STATE OF CONNECTICUT

**DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION**

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Marine Fisheries Division
www.ct.gov/deep/fishing

# American Lobster Monitoring Program

**April 01, 2010 – March 31, 2015**

State of Connecticut

Department of Energy and Environmental Protection
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**Project Title:** ***American Lobster Monitoring Program***

Period Covered: April 01, 2010 – March 31, 2015

**Job Title**

Job 1: Fishery Dependent Monitoring

Job 2: Fishery Independent Monitoring

Job 3: Interstate Fisheries Management Participation

***Approved by*:**
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**Cover: Commercial lobster boats, Stonington Town Dock. Photo credit: CT DEEP.**

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## JOB 1: Fishery Dependent Monitoring

### Objective 1

*Monitor the catch composition of the Long Island Sound (LIS) commercial trap fishery by measuring sex ratio, percentage of females that are ovigerous, incidence of shell disease, biofouling and damage, incidence of mortality, and cull rates of the legal and sublegal commercial catch.*

#### Methods

Commercial lobster fishery sea-sampling trips were scheduled seasonally to be proportional to the average landings from 2001-2004 and were equally divided among the three basins (24 trips per year) of the Sound (eastern, central, western); (Figure 1.1). Carapace lengths (CL) for all lobsters were measured to the nearest 0.1 mm. Additional data recorded include sex; shell hardness; relative fullness of egg mass (<1/4 complement, 1/4, 1/2, 3/4, full); developmental stage of eggs (green, brown, tan); damage observations to determine cull rates and incidence of damage to claws, carapace, abdomen (tail) and walking legs; incidence of shell fouling organisms and incidence and extent of shell disease (0, 1-10%, 11-50%, >50% of shell surface covered). Care was taken to identify wounds caused by mechanical action so they were not identified incorrectly as shell disease. The incidence of dead lobsters was also recorded. The location of individual trap trawls was recorded using a handheld GPS (Figure 1.2).

#### Modifications

Due to funding issues, the collapse of the lobster fishery in Long Island Sound, especially west of the CT River, and the institution of a closed season for the lobster fishery from September 8 through November 28, the number of sea sampling trips to be completed was reduced in 2013.

### Objective 2

*Determine catch, landings, and characterization of Connecticut's portion of the LIS commercial trap fishery.*

#### Methods

Data recorded in the CT DEEP Marine Fisheries Information System were analyzed to obtain lobster trap catch (harvest) in pounds as well as number of traps fished each year within LIS. Commercial landings recorded for Connecticut ports are also given through 2014. Totals include all license types, including landing permits.

Trends in fishing effort were examined using two annual measures. The number of licenses issued was tallied for resident and nonresident commercial license holders from 1979 through 2014. Total traps fished were computed from 1979 through 2013 (Figure 1.2).

#### Modifications

None

### Results and Discussion

In 2014, seven sea-sampling trips were made (Table 1.1). Efforts were made to achieve additional trips but low fishing effort and the institution of a closed season in 2013, which runs from Sept 8 through November 28, resulted in fewer sampling trips completed. Data collected during the seven trips made still need to be transcribed and entered into the database.

*Long Island Sound Fishery Participation and Performance*

The number of lobster licenses issued by the state has fallen since the large scale die off seen in 1999. The number of licenses issued in 2014 was 130, the lowest since 1979 (Figure 1.3). The calculated number of traps actively fished by CT resident license holders rose steadily in the beginning of the time series, from 66,709 traps fished in 1984 to the peak of 162,149 in 1999 (Figure 1.3). Following the die-off of lobsters in the western basin of Long Island Sound in 1999, the numbers of traps fished steadily declined to 18,435 in 2013 (preliminary total). The 2013 total is not only the lowest value in the available time series (1984-2013) but is 89% lower than the highest value recorded in 1999 (162,149 traps).

Connecticut landings peaked at 3.72 million pounds in 1998 and declined steadily through 2014. Total reported landings at all Connecticut ports in 2014 (from all commercial gears) were 135,005 lbs (Figure 1.4). The last two years (2013-2014) marked the lowest years of lobster landings in CT since 1984, a 97% decrease from the 1998 record high.

Lobster landings in all three basins of Long Island Sound in recent years remained at the lowest levels recorded since 1984. Eastern basin landings in 2013 and 2014 were 106,991 and 115,689 pounds respectively, a 90% decline from the record high of 1,123,337 pounds landed in 1998. Central basin landings in 2013 and 2014 were 4,207 and 4,322 pounds respectively, a 99% decline from the record high of 768,057 pounds landed in 1998. Western basin landings in 2013 and 2014 were 13,714 and 14,994 pounds respectively, also a 99% decline from the record high of 1,823,916 pounds landed in 1998. The eastern basin landings in 2014 accounted for 86% of the state-wide landings with the remaining 19,316 pounds landed west of the CT River (Figure 1.5).

*Length Frequency in the Commercial Catch from Long Island Sound*

Length frequencies for the Connecticut commercial catch observed during sea-sampling trips taken from 1984 through 2012 were calculated (Figure 1.6) in order to discern changes in the length composition of the observed catch over 29 years of monitoring. Changes observed are likely the response to management measures which increased the minimum legal length and escape vent size requirements over the given time frames. The average length frequencies for five time periods were calculated: 1984 – 1988 (minimum legal length = 80.9 mm or 3 3/16” CL), 1989-1999 (minimum legal length = 81.8 mm or 3 7/32” in 1989 and increased to 82.6 mm or 3 ¼” CL in 1991); 2000-2006 (minimum legal length increased to 83.3 mm or 3 9/32” CL in August 2005 and again to 84.1 mm or 3 5/16” CL in July 2006), 2007-2009 (minimum legal length = 84.1mm or 3 5/16” was instituted July 1, 2006 and a maximum carapace length of 133.4 mm or 5 1/4" was instituted on July 01, 2008), and 2010-2012. The most recent increase in minimum length became effective January 01, 2010, increasing the minimum size to 85.7 mm or 3 3/8” CL (Table 1.2). The escape vent requirement from 1984 through 1994 was for one horizontal or rectangular opening at least 1 ¾” by 6” or two circular vents at least 2 ¼” in diameter. The escape vent requirement increased to at least 1 7/8” by 5 ¾” horizontal or rectangular or two circular openings at least 2 3/8” in diameter on January 1, 1995 and was in place until May 1, 1998, when the horizontal or rectangular opening increased to at least 1 5/16” by 5 ¾” or two circular openings at least 2 7/16”. Coincident with the most recent increase in minimum legal length, the escape vent regulations in CT waters changed to a rectangular opening at least 2” by 5 ¾” or two 2 5/8” circular escape vents in 2010.

From 1984 through 2009, the length intervals with the highest frequencies (41% to 51%) occur just below the minimum legal size for the timeframes to which they correspond, indicating that the majority of the lobsters observed were one molt (up to 6 mm increment) away from reaching harvestable size.

The length interval one increment below legal size from 1984 - 1988 was between 74.0 and 79.9 mm with 50.8% of the animals observed falling within these lengths. The length intervals below legal size from 1989 – 1999 was between 76.0 and 81.9 mm with 48.3% of the animals observed between these lengths. The length intervals below legal size from 2000–2006 was between 77.0 and 82.9 mm with 41.2% of the animals observed falling within these lengths. The length interval below legal size from 2007 – 2009 was between 78.0 and 83.9 mm with 44.3% of the animals observed falling within these lengths. The length interval below legal size from 2010 through 2012 was between 79.0 and 84.9 mm with 38.8% of the animals observed falling within these lengths.

Length frequencies were broken down for the same five time periods by sex (male and female) and by basin (eastern, central and western) of Long Island Sound (Figures 1.7 – 1.10). The shift in the length frequencies in response to increases in the minimum legal length over the 29-year time period was observed for both males and females (including egg-bearing females) in all three basins. Additionally, a closer look at the composition of the legal-sized catch by basin was attained by calculating the length frequencies of the male and female catches for the group of animals one molt increment above the previous minimum legal length (84.1 mm or 3 5/16" CL – 89.9mm from 1984-2009 and 86.0mm or 3 3/8"CL – 91mm from 2010 to 2012, equivalent to a 6 mm molt increment) and also for the group greater than or equal to 90 mm and 92mm CL respectively for each time period. It is important to note that minimum harvestable length increased several times during the timeframe analyzed which shifts the resulting length frequencies of the commercial catch (Table 1.2).

*Eastern Long Island Sound*

Analysis of the catch composition one increment below legal size in the eastern basin from 1984 - 1988 (74.0 – 79.9 mm) showed that 47.6% of the observed males and 45.0% of the observed females fell within this interval. The average percent of the catch measuring one increment below legal size from 1989 – 1999 (76.0 – 81.9 mm) was 42.0% for males and 48.4% for females. The average percent of the catch one increment below legal size from 2000 – 2006 (77.0 – 82.9 mm) was 30.3% for males and 48.2% for females.

An increase in the average percent of females and males observed in the length interval one increment below minimum legal size occurred from 2007 - 2009 (78.0 – 83.9 mm) with 41.2% of the observed males and 50.2% of the observed females falling within this interval. The average percent of the catch one increment below legal size then decreased in 2010 to 2012 (79.0 – 84.9 mm) to 34.1% for males and 48.6% for females (Figures 1.7 to 1.10).

The percentage of marketable lobsters in the eastern basin increased from an average of 31.5% of the observed catch from 1984-1988 (range = 19.2% - 52.2%) to 36.9% from 2000 to 2009 (range = 31.5% - 46.3%). Due to limited sampling in 2006 and 2011, meaningful percentages could not be calculated and data from the eastern basin for these years are not included. The lowest number of marketable lobsters observed in this area was documented in 2010, with 14% of the catch being marketable. In 2012, the percentage rose to 29.5%, (Figures 1.11 and 1.12) which is below the time series average for this area of 35.4%.

The female component (including egg-bearing females) of the observed legal sized catch from this area (1984 through 2012) was examined. Of the animals meeting the minimum legal size requirements for this time frame, the majority (72.7%) of the legal sized catch occurred within one 6 mm length interval (84.0 – 89.9) between 1984 and 2002. In this time period, an average of 27.3% of the remaining legal size catch measured 90.0 mm or greater (Figure 1.8). This occurrence increased between 2003 and 2009, with 79.4% of the animals falling within the interval just above minimum legal length (84.0 and

89.9 mm) and 20.6% on average, measuring 90.0 mm or greater. Data for 2010 – 2012 show percentages in the same range for the two legal size categories examined. The average for this time period was 82.5% within one 6mm length interval of legal size and 17.5% making up the remainder of the legal catch. The composition of the male harvest in the eastern basin has remained more constant, on a percentage basis, in the distribution across legal lengths. From 1984 through 2002, 65.5% of the male harvest fell within the 84.0 to 89.9 mm interval and the remaining 34.6% measured greater than 90.0 mm. Analyses of data collected from 2003 through 2009 show only a slight deviation in the percentage of animals in the 84.0 to 89.9 mm range, with 70.2% observed during the time period and the remaining 29.8% measuring greater than 90.0 mm CL (Figure 1.10). The data from 2010 through 2012 show percentages in the same range for both size categories examined with 71.7% of the legal catch within one 6mm interval of legal length and 28.2% comprising the remainder of the legal catch.

*Central Long Island Sound*

Sea-sampling in the central basin began in 2000 and the ten year period for which length frequencies are available (2000 – 2012) were analyzed. The same shift in lengths in response to increases in the minimum legal length instituted in 2005 and 2006 was observed for both sexes in this basin (Figures 1.7 – 1.10). Analysis of the catch composition, by sex, one increment below legal size from 2000 - 2006 (76.0 – 81.9 mm) showed 21.8% of the observed males and 35.5% of the observed females fell within this interval. This is similar to averages observed from 2007 to 2009, with 27.1% of males and 44.0% of females measuring one length interval (78.0 – 83.9 mm) below the minimum legal length. The percentage of animals observed in the size category one molt increment below legal length in 2010 and 2012 (79.0 – 84.9 mm) fell to 19% for males and 28.9% for females. There were no data available from this basin for 2011.

From 2000 to 2010, on average, 36.6% of the observed catch was marketable in the central basin. This percentage has ranged from 19.9% (2006) to 46.6% which was recorded during the first year of sampling in this basin, 2000 (Figures 1.11 and 1.12). In 2010, the percentage of marketable lobsters exceeded the average at 40.2% of the catch but fell to 31.2% in 2012. There were no data available for the central basin in 2011.

The female component (including egg-bearing females) of the observed legal size catch from this area (2000 through 2012) was examined. Of the animals meeting the minimum legal size requirements for 2000-2009, 72.6% to 86.7% occurred within one 6 mm length interval (84.0 – 89.9), with 13.3% to 27.4% of the remaining legal size catch measuring 90.0mm or greater (Figure 1.8). The percentages of the legal size categories examined for 2010 and 2012 showed similar trends, with 75.3% within one 6mm molt increment of minimum legal length and 24.7% making up the remainder of the legal catch. There were no data available for this area in 2011. The composition of the marketable male catch observed in the central basin has, since sampling began in this area in 2000, been more evenly distributed across the legal lengths observed. The male harvest within 84.0 – 89.9 mm CL has ranged from 47.3% to 60.2% while the larger lengths (90.0 mm +) ranged between 39.7% and 52.7% of the remaining legal catch (Figure 1.10). Similar to females in this area in 2010 and 2012, the percentages of each legal length category fell within the same range, with 52.5% within one 6mm molt increment of the minimum legal length and 47.5% comprising the remainder of the legal catch for those years.

*Western Long Island Sound*

A large percentage of the observed catch in the western basin from 1984 - 1988 fell within the length interval one increment below legal size during this time period, with 48.6% of the males and 57.7% of the females measured with carapace lengths ranging from 74.0 – 79.9 mm. Analysis of the composition

of observed animals within the length interval one increment below legal size from 1989 - 1999 and 2000 - 2006 (76.0 – 81.9 mm and 77.0 – 82.9 mm respectively) yielded a smaller percentage of males just below minimum legal length (39.5% and 29.8% respectively) while the majority of females (52.1% and 48.7% respectively) fell within the single molt interval. A similar catch composition was observed in the west in recent years with 33.4% of males and 55.7% of females measuring within one increment below legal size (78.0 – 83.9 mm) from 2007-2009. The percentage of animals just below minimum legal length in this area from 2010 to 2012 fell to 22.7% of males and 38.8% of females measuring 79.0 – 84.9 mm CL (Figures 1.7 – 1.10).

The largest measurement for male lobsters in the western basin shifted over the 29-year series, with the largest recorded male increasing slightly for each time period: 102 mm from 1984 - 1988, 106 mm from 1989 – 1999, 108 - 110 mm from 2000 – 2012 and 112 mm in 2011. This was not observed in the eastern basin for either sex. The largest female recorded in the western basin occurred in 2011 at 112 mm, which is slightly higher than the previous range of 106 to 107 mm observed in this area during the 29-year time period. The percentage of marketable lobsters over the same time frame increased from an average of 21.9% of the observed catch from 1984-1988 (range = 18.1% - 27.5%) to 33.3% marketable from 1989 to 2011 (range = 22.7% - 67.7%). In 2012, the marketable catch was 29.5% of the total animals observed in this area (Figures 1.11 and 1.12).

The female component (including egg-bearing females) of the observed legal size catch in the west (1984 through 2012) was examined. Of the animals meeting the minimum legal size requirement, an average of 87.3% of the legal size catch occurred within one 6mm length interval (84.0 – 89.9) between 1984 and 2002, with 12.7% of the remaining legal size catch measuring 90.0 mm or greater (Figure 1.7). Between 2003 and 2009, percentages of each legal size category were within the same range as earlier years, with an average of 80.6% of the legal catch occurring between 84.0 and 89.9 mm CL and the remainder (19.4%) measuring over 90.0 mm. The same was true for 2010 through 2012, with 81.1% of the legal catch falling within one 6mm length interval from legal size and the remaining catch comprising 18.9% of the total. The composition of the marketable male catch observed in the western basin from 1984-2002, on average, showed 68.9% measuring between 84.0 and 89.9 mm CL and the remaining 31.1% measuring greater than 90.0 mm. Analyses of data collected from 2003 through 2009 showed a smaller percent (55.0%) of the harvested males fell within the 6mm interval (84.0 – 89.9 mm) and 45.0% measuring greater than 90.0 mm CL (Figure 1.10). From 2010-2012, the ratio was similar to the range observed in past years with 60.5% falling within one 6mm interval of legal size and the remaining 39.5% comprising the remainder of the legal catch.

*Changes in Sublegal to Legal Abundance Ratios*

To further examine changes in population size structure, all lobsters measured from the commercial catch were grouped into sublegal sizes (70.0 - 82.5 mm CL) and legal sizes (> 84.0 mm CL from 1984 - 2009 and >85mm CL from 2010 - 2012) by sex and basin (Figure 1.13 and 1.14). The interim sizes (82.6 - 84.0 mm CL and 82.6 - 85.6 mm CL) were eliminated because those lobsters were legal at the beginning of the time series but sublegal after 2005-2010 gauge increases. The minimum escape vent size also increased in 1994 and 1997, but remained unchanged from 1998 to 2009. From 1998-2009, the ratio of sublegal sizes (70.0 - 82.5 mm CL) to sizes always fished (>84.0 mm CL) declined from over 2:1 to less than 1:1 for both sexes in the eastern basin and males in the western basin; ratios for females in the western basin also declined substantially but remained slightly higher (1.25) through 2009, until falling below 1:1 from 2010 through 2012 (Figure 1.14). Ratios for both sexes in the central basin also declined to less than 1:1 for both sexes in 2010. A population where older animals, whose abundance has already been reduced by fishing, outnumber younger animals not yet exposed to fishing

is not stable and will very likely show substantial declines in total abundance in future years. Coincident with the most recent increase in minimum legal length effective 2010, the size of the escape vent in lobster pots also increased (Table 1.2). This increase makes data collected from 2010 through 2012 incomparable to the 1991-2009 data presented. As expected with an increase in the escape vent, there was no sizeable increase in the ratio of the unfished to fished population observed from 2010 through 2012 and, with the exception of males in the western basin in 2011 (ratio of 4.0), the other ratios remained less than 1:1.

*Sex Ratio and Percent Egg-Bearing Females in the Commercial Catch from Long Island Sound*

A complete fishing prohibition on ovigerous females has historically been the core regulatory approach to ensure sustainable reproduction for all American lobster stocks. However, the long term consequences of this additional layer of protection for only the female portion of the population are not well understood. Since severe skews in the sex ratio in favor of either sex have the potential of disrupting each population's reproductive success, sex ratios by basin are detailed in this report. In order to minimize seasonal differences in availability and make data comparable among years, only catches from sea-sampling trips made during July-October were examined.

*Eastern Long Island Sound*

For animals observed between July and October from 1984 - 2012, the sex ratio of the observed catch in the eastern basin ranged from 62.0% female to 84.9% female (Figure 1.15). Catches in the eastern basin in 2012 were comprised of 67% female, which is below the average (75%) observed in this area over the time period (1984-2010, note insufficient sampling occurred in the eastern basin in 2006 and no data were available for this area in 2011). The percentage of females observed in years before the die-off (1984-1999, average=73.6%) is lower than what has been observed in subsequent years (2000-2010, average= 77%). The percentage of females that were egg-bearing (Figure 1.16) in the east (July-October) following the die-off in 1999 (2000-2010 average = 15.4% note insufficient sampling occurred in the eastern basin in 2006 and 2011) remains unchanged from previous years (1984-1999 average = 15.7%). The percentage of females observed from 2007 to 2010 reflected the lowest numbers of egg-bearing females seen in this basin since 1995, with only 3.7% observed out of 704 females measured observed in 2010. The percentage of egg-bearers in 2012 rose to 15.0% (80 of 877 lobsters observed).

*Central Long Island Sound*

Sampling in the central basin in 2012 yielded catches that were 56.2% female which is just below the average percentage of females seen in this area since sampling began there in 2000 (59.2%, 2000-2010, no samples were taken in this area in 2011). The highest percentage of females in this area occurred in 2001 and 2002 (67.2% and 68.7% respectively, Figure 1.15) with the lowest occurance of females (44%) seen in 2003. The numbers of females with eggs was highest in this area in 2006 and 2007 (33.5% and 22.7% respectively, Figure 1.16) and has been less than 6% since 2008, with 3% in 2012 (7 out of 420 observed). The average percent of females carrying eggs in this area from 2000-2010 was 10.8%. There were no sampling trips taken in the central basin in 2011.

*Western Long Island Sound*

Patterns in observed catches (July-October) in the western basin have been variable over the time series, ranging from 21.9% (1991) to 83% (2011) of the catch being comprised of females between 1984 and 2012. The percentage of females in 2011 was the highest occurrence of females in the commercial catch observed in this area since 1984 and well above the average (62.4%) across the time series (1984

through 2011, Figure 1.15). The percentage of females that were egg-bearing in the observed commercial catch was 15% in 2012 and 19.3% in 2011. These percentages followed two years of record lows for this basin in 2008 and 2009 (6.4% and 8.1% respectively). The occurrence of egg-bearers in 2012 is also above the average of 13.8% for this area of LIS from 1984 through 2011 (Figure 1.16). It should be noted that the high prevalence of females in the observed catch varies by location within the western basin. Additionally, due to extremely low catches and infrequent participation in the fishery in this area, sea-sampling in recent years has only been possible with the help of less than 3 fishermen. Future analyses need to be performed to examine sex specific distributions within the basin on a spatial and temporal scale.

*Incidence of Shell Disease and Mortality in the Commercial Catch from Long Island Sound*

Epizootic shell disease is an opportunistic but chronic disease contracted when environmental conditions favor both external bacterial growth that digest the minerals in a lobster's shell while chronically weakening the immune system of susceptible lobsters. Affected animals may be genetically predisposed to the disease but can rid themselves of diseased shells by molting. However, unless underlying stress conditions which made them vulnerable in the first place are ameliorated, these animals seem to become readily re-infected. And premature molting may cause undetected declines in reproductive success and egg survival. An increase in shell disease prevalence may be an indication of above normal stresses in the lobster populations. The bacterium *Aquimarina homaria* has been determined to be the proximal cause of shell lesions (Chistoserdov *et al.* 2005), but predisposing factors may include inadequate diet (bait only), temperature (rising global trends), contaminants (alkyl phenols and phosphates used in surfactants, pesticides, heavy metals), and low pH due to ocean acidification.

The occurrence of shell disease in the observed commercial catch has been most prominent in the eastern basin since first observed in 1992. Levels in the eastern basin have been elevated since 1999, ranging from 0.6% in 1995 to 35.5% in 2002, the highest rate of the disease documented in this area (Figure 1.17). The occurrence in 2012 (4.9%) is below the average of 14.4% occurrence of the disease observed from 1992 to 2011. Though at lower levels, egg-bearing females continued to show the highest occurrence and severity of the disease in the eastern basin in 2012 (10.1%). This is an area where up to 92.1% of the observed egg-bearing females were afflicted with the disease in 2006 (Figures 1.18 and 1.19). The incidence of diseased animals in the central basin in 2012 was the lowest observed (0.1%) in the 13-year time series. The average for this basin from 2000 to 2011 was 3.7%. Occurrence rates in the western basin have remained extremely low (< 1.0%) with the highest rate documented (2.1% of the observed catch) in 1997.

The frequency of dead lobsters observed in commercial traps sound-wide fell to 0.7% in 2012 (36 of 5,064 observed) from 1.4% (53 out of 3,742 observed) in 2011. This is just above the average of 0.4% for the time series (2000-2011). The highest frequency of dead lobsters continued to occur in the western basin in September (12% of the observed catch in 2011 and 0.5% in 2012).

*Cull Rates in the Commercial Catch from Long Island Sound*

The level of single or no-clawed animals (culls) in an area can be a general indicator of the health and social structure of the population. Crustaceans drop claws as a survival mechanism to escape predation and limit the severity of wounds resulting from competition between lobsters for food, territory, shelter or mating (Mariappan *et al.* 2000). Commercial fishing gear related injuries also contribute to claw loss and the overall cull rate in a population. Although autonomizing a claw has immediate survival value to the individual, there are long-term negative consequences. Culls have lower survivorship due to an increased difficulty in obtaining food and defending themselves (Atema and Cobb 1980, Lawton

and Lavalli 1995). The ecological consequences of missing appendages in decapod crustaceans, including *Homarus americanus*, were examined by Juanes and Smith (1995). These authors concluded that reduced foraging activity led to changes in diet and loss of dimorphism of the chelipeds in some species, which had effects on growth and regeneration. Cheng and Chang (1993) observed reductions in the growth increment in American lobster with missing limbs, as high as 40%, depending on regeneration rates. Injured lobsters have also been observed to be less likely to successfully mate and, due to decreased social dominance, have more difficulty in locating and establishing shelters (O'Neill and Cobb 1979). Juanes and Smith (1995) also noted that wounded lobsters that were unsuccessful in defending their shelters experienced increased levels of predation and could be at a higher risk for infection or disease.

Cull rates in Long Island Sound have been stable since 1982, showing neither a decreasing or increasing trend despite the fact that fishery effort has changed dramatically over the 31-year time series. Cull rates for sublegal and legal sized lobsters in Long Island Sound were analyzed by basin (eastern, central, western) from July to October throughout the time series. It is important to note that cull rates for lobsters sampled in the eastern basin were not calculated for 2006 due to small sample sizes during the July through October period. There were no data available for the central basin in 2011.

*Sublegal*

The cull rate for sublegal lobsters in the eastern basin (Figure 1.20) in 2012 was 16.9% which is above the average of 14.6% observed in this area between 1982 and 2011. Cull rates for this size class in this area have ranged from 10% (1982) to 22% (2011) over the 31-year time series.

The cull rate for sublegal lobsters in the central basin was the highest recorded for this area (Figure 1.20) at 22.5% in 2012. This is higher than the average cull rate observed for sublegals in this basin from 2000-2010 (17.2%). The range for this area is 14% (2000) to 22.5% (2012) documented from 2000-2012. There were no data available from this basin in 2011.

The cull rate for sublegal lobsters in the western basin was 18.1% of the observed sublegal catch in 2012 (Figure 1.20). This is just above the levels seen in this area in 2011 (17.5%) and is also above the average of 15.1% for sublegals observed from 1983 to 2011. Cull rates for this size class in the west have ranged from 7.8% (1993) to 25.4% (2004).

*Legal*

The cull rate for legal lobsters in the eastern basin (Figure 1.21) was 18.8% of all legal animals observed in 2012, which is the highest cull rate in this area since 1982. The 31-year time-series average for this basin is 13.1% and rates have ranged from 8.5% (1985) to 18.8% (2012).

The cull rate for legal lobsters in the central basin (Figure 1.21) was 17.5% of legal animals in 2012. Cull rates for this basin have averaged 18.2% since sampling began in 2000 and have ranged from 12.9% (2008) to 28.5% (2004). There were no data available from this basin in 2011.

The cull rate for legal lobsters in the western basin (Figure 1.21) was 21.5% of the legal animals in 2012, which is higher than the average of 17.8% in this area from 1983 to 2011. Cull rates for legal animals in the west have ranged from 5.0% (1992) to 29.4% (2005) over the 30-year time series.

## JOB 2: Fishery Independent Monitoring

## Objective 1

*Monitor the annual relative abundance, sex ratio, percentage of females that are ovigerous, incidence of shell disease as well as the general health and condition, and cull rates of the legal and sub-legal length components of the lobster stock in Long Island Sound (LIS).*

### Methods

Lobsters are sampled in Long Island Sound by otter trawl during cruises conducted by the CT DEEP Long Island Sound Trawl Survey (LISTS, Gottschall and Pacileo 2003). This survey uses a 14 m sweep trawl towed at 3.5 kts for 30 min from the 15.2 m research vessel *John Dempsey*. Stations are chosen from all trawlable LIS waters between New London and Norwalk, CT (Figure 2.1) employing a stratified random design with four depth strata (0-9 m, 9.1-18.2 m, 18.3-27.3 m, 27.4+m) and three bottom substrate strata (sand, mud and transitional). Forty stations are sampled monthly during spring (April, May, June) and fall (September and October) surveys. All lobsters collected are counted and a composite weight is recorded (+/- 0.1 kg). Biological data are recorded for all lobsters caught in each tow, or a minimum of 50 when measuring the entire catch is not possible. Data recorded include carapace length (CL) measured to the nearest 0.1 mm, sex, shell hardness, relative fullness of egg mass (<1/4 complement, 1/4, 1/2, 3/4, full), developmental stage of eggs (green, brown, tan), cull status and incidence and extent of shell disease (0, 1-10%, 11-50%, >50% of body covered). The incidence of dead lobsters is also recorded.

Arithmetic and geometric mean indices of abundance for lobster are calculated for each survey. Catches from tows shorter than 30 minutes are expanded, or standardized to the equivalent 30-minute catches. The arithmetic mean is listed as the simplest measure of average conditions; however it is often skewed by tows with extraordinarily large numbers of lobsters. The geometric mean, which is computed using natural log values, is a more reliable measure of relative abundance when catch densities are skewed (e.g. negative binomial distribution). A delta mean is calculated for the catch per tow of specific size and gender classes, including egger and non-egger females, because of the high number of zero-catches for each class (Pennington 1985, Aitchison and Brown 1957, Aitchison 1955). Three size classes are identified: legal (minimum legal size(s) CL and greater), recruit (73 mm-legal size CL or the size range corresponding to one molt below legal length), and pre-recruit (<73 mm CL).

### Modifications

None

## Objective 2

*Provide a larval lobster recruitment index by measuring the annual production (number per 1000 m3) of Stage IV lobster larvae in western LIS.*

### Methods

Neuston samples were collected weekly from May through August at seven stations in western Long Island Sound: three mid-sound sites and two sites each along the Connecticut and Long Island shores (Figure 2.2). These stations have been sampled in the same manner since 1983 and were originally chosen based on the findings of a previous larval lobster survey (Lund and Stewart 1970). Samples were collected using a neuston net (1 m wide x 0.7 m high mouth, 3.05 m net length, 1 mm mesh) with an effective sampling area of 0.5 $m^2$ in the top 0.5 m of the water column. The net was towed by an

8.2m boat. Tow duration was fixed at five minutes and tow speed at 3 knots. Three tows were taken during daylight hours within a half-mile radius of each station location, in tidal fronts where visible. The volume ($m^3$) of water sampled during each tow was recorded by a calibrated flowmeter secured to the mouth of the net frame. Beginning and ending latitude and longitude of each tow were recorded by GPS. Samples were packed in ice at sea immediately following collection and sorted for lobster larvae (stages I-IV) within 24 hours. The four larval stages were identified using characteristics described by Factor (1995).

Density of Stage IV larvae (number per $1000m^3$) was calculated for each tow correcting for stage duration (Templeman 1936) by dividing by development time at prevailing water temperatures for each sample period. The duration-at-temperature values were halved for stage IV larvae because settlement occurs approximately midway through the fourth stage and the larvae are no longer vulnerable to the gear (Scarratt 1973). Weekly and seasonal mean Stage IV larval density estimates were derived using delta-distribution theory (Fogarty *et al*. 1983; Pennington 1985; Pennington and Berrien 1984).

**Modifications**

Larval sampling for lobster in western Long Island Sound ended after the 2012 season due to a lack of funds to support the program.

## Results and Discussion

*Fishery Independent Abundance Indices*

There were a total of 120 bottom trawl tows completed during the spring (April through June) 2014 survey. Biological data were recorded for 167 lobsters (Table 2.1). The 2014 spring standard survey catch was 167 lobsters with a total weight of 28 kg. Twelve of the 120 tows taken in the spring 2014 survey (10%) were less than 30 minutes in duration and their catches were expanded. The spring 2014 abundance index (geometric mean = 0.45 lobsters/tow) was the lowest record of abundance in the 31 year spring survey time series.

There were a total of 79 bottom trawls completed during the fall (September and October) 2014 survey. The 2014 fall standard survey catch was 11 lobsters with a total weight of 4 kg. Biological data were recorded for 10 lobsters (Table 2.1). Five of the 79 tows taken in the fall survey (6%) were less than 30 minutes in duration and their catches were expanded. The fall 2014 abundance index (geometric mean = 0.09 lobsters/tow) was also the lowest record of abundance in the 30 year fall survey time series.

Delta mean catch by sex and size class (Table 2.2 and Figures 2.5 and 2.6) indicated that the abundance of lobsters observed in the spring survey has been at low levels since 2003/2004 for each sex and size category (pre-recruit, recruit and legal) examined, with no legal egg-bearing females observed in the 2011 spring survey. Though the spring 2007 survey showed signs of improvement, particularly for pre-recruits, abundance fell in 2008 and values since 2009 have been at or below the 25th percentiles for each sex and size class.

Combining male and female pre-recruits as well as recruits and legals (to accommodate changes in the minimum legal size instituted in 2005-2006 and 2010) shows that combined abundance for these size classes in the spring survey has been at or below the 25th percentiles for the time series (5.9 and 3.1 respectively) since 2009.

The delta mean catch by sex and size class for the fall survey have indicated abundance levels below the 25th percentiles for each category since 2011. The abundance of recruits and legals (for each sex) has been below the 25th percentile since 2006.

Combining sexes for the pre-recruit size class as well as recruits and legals for the fall survey, also showed that combined abundance for these size classes in the fall survey has been at or below the 75th percentiles for the time series (47.3 and 15.6 respectively) since 2000, and has since fallen below the 25th percentiles for the time series (7.5 and 3.9 respectively) since 2005.

*Length Frequencies of the Research Catch*

Spring length frequencies of females (Table 2.3) show very few animals caught in the spring survey in 2014 above 85.0 mm CL. An average of 7.6% of the spring male trawl catch has been above the minimum legal length from 1984-2011, with the percentage of the male legal catch falling to 2.2% in 2012 and 2.6% in 2014 (Table 2.4). An average of 6.8% of the spring female trawl catch has been above the minimum legal length from 1984-2011. The lowest years of catches for legal sized females in the spring trawl survey have occurred since 2009, with 2014 yielding just two animals out of a total of 90 females caught.

The fall 2014 survey yielded the lowest number of animals caught since the survey began in 1984, with only 12 lobsters. The 2014 catch followed two previous years of record low fall catches, with 54 lobsters in 2012 and 24 in 2013 (Tables 2.5, 2.6). Of the twelve animals seen in 2014, only one (male) was above the minimum legal length (85.7 mm).

*Incidence of Shell Disease in the Research Catch*

Shell disease continues to be an eastern basin phenomenon with higher rates of occurrence and more severe levels of shell degradation in animals observed in this area. Due to the topography of the eastern basin and the spatial nature of the LISTS, the occurrence of shell disease in the research trawl catch is typically much lower than levels observed in the commercial pot catch.

The highest incidence of shell disease in the spring catch occurred in 2011, with 6.2% (10 of 161) of the animals observed showing signs of the disease. The level of shell disease observed in the 2012 spring catch fell to 1.2% (3 of 252) of the animals observed. The percentage of animals with shell disease in the spring catch has ranged from 0.2% to 6.2% from 2001 – 2012. The incidence of the disease in the fall has ranged from 0 – 3.7% from 2001 – 2012 with the fall 2007 survey yielding the highest percentage of diseased animals (3.7%).

*Cull Rates in the Research Catch*

Cull rates were calculated for sublegal and legal sized lobsters captured in the spring and fall 2012 surveys. The average cull rates for the 1991 to 2009 spring and fall surveys were 8.6% and 8.3% respectively. Catches of sublegal-sized lobsters in the spring and fall surveys were not large enough in 2010 or 2011 to calculate meaningful percentages. Cull rates for the 2012 spring and fall surveys were below the average, with 6.7% and 7.7% respectively. Since 2005, catches of legal-sized lobsters in the spring and fall surveys were not large enough to calculate meaningful percentages.

*Larval Sampling*

Annual larval production rates remained low. Weekly sampling in 2012 began May 24th (week 21) and ended July 24th (week 30), four weeks after the last stage IV larvae were observed. Sampling for 4th stage larvae continued beyond the first three weeks of zero catches since the survey began because the annual index for the entire time series has been calculated, on average, across eight weeks (range 5 – 10 weeks) of positive catches. In 2012, there were four weeks where stage IV larvae were observed. It is important to note that due to vessel breakdown in the fourth week of the survey, only two sites were

sampled and no tows were taken during the fifth week. The 2012 larval index was calculated with only 77 samples representing less than four weeks of sampling.

In 2012, stage IV larvae were first captured during week 22 and last captured during week 25. A total of 32 stage IV lobster larvae were collected from nine sampling trips, for a total of 77 tows, during 2012.

Peak concentrations of stage IV larvae occurred during the middle of June (June 15 and June 19, 2012). Annual production in 2012 (15.2 larvae per 1000 m3 water sampled) remained below the long-term median value (78.6) and ranked 28th in the 30-year time series (Figure 2.7).

## JOB 3: Interstate Fisheries Management Participation

## Objective 1

*Participate on the Atlantic States Marine Fisheries Commission's Lobster Scientific Technical Committee and Stock Assessment Subcommittee. This may include: providing technical expertise for developing stock assessments, reviewing state management regulatory proposals, monitoring the status of the stocks and defining mortality rates, and exploring alternative overfishing definitions.*

### Methods

Staff participated in preparation of the latest ASMFC coast-wide stock assessment from 2013 through its completion in June 2015. In addition to technical review of all aspects of the assessment, staff assisted in developing model input data sets which quantified gear selection by the commercial fishery, and related water temperature trends to lobster recruitment. Staff also participated in hiring a contractor to update and expand the habitat section of the ASMFC Fishery Management Plan, reviewing the finished document, and summarizing habitat characteristics that carry management implications.

### Modifications

None

## Objective 2

*Provide data and technical expertise from Connecticut's fishery dependent and independent monitoring programs to further enhance the evaluation of coast-wide and regional stock status.*

### Methods

CT DEEP staff updated catch indices and length data from Connecticut commercial sea sampling (Job 1) and the LISTS (Job 2) for 2008 through 2013. Larval indices were also provided through the last year of this program. Recently developed lobster catch data from the Northeast Monitoring and Assessment Program (NEAMAP) were analyzed for inclusion in the stock assessment modeling exercises. Additionally, staff reviewed and incorporated academic and private power plant research/impact surveys of adult and larval lobster extending back to the 1950s to provide a larger context for stock abundance trends.

### Modifications

None

## Results and Discussion

All data needed for the 2015 stock assessment were prepared and transferred to the ASMFC lobster database. Additional runs of the University of Maine length-based assessment model were completed using the relationship between increasing water temperature and lobster recruitment in both Southern New England, where recruitment failure has occurred, and the Gulf of Maine, where recruitment has surged. These model runs demonstrated that water temperature is an important covariate explaining recruit trends in both the Southern New England (SNE) and Gulf of Maine (GOM) lobster stocks. Explaining the inverse recruitment trends in the two stocks is particularly important since the assessment included cautionary advice to prevent future decline in recruitment for the northern stock.

Model results and non-model based stock indicators demonstrated that abundance, spawning stock biomass, and recruitment are at historic low levels for the SNE stock, which has not shown significant signs of rebuilding since harvest restrictions were put in place following similar results presented from the 2010 assessment. Presently the Long Island Sound population, and the entire SNE stock, can be considered in very poor condition because of the following: the last few larval indices (Job 2) were below their 25th percentile for the time series, as were larval indices in RI and MA waters; lobster distribution as described by encounter rates in LISTS (Job 2), as well as survey indices in RI and MA waters, showed distinct range contraction from 2008-2013; total SNE and CT commercial landings (Job 1) have fallen below the 25th percentile for their time series in recent years. The low landings observed over the last six years were produced by moderate year classes that settled between 2003 and 2007. The extremely poor year classes that settled since 2008 will recruit to the fishery starting in 2015, indicating that stock abundance may decline further in future years.

As a result of the previous 2010 Stock Assessment, a closed season when the harvest of lobster within Long Island Sound (Area 6) is prohibited began September 8, 2013, and extended 11 weeks to November 28$^{th}$. This closure is designed to limit harvest activities, including any unintended by-catch mortality, as a first step in preserving the remaining spawning stock. New York adopted the same closure dates for Area 6 waters. This closed season continues in force and could be expanded in light of the recent documentation of continued poor condition in the SNE lobster stock.

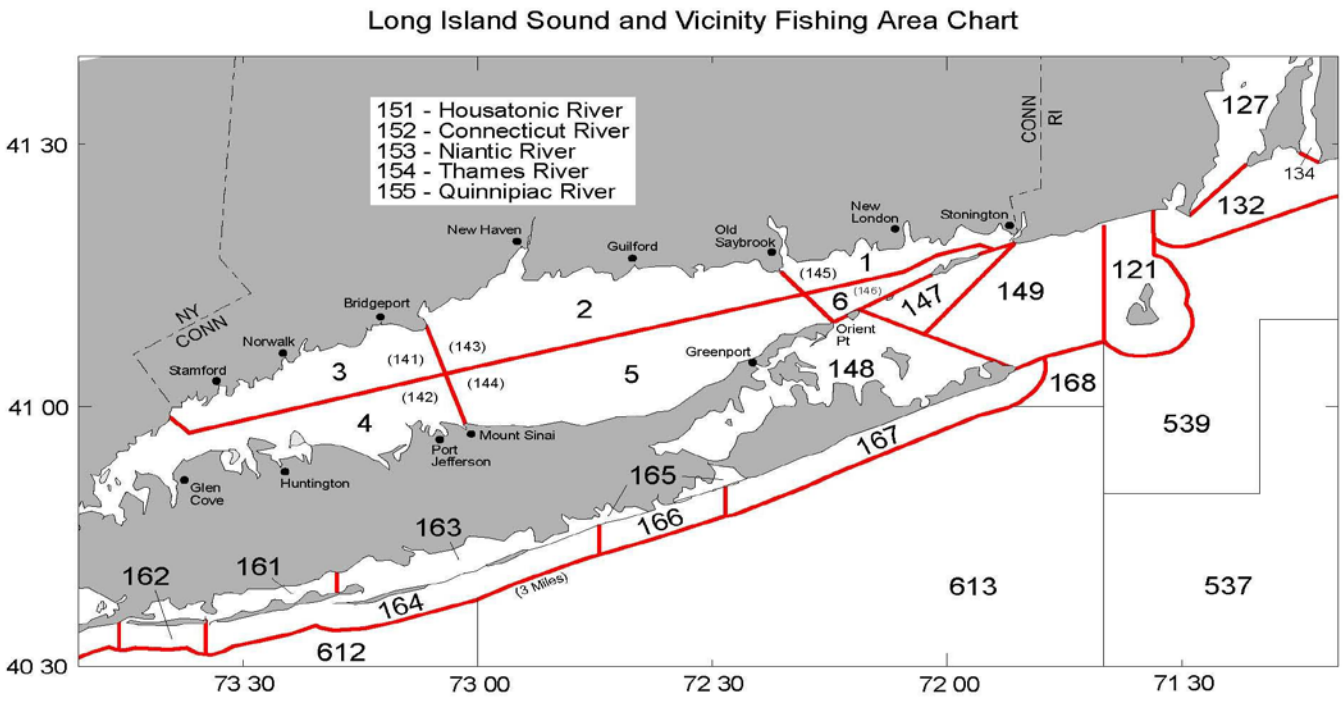



**Figure 1.1 Logbook reporting areas for Connecticut commercial catch data.** Eastern basin commercial sea sampling trips were made in reporting areas 1, 6, and 147. Central basin sampling trips were made in areas 2 and 5. Western basin trips were made in areas 3 and 4. Connecticut state waters include areas 1, 2 and 3 and the River systems in the state (151, 152, 153, 154 and 155).

| | Year | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Period 1: Jan - May | | | | | | | | | | | | | | | |
| Scheduled | 3 | 6 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 |
| Completed | 6 | 16 | 19 | 11 | 10 | 3 | 3 | 8 | 8 | 10 | 4 | 4 | 1 | 1 | 0 |
| Lobsters Measured | 1,147 | 3,829 | 4,827 | 3,008 | 2,705 | 935 | 532 | 3,176 | 1,109 | 4,910 | 1,985 | 1113 | 278 | 38 | 0 |
| Period 2: June - Aug | | | | | | | | | | | | | | | |
| Scheduled | 12 | 30 | 30 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 0 | 0 |
| Completed | 17 | 29 | 30 | 20 | 14 | 10 | 10 | 17 | 12 | 13 | 11 | 4 | 9 | 1 | 7 |
| Lobsters Measured | 8,600 | 17,163 | 15,057 | 8,541 | 5,399 | 3,122 | 6,696 | 4,770 | 9,147 | 5,729 | 6,424 | 1,901 | 3,749 | 686 | ** |
| Period 3: Sept - Oct | | | | | | | | | | | | | | | |
| Scheduled | 3 | 6 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 |
| Completed | 6 | 13 | 12 | 5 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 0 | 0 |
| Lobsters Measured | 1,283 | 4,883 | 1,621 | 1,219 | 666 | 356 | 260 | 792 | 903 | 77 | 181 | 415 | 474 | 0 | 0 |
| Period 4: Nov - Dec | | | | | | | | | | | | | | | |
| Scheduled | 6 | 12 | 12 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 |
| Completed | 7 | 15 | 16 | 5 | 5 | 4 | 6 | 4 | 3 | | 1 | 1 | 4 | 0 | 0 |
| Lobsters Measured | 1,521 | 4,851 | 5,477 | 2,290 | 1,262 | 2,202 | 4,044 | 1,630 | 1,638 | 3,004 | 164 | 313 | 563 | 0 | 0 |
| Total Scheduled | 24 | 54 | 54 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 |
| Total Completed | 36 | 73 | 77 | 41 | 31 | 19 | 20 | 30 | 25 | 24 | 18 | 10 | 16 | 2 | 7 |
| Total Lobsters Measured | 12,551 | 30,726 | 26,982 | 15,058 | 10,032 | 6,615 | 11,532 | 10,368 | 12,797 | 13,720 | 8,754 | 3,742 | 5,064 | 724 | ** |

** data still to be transcribed and entered

**Table 1.1 Commercial sea sampling effort, trip achievements and lobsters observed from 2000 through 2014, by time period.**

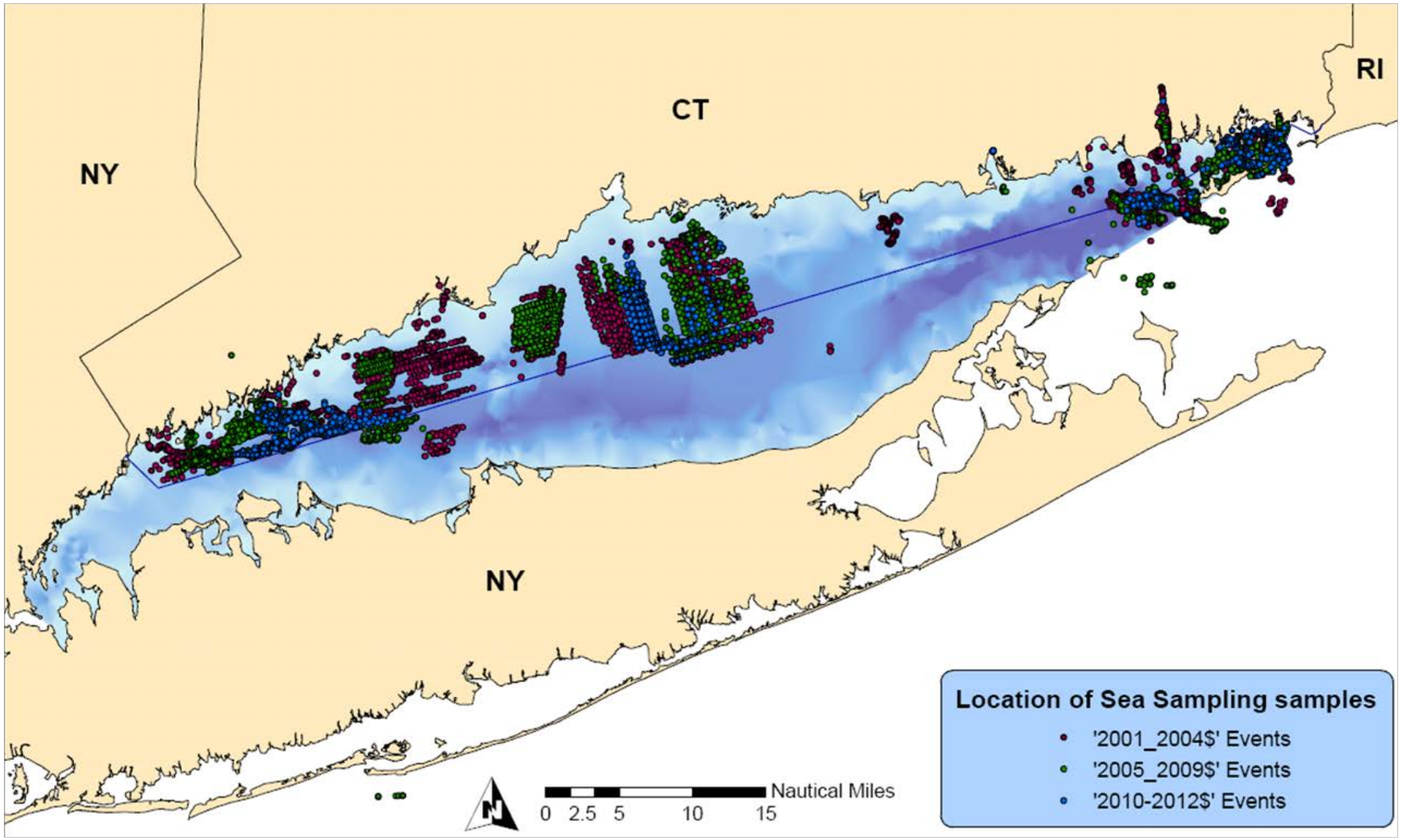
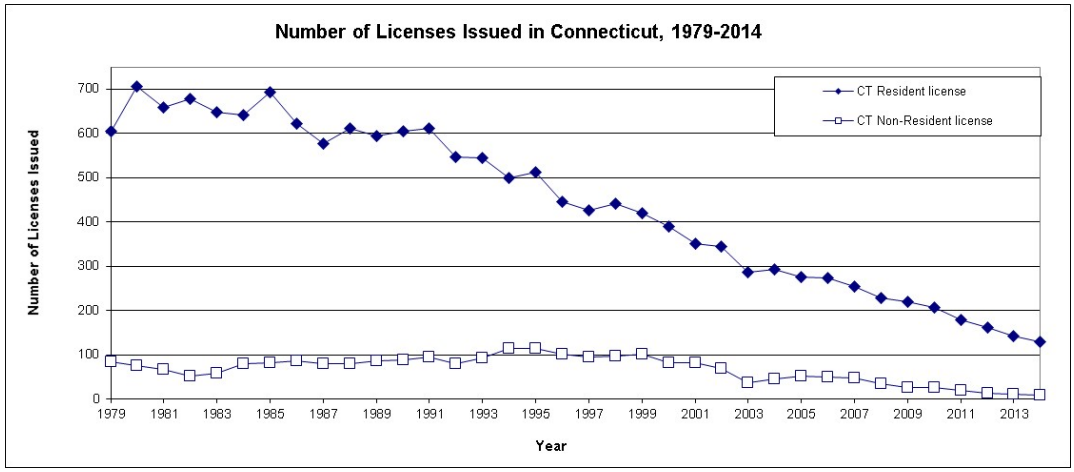



**Figure 1.2 Locations of commercial lobster sea sampling trips taken in Long Island Sound, 2001 – 2012, by time period.**

| number of licenses Issued | | |
|---|---|---|
| Year | Resident | Non-Resident |
| 1979 | 604 | 85 |
| 1980 | 707 | 76 |
| 1981 | 659 | 67 |
| 1982 | 678 | 53 |
| 1983 | 649 | 59 |
| 1984 | 642 | 80 |
| 1985 | 693 | 83 |
| 1986 | 623 | 87 |
| 1987 | 578 | 81 |
| 1988 | 612 | 80 |
| 1989 | 595 | 87 |
| 1990 | 606 | 88 |
| 1991 | 611 | 96 |
| 1992 | 547 | 81 |
| 1993 | 544 | 92 |
| 1994 | 499 | 115 |
| 1995 | 513 | 115 |
| 1996 | 445 | 101 |
| 1997 | 427 | 95 |
| 1998 | 441 | 97 |
| 1999 | 419 | 101 |
| 2000 | 389 | 83 |
| 2001 | 352 | 82 |
| 2002 | 345 | 70 |
| 2003 | 286 | 38 |
| 2004 | 293 | 46 |
| 2005 | 276 | 53 |
| 2006 | 274 | 50 |
| 2007 | 255 | 48 |
| 2008 | 228 | 34 |
| 2009 | 220 | 26 |
| 2010 | 206 | 26 |
| 2011 | 180 | 19 |
| 2012 | 161 | 14 |
| 2013 | 142 | 12 |
| 2014 | 130 | 9 |




| Year | Traps |
|---|---|
| 1984 | 66,709 |
| 1985 | 65,262 |
| 1986 | 65,826 |
| 1987 | 70,646 |
| 1988 | 79,154 |
| 1989 | 83,915 |
| 1990 | 100,360 |
| 1991 | 101,290 |
| 1992 | 107,668 |
| 1993 | 115,224 |
| 1994 | 110,805 |
| 1995 | 119,983 |
| 1996 | 130,360 |
| 1997 | 133,770 |
| 1998 | 158,527 |
| 1999 | 162,149 |
| 2000 | 122,386 |
| 2001 | 121,501 |
| 2002 | 112,731 |
| 2003 | 85,048 |
| 2004 | 84,071 |
| 2005 | 83,946 |
| 2006 | 90,421 |
| 2007 | 81,792 |
| 2008 | 56,355 |
| 2009 | 63,824 |
| 2010 | 53,516 |
| 2011 | 39,518 |
| 2012 | 29,353 |
| 2013 | 18,435 |

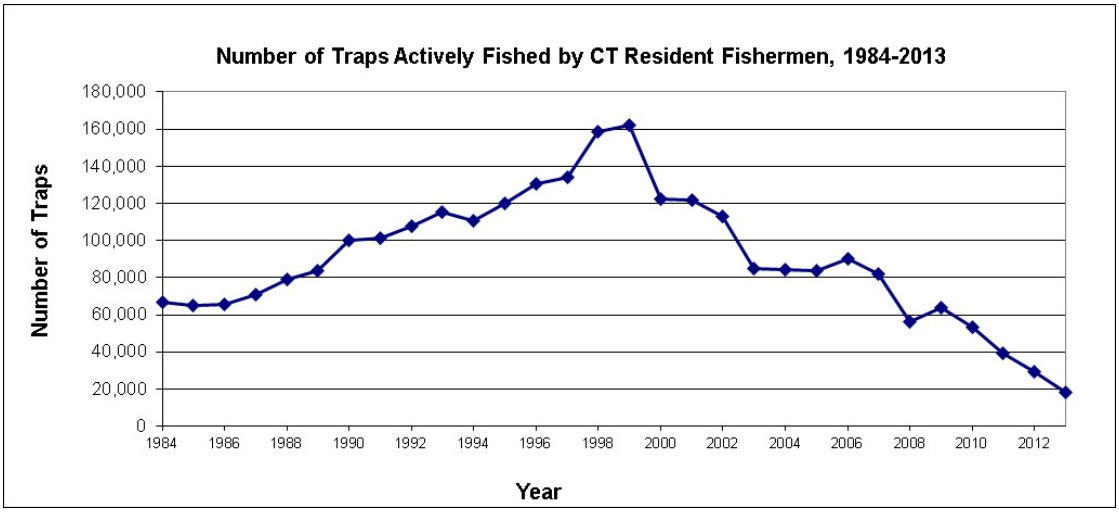



**Figure 1.3 Trends in participation and effort for Connecticut license holders.**

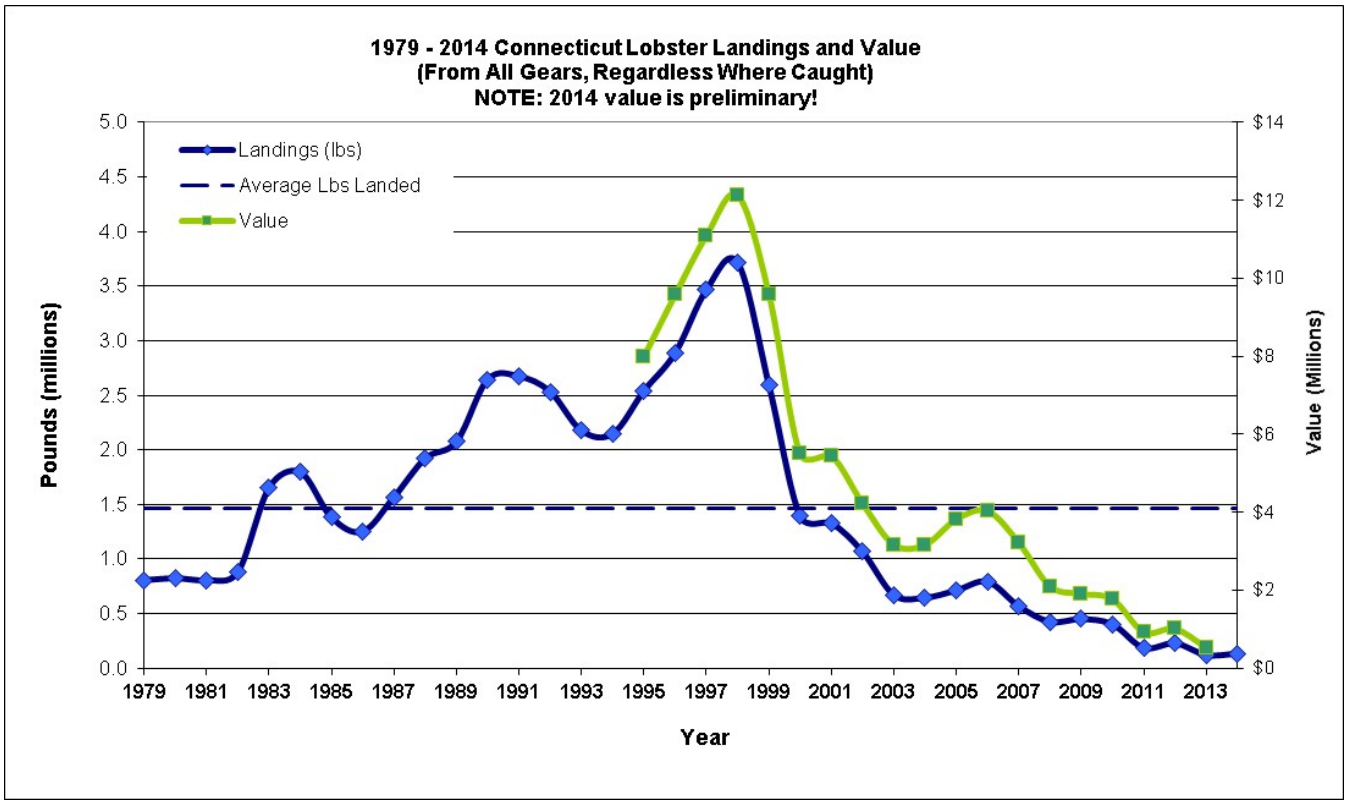



**Figure 1.4 Lobster landings and landed value from all Connecticut ports, 1984-2014.** *The time-series average of 1,467,594 pounds is shown by the heavy dashed line. Value data for landings are available from 1995 – 2013. *Note: 2014 value is preliminary.*

| Year | ELIS Landings | ELIS Pounds V-Notched | CLIS Landings | CLIS Pounds V-Notched | WLIS Landings | WLIS Pounds V-Notched | Total Landings |
|---|---|---|---|---|---|---|---|
| 1984 | 739,093 | | 355,230 | | 702,471 | | 1,796,794 |
| 1985 | 565,767 | | 357,060 | | 457,991 | | 1,380,818 |
| 1986 | 431,024 | | 382,419 | | 440,244 | | 1,253,687 |
| 1987 | 560,084 | | 454,580 | | 554,560 | | 1,569,224 |
| 1988 | 719,355 | | 494,124 | | 709,804 | | 1,923,283 |
| 1989 | 858,408 | | 461,466 | | 756,977 | | 2,076,851 |
| 1990 | 1,177,691 | | 544,666 | | 923,594 | | 2,645,951 |
| 1991 | 1,115,005 | | 586,245 | | 972,424 | | 2,673,674 |
| 1992 | 1,043,934 | | 377,356 | | 1,112,846 | | 2,534,136 |
| 1993 | 947,564 | | 291,116 | | 938,342 | | 2,177,022 |
| 1994 | 706,944 | | 290,905 | | 1,151,237 | | 2,149,086 |
| 1995 | 856,533 | | 504,928 | | 1,179,679 | | 2,541,140 |
| 1996 | 750,303 | | 561,681 | | 1,576,699 | | 2,888,683 |
| 1997 | 1,017,813 | | 730,918 | | 1,719,320 | | 3,468,051 |
| 1998 | 1,123,337 | | 768,057 | | 1,823,916 | | 3,715,310 |
| 1999 | 931,052 | | 653,015 | | 1,011,697 | | 2,595,764 |
| 2000 | 657,193 | | 430,070 | | 306,302 | | 1,393,565 |
| 2001 | 531,047 | | 427,762 | | 370,898 | | 1,329,707 |
| 2002 | 470,438 | | 285,786 | | 310,897 | | 1,067,121 |
| 2003 | 276,606 | | 122,936 | | 271,577 | | 671,119 |
| 2004 | 301,204 | | 112,596 | | 233,194 | | 646,994 |
| 2005 | 368,441 | | 116,515 | | 228,945 | | 713,901 |
| 2006 | 414,119 | | 120,614 | | 258,161 | | 792,894 |
| 2007 | 347,719 | 694 | 96,805 | 81 | 123,645 | 28 | 568,169 |
| 2008 | 291,654 | 24,488 | 43,783 | 1,209 | 91,731 | 4,535 | 427,168 |
| 2009 | 292,643 | | 51,385 | | 106,419 | | 450,447 |
| 2010 | 262,619 | | 55,417 | | 84,198 | | 402,234 |
| 2011 | 150,746 | | 14,751 | | 21,256 | | 186,753 |
| 2012 | 200,750 | | 14,871 | | 14,094 | | 229,715 |
| 2013 | 106,991 | | 4,207 | | 13,714 | | 121,663 |
| 2014 | 115,689 | | 4,322 | | 14,994 | | 135,005 |

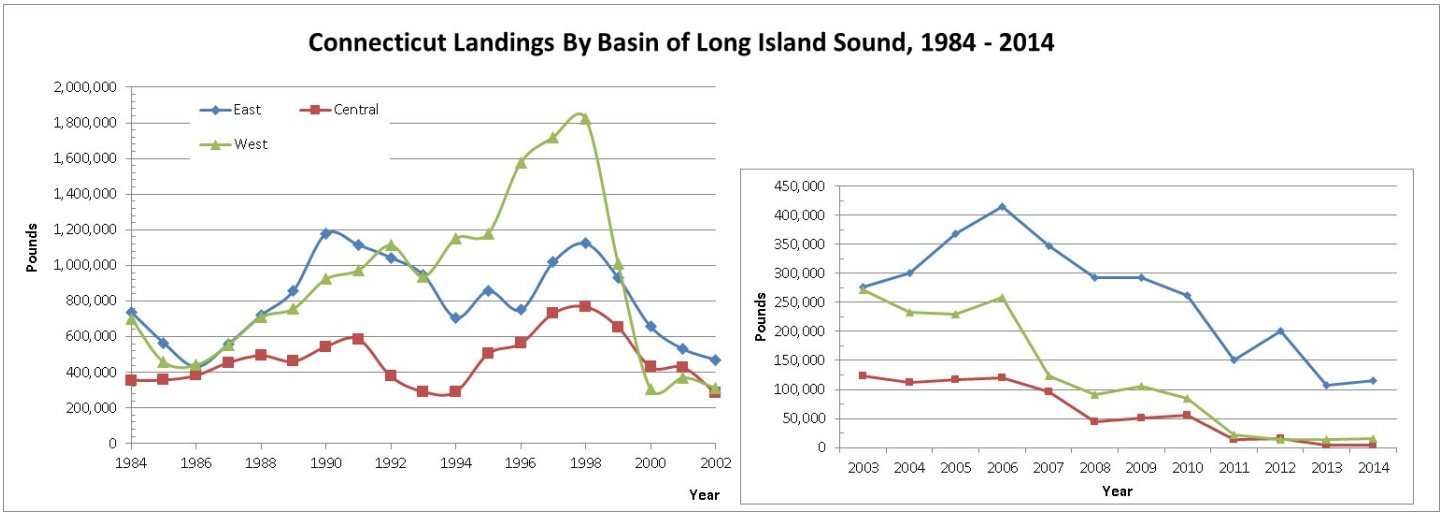



**Figure 1.5 Connecticut lobster landings (lbs) by basin of Long Island Sound, 1984-2014.** *Includes landings from all gear types and areas fished. *2014 values are preliminary.*

| Year | Action |
|---|---|
| 1909 | 4 1/8” rostrum minimum length (through 1935) |
| 1911 | 4 1/8” rostrum minimum length |
| 1923 | 4 1/8” rostrum minimum length (through 1935) |
| 1935 | 3 1/16” minimum carapace length (through 1946) |
| 1947 | 1) 3 1/8” minimum carapace length<br>2) All pots or traps shall have on each side of the bottom an opening not less than one and one-half inches wide which shall be maintained clear and undiminished in size |
| 1976 | 1) 3 3/16 inch minimum carapace length (through 1988)<br>2) Prohibited: a) females with eggs or from which eggs have been removed, b) possession of parts on state waters except as were legally brought onboard from shore or for immediate personal consumption.<br>3) Fishing more than 10 pots requires a commercial license.<br>4) Pots cannot be hauled from ½ h after sunset to ½ h before sunrise |
| 1983 | 1) Effective 7/1/1993: buoyed pots cannot be set within navigation channel as indicated by USCG channel markers |
| 1984 | 1) Effective 4/1/1984: Escape vents required in all pots, traps and similar devices; can be horizontal, rectangular opening not less than 1 3/4 inch by 6 inch, or (2) two circular vents not less than 2 1/4 inch diameter.<br>2) Trawl bycatch limit of 100 pieces west of 73 degree longitude (clarified as extending from Griswold Pt, CT through Mulford Pt, NY) |
| 1985 | 1) Setting or tending pots or use of any other gear to take lobster on leased oyster beds without permission of lease holder is prohibited. |
| 1986 | 1) Effective 7/1/1986: 100 piece limit west of LORAN C 14810 or approx. from Griswold Pt, CT through Mulford Pt, NY. |
| 1987 | 1) Prohibition on setting pots in channel extended to mooring areas from May 1 - Oct 15 and fairways as defined by approved Harbor Management Plans. |
| 1988 | 1) Minimum size for federal license holder of 3 7/32 inch carapace length<br>2) Escape panel: if wooden pot, lath must not exceed 3/8 inch thickness, non-wood traps must have 3 3/4 inch square panel held closed by uncoated ferrous wire not more than 3/32 inch diameter or with untreated natural fibers. |
| 1989 | 1) Effective 12/31/1988: 3 7/32 inch minimum carapace length.<br>2) Buoys must be uniform color and pattern for each license holder. |
| 1990 | 1) Effective 1/1/1990: 3 1/4 inch minimum carapace length |
| 1991 | 1) Prohibited: New York residents from taking lobster by trawl since NY prohibits CT residents (anyone) from using trawls to take lobster. |
| 1992 | 1) Federal license/endorsement holders must have escape vent 1 7/8 inch by 6 inch, or two circular vents 2 3/8 inch diameter |
| 1995 | 1) Effective 1/1/1995: minimum escape vent size increased to 1 7/8 by 6 inches rectangular or two 2 3/8 inch circular vents.<br>2) Effective 4/1/1995: minimum escape vent size 1 7/8 by 5 3/4 inch or two 2 3/8 inch circular vents. In wire pots escape panels may also be constructed of wood.<br>3) Effective 6/2/1995: moratorium on issuance of commercial licenses to take lobster (and other species).<br>4) Effective 10/27/1995 A Commercial Fishing Vessel Permit required to take or land lobsters or fish for commercial purposes. |

**Table 1.2 Connecticut’s management and regulatory history concerning American lobster harvested in the CT waters of Long Island Sound, 1909 through 1995.**

| Year | Action |
|---|---|
| 1998 | 1) Effective 5/1/1998: Escape vent size increased to 1 15/16 by 5 3/4 inches or two 2 7/16 inch circular escape vents<br>2) Effective 10/30/1998: Possession of 'V'-notched lobsters, females with tails mutilated such as to obscure a 'V'-notch marking, lobsters taken by a method which pierces the shell is prohibited.<br>3) Use of pots over 22,950 cubic inches prohibited.<br>4) Fishing methods other than pots limited to 100 pieces per day up to 500 pieces for trips over five days in federal waters. 100 piece limit regardless of trip length in Connecticut waters |
| 2000 | Trap limits established to prevent further increase in effort. |
| 2000 – 2004 | Federal Fishery Disaster (FFD) declared in LIS (CT receives $3 million federal, state adds $1.2 million).<br>2001: Economic Assistance to CT commercial lobstermen – Round 1<br>2002: Trap Buy Back – Round 1<br>2004: Economic Assistance and Sustaining Aid to CT lobstermen – Round 2<br>2004: Trap Buy Back – Round 2; program achieves 19% trap reduction<br>2004: Governor's Office of Workforce Competitiveness - $100k for job retraining |
| 2005 | 1) Effective 08/22/2005: 3 9/32" minimum carapace length |
| 2006 | 1) Effective 07/01/2006: 3 5/16" minimum carapace length.<br>2) Licensed dealers may possess lobsters less than LMA6 minimum carapace length provided the lobsters are at least 3 ¼" in carapace length and meet the minimum size criteria for the LMA from which they were harvested |
| 2007 - 2009 | Minimum carapace length 3 3/8 inch delayed by a "conservation equivalent v-notch program" supported by a $1million appropriation from CT legislature. |
| 07/20 08 | Effective 07/01/2008 maximum carapace length implemented at 133.4mm or 5 ¼". |
| 2010 | 1) Effective 01/01/2010: 3 3/8" minimum carapace length implemented when funding ended in mid-2009 for the v-notch program<br>2) Effective 07/01/2010: Escape vent size increased to 2 inches by 5 3/4 inches or two 2 5/8 inch circular escape vents |
| 2010 - 2011 | CT Legislature appropriates $200k in FY 2011 to continue Lobster Restoration Program. |
| 2011 - 2012 | CT Legislature appropriates $200k in FY 2012 to continue Lobster Restoration Program. |
| 2012-2013 | CT Legislature appropriates $100k in FY2013 to continue Lobster Restoration Program. Total funds appropriated were $200k. These funds were rescinded December 27, 2012 during budget mitigation. |
| 2012 | ASMFC American Lobster Management Board approves fall closure in LMA6 beginning September 2013 to reduce exploitation by 10%. |
| 2013 | Noticed 08/01/2013, no person shall possess fish for, attempt to fish for, or land lobster from LMA 6 between September 8 and November 28 inclusive. This applies to both recreational and commercial fisheries and all gears. |

**Table 1.2 (*continued*) Connecticut's management and regulatory history concerning American lobster harvested in the CT waters of Long Island Sound, 1998 through 2014.**

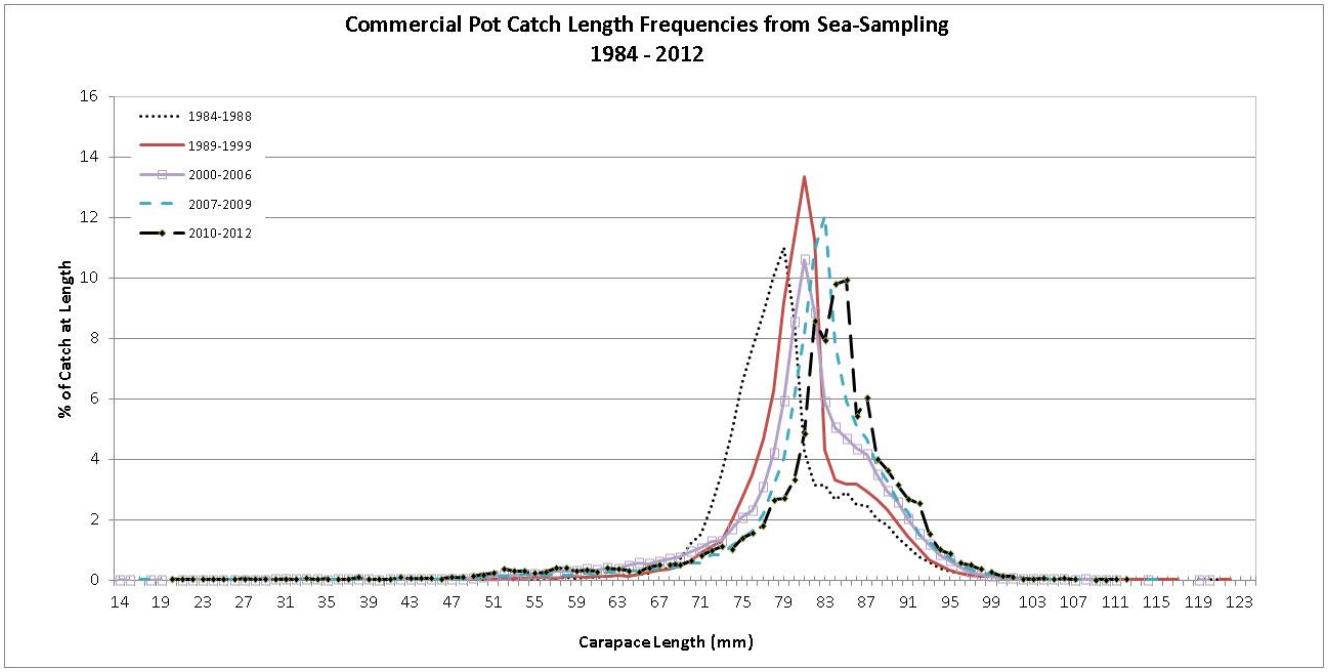



**Figure 1.6 Length frequencies of the commercial lobster pot catch, 1984 - 2012.** *Mean values for years 1984-1988, 1989-1999, 2000-2006, 2007-2009 and 2010-2012 are compared.*

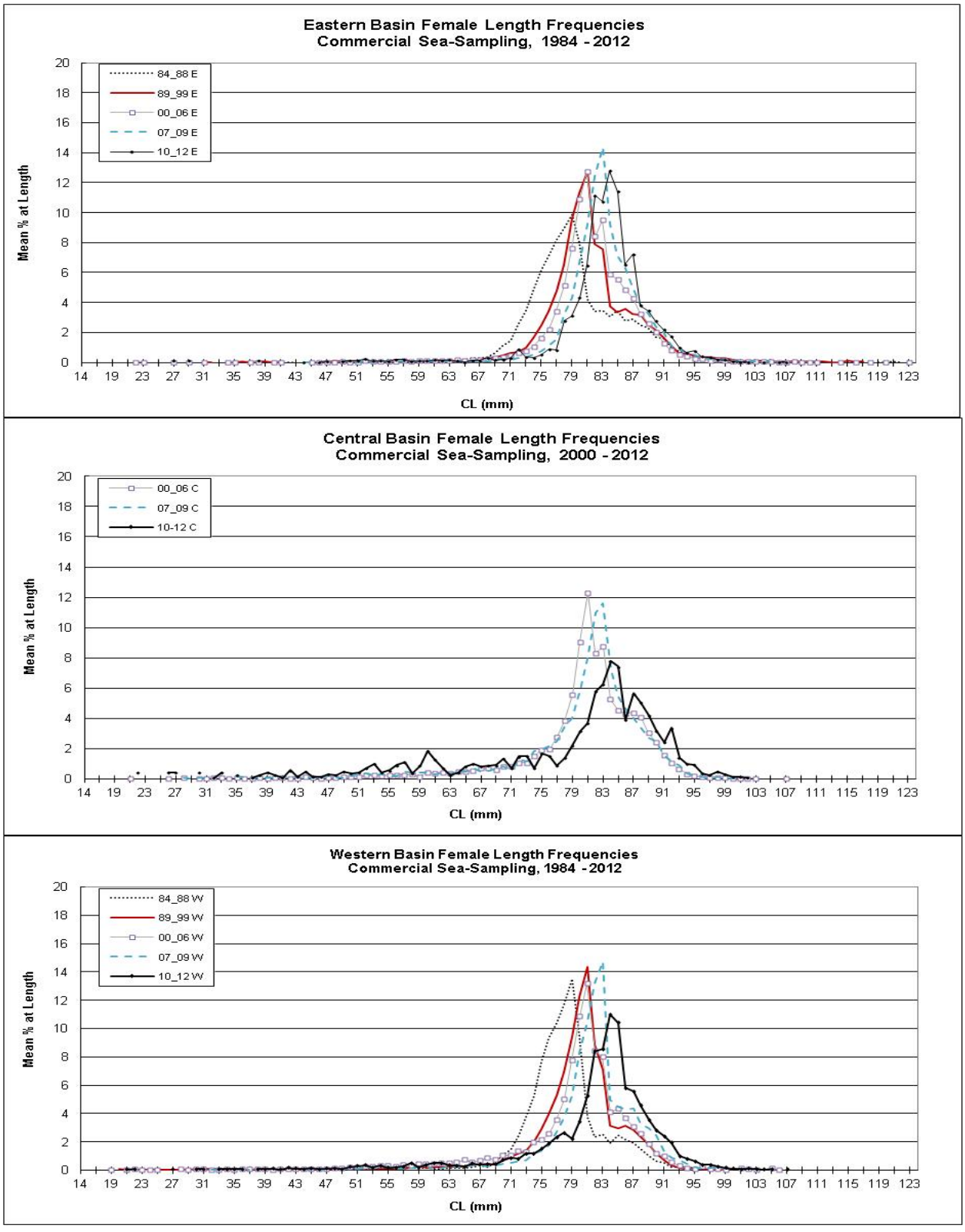



**Figure 1.7 Length frequencies of the female commercial lobster pot catch by basin of Long Island Sound, 1984 - 2012.** *Mean values for years 1984-1988,1989-1999, 2000-2006, 2007-2009 and 2010-2012 are compared. No data were available in the central basin in 2011.*

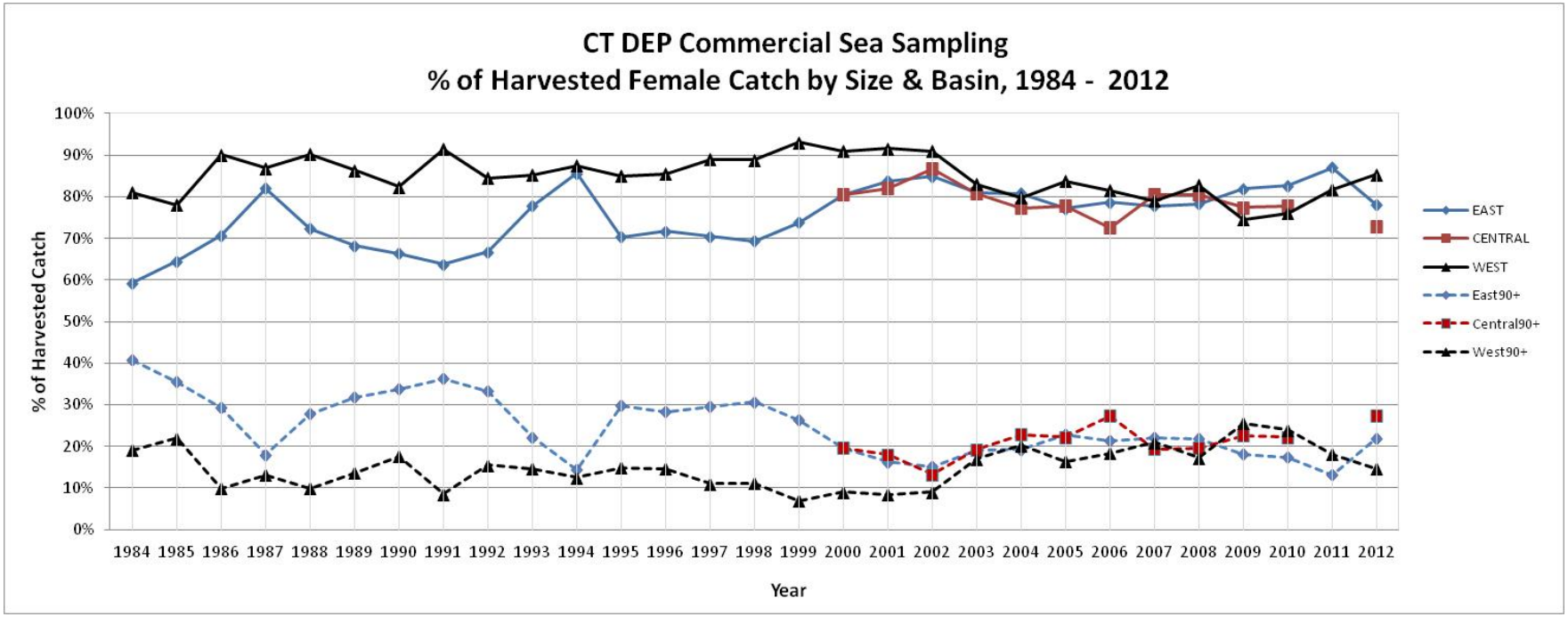



**Figure 1.8 Length frequency of the legal size female commercial lobster pot catch by size category (84.0-89.9 mm from 1984 to 2009 and 86.0 to 91.0mm from 2010 to 2012; 90.0+mm CL from 1984 to 2009 and 91.0+mm CL from 2010 to 2012) and basin (East, Central, West) of Long Island Sound, 1984 - 2012.** *These percentages include the presence of egg-bearing females. No data were available for the central basin in 2011.*

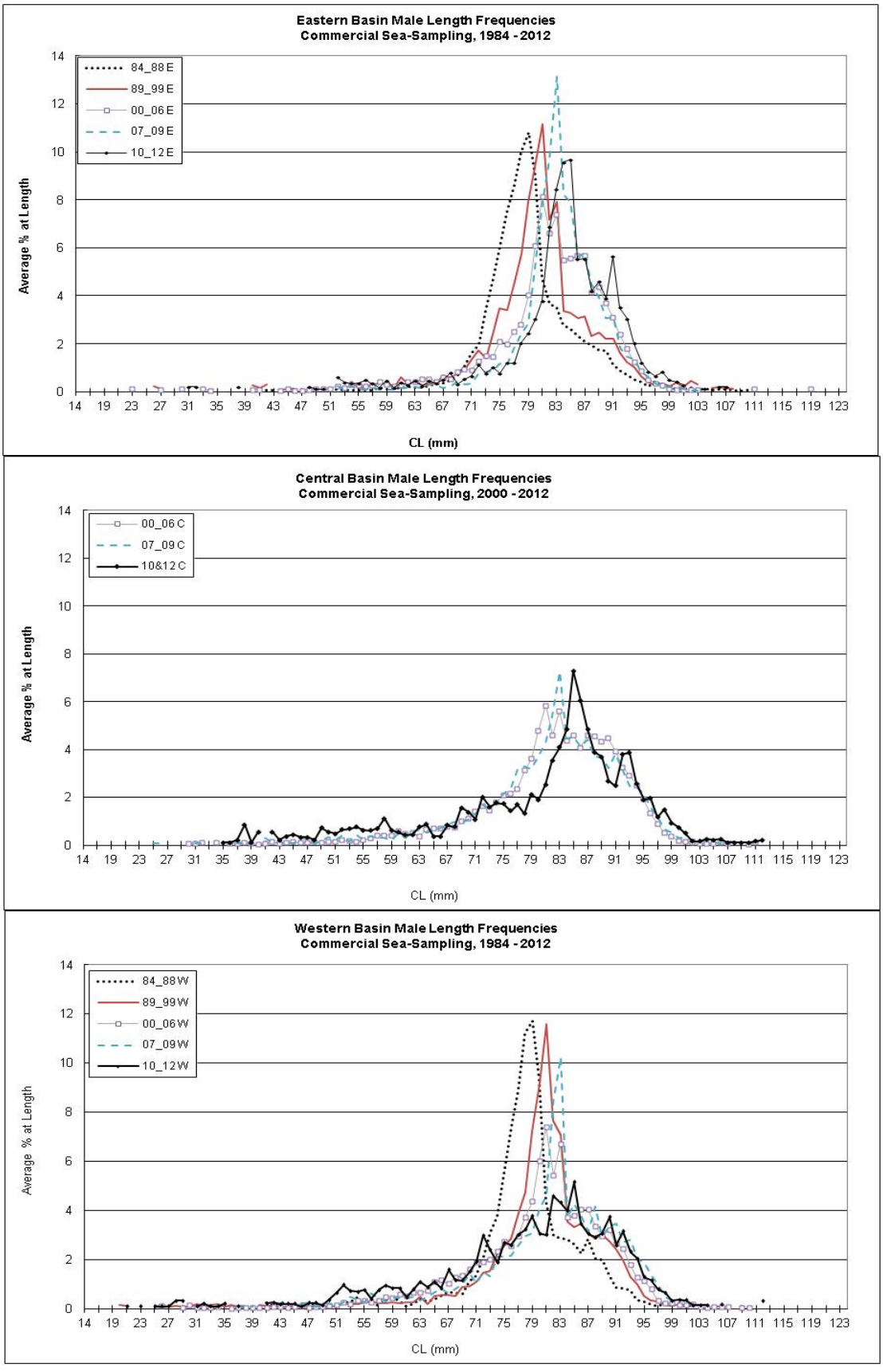



**Figure 1.9 Length frequency of the male commercial lobster pot catch by basin of Long Island Sound, 1984 - 2012.** *Mean values for years 1984-1988, 1989-1999, 2000-2006, 2007-2009 and 2010-2011 are compared. No data were available for the central basin in 2011.*

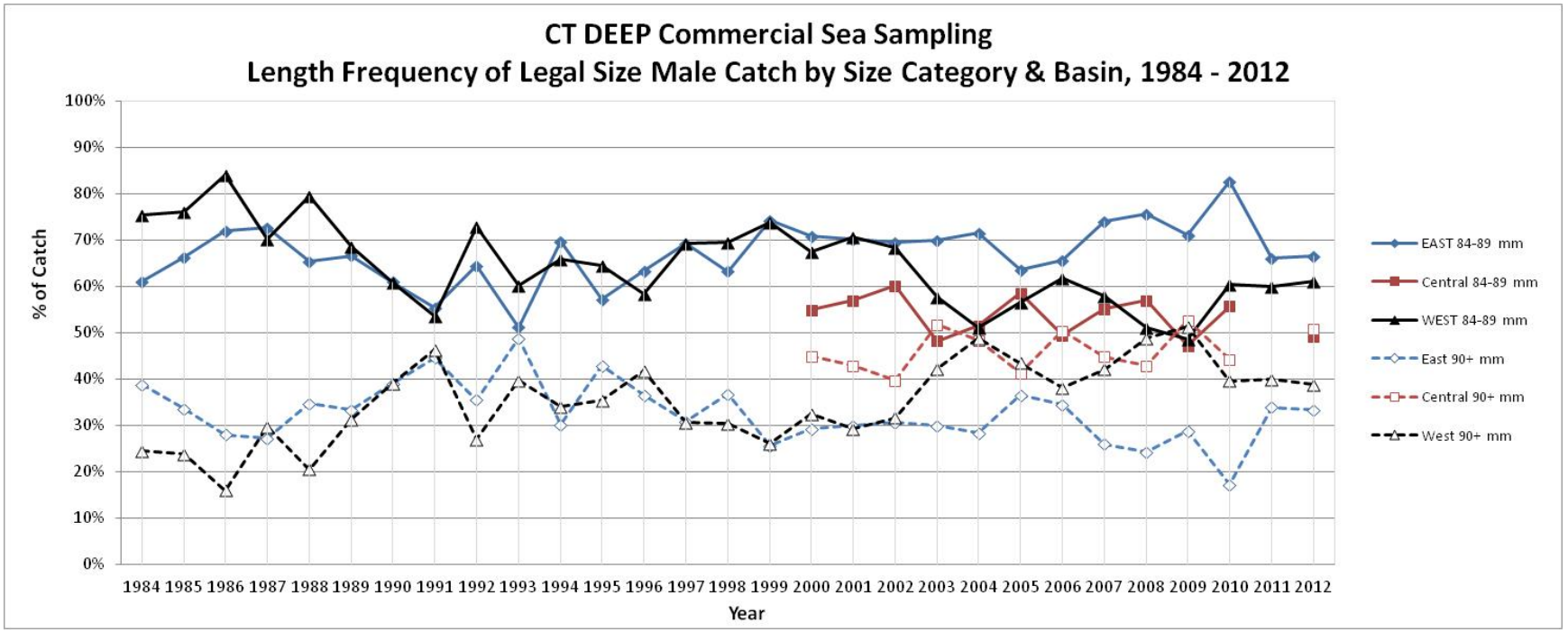
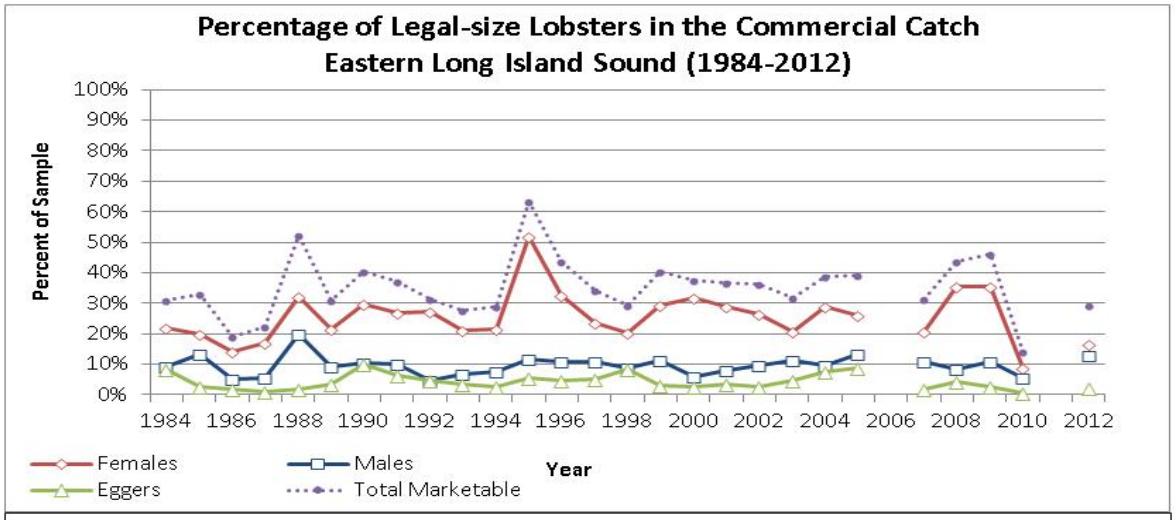
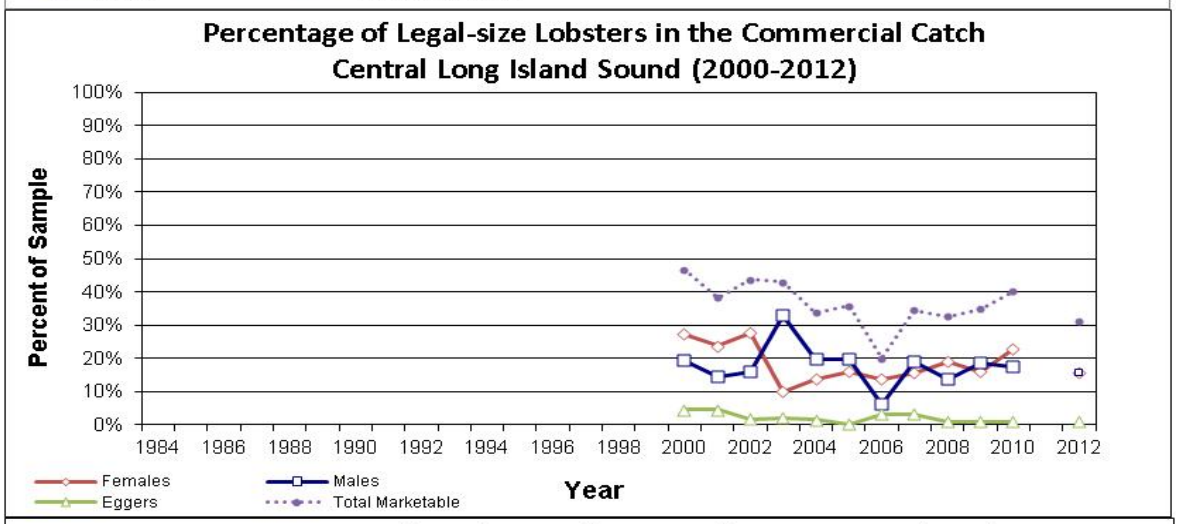



**Figure 1.10 Length frequency of the legal size male commercial lobster pot catch by size category (84.0-89.9 mm from 1984 to 2009 and 86.0 to 91.0mm from 2010 to 2012; 90.0+mm CL from 1984 to 2009 and 91.0+mm CL from 2010 to 2012) and basin (East, Central, West) of Long Island Sound, 1984 - 2012.** *No data were available for the central basin in 2011.*

A




B




C

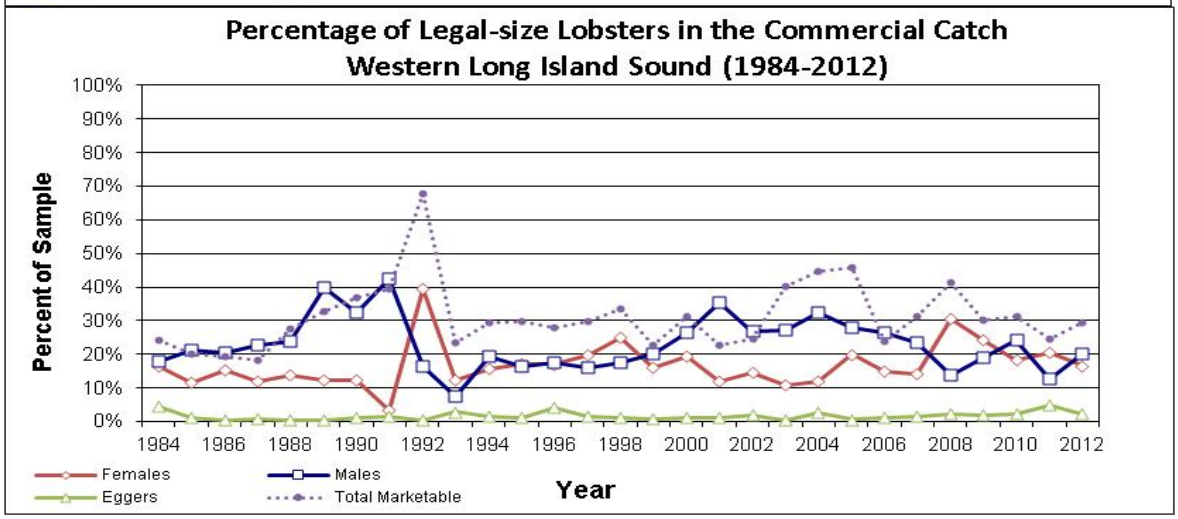
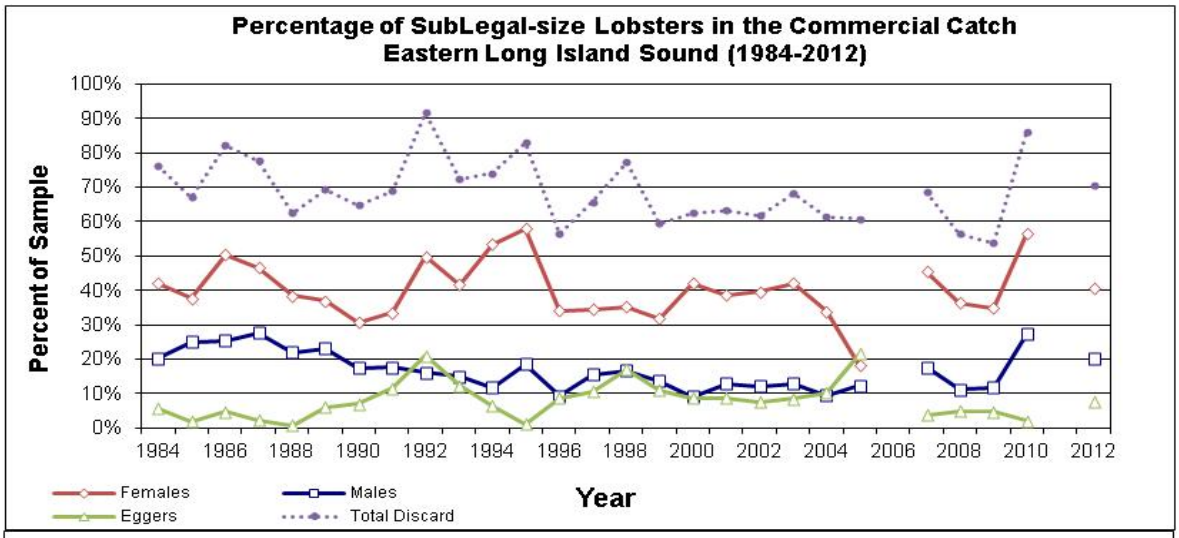
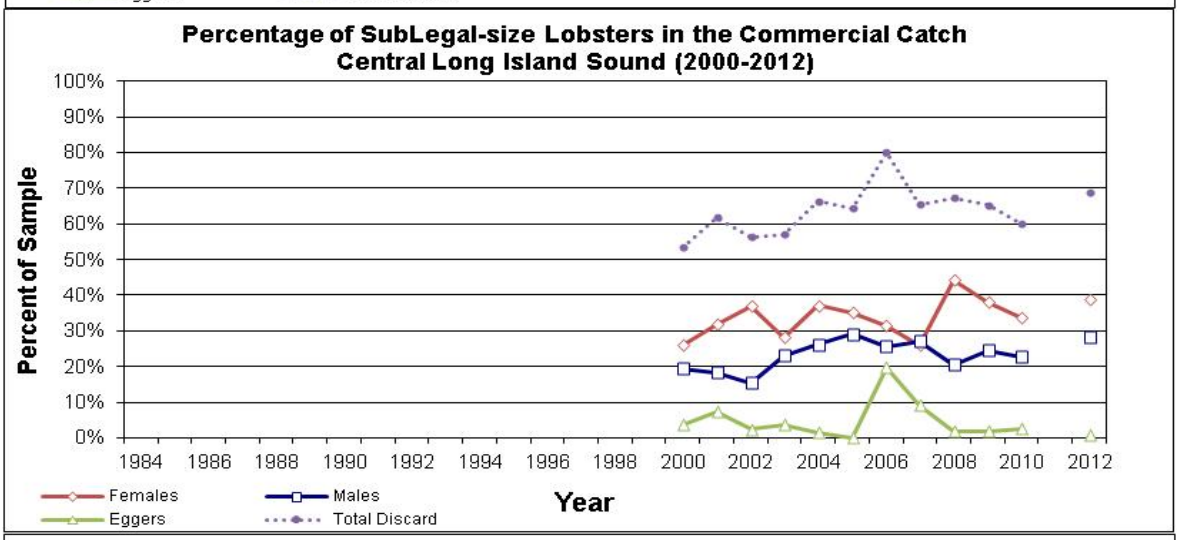



**Figure 1.11 Percentage of marketable lobsters in the observed commercial lobster pot catch, July through October, 1984-2012.** *Percentage by gender and egg-bearing status is shown for the eastern(A) central (B) and western basins (C). *Due to low sample sizes, data from eastern Long Island Sound in 2006 have not been included. Sampling in the central basin began in 2000. There were no trips taken in the central and eastern basins between July and October, 2011.*

A




B




C

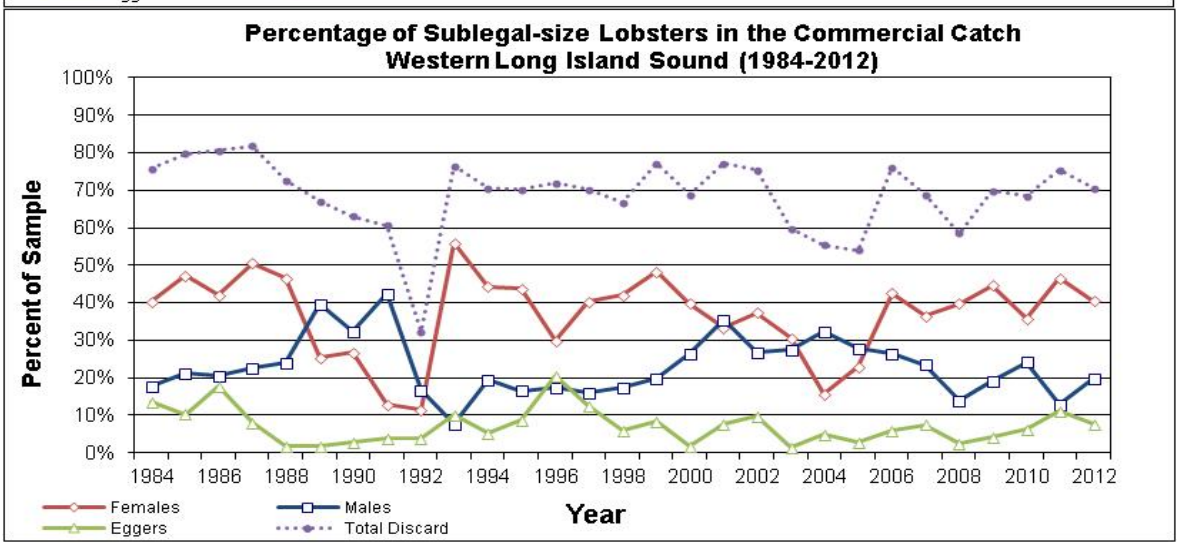



**Figure 1.12 Percentage of sublegal lobsters in the observed commercial lobster pot catch, July through October, 1984-2012.** *Percentage by gender and egg-bearing status is shown for the eastern (A) central (B) and western basins (C). *Due to low sample sizes, data from eastern Long Island Sound in 2006 have not been included. Sampling in the central basin began in 2000. There were no trips taken in the central and eastern basins between July and October, 2011.*

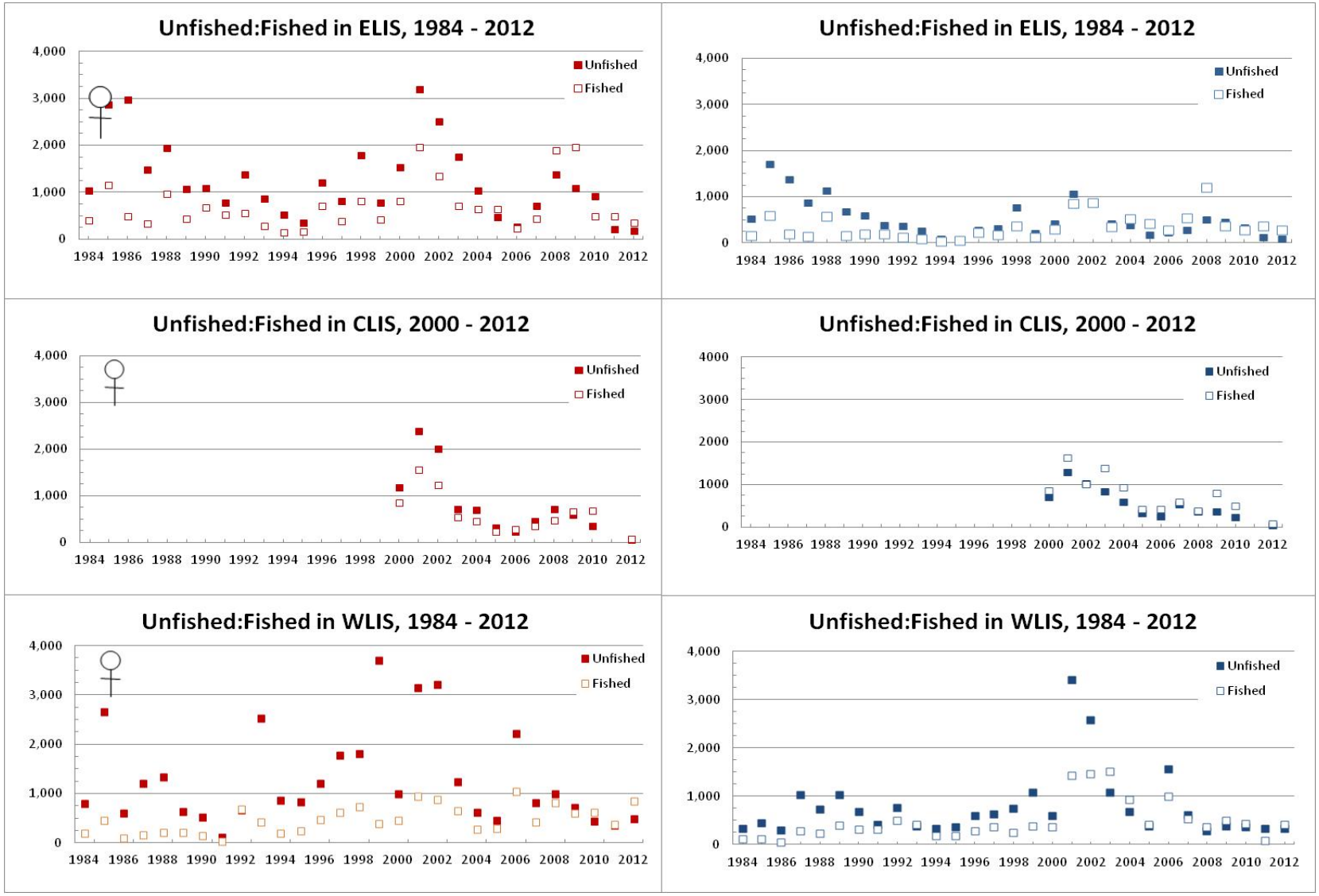
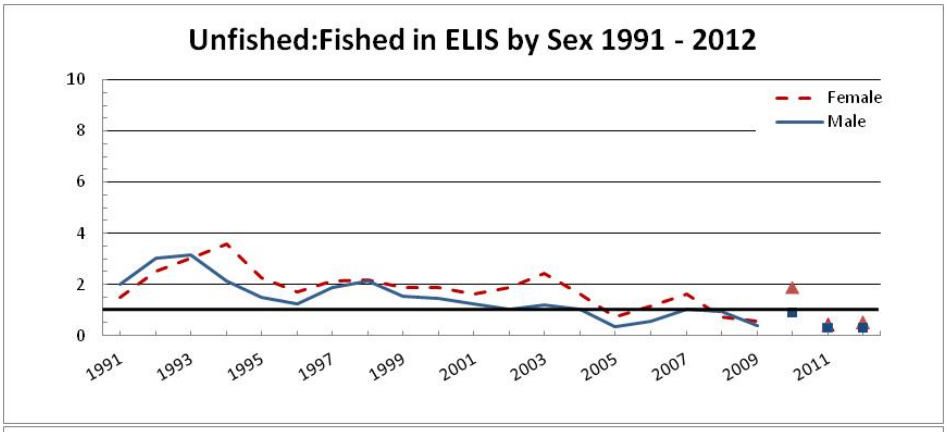


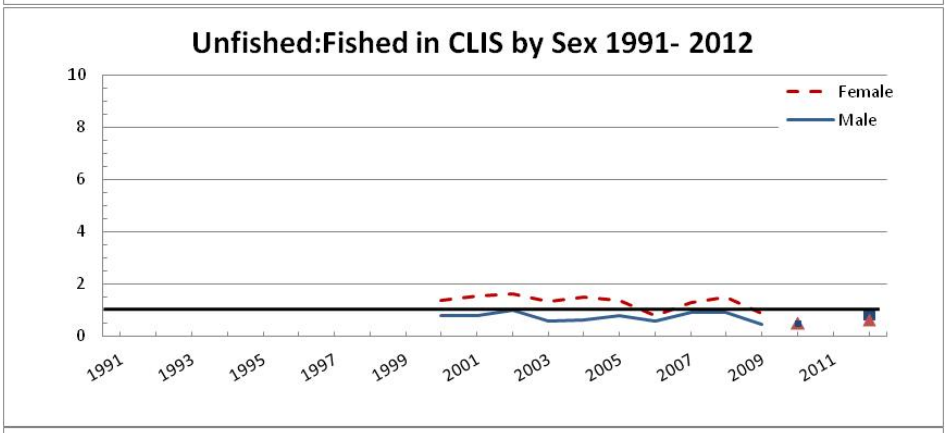

**Figure 1.13 Numbers of unfished (70.0 - 82.5 mm CL) to fished (greater than 84.0 mm CL 1984-2009, >85.0mm CL 2010-2012) lobsters observed in commercial catches sampled all months from 1984-2012.** *Numbers are represented by sex for each size group by basin of Long Island Sound. No data were available for the central basin in 2011.*

| EASTERN BASIN | | | |
|---|---|---|---|
| Year | Ratios | | N |
| | female | male | |
| 1991 | 1.48 | 2.02 | 1,895 |
| 1992 | 2.50 | 3.04 | 2,422 |
| 1993 | 3.03 | 3.13 | 1,479 |
| 1994 | 3.58 | 2.14 | 804 |
| 1995 | 2.25 | 1.49 | 632 |
| 1996 | 1.71 | 1.22 | 2,446 |
| 1997 | 2.13 | 1.87 | 1,692 |
| 1998 | 2.18 | 2.13 | 3,739 |
| 1999 | 1.89 | 1.55 | 1,520 |
| 2000 | 1.90 | 1.44 | 3,040 |
| 2001 | 1.64 | 1.23 | 7,067 |
| 2002 | 1.86 | 1.03 | 5,614 |
| 2003 | 2.45 | 1.19 | 3,243 |
| 2004 | 1.63 | 1.02 | 2,587 |
| 2005 | **0.73** | **0.35** | 1,713 |
| 2006 | 1.13 | **0.54** | 1,002 |
| 2007 | 1.61 | 1.03 | 1,974 |
| 2008 | **0.73** | **0.92** | 4,972 |
| 2009 | **0.56** | **0.38** | 3,867 |
| 2010 | 1.90 | **0.90** | 1,987 |
| 2011 | **0.42** | **0.29** | 1,192 |
| 2012 | **0.50** | **0.29** | 916 |

| CENTRAL BASIN | | | |
|---|---|---|---|
| Year | Ratios | | N |
| | female | male | |
| 2000 | 1.38 | **0.82** | 3,590 |
| 2001 | 1.54 | **0.80** | 6,856 |
| 2002 | 1.62 | 1.01 | 5,275 |
| 2003 | 1.32 | **0.60** | 3,485 |
| 2004 | 1.49 | **0.63** | 2,657 |
| 2005 | 1.38 | **0.78** | 1,271 |
| 2006 | **0.82** | **0.57** | 1,180 |
| 2007 | 1.30 | **0.92** | 1,925 |
| 2008 | 1.50 | **0.93** | 1,914 |
| 2009 | **0.89** | **0.46** | 2,422 |
| 2010 | **0.51** | **0.47** | 1,757 |
| 2011 | | | |
| 2012 | **0.85** | **0.65** | 248 |

| WESTERN BASIN | | | |
|---|---|---|---|
| Year | Ratios | | N |
| | female | male | |
| 1991 | 4.78 | 1.32 | 848 |
| 1992 | **0.98** | 1.54 | 2,592 |
| 1993 | 5.94 | **0.93** | 3,730 |
| 1994 | 4.68 | 1.80 | 1,560 |
| 1995 | 3.47 | 2.12 | 1,610 |
| 1996 | 2.59 | 2.20 | 2,525 |
| 1997 | 2.89 | 1.77 | 3,355 |
| 1998 | 2.47 | 3.00 | 3,524 |
| 1999 | 9.64 | 2.93 | 5,531 |
| 2000 | 2.22 | 1.64 | 2,407 |
| 2001 | 3.35 | 2.40 | 8,917 |
| 2002 | 3.68 | 1.76 | 8,111 |
| 2003 | 1.91 | **0.71** | 4,459 |
| 2004 | 2.29 | **0.72** | 2,470 |
| 2005 | 1.60 | **0.94** | 1,529 |
| 2006 | 2.13 | 1.56 | 5,814 |
| 2007 | 1.97 | 1.17 | 2,363 |
| 2008 | 1.21 | **0.78** | 2,441 |
| 2009 | 1.22 | **0.76** | 2,179 |
| 2010 | **0.70** | **0.84** | 1,836 |
| 2011 | **0.97** | 4.04 | 1,124 |
| 2012 | **0.57** | **0.81** | 2,054 |



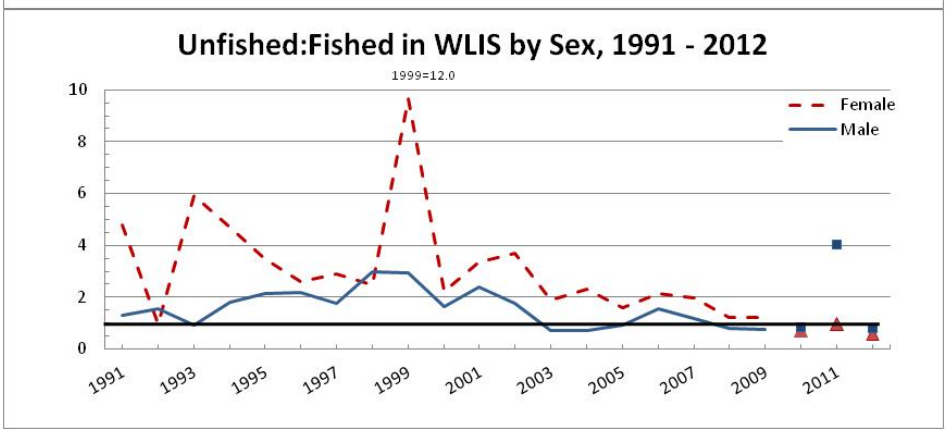




**Figure 1.14 Ratio of unfished (70-82.5 mm CL) to fished (greater than 84mm CL) lobster in commercial catches sampled all months from 1991-2012.** *Ratios represent relative numbers by sex in each size group for total lobsters measured (N) in each basin. Data for 2010 through and 2012 are separated due to an increase in the size of the escape vent in 2010 from 1 15/16" to 2". There were no data available for the central basin in 2011.*

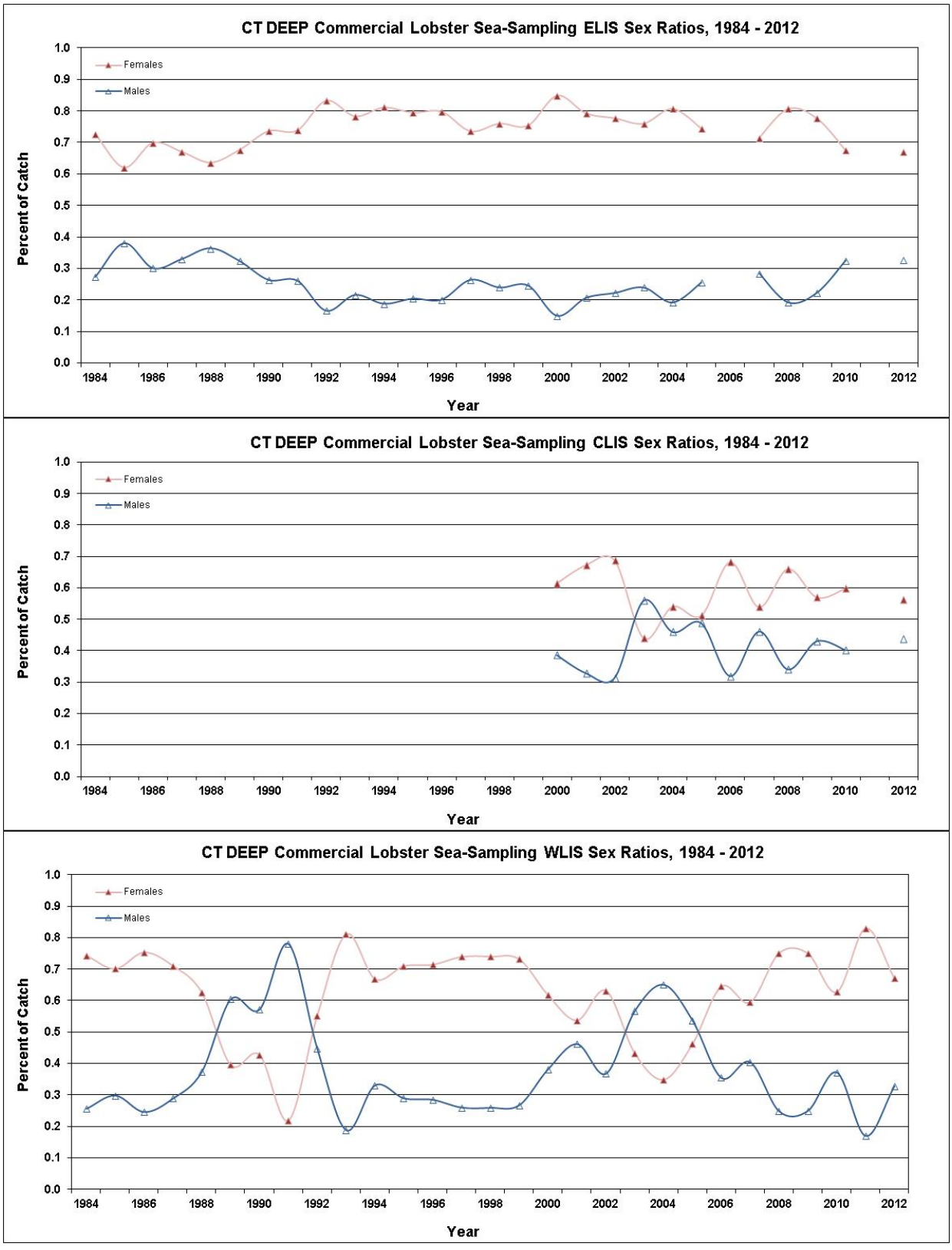
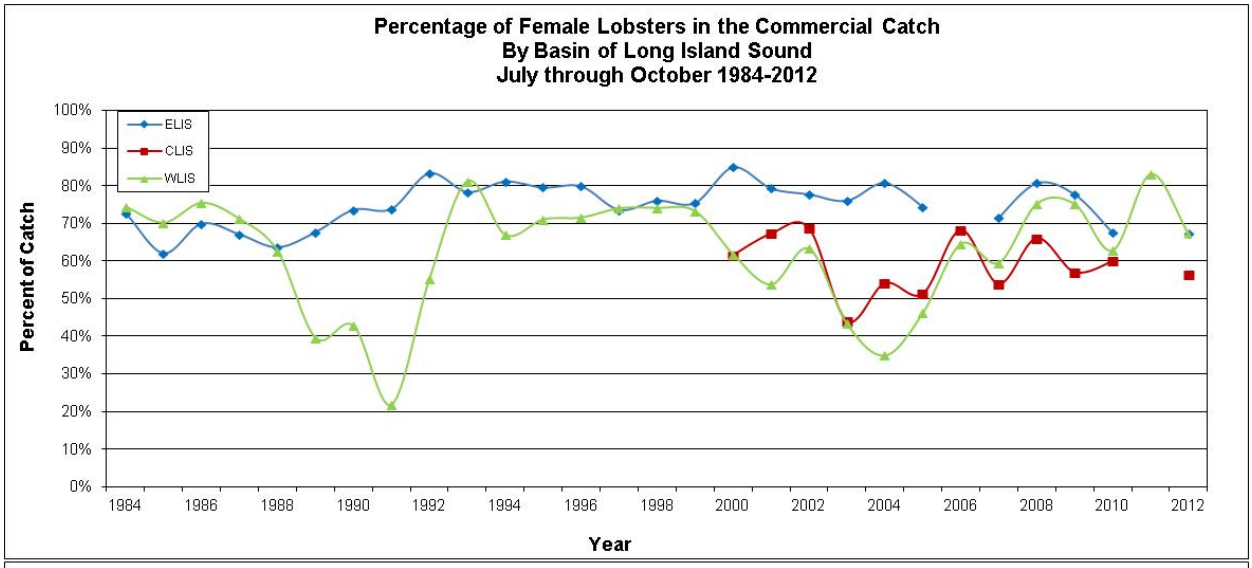



**Figure 1.15 Sex ratio in the observed commercial lobster pot catch by basin, July through October, 1984-2012.** *Shown for samples taken in the eastern=ELIS, central=CLIS (from 2000 through 2012) and western=WLIS basins. *Due to low sample sizes, data from eastern Long Island Sound in 2006 have not been included. There were no trips taken in the central and eastern basins between July and October, 2011.*

A




B

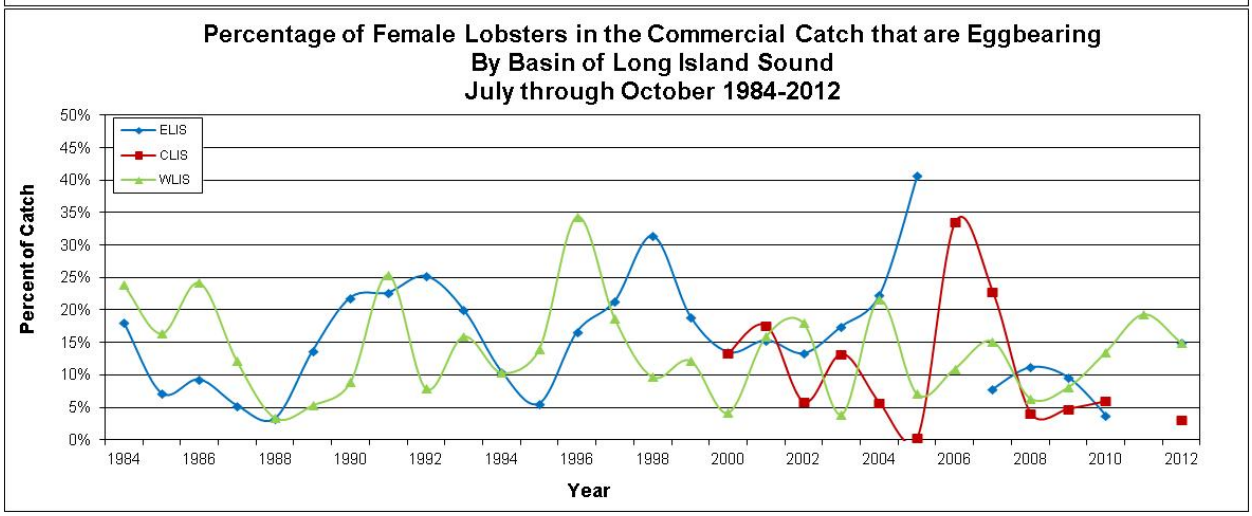



**Figure 1.16 Sex ratio in the observed commercial lobster pot catch, July through October, 1984-2012.** *The percentage of females in the entire observed catch (A) and percentage of females that are egg-bearing (B) are shown for samples taken in the eastern, central (from 2000 through 2012) and western basins. *Due to low sample sizes data from eastern Long Island Sound in 2006 have not been included. There were no trips taken in the central and eastern basins between July and October, 2011.*

| Year | Basin of Long Island Sound | | |
|---|---|---|---|
| | ELIS | CLIS | WLIS |
| 1992 | 0.9 | | 0.4 |
| 1993 | 1.2 | | 0.1 |
| 1994 | 1.4 | | 0.8 |
| 1995 | 0.6 | | 1.2 |
| 1996 | 1.1 | | 1.9 |
| 1997 | 2.7 | | 2.1 |
| 1998 | 3.1 | | 1.0 |
| 1999 | 15.4 | | 0.7 |
| 2000 | 17.0 | 0.8 | 0.4 |
| 2001 | 18.6 | 3.6 | 2.0 |
| 2002 | 35.5 | 6.5 | 0.3 |
| 2003 | 31.0 | 6.9 | 0.8 |
| 2004 | 26.7 | 5.4 | 0.1 |
| 2005 | 28.3 | 0.2 | 0.0 |
| 2006 | | 1.4 | 0.0 |
| 2007 | 30.2 | 2.4 | 0.0 |
| 2008 | 14.3 | 5.5 | 0.2 |
| 2009 | 22.0 | 7.8 | 0.04 |
| 2010 | 9.8 | 0.2 | 0.1 |
| 2011 | 13.5 | | 0.1 |
| 2012 | 4.9 | 0.1 | 0.04 |

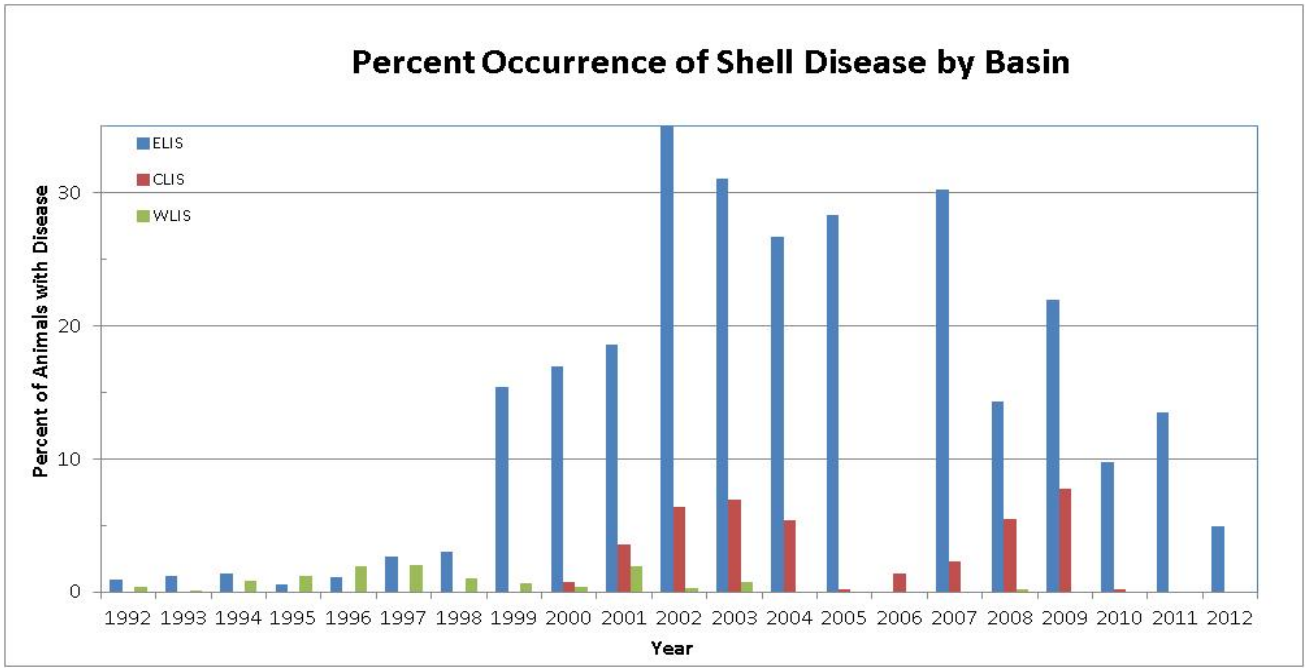



**Figure 1.17 Percent occurrence of shell disease by basin of Long Island Sound (LIS) from commercial sea-sampling conducted 1992 – 2012.** *(ELIS=eastern, CLIS=central, WLIS=western) *Sea-sampling in the central basin began in 2000. Note: only two sea-sampling trips were taken in the east in 2006. This small sample size may have biased the 2006 percent occurrences. There were no trips taken in the central basin in 2011.*

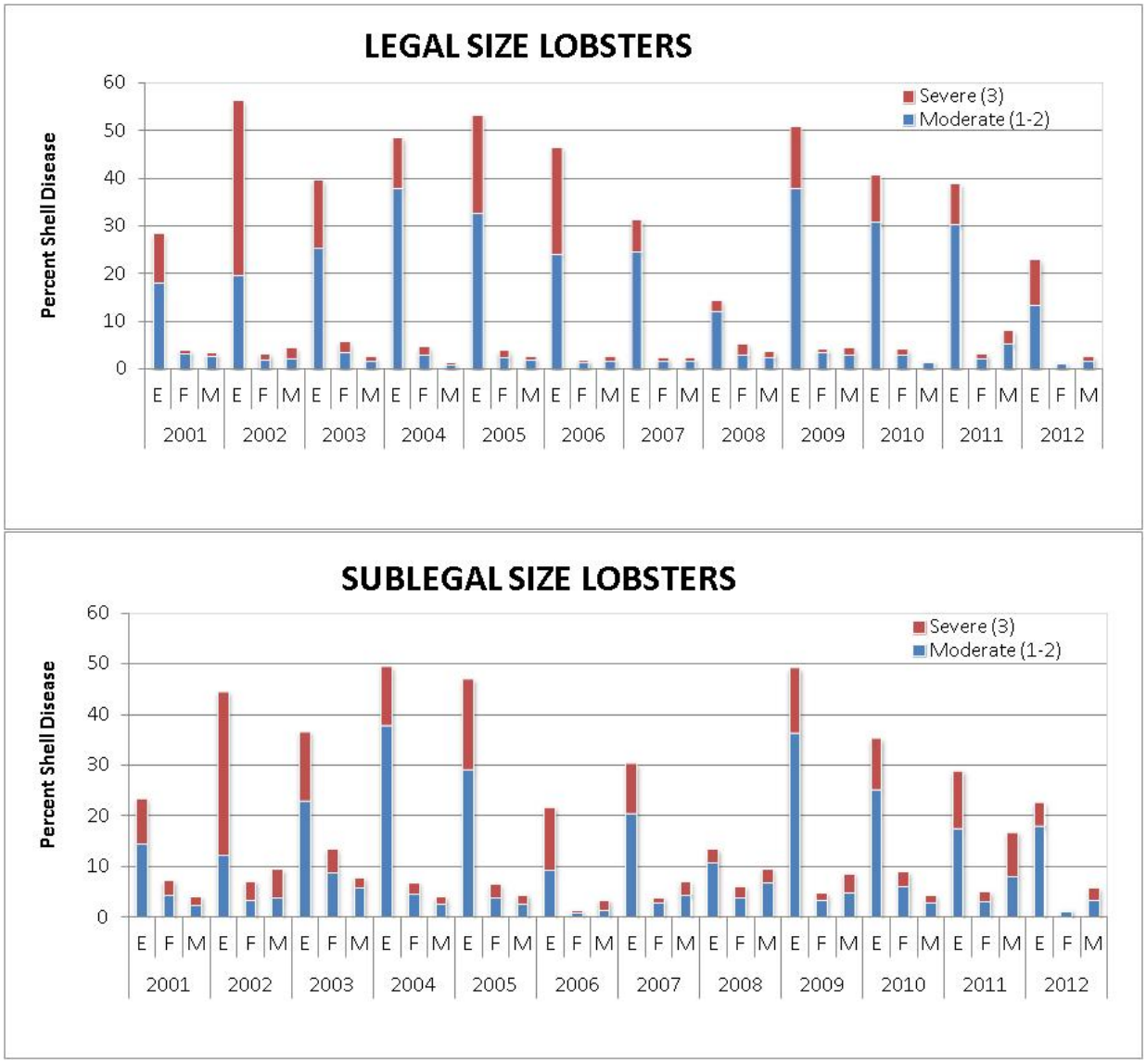



**Figure 1.18 Percent occurrence of shell disease by size (Legal, Sublegal) and severity (based on shell disease index developed in 2001) in Long Island Sound (LIS) 2001 – 2012.** **Only two sea-sampling trips were taken in the east in 2006. This small sample size in the basin most affected may have biased the 2006 percent occurrences.*

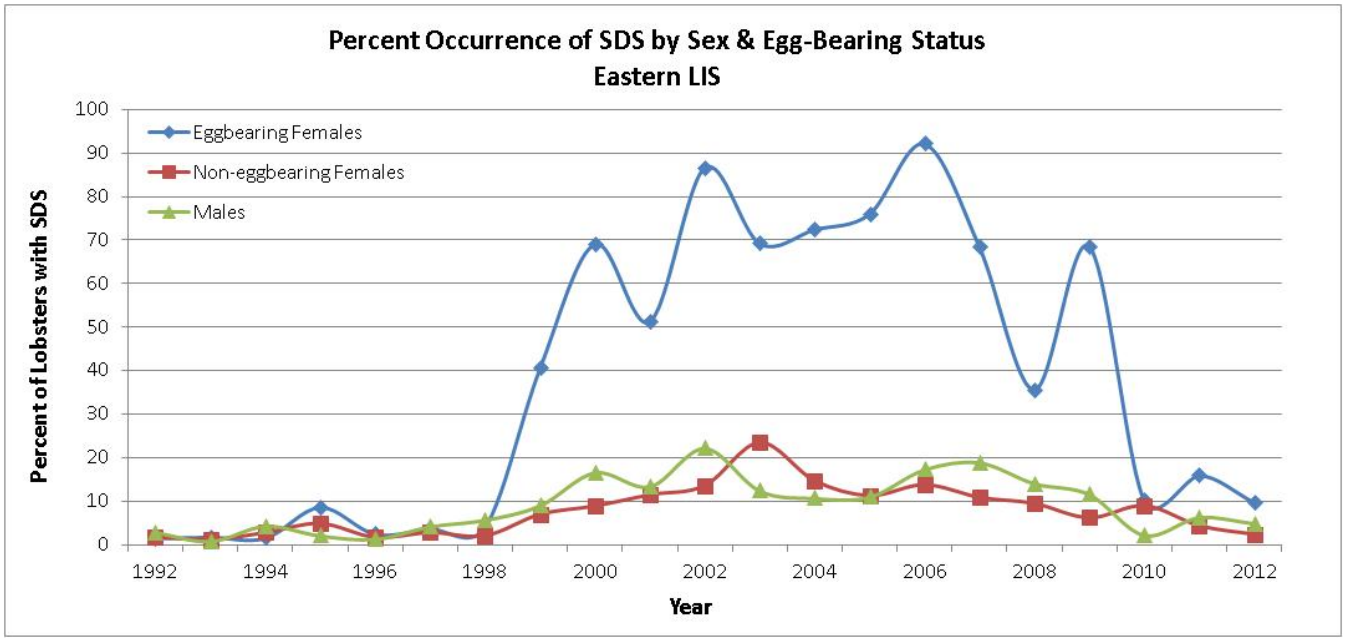



**Figure 1.19 Percent occurrence of shell disease by sex (Eggbearing, Non-Eggbearing, Male) in the Eastern basin of Long Island Sound (LIS) 1992 – 2012.** **Only two sea-sampling trips were taken in the east in 2006. This small sample size may have biased the 2006 percent occurrences.*

| Year | ELIS | CLIS | WLIS |
|---|---|---|---|
| 1982 | 9.5 | | |
| 1983 | 12.4 | | 10.3 |
| 1984 | 14.0 | | 9.4 |
| 1985 | 11.0 | | 9.6 |
| 1986 | 12.5 | | 12.5 |
| 1987 | 12.6 | | 10.3 |
| 1988 | 10.5 | | 12.1 |
| 1989 | 11.1 | | 8.2 |
| 1990 | 13.3 | | 9.8 |
| 1991 | 10.4 | | 12.1 |
| 1992 | 17.9 | | 12.9 |
| 1993 | 14.9 | | 7.8 |
| 1994 | 21.2 | | 12.5 |
| 1995 | 12.9 | | 12.9 |
| 1996 | 19.6 | | 14.0 |
| 1997 | 17.3 | | 15.4 |
| 1998 | 13.2 | | 10.1 |
| 1999 | 13.9 | | 15.9 |
| 2000 | 13.0 | 14.4 | 16.8 |
| 2001 | 16.4 | 17.4 | 20.2 |
| 2002 | 17.8 | 21.2 | 20.6 |
| 2003 | 16.1 | 17.2 | 22.1 |
| 2004 | 14.6 | 21.0 | 25.4 |
| 2005 | 15.9 | 16.1 | 23.9 |
| 2006 | | 18.1 | 21.3 |
| 2007 | 10.8 | 16.1 | 22.7 |
| 2008 | 16.8 | 10.7 | 18.5 |
| 2009 | 14.9 | 16.0 | 15.7 |
| 2010 | 15.8 | 21.1 | 16.6 |
| 2011 | 22.3 | | 17.5 |
| 2012 | 16.9 | 22.5 | 18.1 |
| MEAN | 14.6 | 17.2 | 15.1 |
| STDEV | 3.2 | 3.2 | 5.0 |

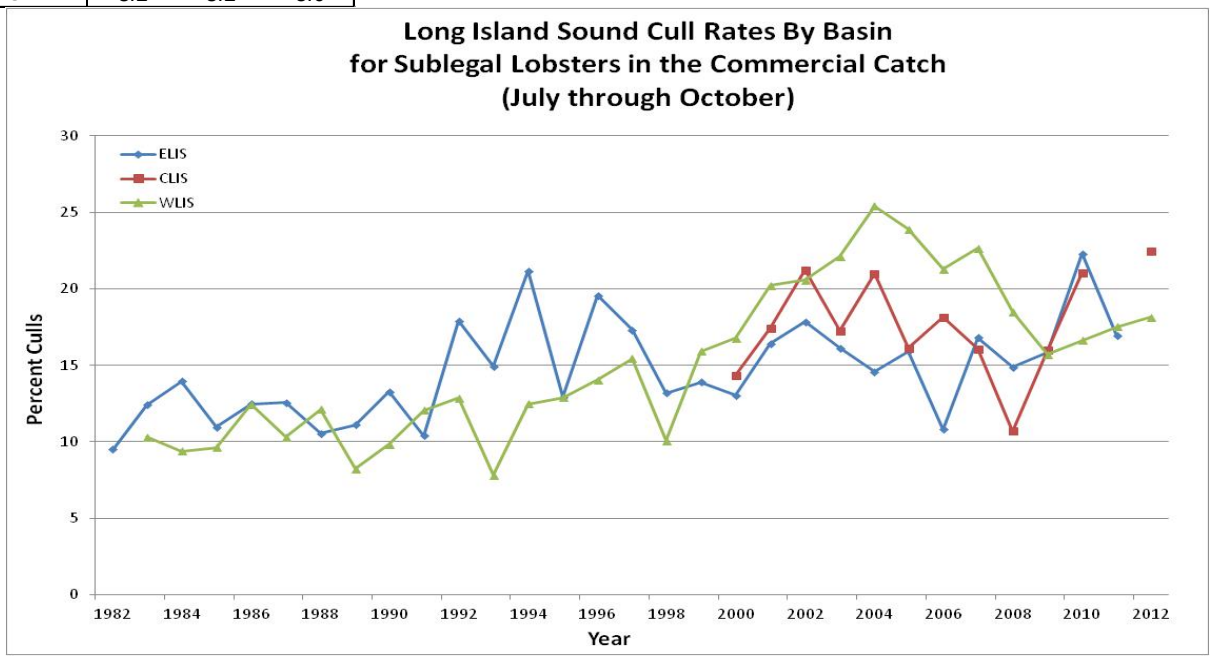



**Figure 1.20 Cull rates for sublegal lobsters observed in the commercial sea-sampling catch, by basin of Long Island Sound (LIS) from July through October, 1982 – 2012.** *(ELIS=eastern, CLIS=central, WLIS=western) *Due to low sample sizes, data from eastern Long Island Sound in 2006 have not been included. No data were available for the central basin in 2011.*

| Year | ELIS | CLIS | WLIS |
|---|---|---|---|
| 1982 | 9.2 | | |
| 1983 | 9.4 | | 11.2 |
| 1984 | 9.6 | | 13.4 |
| 1985 | 8.5 | | 15.4 |
| 1986 | 11.1 | | 17.7 |
| 1987 | 12.0 | | 16.1 |
| 1988 | 9.2 | | 18.1 |
| 1989 | 10.4 | | 13.3 |
| 1990 | 10.5 | | 11.4 |
| 1991 | 13.3 | | 16.4 |
| 1992 | 17.8 | | 5.0 |
| 1993 | 15.3 | | 12.9 |
| 1994 | 11.1 | | 14.4 |
| 1995 | 12.3 | | 17.0 |
| 1996 | 13.9 | | 19.3 |
| 1997 | 14.7 | | 18.5 |
| 1998 | 11.2 | | 14.0 |
| 1999 | 14.5 | | 18.4 |
| 2000 | 13.7 | 15.4 | 19.2 |
| 2001 | 15.2 | 17.5 | 28.2 |
| 2002 | 16.1 | 21.5 | 21.4 |
| 2003 | 17.7 | 20.4 | 26.0 |
| 2004 | 13.5 | 28.5 | 24.4 |
| 2005 | 15.8 | 13.8 | 29.4 |
| 2006 | | 17.5 | 21.5 |
| 2007 | 16.5 | 17.0 | 19.7 |
| 2008 | 14.3 | 12.9 | 18.3 |
| 2009 | 14.0 | 18.2 | 18.3 |
| 2010 | 12.9 | 17.5 | 17.9 |
| 2011 | 17.2 | | 18.0 |
| 2012 | 18.8 | 17.5 | 21.5 |
| MEAN | 13.1 | 18.2 | 17.8 |
| STDEV | 2.8 | 4.2 | 5.1 |

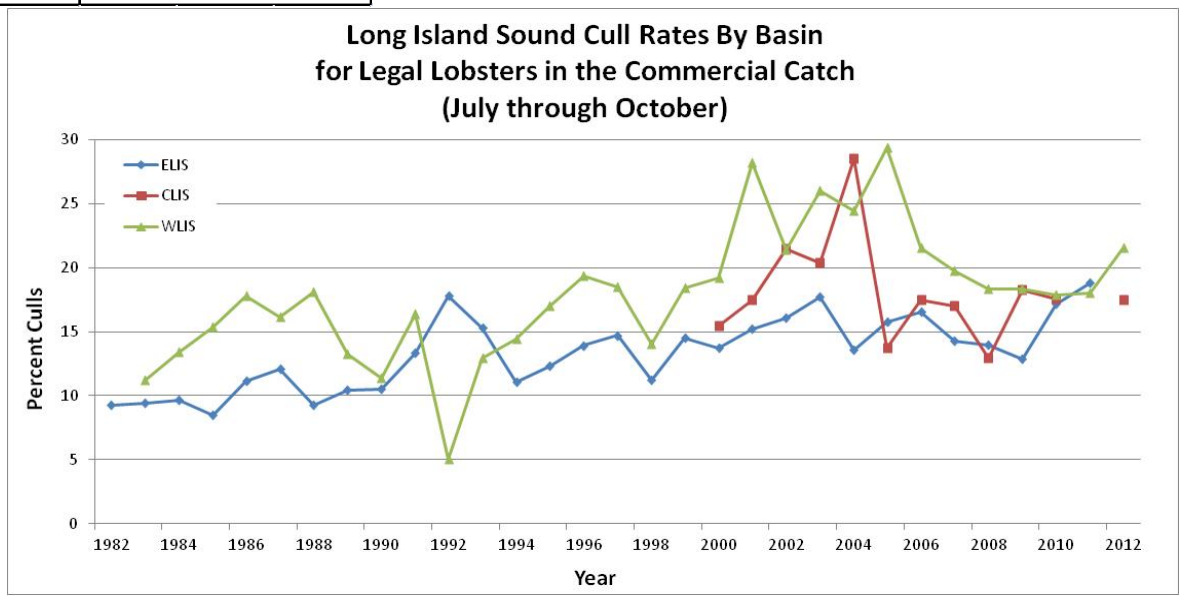



**Figure 1.21 Cull rates for legal lobsters observed in the commercial sea-sampling catch, by basin of Long Island Sound (LIS) from July through October, 1982 – 2012.** *(ELIS=eastern, CLIS=central, WLIS=western) *Due to low sample sizes, data from eastern Long Island Sound in 2006 have not been included. No data were available for the central basin in 2011.*

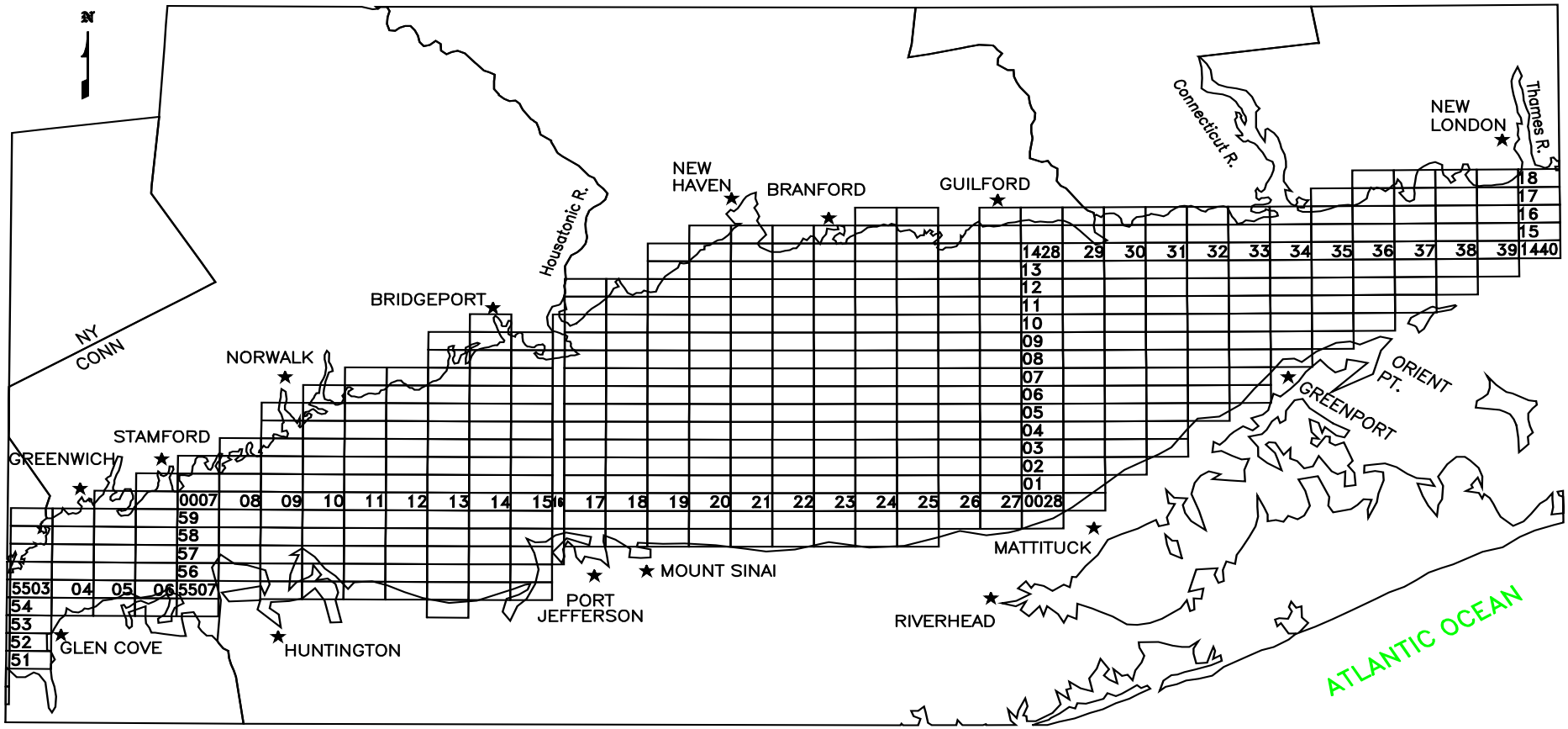



**Figure 2.1 Long Island Sound Trawl Survey sampling area with grid overlay.** *Each sampling grid is 1x2 nmi (nautical miles). A four-digit number identifies the grid: the first two digits are minutes of latitude (row number) and the last two digits are the column number. (Note: sites in column 16 are approximately 2x1 nm).*

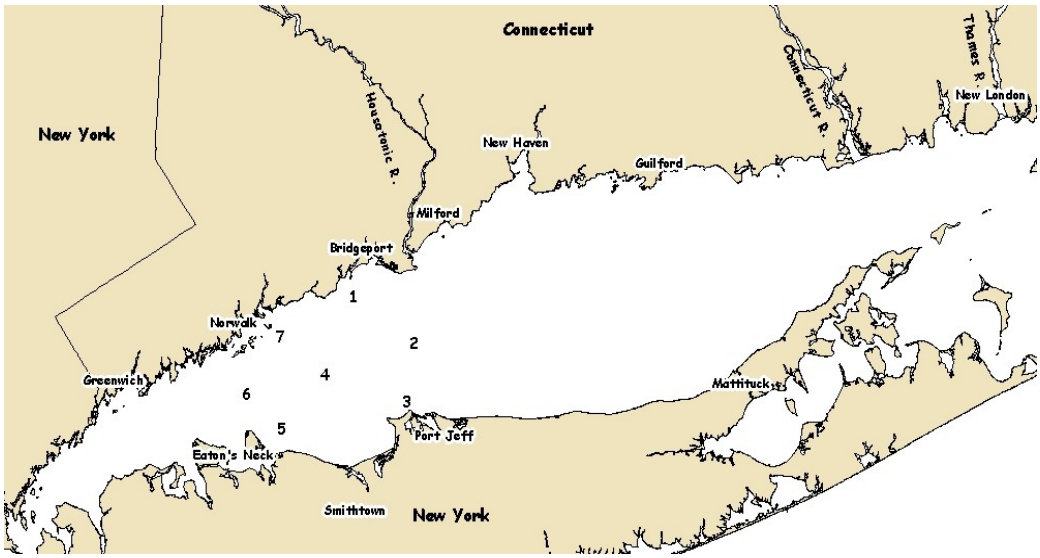



**Figure 2.2 Larval sampling stations in western Long Island Sound, 1983 – 2012.** *Station locations are numerically indicated.*

| | 2005 | | | | | | | | 2006 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Season | Spring | | | | Fall | | | Season | Spring | | | | Fall | | |
| Month | April | May | June | Total | September | October | Total | Month | April | May | June | Total | September | October | Total |
| # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 |
| # Tows taken | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows taken | 0 | 40 | 40 | 80 | 40 | 0 | 40 |
| (# tows with lobster) | 25 | 23 | 27 | 75 | 20 | 24 | 44 | (# tows with lobster) | | 28 | 21 | 49 | 21 | | 21 |
| # Lobsters Caught | 151 | 465 | 280 | 896 | 141 | 352 | 493 | # Lobsters Caught | | 399 | 163 | 562 | 186 | | 186 |
| (Weight kg) | (44) | (114) | (77) | 235 | (39) | (90) | 129 | (Weight kg) | | (104) | (49) | 153 | (45) | | 45 |
| Lobsters Measured | 139 | 453 | 226 | 818 | 120 | 327 | 447 | Lobsters Measured | | 330 | 173 | 503 | 186 | | 186 |
| | 2007 | | | | | | | | 2008 | | | | | | |
| Season | Spring | | | | Fall | | | Season | Spring | | | | Fall | | |
| Month | April | May | June | Total | September | October | Total | Month | April | May | June | Total | September | October | Total |
| # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 |
| # Tows taken | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows taken | 40 | 40 | 40 | 120 | 0 | 40 | 40 |
| (# tows with lobster) | 24 | 31 | 29 | 84 | 19 | 23 | 42 | (# tows with lobster) | 25 | 24 | 26 | 75 | | 26 | 26 |
| # Lobsters Caught | 160 | 970 | 298 | 1,428 | 142 | 78 | 220 | # Lobsters Caught | 240 | 384 | 276 | 900 | | 196 | 196 |
| (Weight kg) | (44) | (200) | (144) | 388 | (41) | (25) | 66 | (Weight kg) | (70) | (101) | (92) | 263 | | (52) | 52 |
| Lobsters Measured | 125 | 866 | 277 | 1268 | 118 | 70 | 188 | Lobsters Measured | 230 | 368 | 230 | 828 | | 173 | 173 |
| | 2009 | | | | | | | | 2010 | | | | | | |
| Season | Spring | | | | Fall | | | Season | Spring | | | | Fall | | |
| Month | April | May | June | Total | September | October | Total | Month | April | May | June | Total | September | October | Total |
| # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows scheduled | 40 | 40 | 40 | 120 | 0 | 0 | 0 |
| # Tows taken | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows taken | 40 | 38 | 0 | 78 | 0 | 0 | 0 |
| (# tows with lobster) | 21 | 19 | 19 | 59 | 12 | 20 | 32 | (# tows with lobster) | 17 | 25 | 0 | 42 | 0 | 0 | 0 |
| # Lobsters Caught | 101 | 235 | 118 | 454 | 62 | 238 | 300 | # Lobsters Caught | 68 | 225 | 0 | 293 | 0 | 0 | 0 |
| (Weight kg) | (32) | (63) | (37) | 132 | (19) | (64) | 83 | (Weight kg) | (21) | (63) | (0) | 84 | (0) | (0) | 0 |
| Lobsters Measured | 96 | 218 | 109 | 423 | 141 | 211 | 352 | Lobsters Measured | 59 | 207 | 0 | 266 | 0 | 0 | 0 |
| | 2011 | | | | | | | | 2012 | | | | | | |
| Season | Spring | | | | Fall | | | Season | Spring | | | | Fall | | |
| Month | April | May | June | Total | September | October | Total | Month | April | May | June | Total | September | October | Total |
| # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 |
| # Tows taken | 12 | 40 | 40 | 92 | 40 | 40 | 80 | # Tows taken | 40 | 40 | 40 | 120 | 40 | 40 | 80 |
| (# tows with lobster) | 4 | 21 | 17 | 42 | 14 | 8 | 22 | (# tows with lobster) | 19 | 14 | 20 | 53 | 13 | 3 | 16 |
| # Lobsters Caught | 9 | 108 | 51 | 168 | 42 | 20 | 62 | # Lobsters Caught | 154 | 37 | 98 | 289 | 36 | 18 | 54 |
| (Weight kg) | (13) | (21) | (6) | 40 | (10) | (3) | 13 | (Weight kg) | (25) | (9) | (25) | 59 | (9) | (3) | 12 |
| Lobsters Measured | 9 | 106 | 46 | 161 | 42 | 20 | 62 | Lobsters Measured | 119 | 36 | 97 | 252 | 33 | 18 | 51 |
| | 2013 | | | | | | | | 2014 | | | | | | |
| Season | Spring | | | | Fall | | | Season | Spring | | | | Fall | | |
| Month | April | May | June | Total | September | October | Total | Month | April | May | June | Total | September | October | Total |
| # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows scheduled | 40 | 40 | 40 | 120 | 40 | 40 | 80 |
| # Tows taken | 40 | 40 | 40 | 120 | 40 | 40 | 80 | # Tows taken | 40 | 40 | 40 | 120 | 40 | 39 | 79 |
| (# tows with lobster) | 10 | 8 | 16 | 34 | 5 | 7 | 12 | (# tows with lobster) | 11 | 13 | 7 | 31 | 3 | 5 | 8 |
| # Lobsters Caught | 20 | 47 | 53 | 120 | 11 | 12 | 23 | # Lobsters Caught | 31 | 121 | 15 | 167 | 5 | 6 | 11 |
| (Weight kg) | (4) | (6) | (20) | (30) | (4) | (3) | (7) | (Weight kg) | (6) | (17) | (5) | (28) | (2) | (2) | (4) |
| Lobsters Measured | 20 | 35 | 44 | 99 | 9 | 12 | 21 | Lobsters Measured | 31 | 121 | 15 | 167 | 4 | 6 | 10 |

**Table 2.1 Research trawl sampling effort and lobster catch for spring and fall cruises, 2005 – fall 2014.** *Number of lobsters and catch weight are expanded totals.*

| YEAR | MONTH | Number of Tows | Total Lobsters | Maximum Catch | Geometric Mean | Arithmetic Mean | % Tows with Lobsters | Geometric Rank | Arithmetic Rank |
|---|---|---|---|---|---|---|---|---|---|
| 1984 | SP | 32 | 846 | 125 | 7.09 | 26.40 | 0.72 | 9 | 12 |
| 1985 | SP | 46 | 630 | 156 | 3.10 | 13.70 | 0.57 | 19 | 17 |
| 1986 | SP | 116 | 905 | 74 | 2.76 | 7.80 | 0.67 | 20 | 21 |
| 1987 | SP | 120 | 1,692 | 212 | 3.30 | 14.10 | 0.63 | 17 | 16 |
| 1988 | SP | 120 | 780 | 66 | 2.24 | 6.50 | 0.65 | 24 | 25 |
| 1989 | SP | 120 | 1,945 | 396 | 3.76 | 16.20 | 0.75 | 16 | 15 |
| 1990 | SP | 120 | 2,983 | 545 | 5.33 | 24.90 | 0.73 | 13 | 13 |
| 1991 | SP | 120 | 4,424 | 373 | 7.74 | 36.90 | 0.81 | 6 | 9 |
| 1992 | SP | 80 | 3,005 | 351 | 7.88 | 37.60 | 0.78 | 5 | 8 |
| 1993 | SP | 120 | 4,991 | 486 | 6.71 | 41.60 | 0.74 | 11 | 7 |
| 1994 | SP | 120 | 2,248 | 278 | 4.10 | 18.70 | 0.73 | 14 | 14 |
| 1995 | SP | 120 | 5,742 | 1,177 | 8.36 | 47.90 | 0.77 | 4 | 6 |
| 1996 | SP | 120 | 5,761 | 707 | 6.77 | 48.00 | 0.68 | 10 | 5 |
| 1997 | SP | 120 | 8,100 | 740 | 7.67 | 67.50 | 0.71 | 7 | 4 |
| 1998 | SP | 120 | 13,034 | 1,862 | 18.52 | 108.60 | 0.83 | 1 | 1 |
| 1999 | SP | 120 | 10,302 | 899 | 12.49 | 85.90 | 0.78 | 2 | 2 |
| 2000 | SP | 120 | 8,321 | 987 | 11.01 | 69.30 | 0.82 | 3 | 3 |
| 2001 | SP | 120 | 4,214 | 266 | 7.56 | 35.10 | 0.77 | 8 | 10 |
| 2002 | SP | 120 | 3,279 | 393 | 6.31 | 27.30 | 0.73 | 12 | 11 |
| 2003 | SP | 120 | 1,563 | 282 | 3.89 | 13.00 | 0.71 | 15 | 18 |
| 2004 | SP | 119 | 1,024 | 119 | 2.50 | 8.60 | 0.61 | 22 | 20 |
| 2005 | SP | 120 | 897 | 146 | 2.43 | 7.50 | 0.63 | 23 | 22 |
| 2006 | SP | 80 | 562 | 114 | 1.94 | 7.02 | 0.61 | 25 | 24 |
| 2007 | SP | 120 | 1,429 | 251 | 3.22 | 11.91 | 0.70 | 18 | 19 |
| 2008 | SP | 120 | 900 | 59 | 2.72 | 7.50 | 0.63 | 21 | 23 |
| 2009 | SP | 120 | 455 | 50 | 1.39 | 3.79 | 0.49 | 26 | 26 |
| 2010 | SP | 78 | 293 | 45 | 1.30 | 3.75 | 0.54 | 27 | 27 |
| 2011 | SP | 92 | 168 | 50 | 0.79 | 0.58 | 0.46 | 29 | 31 |
| 2012 | SP | 120 | 289 | 34 | 0.97 | 2.40 | 0.44 | 28 | 28 |
| 2013 | SP | 120 | 120 | 21 | 0.44 | 1.00 | 0.28 | 31 | 30 |
| 2014 | SP | 120 | 167 | 26 | 0.45 | 1.40 | 0.25 | 30 | 29 |

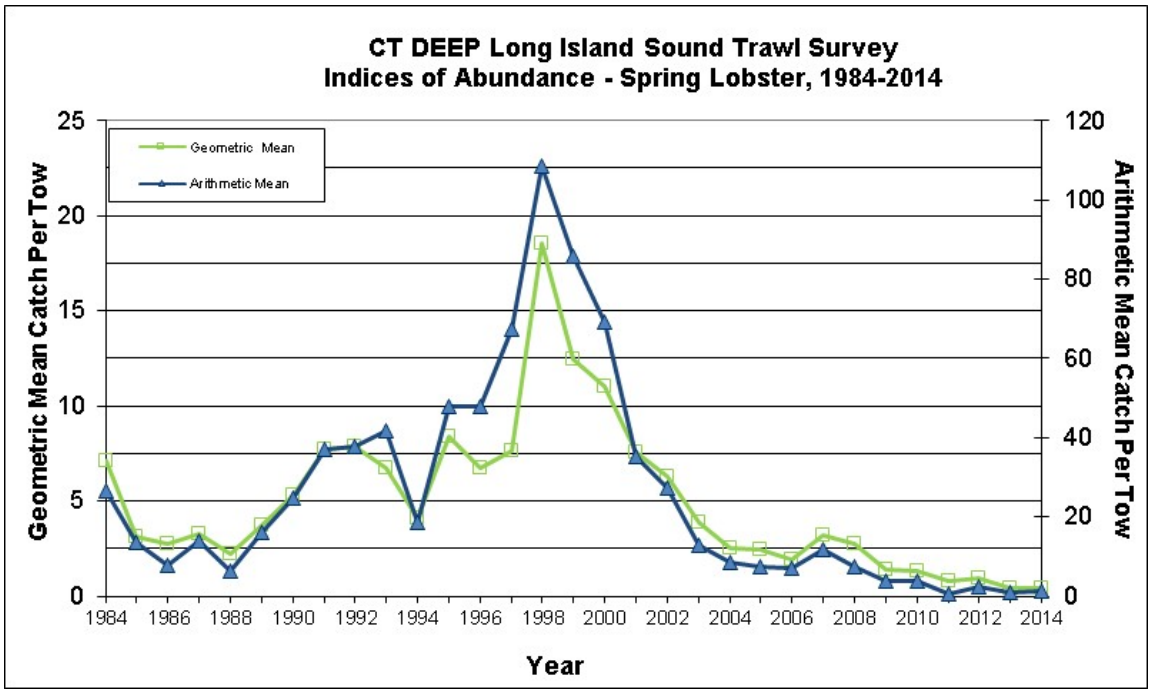



**Figure 2.3 Long Island Sound Trawl Survey spring abundance indices for American lobster, 1984-2014.** *The number of tows, total catch and percent of tows catching lobsters are shown above for each year.*

| YEAR | MONTH | Number of Tows | Total Lobsters | Maximum Catch | Geometric Mean | Arithmetic Mean | % Tows with Lobsters | Geometric Rank | Arithmetic Rank |
|---|---|---|---|---|---|---|---|---|---|
| 1984 | FA | 70 | 2,019 | 562 | 7.41 | 28.84 | 0.76 | 10 | 11 |
| 1985 | FA | 80 | 959 | 143 | 3.33 | 11.99 | 0.69 | 19 | 18 |
| 1986 | FA | 80 | 1,648 | 125 | 4.75 | 20.60 | 0.61 | 14 | 14 |
| 1987 | FA | 80 | 1,852 | 247 | 5.95 | 23.15 | 0.76 | 13 | 13 |
| 1988 | FA | 80 | 1,334 | 372 | 3.54 | 16.68 | 0.66 | 18 | 17 |
| 1989 | FA | 80 | 1,502 | 285 | 3.75 | 18.78 | 0.63 | 16 | 15 |
| 1990 | FA | 80 | 2,386 | 215 | 7.29 | 29.83 | 0.76 | 11 | 10 |
| 1991 | FA | 80 | 4,100 | 342 | 9.90 | 51.25 | 0.78 | 7 | 6 |
| 1992 | FA | 80 | 5,155 | 1,022 | 9.52 | 64.44 | 0.69 | 8 | 2 |
| 1993 | FA | 120 | 7,591 | 735 | 11.50 | 63.26 | 0.77 | 2 | 3 |
| 1994 | FA | 120 | 6,875 | 613 | 10.13 | 57.29 | 0.74 | 5 | 4 |
| 1995 | FA | 80 | 4,202 | 516 | 8.05 | 52.53 | 0.68 | 9 | 5 |
| 1996 | FA | 80 | 3,729 | 431 | 10.07 | 46.61 | 0.78 | 6 | 7 |
| 1997 | FA | 80 | 8,367 | 1,032 | 19.60 | 104.59 | 0.81 | 1 | 1 |
| 1998 | FA | 80 | 3,177 | 300 | 10.47 | 39.71 | 0.71 | 4 | 9 |
| 1999 | FA | 80 | 3,620 | 566 | 11.18 | 45.25 | 0.79 | 3 | 8 |
| 2000 | FA | 80 | 2,160 | 223 | 6.83 | 27.00 | 0.73 | 12 | 12 |
| 2001 | FA | 80 | 1,413 | 127 | 4.28 | 17.66 | 0.58 | 15 | 16 |
| 2002 | FA | 80 | 601 | 68 | 2.68 | 7.51 | 0.59 | 21 | 21 |
| 2003 | FA | 40 | 396 | 126 | 3.03 | 9.89 | 0.63 | 20 | 20 |
| 2004 | FA | 80 | 818 | 87 | 3.68 | 10.23 | 0.66 | 17 | 19 |
| 2005 | FA | 80 | 492 | 49 | 2.10 | 6.15 | 0.55 | 22 | 22 |
| 2006 | FA | 40 | 186 | 43 | 1.48 | 4.65 | 0.53 | 25 | 24 |
| 2007 | FA | 80 | 220 | 41 | 1.21 | 2.75 | 0.53 | 26 | 25 |
| 2008 | FA | 40 | 196 | 31 | 2.07 | 4.90 | 0.65 | 23 | 23 |
| 2009 | FA | 80 | 384 | 43 | 1.82 | 1.83 | 0.55 | 24 | 26 |
| 2010 | FA | | | | 1.10 | 1.08 | | 27 | 27 |
| 2011 | FA | 80 | 62 | 13 | 0.38 | 0.32 | 0.28 | 28 | 29 |
| 2012 | FA | 80 | 54 | 15 | 0.29 | 0.68 | 0.20 | 29 | 28 |
| 2013 | FA | 80 | 24 | 5 | 0.16 | 0.29 | 0.15 | 30 | 30 |
| 2014 | FA | 79 | 11 | 3 | 0.09 | 0.1 | 0.10 | 31 | 31 |

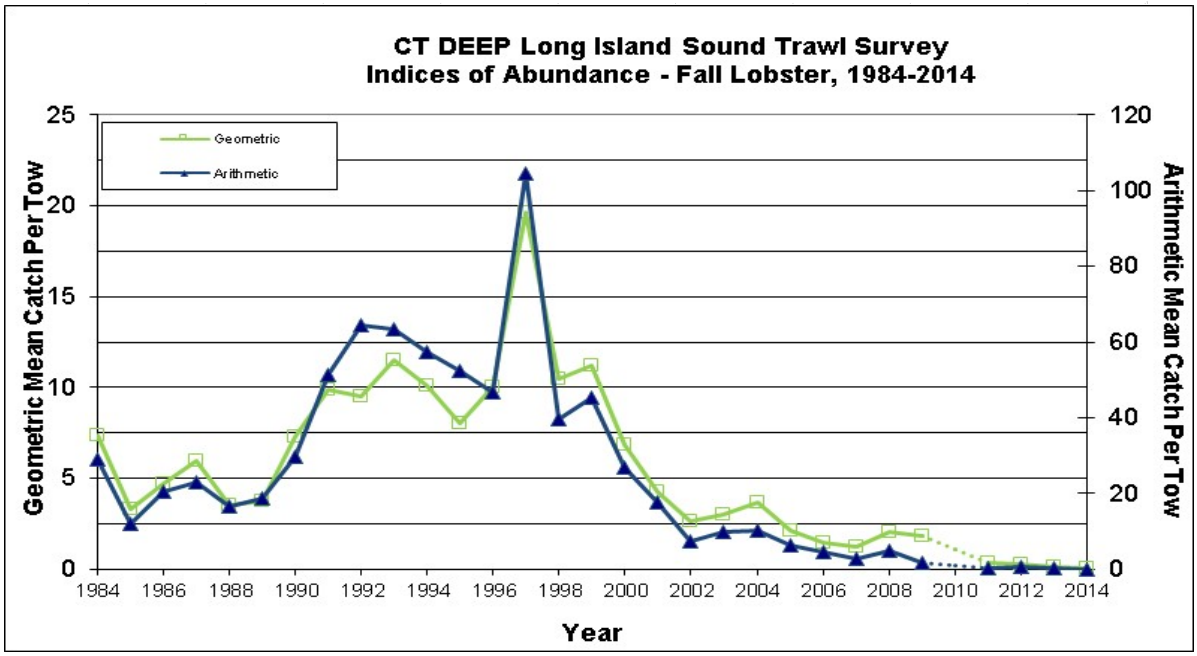



**Figure 2.4 Long Island Sound Trawl Survey fall abundance indices for American lobster, 1984-2014.** *The number of tows, total catch and percent of tows catching lobsters are shown above for each year. 2010 values are interpolated.*

| Spring | Pre-Recruit | | | | Recruit | | | | Legal | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Egger | | Nonegger | All | Egger | | Nonegger | All | Egger | | Nonegger | All |
| Year | Female | Male | Female | Females | Female | Male | Female | Females | Female | Male | Female | Females |
| 1985 | 0.03 | 6.97 | 7.43 | 7.46 | 0.13 | 2.22 | 2.29 | 2.42 | 0.36 | 0.45 | 0.74 | 1.10 |
| 1986 | 0.04 | 2.55 | 2.45 | 2.49 | 0.43 | 1.58 | 1.48 | 1.91 | 0.24 | 0.57 | 0.42 | 0.65 |
| 1987 | 0.00 | 6.33 | 6.32 | 6.32 | 0.38 | 1.89 | 1.55 | 1.93 | 0.24 | 1.13 | 0.70 | 0.95 |
| 1988 | 0.00 | 2.05 | 2.13 | 2.13 | 0.13 | 1.15 | 0.91 | 1.04 | 0.33 | 0.46 | 0.48 | 0.81 |
| 1989 | 0.03 | 5.72 | 4.83 | 4.85 | 0.37 | 2.76 | 2.46 | 2.83 | 0.22 | 1.21 | 0.68 | 0.91 |
| 1990 | 0.12 | 11.07 | 11.34 | 11.46 | 0.97 | 3.71 | 4.65 | 5.61 | 0.32 | 0.79 | 1.30 | 1.61 |
| 1991 | 0.16 | 17.69 | 14.62 | 14.78 | 1.26 | 7.77 | 5.89 | 7.16 | 0.34 | 3.67 | 1.00 | 1.34 |
| 1992 | 0.07 | 20.13 | 20.29 | 20.36 | 2.87 | 6.23 | 7.34 | 10.21 | 0.65 | 1.79 | 0.87 | 1.52 |
| 1993 | 0.39 | 18.31 | 20.26 | 20.65 | 1.24 | 3.85 | 4.91 | 6.15 | 0.47 | 0.38 | 0.43 | 0.90 |
| 1994 | 0.11 | 7.81 | 7.58 | 7.69 | 0.85 | 2.37 | 2.22 | 3.07 | 0.22 | 0.32 | 0.39 | 0.60 |
| 1995 | 0.33 | 21.72 | 23.27 | 23.60 | 2.68 | 6.33 | 6.43 | 9.10 | 0.74 | 2.03 | 0.81 | 1.54 |
| 1996 | 0.35 | 22.73 | 23.97 | 24.32 | 2.98 | 6.19 | 6.14 | 9.12 | 0.90 | 1.15 | 1.43 | 2.33 |
| 1997 | 0.71 | 38.84 | 38.89 | 39.60 | 4.89 | 9.77 | 10.74 | 15.63 | 1.12 | 4.84 | 1.90 | 3.02 |
| 1998 | 1.01 | 59.95 | 63.31 | 64.32 | 6.61 | 15.36 | 16.40 | 23.01 | 1.39 | 4.08 | 1.46 | 2.85 |
| 1999 | 1.40 | 45.58 | 50.52 | 51.92 | 9.50 | 13.32 | 15.80 | 25.29 | 0.83 | 4.05 | 1.63 | 2.46 |
| 2000 | 1.20 | 38.76 | 45.96 | 47.15 | 5.74 | 6.48 | 6.82 | 12.57 | 0.36 | 3.05 | 1.16 | 1.52 |
| 2001 | 0.73 | 20.73 | 18.99 | 19.72 | 2.02 | 8.98 | 6.38 | 8.40 | 0.47 | 2.85 | 1.19 | 1.66 |
| 2002 | 0.47 | 12.57 | 12.47 | 12.94 | 1.32 | 4.64 | 4.11 | 5.43 | 0.21 | 1.76 | 0.72 | 0.93 |
| 2003 | 0.21 | 6.81 | 5.39 | 5.61 | 0.86 | 2.02 | 1.15 | 2.01 | 0.04 | 0.44 | 0.19 | 0.23 |
| 2004 | 0.07 | 3.88 | 3.37 | 3.44 | 0.38 | 1.24 | 0.93 | 1.31 | 0.04 | 0.46 | 0.20 | 0.24 |
| 2005 | 0.11 | 3.04 | 3.01 | 3.12 | 0.19 | 1.02 | 1.00 | 1.19 | 0.02 | 0.20 | 0.24 | 0.26 |
| 2006 | 0.14 | 2.68 | 2.13 | 2.27 | 0.62 | 0.58 | 0.88 | 1.51 | 0.06 | 0.28 | 0.07 | 0.13 |
| 2007 | 0.12 | 4.78 | 5.23 | 5.35 | 0.43 | 0.90 | 0.88 | 1.31 | 0.09 | 0.25 | 0.09 | 0.18 |
| 2008 | 0.16 | 3.59 | 3.12 | 3.28 | 0.43 | 1.13 | 1.17 | 1.6 | 0.04 | 0.52 | 0.37 | 0.41 |
| 2009 | 0.06 | 1.50 | 1.54 | 1.6 | 0.18 | 0.73 | 0.56 | 0.74 | 0.05 | 0.25 | 0.18 | 0.23 |
| 2010 | 0.06 | 1.54 | 1.18 | 1.24 | 0.11 | 0.45 | 0.6 | 0.71 | 0.06 | 0.08 | 0.13 | 0.19 |
| 2011 | 0.03 | 0.79 | 0.53 | 0.56 | 0.07 | 0.18 | 0.11 | 0.18 | 0 | 0.09 | 0 | 0 |
| 2012 | 0.01 | 1.23 | 1.14 | 1.15 | 0.02 | 0.18 | 0.14 | 0.17 | 0.00 | 0.03 | 0.02 | 0.02 |
| Median 85_11 | 0.12 | 6.97 | 7.43 | 7.46 | 0.85 | 2.37 | 2.29 | 2.83 | 0.24 | 0.57 | 0.68 | 0.91 |
| 25th %ile | 0.06 | 2.95 | 2.87 | 2.97 | 0.33 | 1.10 | 0.93 | 1.31 | 0.05 | 0.31 | 0.20 | 0.24 |

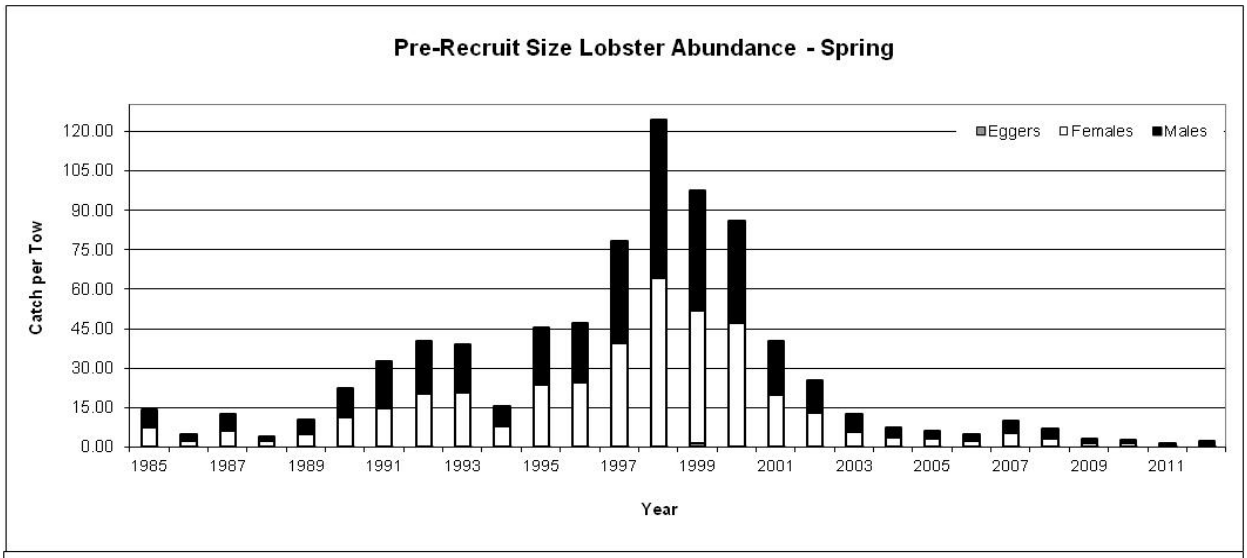
| FALL | Pre-Recruit | | | | Recruit | | | | Legal | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Egger | | Nonegger | All | Egger | | Nonegger | All | Egger | | Nonegger | All |
| Year | Female | Male | Female | Females | Female | Male | Female | Females | Female | Male | Female | Females |
| 1984 | 0.02 | 11.16 | 12.43 | 12.45 | 0.86 | 3.61 | 4.14 | 5.00 | 0.83 | 2.10 | 1.43 | 2.26 |
| 1985 | 0.02 | 3.92 | 4.80 | 4.82 | 0.66 | 2.21 | 2.15 | 2.82 | 0.44 | 0.77 | 0.35 | 0.80 |
| 1986 | 0.00 | 8.09 | 6.92 | 6.92 | 0.66 | 4.15 | 3.45 | 4.11 | 0.40 | 3.37 | 1.16 | 1.56 |
| 1987 | 0.05 | 10.53 | 8.94 | 8.99 | 0.81 | 4.53 | 4.08 | 4.89 | 0.50 | 1.44 | 1.08 | 1.58 |
| 1988 | 0.01 | 5.31 | 4.23 | 4.24 | 0.29 | 2.41 | 2.17 | 2.46 | 0.23 | 1.14 | 0.70 | 0.93 |
| 1989 | 0.04 | 7.39 | 7.36 | 7.41 | 0.35 | 3.73 | 1.90 | 2.25 | 0.27 | 1.22 | 0.17 | 0.43 |
| 1990 | 0.12 | 13.65 | 13.58 | 13.70 | 0.80 | 5.11 | 3.60 | 4.41 | 0.64 | 2.13 | 0.67 | 1.31 |
| 1991 | 0.34 | 27.15 | 26.64 | 26.98 | 1.49 | 7.17 | 3.47 | 4.96 | 0.34 | 1.56 | 0.90 | 1.24 |
| 1992 | 0.29 | 32.10 | 28.39 | 28.68 | 0.98 | 7.07 | 3.22 | 4.20 | 0.30 | 3.03 | 0.87 | 1.17 |
| 1993 | 0.51 | 33.46 | 31.09 | 31.60 | 2.12 | 10.05 | 6.84 | 8.96 | 0.54 | 1.62 | 0.76 | 1.30 |
| 1994 | 0.27 | 36.10 | 32.88 | 33.15 | 1.16 | 9.32 | 6.57 | 7.73 | 0.28 | 3.26 | 1.95 | 2.22 |
| 1995 | 0.34 | 29.55 | 23.54 | 23.88 | 1.00 | 8.17 | 4.99 | 5.99 | 0.22 | 3.30 | 0.68 | 0.90 |
| 1996 | 0.67 | 21.82 | 23.93 | 24.60 | 2.23 | 5.98 | 4.48 | 6.71 | 0.77 | 1.26 | 1.12 | 1.89 |
| 1997 | 1.83 | 63.16 | 61.95 | 63.78 | 8.33 | 16.98 | 10.92 | 19.24 | 1.59 | 3.78 | 1.17 | 2.76 |
| 1998 | 0.35 | 21.70 | 16.31 | 16.67 | 2.67 | 9.21 | 4.66 | 7.34 | 0.26 | 1.82 | 0.67 | 0.94 |
| 1999 | 0.83 | 28.06 | 21.07 | 21.90 | 3.76 | 11.46 | 3.83 | 7.59 | 0.50 | 2.47 | 0.23 | 0.72 |
| 2000 | 0.72 | 16.38 | 12.49 | 13.21 | 2.24 | 6.51 | 3.11 | 5.35 | 0.55 | 1.33 | 0.35 | 0.90 |
| 2001 | 0.59 | 9.79 | 6.70 | 7.29 | 2.00 | 5.98 | 2.30 | 4.29 | 0.21 | 0.53 | 0.36 | 0.57 |
| 2002 | 0.24 | 3.81 | 2.17 | 2.41 | 0.63 | 2.06 | 0.45 | 1.08 | 0.10 | 0.15 | 0.00 | 0.10 |
| 2003 | 0.33 | 8.70 | 8.31 | 8.63 | 1.12 | 1.88 | 1.84 | 2.97 | 0.16 | 0.44 | 0.35 | 0.51 |
| 2004 | 0.20 | 5.28 | 3.89 | 4.09 | 0.60 | 1.94 | 1.29 | 1.89 | 0.08 | 0.39 | 0.08 | 0.17 |
| 2005 | 0.11 | 3.40 | 2.46 | 2.57 | 0.57 | 1.14 | 0.59 | 1.16 | 0.07 | 0.12 | 0.17 | 0.24 |
| 2006 | 0.09 | 2.36 | 1.55 | 1.64 | 0.25 | 0.48 | 0.40 | 0.65 | 0.00 | 0.00 | 0.03 | 0.03 |
| 2007 | 0.05 | 1.10 | 0.83 | 0.88 | 0.21 | 0.71 | 0.30 | 0.51 | 0.02 | 0.10 | 0.00 | 0.02 |
| 2008 | 0.13 | 2.00 | 2.10 | 2.23 | 0.18 | 0.57 | 0.23 | 0.41 | 0.10 | 0.15 | 0.06 | 0.16 |
| 2009 | 0.14 | 2.78 | 1.69 | 1.83 | 0.20 | 0.76 | 0.34 | 0.54 | 0.00 | 0.17 | 0.16 | 0.16 |
| 2010 | | | | | | | | | | | | |
| 2011 | 0.02 | 0.33 | 0.32 | 0.34 | 0.02 | 0.08 | 0.03 | 0.05 | 0.02 | 0.00 | 0.00 | 0.02 |
| 2012 | 0.00 | 0.43 | 0.26 | 0.26 | 0.02 | 0.04 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | 0.00 |
| Median 84_11 | 0.20 | 9.79 | 8.31 | 8.63 | 0.81 | 4.15 | 3.11 | 4.20 | 0.27 | 1.26 | 0.36 | 0.90 |
| 25th%ile | 0.05 | 3.87 | 3.18 | 3.33 | 0.46 | 1.91 | 0.94 | 1.52 | 0.10 | 0.28 | 0.16 | 0.21 |

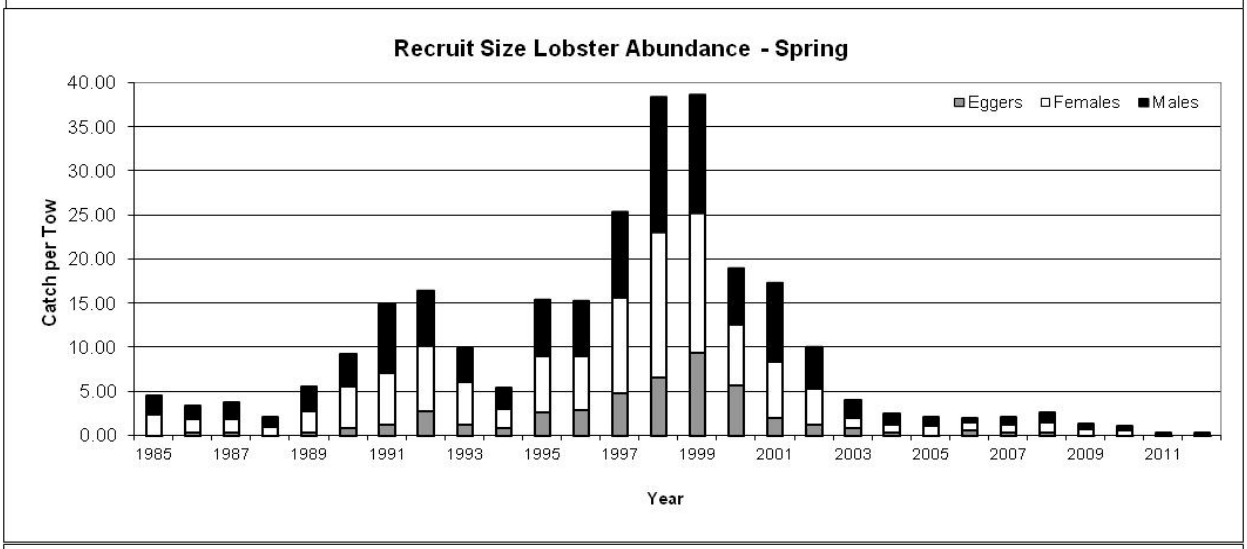
**Table 2.2 Spring and Fall LIS Trawl Survey lobster catch by size class and gender / egg-bearing status, 1985 - 2012.** *Values given are delta mean catch per standard tow for all survey tows taken over mud or transition bottom types (sand sites omitted). See figures 2.4 and 2.5 for graphic presentations.*

Pre-recruit class = < 73mm carapace length

Recruit class = 73 - < legal size carapace length

Legal class = 82.6 mm carapace length and larger through August 13, 2005;
= 83.3 mm carapace length and larger August 14, 2005 - June 30, 2006;
= 84.1 mm carapace length and larger July 1, 2006 – December 31, 2009;
= 85.7 mm carapace length and larger January 1, 2010 – present.



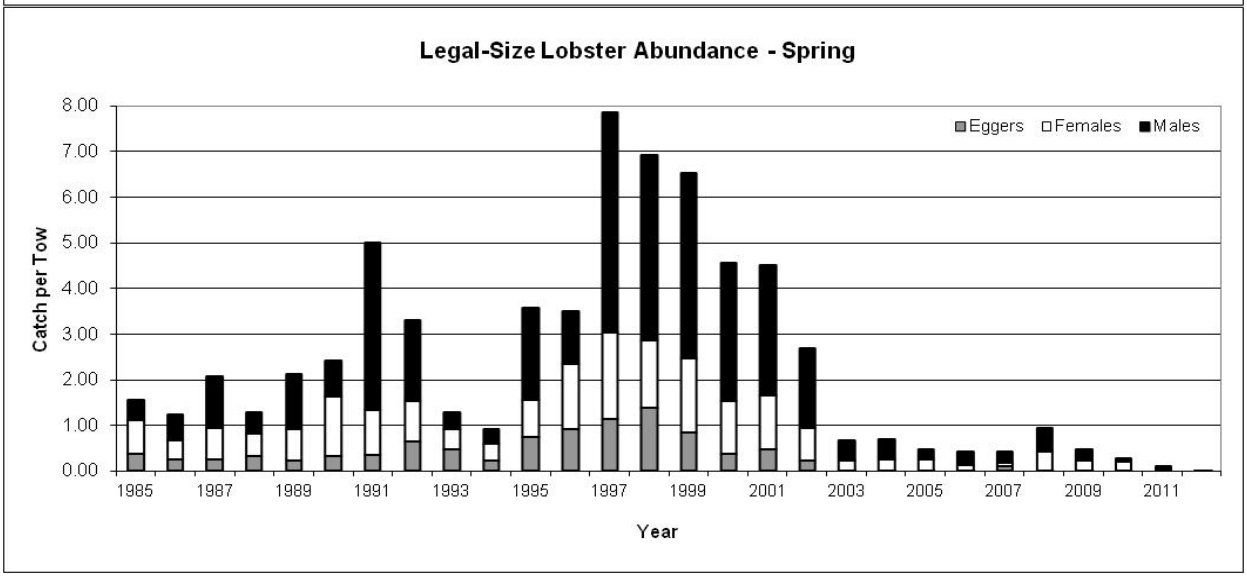




**Figure 2.5 Spring LIS Trawl Survey lobster catch by size class and gender/ egg-bearing status, 1985-2012.** *Values given are delta mean catch per standard tow for all spring survey tows (April-June) taken over mud or transition bottom types (sand sites omitted). See Table 2.2 for a listing of the data.*

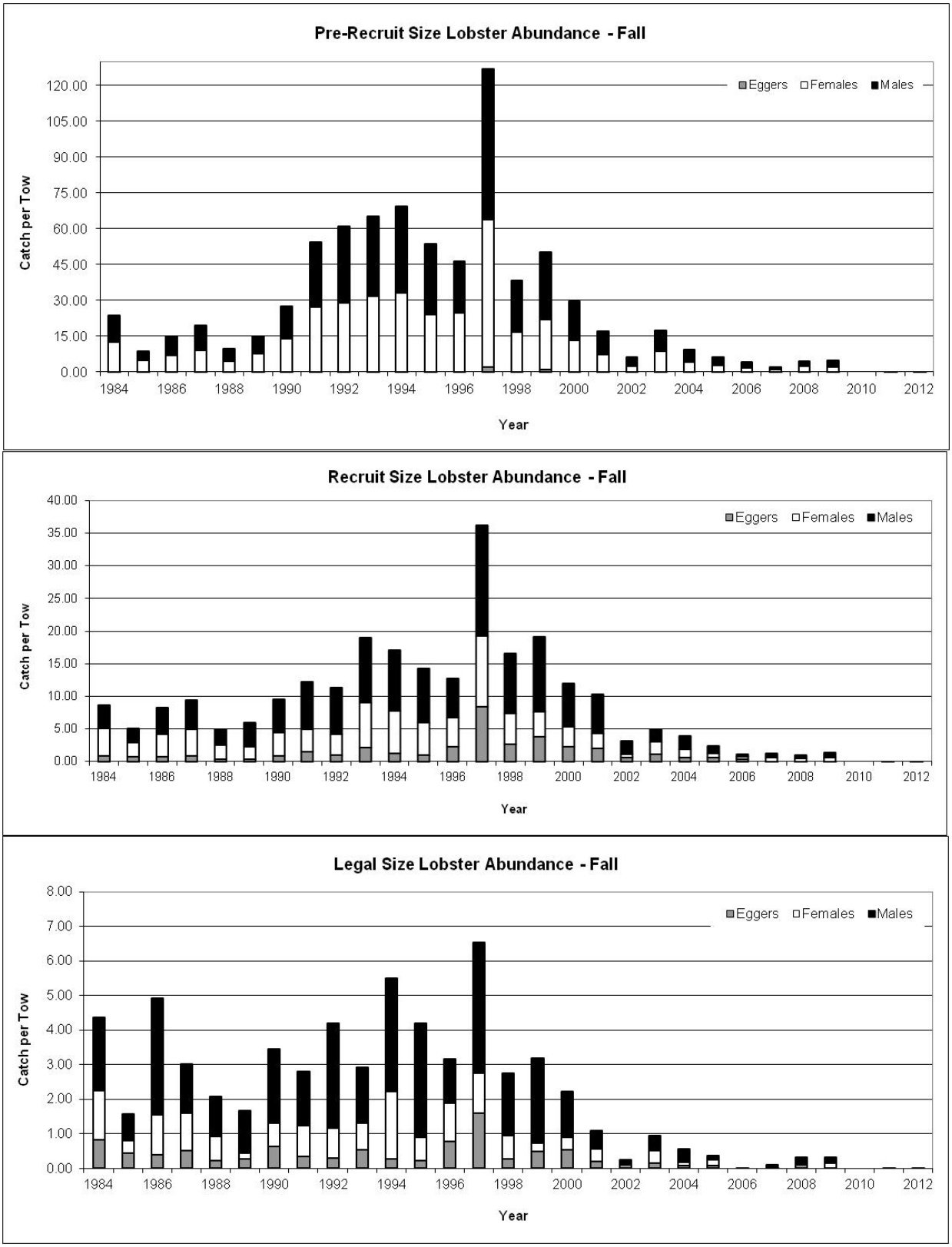



**Figure 2.6 Fall LIS Trawl Survey lobster catch by size class and gender/ egg-bearing status, 1984-2012.** *Values given are delta mean catch per standard tow for all fall survey tows (September-October) taken over mud or transition bottom types (sand sites omitted). See Table 2.2 for a listing of data. Note the 2003 means include catches taken in September & November (overall geometric mean = 4.71) unlike the geometric mean in Figure 2.3 that includes only September data. Also, no fall samples were taken in 2010 due to vessel repairs.*

| Female | | | | | | | | | | | | | | | | Spring | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Length | (32) | (46) | (116) | (120) | (120) | (120) | (120) | (120) | (80) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (119) | (120) | (80) | (120) | (120) | (120) | (78) | (92) | (120) | (120) | (119) |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 17 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 2 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 3 | 1 | 1 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 8 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 25 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 6 | 9 | 3 | 9 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 7 | 12 | 4 | 6 | 9 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 1 | 1 | 0 | 5 | 8 | 6 | 10 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 29 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 13 | 14 | 7 | 8 | 13 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 30 | 0 | 0 | 0 | 1 | 1 | 0 | 11 | 6 | 0 | 5 | 3 | 0 | 13 | 12 | 95 | 2 | 19 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 5 | 0 | 0 |
| 31 | 0 | 0 | 0 | 0 | 1 | 1 | 6 | 3 | 6 | 1 | 1 | 4 | 8 | 22 | 19 | 16 | 20 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0 | 0 | 0 | 1 | 0 | 0 | 13 | 7 | 2 | 20 | 0 | 2 | 15 | 13 | 18 | 21 | 23 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 33 | 0 | 1 | 0 | 2 | 2 | 6 | 8 | 0 | 5 | 1 | 6 | 21 | 14 | 13 | 35 | 18 | 8 | 3 | 0 | 2 | 1 | 1 | 0 | 5 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 34 | 0 | 3 | 0 | 1 | 0 | 0 | 5 | 8 | 15 | 4 | 0 | 18 | 7 | 22 | 64 | 8 | 37 | 4 | 8 | 2 | 3 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 4 | 0 |
| 35 | 4 | 4 | 3 | 2 | 0 | 0 | 9 | 1 | 4 | 6 | 4 | 22 | 15 | 22 | 59 | 22 | 48 | 3 | 5 | 2 | 1 | 2 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 36 | 5 | 3 | 2 | 11 | 0 | 0 | 9 | 8 | 6 | 14 | 0 | 8 | 14 | 21 | 41 | 26 | 48 | 3 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 2 |
| 37 | 0 | 4 | 1 | 2 | 0 | 0 | 10 | 9 | 6 | 7 | 11 | 27 | 21 | 42 | 58 | 29 | 36 | 2 | 3 | 4 | 0 | 2 | 0 | 3 | 3 | 0 | 0 | 1 | 4 | 0 | 0 |
| 38 | 2 | 0 | 0 | 7 | 2 | 4 | 6 | 11 | 13 | 17 | 1 | 49 | 10 | 31 | 72 | 42 | 35 | 7 | 10 | 2 | 3 | 0 | 1 | 5 | 0 | 0 | 1 | 1 | 2 | 0 | 0 |
| 39 | 1 | 3 | 0 | 3 | 5 | 1 | 0 | 8 | 12 | 9 | 4 | 22 | 16 | 39 | 73 | 34 | 53 | 7 | 3 | 2 | 3 | 2 | 0 | 10 | 3 | 1 | 2 | 4 | 1 | 1 | 3 |
| 40 | 1 | 4 | 2 | 10 | 4 | 4 | 7 | 6 | 17 | 28 | 8 | 41 | 18 | 30 | 98 | 23 | 68 | 8 | 10 | 6 | 5 | 2 | 3 | 11 | 1 | 0 | 3 | 1 | 1 | 0 | 3 |
| 41 | 2 | 3 | 1 | 18 | 2 | 3 | 22 | 9 | 10 | 23 | 8 | 18 | 18 | 17 | 71 | 36 | 58 | 11 | 8 | 4 | 2 | 2 | 2 | 13 | 1 | 3 | 2 | 0 | 1 | 1 | 1 |
| 42 | 1 | 6 | 3 | 8 | 1 | 3 | 17 | 22 | 9 | 41 | 11 | 46 | 18 | 33 | 143 | 54 | 65 | 11 | 18 | 5 | 6 | 0 | 0 | 5 | 2 | 0 | 1 | 1 | 1 | 2 | 2 |
| 43 | 1 | 1 | 1 | 22 | 0 | 11 | 19 | 16 | 11 | 13 | 11 | 53 | 27 | 44 | 59 | 50 | 84 | 9 | 6 | 8 | 6 | 4 | 1 | 7 | 1 | 2 | 1 | 0 | 3 | 0 | 1 |
| 44 | 1 | 1 | 2 | 16 | 6 | 2 | 13 | 12 | 14 | 25 | 9 | 61 | 22 | 32 | 43 | 38 | 117 | 19 | 15 | 15 | 4 | 5 | 4 | 9 | 3 | 3 | 0 | 1 | 4 | 0 | 0 |
| 45 | 0 | 2 | 1 | 9 | 1 | 12 | 11 | 12 | 5 | 24 | 8 | 38 | 22 | 36 | 135 | 35 | 138 | 9 | 14 | 3 | 3 | 2 | 2 | 9 | 0 | 0 | 1 | 0 | 1 | 1 | 2 |
| 46 | 4 | 3 | 1 | 12 | 3 | 8 | 4 | 18 | 26 | 30 | 2 | 34 | 22 | 42 | 88 | 64 | 102 | 15 | 22 | 4 | 0 | 1 | 4 | 3 | 3 | 1 | 1 | 2 | 3 | 1 | 1 |
| 47 | 2 | 1 | 4 | 31 | 2 | 14 | 4 | 21 | 8 | 40 | 8 | 59 | 35 | 53 | 70 | 77 | 91 | 18 | 20 | 25 | 7 | 2 | 5 | 11 | 3 | 1 | 0 | 1 | 5 | 0 | 4 |
| 48 | 2 | 2 | 2 | 15 | 6 | 20 | 22 | 17 | 28 | 35 | 12 | 54 | 31 | 56 | 104 | 59 | 72 | 11 | 17 | 9 | 7 | 6 | 2 | 7 | 3 | 5 | 3 | 2 | 1 | 1 | 5 |
| 49 | 4 | 4 | 4 | 10 | 4 | 7 | 13 | 28 | 19 | 67 | 15 | 37 | 32 | 55 | 198 | 90 | 89 | 8 | 15 | 15 | 5 | 1 | 3 | 7 | 2 | 2 | 0 | 5 | 6 | 3 | 3 |
| 50 | 6 | 1 | 6 | 7 | 4 | 7 | 16 | 18 | 5 | 40 | 21 | 51 | 43 | 67 | 139 | 63 | 104 | 13 | 21 | 13 | 6 | 2 | 0 | 10 | 6 | 1 | 0 | 3 | 2 | 1 | 3 |
| 51 | 4 | 5 | 6 | 8 | 3 | 15 | 33 | 24 | 22 | 59 | 16 | 58 | 48 | 88 | 133 | 95 | 109 | 31 | 17 | 13 | 5 | 2 | 4 | 16 | 6 | 3 | 1 | 0 | 3 | 0 | 5 |
| 52 | 9 | 8 | 3 | 15 | 3 | 14 | 29 | 45 | 32 | 35 | 33 | 58 | 57 | 73 | 165 | 89 | 125 | 40 | 25 | 11 | 6 | 4 | 3 | 13 | 3 | 3 | 1 | 0 | 4 | 3 | 4 |
| 53 | 10 | 4 | 4 | 20 | 5 | 19 | 14 | 38 | 31 | 54 | 24 | 53 | 47 | 82 | 167 | 89 | 83 | 32 | 26 | 9 | 6 | 6 | 5 | 14 | 3 | 3 | 0 | 0 | 2 | 0 | 2 |
| 54 | 2 | 4 | 6 | 15 | 2 | 22 | 38 | 35 | 18 | 38 | 29 | 44 | 45 | 87 | 140 | 84 | 152 | 30 | 41 | 15 | 6 | 7 | 2 | 9 | 3 | 3 | 1 | 1 | 3 | 0 | 1 |
| 55 | 9 | 2 | 8 | 14 | 3 | 9 | 26 | 19 | 26 | 47 | 17 | 59 | 64 | 82 | 191 | 91 | 132 | 34 | 38 | 21 | 8 | 9 | 11 | 20 | 6 | 7 | 2 | 2 | 4 | 0 | 4 |
| 56 | 6 | 9 | 11 | 12 | 14 | 15 | 31 | 47 | 16 | 60 | 17 | 64 | 56 | 98 | 152 | 99 | 85 | 44 | 24 | 14 | 10 | 14 | 2 | 20 | 7 | 0 | 3 | 0 | 4 | 0 | 4 |
| 57 | 10 | 3 | 6 | 10 | 11 | 23 | 24 | 57 | 61 | 79 | 24 | 46 | 60 | 95 | 159 | 156 | 102 | 44 | 28 | 11 | 7 | 10 | 7 | 17 | 12 | 6 | 1 | 2 | 0 | 3 | 3 |
| 58 | 1 | 8 | 7 | 15 | 6 | 25 | 38 | 35 | 27 | 53 | 17 | 56 | 62 | 111 | 144 | 118 | 118 | 38 | 35 | 11 | 12 | 12 | 7 | 15 | 9 | 5 | 5 | 1 | 3 | 2 | 2 |
| 59 | 10 | 18 | 7 | 14 | 7 | 29 | 13 | 51 | 28 | 52 | 37 | 70 | 66 | 97 | 144 | 147 | 105 | 45 | 32 | 12 | 12 | 11 | 9 | 15 | 4 | 3 | 5 | 0 | 12 | 2 | 2 |
| 60 | 6 | 12 | 11 | 19 | 9 | 25 | 34 | 45 | 43 | 57 | 30 | 91 | 76 | 97 | 114 | 102 | 97 | 60 | 48 | 15 | 16 | 10 | 3 | 24 | 6 | 4 | 1 | 3 | 2 | 1 | 2 |
| 61 | 5 | 14 | 11 | 8 | 12 | 15 | 33 | 49 | 31 | 56 | 44 | 62 | 62 | 92 | 181 | 160 | 79 | 46 | 40 | 21 | 6 | 20 | 13 | 28 | 7 | 3 | 2 | 2 | 3 | 1 | 0 |
| 62 | 12 | 9 | 5 | 11 | 4 | 12 | 57 | 33 | 34 | 75 | 46 | 61 | 67 | 94 | 118 | 116 | 75 | 59 | 46 | 13 | 11 | 14 | 9 | 22 | 10 | 7 | 2 | 2 | 4 | 0 | 0 |
| 63 | 4 | 9 | 10 | 27 | 9 | 27 | 56 | 41 | 25 | 60 | 44 | 60 | 70 | 96 | 133 | 136 | 66 | 43 | 41 | 28 | 14 | 13 | 6 | 23 | 11 | 5 | 4 | 1 | 5 | 0 | 3 |
| 64 | 10 | 16 | 9 | 16 | 8 | 13 | 38 | 33 | 41 | 75 | 24 | 64 | 91 | 86 | 176 | 148 | 110 | 75 | 46 | 23 | 11 | 16 | 8 | 25 | 10 | 6 | 1 | 1 | 0 | 1 | 2 |
| 65 | 9 | 7 | 9 | 29 | 15 | 25 | 46 | 45 | 26 | 68 | 28 | 72 | 78 | 110 | 169 | 160 | 84 | 63 | 48 | 10 | 16 | 19 | 12 | 16 | 13 | 10 | 0 | 0 | 0 | 0 | 0 |
| 66 | 11 | 15 | 18 | 25 | 10 | 21 | 43 | 59 | 48 | 86 | 26 | 84 | 87 | 116 | 147 | 121 | 99 | 55 | 39 | 15 | 19 | 9 | 3 | 21 | 23 | 8 | 1 | 0 | 4 | 0 | 2 |
| 67 | 6 | 20 | 22 | 21 | 14 | 31 | 33 | 51 | 41 | 52 | 28 | 67 | 62 | 98 | 148 | 171 | 90 | 72 | 42 | 16 | 23 | 23 | 9 | 17 | 8 | 4 | 4 | 1 | 7 | 0 | 3 |
| 68 | 21 | 10 | 12 | 43 | 11 | 14 | 41 | 65 | 37 | 45 | 29 | 76 | 73 | 94 | 142 | 158 | 107 | 49 | 48 | 19 | 20 | 13 | 14 | 21 | 15 | 7 | 4 | 2 | 1 | 1 | 2 |
| 69 | 10 | 8 | 18 | 33 | 16 | 16 | 36 | 78 | 56 | 58 | 30 | 71 | 57 | 107 | 148 | 188 | 76 | 79 | 52 | 28 | 16 | 13 | 1 | 13 | 19 | 10 | 2 | 2 | 1 | 0 | 1 |
| 70 | 15 | 5 | 14 | 30 | 13 | 29 | 51 | 59 | 37 | 67 | 27 | 79 | 74 | 119 | 157 | 177 | 86 | 67 | 57 | 25 | 21 | 12 | 6 | 23 | 20 | 6 | 6 | 0 | 1 | 0 | 0 |
| 71 | 10 | 11 | 12 | 21 | 12 | 13 | 29 | 48 | 49 | 67 | 44 | 92 | 88 | 125 | 117 | 166 | 91 | 74 | 45 | 24 | 15 | 18 | 10 | 23 | 14 | 6 | 3 | 4 | 2 | 2 | 2 |
| 72 | 11 | 6 | 20 | 18 | 8 | 24 | 40 | 50 | 48 | 61 | 30 | 77 | 91 | 107 | 157 | 177 | 98 | 75 | 80 | 20 | 13 | 22 | 10 | 30 | 15 | 8 | 0 | 1 | 2 | 4 | 2 |
| 73 | 13 | 9 | 18 | 13 | 14 | 20 | 47 | 39 | 54 | 54 | 37 | 97 | 69 | 107 | 171 | 164 | 99 | 59 | 61 | 30 | 17 | 17 | 8 | 23 | 18 | 8 | 6 | 1 | 3 | 1 | 3 |
| 74 | 10 | 6 | 17 | 20 | 8 | 24 | 24 | 43 | 52 | 45 | 39 | 60 | 74 | 130 | 153 | 215 | 104 | 66 | 70 | 25 | 11 | 12 | 9 | 17 | 13 | 6 | 5 | 0 | 2 | 0 | 2 |
| 75 | 15 | 12 | 17 | 28 | 7 | 20 | 67 | 87 | 56 | 54 | 25 | 83 | 68 | 103 | 181 | 196 | 124 | 80 | 47 | 27 | 16 | 19 | 9 | 17 | 14 | 7 | 5 | 0 | 0 | 4 | 0 |
| 76 | 14 | 9 | 20 | 14 | 8 | 25 | 67 | 71 | 41 | 38 | 24 | 78 | 69 | 114 | 229 | 185 | 102 | 59 | 45 | 15 | 9 | 16 | 11 | 13 | 25 | 5 | 9 | 0 | 4 | 0 | 1 |
| 77 | 9 | 5 | 15 | 19 | 15 | 32 | 41 | 77 | 69 | 44 | 20 | 102 | 65 | 95 | 160 | 195 | 109 | 52 | 39 | 23 | 16 | 13 | 17 | 16 | 11 | 6 | 3 | 2 | 1 | 0 | 1 |
| 78 | 24 | 9 | 15 | 14 | 13 | 49 | 60 | 57 | 63 | 64 | 22 | 90 | 61 | 110 | 177 | 176 | 93 | 48 | 55 | 18 | 7 | 9 | 15 | 16 | 16 | 10 | 4 | 4 | 1 | 1 | 2 |
| 79 | 23 | 6 | 24 | 21 | 10 | 55 | 42 | 64 | 35 | 52 | 30 | 77 | 92 | 117 | 179 | 203 | 98 | 51 | 52 | 11 | 10 | 9 | 13 | 14 | 12 | 14 | 3 | 2 | 3 | 2 | 0 |
| 80 | 22 | 1 | 18 | 10 | 11 | 35 | 34 | 45 | 31 | 71 | 41 | 71 | 79 | 92 | 180 | 200 | 91 | 63 | 41 | 16 | 15 | 9 | 11 | 15 | 8 | 7 | 9 | 3 | 4 | 1 | 0 |
| 81 | 10 | 2 | 7 | 15 | 13 | 19 | 69 | 56 | 49 | 48 | 34 | 72 | 86 | 148 | 170 | 140 | 85 | 62 | 33 | 11 | 15 | 9 | 9 | 12 | 16 | 2 | 8 | 2 | 0 | 1 | 1 |
| 82 | 9 | 0 | 3 | 9 | 5 | 15 | 28 | 41 | 36 | 35 | 21 | 71 | 57 | 110 | 108 | 106 | 47 | 40 | 21 | 14 | 8 | 6 | 5 | 14 | 10 | 4 | 5 | 0 | 1 | 0 | 0 |
| 83 | 9 | 5 | 5 | 8 | 3 | 7 | 25 | 22 | 16 | 7 | 7 | 15 | 31 | 28 | 65 | 59 | 41 | 25 | 17 | 4 | 4 | 7 | 3 | 9 | 14 | 9 | 2 | 1 | 1 | 0 | 0 |
| 84 | 3 | 1 | 7 | 9 | 4 | 11 | 15 | 12 | 7 | 8 | 4 | 11 | 19 | 20 | 7 | 33 | 14 | 18 | 18 | 4 | 4 | 5 | 3 | 5 | 7 | 7 | 2 | 0 | 3 | 3 | 0 |
| 85 | 5 | 2 | 5 | 7 | 6 | 3 | 11 | 5 | 7 | 8 | 8 | 17 | 20 | 28 | 22 | 9 | 15 | 9 | 7 | 1 | 5 | 1 | 0 | 5 | 6 | 2 | 1 | 2 | 0 | 1 | 0 |
| 86 | 9 | 3 | 6 | 3 | 6 | 8 | 14 | 14 | 3 | 3 | 2 | 11 | 23 | 24 | 23 | 10 | 12 | 8 | 11 | 2 | 0 | 3 | 0 | 2 | 7 | 1 | 4 | 0 | 0 | 0 | 1 |
| 87 | 10 | 0 | 3 | 4 | 8 | 13 | 17 | 9 | 7 | 13 | 15 | 16 | 11 | 13 | 12 | 9 | 8 | 7 | 4 | 4 | 1 | 3 | 3 | 0 | 1 | 2 | 1 | 0 | 2 | 0 | 0 |
| 88 | 2 | 3 | 8 | 3 | 9 | 9 | 6 | 11 | 3 | 11 | 2 | 7 | 13 | 18 | 17 | 5 | 1 | 9 | 1 | 0 | 1 | 0 | 0 | 2 | 5 | 3 | 2 | 0 | 0 | 0 | 0 |
| 89 | 3 | 6 | 5 | 8 | 5 | 8 | 12 | 10 | 12 | 5 | 2 | 16 | 12 | 16 | 13 | 11 | 8 | 9 | 5 | 1 | 1 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 90 | 15 | 2 | 4 | 3 | 8 | 4 | 5 | 8 | 11 | 3 | 3 | 9 | 15 | 10 | 11 | 10 | 7 | 10 | 4 | 1 | 4 | 2 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 91 | 5 | 1 | 1 | 6 | 2 | 5 | 11 | 8 | 1 | 3 | 0 | 5 | 7 | 11 | 6 | 3 | 2 | 4 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 |
| 92 | 4 | 2 | 0 | 2 | 3 | 2 | 7 | 1 | 0 | 3 | 3 | 3 | 5 | 7 | 7 | 2 | 1 | 2 | 7 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| 93 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 6 | 3 | 0 | 2 | 5 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 1 |
| 94 | 0 | 2 | 1 | 1 | 3 | 1 | 1 | 2 | 0 | 1 | 5 | 1 | 1 | 1 | 4 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 95 | 0 | 0 | 1 | 2 | 2 | 3 | 8 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 96 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97 | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 98 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 99 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 101 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 102 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 103 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 106 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 109 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 111 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 451 | 335 | 469 | 838 | 405 | 914 | 1,621 | 1,946 | 1,560 | 2,336 | 1,131 | 3,052 | 2,837 | 4,220 | 6,921 | 5,731 | 4,595 | 2,011 | 1,646 | 709 | 483 | 458 | 296 | 737 | 449 | 238 | 144 | 69 | 139 | 56 | 90 |
| legal size | | | 81.0 | | | 81.8 | | | | | | | | | 82.6 | | | | | | | | 83.3 | | 84.1 | | | | 85.7 | | |

**Table 2.3 American lobster length frequencies-spring, female, 1 mm intervals, 1984–2014.**
Lobsters were measured from each tow.

| Male | | | | | | Spring | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Length | (32) | (46) | (116) | (120) | (120) | (120) | (120) | (120) | (80) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (120) | (119) | (120) | (80) | (120) | (120) | (120) | (78) | (92) | (120) | (120) | (119) |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 6 | 0 | 1 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 3 | 2 | 2 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 1 | 9 | 2 | 0 | 2 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 2 | 1 | 5 | 2 | 12 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 2 | 3 | 5 | 0 | 9 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 |
| 30 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 0 | 5 | 1 | 0 | 3 | 10 | 5 | 2 | 4 | 15 | 3 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 31 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 8 | 4 | 3 | 2 | 0 | 8 | 13 | 14 | 7 | 18 | 3 | 4 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 32 | 0 | 0 | 0 | 0 | 3 | 6 | 0 | 6 | 6 | 8 | 1 | 8 | 9 | 12 | 11 | 16 | 17 | 2 | 2 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 3 | 2 | 0 |
| 33 | 0 | 2 | 1 | 2 | 0 | 0 | 1 | 9 | 0 | 6 | 4 | 15 | 6 | 9 | 4 | 15 | 16 | 3 | 9 | 3 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 34 | 0 | 0 | 3 | 2 | 0 | 1 | 1 | 5 | 1 | 6 | 0 | 27 | 19 | 16 | 52 | 12 | 25 | 2 | 4 | 1 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 35 | 2 | 0 | 2 | 0 | 0 | 0 | 4 | 5 | 9 | 5 | 1 | 20 | 12 | 22 | 26 | 23 | 33 | 2 | 5 | 2 | 4 | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 2 | 0 | 1 |
| 36 | 2 | 4 | 0 | 1 | 1 | 7 | 14 | 4 | 5 | 7 | 3 | 17 | 13 | 24 | 34 | 19 | 26 | 6 | 1 | 3 | 1 | 2 | 0 | 6 | 0 | 0 | 1 | 3 | 3 | 0 | 1 |
| 37 | 1 | 1 | 2 | 5 | 0 | 3 | 2 | 23 | 9 | 12 | 4 | 15 | 20 | 32 | 58 | 35 | 32 | 5 | 3 | 2 | 4 | 2 | 0 | 7 | 1 | 0 | 0 | 1 | | 0 | 0 |
| 38 | 0 | 1 | 1 | 5 | 2 | 7 | 14 | 9 | 1 | 26 | 3 | 18 | 18 | 21 | 93 | 12 | 28 | 3 | 8 | 4 | 2 | 1 | 2 | 7 | 0 | 0 | 2 | 1 | 4 | 0 | 3 |
| 39 | 0 | 0 | 0 | 10 | 0 | 6 | 12 | 5 | 7 | 15 | 4 | 31 | 15 | 20 | 33 | 20 | 35 | 11 | 9 | 4 | 3 | 2 | 3 | 8 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 40 | 0 | 2 | 0 | 7 | 2 | 8 | 3 | 5 | 12 | 17 | 7 | 25 | 21 | 41 | 32 | 20 | 52 | 8 | 10 | 2 | 0 | 1 | 2 | 4 | 2 | 0 | 1 | 3 | 3 | 2 | 1 |
| 41 | 0 | 2 | 2 | 9 | 1 | 0 | 11 | 8 | 7 | 4 | 10 | 28 | 19 | 41 | 75 | 46 | 55 | 3 | 13 | 7 | 3 | 0 | 1 | 6 | 3 | 0 | 2 | 2 | 2 | 0 | 0 |
| 42 | 4 | 2 | 0 | 3 | 1 | 9 | 13 | 10 | 13 | 42 | 7 | 39 | 18 | 46 | 125 | 36 | 63 | 14 | 9 | 10 | 3 | 5 | 0 | 16 | 3 | 2 | 0 | 3 | 4 | 1 | 2 |
| 43 | 1 | 2 | 1 | 16 | 0 | 9 | 14 | 9 | 12 | 23 | 5 | 52 | 26 | 24 | 70 | 51 | 32 | 5 | 9 | 10 | 5 | 2 | 2 | 8 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |
| 44 | 3 | 0 | 1 | 15 | 1 | 3 | 10 | 11 | 6 | 42 | 9 | 17 | 21 | 50 | 170 | 44 | 110 | 10 | 15 | 9 | 1 | 0 | 4 | 12 | 2 | 1 | 3 | 3 | 2 | 0 | 3 |
| 45 | 1 | 5 | 4 | 22 | 3 | 7 | 7 | 20 | 13 | 45 | 6 | 39 | 28 | 46 | 76 | 50 | 65 | 17 | 16 | 20 | 5 | 3 | 2 | 9 | 3 | 1 | 2 | 2 | 4 | 3 | 1 |
| 46 | 0 | 2 | 2 | 24 | 2 | 24 | 7 | 12 | 25 | 37 | 9 | 32 | 22 | 66 | 155 | 71 | 74 | 19 | 18 | 18 | 4 | 3 | 2 | 11 | 0 | 4 | 1 | 3 | 2 | 0 | 6 |
| 47 | 0 | 1 | 2 | 31 | 7 | 3 | 2 | 17 | 47 | 32 | 9 | 54 | 32 | 66 | 146 | 87 | 65 | 17 | 9 | 4 | 4 | 4 | 1 | 16 | 0 | 2 | 2 | 1 | 0 | 0 | 1 |
| 48 | 6 | 6 | 5 | 9 | 1 | 8 | 20 | 17 | 7 | 23 | 6 | 45 | 32 | 78 | 93 | 60 | 57 | 22 | 29 | 6 | 3 | 6 | 5 | 8 | 4 | 2 | 2 | 0 | 2 | 1 | 5 |
| 49 | 9 | 3 | 4 | 24 | 4 | 22 | 20 | 45 | 21 | 40 | 19 | 46 | 18 | 82 | 120 | 87 | 69 | 16 | 18 | 8 | 15 | 3 | 4 | 16 | 3 | 3 | 1 | 0 | 3 | 0 | 1 |
| 50 | 7 | 3 | 1 | 19 | 4 | 23 | 10 | 21 | 25 | 30 | 21 | 29 | 35 | 61 | 66 | 83 | 110 | 34 | 22 | 16 | 7 | 6 | 4 | 9 | 4 | 2 | 0 | 2 | 2 | 0 | 3 |
| 51 | 3 | 4 | 4 | 12 | 2 | 20 | 26 | 42 | 16 | 75 | 16 | 62 | 45 | 57 | 158 | 90 | 65 | 24 | 31 | 19 | 8 | 8 | 9 | 10 | 3 | 5 | 0 | 0 | 1 | 0 | 2 |
| 52 | 9 | 5 | 2 | 12 | 2 | 15 | 23 | 21 | 25 | 37 | 31 | 49 | 52 | 75 | 81 | 80 | 100 | 27 | 27 | 14 | 10 | 6 | 2 | 12 | 3 | 2 | 2 | 0 | 7 | 0 | 3 |
| 53 | 5 | 9 | 7 | 17 | 4 | 10 | 12 | 33 | 16 | 41 | 26 | 60 | 50 | 56 | 138 | 69 | 66 | 25 | 20 | 11 | 5 | 7 | 5 | 19 | 6 | 4 | 1 | 0 | 2 | 1 | 1 |
| 54 | 10 | 3 | 16 | 14 | 7 | 14 | 30 | 45 | 36 | 43 | 29 | 74 | 49 | 74 | 210 | 79 | 110 | 33 | 38 | 26 | 15 | 6 | 5 | 21 | 5 | 4 | 1 | 4 | 4 | 2 | 0 |
| 55 | 5 | 3 | 6 | 18 | 7 | 23 | 16 | 42 | 27 | 50 | 27 | 46 | 51 | 82 | 101 | 101 | 114 | 38 | 23 | 18 | 2 | 9 | 6 | 12 | 5 | 3 | 2 | 1 | 3 | 4 | 4 |
| 56 | 3 | 12 | 11 | 17 | 10 | 6 | 34 | 38 | 37 | 44 | 14 | 70 | 54 | 83 | 130 | 82 | 95 | 37 | 29 | 19 | 13 | 11 | 9 | 7 | 7 | 6 | 6 | 2 | 4 | 0 | 3 |
| 57 | 1 | 7 | 10 | 26 | 11 | 17 | 36 | 30 | 12 | 51 | 27 | 54 | 60 | 68 | 145 | 93 | 95 | 43 | 35 | 22 | 7 | 6 | 5 | 21 | 4 | 3 | 3 | 3 | 1 | 1 | 2 |
| 58 | 12 | 7 | 5 | 10 | 4 | 19 | 44 | 71 | 31 | 47 | 35 | 41 | 83 | 96 | 111 | 111 | 99 | 43 | 46 | 11 | 12 | 8 | 5 | 13 | 8 | 1 | 2 | 1 | 2 | 2 | 0 |
| 59 | 3 | 13 | 7 | 12 | 14 | 25 | 29 | 57 | 27 | 88 | 34 | 71 | 56 | 67 | 63 | 144 | 89 | 43 | 43 | 13 | 6 | 11 | 10 | 24 | 9 | 7 | 4 | 2 | 3 | 0 | 1 |
| 60 | 1 | 9 | 14 | 29 | 8 | 23 | 49 | 50 | 37 | 42 | 34 | 94 | 84 | 156 | 121 | 105 | 105 | 56 | 35 | 24 | 8 | 9 | 6 | 16 | 9 | 6 | 1 | 0 | 4 | 2 | 3 |
| 61 | 9 | 14 | 16 | 12 | 10 | 22 | 39 | 56 | 46 | 62 | 34 | 77 | 59 | 102 | 176 | 123 | 83 | 51 | 36 | 28 | 14 | 10 | 14 | 11 | 11 | 6 | 3 | 3 | 5 | 2 | 3 |
| 62 | 11 | 10 | 13 | 15 | 6 | 30 | 44 | 78 | 36 | 65 | 54 | 57 | 58 | 127 | 152 | 117 | 84 | 69 | 44 | 20 | 11 | 12 | 7 | 12 | 16 | 12 | 2 | 0 | 5 | 0 | 2 |
| 63 | 18 | 15 | 16 | 28 | 8 | 24 | 52 | 65 | 54 | 44 | 36 | 59 | 60 | 101 | 167 | 132 | 73 | 54 | 44 | 24 | 16 | 13 | 13 | 19 | 19 | 5 | 6 | 2 | 5 | 3 | 4 |
| 64 | 8 | 16 | 12 | 26 | 8 | 21 | 45 | 72 | 43 | 63 | 27 | 73 | 90 | 95 | 153 | 133 | 98 | 69 | 46 | 26 | 10 | 14 | 8 | 22 | 16 | 4 | 8 | 3 | 5 | 1 | 0 |
| 65 | 13 | 8 | 11 | 20 | 15 | 20 | 47 | 55 | 36 | 73 | 33 | 77 | 73 | 97 | 165 | 111 | 96 | 75 | 50 | 30 | 21 | 17 | 8 | 16 | 16 | 8 | 2 | 1 | 5 | 1 | 1 |
| 66 | 5 | 10 | 11 | 26 | 16 | 32 | 49 | 71 | 31 | 71 | 23 | 39 | 73 | 107 | 223 | 129 | 64 | 56 | 39 | 23 | 31 | 15 | 6 | 22 | 23 | 2 | 6 | 2 | 0 | 1 | 0 |
| 67 | 1 | 5 | 11 | 26 | 11 | 32 | 29 | 57 | 44 | 39 | 21 | 69 | 60 | 118 | 182 | 149 | 66 | 77 | 53 | 24 | 16 | 14 | 6 | 33 | 19 | 1 | 3 | 1 | 10 | 1 | 0 |
| 68 | 5 | 10 | 13 | 12 | 7 | 21 | 33 | 80 | 48 | 26 | 34 | 67 | 64 | 100 | 147 | 116 | 81 | 82 | 32 | 36 | 22 | 23 | 11 | 20 | 19 | 10 | 5 | 0 | 0 | 1 | 2 |
| 69 | 8 | 9 | 10 | 19 | 24 | 25 | 39 | 71 | 46 | 43 | 32 | 57 | 79 | 101 | 156 | 140 | 77 | 73 | 51 | 25 | 11 | 20 | 8 | 16 | 11 | 4 | 3 | 4 | 3 | 2 | 3 |
| 70 | 8 | 11 | 14 | 23 | 7 | 34 | 38 | 50 | 51 | 27 | 24 | 60 | 77 | 99 | 158 | 152 | 85 | 73 | 44 | 27 | 21 | 16 | 9 | 15 | 21 | 11 | 5 | 2 | 5 | 1 | 2 |
| 71 | 9 | 5 | 13 | 22 | 13 | 29 | 55 | 66 | 23 | 48 | 42 | 85 | 58 | 91 | 112 | 152 | 62 | 71 | 56 | 20 | 29 | 20 | 7 | 4 | 18 | 5 | 11 | 3 | 1 | 0 | 0 |
| 72 | 6 | 17 | 13 | 14 | 17 | 33 | 40 | 93 | 42 | 37 | 41 | 59 | 85 | 111 | 145 | 105 | 72 | 62 | 42 | 23 | 13 | 11 | 8 | 25 | 15 | 7 | 4 | 3 | 5 | 2 | 0 |
| 73 | 14 | 5 | 10 | 21 | 11 | 28 | 37 | 94 | 42 | 34 | 27 | 93 | 64 | 82 | 122 | 109 | 61 | 63 | 46 | 15 | 22 | 16 | 6 | 13 | 14 | 3 | 6 | 1 | 2 | 3 | 1 |
| 74 | 6 | 9 | 27 | 21 | 11 | 45 | 40 | 74 | 36 | 32 | 33 | 67 | 71 | 92 | 146 | 123 | 74 | 85 | 40 | 35 | 15 | 10 | 2 | 15 | 8 | 9 | 5 | 3 | 4 | 2 | 1 |
| 75 | 6 | 3 | 13 | 15 | 10 | 35 | 29 | 63 | 40 | 48 | 21 | 84 | 62 | 73 | 81 | 120 | 52 | 72 | 39 | 21 | 16 | 14 | 6 | 19 | 11 | 5 | 2 | 3 | 3 | 0 | 2 |
| 76 | 12 | 3 | 20 | 16 | 18 | 18 | 33 | 79 | 23 | 32 | 23 | 47 | 48 | 67 | 143 | 122 | 49 | 69 | 50 | 25 | 9 | 11 | 4 | 13 | 8 | 3 | 4 | 2 | 5 | 0 | 0 |
| 77 | 9 | 7 | 10 | 14 | 7 | 22 | 30 | 69 | 31 | 24 | 12 | 50 | 54 | 66 | 115 | 97 | 57 | 63 | 35 | 24 | 18 | 17 | 2 | 8 | 14 | 10 | 6 | 2 | 6 | 0 | 1 |
| 78 | 18 | 3 | 18 | 9 | 11 | 33 | 46 | 37 | 29 | 38 | 20 | 55 | 35 | 46 | 113 | 90 | 37 | 56 | 55 | 14 | 9 | 8 | 4 | 9 | 13 | 8 | 0 | 2 | 3 | 0 | 0 |
| 79 | 7 | 9 | 15 | 21 | 15 | 22 | 31 | 77 | 19 | 41 | 30 | 36 | 43 | 64 | 129 | 83 | 43 | 57 | 31 | 14 | 13 | 9 | 7 | 13 | 7 | 12 | 6 | 4 | 0 | 4 | 0 |
| 80 | 5 | 6 | 9 | 22 | 5 | 23 | 34 | 49 | 22 | 19 | 32 | 52 | 37 | 57 | 77 | 63 | 47 | 67 | 39 | 19 | 8 | 10 | 6 | 15 | 9 | 4 | 7 | 0 | 1 | 1 | 0 |
| 81 | 8 | 0 | 9 | 11 | 1 | 34 | 21 | 53 | 34 | 31 | 19 | 43 | 27 | 70 | 118 | 67 | 44 | 45 | 41 | 11 | 6 | 8 | 5 | 11 | 9 | 10 | 3 | 1 | 1 | 2 | 0 |
| 82 | 2 | 3 | 2 | 10 | 4 | 9 | 18 | 39 | 25 | 13 | 13 | 51 | 27 | 62 | 97 | 83 | 23 | 36 | 31 | 10 | 7 | 2 | 1 | 16 | 8 | 2 | 2 | 0 | 1 | 2 | 1 |
| 83 | 9 | 0 | 5 | 9 | 7 | 18 | 12 | 33 | 24 | 6 | 7 | 15 | 15 | 47 | 33 | 41 | 37 | 25 | 21 | 4 | 8 | 4 | 7 | 2 | 8 | 6 | 0 | 3 | 0 | 1 | 1 |
| 84 | 5 | 1 | 8 | 12 | 2 | 5 | 10 | 33 | 9 | 7 | 3 | 26 | 8 | 34 | 28 | 29 | 24 | 23 | 21 | 8 | 7 | 3 | 3 | 8 | 10 | 2 | 2 | 2 | 2 | 2 | 0 |
| 85 | 3 | 2 | 6 | 8 | 4 | 6 | 9 | 28 | 6 | 3 | 0 | 14 | 4 | 49 | 18 | 20 | 26 | 23 | 18 | 2 | 8 | 3 | 5 | 5 | 1 | 2 | 1 | 1 | 0 | 0 | 0 |
| 86 | 1 | 3 | 5 | 1 | 6 | 26 | 8 | 28 | 7 | 4 | 2 | 15 | 13 | 12 | 19 | 17 | 30 | 23 | 15 | 1 | 8 | 1 | 1 | 7 | 6 | 1 | 2 | 1 | 0 | 2 | 0 |
| 87 | 3 | 0 | 1 | 13 | 8 | 9 | 4 | 31 | 0 | 0 | 6 | 3 | 6 | 30 | 37 | 23 | 11 | 15 | 8 | 3 | 3 | 1 | 2 | 1 | 7 | 4 | 0 | 2 | 0 | 1 | 0 |
| 88 | 0 | 0 | 5 | 4 | 1 | 14 | 2 | 21 | 2 | 0 | 4 | 14 | 4 | 32 | 15 | 27 | 12 | 10 | 13 | 2 | 2 | 1 | 1 | 1 | 4 | 1 | 1 | 0 | 0 | 3 | 0 |
| 89 | 5 | 0 | 2 | 2 | 3 | 2 | 6 | 21 | 5 | 0 | 2 | 11 | 3 | 33 | 28 | 23 | 13 | 10 | 8 | 2 | 1 | 3 | 2 | 0 | 4 | 4 | 2 | 0 | 0 | 0 | 0 |
| 90 | 0 | 0 | 0 | 1 | 5 | 6 | 5 | 24 | 2 | 1 | 0 | 7 | 7 | 30 | 25 | 24 | 16 | 11 | 9 | 3 | 0 | 0 | 1 | 3 | 3 | 4 | 0 | 1 | 0 | 0 | 1 |
| 91 | 4 | 0 | 1 | 7 | 4 | 7 | 5 | 26 | 6 | 1 | 0 | 7 | 2 | 25 | 11 | 20 | 11 | 14 | 8 | 3 | 1 | 4 | 0 | 0 | 3 | 2 | 1 | 1 | 0 | 0 | 1 |
| 92 | 2 | 0 | 2 | 4 | 2 | 3 | 1 | 24 | 1 | 3 | 0 | 8 | 11 | 23 | 15 | 9 | 8 | 10 | 10 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| 93 | 0 | 0 | 3 | 6 | 1 | 10 | 0 | 5 | 0 | 1 | 0 | 8 | 2 | 6 | 27 | 4 | 13 | 9 | 4 | 0 | 1 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 94 | 0 | 2 | 1 | 3 | 0 | 1 | 0 | 9 | 1 | 0 | 0 | 9 | 2 | 7 | 16 | 17 | 11 | 9 | 4 | 3 | 2 | 0 | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 |
| 95 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 7 | 1 | 4 | 5 | 8 | 7 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 96 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 8 | 1 | 1 | 0 | 6 | 0 | 1 | 8 | 4 | 5 | 2 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97 | 3 | 3 | 1 | 2 | 1 | 9 | 2 | 2 | 4 | 0 | 0 | 3 | 0 | 6 | 3 | 4 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 98 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 99 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 100 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 103 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 104 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 107 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 317 | 295 | 436 | 854 | 375 | 1,031 | 1,362 | 2,429 | 1,371 | 1,906 | 1,064 | 2,690 | 2,389 | 3,875 | 6,112 | 4,554 | 3,624 | 2,198 | 1,633 | 843 | 541 | 439 | 266 | 690 | 451 | 231 | 149 | 99 | 154 | 64 | 77 |
| legal size | | | 81.0 | | | 81.8 | | 82.6 | | | | | | | | | | | | | | | 83.3 | | 84.1 | | | | 85.7 | | |

**Table 2.4 American lobster length frequencies-spring, male, 1 mm intervals, 1984–2014.**
Lobsters were measured from each tow.

| Female | | | | | | | | | | | | | | | Fall | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Length | (70) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (120) | (120) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (40) | (80) | (80) | (40) | (80) | (40) | (80) | (0) | (80) | (80) | (80) | (80) |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 29 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 |
| 30 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 2 | 5 | 3 | 0 | 5 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 31 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 7 | 11 | 8 | 1 | 5 | 4 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 32 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 15 | 4 | 13 | 1 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 33 | 0 | 0 | 0 | 2 | 1 | 1 | 3 | 12 | 9 | 2 | 2 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 |
| 34 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 6 | 16 | 3 | 17 | 2 | 6 | 8 | 1 | 8 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 |
| 35 | 0 | 0 | 6 | 1 | 0 | 2 | 3 | 0 | 23 | 5 | 16 | 3 | 8 | 6 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 |
| 36 | 4 | 0 | 1 | 1 | 1 | 3 | 1 | 1 | 31 | 7 | 26 | 0 | 8 | 14 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | - | 0 | 0 | 3 | 0 |
| 37 | 4 | 0 | 2 | 0 | 3 | 2 | 10 | 22 | 19 | 2 | 19 | 5 | 5 | 7 | 1 | 8 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 38 | 3 | 2 | 2 | 3 | 3 | 2 | 8 | 1 | 24 | 9 | 23 | 1 | 18 | 17 | 2 | 13 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 |
| 39 | 6 | 0 | 10 | 1 | 1 | 0 | 9 | 15 | 32 | 6 | 22 | 0 | 7 | 22 | 2 | 4 | 1 | 2 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 40 | 0 | 0 | 3 | 1 | 12 | 14 | 14 | 20 | 35 | 16 | 24 | 12 | 23 | 15 | 3 | 8 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 41 | 3 | 0 | 0 | 5 | 2 | 6 | 19 | 21 | 32 | 22 | 52 | 8 | 39 | 15 | 7 | 13 | 2 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 |
| 42 | 7 | 0 | 5 | 0 | 4 | 2 | 3 | 36 | 52 | 21 | 43 | 7 | 24 | 49 | 9 | 17 | 2 | 3 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 43 | 5 | 0 | 2 | 4 | 4 | 2 | 16 | 23 | 30 | 39 | 52 | 16 | 20 | 25 | 5 | 15 | 3 | 0 | 1 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 |
| 44 | 29 | 7 | 1 | 8 | 1 | 6 | 11 | 32 | 32 | 29 | 63 | 14 | 46 | 47 | 9 | 17 | 5 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 2 | - | 1 | 1 | 1 | 0 |
| 45 | 18 | 0 | 7 | 3 | 2 | 0 | 12 | 25 | 50 | 17 | 57 | 22 | 38 | 32 | 7 | 27 | 4 | 2 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | - | 0 | 1 | 0 | 0 |
| 46 | 10 | 0 | 1 | 11 | 6 | 6 | 26 | 34 | 42 | 43 | 63 | 20 | 33 | 50 | 12 | 18 | 9 | 3 | 2 | 1 | 5 | 2 | 2 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 |
| 47 | 21 | 7 | 3 | 12 | 2 | 12 | 18 | 52 | 47 | 44 | 41 | 27 | 32 | 42 | 5 | 16 | 2 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | - | 1 | 0 | 0 | 0 |
| 48 | 10 | 5 | 4 | 14 | 8 | 18 | 19 | 35 | 58 | 52 | 69 | 28 | 33 | 58 | 14 | 15 | 7 | 2 | 6 | 0 | 2 | 2 | 1 | 0 | 1 | 0 | - | 0 | 0 | 0 | 0 |
| 49 | 29 | 6 | 7 | 14 | 15 | 11 | 15 | 27 | 77 | 58 | 47 | 47 | 19 | 71 | 11 | 27 | 10 | 2 | 4 | 2 | 4 | 1 | 1 | 0 | 0 | 1 | - | 0 | 0 | 1 | 0 |
| 50 | 27 | 9 | 6 | 21 | 12 | 4 | 31 | 41 | 52 | 38 | 69 | 54 | 28 | 61 | 13 | 31 | 10 | 6 | 2 | 2 | 2 | 4 | 3 | 2 | 3 | 0 | - | 0 | 0 | 0 | 0 |
| 51 | 35 | 8 | 2 | 12 | 3 | 11 | 10 | 44 | 73 | 72 | 94 | 45 | 41 | 49 | 15 | 30 | 13 | 6 | 3 | 1 | 2 | 2 | 0 | 0 | 1 | 0 | - | 0 | 1 | 0 | 0 |
| 52 | 26 | 11 | 3 | 15 | 3 | 11 | 21 | 40 | 66 | 54 | 59 | 51 | 42 | 120 | 18 | 34 | 13 | 3 | 6 | 3 | 5 | 2 | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 |
| 53 | 33 | 8 | 3 | 22 | 10 | 7 | 22 | 55 | 82 | 94 | 55 | 43 | 43 | 106 | 29 | 18 | 16 | 9 | 3 | 1 | 6 | 10 | 2 | 3 | 1 | 3 | - | 0 | 0 | 1 | 0 |
| 54 | 16 | 8 | 18 | 11 | 12 | 14 | 20 | 41 | 61 | 83 | 76 | 38 | 58 | 82 | 17 | 45 | 28 | 8 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | - | 1 | 1 | 0 | 0 |
| 55 | 23 | 10 | 27 | 21 | 2 | 6 | 22 | 59 | 58 | 59 | 54 | 39 | 45 | 102 | 48 | 32 | 18 | 9 | 1 | 3 | 7 | 8 | 1 | 1 | 3 | 1 | - | 3 | 2 | 0 | 0 |
| 56 | 45 | 10 | 11 | 36 | 10 | 24 | 22 | 29 | 82 | 87 | 74 | 45 | 41 | 90 | 23 | 32 | 33 | 12 | 1 | 3 | 6 | 0 | 3 | 2 | 1 | 6 | - | 3 | 2 | 0 | 0 |
| 57 | 16 | 15 | 16 | 18 | 7 | 7 | 15 | 52 | 71 | 71 | 78 | 50 | 44 | 121 | 24 | 39 | 22 | 13 | 5 | 2 | 13 | 5 | 2 | 1 | 10 | 6 | - | 2 | 0 | 0 | 0 |
| 58 | 23 | 16 | 11 | 19 | 13 | 17 | 36 | 55 | 63 | 119 | 79 | 69 | 47 | 114 | 29 | 31 | 23 | 14 | 6 | 5 | 5 | 8 | 1 | 2 | 2 | 5 | - | 1 | 0 | 1 | 0 |
| 59 | 21 | 11 | 13 | 26 | 13 | 23 | 30 | 79 | 66 | 110 | 84 | 48 | 46 | 110 | 35 | 36 | 28 | 18 | 5 | 6 | 10 | 4 | 4 | 0 | 2 | 5 | - | 0 | 2 | 1 | 0 |
| 60 | 30 | 18 | 20 | 18 | 7 | 17 | 16 | 74 | 53 | 115 | 70 | 53 | 51 | 140 | 29 | 35 | 34 | 8 | 6 | 9 | 7 | 6 | 1 | 4 | 5 | 2 | - | 1 | 2 | 0 | 0 |
| 61 | 10 | 4 | 17 | 24 | 12 | 14 | 37 | 46 | 52 | 91 | 79 | 51 | 56 | 119 | 34 | 37 | 27 | 9 | 5 | 2 | 12 | 7 | 2 | 1 | 2 | 6 | - | 1 | 1 | 0 | 0 |
| 62 | 27 | 16 | 23 | 21 | 14 | 32 | 41 | 64 | 53 | 107 | 117 | 44 | 53 | 133 | 39 | 44 | 32 | 19 | 3 | 5 | 10 | 3 | 5 | 1 | 2 | 8 | - | 1 | 1 | 1 | 0 |
| 63 | 31 | 14 | 13 | 22 | 8 | 20 | 22 | 53 | 66 | 130 | 93 | 58 | 41 | 126 | 51 | 45 | 29 | 19 | 6 | 6 | 16 | 12 | 4 | 4 | 4 | 5 | - | 0 | 1 | 0 | 0 |
| 64 | 25 | 10 | 15 | 29 | 23 | 31 | 26 | 71 | 38 | 100 | 86 | 79 | 38 | 139 | 34 | 44 | 29 | 21 | 9 | 12 | 19 | 5 | 4 | 4 | 4 | 7 | - | 0 | 0 | 0 | 0 |
| 65 | 17 | 9 | 39 | 24 | 15 | 28 | 26 | 77 | 44 | 93 | 89 | 49 | 43 | 146 | 49 | 42 | 37 | 18 | 9 | 6 | 15 | 9 | 1 | 2 | 3 | 9 | - | 0 | 0 | 0 | 0 |
| 66 | 24 | 26 | 25 | 23 | 15 | 16 | 42 | 70 | 56 | 90 | 87 | 82 | 53 | 126 | 51 | 43 | 26 | 19 | 5 | 5 | 10 | 7 | 1 | 4 | 1 | 6 | - | 0 | 0 | 1 | 0 |
| 67 | 17 | 24 | 33 | 11 | 19 | 16 | 29 | 38 | 43 | 78 | 106 | 51 | 38 | 117 | 26 | 53 | 31 | 17 | 8 | 11 | 14 | 6 | 2 | 3 | 3 | 8 | - | 0 | 1 | 0 | 0 |
| 68 | 15 | 8 | 27 | 18 | 22 | 30 | 36 | 41 | 42 | 94 | 77 | 48 | 55 | 124 | 54 | 44 | 37 | 19 | 7 | 6 | 4 | 8 | 1 | 6 | 4 | 4 | - | 0 | 0 | 0 | 2 |
| 69 | 13 | 18 | 15 | 27 | 26 | 32 | 21 | 34 | 61 | 104 | 85 | 38 | 50 | 136 | 54 | 47 | 30 | 22 | 4 | 8 | 16 | 12 | 5 | 1 | 4 | 3 | - | 1 | 0 | 0 | 0 |
| 70 | 63 | 18 | 42 | 27 | 34 | 23 | 20 | 36 | 51 | 122 | 63 | 60 | 55 | 128 | 47 | 35 | 34 | 23 | 17 | 4 | 13 | 5 | 0 | 4 | 3 | 3 | - | 0 | 0 | 0 | 0 |
| 71 | 26 | 21 | 28 | 34 | 33 | 40 | 30 | 50 | 50 | 94 | 87 | 62 | 87 | 127 | 50 | 40 | 20 | 20 | 3 | 6 | 14 | 2 | 0 | 2 | 3 | 6 | - | 2 | 0 | 0 | 0 |
| 72 | 27 | 16 | 27 | 32 | 13 | 12 | 39 | 58 | 31 | 81 | 85 | 38 | 49 | 150 | 41 | 53 | 32 | 25 | 11 | 12 | 10 | 3 | 2 | 3 | 6 | 4 | - | 0 | 0 | 0 | 0 |
| 73 | 21 | 29 | 42 | 24 | 18 | 15 | 58 | 46 | 33 | 74 | 69 | 60 | 40 | 106 | 41 | 47 | 36 | 24 | 9 | 6 | 10 | 5 | 2 | 6 | 4 | 5 | - | 1 | 0 | 1 | 0 |
| 74 | 31 | 17 | 23 | 29 | 14 | 21 | 36 | 30 | 39 | 85 | 73 | 44 | 38 | 111 | 37 | 49 | 39 | 19 | 12 | 7 | 16 | 9 | 3 | 2 | 3 | 1 | - | 1 | 0 | 1 | 0 |
| 75 | 39 | 14 | 25 | 24 | 14 | 12 | 21 | 31 | 25 | 66 | 84 | 31 | 58 | 122 | 67 | 50 | 29 | 28 | 7 | 7 | 16 | 5 | 3 | 7 | 3 | 1 | - | 1 | 0 | 1 | 0 |
| 76 | 31 | 14 | 22 | 36 | 14 | 13 | 35 | 27 | 35 | 112 | 50 | 38 | 57 | 113 | 47 | 43 | 26 | 21 | 10 | 8 | 15 | 5 | 3 | 4 | 2 | 3 | - | 0 | 0 | 0 | 0 |
| 77 | 17 | 16 | 10 | 26 | 13 | 14 | 17 | 37 | 40 | 74 | 72 | 36 | 23 | 64 | 41 | 31 | 22 | 18 | 2 | 1 | 18 | 5 | 3 | 4 | 0 | 1 | - | 0 | 0 | 0 | 1 |
| 78 | 27 | 17 | 24 | 27 | 27 | 21 | 22 | 24 | 19 | 57 | 53 | 19 | 34 | 96 | 43 | 38 | 20 | 33 | 6 | 15 | 5 | 8 | 2 | 2 | 0 | 2 | - | 0 | 0 | 0 | 0 |
| 79 | 26 | 19 | 16 | 37 | 31 | 13 | 29 | 33 | 26 | 72 | 42 | 28 | 28 | 91 | 34 | 28 | 32 | 21 | 2 | 9 | 12 | 6 | 3 | 5 | 3 | 5 | - | 0 | 0 | 0 | 1 |
| 80 | 33 | 11 | 15 | 20 | 23 | 12 | 6 | 14 | 23 | 65 | 26 | 25 | 44 | 91 | 25 | 32 | 26 | 19 | 14 | 2 | 16 | 4 | 2 | 5 | 1 | 4 | - | 0 | 1 | 0 | 0 |
| 81 | 13 | 7 | 13 | 14 | 5 | 10 | 12 | 18 | 24 | 36 | 38 | 36 | 41 | 61 | 25 | 28 | 20 | 20 | 2 | 4 | 3 | 4 | 0 | 0 | 2 | 5 | - | 3 | 0 | 0 | 0 |
| 82 | 9 | 2 | 19 | 6 | 6 | 2 | 10 | 14 | 10 | 39 | 26 | 25 | 21 | 52 | 23 | 23 | 14 | 7 | 2 | 5 | 3 | 8 | 3 | 2 | 0 | 5 | - | 0 | 0 | 1 | 0 |
| 83 | 10 | 5 | 8 | 12 | 6 | 12 | 8 | 3 | 11 | 17 | 11 | 12 | 31 | 20 | 10 | 6 | 13 | 7 | 4 | 1 | 2 | 9 | 1 | 5 | 0 | 4 | - | 0 | 0 | 0 | 0 |
| 84 | 5 | 6 | 2 | 7 | 1 | 1 | 4 | 10 | 8 | 17 | 22 | 10 | 7 | 17 | 5 | 4 | 7 | 6 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 3 | - | 0 | 0 | 1 | 0 |
| 85 | 9 | 1 | 8 | 6 | 9 | 3 | 6 | 17 | 7 | 8 | 20 | 5 | 5 | 13 | 5 | 2 | 5 | 3 | 1 | 0 | 2 | 1 | 0 | 1 | 2 | 1 | - | 0 | 0 | 0 | 0 |
| 86 | 11 | 2 | 9 | 10 | 0 | 1 | 10 | 12 | 4 | 10 | 14 | 1 | 6 | 12 | 5 | 2 | 6 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 87 | 11 | 6 | 9 | 8 | 23 | 4 | 18 | 12 | 5 | 16 | 20 | 1 | 8 | 11 | 3 | 5 | 5 | 3 | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | - | 1 | 0 | 0 | 0 |
| 88 | 9 | 3 | 9 | 9 | 3 | 1 | 3 | 9 | 9 | 13 | 8 | 1 | 20 | 10 | 7 | 5 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 |
| 89 | 3 | 4 | 6 | 2 | 7 | 3 | 5 | 1 | 8 | 8 | 12 | 5 | 13 | 14 | 1 | 3 | 3 | 3 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | - | 0 | 0 | 0 | 0 |
| 90 | 8 | 1 | 3 | 6 | 0 | 1 | 6 | 1 | 5 | 1 | 15 | 9 | 5 | 10 | 1 | 2 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 91 | 3 | 1 | 2 | 5 | 0 | 1 | 1 | 0 | 3 | 0 | 5 | 0 | 9 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 92 | 8 | 0 | 0 | 2 | 1 | 1 | 4 | 1 | 7 | 1 | 6 | 1 | 3 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | - | 0 | 0 | 0 | 0 |
| 93 | 2 | 2 | 0 | 3 | 2 | 0 | 0 | 1 | 2 | 1 | 8 | 0 | 1 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 94 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 95 | 1 | 0 | 0 | 1 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 96 | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 97 | 15 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 98 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 100 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 101 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 102 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 103 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 104 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 105 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 107 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 111 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 113 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 117 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| Total | 1,089 | 523 | 759 | 907 | 622 | 688 | 1,133 | 1,917 | 2,301 | 3,264 | 3,198 | 1,795 | 1,979 | 4,196 | 1,329 | 1,511 | 957 | 596 | 223 | 195 | 365 | 225 | 84 | 94 | 96 | 150 | - | 31 | 20 | 18 | 4 |
| legal size: | | | 81.0 | | | 81.8 | | | | | | | | 82.6 | | | | | | | | 83.3 | | 84.1 | | | - | | 85.7 | | |

**Table 2.5 American lobster length frequencies-fall, female, 1 mm intervals, 1984–2014.**
Lobsters were measured from each tow.

| Male | | | | | | | | | | | | | | | Fall | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Length | (70) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (120) | (120) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (80) | (40) | (80) | (80) | (40) | (80) | (40) | (80) | (0) | (80) | (80) | (80) | (80) |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 28 | 1 | 2 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 4 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 |
| 29 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 6 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 4 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 31 | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 4 | 2 | 3 | 0 | 6 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 32 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 5 | 13 | 2 | 3 | 0 | 4 | 5 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 33 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 3 | 4 | 0 | 9 | 1 | 11 | 3 | 1 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 34 | 1 | 0 | 0 | 2 | 1 | 0 | 2 | 1 | 13 | 4 | 11 | 0 | 4 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | - | 0 | 0 | 0 | 0 |
| 35 | 3 | 0 | 0 | 1 | 0 | 0 | 3 | 7 | 13 | 15 | 12 | 1 | 8 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 36 | 3 | 0 | 0 | 1 | 0 | 1 | 5 | 8 | 25 | 8 | 21 | 1 | 7 | 14 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 37 | 3 | 0 | 6 | 0 | 1 | 1 | 7 | 4 | 38 | 4 | 21 | 1 | 11 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 38 | 2 | 2 | 2 | 3 | 2 | 0 | 0 | 6 | 40 | 6 | 34 | 1 | 17 | 14 | 3 | 5 | 0 | 0 | 0 | 0 | 1 | 4 | 3 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 39 | 0 | 0 | 2 | 1 | 2 | 1 | 5 | 8 | 34 | 5 | 25 | 4 | 16 | 28 | 7 | 17 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | - | 0 | 0 | 0 | 0 |
| 40 | 3 | 0 | 6 | 2 | 1 | 5 | 10 | 8 | 35 | 21 | 35 | 6 | 15 | 14 | 5 | 7 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | - | 0 | 1 | 0 | 0 |
| 41 | 6 | 1 | 1 | 3 | 4 | 1 | 12 | 13 | 43 | 14 | 54 | 5 | 11 | 24 | 1 | 6 | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 0 | - | 0 | 0 | 0 | 0 |
| 42 | 4 | 6 | 2 | 0 | 11 | 3 | 12 | 13 | 43 | 34 | 55 | 5 | 29 | 25 | 9 | 8 | 5 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | - | 1 | 1 | 0 | 0 |
| 43 | 1 | 0 | 3 | 3 | 2 | 1 | 7 | 7 | 49 | 17 | 56 | 12 | 23 | 41 | 5 | 21 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | - | 0 | 0 | 0 | 0 |
| 44 | 4 | 1 | 1 | 5 | 11 | 1 | 6 | 13 | 35 | 13 | 63 | 26 | 16 | 40 | 5 | 19 | 3 | 2 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 2 | - | 2 | 0 | 0 | 0 |
| 45 | 7 | 3 | 3 | 3 | 8 | 10 | 11 | 42 | 44 | 34 | 43 | 20 | 44 | 53 | 9 | 18 | 5 | 3 | 2 | 1 | 2 | 2 | 2 | 0 | 0 | 1 | - | 1 | 0 | 0 | 0 |
| 46 | 2 | 2 | 1 | 7 | 4 | 14 | 10 | 31 | 44 | 19 | 58 | 33 | 18 | 35 | 7 | 16 | 5 | 2 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | - | 2 | 0 | 0 | 0 |
| 47 | 13 | 4 | 3 | 10 | 10 | 5 | 16 | 14 | 66 | 60 | 26 | 26 | 33 | 41 | 13 | 20 | 7 | 2 | 2 | 1 | 2 | 3 | 0 | 1 | 1 | 0 | - | 0 | 0 | 0 | 0 |
| 48 | 15 | 3 | 5 | 7 | 14 | 4 | 16 | 10 | 67 | 49 | 72 | 19 | 49 | 72 | 8 | 20 | 9 | 9 | 1 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 |
| 49 | 4 | 2 | 10 | 8 | 2 | 12 | 18 | 45 | 48 | 100 | 56 | 33 | 30 | 48 | 10 | 37 | 9 | 1 | 0 | 1 | 6 | 3 | 2 | 0 | 1 | 2 | - | 0 | 0 | 0 | 0 |
| 50 | 13 | 5 | 8 | 21 | 9 | 11 | 16 | 37 | 63 | 56 | 55 | 53 | 28 | 56 | 15 | 44 | 9 | 3 | 2 | 0 | 5 | 4 | 3 | 1 | 0 | 0 | - | 1 | 2 | 0 | 0 |
| 51 | 51 | 6 | 5 | 17 | 10 | 11 | 24 | 46 | 74 | 30 | 88 | 27 | 22 | 88 | 21 | 37 | 18 | 6 | 3 | 3 | 3 | 0 | 1 | 0 | 0 | 1 | - | 0 | 1 | 0 | 0 |
| 52 | 15 | 5 | 11 | 17 | 3 | 16 | 31 | 43 | 65 | 78 | 82 | 56 | 30 | 80 | 36 | 42 | 9 | 4 | 2 | 0 | 3 | 4 | 1 | 1 | 1 | 3 | - | 0 | 0 | 0 | 1 |
| 53 | 13 | 9 | 3 | 30 | 5 | 15 | 22 | 57 | 55 | 83 | 83 | 61 | 37 | 103 | 29 | 29 | 15 | 8 | 3 | 1 | 7 | 1 | 0 | 1 | 0 | 1 | - | 1 | 0 | 0 | 0 |
| 54 | 24 | 12 | 19 | 26 | 21 | 17 | 25 | 76 | 47 | 59 | 97 | 59 | 30 | 116 | 23 | 43 | 21 | 7 | 2 | 3 | 8 | 5 | 2 | 1 | 3 | 3 | - | 1 | 1 | 0 | 0 |
| 55 | 23 | 4 | 17 | 23 | 13 | 26 | 25 | 47 | 83 | 84 | 70 | 80 | 32 | 96 | 26 | 46 | 38 | 9 | 2 | 2 | 12 | 3 | 3 | 1 | 0 | 7 | - | 1 | 1 | 0 | 0 |
| 56 | 18 | 12 | 25 | 18 | 13 | 13 | 13 | 37 | 65 | 104 | 90 | 52 | 43 | 89 | 39 | 39 | 21 | 10 | 3 | 4 | 10 | 3 | 3 | 0 | 2 | 6 | - | 0 | 0 | 0 | 0 |
| 57 | 9 | 0 | 10 | 30 | 26 | 18 | 36 | 43 | 64 | 101 | 79 | 92 | 27 | 111 | 44 | 42 | 27 | 10 | 5 | 4 | 8 | 8 | 1 | 7 | 2 | 4 | - | 0 | 0 | 0 | 0 |
| 58 | 29 | 15 | 24 | 23 | 13 | 30 | 34 | 51 | 68 | 68 | 107 | 58 | 48 | 80 | 42 | 57 | 21 | 10 | 8 | 5 | 6 | 7 | 3 | 1 | 1 | 5 | - | 1 | 0 | 0 | 0 |
| 59 | 47 | 8 | 26 | 31 | 16 | 14 | 23 | 43 | 86 | 109 | 78 | 76 | 40 | 143 | 33 | 54 | 29 | 24 | 10 | 8 | 10 | 13 | 6 | 5 | 1 | 6 | - | 0 | 2 | 0 | 0 |
| 60 | 16 | 6 | 11 | 26 | 7 | 26 | 39 | 56 | 77 | 103 | 109 | 69 | 30 | 134 | 56 | 61 | 37 | 9 | 9 | 7 | 13 | 7 | 2 | 2 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 61 | 23 | 5 | 10 | 25 | 30 | 12 | 24 | 57 | 68 | 138 | 120 | 78 | 59 | 128 | 53 | 64 | 44 | 15 | 8 | 5 | 17 | 8 | 5 | 4 | 1 | 3 | - | 0 | 0 | 0 | 0 |
| 62 | 50 | 17 | 26 | 23 | 10 | 13 | 36 | 37 | 57 | 125 | 92 | 80 | 42 | 145 | 57 | 49 | 28 | 19 | 10 | 7 | 10 | 6 | 3 | 1 | 4 | 7 | - | 0 | 2 | 0 | 0 |
| 63 | 14 | 18 | 37 | 20 | 15 | 19 | 28 | 63 | 68 | 144 | 107 | 74 | 41 | 149 | 60 | 63 | 39 | 29 | 15 | 7 | 4 | 9 | 5 | 4 | 1 | 10 | - | 2 | 0 | 0 | 0 |
| 64 | 28 | 17 | 22 | 24 | 35 | 19 | 25 | 86 | 74 | 87 | 106 | 73 | 77 | 138 | 57 | 68 | 42 | 35 | 9 | 8 | 19 | 12 | 2 | 2 | 2 | 8 | - | 0 | 3 | 0 | 0 |
| 65 | 36 | 10 | 39 | 31 | 20 | 16 | 39 | 87 | 49 | 107 | 83 | 75 | 73 | 161 | 75 | 48 | 37 | 34 | 17 | 10 | 14 | 14 | 3 | 4 | 6 | 11 | - | 1 | 1 | 0 | 0 |
| 66 | 22 | 13 | 21 | 41 | 31 | 27 | 22 | 60 | 59 | 81 | 87 | 93 | 40 | 130 | 63 | 61 | 41 | 24 | 12 | 7 | 21 | 6 | 4 | 2 | 6 | 11 | - | 3 | 1 | 1 | 1 |
| 67 | 14 | 16 | 39 | 28 | 21 | 24 | 30 | 78 | 82 | 108 | 119 | 63 | 46 | 136 | 51 | 38 | 43 | 38 | 13 | 7 | 17 | 12 | 2 | 7 | 7 | 14 | - | 1 | 3 | 0 | 1 |
| 68 | 16 | 18 | 30 | 31 | 17 | 19 | 42 | 71 | 69 | 107 | 79 | 55 | 34 | 113 | 67 | 61 | 57 | 33 | 21 | 7 | 15 | 12 | 5 | 5 | 4 | 16 | - | 0 | 4 | 1 | 0 |
| 69 | 46 | 13 | 22 | 32 | 31 | 30 | 24 | 51 | 81 | 131 | 101 | 75 | 28 | 121 | 52 | 54 | 41 | 21 | 20 | 11 | 23 | 10 | 2 | 5 | 5 | 8 | - | 0 | 2 | 0 | 0 |
| 70 | 32 | 11 | 28 | 31 | 14 | 24 | 26 | 63 | 56 | 117 | 112 | 79 | 36 | 122 | 60 | 78 | 42 | 22 | 12 | 8 | 30 | 7 | 1 | 4 | 3 | 6 | - | 3 | 0 | 0 | 1 |
| 71 | 8 | 14 | 25 | 23 | 21 | 25 | 24 | 58 | 63 | 115 | 83 | 52 | 63 | 126 | 69 | 75 | 48 | 47 | 21 | 13 | 20 | 6 | 6 | 0 | 4 | 12 | - | 1 | 0 | 0 | 0 |
| 72 | 23 | 20 | 31 | 36 | 29 | 19 | 33 | 89 | 61 | 86 | 76 | 65 | 66 | 86 | 77 | 64 | 47 | 52 | 13 | 9 | 19 | 10 | 6 | 9 | 2 | 8 | - | 0 | 1 | 2 | 0 |
| 73 | 40 | 18 | 42 | 29 | 13 | 42 | 40 | 53 | 44 | 85 | 83 | 51 | 44 | 98 | 54 | 70 | 47 | 32 | 6 | 5 | 20 | 9 | 0 | 3 | 4 | 9 | - | 1 | 0 | 0 | 0 |
| 74 | 36 | 18 | 22 | 25 | 22 | 19 | 39 | 28 | 69 | 130 | 108 | 56 | 42 | 99 | 64 | 65 | 37 | 39 | 21 | 14 | 10 | 4 | 1 | 8 | 6 | 12 | - | 1 | 0 | 0 | 0 |
| 75 | 9 | 8 | 23 | 18 | 16 | 28 | 33 | 38 | 53 | 101 | 97 | 58 | 35 | 99 | 62 | 63 | 39 | 33 | 14 | 6 | 23 | 12 | 0 | 3 | 1 | 11 | - | 1 | 1 | 0 | 0 |
| 76 | 21 | 15 | 24 | 25 | 12 | 36 | 20 | 37 | 33 | 75 | 66 | 37 | 32 | 88 | 55 | 66 | 33 | 28 | 14 | 5 | 16 | 4 | 5 | 7 | 0 | 6 | - | 1 | 1 | 0 | 1 |
| 77 | 13 | 6 | 23 | 19 | 33 | 18 | 32 | 28 | 53 | 79 | 52 | 55 | 37 | 94 | 55 | 60 | 31 | 33 | 17 | 3 | 7 | 9 | 5 | 6 | 2 | 7 | - | 0 | 0 | 0 | 0 |
| 78 | 28 | 12 | 9 | 32 | 13 | 29 | 24 | 36 | 46 | 70 | 55 | 59 | 33 | 76 | 46 | 54 | 28 | 38 | 11 | 5 | 8 | 3 | 1 | 5 | 4 | 2 | - | 2 | 1 | 0 | 1 |
| 79 | 5 | 13 | 11 | 33 | 8 | 19 | 19 | 56 | 48 | 61 | 66 | 43 | 47 | 81 | 52 | 59 | 35 | 35 | 17 | 6 | 9 | 4 | 2 | 5 | 4 | 6 | - | 2 | 2 | 0 | 0 |
| 80 | 15 | 18 | 13 | 20 | 22 | 15 | 38 | 40 | 49 | 102 | 53 | 39 | 29 | 78 | 44 | 51 | 34 | 26 | 7 | 5 | 5 | 7 | 3 | 4 | 0 | 3 | - | 0 | 0 | 0 | 0 |
| 81 | 23 | 11 | 18 | 10 | 8 | 17 | 16 | 45 | 39 | 47 | 66 | 46 | 32 | 83 | 37 | 52 | 25 | 18 | 14 | 2 | 12 | 5 | 0 | 4 | 0 | 2 | - | 0 | 0 | 1 | 0 |
| 82 | 7 | 7 | 20 | 10 | 6 | 6 | 21 | 19 | 21 | 46 | 26 | 41 | 15 | 57 | 34 | 29 | 23 | 21 | 10 | 3 | 8 | 5 | 3 | 5 | 4 | 5 | - | 0 | 0 | 0 | 0 |
| 83 | 6 | 6 | 12 | 5 | 6 | 11 | 14 | 23 | 29 | 26 | 25 | 23 | 10 | 23 | 20 | 20 | 12 | 4 | 3 | 1 | 3 | 2 | 1 | 0 | 4 | 2 | - | 0 | 0 | 0 | 0 |
| 84 | 4 | 2 | 13 | 5 | 8 | 10 | 6 | 10 | 23 | 12 | 15 | 31 | 8 | 19 | 6 | 15 | 7 | 6 | 1 | 2 | 3 | 2 | 0 | 4 | 1 | 1 | - | 0 | 0 | 0 | 0 |
| 85 | 7 | 2 | 15 | 8 | 10 | 3 | 14 | 15 | 39 | 11 | 13 | 17 | 5 | 12 | 4 | 10 | 8 | 3 | 1 | 1 | 3 | 2 | 0 | 0 | 0 | 3 | - | 0 | 0 | 0 | 0 |
| 86 | 7 | 5 | 11 | 5 | 5 | 3 | 8 | 2 | 10 | 10 | 30 | 26 | 14 | 20 | 7 | 10 | 3 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | - | 0 | 1 | 0 | 0 |
| 87 | 5 | 0 | 15 | 5 | 7 | 6 | 17 | 2 | 16 | 8 | 13 | 15 | 4 | 16 | 6 | 17 | 3 | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | - | 0 | 0 | 0 | 1 |
| 88 | 3 | 1 | 12 | 7 | 2 | 0 | 26 | 2 | 16 | 9 | 25 | 13 | 8 | 14 | 6 | 7 | 7 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |  | - | 0 | 0 | 0 | 0 |
| 89 | 7 | 5 | 9 | 5 | 9 | 7 | 7 | 4 | 19 | 9 | 20 | 17 | 10 | 15 | 8 | 12 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | - | 0 | 0 | 0 | 0 |
| 90 | 18 | 3 | 13 | 3 | 5 | 7 | 8 | 8 | 10 | 3 | 22 | 10 | 5 | 14 | 3 | 4 | 6 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 |
| 91 | 4 | 2 | 14 | 5 | 2 | 11 | 5 | 7 | 12 | 17 | 15 | 6 | 3 | 15 | 4 | 7 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | - | 0 | 0 | 0 | 0 |
| 92 | 7 | 0 | 8 | 4 | 14 | 1 | 3 | 2 | 10 | 3 | 19 | 6 | 3 | 10 | 4 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | - | 0 | 0 | 0 | 0 |
| 93 | 1 | 0 | 0 | 1 | 6 | 0 | 6 | 5 | 7 | 3 | 12 | 12 | 0 | 8 | 3 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | - | 0 | 0 | 0 | 0 |
| 94 | 1 | 1 | 2 | 1 | 0 | 1 | 4 | 2 | 3 | 2 | 12 | 2 | 1 | 6 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 95 | 0 | 1 | 5 | 1 | 0 | 0 | 0 | 1 | 3 | 2 | 9 | 1 | 0 | 4 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 96 | 0 | 0 | 3 | 1 | 0 | 14 | 0 | 0 | 1 | 4 | 1 | 2 | 0 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 97 | 13 | 0 | 4 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | - | 0 | 0 | 0 | 0 |
| 98 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 99 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 100 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 101 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 102 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 103 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| 106 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | - | 0 | 0 | 0 | 0 |
| 107 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| Total | 930 | 436 | 888 | 945 | 712 | 814 | 1,198 | 2,043 | 2,853 | 3,563 | 3,673 | 2,406 | 1,750 | 4,165 | 1,783 | 2,107 | 1,202 | 814 | 375 | 200 | 454 | 266 | 101 | 126 | 100 | 235 | - | 31 | 34 | 6 | 8 |
| legal size: | | | 81.0 | | | 81.8 | | | | | | | | 82.6 | | | | | | | | 83.3 | | 84.1 | | | | | 85.7 | | |

**Table 2.6 American lobster length frequencies-fall, male, 1 mm intervals, 1984–2014.**
Lobsters were measured from each tow.

| Year | Annual Production | Rank (Density) | Mean Annual Densities |
|---|---|---|---|
| 1983 | 75.41 | 10 | 14.48 |
| 1984 | 33.86 | 21 | 6.89 |
| 1985 | 1064.00 | 2 | 66.75 |
| 1986 | 46.46 | 26 | 4.58 |
| 1987 | 120.51 | 7 | 18.98 |
| 1988 | 419.85 | 3 | 49.27 |
| 1989 | 59.43 | 24 | 5.88 |
| 1990 | 184.19 | 6 | 19.66 |
| 1991 | 93.67 | 15 | 9.97 |
| 1992 | 149.76 | 12 | 14.12 |
| 1993 | 250.19 | 5 | 26.23 |
| 1994 | 592.06 | 1 | 96.52 |
| 1995 | 183.34 | 8 | 18.20 |
| 1996 | 94.38 | 14 | 12.07 |
| 1997 | 107.77 | 13 | 13.69 |
| 1998 | 45.57 | 25 | 4.85 |
| 1999 | 403.53 | 4 | 39.70 |
| 2000 | 131.01 | 11 | 14.28 |
| 2001 | 68.86 | 17 | 9.46 |
| 2002 | 15.03 | 29 | 1.99 |
| 2003 | 18.70 | 27 | 2.60 |
| 2004 | 64.60 | 22 | 6.10 |
| 2005 | 78.52 | 20 | 6.90 |
| 2006 | 9.06 | 30 | 1.70 |
| 2007 | 161.52 | 9 | 18.10 |
| 2008 | 64.62 | 18 | 8.10 |
| 2009 | 67.38 | 19 | 7.62 |
| 2010 | 61.03 | 16 | 9.91 |
| 2011 | 17.90 | 23 | 5.90 |
| 2012 | 15.22 | 28 | 2.77 |
| 1983-2011 Mean | 161.46 | | 17.24 |

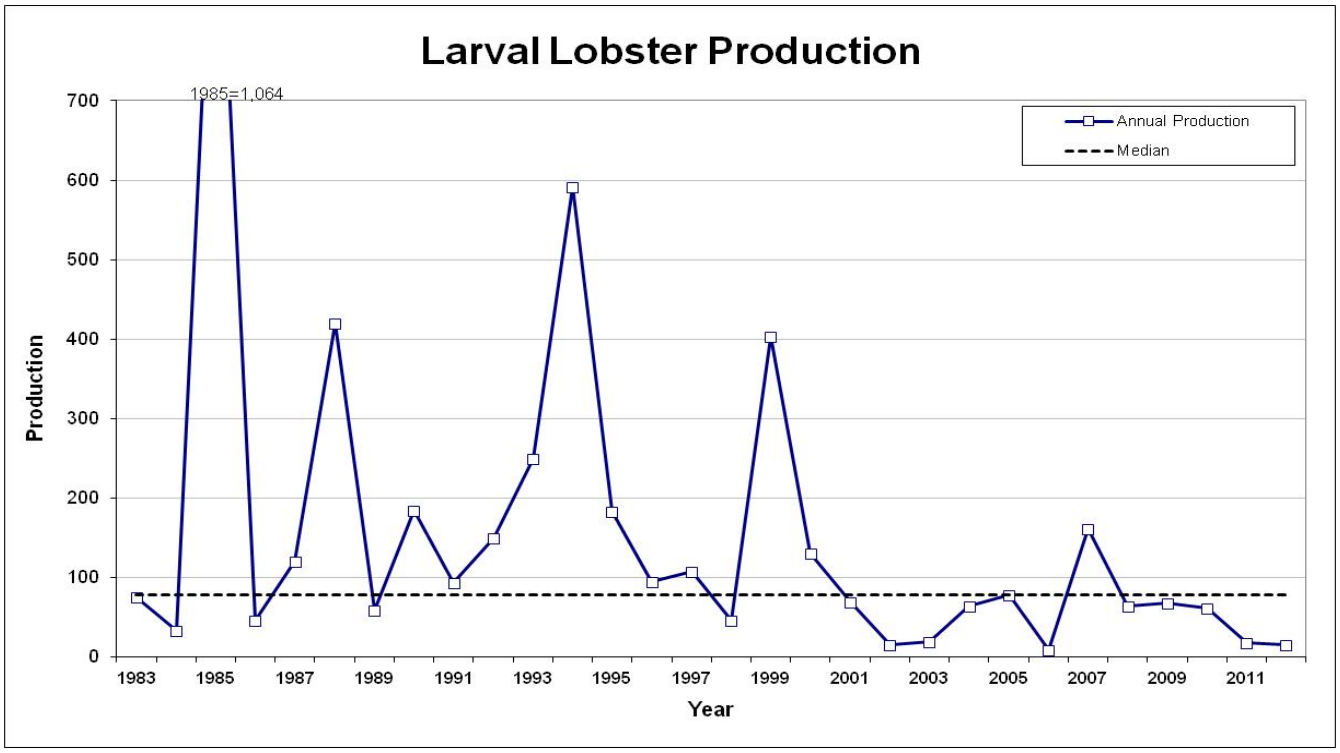



**Figure 2.7 Annual lobster larval production (Stage IV) in western Long Island Sound, 1983-2012.**
*Annual production is the sum of the year's weekly densities.*

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