

Atlantic States Marine Fisheries Commission

**DRAFT ADDENDUM XXI TO THE SUMMER FLOUNDER,
SCUP AND BLACK SEA BASS FISHERY MANAGEMENT
PLAN FOR PUBLIC COMMENT**

Black Sea Bass Recreational Management in 2011



ASMFC Vision Statement:

Healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015.

February 2011

Public Comment Process and Proposed Timeline

At the December 2010 Joint Mid-Atlantic Fishery Management Council (Council) and Atlantic States Marine Fisheries Commission (Commission) meeting, the Summer Flounder, Scup, and Black Sea Bass Management Board (Board) and Council approved the following motion: the 2011 recreational black sea bass fishery measures will be a 13-inch TL minimum fish size, a 25 fish possession limit, and an open season from July 1 to October 1 and November 1 to December 31. The measures will remain in effect until the ASMFC approves an addendum to the Summer Flounder, Scup, and Black Sea Bass Plan that implements regional specifications for black sea bass that would achieve the necessary reduction in fishing mortality for 2011. The Council and the Board voted to recommend to NOAA that management measures in federal waters revert to the same measures in place for 2010 once the addendum is in place. The Board met via conference call on February 3, 2011 to review possible options to address the 2011 recreational black sea bass fishery measures. On this call the Board initiated an addendum to allow more flexibility in setting recreational measures for the 2011 fishing year. The addendum proposes to allow state-by-state or regional management measures for the 2011 black sea bass fishery. This draft addendum presents background on the Commission's management of summer flounder, scup, and black sea bass; the addendum process and timeline; and a statement of the problem. This document also provides options of management for public consideration and comment.

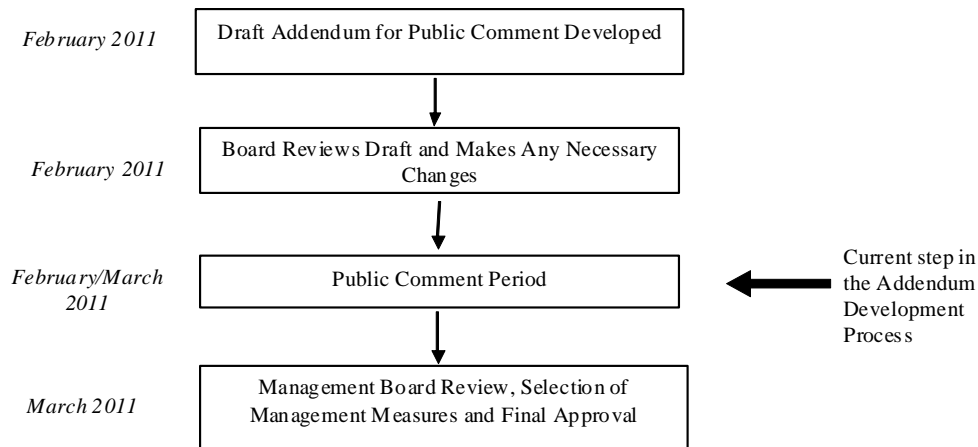
Specifically the Commission is seeking comment on issues under section 4.0 Management measures including: State-by-state management (p.6-9) and regional management (p. 9-11).

The public is encouraged to submit comments regarding this document at any time during the addendum process. The final date comments will be accepted is March 18, 2011 at 5:00 p.m. Comments may be submitted by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below.

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1.0 Introduction

This Addendum is proposed under the adaptive management/framework procedures of Amendment 12 and Framework 2 that are a part of the Fishery Management Plan for summer flounder, scup, and black sea bass. The Addendum applies only to the black sea bass fishery management plan. The adaptive management possibilities authorized by Amendment 12 include recreational fishery measures. The black sea bass fishery is managed cooperatively by the states through the Atlantic States Marine Fisheries Commission for state waters, and the federal government through the Mid-Atlantic Fishery Management Council and the National Marine Fisheries Service for federal waters. The management unit for black sea bass remains unchanged in this addendum. Specifically, the management unit for black sea bass in US waters is the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the US-Canadian border.

2.0 Statement of the Problem

The recreational fishery for black sea bass is managed on a “target quota” basis. Fifty-one percent of the total allowable landings are allocated as a recreational harvest target and forty-nine percent is allocated to the commercial sector. Since 1996, a uniform coastwide size limit, season, and bag limit has been set by the Commission and Council to constrain the fishery to the annual recreational harvest limit. During the last 15 years the harvest target was exceeded 5 times, most recently in 2009 and 2010 when the harvest target was the lowest in the time series (Table 1). In 2009 the target was exceeded by 1.18 million pounds and by an estimated 1.15 million pounds in 2010 (based on preliminary estimates of waves 1-6 and harvest in North Carolina only north of Cape Hatteras).

The current management plan for black sea bass does not provide an opportunity to craft recreational measures by regions or state, it only allows for a coastwide measure. In 2010 all states, with the exception of Massachusetts, adopted the coastwide regulations of a 25 fish bag limit, 12.5 inches TL minimum fish size, and an open season from May 22 to October 11 and November 1 to December 31 in 2010 (Table 1). Massachusetts opted for a more restrictive 20 fish possession limit, and adopted all other coastwide regulations in 2010. The 2010 regulations resulted in an estimated harvest of 2.98 million pounds, approximately 1.15 million pounds above the 2010 target. Due to the wide geographic range of this species, the application of coastwide minimum size, possession limit and season restrictions may not affect every area involved in the fishery the same way. Additionally, black sea bass migrations may result in differences in availability to the recreational fishery in each state. States are concerned that the 2010 regulations disproportionately impacted states within the management unit.

For the 2011 recreational fishing year, a 40% reduction in harvest (based on the effectiveness of the 2010 regulations and the 2011 harvest target) is necessary to achieve the harvest target of 1.78 million pounds. If a coastwide measure was continued in 2011, the board has proposed an increase in the minimum size limit from 12.5 inches to 13.0 inches and a season from July 1 to October 1 and November 1 to December 31 (a reduction in the season by 50 days, 40 days from wave 3 and 10 days from wave 5) to meet the reduction. Table 2 shows the potential reduction in harvest by state if the size limit were to increase from 12.5 inches to 13 inches, note that this is raw length frequency data which is heavily biased by the party charter mode and may not be reflective of patterns in the private boat or shore mode fishery. Reductions vary by state from 11

to 54%. In order to analyze the impact of a change in season, data from 2006-2008 was used because this was the most recent period when the season was open all year, which may not be reflective of harvest patterns in more recent years. Table 3 shows the potential reduction in harvest by state if an entire wave is closed, impacts vary by state from 0 to 78%. Both Tables 2 and 3 and Figure 1 show that changes in seasons and size limits impact states differently. The Board initiated the Draft Addendum to provide the necessary management flexibility to mitigate potential disproportionate impact on states that can result from coastwide measures. This Addendum proposes to establish a program wherein the black sea bass management board could sub-divide the recreational black sea bass coastwide allocations into regional or state-by-state management for 2011 only.

3.0 Fishery Description

Black sea bass are generally considered structure oriented, preferring live-bottom and reef habitats. Within the stock area, distribution changes on a seasonal basis and the extent of the seasonal change varies by location. In the northern end of the range (Massachusetts to New York), sea bass move offshore crossing the continental shelf, then south along the edge of the shelf (Moser and Shepherd, 2009). By late winter, northern fish may travel as far south as Virginia, however most return to the northern inshore areas by May. Sea bass along the Mid-Atlantic (New Jersey to Maryland) head offshore to the shelf edge during late autumn, travelling in a southeasterly direction. They also return inshore in spring to the general area from which they originated (Moser and Shepherd, 2009). Black sea bass in the southern end of the stock (Virginia and North Carolina) move offshore in late autumn/early winter. Because they are close to the continental shelf, they transit a relatively short distance, due east, to reach over-wintering areas (Moser and Shepherd, 2009). Fisheries also change seasonally with changes in distribution; recreational fisheries generally occur during the period that sea bass are inshore. However, in recent years party/charter vessels, primarily from New Jersey and New York, participate in an offshore winter sea bass fishery during January and February.

Stock Status

Based on the June 2010 assessment update, the stock is not overfished and overfishing is not occurring (Shepherd and Nieland 2010). The stock has been considered rebuilt since 2009.

The recent assessment model indicates that spawning stock biomass (SSB) decreased from about 26.8 million pounds in 1975 to about 18.2 million pounds in 1979, then increased to about 25.6 million pounds during the mid 1980s. SSB declined through the 1980s and early 1990s to only 14.7 million pounds in 1996. With improved recruitment and low fishing mortality rates since 2001, SSB has steadily increased to about 28.6 million pounds in 2009. Recruitment, fish entering into the fishery, averaged 26.4 million fish during 1968-1999 but increased to 56 million in 2000 followed by recruitment of 40 million fish in 2002. Although 2004 recruitment was the lowest in the time series, recent years have been near average. The black sea bass model average retrospective pattern suggests recruitment and total biomass are over-estimated in the terminal year.

The following is a description of state fishery independent data to provide insight to local availability of black sea bass within each state.

Massachusetts

Figure 2 represents the DMF trawl survey adult abundance indices for the entire time series. The series is an index of local relative abundance for adult sea bass and is derived from data from Regions 1-3 (stations that include the back side of Cape Cod and all waters south and west of Cape Cod) and represent stratified mean weight and numbers per tow from the spring cruise leg. While the survey indices are somewhat noisy due to inter-annual variability some general trends are apparent. The indices are very high in the early to mid 1980's while the commercial pot fishery was developing and the recreational fishery was undeveloped. Local abundance was low during the late 1980's through the late 1990's, likely representing a stock collapse from coastwide overfishing and poor recruitment. From the late 1990's there appears to be a high abundance of sea bass in Massachusetts waters, likely from local stock rebuilding, as the commercial fishery has been well controlled by quotas and other unilaterally enacted management measures. The peak of abundance was 2008, and while most recent year's abundance is lower it is still far above the time series mean, indicating that black sea bass are currently very abundant in Massachusetts waters.

Rhode Island

Local abundance of black sea bass is best indicated by the fall seasonal survey, the monthly survey, and the coastal pond juvenile abundance index (Figure 3a, b, and c). In state waters there is an increasing trend in both numbers and biomass of fish beginning in 2000. Similar to Massachusetts and the assessment, increases in abundance begin in 2000 but stabilized in recent years at a relatively high level. The juvenile abundance index follows the same trend.

Connecticut

The Connecticut Fall and Spring Long Island Sound Survey for black sea bass follow similar trends over the course of the time series (1984 - 2010) (Figure 4 a and b). The fall survey tends to catch smaller fish (18 - 20 cm) and may be a better indication of yearling fish. Both surveys had low catches prior to 2000, a strong peak in 2002 and an increasing trend from 2006 to 2010. In the spring survey the four most recent years were above the series mean. In the fall survey, three of the last four years were above the series mean. The series mean for the spring was .15 fish per tow but over the last 11 years, (2000 - 2010) the mean was .25 fish per tow. The series mean for the fall was .19 fish per tow; however of the last 10 years (2000 - 2010) the series mean was significantly higher at .39 fish per tow.

New York

Overall, black sea bass in New York's Peconic Bay Small Mesh Trawl Survey (a survey aimed at measuring the abundance of juvenile fish) exhibit an increasing trend in abundance from 1987 - 2010 (Figure 5). There has been a high degree of variability in catch since 1993 to the present with large swings in CPUE from year to year. Most recently, after a 3 year period of increasing catches, black sea bass numbers dropped in 2010.

New Jersey

The New Jersey Ocean Trawl Survey is a multispecies survey that started in August 1988 and samples the near shore waters from the entrance of New York Harbor south, to the entrance of the Delaware Bay five times a year (January, April, June, August and October). Black sea bass abundance from New Jersey's Ocean Trawl Survey in 2009 was average for the time series of

the survey (Figure 6). The most recent years where catches were well above the average included 2002 and 2007, while 2005, 2006 and 2008 were below the average.

Maryland

The Maryland Coastal Bays Finfish Project conducts trawl and seine samples in the Maryland coastal bays from April through October. The trawl portion of the survey encounters the most black sea bass, and is the best indicator of juvenile abundance in the coastal bays. Juvenile abundance from the trawl survey was below average in 2009, above average in 2008, and equal to average in 2006, 2007, and 2010 (Figure 7). The 2008 year class was one of the strongest of the time series.

Virginia

Black sea bass are seldom taken in large numbers but regularly occur in the Virginia Institute of Marine Science (VIMS) juvenile trawl survey catches. Young-of-year black sea bass occur throughout the Chesapeake Bay and appear occasionally in the lower portions of the tributaries (James, York, and Rappahannock rivers). Index calculations are based on all Bay strata and the lower James stratum from May through July. Although some early juveniles appear in the Bay during their first summer and fall, more young-of-year enter the estuary during the following spring. The index is calculated for the year class spawned the previous calendar year (i.e., the index for the 2008 year class is based on catches from May to July 2009). The black sea bass random-stratified index (RSI) was generally above average (mean RSI = 0.71) prior to 1995, but fell below average in subsequent years with the exception of 2001 and 2007 (Figure 8). The index is the geometric mean and the RSI = 0.71 is the arithmetic average of the indices over time.

4.0 Proposed Management Program

If one of the options in this draft addendum were adopted (other than status quo), the measures would only be effective in state waters. The Federal FMP does not allow for conservation equivalency and would require an amendment to the plan to make the necessary changes consistent with those proposed in this document, therefore, a single coastwide measure would be set in Federal waters regardless of the regulations set in state waters. Federal permit holders would have to follow regulations set by NMFS regardless of where they are fishing. This could create an inequity between those fishing in state vs. federal waters of a particular state. \

The state-by-state and regional management options shares and reductions are based on MRFSS data. For 2010 preliminary harvest estimates for wave 1-6 were used. In North Carolina only harvest north of Cape Hatteras were used, for waves 5 and 6 the harvest was estimated using the portion of harvest N. of Hatteras from 2006-2008.

Option one: Status Quo

2011 black sea bass recreational measures would be set using a single coastwide size limit, bag limit, and season.

Option two: State-by-State Measures

Under this option states would implement individual recreational black sea bass management programs that utilize minimum size limits, maximum possession limits, and seasonal closures that are designed to achieve a specific harvest reduction that, when combined with the other states in the management unit, achieve the required coastwide reduction for 2011.

Reduction tables, provided to the technical committee, would be used to determine which suite of possession limits, size limits, and closed seasons would constrain recreational landings to the recreational harvest limit for the state. Tables would be adjusted for each state, to account for past effectiveness of the regulations. The state would propose a combination of size limit, possession limit, and closed season that would constrain landings to the appropriate level, to be reviewed by the technical committee and approved by the Summer Flounder, Scup, and Black Sea Bass Management Board. If this alternative were chosen, states would not be allowed to implement measures by mode or area unless the PSE of the mode or area for that region is less than 15%.

Note: The MRFSS data used to set state specific conservation equivalent measures produces more variable results when used on a state-by-state basis. As the coverage area increases the variability of the data decreases; therefore, adopting regional or coastwide approaches will give more credibility to the data.

Under this option the Board will need to choose what reference years to base state harvest target on for 2011. Options A-D.

Option A. Shares based on 2006-2010 harvest.

	% Share based on 5 yrs	% Reduction in 2011 based on 5 yr avg
MA	16%	64%
RI	4%	65%
CT	1%	48%
NY	24%	51%
NJ	42%	7%
DE	4%	-138%
MD	3%	-73%
VA	5%	-315%
NC	1%	-7%

Negative % reduction means a state could liberalize regulations by that %.

Option B. Shares based on 2008-2010 harvest

	% Share based on 3 yrs	% Reduction in 2011 based on 3 yr avg
MA	23%	50%
RI	5%	60%
CT	1%	27%
NY	28%	43%
NJ	35%	23%
DE	2%	-27%
MD	2%	-4%
VA	4%	-245%
NC	1%	6%

Negative % reduction means a state could liberalize regulations by that %.

Option C. Shares based on 2009 -2010 harvest.

	% Share based on 2 yrs	% Reduction in 2011 based on 2 yr avg
MA	24%	46%
RI	5%	59%
CT	0%	65%
NY	30%	40%
NJ	33%	28%
DE	2%	-23%
MD	1%	17%
VA	3%	-202%
NC	1%	13%

Negative % reduction means a state could liberalize regulations by that %.

Option D. Shares based on 2010 harvest.

	% Share based on 2010	% Reduction in 2011 based on 2010
MA	29%	37%
RI	8%	37%
CT	1%	37%
NY	31%	37%
NJ	28%	38%
DE	1%	41%
MD	1%	37%
VA	1%	37%
NC	1%	-3%

Negative % reduction means a state could liberalize regulations by that %.

Option three: Regional Management

This scenario proposes adjacent states or a running line of adjacent states to develop multi-state conservation equivalency regions. Reduction tables, provided to the technical committee, would be used to determine which suite of possession limits, size limits, and closed seasons would constrain recreational landings to the recreational harvest limit for the entire region. Tables would be adjusted for each region, to account for past effectiveness of the regulations. The states within the region would propose a regional size limit, possession limit, and closed season that would constrain landings to the appropriate level to be reviewed by the technical committee and approved by the Summer Flounder, Scup, and Black Sea Bass Management Board. The management measures within the region would be the same for each state in that region and conservation equivalency would not be permitted. If this alternative were chosen, regions would not be allowed to implement measures by mode or area unless the PSE of the mode or area for that region is less than 15%.

Regional Delineations

A review of the tagging data shows no clear division line to set regions. During summer months fish throughout the stock remain stationary in coastal areas with very little mixing among adjacent areas. In autumn, offshore migration toward the edge of the continental shelf begins in the north and progresses southward. During the offshore overwintering period, intermixing of fish from various inshore areas is more frequent. Recaptures following spring inshore migrations demonstrate a high degree of site-fidelity with occasional straying to adjacent areas. Archival data tags suggest that offshore migration coincides with declining water temperature.

The tagging data could be interpreted to treat Massachusetts –New York as one region and New Jersey south as a separate region. The evidence from the tagging results suggest somewhat of a natural partition associated with the Hudson Canyon (Figure 9). Fish from Long Island east

seem to generally migrate offshore going southeast then along the edge of the shelf, avoiding the Hudson Canyon. Fish from New Jersey and south tend to also go southeast or east but not in the same pathway as northern fish. Anecdotal evidence suggests that the winter offshore fishery in New Jersey is targeting the northern fish heading south, hence the larger fish in the New Jersey winter catch.

Other suggestions for regional management include a scup-like region grouping the states that historically land the most fish together. This would result in the grouping of the states of Massachusetts –New Jersey and Delaware – North Carolina, forming two regions.

An examination of the previous 5 years of recreational harvest data shows that the states of New Jersey, Delaware, Maryland, and Virginia have seen a decline in harvest (Figures 10-12), Massachusetts and New York have seen an increase in harvest (Figures 10 and 13), and Connecticut, Rhode Island and North Carolina have remained fairly stable (Figures 12 and 13). Overall since 2005, the following grouping of states have exhibited similar landings patterns: Virginia, Maryland, and Delaware; Connecticut, Rhode Island and North Carolina; and New York and New Jersey with the exception of the terminal year where New Jersey harvest has declined and New York increased. The states of The states of Massachusetts, New York and New Jersey have all landed more than 500 thousand fish in 2010, with all other states landing less than 25,000 fish except Rhode Island (146,361 fish) (Figure 10).

State specific MRFSS landings estimates from 2005 to 2010 by ‘Area Harvested’ (State v. Federal waters) are presented in Table 4. In recent years, from Massachusetts to New York, the BSB fishery occurs mostly in state waters while from Delaware to North Carolina the fishery operates in the waters of the EEZ. New Jersey’s fishery is split close to half in state and half in the EEZ.

Appendix 1 includes the total recreational catch per trip by state. Catch is harvest plus discards. Some members of the Technical Committee have indicated that this data can be used to determine where a regional spilt could occur.

If one of the regional management options is selected (options 1-3), the Board will need to identify what reference years to base a regional harvest target on for 2011 (present in options A-D below).

Region Option 1. Two Regions: Massachusetts- New Jersey and Delaware- North Carolina

Option A	% Share based on 5 yrs	% Reduction in 2011 based on 5 yr avg	Option B	% Share based on 3 yrs	% Reduction in 2011 based on 3 yr avg
MA-NJ	88%	43%	MA-NJ	92%	41%
DE-NC	12%	-113%	DE-NC	8%	-59%

Option C	% Share based on 2 yrs	% Reduction in 2011 based on 2 yr avg	Option D	% Share based on 2010	% Reduction in 2011 based on 2010
MA-NJ	93%	40%	MA-NJ	97%	37%
DE-NC	7%	-40%	DE-NC	3%	32%

Negative % reduction means a state could liberalize regulations by that %.

Region Option 2. Two Regions: Massachusetts- New York and New Jersey- North Carolina

Option A	% Share based on 5 yrs	% Reduction in 2011 based on 5 yr avg	Option B	% Share based on 3 yrs	% Reduction in 2011 based on 3 yr avg
MA-NY	45%	58%	MA-NY	57%	48%
NJ-NC	55%	-8%	NJ-NC	43%	15%

Option C	% Share based on 2 yrs	% Reduction in 2011 based on 2 yr avg	Option D	% Share based on 2010	% Reduction in 2011 based on 2010
MA-NY	60%	45%	MA-NY	68%	37%
NJ-NC	40%	21%	NJ-NC	32%	38%

Negative % reduction means a state could liberalize regulations by that %.

Region Option 3. Three Regions Massachusetts-New York, New Jersey, and Delaware-North Carolina

Option A	% Share based on 5 yrs	% Reduction in 2011 based on 5 yr avg	Option B	% Share based on 3 yrs	% Reduction in 2011 based on 3 yr avg
MA-NY	45%	58%	MA-NY	57%	48%
NJ	42%	7%	NJ	35%	23%
DE-NC	12%	-131%	DE-NC	8%	-59%

Option C	% Share based on 2 yrs	% Reduction in 2011 based on 2 yr avg	Option D	% Share based on 2010	% Reduction in 2011 based on 2010
MA-NY	60%	45%	MA-NY	68%	37%
NJ	33%	28%	NJ	28%	38%
DE-NC	7%	-40%	DE-NC	3%	32%

Negative % reduction means a state could liberalize regulations by that %.

5.0 Tables

Table 1. Recreational Black Sea Bass Specifications and Harvest from 1996-2010

Year	1996	1997	1998	1999	2000	2001	2002	2003
Harvest Limit (mlbs)	--	--	3.15	3.15	3.15	3.15	3.43	3.43
Harvest (mlbs)	4.0	4.3	1.2	1.7	4.0	3.4	4.3	3.3
Size (inches)	9	9	10	10	10	11	11.5	12
Bag[^]	--	--	--	--	--	25	25	25
Open Season	All year	All year	1/1-7/30 and 8/16- 12/31	All year	All year	1/1-2/28 and 5/10- 12/31	All year	1/1-9/1 and 9/16- 11/30

Year	2004	2005	2006	2007	2008	2009	2010
Harvest Limit (mlbs)	4.01	4.13	3.99	2.47	2.11	1.14	1.83
Harvest (mlbs)	1.67	1.89	1.99	2.25	1.56	2.32	2.98**
Size (inches)	12	12	12	12	12	12.5	12.5
Bag[^]	25	25	25	25	25	25	25
Open Season	1/1-9/7 and 9/22- 11/30	All year	All year	All year	All year	All year*	5/22- 10/11 and 11/1- 12/31

[^] The state of Massachusetts has a more conservative bag limit of 20 fish.

** 2010 Harvest is a preliminary estimate of harvest from waves 1-6.

* In 2009 Federal waters were closed on October 5, 2009.

Table 2. Estimated Percent reduction in black sea bass harvest when increasing the size limit from 12.5 to 13.0 inches. Number of samples is the number of lengths used to estimate the reduction.

Percent Reduction in Harvest by State	Number of Samples
MA	32%
RI	48%
CT	20%
NY	43%
NJ	54%
DE	54%
MD	632
VA	9
NC	573

Table 3. Percent of state harvest taken in each wave estimated from the average landings by wave from 2006 to 2008.

	MA	RI	CT	NY	NJ	DE	MD	VA	NC*
Wave 1	0%	0%	0%	0%	0%	0%	0%	0%	14%
Wave 2	0%	0%	0%	0%	0%	3%	1%	6%	18%
Wave 3	28%	5%	8%	25%	55%	48%	57%	52%	30%
Wave 4	23%	33%	78%	39%	15%	22%	15%	18%	18%
Wave 5	49%	56%	1%	30%	27%	24%	21%	15%	4%
Wave 6	0%	6%	13%	7%	2%	2%	7%	9%	15%

*NC harvest is north of Hatteras.

Table 4. Landings estimates (pounds) of black sea bass by area fished for 2005-2010.

State	Fishing Area	2005	2006	2007	2008	2009	2010*	2008-2010 % State Landings
MA	Fed waters	32,531	10,472	0	4,495	0	0	99.71
	State waters	304,579	150,916	190,365	326,066	445,122	763,714	
	% State landings	0.90	0.94	1.00	0.99	1.00	1.00	
RI	Fed waters	3,020	11,753	3,450	8,807	979	28,728	90.59
	State waters	36,680	55,441	78,462	74,240	47,094	249,334	
	% State landings	0.92	0.83	0.96	0.89	0.98	0.90	
CT	Fed waters	0	0	0	0	0	0	100.00
	State waters	161	5,392	2,985	36,766	419	25,077	
	% State landings	1.00	1.00	1.00	1.00	1.00	1.00	
NY	Fed waters	182,653	102,776	191,342	20,591	127,602	152,748	86.29
	State waters	129,745	298,688	242,526	344,200	583,966	966,624	
	% State landings	0.42	0.74	0.56	0.94	0.82	0.86	
NJ	Fed waters	692,425	808,993	1,075,690	432,708	409,681	261,629	47.19
	State waters	206,080	112,271	162,087	139,800	412,023	434,533	
	% State landings	0.23	0.12	0.13	0.24	0.50	0.62	
DE	Fed waters	68,290	100,995	96,828	27,207	44,987	12,121	19.66
	State waters	2,983	20,053	13,489	2,822	7,454	10,355	
	% State landings	0.04	0.17	0.12	0.09	0.14	0.46	
MD	Fed waters	84,776	118,940	68,797	44,440	35,686	23,076	3.42
	State waters	939	0	57	3,633	18	0	
	% State landings	0.01	0.00	0.00	0.08	0.00	0.00	
VA	Fed waters	114,084	150,887	74,584	39,495	138,328	2,674	34.59
	State waters	6,470	6,231	16,385	40,373	42,599	12,489	
	% State landings	0.05	0.04	0.18	0.51	0.24	0.82	
NC*	Fed waters	181,743	129,705	181,487	83,451	121,745	145,206	15.02
	State waters	48,151	21,369	14,647	7,527	23,466	30,949	
	% State landings	0.21	0.14	0.07	0.08	0.16	0.18	

*2010 harvest estimates do not include Wave 6.

** NC estimates include all of North Carolina.

6.0 Figures

Figure 1. Average Percent of recreational black sea bass harvest by state and wave for (2006-2008).

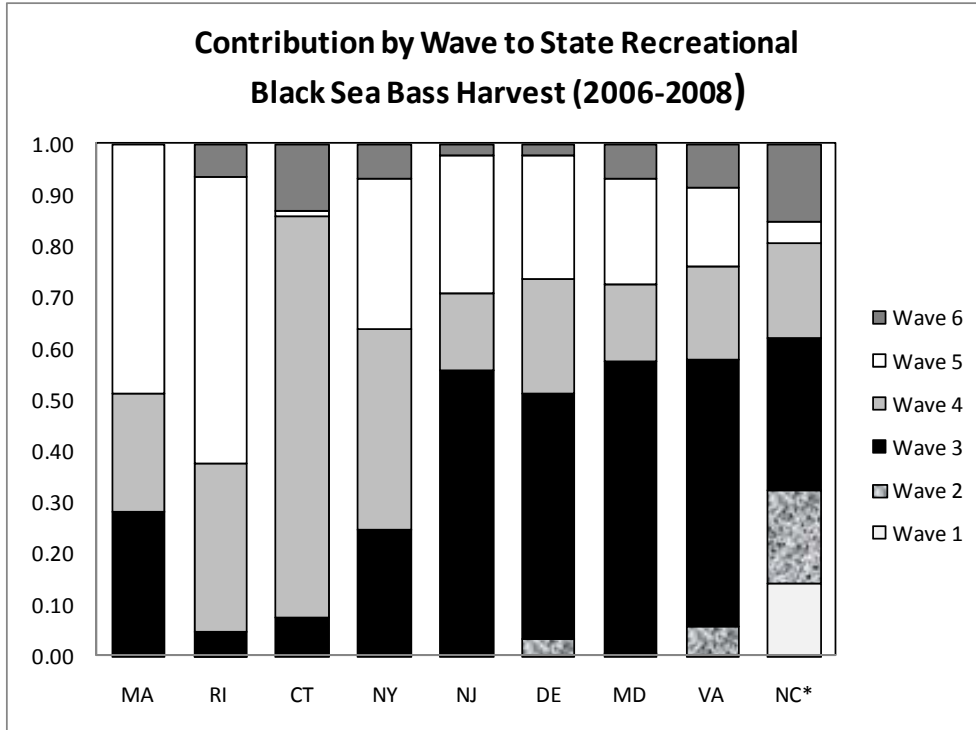


Figure 2. Massachusetts index of local black sea bass abundance

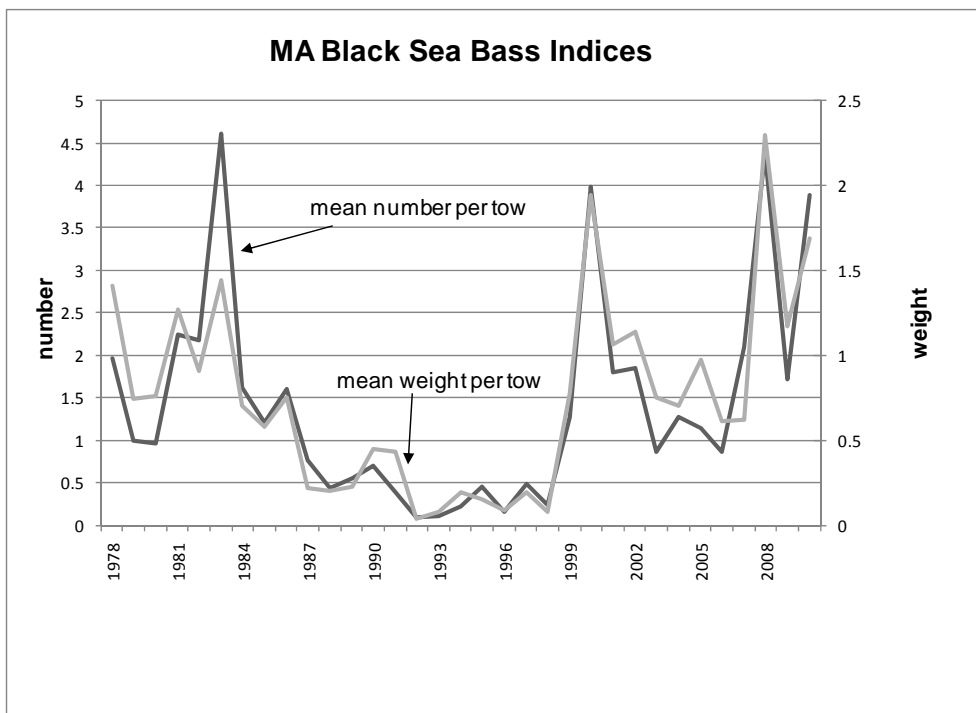
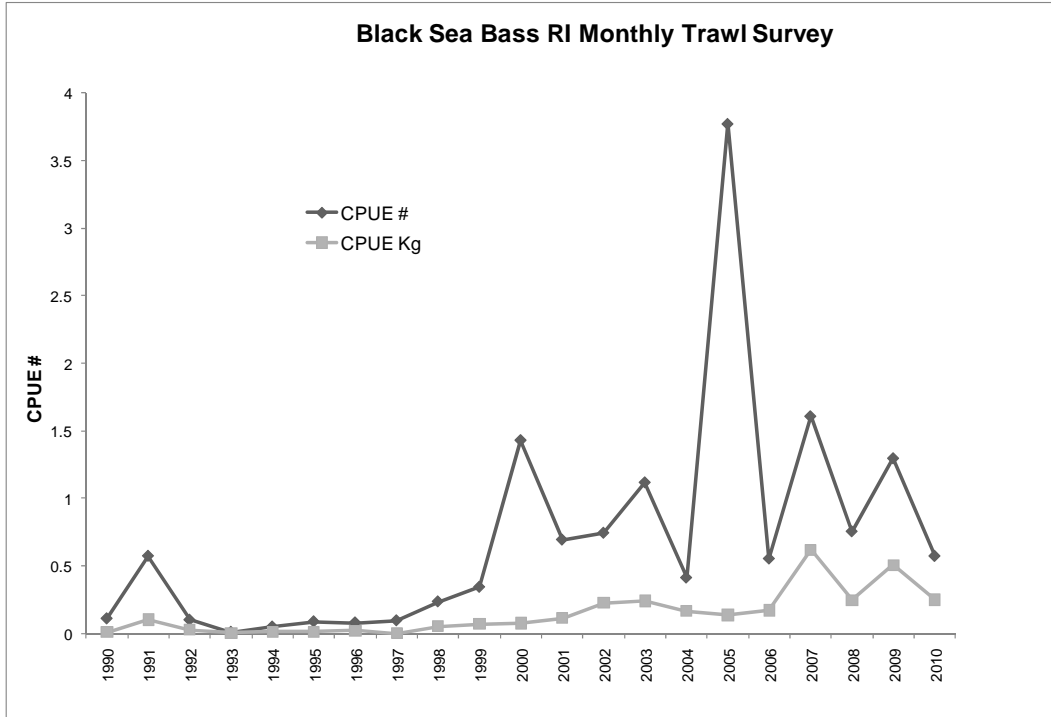
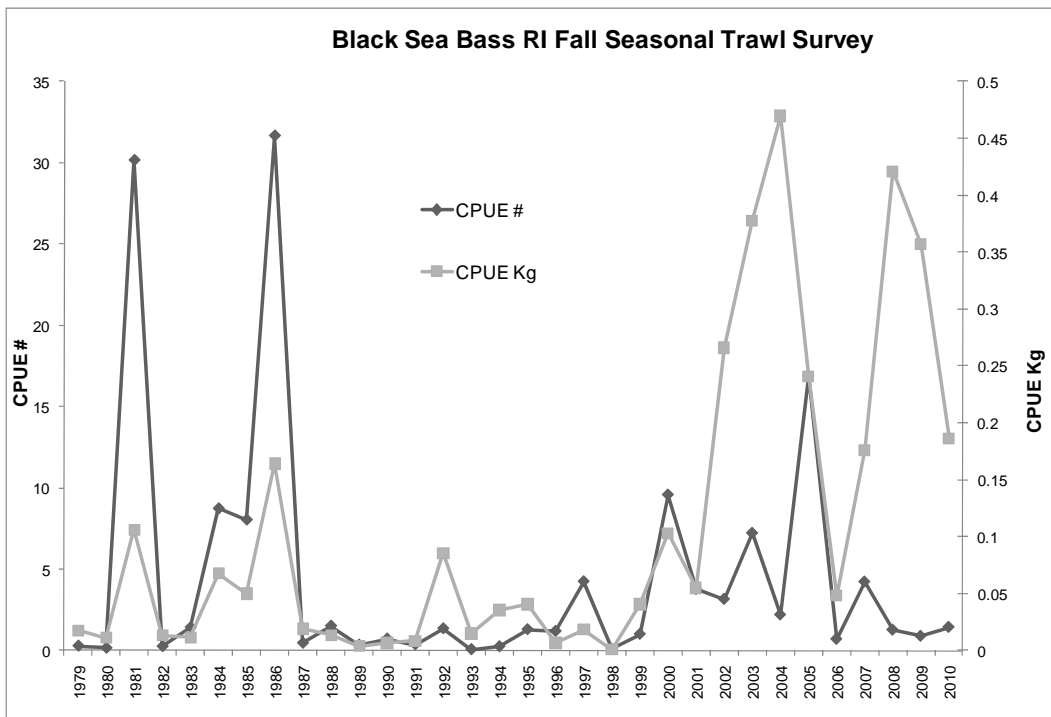


Figure 3a, b, and c. Rhode Island indices of local black sea bass abundance (a. Monthly trawl, b. Fall seasonal trawl, and c. Coastal pond seine).

a.



b.



c.

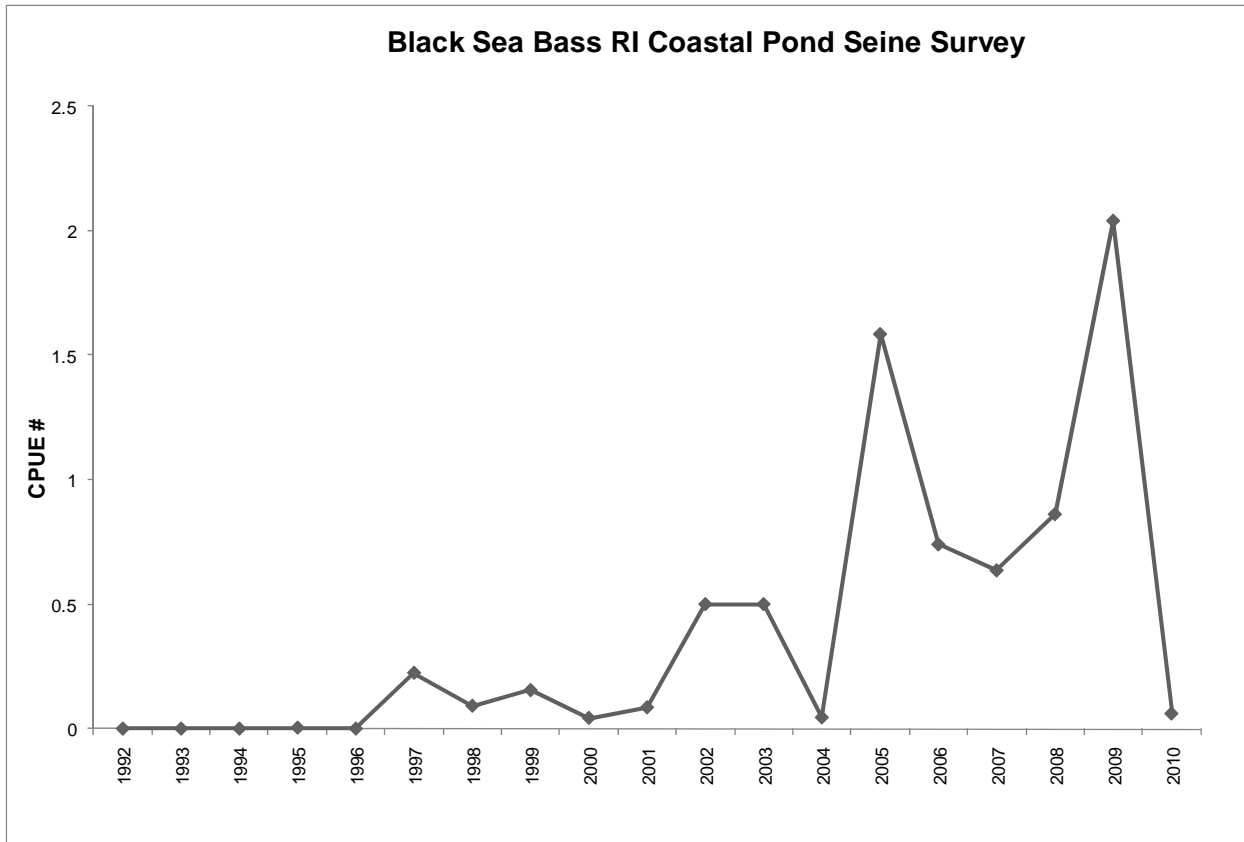
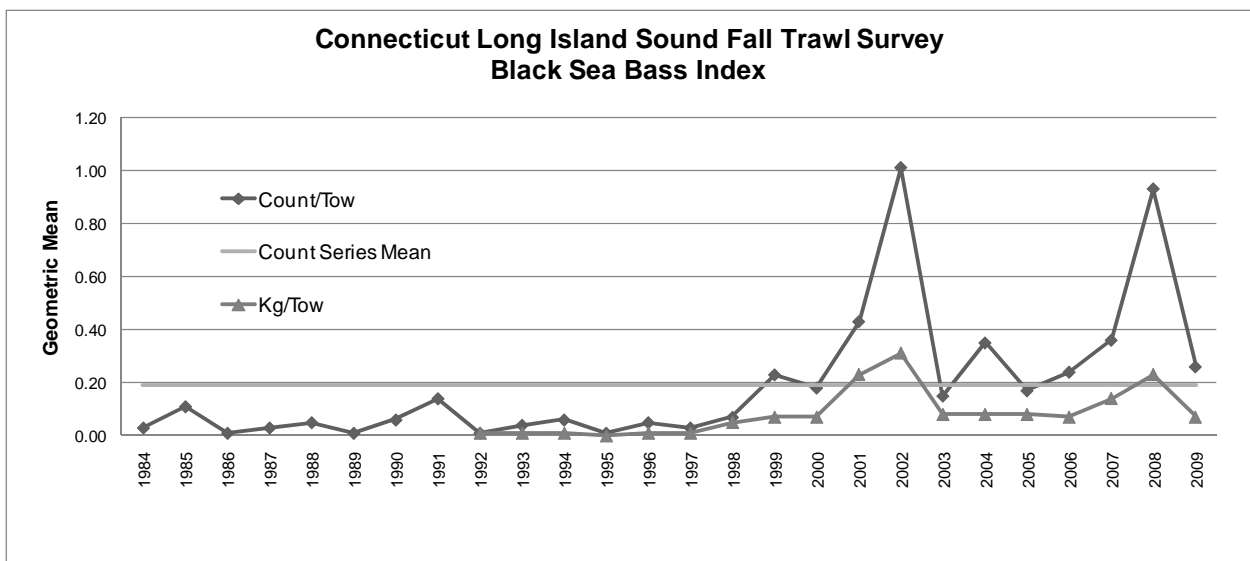


Figure 4a and b. Connecticut Long Island Sound fall trawl survey (a) and spring trawl survey (b).

a.



b.

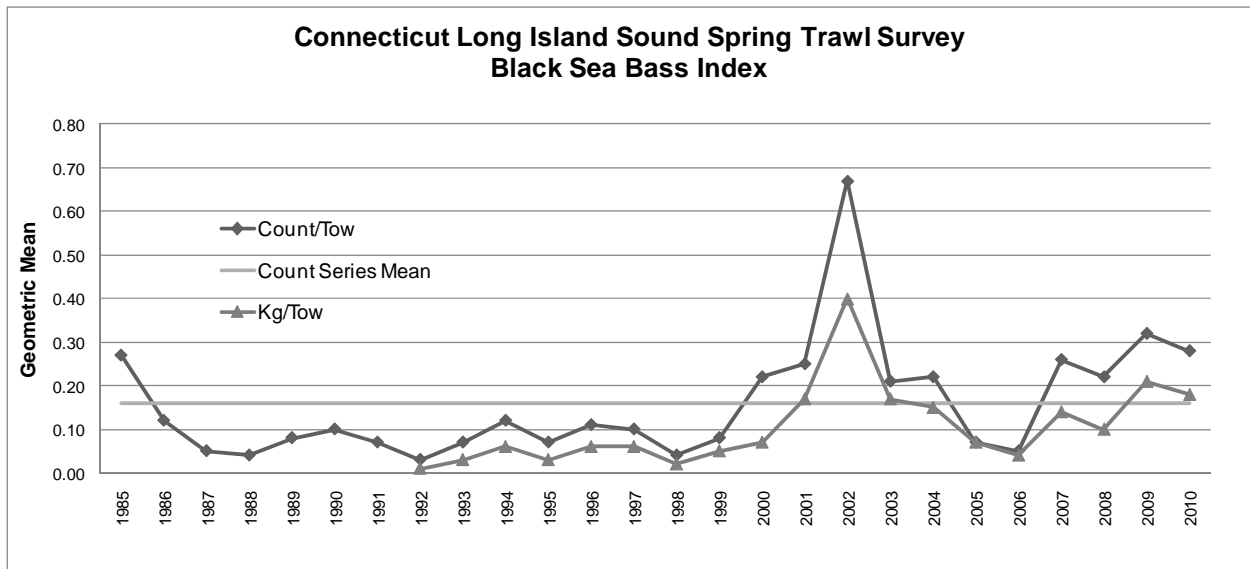


Figure 5. New York Peconic Bay small mesh trawl survey.

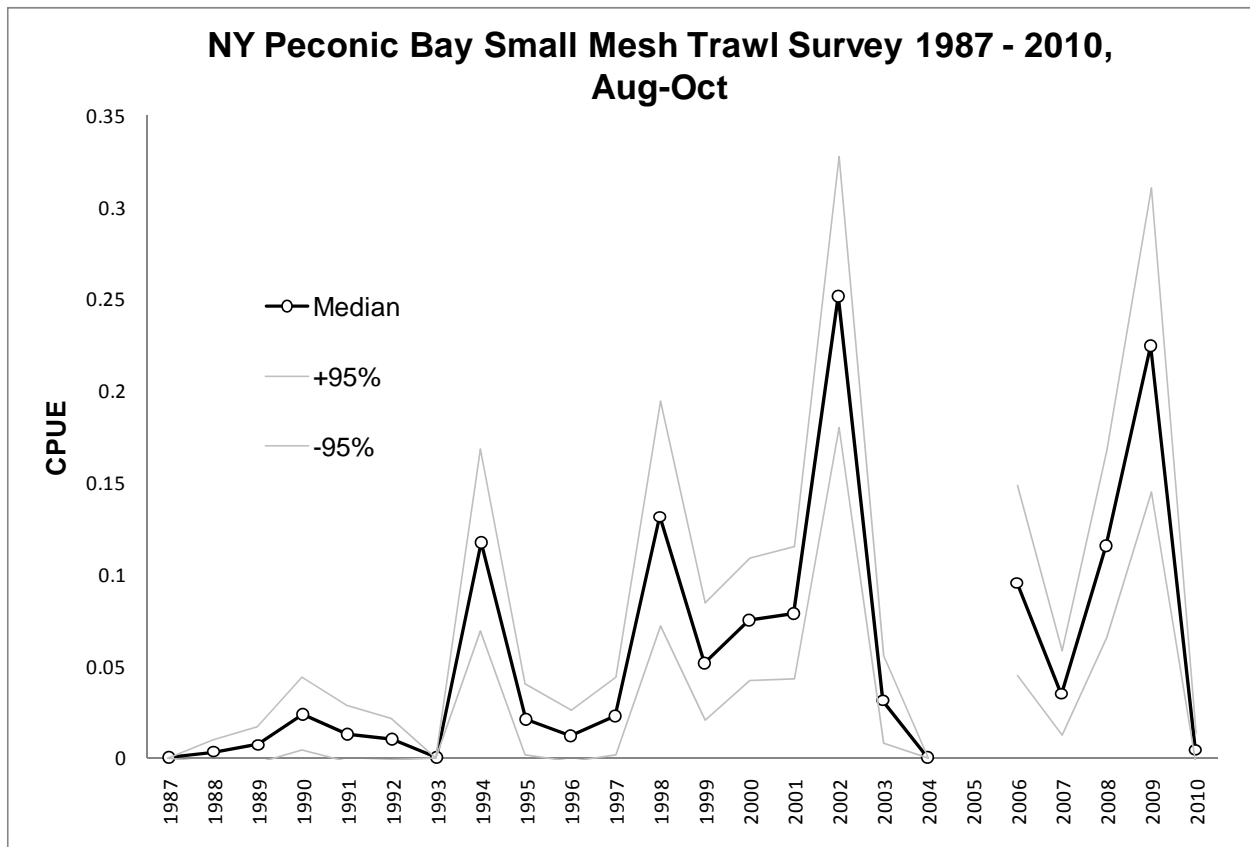


Figure 6. New Jersey ocean trawl survey.

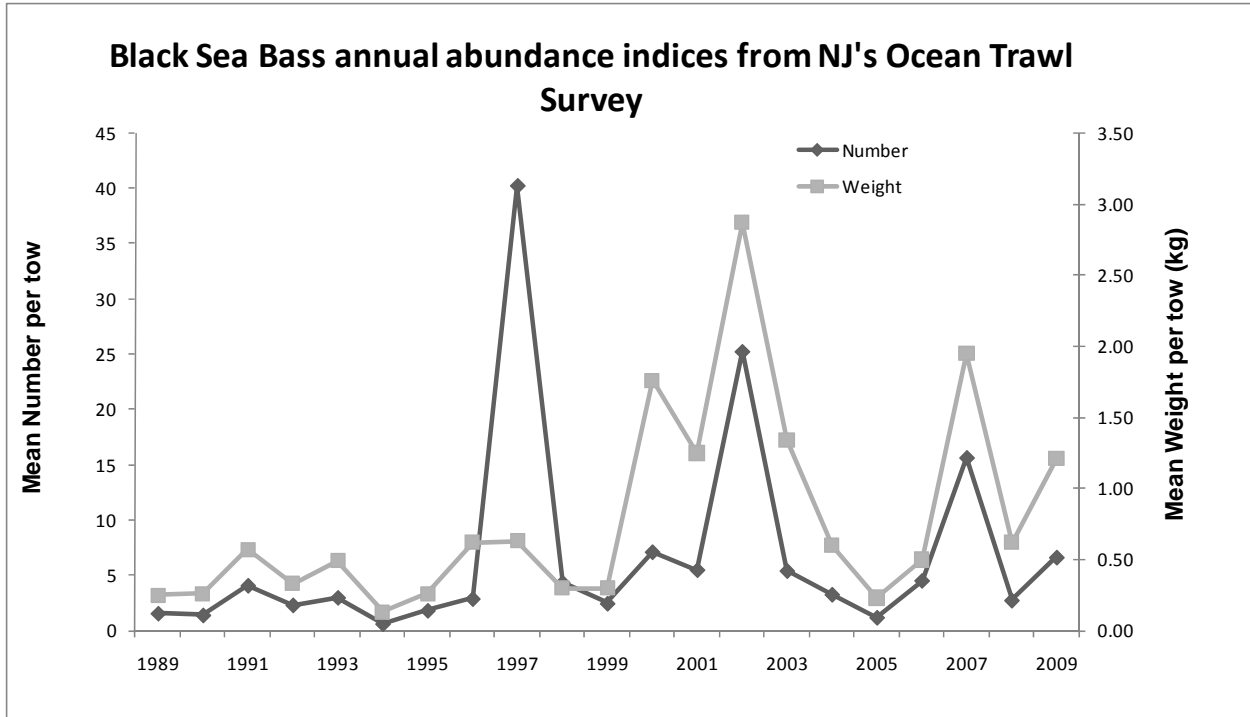


Figure 7. Maryland coastal bays juvenile black sea bass trawl index.

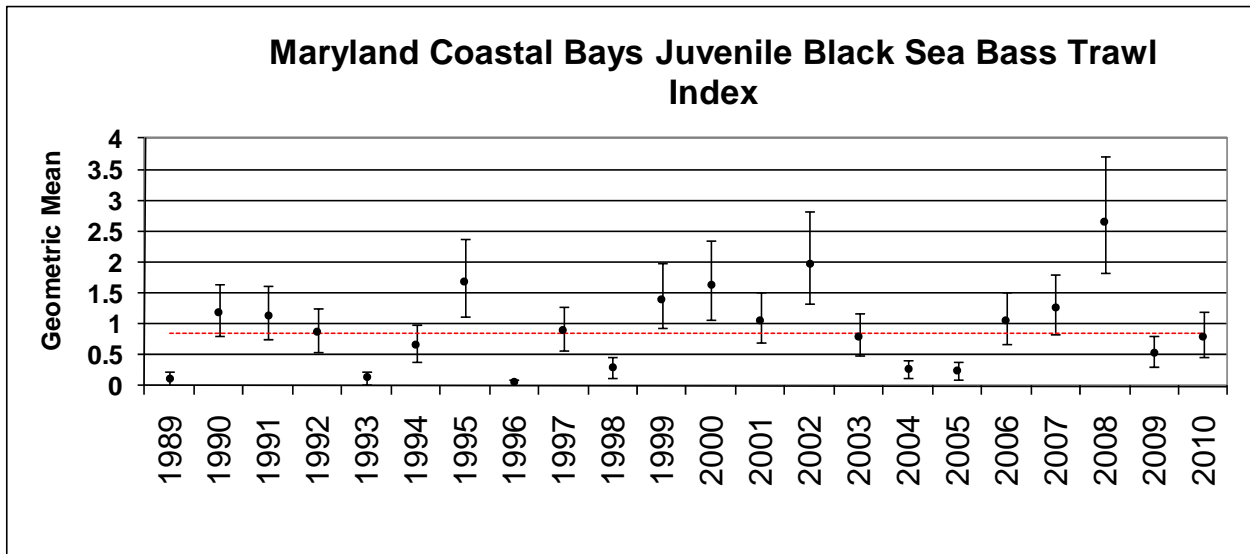


Figure 8. Virginia Institute of Marine Science random stratified index.

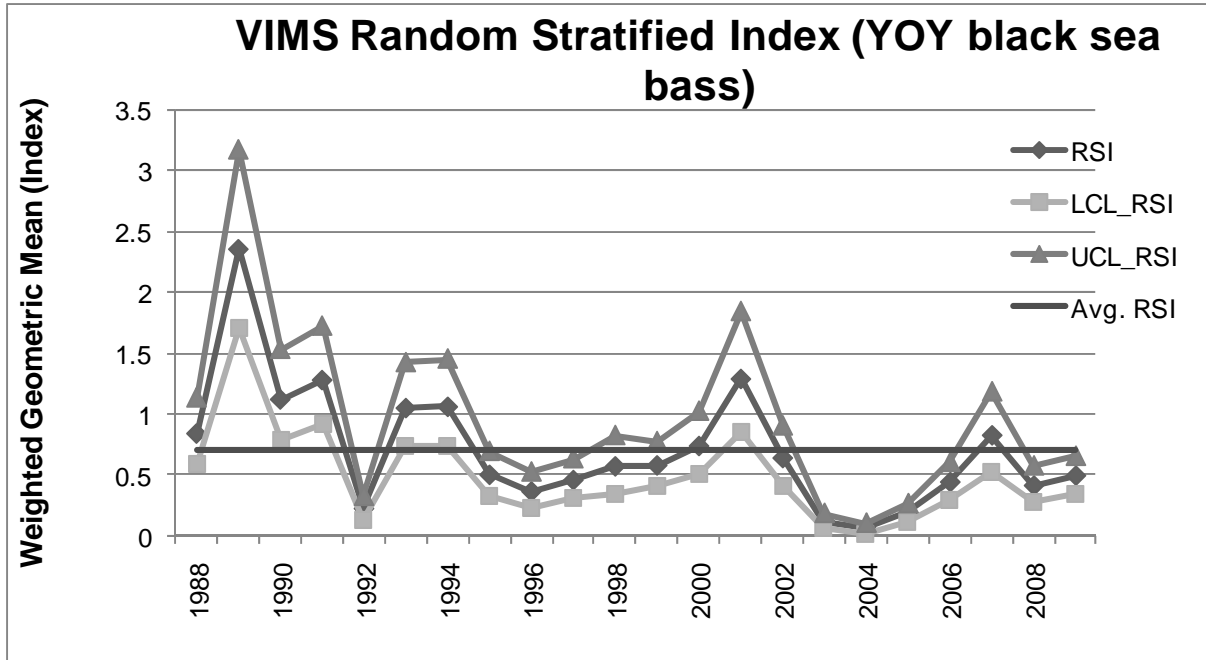


Figure 9. Chart of Hudson Canyon

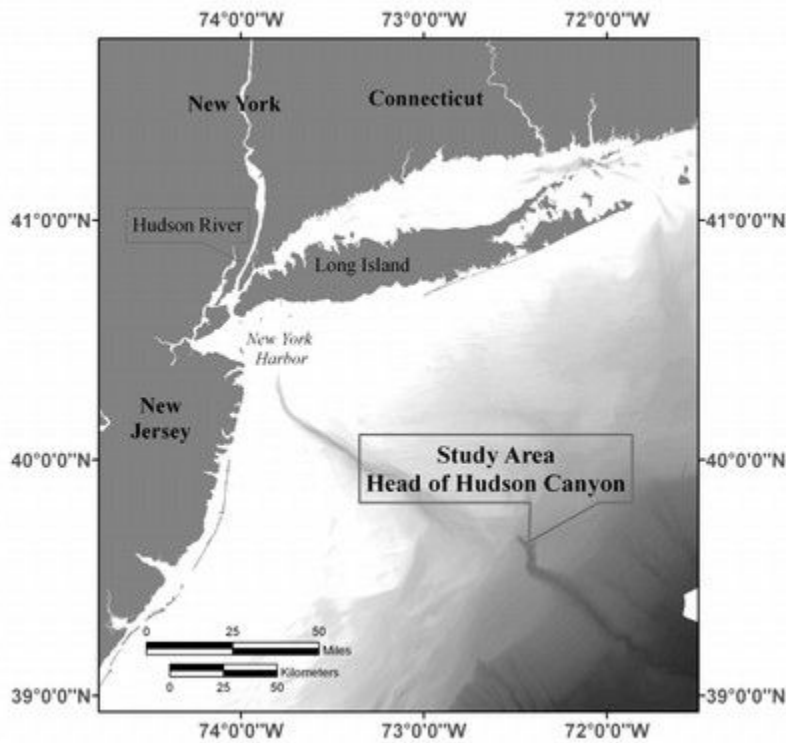


Figure 10. Recreational black sea bass harvest from 2006-2010 by state in numbers of fish.

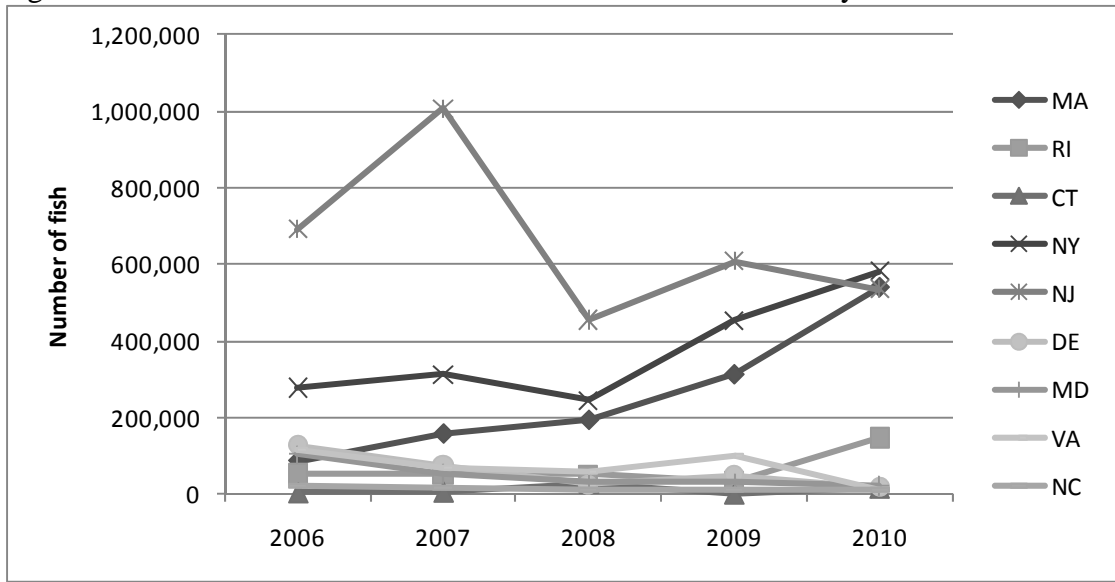


Figure 11. Recreational black sea bass harvest from 2006-2010 in NJ, DE, MD, VA and NC in numbers of fish.

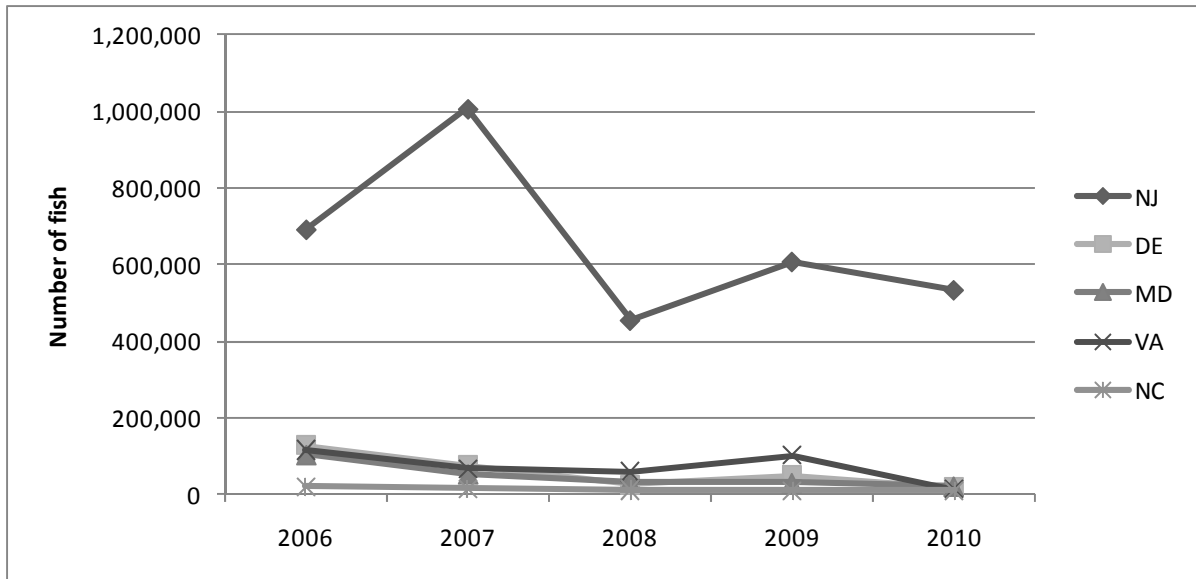


Figure 12. Recreational black sea bass harvest from 2006-2010 in DE, MD, VA and NC in numbers of fish.

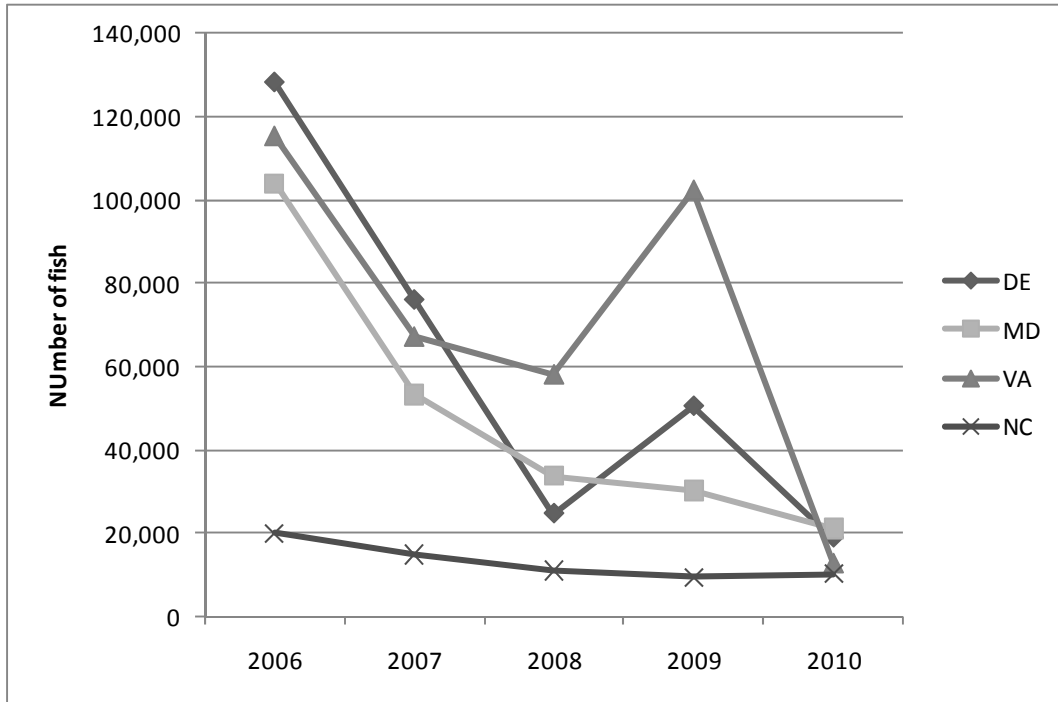
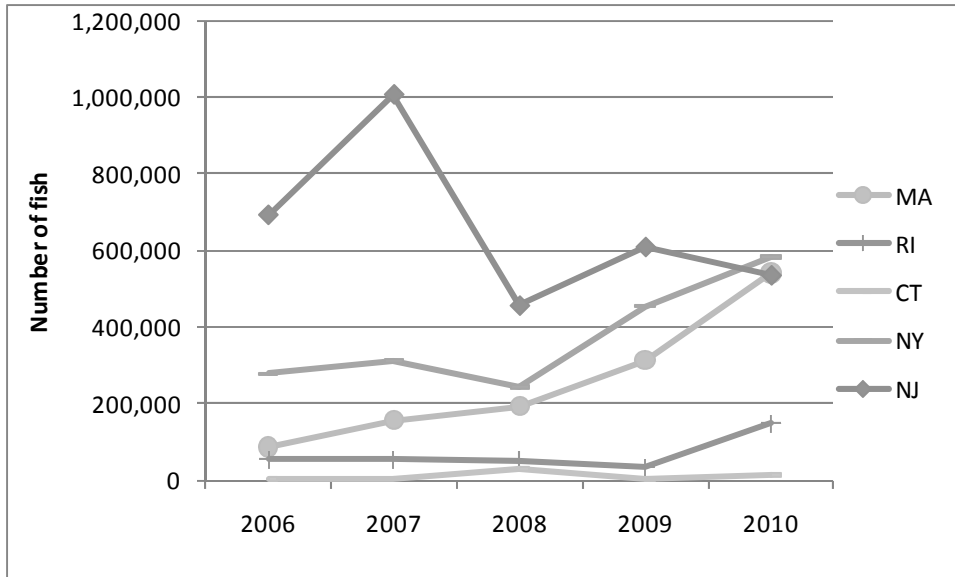
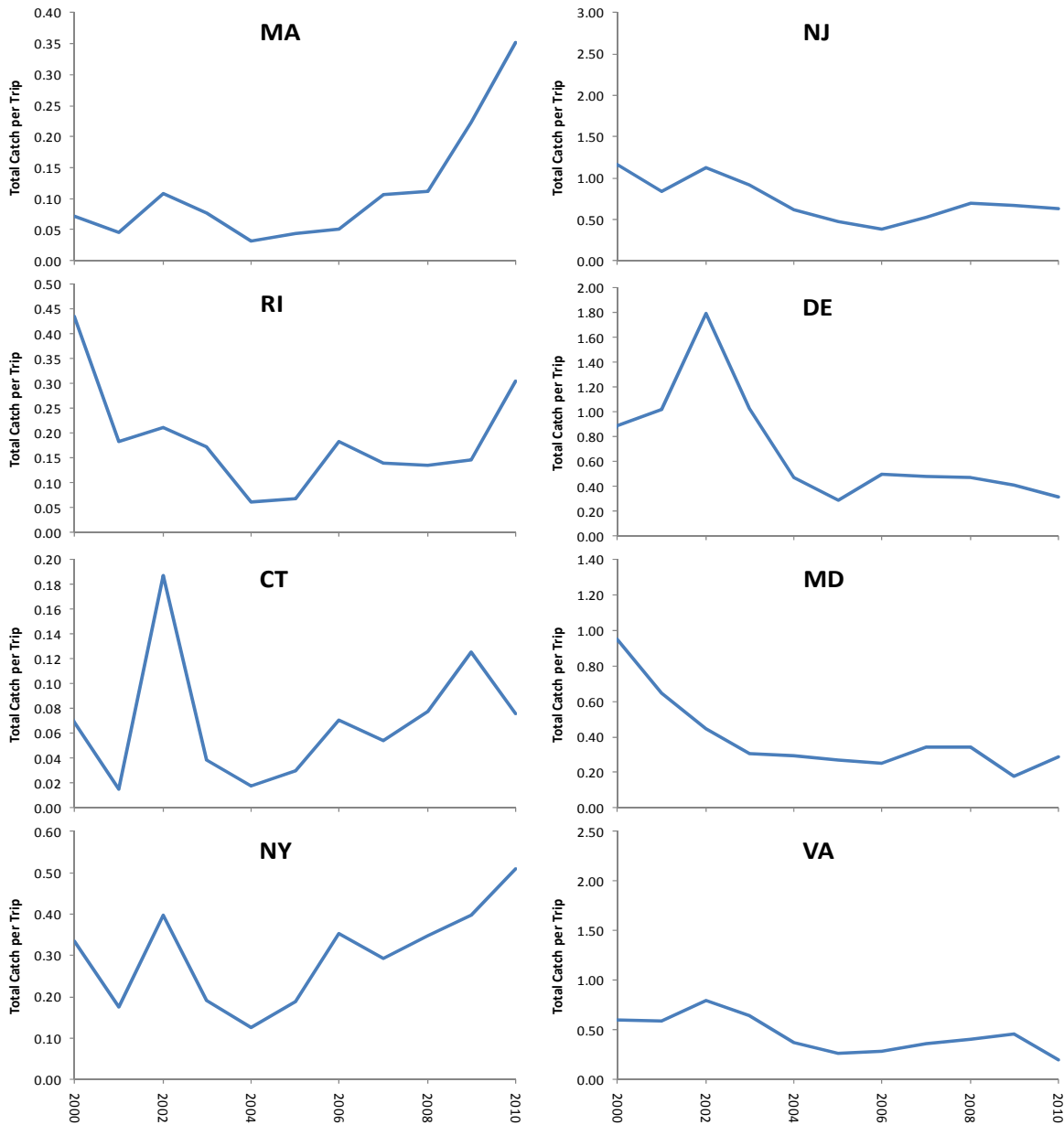


Figure 13. Recreational black sea bass harvest from 2006-2010 in MA, RI, CT, NY and NJ in numbers of fish.



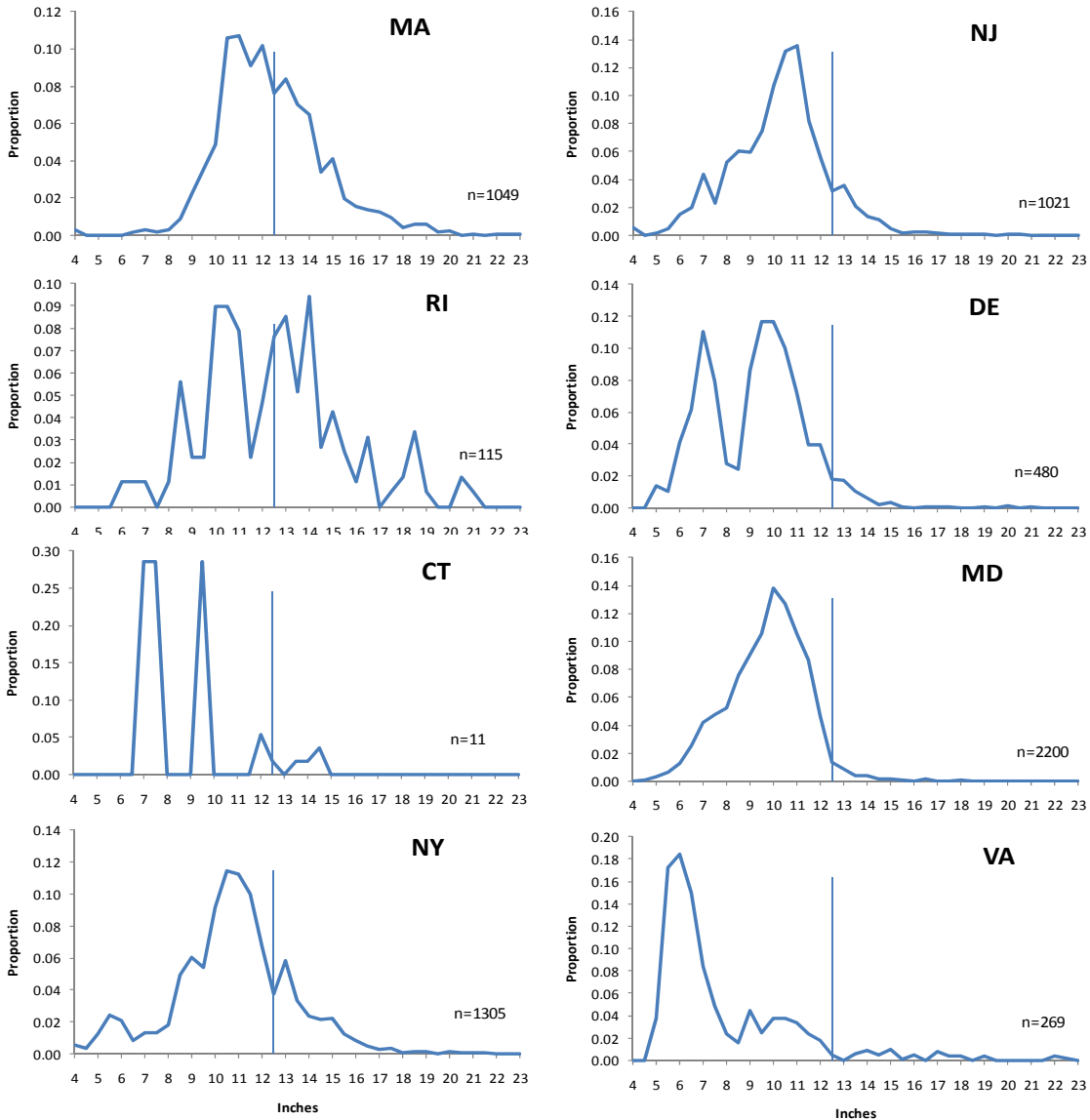
Appendix 1.

Total Catch per Trip



- Method: mrfss bsb total catch (A+B1+B2) per trip by state. NC was omitted due to southern stock considerations & time constraints.
- Summary: Increasing total catch per trip from MA to NY since 2004. No increase in catch per trip from NJ south with declining catch per trip seen in DE, MD, and VA.

2010 Total Catch Size Comps



- **Method:** mrfss intercept length comps expanded to the harvest (A+B1) and discard (B2) estimates. NC was omitted due to southern stock considerations & time constraints. Disregard CT due to low sample size.
- **Summary:** $B_{sb} \geq 12.5''$ decline in availability from N to S. Size limits very strongly affect states from NJ southward.

7.0 References

1. Shepherd GR, and J.Nieland. 2010. Black sea bass 2010 stock assessment update. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 10-13; 25 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at <http://www.nefsc.noaa.gov/nefsc/publications/>
2. Moser, J. and G.R. Shepherd. 2009. Seasonal Distribution and Movement of Black Sea Bass (*Centropristis striata*) in the Northwest Atlantic as Determined from a Mark-Recapture Experiment. *Journal of Northwest Fisheries Science*. 40:17-28.
3. Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division.
4. Personal Communication with Gary Shepherd
5. Personal Communication with Jessica Coakley