

## Appendix A. Cape Cod – Gulf of Maine yellowtail flounder ADAPT

Fisheries Assessment Toolbox Cape Cod -Gulf of Maine Yellowtail Flounder - SAW36 Run  
 Number 1 12/4/02 2:56:38 PM

FACT Version 1.5.0

Cape Cod -Gulf of Maine Yellowtail Flounder - SAW36 1985 - 2002

Input Parameters and Options Selected

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Natural mortality is a matrix below

Oldest age (not in the plus group) is 4

For all years prior to the terminal year ( 17 ), backcalculated

stock sizes for the following ages used to estimate

total mortality (Z) for age 4 : 3 4

This method for estimating F on the oldest age is generally used when a

flat-topped partial recruitment curve is thought to be characteristic of the stock.

F for age 5 + is then calculated from the following

ratios of F[age 5 +] to F[age 4 ]

1985	1
1986	1
1987	1
1988	1
1989	1
1990	1
1991	1
1992	1
1993	1
1994	1
1995	1
1996	1
1997	1
1998	1
1999	1
2000	1
2001	1

Stock size of the 5 + group is then calculated using

the following method: CATCH EQUATION

Partial recruitment estimate for 2002

1	0.01
2	0.1
3	1
4	1

Objective function is Sum w\*(LOG(OBS)-LOG(PRED))\*\*2

Indices normalized (by dividing by mean observed value)

before tuning to VFA stocksizes

Downweighting is None or Uniform

Biomass estimates (other than SSB) reflect mean stock sizes.

SSB calculated as in the NEFSC projection program

(see note below SSB table for description of the algorithm).

Initial estimates of parameters for the Marquardt algorithm

and lower and upper bounds on the parameter estimates:

Par.	Initial Est	Lower Bnd	Upper Bnd
N 2	1.00E+06	0.00E+00	1.00E+08
N 3	1.00E+06	0.00E+00	1.00E+08
N 4	1.00E+05	0.00E+00	1.00E+08
q NMFSSs2	1.00E-04	0.00E+00	1.00E-01
q NMFSSs3	1.00E-04	0.00E+00	1.00E-01
q NMFSSs4	1.00E-04	0.00E+00	1.00E-01
q NMFSSs5	1.00E-04	0.00E+00	1.00E-01
q NMFSSf2	1.00E-04	0.00E+00	1.00E-01
q NMFSSf3	1.00E-04	0.00E+00	1.00E-01
q NMFSSf4	1.00E-04	0.00E+00	1.00E-01
q NMFSSf5	1.00E-04	0.00E+00	1.00E-01
q MASSs1	1.00E-04	0.00E+00	1.00E-01
q MASSs2	1.00E-04	0.00E+00	1.00E-01
q MASSs3	1.00E-04	0.00E+00	1.00E-01
q MASSs4	1.00E-04	0.00E+00	1.00E-01
q MASSs5	1.00E-04	0.00E+00	1.00E-01
q MASSf2	1.00E-04	0.00E+00	1.00E-01
q MASSf3	1.00E-04	0.00E+00	1.00E-01
q MASSf4	1.00E-04	0.00E+00	1.00E-01
q MASSf5	1.00E-04	0.00E+00	1.00E-01

The Indices that will be used in this run are:

- 1 NMFSS2
- 2 NMFSS3
- 3 NMFSS4
- 4 NMFSS5
- 5 NMFsf2
- 6 NMFsf3
- 7 NMFsf4
- 8 NMFsf5
- 9 MASSs1
- 10 MASSs2
- 11 MASSs3
- 12 MASSs4
- 13 MASSs5
- 14 MASSf2
- 15 MASSf3
- 16 MASSf4
- 17 MASSf5

Obs Indices (before transvba.formation) by index and year; with Index means

	1985	1986	1987	1988	1989	1990	1991
NMFSS2	0.81	1.79	1.60	3.78	2.18	6.14	3.55
NMFSS3	0.87	0.20	2.36	0.92	1.44	0.21	2.83
NMFSS4	0.21	0.14	0.64	0.51	0.37	0.00	1.05
NMFSS5	0.17	0.10	2.02	0.42	0.39	0.10	0.27
NMFsf2	0.32	4.61	1.31	0.56	3.13	1.66	3.50
NMFsf3	1.12	1.78	3.61	1.36	4.59	5.34	6.20
NMFsf4	0.44	1.35	0.30	0.48	0.44	2.01	2.87
NMFsf5	1.61	0.20	0.04	0.11	0.13	0.63	0.06
MASSs1	1.97	1.73	2.53	3.10	0.67	0.63	0.06
MASSs2	8.27	15.39	4.95	14.46	22.26	11.77	5.34
MASSs3	7.15	1.74	5.31	2.52	3.18	15.57	3.31
MASSs4	1.52	0.24	0.97	0.60	1.08	0.63	2.15
MASSs5	1.07	0.25	0.47	0.07	0.06	0.17	0.65
MASSf2	1.91	5.70	2.60	5.85	8.96	2.64	5.20
MASSf3	3.00	1.63	4.95	2.30	11.24	5.22	11.93
MASSf4	0.86	1.03	0.20	0.49	2.27	0.96	4.84
MASSf5	0.55	0.02	0.04	0.09	0.15	0.10	0.01

  

	1992	1993	1994	1995	1996	1997	1998
NMFSS2	0.91	0.66	2.63	1.04	0.55	0.93	0.75
NMFSS3	1.83	1.05	1.58	3.98	1.43	2.02	2.93
NMFSS4	0.50	0.56	0.95	2.99	2.01	1.55	0.89
NMFSS5	0.02	0.00	0.80	0.48	0.33	0.29	0.14
NMFsf2	1.84	2.54	4.45	2.47	0.52	1.06	1.05
NMFsf3	1.64	2.76	4.51	7.37	0.71	2.91	2.44
NMFsf4	1.64	1.88	0.60	2.60	1.07	4.93	2.94
NMFsf5	0.33	1.27	0.10	1.18	0.47	1.31	2.01
MASSs1	1.30	0.63	2.67	7.51	1.17	0.52	0.55
MASSs2	11.03	7.99	24.02	14.64	18.03	16.94	4.96
MASSs3	9.71	6.31	7.53	24.96	14.70	12.22	13.50
MASSs4	2.38	1.94	1.49	2.88	6.78	4.04	1.25
MASSs5	1.51	0.51	0.45	1.24	1.78	0.54	0.21
MASSf2	3.76	7.18	8.39	2.36	8.38	1.87	1.01
MASSf3	5.14	3.62	7.29	11.79	15.16	3.94	7.38
MASSf4	5.03	2.08	5.80	1.79	5.85	2.18	1.14
MASSf5	0.86	0.67	1.43	0.15	0.00	0.17	0.26

	1999	2000	2001	2002	Average
NMFSs2	0.85	3.93	1.20	1.57	1.937
NMFSs3	3.63	17.63	4.88	7.09	3.160
NMFSs4	1.85	5.84	1.03	3.27	1.433
NMFSs5	0.48	1.67	0.22	0.26	0.480
NMFSf2	1.02	4.15	0.95	0.12	1.959
NMFSf3	2.98	8.09	6.73	3.84	3.777
NMFSf4	1.20	5.53	4.46	2.23	2.054
NMFSf5	1.22	2.42	0.26	0.13	0.749
MASSs1	0.10	0.83	0.22	0.36	1.475
MASSs2	6.34	21.92	10.21	1.29	12.212
MASSs3	10.90	33.29	38.20	13.84	12.441
MASSs4	1.28	11.28	10.39	5.34	3.124
MASSs5	0.08	1.82	1.68	0.43	0.722
MASSf2	7.05	4.73	1.36	0.57	4.418
MASSf3	6.74	11.94	8.25	8.06	7.199
MASSf4	2.25	4.10	3.53	4.23	2.702
MASSf5	0.00	0.73	0.35	0.14	0.358

Catch at age (thousands) - C:\all\_work\yt\2002\ccgom\ccgomyt\_5.2

	1985	1986	1987	1988	1989	1990	1991
1	686	95	19	452	118	84	465
2	1245	4225	1885	2582	2297	2897	1372
3	907	785	2331	1503	1812	9400	1765
4	635	304	309	744	298	493	1953
5	450	48	169	240	46	64	372
1+	3923	5457	4713	5521	4571	12938	5927
	1992	1993	1994	1995	1996	1997	1998
1	1709	159	75	458	07	02	108
2	3979	425	535	751	592	912	707
3	1961	1074	1653	2754	1593	1574	2299
4	731	795	1031	1069	1077	889	563
5	205	165	599	330	359	210	211
1+	8585	2618	3893	5362	3628	3587	3888
	1999	2000	2001				
1	17	09	20				
2	564	1144	1705				
3	1549	3059	3811				
4	770	1310	1261				
5	177	196	217				
1+	3077	5718	7014				

Weight at age (mid year) in kg - C:\all\_work\yt\2002\ccgom\ccgomyt\_5.2

	1985	1986	1987	1988	1989	1990	1991
1	0.130	0.100	0.060	0.120	0.130	0.080	0.120
2	0.270	0.250	0.230	0.210	0.270	0.250	0.240
3	0.360	0.430	0.390	0.340	0.380	0.370	0.340
4	0.490	0.530	0.550	0.520	0.650	0.550	0.520
5	0.650	0.770	0.730	0.720	1.000	0.880	0.790
	1992	1993	1994	1995	1996	1997	1998
1	0.050	0.090	0.080	0.070	0.040	0.030	0.030
2	0.130	0.160	0.220	0.220	0.190	0.300	0.260
3	0.320	0.360	0.370	0.320	0.380	0.380	0.390
4	0.500	0.420	0.460	0.410	0.470	0.460	0.530
5	0.640	0.820	0.650	0.600	0.560	0.590	0.710

	1999	2000	2001
1	0.030	0.030	0.030
2	0.310	0.360	0.320
3	0.410	0.430	0.410
4	0.560	0.560	0.560
5	0.680	0.660	0.780

	C:\all_work\yt\2002\ccgom\ccgomyt_5.2						
	1985	1986	1987	1988	1989	1990	1991
1	00	00	00	00	00	00	00
2	08	08	08	08	08	08	08
3	81	81	81	81	81	81	81
4	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100

	1992	1993	1994	1995	1996	1997	1998
1	00	00	00	00	00	00	00
2	08	08	08	08	08	08	08
3	81	81	81	81	81	81	81
4	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100

	1999	2000	2001
1	00	00	00
2	08	08	08
3	81	81	81
4	100	100	100
5	100	100	100

	C:\all_work\yt\2002\ccgom\ccgomyt_5.2						
	1985	1986	1987	1988	1989	1990	1991
1	.200	.200	.200	.200	.200	.200	.200
2	.200	.200	.200	.200	.200	.200	.200
3	.200	.200	.200	.200	.200	.200	.200
4	.200	.200	.200	.200	.200	.200	.200
5	.200	.200	.200	.200	.200	.200	.200

	1992	1993	1994	1995	1996	1997	1998
1	.200	.200	.200	.200	.200	.200	.200
2	.200	.200	.200	.200	.200	.200	.200
3	.200	.200	.200	.200	.200	.200	.200
4	.200	.200	.200	.200	.200	.200	.200
5	.200	.200	.200	.200	.200	.200	.200

	1999	2000	2001
1	.200	.200	.200
2	.200	.200	.200
3	.200	.200	.200
4	.200	.200	.200
5	.200	.200	.200

	C:\all_work\yt\2002\ccgom\ccgomyt_5.2						
	1985	1986	1987	1988	1989	1990	1991
1	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

	1992	1993	1994	1995	1996	1997	1998
1	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

1	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

	1999	2000	2001
1	0.5	0.5	0.5
2	0.5	0.5	0.5
3	0.5	0.5	0.5
4	0.5	0.5	0.5
5	0.5	0.5	0.5

pF is 0.4167  
pM is 0.4167

Residual Sum of Squares from Marquardt Algorithm

Number 1  
RSS 1167.20610570676  
Lambda 1.00E-02

Number 2  
RSS 960.501312588428  
Lambda 1.00E-03

Number 3  
RSS 812.825939753472  
Lambda 1.00E-01

Number 4  
RSS 713.970645319367  
Lambda 1.00E-02

Number 5  
RSS 673.699577834991  
Lambda 1.00E+00

Number 6  
RSS 606.43245075567  
Lambda 1.00E-01

Number 7  
RSS 577.10979290372  
Lambda 1.00E+01

Number 8  
RSS 529.352828448824  
Lambda 1.00E+00

Number 9  
RSS 507.505243244601  
Lambda 1.00E+02

Number 10  
RSS 472.756446761431  
Lambda 1.00E+01

Number 11  
RSS 456.135501171479  
Lambda 1.00E+00

Number 12  
RSS 430.295151140774  
Lambda 1.00E+02

Number 13  
RSS 325.711420522229  
Lambda 1.00E+01

Number	14	
RSS		313.832802099644
Lambda		1.00E+00
Number	15	
RSS		278.1395076188
Lambda		1.00E+02
Number	16	
RSS		247.371317320554
Lambda		1.00E+01
Number	17	
RSS		242.514033336774
Lambda		1.00E+00
Number	18	
RSS		242.483110462957
Lambda		1.00E+02
Number	19	
RSS		242.482958798594
Lambda		1.00E+01
Number	20	
RSS		242.482972319165
Lambda		1.00E+00
Number	21	
RSS		242.482959173079
Lambda		1.00E-01
Number	22	
RSS		242.482958801263
Lambda		1.00E+01
Number	23	
RSS		242.482958798597
Lambda		1.00E+00
Number	24	
RSS		242.482958798595
Lambda		1.00E-01
Number	25	
RSS		242.482958798594
Lambda		1.00E-02

RESULTS

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 Approximate Statistics Assuming Linearity Near Solution  
 Sum of Squares: 242.482958798594  
 Mean Square Residuals: 0.85987

	PAR.	EST.	STD. ERR.	T-STATISTIC	C.V.
N	2	1.57E+03	6.76E+02	2.32E+00	0.43
N	3	5.19E+03	1.89E+03	2.75E+00	0.36
N	4	3.07E+03	8.80E+02	3.49E+00	0.29
q	NMFSs2	1.10E-04	2.44E-05	4.50E+00	0.22
q	NMFSs3	1.31E-04	2.89E-05	4.52E+00	0.22
q	NMFSs4	3.59E-04	8.21E-05	4.37E+00	0.23
q	NMFSs5	1.35E-03	3.08E-04	4.37E+00	0.23
q	NMFSf2	9.86E-05	2.19E-05	4.50E+00	0.22
q	NMFSf3	1.82E-04	4.03E-05	4.52E+00	0.22
q	NMFSf4	4.13E-04	9.16E-05	4.50E+00	0.22
q	NMFSf5	1.13E-03	2.51E-04	4.50E+00	0.22
q	MASSs1	6.19E-05	1.42E-05	4.37E+00	0.23
q	MASSs2	1.16E-04	2.58E-05	4.50E+00	0.22
q	MASSs3	1.60E-04	3.55E-05	4.52E+00	0.22
q	MASSs4	3.59E-04	7.98E-05	4.50E+00	0.22
q	MASSs5	1.35E-03	2.99E-04	4.50E+00	0.22
q	MASSf2	1.10E-04	2.44E-05	4.50E+00	0.22
q	MASSf3	1.89E-04	4.18E-05	4.52E+00	0.22
q	MASSf4	4.19E-04	9.31E-05	4.50E+00	0.22
q	MASSf5	1.15E-03	2.71E-04	4.25E+00	0.24

Catchability Estimates in Original Units

	Estimate	Std.Err.	C.V.	
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q	NMFSs2	2.13E-04	4.73E-05	0.22
q	NMFSs3	4.13E-04	9.15E-05	0.22
q	NMFSs4	5.14E-04	1.18E-04	0.23
q	NMFSs5	6.46E-04	1.48E-04	0.23
q	NMFSf2	1.93E-04	4.29E-05	0.22
q	NMFSf3	6.88E-04	1.52E-04	0.22
q	NMFSf4	8.47E-04	1.88E-04	0.22
q	NMFSf5	8.45E-04	1.88E-04	0.22
q	MASSs1	9.13E-05	2.09E-05	0.23
q	MASSs2	1.42E-03	3.15E-04	0.22
q	MASSs3	1.99E-03	4.41E-04	0.22
q	MASSs4	1.12E-03	2.49E-04	0.22
q	MASSs5	9.72E-04	2.16E-04	0.22
q	MASSf2	4.85E-04	1.08E-04	0.22
q	MASSf3	1.36E-03	3.01E-04	0.22
q	MASSf4	1.13E-03	2.52E-04	0.22
q	MASSf5	4.11E-04	9.69E-05	0.24

CORRELATION BETWEEN PARAMETERS ESTIMATED

1	0.04	0.04	-0.11	-0.01	-0.01	-0.01	-0.11	-0.01	-0.01	-0.01	-0.12	-0.11	-0.01	-0.01	-0.01	-0.11	-0.01	-0.01	-0.01
0.04	1	0.05	-0.08	-0.1	-0.01	-0.01	-0.08	-0.1	-0.01	-0.01	-0.08	-0.08	-0.1	-0.01	-0.01	-0.08	-0.1	-0.01	-0.01
0.04	0.05	1	-0.07	-0.08	-0.15	-0.15	-0.07	-0.08	-0.15	-0.15	-0.08	-0.07	-0.08	-0.15	-0.15	-0.07	-0.08	-0.15	-0.14
-0.11	-0.08	-0.07	1	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01
-0.01	-0.1	-0.08	0.01	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-0.01	-0.01	-0.15	0.01	0.01	1	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02
-0.01	-0.01	-0.15	0.01	0.01	0.02	1	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02
-0.11	-0.08	-0.07	0.02	0.01	0.01	0.01	1	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01
-0.01	-0.1	-0.08	0.01	0.01	0.01	0.01	0.01	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-0.01	-0.01	-0.15	0.01	0.01	0.02	0.02	0.01	0.01	1	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02
-0.12	-0.08	-0.08	0.02	0.01	0.01	0.01	0.02	0.01	0.01	1	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
-0.11	-0.08	-0.07	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.02	1	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
-0.01	-0.1	-0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
-0.01	-0.01	-0.15	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	1	0.02	0.01	0.01	0.01	0.02	0.02
-0.01	-0.01	-0.15	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	1	0.01	0.01	0.01	0.02	0.02
-0.11	-0.08	-0.07	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	1	0.01	0.01	0.01	0.01
-0.01	-0.1	-0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1	0.01	0.01	0.01
-0.01	-0.01	-0.15	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	1	0.01	0.01
-0.01	-0.01	-0.15	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	1	0.01
-0.01	-0.01	-0.14	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1





NMFSS

Tuned to: 1-Jan and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	0.870	0.701	-1.290		-1.506		1	0.216	0.233	1696
1986	0.200	0.616	-2.760		-1.636		1	-1.124	-1.212	1489
1987	2.360	1.618	-0.292		-0.669		1	0.377	0.407	3915
1988	0.920	0.936	-1.234		-1.216		1	-0.018	-0.019	2266
1989	1.440	1.268	-0.786		-0.913		1	0.127	0.137	3068
1990	0.210	6.993	-2.711		0.794		1	-3.506	-3.780	16922
1991	2.830	2.018	-0.110		-0.448		1	0.338	0.365	4883
1992	1.830	2.684	-0.546		-0.163		1	-0.383	-0.413	6495
1993	1.050	1.991	-1.102		-0.462		1	-0.640	-0.690	4817
1994	1.580	1.988	-0.693		-0.463		1	-0.230	-0.248	4811
1995	3.980	2.634	0.231		-0.182		1	0.413	0.445	6372
1996	1.430	1.684	-0.793		-0.629		1	-0.164	-0.177	4076
1997	2.020	1.406	-0.447		-0.810		1	0.362	0.391	3402
1998	2.930	2.323	-0.076		-0.308		1	0.232	0.250	5621
1999	3.630	2.115	0.139		-0.402		1	0.540	0.583	5117
2000	17.630	2.727	1.719		-0.147		1	1.866	2.013	6598
2001	4.880	3.290	0.435		0.040		1	0.394	0.425	7961
2002	7.090	2.143	0.808		-0.388		1	1.196	1.290	5185

Partial Variance: 1.202

NMFSS

Tuned to: 1-Jan and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	0.210	0.601	-1.920		-0.869		1	-1.051	-1.134	1168
1986	0.140	0.292	-2.326		-1.591		1	-0.735	-0.793	568
1987	0.640	0.262	-0.806		-1.699		1	0.893	0.964	509
1988	0.510	0.564	-1.033		-0.933		1	-0.100	-0.108	1096
1989	0.370	0.255	-1.354		-1.727		1	0.373	0.403	495
1990	0.000	0.000	0		0		1	0.000	0.000	00
1991	1.050	2.751	-0.311		0.652		1	-0.963	-1.039	5349
1992	0.500	1.235	-1.053		-0.149		1	-0.904	-0.975	2401
1993	0.560	1.823	-0.940		0.241		1	-1.180	-1.273	3543
1994	0.950	1.529	-0.411		0.065		1	-0.476	-0.513	2972
1995	2.990	1.257	0.736		-0.131		1	0.867	0.935	2443
1996	2.010	1.402	0.338		-0.022		1	0.360	0.389	2725
1997	1.550	0.975	0.079		-0.385		1	0.463	0.500	1896
1998	0.890	0.700	-0.476		-0.716		1	0.240	0.259	1361
1999	1.850	1.297	0.255		-0.099		1	0.355	0.383	2522
2000	5.840	1.434	1.405		0.001		1	1.404	1.514	2788
2001	1.030	1.355	-0.330		-0.056		1	-0.274	-0.296	2634
2002	3.270	1.579	0.825		0.097		1	0.728	0.785	3069

Partial Variance: 0.62

NMFSs

Tuned to: 1-Jan and number

For ages: 5

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	0.170	0.526	-1.038		0.091		1	-1.129	-1.217	814
1986	0.100	0.057	-1.569		-2.132		1	0.563	0.607	88
1987	2.020	0.176	1.437		-1.002		1	2.439	2.630	273
1988	0.420	0.223	-0.134		-0.767		1	0.633	0.683	345
1989	0.390	0.048	-0.208		-2.294		1	2.087	2.250	75
1990	0.100	0.072	-1.569		-1.899		1	0.331	0.357	111
1991	0.270	0.651	-0.575		0.305		1	-0.880	-0.949	1008
1992	0.020	0.431	-3.178		-0.108		1	-3.071	-3.311	668
1993	0.000	0.000	0		0		1	0.000	0.000	00
1994	0.800	1.104	0.511		0.833		1	-0.322	-0.348	1710
1995	0.480	0.481	0.000		0.002		1	-0.002	-0.002	745
1996	0.330	0.580	-0.375		0.189		1	-0.564	-0.608	898
1997	0.290	0.285	-0.504		-0.521		1	0.017	0.018	442
1998	0.140	0.325	-1.232		-0.389		1	-0.844	-0.910	504
1999	0.480	0.371	0.000		-0.257		1	0.257	0.277	575
2000	1.670	0.266	1.247		-0.592		1	1.838	1.983	411
2001	0.220	0.289	-0.780		-0.509		1	-0.271	-0.293	447
2002	0.260	0.767	-0.613		0.469		1	-1.082	-1.167	1188

Partial Variance: 1.797

NMFSf

Tuned to: 1-Jan and number

For ages: 2

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	0.320	0.617	-1.812		-1.155		1	-0.657	-0.708	3195
1986	4.610	1.825	0.856		-0.071		1	0.926	0.999	9451
1987	1.310	0.937	-0.402		-0.738		1	0.335	0.362	4851
1988	0.560	1.275	-1.252		-0.430		1	-0.823	-0.887	6601
1989	3.130	4.482	0.469		0.828		1	-0.359	-0.387	23207
1990	1.660	1.770	-0.166		-0.101		1	-0.064	-0.069	9166
1991	3.500	1.825	0.580		-0.071		1	0.651	0.702	9449
1992	1.840	1.986	-0.063		0.014		1	-0.076	-0.082	10281
1993	2.540	1.226	0.260		-0.469		1	0.729	0.786	6346
1994	4.450	1.617	0.821		-0.192		1	1.012	1.091	8375
1995	2.470	1.122	0.232		-0.557		1	0.789	0.851	5808
1996	0.520	0.929	-1.326		-0.746		1	-0.580	-0.626	4809
1997	1.060	1.521	-0.614		-0.253		1	-0.361	-0.389	7874
1998	1.050	1.358	-0.624		-0.366		1	-0.257	-0.277	7031
1999	1.020	1.677	-0.653		-0.155		1	-0.497	-0.536	8682
2000	4.150	2.122	0.751		0.080		1	0.671	0.723	10988
2001	0.950	1.587	-0.724		-0.210		1	-0.513	-0.553	8218
2002	0.120	0.303	-2.793		-1.866		1	-0.926	-0.999	1569

Partial Variance: 0.426

NMFSf

Tuned to: 1-Jan and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	1.120	1.166	-1.216		-1.175		1	-0.041	-0.044	1696
1986	1.780	1.024	-0.752		-1.305		1	0.552	0.596	1489
1987	3.610	2.693	-0.045		-0.338		1	0.293	0.316	3915
1988	1.360	1.559	-1.021		-0.885		1	-0.136	-0.147	2266
1989	4.590	2.110	0.195		-0.582		1	0.777	0.838	3068
1990	5.340	11.639	0.346		1.126		1	-0.779	-0.840	16922
1991	6.200	3.359	0.496		-0.117		1	0.613	0.661	4883
1992	1.640	4.467	-0.834		0.168		1	-1.002	-1.081	6495
1993	2.760	3.313	-0.314		-0.131		1	-0.183	-0.197	4817
1994	4.510	3.309	0.177		-0.132		1	0.310	0.334	4811
1995	7.370	4.383	0.669		0.149		1	0.520	0.560	6372
1996	0.710	2.803	-1.671		-0.298		1	-1.373	-1.481	4076
1997	2.910	2.340	-0.261		-0.479		1	0.218	0.235	3402
1998	2.440	3.867	-0.437		0.024		1	-0.460	-0.496	5621
1999	2.980	3.520	-0.237		-0.071		1	-0.166	-0.179	5117
2000	8.090	4.538	0.762		0.184		1	0.578	0.623	6598
2001	6.730	5.476	0.578		0.371		1	0.206	0.222	7961
2002	3.840	3.567	0.017		-0.057		1	0.074	0.080	5185

Partial Variance: 0.354

NMFSf

Tuned to: 1-Jan and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	0.440	0.990	-1.541		-0.730		1	-0.811	-0.874	1168
1986	1.350	0.481	-0.420		-1.452		1	1.032	1.113	568
1987	0.300	0.431	-1.924		-1.560		1	-0.363	-0.392	509
1988	0.480	0.929	-1.454		-0.794		1	-0.660	-0.712	1096
1989	0.440	0.420	-1.541		-1.588		1	0.048	0.051	495
1990	2.010	0.739	-0.022		-1.022		1	1.000	1.079	872
1991	2.870	4.532	0.335		0.791		1	-0.457	-0.493	5349
1992	1.640	2.034	-0.225		-0.010		1	-0.215	-0.232	2401
1993	1.880	3.002	-0.088		0.380		1	-0.468	-0.505	3543
1994	0.600	2.518	-1.231		0.204		1	-1.434	-1.547	2972
1995	2.600	2.070	0.236		0.008		1	0.228	0.246	2443
1996	1.070	2.309	-0.652		0.117		1	-0.769	-0.830	2725
1997	4.930	1.606	0.876		-0.246		1	1.122	1.209	1896
1998	2.940	1.153	0.359		-0.577		1	0.936	1.009	1361
1999	1.200	2.137	-0.537		0.040		1	-0.577	-0.622	2522
2000	5.530	2.362	0.990		0.140		1	0.851	0.917	2788
2001	4.460	2.232	0.775		0.083		1	0.692	0.747	2634
2002	2.230	2.601	0.082		0.236		1	-0.154	-0.166	3069

Partial Variance: 0.604

NMFSf

Tuned to: 1-Jan and number

For ages: 5

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	1.610	0.688	0.765	-0.085	1			0.851	0.918	814
1986	0.200	0.074	-1.320	-2.308	1			0.988	1.065	88
1987	0.040	0.231	-2.930	-1.178	1			-1.752	-1.889	273
1988	0.110	0.292	-1.918	-0.943	1			-0.975	-1.051	345
1989	0.130	0.063	-1.751	-2.470	1			0.719	0.776	75
1990	0.630	0.094	-0.173	-2.076	1			1.903	2.052	111
1991	0.060	0.852	-2.524	0.129	1			-2.653	-2.861	1008
1992	0.330	0.564	-0.819	-0.284	1			-0.536	-0.578	668
1993	1.270	0.617	0.528	-0.193	1			0.722	0.778	731
1994	0.100	1.444	-2.013	0.657	1			-2.670	-2.880	1710
1995	1.180	0.629	0.455	-0.174	1			0.629	0.678	745
1996	0.470	0.759	-0.466	0.013	1			-0.479	-0.517	898
1997	1.310	0.373	0.559	-0.697	1			1.256	1.355	442
1998	2.010	0.426	0.987	-0.565	1			1.552	1.674	504
1999	1.220	0.486	0.488	-0.433	1			0.921	0.994	575
2000	2.420	0.347	1.173	-0.768	1			1.941	2.093	411
2001	0.260	0.378	-1.058	-0.685	1			-0.373	-0.402	447
2002	0.130	1.003	-1.751	0.293	1			-2.044	-2.204	1188

Partial Variance: 2.281

MASSs

Tuned to: 1-Jan and number

For ages: 1

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	1.970	1.124	0.289	-0.272	1			0.562	0.606	12302
1986	1.730	0.551	0.159	-0.985	1			1.145	1.234	6030
1987	2.530	0.738	0.540	-0.692	1			1.232	1.328	8083
1988	3.100	2.634	0.743	0.580	1			0.163	0.176	28844
1989	0.670	1.034	-0.789	-0.355	1			-0.434	-0.468	11325
1990	0.630	1.063	-0.851	-0.328	1			-0.523	-0.564	11634
1991	0.060	1.194	-3.202	-0.212	1			-2.991	-3.225	13071
1992	1.300	0.880	-0.126	-0.516	1			0.390	0.420	9639
1993	0.630	0.950	-0.851	-0.440	1			-0.411	-0.443	10404
1994	2.670	0.655	0.593	-0.811	1			1.404	1.515	7177
1995	7.510	0.583	1.628	-0.929	1			2.556	2.757	6380
1996	1.170	0.879	-0.232	-0.518	1			0.286	0.308	9625
1997	0.520	0.785	-1.043	-0.631	1			-0.411	-0.443	8590
1998	0.550	0.979	-0.986	-0.409	1			-0.577	-0.622	10724
1999	0.100	1.227	-2.691	-0.184	1			-2.507	-2.704	13439
2000	0.830	0.918	-0.575	-0.475	1			-0.100	-0.108	10047
2001	0.220	0.177	-1.903	-2.120	1			0.217	0.234	1939
2002	0.360	0.000	-1.410	0		0		0.000	0.000	00

Partial Variance: 1.684

MASSs

Tuned to: 1-Jan and number

For ages: 2

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	8.270	4.533	-0.390		-0.991		1	0.601	0.648	3195
1986	15.390	13.409	0.231		0.094		1	0.138	0.149	9451
1987	4.950	6.882	-0.903		-0.573		1	-0.330	-0.355	4851
1988	14.460	9.365	0.169		-0.265		1	0.434	0.468	6601
1989	22.260	32.924	0.600		0.992		1	-0.391	-0.422	23207
1990	11.770	13.004	-0.037		0.063		1	-0.100	-0.107	9166
1991	5.340	13.406	-0.827		0.093		1	-0.920	-0.993	9449
1992	11.030	14.586	-0.102		0.178		1	-0.279	-0.301	10281
1993	7.990	9.003	-0.424		-0.305		1	-0.119	-0.129	6346
1994	24.020	11.881	0.676		-0.027		1	0.704	0.759	8375
1995	14.640	8.240	0.181		-0.393		1	0.575	0.620	5808
1996	18.030	6.823	0.390		-0.582		1	0.972	1.048	4809
1997	16.940	11.171	0.327		-0.089		1	0.416	0.449	7874
1998	4.960	9.975	-0.901		-0.202		1	-0.699	-0.753	7031
1999	6.340	12.318	-0.656		0.009		1	-0.664	-0.716	8682
2000	21.920	15.589	0.585		0.244		1	0.341	0.368	10988
2001	10.210	11.659	-0.179		-0.046		1	-0.133	-0.143	8218
2002	1.290	2.226	-2.248		-1.702		1	-0.546	-0.589	1569

Partial Variance: 0.302

MASSs

Tuned to: 1-Jan and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	7.150	3.380	-0.554		-1.303		1	0.749	0.808	1696
1986	1.740	2.969	-1.967		-1.433		1	-0.534	-0.576	1489
1987	5.310	7.804	-0.851		-0.466		1	-0.385	-0.415	3915
1988	2.520	4.517	-1.597		-1.013		1	-0.584	-0.629	2266
1989	3.180	6.116	-1.364		-0.710		1	-0.654	-0.705	3068
1990	15.570	33.732	0.224		0.997		1	-0.773	-0.834	16922
1991	3.310	9.734	-1.324		-0.245		1	-1.079	-1.163	4883
1992	9.710	12.947	-0.248		0.040		1	-0.288	-0.310	6495
1993	6.310	9.602	-0.679		-0.259		1	-0.420	-0.453	4817
1994	7.530	9.590	-0.502		-0.260		1	-0.242	-0.261	4811
1995	24.960	12.703	0.696		0.021		1	0.675	0.728	6372
1996	14.700	8.125	0.167		-0.426		1	0.593	0.639	4076
1997	12.220	6.781	-0.018		-0.607		1	0.589	0.635	3402
1998	13.500	11.206	0.082		-0.105		1	0.186	0.201	5621
1999	10.900	10.200	-0.132		-0.199		1	0.066	0.072	5117
2000	33.290	13.153	0.984		0.056		1	0.929	1.001	6598
2001	38.200	15.869	1.122		0.243		1	0.878	0.947	7961
2002	13.840	10.337	0.107		-0.185		1	0.292	0.315	5185

Partial Variance: 0.402

MASSs

Tuned to: 1-Jan and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	1.520	1.311	-0.721	-0.868	1	0.148	0.160	1168		
1986	0.240	0.637	-2.566	-1.590	1	-0.976	-1.053	568		
1987	0.970	0.572	-1.170	-1.699	1	0.529	0.571	509		
1988	0.600	1.230	-1.650	-0.932	1	-0.718	-0.774	1096		
1989	1.080	0.556	-1.062	-1.727	1	0.664	0.716	495		
1990	0.630	0.979	-1.601	-1.160	1	-0.441	-0.476	872		
1991	2.150	6.004	-0.374	0.653	1	-1.027	-1.107	5349		
1992	2.380	2.695	-0.272	-0.148	1	-0.124	-0.134	2401		
1993	1.940	3.977	-0.477	0.241	1	-0.718	-0.774	3543		
1994	1.490	3.336	-0.740	0.065	1	-0.806	-0.869	2972		
1995	2.880	2.742	-0.081	-0.130	1	0.049	0.053	2443		
1996	6.780	3.059	0.775	-0.021	1	0.796	0.858	2725		
1997	4.040	2.128	0.257	-0.384	1	0.641	0.692	1896		
1998	1.250	1.527	-0.916	-0.716	1	-0.200	-0.216	1361		
1999	1.280	2.831	-0.892	-0.099	1	-0.794	-0.856	2522		
2000	11.280	3.129	1.284	0.001	1	1.282	1.383	2788		
2001	10.390	2.957	1.202	-0.055	1	1.257	1.355	2634		
2002	5.340	3.445	0.536	0.098	1	0.438	0.473	3069		

Partial Variance: 0.581

MASSs

Tuned to: 1-Jan and number

For ages: 5

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	1.070	0.791	0.394	0.092	1	0.302	0.326	814		
1986	0.250	0.086	-1.060	-2.131	1	1.071	1.154	88		
1987	0.470	0.265	-0.429	-1.000	1	0.572	0.616	273		
1988	0.070	0.336	-2.333	-0.766	1	-1.567	-1.690	345		
1989	0.060	0.073	-2.487	-2.293	1	-0.194	-0.209	75		
1990	0.170	0.108	-1.446	-1.898	1	0.452	0.488	111		
1991	0.650	0.980	-0.105	0.306	1	-0.411	-0.443	1008		
1992	1.510	0.649	0.738	-0.106	1	0.845	0.911	668		
1993	0.510	0.710	-0.347	-0.016	1	-0.331	-0.357	731		
1994	0.450	1.662	-0.472	0.834	1	-1.307	-1.409	1710		
1995	1.240	0.724	0.541	0.003	1	0.538	0.580	745		
1996	1.780	0.873	0.903	0.191	1	0.712	0.768	898		
1997	0.540	0.429	-0.290	-0.519	1	0.229	0.247	442		
1998	0.210	0.490	-1.234	-0.387	1	-0.847	-0.914	504		
1999	0.080	0.559	-2.200	-0.256	1	-1.944	-2.096	575		
2000	1.820	0.400	0.925	-0.590	1	1.515	1.634	411		
2001	1.680	0.434	0.845	-0.507	1	1.352	1.459	447		
2002	0.430	1.155	-0.518	0.470	1	-0.988	-1.065	1188		

Partial Variance: 1.035

MASSf

Tuned to: 1-Jan and number

For ages: 2

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	1.910	1.550	-0.839		-1.048		1	0.209	0.225	3195
1986	5.700	4.584	0.255		0.037		1	0.218	0.235	9451
1987	2.600	2.353	-0.530		-0.630		1	0.100	0.108	4851
1988	5.850	3.201	0.281		-0.322		1	0.603	0.650	6601
1989	8.960	11.255	0.707		0.935		1	-0.228	-0.246	23207
1990	2.640	4.445	-0.515		0.006		1	-0.521	-0.562	9166
1991	5.200	4.583	0.163		0.037		1	0.126	0.136	9449
1992	3.760	4.986	-0.161		0.121		1	-0.282	-0.304	10281
1993	7.180	3.078	0.486		-0.361		1	0.847	0.914	6346
1994	8.390	4.062	0.641		-0.084		1	0.725	0.782	8375
1995	2.360	2.817	-0.627		-0.450		1	-0.177	-0.191	5808
1996	8.380	2.332	0.640		-0.639		1	1.279	1.379	4809
1997	1.870	3.819	-0.860		-0.146		1	-0.714	-0.770	7874
1998	1.010	3.410	-1.476		-0.259		1	-1.217	-1.312	7031
1999	7.050	4.211	0.467		-0.048		1	0.515	0.556	8682
2000	4.730	5.329	0.068		0.188		1	-0.119	-0.129	10988
2001	1.360	3.986	-1.178		-0.103		1	-1.075	-1.160	8218
2002	0.570	0.761	-2.048		-1.759		1	-0.289	-0.312	1569

Partial Variance: 0.434

MASSf

Tuned to: 1-Jan and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	3.000	2.304	-0.875		-1.139		1	0.264	0.285	1696
1986	1.630	2.023	-1.485		-1.269		1	-0.216	-0.233	1489
1987	4.950	5.319	-0.375		-0.303		1	-0.072	-0.077	3915
1988	2.300	3.078	-1.141		-0.850		1	-0.291	-0.314	2266
1989	11.240	4.168	0.446		-0.546		1	0.992	1.070	3068
1990	5.220	22.988	-0.321		1.161		1	-1.482	-1.599	16922
1991	11.930	6.634	0.505		-0.082		1	0.587	0.633	4883
1992	5.140	8.823	-0.337		0.203		1	-0.540	-0.583	6495
1993	3.620	6.544	-0.687		-0.095		1	-0.592	-0.639	4817
1994	7.290	6.536	0.013		-0.097		1	0.109	0.118	4811
1995	11.790	8.657	0.493		0.184		1	0.309	0.333	6372
1996	15.160	5.537	0.745		-0.262		1	1.007	1.086	4076
1997	3.940	4.621	-0.603		-0.443		1	-0.159	-0.172	3402
1998	7.380	7.637	0.025		0.059		1	-0.034	-0.037	5621
1999	6.740	6.951	-0.066		-0.035		1	-0.031	-0.033	5117
2000	11.940	8.964	0.506		0.219		1	0.287	0.309	6598
2001	8.250	10.815	0.136		0.407		1	-0.271	-0.292	7961
2002	8.060	7.045	0.113		-0.022		1	0.135	0.145	5185

Partial Variance: 0.339

MASSf

Tuned to: 1-Jan and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	0.860	1.323	-1.145		-0.714		1	-0.431	-0.465	1168
1986	1.030	0.643	-0.964		-1.435		1	0.471	0.508	568
1987	0.200	0.577	-2.603		-1.544		1	-1.059	-1.142	509
1988	0.490	1.242	-1.707		-0.777		1	-0.930	-1.003	1096
1989	2.270	0.561	-0.174		-1.572		1	1.398	1.508	495
1990	0.960	0.988	-1.035		-1.006		1	-0.029	-0.031	872
1991	4.840	6.059	0.583		0.808		1	-0.225	-0.242	5349
1992	5.030	2.720	0.622		0.007		1	0.615	0.663	2401
1993	2.080	4.014	-0.262		0.396		1	-0.657	-0.709	3543
1994	5.800	3.367	0.764		0.220		1	0.544	0.587	2972
1995	1.790	2.768	-0.412		0.024		1	-0.436	-0.470	2443
1996	5.850	3.087	0.773		0.133		1	0.639	0.689	2725
1997	2.180	2.147	-0.215		-0.230		1	0.015	0.016	1896
1998	1.140	1.541	-0.863		-0.561		1	-0.302	-0.325	1361
1999	2.250	2.857	-0.183		0.056		1	-0.239	-0.258	2522
2000	4.100	3.158	0.417		0.156		1	0.261	0.282	2788
2001	3.530	2.984	0.267		0.099		1	0.168	0.181	2634
2002	4.230	3.477	0.448		0.252		1	0.196	0.211	3069

Partial Variance: 0.38

MASSf

Tuned to: 1-Jan and number

For ages: 5

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred.
1985	0.550	0.335	0.431		-0.065		1	0.496	0.535	814
1986	0.020	0.036	-2.883		-2.288		1	-0.596	-0.642	88
1987	0.040	0.112	-2.190		-1.158		1	-1.033	-1.114	273
1988	0.090	0.142	-1.379		-0.923		1	-0.456	-0.492	345
1989	0.150	0.031	-0.869		-2.450		1	1.582	1.706	75
1990	0.100	0.046	-1.274		-2.055		1	0.781	0.843	111
1991	0.010	0.415	-3.577		0.149		1	-3.726	-4.018	1008
1992	0.860	0.275	0.878		-0.263		1	1.141	1.231	668
1993	0.670	0.301	0.628		-0.173		1	0.801	0.864	731
1994	1.430	0.704	1.386		0.677		1	0.709	0.765	1710
1995	0.150	0.306	-0.869		-0.154		1	-0.714	-0.770	745
1996	0.000	0.000	0		0		1	0.000	0.000	00
1997	0.170	0.182	-0.743		-0.677		1	-0.067	-0.072	442
1998	0.260	0.207	-0.318		-0.545		1	0.226	0.244	504
1999	0.000	0.000	0		0		1	0.000	0.000	00
2000	0.730	0.169	0.714		-0.748		1	1.461	1.576	411
2001	0.350	0.184	-0.021		-0.665		1	0.643	0.694	447
2002	0.140	0.489	-0.937		0.313		1	-1.250	-1.348	1188

Partial Variance: 1.754



Partial variance (and proportion of total) by index

Index	Partial Variance	Proportion
NMFSs 2	0.571	0.039
NMFSs 3	1.202	0.081
NMFSs 4	0.62	0.042
NMFSs 5	1.797	0.122
NMFSf 2	0.426	0.029
NMFSf 3	0.354	0.024
NMFSf 4	0.604	0.041
NMFSf 5	2.281	0.154
MASSs 1	1.684	0.114
MASSs 2	0.302	0.02
MASSs 3	0.402	0.027
MASSs 4	0.581	0.039
MASSs 5	1.035	0.07
MASSf 2	0.434	0.029
MASSf 3	0.339	0.023
MASSf 4	0.38	0.026
MASSf 5	1.754	0.119

Standardized residuals by index and year; with row/column/grand means

	1985	1986	1987	1988	1989	1990	1991
NMFSs2	0.187	-0.127	0.471	1.066	-0.883	1.235	0.612
NMFSs3	0.233	-1.212	0.407	-0.019	0.137	-3.780	0.365
NMFSs4	-1.134	-0.793	0.964	-0.108	0.403	0.000	-1.039
NMFSs5	-1.217	0.607	2.630	0.683	2.250	0.357	-0.949
NMFSf2	-0.708	0.999	0.362	-0.887	-0.387	-0.069	0.702
NMFSf3	-0.044	0.596	0.316	-0.147	0.838	-0.840	0.661
NMFSf4	-0.874	1.113	-0.392	-0.712	0.051	1.079	-0.493
NMFSf5	0.918	1.065	-1.889	-1.051	0.776	2.052	-2.861
MASSs1	0.606	1.234	1.328	0.176	-0.468	-0.564	-3.225
MASSs2	0.648	0.149	-0.355	0.468	-0.422	-0.107	-0.993
MASSs3	0.808	-0.576	-0.415	-0.629	-0.705	-0.834	-1.163
MASSs4	0.160	-1.053	0.571	-0.774	0.716	-0.476	-1.107
MASSs5	0.326	1.154	0.616	-1.690	-0.209	0.488	-0.443
MASSf2	0.225	0.235	0.108	0.650	-0.246	-0.562	0.136
MASSf3	0.285	-0.233	-0.077	-0.314	1.070	-1.599	0.633
MASSf4	-0.465	0.508	-1.142	-1.003	1.508	-0.031	-0.242
MASSf5	0.535	-0.642	-1.114	-0.492	1.706	0.843	-4.018
Col Avg	0.029	0.178	0.141	-0.281	0.361	-0.176	-0.790
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	1992	1993	1994	1995	1996	1997	1998
NMFSs2	-0.947	-0.773	0.418	-0.187	-0.671	-0.636	-0.746
NMFSs3	-0.413	-0.690	-0.248	0.445	-0.177	0.391	0.250
NMFSs4	-0.975	-1.273	-0.513	0.935	0.389	0.500	0.259
NMFSs5	-3.311	0.000	-0.348	-0.002	-0.608	0.018	-0.910
NMFSf2	-0.082	0.786	1.091	0.851	-0.626	-0.389	-0.277
NMFSf3	-1.081	-0.197	0.334	0.560	-1.481	0.235	-0.496
NMFSf4	-0.232	-0.505	-1.547	0.246	-0.830	1.209	1.009
NMFSf5	-0.578	0.778	-2.880	0.678	-0.517	1.355	1.674
MASSs1	0.420	-0.443	1.515	2.757	0.308	-0.443	-0.622
MASSs2	-0.301	-0.129	0.759	0.620	1.048	0.449	-0.753
MASSs3	-0.310	-0.453	-0.261	0.728	0.639	0.635	0.201
MASSs4	-0.134	-0.774	-0.869	0.053	0.858	0.692	-0.216
MASSs5	0.911	-0.357	-1.409	0.580	0.768	0.247	-0.914
MASSf2	-0.304	0.914	0.782	-0.191	1.379	-0.770	-1.312
MASSf3	-0.583	-0.639	0.118	0.333	1.086	-0.172	-0.037
MASSf4	0.663	-0.709	0.587	-0.470	0.689	0.016	-0.325
MASSf5	1.231	0.864	0.765	-0.770	0.000	-0.072	0.244
Col Avg	-0.354	-0.225	-0.100	0.422	0.141	0.192	-0.175

	1999	2000	2001	2002
NMFSs2	-0.839	0.559	-0.407	1.668
NMFSs3	0.583	2.013	0.425	1.290
NMFSs4	0.383	1.514	-0.296	0.785
NMFSs5	0.277	1.983	-0.293	-1.167
NMFSf2	-0.536	0.723	-0.553	-0.999
NMFSf3	-0.179	0.623	0.222	0.080
NMFSf4	-0.622	0.917	0.747	-0.166
NMFSf5	0.994	2.093	-0.402	-2.204
MASSs1	-2.704	-0.108	0.234	0.000
MASSs2	-0.716	0.368	-0.143	-0.589
MASSs3	0.072	1.001	0.947	0.315
MASSs4	-0.856	1.383	1.355	0.473
MASSs5	-2.096	1.634	1.459	-1.065
MASSf2	0.556	-0.129	-1.160	-0.312
MASSf3	-0.033	0.309	-0.292	0.145
MASSf4	-0.258	0.282	0.181	0.211
MASSf5	0.000	1.576	0.694	-1.348
Col Avg	-0.373	0.985	0.160	-0.170

Percent of total sum of squares by index and year; with row/column sums

	1985	1986	1987	1988	1989	1990	1991
NMFSs2	0.012	0.006	0.079	0.403	0.277	0.541	0.133
NMFSs3	0.019	0.521	0.059	0.000	0.007	5.068	0.047
NMFSs4	0.456	0.223	0.329	0.004	0.058	0.000	0.383
NMFSs5	0.525	0.131	2.453	0.165	1.796	0.045	0.320
NMFSf2	0.178	0.354	0.046	0.279	0.053	0.002	0.175
NMFSf3	0.001	0.126	0.035	0.008	0.249	0.250	0.155
NMFSf4	0.271	0.439	0.054	0.180	0.001	0.413	0.086
NMFSf5	0.299	0.402	1.266	0.392	0.213	1.493	2.903
MASSs1	0.130	0.540	0.626	0.011	0.078	0.113	3.688
MASSs2	0.149	0.008	0.045	0.078	0.063	0.004	0.349
MASSs3	0.231	0.118	0.061	0.140	0.176	0.246	0.480
MASSs4	0.009	0.393	0.115	0.213	0.182	0.080	0.435
MASSs5	0.038	0.473	0.135	1.013	0.016	0.084	0.070
MASSf2	0.018	0.020	0.004	0.150	0.021	0.112	0.007
MASSf3	0.029	0.019	0.002	0.035	0.406	0.906	0.142
MASSf4	0.077	0.092	0.463	0.357	0.806	0.000	0.021
MASSf5	0.101	0.146	0.440	0.086	1.032	0.252	5.724

++ 2.543 4.011 6.212 3.514 5.433 9.610 15.116

	1992	1993	1994	1995	1996	1997	1998
NMFSs2	0.318	0.212	0.062	0.012	0.160	0.144	0.197
NMFSs3	0.061	0.169	0.022	0.070	0.011	0.054	0.022
NMFSs4	0.337	0.574	0.093	0.310	0.054	0.089	0.024
NMFSs5	3.888	0.000	0.043	0.000	0.131	0.000	0.293
NMFSf2	0.002	0.219	0.422	0.257	0.139	0.054	0.027
NMFSf3	0.414	0.014	0.040	0.111	0.778	0.020	0.087
NMFSf4	0.019	0.090	0.848	0.021	0.244	0.519	0.361
NMFSf5	0.118	0.215	2.941	0.163	0.095	0.651	0.993
MASSs1	0.063	0.070	0.814	2.695	0.034	0.070	0.137
MASSs2	0.032	0.006	0.204	0.136	0.389	0.071	0.201
MASSs3	0.034	0.073	0.024	0.188	0.145	0.143	0.014
MASSs4	0.006	0.212	0.268	0.001	0.261	0.170	0.017
MASSs5	0.294	0.045	0.704	0.119	0.209	0.022	0.296
MASSf2	0.033	0.296	0.217	0.013	0.675	0.210	0.611
MASSf3	0.120	0.145	0.005	0.039	0.418	0.010	0.000
MASSf4	0.156	0.178	0.122	0.078	0.168	0.000	0.038
MASSf5	0.537	0.265	0.207	0.210	0.000	0.002	0.021

++ 6.434 2.782 7.036 4.426 3.911 2.227 3.341

	1999	2000	2001	2002	++
NMFSs2	0.249	0.111	0.059	0.987	3.961
NMFSs3	0.120	1.437	0.064	0.590	8.342
NMFSs4	0.052	0.813	0.031	0.219	4.047
NMFSs5	0.027	1.394	0.030	0.483	11.725
NMFSf2	0.102	0.186	0.109	0.354	2.958
NMFSf3	0.011	0.138	0.018	0.002	2.457
NMFSf4	0.137	0.298	0.198	0.010	4.191
NMFSf5	0.350	1.553	0.057	1.722	15.826
MASSs1	2.593	0.004	0.019	0.000	11.684
MASSs2	0.182	0.048	0.007	0.123	2.097
MASSs3	0.002	0.356	0.318	0.035	2.786
MASSs4	0.260	0.678	0.651	0.079	4.031
MASSs5	1.558	0.947	0.754	0.402	7.179
MASSf2	0.110	0.006	0.477	0.034	3.012
MASSf3	0.000	0.034	0.030	0.007	2.350
MASSf4	0.024	0.028	0.012	0.016	2.634
MASSf5	0.000	0.881	0.171	0.645	10.720
++	5.778	8.911	3.006	5.709	100.000

STOCK NUMBERS (Jan 1) in thousands - C:\all\_work\yt\2002\ccgom\ccgomyt\_5.2

	1985	1986	1987	1988	1989	1990	1991
1	12302	6030	8083	28844	11325	11634	13071
2	3195	9451	4851	6601	23207	9166	9449
3	1696	1489	3915	2266	3068	16922	4883
4	1168	568	509	1096	495	872	5349
5	814	88	273	345	75	111	1008
1+	19175	17626	17631	39152	38170	38705	33760
	1992	1993	1994	1995	1996	1997	1998
1	9639	10404	7177	6380	9625	8590	10724
2	10281	6346	8375	5808	4809	7874	7031
3	6495	4817	4811	6372	4076	3402	5621
4	2401	3543	2972	2443	2725	1896	1361
5	668	731	1710	745	898	442	504
1+	29484	25841	25045	21748	22134	22203	25241
	1999	2000	2001	2002			
1	13439	10047	1939	00			
2	8682	10988	8218	1569			
3	5117	6598	7961	5185			
4	2522	2788	2634	3069			
5	575	411	447	1188			
1+	30335	30832	21199	11012			

FISHING MORTALITY -		C:\all_work\yt\2002\ccgom\ccgomyt_5.2					
	1985	1986	1987	1988	1989	1990	1991
1	0.06	0.02	0.00	0.02	0.01	0.01	0.04
2	0.56	0.68	0.56	0.57	0.12	0.43	0.17
3	0.89	0.87	1.07	1.32	1.06	0.95	0.51
4	0.92	0.90	1.11	1.39	1.09	0.98	0.52
5	0.92	0.90	1.11	1.39	1.09	0.98	0.52

	1992	1993	1994	1995	1996	1997	1998
1	0.22	0.02	0.01	0.08	0.00	0.00	0.01
2	0.56	0.08	0.07	0.15	0.15	0.14	0.12
3	0.41	0.28	0.48	0.65	0.57	0.72	0.60
4	0.41	0.28	0.48	0.66	0.57	0.73	0.61
5	0.41	0.28	0.48	0.66	0.57	0.73	0.61

	1999	2000	2001
1	0.00	0.00	0.01
2	0.07	0.12	0.26
3	0.41	0.72	0.75
4	0.41	0.73	0.75
5	0.41	0.73	0.75

3,4  
Average F for 3,4

	1985	1986	1987	1988	1989	1990	1991
3,4	0.91	0.88	1.09	1.35	1.08	0.97	0.51

	1992	1993	1994	1995	1996	1997	1998
3,4	0.41	0.28	0.48	0.66	0.57	0.72	0.61

	1999	2000	2001
3,4	0.41	0.73	0.75

BACKCALCULATED PARTIAL RECRUITMENT

	1985	1986	1987	1988	1989	1990	1991
1	0.07	0.02	0.00	0.01	0.01	0.01	0.08
2	0.61	0.76	0.51	0.41	0.11	0.44	0.34
3	0.97	0.97	0.97	0.95	0.97	0.97	0.99
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00

	1992	1993	1994	1995	1996	1997	1998
1	0.39	0.06	0.02	0.13	0.00	0.00	0.02
2	1.00	0.27	0.15	0.23	0.25	0.19	0.19
3	0.73	0.99	0.99	0.98	0.99	0.98	0.98
4	0.74	1.00	1.00	1.00	1.00	1.00	1.00
5	0.74	1.00	1.00	1.00	1.00	1.00	1.00

	1999	2000	2001
1	0.00	0.00	0.02
2	0.18	0.17	0.35
3	0.99	0.98	1.00
4	1.00	1.00	1.00
5	1.00	1.00	1.00

SSB AT THE START OF THE SPAWNING SEASON -MALES AND FEMALES (MT) (using SSB mean weights)

	1985	1986	1987	1988	1989	1990	1991
1	00	00	00	00	00	00	00
2	50	131	65	81	439	141	155
3	313	332	728	331	559	3138	1000
4	359	191	162	294	188	293	2063
5	332	43	115	128	44	60	591
1+	1055	696	1070	834	1230	3633	3810

	1992	1993	1994	1995	1996	1997	1998
1	00	00	00	00	00	00	00
2	78	72	132	88	63	164	128
3	1308	1149	1087	1159	912	715	1272
4	931	1216	1028	700	928	592	514
5	331	490	836	312	364	177	255
1+	2648	2926	3083	2260	2267	1647	2169

  

	1999	2000	2001
1	00	00	00
2	192	277	174
3	1319	1567	1777
4	1095	1058	992
5	303	184	234
1+	2909	3087	3177

The number of bootstraps: 500  
 Bootstrap Output Variable: N hat

	NLLS ESTIMATE	BOOTSTRAP MEAN	BOOTSTRAP StdError	C.V. FOR NLLS SOLN
N 2	1569	1706	727	0.46
N 3	5185	5394	1818	0.35
N 4	3069	3088	794	0.26

  

	BIAS ESTIMATE	BIAS STD ERROR	PERCENT BIAS	NLLS EST CORRECTED FOR BIAS	C.V. FOR CORRECTED ESTIMATE	LOWER 80%CI	UPPER 80%CI
N 2	137	33	8.70	1433	0.507538	908	2552
N 3	209	81	4.03	4977	0.365209	3170	7645
N 4	19	36	0.61	3051	0.260409	2153	4255

Bootstrap Output Variable: Q\_unscaled

	NLLS ESTIMATE	BOOTSTRAP MEAN	BOOTSTRAP StdError	C.V. FOR NLLS SOLN
q NMFSS2	0.0002131	0.0002192	0.0000455	0.21
q NMFSS3	0.0004133	0.0004226	0.0000860	0.21
q NMFSS4	0.0005144	0.0005219	0.0001188	0.23
q NMFSS5	0.0006457	0.0006491	0.0001333	0.21
q NMFSSf2	0.0001931	0.0001946	0.0000412	0.21
q NMFSSf3	0.0006878	0.0007032	0.0001453	0.21
q NMFSSf4	0.0008473	0.0008619	0.0001804	0.21
q NMFSSf5	0.0008446	0.0008615	0.0001776	0.21
q MASSs1	0.0000913	0.0000936	0.0000200	0.22
q MASSs2	0.0014187	0.0014222	0.0003010	0.21
q MASSs3	0.0019934	0.0020707	0.0004281	0.21
q MASSs4	0.0011224	0.0011489	0.0002404	0.21
q MASSs5	0.0009720	0.0009982	0.0002136	0.22
q MASSf2	0.0004850	0.0005014	0.0001061	0.22
q MASSf3	0.0013585	0.0013820	0.0003112	0.23
q MASSf4	0.0011328	0.0011696	0.0002559	0.23
q MASSf5	0.0004115	0.0004236	0.0000966	0.23

  

	BIAS ESTIMATE	BIAS STD ERROR	PERCENT BIAS	NLLS EST CORRECTED FOR BIAS	C.V. FOR CORRECTED ESTIMATE	LOWER 80%CI	UPPER 80%CI
q NMFSS2	0.00000612	0.000002033	2.872	0.000206936	0.22	0.0001576	0.0002763
q NMFSS3	0.00000930	0.000003847	2.250	0.000403986	0.21	0.0003021	0.0005279
q NMFSS4	0.00000749	0.000005313	1.455	0.000506923	0.23	0.0003867	0.0006816
q NMFSS5	0.00000342	0.000005963	0.530	0.000642272	0.21	0.0004951	0.0008712
q NMFSSf2	0.00000149	0.000001845	0.773	0.000191641	0.22	0.0001471	0.0002548
q NMFSSf3	0.00001541	0.000006498	2.240	0.000672429	0.22	0.0005038	0.0008737
q NMFSSf4	0.00001460	0.000008069	1.723	0.000832687	0.22	0.0006273	0.0010674
q NMFSSf5	0.00001681	0.000007941	1.990	0.000827835	0.21	0.0006234	0.0010605
q MASSs1	0.00000231	0.000000894	2.528	0.000089019	0.22	0.0000706	0.0001198
q MASSs2	0.00000350	0.000013461	0.247	0.001415229	0.21	0.0011026	0.0019276
q MASSs3	0.00007732	0.000019146	3.879	0.001916089	0.22	0.0014495	0.0025068
q MASSs4	0.00002648	0.000010751	2.359	0.001095963	0.22	0.0008648	0.0014987
q MASSs5	0.00002621	0.000009552	2.697	0.000945751	0.23	0.0007145	0.0012522
q MASSf2	0.00001640	0.000004747	3.381	0.000468611	0.23	0.0003448	0.0006041
q MASSf3	0.00002344	0.000013916	1.725	0.001335089	0.23	0.0010149	0.0018078
q MASSf4	0.00003682	0.000011445	3.251	0.001095988	0.23	0.0008543	0.0014335
q MASSf5	0.00001218	0.000004319	2.959	0.000399287	0.24	0.0002816	0.0005261

Bootstrap Output Variable: N t1

	NLLS ESTIMATE	BOOTSTRAP MEAN	BOOTSTRAP StdError	C.V. FOR NLLS SOLN
Age 1	9347.4	9349.8	308.6	0.0330
Age 2	1569.2	1705.8	727.1	0.4634
Age 3	5185.4	5394.2	1817.5	0.3505
Age 4	3069.5	3088.4	794.4	0.2588
Age 5	1188.0	1195.3	307.8	0.2591

	BIAS ESTIMATE	BIAS STD ERROR	PERCENT BIAS	NLLS EST CORRECTED FOR BIAS	C.V. FOR CORRECTED ESTIMATE	LOWER 80%CI	UPPER 80%CI
Age 1	2.38	13.80	0.025	9345.00	0.03	8975.1	9762.2
Age 2	136.55	32.52	8.702	1432.69	0.51	908.3	2552.3
Age 3	208.80	81.28	4.027	4976.62	0.37	3169.8	7644.6
Age 4	18.86	35.53	0.615	3050.63	0.26	2153.3	4255.4
Age 5	7.34	13.77	0.618	1180.65	0.26	833.0	1647.6

Bootstrap Output Variable: F t

	NLLS ESTIMATE	BOOTSTRAP MEAN	BOOTSTRAP StdError	C.V. FOR NLLS SOLN
Age 1	0.0115	0.0125	0.0055	0.48
Age 2	0.2605	0.2758	0.0903	0.35
Age 3	0.7530	0.7761	0.1439	0.19
Age 4	0.7530	0.7761	0.1439	0.19
Age 5	0.7530	0.7761	0.1439	0.19

	BIAS ESTIMATE	BIAS STD ERROR	PERCENT BIAS	NLLS EST CORRECTED FOR BIAS	C.V. FOR CORRECTED ESTIMATE	LOWER 80%CI	UPPER 80%CI
Age 1	0.0010210	0.0002474	8.905	0.0104451	0.53	0.0070	0.0194
Age 2	0.0153796	0.0040390	5.905	0.2450722	0.37	0.1824	0.3933
Age 3	0.0231098	0.0064362	3.069	0.7299197	0.20	0.5900	0.9526
Age 4	0.0231098	0.0064362	3.069	0.7299197	0.20	0.5900	0.9526
Age 5	0.0231098	0.0064362	3.069	0.7299197	0.20	0.5900	0.9526

Bootstrap Output Variable: F full t

	NLLS ESTIMATE	BOOTSTRAP MEAN	BOOTSTRAP StdError	C.V. FOR NLLS SOLN
	0.7530	0.7761	0.1439	0.19

	BIAS ESTIMATE	BIAS STD ERROR	PERCENT BIAS	NLLS EST CORRECTED FOR BIAS	C.V. FOR CORRECTED ESTIMATE	LOWER 80%CI	UPPER 80%CI
	0.02311	0.00644	3.07	0.72992	0.20	0.5900	0.9526

Bootstrap Output Variable: PR t

	NLLS ESTIMATE	BOOTSTRAP MEAN	BOOTSTRAP StdError	C.V. FOR NLLS SOLN
Age 1	0.0152	0.0166	0.0080	0.53
Age 2	0.3459	0.3658	0.1326	0.38
Age 3	1.0000	1.0000	0.0000	0.00
Age 4	1.0000	1.0000	0.0000	0.00
Age 5	1.0000	1.0000	0.0000	0.00

	BIAS ESTIMATE	BIAS STD ERROR	PERCENT BIAS	NLLS EST CORRECTED FOR BIAS	C.V. FOR CORRECTED ESTIMATE	LOWER 80%CI	UPPER 80%CI
Age 1	0.00137	0.000358	9.00	0.01385688	0.58	0.0091	0.0278
Age 2	0.01992	0.005931	5.76	0.32595487	0.41	0.2323	0.5485
Age 3	0.00000	0.000000	0.00	1.00000000	0.00	1.0000	1.0000
Age 4	0.00000	0.000000	0.00	1.00000000	0.00	1.0000	1.0000
Age 5	0.00000	0.000000	0.00	1.00000000	0.00	1.0000	1.0000

Bootstrap Output Variable: PR mean

	NLLS ESTIMATE	BOOTSTRAP MEAN	BOOTSTRAP StdError	C.V. FOR NLLS SOLN
Age 1	0.0041	0.0042	0.0007	0.18
Age 2	0.2186	0.2198	0.0244	0.11
Age 3	0.9900	0.9899	0.0009	0.00
Age 4	1.0000	1.0000	0.0000	0.00
Age 5	1.0000	1.0000	0.0000	0.00

	BIAS ESTIMATE	BIAS STD ERROR	PERCENT BIAS	NLLS EST CORRECTED FOR BIAS	C.V. FOR CORRECTED ESTIMATE	LOWER 80%CI	UPPER 80%CI
Age 1	0.00005	0.0000332	1.23	0.0040700	0.18	0.0034	0.0054
Age 2	0.00119	0.0010904	0.54	0.2174200	0.11	0.1926	0.2538
Age 3	-0.00007	0.0000396	-0.01	0.9900540	0.00	0.9888	0.9911
Age 4	0.00000	0.0000000	0.00	1.0000000	0.00	1.0000	1.0000
Age 5	0.00000	0.0000000	0.00	1.0000000	0.00	1.0000	1.0000

Bootstrap Output Variable: Mean Biomass

```
-----  
      NLLS      BOOTSTRAP      BOOTSTRAP      C.V. FOR  
ESTIMATE      MEAN      StdError      NLLS SOLN  
5439.9491      5526.6750      901.3463      0.17  
  
      BIAS      BIAS      PERCENT      NLLS EST      C.V. FOR  
ESTIMATE      STD ERROR      BIAS      CORRECTED      CORRECTED      LOWER      UPPER  
86.7259      40.3094      1.59      FOR BIAS      ESTIMATE      80%CI      80%CI  
5353.2232      0.17      4401.4875      6656.5462
```

Bootstrap Output Variable: SSB female mean

```
-----  
      NLLS      BOOTSTRAP      BOOTSTRAP      C.V. FOR  
ESTIMATE      MEAN      StdError      NLLS SOLN  
1524.4416      1531.2888      261.7565      0.17  
  
      BIAS      BIAS      PERCENT      NLLS EST      C.V. FOR  
ESTIMATE      STD ERROR      BIAS      CORRECTED      CORRECTED      LOWER      UPPER  
6.847      11.706      0.45      FOR BIAS      ESTIMATE      80%CI      80%CI  
1517.594      0.17      1223.0888      1921.7306
```

Bootstrap Output Variable: SSB spawn t

```
-----  
      NLLS      BOOTSTRAP      BOOTSTRAP      C.V. FOR  
ESTIMATE      MEAN      StdError      NLLS SOLN  
3176.9612      3188.7615      543.8036      0.17  
  
      BIAS      BIAS      PERCENT      NLLS EST      C.V. FOR  
ESTIMATE      STD ERROR      BIAS      CORRECTED      CORRECTED      LOWER      UPPER  
11.80      24.32      0.37      FOR BIAS      ESTIMATE      80%CI      80%CI  
3165.16      0.17      2547.0699      3998.3867
```

Bootstrap Output Variable: Jan 1 biomass

```
-----  
      NLLS      BOOTSTRAP      BOOTSTRAP      C.V. FOR  
ESTIMATE      MEAN      StdError      NLLS SOLN  
5521.7750      5561.8378      624.8018      0.11  
  
      BIAS      BIAS      PERCENT      NLLS EST      C.V. FOR  
ESTIMATE      STD ERROR      BIAS      CORRECTED      CORRECTED      LOWER      UPPER  
40.06      27.94      0.73      FOR BIAS      ESTIMATE      80%CI      80%CI  
5481.71      0.11      4804.18      6452.91
```

Projection Input:

```
CC-GOM yellowtail SAW 36  
2002 ! first year  
9 ! number of years  
10 ! recruitment simulations  
123456 ! seed  
0 ! age-2 recruitment?  
0 ! F and quota basis?  
1 ! discards?  
0 ! quota-based?  
0 ! constant catch?  
0 ! F target?  
0 ! index?  
1 ! thresholds?  
0 ! market categories?  
0 ! total mortality?  
0 ! PR?  
1 ! constant discards?  
1 ! bounded recruitment?  
1 ! constant M?  
1 ! bootstrap abundance?  
5 1 5 ! ages, first and last  
0.2 ! M  
0.15 0.34 0.40 0.51 0.65 ! spawn wts  
0.11 0.35 0.41 0.52 0.66 ! landed wts  
0.06 0.20 0.29 0.37 0.48 ! discard wts  
0.00 0.08 0.81 1.00 1.00 1.00 ! maturity  
0.42 ! spawning time  
14 ! recruitment option  
17 ! 1984-2000 recruitment  
12302000 6030000 8083000 28844000 11325000 11634000 13071000 9639000  
10404000 7177000 6380000 9625000 8590000 10724000 13439000 10047000 1939000  
500 ! number of bootstrap replicates  
csgomyt.dat  
1000.0 ! bootstrap scaling  
12600000 17800000 0.17 17800000 0.13 ! SSB,Jan1B,Ffull,MeanB,Fwb thresholds  
0.02 0.22 0.98 1.00 1.00 ! PR  
1.00 0.53 0.21 0.12 0.11 ! proportion discard at age  
0.64 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 ! schedule of F
```

Projection Output:  
 PROJECTION RUN: CC-GOM yellowtail SAW 36  
 INPUT FILE: ccgomyt.in  
 OUTPUT FILE: ccgomyt.out  
 RECRUITMENT MODEL: 14  
 NUMBER OF SIMULATIONS: 10

F-BASED PROJECTIONS  
 TIME-VARYING F

YEAR	F
2002	0.640
2003	0.030
2004	0.030
2005	0.030
2006	0.030
2007	0.030
2008	0.030
2009	0.030
2010	0.030

SPAWNING STOCK BIOMASS (THOUSAND MT)

YEAR	AVG SSB (000 MT)	STD
2002	2.928	0.612
2003	2.729	0.513
2004	4.439	0.552
2005	6.511	0.901
2006	8.636	1.265
2007	10.386	1.556
2008	11.767	1.705
2009	12.873	1.811
2010	13.737	1.881

PERCENTILES OF SPAWNING STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2002	1.537	2.023	2.185	2.491	2.881	3.322	3.727	3.992	4.512
2003	1.667	1.955	2.125	2.369	2.706	3.037	3.423	3.584	4.036
2004	3.272	3.599	3.774	4.045	4.418	4.782	5.178	5.364	5.797
2005	4.702	5.230	5.497	5.951	6.451	6.918	7.483	8.030	9.733
2006	6.133	6.837	7.230	7.862	8.520	9.195	10.040	11.182	12.723
2007	7.337	8.175	8.646	9.404	10.221	11.074	12.424	13.520	15.068
2008	8.348	9.331	9.818	10.672	11.564	12.576	14.102	15.109	16.755
2009	9.316	10.338	10.822	11.704	12.654	13.772	15.337	16.286	18.064
2010	10.066	11.042	11.576	12.478	13.513	14.722	16.287	17.195	19.242

ANNUAL PROBABILITY THAT SSB EXCEEDS THRESHOLD: 12.600 THOUSAND MT

YEAR	Pr(SSB > Threshold Value)
2002	0.000
2003	0.000
2004	0.000
2005	0.000
2006	0.012
2007	0.093
2008	0.246
2009	0.518
2010	0.726

MEAN BIOMASS (THOUSAND MT) FOR AGES:1 TO 5

YEAR	AVG MEAN B (000 MT)	STD
2002	4.557	0.746
2003	6.048	0.704
2004	8.359	1.207
2005	10.476	1.483
2006	12.606	1.727
2007	14.348	1.949
2008	15.732	2.097
2009	16.816	2.174
2010	17.672	2.204

PERCENTILES OF MEAN STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2002	3.019	3.434	3.654	4.022	4.513	5.013	5.581	5.829	6.473
2003	4.551	4.969	5.218	5.562	6.004	6.473	6.949	7.241	8.023
2004	5.966	6.629	7.010	7.613	8.267	8.900	9.672	10.509	12.597
2005	7.540	8.365	8.812	9.542	10.336	11.152	12.269	13.457	15.099
2006	9.139	10.148	10.633	11.499	12.415	13.427	14.902	15.986	17.628
2007	10.439	11.562	12.117	13.105	14.125	15.301	17.018	18.082	20.030
2008	11.571	12.734	13.372	14.349	15.485	16.831	18.562	19.625	21.752
2009	12.579	13.655	14.322	15.378	16.574	17.980	19.745	20.876	23.192
2010	13.307	14.469	15.114	16.181	17.446	18.859	20.578	21.781	24.111

ANNUAL PROBABILITY THAT MEAN BIOMASS EXCEEDS THRESHOLD: 17.800 THOUSAND MT

YEAR	Pr(MEAN B > Threshold Value)
2002	0.000
2003	0.000
2004	0.000
2005	0.001
2006	0.008
2007	0.060
2008	0.149
2009	0.276
2010	0.426

F WEIGHTED BY MEAN BIOMASS FOR AGES:1 TO 5

YEAR	AVG F_WT_B	STD
------	------------	-----



2002	0.450	0.029
2003	0.016	0.001
2004	0.019	0.002
2005	0.021	0.002
2006	0.023	0.002
2007	0.023	0.001
2008	0.024	0.001
2009	0.024	0.001
2010	0.025	0.001

PERCENTILES OF F WEIGHTED BY MEAN BIOMASS FOR AGES:1 TO 5

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2002	0.357	0.403	0.412	0.432	0.452	0.469	0.485	0.494	0.512
2003	0.012	0.013	0.014	0.015	0.016	0.017	0.017	0.018	0.019
2004	0.014	0.016	0.017	0.018	0.019	0.020	0.021	0.022	0.023
2005	0.016	0.018	0.019	0.020	0.021	0.022	0.023	0.024	0.025
2006	0.018	0.020	0.021	0.022	0.023	0.024	0.024	0.025	0.026
2007	0.019	0.021	0.022	0.023	0.024	0.024	0.025	0.026	0.027
2008	0.020	0.022	0.022	0.023	0.024	0.025	0.026	0.026	0.027
2009	0.021	0.022	0.023	0.024	0.025	0.025	0.026	0.026	0.027
2010	0.021	0.023	0.023	0.024	0.025	0.026	0.026	0.027	0.027

ANNUAL PROBABILITY THAT F WEIGHTED BY MEAN BIOMASS EXCEEDS THRESHOLD: 0.130

YEAR	Pr(F_WT_B > Threshold Value)
2002	1.000
2003	0.000
2004	0.000
2005	0.000
2006	0.000
2007	0.000
2008	0.000
2009	0.000
2010	0.000

TOTAL STOCK BIOMASS (THOUSAND MT)

YEAR	AVG TOTAL B (000 MT)	STD
2002	6.492	1.055
2003	7.007	0.868
2004	9.527	1.361
2005	11.853	1.657
2006	14.197	1.918
2007	16.121	2.167
2008	17.643	2.326
2009	18.837	2.407
2010	19.783	2.443

PERCENTILES OF TOTAL STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2002	4.246	4.921	5.226	5.742	6.449	7.125	7.921	8.295	9.157
2003	5.190	5.709	5.999	6.433	6.946	7.487	8.071	8.515	9.712
2004	6.861	7.572	7.990	8.688	9.409	10.152	11.088	12.049	14.135
2005	8.519	9.512	9.969	10.813	11.688	12.602	13.927	15.130	16.863
2006	10.356	11.463	12.003	12.968	13.986	15.124	16.776	17.928	19.814
2007	11.808	13.002	13.654	14.717	15.863	17.173	19.120	20.260	22.369
2008	13.043	14.293	15.003	16.099	17.371	18.876	20.778	21.943	24.324
2009	14.142	15.326	16.058	17.244	18.565	20.133	22.081	23.284	25.931
2010	14.908	16.233	16.916	18.129	19.530	21.116	23.041	24.316	26.911

ANNUAL PROBABILITY THAT TOTAL STOCK BIOMASS EXCEEDS THRESHOLD: 17.800 THOUSAND MT

YEAR	Pr(B > Threshold Value)
2002	0.000
2003	0.000
2004	0.000
2005	0.004
2006	0.055
2007	0.189
2008	0.410
2009	0.645
2010	0.803

RECRUITMENT UNITS ARE:1000. FISH

BIRTH YEAR	AVG RECRUITMENT	STD
2002	10314.052	3929.655
2003	10227.902	3767.061
2004	10297.420	3821.556
2005	10233.164	3790.634
2006	10300.605	3879.492
2007	10207.951	3835.446
2008	10188.915	3752.985
2009	10209.153	3871.535
2010	10304.924	3822.402

PERCENTILES OF RECRUITMENT UNITS ARE:1000. FISH

BIRTH YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2002	2572.243	5375.282	6261.513	8134.272	10056.230	11692.031	13235.250	17095.808	26663.468
2003	2768.862	5341.919	6237.515	8128.374	10093.052	11615.277	13184.411	15175.162	26499.819
2004	2660.581	5708.333	6257.184	8168.939	10059.612	11687.485	13220.463	16526.135	26494.305
2005	2634.604	5382.393	6229.699	8061.477	10060.593	11736.947	13215.668	15621.186	26146.995
2006	2422.072	5284.432	6295.067	8156.284	10060.613	11629.025	13238.528	17128.554	26316.505
2007	2659.372	5195.097	6222.910	7970.817	10051.001	11644.248	13207.994	16216.961	26140.012
2008	2539.160	5092.214	6244.088	8124.641	10103.205	11594.478	13181.109	14946.936	25903.932
2009	2605.043	5162.777	6239.607	8091.648	10015.463	11609.300	13189.498	16321.958	26728.068
2010	2850.141	5566.452	6269.738	8164.893	10089.615	11666.431	13223.332	16326.657	26061.229

LANDINGS FOR F-BASED PROJECTIONS

YEAR	AVG LANDINGS (000 MT)	STD
2002	1.695	0.354
2003	0.076	0.014
2004	0.125	0.015
2005	0.180	0.026
2006	0.237	0.035
2007	0.284	0.042
2008	0.321	0.046
2009	0.350	0.049
2010	0.373	0.051

PERCENTILES OF LANDINGS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2002	0.882	1.168	1.268	1.441	1.668	1.922	2.148	2.319	2.581
2003	0.047	0.055	0.059	0.066	0.075	0.084	0.094	0.098	0.111
2004	0.093	0.102	0.107	0.114	0.125	0.134	0.145	0.150	0.163
2005	0.130	0.144	0.152	0.165	0.179	0.192	0.207	0.223	0.273
2006	0.168	0.188	0.199	0.216	0.234	0.252	0.276	0.307	0.348
2007	0.201	0.224	0.236	0.257	0.279	0.302	0.340	0.368	0.411
2008	0.227	0.255	0.267	0.291	0.315	0.342	0.384	0.412	0.457
2009	0.254	0.281	0.295	0.318	0.344	0.374	0.416	0.443	0.491
2010	0.274	0.300	0.315	0.339	0.367	0.400	0.442	0.466	0.522

DISCARDS FOR F-BASED PROJECTIONS

YEAR	AVG DISCARDS (000 MT)	STD
2002	0.255	0.055
2003	0.012	0.002
2004	0.021	0.002
2005	0.027	0.005
2006	0.032	0.005
2007	0.037	0.006
2008	0.040	0.006
2009	0.043	0.006
2010	0.045	0.006

PERCENTILES OF DISCARDS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2002	0.140	0.172	0.189	0.216	0.250	0.290	0.328	0.347	0.393
2003	0.009	0.010	0.010	0.011	0.012	0.013	0.015	0.015	0.017
2004	0.016	0.018	0.019	0.020	0.021	0.023	0.024	0.026	0.030
2005	0.018	0.021	0.022	0.024	0.027	0.029	0.032	0.036	0.045
2006	0.022	0.025	0.027	0.029	0.032	0.035	0.039	0.042	0.049
2007	0.026	0.029	0.030	0.033	0.036	0.039	0.044	0.047	0.054
2008	0.028	0.032	0.033	0.036	0.039	0.043	0.047	0.051	0.058
2009	0.030	0.034	0.036	0.039	0.042	0.046	0.051	0.054	0.061
2010	0.033	0.036	0.037	0.040	0.044	0.048	0.053	0.056	0.063

ANNUAL PROBABILITY FULLY-RECRUITED F EXCEEDS THRESHOLD: 0.170

YEAR	Pr(F > Threshold Value)
2002	1.000
2003	0.000
2004	0.000
2005	0.000
2006	0.000
2007	0.000
2008	0.000
2009	0.000
2010	0.000