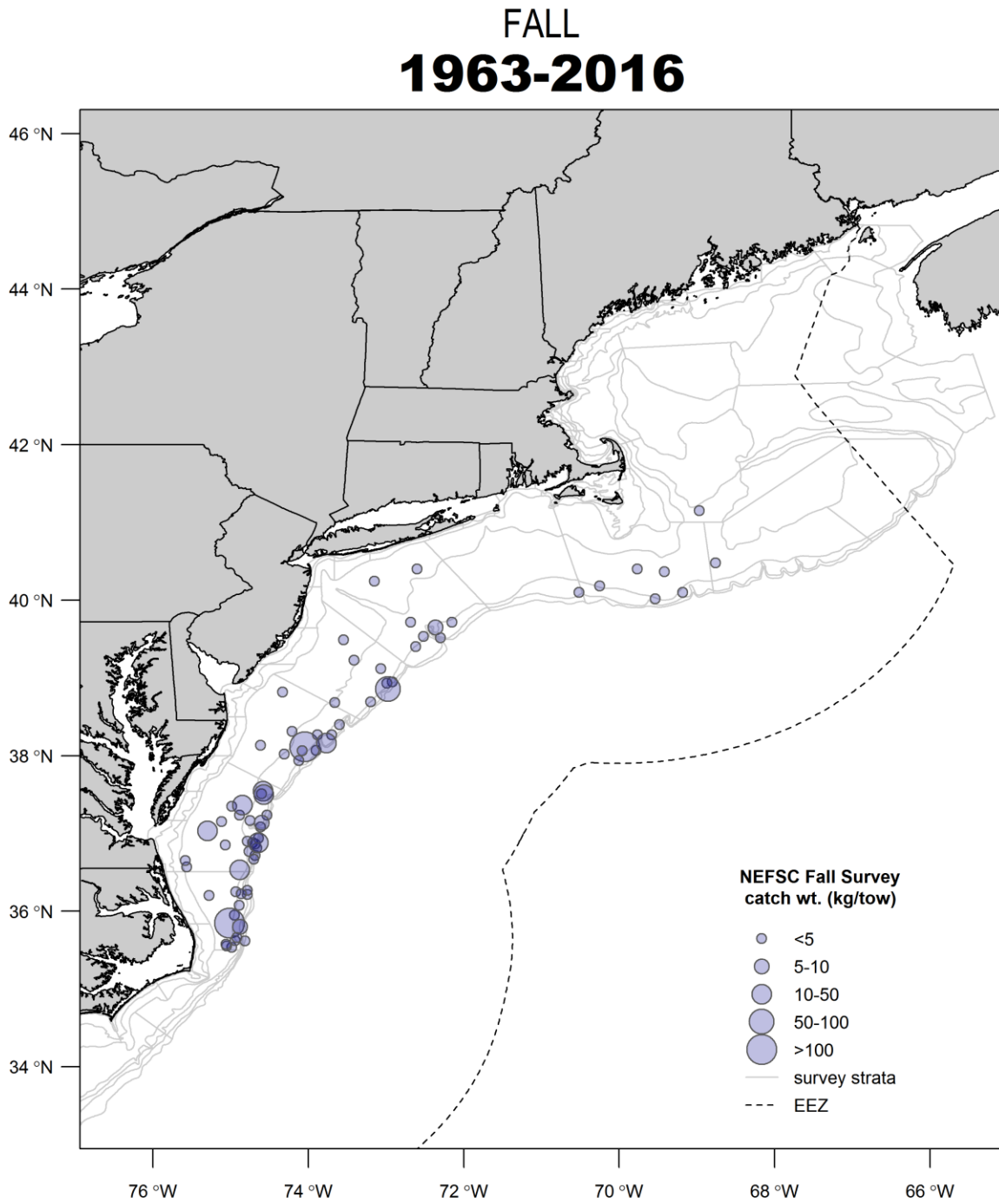


Figure 4. Stratified mean number per tow for chub mackerel during the NEFSC fall survey, 1963-2016. The bottom plot includes the 95% confidence intervals (in light blue).

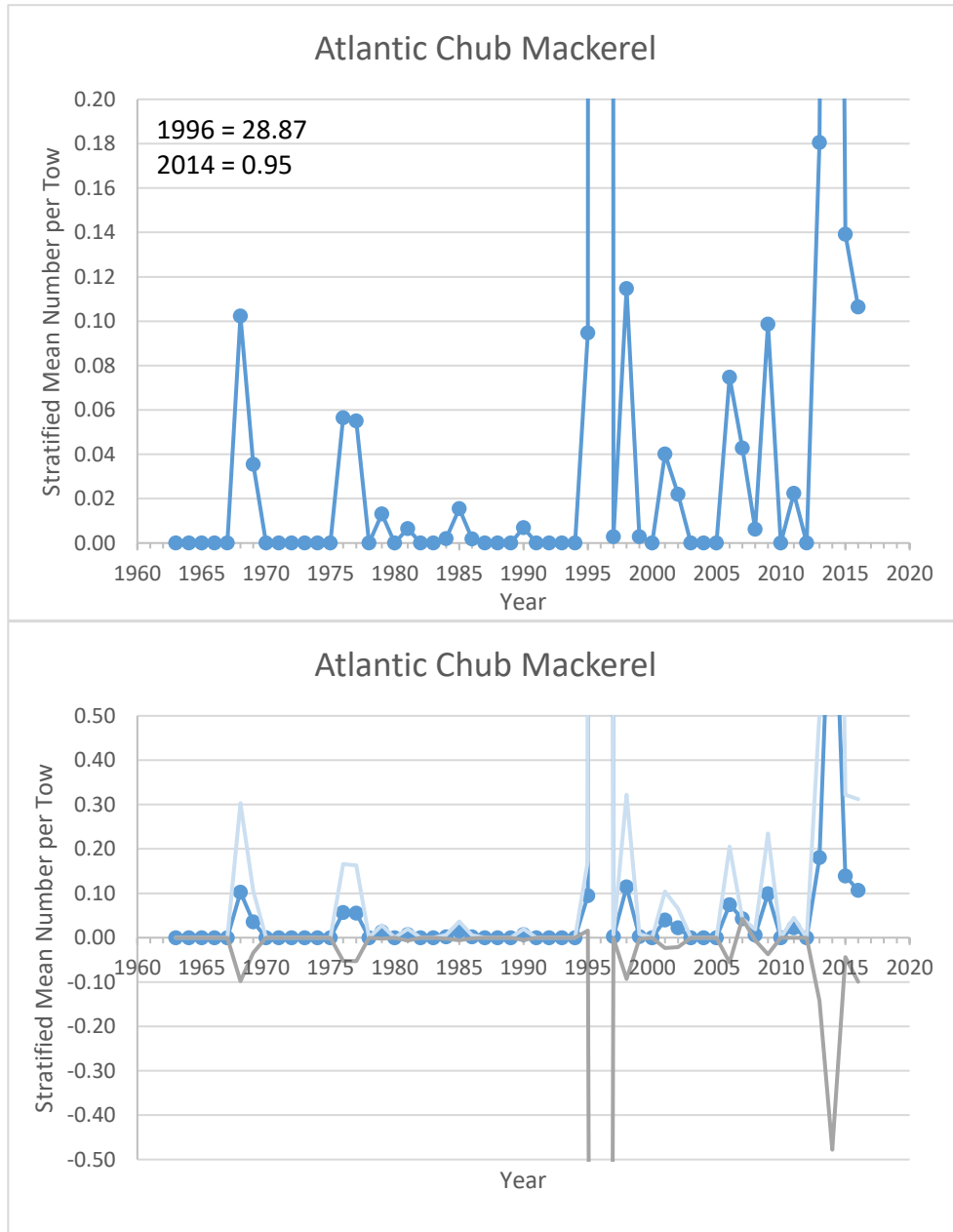
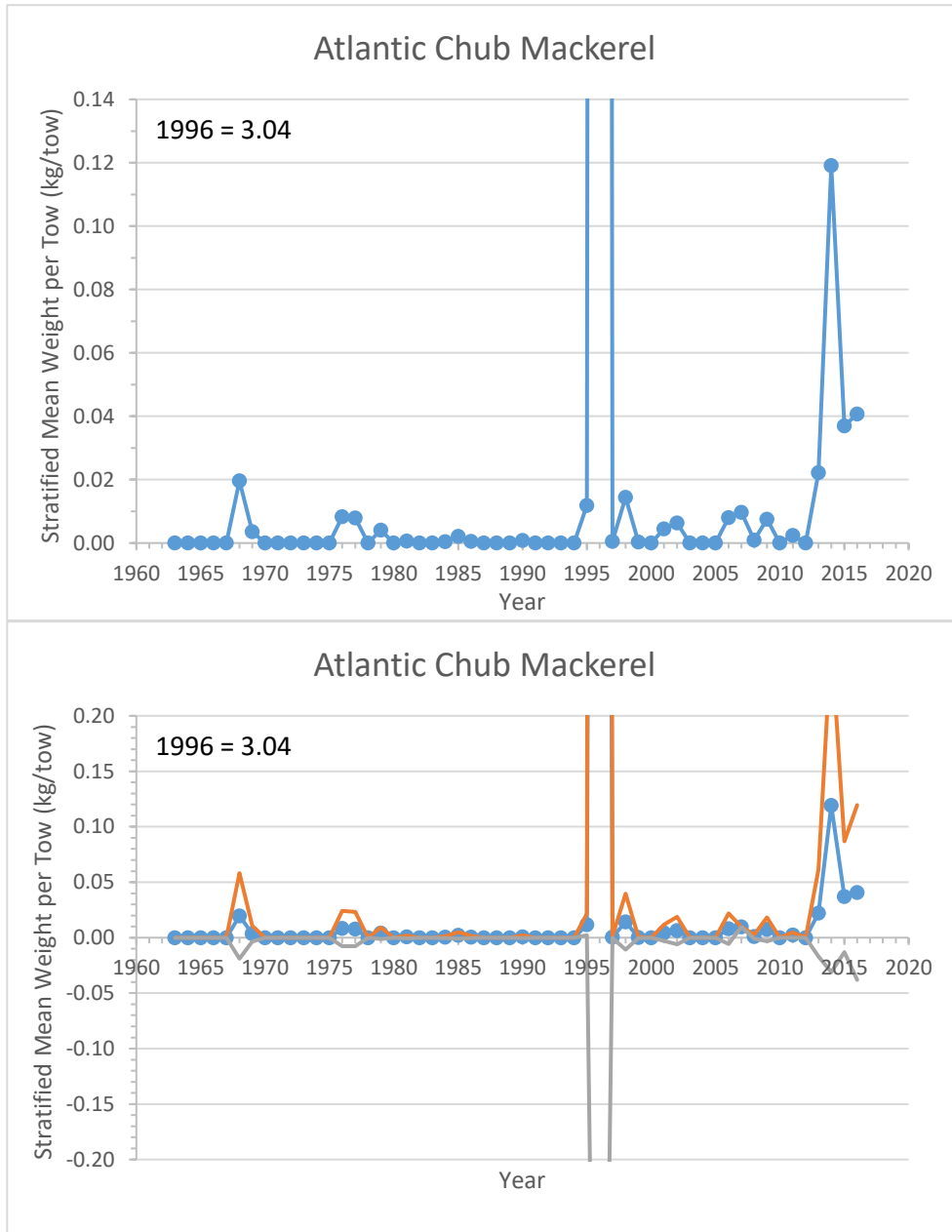
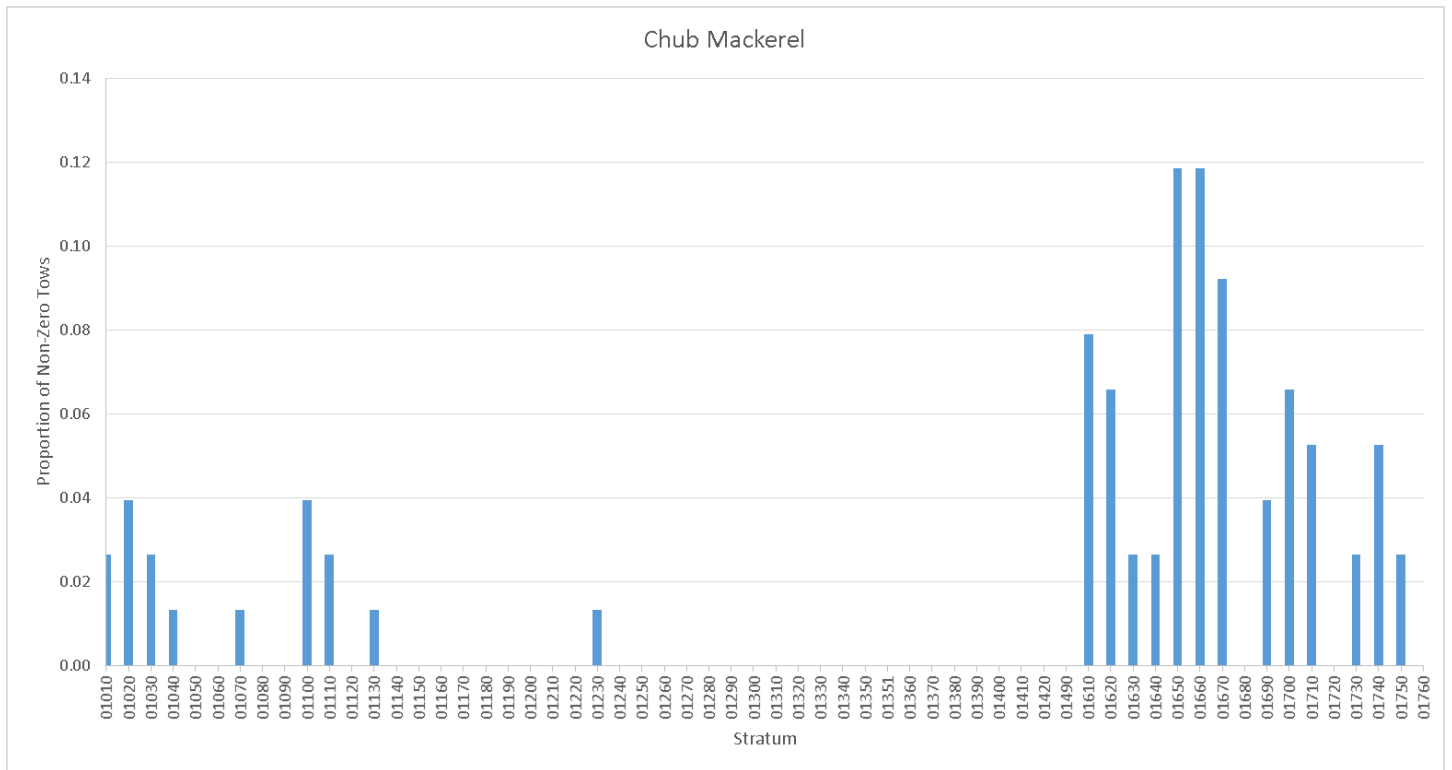


Figure 5. Stratified mean weight per tow (kg/tow) for chub mackerel during the NEFSC fall survey, 1963-2016. The bottom plot includes the 95% confidence intervals (in orange).



DRAFT

Figure 6. Proportion of positive tows that caught chub mackerel by stratum during the NEFSC fall survey, 1963-2016.



DRAFT

Figure 7. Catch number by year and stratum for chub mackerel during the NEFSC fall survey, 1963-2016.

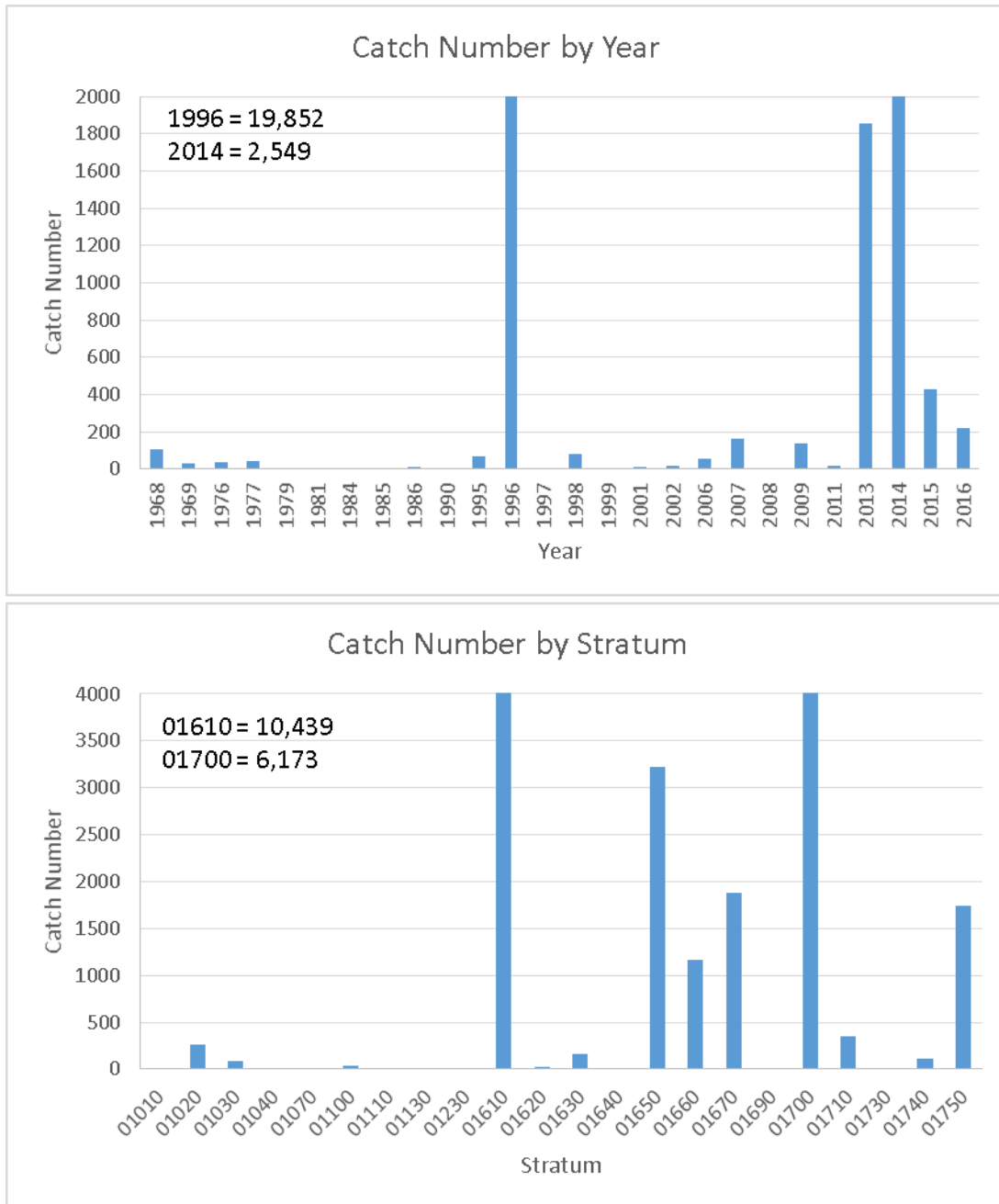


Table 1. NEFSC fall survey indices, with confidence intervals.

Year	Stratified Mean Number per Tow	Upper CI (numbers)	Lower CI (numbers)	Stratified Mean Weight (kg/tow)	Upper CI (weight)	Lower CI (weight)	Average Individual Weight (kg)	Stratified Mean Temp (°C)	Stratified Mean Depth (m)
1963	0	0	0	0	0	0	0	8.39	120.21
1964	0	0	0	0	0	0	0	7.73	119.25
1965	0	0	0	0	0	0	0	8.00	119.41
1966	0	0	0	0	0	0	0	7.42	120.86
1967	0	0	0	0	0	0	0	8.31	111.88
1968	0.102	0.303	-0.098	0.020	0.058	-0.019	0.192	9.89	116.11
1969	0.035	0.105	-0.034	0.004	0.011	-0.003	0.100	10.01	114.19
1970	0	0	0	0	0	0	0	9.05	110.61
1971	0	0	0	0	0	0	0	10.27	113.10
1972	0	0	0	0	0	0	0	11.04	110.22
1973	0	0	0	0	0	0	0	11.10	113.74
1974	0	0	0	0	0	0	0	11.43	113.98
1975	0	0	0	0	0	0	0	10.50	111.55
1976	0.057	0.166	-0.053	0.008	0.024	-0.008	0.147	11.48	109.32
1977	0.055	0.163	-0.053	0.008	0.023	-0.008	0.143	10.48	111.64
1978	0	0	0	0	0	0	0	9.55	110.97
1979	0.013	0.028	-0.002	0.004	0.009	-0.001	0.310	10.60	108.56
1980	0	0	0	0	0	0	0	10.43	108.63
1981	0.007	0.019	-0.006	0.001	0.002	-0.001	0.100	9.91	112.55
1982	0	0	0	0	0	0	0	10.25	109.28
1983	0	0	0	0	0	0	0	10.50	110.77
1984	0.002	0.006	-0.002	0.000	0.001	0.000	0.200	10.75	114.65
1985	0.015	0.037	-0.006	0.002	0.005	-0.001	0.133	10.71	111.77
1986	0.002	0.006	-0.002	0.001	0.002	0.000	0.267	10.81	112.32
1987	0	0	0	0	0	0	0	9.49	111.62
1988	0	0	0	0	0	0	0	9.35	111.05
1989	0	0	0	0	0	0	0	8.94	110.72
1990	0.007	0.019	-0.005	0.001	0.002	0.000	0.119	7.22	111.93
1991	0	0	0	0	0	0	0	10.76	107.61
1992	0	0	0	0	0	0	0	10.41	110.81
1993	0	0	0	0	0	0	0	10.10	113.14
1994	0	0	0	0	0	0	0	11.24	113.76
1995	0.095	0.173	0.016	0.012	0.021	0.002	0.125	11.99	110.26
1996	28.870	65.928	-8.188	3.049	6.959	-0.862	0.106	9.90	110.62
1997	0.003	0.007	-0.002	0.001	0.001	0.000	0.200	11.04	109.33
1998	0.115	0.322	-0.093	0.014	0.040	-0.011	0.126	9.65	109.10
1999	0.003	0.009	-0.003	0.000	0.001	0.000	0.100	12.50	107.76
2000	0	0	0	0	0	0	0	11.60	107.06
2001	0.040	0.104	-0.023	0.004	0.012	-0.003	0.112	10.50	108.12
2002	0.022	0.065	-0.021	0.006	0.019	-0.006	0.288	11.50	111.94
2003	0	0	0	0	0	0	0	10.77	111.97
2004	0	0	0	0	0	0	0	9.86	108.77
2005	0	0	0	0	0	0	0	10.27	107.73
2006	0.075	0.205	-0.056	0.008	0.022	-0.006	0.107	11.66	107.50
2007	0.043	0.043	0.043	0.010	0.010	0.010	0.225	9.74	111.49
2008	0.006	0.019	-0.006	0.001	0.003	-0.001	0.146	3.61	110.45
2009	0.099	0.235	-0.038	0.007	0.018	-0.003	0.076	11.72	113.25
2010	0	0	0	0	0	0	0	11.58	111.22
2011	0.022	0.045	0.000	0.002	0.005	0.000	0.106	11.48	112.95
2012	0	0	0	0	0	0	0	11.96	113.78
2013	0.181	0.504	-0.143	0.022	0.061	-0.017	0.123	10.93	111.44
2014	0.950	2.378	-0.478	0.119	0.269	-0.031	0.125	12.65	110.44
2015	0.139	0.322	-0.044	0.037	0.087	-0.013	0.266	11.53	114.01
2016	0.106	0.312	-0.100	0.041	0.119	-0.038	0.383	12.51	114.58

DRAFT

Table 2. Number and proportion of positive tows that caught chub mackerel during the NEFSC fall survey, 1992-2016.

Stratum	Non-Zero Tows	Proportion			
01010	2	0.026	01310	0	0.000
01020	3	0.039	01320	0	0.000
01030	2	0.026	01330	0	0.000
01040	1	0.013	01340	0	0.000
01050	0	0.000	01350	0	0.000
01060	0	0.000	01351	0	0.000
01070	1	0.013	01360	0	0.000
01080	0	0.000	01370	0	0.000
01090	0	0.000	01380	0	0.000
01100	3	0.039	01390	0	0.000
01110	2	0.026	01400	0	0.000
01120	0	0.000	01410	0	0.000
01130	1	0.013	01420	0	0.000
01140	0	0.000	01490	0	0.000
01150	0	0.000	01610	6	0.079
01160	0	0.000	01620	5	0.066
01170	0	0.000	01630	2	0.026
01180	0	0.000	01640	2	0.026
01190	0	0.000	01650	9	0.118
01200	0	0.000	01660	9	0.118
01210	0	0.000	01670	7	0.092
01220	0	0.000	01680	0	0.000
01230	1	0.013	01690	3	0.039
01240	0	0.000	01700	5	0.066
01250	0	0.000	01710	4	0.053
01260	0	0.000	01720	0	0.000
01270	0	0.000	01730	2	0.026
01280	0	0.000	01740	4	0.053
01290	0	0.000	01750	2	0.026
01300	0	0.000	01760	0	0.000
			Total	76	1

DRAFT

Table 3. Total catch number by stratum and year during the NEFSC fall survey, 1968-2016.

stratum	catch number
01010	3
01020	262
01030	87
01040	1
01070	8
01100	36
01110	5
01130	4
01230	1
01610	10439
01620	20
01630	161
01640	10
01650	3218
01660	1162
01670	1878
01690	6
01700	6173
01710	349
01730	11
01740	106
01750	1744

year	catch number
1968	104
1969	32
1976	37
1977	42
1979	4
1981	1
1984	1
1985	5
1986	9
1990	2
1995	68
1996	19852
1997	2
1998	80
1999	1
2001	11
2002	15
2006	53
2007	160
2008	1
2009	138
2011	17
2013	1858
2014	2549
2015	425
2016	217