Annual Report on the Maine-New Hampshire Inshore Trawl Survey

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By

Sally A. Sherman, Keri L. Stepanek, Craig King, and Andrew M. Gowen
Maine Department of Marine Resources
21 State House Station
Augusta, Maine 04333

Robert Tetrault, Robert Michael Inc.
2 Portland Fish Pier, Suite 211
Portland, ME 04101

And
Robert Ekert
New Hampshire Fish and Game Department
225 Main Street
Durham, NH 03824-4732

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ACKNOWLEDGEMENTS

The Maine-New Hampshire Inshore Trawl Survey is a complex project that benefits from the assistance of many people. Without their help the surveys could not be successfully completed.

We would like to thank the Maine DMR and New Hampshire F&G staff that helped with the mailings, car shuttles, web site, and contributed to the data collection and entry. We appreciate the hard work put in by the crew of the F/V Robert Michael, Captain Robert Tetrault II, and crewmembers Robert Woods, Steve Train, Larry Rich, and Kris Weeks. Jeff Flagg and Danny Libby provided invaluable assistance by mending and transporting nets to keep the survey running on schedule, and storing gear during the off-season.

Thanks to science staff, Trisha DeGraaf, Melissa Smith, Kathleen Reardon, Lisa Pinkham, James Becker, Jeanne Cushman, Linda Mercer, George Lapointe, Steve Sutton, Curt Brown, Graham Sherwood, Robert Ekert, Jessica Devoid, Simon Beirne, Renee Zobel, and Lon Robinson. Thanks to Margaret Hunter for updating our website. We are especially grateful for the support provided by Colonel Joe Fessenden, Lieutenants Jon Cornish and Dale Sproul, boat captains Ed Logan, Mike Neelon, Mike Forgues, Corrie Roberts, Colin McDonald, Mark Murry, Russell Wright and other Marine Patrol Officers who helped both on and off the water, handling gear and assisting in communications with lobstermen, and whose presence added to our security.

We also express many thanks to all of the facilities along the coast that provided dockage for the survey vessel: University of New Hampshire Pier (Newcastle, NH), Journey's End Marina (Rockland, ME), Vinalhaven Town Pier (Vinalhaven, ME), Billings Marine (Stonington, ME), Dysart's Great Harbor Marina (Southwest Harbor, ME) and the US Coast Guard (Jonesport, ME).

Lastly, we appreciate the support and cooperation of those fixed gear fishermen throughout the survey area that moved gear and suggested alternate sites when necessary. The Lobster Zone Councils, Maine Lobster Advisory Council, Maine Lobstermen's Association, and Downeast Lobstermen's Association also provided many comments and suggestions to help minimize gear conflicts and improve cooperation.

EXECUTIVE SUMMARY

This report summarizes results from the 2010 sampling season of a comprehensive bottom trawl survey of groundfish and invertebrate species along the coast of Maine and New Hampshire. Prior to 2000, fishery-independent data were not available for nearly 80% of the Gulf of Maine's inshore waters. The Maine-New Hampshire Inshore Trawl Survey was established to fill the information gap and collect valuable information on the fish and biological communities in this area and create a time series for long-term monitoring of inshore stocks. The survey uses a stratified random sampling design, with an additional single fixed 'sentinel' station per stratum. Using the Jeff Flagg designed MENH survey trawl net and a commercial fishing vessel, the survey has proven to be a successful example of fishermen and scientists working together to benefit fisheries management. Two annual surveys are conducted, fall and spring, to create a rich database on fish and invertebrate species that is accessible to fishery managers, academic researchers, fishing industry members, graduate students, non-governmental organizations, and the general public. With ten complete years and an eleventh underway, seasonal time series of abundance have been established for over 25 species of fish and invertebrates. Information from the survey is used in the assessment and management of several fisheries, and additional requests for and uses of these data have provided new insight into communities and populations in the Gulf of Maine.

INTRODUCTION

Initiated in the fall of 2000, the Maine-New Hampshire Inshore Trawl Survey is a collaborative partnership between commercial fishermen and state researchers to assess inshore fish stocks along the Maine and New Hampshire coasts. The survey has completed ten years of biannual survey work, and the eleventh year is now underway. From its inception, the project has been supported by federal funds appropriated to the National Marine Fisheries Service to foster cooperative research using commercial vessels. Collaborative research enables fishermen to contribute their knowledge and experience toward the progress of scientific data collection and ultimately to resource management decisions. It is a valuable method to strengthen the trust between fishermen and scientists and increase the confidence fishermen have in the data.

Fishery-independent trawl surveys help to provide an index of the distribution and abundance of a variety of fish and invertebrate species that is not influenced or biased by fishing effort or outside factors. As they continue on an annual basis, these surveys should reflect changes in population abundances more accurately than commercial fisheries catch statistics. Abundance indices derived from research trawl surveys that maintain consistent and standardized efforts can be utilized to enhance catch statistic based assessments and with additional research efforts could eventually provide population abundance estimates.

Surveying the inshore waters of the Maine and New Hampshire coasts has been difficult due to a complex bottom consisting of ledges, canyons, seamounts and boulders, amplified by an abundance of lobster gear. The survey has seen an average success rate of 99% in the spring and 74% in the fall. Dealing with the large quantity of fixed gear, especially in the fall, still limits the number of tows that can be made, but continual and extensive public outreach has maintained a satisfactory level of tow completion. Despite the difficulties, the coverage this survey provides promises to be very valuable to better understanding marine ecosystems in the Gulf of Maine. We are confident that the northern Gulf of Maine can be successfully and consistently sampled via trawl survey indefinitely, with sustained funding.

Project Objectives:

The overall goal of this project is to establish a solid foundation for a long-term fishery-independent monitoring program in Maine and New Hampshire's inshore waters (5-80^{+} fathoms).

Specific objectives are:

- To document the distribution and relative abundance of marine resources in the nearshore Gulf of Maine.
- To improve survey logistics to gain cooperation of the fixed gear fishermen.
- To develop recruitment indices for assessments of target species.
- To involve fishermen in scientific data collection.
- To collect environmental data, including temperature and salinity that can affect fish distribution.
- To gather information on biological parameters (growth rates and reproduction).

MATERIALS AND METHODS

Methods are described under separate cover in "Maine-New Hampshire Inshore Groundfish Trawl Survey Procedures and Protocols (2005)," available on-line at http://www.maine.gov/dmr/rm/trawl/reports.htm. The manual includes detailed descriptions of survey design, station selection, survey vessels, net design, public notification, sample collection and catch handling, and other information on survey methods and operations.
Figure 1 illustrates the survey design. The 12-mile limit approximates the survey's seaward extent, the black lines divide the regions and the depth strata are illustrated by the color gradient.

SURVEY STRATA

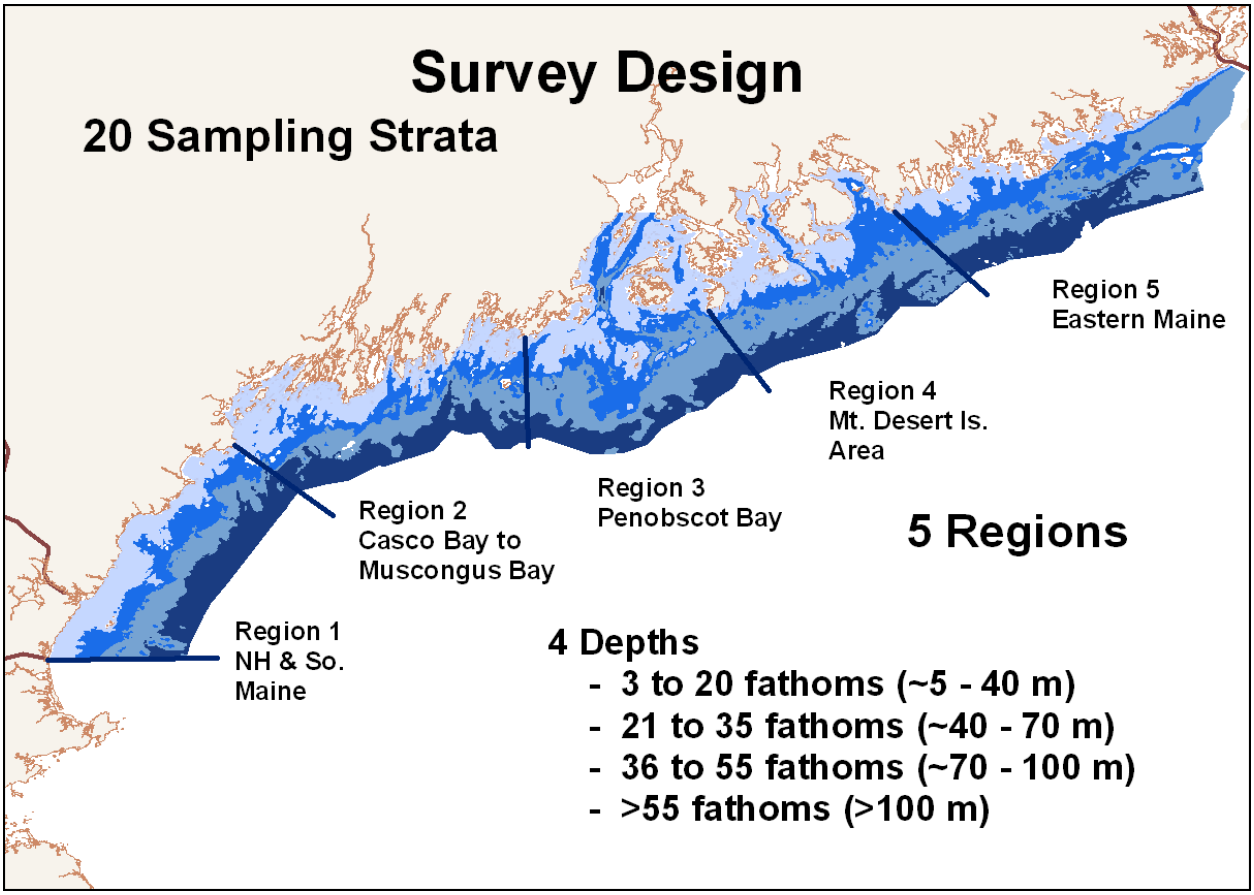

Figure 1. Sampling strata for the Maine-New Hampshire Inshore Trawl Survey

RESULTS

SPRING 2010 SUMMARY

The spring survey began May 3, 2010 in Portsmouth, New Hampshire and finished on June 4 off Cutler, ME. Of the 120 targeted tows, 117 total tows were completed for a success rate of 98%, which is higher than last spring's survey totals. Start coordinates for the spring survey are shown in Figure 2.On average, 4.7 tows were completed per day. The weather conditions were quite good for the spring survey and no days were lost to weather. Individual station descriptions are presented in Appendix A.

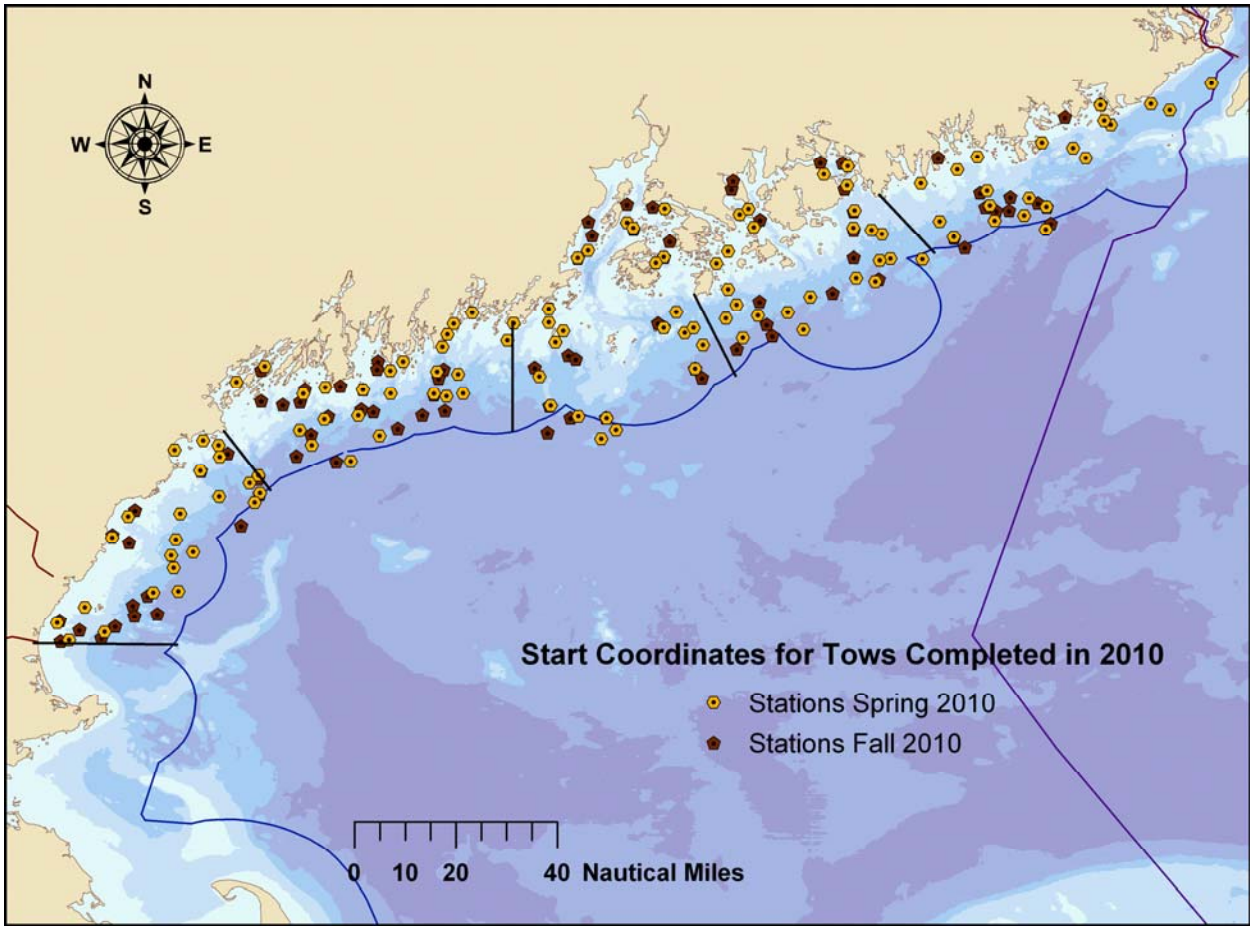

Figure 2. Survey start coordinates for the 2010 season.

Average bottom temperatures by stratum ranged from 4.4 to 7.5^{o}C (Table 1), with an overall average of 5.9^{o}C. The highest spring survey average temperature was 6.2^{o}C in 2006 and the lowest average was 4.0^{o}C in 2004.

Table 1. Average bottom temperature (^{o}C) for the spring 2010 survey

REGION					
STRATUM	**1**	**2**	**3**	**4**	**5**
1	5.3	5.5	6.9	8.4	7.5
2	4.4	4.5	6.0	6.8	7.1
3	4.5	4.4	5.5	6.2	6.9
4	4.6	4.7	5.0	6.2	7.3

The volume of total mixed catch varied from 1 kg to 600 kg per tow, with an average of 123 kg and a median of 96 kg per tow. The average catch per tow for this survey was the highest average spring catch since the start of the survey, the lowest (80 kg) occurring in 2005 (Sherman et al, 2007).

The total number of species caught was 90, with a low of 8 and high of 31 in any particular tow, and an average of 21 species. A complete listing of tow locations, coordinates, dates, times, and depths can be found in Appendix A. Biological samples are collected on selected finfish species, based on seasonal abundance and available time between tows. Table 2 shows the numbers of biological samples taken for the spring 2010 survey, one halibut was sampled due to bad condition. Halibut are usually tagged and released.

Table 2. Spring 2010 species sampled for individual weights, sex, maturity, food habits, and hard parts for aging.

Number of Biological Samples Spring 2010				
Species	**Lengths**	**Sex and Maturity Stage**	**Otoliths**	**Food Habits**
American plaice	4185	656	419	NA
Atlantic cod	212	196	36	NA
Haddock	84	58	35	NA
Goosefish	61	36	NA	36
Pollock	41	31	22	NA
Winter flounder	2701	686	408	NA
Yellowtail flounder	480	257	NA	NA

Catches of Atlantic herring and silver hake were up considerably from 2009, rainbow smelt, yellowtail flounder, and sea scallop were up as well. Many of the catches of other species were down; especially white hake, Acadian redfish, and longhorn sculpin. Distribution maps, catch at length, and abundance indices for selected species are presented in Appendix C.

Two species of small fish, snakeblenny, *Lumpenus lumpretaeformis*, and daubed shanny, *Lumpenus maculatus*, are commonly seen in low abundance in our spring trawls and rarely seen in the fall. Snakeblenny are slender eel-like fish that are more commonly found over soft sediments (Gordon and Duncan 1979) and are forage food for larger predators such as cod, halibut, white hake, goosefish, sea raven, and dogfish (Goode and Bean 1879, Roundtree 1999). Snakeblenny are found all along the coasts of Maine and New Hampshire (Figure 3). Seen in all spring trawls at modest abundances with a yearly average of 204 individuals, they occur in about 21% of the tows.

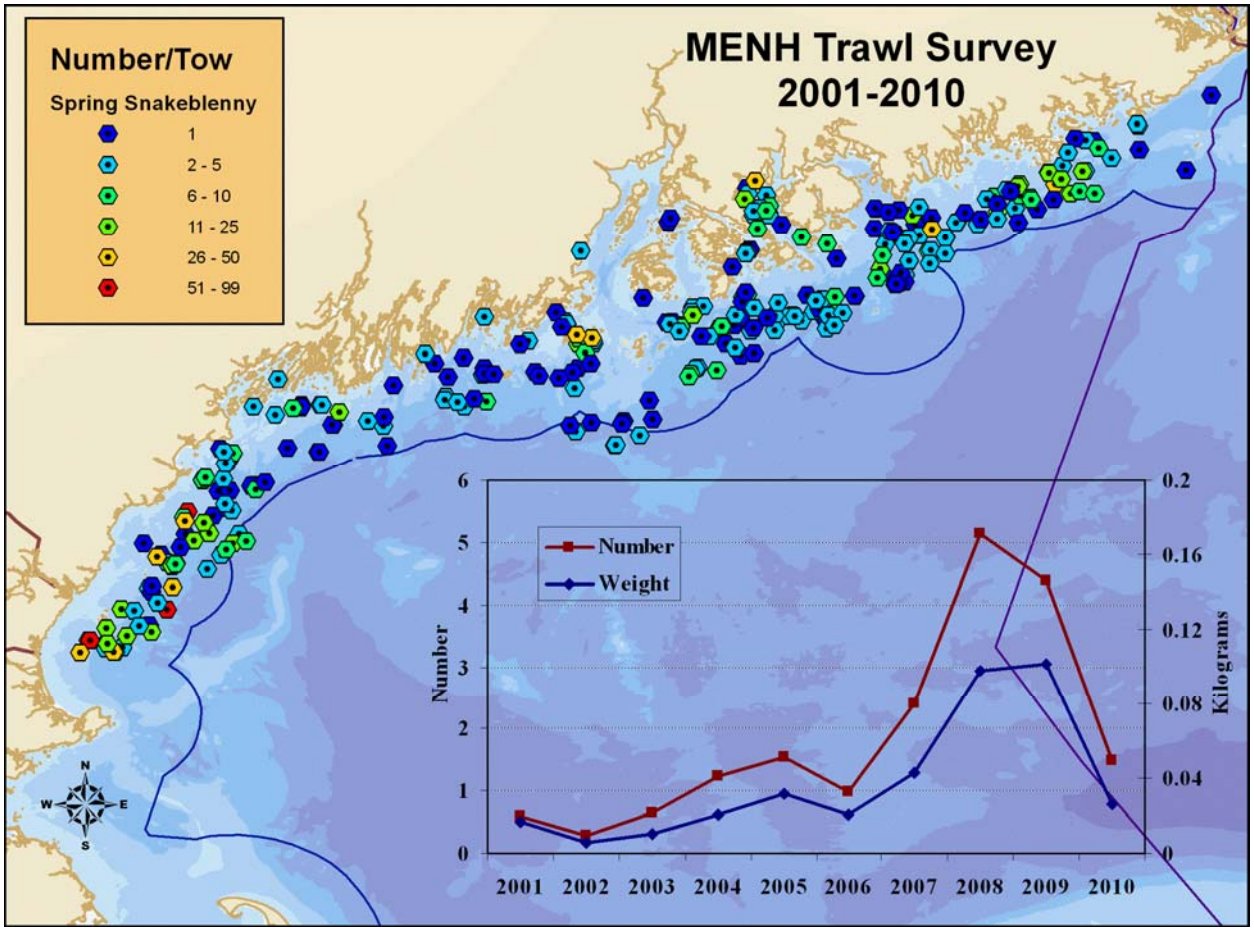

Figure 3. Numbers of snakeblenny caught for individual tows for the spring surveys 2001 through 2010 (bubble plot) and the plot shows the simple mean numbers and weights of fish caught per year for the entire area

Snakeblenny are more abundant in depth strata 2 and 3 (Figure 4 top). Nearly 75% of the snakeblenny sampled are caught between 60 and 100 m (Figure 4 bottom) which corresponds to strata 2 and 3 (Figure 1).

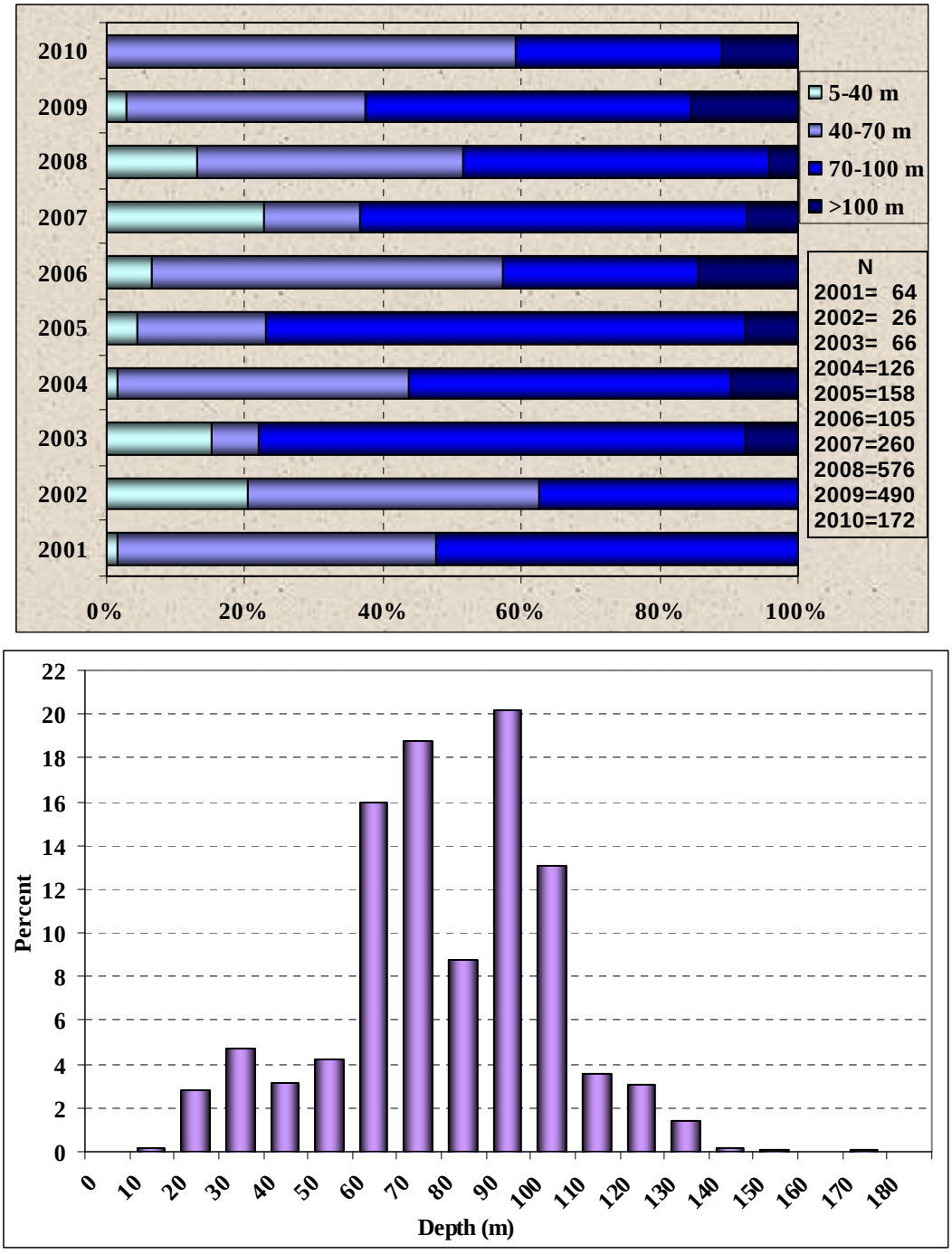

Figure 4. The top graph shows the percent of yearly catch by depth strata for snakeblenny. The lower plot illustrates the percent catch by depth for all spring surveys combined.

Snakeblenny sizes range from 6 cm to 46 cm (Figure 5). The mean lengths for individuals sampled yearly ranged from 24.9 to 29.4 (Table 3).

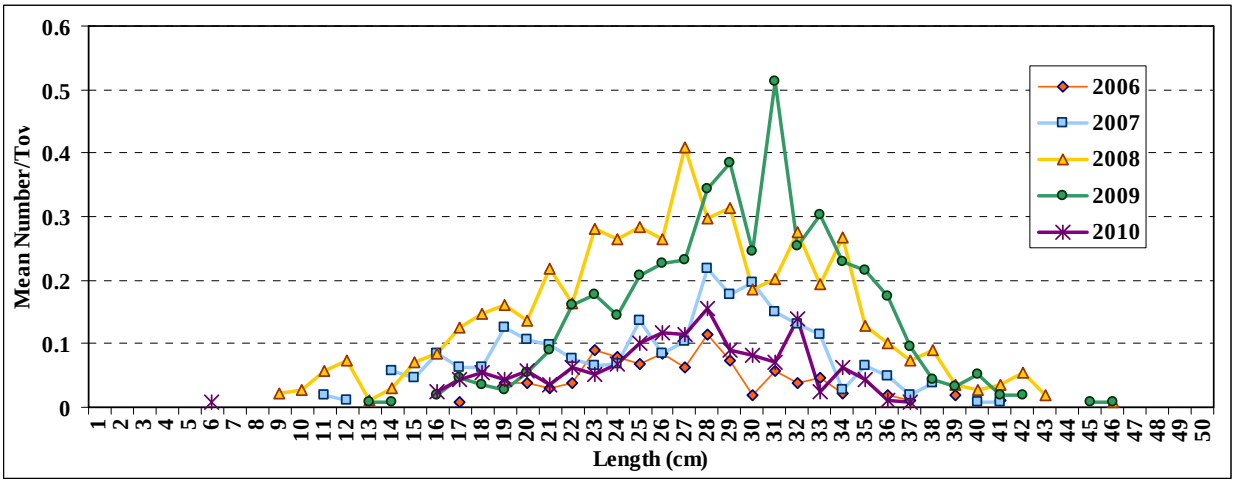

Figure 5. Length frequencies as simple mean number per tow for snakeblenny in recent spring surveys.

Table 3. Mean lengths (cm) and standard errors of snakeblenny for each spring.

Year	Mean LT	SE
2001	27.58	0.76
2002	24.89	1.16
2003	26.11	0.70
2004	25.41	0.55
2005	27.97	0.46
2006	26.95	0.59
2007	26.03	0.64
2008	26.61	0.63
2009	29.35	0.43
2010	26.51	0.62

The daubed shanny is a small benthic fish usually found on soft sediments (Scott and Scott 1988). They are very similar in appearance to snakeblenny, but are thicker in body and do not grow as long (Collette and Klein-MacPhee 2002). Daubed shanny are also prey for larger fish such as cod, hake, halibut, sea raven, longhorn sculpin, and skate (Roundtree 1999; Tyler 1972; Bowman et al 2000). In the MENH survey area, daubed shanny are more abundant in the southwestern sections and have not been caught beyond Petit Manan Point in the eastern section (Figure 6). They occur in about 17% of the spring trawls and over 50% of the time they are caught in conjunction with snakeblenny. Daubed shanny are lower in abundance with a yearly average of approximately 73 individuals.

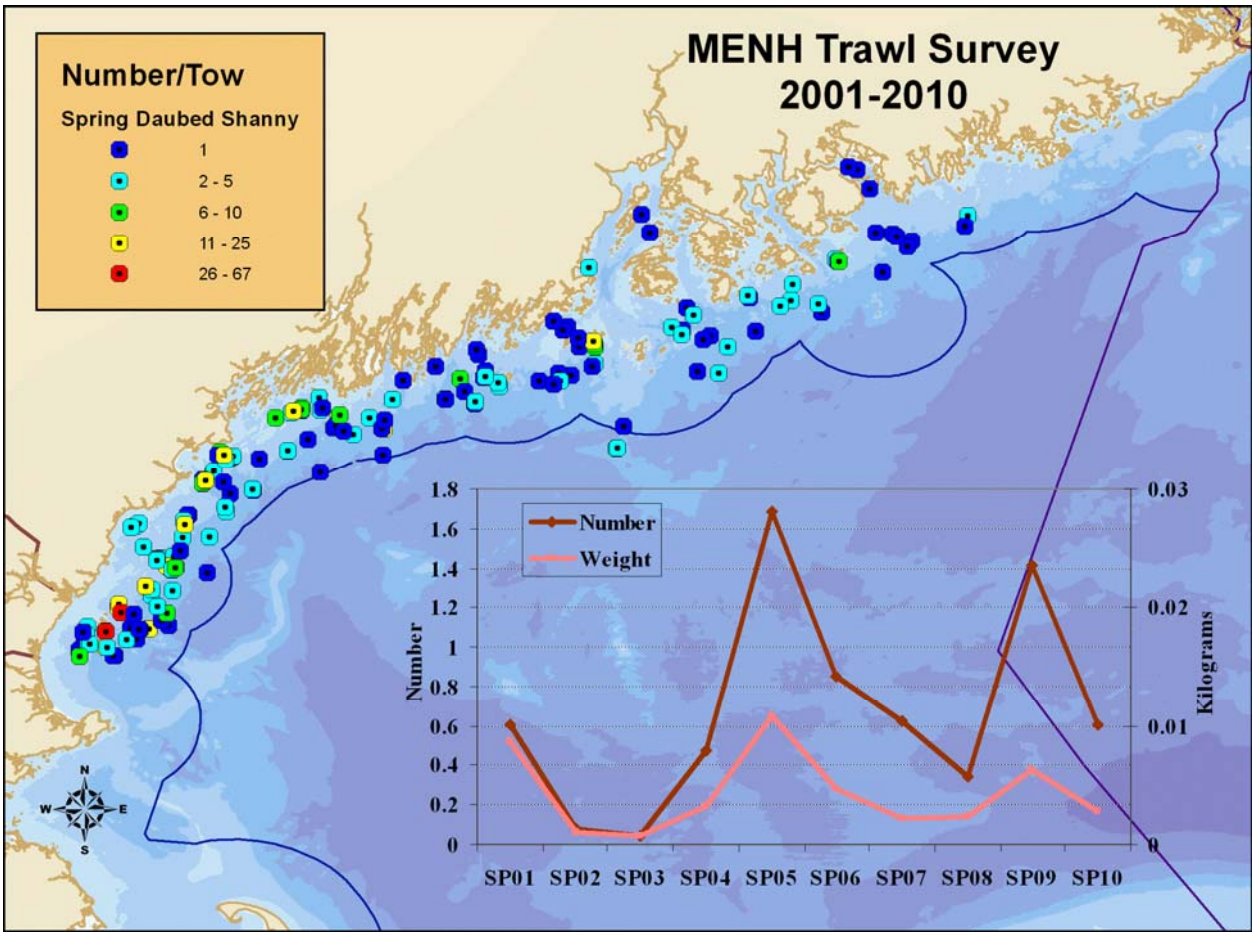

Figure 6. Numbers of daubed shanny caught for individual tows for the spring surveys 2001 through 2010 (bubble plot) and the plot shows the simple mean numbers and weights of fish caught per year for the entire area

Like snakeblenny, daubed shanny are found mostly in strata 2 and 3 (Figure 7). Over 90% are caught between of 40 to 100 m (Table 4) which encompasses strata 2 and 3.

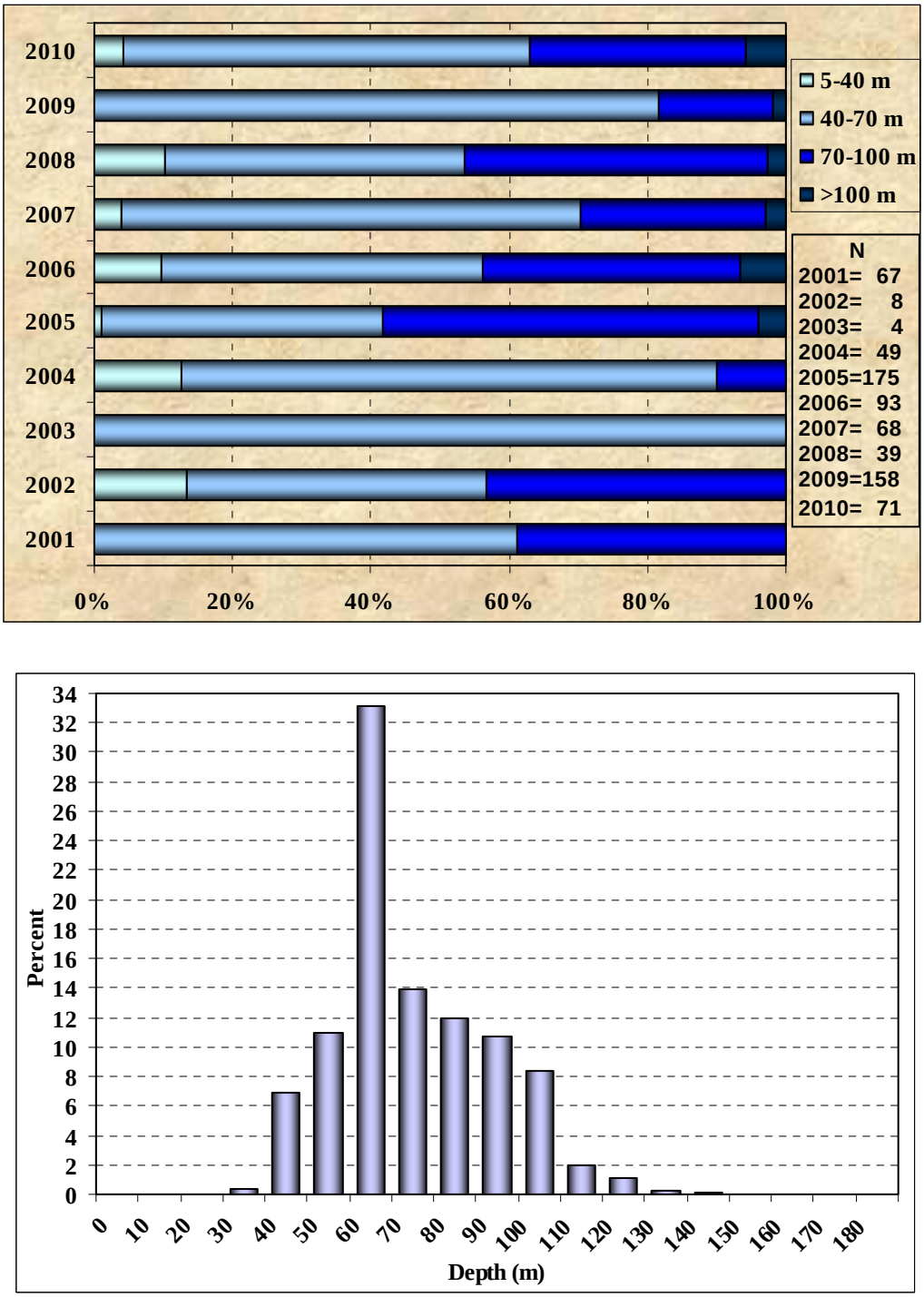

Figure 7. The top graph shows the percent of yearly catch by depth strata for daubed shanny. The lower plot illustrates the percent catch by depth for all spring surveys combined.

Daubed shanny sizes range from 8 cm to 18 cm (Figure 8). The mean lengths for individuals sampled yearly ranged from 11.2 to 12.9 (Table 3).

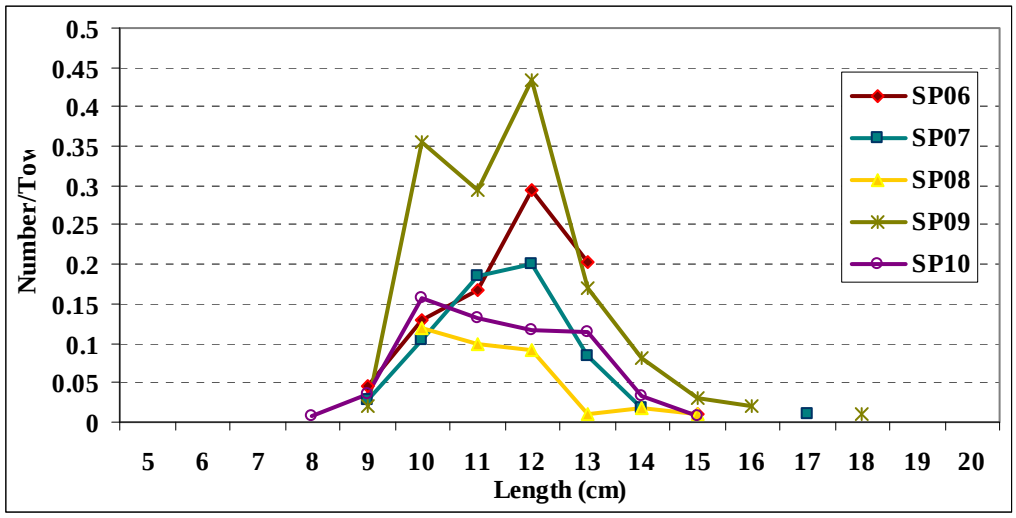

Figure 8. Length frequencies as simple mean number per tow for daubed shanny in recent spring surveys.

Table 4. Mean lengths (cm) and standard errors for daubed shanny in spring surveys.

Year	Mean LT	SE
2001	12.64	0.30
2002	12.93	0.70
2003	12.00	0.44
2004	12.40	0.45
2005	12.31	0.41
2006	11.60	0.23
2007	11.51	0.32
2008	11.23	0.24
2009	11.64	0.34
2010	11.38	0.29

Of note for the spring 2010 survey were the catches of sand lance, *Ammodytes americanus*, which were higher than previous years in the mid-coast region of the survey. A total of 539 individuals were sampled primarily from 2 stations in the mid-coast area near Boothbay Harbor (Figure 9) in 2010. Large numbers (430 and 1103) were seen in this same area in 2001 (Figure 9). Typically, sand lances are associated with fine gravel and sandy substrates (Collette and Klein-MacPhee 2002). Sand lance have been shown to occur in large schools (Meyer et al. 1979; Reay 1970) and spend a large part of the time burrowed in the substrate, which could account for their spotty occurrence in the trawls.

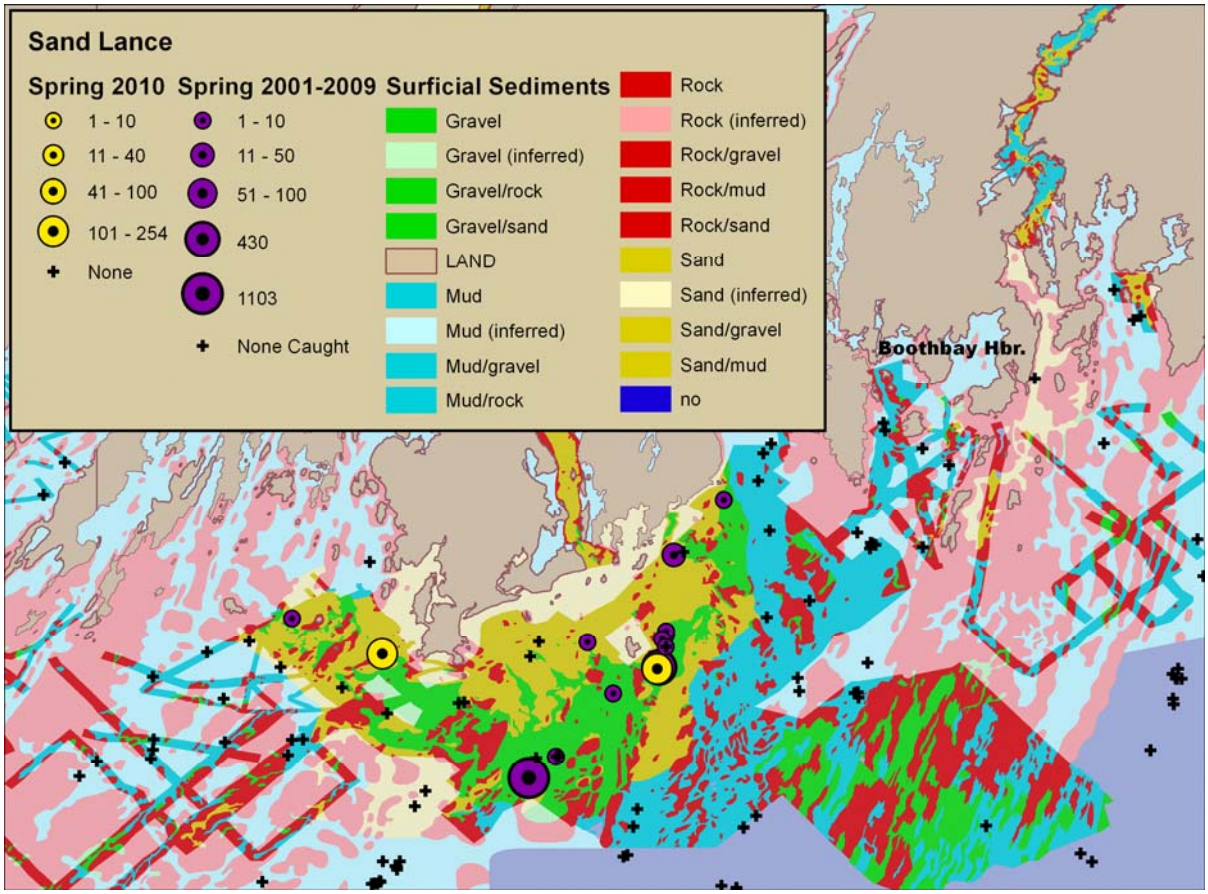

Figure 9. Numbers of sand lance caught for individual tows for the spring surveys 2001 through 2010 in the mid-coast region. The numbers are overlain on a layer of surficial sediments from Kelley and Dixon 1999.

FALL 2010 SUMMARY

The survey began October 4, 2010 in Portsmouth, New Hampshire and finished on November 4th off of Cutler, Maine. Weather conditions were average for a fall survey. Two days were lost to weather and the amount of fixed gear in the eastern portion of the survey area made it difficult to finish the planned stations. We completed 85 tows out of the scheduled 120. This translates to a 70.8% completion rate, with an average of 3.7 tows per day. Personnel from Maine DMR as well as New Hampshire F&G participated in the survey. Additionally, Steve Sutton working with Kevin Friedland and Jason Link of NMFS on the diadromous predator project joined the survey for two weeks to collect stomach samples and assist us. Start coordinates for the fall survey are shown in Figure 2. Individual station descriptions are presented in Appendix B.

Unfortunately, a brand new freezer purchased just before the survey failed while we were still in the field and the first 2 weeks' shrimp samples were lost. Total weights of combined shrimp species are collected on the vessel and a 1 kilogram sample is taken. Samples are typically worked up in the lab after the survey and species are identified and numbers and weights are estimated from the samples. Therefore the catches and numbers of northern shrimp are an estimate of the actual catch.

Average bottom sea water temperatures for each stratum ranged from 7.6°C to14.0°C (Table 5) and the overall average was 10.6°C.

Table 5. Average bottom temperature (°C) for the fall 2010 survey.

	REGION				
STRATUM	**1**	**2**	**3**	**4**	**5**
1	14.0	12.3	12.4	11.5	10.3
2	10.2	11.0	12.3	11.2	10.8
3	8.7	9.6	11.0	10.9	10.5
4	7.6	8.6	10.0	10.2	9.8

The volume of total mixed catch varied from 20.0 kg to 619.6 kg per tow, with an average of 202.1 kg and a median of 168 kg per tow. This catch average is among the top five of the last 10 years with 2007 being the highest (Sherman et al. 2009). The total number of species caught was 104, with a low of 13 and high of 35 in any particular tow, and an average of 22 species. Two species were new to the survey this fall, northern puffer and Atlantic soft pout. Several Atlantic halibut were tagged.

Catches of haddock, alewife, silver hake, sea scallop, and winter flounder were up significantly from fall 2009; while catches of butterfish, spiny dogfish, and goosefish dropped from previous falls. Catches of northern shrimp appear to have jumped up, but those numbers had to be

estimated due to the aforementioned freezer failure. Distribution maps, catch at length, and abundance indices for selected species are presented in Appendix C.

Otoliths, sex, and maturity stages were collected on selected individuals of cod, haddock, white hake, and witch flounder. Stomach content analysis was done on goosefish and cod (Table 6).

Table 6. Fall 2010 species sampled for individual weights, sex, maturity, food habits, and hard parts for aging.

Number of Biological Samples Fall 2010				
Species	**Lengths**	**Sex and Maturity Stage**	**Otoliths**	**Food Habits**
Atlantic cod	56	37	36	15
Haddock	707	107	52	NA
Goosefish	106	28	NA	27
Pollock	13	4	6	NA
White Hake	1801	361	219	NA
Witch Flounder	1414	321	160	NA

Scup, *Stenotomas chrysops*, are said to be rare visitors north of Cape Cod and may spread north in favorable summers only to withdraw in the autumn (Bigelow and Schroeder 1953). They are seen in varying densities in the survey area and are occasionally abundant in the fall surveys (Figure 10). Since the onset of the survey, no scup have been seen in the spring. A large number of scup were seen in the fall of 2004 (Figure 10). Scup were not seen in fall 2001 or 2007 (Figure 10 overlay) and percent occurrence ranges from 2 to 46 in the positive catch years. Scup are reported to occur from 2 to 180 m, to move inshore during the summer months and most scup leave the coast in late October (Collette and Klein-MacPhee 2002). The large catches from 2004 occurred at shallow depths (Figure 11) and close to shore (Figure 10). Other year's catches have been farther from shore and at deeper stations.

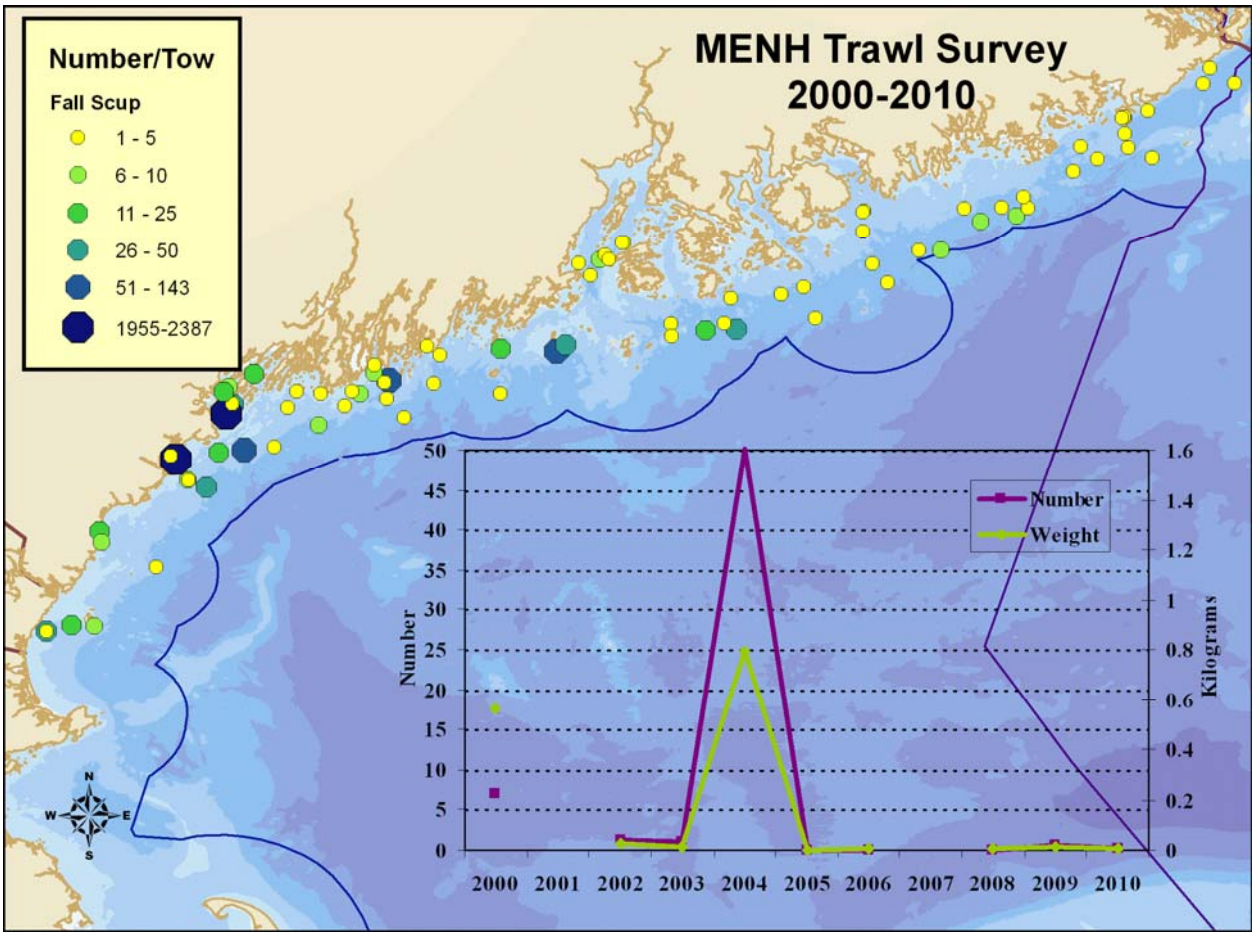

Figure 10. Catches in number for scup in the fall surveys from 2000 through 2010. The two catches of 1955 and 2387 (dark blue dots) were from fall 2004. The plot overlay displays the simple mean catch in number and kilograms for all fall surveys.

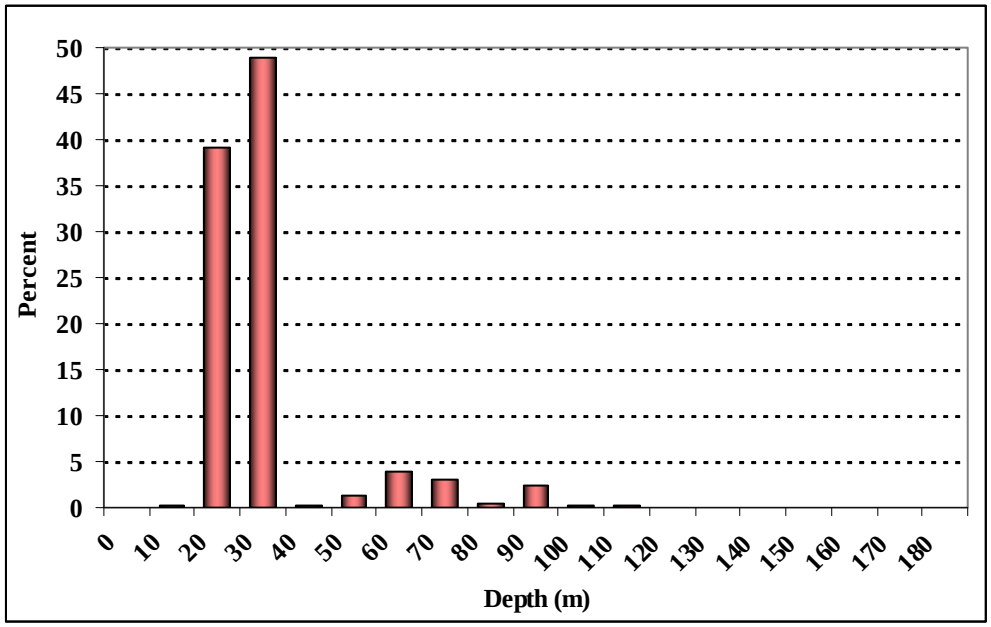

Figure 11. Shown is the percent catch of scup by depth for all fall surveys combined.

The length frequency pattern can be bi-modal with the largest numbers seen in the 8 to 12 cm range (Figure 12). Mean lengths ranged from 8.7 cm in 2004 to 23.0 cm in 2008 (only one individual). The large number of 8 to 11 cm fish seen in the high catches of the fall 2004 survey were the result of 2 tows in Saco Bay and Casco Bay waters (Figures 10, 11, and 12).

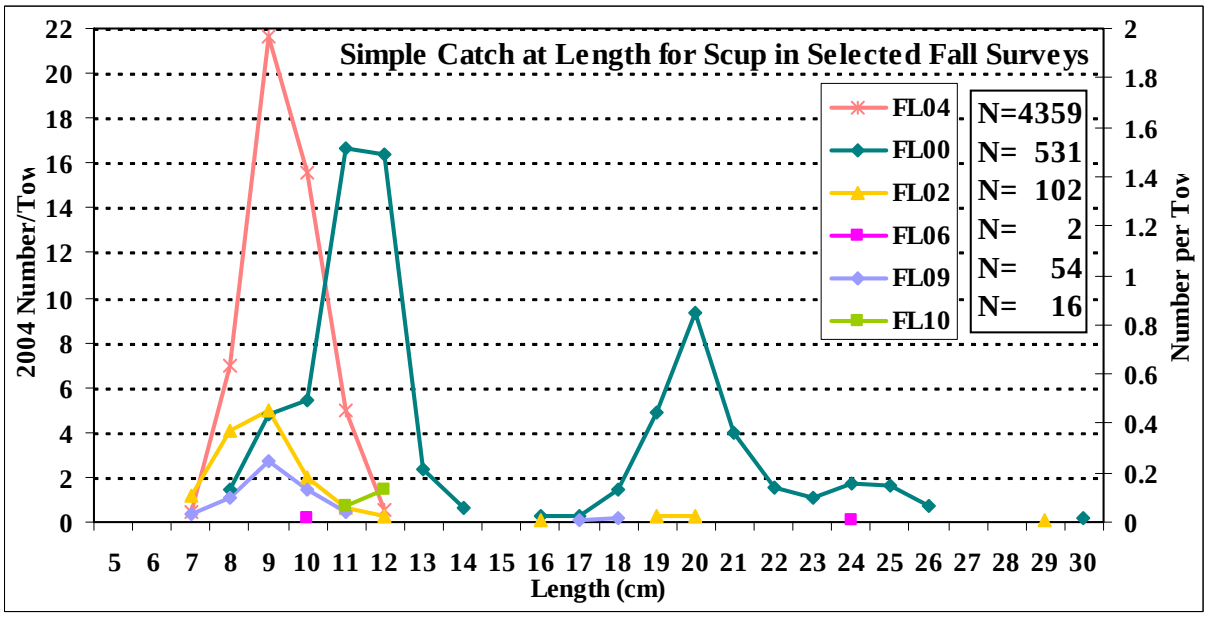

Figure 12. Catch at length as simple mean number per tow for scup for selected fall surveys. Note that 2004 is on a different scale than the rest of the years.

Skates are not greatly abundant in the MENH survey with the total number caught for each survey ranging from 68 to 268, most are slightly more abundant in the fall than the spring. Listed here in the order of their overall abundance are little skate, *Leucoraja erinacea* (average number per fall survey is 85.6), thorny skate, *Amblyraja radiata* (29.0), smooth skate, *Malacoraja senta* (15.4), winter skate, *Leucoraja ocellata* (14.9), and barndoor skate, *Dipturus laevis* (0.7). As little skate and winter skate are hard to distinguish morphometrically at small sizes (<30 cm) (McEachran and Musick 1973); skate at these sizes were all identified as little skate. Skate are found in all of the survey strata and regions but are more common in the northeast and southwest (Figures 13 and 14). Little skate and thorny skate are most abundant in regions 1 and 5(Figure 14). Winter skate are slightly more numerous in the eastern portion of the survey, as are smooth skate (Figure 13). We see too few barndoor skate to deduce a pattern.

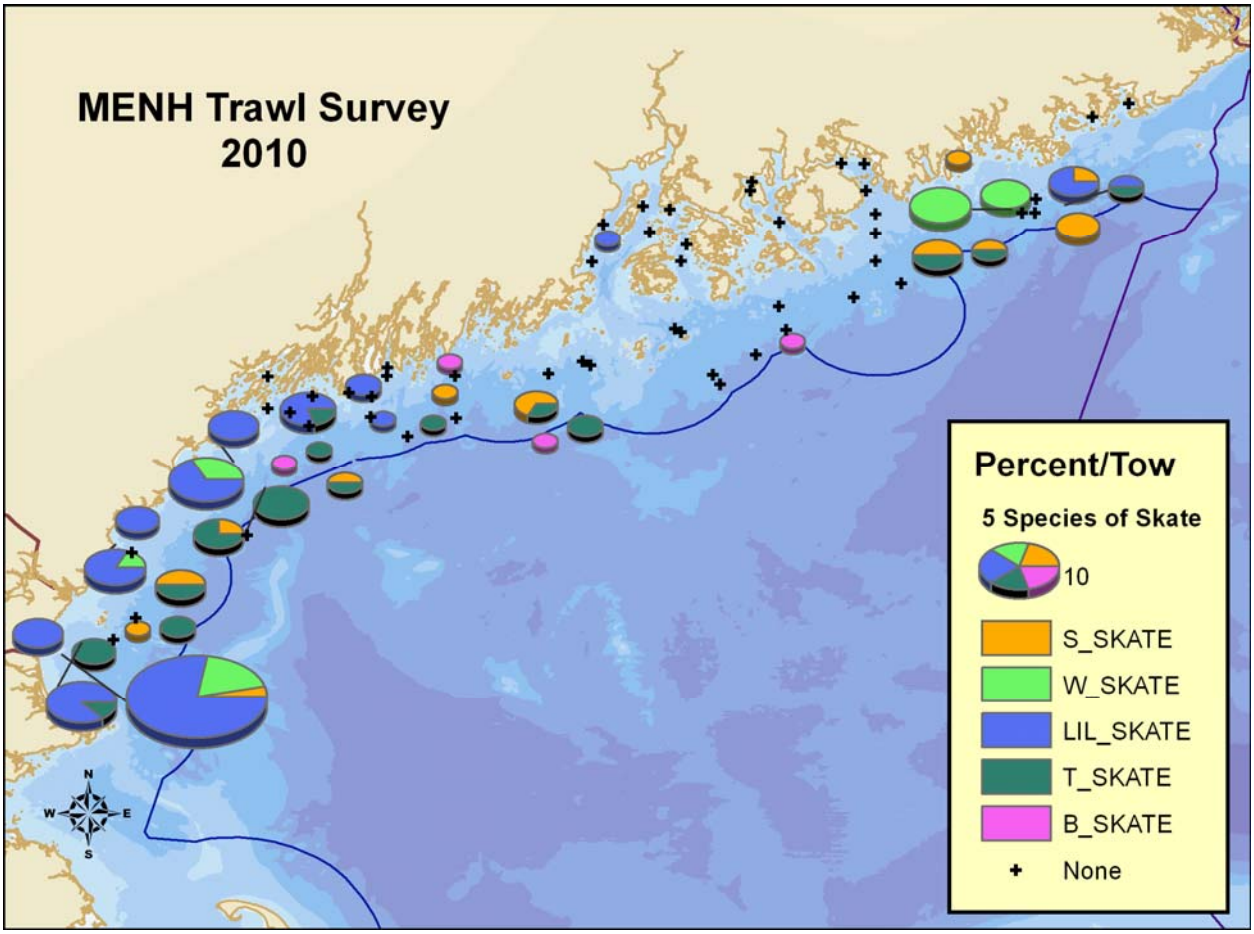

Figure 13. Distribution and abundance of 5 species of skate along the coasts of New Hampshire and Maine in fall 2010. The pie charts show the proportion for each species caught and the size of the pie is relative to the total catch of skates at that station.

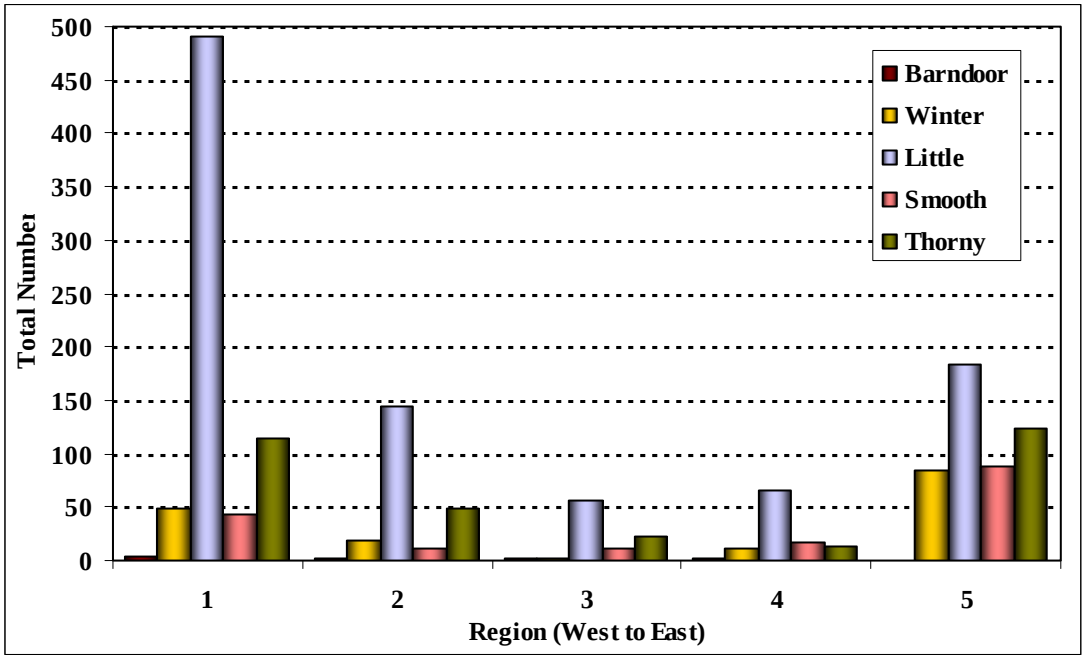

Figure 14. Total number of skate caught for each region of the survey all falls combined. See Figure 1 for a description of the regions.

Figure 15 illustrates the distribution of little skate, winter skate, thorny skate, and smooth skate by size bins in relation to water temperature. Little and winter skate show very similar distribution patterns with not much difference in occurrences of juveniles and adults, the largest percent seen between 9 and 10 degrees. Thorny and smooth skate show some distribution pattern differences between size classes with more adults found at temperatures less than 9 degrees.

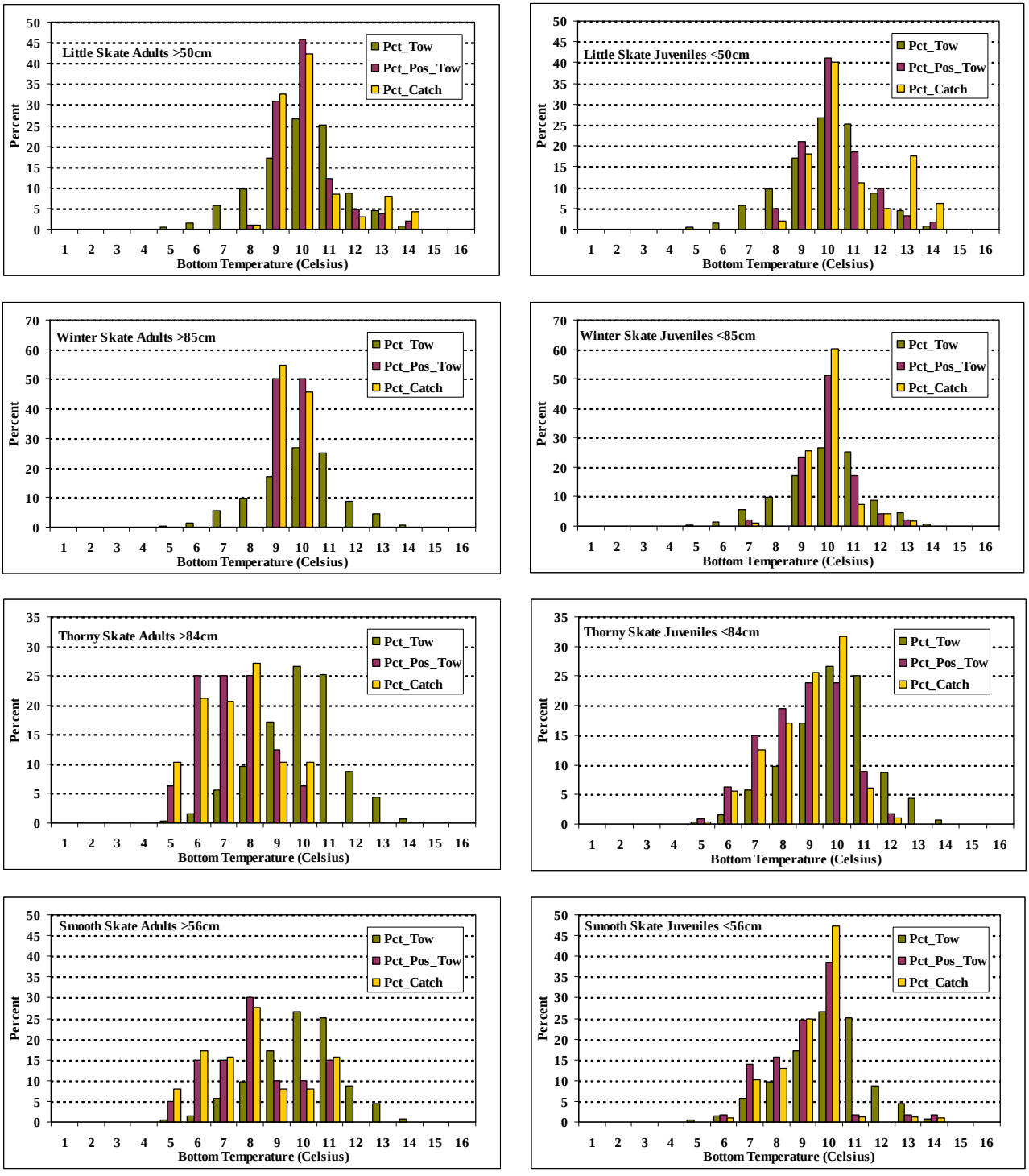

Figure 15. Distribution of four species of skate in relation to bottom water temperature for juveniles and adults (based on length) for fall 2000-2010 (all years combined).

Catches of long-finned squid, *Loligo pealeii*, another migratory species that moves into the area in the summer and fall, have dipped in recent years after a fall high in 2006. Where *Illex* squid numbers have been on the rise in the last few years (Sherman et al 2010), *Loligo* numbers have decreased somewhat but are still greater than the pre-2006 years (Figure 16). *Loligo* are consistently distributed regionally and across all depth strata (Figure 16).

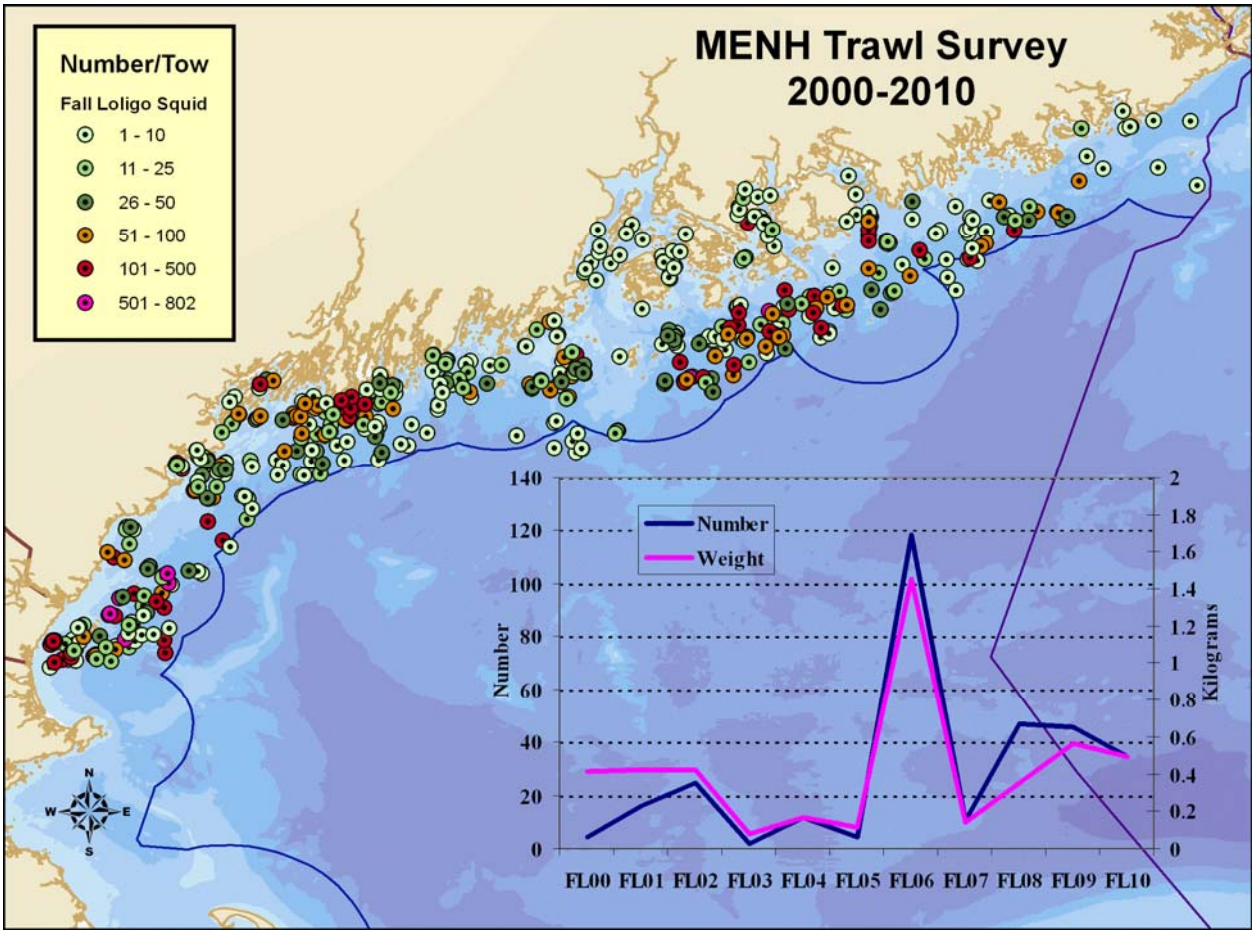

Figure 16. Numbers of *Loligo* caught for fall tows conducted from 2000 through 2010 (tows without squid are not included). The plot overlay displays the simple mean catch in number and kilograms for all fall surveys.

Mean mantle lengths ranged from a low of 4.4 cm in 2008 to a high of 11.8 cm in 2000. The sizes of squid sampled have generally been smaller since 2005 (Figure 17). *Loligo* recruits into the fishery at 8 cm mantle length (Jacobson 2005); more than 60 % of the *Loligo* sampled are pre-recruits.

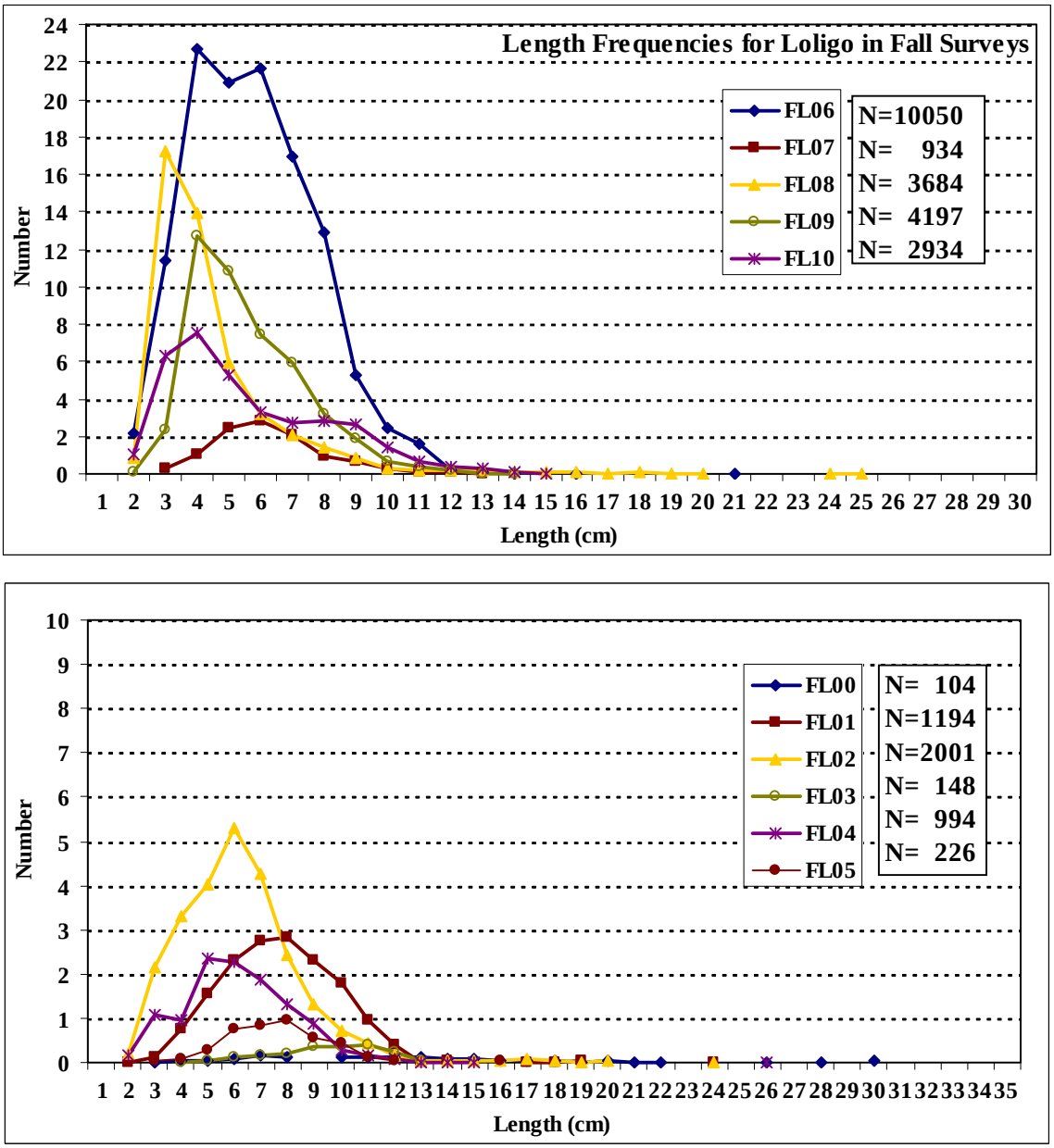

Figure 17. Top graph shows catch at length as simple mean number per tow for *Loligo* squid for recent fall surveys. Catch at length for previous surveys is displayed below (note the difference in scale for the y-axes).

PARTNERSHIPS

The fisherman-scientist partnership during this project has been consistently strong. Foremost is the partnership between the scientific staff and commercial boat crews. The commercial crew of the F/V Robert Michael has proven to be completely dedicated to this project. Not only did the crew operate the boat and handle the gear, they have become equal partners in solving problems related to gear conflicts, communications, scheduling and logistics. Their participation involves far more than boat operations and gear handling, including sorting the catch, weighing and measuring samples, and collecting biological specimens including otoliths. Their involvement has resulted in significant improvements to survey efficiency while still adhering to standard protocols.

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Appendix A
Individual Station Descriptors for Start of Tow

DATE	REGION	TOWID	LAT deg/min	LON deg/min	Stratum	Time	Tow Duration	Depth (FA)	Temp C °	Salinity ppt
Spring 2010										
5/3/2010	1	SP10__1	4253.934	7035.778	3	733	20	42.1	4.5	32.08
5/3/2010	1	SP10__2	4301.782	7026.143	3	956	20	52.5	4.5	32.23
5/3/2010	1	SP10__3	4258.868	7039.662	1	1205	20	13.8	5.5	31.72
5/3/2010	1	SP10__4	4252.376	7042.767	2	1348	20	23.4	4.6	31.92
5/3/2010	1	SP10__5	4255.767	7045.097	1	1508	20	15.8	4.8	31.64
5/4/2010	1	SP10__6	4301.993	7021.203	4	1316	20	67.0	4.5	32.35
5/4/2010	1	SP10__7	4306.710	7022.108	3	1503	20	56.4	4.5	32.28
5/4/2010	1	SP10__8	4309.888	7018.256	4	1644	18	64.6	4.6	32.26
5/4/2010	1	SP10__9	4312.350	7021.715	3	1759	17	51.7	4.4	32.09
5/4/2010	1	SP10_10	4309.203	7022.649	3	1900	20	49.7	4.5	32.14
5/5/2010	1	SP10_11	4312.732	7034.291	1	741	20	15.4	5.0	31.71
5/5/2010	1	SP10_12	4316.865	7031.113	1	920	20	19.3	5.1	31.86
5/5/2010	1	SP10_13	4317.454	7020.799	2	1141	17	38.8	4.4	32.06
5/5/2010	1	SP10_14	4320.818	7013.138	3	1323	20	46.5	4.4	31.90
5/5/2010	1	SP10_15	4325.924	7016.887	2	1454	20	34.9	4.3	31.82
5/5/2010	1	SP10_16	4323.524	7007.162	4	828	20	60.0	4.6	32.21
5/6/2010	1	SP10_17	4321.534	7005.102	4	934	20	87.8	5.1	32.58
5/6/2010	1	SP10_18	4319.664	7006.151	4	1048	20	73.6	4.6	32.35
5/6/2010	1	SP10_19	4324.971	7005.397	4	1217	20	66.7	4.4	32.15
5/7/2010	1	SP10_20	4328.649	7013.042	2	754	20	37.3	4.3	31.90
5/7/2010	1	SP10_21	4330.915	7013.284	2	943	20	25.7	4.4	31.78
5/7/2010	1	SP10_22	4330.024	7021.931	1	1131	20	3.5	5.9	31.98
5/7/2010	1	SP10_23	4331.865	7016.279	1	1231	20	12.7	5.4	31.51
5/10/2010	2	SP10_24	4333.925	6957.197	3	809	20	54.3	4.3	32.07
5/10/2010	2	SP10_25	4330.921	6954.887	4	934	20	62.5	4.6	32.11
5/10/2010	2	SP10_26	4327.786	6947.210	4	1117	20	76.5	4.9	32.51
5/10/2010	2	SP10_27	4336.109	6952.366	3	1304	20	42.6	4.3	32.05
5/11/2010	2	SP10_28	4343.424	7009.763	1	740	20	6.9	6.4	31.02
5/11/2010	2	SP10_29	4346.517	7004.131	1	910	20	7.6	5.9	31.34
5/11/2010	2	SP10_30	4341.107	6956.527	2	1111	20	25.4	4.6	31.70
5/11/2010	2	SP10_31	4342.320	6952.220	1	1222	20	8.6	5.6	31.56
5/11/2010	2	SP10_32	4341.915	6944.775	1	1337	20	19.4	5.0	31.86
5/11/2010	2	SP10_33	4345.604	6939.357	2	1503	20	29.5	4.3	31.74
5/12/2010	2	SP10_34	4347.437	6936.873	1	601	20	19.5	4.7	30.11
5/12/2010	2	SP10_35	4336.833	6945.686	3	832	20	50.9	4.5	32.13
5/12/2010	2	SP10_36	4332.804	6941.474	4	1040	20	68.4	4.2	32.41
5/12/2010	2	SP10_37	4341.145	6939.316	3	1328	20	46.3	4.4	32.02
5/13/2010	2	SP10_38	4351.630	6916.256	2	831	20	34.9	4.6	31.87
5/13/2010	2	SP10_39	4357.085	6923.198	1	1043	20	8.1	5.9	31.54
5/13/2010	2	SP10_40	4354.888	6926.852	1	1201	20	10.9	5.2	31.99
5/13/2010	2	SP10_41	4352.821	6928.107	2	1305	17	22.6	4.4	31.74
5/13/2010	2	SP10_42	4350.311	6929.096	2	1348	20	34.5	4.4	32.05
5/14/2010	2	SP10_43	4341.110	6930.798	4	716	20	68.9	4.7	32.38
5/14/2010	2	SP10_44	4345.426	6930.133	3	833	20	57.1	4.6	32.38
5/14/2010	2	SP10_45	4344.926	6925.994	3	940	20	47.3	4.5	31.59

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DATE	REGION	TOWID	LAT deg/min	LON deg/min	Stratum	Time	Tow Duration	Depth (FA)	Temp C °	Salinity ppt
5/14/2010	2	SP10_46	4341.185	6925.023	4	1113	20	59.9	5.0	32.58
5/14/2010	2	SP10_47	4340.576	6928.282	4	1218	20	65.7	4.9	32.51
5/17/2010	3	SP10_48	4355.001	6915.049	1	819	19	7.4	7.5	31.86
5/17/2010	3	SP10_49	4351.259	6906.817	2	1008	20	32.3	4.9	32.03
5/17/2010	3	SP10_50	4353.472	6905.235	2	1118	20	27.0	5.2	31.87
5/17/2010	3	SP10_51	4355.143	6908.081	1	1246	20	20.4	6.2	31.35
5/17/2010	3	SP10_52	4357.852	6908.115	1	1438	20	16.7	7.1	31.09
5/17/2010	3	SP10_53	4407.847	6902.373	2	1652	20	25.5	6.1	31.19
5/18/2010	3	SP10_54	4344.496	6909.967	3	814	20	55.3	4.7	32.34
5/18/2010	3	SP10_55	4338.773	6907.746	3	1101	20	72.5	5.0	32.55
5/18/2010	3	SP10_56	4336.645	6902.296	4	1229	20	68.6	4.9	31.70
5/18/2010	3	SP10_57	4332.254	6857.740	4	1402	20	60.1	4.7	32.37
5/18/2010	3	SP10_58	4333.959	6854.849	4	1505	20	73.6	4.9	32.41
5/18/2010	3	SP10_59	4336.283	6856.683	4	1610	20	68.6	4.8	32.46
5/19/2010	3	SP10_60	4409.339	6900.350	2	715	20	31.4	6.1	31.18
5/19/2010	3	SP10_61	4414.840	6852.664	2	923	20	27.2	6.3	31.22
5/19/2010	3	SP10_62	4413.820	6851.470	1	1030	20	14.7	6.4	31.10
5/19/2010	3	SP10_63	4417.634	6845.273	1	1209	20	12.5	6.5	31.03
5/20/2010	3	SP10_64	4346.081	6839.253	4	1040	20	63.6	5.6	32.61
5/20/2010	3	SP10_65	4350.727	6837.685	3	1255	14	56.9	5.7	32.18
5/20/2010	3	SP10_66	4353.095	6841.257	3	1427	20	52.9	5.6	32.12
5/20/2010	3	SP10_67	4354.118	6839.526	3	1528	20	54.3	5.6	32.15
5/21/2010	3	SP10_68	4354.129	6845.427	3	738	20	48.4	5.9	31.91
5/21/2010	3	SP10_69	4357.191	6842.926	3	852	20	45.3	6.1	31.89
5/21/2010	3	SP10_70	4408.036	6845.410	2	1125	20	28.3	7.5	30.26
5/21/2010	3	SP10_71	4406.888	6847.009	1	1241	20	12.2	7.7	31.71
5/24/2010	4	SP10_72	4355.992	6833.163	3	817	20	51.8	5.6	32.19
5/24/2010	4	SP10_73	4352.097	6829.839	4	1007	18	66.4	5.8	32.76
5/24/2010	4	SP10_74	4356.549	6826.827	3	1130	20	54.2	5.7	32.22
5/24/2010	4	SP10_75	4358.657	6831.071	3	1255	15	50.7	5.9	31.86
5/24/2010	4	SP10_76	4401.642	6832.728	2	1422	20	36.6	6.1	31.89
5/25/2010	4	SP10_77	4406.757	6835.010	1	630	19	13.8	9.1	31.42
5/25/2010	4	SP10_78	4409.178	6832.757	1	746	19	13.0	8.9	31.49
5/25/2010	4	SP10_79	4413.918	6827.672	1	929	20	15.0	8.6	31.36
5/25/2010	4	SP10_80	4416.454	6830.420	1	1040	20	16.6	8.1	31.26
5/25/2010	4	SP10_81	4417.583	6828.713	2	1145	18	32.0	8.3	30.10
5/26/2010	4	SP10_82	4400.160	6816.530	3	933	20	55.8	5.9	32.48
5/26/2010	4	SP10_83	4357.168	6820.965	4	1104	20	58.1	5.7	31.73
5/26/2010	4	SP10_84	4353.723	6817.858	4	1233	20	70.0	6.4	32.79
5/26/2010	4	SP10_85	4403.235	6803.653	4	1509	20	60.4	6.5	32.36
5/26/2010	4	SP10_86	4403.916	6807.472	3	1650	20	54.5	6.4	32.34
5/27/2010	4	SP10_87	4407.613	6754.378	3	644	20	55.0	6.8	32.60
5/27/2010	4	SP10_88	4407.720	6800.729	3	805	20	51.0	6.5	32.29
5/27/2010	4	SP10_89	4407.365	6802.795	4	911	20	57.5	6.4	32.34
5/27/2010	4	SP10_90	4412.585	6802.386	3	1031	20	40.9	6.4	32.06
5/27/2010	4	SP10_91	4413.357	6804.443	3	1139	20	40.5	6.3	32.03

Appendix A
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DATE	REGION	TOWID	LAT deg/min	LON deg/min	Stratum	Time	Tow Duration	Depth (FA)	Temp C °	Salinity ppt
5/27/2010	4	SP10_92	4413.813	6808.035	2	1308	20	37.6	6.6	31.95
5/28/2010	4	SP10_93	4417.251	6807.775	2	902	20	35.7	6.4	31.63
5/28/2010	4	SP10_94	4424.526	6813.851	1	1049	20	8.4	8.2	31.78
5/28/2010	4	SP10_95	4426.155	6809.154	1	1207	20	18.4	7.3	31.97
5/28/2010	4	SP10_96	4422.277	6809.278	2	1325	20	29.8	6.8	31.56
5/31/2010	5	SP10_97	4415.128	6750.982	3	939	20	42.5	6.9	32.06
5/31/2010	5	SP10_98	4411.988	6748.222	4	1105	19	69.4	7.1	33.02
5/31/2010	5	SP10_99	4422.757	6754.694	1	1330	20	21.6	7.8	31.71
5/31/2010	5	SP10100	4425.444	6747.497	2	1527	20	23.1	7.2	31.88
5/31/2010	5	SP10101	4427.964	6743.560	1	641	20	19.3	7.5	31.84
6/1/2010	5	SP10102	4418.264	6741.061	3	1000	20	47.5	7.0	32.43
6/2/2010	5	SP10103	4415.223	6740.132	4	734	20	54.9	7.1	32.69
6/2/2010	5	SP10104	4413.504	6730.038	4	955	20	101.0	7.7	33.87
6/2/2010	5	SP10105	4418.005	6729.915	4	1138	20	63.1	7.1	32.77
6/2/2010	5	SP10106	4416.266	6734.294	4	1257	20	64.8	7.5	33.63
6/2/2010	5	SP10107	4419.750	6733.354	3	1432	18	48.2	7.0	32.52
6/2/2010	5	SP10108	4421.267	6741.639	2	1609	20	35.7	7.1	32.16
6/3/2010	5	SP10109	4430.802	6730.768	1	849	20	17.5	7.6	31.84
6/3/2010	5	SP10110	4429.729	6724.649	2	1022	20	35.7	7.0	31.91
6/3/2010	5	SP10111	4427.739	6722.170	2	1151	20	38.6	7.1	31.97
6/3/2010	5	SP10112	4434.298	6717.248	3	1346	20	35.9	7.0	31.86
6/3/2010	5	SP10113	4435.095	6718.544	2	1509	20	28.2	7.0	31.81
6/3/2010	5	SP10114	4438.242	6719.248	1	1628	20	10.3	7.2	31.85
6/4/2010	5	SP10115	4442.504	6657.340	3	855	20	56.3	6.8	31.80
6/4/2010	5	SP10116	4433.461	6709.276	3	1041	20	47.5	7.0	31.77
6/4/2010	5	SP10117	4437.243	6705.579	3	1151	20	48.4	6.9	31.78

Appendix B
Individual Station Descriptors for Start of Tow

DATE	REGION	TOWID	LAT deg/min	LON deg/min	Stratum	Time	Tow Duration	Depth (FA)	Temp C °	Salinity ppt
Fall 2010										
10/4/2010	1	FL10__1	4256.275	7044.597	1	1038	20	15.7	14.1	31.98
10/5/2010	1	FL10__2	4252.193	7044.450	1	904	20	19.5	14.3	32.08
10/5/2010	1	FL10__3	4254.424	7040.689	2	1048	20	30.3	10.5	32.45
10/5/2010	1	FL10__4	4252.796	7036.342	3	1255	20	44.1	8.8	32.71
10/5/2010	1	FL10__5	4255.121	7033.623	3	1455	20	42.3	8.9	32.59
10/7/2010	1	FL10__6	4259.315	7030.157	3	915	20	48.5	8.9	32.69
10/7/2010	1	FL10__7	4301.153	7027.274	3	1109	20	52.3	7.9	32.76
10/7/2010	1	FL10__8	4257.541	7025.362	4	1308	20	59.5	6.4	32.96
10/7/2010	1	FL10__9	4257.153	7029.848	3	1506	20	41.8	9.0	32.34
10/8/2010	1	FL10_10	4311.832	7030.926	1	838	20	17.5	13.6	32.17
10/8/2010	1	FL10_11	4313.313	7034.209	1	1001	20	14.1	14.1	32.13
10/8/2010	1	FL10_12	4318.178	7029.736	1	1151	15	18.1	13.9	32.13
10/8/2010	1	FL10_13	4315.175	7008.786	4	1432	20	75	7.6	33.27
10/8/2010	1	FL10_14	4321.350	7005.149	4	1627	20	82	7.6	33.55
10/8/2010	1	FL10_15	4324.380	7005.441	4	1737	20	65.4	8.8	33.11
10/9/2010	1	FL10_16	4329.381	7011.471	2	712	20	35.2	9.5	32.83
10/9/2010	1	FL10_17	4325.895	7016.724	2	859	18	34.6	10.7	32.74
10/11/2010	2	FL10_18	4328.865	6957.886	4	821	20	64.9	8.9	33.13
10/11/2010	2	FL10_19	4327.732	6950.055	4	1008	20	74.8	7.5	32.64
10/11/2010	2	FL10_20	4333.125	6955.001	3	1150	20	51.8	8.9	33.22
10/11/2010	2	FL10_21	4336.701	6951.644	3	1314	20	43.8	9.3	33.06
10/12/2010	2	FL10_22	4345.791	7004.827	1	827	20	8.5	13.1	31.82
10/12/2010	2	FL10_23	4339.711	7004.871	1	1029	20	19.6	12.5	32.34
10/12/2010	2	FL10_24	4338.982	7000.568	2	1318	16	28.2	11.1	32.85
10/12/2010	2	FL10_25	4339.560	6957.140	2	1432	20	27.4	11.4	32.74
10/12/2010	2	FL10_26	4342.055	6956.257	1	1558	20	20.4	12.3	32.54
10/13/2010	2	FL10_27	4347.570	6941.795	2	812	19	27.2	10.8	32.84
10/13/2010	2	FL10_28	4345.975	6941.959	2	950	10	28.3	10.5	32.99
10/13/2010	2	FL10_29	4342.673	6949.207	1	1206	20	6.7	12.4	32.56
10/13/2010	2	FL10_30	4341.990	6944.776	1	1321	20	18.9	11.3	32.80
10/13/2010	2	FL10_31	4338.068	6945.054	3	1450	20	45.8	10.1	33.07
10/13/2010	2	FL10_32	4337.628	6942.752	3	1606	20	52	9.8	33.13
10/14/2010	2	FL10_33	4345.934	6928.850	3	755	20	47.2	10.1	33.37
10/14/2010	2	FL10_34	4344.225	6929.868	3	914	20	53.6	9.6	33.15
10/14/2010	2	FL10_35	4340.930	6930.804	4	1037	20	67.8	9.3	33.25
10/14/2010	2	FL10_36	4337.834	6928.594	4	1153	20	76.1	8.8	33.36
10/14/2010	2	FL10_37	4336.923	6933.079	4	1322	20	74.6	8.6	33.34
10/14/2010	2	FL10_38	4334.311	6937.905	4	1445	20	72	8.8	33.15
10/18/2010	3	FL10_39	4346.330	6910.864	3	1130	15	48.4	10.9	33.19
10/18/2010	3	FL10_40	4348.690	6904.255	3	1326	20	43.2	11.1	33.14
10/18/2010	3	FL10_41	4348.005	6902.762	3	1513	20	42.6	11.3	33.14
10/19/2010	3	FL10_42	4413.578	6851.408	1	750	20	16.9	12.4	31.14
10/19/2010	3	FL10_43	4418.030	6847.578	1	929	16	22	12.6	31.87
10/19/2010	3	FL10_44	4418.607	6852.689	1	1113	12	20.4	12.4	32.30
10/19/2010	3	FL10_45	4412.291	6859.550	2	1316	20	30.7	12.4	32.41

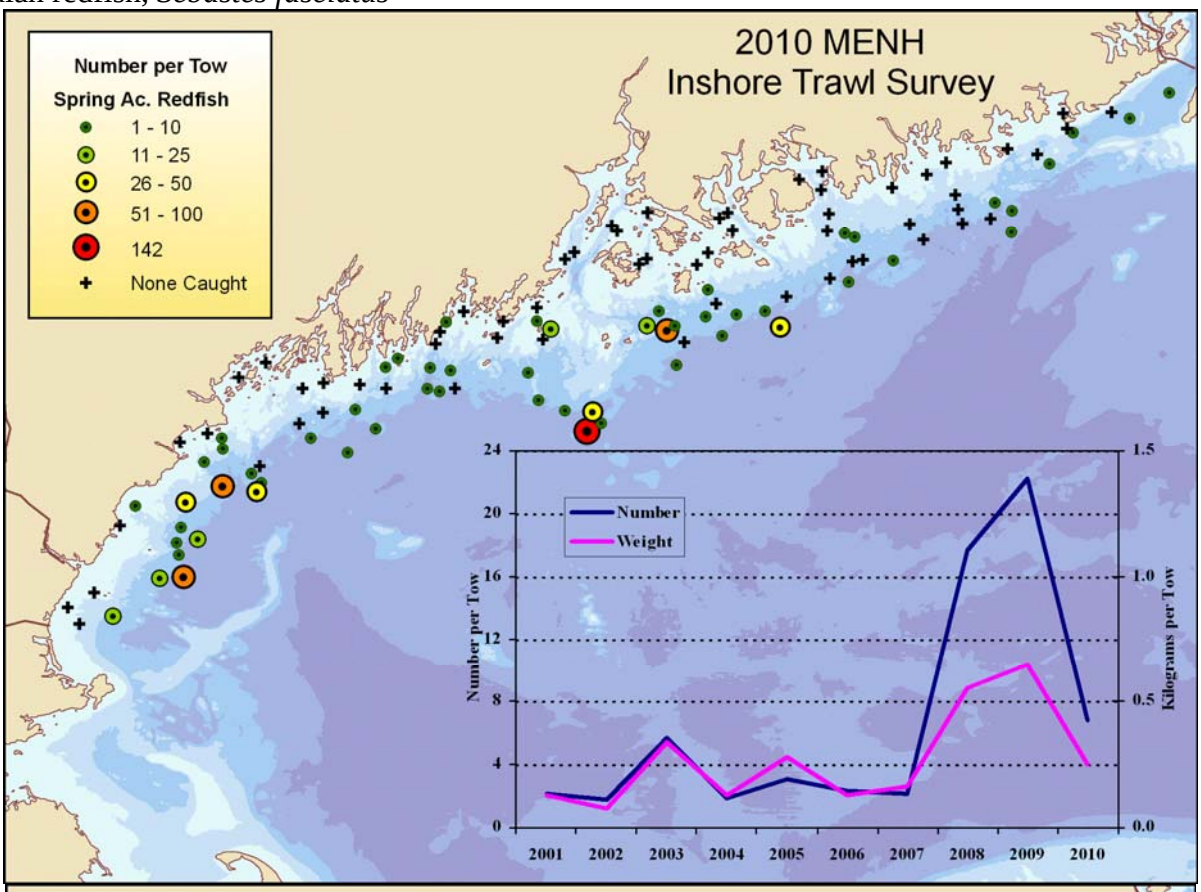
Appendix B
Individual Station Descriptors for Start of Tow

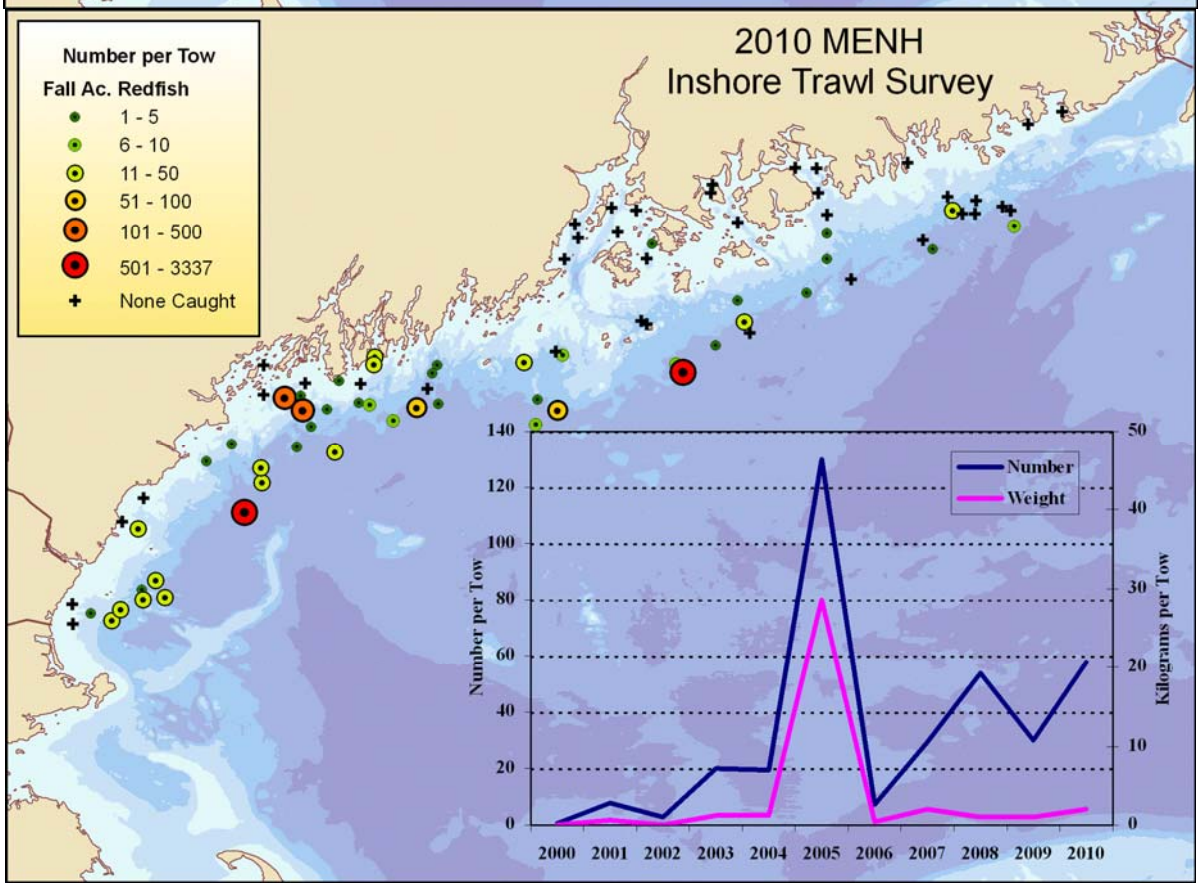
DATE	REGION	TOWID	LAT deg/min	LON deg/min	Stratum	Time	Tow Duration	Depth (FA)	Temp C °	Salinity ppt
10/19/2010	3	FL10_46	4415.100	6900.280	2	1436	20	22.4	12.5	32.31
10/19/2010	3	FL10_47	4407.870	6902.429	2	1635	20	24.8	12.4	32.29
10/20/2010	3	FL10_48	4338.728	6907.975	3	954	20	72.6	9.7	33.65
10/20/2010	3	FL10_49	4333.507	6908.368	4	1144	20	78.7	8.6	33.61
10/20/2010	3	FL10_50	4336.363	6903.856	4	1308	20	76.1	10.2	33.67
10/20/2010	3	FL10_51	4336.378	6856.841	4	1448	20	66.8	10.3	32.10
10/21/2010	3	FL10_52	4354.303	6845.415	3	746	20	47.6	11.5	33.05
10/21/2010	3	FL10_53	4346.131	6839.212	4	1025	20	65.3	10.4	33.64
10/21/2010	3	FL10_54	4344.346	6837.886	4	1149	20	60.9	10.3	33.64
10/21/2010	3	FL10_55	4355.009	6846.544	3	1431	20	51.5	11.5	32.91
10/22/2010	3	FL10_56	4408.029	6845.366	2	823	20	29.2	12.0	32.38
10/22/2010	3	FL10_57	4411.214	6844.253	1	1108	16	13.8	12.1	32.17
10/25/2010	4	FL10_58	4349.972	6830.997	4	1005	20	82.1	9.8	33.86
10/25/2010	4	FL10_59	4352.550	6823.969	4	1147	20	67.7	10.1	33.80
10/25/2010	4	FL10_60	4354.805	6825.131	4	1442	20	59.3	10.3	33.81
10/25/2010	4	FL10_61	4359.301	6826.516	3	1605	10	46.6	10.6	33.50
10/26/2010	4	FL10_62	4421.620	6832.066	1	1030	20	18	11.9	32.53
10/26/2010	4	FL10_63	4423.313	6831.720	1	1231	20	12.6	12.0	32.45
10/26/2010	4	FL10_64	4415.458	6826.442	2	1432	17	23.6	11.3	32.67
10/27/2010	4	FL10_65	4400.965	6812.135	3	908	14	52.4	11.0	33.36
10/27/2010	4	FL10_66	4403.702	6802.988	4	1110	15	59.2	10.6	33.55
10/28/2010	4	FL10_67	4408.008	6807.985	3	1233	20	45.6	11.1	33.18
10/29/2010	4	FL10_68	4426.913	6814.516	1	819	20	22	11.2	32.85
10/29/2010	4	FL10_69	4426.755	6810.149	1	956	20	19.4	11.1	32.85
10/29/2010	4	FL10_70	4421.611	6809.775	2	1133	20	25.6	11.3	32.85
10/29/2010	4	FL10_71	4417.084	6807.939	2	1320	20	36.3	11.1	33.03
10/29/2010	4	FL10_72	4413.366	6807.979	2	1525	20	33.5	11.1	32.81
11/1/2010	5	FL10_73	4411.839	6748.113	4	1006	20	69.9	9.8	34.12
11/1/2010	5	FL10_74	4409.993	6746.043	4	1127	20	93.6	9.8	34.09
11/1/2010	5	FL10_75	4427.856	6751.284	1	1512	20	5.1	10.5	32.43
11/2/2010	5	FL10_76	4420.019	6737.072	3	903	16	44.9	10.7	33.37
11/2/2010	5	FL10_77	4417.943	6741.963	3	1028	16	44.1	10.7	33.37
11/2/2010	5	FL10_78	4420.856	6742.971	2	1202	15	35.5	10.8	33.02
11/3/2010	5	FL10_79	4418.804	6731.579	3	848	20	55.7	10.0	33.95
11/3/2010	5	FL10_80	4418.016	6729.864	4	1009	20	63.6	10.5	32.62
11/3/2010	5	FL10_81	4414.766	6729.057	4	1211	20	99.1	9.2	34.49
11/3/2010	5	FL10_82	4417.356	6737.274	3	1407	20	49.6	10.6	33.48
11/3/2010	5	FL10_83	4417.297	6739.832	3	1510	20	50.3	10.6	33.44
11/4/2010	5	FL10_84	4438.421	6719.212	1	734	16	10.1	10.4	32.77
11/4/2010	5	FL10_85	4435.847	6726.271	1	941	20	10.7	9.9	32.58

SELECTED SPECIES

The following pages contain bubble distribution maps, catch at length plots, abundance indices, and data tables for a selection of fish and invertebrates that are important to Maine and New Hampshire commercially or recreationally as well as others that are consistently abundant in our trawl catch. All indices and catch at length data were calculated for the entire survey area (20 strata) unless otherwise noted. All means are stratified mean number or weight and length frequencies are stratified catch at length.

Acadian redfish, *Sebastes fasciatus*





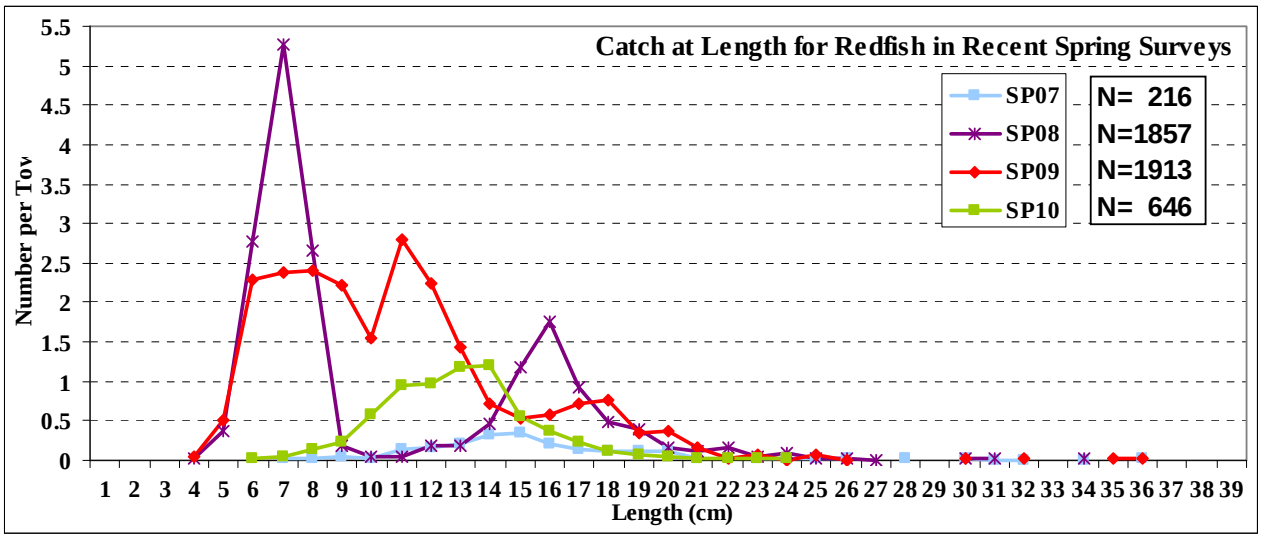
Means and standerd error for the graphs overlain on the distribution maps

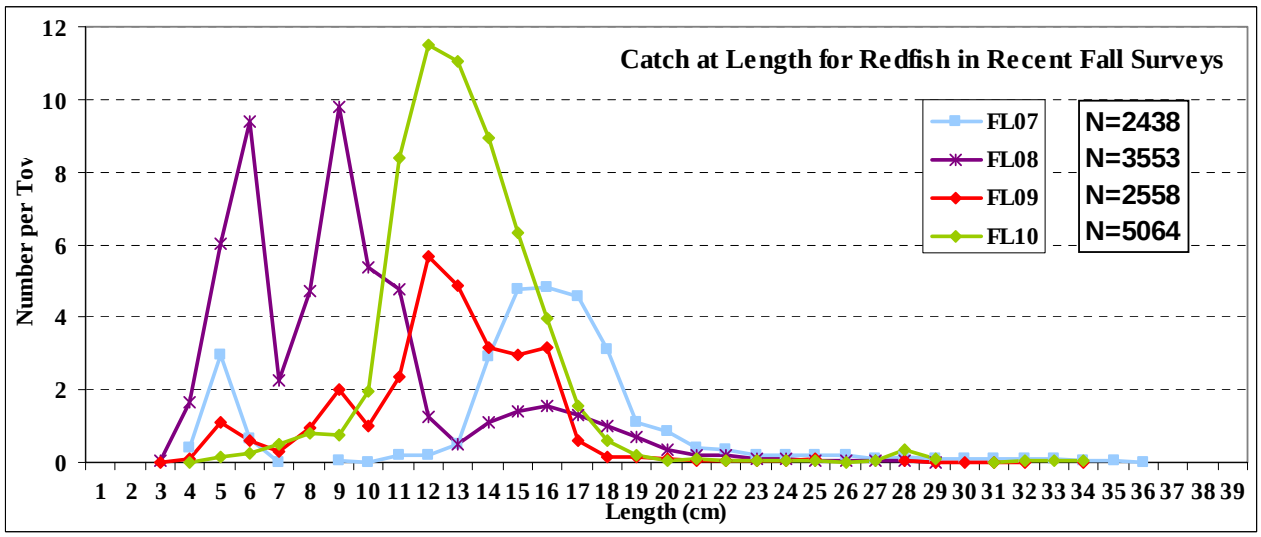
fixed stations not included

SPRING **FALL**

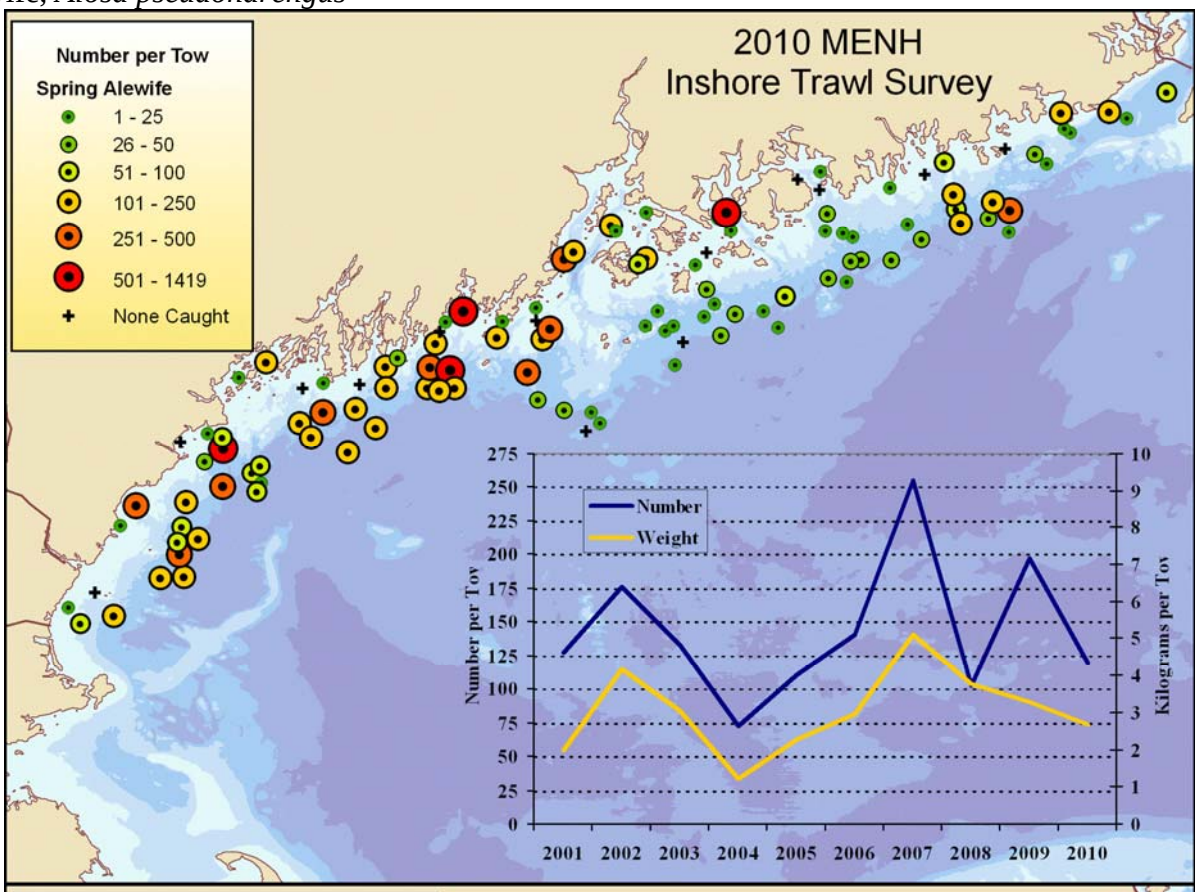
for redfish, indices calculated for regions 1 through 5, strata 1 through 4 (2003 on)

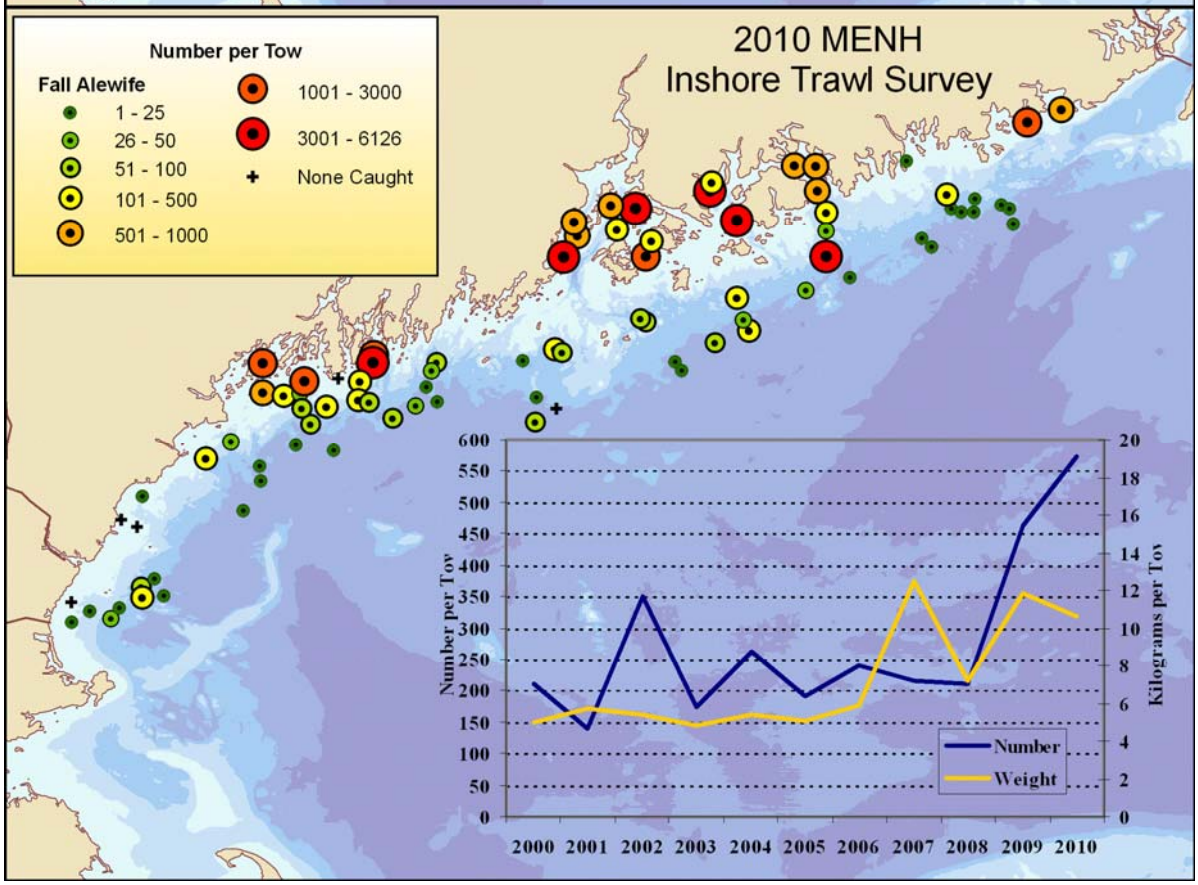
	Stratified Mean Number		Weight			Stratified Mean Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	0.65	0.21	0.03	0.01
2001	2.18	0.62	0.13	0.06	**2001**	7.95	2.74	0.54	0.33
2002	1.79	0.41	0.08	0.02	**2002**	2.70	1.24	0.07	0.05
2003	5.66	2.14	0.34	0.14	**2003**	20.07	17.79	1.19	0.88
2004	1.82	0.53	0.13	0.03	**2004**	19.42	5.58	1.22	0.46
2005	3.09	0.76	0.28	0.12	**2005**	129.96	105.82	28.50	28.05
2006	2.33	0.91	0.13	0.05	**2006**	6.95	2.10	0.32	0.09
2007	2.15	0.51	0.16	0.04	**2007**	29.64	12.15	2.07	0.64
2008	17.69	5.14	0.56	0.22	**2008**	53.93	14.85	1.06	0.33
2009	22.27	7.18	0.65	0.24	**2009**	29.73	17.19	1.03	0.62
2010	6.80	2.04	0.25	0.07	**2010**	57.78	38.11	2.03	1.21





Alewife, *Alosa pseudoharengus*





Mean and standard error for the graphs overlain on the distribution maps

fixed stations not included

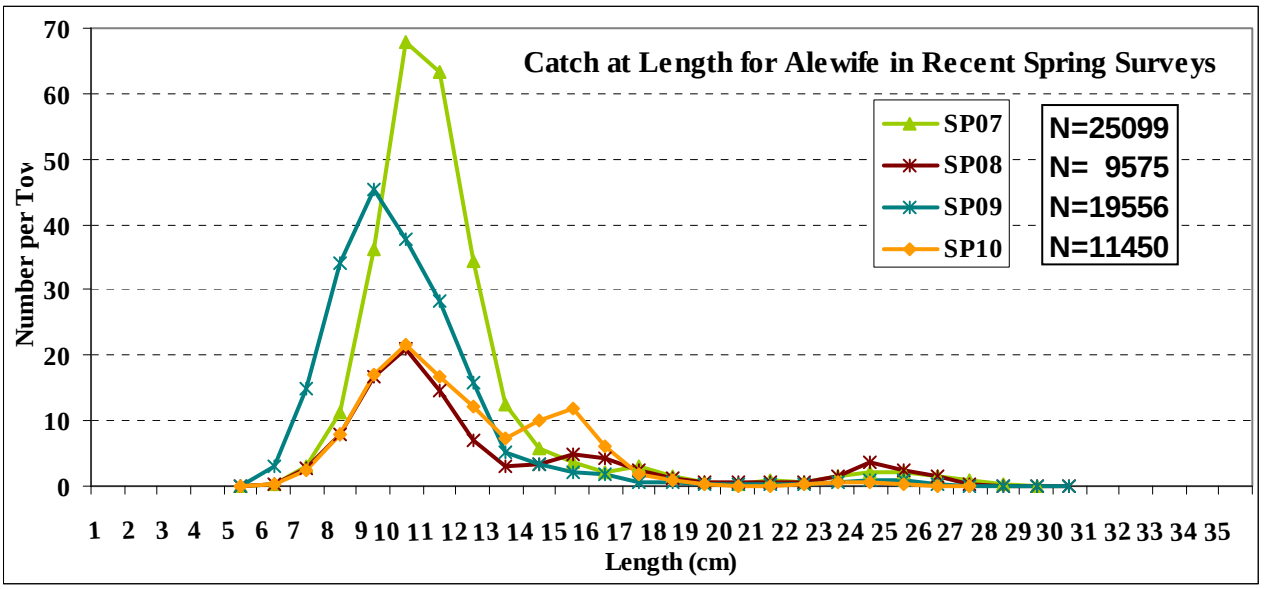
For alewife, Regions 1 through 5; Strata 1 through 4 (2003 on)

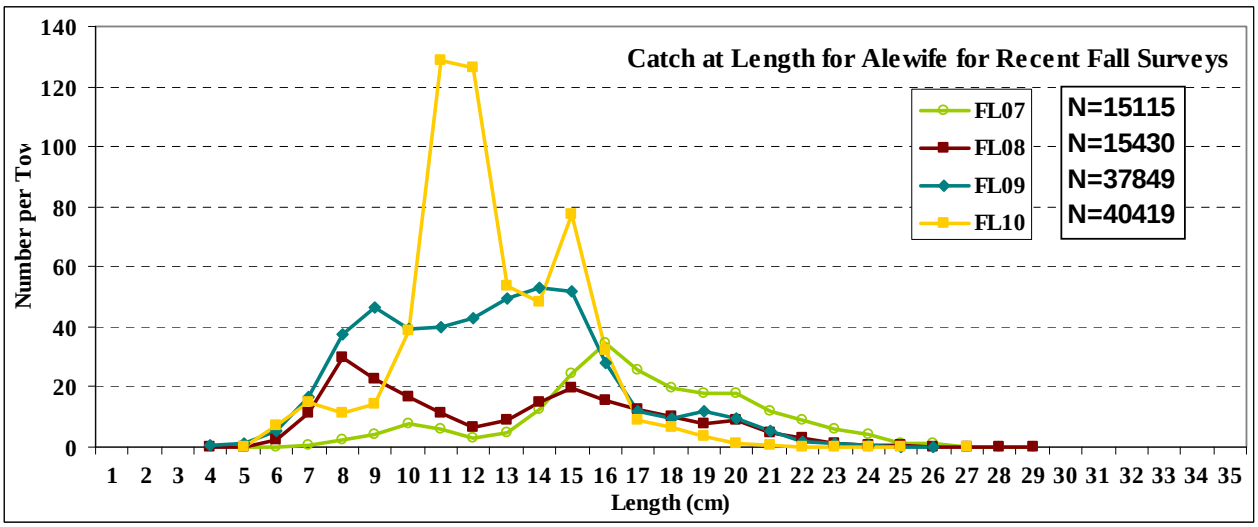
SPRING

	Stratified Mean Number mean	error	Weight mean	error
2001	127.26	31.42	1.97	0.41
2002	175.75	53.23	4.15	0.88
2003	132.75	32.46	3.05	0.72
2004	72.77	10.47	1.20	0.15
2005	109.69	13.40	2.29	0.29
2006	140.15	18.11	2.97	0.39
2007	255.32	67.31	5.10	1.06
2008	101.88	11.83	3.78	1.13
2009	196.87	37.43	3.30	0.48
2010	118.66	22.21	2.66	0.46

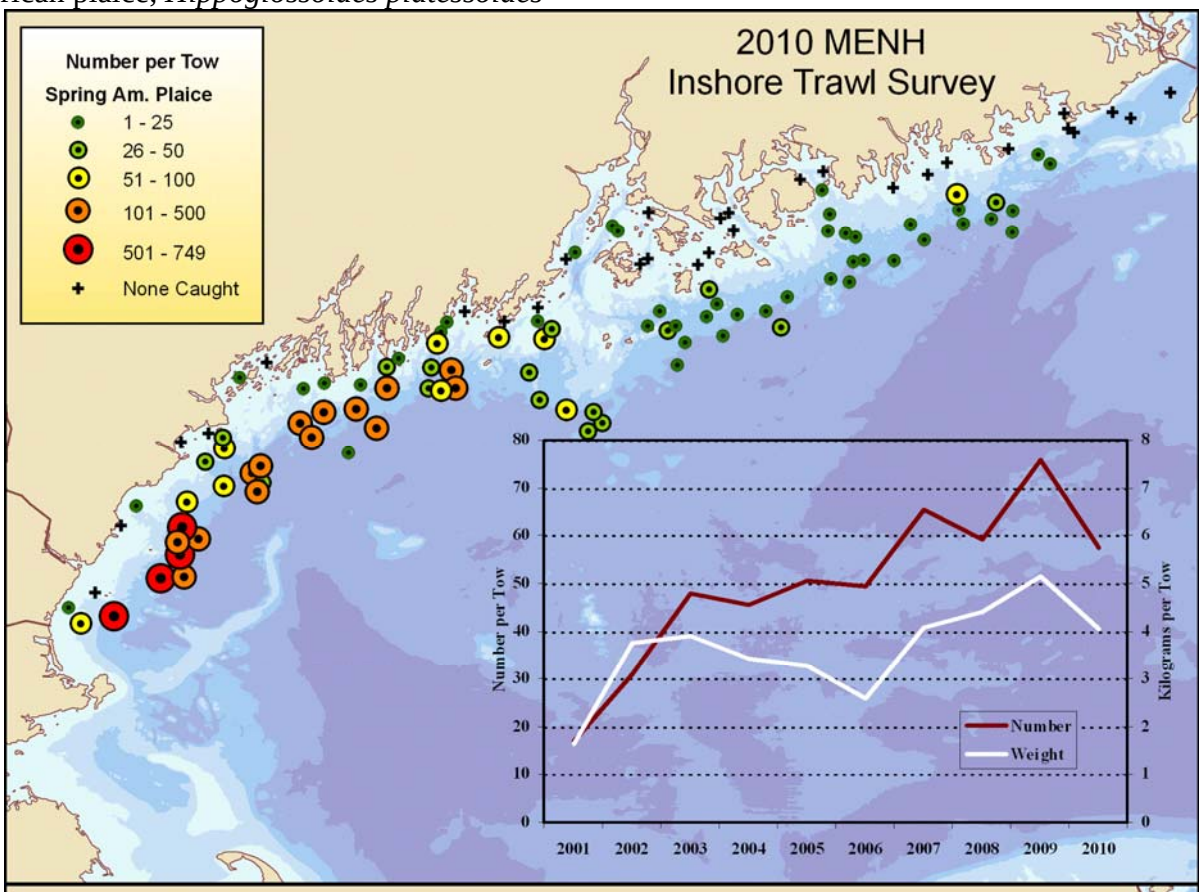
FALL

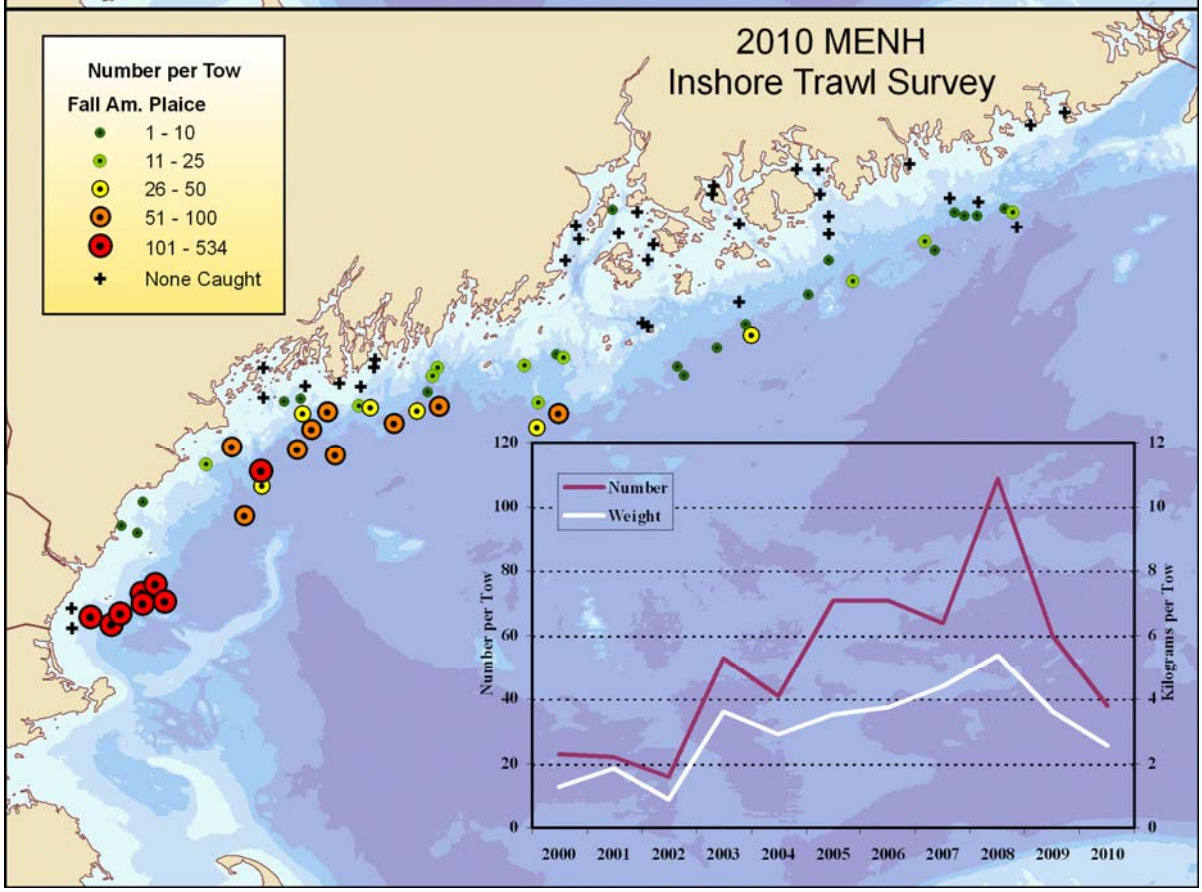
	Stratified Mean Number mean	error	Weight mean	error
2000	210.59	72.13	4.94	1.48
2001	140.64	57.86	5.72	2.16
2002	349.94	159.70	5.36	1.71
2003	174.43	51.42	4.85	2.07
2004	261.39	61.81	5.36	0.66
2005	190.51	28.49	5.10	0.70
2006	239.38	59.48	5.85	1.45
2007	215.24	49.97	12.52	3.33
2008	211.32	43.56	7.18	0.79
2009	463.66	117.52	11.85	1.59
2010	573.83	144.15	10.58	2.38





American plaice, *Hippoglossoides platessoides*





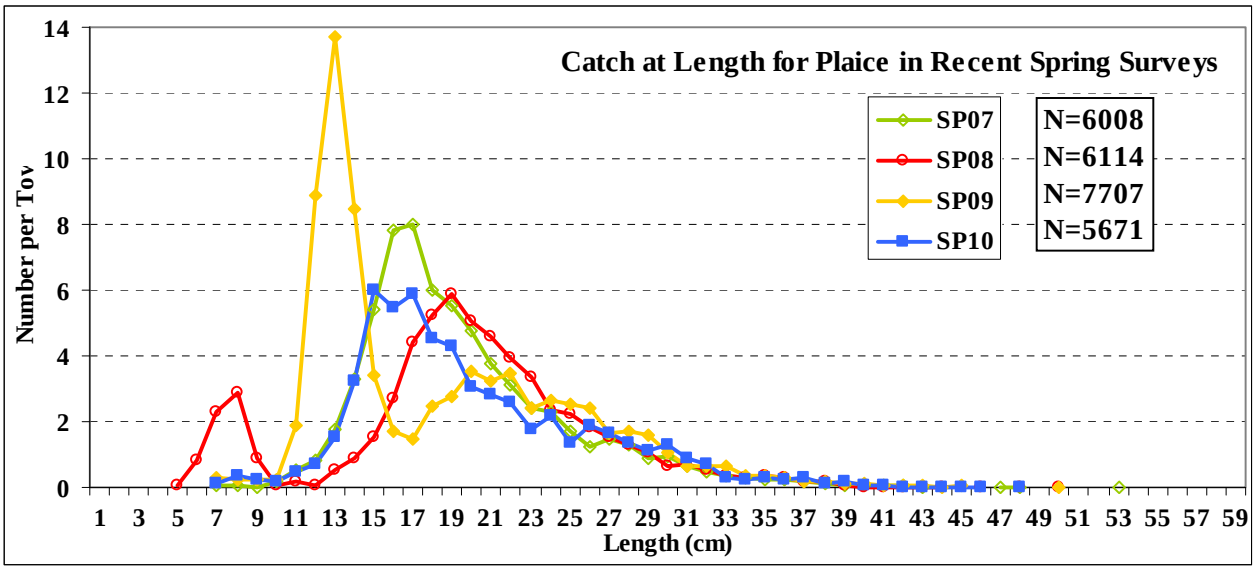
Mean and standard error for the graphs overlain on the distribution maps

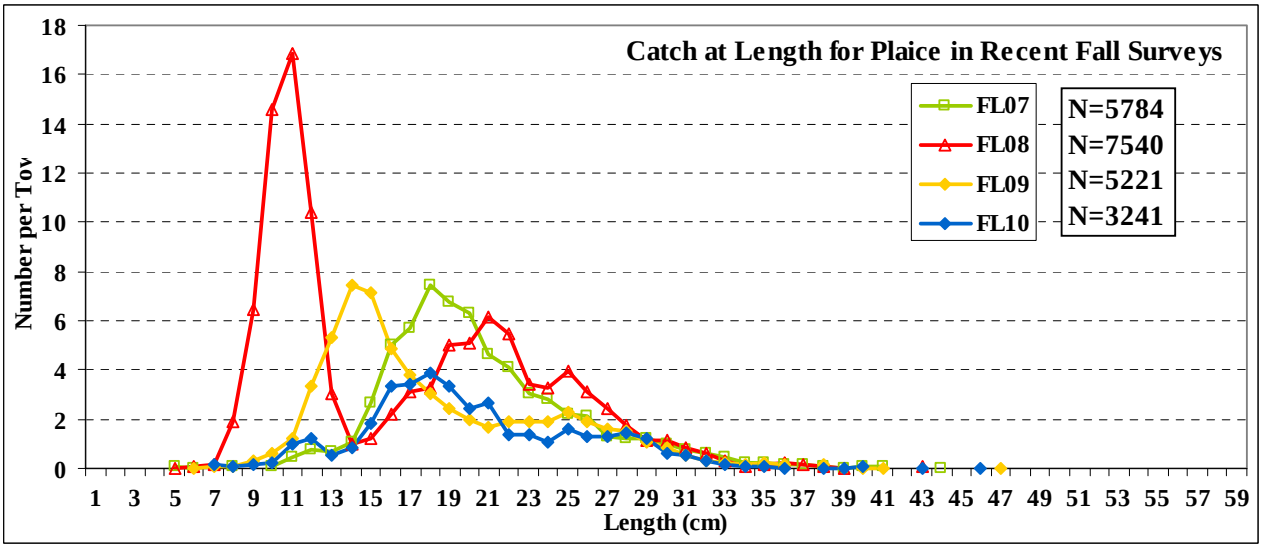
fixed stations not included

SPRING **FALL**

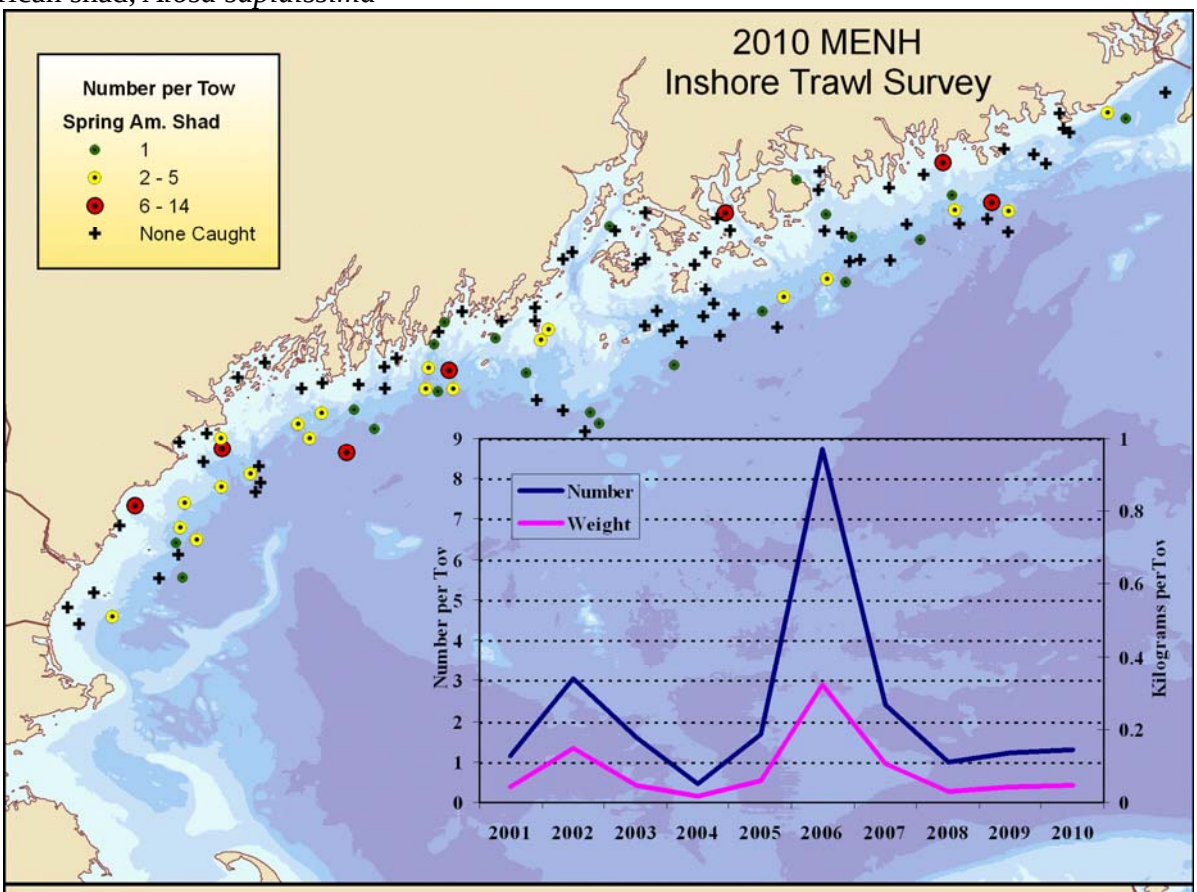
for plaice, indices calculated for regions 1 through 5, strata 1 through 4 (2003 on)

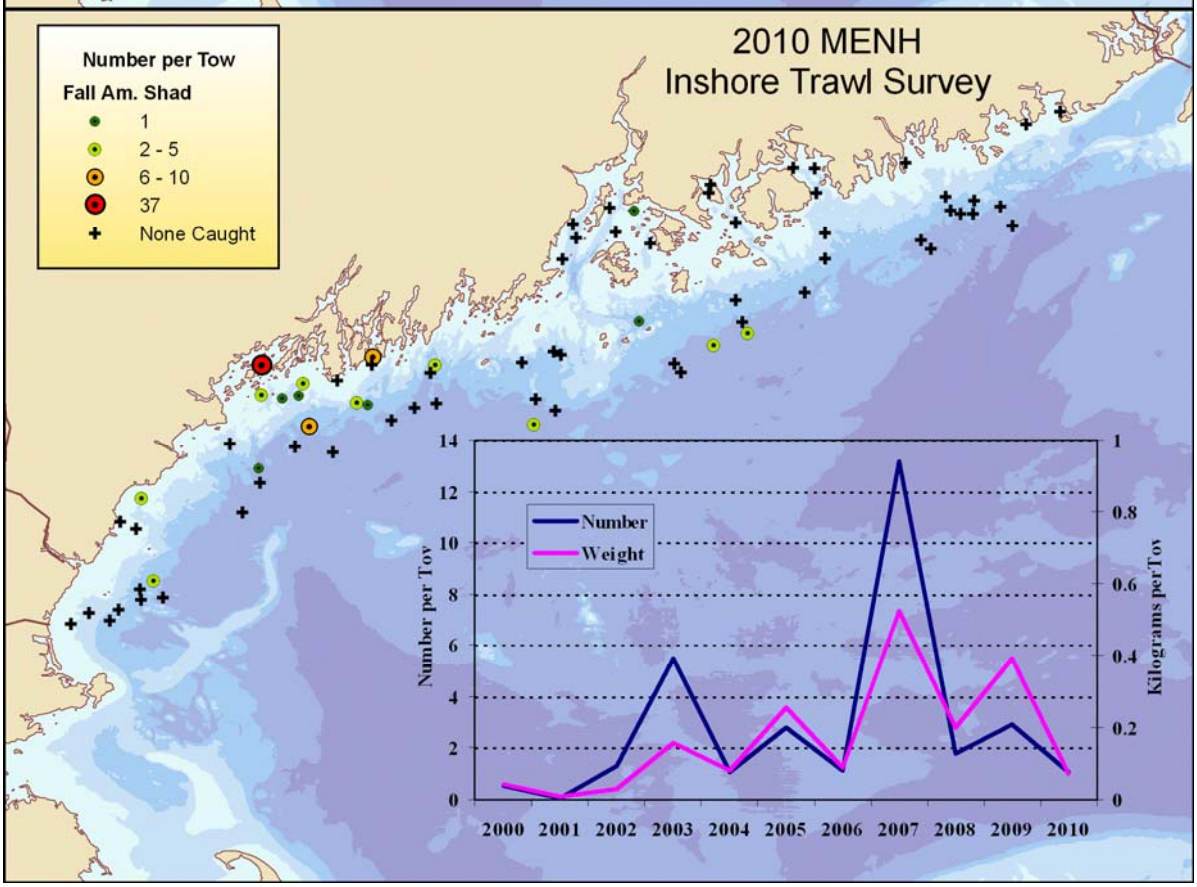
	Stratified Mean Number Mean	Error	Weight Mean	Error		Stratified Mean Number Mean	Error	Weight Mean	Error
					2000	22.66	6.29	1.28	0.28
2001	16.93	3.73	1.64	0.44	**2001**	21.93	2.26	1.85	0.20
2002	31.04	3.80	3.76	0.46	**2002**	15.68	3.68	0.87	0.17
2003	47.97	6.10	3.89	0.46	**2003**	52.82	7.31	3.60	0.49
2004	45.62	7.91	3.42	0.52	**2004**	41.09	4.28	2.89	0.36
2005	50.66	5.85	3.27	0.34	**2005**	70.75	8.89	3.53	0.42
2006	49.51	5.03	2.58	0.20	**2006**	70.75	7.67	3.74	0.39
2007	65.57	6.40	4.09	0.35	**2007**	63.60	7.38	4.38	0.56
2008	59.29	7.51	4.41	0.45	**2008**	108.72	12.69	5.35	0.63
2009	75.69	7.71	5.14	0.51	**2009**	59.93	6.69	3.61	0.43
2010	57.45	6.10	4.05	0.36	**2010**	37.59	6.91	2.56	0.56





American shad, *Alosa sapidissima*





Mean and standard error for the graphs overlain on the distribution maps

fixed stations not included

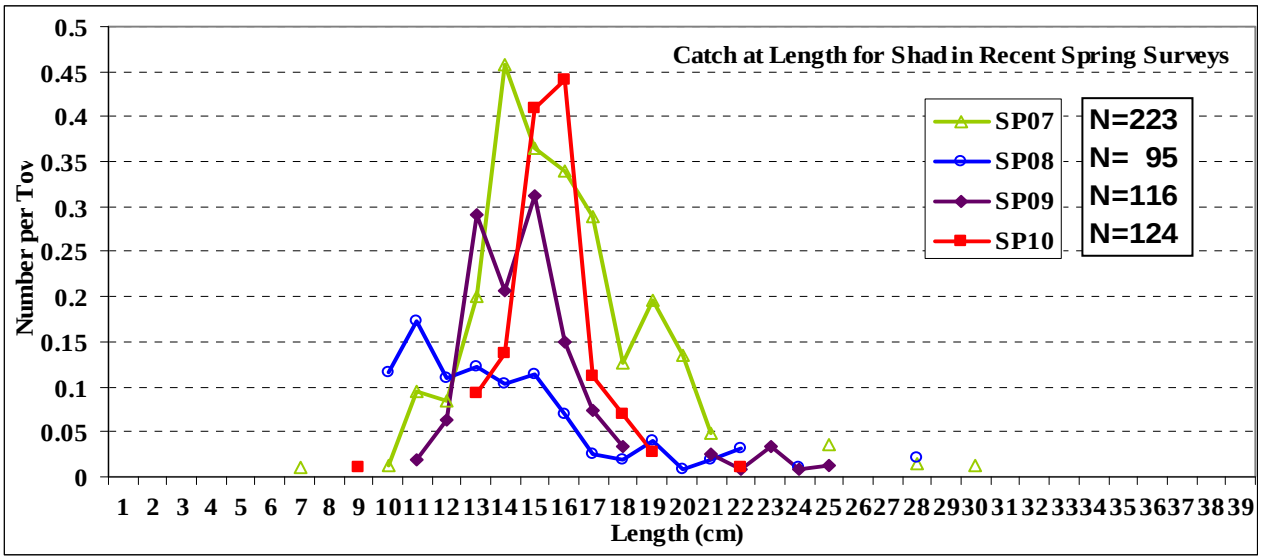
For shad, Regions 1 through 5; Strata 1 through 4 (2003 on)

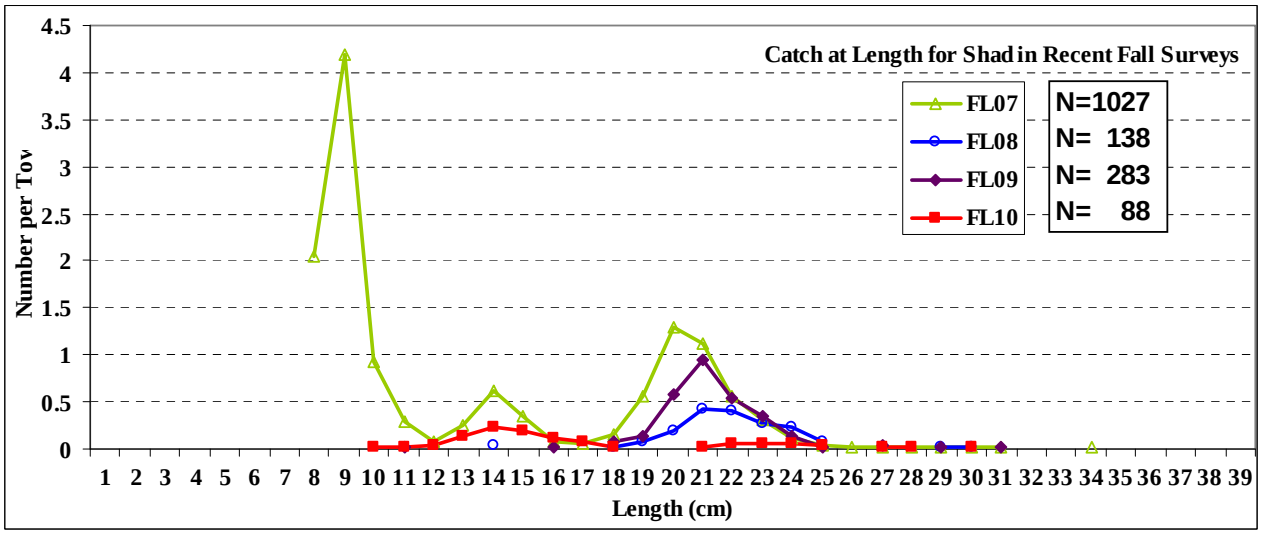
SPRING

	Stratified Mean Number		Weight	
	Mean	Error	Mean	Error
2001	1.16	0.37	0.04	0.01
2002	3.05	0.50	0.15	0.03
2003	1.62	0.34	0.05	0.01
2004	0.45	0.11	0.02	0.00
2005	1.67	0.29	0.06	0.01
2006	8.72	1.59	0.32	0.06
2007	2.41	0.30	0.11	0.01
2008	0.98	0.35	0.03	0.01
2009	1.24	0.17	0.04	0.01
2010	1.31	0.25	0.05	0.01

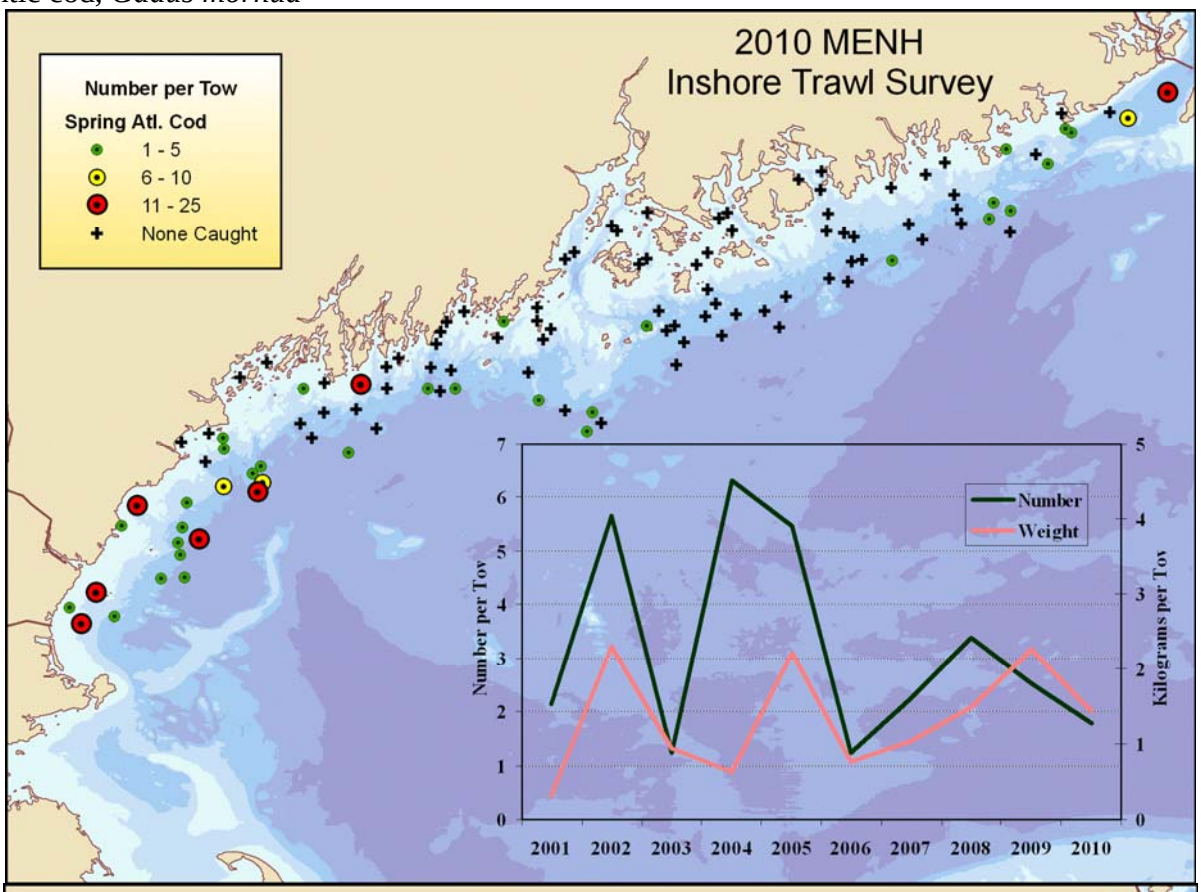
FALL

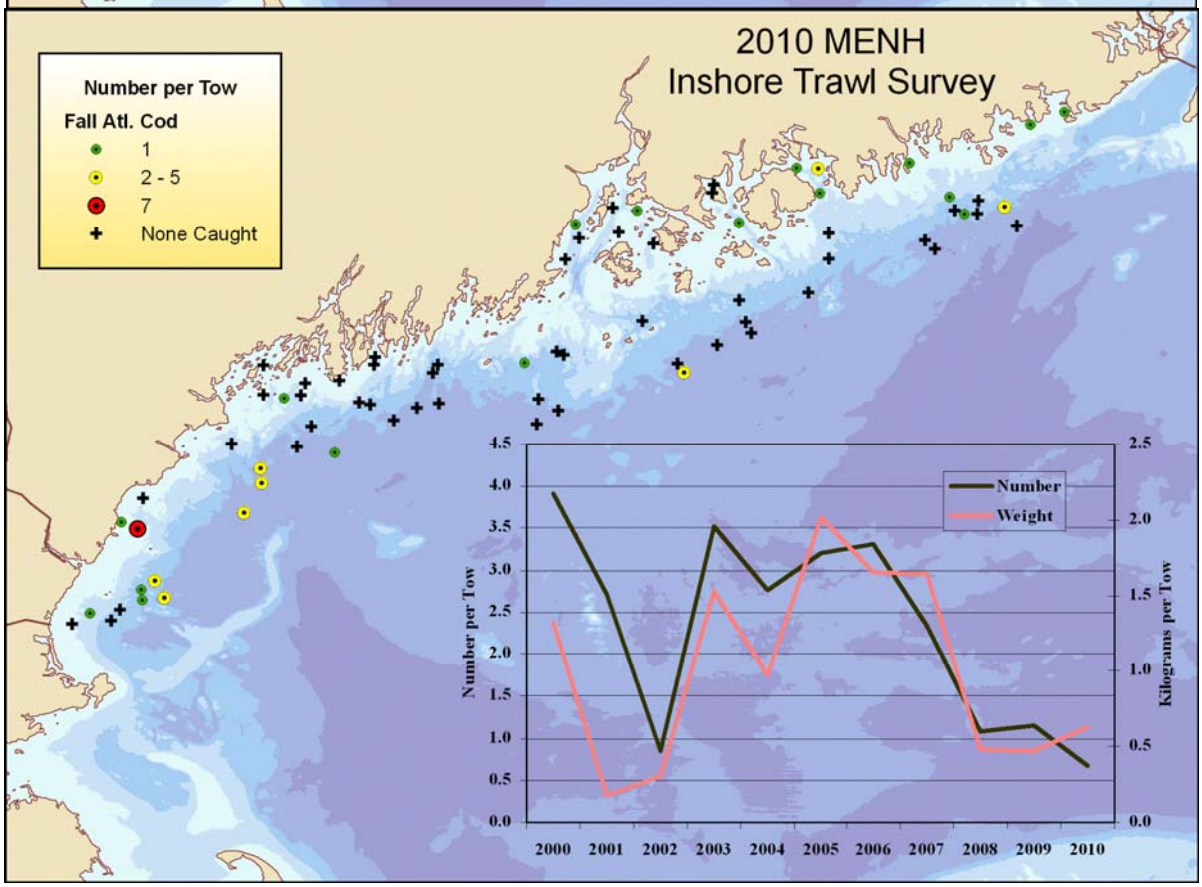
	Stratified Mean Number		Weight	
	Mean	Error	Mean	Error
2000	0.56	0.18	0.04	0.01
2001	0.06	0.04	0.01	0.00
2002	1.33	0.54	0.03	0.01
2003	5.45	4.52	0.16	0.09
2004	1.08	0.46	0.08	0.03
2005	2.81	0.37	0.25	0.03
2006	1.14	0.54	0.09	0.02
2007	13.15	7.26	0.53	0.16
2008	1.78	0.43	0.20	0.05
2009	2.91	1.60	0.39	0.21
2010	1.10	0.51	0.07	0.02





Atlantic cod, *Gadus morhua*





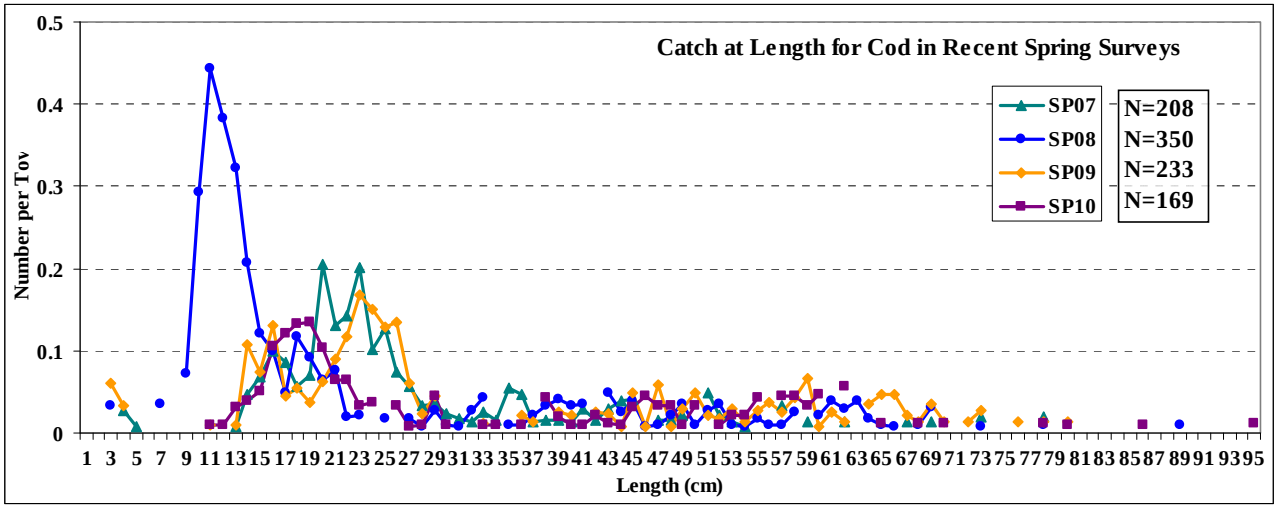
Mean and standard error for the graphs overlain on the distribution maps

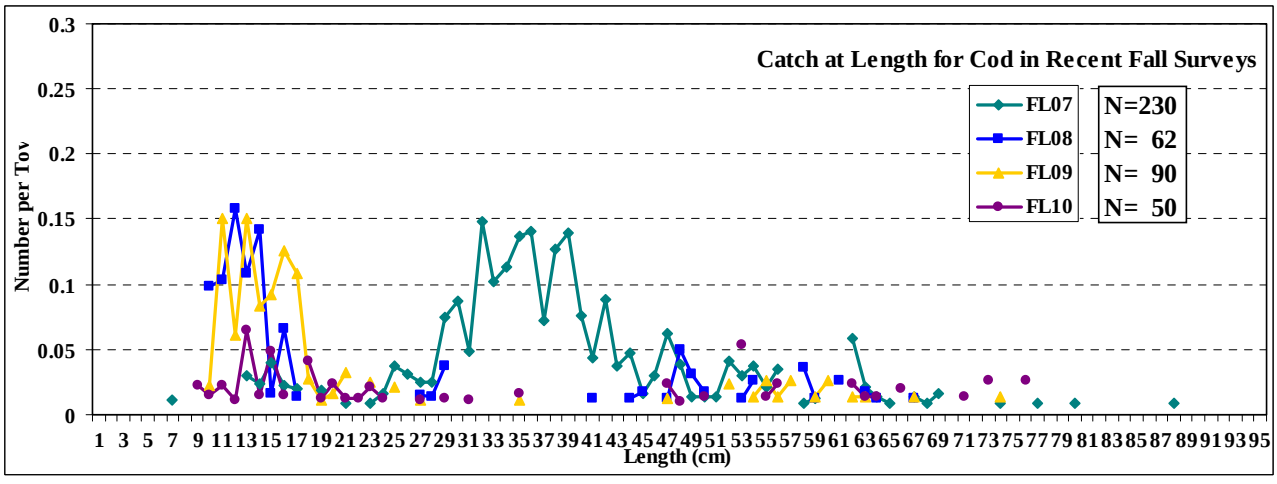
fixed stations not included

SPRING **FALL**

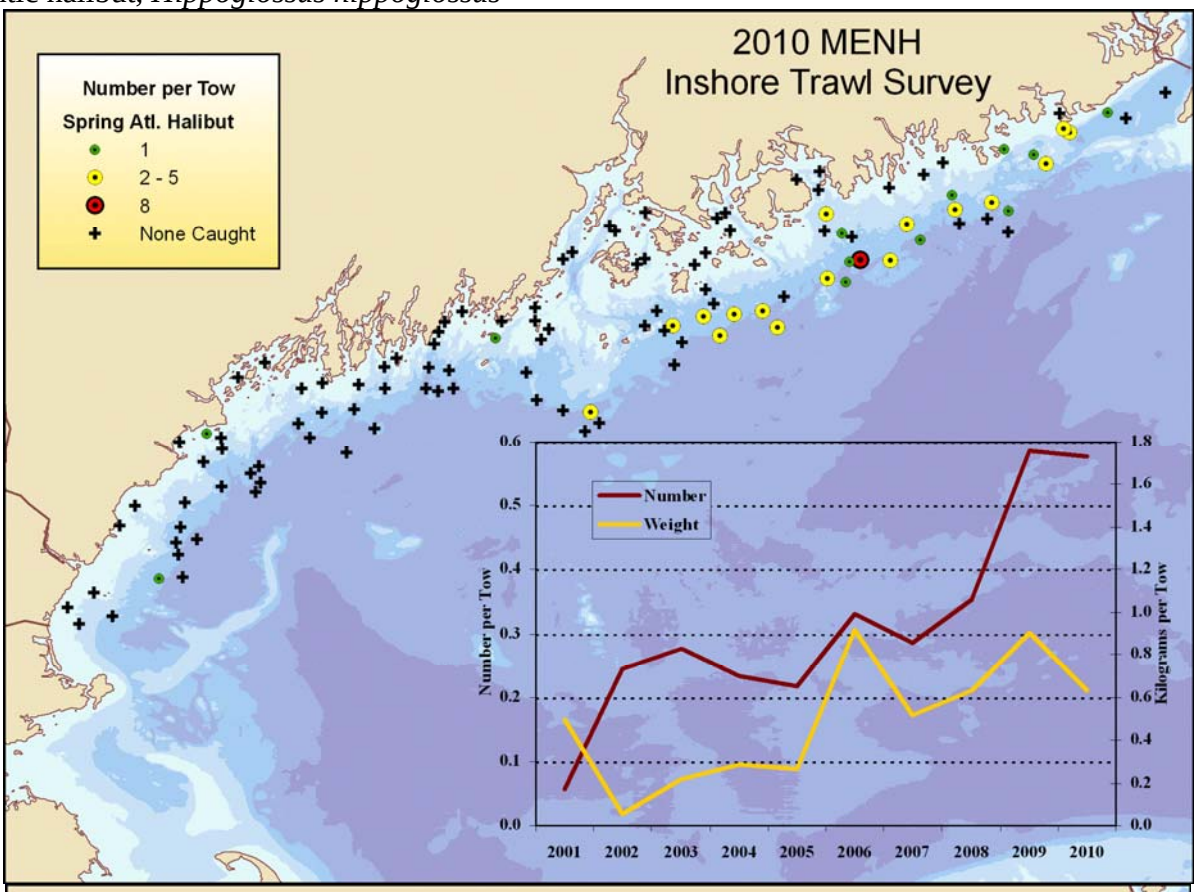
for Atlantic cod, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

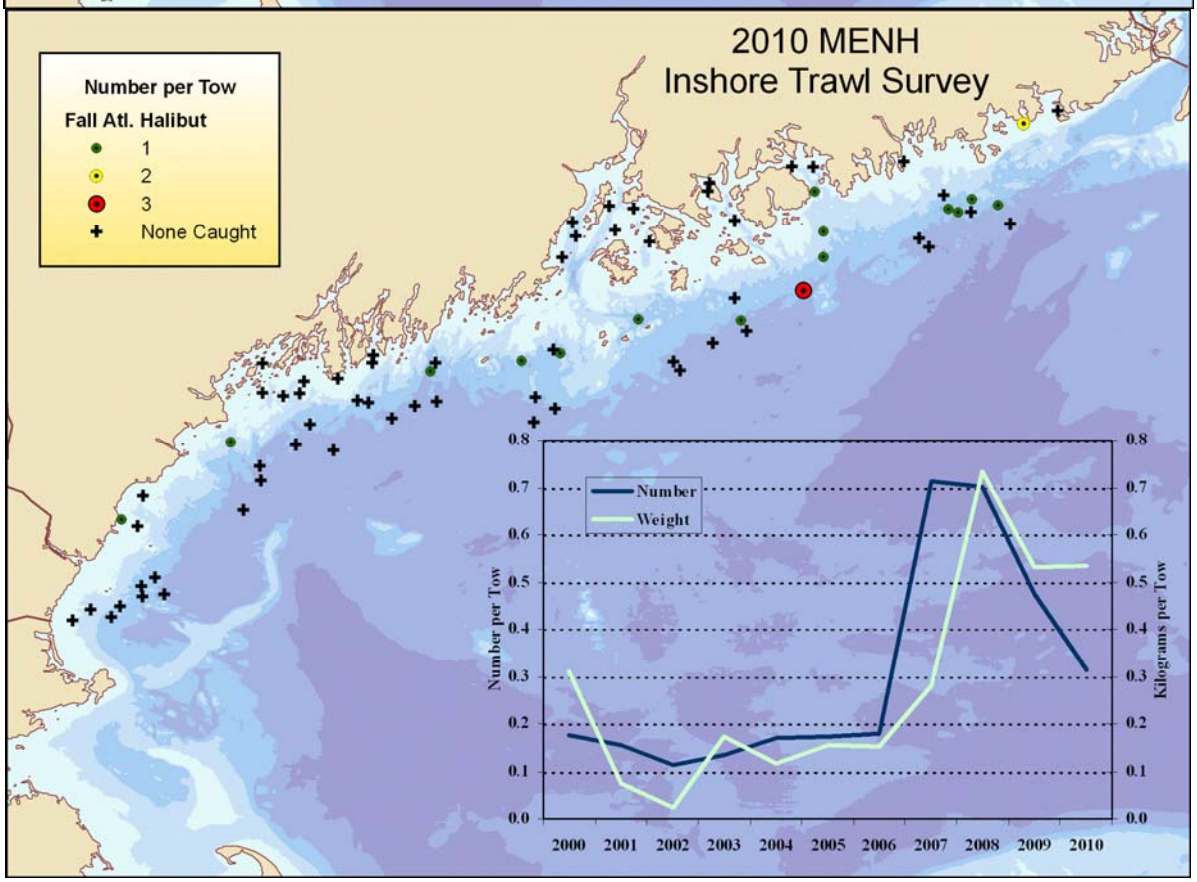
	Stratified Mean Number Mean	SE	Weight Mean	SE		Stratified Mean Number Mean	SE	Weight Mean	SE
					2000	3.91	1.85	1.32	0.74
2001	2.14	0.51	0.32	0.09	**2001**	2.72	0.72	0.18	0.04
2002	5.66	2.95	2.29	0.92	**2002**	0.85	0.20	0.30	0.09
2003	1.23	0.27	0.94	0.28	**2003**	3.53	0.80	1.52	0.30
2004	6.30	1.60	0.63	0.18	**2004**	2.76	1.11	0.98	0.27
2005	5.46	2.68	2.22	1.45	**2005**	3.20	1.87	2.01	1.37
2006	1.24	0.35	0.76	0.45	**2006**	3.31	1.59	1.66	0.86
2007	2.25	0.61	1.04	0.19	**2007**	2.34	1.21	1.64	0.83
2008	3.38	1.46	1.49	0.57	**2008**	1.08	0.45	0.48	0.19
2009	2.52	0.59	2.25	0.79	**2009**	1.16	0.26	0.47	0.05
2010	1.79	0.42	1.427	0.498	**2010**	0.67	0.12	0.63	0.13





Atlantic halibut, *Hippoglossus hippoglossus*



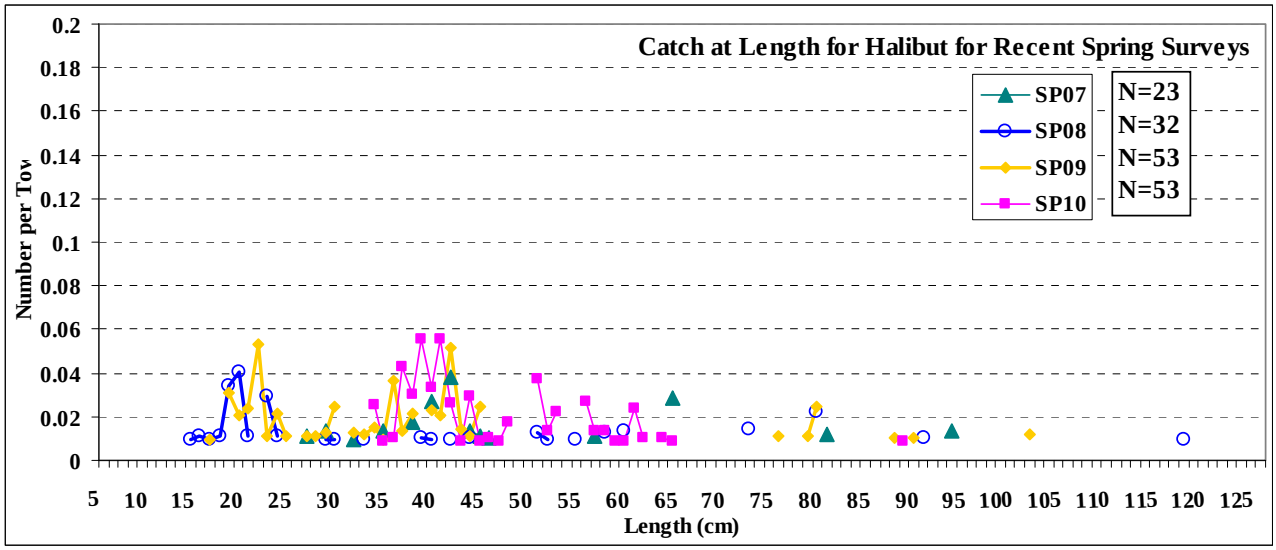


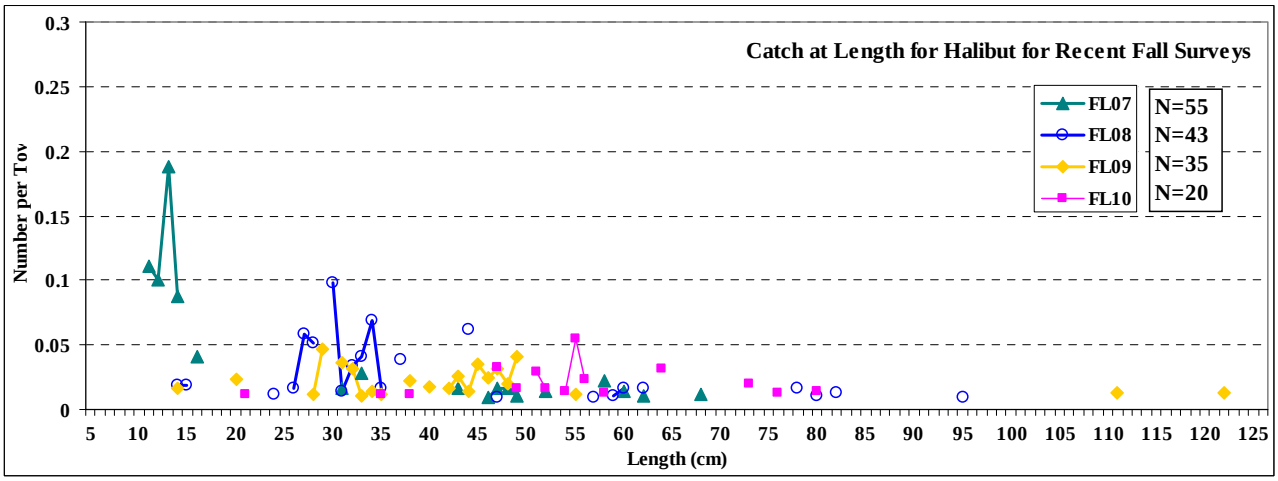
Means and standard error for graphs overlain on distribution maps

fixed stations not included

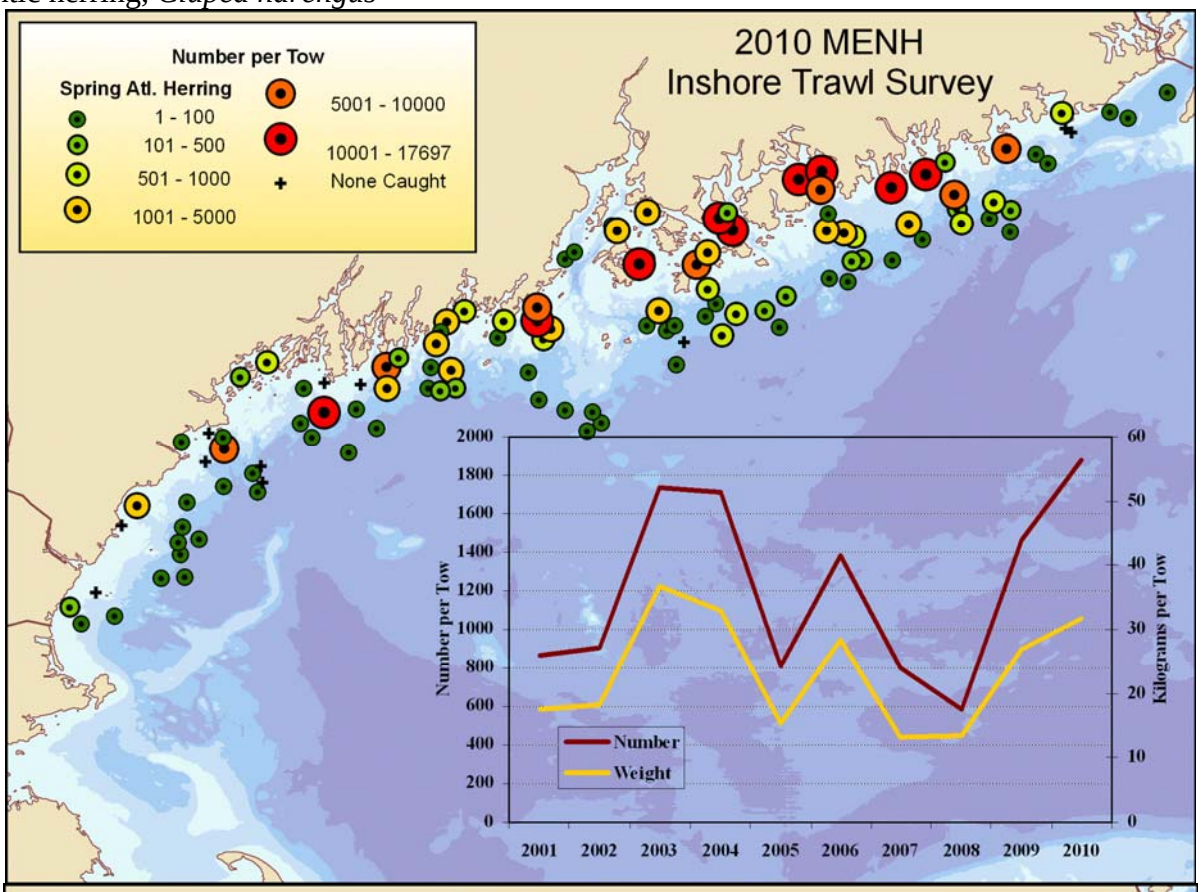
for halibut, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

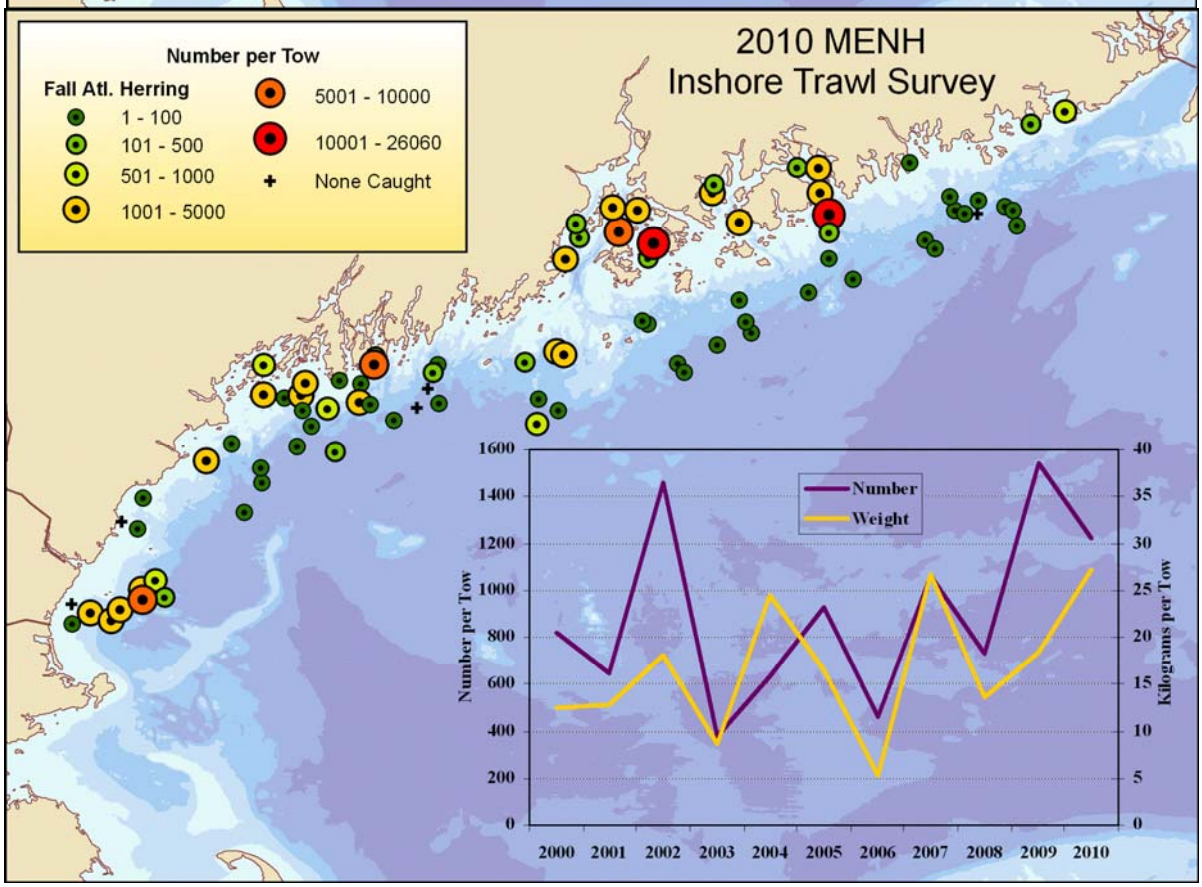
	SPRING Stratified Mean Number		Weight			FALL Stratified Mean Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	0.18	0.08	0.31	0.16
2001	0.06	0.02	0.49	0.41	**2001**	0.16	0.09	0.08	0.07
2002	0.24	0.08	0.05	0.03	**2002**	0.11	0.05	0.02	0.01
2003	0.28	0.07	0.22	0.13	**2003**	0.14	0.05	0.17	0.07
2004	0.23	0.06	0.29	0.18	**2004**	0.17	0.09	0.12	0.04
2005	0.22	0.08	0.27	0.12	**2005**	0.17	0.06	0.16	0.05
2006	0.33	0.08	0.92	0.34	**2006**	0.18	0.10	0.15	0.09
2007	0.29	0.09	0.52	0.21	**2007**	0.71	0.39	0.28	0.08
2008	0.35	0.11	0.63	0.27	**2008**	0.70	0.18	0.73	0.23
2009	0.59	0.15	0.90	0.32	**2009**	0.48	0.10	0.53	0.24
2010	0.58	0.11	0.63	0.14	**2010**	0.31	0.08	0.53	0.13





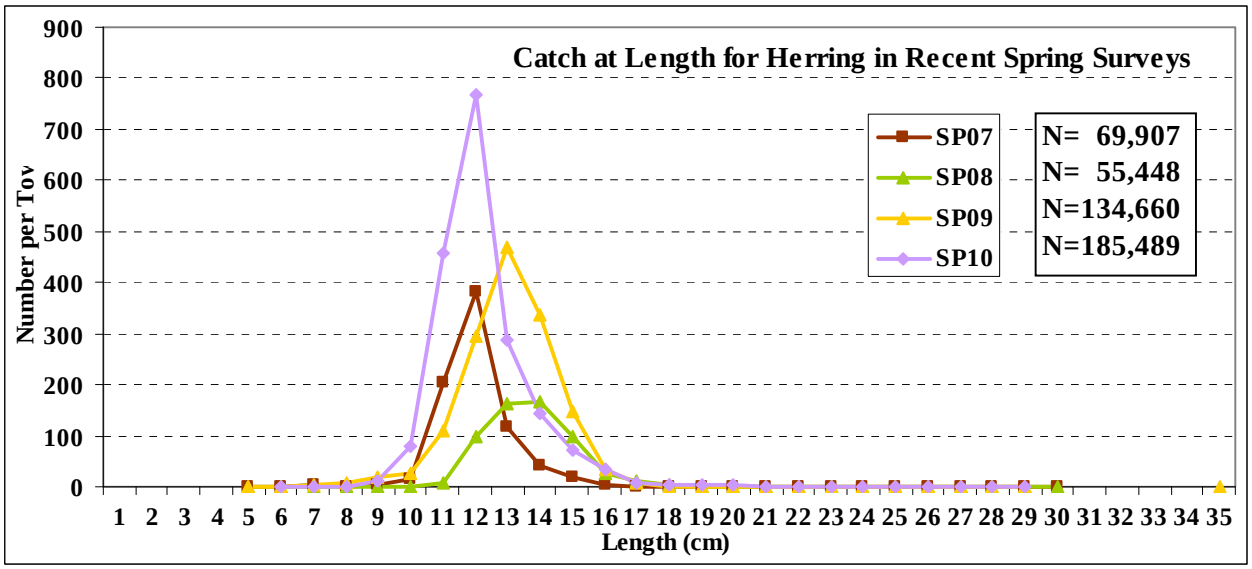
Atlantic herring, *Clupea harengus*

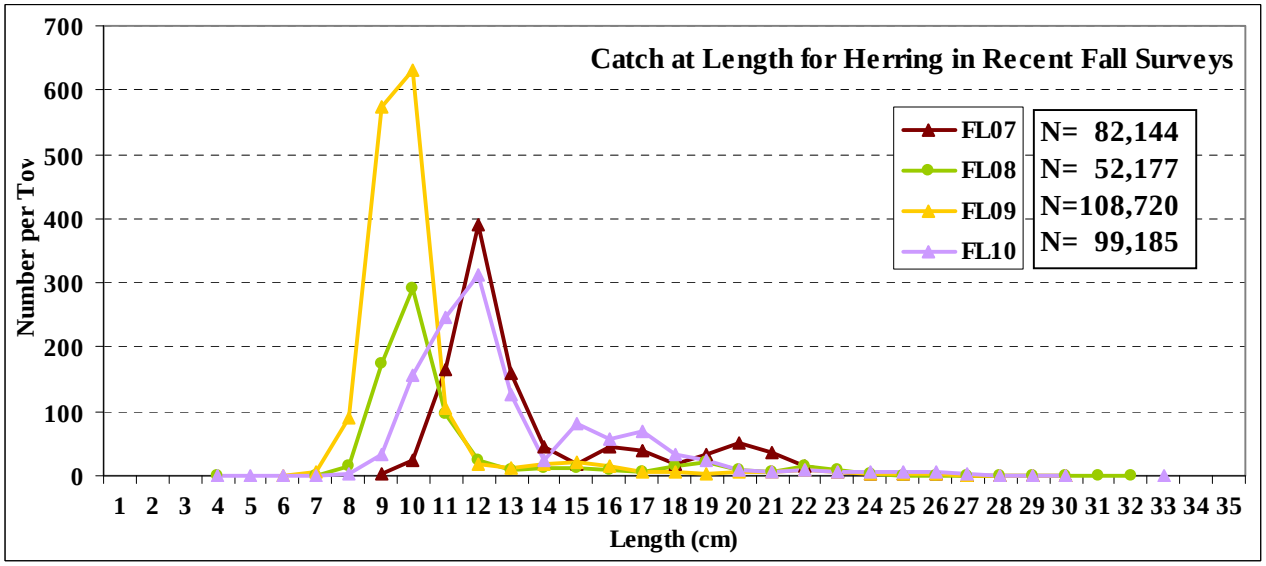




Means and standard error for graphs overlaid on distribution maps
fixed stations not included
for herring, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

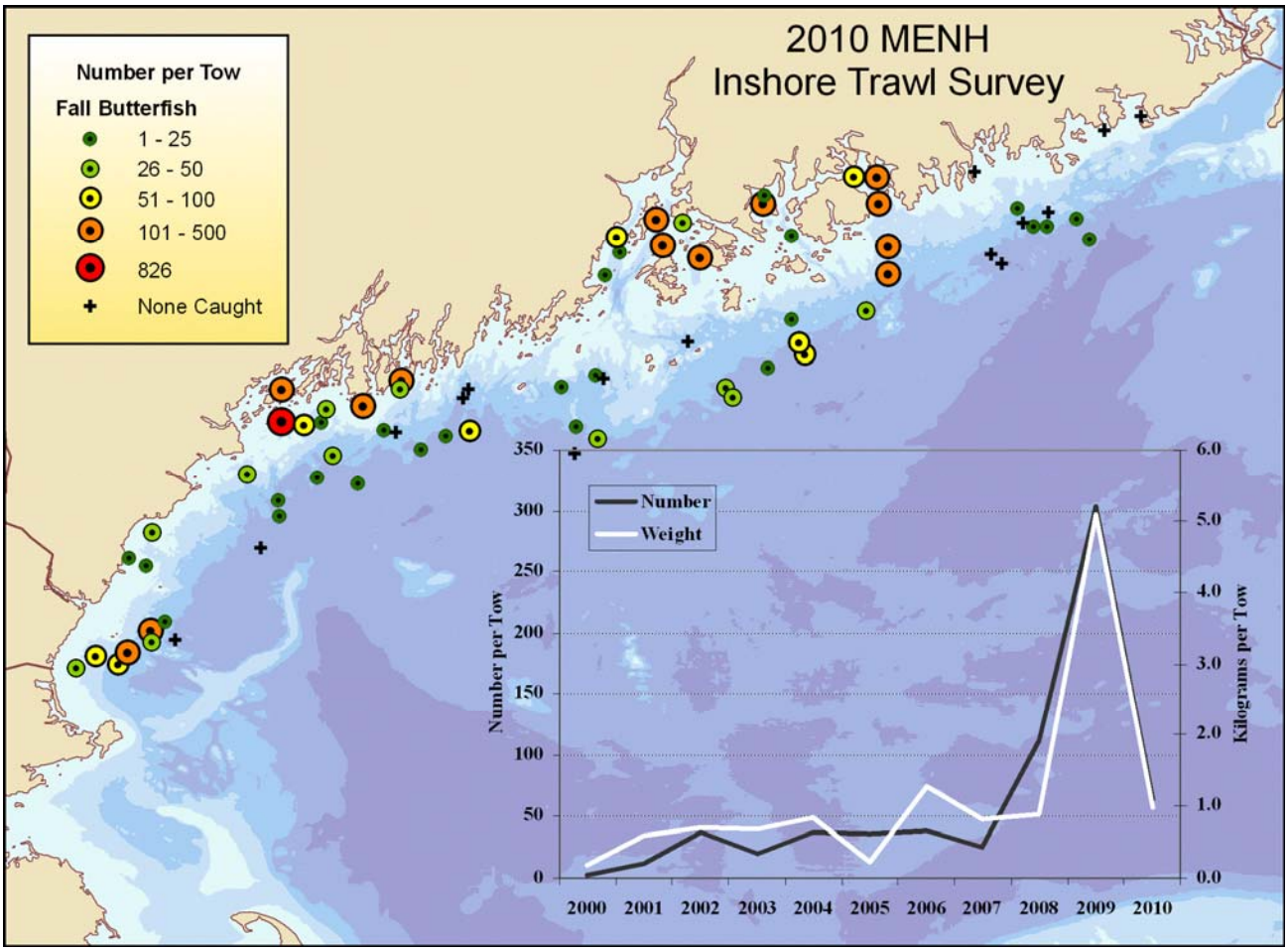
SPRING	Stratified Mean Number		Weight		FALL	Stratified Mean Number		Weight	
	Mean	Error	Mean	Error		Mean	Error	Mean	Error
					2000	819.97	280.03	12.42	2.99
2001	863.57	320.16	17.43	6.35	**2001**	647.59	257.07	12.83	5.45
2002	907.86	277.64	18.16	5.12	**2002**	1457.21	583.46	18.15	6.45
2003	1734.75	451.80	36.64	9.17	**2003**	376.73	184.61	8.71	5.23
2004	1709.26	394.93	32.81	7.04	**2004**	633.36	206.06	24.47	11.50
2005	810.78	285.45	15.25	4.24	**2005**	928.07	248.14	16.44	6.37
2006	1383.08	320.83	28.35	6.04	**2006**	461.44	86.01	5.26	1.22
2007	800.47	279.69	13.16	4.45	**2007**	1059.36	284.90	26.78	13.05
2008	582.13	97.32	13.40	2.16	**2008**	730.87	195.77	13.58	5.61
2009	1461.51	401.06	26.99	7.71	**2009**	1542.49	361.47	18.32	4.58
2010	1877.75	292.24	31.58	4.85	**2010**	1221.33	316.57	27.12	7.01



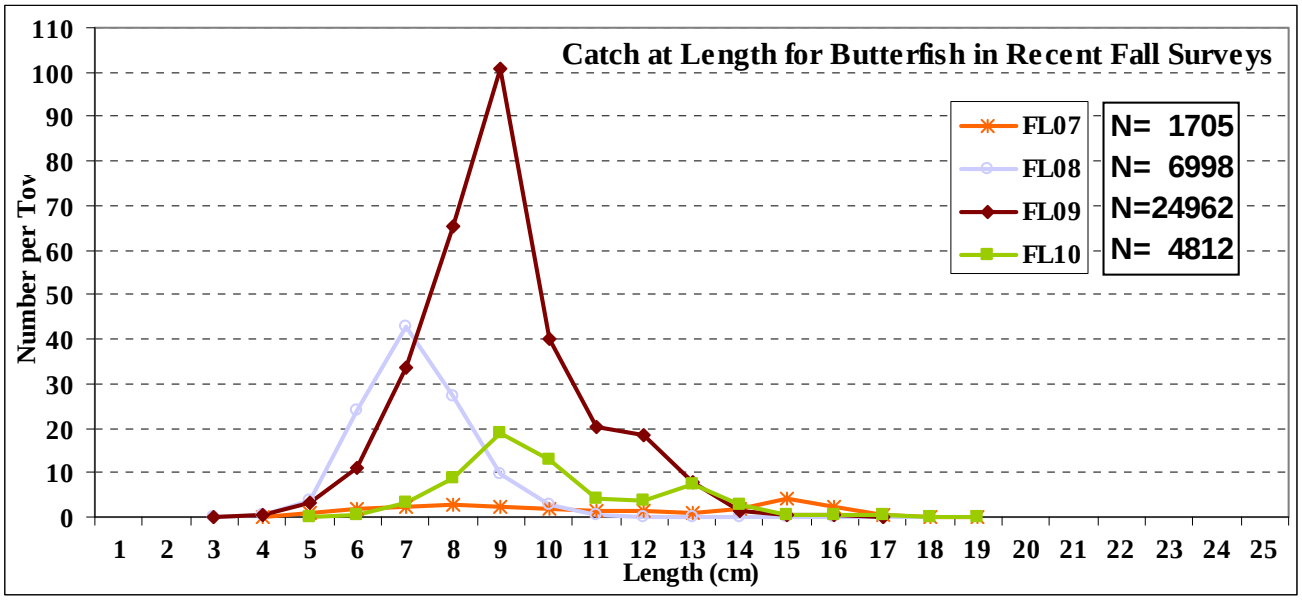


Butterfish, *Peprilus tricanthus*

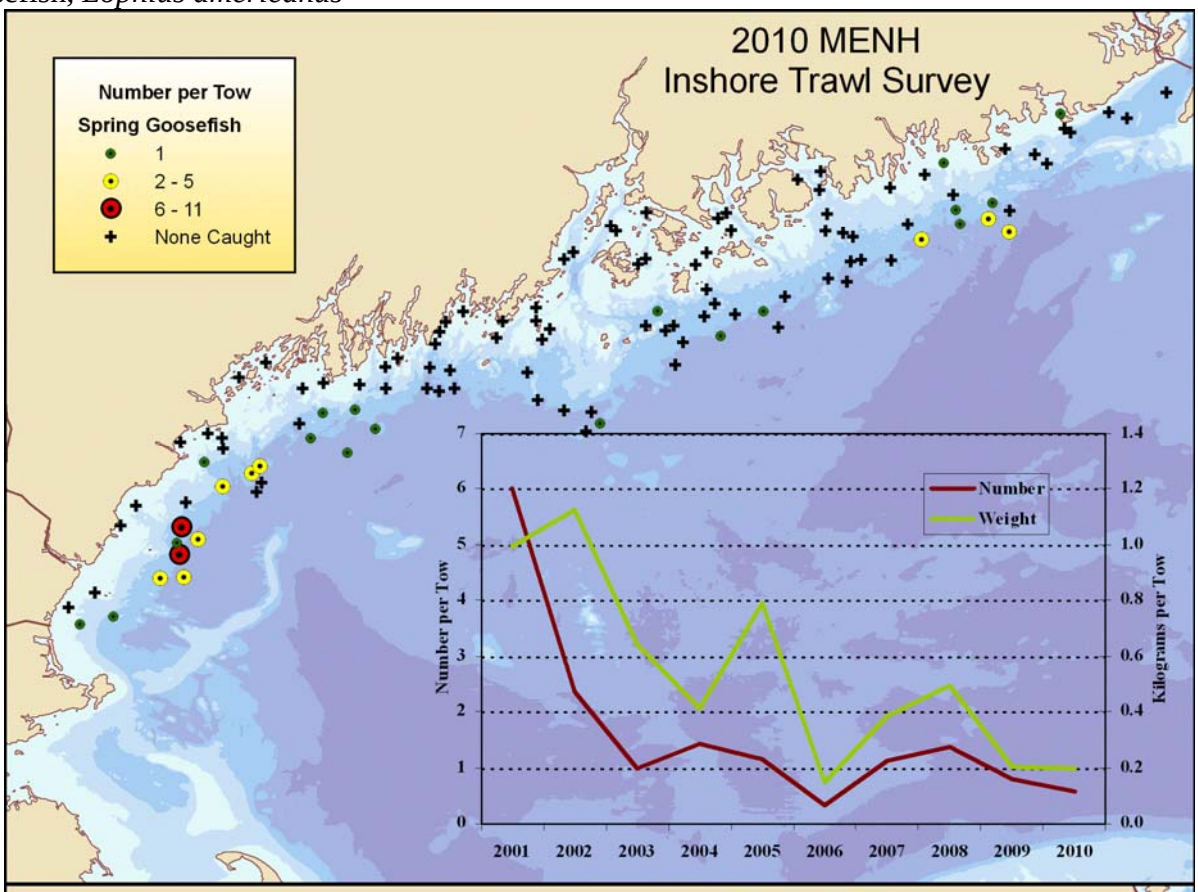
Butterfish are fairly rare in the spring surveys, a total of 2 fish were caught in 2001, 3 in 2002, then nothing until 2006 where 13 fish were caught, 15 in 2007, 3 in spring 2008, none in 2009, and 35 in 2010. Shown here are fall catches.

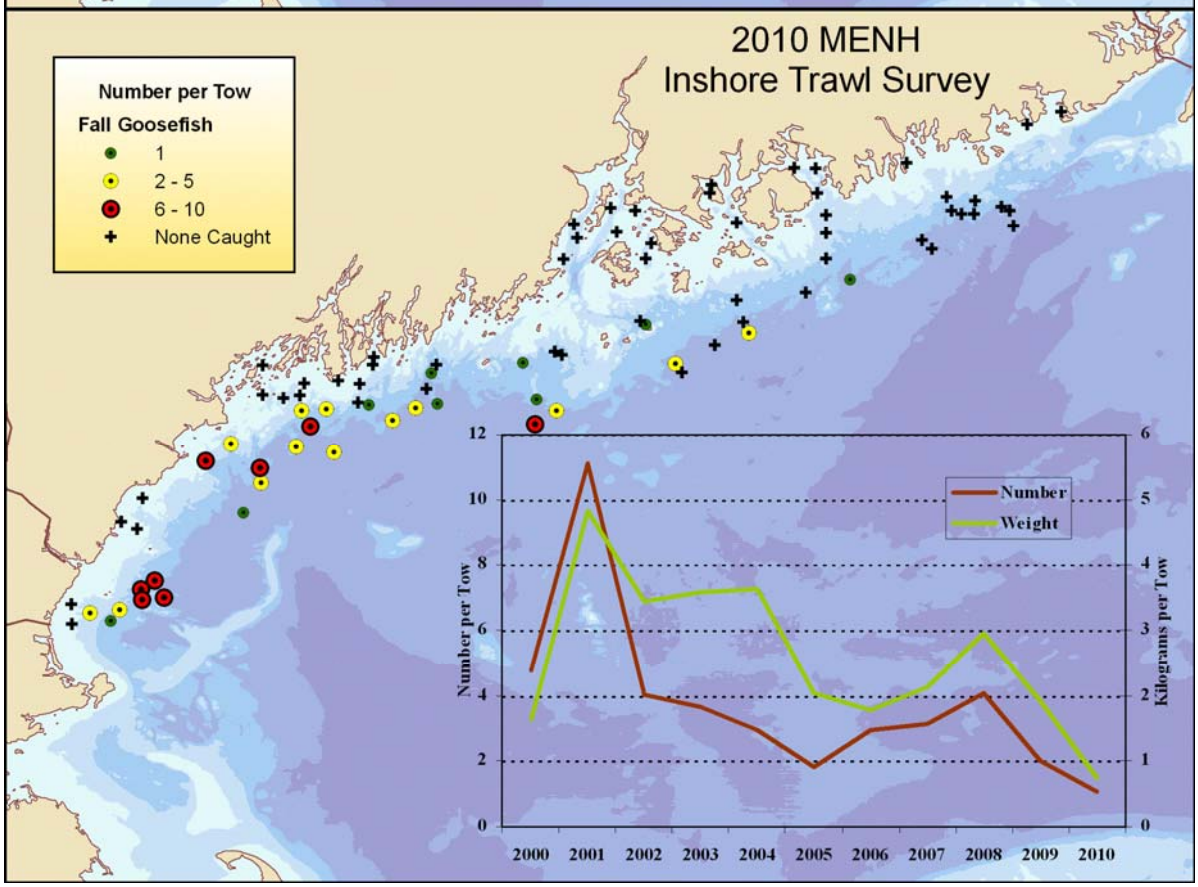


Means and standard error for graphs overlaid on distribution maps				
FALL				
Fixed stations not included				
for butterfish, indices calculated for regions 1 through 5				
strata 1 through 4 (2003 on)				
	Stratified Mean			
	Number		**Weight**	
	Mean	**Error**	**Mean**	**Error**
2000	2.26	0.78	0.18	0.07
2001	11.67	4.38	0.60	0.23
2002	37.92	13.73	0.71	0.21
2003	19.65	4.50	0.86	0.12
2004	37.60	5.91	1.06	0.34
2005	36.16	21.37	0.29	0.13
2006	38.91	10.93	1.55	0.56
2007	24.85	3.71	0.92	0.11
2008	112.10	42.00	1.14	0.37
2009	303.32	50.56	5.08	0.75
2010	63.24	12.26	0.98	0.15



Goosefish, *Lophius americanus*





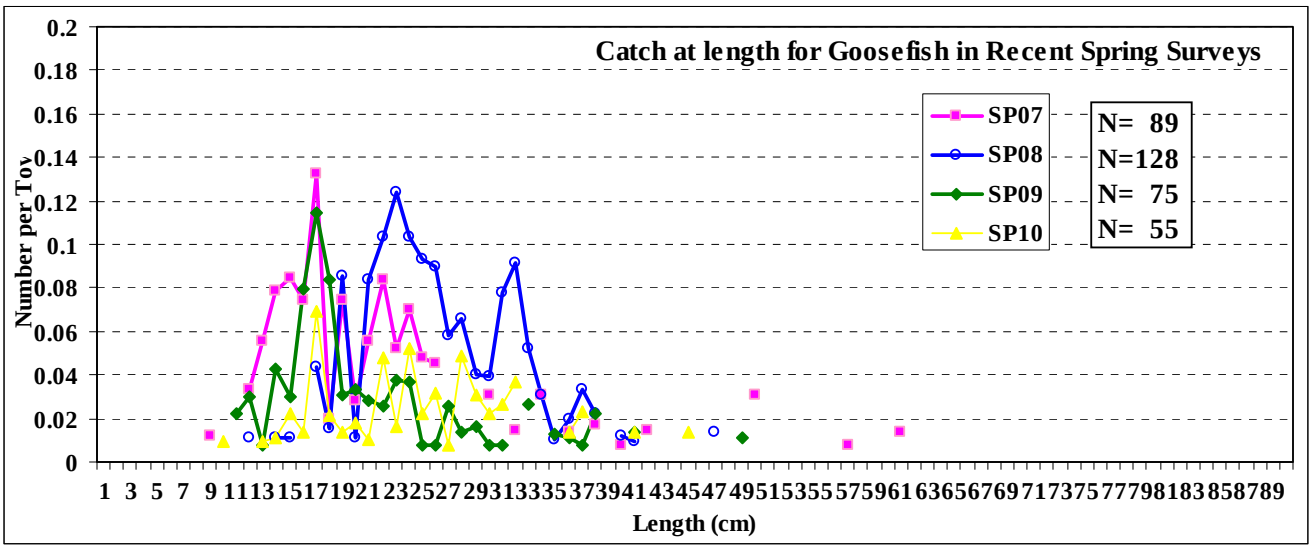
Means and standard error for graphs overlain on distribution maps
fixed stations not included
for goosefish, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

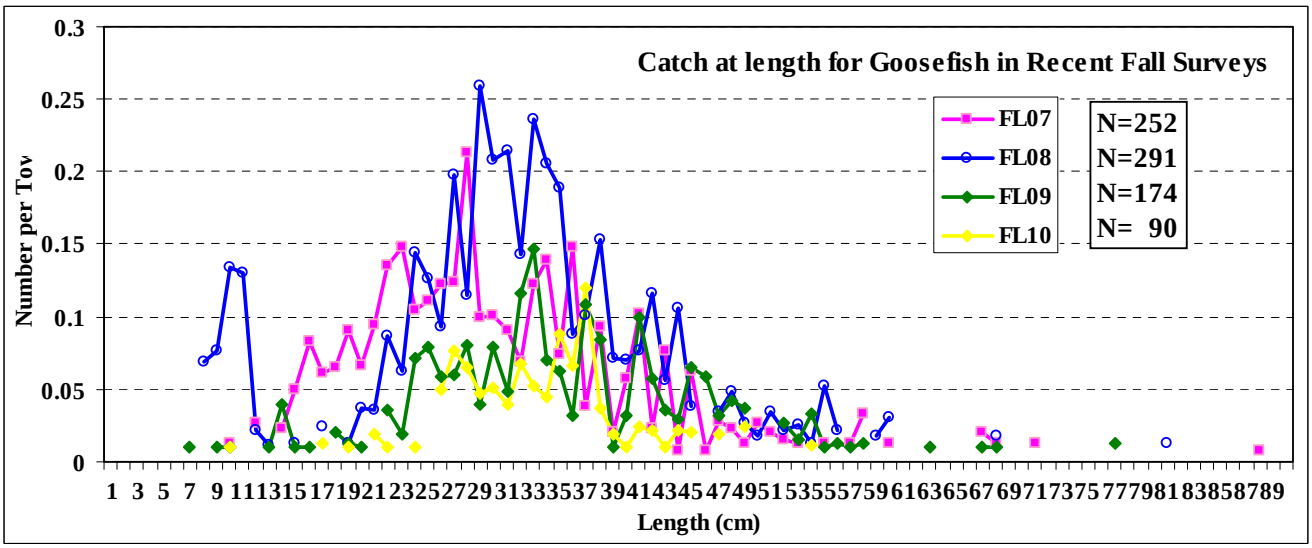
SPRING

	Stratified Mean Number		Weight	
	Mean	**SE**	**Mean**	**SE**
2001	6.0	0.91	0.99	0.15
2002	2.4	0.33	1.12	0.17
2003	1.0	0.14	0.64	0.18
2004	1.4	0.17	0.41	0.12
2005	1.1	0.16	0.79	0.15
2006	0.3	0.06	0.15	0.03
2007	1.1	0.18	0.38	0.10
2008	1.37	0.19	0.49	0.08
2009	0.79	0.11	0.20	0.04
2010	0.57	0.10	0.20	0.04

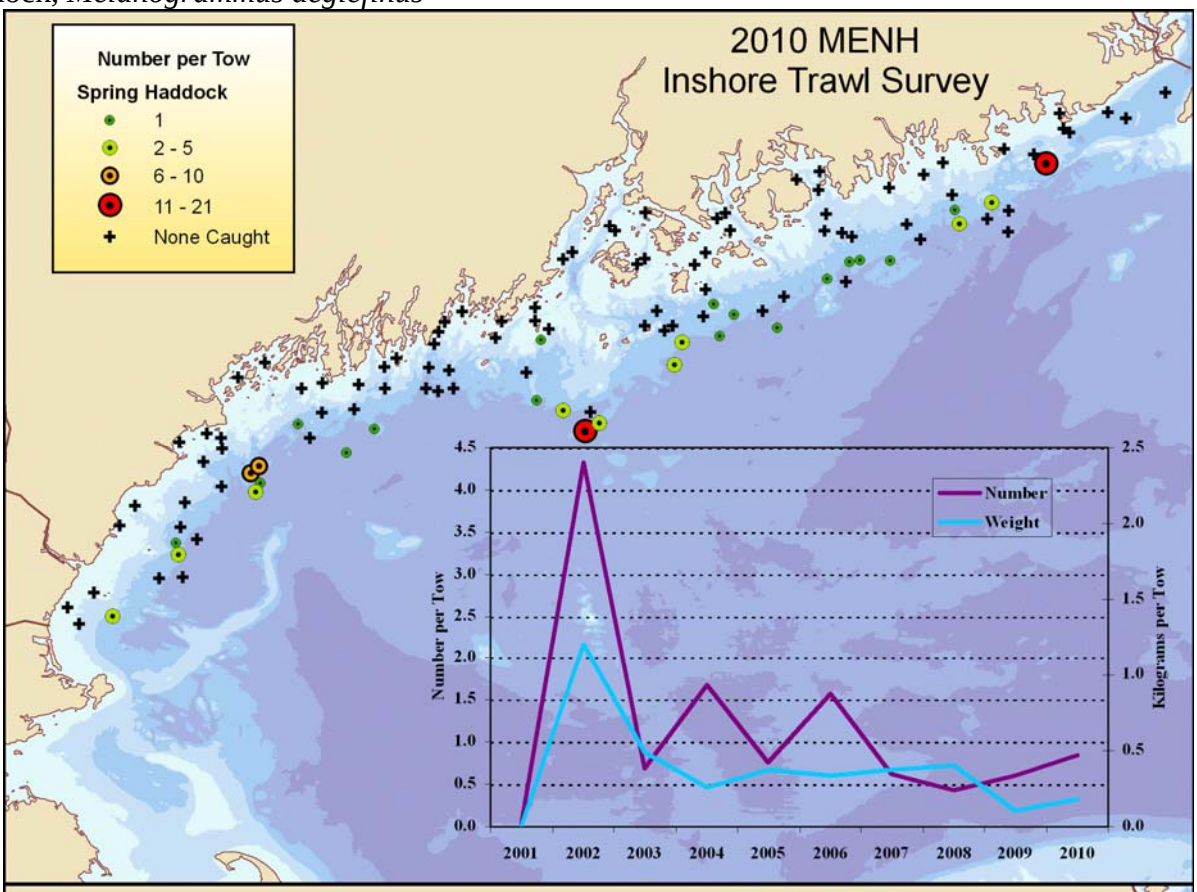
FALL

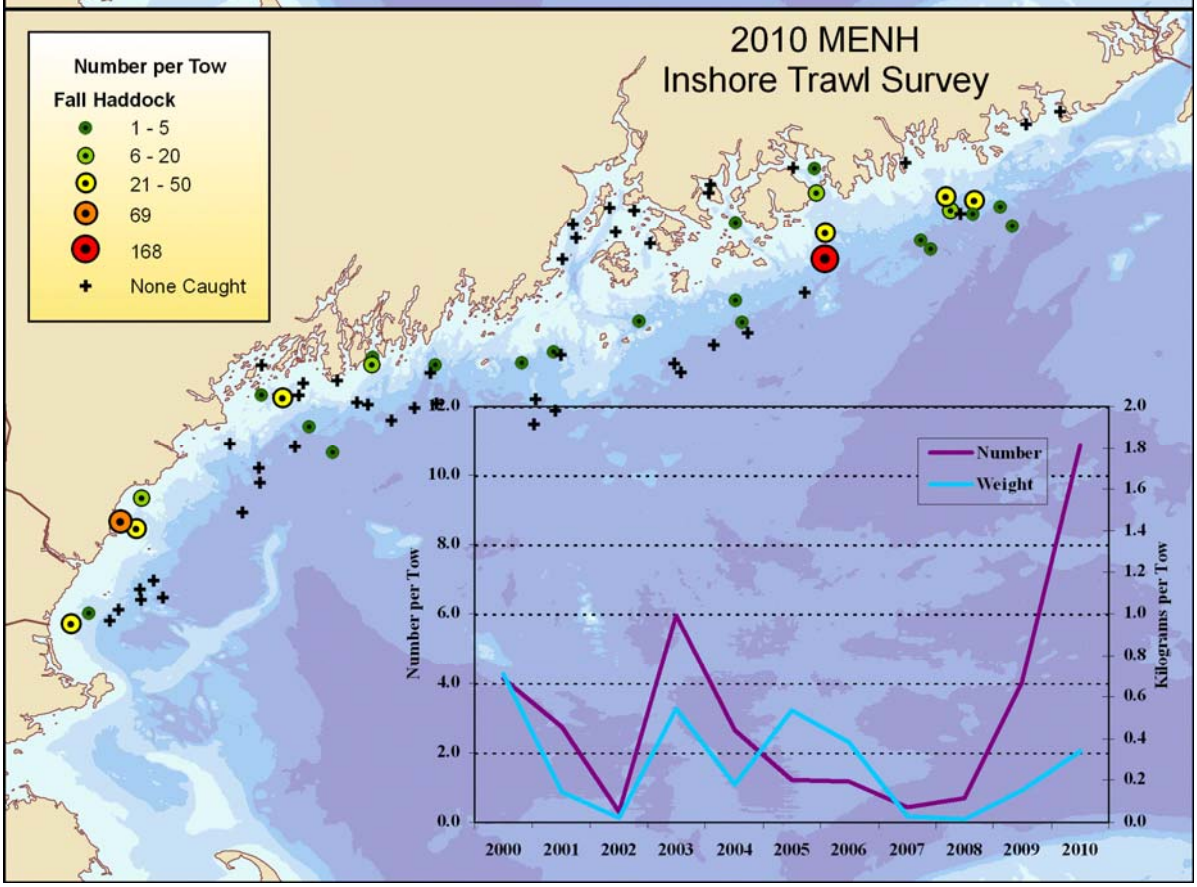
	Stratified Mean Number		Weight	
	Mean	**SE**	**Mean**	**SE**
2000	4.8	0.61	1.65	0.28
2001	11.1	1.56	4.83	0.50
2002	4.1	1.13	3.45	1.14
2003	3.7	0.64	3.60	0.80
2004	3.0	0.52	3.63	0.84
2005	1.8	0.25	2.04	0.47
2006	2.9	0.31	1.79	0.20
2007	3.1	0.43	2.13	0.35
2008	4.10	0.70	2.96	0.41
2009	2.00	0.41	1.93	0.52
2010	1.06	0.17	0.74	0.13





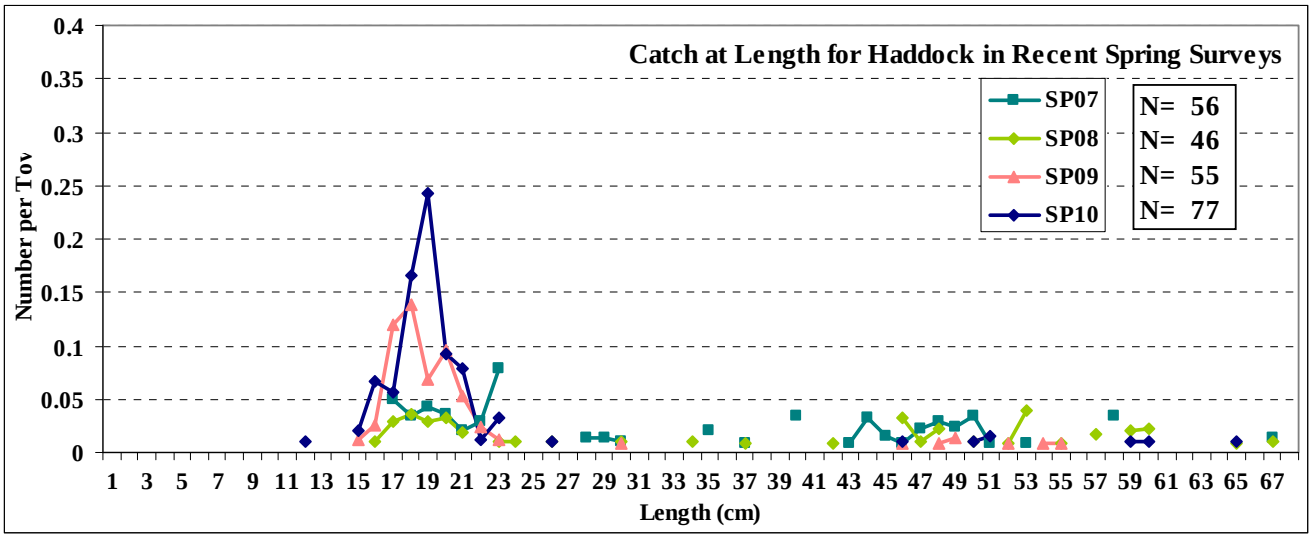
Haddock, *Melanogrammus aeglefinus*

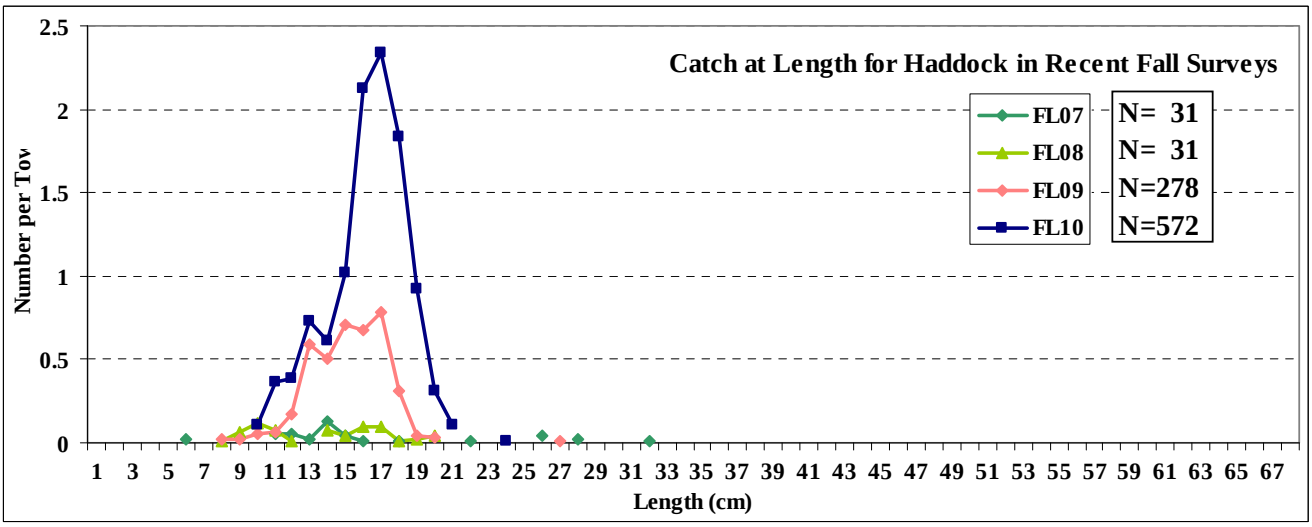




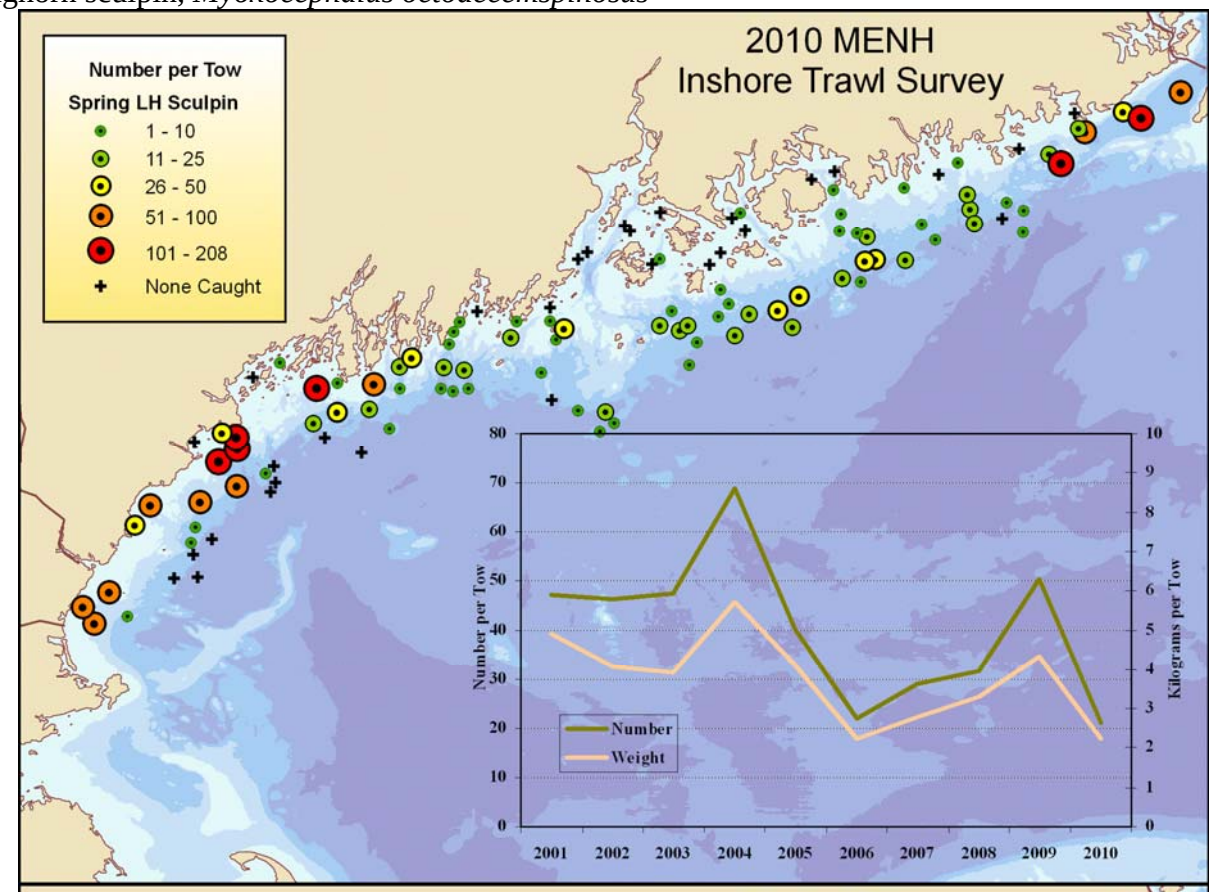
Means and standard errors for graphs overlain on distribution maps
fixed stations not included
for haddock, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

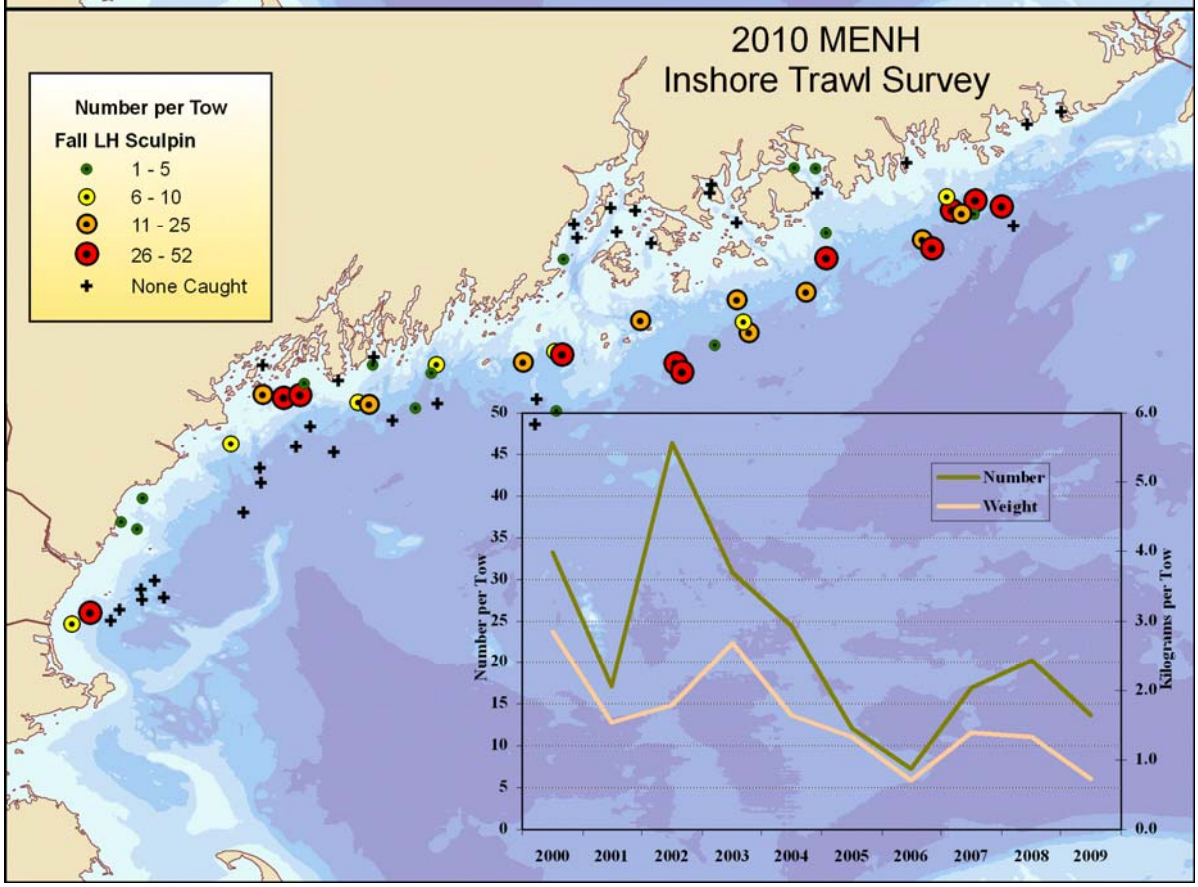
SPRING	Number mean	error	Weight mean	error	FALL	Number mean	error	Weight mean	error
					2000	4.12	1.27	0.71	0.47
2001	0.02	0.02	0.00	0.00	**2001**	2.75	1.35	0.15	0.07
2002	4.33	1.25	1.20	0.32	**2002**	0.29	0.15	0.02	0.02
2003	0.70	0.43	0.49	0.34	**2003**	5.94	3.90	0.54	0.24
2004	1.67	0.66	0.26	0.11	**2004**	2.65	1.04	0.18	0.07
2005	0.77	0.35	0.37	0.24	**2005**	1.23	0.60	0.54	0.52
2006	1.58	1.35	0.33	0.15	**2006**	1.18	0.62	0.38	0.35
2007	0.63	0.20	0.38	0.16	**2007**	0.44	0.23	0.03	0.01
2008	0.43	0.17	0.40	0.17	**2008**	0.68	0.26	0.02	0.01
2009	0.61	0.23	0.10	0.04	**2009**	3.99	1.24	0.15	0.06
2010	0.85	0.37	0.19	0.08	**2010**	10.86	3.97	0.34	0.11





Longhorn sculpin, *Myoxocephalus octodecemspinosus*





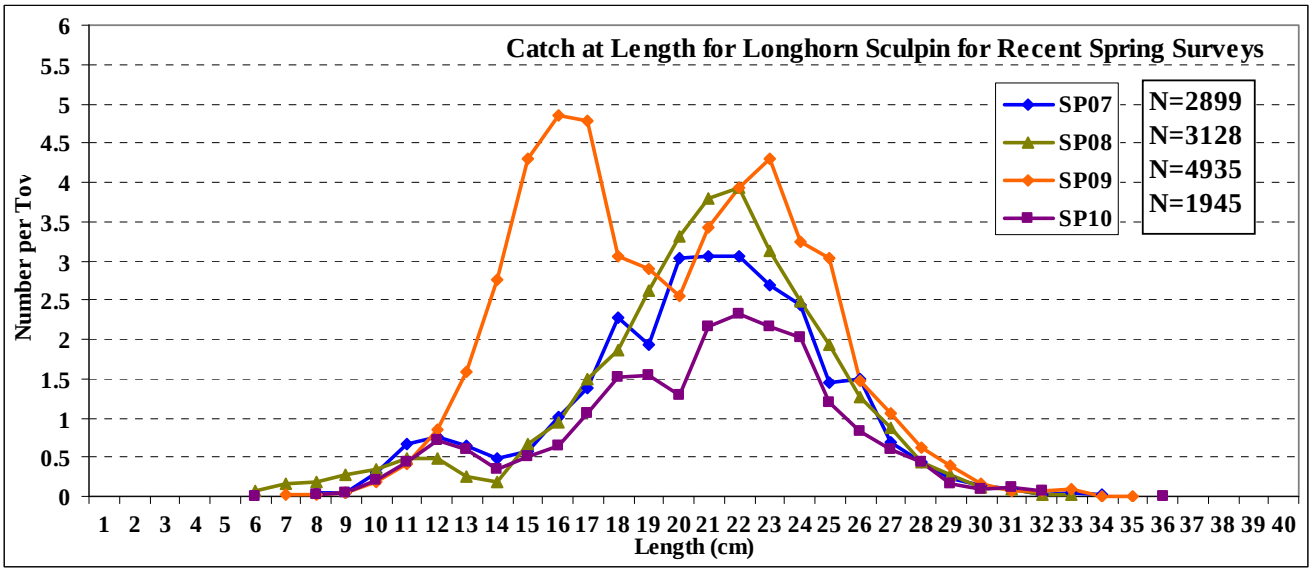
Means and standard errors for graphs overlain on distribution maps
fixed stations not included
for LH Sculpin, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

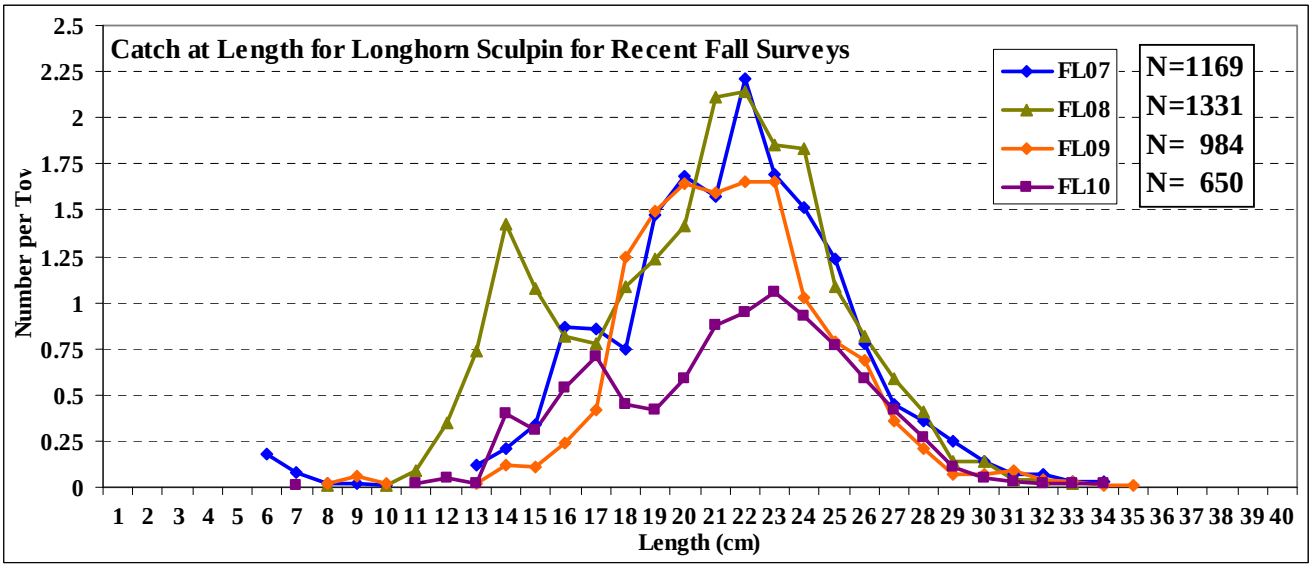
SPRING
Stratified Mean

	Number Mean	SE	Weight Mean	SE
2001	47.28	5.67	4.91	0.53
2002	46.37	7.31	4.07	0.53
2003	47.45	5.25	3.93	0.50
2004	68.73	5.83	5.70	0.50
2005	40.17	3.90	4.10	0.37
2006	21.86	3.79	2.22	0.34
2007	29.00	5.01	2.77	0.46
2008	31.61	3.51	3.28	0.39
2009	50.34	7.59	4.33	0.51
2010	21.08	3.26	2.25	0.32

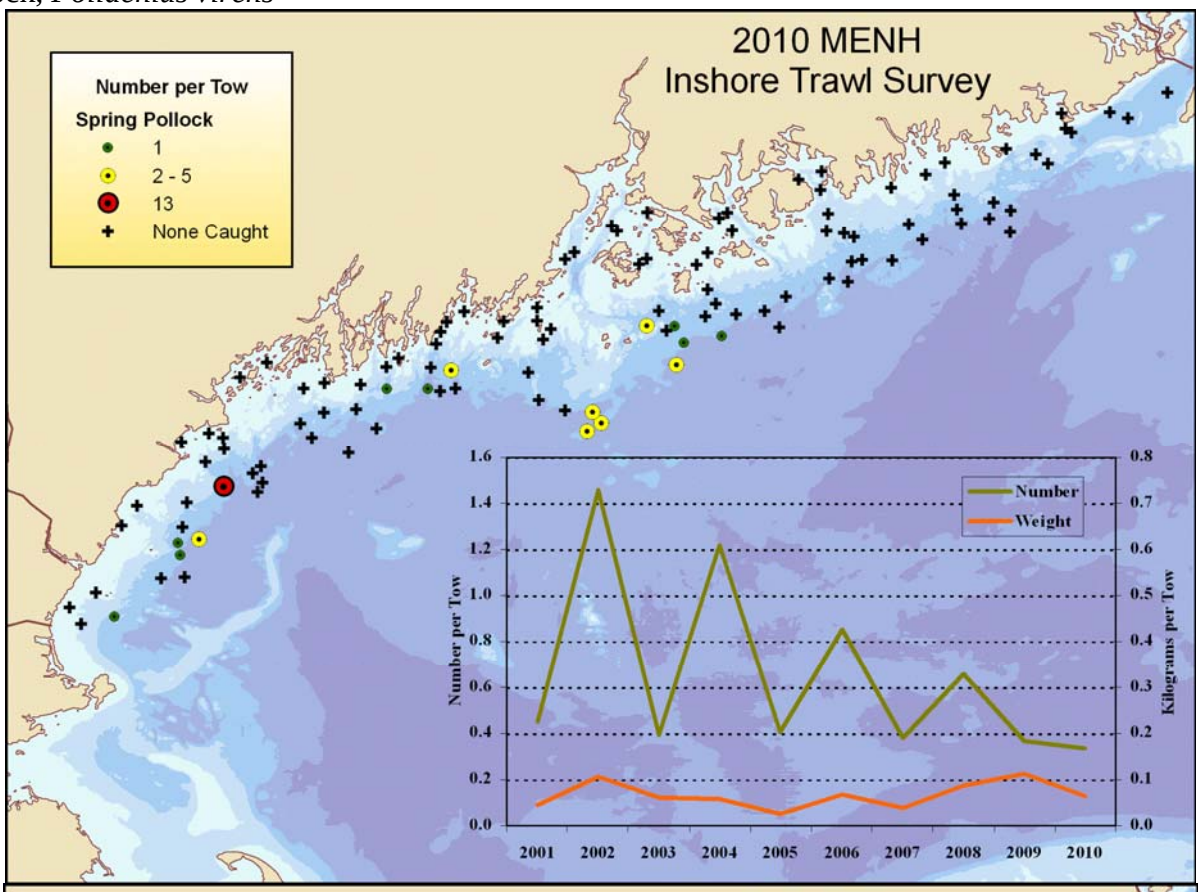
FALL
Stratified Mean

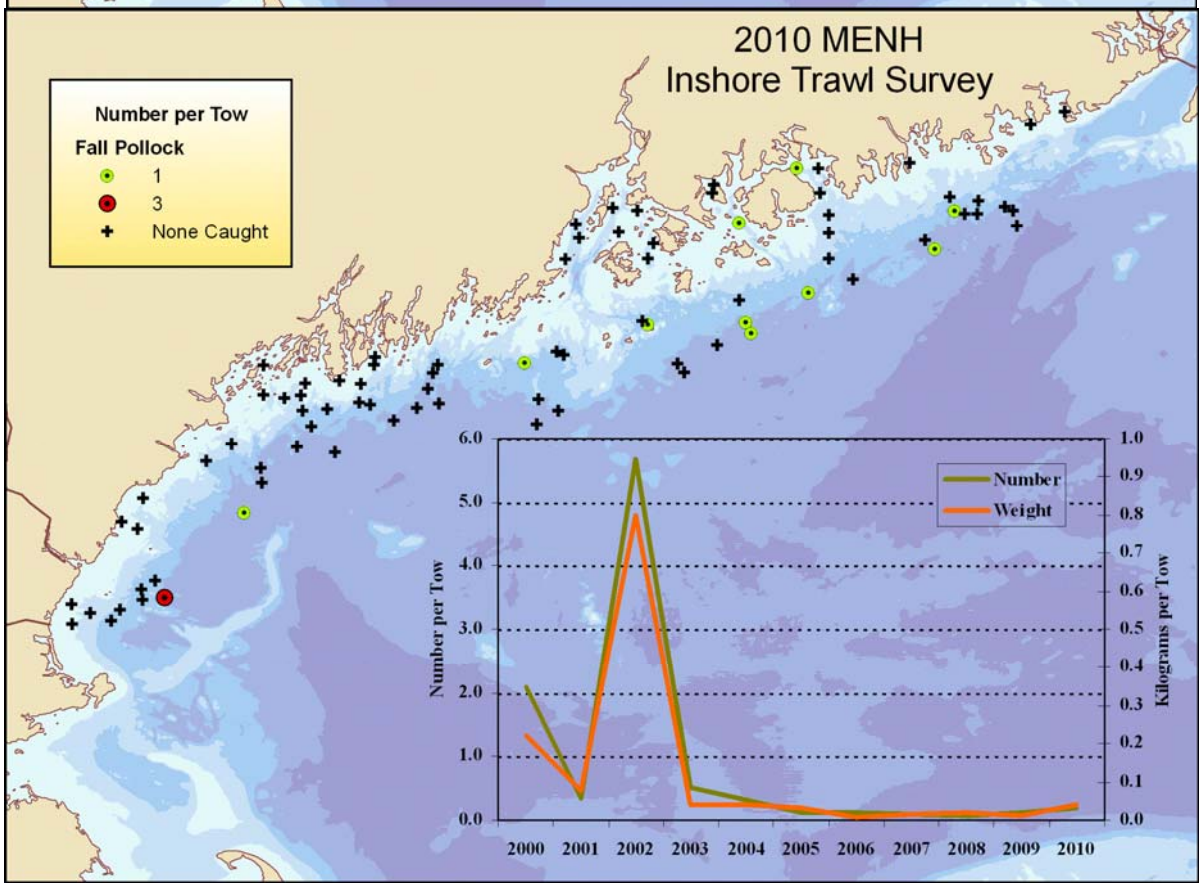
	Number Mean	SE	Weight Mean	SE
2000	33.27	7.82	2.84	0.38
2001	17.05	4.05	1.53	0.32
2002	46.40	8.24	1.79	0.51
2003	30.72	1.73	2.69	0.17
2004	24.45	4.55	1.64	0.29
2005	12.20	2.89	1.32	0.28
2006	7.27	0.97	0.70	0.10
2007	17.00	3.33	1.40	0.28
2008	20.25	3.00	1.32	0.26
2009	13.68	1.81	0.72	0.14
2010	9.62	1.33	0.54	0.10





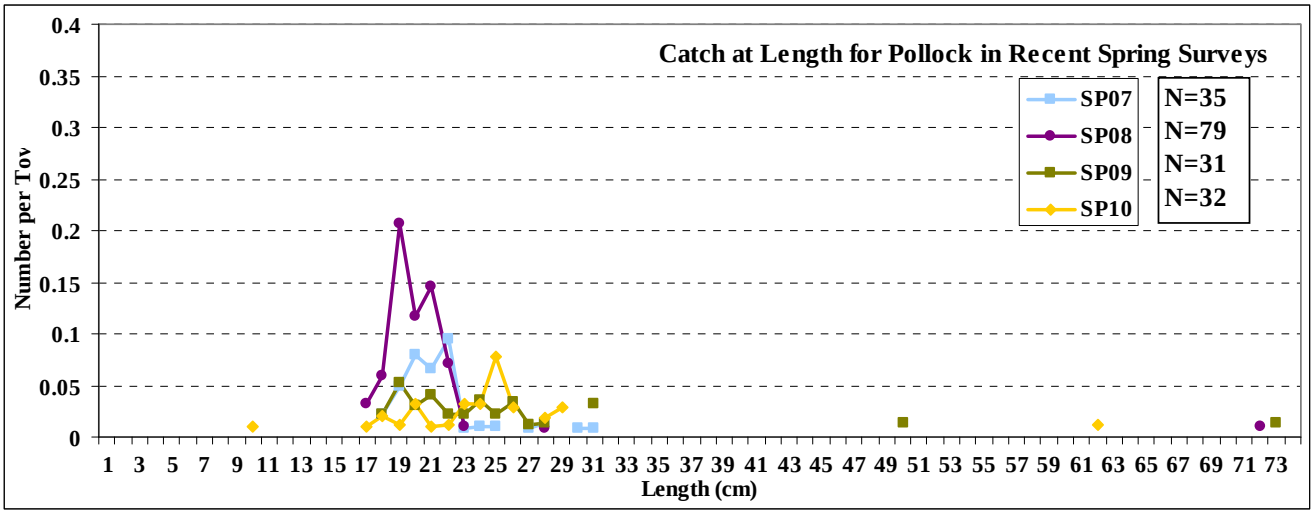
Pollock, *Pollachius virens*

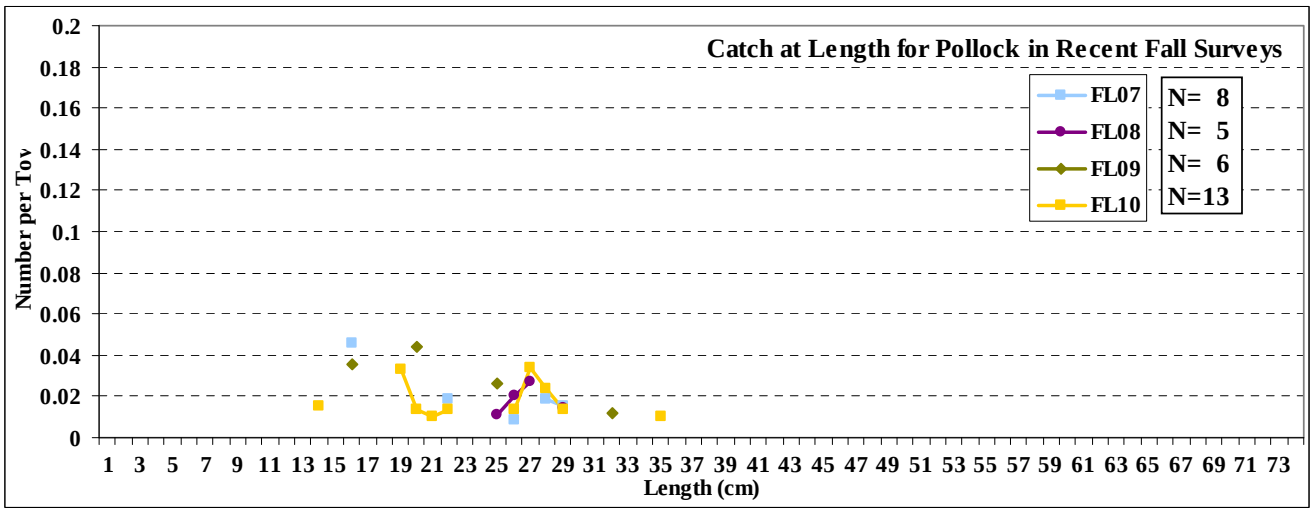




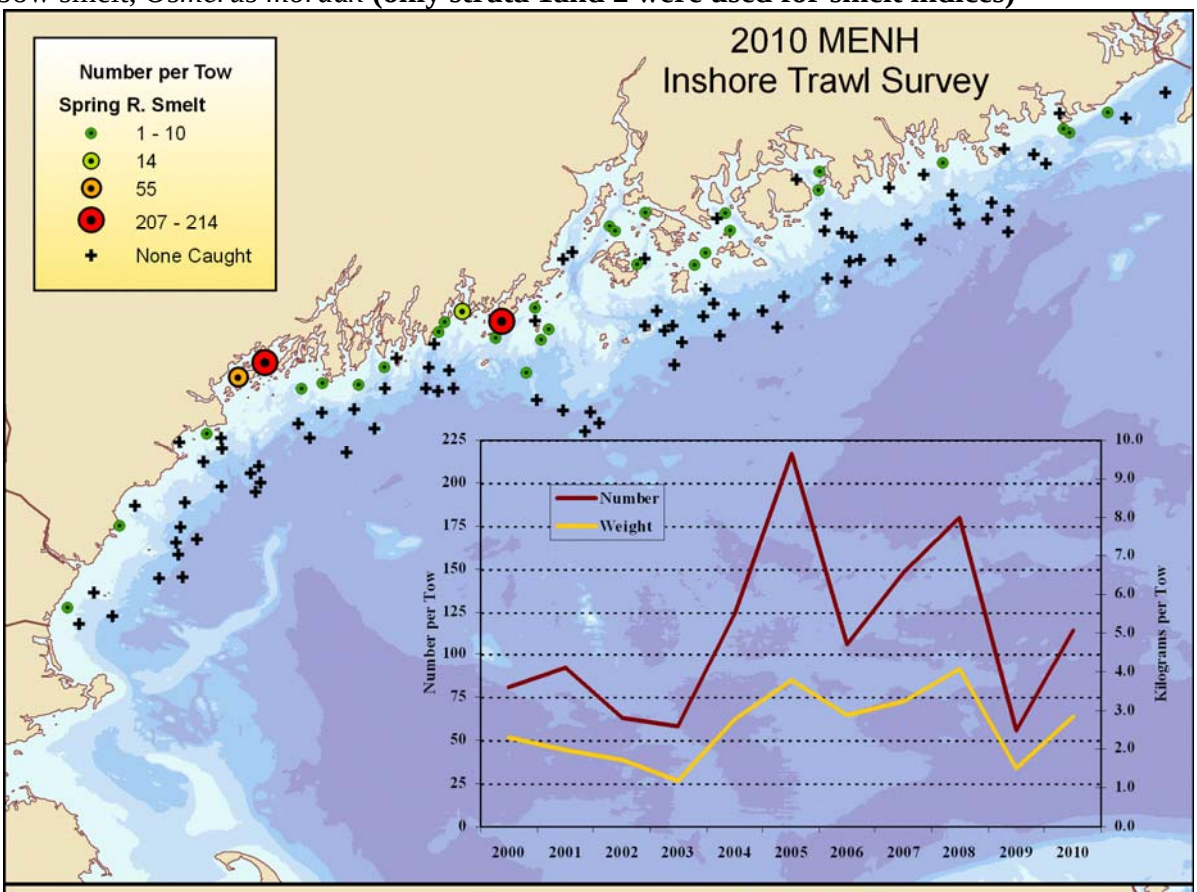
Mean and standard error for graphs overlain on distribution maps
fixed stations not included
for pollock, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

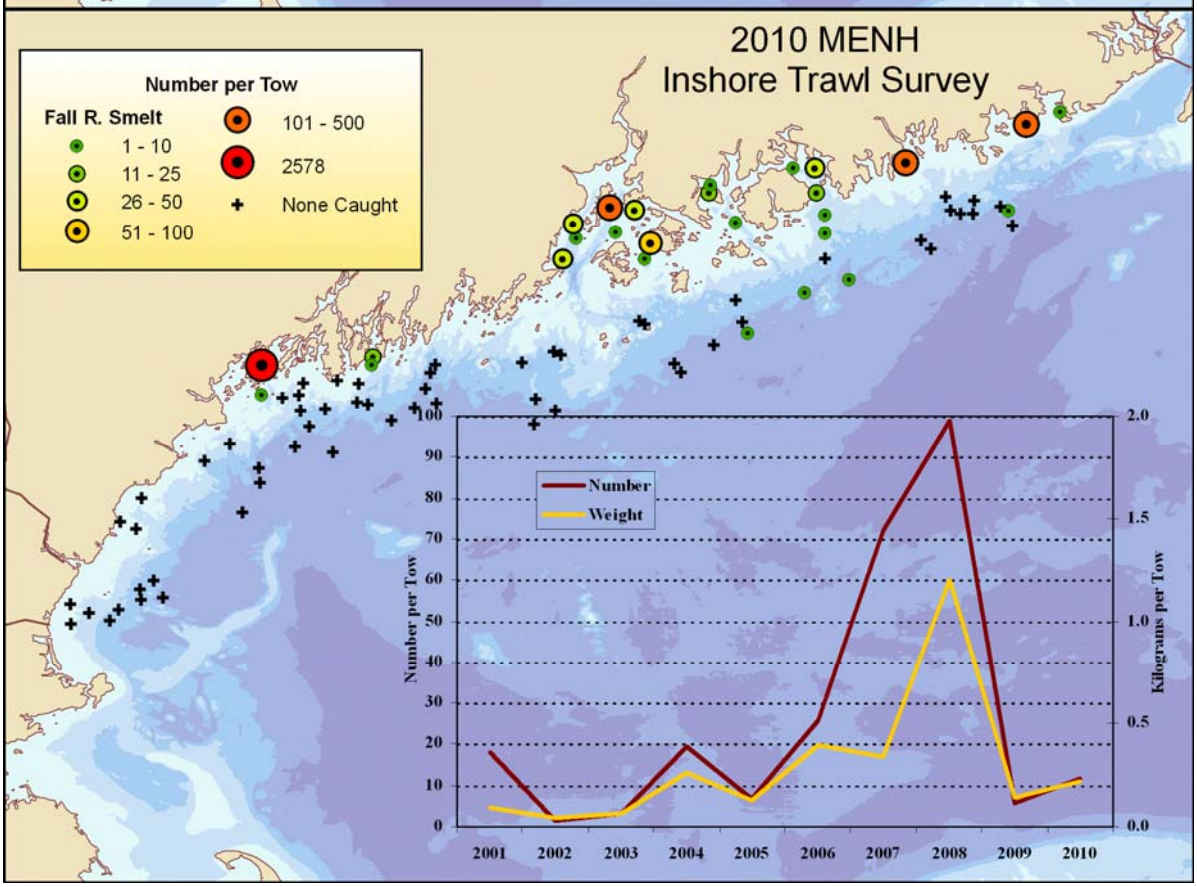
SPRING	Stratified Mean Number		Weight		FALL	Stratified Mean Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	2.08	1.10	0.22	0.06
2001	0.45	0.159	0.05	0.02	**2001**	0.33	0.09	0.08	0.02
2002	1.46	0.455	0.11	0.03	**2002**	5.68	4.03	0.80	0.60
2003	0.40	0.132	0.06	0.04	**2003**	0.51	0.19	0.04	0.02
2004	1.22	0.370	0.06	0.02	**2004**	0.31	0.11	0.04	0.01
2005	0.41	0.377	0.03	0.02	**2005**	0.13	0.06	0.03	0.02
2006	0.85	0.464	0.07	0.04	**2006**	0.13	0.06	0.01	0.00
2007	0.38	0.223	0.04	0.02	**2007**	0.11	0.05	0.02	0.01
2008	0.66	0.476	0.09	0.05	**2008**	0.07	0.03	0.02	0.01
2009	0.37	0.13	0.113	0.071	**2009**	0.12	0.05	0.01	0.01
2010	0.34	0.13	0.063	0.032	**2010**	0.19	0.06	0.04	0.01





Rainbow smelt, *Osmerus mordax* **(only strata 1and 2 were used for smelt indices)**





Mean and standard error for graphs overlain on distribution maps for smelt, indices calculated for regions 1 through 5; Strata 1 and 2

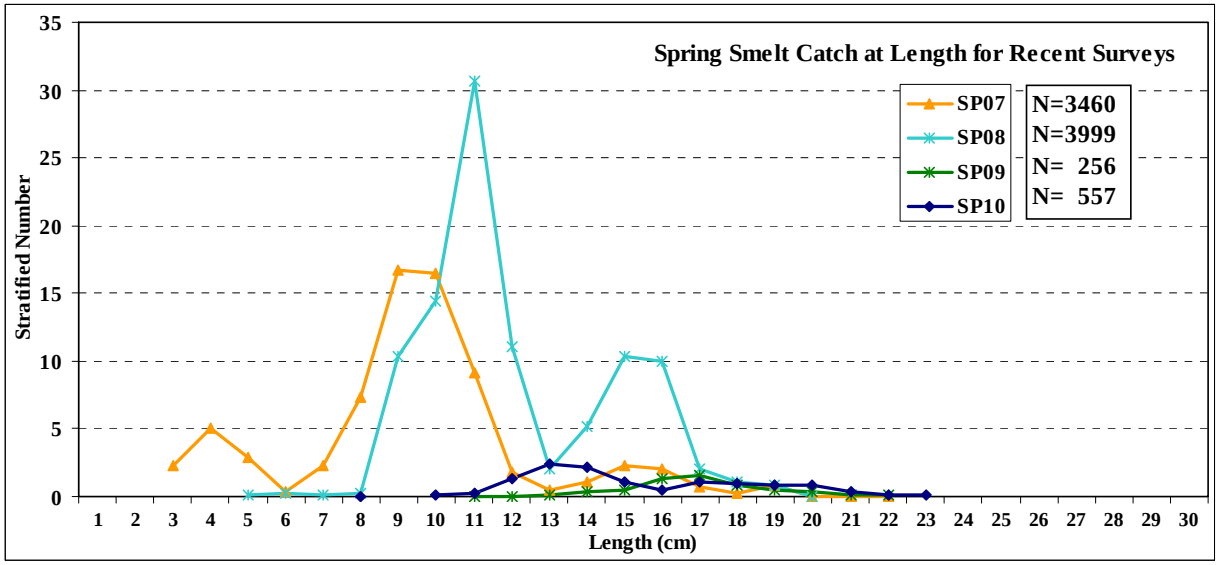
fixed stations not included

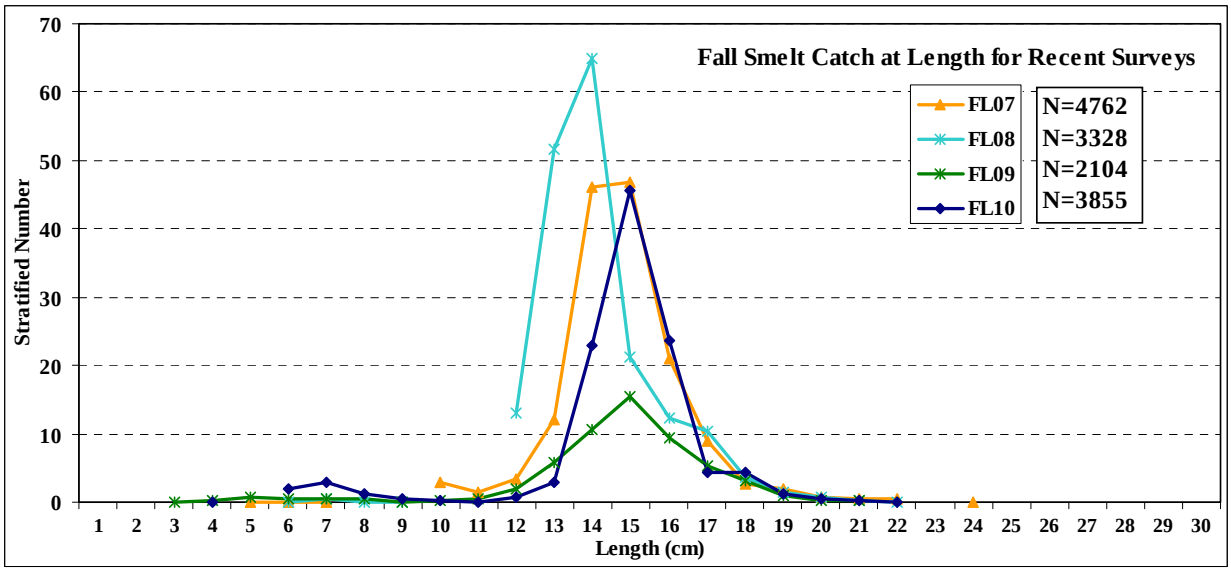
SPRING

	Stratified Mean Number		Weight	
	Mean	SE	Mean	SE
2001	18.07	11.76	0.09	0.05
2002	1.34	0.53	0.04	0.02
2003	3.20	1.16	0.06	0.02
2004	19.50	10.88	0.26	0.12
2005	6.68	2.14	0.13	0.06
2006	25.62	9.20	0.40	0.14
2007	72.07	37.68	0.34	0.14
2008	98.81	78.88	1.20	0.91
2009	5.59	2.05	0.14	0.05
2010	11.74	6.10	0.22	0.11

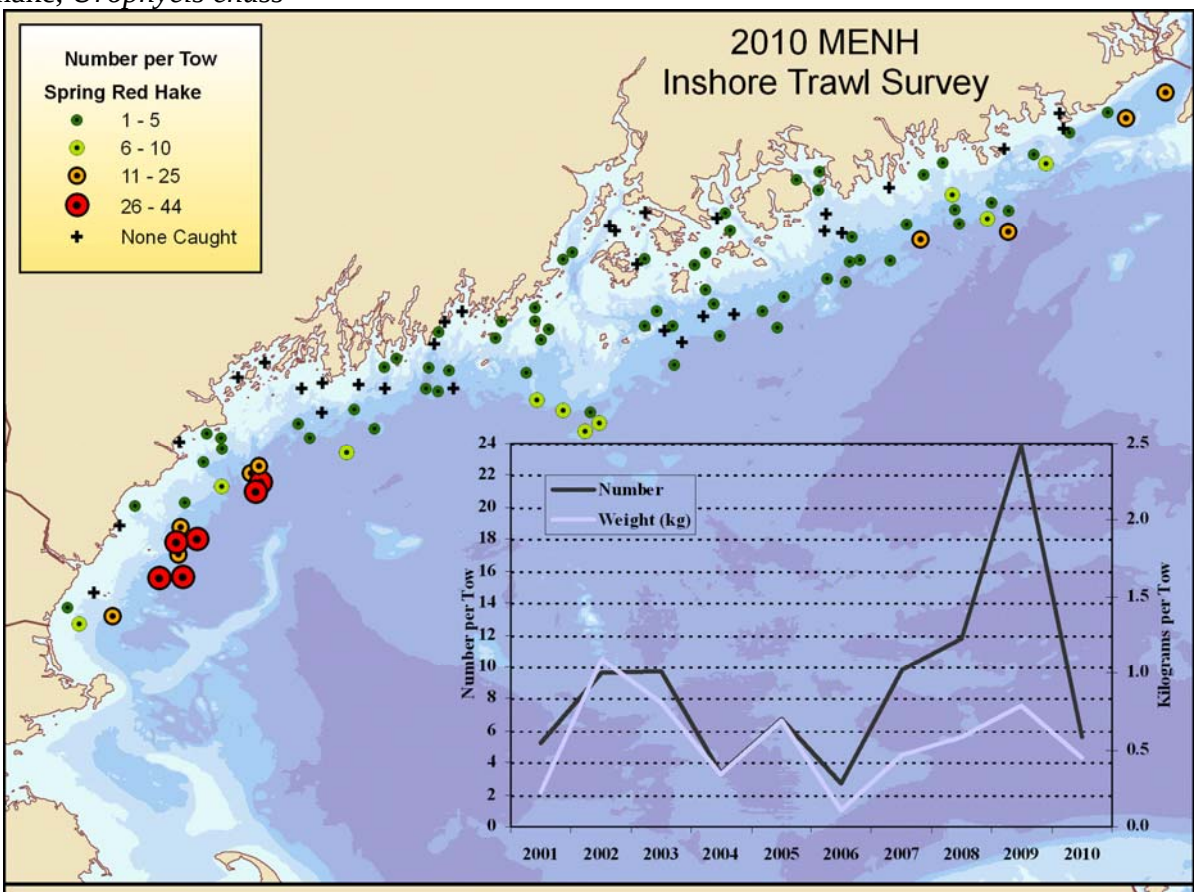
FALL

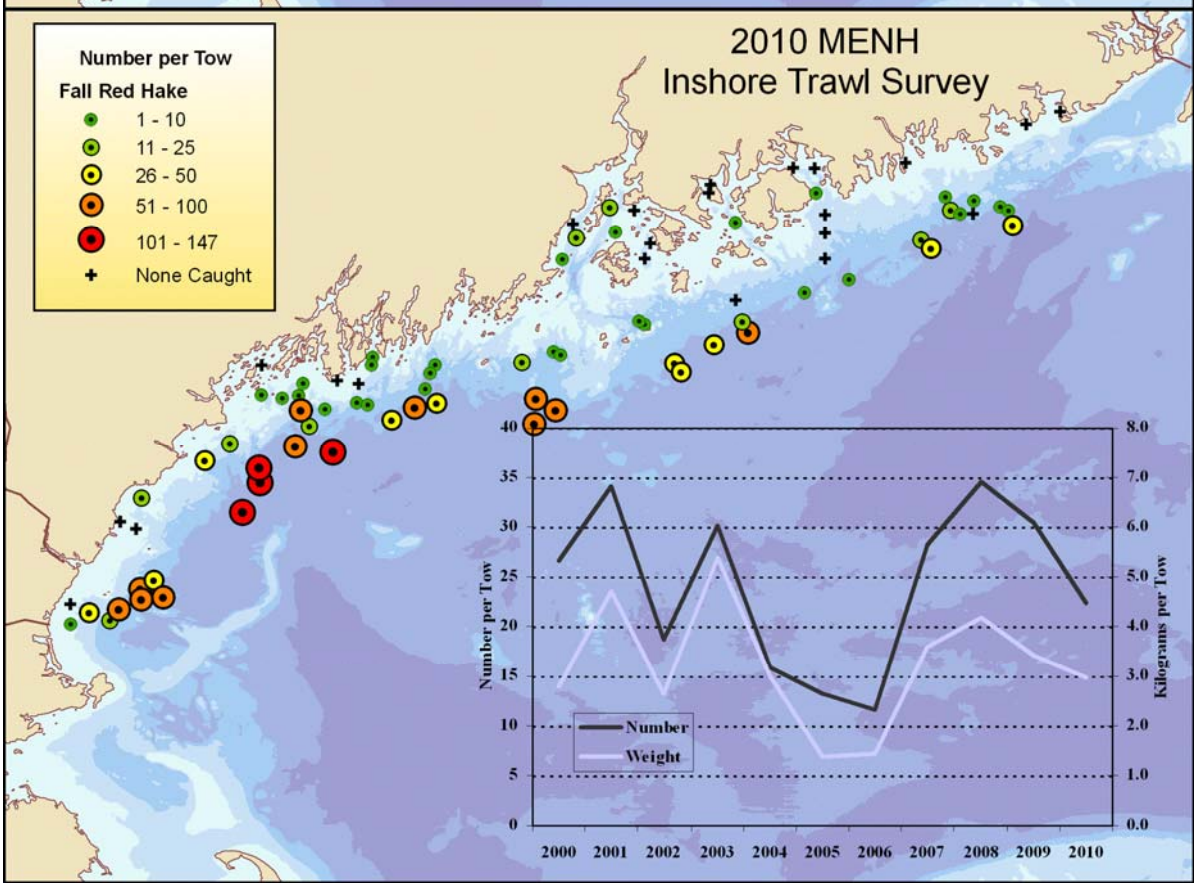
	Stratified Mean Number		Weight	
	Mean	SE	Mean	SE
2000	81.00	38.77	2.32	1.28
2001	91.94	17.99	1.99	0.41
2002	63.24	49.51	1.74	1.32
2003	58.18	16.65	1.20	0.35
2004	123.81	42.44	2.77	0.92
2005	217.23	48.69	3.76	0.97
2006	105.85	58.25	2.89	1.39
2007	148.49	85.05	3.25	1.70
2008	179.87	156.18	4.07	3.34
2009	56.05	20.44	1.52	0.61
2010	113.81	81.07	2.83	2.11





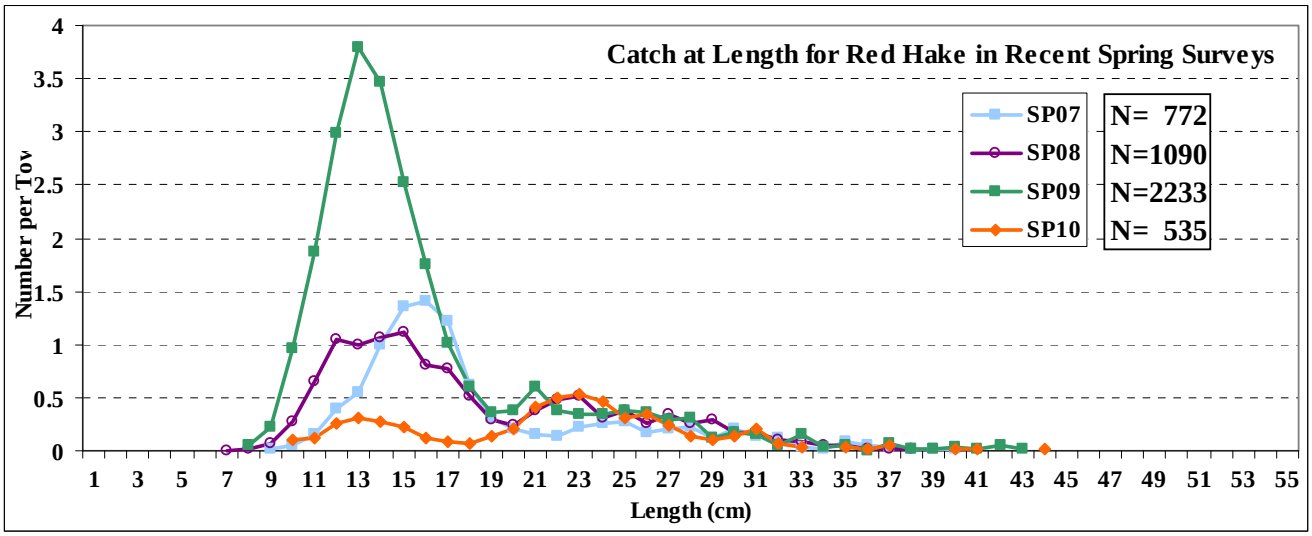
Red hake, *Urophycis chuss*

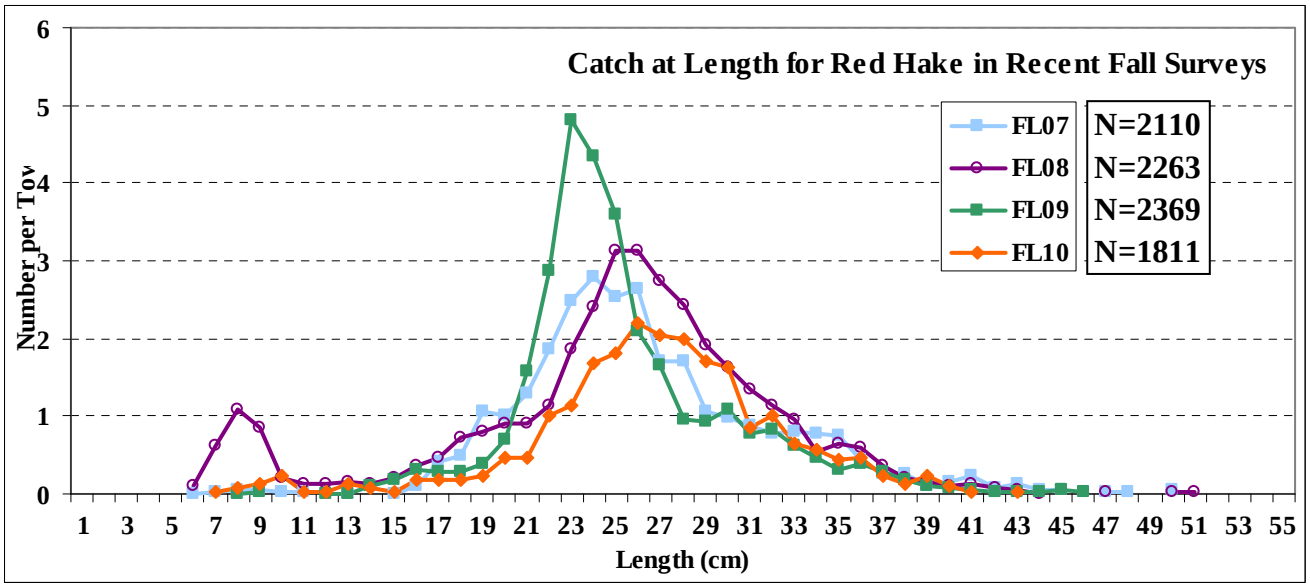




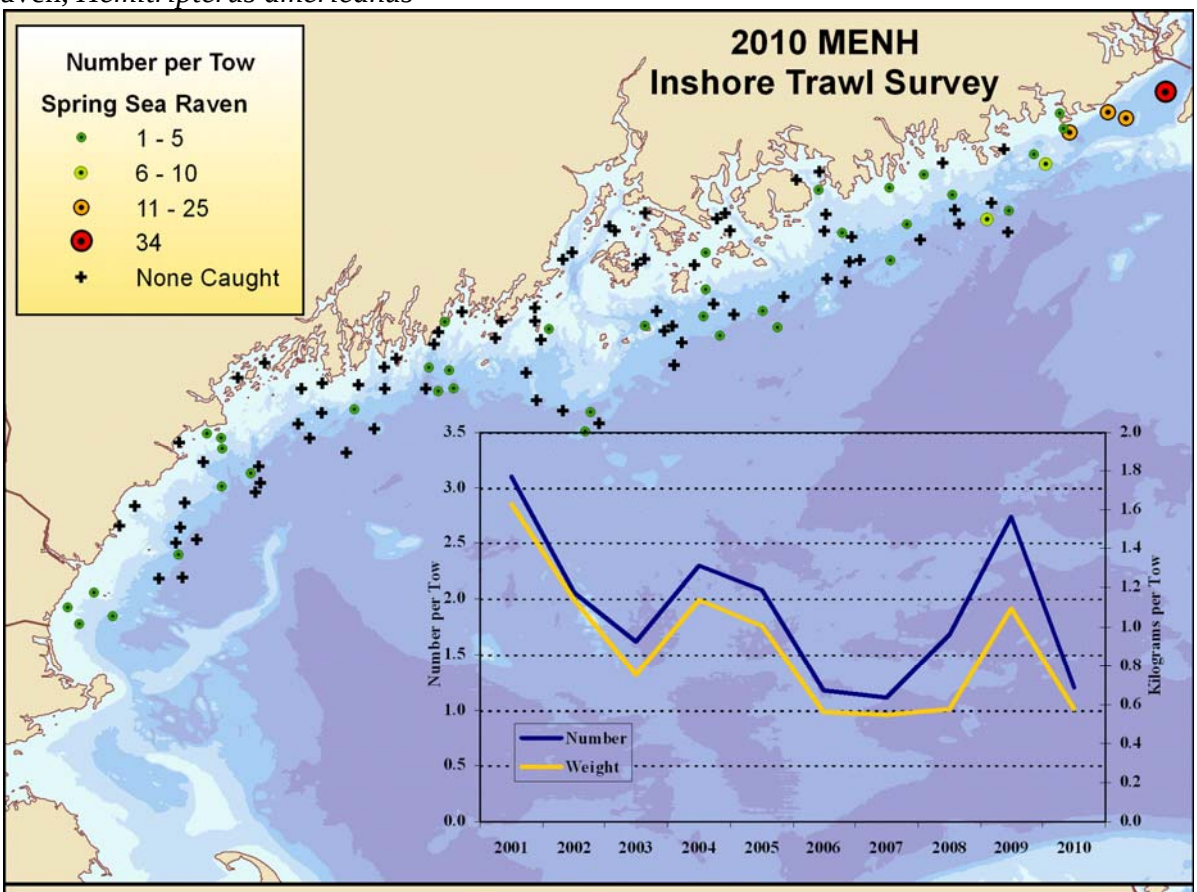
Mean and standard error for graphs overlain on distribution maps
fixed stations not included
for red hake, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

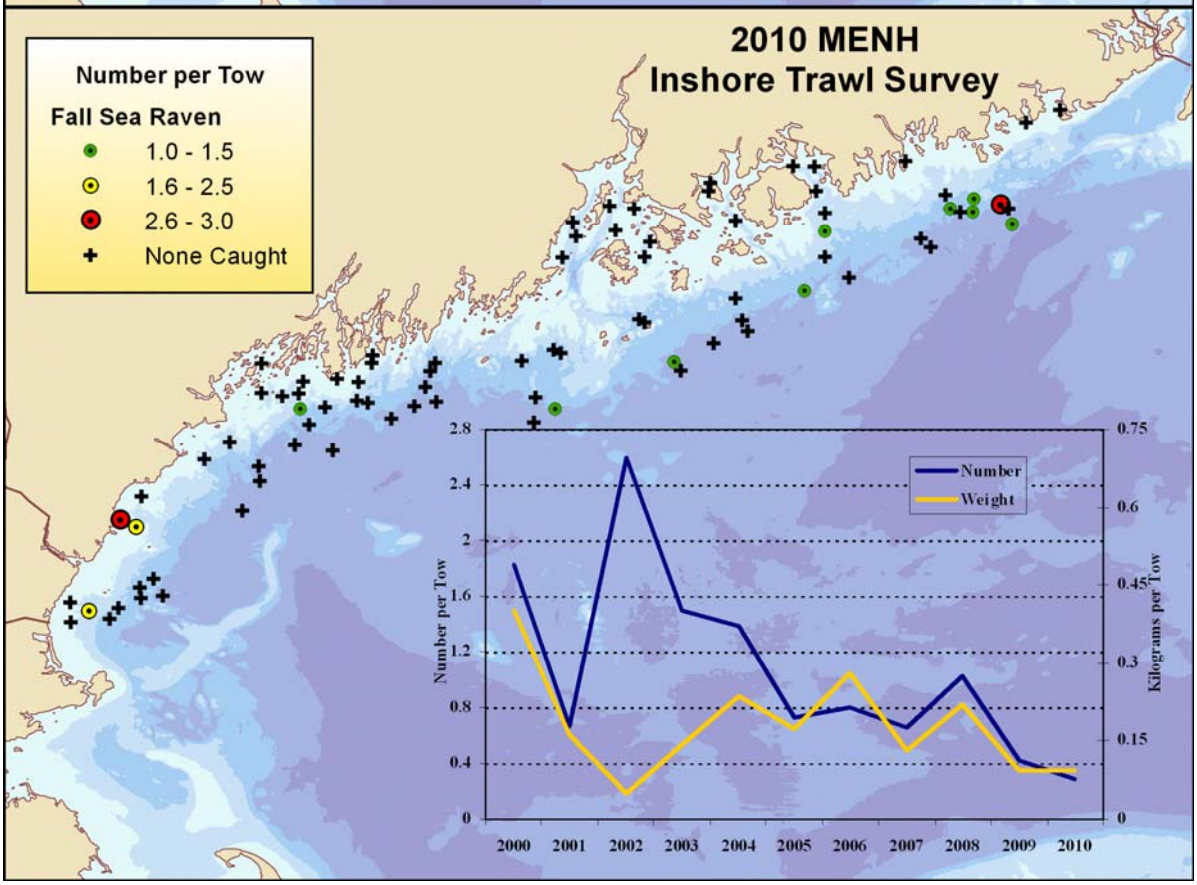
SPRING	Stratified Mean Number		Weight		FALL	Stratified Mean Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	26.69	3.26	2.81	0.33
2001	5.24	1.13	0.22	0.08	**2001**	34.08	5.05	4.70	0.68
2002	9.59	1.11	1.09	0.13	**2002**	18.67	3.35	2.64	0.52
2003	9.69	1.53	0.81	0.18	**2003**	30.07	2.46	5.39	0.45
2004	3.37	0.37	0.34	0.05	**2004**	15.81	1.68	3.00	0.39
2005	6.68	0.63	0.69	0.06	**2005**	13.20	1.18	1.39	0.20
2006	2.69	0.49	0.11	0.02	**2006**	11.58	1.53	1.45	0.17
2007	9.76	1.48	0.47	0.10	**2007**	28.19	3.37	3.60	0.48
2008	11.76	1.77	0.58	0.07	**2008**	34.50	2.90	4.16	0.28
2009	23.89	2.10	0.78	0.05	**2009**	30.45	2.84	3.41	0.33
2010	5.60	0.43	0.45	0.05	**2010**	22.30	1.95	2.97	0.27





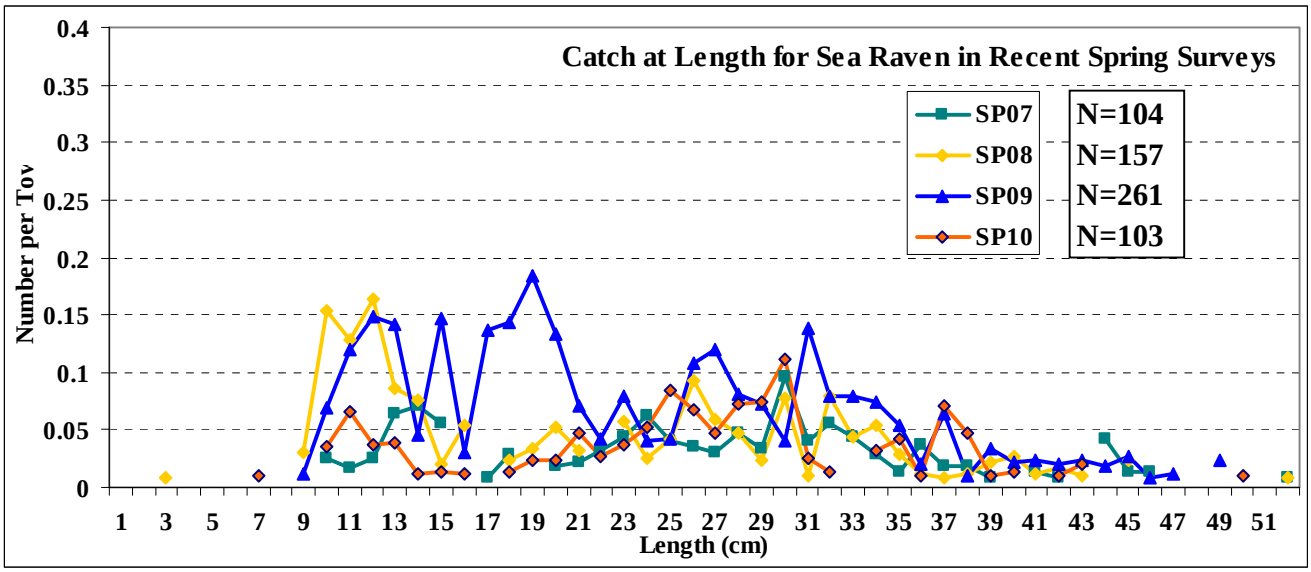
Sea raven, *Hemitripterus americanus*

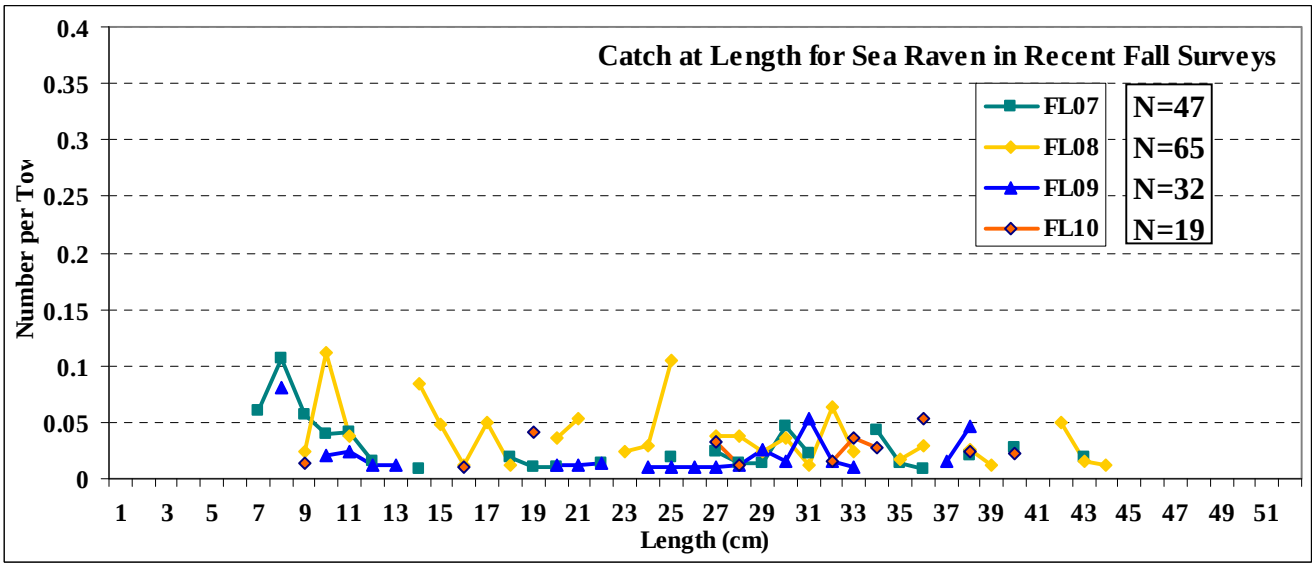




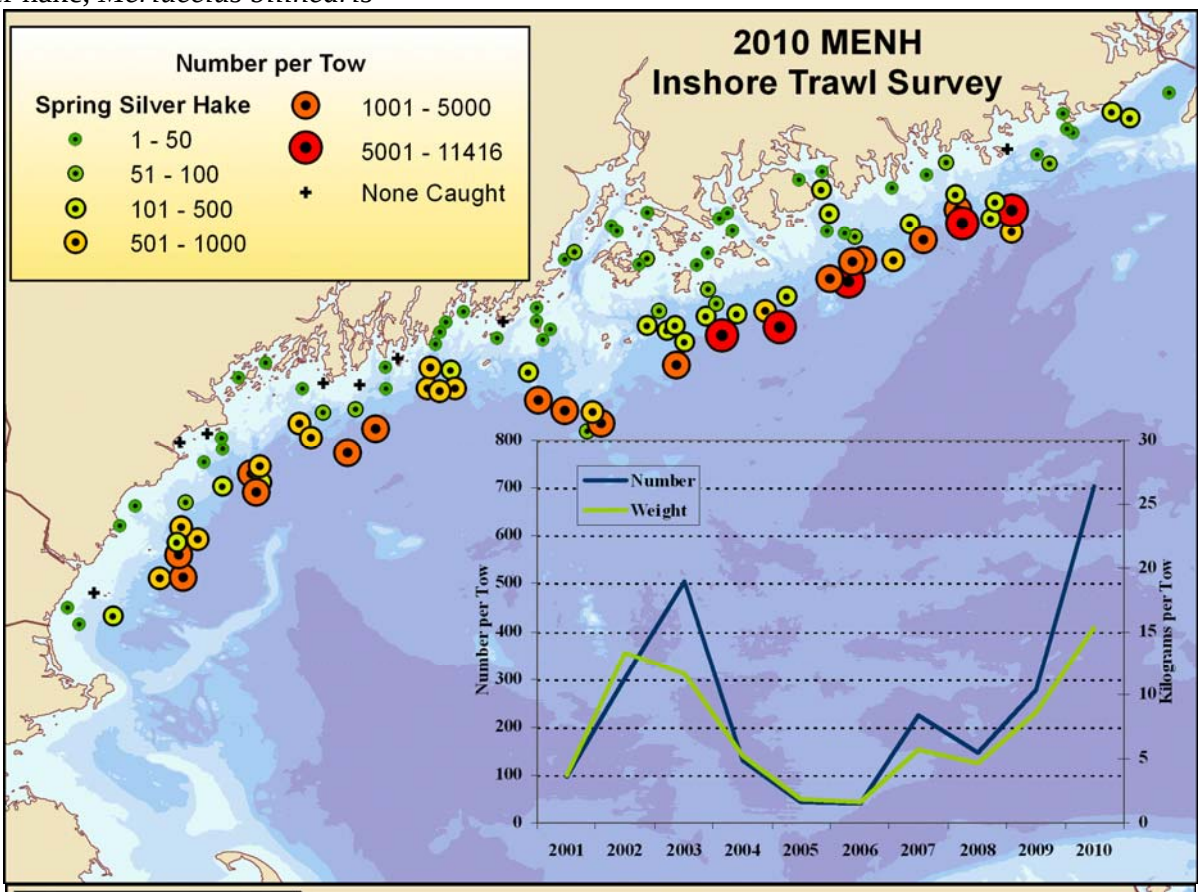
Mean and standard error for graphs overlain on distribution maps
fixed stations not included
for sea raven, indices calculated for regions 1 through 5 and strata 1 through 4

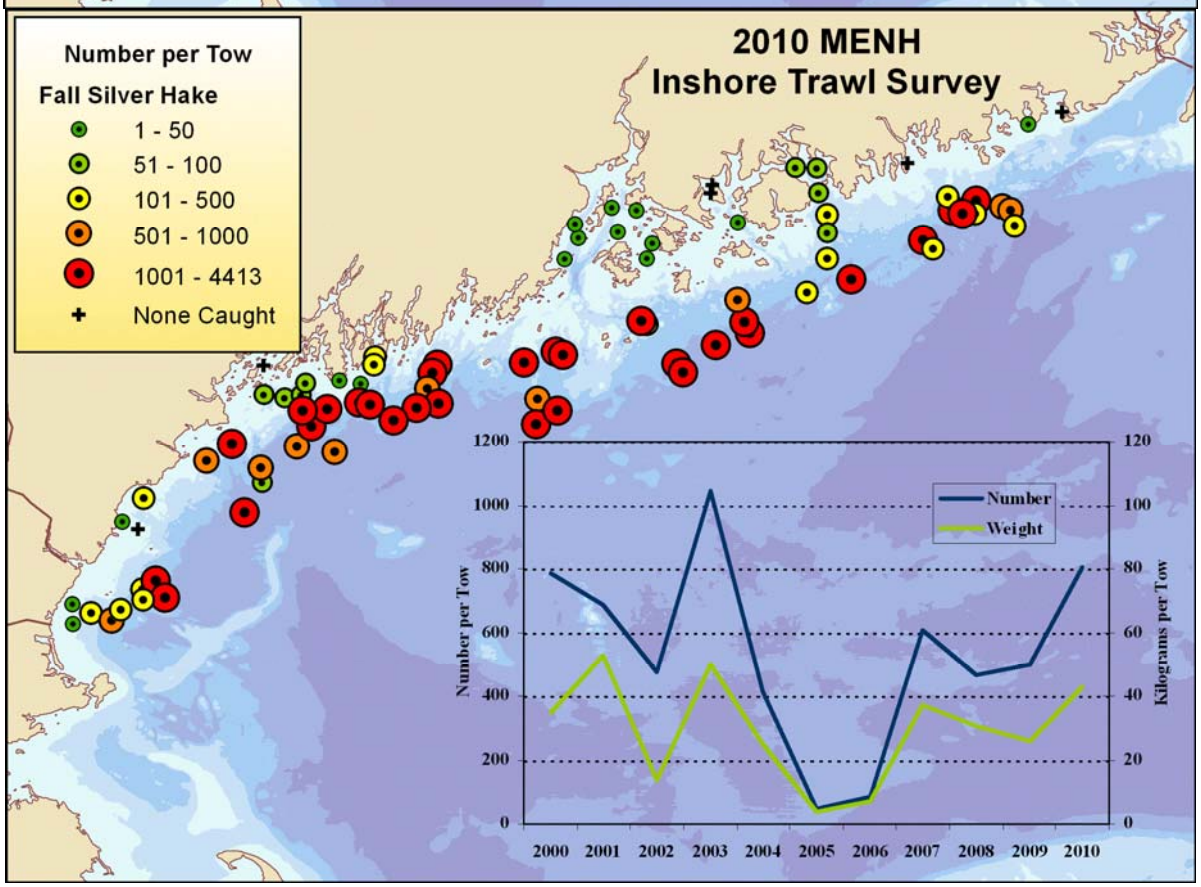
SPRING	Stratified Mean Number Mean	Error	Weight Mean	Error	FALL	Stratified Mean Number Mean	Error	Weight Mean	Error
					2000	1.83	0.30	0.40	0.09
2001	3.09	1.01	1.63	0.55	**2001**	0.67	0.13	0.16	0.06
2002	2.06	0.34	1.14	0.22	**2002**	2.59	0.84	0.05	0.02
2003	1.62	0.35	0.75	0.17	**2003**	1.50	0.36	0.14	0.06
2004	2.30	0.56	1.14	0.33	**2004**	1.39	0.42	0.24	0.06
2005	2.08	0.29	1.00	0.14	**2005**	0.73	0.17	0.17	0.04
2006	1.18	0.26	0.56	0.15	**2006**	0.80	0.17	0.28	0.07
2007	1.11	0.22	0.54	0.09	**2007**	0.65	0.25	0.13	0.04
2008	1.68	0.32	0.58	0.09	**2008**	1.03	0.34	0.22	0.11
2009	2.74	0.42	1.09	0.19	**2009**	0.43	0.09	0.09	0.03
2010	1.21	0.27	0.58	0.14	**2010**	0.29	0.08	0.09	0.05





Silver hake, *Merluccius bilinearis*





Mean and standard error for grpahs overlain on distribution maps

fixed stations not included

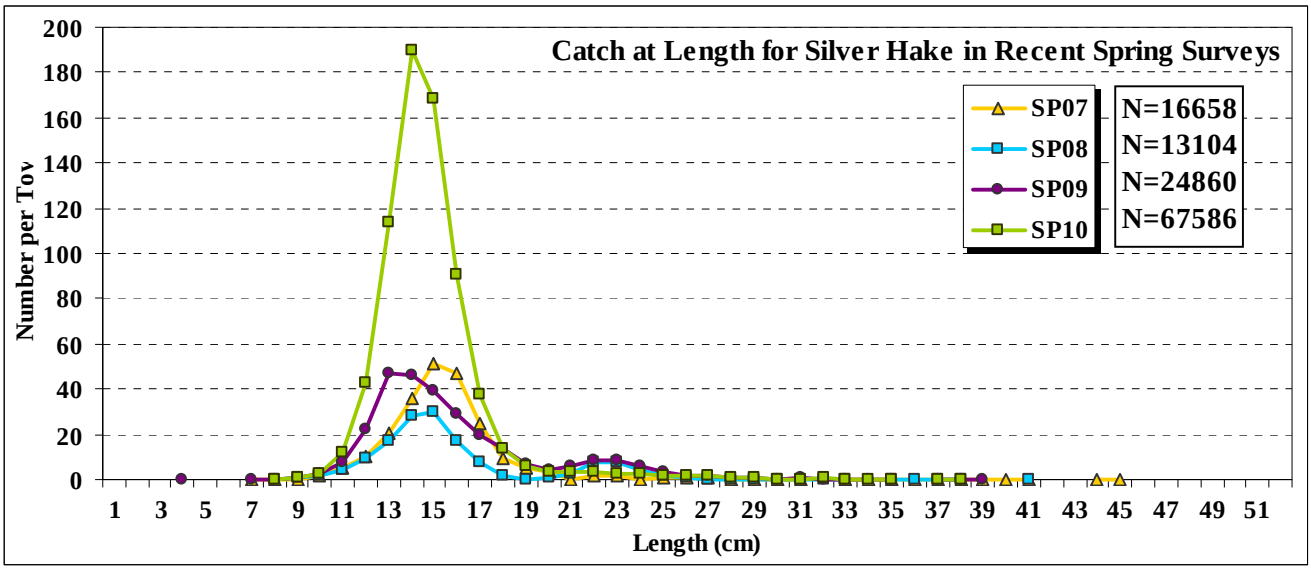
for silver hake, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

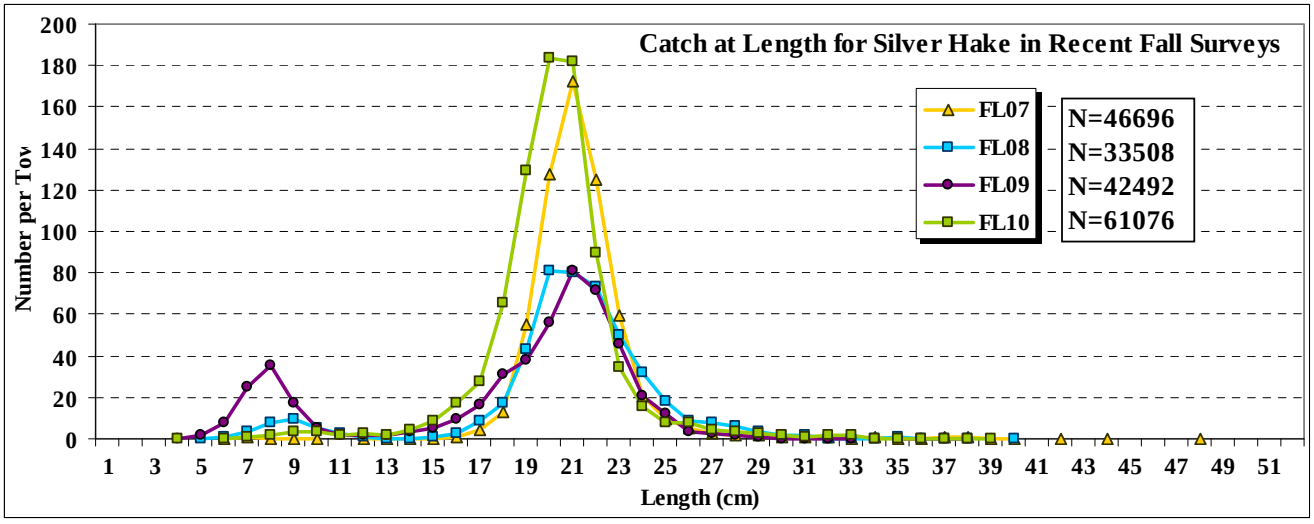
SPRING

	Stratified Mean Number Mean	SE	Weight Mean	SE
2001	97.64	13.59	3.68	0.50
2002	302.35	103.63	13.34	4.69
2003	503.73	79.67	11.63	1.86
2004	131.82	11.73	5.25	0.64
2005	43.34	4.88	1.91	0.21
2006	40.47	7.24	1.58	0.29
2007	223.16	97.15	5.68	2.57
2008	145.22	18.62	4.67	0.70
2009	277.94	30.35	8.59	1.03
2010	702.25	115.60	15.33	2.28

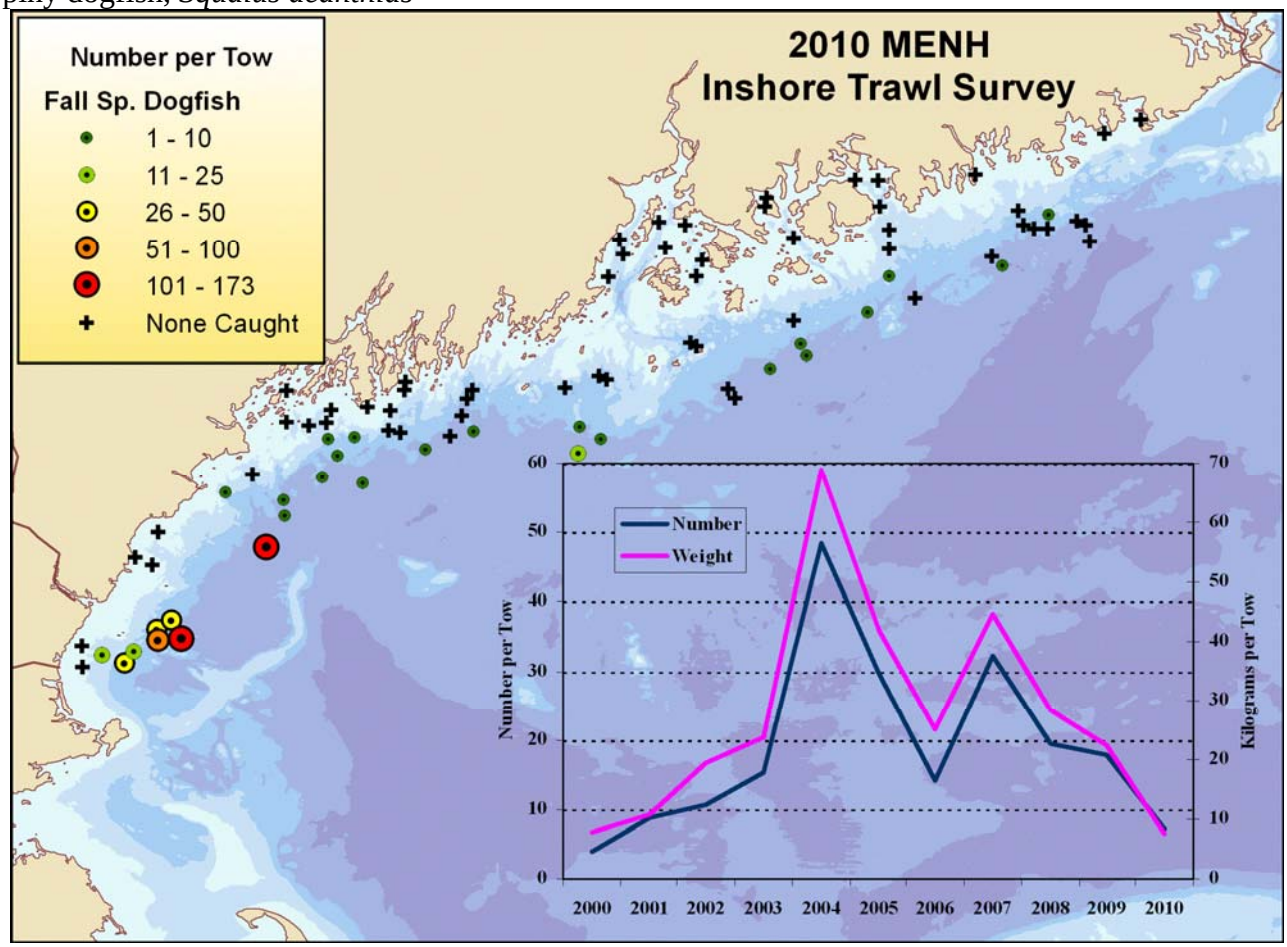
FALL

	Stratified Mean Number Mean	SE	Weight Mean	SE
2000	786.19	70.48	34.77	3.55
2001	687.67	109.48	52.88	7.74
2002	476.30	111.28	13.47	2.15
2003	1046.25	116.65	49.97	5.72
2004	413.66	95.64	24.85	6.03
2005	44.93	9.31	3.77	0.92
2006	83.14	20.10	7.13	2.03
2007	605.57	111.88	37.14	6.75
2008	467.93	120.68	30.66	9.67
2009	498.48	82.68	25.73	4.48
2010	806.38	112.03	42.63	5.31



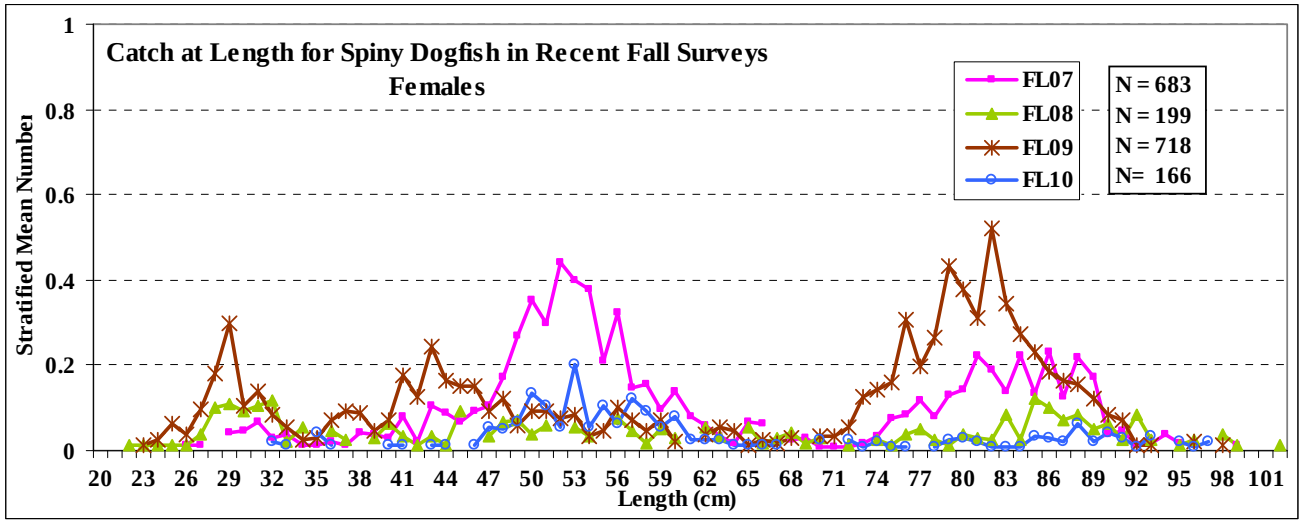


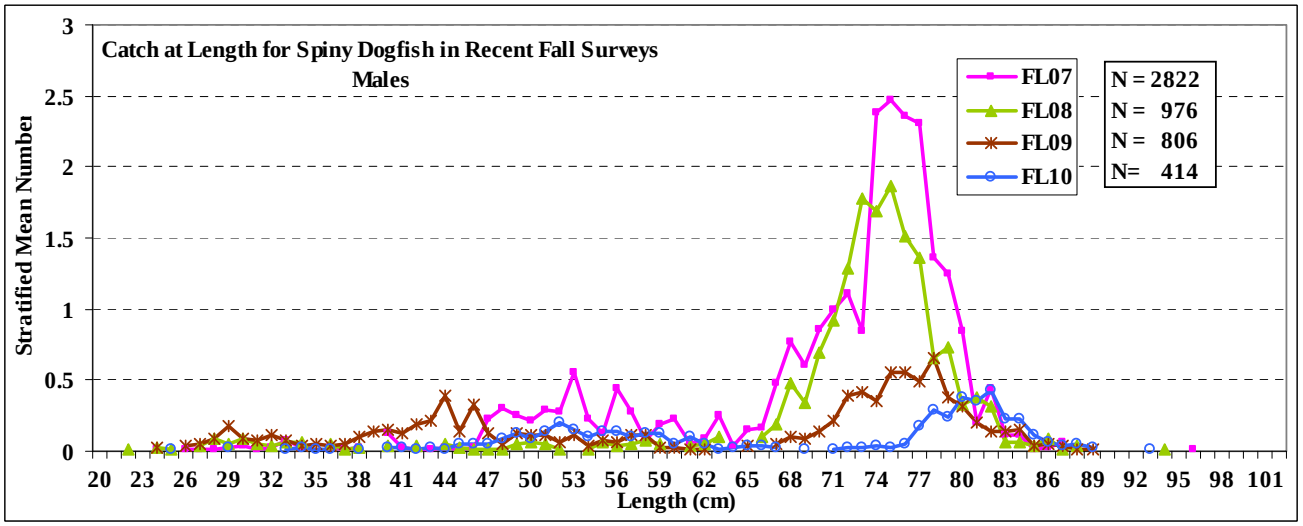
Spiny dogfish, *Squalus acanthias*



Means and standard errors for both seasons, only fall is displayed on the distribution map
fixed stations not included
for dogs, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

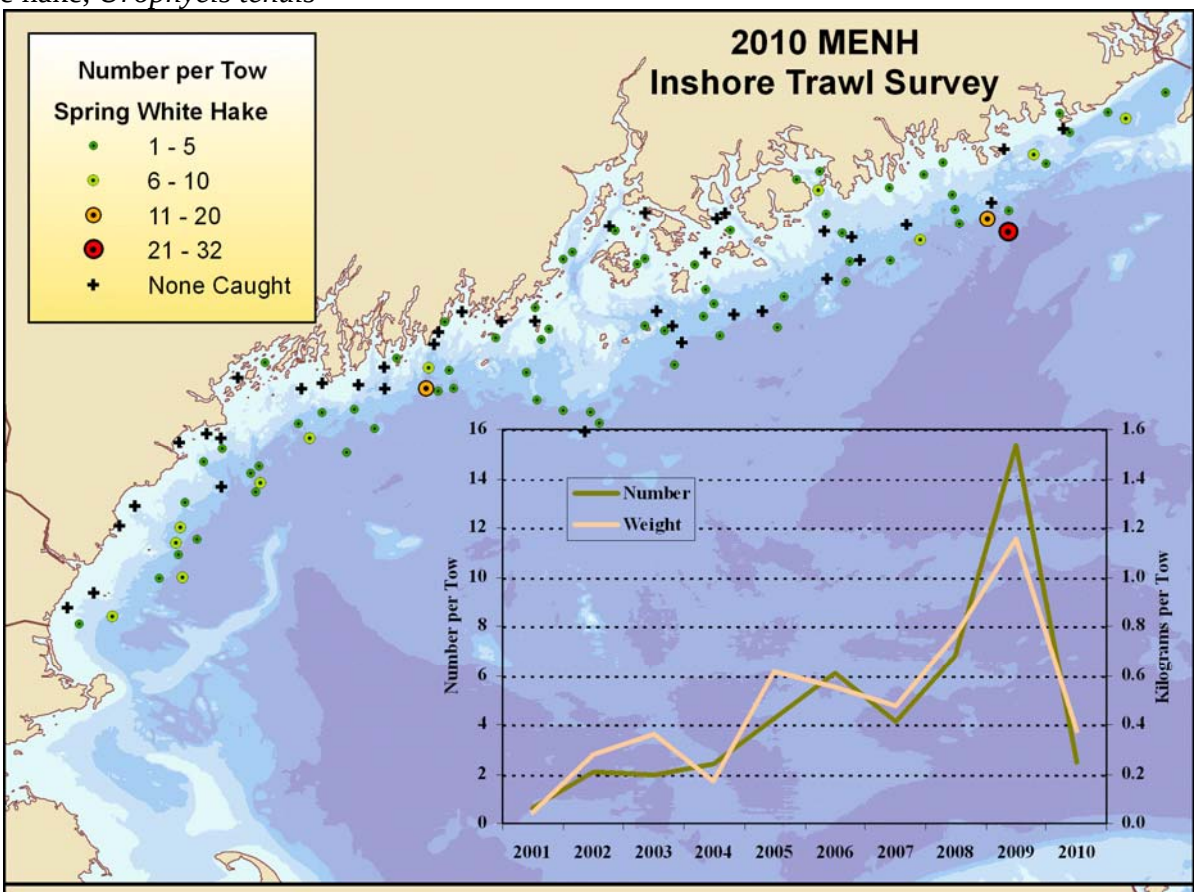
SPRING	Stratified Mean Number		Weight		FALL	Stratified Mean Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	4.04	0.54	7.74	1.05
2001					**2001**	8.86	2.70	10.68	3.06
2002	0.08	0.04	0.17	0.08	**2002**	10.60	1.94	19.45	3.81
2003	0.21	0.15	0.23	0.22	**2003**	15.36	3.36	23.82	4.96
2004					**2004**	48.50	12.02	69.03	17.73
2005					**2005**	29.75	3.43	41.79	5.54
2006	0.33	0.13	0.10	0.05	**2006**	14.16	2.38	25.23	4.16
2007	0.04	0.03	0.04	0.04	**2007**	32.22	7.90	44.50	11.06
2008	0.25	0.16	0.30	0.20	**2008**	19.52	8.87	28.25	13.75
2009	0.01	0.01	0.01	0.01	**2009**	17.79	5.33	22.40	5.29
2010	0.28	0.28	0.20	0.20	**2010**	7.08	2.50	7.66	1.83

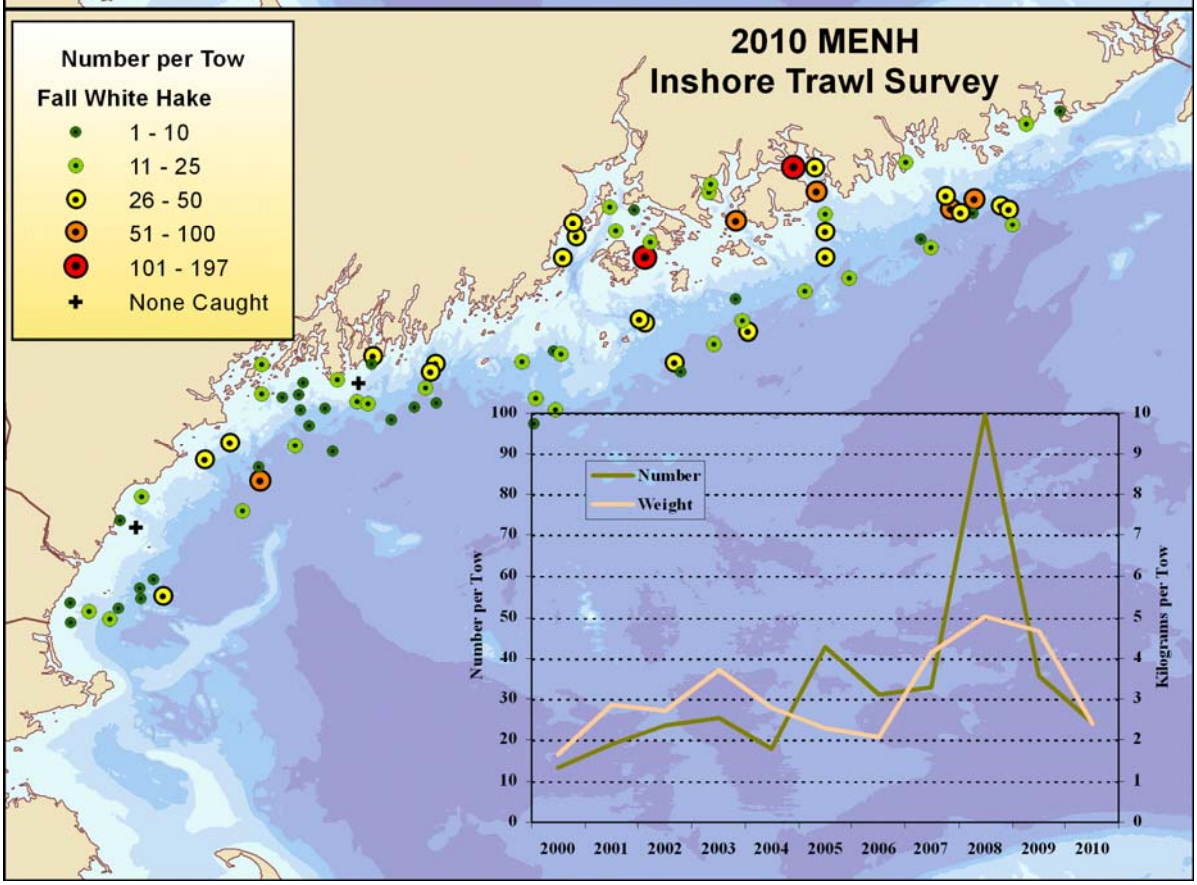




Dogfish are rarely caught in spring surveys, so only the indices are presented.

White hake, *Urophycis tenuis*

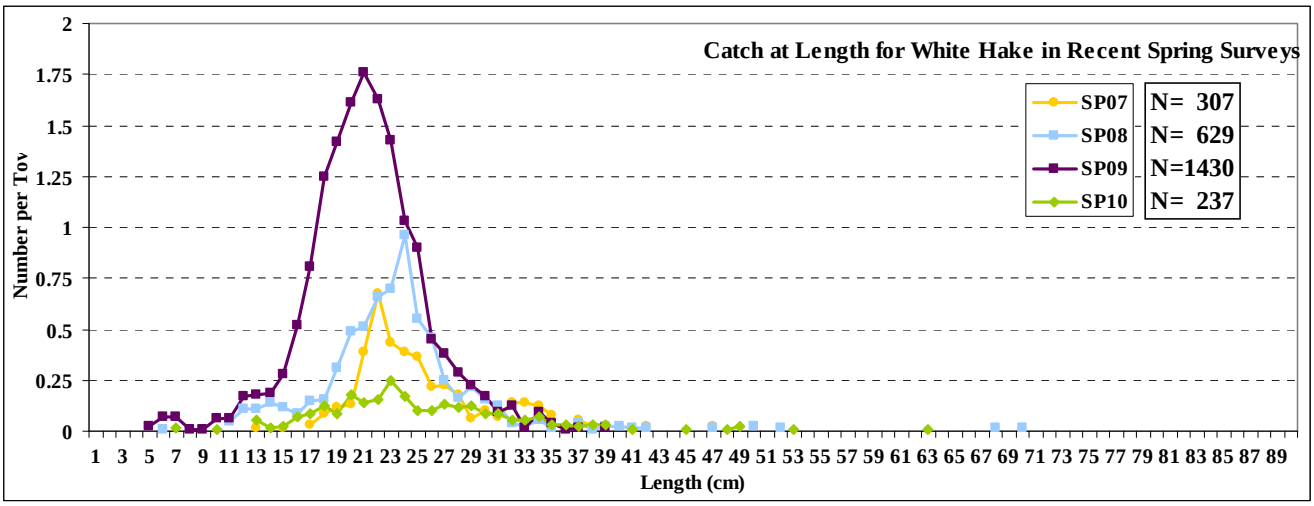


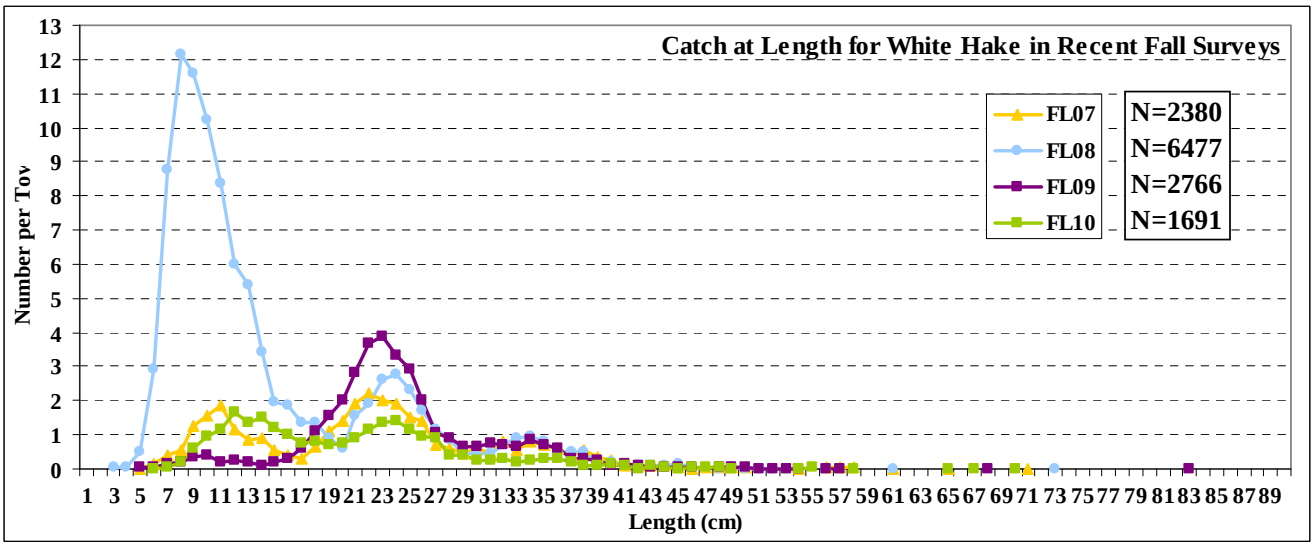


Means and standard errors for both seasons, only fall is displayed on the distribution map
fixed stations not included
for white hake, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

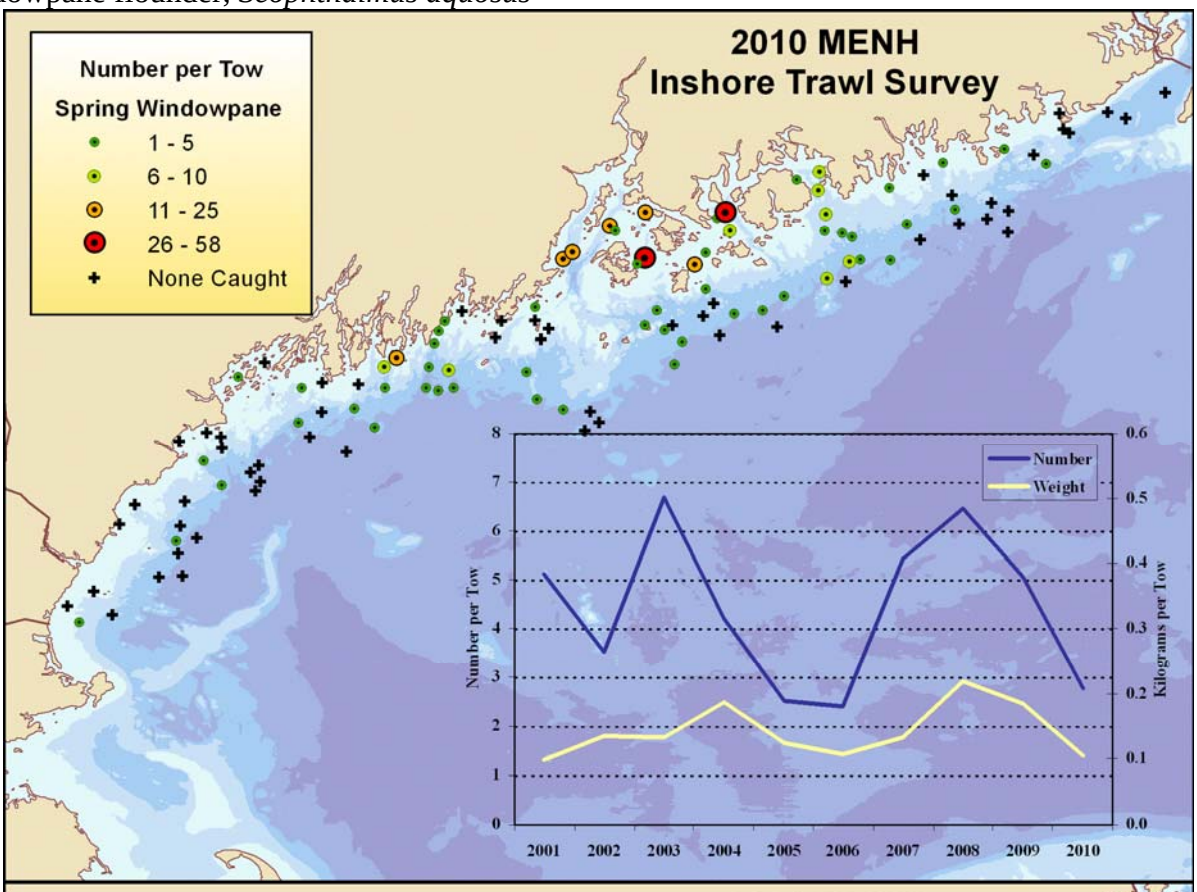
SPRING	Stratified Mean Number Mean	SE	Weight Mean	SE
2001	0.65	0.15	0.04	0.01
2002	2.10	0.40	0.28	0.06
2003	1.94	0.47	0.36	0.11
2004	2.39	0.41	0.17	0.03
2005	4.23	0.77	0.62	0.13
2006	6.12	0.72	0.55	0.08
2007	4.11	0.91	0.48	0.17
2008	6.79	0.78	0.76	0.12
2009	15.38	1.34	1.16	0.14
2010	2.49	0.35	0.37	0.14

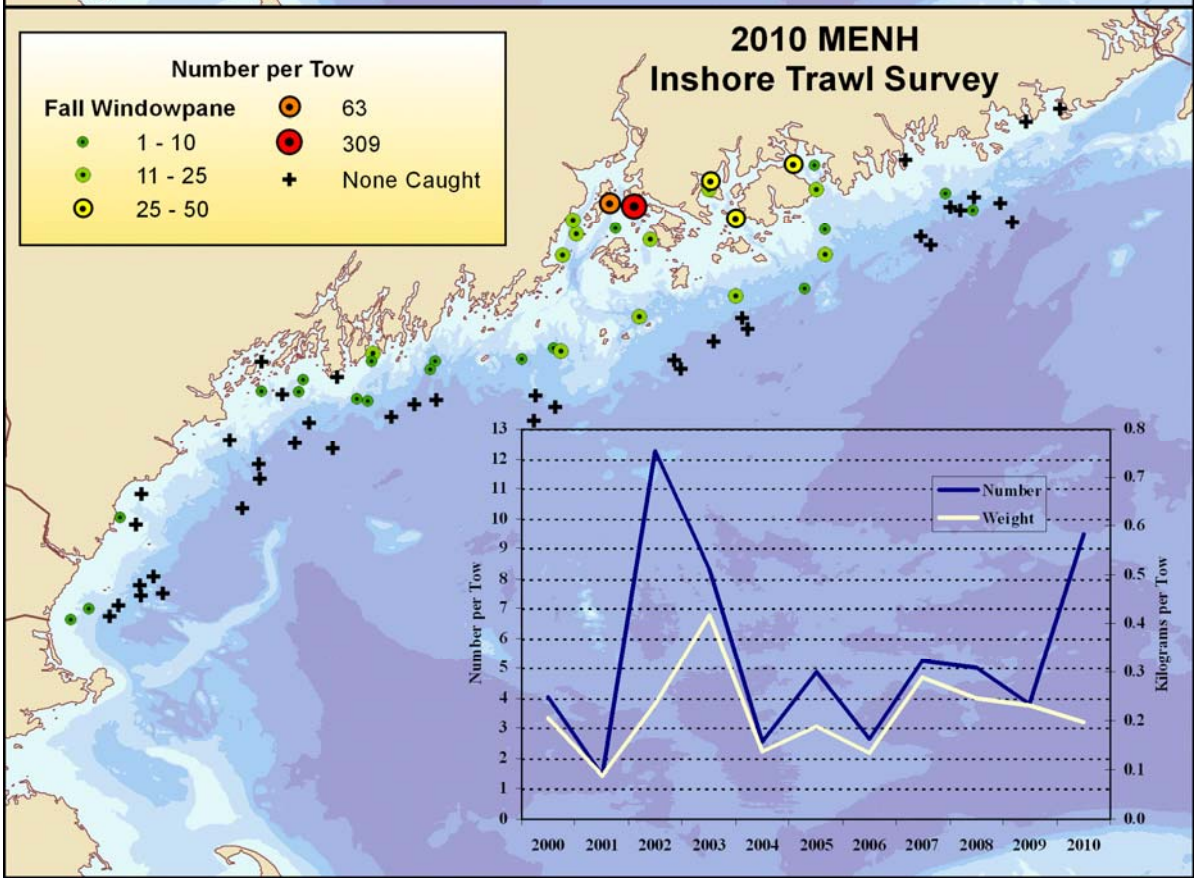
FALL	Stratified Mean Number Mean	SE	Weight Mean	SE
2000	13.0	1.2	1.63	0.16
2001	18.9	2.7	2.84	0.33
2002	23.6	1.9	2.71	0.27
2003	25.4	3.0	3.70	0.45
2004	17.8	2.6	2.77	0.35
2005	42.8	3.1	2.26	0.22
2006	31.1	3.7	2.05	0.21
2007	32.9	2.8	4.12	0.51
2008	99.9	8.4	5.00	0.33
2009	35.5	2.2	4.65	0.37
2010	24.20	2.47	2.37	0.27





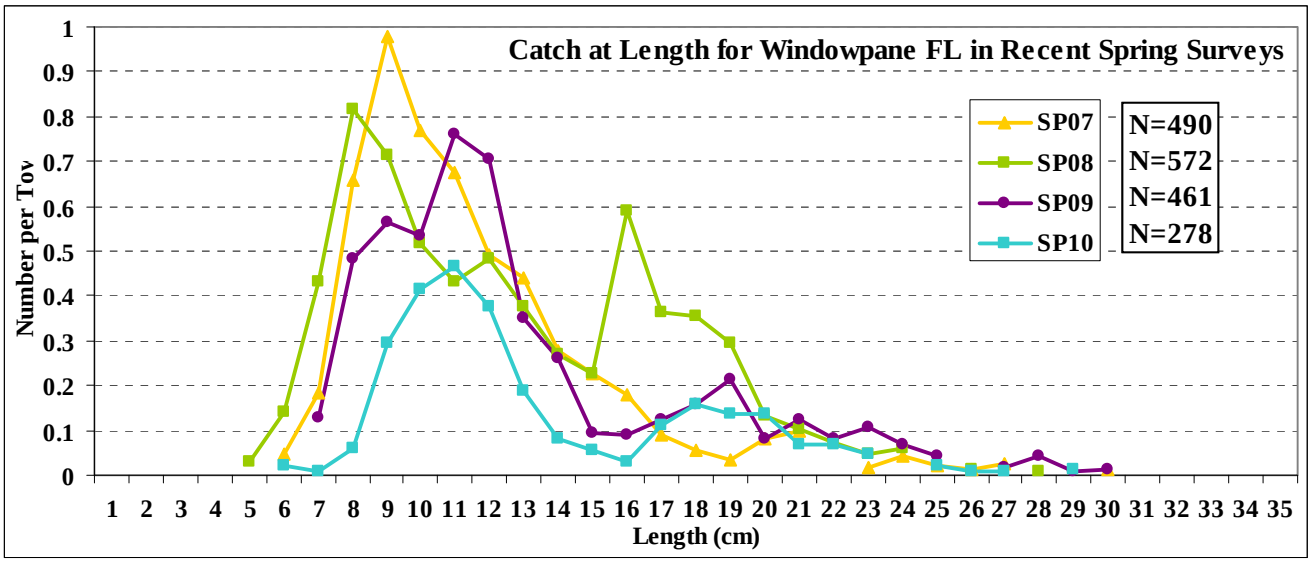
Windowpane flounder, *Scophthalmus aquosus*

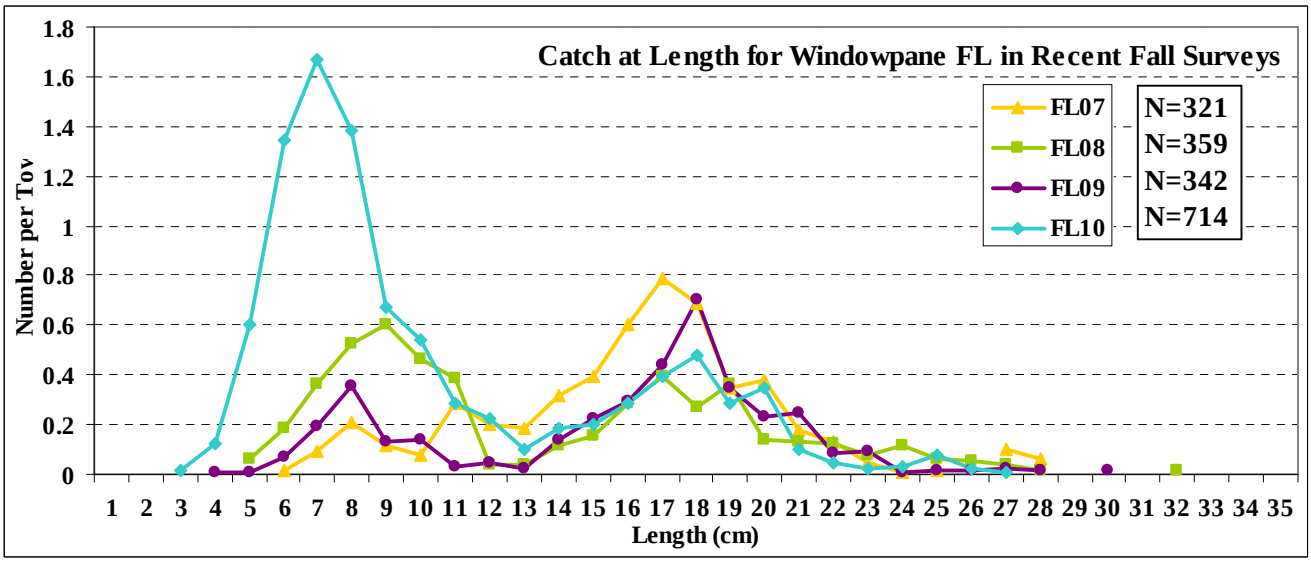




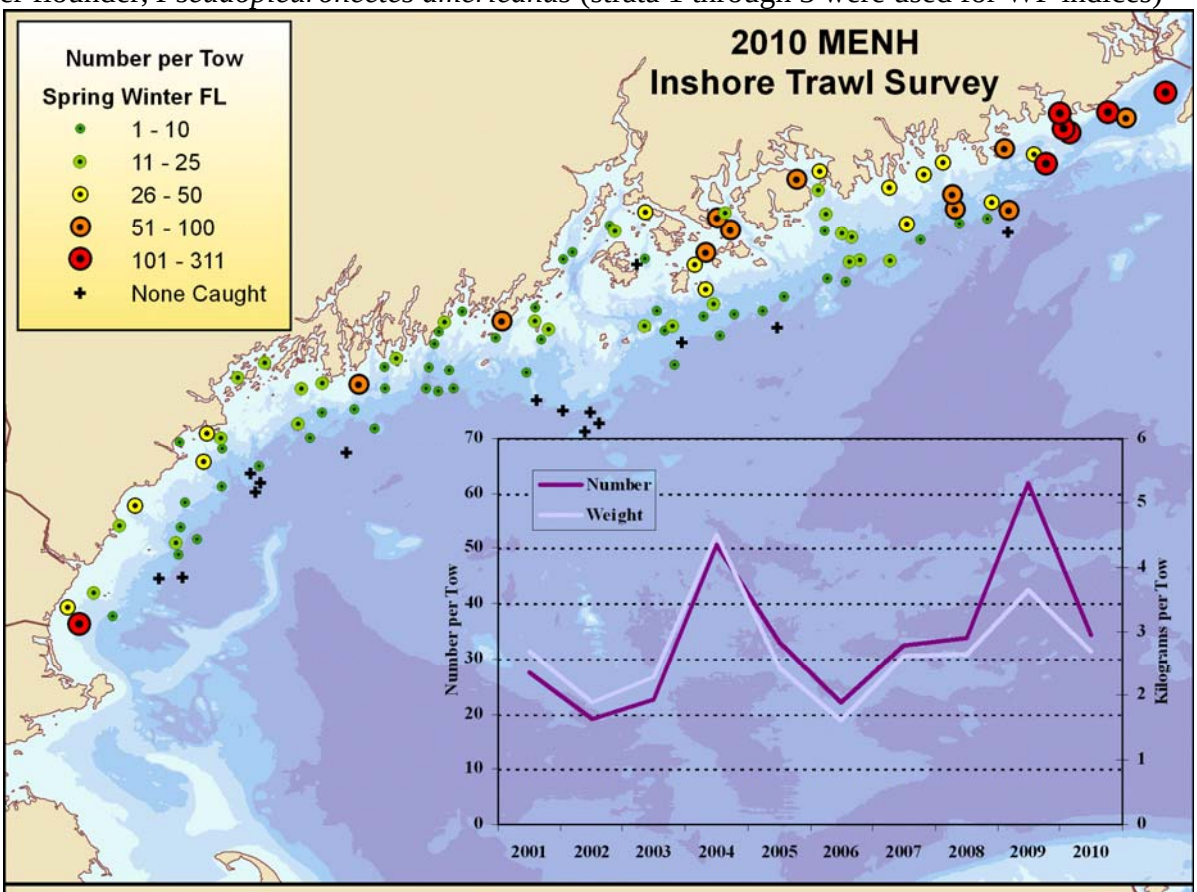
Mean and standard error for graphs overlain on distribution maps
fixed stations not included
for windowpane, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

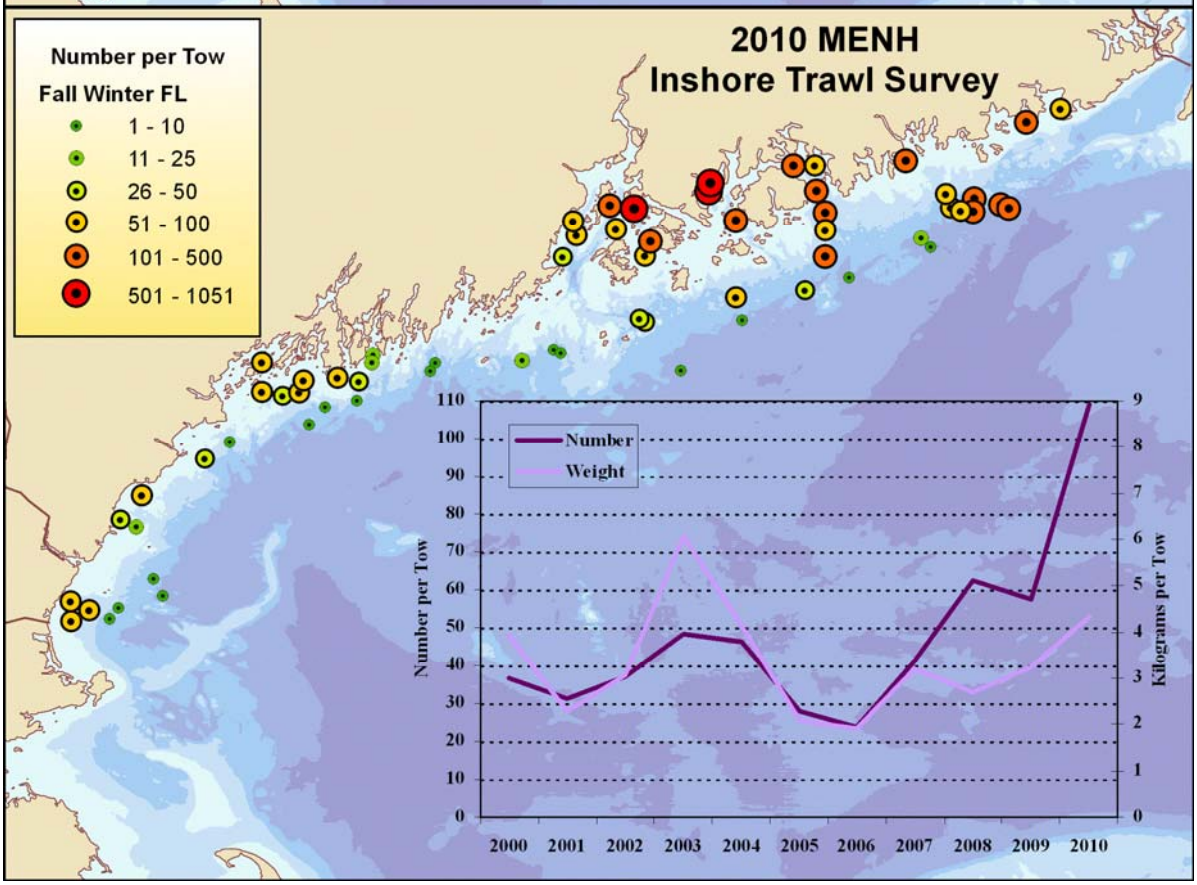
SPRING	Stratified Mean Number		Weight		FALL	Stratified Mean Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	4.05	0.62	0.20	0.03
2001	5.12	1.48	0.10	0.02	**2001**	1.46	0.48	0.09	0.03
2002	3.51	0.61	0.13	0.02	**2002**	12.24	3.60	0.24	0.05
2003	6.70	1.15	0.13	0.02	**2003**	8.31	1.20	0.42	0.05
2004	4.20	0.69	0.19	0.03	**2004**	2.52	0.78	0.14	0.03
2005	2.51	0.45	0.12	0.02	**2005**	4.90	1.60	0.19	0.04
2006	2.39	0.52	0.11	0.02	**2006**	2.66	0.39	0.14	0.03
2007	5.42	1.06	0.13	0.02	**2007**	5.24	1.16	0.29	0.06
2008	6.47	1.31	0.22	0.03	**2008**	5.03	0.82	0.24	0.03
2009	5.05	0.84	0.18	0.02	**2009**	3.83	0.46	0.23	0.03
2010	2.78	0.46	0.11	0.01	**2010**	9.47	3.53	0.20	0.02





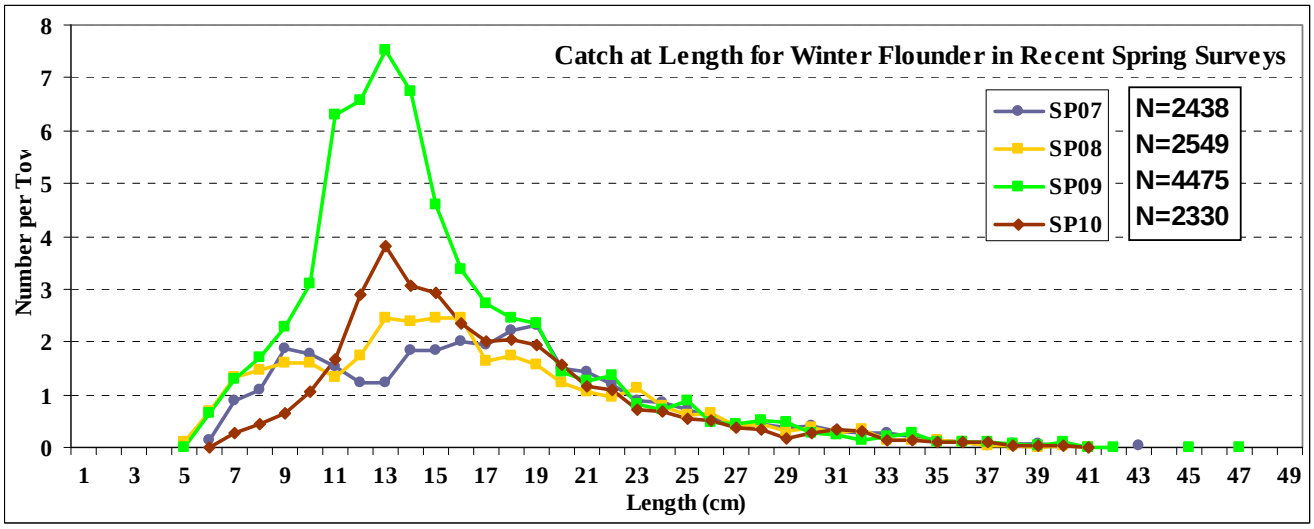
Winter flounder, *Pseudopleuronectes americanus* (strata 1 through 3 were used for WF indices)

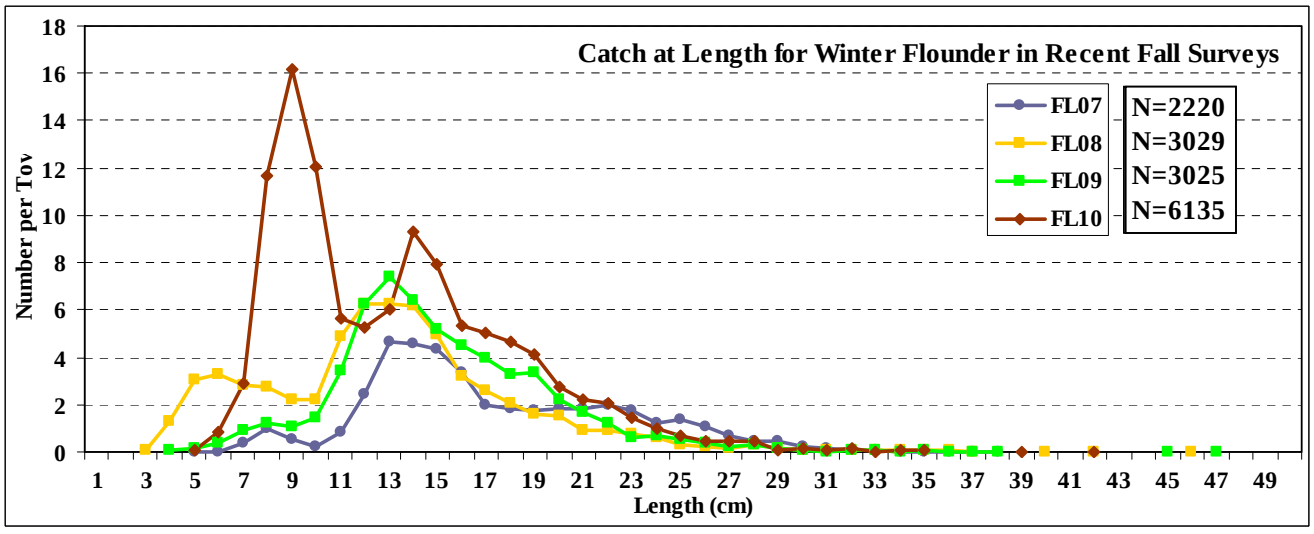




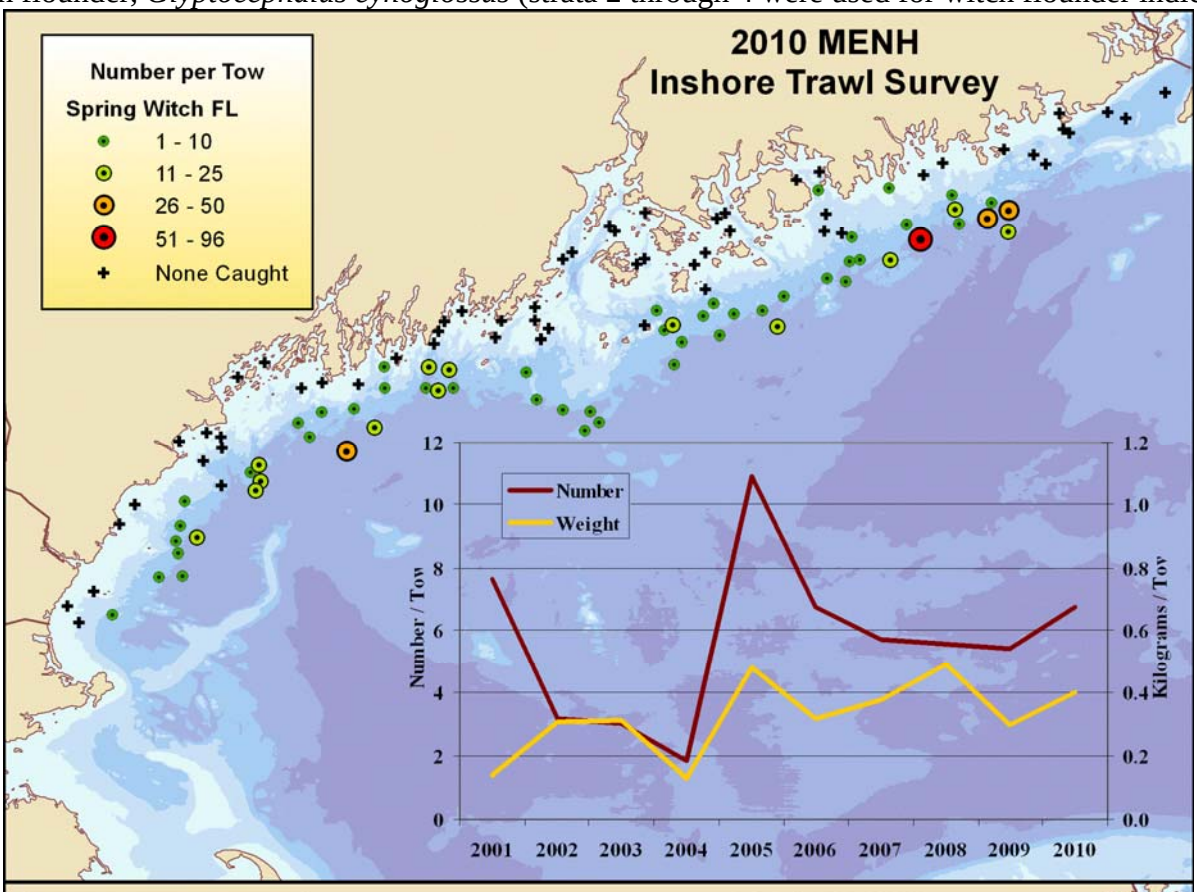
Means and standard errors for graphs overlain on distrbution maps
fixed stations not included
for winter flounder, indices calculated for regions 1 through 5; Strata 1 through 3

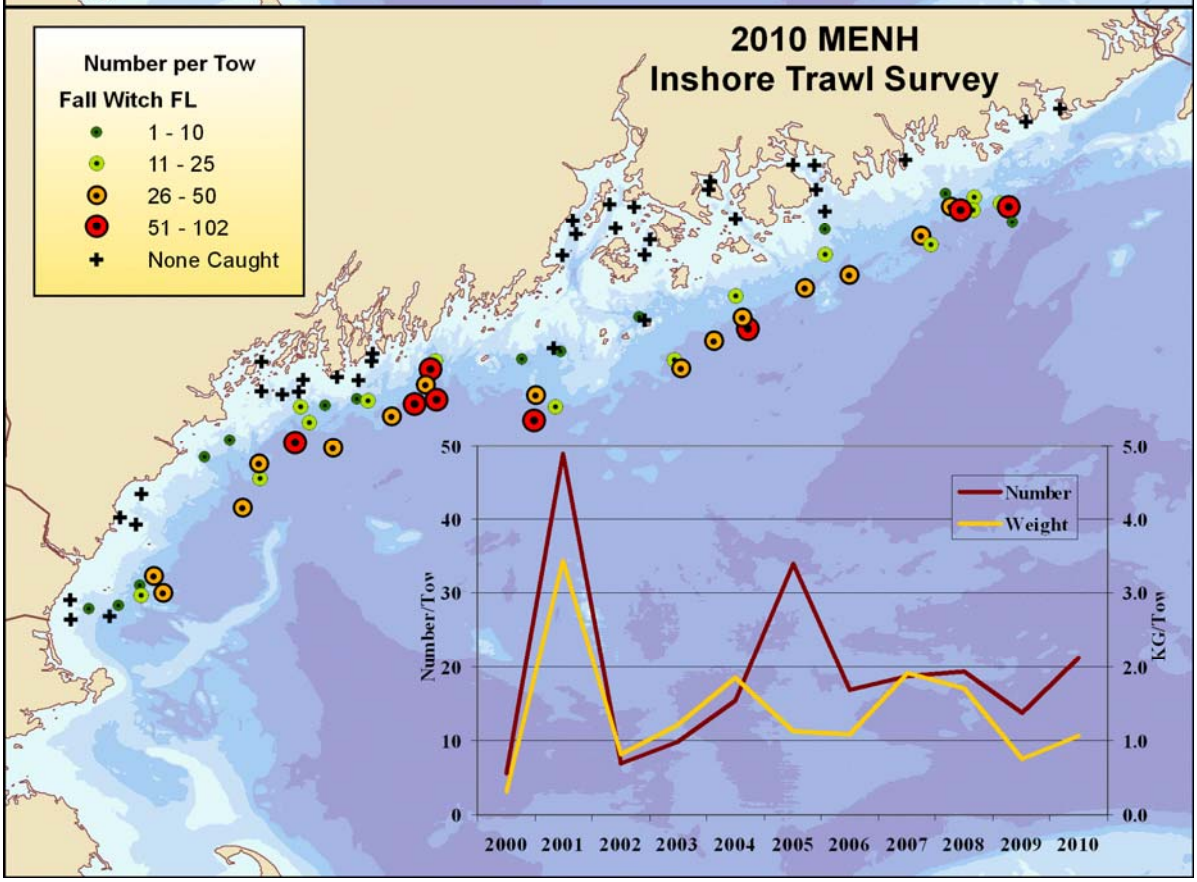
SPRING	Stratified Mean Number		Weight		FALL	Stratified Mean Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	36.59	3.12	3.92	0.41
2001	27.40	4.03	2.69	0.35	**2001**	31.43	6.21	2.28	0.25
2002	19.04	2.81	1.88	0.23	**2002**	36.92	6.77	3.08	0.71
2003	22.57	3.81	2.30	0.41	**2003**	48.15	5.82	6.06	0.22
2004	50.79	6.31	4.50	0.83	**2004**	46.42	9.01	4.14	0.82
2005	32.88	3.82	2.43	0.23	**2005**	27.90	2.57	2.08	0.28
2006	21.94	5.25	1.62	0.36	**2006**	23.90	3.43	1.92	0.25
2007	32.29	3.69	2.63	0.27	**2007**	41.18	7.78	3.22	0.91
2008	33.89	4.63	2.65	0.36	**2008**	62.46	5.96	2.70	0.24
2009	61.85	11.03	3.64	0.39	**2009**	57.57	8.49	3.22	0.51
2010	34.19	5.95	2.69	0.41	**2010**	109.08	17.74	4.31	0.46





Witch flounder, *Glyptocephalus cynoglossus* (strata 2 through 4 were used for witch flounder indices)





Mean and standard errors for graphs overlain on distribution maps

fixed stations not included

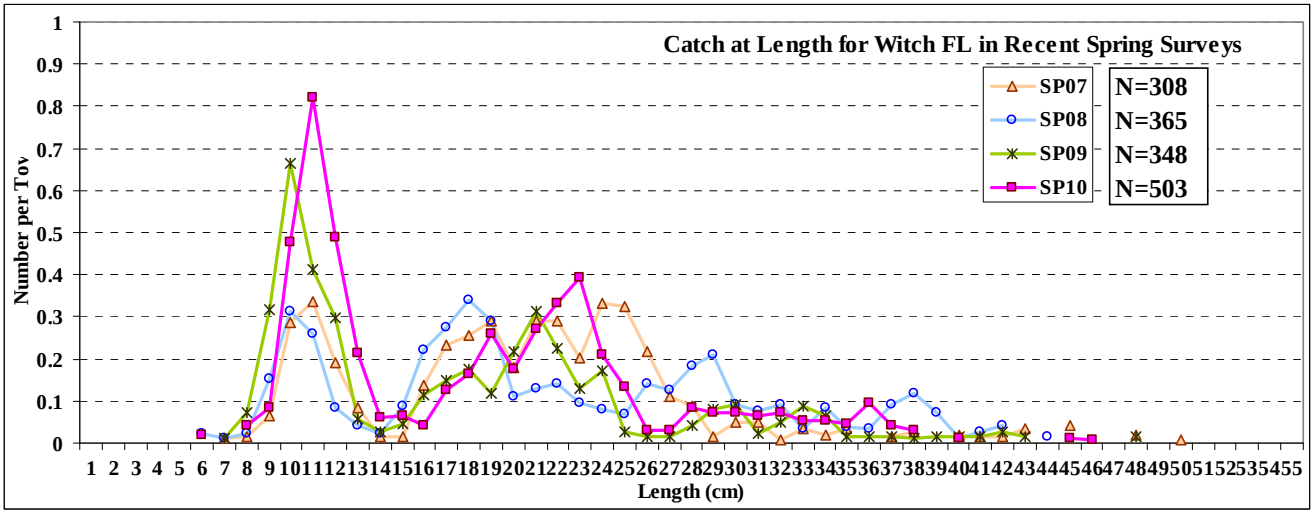
for witch flounder, indices calculated for regions 1 through 5; Strata 2 through 4 (2003 on)

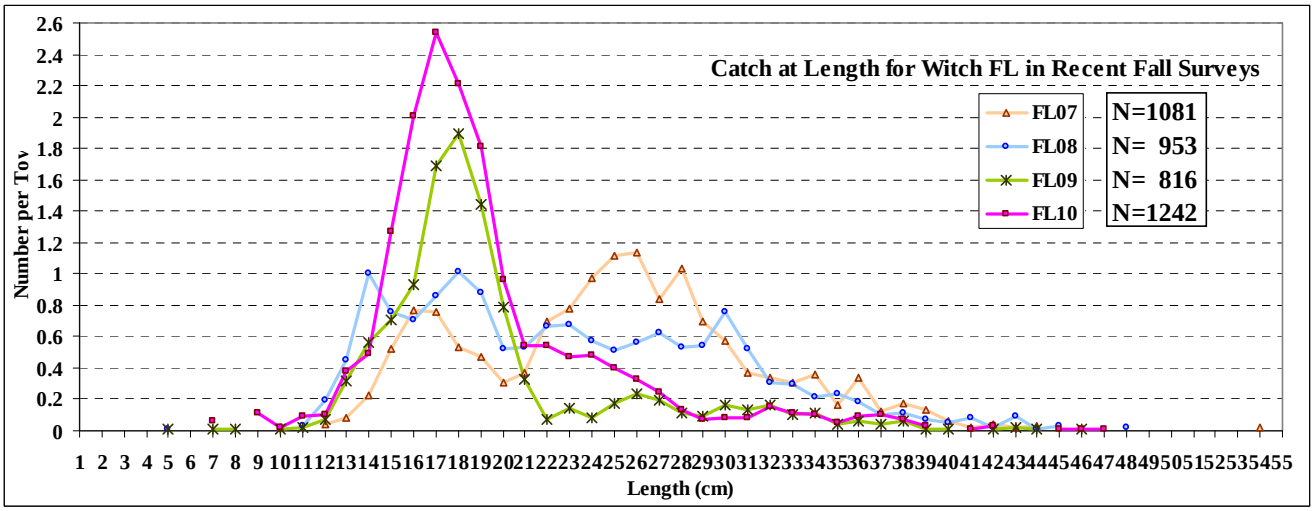
SPRING

	Stratified Mean Number Mean	SE	Weight Mean	SE
2001	7.65	1.98	0.14	0.04
2002	3.18	1.30	0.31	0.18
2003	3.02	0.94	0.31	0.10
2004	1.86	0.27	0.13	0.03
2005	10.91	1.73	0.48	0.11
2006	6.74	1.44	0.32	0.08
2007	5.69	0.88	0.38	0.05
2008	5.54	0.79	0.49	0.11
2009	5.41	0.88	0.30	0.08
2010	6.72	1.19	0.40	0.08

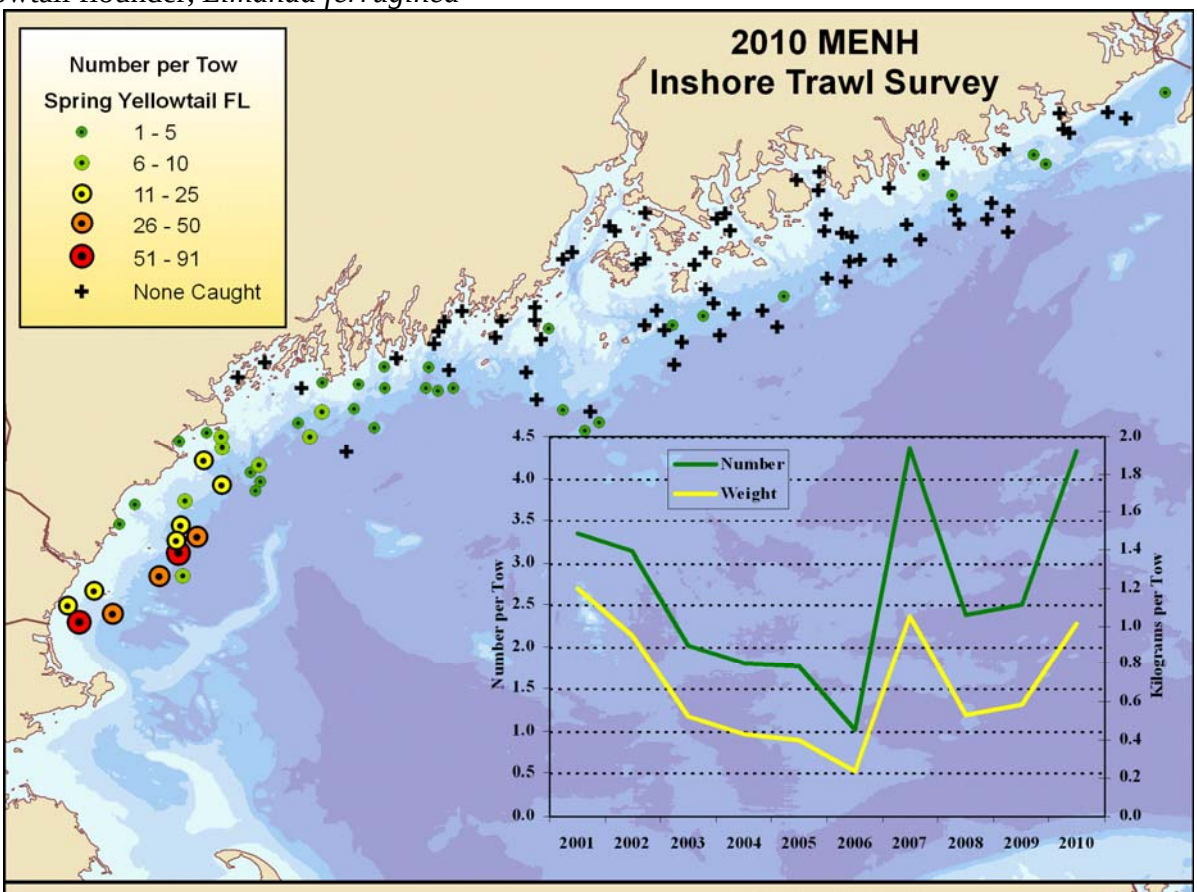
FALL

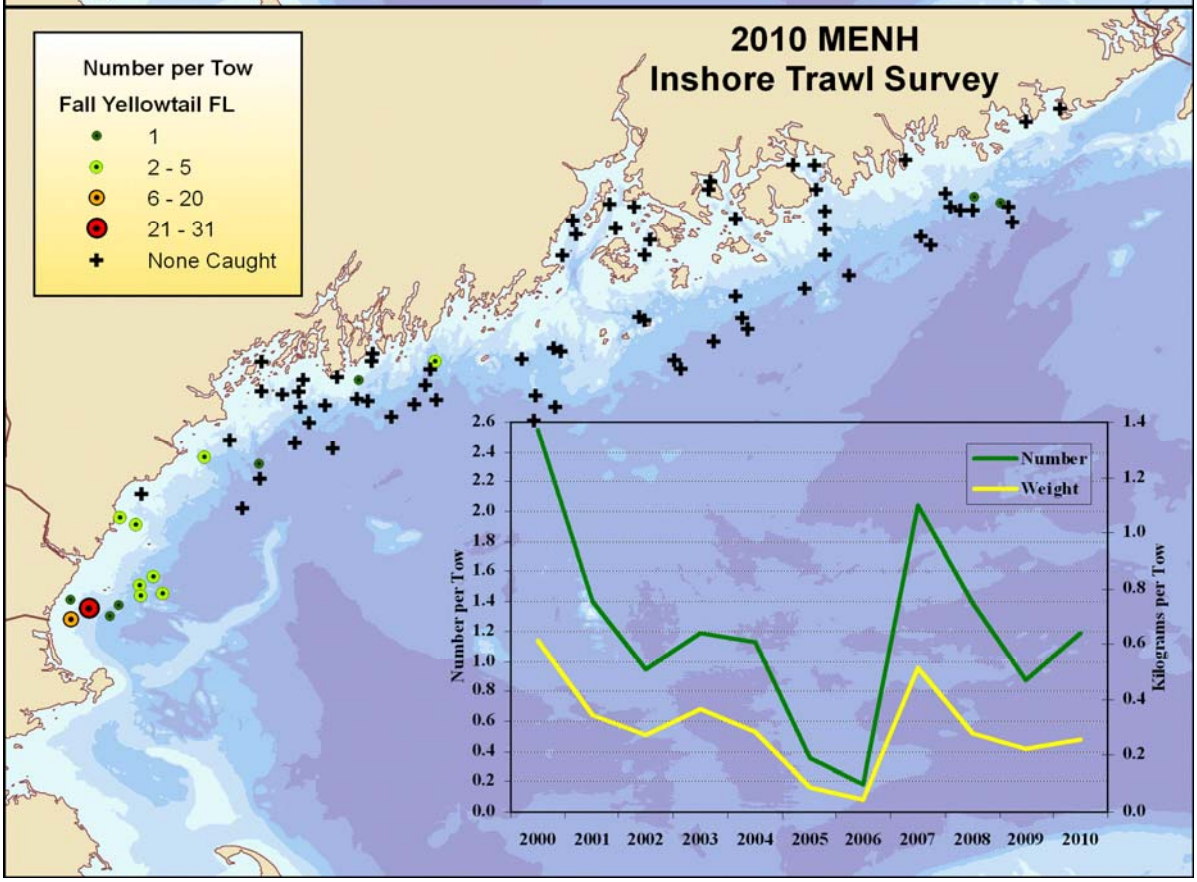
	Stratified Mean Number Mean	SE	Weight Mean	SE
2000	5.52	1.02	0.31	0.06
2001	48.96	6.18	3.44	0.65
2002	6.94	1.77	0.81	0.25
2003	9.71	1.51	1.20	0.25
2004	15.29	2.54	1.84	0.26
2005	34.08	4.63	1.12	0.13
2006	16.73	1.79	1.09	0.09
2007	18.76	2.66	1.91	0.39
2008	19.27	2.33	1.71	0.30
2009	13.7	1.4	0.74	0.09
2010	21.15	2.27	1.06	0.13





Yellowtail flounder, *Limanda ferruginea*





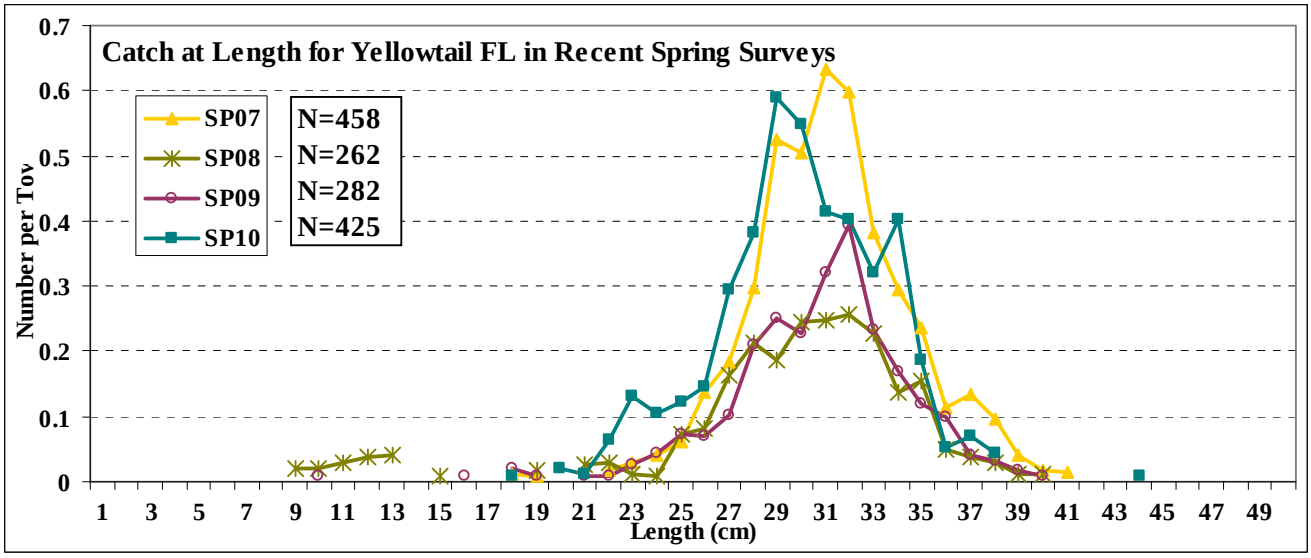
Mean and standard errors for graphs overlain on distribution maps
fixed stations not included
for yellowtail flounder, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

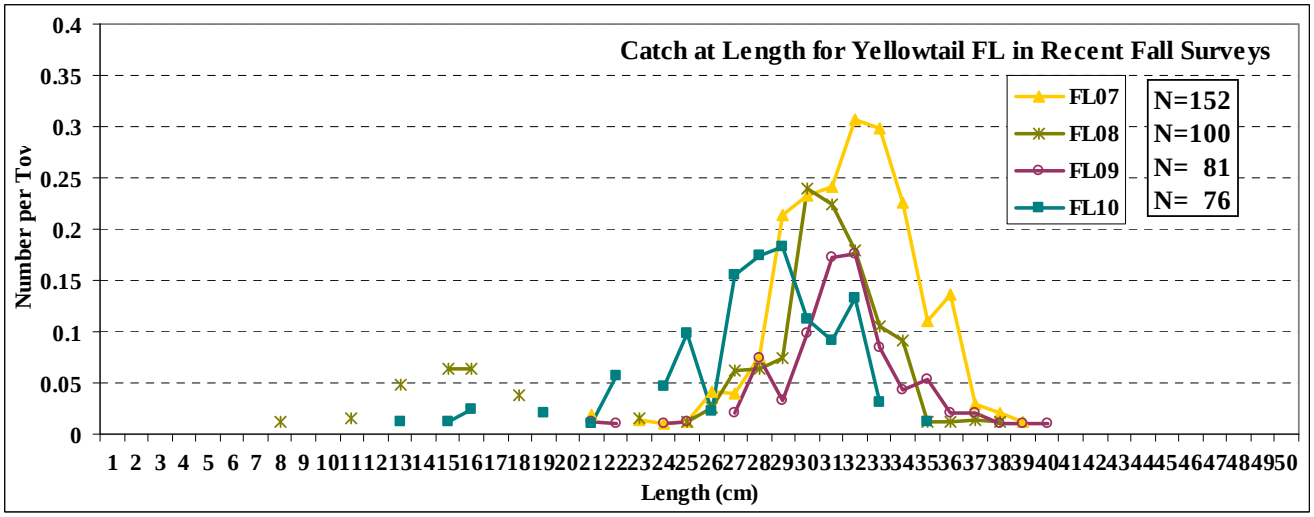
SPRING

	Stratified Mean Number Mean	SE	Weight Mean	SE
2001	3.35	2.09	1.20	0.82
2002	3.14	0.76	0.95	0.22
2003	2.01	0.43	0.52	0.11
2004	1.80	0.45	0.43	0.11
2005	1.77	0.51	0.40	0.11
2006	1.02	0.20	0.23	0.05
2007	4.36	1.17	1.05	0.27
2008	2.37	0.68	0.53	0.15
2009	2.50	0.61	0.58	0.15
2010	4.33	1.15	1.01	0.27

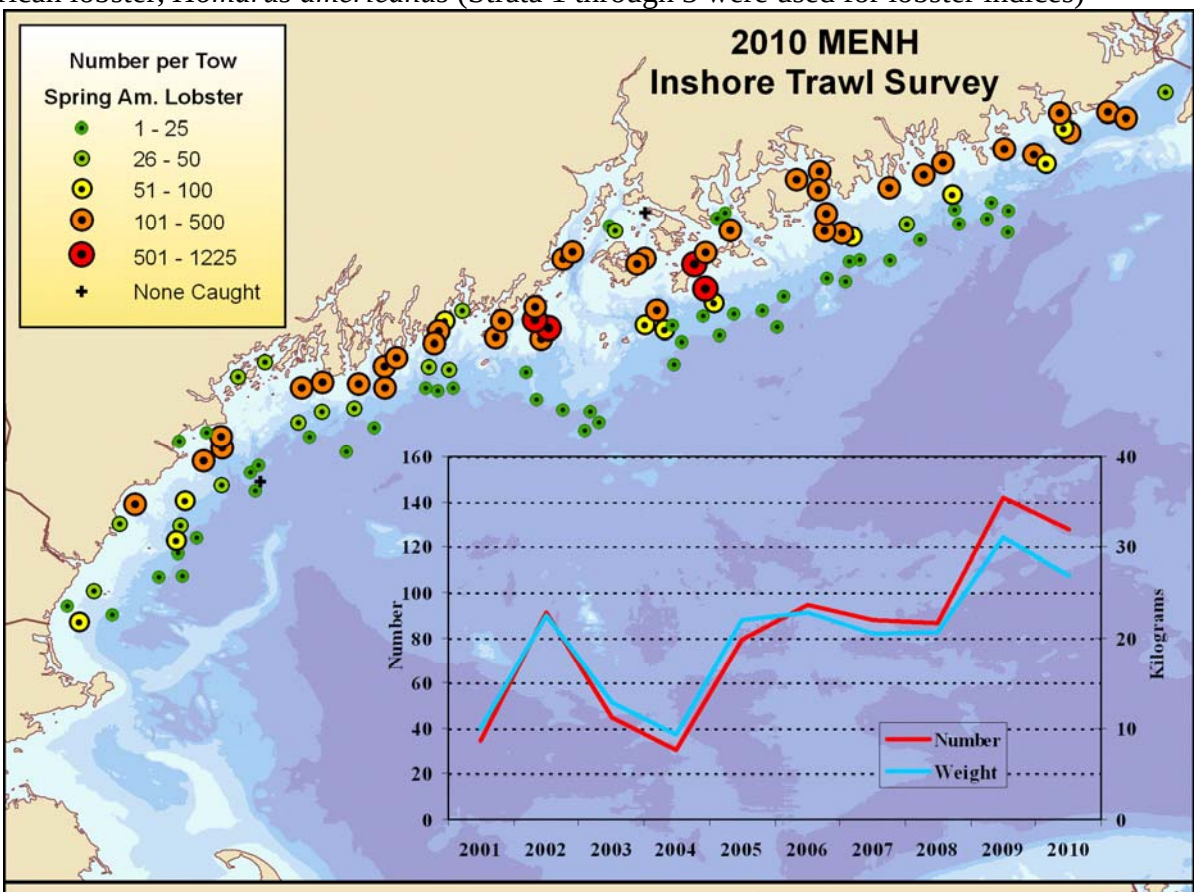
FALL

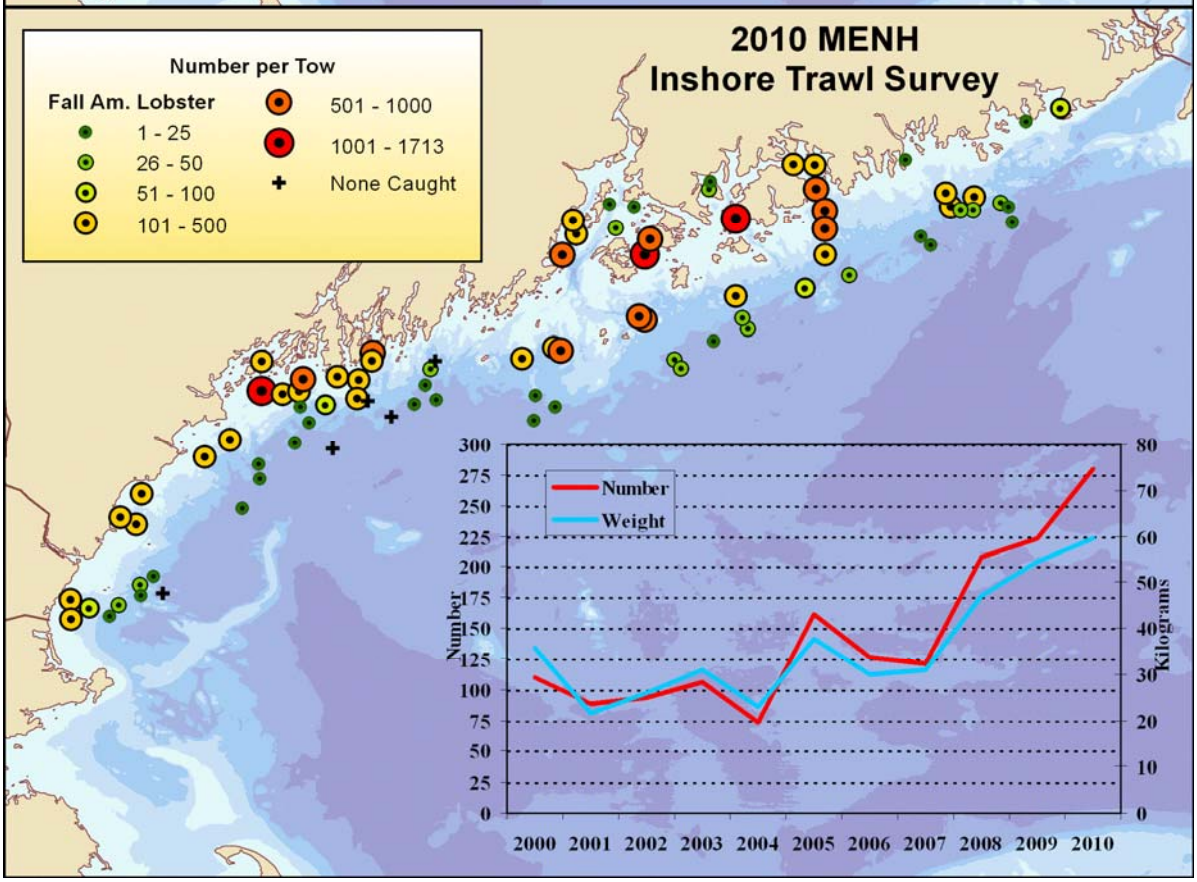
	Stratified Mean Number Mean	SE	Weight Mean	SE
2000	2.55	1.34	0.61	0.31
2001	1.40	0.74	0.35	0.17
2002	0.94	0.28	0.27	0.07
2003	1.19	0.04	0.37	0.01
2004	1.13	0.29	0.28	0.06
2005	0.36	0.24	0.09	0.06
2006	0.19	0.14	0.05	0.03
2007	2.04	0.95	0.52	0.27
2008	1.39	0.53	0.28	0.11
2009	0.87	0.33	0.22	0.08
2010	1.19	0.70	0.26	0.16





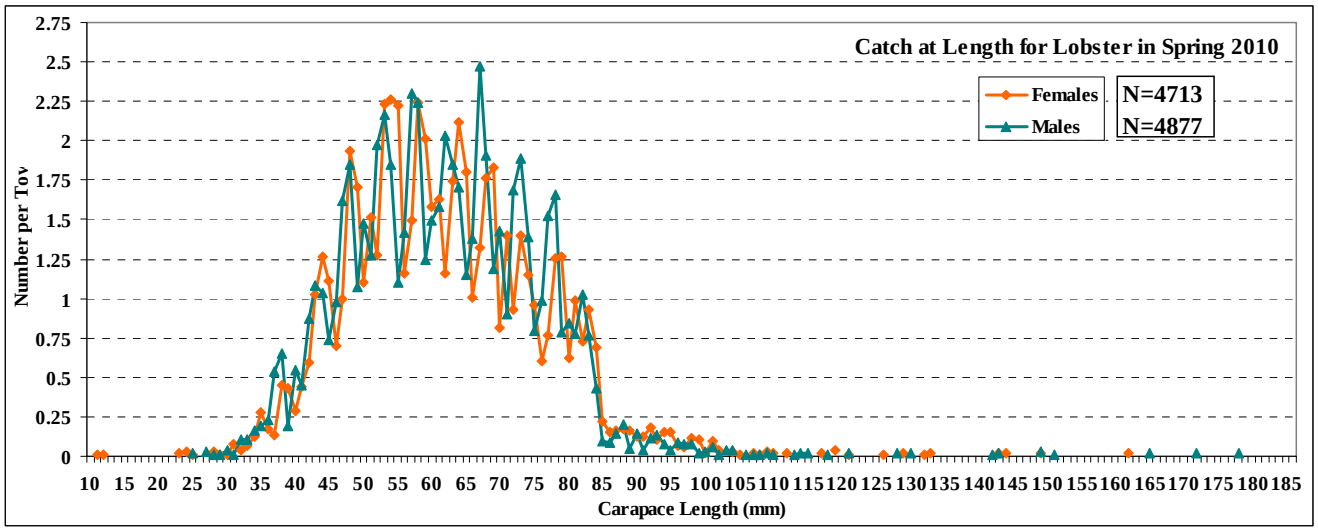
American lobster, *Homarus americanus* (Strata 1 through 3 were used for lobster indices)

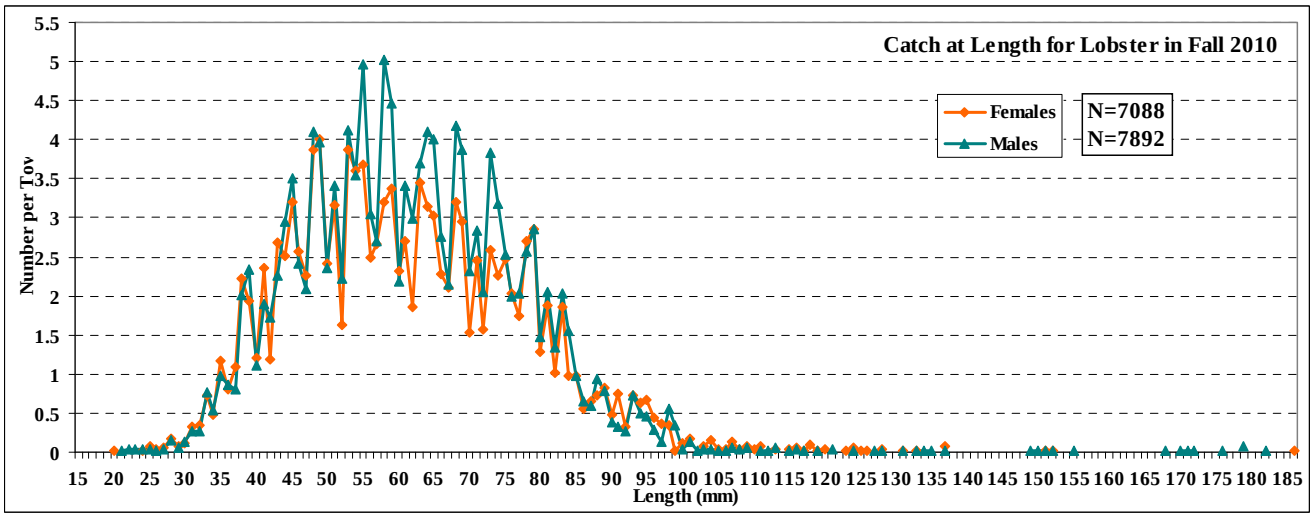




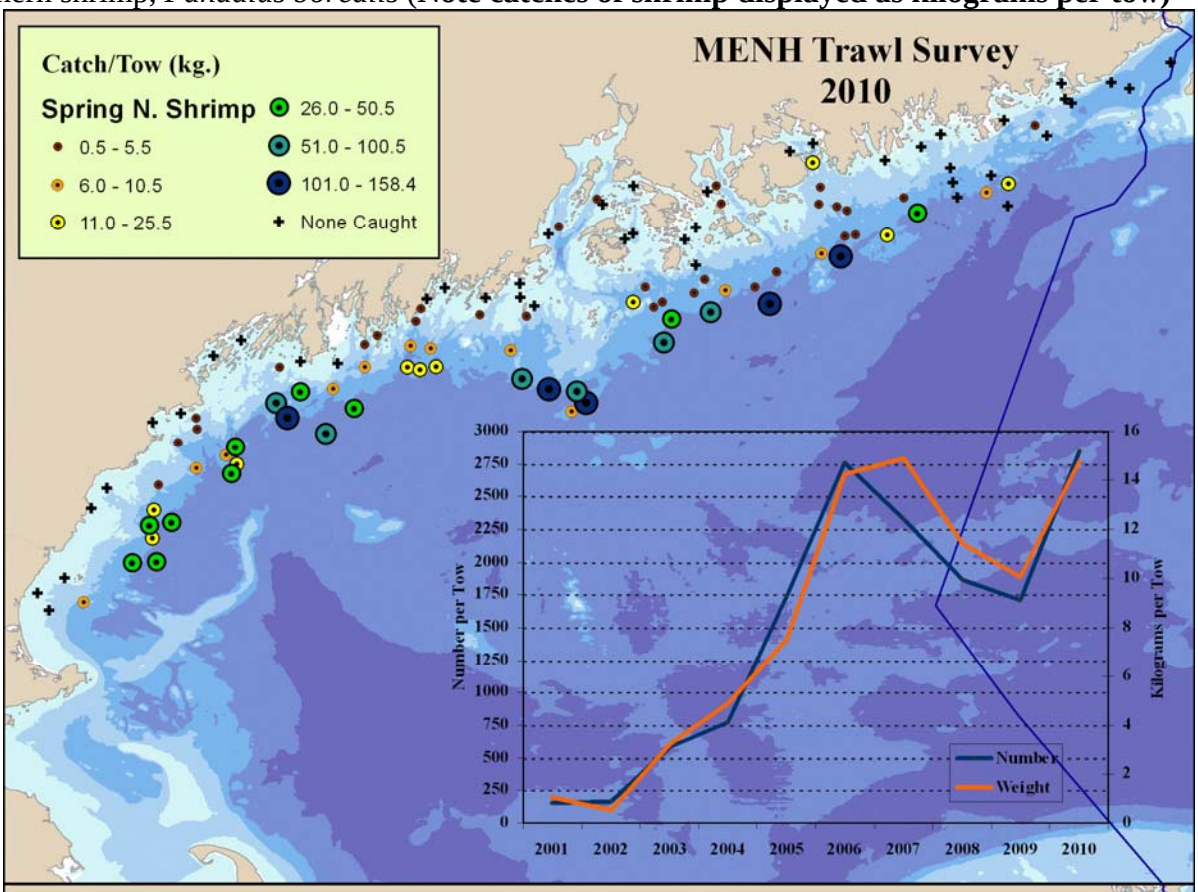
Mean and standard error for graphs overlain on distribution maps
fixed stations not included
for lobster, indices calculated for regions 1 through 5; Strata 1 through 3

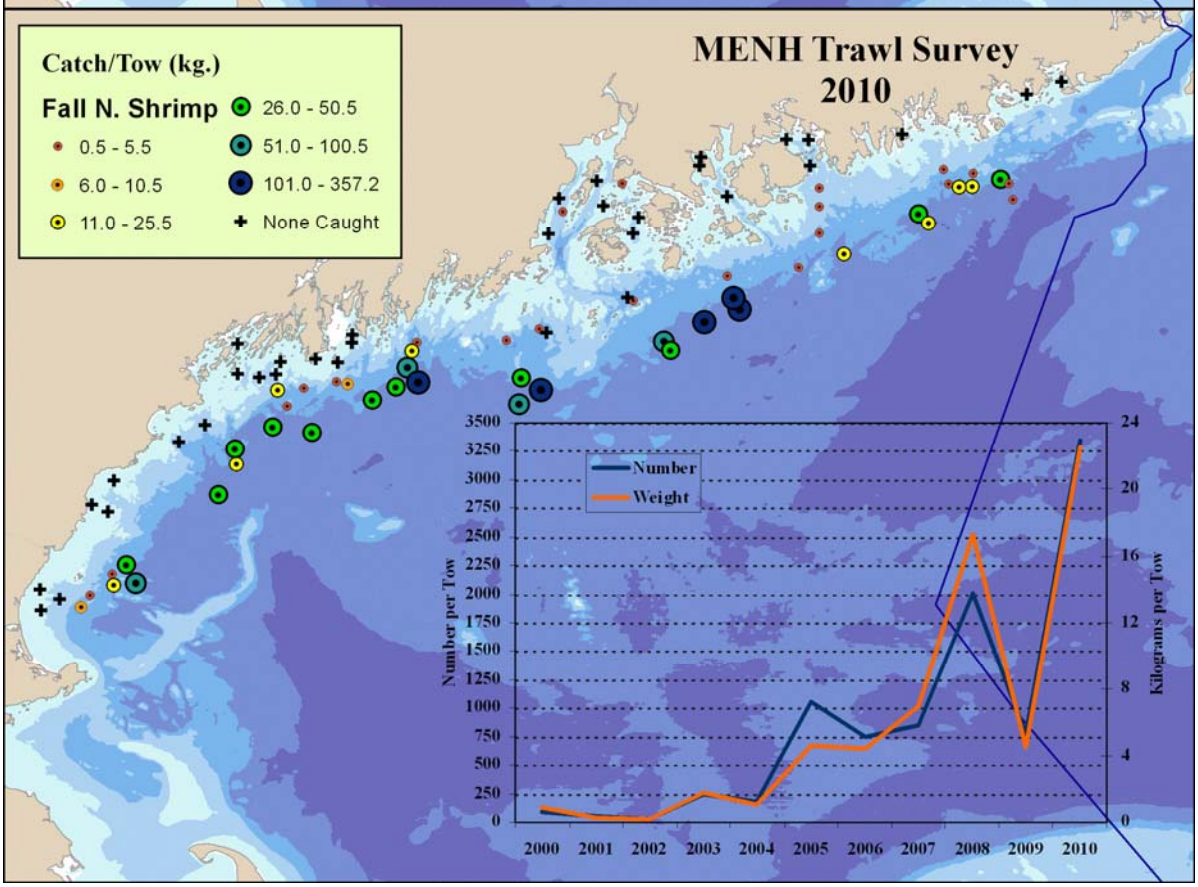
SPRING					FALL				
Stratified Mean			Stratified Mean		Stratified Mean			Stratified Mean	
	Number		Weight			Number		Weight	
	Mean	SE	Mean	SE		Mean	SE	Mean	SE
					2000	109.43	19.58	35.60	4.98
2001	34.67	5.53	10.04	1.37	**2001**	88.47	19.08	21.68	3.71
2002	91.47	13.85	22.42	3.09	**2002**	93.61	11.91	25.97	2.77
2003	44.64	7.43	12.81	1.84	**2003**	105.40	10.09	30.99	2.97
2004	30.17	3.81	9.31	1.07	**2004**	73.21	14.55	22.84	3.69
2005	79.24	14.21	22.02	3.75	**2005**	161.77	28.23	37.66	6.82
2006	94.52	22.57	22.75	4.65	**2006**	126.31	20.14	30.02	4.37
2007	87.97	11.67	20.38	2.47	**2007**	121.53	21.91	30.87	4.24
2008	86.54	22.40	20.63	5.34	**2008**	207.77	50.58	47.15	7.64
2009	141.89	30.74	31.02	5.33	**2009**	223.66	39.24	54.62	7.64
2010	127.54	13.97	26.80	2.59	**2010**	280.43	31.71	59.57	6.87





Northern shrimp, *Pandalus borealis* (**Note catches of shrimp displayed as kilograms per tow)**



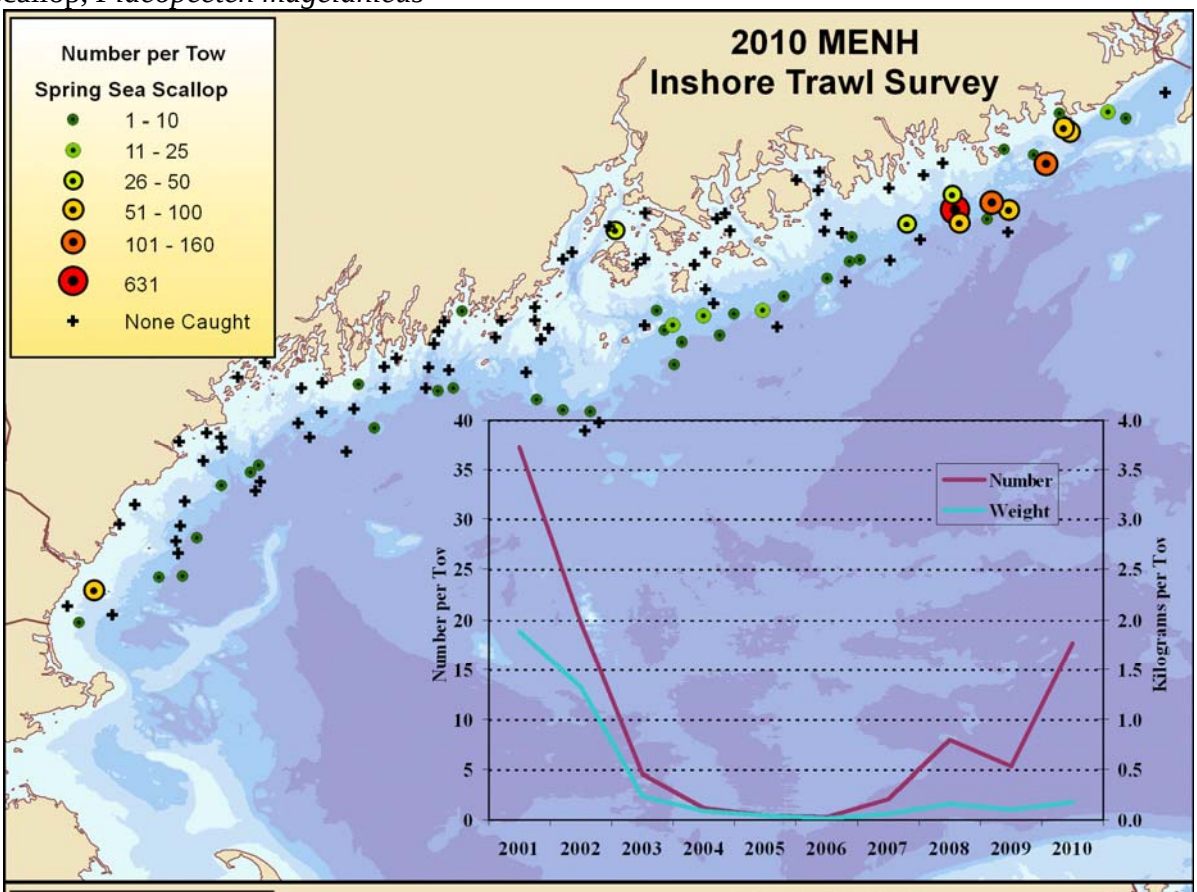


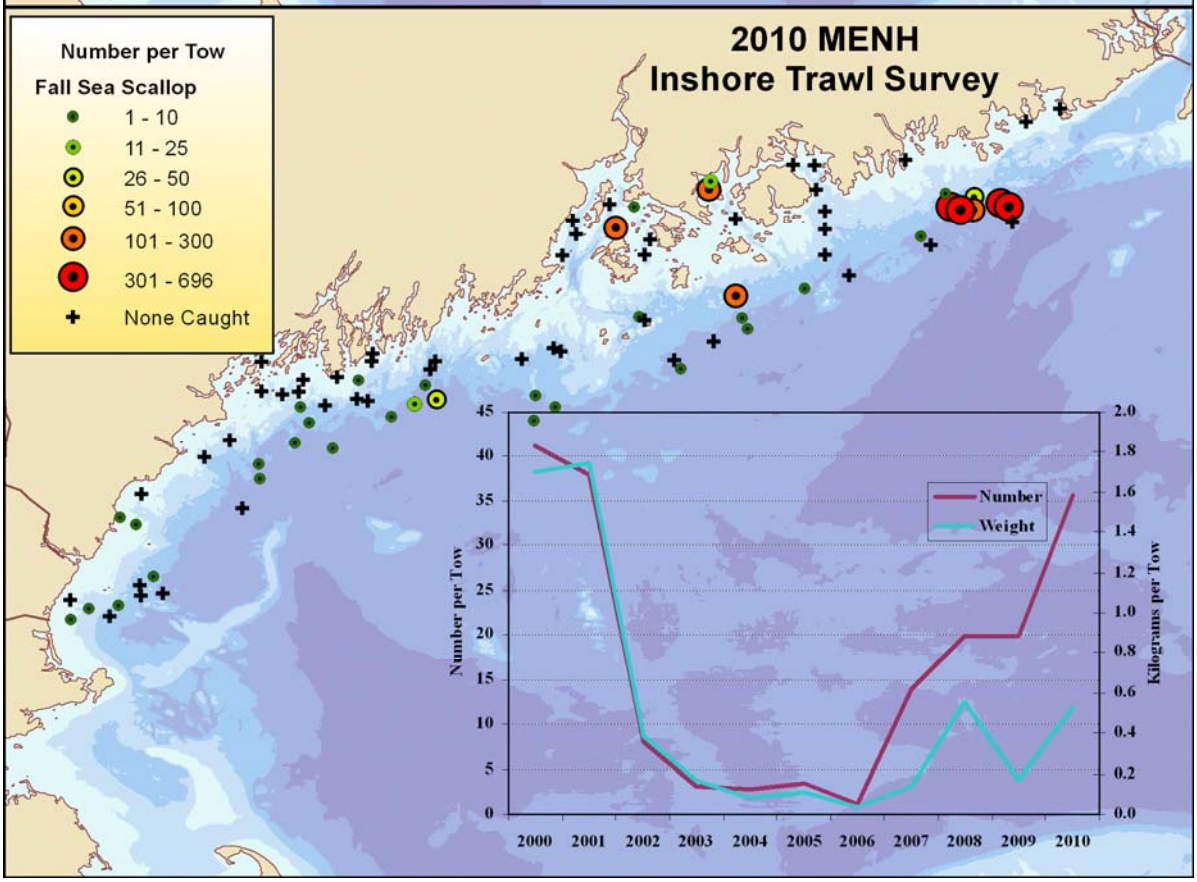
Mean numbers and weights for fall 2010 northern shrimp are estimates. Total weights of mixed shrimp catches are recorded on the vessel. Region 1 and 2 shrimp samples were lost due to a freezer failure. Data collected for the remaining regions was worked up according to protocols. In the case of the missing samples, estimated weights for northern shrimp were obtained by averaging all previous fall's proportions of pandalid shrimp species from the missing regions and strata. The number per tow was also estimated from averaging previous data.

Mean and standard error for graphs overlain on distribution maps
fixed stations not included
for shrimp, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

SPRING					**FALL**				
	Stratified Mean					**Stratified Mean**			
	Number		**Weight**			**Number**		**Weight**	
	Mean	**Error**	**Mean**	**Error**		**Mean**	**Error**	**Mean**	**Error**
					2000	92.57	54.20	0.88	0.41
2001	159.77	52.13	1.05	0.35	**2001**	49.89	24.04	0.27	0.13
2002	167.40	68.82	0.50	0.22	**2002**	22.95	10.15	0.16	0.07
2003	582.09	77.06	3.25	0.39	**2003**	242.48	92.03	1.80	0.67
2004	774.30	139.20	4.86	1.18	**2004**	175.04	99.88	1.03	0.57
2005	1746.05	176.71	7.54	0.89	**2005**	1052.09	50.44	4.63	0.17
2006	2754.63	407.04	14.25	2.17	**2006**	749.43	204.83	4.44	1.34
2007	2327.07	611.97	14.86	4.38	**2007**	843.76	163.47	7.00	1.37
2008	1865.34	169.86	11.41	1.19	**2008**	2010.33	965.43	17.29	9.23
2009	1709.08	250.33	10.08	1.46	**2009**	775.52	55.45	4.47	0.37
2010	2849.73	360.86	14.76	2.36	**2010**	3340.03	428.25	22.47	3.27

Sea scallop, *Placopecten magelanicus*





Mean and standard error for graphs overlain on distribution maps

fixed stations not included

for scallop, indices calculated for regions 1 through 5; Strata 1 through 4 (2003 on)

SPRING Stratified Mean					FALL Stratified Mean				
	Number Mean	SE	Weight Mean	SE		Number Mean	SE	Weight Mean	SE
					2000	41.30	11.65	1.70	0.67
2001	37.25	8.35	1.87	0.70	**2001**	38.01	10.51	1.75	0.37
2002	19.66	5.41	1.32	0.39	**2002**	8.13	1.95	0.39	0.10
2003	4.55	1.20	0.23	0.07	**2003**	3.17	1.96	0.16	0.09
2004	1.23	0.33	0.09	0.02	**2004**	2.72	1.20	0.08	0.03
2005	0.51	0.16	0.04	0.02	**2005**	3.38	1.24	0.11	0.04
2006	0.27	0.11	0.01	0.00	**2006**	1.16	0.39	0.04	0.01
2007	2.08	0.60	0.06	0.02	**2007**	13.94	4.71	0.14	0.03
2008	7.89	1.87	0.17	0.04	**2008**	19.80	6.12	0.55	0.27
2009	5.28	1.75	0.11	0.03	**2009**	19.88	9.17	0.17	0.05
2010	17.61	8.07	0.18	0.08	**2010**	35.57	8.39	0.53	0.19