Georges Bank Atlantic Cod Tables

Table 1. Catch by country (com and rec denote US commercial and US recreational, respectively, while Ca denotes Canadian) and disposition (land and disc denote landed and discarded, respectively) in metric tons. Discards have discard mortality rate applied.

Year	comland	comdisc	recland	recdisc	Caland	Cadisc	total
1981	33849	775	1796	3	8508	98	45029
1982	39333	739	4790	2	17827	71	62762
1983	36756	492	2103	7	12131	64	51554
1984	32915	74	2501	2	5761	68	41321
1985	26828	262	2220	6	10442	103	39861
1986	17490	343	976	2	8504	51	27366
1987	19035	200	2228	12	11844	76	33395
1988	26310	242	6445	12	12741	83	45833
1989	25056	628	1634	20	7895	76	35309
1990	28110	453	758	19	14364	70	43775
1991	24219	358	1584	7	13467	65	39700
1992	16899	515	1103	17	11667	71	30272
1993	14590	163	2098	74	8526	63	25513
1994	9737	166	717	33	5277	63	15992
1995	7026	85	1820	62	1102	38	10133
1996	7261	114	388	22	1924	56	9765
1997	7548	107	2127	40	2919	486	13226
1998	7041	113	422	64	1907	365	9912
1999	8313	81	194	26	1818	338	10770
2000	7600	134	667	57	1572	69	10099
2001	10749	308	94	20	2143	143	13457
2002	9472	167	458	37	1278	94	11506
2003	6852	229	265	35	1317	200	8898
2004	3508	130	210	21	1112	145	5127
2005	2754	394	325	23	630	226	4352
2006	2700	232	36	6	1097	350	4421
2007	3699	728	23	31	1107	117	5705
2008	3255	309	208	3	1390	140	5305
2009	2999	385	142	9	1003	206	4744
2010	2688	253	195	27	748	94	4005
2011	3387	122	142	25	702	43	4421
2012	2007	120	81	3	395	75	2681
2013	1312	83	7	2	384	39	1828
2014	1514	19	257	19	430	28	2267
2015	1300	31	486	71	472	20	2380
2016	1109	33	1075	32	428	12	2690
2017	464	20	785	25	474	14	1782
2018	574	13	66	6	510	7	1176

Table 2. Discard summary for large mesh otter trawl. WGB = western Georges Bank, EGB = eastern Georges Bank, SNE = southern New England, mt = metric tons, cv = coefficient of variation, # trips = number of observed trips, Prop Dead = fraction of discards assumed to die.

	Large Mesh Otter Trawl									Total		Total
	WGB			EGB			SNE			Disc	Prop	Dead
Year	mt	cv	# trips	mt	cv	# trips	mt	cv	# trips	mt	Dead	mt
1989	606.7	0.28	25	100.0	0.45	12	41.9	0.00	4	749	0.75	561
1990	431.8	0.35	23	92.0	0.38	10	28.8	0.61	17	553	0.75	414
1991	302.8	0.48	28	149.0	0.74	4	0.0	0.00	9	452	0.75	339
1992	147.5	0.52	26	232.0	0.42	11	0.9	0.83	9	380	0.75	285
1993	92.9	0.52	18	73.0	0.57	13	7.4	0.00	15	173	0.75	130
1994	87.1	0.86	20	5.0	1.17	15	0.0	0.00	12	92	0.75	69
1995	52.9	0.48	42	0.0	0.61	15	0.0	0.00	24	53	0.75	40
1996	20.4	0.36	17	1.0	0.38	9	0.3	0.51	21	22	0.75	16
1997	19.1	0.30	16	0.0	0.00	0	0.4	0.75	12	20	0.75	15
1998	6.6	0.61	5	2.0	0.00	3	0.0	0.00	5	9	0.75	6
1999	35.3	0.56	12	12.0	0.00	4	0.0	0.00	10	47	0.75	35
2000	66.7	1.04	21	21.0	0.45	10	0.0	0.00	11	88	0.75	66
2001	150.8	0.59	34	195.0	0.70	11	0.0	0.00	18	346	0.75	259
2002	75.5	0.33	69	12.0	0.49	22	0.0	0.00	13	88	0.75	66
2003	116.9	0.21	142	104.0	0.51	68	0.0	0.00	14	221	0.75	166
2004	51.1	0.19	193	69.0	0.51	67	0.3	0.59	108	120	0.75	90
2005	225.2	0.12	649	254.0	0.13	93	1.0	0.53	270	480	0.75	360
2006	155.7	0.18	342	125.0	0.23	40	0.2	1.16	106	281	0.75	211
2007	563.9	0.11	347	354.0	0.31	49	1.9	0.94	100	920	0.75	690
2008	354.8	0.10	446	26.0	0.19	123	0.1	0.97	114	381	0.75	286
2009	250.6	0.13	380	194.0	0.19	116	25.8	0.78	147	470	0.75	353
2010	160.8	0.11	436	129.0	0.50	87	31.4	1.47	141	321	0.75	241
2011	94.8	0.10	532	25.0	0.04	134	29.4	0.22	296	149	0.75	112
2012	77.4	0.13	379	68.0	0.31	83	2.1	0.26	242	148	0.75	111
2013	62.6	0.13	312	18.0	0.22	43	17.8	0.29	295	98	0.75	74
2014	14.2	0.09	331	2.0	0.26	42	2.9	0.47	395	19	0.75	14
2015	26.7	0.15	269	5.8	0.36	59	1.8	0.28	314	34	0.75	26
2016	24.0	0.15	166	5.4	0.55	31	2.8	0.52	214	32	0.75	24
2017	18.0	0.32	166	2.4	0.24	33	0.5	0.66	245	21	0.75	16
2018	5.9	0.24	103	2.4	0.23	22	0.9	0.46	241	9	0.75	7

Table 3. Discard summary for small mesh otter trawl. WGB = western Georges Bank, EGB = eastern Georges Bank, SNE = southern New England, mt = metric tons, cv = coefficient of variation, # trips = number of observed trips, Prop Dead = fraction of discards assumed to die.

	Small Mesh Otter Trawl									Total		Total
	WGB			EGB			SNE			Discarded	Prop	Dead
Year	mt	cv	# trips	mt	cv	# trips	mt	cv	# trips	mt	Dead	mt
1989	31.1	0.53	23	12.4	0.00	3	44.5	0.56	47	88	0.75	66
1990	1.6	0.49	16	0.0	0.00	1	51.7	5.48	19	53	0.75	40
1991	0.8	0.73	13	0.0	0.00	0	0.6	0.61	58	1	0.75	1
1992	0.1	3.94	13	0.0	0.00	0	0.5	1.04	31	1	0.75	0
1993	11.5	1.13	6	0.0	0.00	0	8.2	0.69	21	20	0.75	15
1994	11.7	0.00	2	0.0	0.00	1	0.7	0.79	16	12	0.75	9
1995	1.2	1.33	5	0.0	0.00	0	0.0	0.00	9	1	0.75	1
1996	0.8	0.00	3	0.0	0.00	0	0.0	0.00	8	1	0.75	1
1997	0.5	0.00	4	0.0	0.00	0	0.0	16.10	18	1	0.75	0
1998	6.0	0.00	1	0.0	0.00	0	5.3	0.77	5	11	0.75	8
1999	0.0	0.00	4	0.0	0.00	0	0.0	0.00	7	0	0.75	0
2000	7.5	0.42	6	0.0	0.00	2	0.0	0.00	12	8	0.75	6
2001	8.0	0.42	10	0.5	0.00	2	0.0	0.00	7	9	0.75	6
2002	15.0	0.34	17	0.5	1.37	6	0.0	0.00	17	16	0.75	12
2003	18.3	0.69	22	6.4	0.00	4	1.7	0.42	34	26	0.75	20
2004	5.2	0.35	32	7.2	0.66	7	0.3	0.46	80	13	0.75	10
2005	8.0	0.19	90	11.0	0.60	14	1.0	0.57	109	20	0.75	15
2006	2.5	0.47	24	0.0	0.00	6	0.0	0.00	44	3	0.75	2
2007	7.6	0.76	17	14.6	1.00	12	1.8	0.54	43	24	0.75	18
2008	3.1	0.63	8	0.2	0.76	5	0.4	0.48	44	4	0.75	3
2009	1.9	1.16	26	0.5	0.53	14	1.5	0.44	172	4	0.75	3
2010	3.6	0.61	33	0.3	0.77	22	0.0	1.02	184	4	0.75	3
2011	0.6	0.66	28	0.0	0.33	19	0.3	0.64	142	1	0.75	1
2012	2.3	0.32	16	0.0	0.00	10	0.3	0.96	118	3	0.75	2
2013	3.3	0.26	44	0.2	1.11	15	0.2	0.84	141	4	0.75	3
2014	0.5	0.44	49	0.0	1.19	11	0.2	0.39	233	1	0.75	1
2015	0.6	0.74	39	0.0	0.94	60	0.4	0.52	180	1	0.75	1
2016	0.2	1.03	26	0.5	0.83	38	1.0	0.88	251	2	0.75	1
2017	0.5	0.50	60	0.0	0.46	46	0.2	0.37	558	1	0.75	1
2018	0.1	0.50	62	0.0	0.42	24	1.0	0.83	325	1	0.75	1

Table 4. Discard summary for scallop dredge. WGB = western Georges Bank, EGB = eastern Georges Bank, SNE = southern New England, mt = metric tons, cv = coefficient of variation, # trips = number of observed trips, Prop Dead = fraction of discards assumed to die.

	Scallop Dredge									Total		Total
	WGB			EGB			SNE			Disc	Prop	Dead
Year	mt	cv	# trips	mt	cv	# trips	mt	cv	# trips	mt	Dead	mt
1989										0	1.00	0
1990										0	1.00	0
1991			1							0	1.00	0
1992	34.0	0.84	10	3.3	0.00	4				37	1.00	37
1993	16.0	0.35	11	2.3	0.00	6				18	1.00	18
1994	30.0	1.04	6	1.2	0.00	1				31	1.00	31
1995	0.0	0.74	6	0.0	0.00	3				0	1.00	0
1996	25.0	0.48	13	0.0	0.00	4				25	1.00	25
1997	24.0	0.54	10	6.4	0.00	4				30	1.00	30
1998	43.0	0.40	9	5.8	0.00	3				49	1.00	49
1999	19.0	0.37	35	1.3	0.86	58				20	1.00	20
2000	3.0	0.15	178	0.7	0.22	88				4	1.00	4
2001	7.0	0.24	17	0.0	0.00	0				7	1.00	7
2002	5.0	0.42	11	0.0	0.00	0				5	1.00	5
2003	5.0	0.31	11	1.8	0.00	1				7	1.00	7
2004	0.0	0.77	22	0.3	0.43	22				0	1.00	0
2005	2.0	0.32	59	0.5	0.70	31				3	1.00	3
2006	4.0	0.23	81	0.6	0.59	50				5	1.00	5
2007	4.0	0.21	106	0.7	0.49	11				5	1.00	5
2008	2.0	0.19	99	0.9	0.26	16				3	1.00	3
2009	1.0	0.37	54	1.1	0.43	35				2	1.00	2
2010	2.0	0.33	52	0.1	0.00	5				2	1.00	2
2011	2.0	0.20	72	1.1	0.54	27				3	1.00	3
2012	3.0	0.19	156	0.9	0.34	52				4	1.00	4
2013	3.0	0.15	150	1.7	0.23	48				5	1.00	5
2014	3.0	0.31	76	0.7	0.50	31				4	1.00	4
2015	2.1	0.24	97	0.9	0.73	49				3	1.00	3
2016	5.5	0.31	136	0.3	0.00	9				6	1.00	6
2017	1.2	0.32	97	1.7	0.26	110				3	1.00	3
2018	5.0	0.17	219	0.3	0.56	28				5	1.00	5

Table 5. Discard summary for gillnet. WGB = western Georges Bank, EGB = eastern Georges Bank, SNE = southern New England, mt = metric tons, cv = coefficient of variation, # trips = number of observed trips, Prop Dead = fraction of discards assumed to die.

	Gillnet									Total		Total
	WGB			EGB			SNE			Disc	Prop	Dead
Year	mt	cv	# trips	mt	cv	# trips	mt	cv	# trips	mt	Dead	mt
1989										0	0.80	0
1990										0	0.80	0
1991										0	0.80	0
1992										0	0.80	0
1993										0	0.80	0
1994	72.0	0.42	13							72	0.80	58
1995	54.0	0.35	39							54	0.80	43
1996	90.0	0.71	17							90	0.80	72
1997	77.0	0.45	13							77	0.80	62
1998	57.0	0.80	33							57	0.80	46
1999	44.0	0.44	30							44	0.80	35
2000	78.0	0.30	44							78	0.80	62
2001	42.0	0.52	27							42	0.80	34
2002	61.0	0.63	22							61	0.80	49
2003	44.0	0.24	88							44	0.80	35
2004	32.0	0.32	174							32	0.80	26
2005	6.0	0.44	161							6	0.80	5
2006	11.0	0.43	45							11	0.80	9
2007	13.0	0.37	106							13	0.80	10
2008	20.0	0.52	61							20	0.80	16
2009	33.0	0.35	48							33	0.80	26
2010	7.0	0.13	434							7	0.80	6
2011	2.0	0.17	366							2	0.80	2
2012	4.0	0.12	276							4	0.80	3
2013	2.0	0.19	233							2	0.80	2
2014	1.0	0.09	364							1	0.80	1
2015	1.5	0.17	263							1	0.80	1
2016	0.2	0.81	143							0	0.80	0
2017	0.5	0.34	244							1	0.80	0
2018	0.1	0.21	86							0	0.80	0

Table 6. Discard summary for longline. WGB = western Georges Bank, EGB = eastern Georges Bank, SNE = southern New England, mt = metric tons, cv = coefficient of variation, # trips = number of observed trips, Prop Dead = fraction of discards assumed to die.

	Longline									Total		Total
	WGB			EGB			SNE			Disc	Prop	Dead
Year	mt	cv	# trips	mt	cv	# trips	mt	cv	# trips	mt	Dead	mt
1989										0	0.33	0
1990										0	0.33	0
1991	55.0	0.84	16							55	0.33	18
1992	581.0	0.18	23							581	0.33	192
1993										0	0.33	0
1994	0.0	0.00	1							0	0.33	0
1995										0	0.33	0
1996										0	0.33	0
1997										0	0.33	0
1998										0	0.33	0
1999										0	0.33	0
2000										0	0.33	0
2001										0	0.33	0
2002	114.0	0.56	7							114	0.33	38
2003	6.0	4.68	5							6	0.33	2
2004	12.0	0.36	111							12	0.33	4
2005	37.0	0.51	224							37	0.33	12
2006	15.0	0.60	57							15	0.33	5
2007	5.0	0.61	51							5	0.33	2
2008	5.0	0.46	54							5	0.33	2
2009	3.0	0.23	44							3	0.33	1
2010	3.0	0.29	112							3	0.33	1
2011	13.0	0.37	33							13	0.33	4
2012	1.0	0.72	106							1	0.33	0
2013	0.0	0.00	3							0	0.33	0
2014	0.0	0.00	2							0	0.33	0
2015	0.0	0.00	0							0	0.33	0
2016	5.4	2.08	15							5	0.33	2
2017	0.0	0.00	72							0	0.33	0
2018	0.0	0.00	132							0	0.33	0

Table 7. Discard summary by region. WGB = western Georges Bank, EGB = eastern Georges Bank, SNE = southern New England, mt = metric tons.

	WGB		EGB		SNE		Total	
	Discarded	Dead	Discarded	Dead	Discarded	Dead	Discarded	Dead
Year	mt	mt	mt	mt	mt	mt	mt	mt
1989	638	478	112	84	86	65	837	627
1990	433	325	92	69	81	60	606	454
1991	359	246	149	112	1	0	508	358
1992	763	336	235	177	1	1	999	515
1993	120	94	75	57	16	12	211	163
1994	201	162	6	5	1	1	208	167
1995	108	84	0	0	0	0	108	84
1996	136	113	1	1	0	0	138	114
1997	121	100	6	6	0	0	127	107
1998	113	98	8	7	5	4	126	109
1999	98	81	13	10	0	0	112	91
2000	155	121	22	16	0	0	177	138
2001	208	160	196	147	0	0	403	306
2002	271	159	13	9	0	0	283	169
2003	190	144	112	85	2	1	304	229
2004	100	72	77	57	1	0	177	130
2005	278	194	266	199	2	2	546	395
2006	188	136	126	94	0	0	314	231
2007	593	445	369	277	4	3	966	725
2008	385	288	27	21	1	0	412	309
2009	289	218	196	147	27	20	512	385
2010	176	132	129	97	31	24	337	252
2011	112	79	26	20	30	22	168	122
2012	88	66	69	52	2	2	159	120
2013	71	54	20	15	18	14	109	83
2014	19	15	3	2	3	2	25	19
2015	31	24	7	5	2	2	40	31
2016	35	26	6	5	4	3	45	33
2017	20	16	4	4	1	1	25	20
2018	11	10	3	2	2	1	16	13

Table 8. Comparison of US recreational catch in metric tons from old (2017) and new (2019) update assessments by catch component.

Year	OldLand	OldDisc	OldCatch	NewLand	NewDisc	NewCatch
1981	5173	3	5176	1796	3	1799
1982	4293	2	4295	4790	2	4792
1983	4681	7	4688	2103	7	2110
1984	1585	2	1587	2501	2	2503
1985	5633	6	5639	2220	6	2226
1986	1045	2	1047	976	2	978
1987	1432	12	1444	2228	12	2240
1988	3243	12	3255	6445	12	6457
1989	1264	20	1284	1634	20	1654
1990	1524	19	1543	758	19	777
1991	1225	7	1232	1584	7	1591
1992	656	17	673	1103	17	1120
1993	2591	74	2665	2098	74	2172
1994	769	33	802	717	33	750
1995	1670	62	1732	1820	62	1882
1996	464	22	486	388	22	410
1997	1323	40	1363	2127	40	2167
1998	881	64	945	422	64	486
1999	411	26	437	194	26	220
2000	863	57	920	667	57	724
2001	348	20	368	94	20	114
2002	325	37	362	458	37	495
2003	312	35	347	265	35	300
2004	274	13	287	210	21	231
2005	966	101	1067	325	23	348
2006	59	4	63	36	6	42
2007	11	3	14	23	31	54
2008	69	1	70	208	3	211
2009	48	5	53	142	9	151
2010	153	23	176	195	27	222
2011	177	17	194	142	25	167
2012	56	1	57	81	3	84
2013	6	1	7	7	2	9
2014	88	2	90	257	19	276
2015	124	15	139	486	71	557
2016	369	30	399	1075	32	1107
2017				785	25	810
2018				66	6	72

Table 9. NMFS spring and fall bottom trawl survey biomass (kg/tow) indices and associated coefficients of variation (CV).

YEAR	Fall	Fall CV	Spring	Spring CV
1963	17.772	0.248		
1964	11.767	0.268		
1965	11.833	0.291		
1966	8.130	0.208		
1967	13.620	0.201		
1968	8.526	0.213	12.675	0.179
1969	7.995	0.185	17.780	0.138
1970	12.579	0.177	15.782	0.185
1971	9.840	0.230	14.256	0.213
1972	22.982	0.304	19.305	0.128
1973	30.840	0.270	94.069	0.550
1974	8.226	0.194	36.383	0.154
1975	14.058	0.367	26.069	0.306
1976	17.663	0.223	18.639	0.134
1977	12.524	0.126	15.441	0.123
1978	23.288	0.140	31.243	0.140
1979	16.507	0.123	16.199	0.140
1980	6.731	0.228	24.133	0.206
1981	20.250	0.410	26.081	0.145
1982	6.076	0.389	101.905	0.820
1983	7.394	0.278	23.484	0.171
1984	10.008	0.299	15.257	0.190
1985	3.110	0.421	21.695	0.182
1986	3.714	0.244	16.684	0.140
1987	4.423	0.268	9.932	0.155
1988	5.600	0.320	13.470	0.176
1989	4.711	0.273	10.943	0.174
1990	11.533	0.381	11.744	0.168
1991	1.423	0.273	8.935	0.128
1992	2.954	0.272	7.441	0.185
1993	2.174	0.315	6.964	0.235
1994	3.257	0.282	1.209	0.244
1995	5.626	0.417	8.373	0.372
1996	2.710	0.253	7.503	0.213
1997	1.894	0.436	5.214	0.235
1998	2.819	0.200	11.651	0.329
1999	3.010	0.387	4.668	0.184
2000	1.352	0.332	8.222	0.213
2001	2.093	0.295	5.473	0.311
2002	11.271	0.404	5.041	0.191
2003	2.093	0.278	4.195	0.373
2004	5.891	0.661	14.326	0.516
2005	1.571	0.267	4.542	0.177
2006	2.645	0.417	6.065	0.226
2007	1.109	0.329	5.065	0.228
2008	2.883	0.306	4.313	0.206
2009	4.220	0.350	3.487	0.198
2010	2.479	0.280	3.777	0.180
2011	3.029	0.350	1.852	0.228
2012	1.611	0.337	3.481	0.225
2013	1.993	0.482	5.719	0.476
2014	1.356	0.273	3.520	0.249
2015	3.503	0.278	1.467	0.193
2016	3.589	0.412	4.157	0.350
2017	1.224	0.407	12.760	0.337
2018	1.692	0.464	2.943	0.395
2019			6.251	0.757

Table 10. Results of PlanBsmooth. avg = average survey biomass index, pred = loess smooth, loci = lower 95% confidence interval for the loess smooth, hici = upper 95% confidence interval for the loess smooth.

Year	avg	pred	loci	hici
1987	6.823	6.960	3.966	9.955
1988	8.947	8.328	6.492	10.164
1989	8.272	8.974	7.203	10.745
1990	8.227	8.851	6.950	10.751
1991	10.234	8.030	5.977	10.082
1992	4.432	6.107	4.055	8.160
1993	4.959	3.866	1.813	5.918
1994	1.692	3.732	1.680	5.785
1995	5.815	4.661	2.609	6.714
1996	6.565	5.542	3.490	7.595
1997	3.962	5.736	3.684	7.789
1998	6.773	5.175	3.122	7.227
1999	3.744	5.071	3.018	7.123
2000	5.616	4.299	2.247	6.352
2001	3.412	3.912	1.859	5.964
2002	3.567	5.058	3.006	7.111
2003	7.733	6.580	4.527	8.632
2004	8.209	7.182	5.130	9.235
2005	5.216	6.012	3.959	8.064
2006	3.818	4.247	2.194	6.299
2007	3.855	3.270	1.217	5.322
2008	2.711	3.223	1.170	5.275
2009	3.185	3.227	1.174	5.279
2010	3.998	3.107	1.055	5.160
2011	2.166	3.130	1.077	5.182
2012	3.255	3.175	1.123	5.228
2013	3.665	3.022	0.969	5.074
2014	2.756	2.428	0.376	4.481
2015	1.412	2.919	0.866	4.971
2016	3.830	4.000	2.100	5.901
2017	8.175	4.270	2.499	6.042
2018	2.084	4.256	2.420	6.092
2019	3.971	3.742	0.745	6.740