

Appendix 4. Bootstrap Output for Gulf of Maine Cod

Bootstrap Summary Report

Number of Bootstrap Repetitions Requested = 1000
 Number of Bootstrap Repetitions Completed = 1000
 Bootstrap Output Variable: Stock Estimates (2005)

	NLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLS Soln.
N 2	18051.	19801.	9675.	0.4886
N 3	2052.	2161.	673.	0.3115
N 4	3597.	3743.	886.	0.2368
N 5	174.	183.	66.	0.3625
N 6	737.	756.	208.	0.2748

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLS Estimate Corrected For Bias	C.V. For Corrected Estimate
N 2	1749.	311.	9.6916	16302.	0.5935
N 3	109.	22.	5.2931	1944.	0.3463
N 4	146.	28.	4.0501	3452.	0.2568
N 5	10.	2.	5.5365	164.	0.4050
N 6	19.	7.	2.5377	719.	0.2891

	LOWER 80. % CI	UPPER 80. % CI
N 2	9440.	31891.
N 3	1376.	3049.
N 4	2727.	4909.
N 5	104.	272.
N 6	513.	1023.

Bootstrap Output Variable: Catchability Estimates

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
Q 1	0.540727E-04	0.545956E-04	0.827388E-05	0.1515
Q 2	0.119324E-03	0.120012E-03	0.120371E-04	0.1003
Q 3	0.213271E-03	0.212844E-03	0.189102E-04	0.0888
Q 4	0.286265E-03	0.287855E-03	0.358489E-04	0.1245
Q 5	0.385326E-03	0.387728E-03	0.679215E-04	0.1752
Q 6	0.512569E-04	0.512655E-04	0.657115E-05	0.1282
Q 7	0.114621E-03	0.114339E-03	0.147188E-04	0.1287
Q 8	0.235486E-03	0.235978E-03	0.251229E-04	0.1065
Q 9	0.377789E-03	0.382567E-03	0.528013E-04	0.1380
Q 10	0.542803E-03	0.547428E-03	0.679780E-04	0.1242
Q 11	0.802556E-03	0.802377E-03	0.962255E-04	0.1199
Q 12	0.622564E-03	0.622083E-03	0.574202E-04	0.0923
Q 13	0.493316E-03	0.498635E-03	0.656052E-04	0.1316
Q 15	0.269618E-03	0.283644E-03	0.875370E-04	0.3086
Q 18	0.142705E-04	0.144301E-04	0.170770E-05	0.1183
Q 19	0.241124E-04	0.242120E-04	0.140148E-05	0.0579
Q 20	0.246504E-04	0.246868E-04	0.108934E-05	0.0441
Q 21	0.256380E-04	0.256148E-04	0.710634E-06	0.0277

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
Q 1	0.5229E-06	0.2622E-06	0.9671	0.5355E-04	0.1545
Q 2	0.6878E-06	0.3813E-06	0.5764	0.1186E-03	0.1015
Q 3	-0.4265E-06	0.5981E-06	-0.2000	0.2137E-03	0.0885
Q 4	0.1590E-05	0.1135E-05	0.5555	0.2847E-03	0.1259
Q 5	0.2401E-05	0.2149E-05	0.6232	0.3829E-03	0.1774
Q 6	0.8607E-08	0.2078E-06	0.0168	0.5125E-04	0.1282
Q 7	-0.2822E-06	0.4655E-06	-0.2462	0.1149E-03	0.1281
Q 8	0.4918E-06	0.7946E-06	0.2088	0.2350E-03	0.1069
Q 9	0.4778E-05	0.1677E-05	1.2648	0.3730E-03	0.1416
Q 10	0.4625E-05	0.2155E-05	0.8520	0.5382E-03	0.1263
Q 11	-0.1789E-06	0.3043E-05	-0.0223	0.8027E-03	0.1199
Q 12	-0.4808E-06	0.1816E-05	-0.0772	0.6230E-03	0.0922
Q 13	0.5319E-05	0.2081E-05	1.0782	0.4880E-03	0.1344
Q 15	0.1403E-04	0.2804E-05	5.2021	0.2556E-03	0.3425
Q 18	0.1595E-06	0.5424E-07	1.1179	0.1411E-04	0.1210
Q 19	0.9953E-07	0.4443E-07	0.4128	0.2401E-04	0.0584
Q 20	0.3645E-07	0.3447E-07	0.1479	0.2461E-04	0.0443
Q 21	-0.2326E-07	0.2248E-07	-0.0907	0.2566E-04	0.0277

	LOWER 80. % CI	UPPER 80. % CI
Q 1	0.443115E-04	0.652195E-04
Q 2	0.104895E-03	0.135329E-03
Q 3	0.189258E-03	0.237830E-03
Q 4	0.243205E-03	0.334172E-03
Q 5	0.302247E-03	0.472936E-03
Q 6	0.434941E-04	0.596438E-04
Q 7	0.956714E-04	0.133125E-03
Q 8	0.205385E-03	0.268675E-03
Q 9	0.319952E-03	0.449477E-03
Q 10	0.462585E-03	0.637418E-03
Q 11	0.680870E-03	0.927766E-03
Q 12	0.554410E-03	0.698540E-03
Q 13	0.416928E-03	0.586342E-03
Q 15	0.183680E-03	0.397477E-03
Q 18	0.123328E-04	0.166984E-04
Q 19	0.223536E-04	0.259625E-04
Q 20	0.232452E-04	0.261059E-04
Q 21	0.247162E-04	0.264931E-04

Bootstrap Output Variable: Fishing Mortality (2004)

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
AGE 1	0.0000	0.0000	0.000000	0.5352
AGE 2	0.0004	0.0005	0.000146	0.3170
AGE 3	0.0690	0.0698	0.015871	0.2273
AGE 4	0.7801	0.8043	0.212510	0.2642
AGE 5	0.3760	0.3896	0.098774	0.2535
AGE 6	0.5781	0.5969	0.122221	0.2047
AGE 7	0.5781	0.5969	0.122221	0.2047

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
AGE 1	0.000000	0.000000	14.8487	0.0000	0.7218
AGE 2	0.000019	0.000005	4.3820	0.0004	0.3461
AGE 3	0.000832	0.000503	1.2054	0.0682	0.2328
AGE 4	0.024150	0.006763	3.0957	0.7560	0.2811
AGE 5	0.013606	0.003153	3.6188	0.3624	0.2726
AGE 6	0.018878	0.003911	3.2658	0.5592	0.2186
AGE 7	0.018878	0.003911	3.2658	0.5592	0.2186

	LOWER 80. % CI	UPPER 80. % CI
AGE 1	0.000000	0.000000
AGE 2	0.000296	0.000657
AGE 3	0.050983	0.089993
AGE 4	0.561080	1.087988
AGE 5	0.284153	0.502891
AGE 6	0.455558	0.755217
AGE 7	0.455558	0.755217

Bootstrap Output Variable: Average F (2004) AGES 4 - 5

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
AVG F	0.5781	0.5969	0.122221	0.2047
N WTD	0.4814	0.4910	0.098450	0.2005
B WTD	0.4675	0.4775	0.097484	0.2042
C WTD	0.5291	0.5468	0.106708	0.1952

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
AVG F	0.018878	0.003911	3.2658	0.5592	0.2186
N WTD	0.009593	0.003128	1.9926	0.4719	0.2086
B WTD	0.009957	0.003099	2.1296	0.4576	0.2130
C WTD	0.017602	0.003420	3.3265	0.5115	0.2086

	LOWER 80. % CI	UPPER 80. % CI
AVG F	0.455558	0.755217
N WTD	0.379037	0.617081
B WTD	0.367838	0.598736
C WTD	0.421293	0.683605

Bootstrap Output Variable: Biomass

JAN-1 Biomass (2005) Mean Biomass & SSB (2004)

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
JAN-1	38331.	40563.	8769.	0.2162
MEAN	30863.	32385.	5554.	0.1715
SSB	20549.	21135.	2892.	0.1368

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
JAN-1	2232.	286.	5.8223	36099.	0.2429
MEAN	1522.	182.	4.9316	29341.	0.1893
SSB	586.	93.	2.8525	19963.	0.1449

	LOWER 80. % CI	UPPER 80. % CI
JAN-1	30807.	51619.
MEAN	25887.	39668.
SSB	17809.	24840.