DRAFT

SEDAR 15 Summary Report

South Atlantic Greater Amberjack

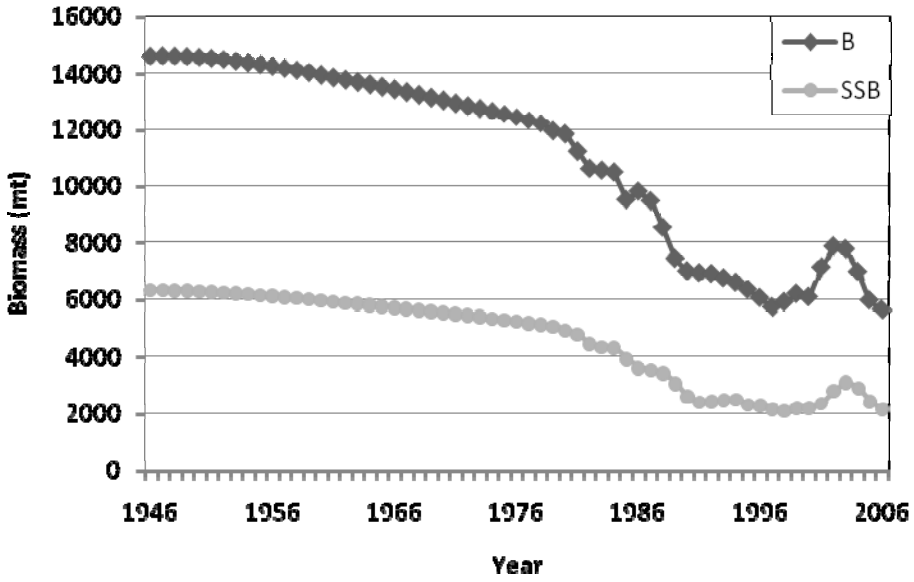
Stock Distribution and Identification

This assessment applies to greater amberjack within US waters of the South Atlantic from Monroe, FL (including the Gulf of Mexico) through Massachusetts.

Stock Status

The South Atlantic stock of greater amberjack was not overfished and was not experiencing overfishing in 2006.

Figure 1. Biomass and Spawning Stock Biomass.



Assessment Methods

A catch-at-age model (SCA and a surplus-projection model (ASPIC) were considered in this assessment. A surplus-production model treats all fish in the population as having similar characteristics such as vulnerability to predation or to being caught in the fishery, and similar reproductive capacity. However, in fish populations natural mortality decreases with age, as fish become larger, and fecundity – reproductive capacity – increases with age. A catch-at-age model takes into account the changes in those characteristics with the age of the fish. Because of this enhanced ability to capture demographics, the catch-at-age model was chosen for evaluating stock status and providing management benchmarks and advice.

Assessment Data Summary

Data used for this assessment consist of records of commercial catch for the handline and commercial dive fisheries, logbook data from the recreational headboat fishery, and MRFSS survey data of the rest of the recreational sector. Commercial longline and "other" landings were included with the hook and line landings for analysis.

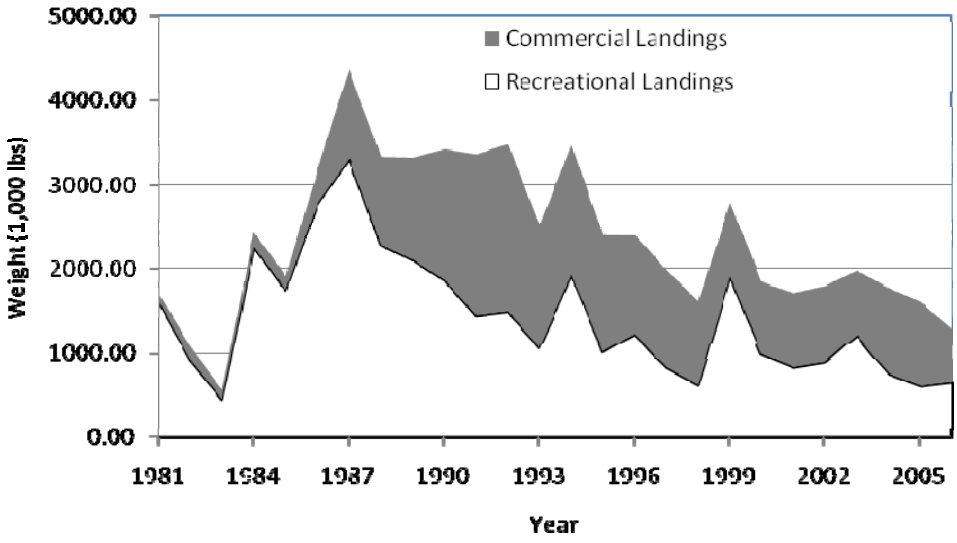
Table 1. Assessment Data Availability

Fishery	Landings	Estimated Discards	Indices
Commercial handline	1946-2006	1984-2006	1993-2006
Commercial dive	1986-2006	--	--
Headboat	1981-2006	1992-2006	1978-2006
Recreational (MRFSS)	1981-2006	1984-2006	1986-2006

Catch Trends

Greater amberjack were a recreationally-caught species until the late 1980's, when the commercial handline fishery began to target them. Since the early 1990's, landings have been fairly equal between the commercial and recreational sectors. Discards of greater amberjack are relatively low.

Figure 2. Landings by sector, 1981-2006. (Discards by weight were unavailable in this assessment).



Fishing Mortality Trends

The estimated time series of fishing mortality rate (*F*) shows a generally increasing trend from the 1980s through the mid-1990s, and then a decline from the 1990s to the present value (around F = 0.23). Fishing mortality is compared to what the fishing mortality would be if the fishery were operating at maximum sustainable yield (F_{MSY}). This ratio (F/F_{MSY}) indicates that overfishing has not occurred over most of the assessment period, except in 1992, 1994, and 1999.

Figure 3. F/F_{MSY}

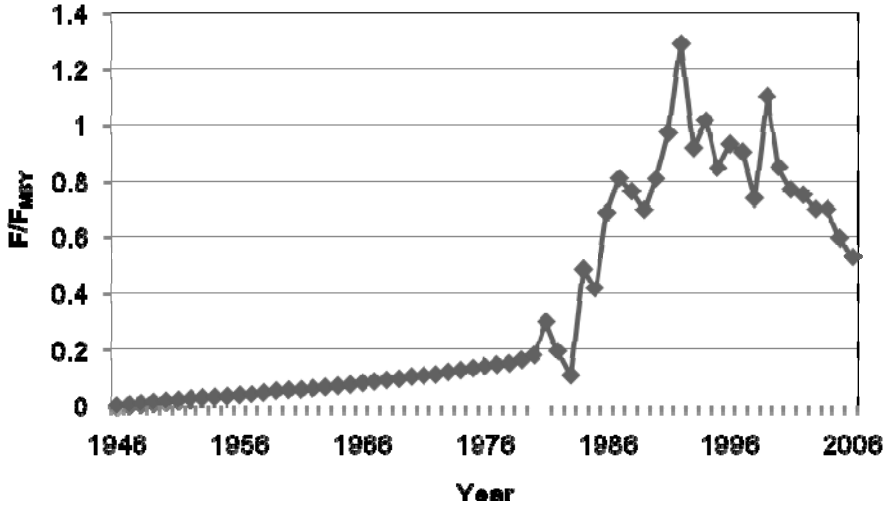
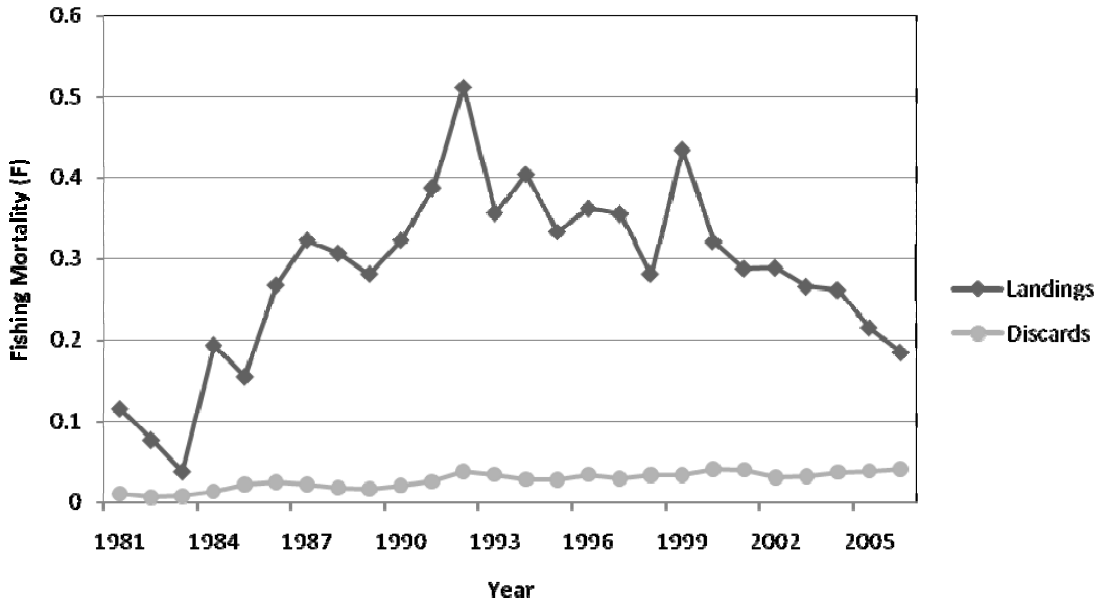


Figure 4. Fully recruited fishing mortality.



Minimum size limits have increased the age at full selection and the fishing mortality has reduced the number of older fish, suggesting that current landings are being supported by only 2 to 4 year classes in any given year.

Stock Abundance and Biomass Trends

Total estimated stock abundance averages 1.5 million fish and varies with a slightly decreasing trend. Abundance peaked with the strong 1986 year class, and again in 2001. Total abundance tapers off gradually thereafter to the estimate of slightly more than million fish in 2006.

Estimated spawning stock biomass has gradually and steadily decreased over the assessment period.

Status Determination Criteria

The maximum fishing mortality threshold (MFMT) is defined by the Council as F_{MSY}, and the minimum stock size threshold (MSST) as $(1 - M)SSB_{MSY}$, where SSB refers to Spawning Stock Biomass, SSB_{MSY} is the level of SSB when the fishery is operating at maximum sustainable yield, and constant M is 0.23 Technically, "overfishing" is defined as occurring whenever F >

MFMT and a stock is "overfished" when SSB < MSST. Current status of the stock and fishery are represented by the latest assessment year (2006).

Table 2. Status Summary Table

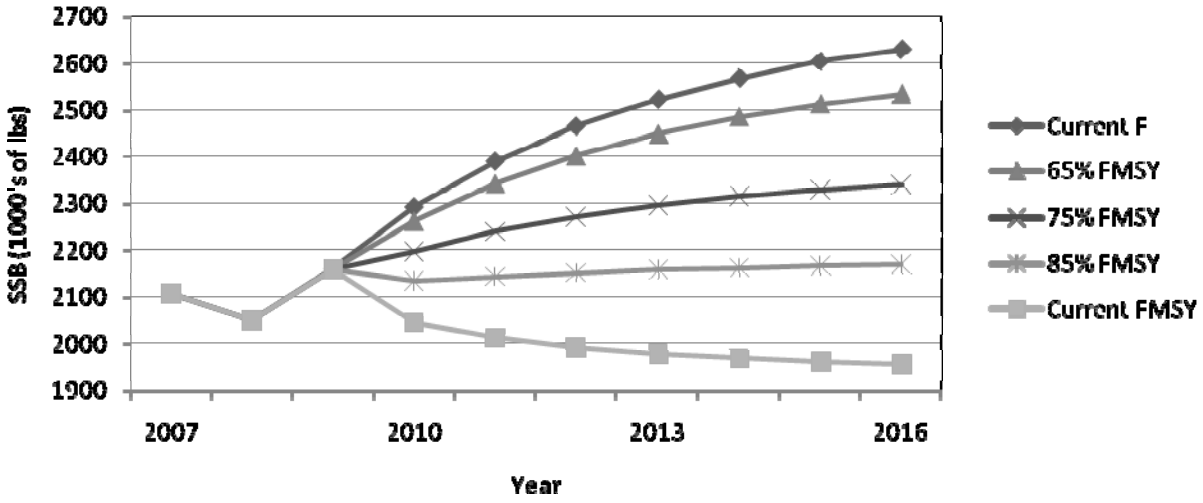
Quantity	Units	Estimate
MFMT (F_{MSY})	per year	0.424
$F_{30\%}$	per year	0.56
$F_{40\%}$	per year	0.342
F_{max}	per year	0.75
B_{MSY}	metric tonnes	5491
SSB_{MSY}	metric tonnes	1940
MSST	metric tonnes	1455
MSY	1000 lbs	2005
D_{MSY}	1000 fish	18
R_{MSY}	1000 fish	435
F_{2006}/F_{MSY}	–	0.531
SSB_{2006}/SSB_{MSY}	–	1.096
SSB_{2006}/MSST	–	1.461

Projections

Short term projections (2007 - 2016) were prepared to evaluate stock status over a range of future fishing mortalities (F_{MSY}, F_{OY}, $F_{current}$). These projections assumed that management changes could take place in 2009. The structure of the projection model was the same as that of the assessment model, and parameter estimates were those from the assessment base run. The fully selected fishing mortality rate in the initialization period was taken from the fully selected F during 2004–2006.

Projection results indicate spawning stock will remain above SSB_{MSY} and increase slightly from its current level through at least 2016 if fishing mortality and total removals are held at current conditions. Spawning stock biomass will decline to SSB_{MSY} levels by 2016 if mortality increases to F_{MSY}.

Figure 5. Projection results for Spawning Stock Biomass (in 1000's of pounds).



Allowable Biological Catch

Because overfishing is not occurring and estimated spawning stock exceeds the MSY spawning stock level, harvest levels are recommended based on exploitation at 75%F_{MSY}

Table 3. Landings and discards projected when ABC = 75% F_{MSY}. Landings are in metric tonnes and in thousands of pounds; discards are given in thousands of fish.

Year	L (mt)	L (1,000 lbs)	D (1,000 fish)
2007	747	1646	10
2008	650	1434	10
2009	777	1714	15
2010	806	1777	15
2011	833	1836	15
2012	848	1869	15
2013	859	1894	15
2014	868	1913	15
2015	874	1928	16
2016	879	1939	16

Uncertainty

The effects of uncertainty in model structure were examined by comparing two structurally different assessment models—the catch-at-age model and a surplus-production model. For each model, uncertainty in data or assumptions was examined through sensitivity runs, which involve varying the value of a parameter and evaluating its impact on the model. Precision of benchmarks was computed by a parametric bootstrap procedure.

Special Comments

The Peer Review Panel had no special comments on this assessment.

Table 4. Landings and discards for greater amberjack 1981-2006. Landings are in 1,000 lbs. whole weight, discards are thousands of fish.

Year	Recreational Landings 1,000 lbs.	Commercial Landings 1,000 lbs	Recreational Discards 1,000 fish	Commercial Discards 1,000 fish
1981	1611.71	86.99	5.46	0.00
1982	927.50	157.85	3.12	0.00
1983	451.98	111.04	3.91	0.00
1984	2254.34	182.94	6.34	0.00
1985	1746.49	157.10	9.75	0.00
1986	2770.13	397.06	10.85	0.00
1987	3308.15	1069.98	8.69	0.00
1988	2281.03	1043.37	6.66	0.00
1989	2103.88	1210.99	5.38	0.00
1990	1865.65	1549.50	6.80	0.00
1991	1440.55	1913.30	7.57	0.00
1992	1488.86	1987.71	8.46	1.15
1993	1067.10	1454.93	7.23	1.22
1994	1925.90	1537.24	4.90	1.71
1995	1019.18	1386.74	5.23	1.61
1996	1224.93	1172.92	5.30	2.02
1997	835.29	1145.28	5.52	2.11
1998	621.25	987.71	5.53	1.90
1999	1906.96	874.90	7.51	1.63
2000	998.29	845.19	8.36	1.73
2001	835.59	869.17	9.26	1.80
2002	901.00	895.99	9.60	1.64
2003	1212.86	762.77	10.64	1.37
2004	760.95	1008.03	10.29	1.18
2005	611.22	989.76	8.02	1.15
2006	657.22	613.61	7.65	1.30

Table 5. Benchmarks 1981-2006. The fishing mortality rate is full F, which includes the discard mortalities. B is the total biomass at the start of the year, and SSB is the spawning biomass at midyear. B and SSB are in units mt (metric tonnes: 1,000 kg). SPR is static spawning potential ratio.

Year	F	F/FMSY	B	SSB	SSB/SSBMSY	SPR
1981	0.126	0.298	11203	4764	2.46	0.654
1982	0.082	0.194	10595	4425	2.28	0.722
1983	0.046	0.108	10536	4326	2.23	0.826
1984	0.207	0.487	10470	4301	2.22	0.536
1985	0.177	0.417	9491	3897	2.01	0.579
1986	0.292	0.688	9785	3582	1.85	0.463
1987	0.344	0.812	9447	3500	1.8	0.41
1988	0.324	0.764	8514	3398	1.75	0.427
1989	0.296	0.699	7413	3041	1.57	0.447
1990	0.343	0.81	6976	2575	1.33	0.409
1991	0.413	0.973	6904	2377	1.23	0.362
1992	0.549	1.295	6875	2399	1.24	0.329
1993	0.39	0.921	6722	2437	1.26	0.4
1994	0.432	1.019	6570	2467	1.27	0.364
1995	0.36	0.849	6321	2299	1.18	0.416
1996	0.396	0.934	6031	2263	1.17	0.383
1997	0.384	0.907	5706	2123	1.09	0.401
1998	0.314	0.74	5883	2071	1.07	0.447
1999	0.469	1.106	6173	2175	1.12	0.329
2000	0.361	0.852	6063	2168	1.12	0.401
2001	0.327	0.771	7109	2337	1.2	0.427
2002	0.319	0.752	7844	2796	1.44	0.432
2003	0.297	0.701	7749	3084	1.59	0.435
2004	0.297	0.701	6951	2862	1.48	0.44
2005	0.253	0.597	5942	2407	1.24	0.489
2006	0.225	0.531	5617	2126	1.1	0.504