Summary of Sea Scallop stock status and fishery (DRAFT)

1.1 ATLANTIC SEA SCALLOP RESOURCE

The Atlantic sea scallop (*Placopetcen magellanicus*) is a bivalve mollusk that is distributed along the continental shelf, typically on sand and gravel bottoms from the Gulf of St. Lawrence to North Carolina (Hart and Chute, 2004). The species generally inhabit waters less than 20^{o} C and depths that range from 30-110 m on Georges Bank, 20-80 m in the Mid-Atlantic, and less than 40 m in the near-shore waters of the Gulf of Maine. Although all sea scallops in the US EEZ are managed as a single stock per Amendment 10, assessments focus on two main parts of the stock and fishery that contain the largest concentrations of sea scallops: Georges Bank and the Mid-Atlantic, which are combined to evaluate the status of the whole stock.

The scallop assessment is a very data rich assessment. The overall biomass and recruitment information are based on results from several surveys. First, the NEFSC has had a dedicated dredge survey since 1977 that has sampled the resource using a stratified random design. More recently, the NEFSC scallop survey has evolved into a combined dredge and optical survey. Dredge tows are still completed in each stratum, and a digital camera (Seahorse) is towed behind the survey vessel on all three legs of the survey. In addition, SMAST completes a video survey in portions of the scallop resource area. VIMS conducts an intensive grid design survey towing two dredges in several areas that vary year to year. Finally, Arnie's Fisheries has completed very intensive optical surveys of discrete areas that also change each year using a towed camera similar to the one used by NEFSC (Habcam). The Scallop PDT combines the results from all available surveys to estimate sea scallop biomass and recruitment on an annual basis.

1.1.1 Biomass

1.1.1.1 Georges Bank

The scallop abundance and biomass on Georges Bank increased from 1995-2000 after implementing closures and effort reduction measures. Biomass and abundance then declined from 2006-2008 because of poor recruitment and the reopening of portions of groundfish closed areas. Biomass increased on Georges Bank in both 2009 and 2010, mainly due to increased growth rates and strong recruitment in the Great South Channel, along with continuing concentrations on the Northern Edge and in the central portion of Closed Area I, especially just south of the "sliver" access area.

In 2012, GB biomass was primarily concentrated in NL, the Channel, and cod HAPC within CA2. In 2013, GB biomass declined in all areas, especially the Channel. Figure 1 - Figure 3 shows the survey results for scallop biomass and abundance for GB. Note the SMAST figure is in numbers and the other two are biomass. Overall, GB biomass has been declining since 2010 (Figure 7). The total biomass estimate for the Channel in 2013 is about 10,000 mt lower than it was in 2012, primarily due to high levels of fishing that went on in that area in 2013.

Figure 1 - Total scallop biomass (g/tow) on Georges Bank from the 2013 NEFSC dredge tows as well as 2013 VIMS dredge tows in NL and in Closed Area II "north" and west of cod HAPC (TOP) compared to 2012 biomass estimates (BOTTOM)

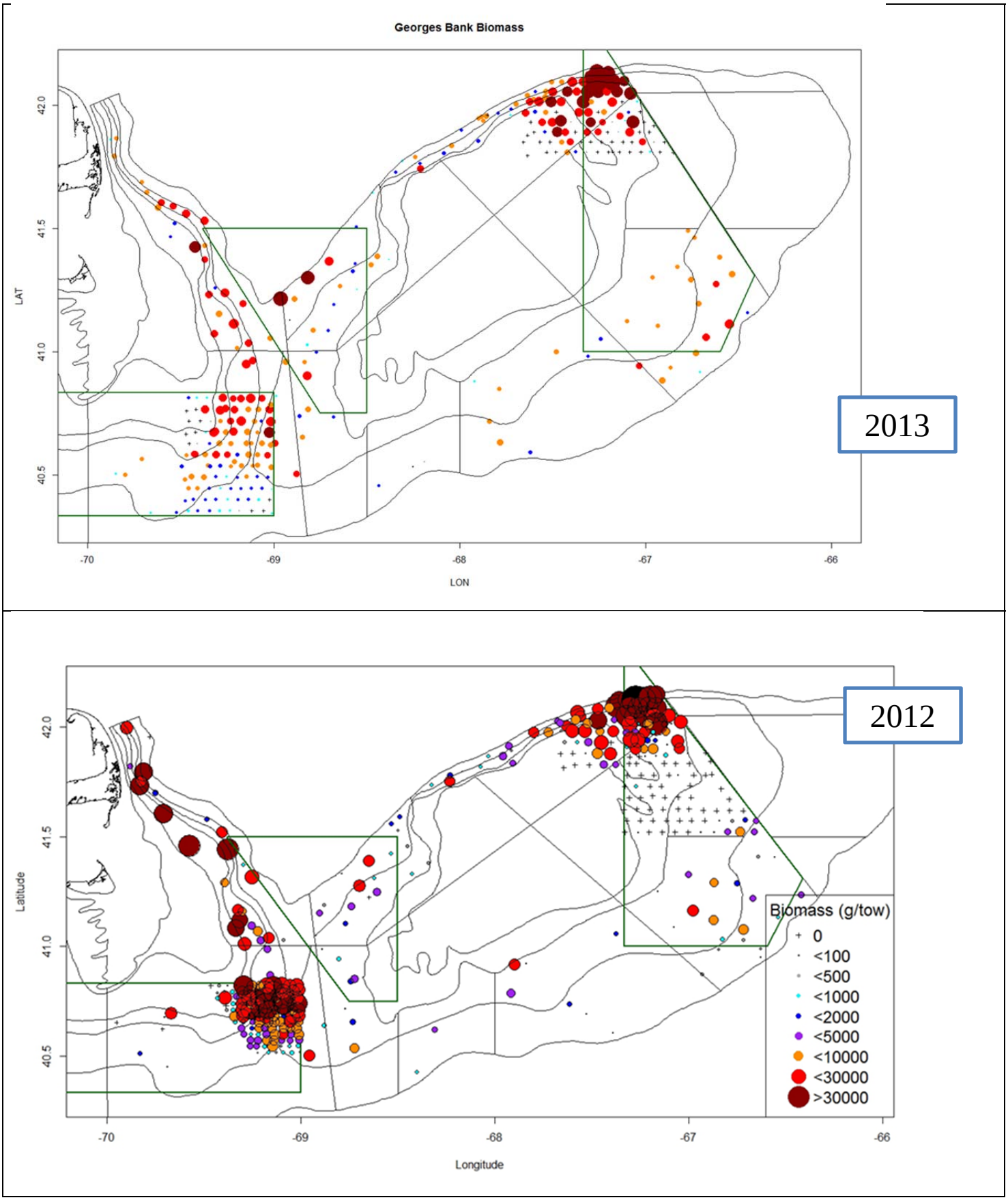


Figure 2 - Total scallop abundance (numbers per station) on in CA2 south (2013 SMAST video survey)

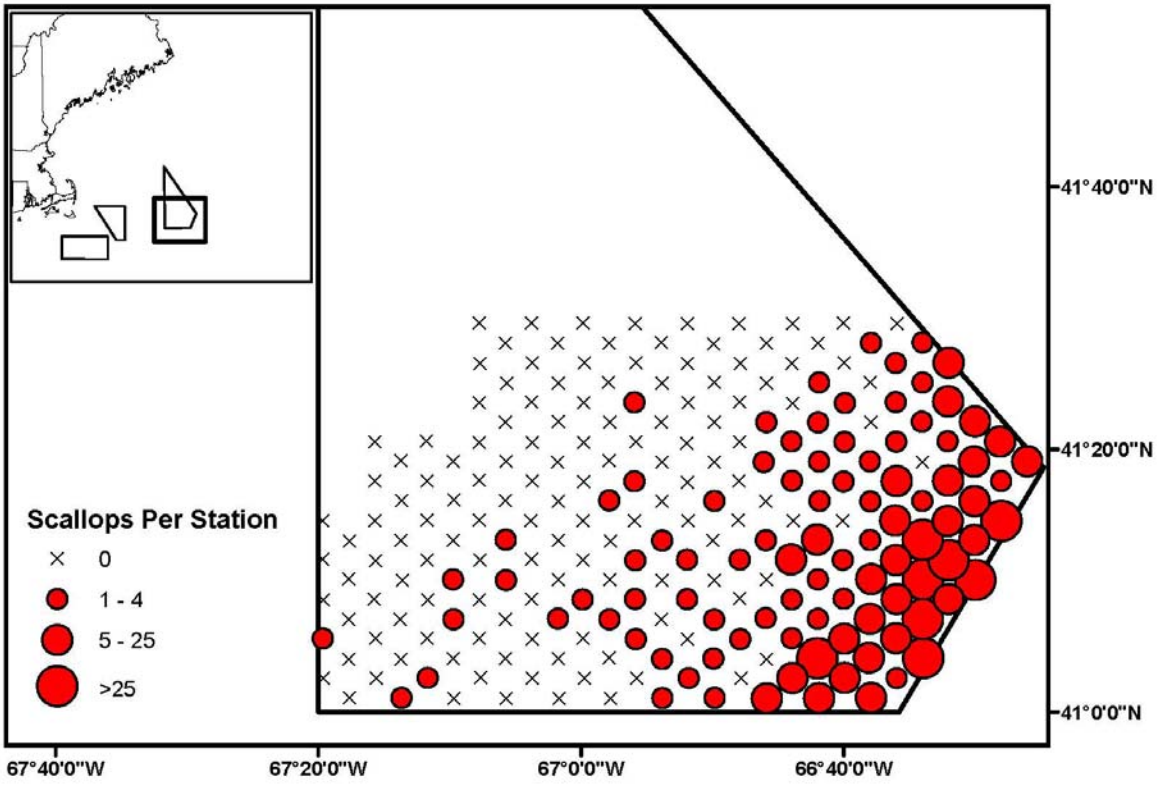
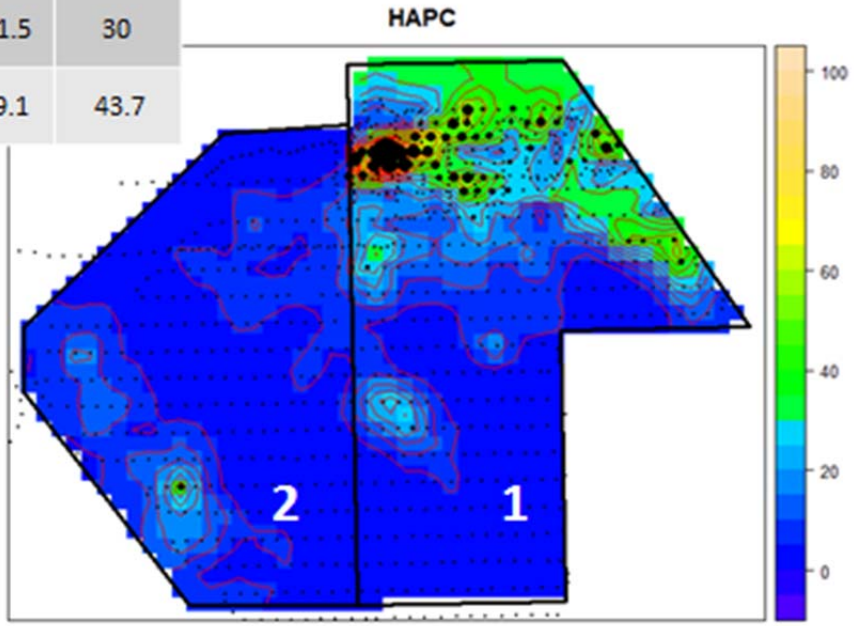
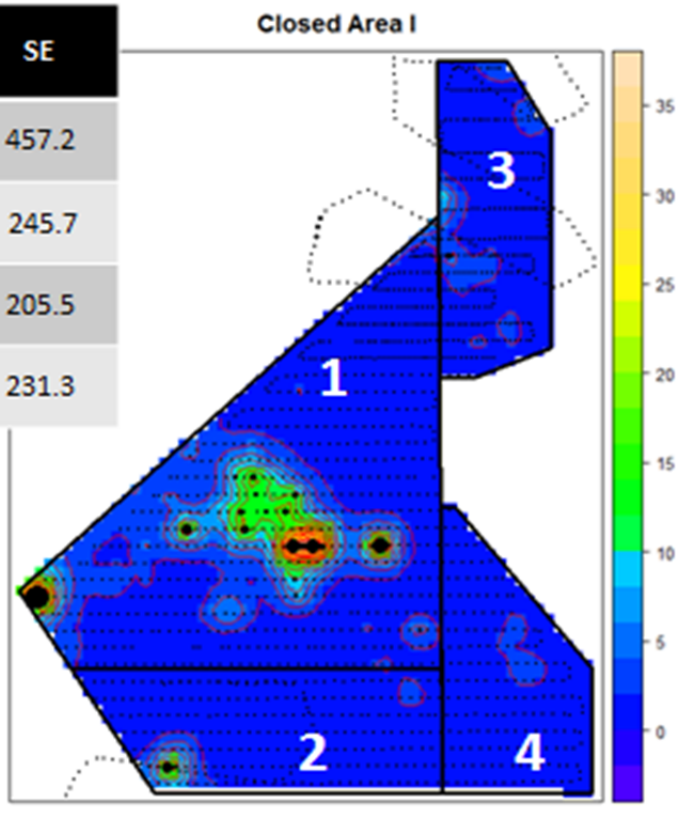


Figure 3 - Total scallop biomass in areas on GB combining optical survey results from 2013 NEFSC and Habcam

Area	Size (k^2)	Biomass (mt)	SE
1	633.42	9101.5	30
2	539.29	2709.1	43.7



Area	Size (k^2)	Biomass (mt)	SE
1	1241.61	3473.9	457.2
2	464.06	575.3	245.7
3	372.77	551.6	205.5
4	363.4	406.7	231.3



1.1.1.2 Mid-Atlantic

In general, Mid-Atlantic biomass is declining. This is primarily from depletion of the large biomass in Elephant Trunk and several years of poor recruitment in that area (2009-2011). However, stronger recruitment has been observed in 2012 and 2013. Once these scallops grow larger biomass in the Mid-Atlantic is expected to increase. Figure 4 through Figure 6 show survey results for MA biomass with highest concentrations in Elephant Trunk. The large number of small scallops observed in 2012 in all three MA access areas seems to have survived, but these animals are too small for harvesting. Note the SMAST figure is in numbers and the other two are biomass. Overall MA scallop abundance is widespread, but density is relatively low for larger animals and has declined in recent years (Figure 7).

Figure 4 - Total scallop biomass (g/tow) for the Mid-Atlantic from the 2012 NEFSC dredge tows as well as 2012 VIMS dredge tows in Hudson Canyon and inshore NYB

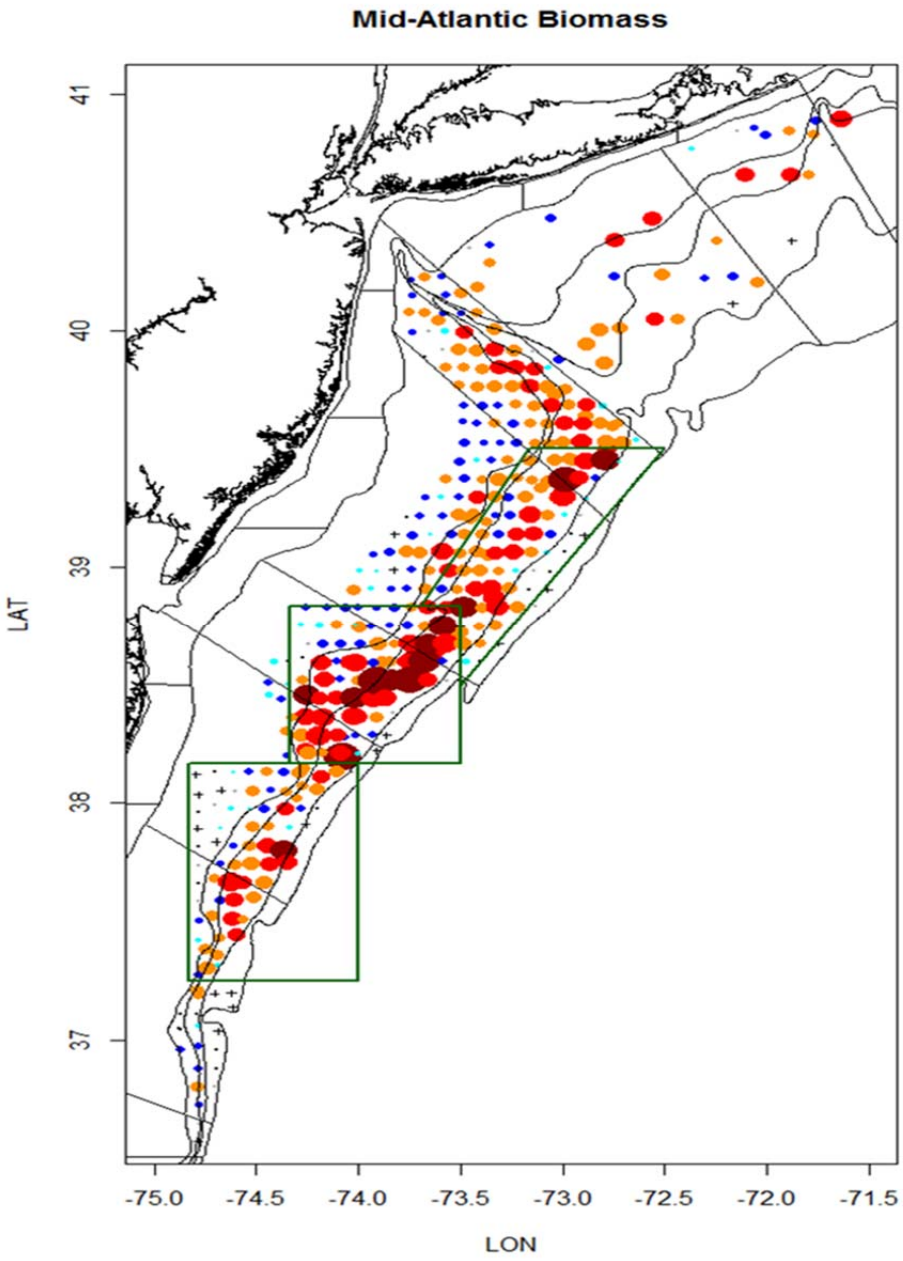


Figure 5 - Total scallop abundance (numbers per station) for Delmarva from the 2013 SMAST video survey

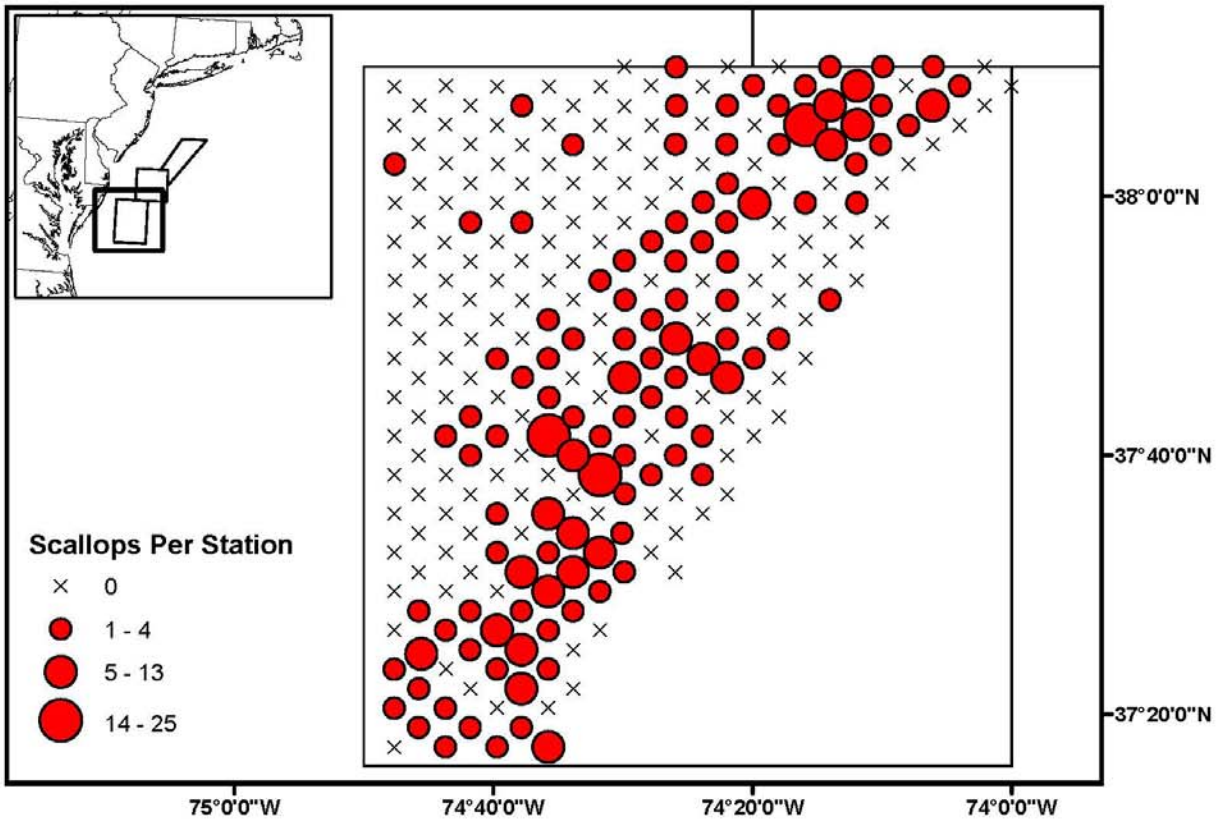


Figure 6 - Total scallop biomass for the Mid-Atlantic from the 2013 NEFSC optical survey (Seahorse)

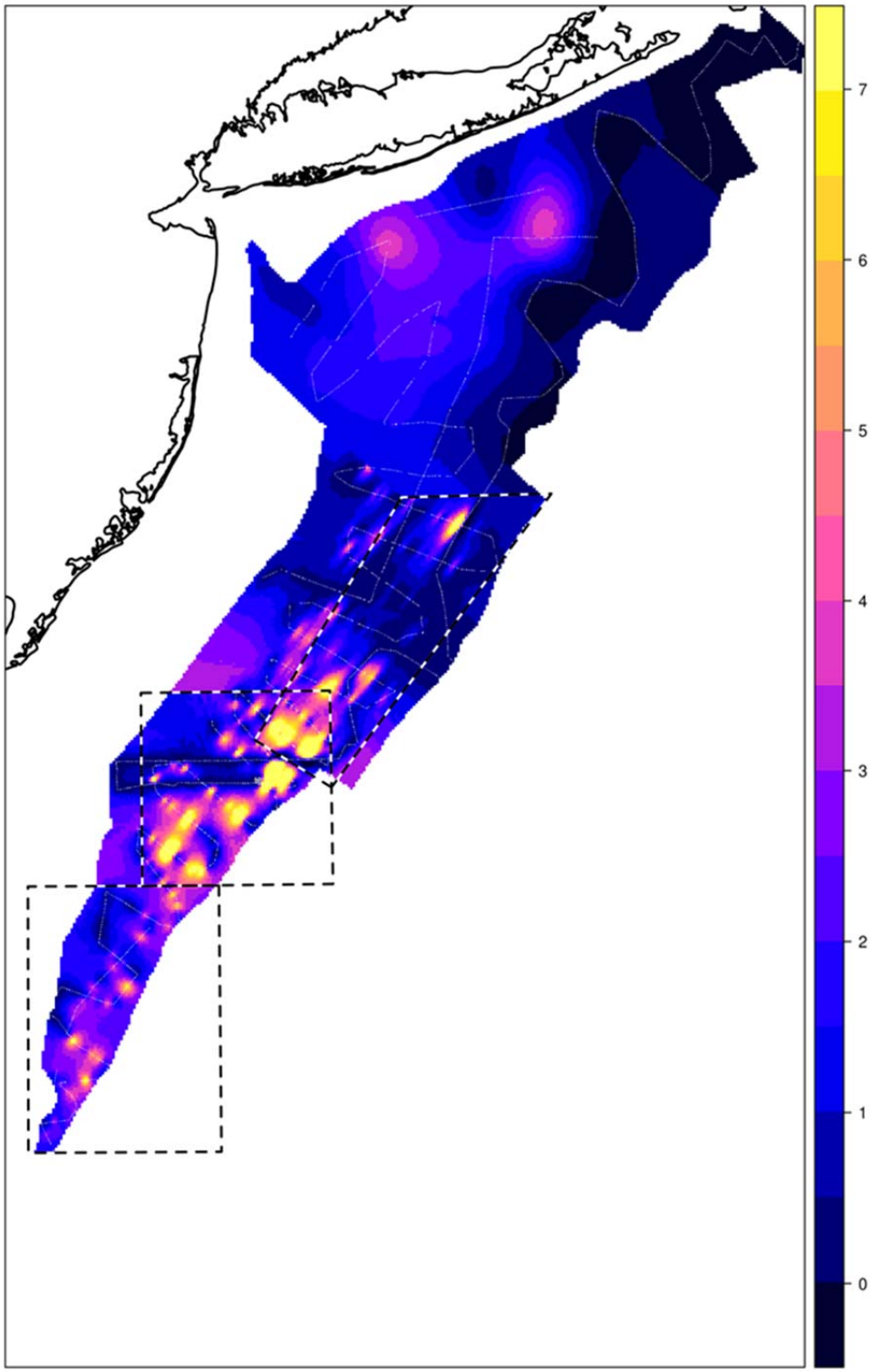


Figure 7 – NEFSC biomass survey indices (through 2012)

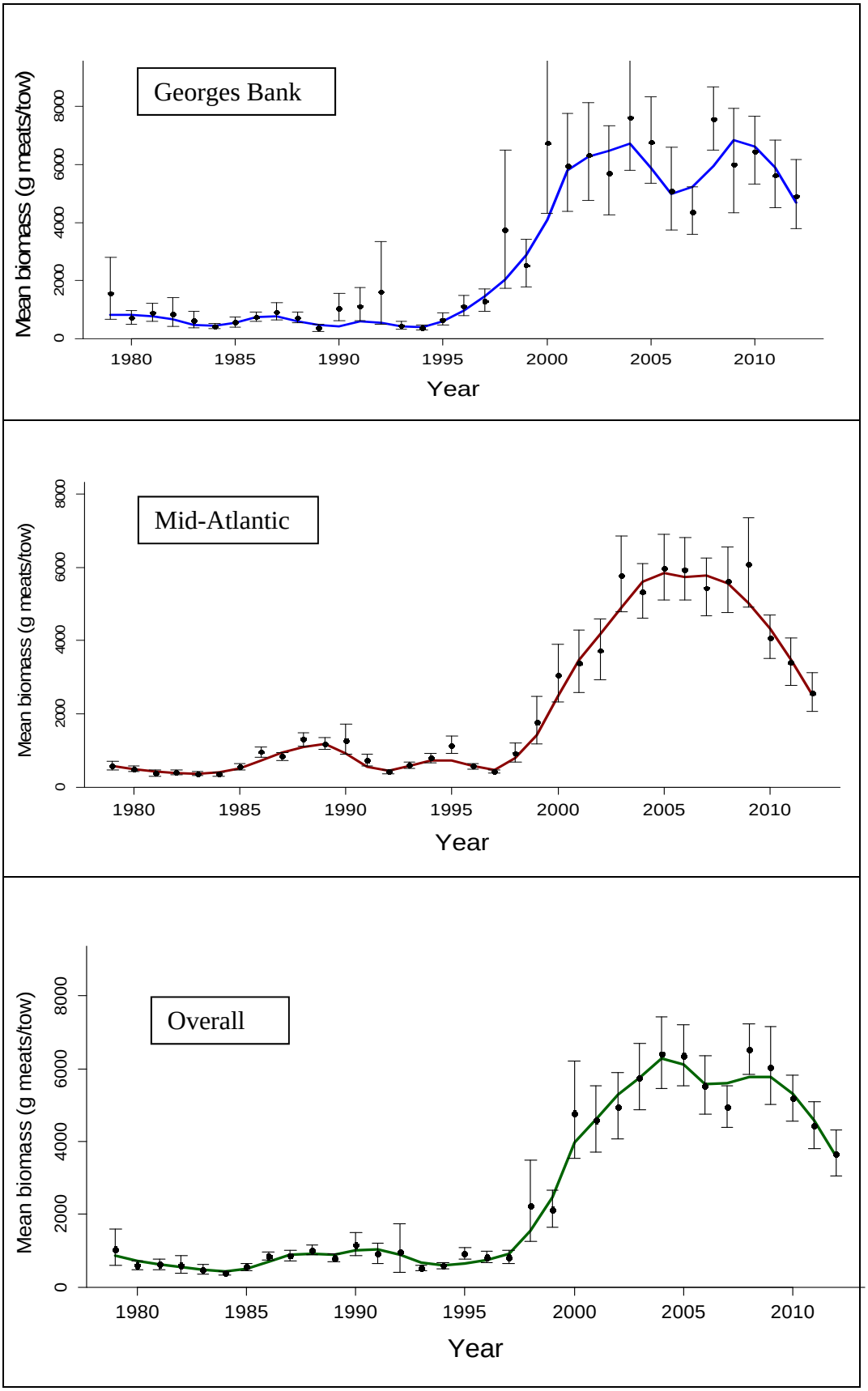


Table 1 – Summary of biomass estimates by SAMS area (2013 surveys)

Mid-Atlantic Bight	Dredge	SE	Habcam	SE	SMAST	SE	Mean	SE
Hudson Canyon South	7839	1126	7528	831			7684	700
Delmarva	4559	605	6415	781	6249	803	5741	424
Elephant Trunk	14317	1758	19063	1993			16690	1329
Inshore of ET	109	421	868	825			489	463
Virginia Beach	1208	605	395	388			802	359
NYB/LI (includes str 21)	20662	2468	23497	1893			22080	1555
Block Island	N/S	N/S	1655	364			1655	364
TotalMA Rotational	26715	2173	33006	2296			29861	1581
TotalMA Open	21979	2575	24760	2101			23370	1662
Total MidAtlantic	**48694**	**3370**	**57766**	**3112**			**53230**	**2200**
Georges Bank								
Closed Area I Acc	494	108	3340	401			1917	208
Closed Area I NA	16940	5750	4553	747			10747	2899
Closed Area II Acc	5552	1042	3340	1324	5148	1049	4680	662
Closed Area II NA	9041	1220	8497	765			8769	720
NLS Acc	3271	342	4098	584			3685	338
NLS NA	90	28	N/S	N/S			90	28
S Channel	11711	2842	13496	1130			12603	1529
Southern Flank	5704	1197	11445	1946			8575	1142
Northern Edge	4425	580	3160	537			3793	395
Total GB Clsd/Acc	35389	5980	23828	1843			29608	3129
Total GB Open	21840	3138	28101	2313			24970	1949
Total Georges Bank	**57229**	**6754**	**51929**	**2958**			**54858**	**7922**
TOTAL	105923	7548	109695	4294			**108089**	**8221**

Table 2 – Summary of biomass estimates by SAMS area (2012 surveys)

Summary of 2012 Survey Results										
	Dredge		SMAST Video		Habcam		Mean	SE	IVM	SE
MidAtlantic	**Bms(mt)**	**SE**	**Bms(mt)**	**SE**	**Bms(mt)**	**SE**				
Delmarva	2299	220	4762	674	3005	798	3355	356	2566	202
HCSAA	6791	530	6532	1082	7139	642	6821	455	6882	382
ET	4570	803	7021	1419	8130	847	6574	612	6366	539
VB	102	55	NS	NS	NS	NS	102	55	102	55
NYB	11803	2084	4673	810	8750	1015	8408	819	6728	606
LI	13196	1273	13053	1147	10351	185	12200	575	10476	181
Stratum21	2077	265	2632	709	1540	426	2083	290	1992	214
Block Island	NS	NS	1803	463	821	NA	1803	463	1803	463
MidAtl	**40837**	**2648**	**40476**	**2516**	**39736**	**1736**	**41346**	**1418**	**36915**	**1068**
									40169	**1257**
Georges Bank										
CL1ACC	4431	716	5789	1180	3054	356	4425	475	3494	307
CL1NA	1768	729	6990	3572	10230	877	6330	1250	5266	554
CL-2(N)	11207	1233	14921	4036	8183	2240	11437	1593	10799	1044
CL-2(S)	7007	1110	6014	1000	7404	707	6808	551	6955	512
NLS-Access	8598	699	4401	722	4434	324	5811	352	5062	273
NLS-NA	23	13	2412	857	NS	NS	2412	857	2412	857
SCC	12420	1353	10873	2610	10230	877	11174	1023	10878	708
SCH	6924	1011	11370	3649	14195	1201	10830	1324	10002	757
NEP	4004	1163	3933	983	5836	481	4591	532	5291	405
SEP	1027	124	2226	390	7111	NA	2226	390	2226	390
Georges Bank	**57408**	**2916**	**68930**	**7345**	**70677**	**2994**	**65672**	**2953**	**62385**	**1988**
									64248	**2009**
Total	**98246**	**3939**	**109406**	**7764**	**110413**	**3460**	**107018**	**3276**	**99299**	**2257**
									104417	**2370**

1.1.1.3 Northern Gulf of Maine

The last survey of the federal portion of NGOM management area was completed in 2012 from a 2011 RSA award. About 200 stations were completed in five overall survey areas. Overall the biomass was very patchy and some areas had poor meat conditions (smaller meats on Platt's and Fippennies Banks compared to shell heights)(Figure 8 - Figure 10). Most biomass found in SE part of NGOM management area (offshore from northeastern MA in survey areas 4 and 5) with some recruitment observed in that area as well. The level of scallop fishing in federal waters in the NGOM remains very low; catches have been about 8-15,000 per year since 2008 when the limited access NGOM fishery was first implemented.

Figure 8 – NGOM estimate of biomass from 2012 NGOM dredge survey

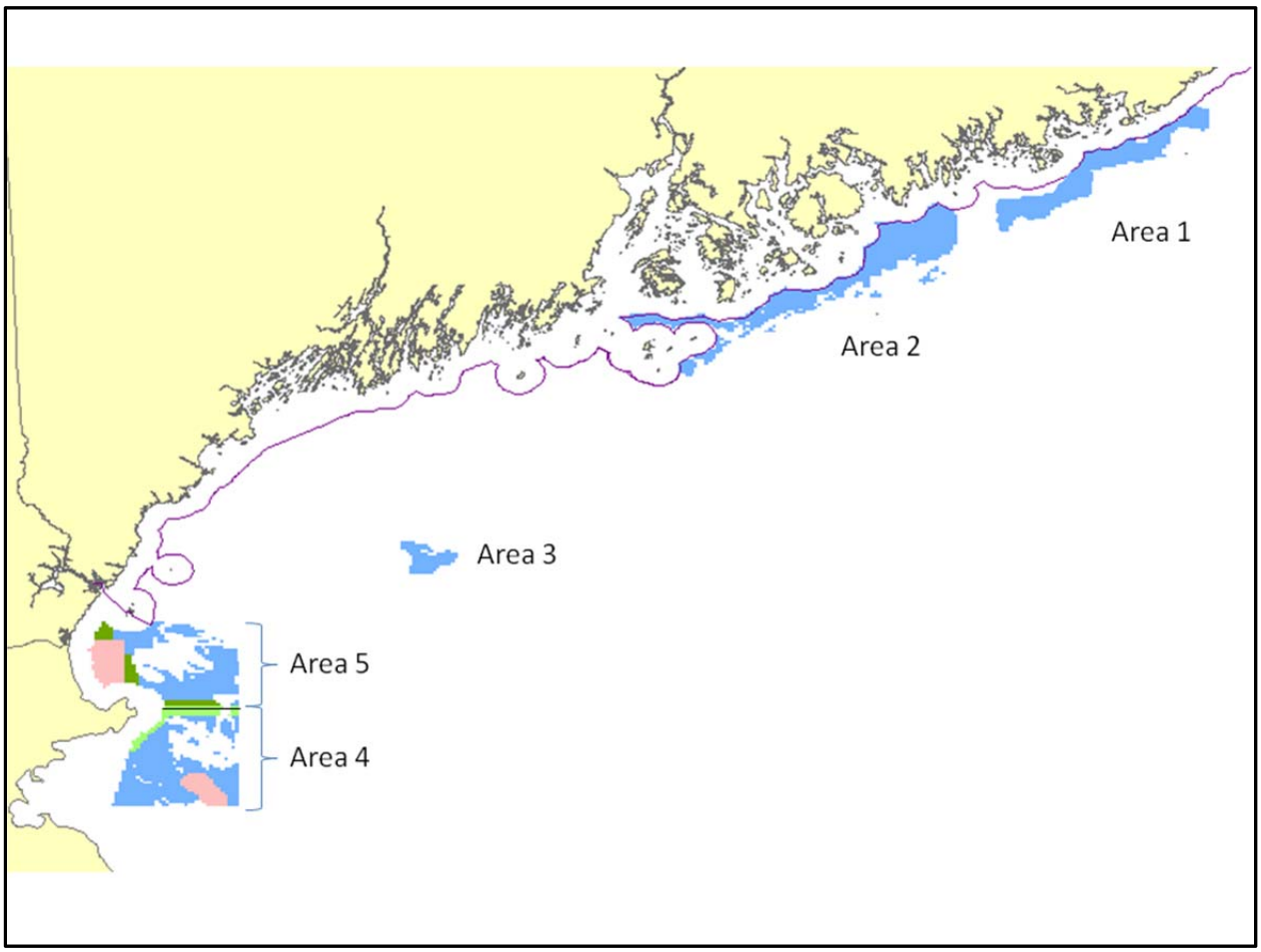


Figure 9 – Mean biomass per survey area within NGOM

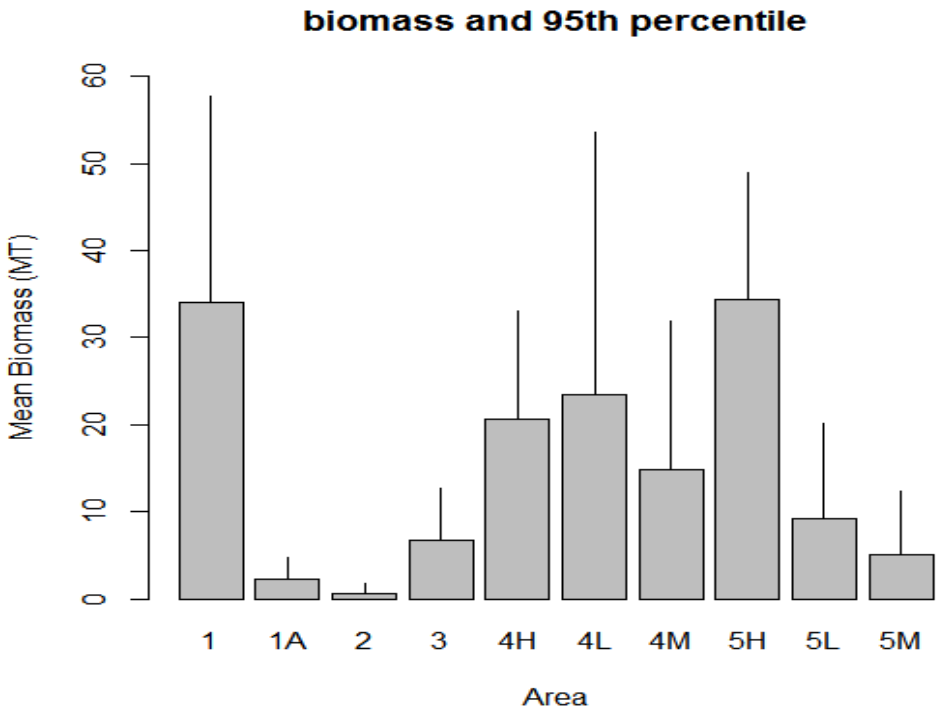
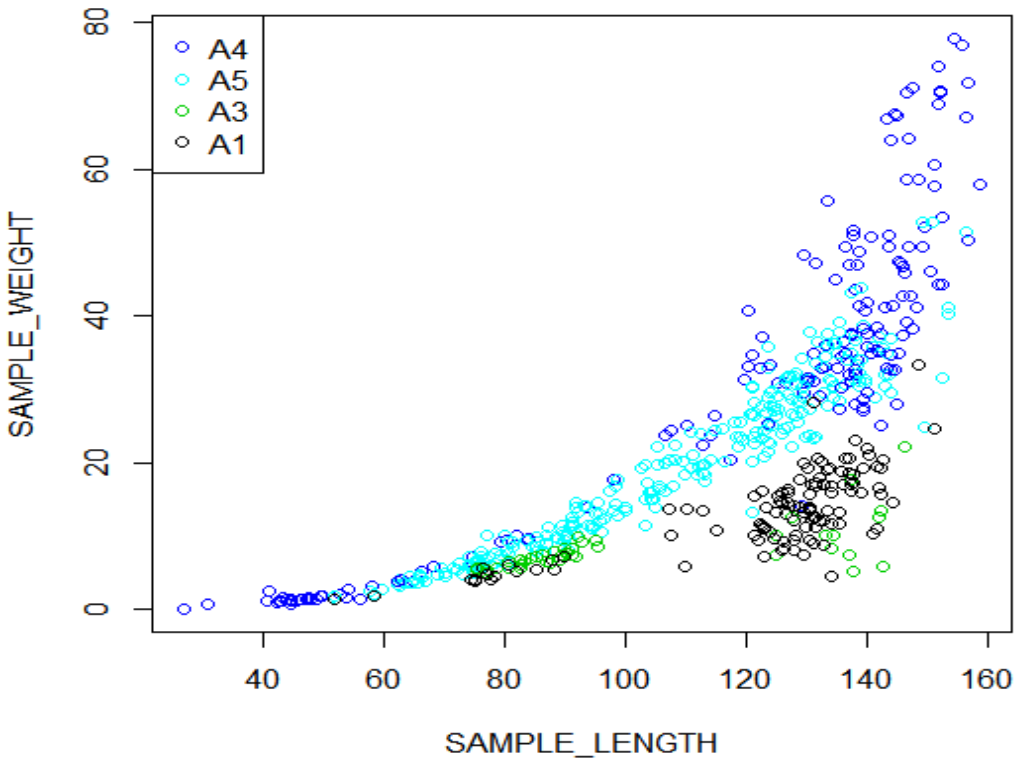


Figure 10 – Individual shell height meat weight relationships by survey area (1, 3, 4, and 5)

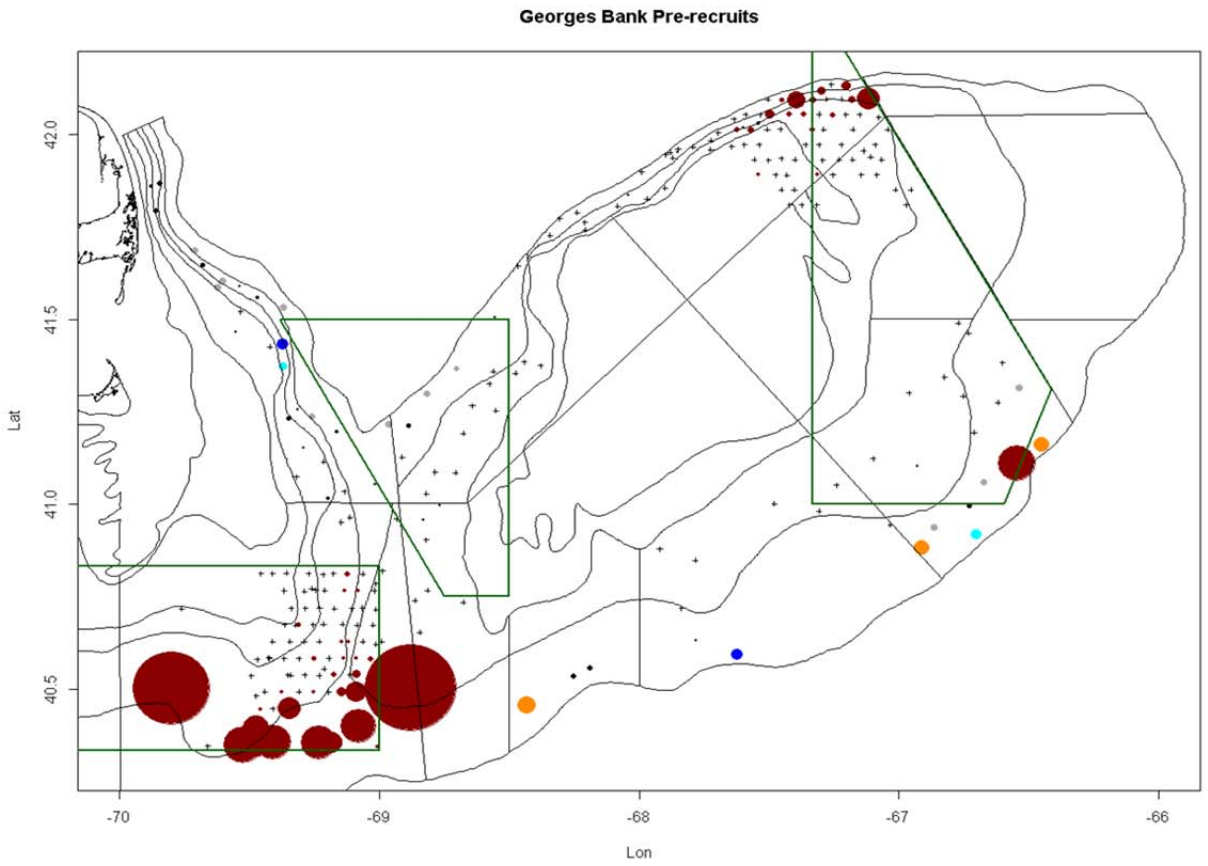


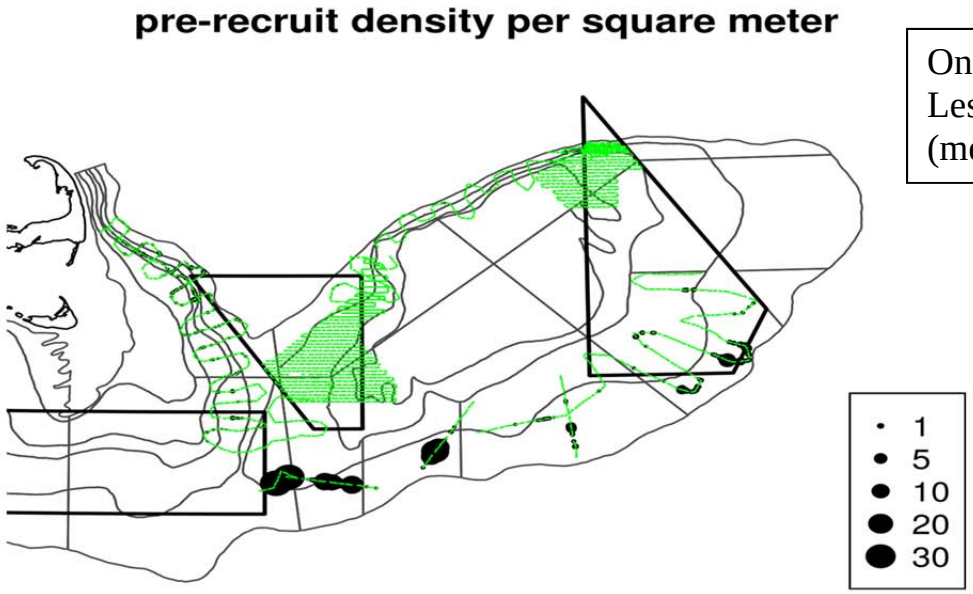
1.1.2 Recruitment

Recruitment was strong on GB for several years (2008-2010) but declined with very little signs of recruitment in 2011 and 2012. However, in 2013 a very large number of small scallops were observed in and around the Nantucket Lightship access area (Figure 11). The largest tow on record from the NEFSC dredge survey database was collected just east of the access area, over 60,000 scallops in one tow. It is very difficult to get a quantitative estimate of biomass from scallops this small. Many are assumed to escape the survey gear.

Recruitment in the MA was unusually high during 1998-2008. MA recruitment then declined for several years, but improved again in 2011 and 2012. According to all 2012 survey results, recruitment was very widespread in the MA and dense in all MA access areas, especially ETA. There was some concern that these high levels of recruitment would not materialize, but many two year old scallops are still present (Figure 12). Overall, recruitment in 2013 is still relatively high (Figure 13).

Figure 11 – Recruitment on GB from 2013 NEFSC and VIMS dredge surveys combined (TOP) and NEFSC habcam survey (BOTTOM)





One year old scallops
Less than 40mm
(mean = 17mm)

Figure 12 Two year old recruit density in MA from 2013 NEFSC optical survey

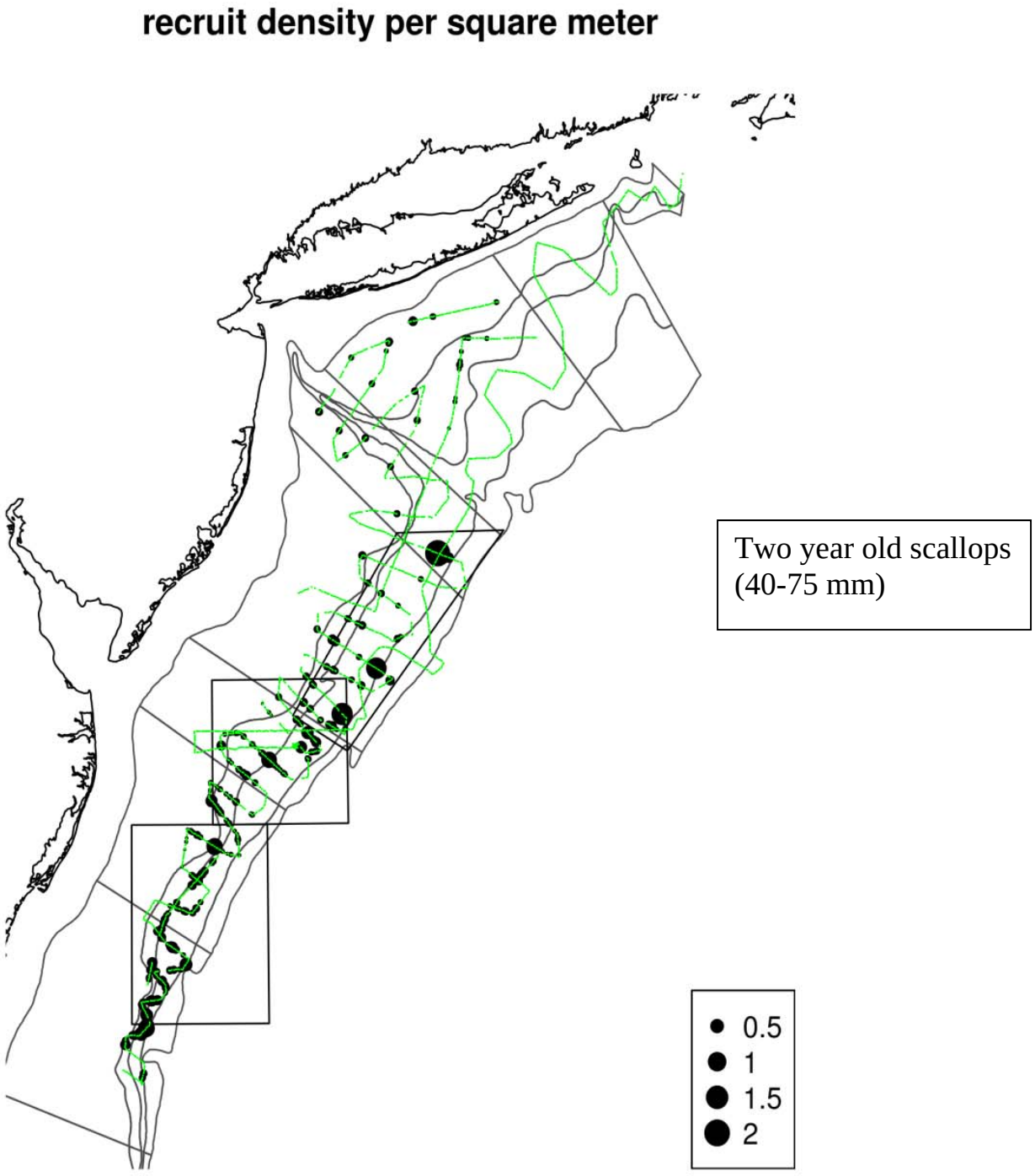
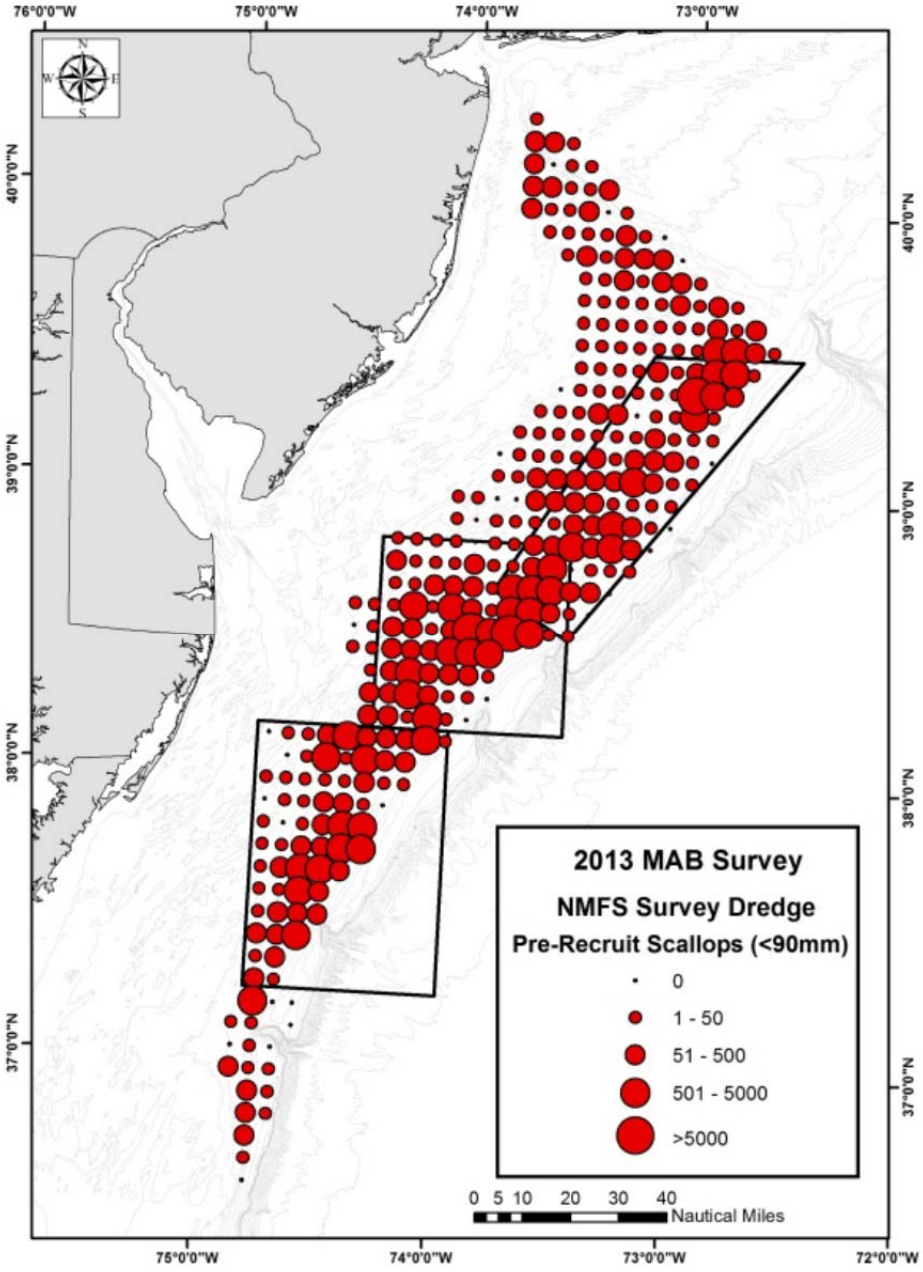


Figure 13 – 2013 Abundance of small scallops (pre-recruits less than 90mm) from the VIMS survey using the NMFS survey dredge



1.1.3 Fishing mortality and status of the stock

Four types of mortality are accounted for in the assessment of the sea scallop resource: natural, discard, incidental, and fishing mortality. The updated stock assessment established new values for natural mortality on both stocks. The new estimates are M = 0.12 for Georges Bank, and M = 0.15 for the Mid-Atlantic (NEFSC, 2010), compared to 0.10 used for the resource overall in previous assessments since natural mortality increases with larger shell heights. Discard mortality occurs when scallops are discarded on directed scallop trips because they are too small to be economically profitable to shuck or due to high-grading during access area trips to previously-closed areas. Total discard mortality is estimated at 20% (NEFSC, 2007). Incidental mortality is non-landed mortality associated with scallop dredges that likely kill and injure some scallops that are contacted but not caught by crushing their shells. The last benchmark assessment in 2010 used 0.20 on Georges Bank and 0.10 in the Mid-Atlantic (NEFSC, 2010), compared to earlier values of 0.15 on Georges Bank and 0.04 for Mid-Atlantic. The increase in assumed values for both natural and incidental mortality is expected to reduce the productivity potential of the stock, which is likely to cause the model to produce less (over) optimistic projections moving forward.

Finally, fishing mortality, the mortality associated with scallop landings on directed scallop trips, is calculated separately for Georges Bank and the Mid-Atlantic because of differences in growth rates. Fishing mortality peaked for both stocks in the early 1990s, but has decreased substantially since then as tighter regulations were put into place including area closures, and biomass levels recovered. In general, *F* has remained stable on Georges Bank since 1995, and the Mid-Atlantic has shown larger fluctuations and an overall higher *F* (Figure 12). Figure 13 shows F and biomass estimates for the combined stock overall.

The formal stock status update was prepared through FY2009 as part of SARC 50 (NEFSC, 2010), and the F_{max} reference point was changed to F_{msy}. F_{msy} for the whole stock was estimated from the Stochastic Yield Model (SYM) to be 0.38. SARC 50 estimated that overall fishing mortality in 2009 was 0.38, consistent with recent years. Since the fishing mortality in 2009 was equal to F_{msy}, overfishing did not occur (*F* must be above the threshold).

Figure 12 - Fishing mortality (red line) and biomass estimates (y^{-1}, gray bars) from the CASA model for scallops on Georges Bank (right) and in the Mid-Atlantic (left), through 2009

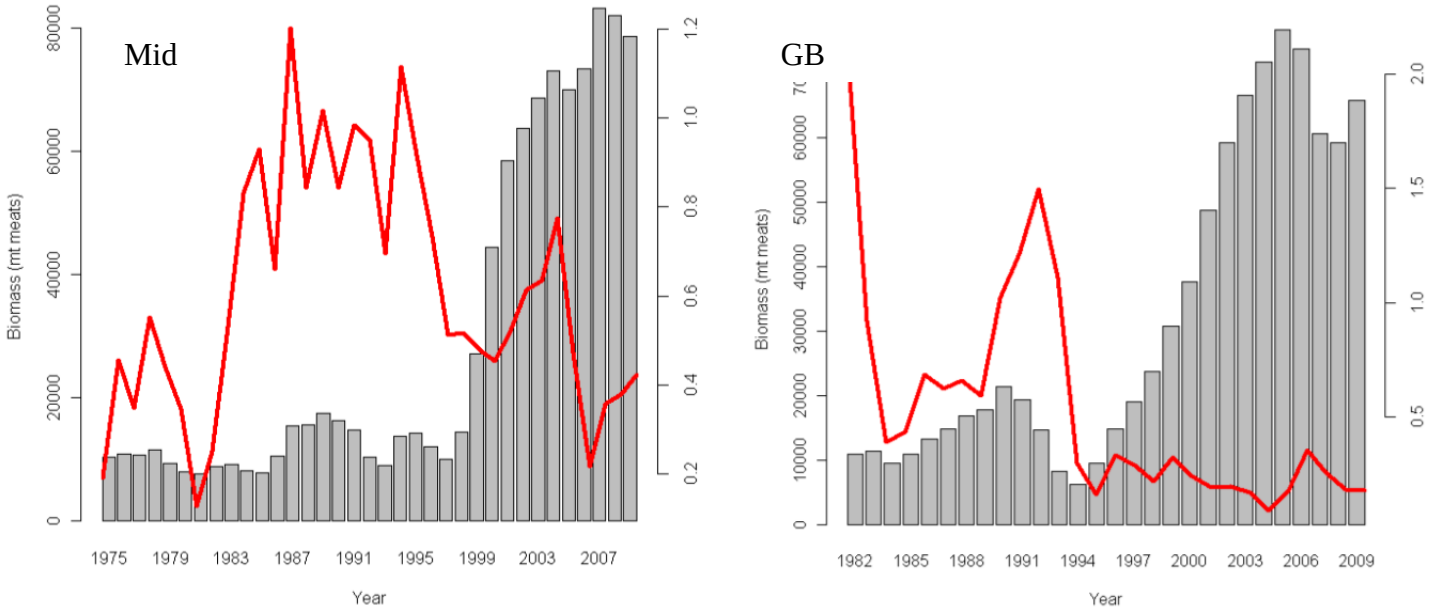
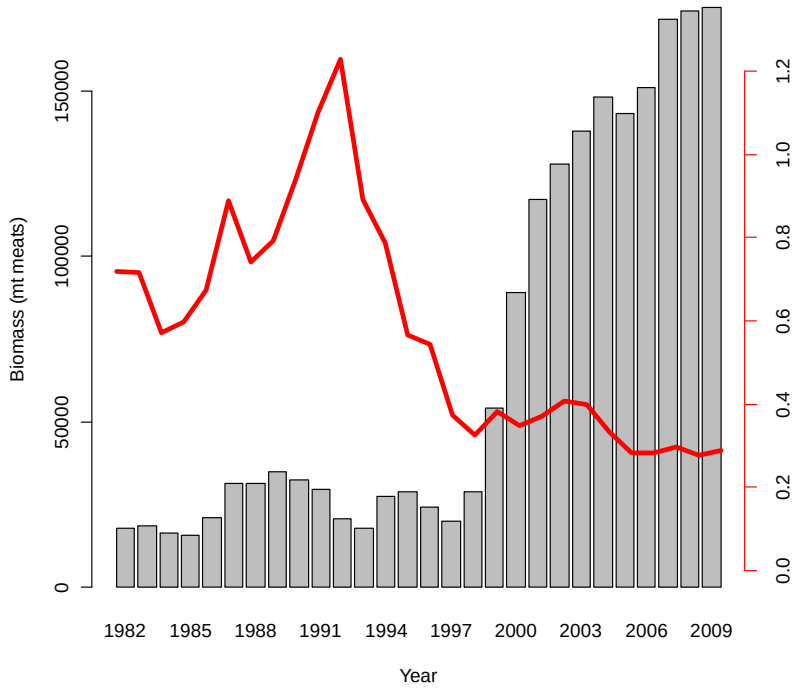


Figure 13 - Fishing mortality (red line) and biomass estimates (y^{-1}, gray bars) from the CASA model for sea scallop resource overall (Georges Bank and Mid-Atlantic combined) through 2009



The Scallop PDT met in May 2013 to review updated biomass and fishing mortality estimates developed for Framework 25. The results are not an official stock status update, but were completed for the purposes of setting fishery allocations for FY2014-2015 in Framework 25. A catch at size model (CASA model) is used by the PDT to estimate realized scallop biomass and fishing mortality. It was updated through 2012 using 2012 dredge (NEFSC and VIMS) and video (SMAST) surveys, as well as complete FY2012 fishery data. Habcam surveys were not used in CASA estimate for 2012, but will likely be included next year.

Based on the overfishing definition in the Scallop FMP, overfishing occurs when F exceeds Fmsy (0.38). The scallop stock is overfished when biomass is below ½ Bmsy. The last scallop stock assessment estimated Bmsy at 125,358, so ½ Bmsy = 62,679 mt. Since the last benchmark assessment (2010) three full years of observer, survey and fishery data have been added 2010-2012. Total biomass in MA and GB are almost unchanged from 2011, but exploitable biomass is down in MA. The total biomass estimate for 2012 is over 100,000 mt, well above the overfishing threshold of 62,679 – therefore, the stock is not overfished.

Fishing mortality increased on GB, and fishing effort shifted there from the MA for the first time since 2006. Fishing mortality increased in MA as well, MA catch declined but estimated F is actually higher because there is less exploitable biomass is in that area overall. Therefore, the estimate of overall F increased compared to recent years (0.377). This estimate is just below the overfishing threshold of 0.38 so overfishing is not occurring. Total F was about 0.32 in 2010 and 0.33 in 2011.

Table 3 – 2012 sea scallop stock status – overfishing is not occurring and the resource is not overfished

	Total 2012 Estimate	Stock Status Reference Points
Biomass (in 1000 mt)	119	½ Bmsy = 62,679
F	0.377	OFL = 0.38

Figure 16 – CASA estaimte of biomass through 2012

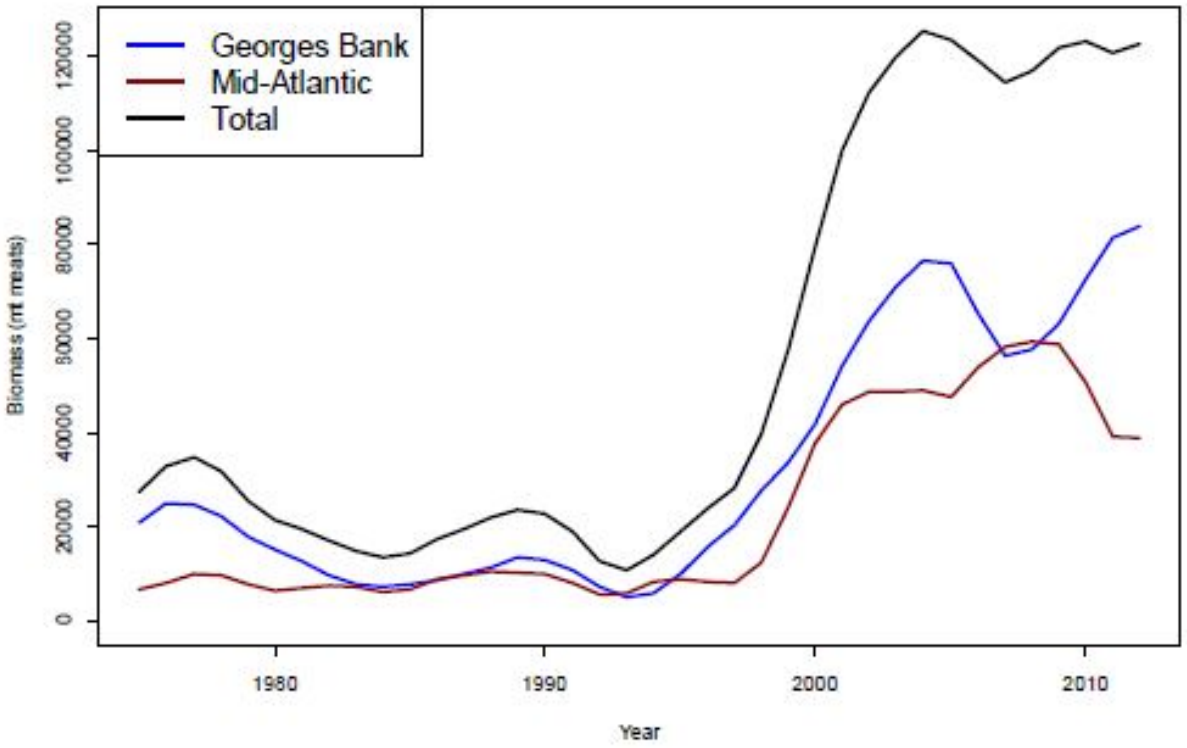
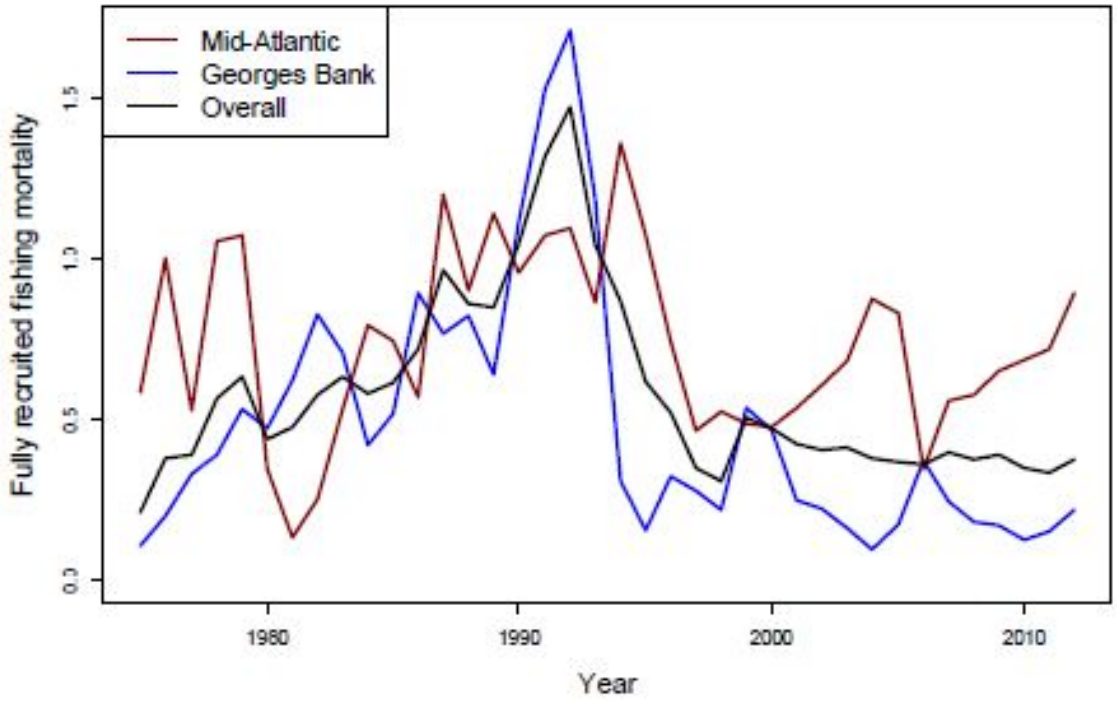


Figure 17 – CASA estimte of fishing mortaltiy through 2012



1.2 SEA SCALLOP FISHERY

This section provides background information in terms of landings, revenues, permits, vessels and various ports and coastal communities in the Northeast Sea Scallop Fishery up through FY2011. For more detailed information about the Economic and Social Trends in the Sea Scallop Fishery please see Appendix I to Framework 24.

1.2.1 Trends in Landings, prices and revenues

In the fishing years 2003-2011, the landings from the northeast sea scallop fishery stayed above 50 million pounds, surpassing the levels observed historically (Figure 18). The recovery of the scallop resource and consequent increase in landings and revenues was striking given that average scallop landings per year were below 16 million pounds during the 1994-1998 fishing years, less than one-third of the present level of landings. The increase in the abundance of scallops coupled with higher scallop prices increased the profitability of fishing for scallops by the general category vessels. As a result, general category landings increased from less than 0.4 million pounds during the 1994-1998 fishing years to more than 4 million pounds during the fishing years 2005-2009, peaking at 7 million pounds in 2005 or 13.5% of the total scallop landings. The landings by the general category vessels declined after 2009 as a result of the Amendment 11 implementation that restricts TAC for the limited access general category fishery to 5.5% of the total ACL. However, the landings by limited access general category IFQ fishery increased in 2011 from its levels in 2010 due to a higher projected catch and a higher ACT for all permit categories.

Figure 18. Scallop landings by permit category and fishing year (in lb., dealer data)

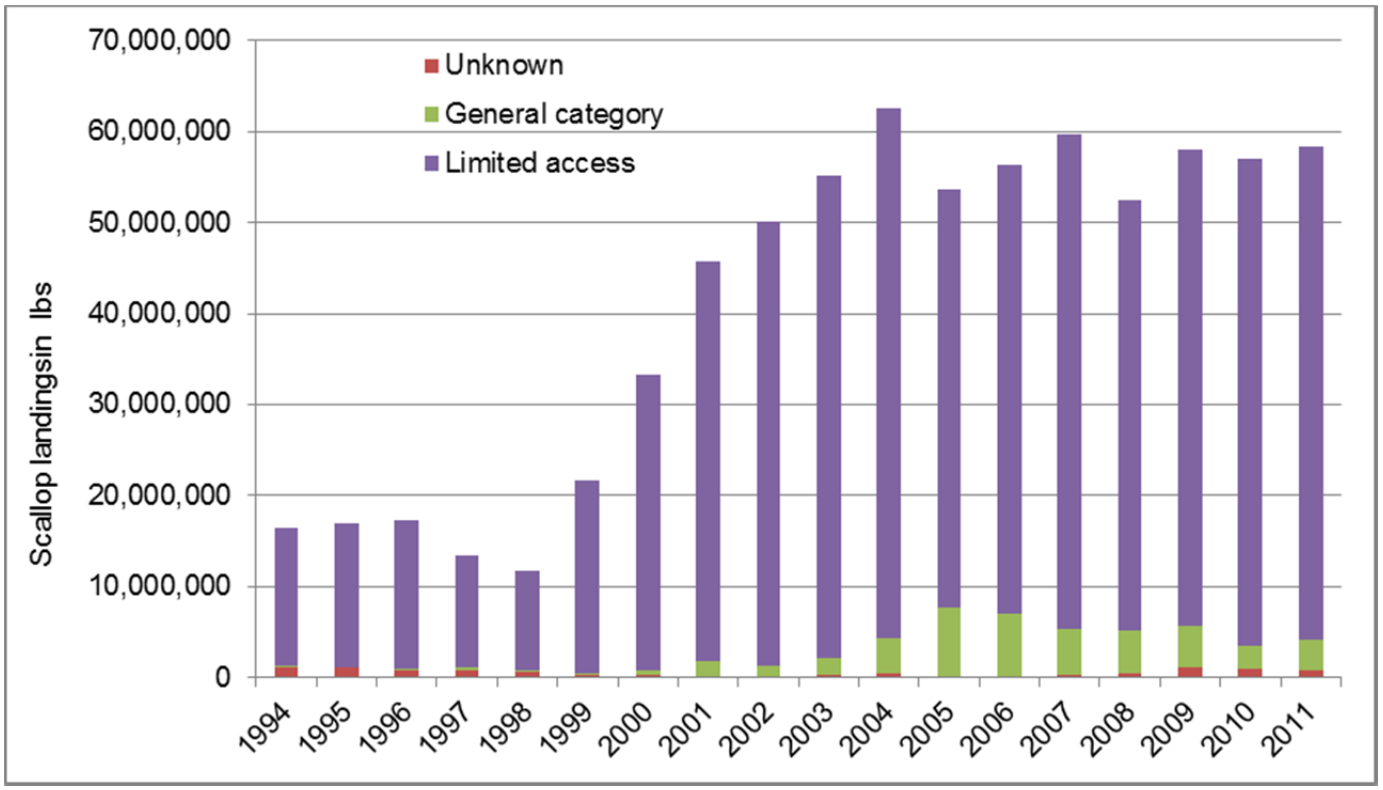
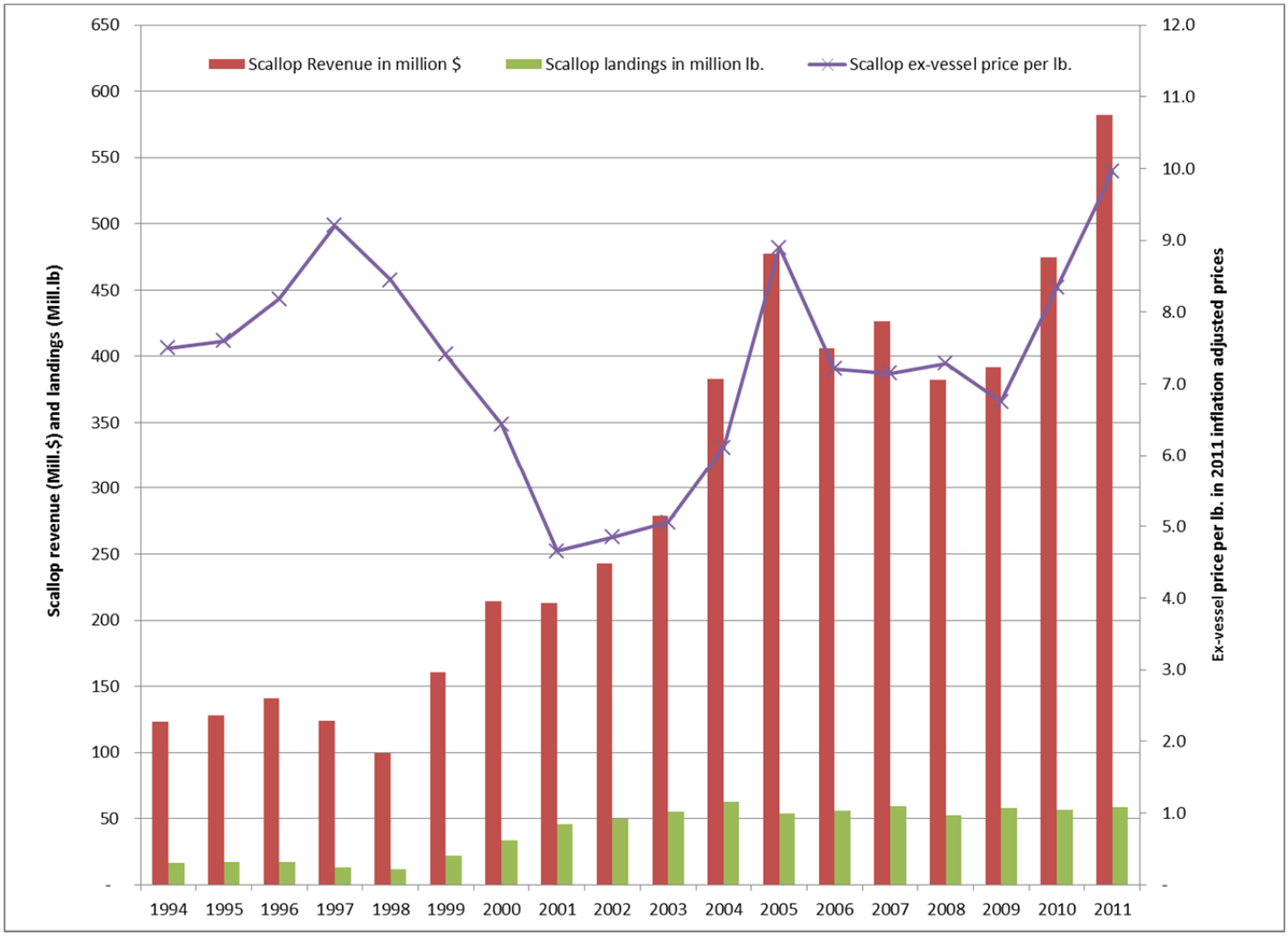


Figure 19 shows that total fleet revenues more than quadrupled in 2011 ($582 million) fishing year from its level in 1994 ($123 million, in inflation adjusted 2011 dollars). Scallop ex-vessel prices increased after 2001 as the composition of landings changed to larger scallops that in general command a higher price than smaller scallops. However, the rise in prices was not the only factor that led to the increase in revenue in the recent years compared to 1994-1998. In fact, inflation adjusted ex-vessel prices in 2008-2009 were lower than prices

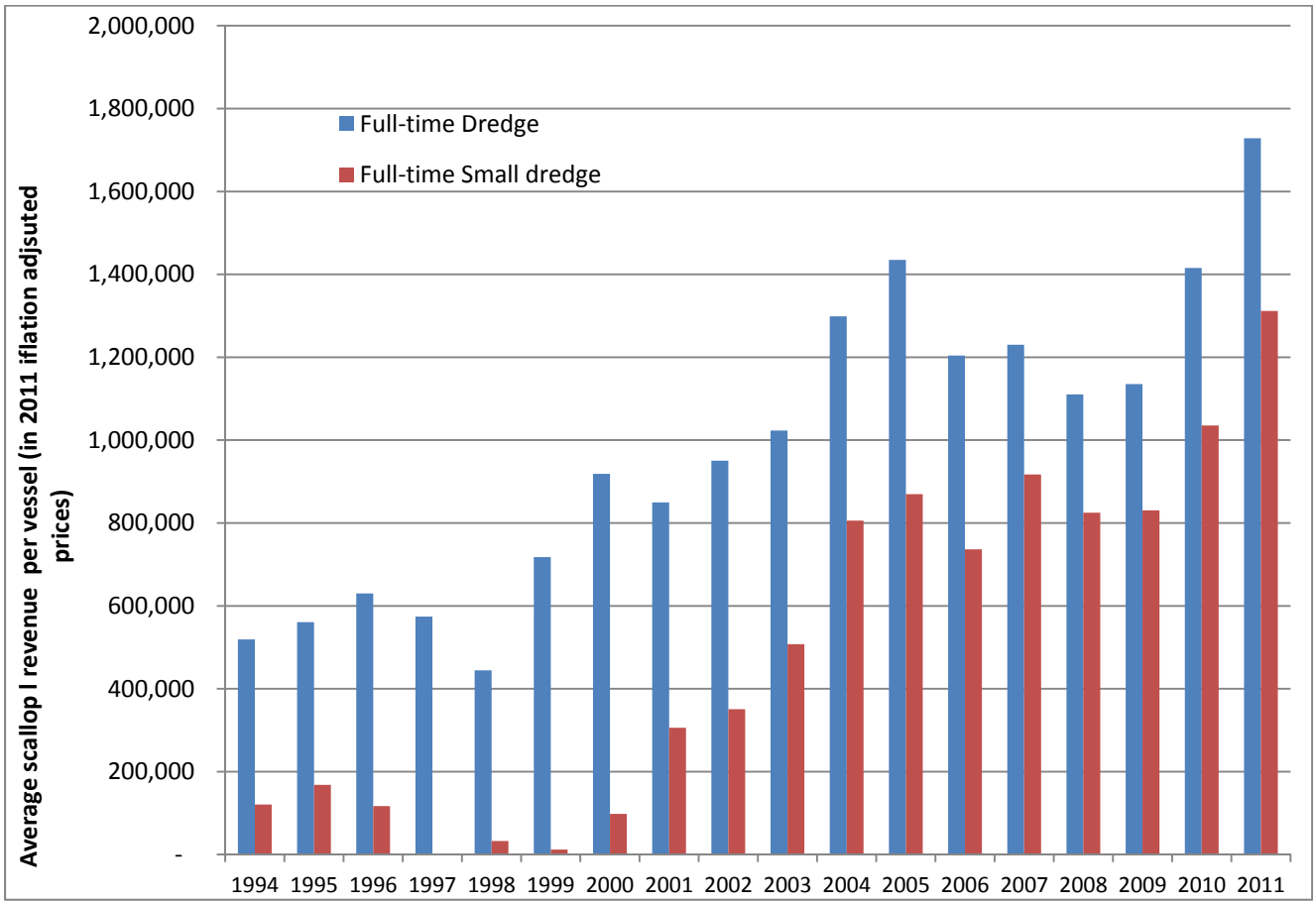
in 1994 (Figure 19). The increase in total fleet revenue was mainly due to the increase in scallop landings and the increase in the number of active limited access vessels during the same period. The ex-vessel prices increased substantially to about $10 per pound of scallops in 2011 fishing year, however, as the decline in dollar attracted more imports of large scallops from the European countries resulting in record revenues from scallops reaching to $582 million for the first time in scallop fishing industry history (Figure 19).

Figure 19. Trends in total scallop landings, revenue and ex-vessel price by fishing year (including limited access and general category fisheries, revenues and prices are expressed in 2011 constant prices)



The trends in revenue per full-time vessel were similar to the trends for the fleet as a whole. The average scallop revenue per limited access full-time dredge vessel almost quadrupled from about $518,000 in 1994 to over $1,728,000 in 2011 as a result of higher landings combined with an increase in ex-vessel price to about $10.00 per pound of scallops (Figure 20).

Figure 20. Trends in average scallop revenue per full-time vessel by category (Dealer data)



Although general category landings declined after 2009, the revenue per active limited access general category vessel increased in 2011 as the quota is consolidated on or fished by using fewer vessels. It should be noted that these are estimated numbers from dealer data based on some assumptions in separating the LAGC landings from LA landings. It was assumed that if an LA vessel also had an LAGC permit, those trip landings which are less than 600 lb. in 2011 and less than 400 lb. in 2010 and 2009 were LAGC landings and any among above these were LA landings.

Table 4. Estimated Average annual revenue per limited access general category vessel (Dealer Data)

Data	Fishyear	IFQ	INCI	NGOM	Total
Number of vessels	2009	231	74	12	317
	2010	179	68	12	259
	2011	169	76	14	259
Average scallop lb. per vessel	2009	18,650	2,650	2,038	14,286
	2010	13,319	2,238	595	9,820
	2011	19,717	796	789	13,142
Average scallop revenue per vessel	2009	121,884	16,768	13,551	93,245
	2010	120,782	18,583	4,883	88,580
	2011	203,814	7,735	7,164	135,647

1.2.2 Trends in effort and LPUE

There has been a steady decline in the total DAS used by the limited access scallop vessels from 1994 to 2011 fishing years as a result of the effort-reduction measures since Amendment 4 (1994). The numbers in Figure 21 are obtained from the VTR database and include the steam time showing the days spent at sea starting with the sail date and ending with the landing date. In addition, those numbers include both open and access areas. Figure 21 shows that total DAS-used declined further in 2008 as the open area DAS allocations are reduced by 30% from 51 days to 35 days per full-time vessel, but increased in 2009 as the limited access vessels received access area trips (5 trips per vessel). Open area DAS allocations were slightly higher in 2010 (38 DAS versus 37 DAS in 2009), resulting in slightly higher total DAS-used by the limited access vessels despite lower number of access area trips (4 trips per vessel). Total DAS-used decreased further in 2011, despite the increase in the open area DAS allocations as LPUE (the landings per DAS-used including the steam time from VTR data) surged to about 2300 lb. per DAS as an average for all the limited access vessels (Figure 21).

The LPUE is much higher if it was calculated as based on the time a vessel crossed the VMS demarcation line going out on a trip, and the time it crossed again coming back from a trip, so it wouldn't include the time from (to) the port to (from) the demarcation line at the start (end) of the trip. Table 5 shows that the share of open area catch increased to 61% in 2010 and to almost 58% in 2011 as LPUE reached over 2,600 lb. per DAS in 2010 and over 3000 lb. per DAS (for the first time in 2011) in the open areas.

Figure 21. Total DAS-used (Date landed – Date sailed from VTR data) by all limited access vessels and LPUE

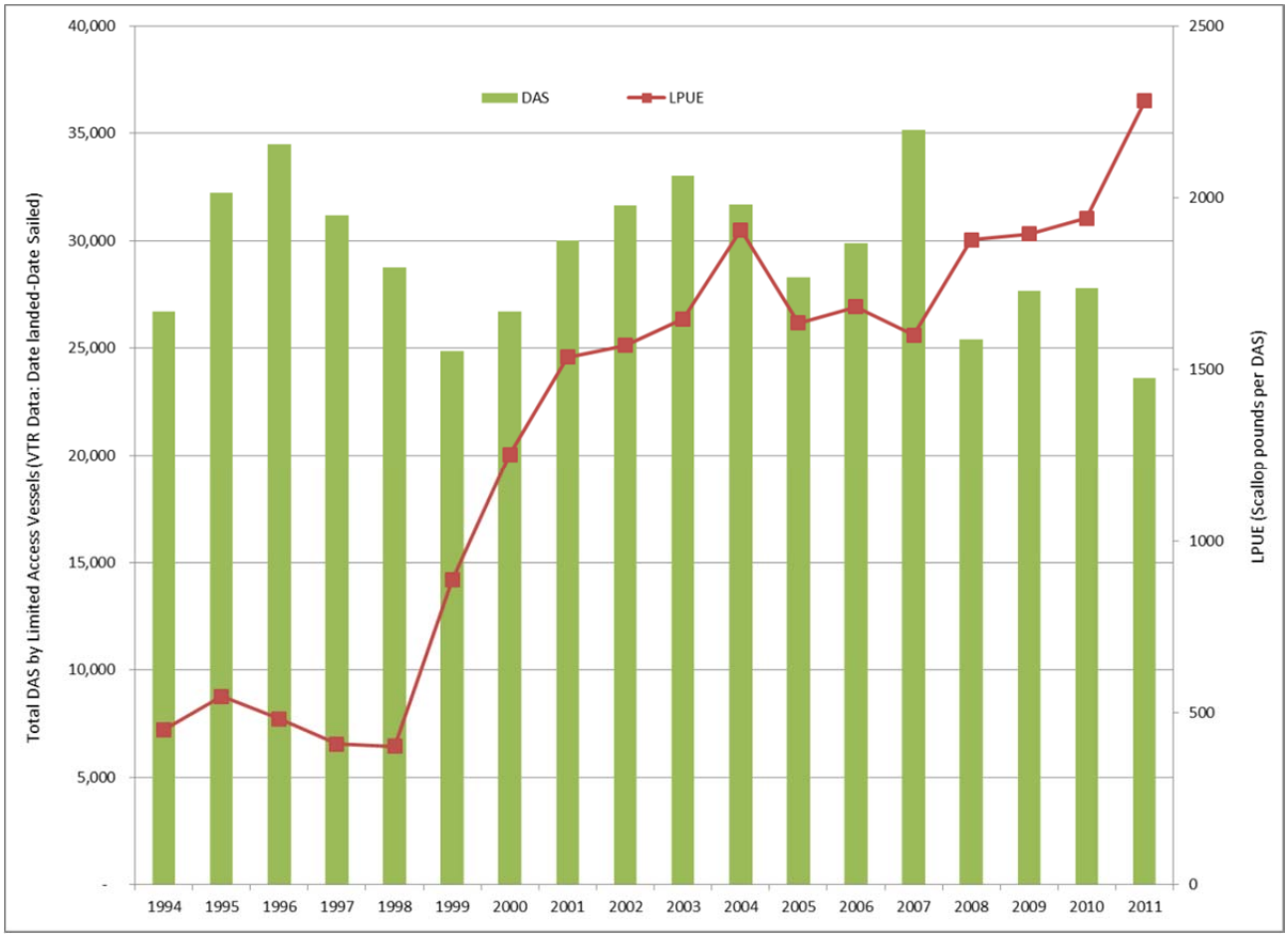


Table 5 – LPUE by area and fish year (Limited access vessels, dealer and DAS data)

Access Area	2010	2011
Closed Area 1		2,511
Closed Area 2		2,102
Delmarva	2,038	1,733
Elephant Trunk	1,362	779
Hudson Canyon	1,897	2,415
Nantucket Lightship	2,406	
OPEN	2,632	3,112

1.2.3 Trends in the meat count and size composition of scallops

Average scallop meat count has declined continuously since 1999 as a result of effort-reduction measures, area closures, and an increase in ring sizes implemented by the Sea Scallop FMP. The share of larger scallops increased with the share of U10 scallops rising to over 20% during 2006-2008, and to 15% in 2009 on compared to less than 10% in 2000-2004. The share of 11-20 count scallops increased from 12% in 1999 to 77% in 2011. On the other hand, the share of 30 or more count scallops declined from 30% in 1999 to 1% or less since 2008 (Table 8). Larger scallops priced higher than the smaller scallops contributed to the increase in average scallop prices in recent years despite larger landings (Table 7). The price of smaller scallops, especially the 21 to 30 count scallops, increased however in 2011 fishing year as their supply declined to 6% of total scallop landings. The scarcity of smaller scallops reduced the differences in price of large and small scallops especially in 2011 fishing year.

Table 6. Size composition of scallops

FISHYEAR	U10	11 to 20	21 to 30	>30	UNK	Grand Total
1999	16%	12%	27%	33%	12%	100%
2000	7%	20%	42%	21%	10%	100%
2001	3%	23%	52%	10%	12%	100%
2002	5%	14%	66%	4%	11%	100%
2003	6%	21%	56%	3%	13%	100%
2004	8%	45%	39%	1%	8%	100%
2005	13%	57%	21%	2%	7%	100%
2006	23%	50%	19%	1%	6%	100%
2007	24%	52%	12%	4%	7%	100%
2008	23%	52%	19%	1%	4%	100%
2009	15%	62%	21%	0%	3%	100%
2010	15%	63%	19%	0%	2%	100%
2011	15%	77%	6%	1%	2%	100%
2012	11%	83%	5%	0%	1%	100%

*2012 is for months 3 to 5

Table 7. Price of scallop by market category (in 2011 inflation adjusted prices)

FISHYEAR	U10	11 to 20	21 to 30	>30	UNK	All counts
1999	8.04	8.18	7.54	6.62	7.65	7.41
2000	8.94	6.73	6.02	6.08	6.54	6.43
2001	7.47	4.75	4.45	4.54	4.65	4.65
2002	6.84	4.97	4.66	5.43	4.82	4.86
2003	5.95	4.98	4.99	5.55	4.94	5.06
2004	7.14	6.20	5.79	6.03	5.68	6.08
2005	9.09	8.94	8.80	8.69	8.64	8.90
2006	6.63	7.33	7.69	7.59	6.77	7.20
2007	7.44	7.14	6.88	6.34	6.78	7.13
2008	7.48	7.20	7.06	6.86	6.72	7.21
2009	8.39	6.48	6.38	6.05	6.10	6.72
2010	10.83	7.71	8.44	8.74	7.65	8.33
2011	10.18	9.87	10.31	9.77	9.89	9.94
2012	10.47	9.33	9.36	9.74	9.72	9.46

1.2.4 The trends in participation by permit, vessel characteristics and gear type

The limited access scallop fishery consists of 347 vessels. It is primarily full-time, with 250 full-time (FT) dredge, 52 FT small dredge vessels and 11 FT net boats. There have been no occasional permits left in the fishery since 2009 because they were converted to part-time small dredge (32 vessels in 2011). Similarly, there are only two part-time permits because most were converted into full-time dredge vessels after 2000 (Table 8).

Since 2001, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices. Amendment 11 implemented a limited entry program for the general category fishery reducing the number of general category permits after 2007. In 2011, there were 288 LAGC IFQ permits, 103 NGOM and 279 incidental catch permits in the fishery totaling 670 permits. Although not all vessels with general category permits were active in the years preceding 2008, there is no question that the number of vessels (and owners) that hold a limited access general category permit under the Amendment 11 regulations are less than the number of general category vessels that were active prior to 2008 (Table 9).

Table 8. Scallop Permits by unique right-id and category by application year

Permit category	2009-2011
Full-time	250
Full-time small dredge	52
Full-time net boat	11
Total full-time	**313**
Part-time	2
Part-time small dredge	32
Part-time trawl	0
Total part-time	**34**
Occasional	0
Total Limited access	347

Table 9. Active vessels by fishyear and permit category (Vessels that landed any amount of scallops--may include duplicate records for replaced vessels with different permit numbers)

Fishyear	General category	Limited Access General Category	Limited Access
1994	186		260
1995	188		244
1996	222		246
1997	244		225
1998	209		229
1999	194		244
2000	208		258
2001	280		281
2002	299		292
2003	337		303
2004	446		315
2005	618		327
2006	639		340
2007	485		353
2008	151	288	348
2009		317	353
2010		267	351
2011		259	348

1.2.5 Landings by gear type

Most limited access category effort is from vessels using scallop dredges, including small dredges. The number of vessels using scallop trawl gear has decreased continuously and has been at 11 full-time trawl vessels since 2006. In comparison, there has been an increase in the numbers of full-time and part-time small dredge vessels after 2002. About 80% of the scallop pounds are landed by full-time dredge and about 13% landed by full-time small dredge vessels since the 2007 fishing year (Section 1.1.6 of Appx. I, FRW 24).

Most general category effort is, and has been, from vessels using scallop dredge and other trawl gear. The percentages of scallop landings show that landings made with a scallop dredge in 2012 continue to be the highest compared to other general category gear types (Table 18 and Table 22, Appx. I, FRW 24).

1.2.6 Trends in ownership patterns in the scallop fishery

Sea Scallop Limited access fishery has a highly concentrated ownership structure. According to the ownership data for 2011, only 63 out of 344 vessels belonged to single boat owners (Table 30, Appx.I, FW 24). The rest were owned by several individuals and/or different corporations with ownership interest in more than one vessel. This in contrast to the LAGC IFQ Fishery which is dominated mostly with single boat owners --118 out of 259 active vessels belonged to the single boat owners (Table 32, ibid.).

1.2.7 Trip Costs for the Limited Access Full-time vessels

Data for variable costs, i.e., trip expenses include food, fuel, oil, ice, water and supplies and obtained from observer cost data for 1994-2011. Because of the increase in fuel prices in 2011, the share of fuel costs increased to 80% of the total trip cost and average trip cost per DAS for the full-time dredge vessels amounted to over $1950 per day-at-sea (Table 34, Appx.I, FW24). Average trip costs for full-time small dredge vessels was about $1250 per day-at-sea in 2011 (Table 36, ibid.).

1.2.8 Trends in Foreign Trade

One of most substantial changes in the trend for foreign trade for scallops after 1999 was the striking increase in scallop exports. The increase in landings especially of larger scallops led to a tripling of U.S. exports of scallops from about 5 million pounds in 1999 to a record amount of 32 million pounds in 2011 (Figure 11, Appx.I, FW24). In contrast, imports of scallops declined to 42 million lb. in 2011 from over 60 million lb. in the preceding five years, that is by almost 30%. Because of the increase in the value of scallop exports to over $214 million in 2011, the difference in the value of exported and imported scallops, that is scallop trade deficit reached to its lowest level, $42 million, since 1994 (Figure 33, ibid.). Therefore, rebuilding of scallops as a result of the management of the scallop fishery benefited the nation by reducing the scallop trade deficit in addition to increasing the revenue for the scallop fishery as a whole.

1.2.9 Dependence on the Scallop Fishery

Both full-time and part-time limited access vessels had a high dependence on scallops as a source of their income. Full-time limited access vessels had a high dependence on scallops as a source of their income and the majority of the full-time vessels (94%) derived more than 90% of their revenue from the scallop fishery in 2011 (Table 37, Appx. I, FRW 24). Comparatively, part-time limited access vessels were less dependent on the scallop fishery in 2011, with only 37% of part-time vessels earning more than 90% of their revenue from scallops (Table 37, ibid).

Table 38 shows that general category permit holders (IFQ and NGOM) are less dependent on scallops compared to vessels with limited access permits. In 2011, less than half (43%) of IFQ permitted vessels earned greater than 50% of their revenue from scallops. Among active NGOM permitted vessels (that did not also have a limited access permit), 88% had no landings with scallops in 2011. Scallops still comprise the largest proportion of the revenue for IFQ general category vessels, accounting for 38.6% of these vessels revenue. Scallops still comprise the largest proportion of the revenue for IFQ general category vessels, accounting for 38.6% of these vessels revenue (Table 39 Appx I, FRW 24,). For NGOM vessels (that did not also have a limited access permit) scallop landings accounted for less than 1% of revenue in 2011. The composition of revenue for both the IFQ and NGOM general category vessels are shown in Table 39 (ibid).

1.2.10 Trends in Employment in the Scallop Fishery

The number of crew positions, measured by summing the average crew size of all active limited access vessels on all trips that included scallops, has increased slightly from 2,172 positions in 2007 to 2,262 positions in 2011 (a 4% increase) (Table 47, Appx. I, FRW 24). Broken out by home port state, the number of crew positions has stayed relatively constant during the past five years. Limited access vessels with a home port in Massachusetts and New Jersey experienced the largest percentage increase (5%: 969 to 1015 crew positions in MA and 15%: 490 to 564 crew positions in NJ). However, total crew effort in the limited access fishery, measured by crew days, declined from 207,088 to 160,355 (23%, Table 50, Appx I, FRW 24) from 2007 to 2011. The number of crew days on general category vessels followed a similar pattern as the general category crew positions and trips, with large declines in 2008 and 2010, but then an increase in days in 2011(Table 52, ibid.).

1.2.11 Trends in the Number of Seafood Dealers

Dealer data shows that the actual landings of scallops are highly concentrated in the states of Massachusetts (58%), New Jersey (24%) and Virginia (13%), but that dealers from all over New England and the Mid Atlantic are buying these scallops. Table 53 (Appx.I, FW24) shows that Massachusetts is still the state with the most dealers purchasing scallops at 48, but states like New York, New Jersey and Maine also have large numbers of dealers and seafood processors buying scallops. In recent years the total number of dealers purchasing scallops has declined, from a high of 303 dealers in 2005, to 161 dealers in 2011. Without more information about these seafood related businesses it is difficult to draw any conclusions about the recent decline in the number of dealers, but it is interesting to note that the largest declines in dealers accepting scallops has been in Massachusetts, which had 107 dealers in 2005, but had only 48 in 2011.

1.2.12 Trends in scallop landings by port

The landed value of scallops by port landing fluctuated from 1994 through 2011 for many ports. In 2011 New Bedford accounted for 53% of all scallop landings and it continues to be the number one port for scallop landings. Included in the top five scallop ports are: Cape May, NJ; Newport News, VA; Barnegat Light/Long Beach NJ; and Seaford, VA. It is also fair to describe the fishing activities in these ports as highly reliant on the ex-vessel revenue generated from scallop landings as scallop landings represent greater than 75% of all ex-vessel revenue for each of the ports (Table 59, Appx. I, FRW 24). There are also a number of ports with a comparatively small amount of ex-vessel revenue from scallops but where that scallop revenue represents a vast majority of the revenue from landings of all species (Table 60, ibid.). In 2011, in the ports of Newport News, VA and Seaford, VA; revenue from scallop landings accounted for 89.0% and 99.9% of all ex-vessel revenue respectively (Table 60, ibid.). A more detailed description of port profiles can be found at http://www.nefsc.noaa.gov/read/socialsci/communityProfiles.html.

In terms of homestate, the vessels from MA landed over 45% of scallops in 2010 and 2011 fishing years, followed by NJ with about 24.5% of all scallops landed by vessels homeported in this state (Appx. I, FRW 24). Scallops also comprise a significant proportion of revenue (and landings) from all species with over 90% of total revenue in VA, over 75% of total revenue in NC, over 60% of total revenue in MA and over 68% of total revenue in NJ (ibid.).

As in previous years, the largest numbers of permitted limited access scallop vessels have home ports of New Bedford, MA and Cape May, NJ, which represent 39% and 21% of all limited access vessels, respectively (Table 62, Appx. I, FRW 24). New Bedford also has the greatest number of general category scallop vessels, but while limited access vessels are mostly concentrated in the ports of New Bedford and Cape May, general category vessels are more evenly distributed throughout coastal New England. In addition to New Bedford, Point Judith, RI, Gloucester, MA, Boston, MA, Cape May, NJ and Barnegat Light, NJ, are all the homeport of at least 20 vessels with general category scallop permits (Table 63, ibid).

1.3 OVERALL PERFORMANCE OF ACL MANAGEMENT

ACLs were implemented under Amendment 15 to the Scallop FMP. Fishing year 2011 was the first year the fishery was managed under ACLs. The flowchart below provides a schematic of the various sources of catch in the scallop fishery and how it is accounted for, using FY2012 as an example. For the first year under ACLs, the scallop fishery caught about 98% of the ABC (Table 12). Fishing year 2012 is not over yet, but it does not appear that the ABC will be exceeded.

Figure 22 – Flowchart of ACL related terms for FY2012

Values in Table 12

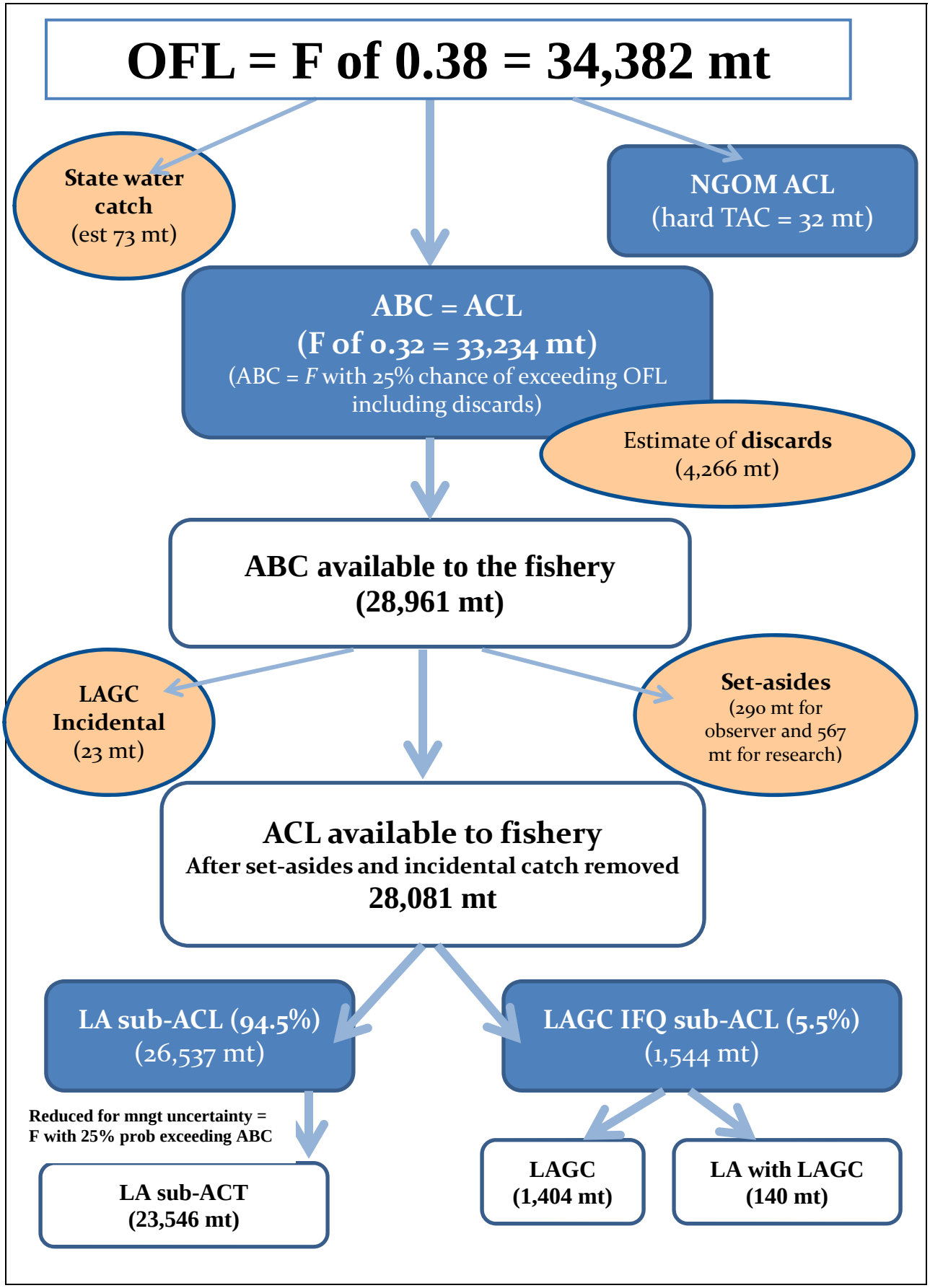


Table 10 – Summary of OFL, ABC and catch values adopted for FY2011 (Framework 22) compared to actual catches

(Note that state water catch was not included in yearend report from NMFS, so landings is actually for CY2012 based catch from vessels without a federal permit Source: ACCSP)

	Allocation	Landings	Difference	% of Allocation	Notes
OFL	71,400,000	59,529,572	-11,870,428	83.37%	OFL = ABC catch + NGOM + state water catch
NGOM	70,000	7,733	-62,267	11.05%	
State water landings	160,000	450,000	290,000	281.25%	
ABC	60,117,237	59,071,839	-1,045,398	98.26%	ABC = ACL catches + incidental + set-asides
Incidental Catch	50,000	38,700	-11,300	77.40%	
Research Set-Aside	1,250,000	1,218,781	-31,219	97.50%	
Observer Set Aside	601,170	228,370	-372,800	37.99%	
Scallop Fishery ACL	**58,216,070**	**57,585,988**	**-630,082**	**98.92%**	Scallop ACL = LA catch + LAGC catch + unattributed catch
Limited Access (LA) Sub-ACL	55,014,180	53,929,369	-1,084,811	98.03%	
Limited Access (LA) Sub-ACT	47,247,270	53,929,369	6,682,099	114.14%	
LAGC sub-ACL*	2,910,800	2,773,744	-137,056	95.29%	
LA with LAGC sub-ACL*	291,080	272,501	-18,579	93.62%	
Unattributed catch	N/A	610,347	N/A	N/A	This catch is added to ACL catch because landed by a vessel with a federal permit

Table 11 – Summary of OFL, ABC and catch values adopted for FY2012 (Framework 24) compared to actual catches

	Allocation	Landings	Difference	% of Allocation	Notes
OFL	75,800,000	58,336,044	-17,463,956	76.96%	OFL = ABC catch + NGOM + state water catch
NGOM	70,000	7,733	-62,267	11.05%	
State water landings	160,000	654,966	494,966	409.35%	
ABC	63,847,421	57,673,345	-6,174,076	85.50%	ABC = ACL catches + incidental + set-asides
Incidental Catch	50,000	61,869	11,869	123.74%	
Research Set-Aside	1,250,000	1,167,316	-82,684	93.39%	
Observer Set Aside	638,470	263,700	-374,770	41.30%	
Scallop Fishery ACL	**61,908,950**	**56,180,460**	**-5,728,490**	**90.75%**	Scallop ACL = LA catch + LAGC catch + unattributed catch
Limited Access (LA) Sub-ACL	58,503,960	52,274,515	-6,229,445	89.35%	
Limited Access (LA) Sub-ACT	51,910,040	52,274,515	364,475	100.70%	
LAGC sub-ACL*	3,289,498	3,033,538	-255,960	92.22%	
LA with LAGC sub-ACL*	309,455	297,746	-11,709	96.22%	
Unattributed catch	N/A	574,661	N/A	N/A	This catch is added to ACL catch because landed by a vessel with a federal permit

* Does not include carryover (In 2012 vessels with LAGC IFQ has 193,622 pounds of carryover)

Table 12 is a summary of actual landings compared to OFL, ABC and ACL for FY2011 and FY2012, as well as proposed values for Framework 25 (FY2014-2015).

FY3013 is only half over, so actual landings are not available yet. For this analysis an estimate of 21,000 mt has been made for total catch. This estimate assumes: 100% of LA and LAGC sub-ACLs are harvested, 50 mt for incidental catch, 200 mt for state water catch, 10 mt for NGOM and 100% catch set aside for observer coverage and research.

Table 12 – Summary of OFL, ABC and catch values under ACL management

	OFL	ABC (including discards)	Discards	ABC available to fishery = ACL (after discards removed)	Actual Landings	% of ACL (landings/ACL)	Total Catch (landings plus assumed discards)	% of ABC caught (including discards)
	A	B	C	A-C = D	E	E/D	E+C=F	F/B
2011	32,387	31,279	4,009	27,269	26,795	98.3%	30,804	98.5%
2012	34,382	33,234	4266	28,961	26,160	90.3%	30,426	91.6%
2013	31,555	27,370	6,366	21,004	21,000	100.0%	27,366	100.0%
2014 (default)	35,110	30,353	6,656	23,697				
2014 proposed	31,224	26,452	7,001	19,451				
2015 proposed	37,547	32,380	7,997	24,403				

Note – 2013 actual catch is an estimate only