

# Atlantic States Marine Fisheries Commission

## Atlantic Croaker Technical Committee

October 7, 2008

Charleston, South Carolina

### Meeting Report

#### Participants

Harry Rickabaugh (MD, chair)  
Jim Vasslides (NC)  
Rob O'Reilly (VA)

Heather Corbett (NJ)  
Joseph Munyandorero (FL)

Chris McDonough (SC)  
Nichola Meserve (ASMFC)

#### Overview

The Atlantic Croaker Technical Committee met to conduct the 2008 trigger exercises and discuss preliminary planning for the next croaker assessment.

#### Review Trigger Exercise Calculations

##### Trigger 1A & 1B: Commercial and Recreational Landings

Calculations are for mid-Atlantic and south Atlantic, although only mid-Atlantic can trigger an assessment. NMFS landings in pounds are used. Virginia state-reported commercial landings are different from NMFS in some years (due to double counting of some inshore landings starting in 2004); the difference is limited for 2007. Calculation of the recreational trigger using numbers of fish provided similar percent changes as for pounds. The presentation to the Board will include two years of analysis, and the handout will include three years. Cumulative percent change should also be noted to the Board.

Mid-Atlantic (includes New Jersey, Delaware, Maryland, Virginia and North Carolina)

Comparison of Mid-Atlantic Commercial and Recreational Atlantic croaker harvests (pounds), 2005-2007.				
	2007	Average 2005-2006	Percent Difference	2007 as % of 2005-2006
Commercial	20,038,894	22,595,571	-11.31%	88.69%
Recreational	7,981,267	9,691,170	-17.64%	82.36%

Comparison of Mid-Atlantic Commercial and Recreational Atlantic croaker harvests (pounds), 2004-2006.				
	2006	Average 2004-2005	Percent Difference	2006 as % of 2004-2005
Commercial	20,726,016	24,725,188	-16.17%	83.83%
Recreational	9,024,446	9,467,287	-4.68%	95.32%

Comparison of Mid-Atlantic Commercial and Recreational Atlantic croaker harvests (pounds), 2003-2005.				
	2005	Average 2003-2004	Percent Difference	2006 as % of 2004-2005
Commercial	24,039,549	26,950,329	-10.80%	89.20%
Recreational	10,363,569	8,788,355	17.92%	117.92%

South Atlantic (includes South Carolina, Georgia, and east Florida)

Comparison of South Atlantic Commercial and Recreational Atlantic croaker harvests (pounds), 2005-2007.				
	2007	Average 2005-2006	Percent Difference	2007 as % of 2005-2006
Commercial	27,012	23,515	14.87%	114.87%
Recreational	260,813	205,193	27.11%	127.11%

Comparison of South Atlantic Commercial and Recreational Atlantic croaker harvests (pounds), 2004-2006.				
	2006	Average 2004-2005	Percent Difference	2005 as % of 2003-2004
Commercial	30,279	13,968	116.77%	216.77%
Recreational	207,267	226,742	-8.59%	91.41%

Comparison of South Atlantic Commercial and Recreational Atlantic croaker harvests (pounds), 2003-2005.				
	2005	Average 2003-2004	Percent Difference	2005 as % of 2003-2004
Commercial	16,520	13,967	18.28%	118.28%
Recreational	203,118	230,521	-11.89%	88.11%

Trigger 2A: Recreational Mean Length

The trigger uses MRFSS data to calculate the average mean length, weighted by state, for mid- and south Atlantic. For both regions, mean length decreased in 2007. The Committee did not recommend using this analysis to trigger an assessment until raw MRFSS data are used. In the future, the Committee should put in an early request for the raw length data and use that to develop the trigger. State citation data could also be considered for use in future years' trigger exercises.

Mid-Atlantic (includes New Jersey, Delaware, Maryland, Virginia and North Carolina)

Year	Harvest	Weighted*	Weighted*
	Number of fish	Mean Length (mm)	Mean length (inches)
2004	10,306,222	304.7	11.99
2005	11,084,817	309.8	12.20
2006	9,908,050	309.1	12.17
2007	9,950,168	292.5	11.5

\* Equals (number of fish)\*(mean length for each state)/(total number of fish for year all states combined)

South Atlantic (includes South Carolina, Georgia, and east Florida)

Year	Harvest	Weighted*	Weighted*
	Number of fish	Mean Length (mm)	Mean length (inches)
2004	678,588	235.1	9.26
2005	512,697	244.8	9.64
2006	326,443	270.2	10.64
2007	647,884	249.8	9.8

\* Equals (number of fish)\*(mean length for each state)/(total number of fish for year all states combined)

Trigger 2B: Commercial Mean Size

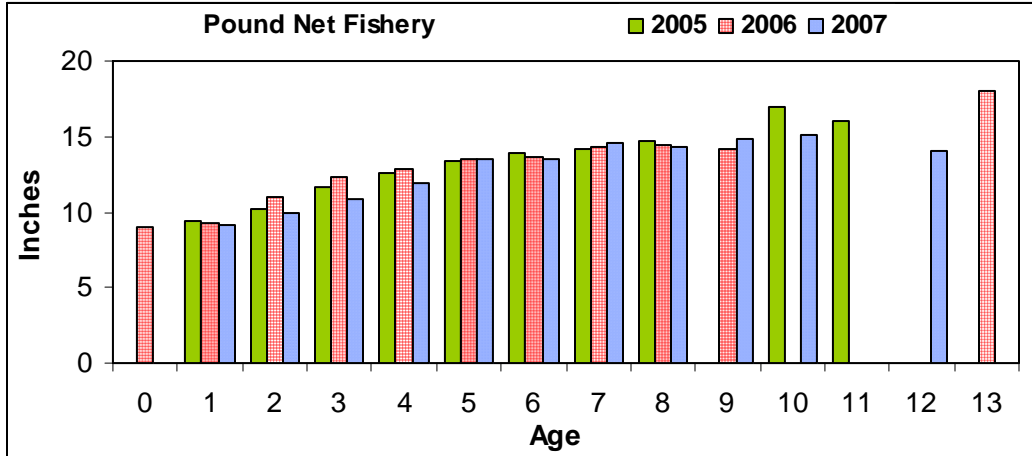
Lengths and weights at age from Maryland, Virginia, and North Carolina were used. The number of age samples is provided. Lengths and weights at age decreased slightly for some ages in each state. Variability may be due to changes in the sampling proportion by gear between years. Virginia's ages were corrected for the aging error identified at the Aging Workshop the following day.

The Committee also discussed looking into standardizing collection sample size and developing regional age length keys and weights and lengths at age.

a. Mean Total Length At Age

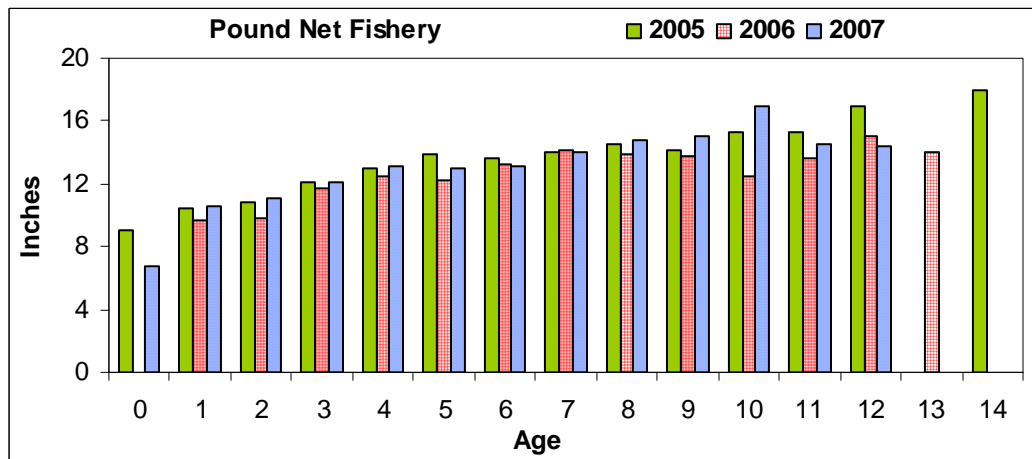
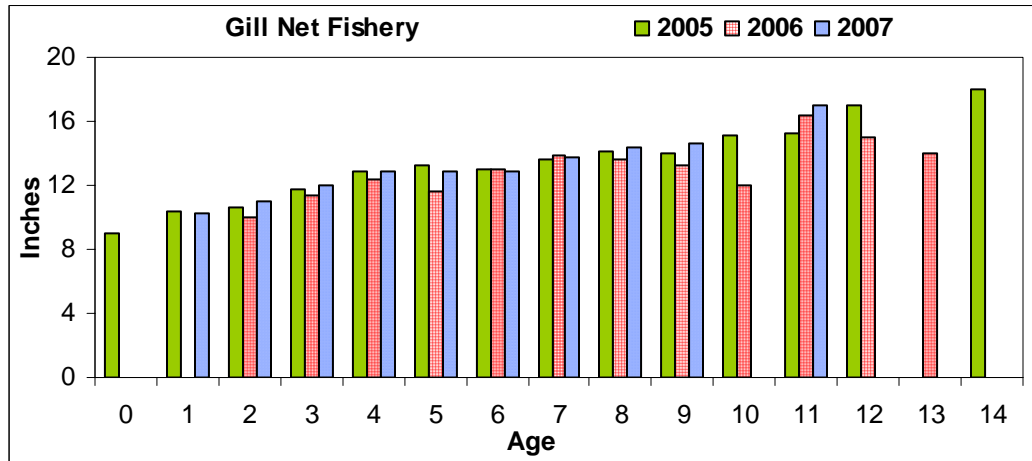
Maryland, 2005-2007, Pound Net Fishery

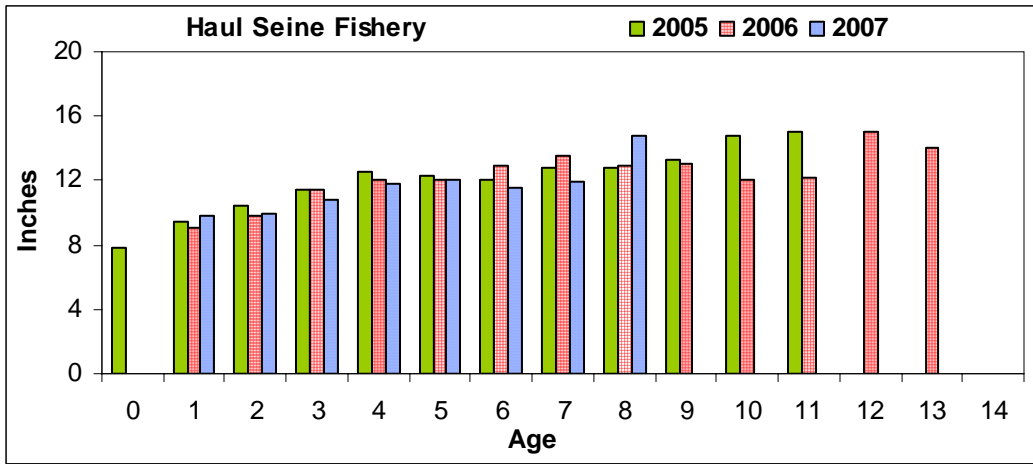
(Number of age samples: 2005-190, 2006-253, 2007-257)



Virginia, 2005-2007, Various Gears Individually

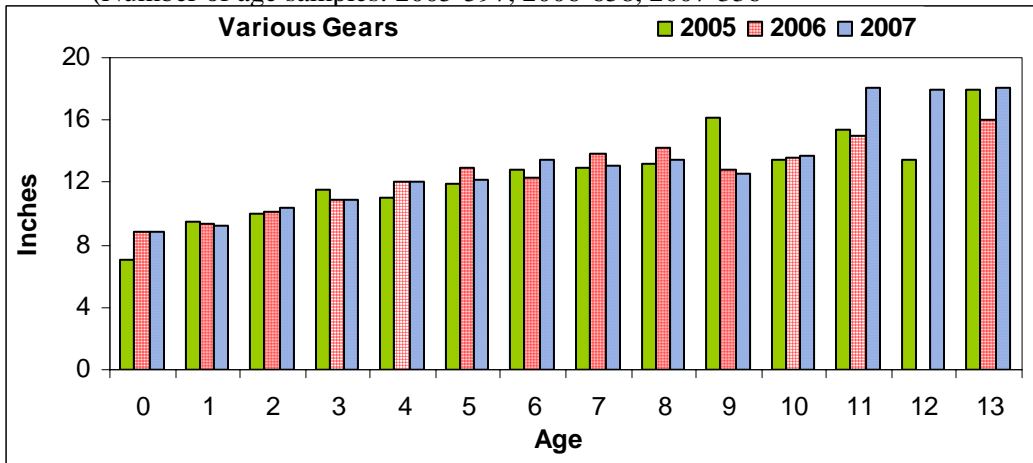
(Number of age samples: 2005-333, 2006-338, 2007-344)





North Carolina, 2005-2007, Various Gears Combined

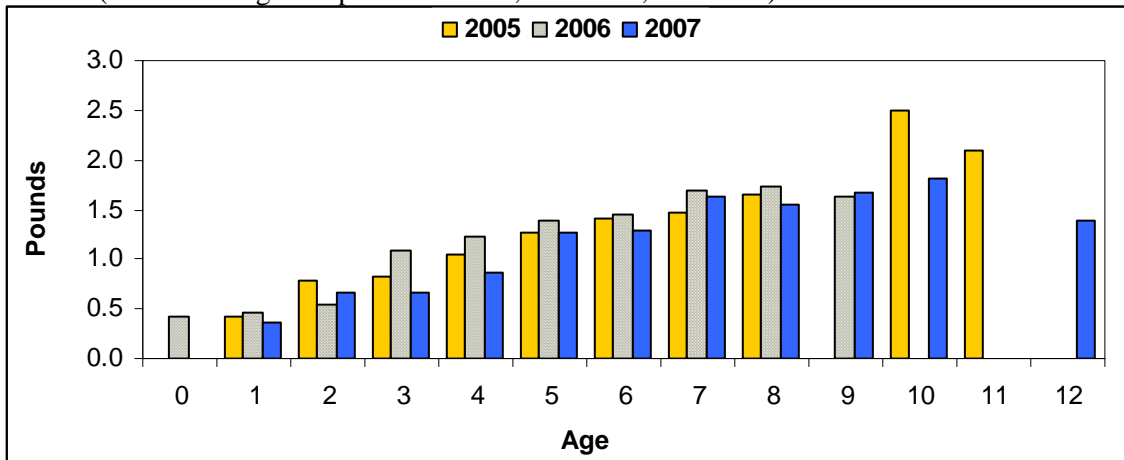
(Number of age samples: 2005-597, 2006-658, 2007-336)



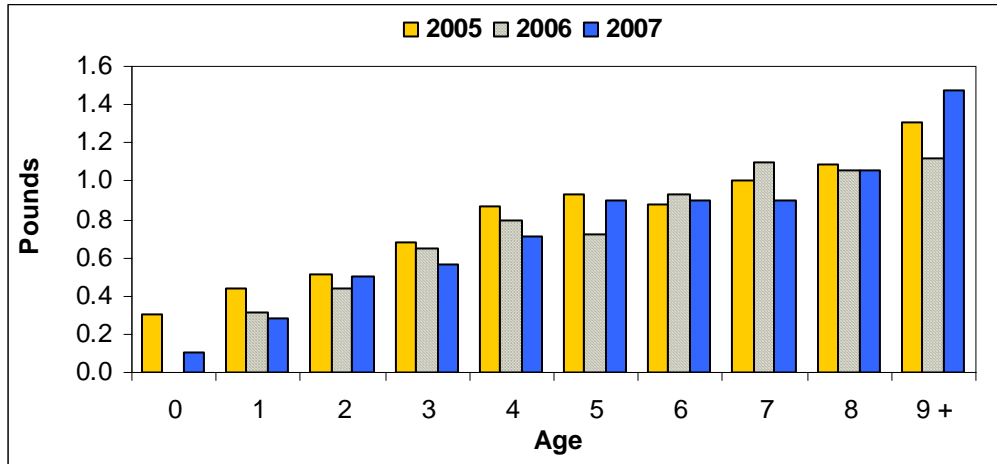
b. Mean Total Weight At Age

Maryland, 2005-2007, Pound Net Fishery

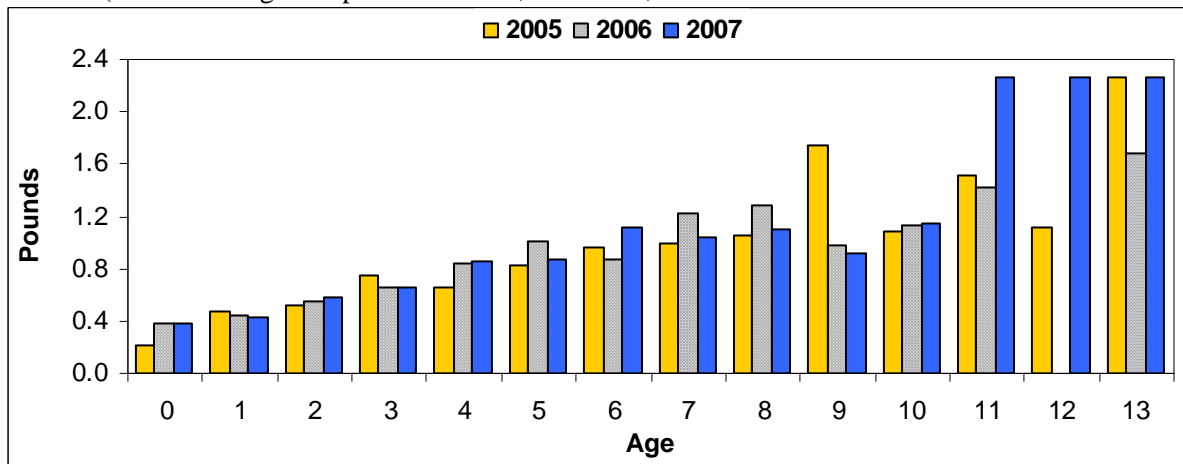
(Number of age samples: 2005-190, 2006-253, 2007-257)



Virginia, 2005-2007, Various Gears Combined  
 (Number of age samples: 2005-333, 2006-338, 2007-344)



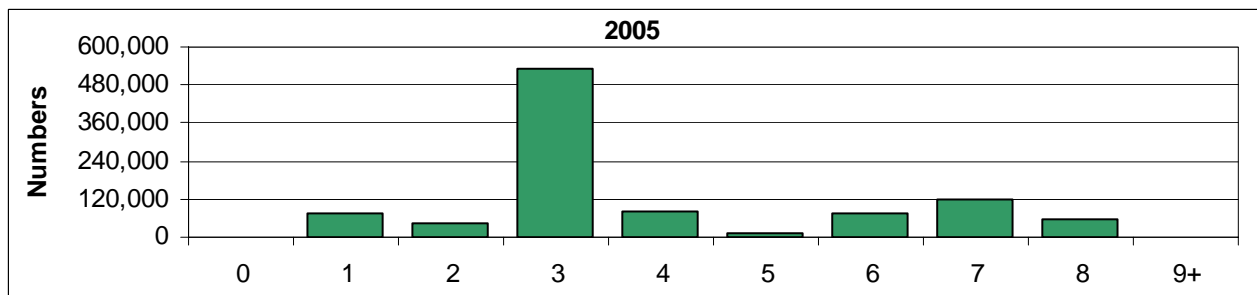
North Carolina, 2005-2007, Various Gears Combined  
 (Number of age samples: 2005-597, 2006-658, 2007- 336)

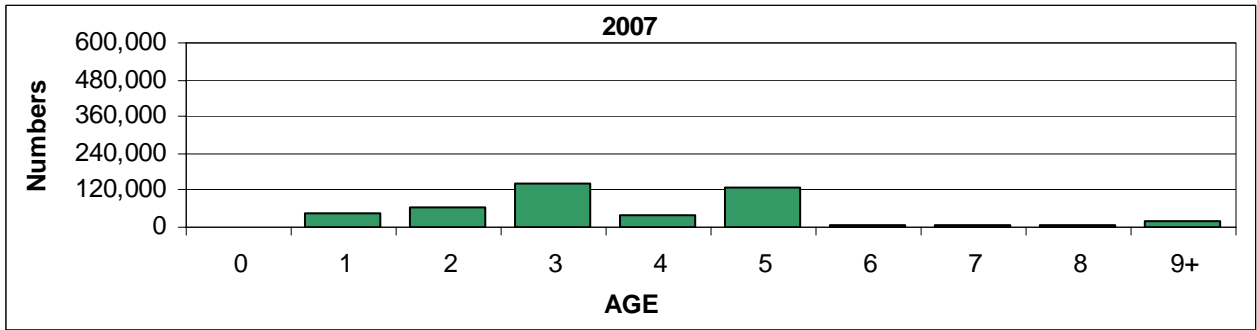
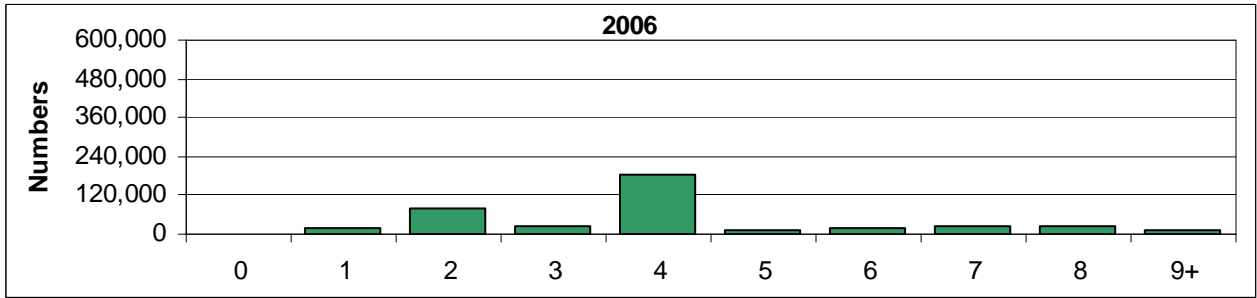


Trigger 2C: Age Composition

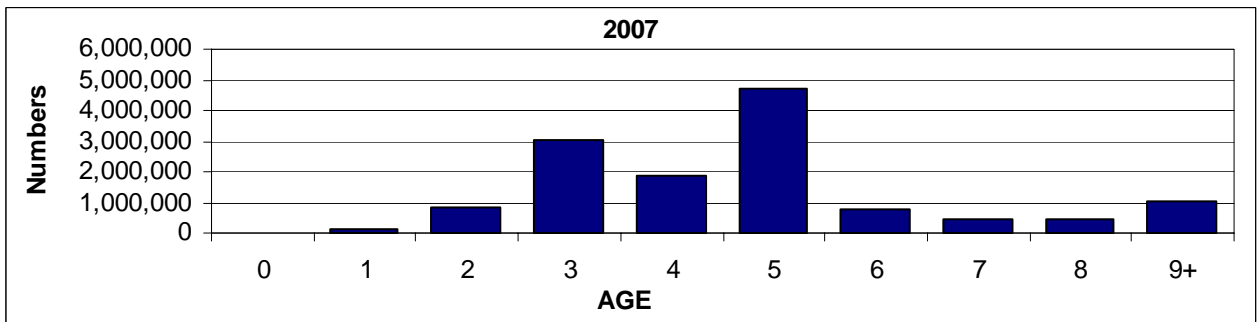
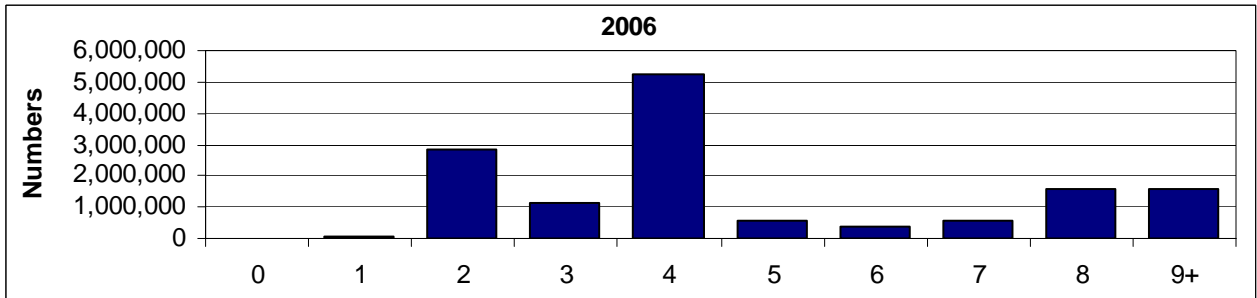
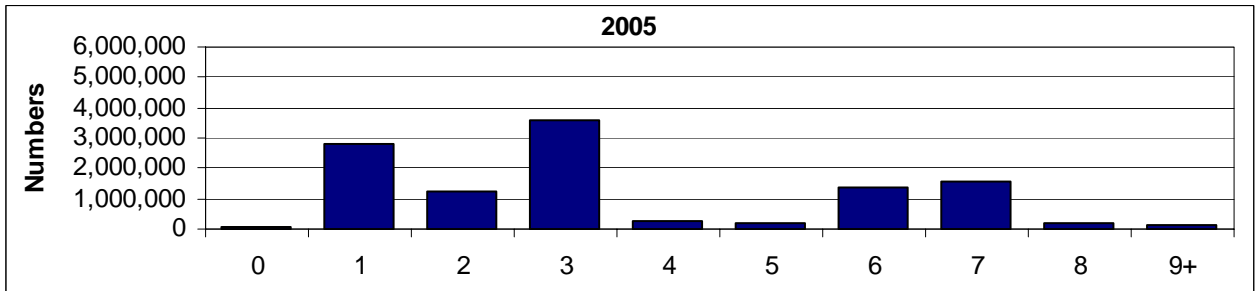
Commercial catch-at-age was produced for Maryland, Virginia, and North Carolina. The CAAs indicate that good year classes, which come every few years likely in relation to environmental factors, drive the fisheries.

Age composition of Maryland commercial harvest (numbers) of Atlantic croaker, 2005-2007

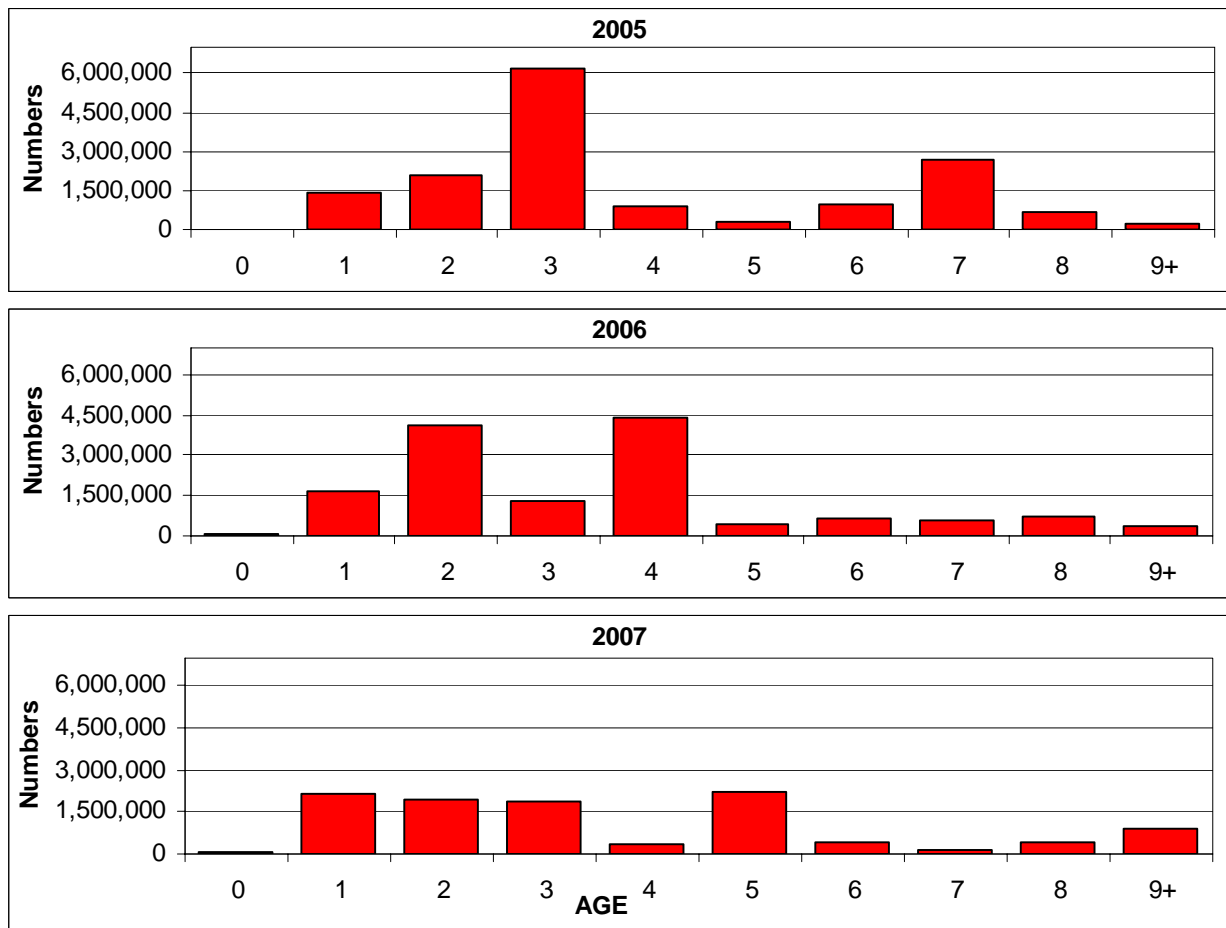




Age composition of Virginia commercial harvest (numbers) of Atlantic croaker, 2005-2007



Age composition of North Carolina commercial harvest (numbers) of Atlantic croaker, 2005-2007

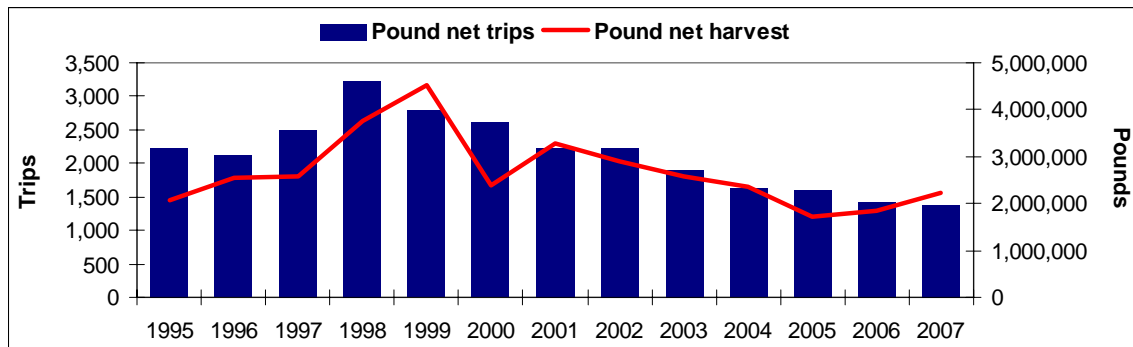
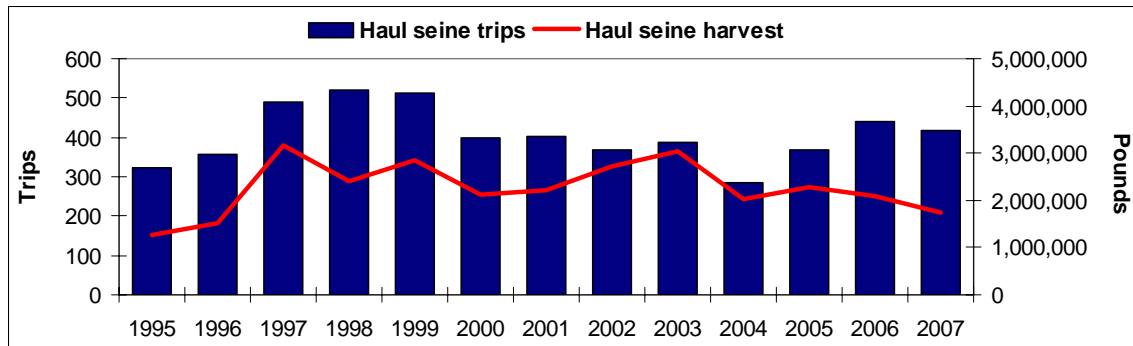
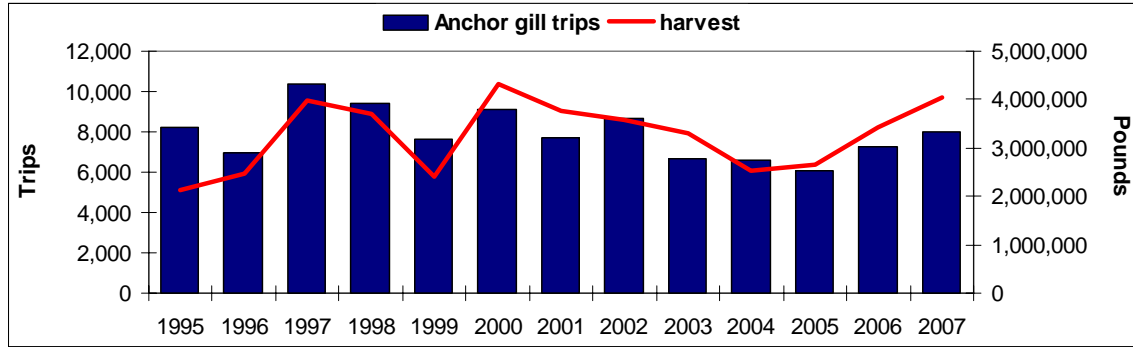


### Trigger 3: Catch-Per-Unit-Effort

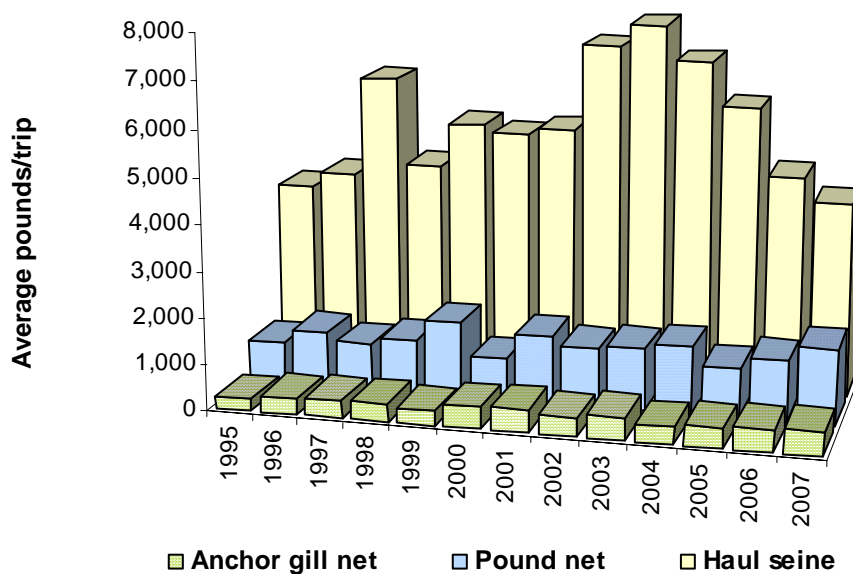
Catch and effort data from Virginia, North Carolina, and Florida were used. The decline in Virginia's haul seine CPUE is likely market driven or related to fish distribution. The number of haul seine trips is small compared to other gears, and the fishery seems to be opportunistic. The increase in Virginia's pound net harvest is surprising given that many veteran fishermen are leaving the fishery. In North Carolina, ocean gill net and fly net harvest and trips declined in 2007, although the fly net fishery contributes significantly more to total croaker harvest and has a higher CPUE. By season, landings in the spring have decreased across most gears in 2006 and 2007, and there was also a fairly large decrease in fall sink net landings. Seasonal effects in the North Carolina sink gill net length at age are apparent with a decrease observed in the fall and little change in the spring. Cast net and hook and line are included for Florida as they are the two major gears. Both gears' CPUE is rather variable.

The Committee discussed its progress towards CPUE being the premier trigger. The hang-up is with the effort data, which are error prone. Removing obvious outliers and trying to increase certainty in the effort data is very time consuming, and it is being worked on when time permits.

**Virginia harvest (pounds) of Atlantic croaker vs. trips, by major gear type, 1995-2007**

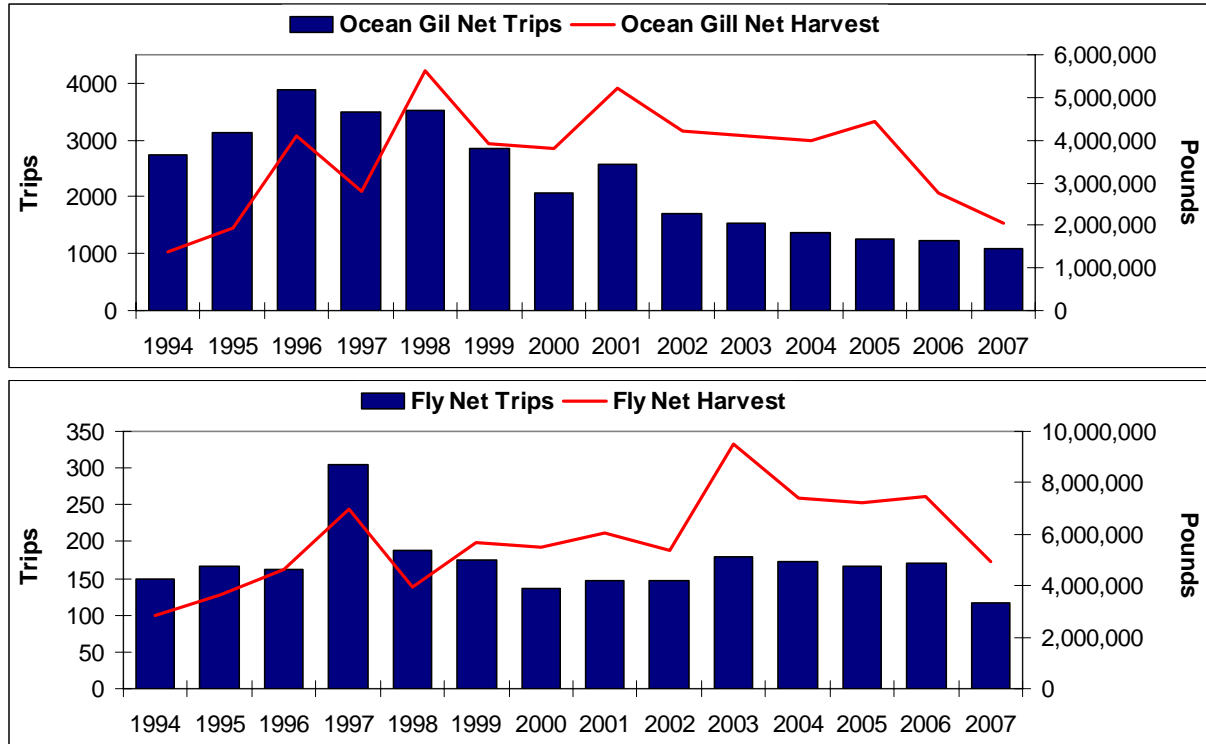


**Virginia catch-per-unit-effort, by major gear type, 1995-2007**

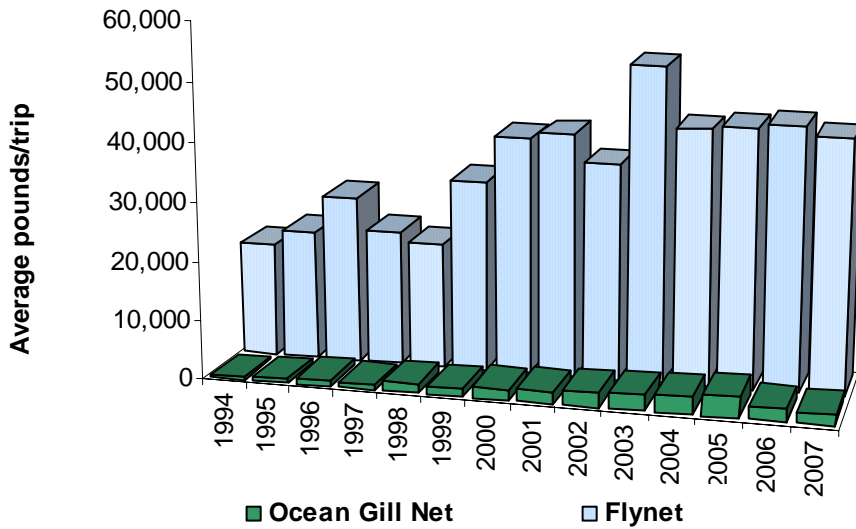




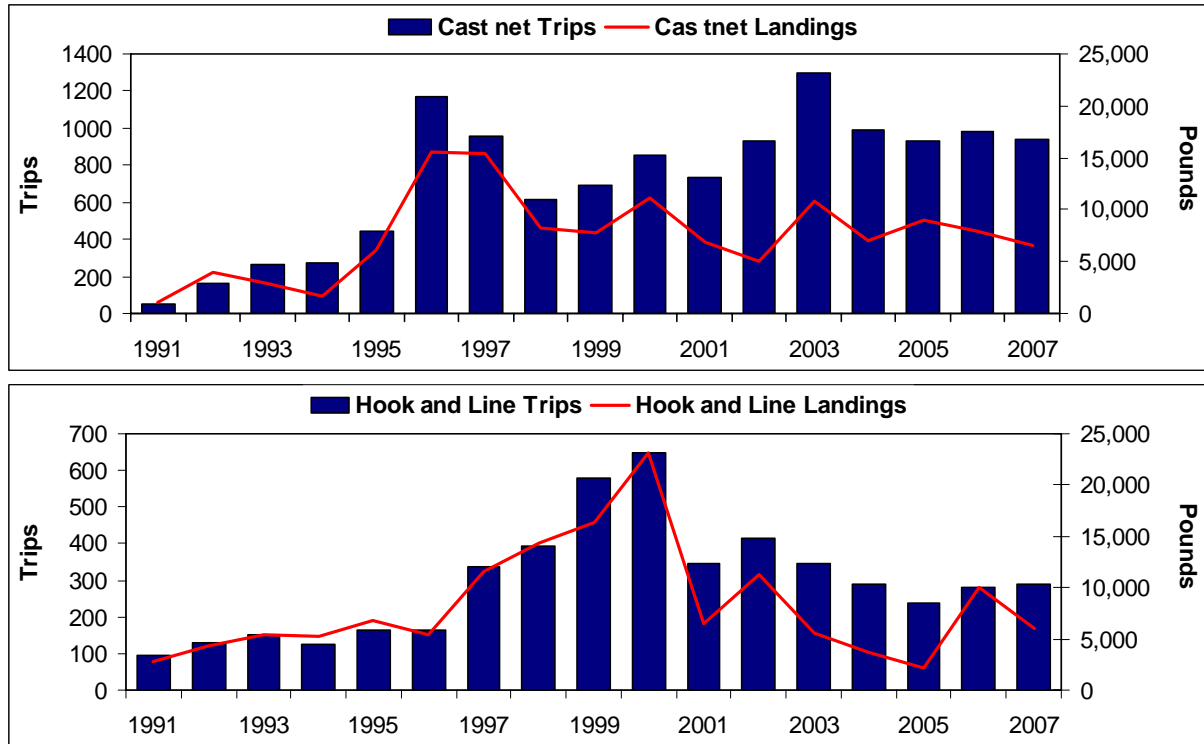
North Carolina harvest (pounds) of Atlantic croaker vs. trips, by major gear type, 1994-2007



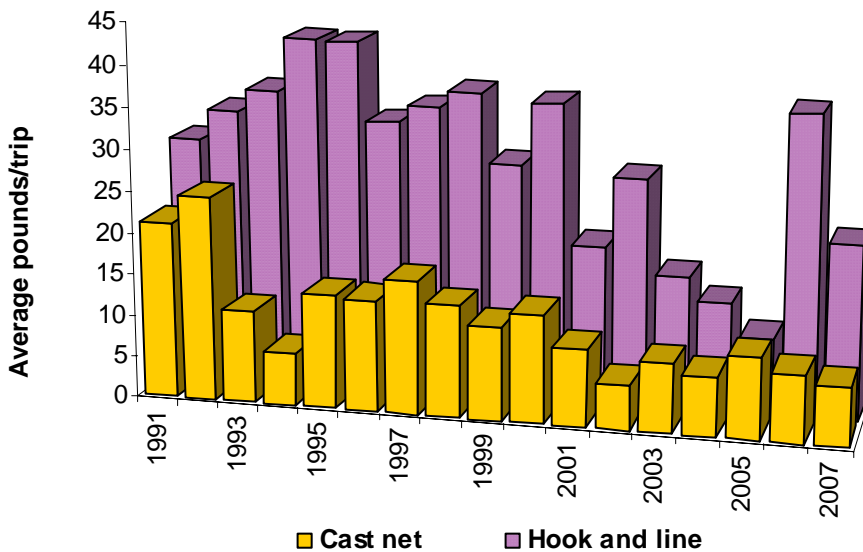
North Carolina catch-per-unit-effort, by major gear type, 1994-2007



**Florida harvest (pounds) of Atlantic croaker vs. trips, by major gear type, 1991-2007**



**Florida catch-per-unit-effort, by major gear type, 1991-2007**



**Trigger 4: MRFSS CPUE**

This index will be updated for the next assessment. The Committee may recalculate the index (entire timeseries) rather than update the index (2003-2008) with the current method.

**Trigger 5: Fishery-Independent Surveys**

Twenty indices were collected for a table. The Committee added a row for the time series average of each index. Figures of the NMFS, SEAMAP, and VIMS indices will be presented to the Board, because these were the primary indices in the last assessment. The Committee also decided to add a slide with all the

juvenile indices for 2007 compared to their long-term average.

The Committee noted that some of the values in the FLOWCC 21.3m seine and 183m seine series had changed. Joseph explained that this is because of the way the indices are standardized. Without a detailed explanation of the methodology, the Committee questioned whether the indices could be used in an assessment, but decided to include them in the table as is. A new 6.1m trawl index from FLOWCC was also added. Joseph will send more information on how the FL indices are calculated.

The Committee discussed how indices would be calculated for the next assessment. In the past, arithmetic or geometric mean have been used. Rob mentioned the standardization method that Yan Jiao (Virginia Tech, Weakfish SAS) is using for weakfish indices. The Stock Assessment Subcommittee should consider this method, Florida's methods, and others for the next assessment.

**Summary Table of Available Fishery Independent and Dependent Indices**  
(Index descriptions in subsequent table)

Year	SEAMAP all Weight	SEAMAP North Weight	SEAMAP South Weight	NMFS Weight	MRFSS NO Numbers	MRFSS SO Numbers	VIMS Spring GM	NCDMF 120 Numbers	NCDMF 195 Numbers	MDDNR CBT GM
1972	x	x	x	0.07	x	x	x	x	x	x
1973	x	x	x	5.65	x	x	0.12	78.15	x	x
1974	x	x	x	23.27	x	x	2.04	39.08	x	x
1975	x	x	x	52.59	x	x	2.63	30.21	x	x
1976	x	x	x	69.83	x	x	1.08	34.47	x	x
1977	x	x	x	31.71	x	x	0.15	3.62	x	x
1978	x	x	x	38.12	x	x	0.08	24.18	x	x
1979	x	x	x	2.41	x	x	2.18	47.91	x	x
1980	x	x	x	12.72	x	x	0.52	64.34	x	x
1981	x	x	x	4.42	0.23	0.59	0.07	16.47	x	x
1982	x	x	x	1.99	0.23	0.57	0.11	48.38	x	x
1983	x	x	x	24.10	0.67	0.38	6.59	92.72	x	x
1984	x	x	x	38.95	0.65	0.47	1.63	60.39	x	x
1985	x	x	x	23.92	0.40	0.58	4.98	27.93	x	x
1986	x	x	x	19.59	0.62	0.44	2.97	21.90	81.33	x
1987	x	x	x	17.20	0.69	0.29	4.24	52.17	86.72	x
1988	x	x	x	5.53	0.81	0.26	0.32	25.30	164.71	x
1989	x	x	x	11.67	0.86	0.32	0.60	24.67	231.2	1.02
1990	12.18	14.02	11.63	7.06	0.63	1.44	0.43	19.09	232.55	0.11
1991	29.71	45.36	25.10	25.88	0.90	0.66	4.41	8.65	84.36	3.09
1992	25.69	74.79	10.96	22.43	0.80	0.71	1.28	20.02	368.42	0.83
1993	13.36	43.58	4.30	9.01	0.96	0.25	2.17	55.59	416.67	1.84
1994	13.15	42.46	4.36	69.98	1.29	0.30	0.90	27.70	302.15	3.65
1995	9.15	24.24	4.62	21.37	0.85	0.28	1.06	42.61	183.26	2.94
1996	5.32	10.04	3.90	45.65	0.85	0.15	0.19	14.83	344.67	1.46
1997	4.18	13.62	1.35	21.48	1.23	0.23	1.47	59.29	436.53	3.22
1998	11.51	33.91	4.79	44.25	1.42	0.35	1.19	97.06	753.5	4.79
1999	11.10	36.28	3.55	123.74	2.11	0.35	1.50	22.35	318.32	2.30
2000	10.10	27.30	4.94	61.50	1.52	0.27	0.60	61.77	241.22	0.94
2001	11.28	19.17	7.83	46.32	1.37	0.20	0.36	29.01	146.97	0.40
2002	10.56	28.20	3.21	118.19	1.14	0.26	1.59	23.27	149.62	2.25
2003	14.85	25.62	10.36	85.82	*	*	0.49	28.86	147.25	0.89

2004	23.97	51.99	10.56	125.43	*	*	0.96	44.63	383.18	0.68
2005	18.09	48.68	3.60	56.45	*	*	0.47	49.50	374.3	0.38
2006	18.68	53.03	4.59	69.63	*	*	1.27	9.56	217.4	1.98
2007	11.93	24.10	8.09	112.29	*	*	1.04	47.95	315.97	0.53

Mean	14.16	34.24	7.10	40.28	0.92	0.43	1.48	38.68	271.83	1.75
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\* The Stock Assessment Subcommittee will update these indices during the next assessment.

**Continued. Summary Table of Available Fishery Independent and Dependent Indices**  
(Index descriptions in subsequent table)

Year	MDDNR BCT GM	FLFWCC 21.3m seine Numbers	FLFWCC 183m seine Numbers	FLFWCC 6.1m trawl Numbers	NJ DR seine Numbers	NJ DB trawl Numbers	NJ OT Aug Numbers	NJ OT Oct Numbers	DE Juvenile GM	De Adult Numbers
1972	x	x	x	x	x	x	x	x	x	x
1973	x	x	x	x	x	x	x	x	x	x
1974	x	x	x	x	x	x	x	x	x	x
1975	x	x	x	x	x	x	x	x	x	x
1976	x	x	x	x	x	x	x	x	x	x
1977	x	x	x	x	x	x	x	x	x	x
1978	x	x	x	x	x	x	x	x	x	x
1979	x	x	x	x	x	x	x	x	x	0.7
1980	x	x	x	x	0.00	x	x	x	0.2	0.4
1981	x	x	x	x	0.00	x	x	x	0.19	0.7
1982	x	x	x	x	0.00	x	x	x	0	0
1983	x	x	x	x	0.00	x	x	x	0	0.3
1984	x	x	x	x	0.00	x	x	x	2.17	0
1985	x	x	x	x	0.17	x	x	x	7.15	x
1986	x	x	x	x	0.27	x	x	x	2.18	x
1987	x	x	x	x	0.00	x	x	x	1.24	x
1988	x	x	x	x	0.00	x	0.28	0.00	0	x
1989	0.83	x	x	x	0.14	x	0.00	0.00	4.94	x
1990	0.18	x	x	x	0.00	x	0.00	0.00	0.06	0.1
1991	4.06	x	x	x	0.14	0.19	0.21	0.08	2	2.9
1992	1.28	x	x	x	0.09	27.82	0.15	6.18	15.01	0.9
1993	3.67	x	x	x	1.12	16.71	0.18	0.77	13.22	1.3
1994	4.25	x	x	x	0.37	5.41	9.87	0.87	6.04	4
1995	0.74	x	x	x	3.67	30.21	40.46	12.95	22.52	6.7
1996	2.15	0.0336	x	x	5.21	52.79	6.38	5.36	42.92	24.37
1997	5.32	0.0921	x	x	0.89	24.04	N/A	3.21	24.05	57.72
1998	30.05	0.4678	x	x	3.14	79.09	0.56	0.00	27.66	69.64
1999	4.18	0.3826	x	x	0.88	77.04	140.13	20.92	45.3	81.54
2000	2.76	0.7738	x	x	3.59	35.51	46.50	45.38	15.84	34.55
2001	0.86	0.6404	0.169	x	1.04	181.63	15.72	22.51	60.72	11.24
2002	3.50	0.6289	0.179	2.44	5.26	175.51	392.90	133.40	88.82	226.68
2003	0.81	0.5085	0.317	1.94	0.06	1.74	21.72	40.70	4.64	131.63
2004	3.51	0.6109	0.244	2.19	0.91	6.31	365.59	168.06	17.19	30.35
2005	0.44	1.7846	0.281	7.87	1.22	17.95	28.62	172.79	5.54	17.23
2006	2.10	0.8998	0.343	3.05	1.82	262.66	7.56	25.97	11.77	193.1
2007	0.54	0.3328	0.324	2.18	2.27	10.33	123.33	444.22	4.47	7.14

Mean	3.75	0.60	0.27	3.28	1.15	59.11	63.17	55.17	15.21	37.63
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INDEX	DESCRIPTION
SEAMAP All	Inshore trawl survey from Cape Hatteras, NC to Cape Canaveral, FL. Index in the mean kilograms of croaker per tow.
SEAMAP South	Inshore trawl survey from the South Carolina North Carolina boarder to Cape Canaveral, FL. Index in the mean kilograms of croaker per tow.
SEAMAP North	Inshore trawl survey from Cape Hatteras, NC south to the South Carolina North Carolina boarder. Index in the mean kilograms of croaker per tow.
NMFS	The survey uses #36-Yankee otter trawl, lined with 0.5-inch mesh, was fished for 30-minutes. Only sites less than 27 meters were included for the index. The index is the stratified mean catch per tow in weight (kilograms).
MRFSS NO & SO	Derived for the last stock assessment.
VIMS	An otter trawl is used from May through August to collect samples for the Spring Atlantic Croaker Recruit Index. Numbers of individuals caught are log transformed ( $1n(n+1)$ ) prior to abundance calculations. Resultant average catch rates are then back-transformed to the index geometric means.
NC DMF 120	The index is an unweighted arithmetic mean number of croaker for the ~105 core stations sampled in May and June. Daylight tows of one minute duration (75 yards) were made with a 2.3 m headrope two seam otter trawl, during May and June at a static set of 105 stations.
NC DMF 195	The weighted arithmetic mean number of croaker for the September and June cruises, with for example year 2005 represented by the September 2005 and June 2006 cruises (split year). Daylight tows were made using double rigged demersal mongoose trawls in six estuarine strata.
MD DNR CBT	A geometric mean catch per tow was calculated for YOY croaker from the coastal bays juvenile trawl survey, which uses a 16 foot otter trawl at fixed sampling locations.
MD DNR BCT	A geometric mean catch per tow was calculated for YOY croaker from the Maryland Chesapeake Bay Blue crab trawl survey, which uses a 16 foot otter trawl at fixed sampling locations in Tangier and Pocomoke sounds.
FLFWCC 21.3m Seine	A juvenile seine index. Values are median number of fish.
FLFWCC 183m Seine	Larger mesh seine survey designed to capture adult fish. Values are median number of fish.
FLFWCC 6.1m Trawl	A juvenile seine index. Values are median number of fish.
NJ DR seine	Juvenile seine survey using a 100 foot beach seine in Delaware River. Index is arithmetic mean catch per haul.
NJ DB trawl	New Jersey has conducted a near shore fixed station trawl survey in the Delaware Bay since 1991. Juvenile abundance data is collected April to November at 11 stations using a 16 foot otter trawl. The index is calculated as arithmetic mean abundance per tow.
NJ OT Aug NJ OT Oct	New Jersey has conducted five nearshore (within 12 nautical miles) trawl surveys each year since 1989. These surveys occur in January/February, April, June, August, and October. All species taken are weighed and measured. Catch per unit effort in number of fish per tow is calculated for each year. Arithmetic indices of abundance for Atlantic croaker are calculated for the August and October trawls only, when juveniles recruit to the gear and abundance is most consistent.
DE Juvenile	Uses a 4.9 meter trawl monthly from April through December. Thirty-three stations are sampled in Delaware Bay and six in the Delaware River. The index is calculated as geometric mean catch per tow.
DE Adult	Uses a 12 meter trawl monthly from March through December. The index is calculated as arithmetic mean catch per tow.

**Preliminary Stock Assessment Planning:**

Timeline for SEDAR 20: Atlantic croaker will have a review workshop (RW) through the SEDAR process, although the data and assessment workshops (DW, AW) will be through the ASMFC. SEDAR 20 is scheduled for 2010. SEDAR has asked for tentative dates for the RW. Given that SEDAR 19 has its RW in January 2010, that SEDAR prefers a few months between workshops, and that ASMFC will have a meeting in early May when the assessment could be presented, the ASMFC will request a RW in March 2010. For the DW, dates in mid-to-late August will be considered, allowing for time to compile data after the July 1 compliance report due date. For the AW, dates in mid-November to mid-December will be considered, allowing for about three months' time after the RW.

SAS Membership: None of the SAS members from the previous assessment are available for this assessment. However, Laura Lee (VMRC) and Joseph Munyandorero were nominated and approved to be on the SAS. Several additional SAS members still need to be appointed.

Updates: Chris noted that some croaker genetic work has been done in South Carolina. Preliminary results show genetic differences between the mid and south Atlantic. Collections were by Charlie Wenner, but the analyses and write-up are being done at the federal lab. The Committee should talk to Tom Geiger about this before the assessment.

**Other Business**

Gabe Gaddis will no longer be on the Committee. Jim Page will likely be the new Georgia representative.

**Adjourn**