

Working Paper D.1 (Appendix 1)
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APPENDIX TABLES AND FIGURES FOR
Potential environmental and spatial effects on survey data and
assessments for GARM stocks¹

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Note-the tables and figures in this appendix should be printed in color or viewed as a PDF file in color on a computer to facilitate interpretation.

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Appendix Tables C1-10. Trend results for GARM species with age structured assessments in NEFSC bottom trawl surveys based on all successful tows at depths ≤ 350 m and in consistently occupied strata. P-values are for slope parameters from linear regression analyses. "Exact p" is for an exact test for all length or age groups in a set under the null hypothesis of no trends. Annual abundance weighted stratified random means were used to test trends in temperature, depth, latitude and longitude. Annual sample means (non-random samples) with weights=sample size were used to test trends in mean depth and length at age. Negative slopes are pink; positive slopes are blue; statistically significant p-values ($p \leq 0.1$) are yellow. All tables continue on a second page.

Appendix Table C1. Trend results for GBK cod (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1978	2006	1978	2006		
Strata sets	1130-1250		1130-1250			
Inconsistent strata	none		1180		NA	
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Temperature					
15-24.9 cm	-0.0302	0.5685	-0.0083	0.6611		
25-34.9 cm	-0.0050	0.8272	0.0063	0.7792		
35-44.9 cm	-0.0172	0.6150	-0.0123	0.4747		
45-54.9 cm	0.0277	0.4464	0.0009	0.9541		
55-64.9 cm	-0.0100	0.7576	-2.1E-05	0.9988		
65-74.9 cm	-0.0234	0.4890	-0.0061	0.7068		NA
75-84.9 cm	-0.0798	0.0953	0.0088	0.6234		
85-94.9 cm	-0.0840	0.0514	0.0181	0.2250		
95-104.9 cm	0.0296	0.7501	0.0129	0.4165		
105-114.9 cm	-0.0613	0.5180	0.0159	0.4816		
Exact <i>p</i>		0.1094		0.7539		
	Depth					
15-24.9 cm	-0.6783	0.0729	-0.3366	0.2992		
25-34.9 cm	-0.6513	0.0999	-0.0221	0.9606		
35-44.9 cm	-0.0296	0.9285	0.1404	0.6661		
45-54.9 cm	-0.3377	0.4265	0.082	0.7696		
55-64.9 cm	0.4392	0.0777	0.0023	0.9934		
65-74.9 cm	0.1407	0.7289	0.0891	0.713		NA
75-84.9 cm	0.5433	0.3546	0.437	0.2362		
85-94.9 cm	0.3592	0.6476	1.7236	0.0059		
95-104.9 cm	-0.3756	0.8038	1.8802	0.0121		
105-114.9 cm	0.7611	0.7332	1.0577	0.233		
Exact <i>p</i>		1.0000		0.1094		
	Latitude					
15-24.9 cm	-0.0038	0.6096	0.0051	0.3647		
25-34.9 cm	-0.0049	0.1896	0.0066	0.2268		
35-44.9 cm	0.0024	0.5392	0.0032	0.5042		
45-54.9 cm	0.0002	0.9671	0.0027	0.3303		
55-64.9 cm	0.0032	0.3949	0.0005	0.8643		
65-74.9 cm	0.0040	0.4356	0.0055	0.0659		NA
75-84.9 cm	0.0042	0.3370	0.0075	0.0915		
85-94.9 cm	0.0151	0.0152	0.0109	0.0259		
95-104.9 cm	0.0156	0.1216	0.0153	0.0086		
105-114.9 cm	0.0060	0.4720	0.0036	0.5756		
Exact <i>p</i>		0.1094		0.7539		
	Longitude					
15-24.9 cm	0.0542	0.0350	0.0490	0.0195		
25-34.9 cm	0.0133	0.5326	-0.0096	0.6167		
35-44.9 cm	0.0047	0.7687	0.0031	0.8009		
45-54.9 cm	0.0029	0.8144	-0.0118	0.0466		
55-64.9 cm	-0.0025	0.7785	-0.0100	0.0569		
65-74.9 cm	-0.0128	0.3537	-0.0129	0.0218		NA
75-84.9 cm	-0.0015	0.9413	-0.0165	0.0782		
85-94.9 cm	-0.0435	0.0475	-0.0142	0.1662		
95-104.9 cm	-0.0296	0.4331	-0.0133	0.3974		
105-114.9 cm	0.0337	0.4205	-0.0010	0.9640		
Exact <i>p</i>		1.0000		1.0000		

Appendix Table C1. (Continued)

Age	Slope	p-value	Slope	p-value	Slope	p-value
Depth at age						
0 yr	-0.2829	0.5152	-0.6562	0.0250		
1 yr	-0.8004	0.0023	-0.2158	0.1055		
2 yr	-1.1288	0.0002	0.1263	0.5985		
3 yr	-0.2023	0.4681	0.5443	0.0063		
4 yr	-0.1522	0.5865	0.3702	0.1620		
5 yr	-1.1186	0.0316	0.4016	0.1536		
6 yr	-0.5212	0.3723	0.7278	0.1233	NA	
7 yr	-0.8846	0.2732	0.2228	0.6128		
8 yr	-0.7194	0.4445	0.9552	0.1020		
9 yr	-1.8716	0.6286	0.4976	0.7285		
10 yr	-1.1722	0.8105	3.2532	0.2386		
11 yr	NA	NA	-0.9677	0.7781		
Exact p		0.0010		0.0386		
Length at age						
0 yr	-0.1105	0.0860	-0.0152	0.1432		
1 yr	-0.1528	0.0139	-0.1301	0.0265		
2 yr	-0.2365	0.0001	-0.1940	0.0050		
3 yr	-0.2093	0.0001	-0.2349	0.0001		
4 yr	-0.3062	0.0000	-0.2567	0.0000		
5 yr	-0.4757	0.0000	-0.3128	0.0000		
6 yr	-0.6077	0.0000	-0.4604	0.0000	NA	
7 yr	-0.2876	0.0396	-0.4851	0.0009		
8 yr	-0.4691	0.1906	-0.5307	0.0001		
9 yr	-1.0337	0.1216	-0.3003	0.2810		
10 yr	-0.5243	0.2817	-0.1668	0.6501		
11 yr	NA	NA	-0.3616	0.6402		
Exact p		0.0010		0.0005		

Appendix Table C2. Trend results for GOM cod (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1982	2006	1982	2006	NA	
Strata sets	1260-1300, 1360-1400		1260-1300, 1360-1400			
Inconsistent strata	none		none			
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
Temperature						
10-19.9 cm	0.0355	0.4057	0.0189	0.5022		
20-29.9 cm	0.0005	0.9874	0.0156	0.5940		
30-39.9 cm	-0.0191	0.4426	0.0203	0.4141		
40-49.9 cm	-0.0191	0.4082	0.0227	0.4330		
50-59.9 cm	0.0158	0.4933	0.0463	0.0692		
60-69.9 cm	-0.0032	0.8795	-0.0135	0.6845		NA
70-79.9 cm	-0.0211	0.3537	-0.0109	0.6700		
80-89.9 cm	0.0140	0.6220	-0.0039	0.9064		
90-99.9 cm	0.0123	0.7287	-0.0046	0.9250		
100-109.9 cm	0.0651	0.4427	-0.0095	0.8890		
110-119.9 cm	-0.0082	0.8769	0.0811	0.1565		
Exact <i>p</i>		1.0000		1.0000		
Depth						
10-19.9 cm	-1.5447	0.2501	0.8900	0.4361		
20-29.9 cm	0.2764	0.7799	-0.1021	0.8970		
30-39.9 cm	-0.3816	0.6895	0.0933	0.9097		
40-49.9 cm	0.2373	0.6624	0.2918	0.7168		
50-59.9 cm	-0.2081	0.7113	0.0365	0.9460		
60-69.9 cm	0.1323	0.8444	-0.8141	0.3676		NA
70-79.9 cm	-0.4813	0.5543	0.5244	0.4922		
80-89.9 cm	-1.0981	0.2878	-0.7469	0.2119		
90-99.9 cm	-2.5698	0.1977	-2.0196	0.1880		
100-109.9 cm	-3.2512	0.0662	-1.3405	0.5302		
110-119.9 cm	-2.7164	0.1903	1.6246	0.4801		
Exact <i>p</i>		0.2266		1.0000		
Latitude						
10-19.9 cm	-0.018	0.3575	-0.0067	0.6327		
20-29.9 cm	0.0023	0.8159	-0.0005	0.9652		
30-39.9 cm	-0.0058	0.3804	-0.0026	0.7786		
40-49.9 cm	-0.0077	0.2002	-0.0045	0.3603		
50-59.9 cm	-0.0061	0.2654	-0.0101	0.0294		
60-69.9 cm	-0.0106	0.1608	-0.0160	0.0120		NA
70-79.9 cm	-0.0121	0.1547	-0.0048	0.4730		
80-89.9 cm	-0.006	0.478	-0.0040	0.6743		
90-99.9 cm	-0.0051	0.5909	-0.0034	0.6859		
100-109.9 cm	0.0052	0.7123	0.0013	0.8710		
110-119.9 cm	0.0026	0.7626	-0.0191	0.2019		
Exact <i>p</i>		0.2266		0.0117		
Longitude						
10-19.9 cm	0.0328	0.2599	0.0014	0.9575		
20-29.9 cm	-0.0106	0.5815	-0.0120	0.5177		
30-39.9 cm	0.0198	0.2724	0.0057	0.7763		
40-49.9 cm	0.0071	0.6647	-0.0142	0.4447		
50-59.9 cm	-0.0092	0.5495	-0.0073	0.6640		
60-69.9 cm	-0.0092	0.6673	0.0301	0.1556		NA
70-79.9 cm	0.0070	0.7497	-0.0004	0.9819		
80-89.9 cm	0.0223	0.4288	0.0240	0.2143		
90-99.9 cm	0.0524	0.1513	0.0492	0.2286		
100-109.9 cm	0.0765	0.0882	0.0168	0.7724		
110-119.9 cm	0.0273	0.6091	-0.0048	0.9310		
Exact <i>p</i>		0.2266		1.0000		

Appendix Table C2. (Continued)

Age	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Depth at age					
0 yr	-1.6555	0.0611	NA	NA		
1 yr	-0.9849	0.0149	-0.6981	0.3889		
2 yr	0.0486	0.9079	-0.2013	0.6519		
3 yr	-0.2147	0.6569	-0.7465	0.1718		
4 yr	-1.0699	0.0526	-1.6632	0.0093		
5 yr	-1.6502	0.0338	-2.0998	0.0035		
6 yr	-2.9415	0.0236	-2.4584	0.0328	NA	
7 yr	-5.4545	0.0413	-3.2382	0.0220		
8 yr	1.8518	0.3271	-5.5139	0.0199		
9 yr	-2.4312	0.0988	-2.9926	0.2723		
10 yr	NA	NA	-1.3692	0.6251		
11 yr	-4.8188	0.1229	NA	NA		
Exact <i>p</i>		0.0654		0.0020		
	Length at age					
0 yr	-0.0575	0.7573	NA	NA		
1 yr	-0.0972	0.2200	-0.0460	0.3657		
2 yr	-0.1906	0.0542	-0.1944	0.0257		
3 yr	-0.2482	0.0535	-0.1651	0.1369		
4 yr	-0.2829	0.0139	-0.0424	0.7470		
5 yr	-0.4246	0.0149	-0.3660	0.0024		
6 yr	-0.3632	0.2697	-0.3065	0.1091	NA	
7 yr	-0.5309	0.1147	-0.2580	0.1879		
8 yr	-0.6552	0.0814	-0.1061	0.8127		
9 yr	-0.2268	0.5246	-0.1613	0.7218		
10 yr	NA	NA	-0.3485	0.1469		
11 yr	-0.655	0.3121	NA	NA		
Exact <i>p</i>		0.0010		0.0020		

Appendix Table C3. Trend results for American plaice (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1980	2006	1980	2006		
Strata sets	1010-1400, 3450-3920		1010-1400, 3450-3920			
Inconsistent strata	1310, 1320, 1350, 3470-3540, 3560-3590, 3620-3920		1120, 1310-1330, 1350, 3470-3540, 3560-3920			NA
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Temperature					
10-19.9 cm	0.0063	0.7444	0.0236	0.1928		
20-29.9 cm	0.0188	0.2636	0.0097	0.5251		
30-39.9 cm	0.0211	0.1927	0.0167	0.2274		
40-49.9 cm	0.0260	0.0950	0.0139	0.3252		NA
50-59.9 cm	0.0170	0.2697	0.0340	0.0890		
Exact <i>p</i>		0.0625		0.0625		
	Depth					
10-19.9 cm	-0.2208	0.4363	0.2154	0.5584		
20-29.9 cm	-0.4153	0.1075	-0.4145	0.1743		
30-39.9 cm	0.0152	0.9434	-0.0816	0.6915		
40-49.9 cm	0.0138	0.9645	-0.0702	0.8294		NA
50-59.9 cm	0.5349	0.1588	0.4900	0.4518		
Exact <i>p</i>		1.0000		1.0000		
	Latitude					
10-19.9 cm	0.0015	0.6152	0.0064	0.2056		
20-29.9 cm	-0.0073	0.0413	-0.0045	0.2483		
30-39.9 cm	-0.0111	0.0000	-0.0055	0.0221		
40-49.9 cm	-0.0095	0.0135	-0.0008	0.8357		NA
50-59.9 cm	-0.0137	0.0553	-0.0019	0.8406		
Exact <i>p</i>		0.3750		0.3750		
	Longitude					
10-19.9 cm	-0.0026	0.6844	-0.0042	0.4661		
20-29.9 cm	-0.0100	0.0686	-0.0127	0.0011		
30-39.9 cm	-0.0168	0.0013	-0.0052	0.0614		
40-49.9 cm	-0.0183	0.0012	-0.0122	0.0033		NA
50-59.9 cm	-0.0216	0.0610	-0.0148	0.1585		
Exact <i>p</i>		0.0625		0.0625		

Appendix Table C3. (Continued)

Age	Slope	p -value	Slope	p -value	Slope	p -value
	Depth at age					
0 yr	0.0029	0.9983	NA	NA		
1 yr	0.4593	0.1836	0.5406	0.3250		
2 yr	0.4264	0.2729	0.4623	0.3338		
3 yr	0.4547	0.0999	0.4369	0.1963		
4 yr	0.1124	0.6844	0.0939	0.7075		
5 yr	-0.4558	0.0925	-0.0518	0.8375		
6 yr	-0.6039	0.0984	-0.5442	0.0321		
7 yr	-0.3162	0.2641	-0.2820	0.2614		NA
8 yr	-0.7213	0.0886	0.3040	0.4916		
9 yr	-0.0752	0.8718	-0.9617	0.0222		
10 yr	-0.9635	0.1284	1.1304	0.0856		
11 yr	0.2775	0.8153	2.3829	0.0248		
12 yr	0.3023	0.8186	1.5860	0.3021		
13 yr	3.2873	0.1590	0.8363	0.6205		
14 yr	-3.2789	0.2906	7.3485	0.7701		
Exact p		1.0000		0.1796		
	Length at age					
0 yr	-0.0528	0.2528	NA	NA		
1 yr	0.0213	0.4459	-0.0044	0.8873		
2 yr	-0.0747	0.0172	-0.0699	0.0726		
3 yr	-0.0754	0.0204	-0.1245	0.0016		
4 yr	-0.0875	0.0141	-0.1040	0.0014		
5 yr	-0.1294	0.0065	-0.0612	0.0826		
6 yr	-0.2078	0.0004	-0.1393	0.0059		
7 yr	-0.1773	0.0054	-0.2106	0.0000		NA
8 yr	-0.1778	0.0019	-0.2336	0.0006		
9 yr	-0.2297	0.0052	-0.2193	0.0003		
10 yr	-0.1402	0.0500	-0.0994	0.1378		
11 yr	-0.2516	0.1293	-0.1153	0.2574		
12 yr	-0.3059	0.1157	-0.1033	0.4029		
13 yr	-0.0017	0.9918	-0.2483	0.1005		
14 yr	-0.0803	0.9018	-0.8030	0.6054		
Exact p		0.0010		0.0001		

Appendix Table C4. Trend results with flounder (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1982	2006	1982	2006		
Strata sets	1220-1300, 1360-1400		1220-1300, 1360-1400			
Inconsistent strata	none		none		NA	
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Temperature					
10-19.9 cm	0.0440	0.1522	0.0393	0.0494		
20-29.9 cm	0.0064	0.7591	0.0564	0.0008		
30-39.9 cm	0.0137	0.3398	0.0353	0.0232		
40-49.9 cm	0.0131	0.2658	0.0453	0.0118		NA
50-59.9 cm	-0.0088	0.7087	0.0217	0.388		
Exact <i>p</i>		0.3750		0.0625		
	Depth					
10-19.9 cm	0.3021	0.6572	0.9498	0.1955		
20-29.9 cm	0.6225	0.2228	0.9189	0.0695		
30-39.9 cm	0.4952	0.1463	0.4198	0.0392		
40-49.9 cm	0.4478	0.0665	0.8609	0.0003		NA
50-59.9 cm	0.7717	0.1172	1.1024	0.0189		
Exact <i>p</i>		0.0625		0.0625		
	Latitude					
10-19.9 cm	0.0054	0.5862	0.0070	0.4339		
20-29.9 cm	-0.0044	0.6192	-0.0030	0.6097		
30-39.9 cm	-0.0078	0.2036	-0.0061	0.1463		
40-49.9 cm	-0.0053	0.1541	-0.0070	0.0178		NA
50-59.9 cm	-0.0166	0.0309	-0.0042	0.5155		
Exact <i>p</i>		0.3750		0.3750		
	Longitude					
10-19.9 cm	-0.0189	0.2328	-0.0168	0.1764		
20-29.9 cm	-0.0061	0.4654	-0.0185	0.0311		
30-39.9 cm	-0.0069	0.2298	-0.0011	0.7978		
40-49.9 cm	-0.0120	0.0134	-0.0118	0.0154		NA
50-59.9 cm	-0.0092	0.5050	-0.0046	0.6962		
Exact <i>p</i>		0.0625		0.0625		

Appendix Table C4. (Continued)

Age	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Depth at age					
0 yr	-0.8880	0.4710	NA	NA		
1 yr	0.3665	0.6013	0.0838	0.9707		
2 yr	0.7714	0.2441	1.9598	0.0070		
3 yr	0.8783	0.1016	1.3089	0.0176		
4 yr	1.4635	0.0002	0.7027	0.0520		
5 yr	1.1392	0.0048	1.0461	0.0018		
6 yr	0.6097	0.0984	0.8850	0.0281		
7 yr	0.5972	0.2133	0.6921	0.0332		
8 yr	0.9904	0.0378	0.7348	0.0659		
9 yr	1.0972	0.2147	1.8821	0.0001		
10 yr	1.2749	0.3603	1.7735	0.0317		
11 yr	5.3678	0.0008	1.2212	0.0837	NA	
12 yr	0.7014	0.5189	2.5877	0.3636		
13 yr	-0.0696	0.9732	4.8009	0.0223		
14 yr	-0.2637	0.9171	5.6199	0.0309		
15 yr	6.8156	0.1911	1.9802	0.2210		
16 yr	4.1598	0.1256	2.6146	0.4890		
17 yr	3.2435	0.4205	8.8218	0.0002		
18 yr	-0.4105	0.8777	5.6306	0.4814		
19 yr	-9.2652	0.3862	NA	NA		
20 yr	-11.0192	0.2487	NA	NA		
21 yr	3.3969	0.2957	NA	NA		
Exact <i>p</i>		0.0525		0.0000		
	Length at age					
0 yr	0.0042	0.8523	NA	NA		
1 yr	0.0743	0.0708	0.0569	0.5539		
2 yr	0.2204	0.0089	0.0957	0.1472		
3 yr	0.0347	0.3954	0.1156	0.1095		
4 yr	0.0168	0.5022	0.0205	0.4683		
5 yr	-0.0496	0.1262	-0.0343	0.1854		
6 yr	-0.1007	0.0114	-0.1230	0.0001		
7 yr	-0.1289	0.0003	-0.1976	0.0000		
8 yr	-0.2030	0.0000	-0.2014	0.0000		
9 yr	-0.2821	0.0004	-0.2784	0.0000		
10 yr	-0.3096	0.0001	-0.3870	0.0000		
11 yr	-0.2427	0.0222	-0.2936	0.0018	NA	
12 yr	-0.3044	0.0524	0.1853	0.4828		
13 yr	-0.2430	0.2367	-0.4307	0.0042		
14 yr	-0.2291	0.0834	-0.4338	0.0349		
15 yr	-0.3240	0.2108	-0.1818	0.0934		
16 yr	0.0690	0.8111	0.3289	0.1795		
17 yr	-0.0683	0.7986	-0.1262	0.2628		
18 yr	-0.2102	0.3371	-0.3408	0.7141		
19 yr	0.9242	0.1962	NA	NA		
20 yr	0.8558	0.1826	NA	NA		
21 yr	-0.0412	0.9244	NA	NA		
Exact <i>p</i>		0.2863		0.2379		

Appendix Table C5. Trend results for Gulf of Maine winter flounder (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1982	2006	1982	2006		
Strata sets	1260, 1270, 1380-1400, 3580-3610, 3650, 3660		1260, 1270, 1380-1400, 3580-3610, 3650, 3660			
Inconsistent strata	1358, 1359, 3650, 3660		3580-3610, 3650, 3660			NA
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
Temperature						
10-19.9 cm	0.0185	0.6845	0.0162	0.4463		
20-29.9 cm	0.0198	0.4816	0.0036	0.8394		
30-39.9 cm	0.0227	0.4598	-0.0049	0.8104		NA
40-49.9 cm	-0.0209	0.6688	-0.0149	0.3804		
Exact <i>p</i>		0.6250		1.0000		
Depth						
10-19.9 cm	-0.4940	0.3422	-0.8003	0.0836		
20-29.9 cm	-0.2454	0.6717	-0.2196	0.5772		
30-39.9 cm	-0.8192	0.1271	-1.2836	0.0065		NA
40-49.9 cm	-0.8294	0.1872	0.2970	0.7678		
Exact <i>p</i>		0.1250		0.6250		
Latitude						
10-19.9 cm	-0.0511	0.0268	-0.0288	0.1218		
20-29.9 cm	-0.0076	0.3703	-0.0218	0.0069		
30-39.9 cm	-0.0239	0.0202	-0.0336	0.0001		NA
40-49.9 cm	-0.0382	0.0460	-0.0103	0.5516		
Exact <i>p</i>		0.1250		0.1250		
Longitude						
10-19.9 cm	0.0555	0.0204	0.0435	0.1041		
20-29.9 cm	0.0073	0.5376	0.0219	0.0499		
30-39.9 cm	0.0249	0.0258	0.0432	0.0019		NA
40-49.9 cm	0.0523	0.0087	0.0228	0.3275		
Exact <i>p</i>		0.1250		0.1250		

Appendix Table C5. (Continued)

Age	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Depth at age					
1 yr	-0.4527	0.1681	-1.5768	0.1492		
2 yr	-0.4508	0.1155	-0.0966	0.8136		
3 yr	-0.5822	0.0301	-1.0068	0.0201		
4 yr	-1.0575	0.0091	-1.2049	0.0050		
5 yr	-1.5920	0.0010	-1.7449	0.0023		
6 yr	-0.9967	0.2419	-1.3535	0.0779	NA	
7 yr	-1.1125	0.2213	-1.0814	0.1941		
8 yr	-1.6537	0.3745	0.5694	0.7058		
9 yr	NA	NA	-3.1758	0.3398		
Exact <i>p</i>		0.0078		0.0391		
	Length at age					
1 yr	-0.0790	0.1476	-0.1295	0.3755		
2 yr	-0.0568	0.1802	0.0465	0.4137		
3 yr	-0.0253	0.5935	-0.0867	0.0257		
4 yr	-0.0687	0.1804	-0.0840	0.0390		
5 yr	-0.0090	0.8817	-0.1097	0.0286		
6 yr	-0.0908	0.3607	-0.1347	0.0129	NA	
7 yr	-0.1405	0.3859	-0.3719	0.0010		
8 yr	-0.1715	0.5356	-0.4346	0.0016		
9 yr	NA	NA	-0.2864	0.2221		
Exact <i>p</i>		0.0078		0.0391		

Appendix Table C6. Trend results for SNEMA winter flounder (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1981	2006	1981	2006	1968	2006
Strata sets	1010-1120, 1250, 1690-1760, 3010-3290, 3450-3560		1010-1120, 1250, 1690-1760, 3010-3290, 3450-3560		1010, 1020, 1050, 1060, 1090, 1100, 1690, 1730	
Inconsistent strata	1720, 3010, 3030, 3060, 3090, 3120, 3150, 3180, 3210, 3240, 3270, 3470-3540, 3560		1120, 1720, 1760, 3010, 3030, 3060, 3090, 3120, 3150, 3180, 3210, 3240, 3270, 3470-3540, 3560		none	
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Temperature					
10-19.9 cm	0.1516	0.0073	-0.0076	0.7460	0.0501	0.5061
20-29.9 cm	0.0532	0.0811	0.0136	0.6295	0.0466	0.5266
30-39.9 cm	0.0150	0.7212	0.0256	0.2773	0.0387	0.6148
40-49.9 cm	0.0722	0.1653	0.0305	0.2141	0.0832	0.2067
50-59.9 cm	-0.1420	0.8238	-0.0039	0.8565	NA	NA
Exact <i>p</i>		0.3750		1.0000		0.1250
	Depth					
10-19.9 cm	-0.1725	0.2878	0.0830	0.4964	0.1891	0.4688
20-29.9 cm	0.0309	0.8155	0.3137	0.0342	0.0994	0.7748
30-39.9 cm	-0.0170	0.8730	0.1729	0.2522	-0.2081	0.2975
40-49.9 cm	0.1687	0.5116	0.0923	0.7520	-0.2002	0.8263
50-59.9 cm	-1.6310	0.4900	1.0940	0.0164	NA	NA
Exact <i>p</i>		1.0000		0.0625		1.0000
	Latitude					
10-19.9 cm	0.0228	0.0654	0.0133	0.0879	-0.0010	0.9705
20-29.9 cm	0.0099	0.0907	0.0105	0.0756	0.0070	0.6090
30-39.9 cm	0.0049	0.4231	0.0025	0.6277	0.0049	0.6918
40-49.9 cm	-0.0110	0.3251	-0.0028	0.7405	-0.0417	0.0003
50-59.9 cm	-0.0045	0.9013	-0.0110	0.3705	NA	NA
Exact <i>p</i>		1.0000		1.0000		1.0000
	Longitude					
10-19.9 cm	-0.0352	0.2522	-0.0419	0.0175	-0.0272	0.5440
20-29.9 cm	-0.0209	0.0579	-0.0341	0.0136	0.0019	0.9538
30-39.9 cm	-0.0007	0.9569	-0.0192	0.1174	-0.0002	0.9940
40-49.9 cm	0.0380	0.2198	0.0102	0.6802	0.1230	0.0985
50-59.9 cm	0.0160	0.6905	-0.0201	0.0216	NA	NA
Exact <i>p</i>		1.0000		0.3750		1.0000

Appendix Table C6. (Continued)

Age	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Depth at age					
0 yr	-0.2045	0.6241	NA	NA		
1 yr	-0.0132	0.8836	0.2319	0.0002		
2 yr	0.0881	0.4183	0.1419	0.0773		
3 yr	0.1627	0.1553	-0.0316	0.7223		
4 yr	0.2155	0.0808	0.0602	0.5032		NA
5 yr	0.0030	0.9849	0.0087	0.9179		
6 yr	0.4758	0.1072	-0.0804	0.6218		
7 yr	-0.1086	0.6955	-0.0853	0.7824		
8 yr	NA	NA	-0.7223	0.2563		
9 yr	NA	NA	-0.5420	0.2660		
Exact <i>p</i>		0.7266		1.0000		
	Length at age					
0 yr	-0.0759	0.0254	NA	NA		
1 yr	0.0594	0.0012	-0.0128	0.6440		
2 yr	0.1181	0.0001	0.1061	0.0603		
3 yr	0.0907	0.0052	0.0351	0.2468		
4 yr	0.0241	0.5242	0.0233	0.4843		NA
5 yr	-0.0739	0.0781	-0.0576	0.0570		
6 yr	-0.1626	0.0271	-0.0291	0.4010		
7 yr	0.0173	0.8916	-0.1098	0.1343		
8 yr	NA	NA	-0.2359	0.1481		
9 yr	NA	NA	-0.4636	0.1576		
Exact <i>p</i>		0.7266		0.5078		

Appendix Table C7. Trend results for Georges Bank haddock (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1963	2006	1968	2006	NA	NA
Strata sets	1130-1250, 1290, 1300		1130-1250, 1290, 1300		NA	
Inconsistent strata	none		1180		NA	
Temperature						
1-9.9 cm	0.0302	0.2708	NA	NA		
10-19.9 cm	0.0115	0.4864	0.0231	0.1562		
20-29.9 cm	-0.0189	0.3149	0.0155	0.3223		
30-39.9 cm	-0.0071	0.5456	0.0177	0.1705		
40-49.9 cm	-0.0309	0.0605	0.0204	0.0543	NA	
50-59.9 cm	-0.0264	0.0206	0.0184	0.0866		
60-69.9 cm	-0.0258	0.0250	0.0135	0.2071		
70-79.9 cm	-0.0238	0.0700	0.0128	0.2385		
Exact <i>p</i>		0.2891		0.0156		
Depth						
1-9.9 cm	-0.7074	0.1788	NA	NA		
10-19.9 cm	0.0838	0.7334	0.3024	0.3592		
20-29.9 cm	0.4521	0.1786	0.4101	0.2233		
30-39.9 cm	0.8477	0.0165	0.4402	0.2759		
40-49.9 cm	1.3548	0.0012	0.7215	0.0201	NA	
50-59.9 cm	1.4327	0.0000	0.6528	0.0546		
60-69.9 cm	1.4638	0.0028	0.2830	0.4157		
70-79.9 cm	1.1988	0.0806	0.3443	0.2686		
Exact <i>p</i>		0.0703		0.0156		
Latitude						
1-9.9 cm	0.0036	0.4693	NA	NA		
10-19.9 cm	0.0011	0.7570	0.0081	0.1222		
20-29.9 cm	0.0016	0.6553	0.0033	0.4617		
30-39.9 cm	0.0039	0.0694	0.0017	0.6942		
40-49.9 cm	0.0039	0.0569	0.0060	0.0392	NA	
50-59.9 cm	0.0049	0.0067	0.0054	0.0478		
60-69.9 cm	0.0031	0.2527	0.0022	0.4263		
70-79.9 cm	0.0000	0.9958	0.0059	0.1154		
Exact <i>p</i>		0.0078		0.0156		
Longitude						
1-9.9 cm	-0.0110	0.4899	NA	NA		
10-19.9 cm	0.0006	0.9186	-0.0080	0.4087		
20-29.9 cm	0.0034	0.6354	0.0010	0.8849		
30-39.9 cm	-0.0088	0.0803	0.0050	0.4317		
40-49.9 cm	-0.0053	0.2530	-0.0018	0.7178	NA	
50-59.9 cm	-0.0081	0.0665	-0.0112	0.0287		
60-69.9 cm	-0.0152	0.0379	-0.0105	0.0421		
70-79.9 cm	-0.0118	0.2962	-0.0061	0.3956		
Exact <i>p</i>		0.2891		0.4531		

Appendix Table C7. (Continued)

Age	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Depth at age					
0 yr	0.3618	0.0529	NA	NA		
1 yr	0.5964	0.0124	0.7658	0.0002		
2 yr	0.9684	0.0007	0.5102	0.0442		
3 yr	0.4956	0.1481	0.5041	0.0093		
4 yr	0.9724	0.0153	0.0652	0.7356		
5 yr	0.8348	0.0155	-0.5441	0.0664		
6 yr	0.9805	0.0289	-0.4031	0.0317		
7 yr	1.3812	0.0060	0.1879	0.4417		
8 yr	1.5075	0.0088	0.1184	0.6799		NA
9 yr	1.2407	0.1363	0.3256	0.4125		
10 yr	1.1221	0.3876	0.7352	0.0402		
11 yr	4.0632	0.0021	0.4521	0.1415		
12 yr	-1.0110	0.7366	0.7476	0.2621		
13 yr	7.3742	0.1662	0.5454	0.6215		
14 yr	8.4706	0.1970	-0.7108	0.7841		
Exact <i>p</i>		0.0010		0.0129		
	Length at age					
0 yr	-0.0204	0.2884	NA	NA		
1 yr	-0.1349	0.0001	-0.0904	0.0002		
2 yr	-0.1036	0.0182	-0.2646	0.0000		
3 yr	-0.1829	0.0001	-0.3627	0.0000		
4 yr	-0.1271	0.0024	-0.2123	0.0000		
5 yr	-0.1232	0.0031	-0.1081	0.0454		
6 yr	-0.1728	0.0009	-0.1244	0.0316		
7 yr	-0.1429	0.0031	-0.0966	0.1368		
8 yr	-0.1964	0.0006	-0.1337	0.0572		NA
9 yr	-0.1330	0.0305	-0.0073	0.9210		
10 yr	-0.2249	0.0035	-0.0326	0.6148		
11 yr	-0.0977	0.3065	-0.2244	0.0014		
12 yr	-0.4805	0.0377	-0.1415	0.1981		
13 yr	-0.2524	0.4584	-0.0605	0.5302		
14 yr	0.1471	0.9132	-0.1326	0.6923		
Exact <i>p</i>		0.0010		0.0129		

Appendix Table C8. Trend results for CCGOM yellowtail flounder (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1982	2006	1982	2006		
Strata sets	1250, 1260, 1390, 1400, 3600,3610		1250, 1260, 1270, 1390, 1400		NA	
Inconsistent strata	3560-3590, 3620-3660		3560-3660			
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
Temperature						
10-19.9 cm	0.0492	0.3848	-0.0029	0.9181		
20-29.9 cm	0.0297	0.4782	0.0128	0.4728		
30-39.9 cm	0.0317	0.4414	0.0006	0.9723	NA	
40-49.9 cm	0.0598	0.1884	0.0017	0.9426		
Exact <i>p</i>		0.1250		0.6250		
Depth						
10-19.9 cm	-0.2942	0.3112	0.0657	0.8916		
20-29.9 cm	-0.1482	0.6465	1.1948	0.0098		
30-39.9 cm	-0.2444	0.4837	1.5536	0.0024	NA	
40-49.9 cm	-0.4186	0.1858	-0.0876	0.8603		
Exact <i>p</i>		0.1250		0.6250		
Latitude						
10-19.9 cm	-0.0099	0.2374	0.0144	0.0444		
20-29.9 cm	0.0002	0.9893	0.0101	0.3035		
30-39.9 cm	-0.0105	0.2064	0.0028	0.6328	NA	
40-49.9 cm	-0.0054	0.7163	-0.0020	0.8843		
Exact <i>p</i>		0.6250		0.6250		
Longitude						
10-19.9 cm	-0.0038	0.6213	0.0153	0.0290		
20-29.9 cm	-0.0009	0.9181	0.0176	0.0322		
30-39.9 cm	0.0121	0.1392	0.0229	0.0021	NA	
40-49.9 cm	-0.0033	0.7267	0.0228	0.0072		
Exact <i>p</i>		0.6250		0.1250		

Appendix Table C8. (Continued)

Age	Slope	p -value	Slope	p -value	Slope	p -value
	Depth at age					
1 yr	-0.1982	0.2102	0.0686	0.9255		
2 yr	0.0227	0.8835	0.7864	0.0392		
3 yr	-0.3347	0.1216	1.3777	0.0085		
4 yr	-0.3656	0.2428	1.6505	0.0021		
5 yr	-0.1084	0.8126	1.0568	0.1486	NA	
6 yr	-0.2303	0.7208	2.2442	0.1533		
7 yr	NA	NA	NA	NA		
8 yr	NA	NA	0.3215	0.8713		
Exact p		0.2188		0.0156		
	Length at age					
1 yr	0.0766	0.2628	0.1657	0.3099		
2 yr	0.1114	0.0131	0.0822	0.2591		
3 yr	0.0365	0.4964	-0.0452	0.3810		
4 yr	-0.0888	0.3373	-0.2029	0.0002		
5 yr	-0.0017	0.9852	-0.2362	0.1031	NA	
6 yr	0.0540	0.8351	-0.1396	0.6270		
7 yr	NA	NA	NA	NA		
8 yr	NA	NA	0.0624	0.8001		
Exact p		0.6875		1.0000		

Appendix Table C9. Trend results for SNEMA yellowtail flounder (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter	
	1982	2006	1982	2006	1982	2006
Strata sets	1010, 1020, 1050, 1060, 1090, 1100		1010, 1020, 1050, 1060, 1090, 1100, 1690, 1730, 1740		1010, 1020, 1050, 1060, 1090, 1100, 1690, 1730, 1740	
Inconsistent strata	none		none		none	
Size groups	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
Temperature						
10-19.9 cm	0.0912	0.0916	-0.0252	0.2778	0.1189	0.3296
20-29.9 cm	0.0198	0.5758	-0.0050	0.8458	0.0003	0.9974
30-39.9 cm	0.0093	0.7906	-0.0130	0.6329	0.0068	0.9142
40-49.9 cm	-0.0432	0.4383	0.0204	0.4056	0.0414	0.5721
Exact <i>p</i>		0.6250		0.6250		0.1250
			Depth			
10-19.9 cm	-0.0244	0.9310	0.3676	0.2505	0.9196	0.1851
20-29.9 cm	-0.1886	0.1171	0.2184	0.1185	0.1617	0.2351
30-39.9 cm	-0.0889	0.4253	0.0383	0.6554	0.4402	0.0166
40-49.9 cm	-0.1968	0.4437	-0.0793	0.7656	0.0958	0.7137
Exact <i>p</i>		0.1250		0.6250		0.1250
			Latitude			
10-19.9 cm	0.0170	0.2127	0.0198	0.1212	0.0391	0.4365
20-29.9 cm	0.0083	0.0939	0.0153	0.0193	0.0126	0.4369
30-39.9 cm	0.0069	0.0458	0.0185	0.0001	0.0338	0.0001
40-49.9 cm	-0.0106	0.2748	-0.0092	0.1038	-0.0008	0.9406
Exact <i>p</i>		0.6250		0.6250		0.6250
			Longitude			
10-19.9 cm	-0.0536	0.0551	-0.0516	0.1909	-0.0582	0.5921
20-29.9 cm	-0.0145	0.3402	-0.0533	0.0093	-0.0372	0.2671
30-39.9 cm	-0.0098	0.3758	-0.0301	0.0045	-0.0619	0.0001
40-49.9 cm	0.0443	0.1840	0.0322	0.2240	0.0162	0.4596
Exact <i>p</i>		0.6250		0.6250		0.6250

Appendix Table C9. (Continued)

Age	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Depth at age					
1 yr	0.1137	0.4525	-0.0818	0.8379	-0.0599	0.9351
2 yr	-0.0575	0.6361	0.2107	0.0465	0.2623	0.1357
3 yr	-0.1064	0.4677	0.0424	0.6629	0.7867	0.0042
4 yr	-0.4052	0.0929	-0.1291	0.3767	0.5495	0.1183
5 yr	0.0242	0.9239	-0.3169	0.1939	0.2792	0.5431
6 yr	1.2192	0.0415	-0.3901	0.5332	0.9117	0.0334
7 yr	-0.2702	0.6110	-0.8370	0.1292	0.9886	0.2383
Exact <i>p</i>		1.0000		0.4531		0.1250
	Length at age					
1 yr	0.1280	0.0465	-0.0541	0.2676	-0.0850	0.6664
2 yr	0.1211	0.0064	0.0344	0.1268	-0.1520	0.0178
3 yr	0.1765	0.0004	0.0573	0.1566	-0.0330	0.7498
4 yr	0.1698	0.0035	0.1534	0.0371	0.2879	0.0014
5 yr	0.2254	0.0053	0.1861	0.0387	0.1383	0.0949
6 yr	0.7192	0.0332	0.2429	0.3424	0.1416	0.1757
7 yr	-0.0240	0.9551	0.2120	0.0299	0.2057	0.2528
Exact <i>p</i>		0.1250		0.1250		1.0000

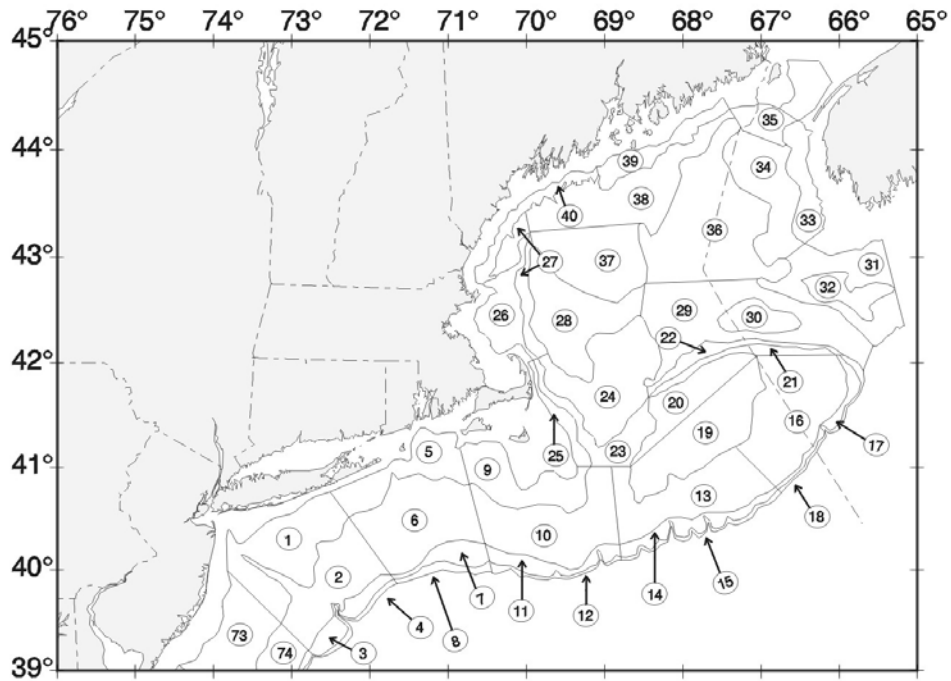
Table C10. Trend results for GBK yellowtail flounder (see table heading above Appendix Table C1).

Years	Fall		Spring		Winter
	1973	2006	1973	2006	
Strata sets	1013-1210		1013-1210		NA
Inconsistent strata	none		none		NA
Size or age					
	Temperature				
10-19.9 cm	-0.0475	0.1619	0.0022	0.9095	
20-29.9 cm	0.0084	0.6425	-0.0313	0.0164	
30-39.9 cm	-0.0047	0.8121	-0.0181	0.1592	NA
40-49.9 cm	-0.0060	0.7736	-0.0112	0.3745	
Exact <i>p</i>		0.6250		0.6250	
	Depth				
10-19.9 cm	-0.1837	0.4675	-0.2125	0.5802	
20-29.9 cm	-0.0214	0.8719	-0.0780	0.3560	
30-39.9 cm	0.0470	0.6663	0.0941	0.2451	NA
40-49.9 cm	0.0247	0.8650	0.3765	0.0063	
Exact <i>p</i>		1.0000		1.0000	
	Latitude				
10-19.9 cm	0.0008	0.8996	0.0124	0.0332	
20-29.9 cm	0.0010	0.7231	0.0028	0.3354	
30-39.9 cm	0.0054	0.0283	0.0046	0.0242	NA
40-49.9 cm	0.0011	0.7472	0.0060	0.0381	
Exact <i>p</i>		0.1250		0.1250	
	Longitude				
10-19.9 cm	0.0101	0.2042	-0.0098	0.5164	
20-29.9 cm	0.0037	0.3573	-0.0066	0.2618	
30-39.9 cm	-0.0061	0.1189	-0.0049	0.1558	NA
40-49.9 cm	-0.0050	0.4587	-0.0139	0.0392	
Exact <i>p</i>		1.0000		0.1250	

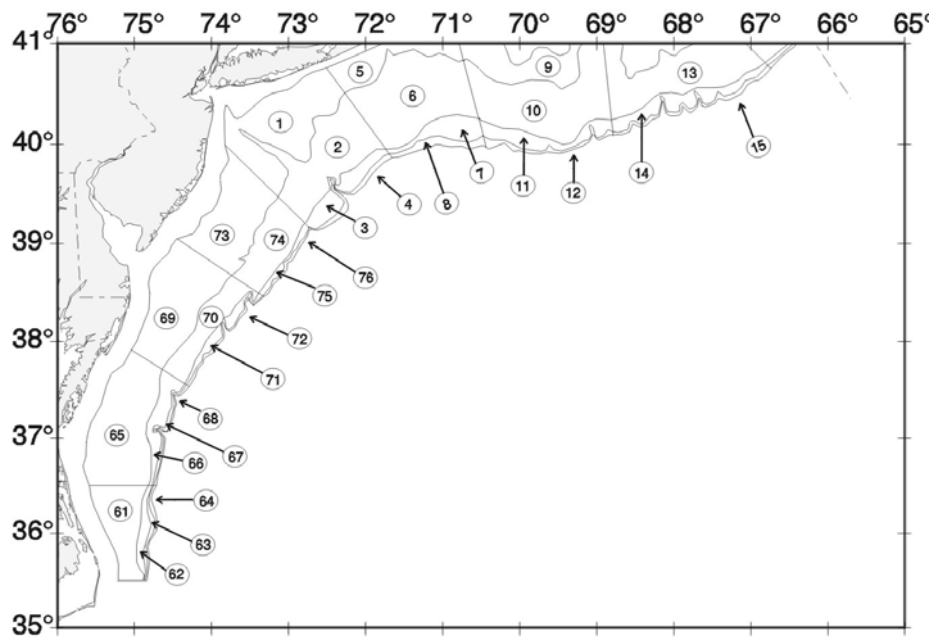
Appendix Table C10. (Continued)

Age	Slope	<i>p</i> -value	Slope	<i>p</i> -value	Slope	<i>p</i> -value
	Depth at age					
0 yr	-0.4234	0.0664	NA	NA		
1 yr	0.0901	0.2377	-0.0961	0.5972		
2 yr	-0.0738	0.3618	0.0978	0.1991		
3 yr	0.0075	0.9260	0.0576	0.5199		
4 yr	0.0417	0.7058	0.2485	0.0025		
5 yr	-0.0618	0.5638	0.3133	0.0028	NA	
6 yr	-0.0361	0.7854	0.1607	0.1358		
7 yr	-0.0608	0.5701	-0.0328	0.8768		
8 yr	0.9753	0.0134	0.7164	0.0443		
9 yr	0.2687	0.5866	NA	NA		
Exact <i>p</i>		1.0000		0.2891		
	Length at age					
0 yr	0.0364	0.2850	NA	NA		
1 yr	-0.0014	0.9540	-0.0643	0.0550		
2 yr	-0.0505	0.0408	-0.0201	0.2494		
3 yr	-0.0795	0.0091	-0.0713	0.0013		
4 yr	0.0073	0.7932	-0.0123	0.6151		
5 yr	0.0995	0.0011	0.0523	0.0323	NA	
6 yr	0.1403	0.0163	0.1530	0.0000		
7 yr	0.2024	0.0090	0.1216	0.0454		
8 yr	-0.0313	0.9358	-0.0083	0.9284		
9 yr	0.3231	0.2233	NA	NA		
Exact <i>p</i>		0.7539		0.7266		

Appendix Figure A1. NEFSC offshore survey strata. Stratum number 5 in the Appendix Figure is, for example, stratum number 1050 in the text.

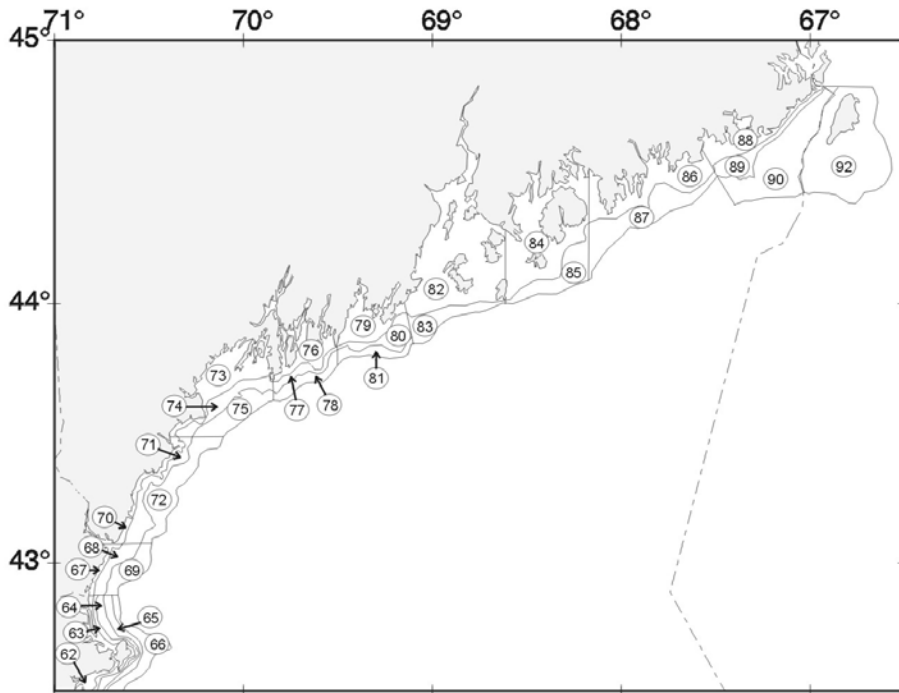


NEFSC Offshore Bottom Trawl Northern Survey Strata

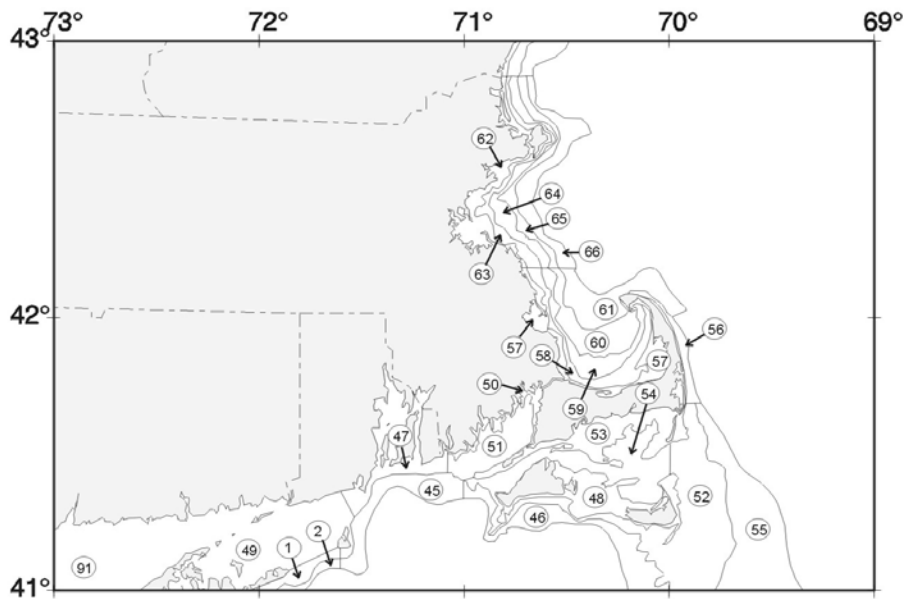


NEFSC Offshore Bottom Trawl Southern Survey Strata

Appendix Figure A2. NEFSC inshore survey strata used in stock assessments for GARM stocks. Stratum number 85 in the Appendix Figure is, for example, stratum number 3850 in the text.

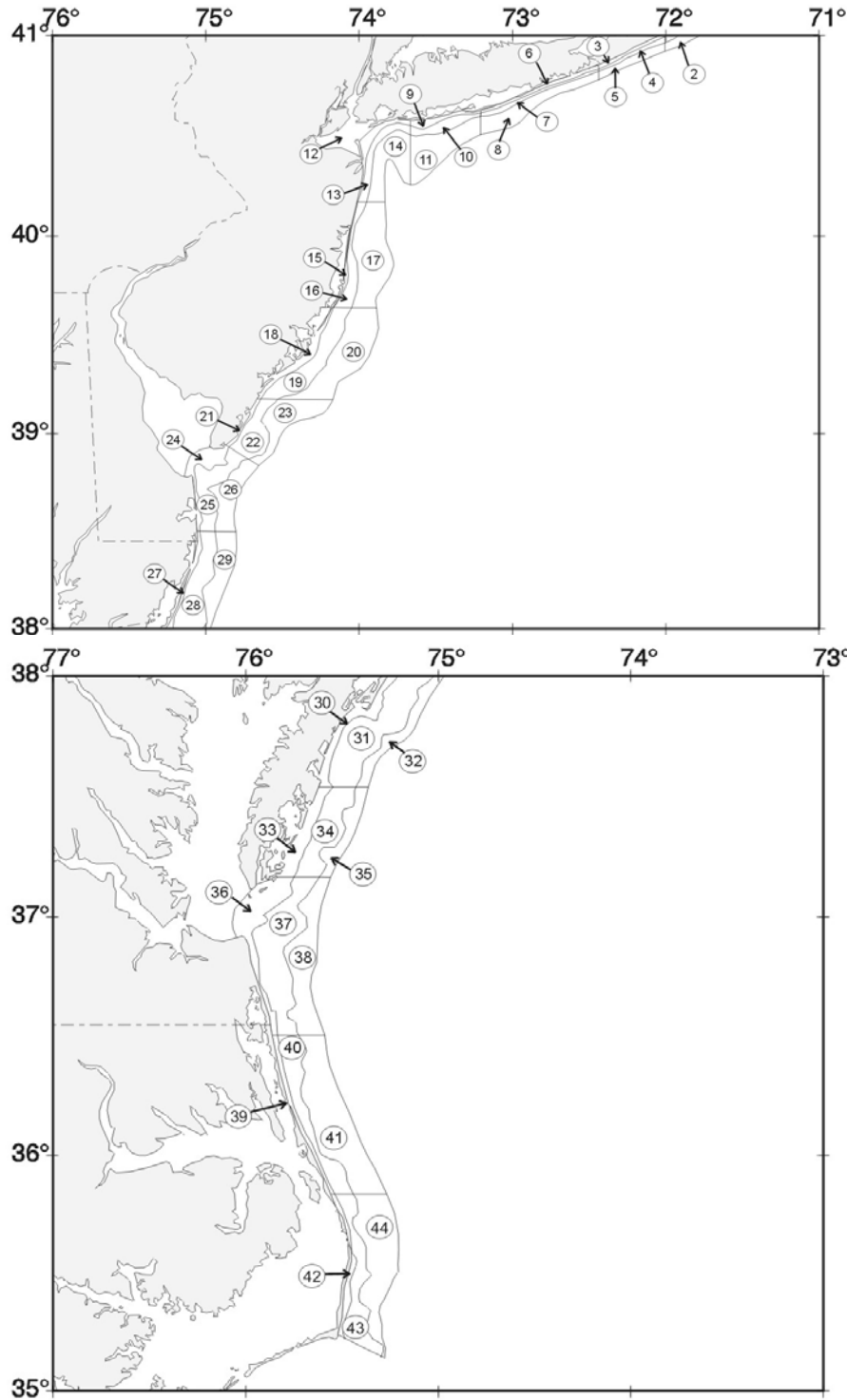


NEFSC Inshore Bottom Trawl Survey Strata - Gulf of Maine Area



NEFSC Inshore Bottom Trawl Survey Strata - Cape Cod & Southern New England Areas

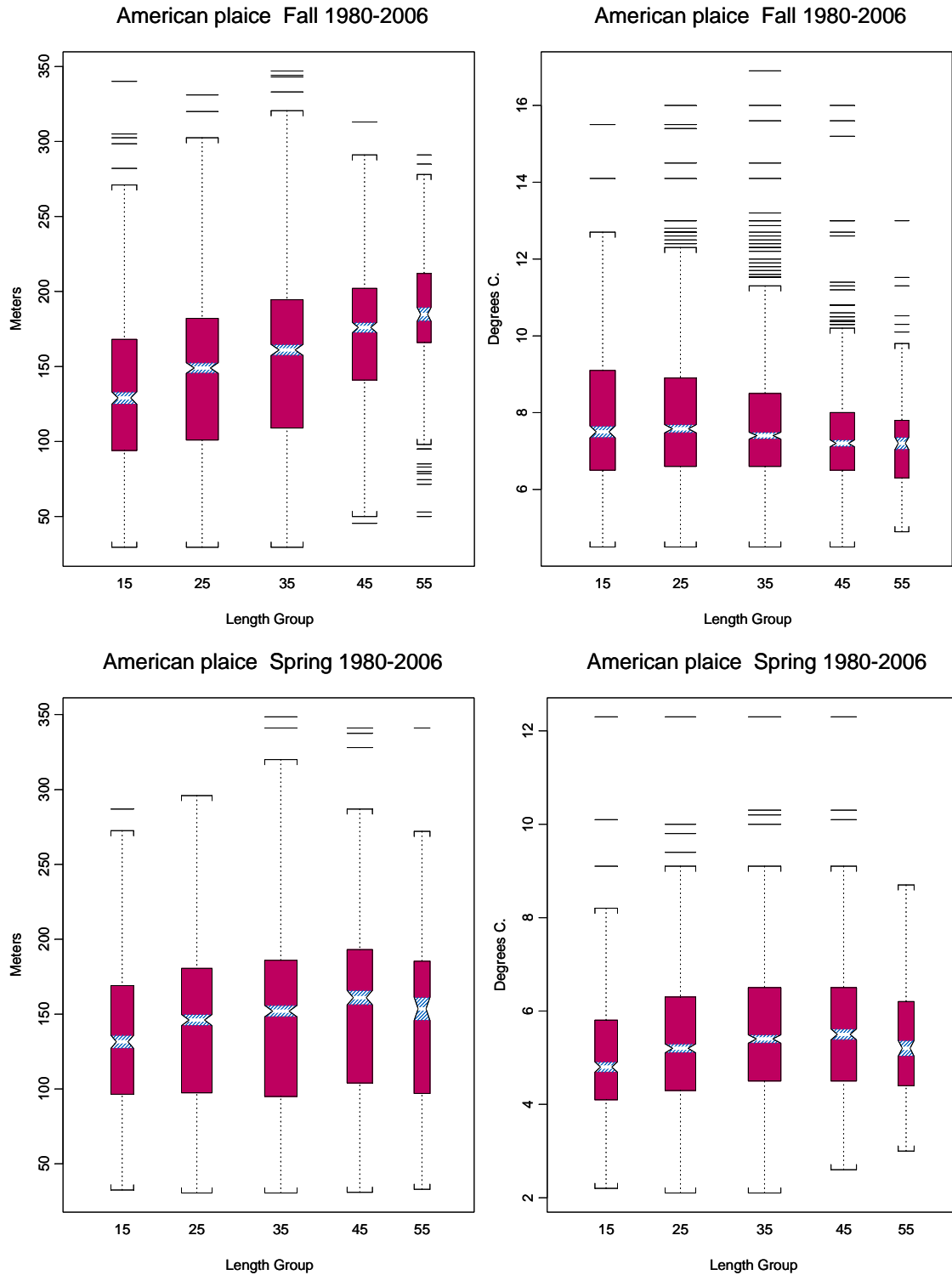
Appendix Figure A2. Continued.



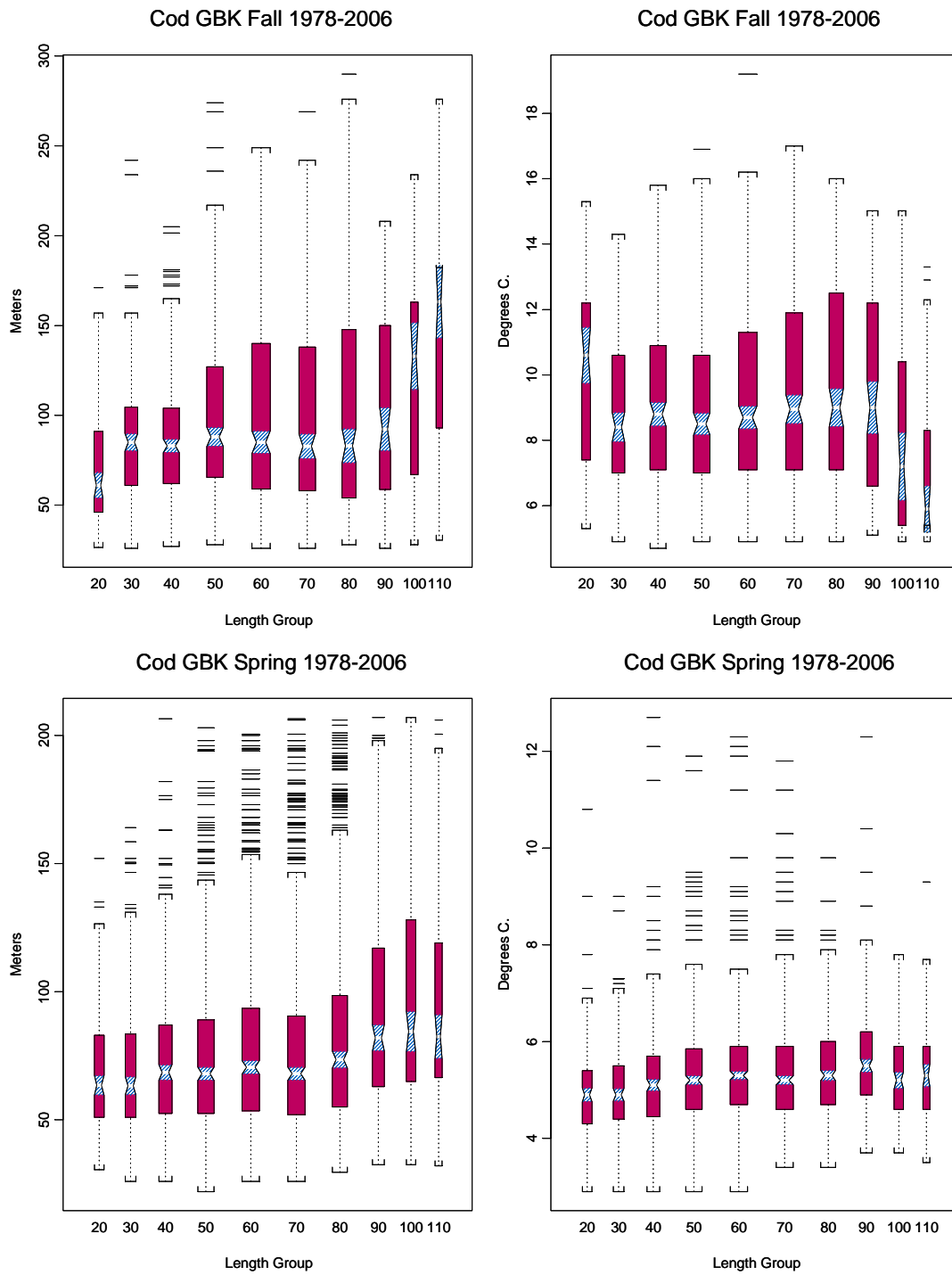
NEFSC Inshore Bottom Trawl Survey Strata - Southern Mid-Atlantic Area

Appendix Figures B1-B10. Boxplots to illustrate relationships between depth, temperature, season and length for GARM stocks in NEFSC bottom trawl surveys. Note that y-axes differ for depth and temperature data from the same stock in different surveys. Boxplots were “abundance” (survey catch) weighted. The boxplots show general relationships between environmental variables and size and probably depict medians and extreme values with reasonable accuracy. However, the data were from stratified random surveys with different sampling rates (stations per km²) among strata. Moreover, the stratification was ignored in computing the boxplots. The adjustment to sample size $N=\text{trunc}(10n)$ and lack of adjustment for stratified random sampling mean that the statistical aspects of the boxplots (e.g. quartiles and confidence intervals for the median) in this analysis are not clear.

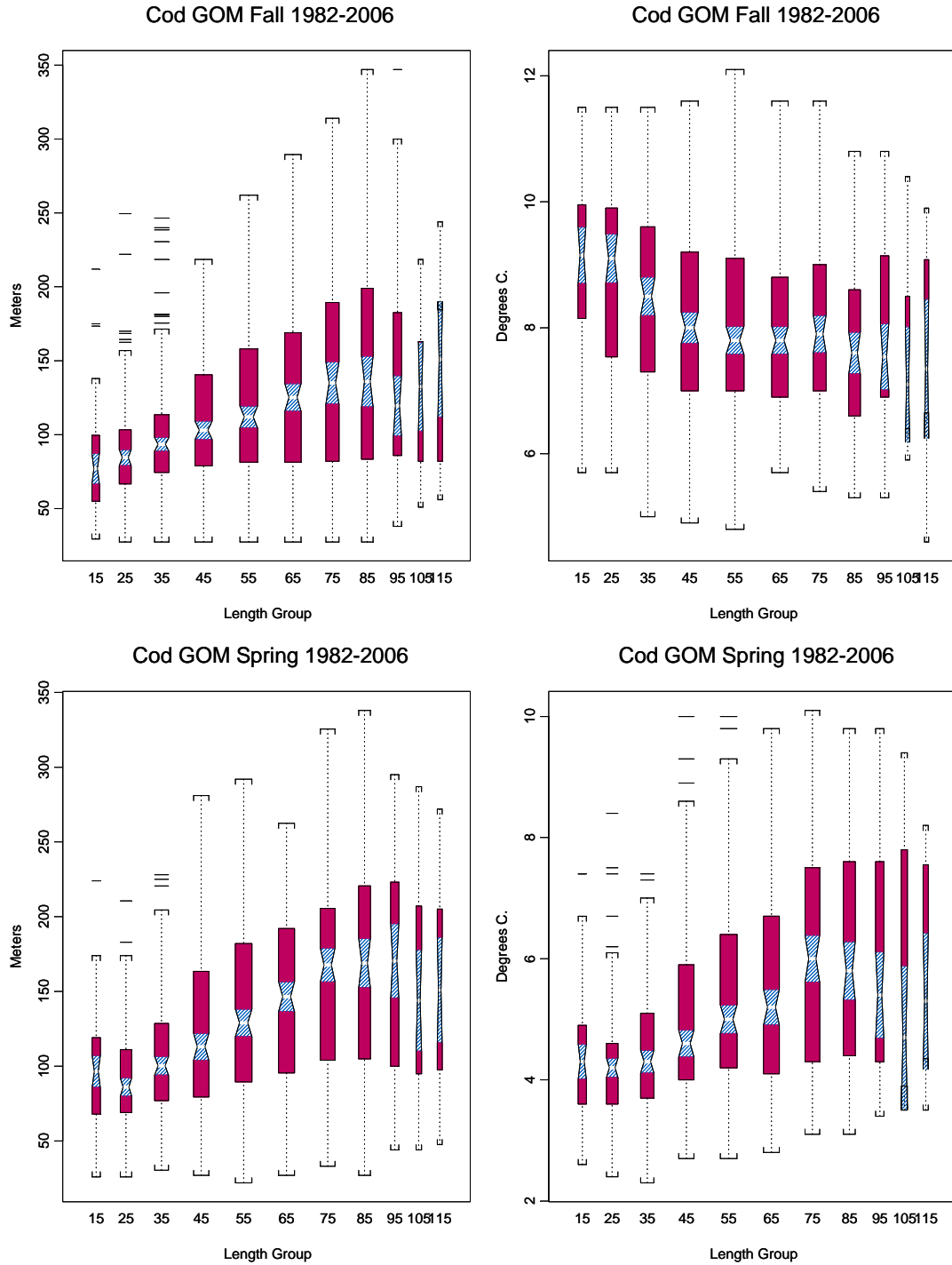
Appendix Figure B1 (see legend above Appendix Figure B1).



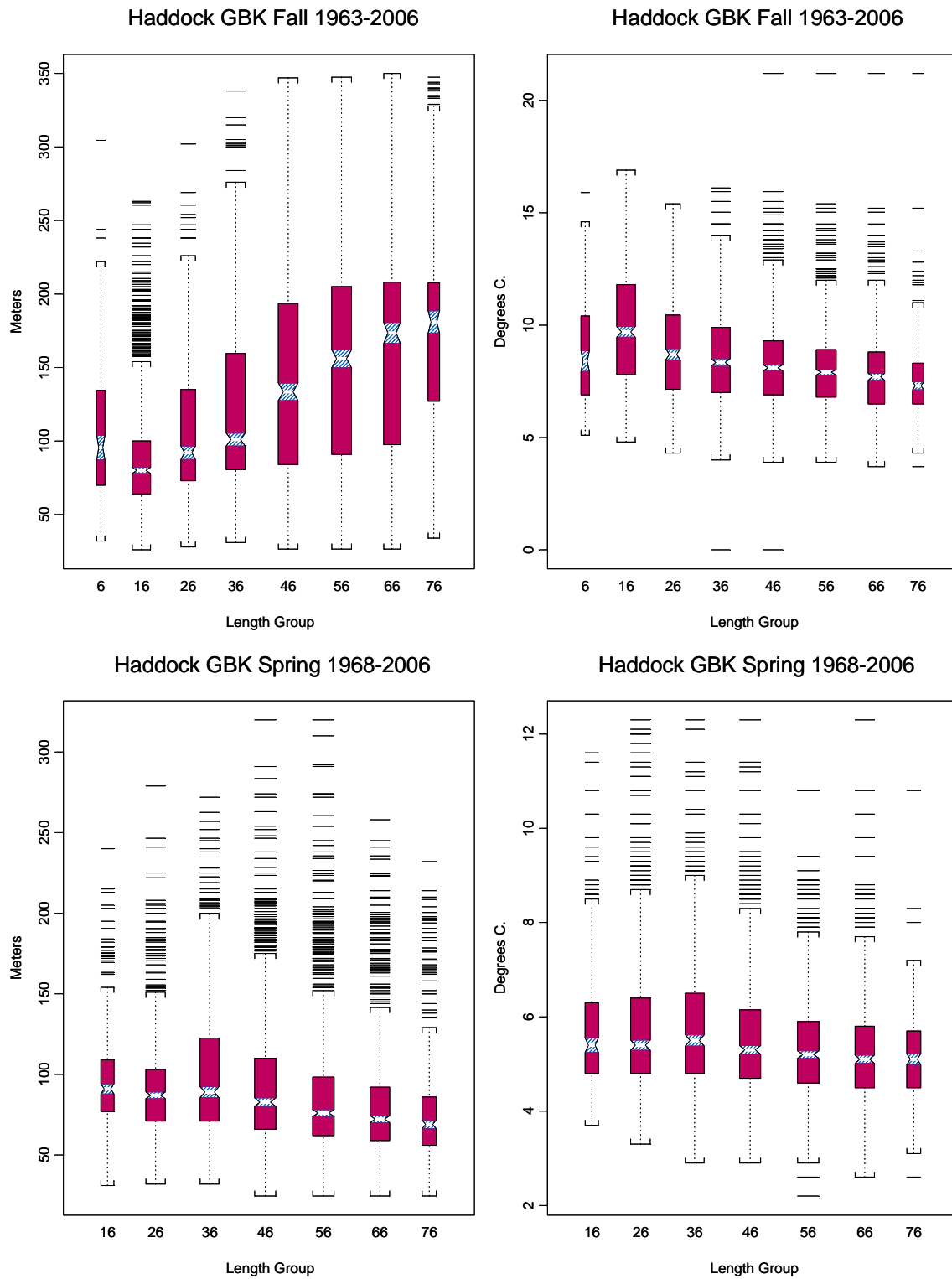
Appendix Figure B2 (see legend above Appendix Figure B1).



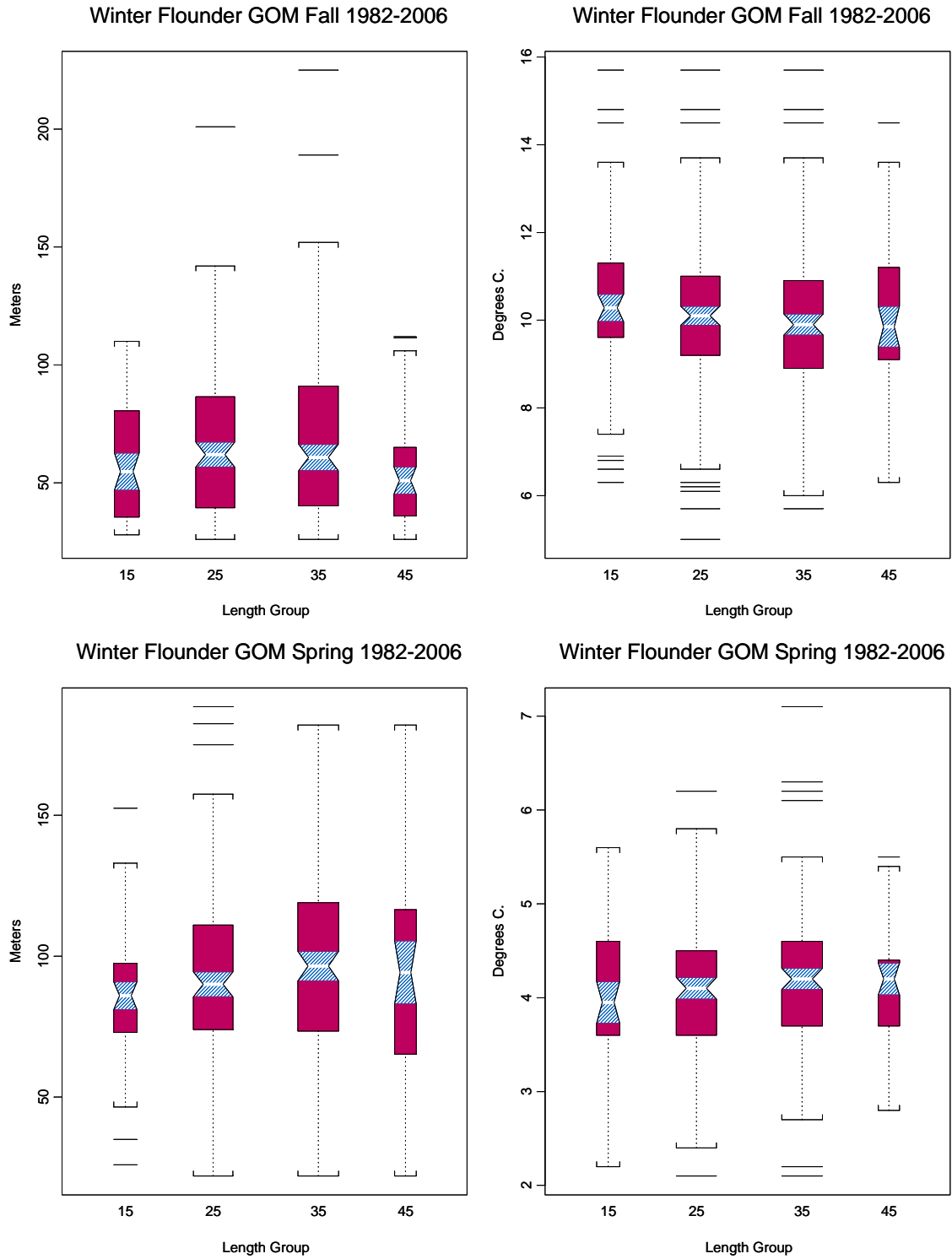
Appendix Figure B3 (see legend above Appendix Figure B1).



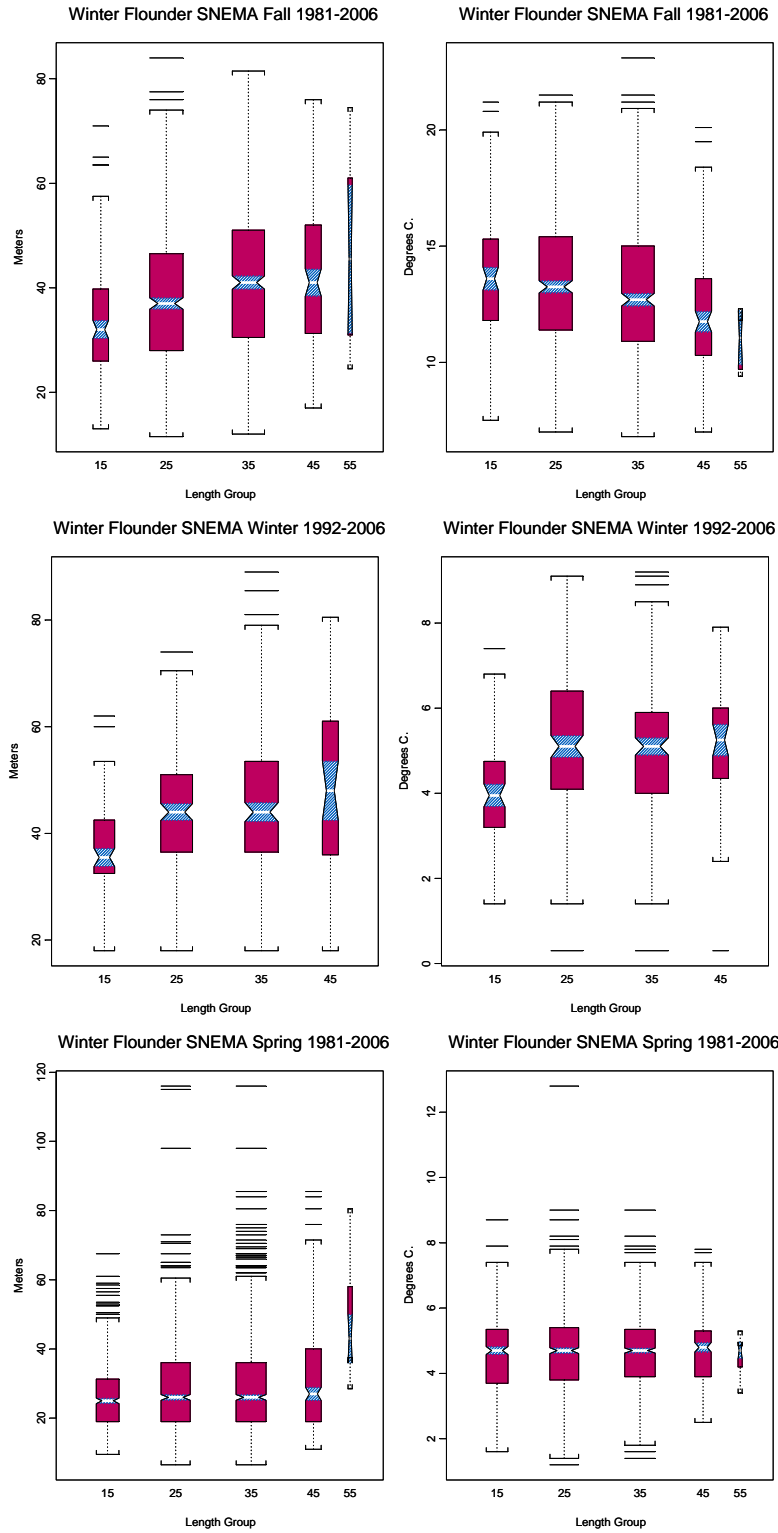
Appendix Figure B4 (see legend above Appendix Figure B1).



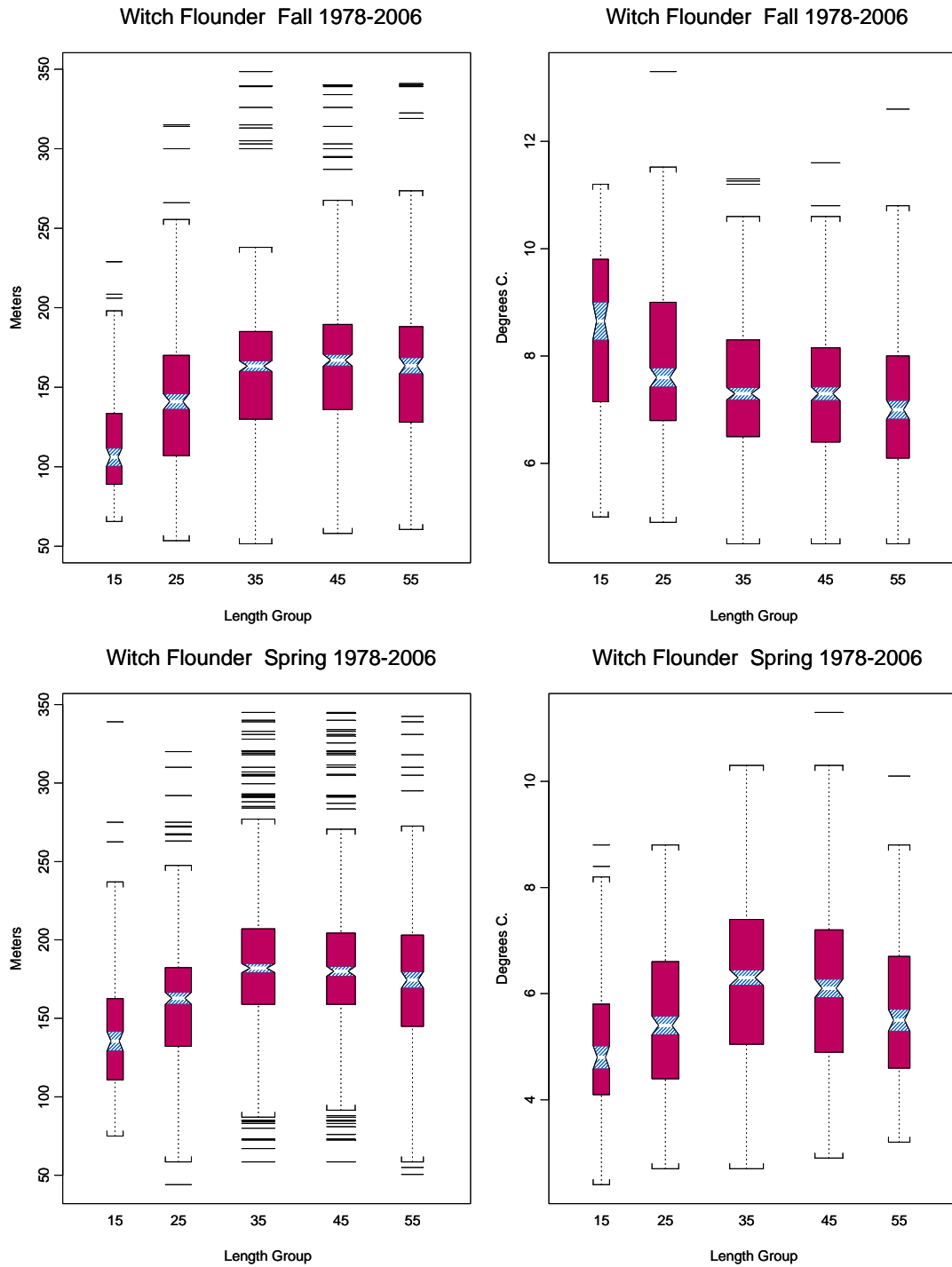
Appendix Figure B5 (see legend above Appendix Figure B1).



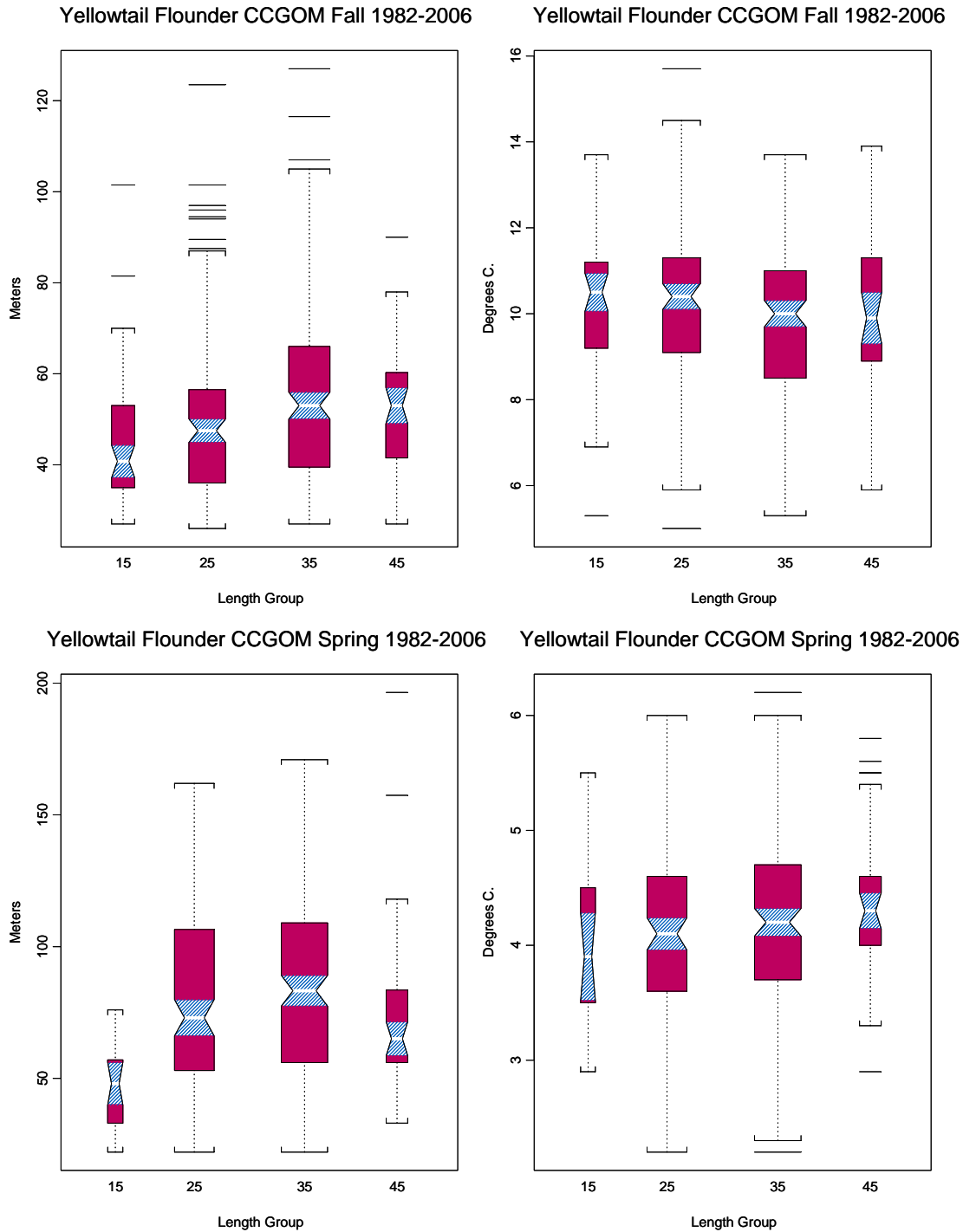
Appendix Figure B6 (see legend above Appendix Figure B1).



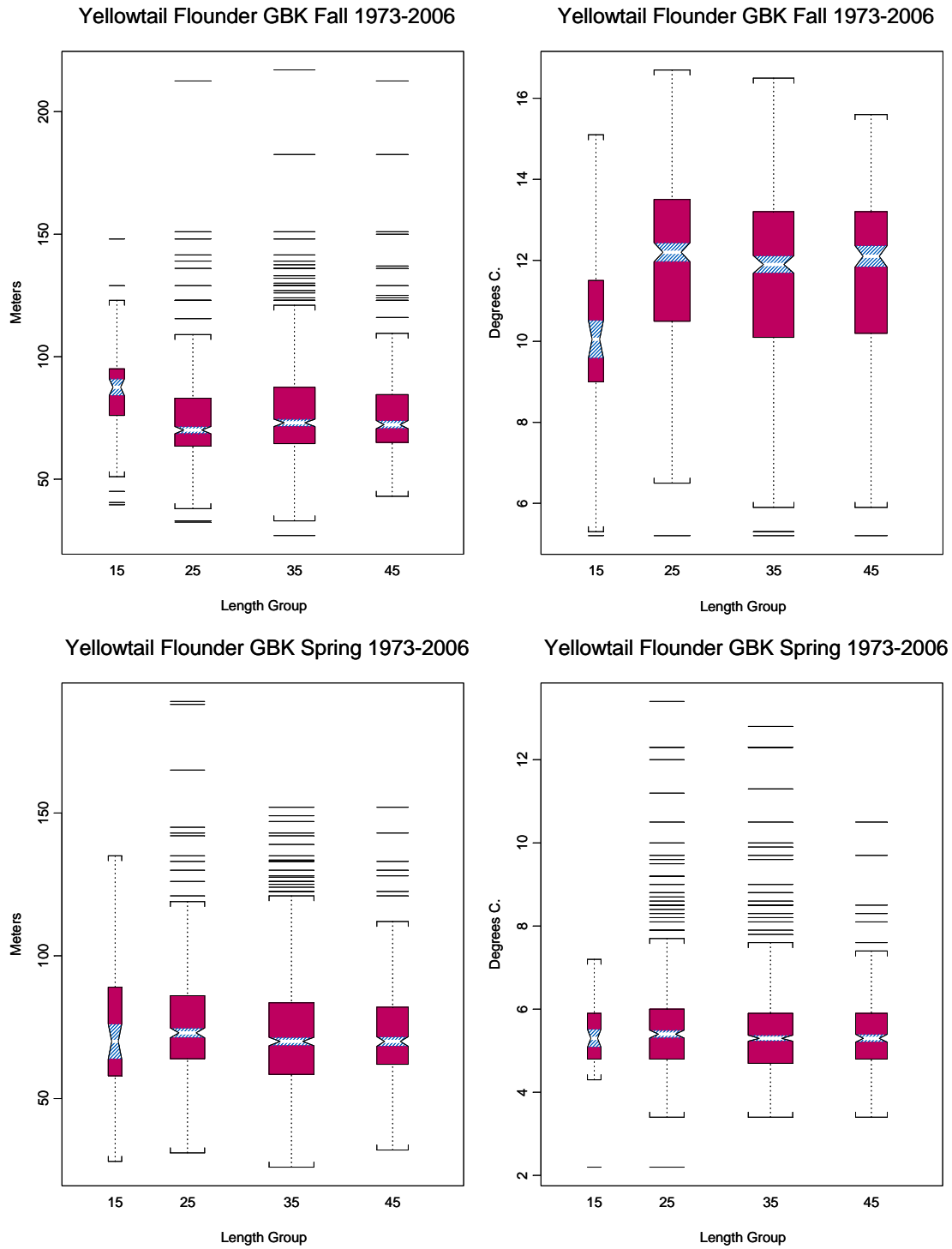
Appendix Figure B7 (see legend above Appendix Figure B1).



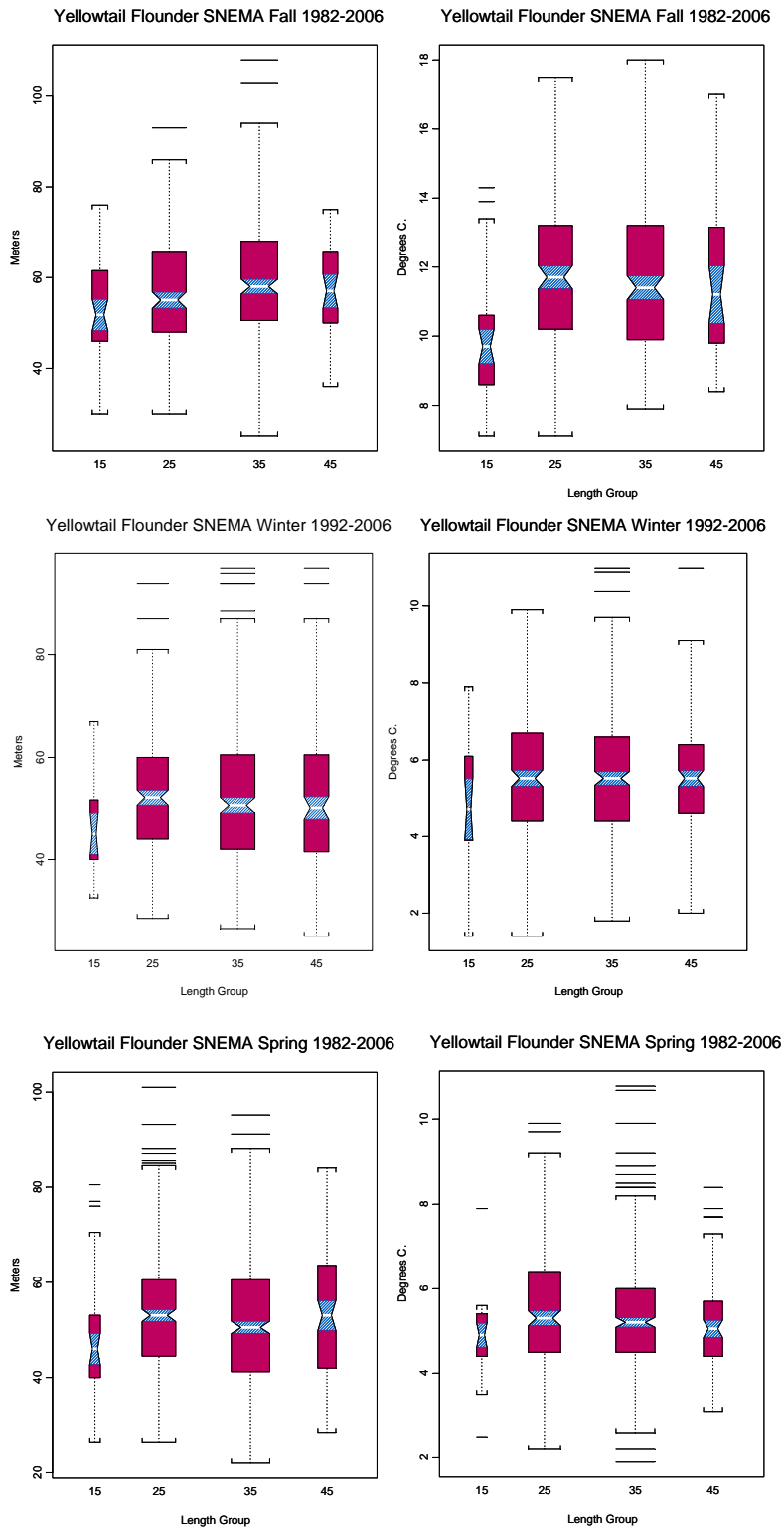
Appendix Figure B8 (see legend above Appendix Figure B1).



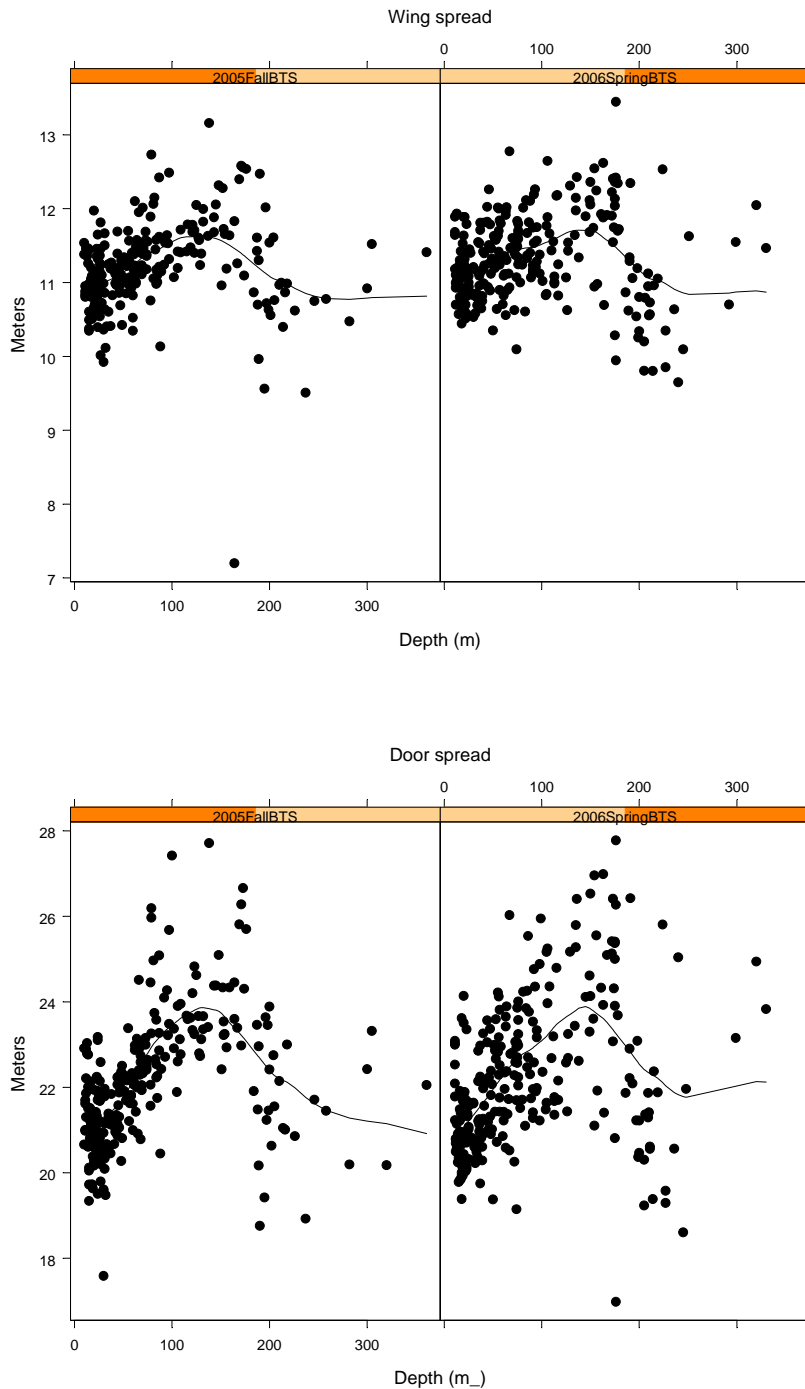
Appendix Figure B9 (see legend above Appendix Figure B1).



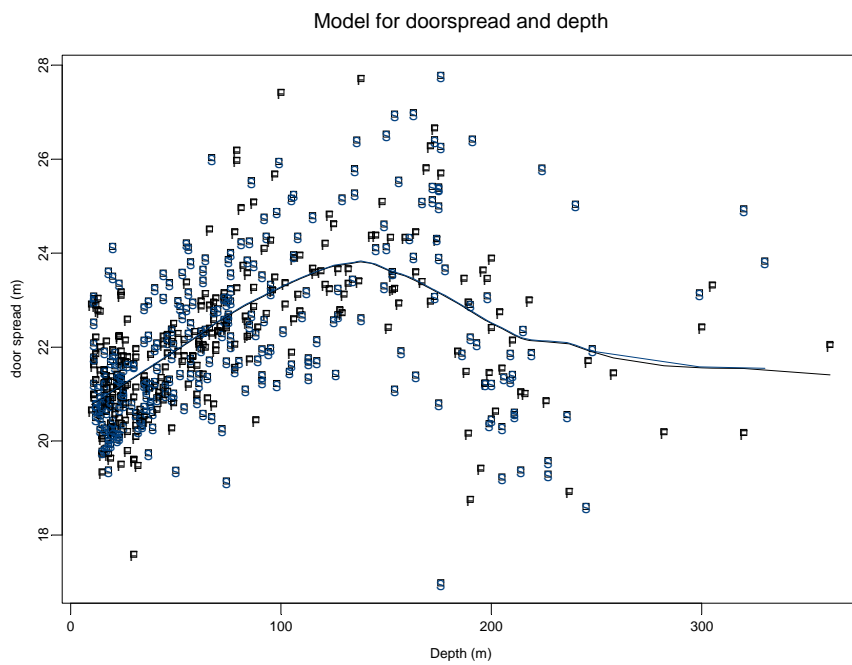
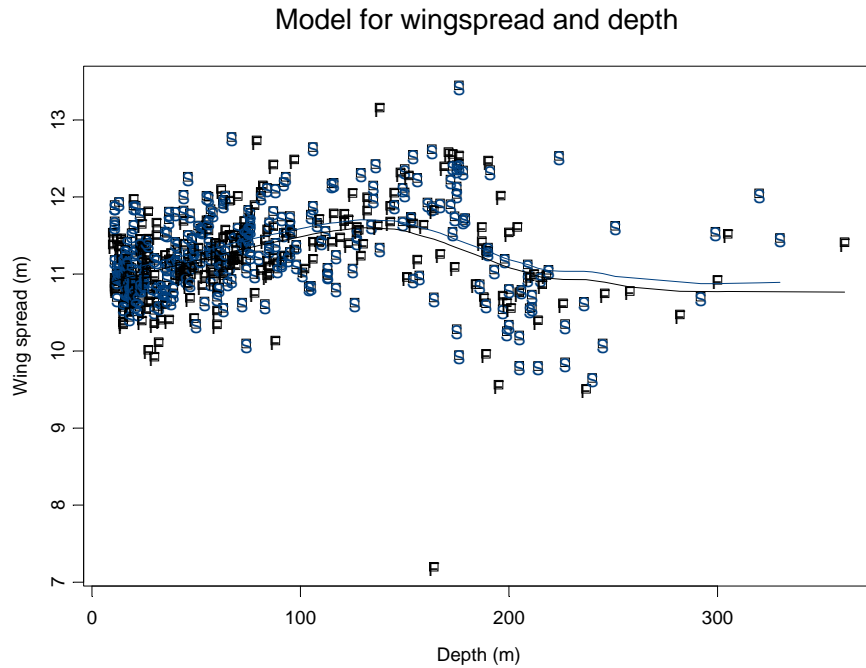
Appendix Figure B10 (see legend above Appendix Figure B1).



Appendix Figure E1. Wing and door spread data collected during the NEFSC 2005 fall and 2006 spring bottom trawl surveys (provided by Phil Politis, NEFSC, Woods Hole, MA). The smooth lines were added to show underlying trends and were not used in statistical analyses.



Appendix Figure E2. Wing and door spread with predicted values from a statistical model. The symbol “F” is used in the plot for the 2005 fall survey and “S” is used in the plot for the 2006 spring survey. There are two smooth lines in each plot showing predicted values from the model for each survey.



Appendix Figure E3. Time on bottom data from a gear calibration experiment conducted in 2002 (provided by Henry Milliken, NEFSC, Woods Hole, MA). *Top*: Original data. The smooth lines show underlying trends but were not used in statistical analyses. *Bottom*: Predicted values from a statistical model and original data. The symbol “A” is used in the lower panel plot for the *R/V Albatross IV* and “D” is used for the *R/V Delaware II*. The two smooth lines in the lower plot show predicted values from the model for each survey.

