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Northeast Area Monitoring and Assessment Program (NEAMAP) Mid-Atlantic Nearshore Trawl Survey: Data collection and analysis in support of single and multispecies stock assessments and management Progress Report: Fall 2008 Survey Data Summary

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Progress Report:

Fall 2008 Survey Data Summary

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NEAMAP ASMFC Progress Report

I. **Project Title:** Data collection and analysis in support of multispecies stock assessments in the mid-Atlantic: Northeast Area Monitoring and Assessment Program Nearshore Trawl Program.

II. **Grantee State and Contact Name:** Virginia/Virginia Institute of Marine Science – Christopher F. Bonzek

III. **Project Period:** 1 August 2005 – 31 May 2009
Reporting Period: 1 August 2008 – 31 January 2009

IV. **Project Description:** This is a new fisheries-independent bottom trawl survey operating in the near coastal ocean waters of the Southern New England and Mid-Atlantic regions. The survey is an element of the ASMFC Northeast Area Monitoring and Assessment Program (NEAMAP) and is designed to sample fishes and invertebrates from coastal waters bounded by the 20ft.and 60ft. depth contours between Montauk, New York and Cape Hatteras, North Carolina and waters between the 60ft.and 120ft. depth contours in Rhode Island Sound and Block Island Sound using a bottom trawl. The main objective of the survey is the estimation of abundance, biomass, length and age structures, various other assessment related parameters and diet compositions of select finfishes inhabiting the area.

V. **Project Summary/Accomplishments:** The Fall 2008 survey was successfully completed during a research cruise which occurred between 22 September and 17 October 2009 (sampling dates 29 September through 17 October). The target number of 150 stations was sampled. About 732,000 individual fishes weighing over 43,000kg and representing 134 species were captured, including 7 species not previously seen in NEAMAP cruises. Individual length measurements were recorded for 60,334 specimens. Lab processing is proceeding on the 4,608 ageing structures (otoliths, vertebrae, spines) and 3,383 stomach samples which were collected (806 otoliths and 1,444 stomachs have been fully processed as of the date of this report). A full report is attached to this standard project summary.

VI. **Challenges/Changes:** Beyond completion of laboratory samples, no significant challenges remain for this contract segment.

VII. **Participants:** Primary program personnel remain unchanged.

VIII. **Quality Assurance:** Previous progress reports provided brief descriptions of quality assurance procedures in selecting fishing gear, conducting fishing operations, and processing the catch. These are interwoven into the attached report as well. Data collected during the survey have been processed through several data quality checks which were previously developed for other survey work and new checks developed specifically for NEAMAP.

IX. **Funding Status:** Expenditures have been generally in line with expectations. Operations during the reporting period were supported primarily by the Mid-Atlantic Council Research Set Aside (RSA) Program.

X. **Future Activities:** The future of this program is dependent upon continued funding. We anticipate sufficient RSA funds to complete two 2009 cruises and are presently awaiting a promised allocation of funds from the state of New York.

XI. **Presentations/Public Outreach:** During 2008, presentations of survey results have been made as follows:

- January 2008: Mid-Atlantic Fishery Management Council
- February 2008: Cape May NJ Party and Charter Boat Association
- February 2008: NMFS NEFSC Trawl Advisory Panel
- February 2008: Bass Pro Shops Fishing Classic (Hampton, VA), Booth exhibit
- March 2008: NEAMAP Operations Committee
- March 2008: NEAMAP Board
- April 2008: New England Fishery Management Council
- July 2008: NEAMAP Board
- October 2008: ASMFC Management and Science Committee
- October 2008: ASMFC ISFMP Policy Board
- December 2008: NEAMAP Peer Review Panel

Further, about 120 individuals representing the recreational, commercial, and management communities and local and national political leaders observed survey operations both in port and in the field during layovers in New Bedford, MA, Pt. Judith, RI, Montauk, NY, Cape May, NJ and Hampton, VA during the fall 2008 cruise. Brief news descriptions of the survey have appeared on local television in Providence, RI, and Long Island, NY, in a June 2008 article in *The Fisherman* (published in New Jersey for the recreational community), in the September 2008 and December 2008 issues of *National Fisherman*, and in the November 2008 issue of *Commercial Fisheries News*.

Introduction

Concerns regarding the status of fishery-independent data collection from the continental shelf waters between Cape Hatteras, North Carolina and the U.S. / Canadian border led the Atlantic States Marine Fisheries Commission's (ASMFC) Management and Science Committee (MSC) to draft a resolution in 1997 calling for the formation the Northeast Area Monitoring and Assessment Program (NEAMAP) (ASMFC 2002). NEAMAP is a cooperative state-federal program modeled after the Southeast Area Monitoring and Assessment Program (SEAMAP), which had been coordinating fishery-independent data collection south of Cape Hatteras since the mid-1980s (Rester 2001). The four main goals of this new program directly address the deficiencies noted by the MSC for this region and include 1) developing fishery-independent surveys where current sampling is either inadequate or absent 2) coordinating data collection amongst existing surveys as well as any new surveys 3) providing for efficient management and dissemination of data and 4) establishing outreach programs (ASMFC 2002). The NEAMAP Memorandum of Understanding was signed by all partner agencies by July 2004.

One of the first major efforts of the NEAMAP was to design a trawl survey intended to operate in the coastal zone (out to the 27.4m depth profile) of the Middle Atlantic Bight (MAB - i.e., Montauk, New York to Cape Hatteras, North Carolina). While the National Marine Fisheries Service (NMFS) Northeast Fisheries Science Center's (NEFSC) bottom trawl survey has been sampling from Cape Hatteras to the U.S. / Canadian border in waters less than 91.4m since 1963, few stations are sampled in waters less than 27.4m due to the sizes of the sampling area and vessels (NEFSC 1988, R. Brown, NMFS, pers. comm). In addition, of the six coastal states in the MAB, only New Jersey conducts a fishery-independent trawl survey in its coastal zone (Byrne 2004). This new NEAMAP Inshore Trawl Survey is intended to fill the aforementioned gap in fishery-independent survey coverage, which is consistent with the program goals.

In early 2005, the ASMFC made $250,000 of "plus-up" funds that it had received through the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) available for pilot work in an effort to assess the viability of the NEAMAP Nearshore Trawl Survey. The Virginia Institute of Marine Science provided the sole response to the Commission's request for proposals and was awarded the funding in August 2005. Two brief pre-pilot cruises and the full pilot cruise were conducted in 2006 (Bonzek et al. 2007).

Early in 2007 ASMFC bundled funds from a combination of sources which were sufficient to begin full scale sampling operations in the fall of 2007. This report summarizes results from the fall 2008 cruise.

Two significant changes to the area sampled by the NEAMAP Nearshore Trawl Program occurred prior to the fall 2007 cruise:

- In 2007 NEFSC took delivery of the *FSV Henry B. Bigelow*, began preliminary sampling operations, and determined that the vessel could safely operate in waters as shallow as 18.3m. NEFSC then made a determination that future surveys would likely extend inshore to that depth contour (R. Brown, NMFS, pers. comm.). The NEAMAP Operations Committee subsequently decided that the offshore boundary of the NEAMAP survey coastal sampling (i.e., Montauk to Cape Hatteras) should be realigned to coincide

with the inshore boundary of the NEFSC survey, and that NEAMAP should discontinue sampling between the 18.3m and 27.4m contours along the coast.

- NEFSC contributed significant funds toward NEAMAP full implementation with the provision that the additional under-sampled areas of Block Island Sound and Rhode Island Sound be added to the NEAMAP sampling area. These areas are deeper than other NEAMAP regions but from a 'distance from shore' standpoint are within the range covered by NEAMAP in other states.

Methods

Station Selection

Primary consideration in regards to survey stratification was consistency with the NMFS bottom trawl surveys. However, those surveys will be redesigned and re-stratified for 2009 (and beyond) and so re-stratification for the inshore NEAMAP areas was open for consideration as well.

Examination of existing NMFS strata revealed that the major divisions among survey areas (latitudinal divisions from New Jersey to the south, longitudinal divisions off Long Island) generally corresponded well with major estuarine outflow areas. Therefore these boundary definitions, with minor modifications so that regional boundaries would more closely correspond to state borders, were used for the NEAMAP survey. However, examination of the current NMFS depth stratum definitions reveals that in some areas (primarily off the southern states) current stratum boundaries do not correspond well to actual depth contours. Depth stratum assignments were redrawn using depth sounding data from the National Ocean Service using depth strata 20ft.-40ft. and 40ft.-60ft. from Montauk, NY to Cape Hatteras, NC and 60ft.-90ft. and 90ft.-120ft. in Rhode Island Sound and Block Island Sound (Figure 1). Finally, each stratum was subdivided into a grid pattern of potential sampling locations, with each cell measuring 1.5 1.5 minutes (2.25sq. nm). The number of stations (cells) selected for each stratum was assigned by proportional sampling according to surface area within the stratum, with a minimum of two stations per stratum.

Species Priority Lists

During the survey design phase, the NEAMAP Operations Committee developed a set of species priority lists. Priority 'A' species were to be subjected to the full processing procedure (see *Procedures at Each Station* below) at each station in which they were collected. Compared to the list used for the 2006 pilot survey, several Priority 'A' species were added due to the expanded survey area (this should lead to collections of additional species of management importance) and the requests of the Mid-Atlantic Fisheries Management Council. Priority 'B' species were to be sampled for full processing as time allowed. Priority 'C' species would only be taken for full processing if sampling of A and B species would not be affected. These three categories might be summarized as 'must have' 'great to have' and 'nice to have,' respectively. In practice, with the exception of the various stingray species, Priority 'A', 'B', and 'C' species are all treated as if they were 'A' species. All other species (here called Priority 'D') were to have aggregate weights recorded and all or an appreciable subsample to be measured. A fifth category ('E') was later defined, including species which required special handling. This category included sharks (other than dogfish) and sturgeon, which were measured, tagged, and

released; and selected invertebrates which were processed similarly to Priority D fish species. Species included in categories A-C are presented below (Table 1).

Table 1. Species priority lists (categories A-C only).

A LIST	
Atlantic Cod	*Gadus morhua*
Black Sea Bass	*Centropristis striata*
Bluefish	*Pomatomus saltatrix*
Butterfish	*Peprilus triacanthus*
Haddock	*Melanogrammus aeglefinus*
Pollock	*Pollachius virens*
Scup	*Stenotomus chrysops*
Silver Hake	*Merluccius bilinearis*
Striped Bass	*Morone saxatilis*
Summer Flounder	*Paralichthys dentatus*
Weakfish	*Cynoscion regalis*
Winter Founder	*Pleuronectes americanus*
B LIST	
American Shad	*Alosa sapidissima*
Atlantic Menhaden	*Brevoortia tyrannus*
Atlantic Croaker	*Micropogonias undulatus*
Monkfish	*Lophius americanus*
Skate and Ray Species	
Smooth Dogfish	*Mustelus canis*
Spiny Dogfish	*Squalus acanthias*
Spot	*Leiostomus xanthurus*
Yellowtail Flounder	*Limanda ferruginea*
C LIST	
Alewife	*Alosa pseudoharengus*
Atlantic Herring	*Clupea harengus*
Atlantic Mackerel	*Scomber scombrus*
Black Drum	*Pogonias cromis*
Blueback Herring	*Alosa aestivalis*
Red Drum	*Sciaenops ocellatus*
Speckled Trout	*Cynoscion nebulosus*
Tautog	*Tautoga onitis*

Gear Performance
Wingspread, doorspread, and headrope height were measured on each tow during the fall 2008 cruise using a digital Netmind® Trawl Monitoring System. Wingspread sensors were positioned on the middle net 'jib' in accordance with NFMS procedures. The headrope sensor was mounted at the midpoint of the headrope. A catch sensor was mounted in the cod-end, set to signal when the catch reached roughly 5,000lbs. GPS coordinates and vessel speed were recorded at intervals using chartplotting software. These data can be used to plot tow tracks for each station. The same computer used to record Netmind readings was also employed to plot station locations (cell boundaries) and to run the countdown clock for each tow.

Procedures at Each Station
All fishing operations were conducted during daylight hours. Each tow was 20 minutes in duration with a target tow speed of between 2.9 and 3.3 knots. Two tows were truncated (three at 15 minutes, two at 16 minutes) due to known hangs in the tow path, surface traffic etc. and three tows were terminated early due to triggering of the catch sensor.

At each station several standard parameters were recorded. These included:

- Station identification parameters (date, station number, region, stratum, depth).
- Vessel operation parameters (beginning and ending GPS position, beginning and ending tow times, compass course, speed over ground, engine RPMs).
- Gear identification and operational parameters (net type code and net number, door type code and door numbers, amount of cable deployed).
- Atmospheric and weather data (air temperature, wind speed, wind direction, general weather state, sea state, barometric pressure).
- Hydrographic data at the surface and at the bottom (water temperature, salinity, pH, and dissolved oxygen).

Upon arrival near a sampling cell, the Captain and Chief Scientist jointly determined the desired starting point and tow path. Flexibility was allowed with regard to these parameters such that a clear tow could be accomplished while staying within the boundaries of the defined cell.

Hydrographic data were taken at the end of each tow, with the vessel stationary while the fishing crew emptied the catch. This was a time-saving procedure compared to prior cruises in which these data were collected prior to setting the net, resulting in a pause in net deployment while the data were collected.

Vessel crew were responsible for all aspects of deployment and retrieval of the fishing gear. Due to the relatively shallow waters, 100fm. or less of warp was set out at all stations. One scientist was present in the wheelhouse during deployment and retrieval. The Captain signaled when the gear was fully set (winch brakes engaged), at which time the Netmind software, the tow track recording software, and the countdown clock were activated. At the conclusion of each tow, the scientist signaled the Captain when the clock reached zero, haulback commenced, and the Netmind recording software was stopped. Vessel crew dumped the catch into one of two enclosed locations (depending upon the size of the catch) on deck for sorting.

The catch was sorted by species and modal size group within species. Aggregate biomass (kg) was measured for each species-size group combination. For priority A species, and nearly always for priority B and C species, a subsample of five individuals from each group was selected for full processing (see next paragraph). For certain very common priority B species including spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), skates, rays, and dogfish only three individuals per group were sampled for full laboratory processing.

Data collected from each subsampled specimen included length (mm fork length where appropriate, mm total length for species lacking a forked caudal fin, mm pre-caudal length for sharks and dogfish, mm disk width for skates and rays, mm carapace width for crabs, mm carapace length for lobster, mm mantle length for squid), total and eviscerated weight (measured in grams, accuracy depended upon the balance on which individuals were measured), and macroscopic sex and maturity stage (immature, mature-resting, mature-ripe, mature-spent) determination. Stomachs were removed (except for spot and butterfish, for which previous sampling indicated that little useful data could be obtained from the stomach contents) and those containing prey items were preserved for subsequent examination. Otoliths or other appropriate ageing structures were removed from each subsampled specimen for later age determination. All specimens not selected for the complete processing were weighed (aggregate weight), and individual length measurements were recorded for either all or a large proportion, in accordance with approved subsampling procedures when necessary.

Laboratory Methods

Otoliths (or, depending upon the species, other appropriate ageing structures) were (and are being) prepared according to methodology established for other VIMS surveys. Typically, one otolith was selected and mounted on a piece of 100 weight paper with a thin layer of *Crystal Bond*. A thin transverse section was cut through the nucleus of the otolith using two *Buehler* diamond wafering blades and a low speed *Isomet* saw. The section was then mounted on a glass slide and covered with *Crystal Bond*. If necessary, the section was wet-sanded to an appropriate thickness before being covered with *Crystal Bond*. Some smaller, fragile otoliths were read whole. Both sectioned and whole otoliths were most commonly read using transmitted light under a dissecting microscope. Age was determined as the mode of three independent readings, one by each of three readers.

Stomach samples were (and are being) analyzed according to standard procedures (Hyslop 1980). Prey were identified to the lowest possible taxon. Experienced laboratory personnel are able to process, on average, approximately 30 to 40 stomachs per person per day.

Analytical Methods (Abundance)

One presented computation of abundance is expressed in terms of minimum trawlable number or biomass according to the general formula:

$$N = \frac{cA}{a}, \qquad (1)$$

where N is the minimum number (or biomass) of fish present within the sampling area that are susceptible to the sampling gear, c is the mean number (or weight) of fish captured per tow, a is the area swept by one trawl tow, and A is the total survey area.

Specifically, abundance was calculated in accordance with standard stratified random sampling:

$$\hat{N} = \sum_{s=1}^{n_s} A_s \hat{\bar{N}}_s \,, \qquad (2)$$

where A_s is the area of stratum s, n_s is the total number of strata in which the species under consideration was captured, and $\hat{\bar{N}}_s$ is an estimate of the mean area-swept catch in stratum s given by:

$$\hat{\bar{N}}_s = \frac{\sum_{i=1}^{n_{t,s}} \frac{c_i}{\hat{a}_i}}{n_{t,s}} \,, \qquad (3)$$

In equation (3), c_i and $\hat{a}_i$ represent the catch (number or weight) and an estimate of the trawl area-swept at sampling location i, respectively, and $n_{t,s}$ is the number of tows in stratum s. Note that the a_i estimates were calculated using vessel GPS data for distance towed and net mensuration gear for measurements of net opening (an average value was calculated from the measurements taken during each tow). As no correction is made for gear efficiency these estimates represent the minimum number (or biomass) of fish present within the sampling area that are susceptible to the sampling gear.

This method produces estimates of abundance for each stratum, which are totaled to produce estimates for the entire survey area. As regional stratum boundaries were drawn to generally correspond with state borders, estimates of abundance (and certain other stock parameters) can be (and in previous reports, were) produced on a state-specific basis. While usually not biologically meaningful, for some parameters it was considered worthwhile to present results in this way due to the potential usefulness for fishery managers. However, state-specific estimates of abundance can be misleading as the sampling area off the coast of each state is variable; a state with a low catch rate for a particular species but with a large sampling area might have a high minimum trawlable abundance in comparison to another state with a high catch rate but a smaller sampling area.

For this report, the primary overall and state-specific estimates of abundance are presented as stratified geometric means of catch per unit area swept (swept area catch rates were standardized to 25,000 sq.m. which is roughly the area swept on an average 20-minute tow). Preliminary evidence indicates that NEAMAP catch data are log-normally distributed which makes the geometric mean the appropriate CPUE metric. Efforts to determine the most appropriate overall and region-specific estimates of abundance will continue and may result in different estimates being presented in future reports. Further, we are investigating several methods for the computation of age-specific indices and these investigations will be presented in a future report.

Analytical Methods (Length Frequency)
Length frequency histograms were constructed using 10mm bins. Length bins were identified using the bin midpoint (e.g. the 250mm bin represents individuals between 245mm and 254mm). For this and several other stock parameters, data from fully processed specimens are expanded to the entire sample (i.e., catch level) for parameter estimation. Because workup procedures result in differential subsampling rates among size groups, failure to account for such factors would bias resulting stock parameter estimates. In the NEAMAP database each specimen has a calculated expansion factor associated with it which represents the number of fish that the specimen represents in the total sample for that station.

Analytical Methods (Sex Ratios)
Sex ratios were determined by summation of data from fully processed specimens, using the expansion factors as described above.

Results

Gear Performance
As was the case during the pilot survey and prior full-scale surveys, the 4-seam net performed consistently within the expected parameters (Figure 2). After using net #2 for the Spring 2008 survey, net #1 was used again for the Fall 2008 survey. To date, net #3 has not been used (currently the program owns three nets). No significant tear-ups occurred during the survey, though due to normal wear-and-tear the bottom belly of the net will be replaced and recertified prior to its next use. No significant deviations were seen in net performance compared to previous surveys, nor between the two nets which have been used.

Stations Sampled
Based on a specified sampling rate of one station per 30sq.nm, the target number of stations to be sampled was 150 for the entire sampling area (2,006 cells x 2.25sq.mi. per cell / 30 stations per sq.nm. = 150 stations) and 150 stations were successfully occupied. The number of stations available and the number sampled in each stratum is given (Table 2).

Of the 150 stations sampled, 126 were sampled within the specified primary sampling cell and 24 were chosen from the available randomly selected alternate sites, due to issues such as known hangs or other obstructions, fixed gear, or vessel traffic. The highest number of alternate stations occupied was in BI Sound (4 out of 10) and RI Sound (5 out of 17) due to a high degree of caution, to unfamiliarity with the area, and to a relatively small number of towable locations in this area. The number of alternate sites in these regions however was smaller than in previous surveys. This results from obtaining a better sample of known towable locations through cooperation with local industry representatives. A region-by-region summary of these results is presented (Table 3).

Table 2. Number of available sample cells and number sampled in each stratum.

Region	State*	Stations Sampled								Totals			Sq. nm. per Station
		20ft.-40ft.		40ft. – 60ft.		60ft. – 90ft.		90ft. – 120ft.					
		Stations sampled	Num. cells	Stations sampled	Num. cells	Stations sampled	Num. cells	Stations sampled	Num. cells	Stations sampled	Num. cells	Sq. nm.**	
RIS	RI					6	85	10	161	16	246	553.2	34.6
BIS	RI					3	42	7	88	10	130	291.9	29.2
1	NY	0	0	2	19					2	19	42.3	21.2
2	NY	2	8	3	19					5	27	57.9	11.6
3	NY	2	16	3	28					5	44	95.4	19.1
4	NY	2	16	3	29					5	45	100.7	20.1
5	NY	2	27	3	45					5	72	160.6	32.1
6	NJ	2	20	3	42					5	62	132.1	26.4
7	NJ	4	49	6	97					10	146	318.9	31.9
8	NJ	2	32	7	90					9	122	269.2	29.9
9	DE	4	53	8	113	5	68			17	166	523.9	30.8
10	MD	2	33	8	114					10	147	324.3	32.4
11	VA	5	62	8	122					13	184	408.2	31.4
12	VA	5	60	4	67					9	127	280.2	31.1
13	VA	6	94	10	142					16	236	523.7	32.7
14	NC	2	24	5	61					7	85	180.8	25.8
15	NC	2	25	4	55					6	80	165.7	27.6
Total		42	519	77	1043	14	195	17	249	150	1938	4429.0	29.5

* Note that region boundaries are not perfectly aligned with all state boundaries:
- Some stations in RI Sound may occur in MA
- Some stations in BI Sound may occur in NY
- Region 5 spans the NY-NJ Harbor area
- Some stations in Region 9 may occur in NJ

** Calculation does not account for decreases in distance per minute of longitude as latitude increases.

Table 3. Number of primary and alternate stations occupied in each region.

Region	Primary Stations	Alternate Stations	Total	Region	Primary Stations	Alternate Stations	Total
RI Sound	11	5	17	**8**	9	0	9
BI Sound	6	4	10	**9**	16	1	17
1	0	2	2	**10**	10	0	10
2	5	0	5	**11**	13	0	13
3	5	0	5	**12**	7	2	9
4	4	1	5	**13**	13	3	16
5	4	1	5	**14**	5	2	7
6	5	0	5	**15**	4	2	6
7	9	1	10	**Total**	**126**	**24**	**150**

On the 17 full sampling days (i.e., no long steam times or port calls), an average of 8.2 stations per day were sampled. Counting all 22 days at sea, including transit days and partial sampling days, the number of stations averaged 6.8. Day-by-day vessel activities and work schedules are presented (Table 4).

Table 4. Summary of activities conducted during each day at sea during the fall 2008 NEAMAP cruise.

Hours Worked and Stations Sampled Each Day

Date	Time of Day	No. Stations
22-Sep	Final Survey Preparations - Leave dock early evening	0
23-Sep	Steaming Day - Hampton to New Bedford (high winds and seas)	0
24-Sep	Steaming Day - Hampton to New Bedford (high winds and seas)	0
25-Sep	Steaming Day - Hampton to New Bedford (high winds and seas)	0
26-Sep	Steaming Day - Hampton to New Bedford (high winds and seas)	0
27-Sep	Outreach Day - New Bedford Working Waterfront Festival	0
28-Sep	Outreach Day - New Bedford Working Waterfront Festival	0
29-Sep		6
30-Sep	Political leaders outreach - Pt. Judith, RI	4
1-Oct		5
2-Oct	Media outreach Pt. Judith - NBC 10	5
3-Oct	Stakeholder outreach - Montauk NY	6
4-Oct		10
5-Oct		9
6-Oct		8
7-Oct		11
8-Oct		11
9-Oct		10
10-Oct	Stakeholder outreach - Cape May, NJ	2
11-Oct		9
12-Oct		11
13-Oct		10
14-Oct		12
15-Oct		9
16-Oct		11
17-Oct	Stakeholder and managers outreach - Hampton, VA	1
	Survey Finished	0

= Fishing hours
= Personnel hours

Catch Summary

A total of 732,000 specimens weighing 43,000kg were collected during the fall 2008 survey. A total of 63,300 individuals were measured. Of those specimens taken for full workup, 4,608 otoliths (or other ageing structures) were taken and 3,383 full stomachs were preserved for later analysis. On average at each station, 4,876 (range 52 – 62,226) specimens were captured (Figure 3) weighing 287kg (range 9kg – 3,056kg) (Figure 4), 402 specimens were measured (range 52 – 1,674), and 31 specimens were processed for the full workup (range 8 – 65). At each station, an average of 19.5 species was captured (range 6 – 36) (Figure 5). The number of specimens processed for each species, separately for each priority category, is summarized in Table 5.

Species Data Summaries
Several graphical data summaries are shown for each species (Figures 6-167). Species are organized alphabetically. Due to the short period of time between the end of the survey and the due date for this report, fewer analyses are presented for each species compared to previous NEAMAP progress reports. It is anticipated that a more comprehensive report covering all 2008 survey operations will be prepared later.

For most species, the following tables and figures are presented:

- GIS figures showing total catch by number and biomass captured at each station.
- A table presenting, for each state, the number of stations sampled, the number of stations at which the species was captured, total number caught, total biomass, number of specimens taken for age and stomach analysis, number of specimens measured, minimum, maximum, and average lengths, and state-specific abundance indices by number and biomass.
- Geometric mean catch per area swept (both number and biomass) by state, annotated with overall survey indices and associated confidence limits, arithmetic mean abundance indices by number and biomass, minimum trawlable abundance, and maximum number captured per station.
- Length-frequency histogram including the number of specimens subjected to full laboratory processing, annotated with the number of otoliths and stomachs removed for processing.
- Sex-specific length-frequency histogram annotated with the number measured by sex.
- Histograms of sex ratio by state, and for species with adequate sample size, by size groups, annotated with the number of specimens examined. Note that for lower priority species sex ratio data may not be available.

These data summaries are numbered as follows:

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Table 5. Number of specimens captured and measured and number of otoliths (or other hard parts) and stomachs sampled, by species priority level.

Priority A Species					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number of Otoliths**	**Number of Stomachs**
black seabass	174	75.182	174	115	114
bluefish	7,120	908.694	2,214	529	406
butterfish	168,269	2,120.606	10,091	551	8
scup	77,858	2,503.182	6,946	670	668
silver hake (whiting)	3,125	183.909	515	96	88
striped bass	1,559	4,611.939	95	43	21
summer flounder	683	418.028	676	440	310
weakfish	44,779	3,990.400	3,879	464	333
winter flounder	670	141.987	522	137	132
Priority B Species					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number of Otoliths**	**Number of Stomachs**
American shad	9	0.542	9	5	5
Atlantic croaker	66,823	5,123.164	3,591	307	281
Atlantic menhaden	208	24.992	208	68	68
Atlantic stingray	32	52.178	32		
barndoor skate	3	1.094	3	3	3
bluntnose stingray	62	214.961	62		
bullnose ray	479	399.912	320		
clearnose skate	885	1,196.183	806	289	287
cownose ray	231	560.402	108		
little skate	7,014	4,104.774	2,247	263	259
monkfish	6	26.178	6	6	6
rosette skate	1	1.846	1		
roughtail stingray	30	411.062	30		
skate spp.	116	22.627	115		
smooth butterfly ray	227	346.579	195		
smooth dogfish	414	365.390	386	162	161
southern stingray	2	20.860	2		
spiny butterfly ray	79	809.340	79		
spiny dogfish	735	1,621.109	161	41	39
spot	56,878	3,871.983	3,435	213	
winter skate	619	920.971	399	120	115
yellowtail flounder	2	0.270	2	2	2
Priority C Species					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number of Otoliths**	**Number of Stomachs**
alewife	5	0.316	5	5	5
Atlantic herring	57	1.122	57	12	12
black drum	25	2.493	25	22	18
blueback herring	20	0.702	20	9	9
red drum	6	73.500	6	6	4
spotted seatrout	1	0.375	1		
tautog	137	59.188	69	27	26

continued

Table 5. cont..

Priority D Species					
Species	Total Number Caught	Total Species Weight(kg)	Number Measured	Number of Otoliths	Number of Stomachs
African pompano	1	0.062	1		
American eel	8	15.950	8		
American sand lance	1	0.004	1		
Atlantic bumper	3	0.022	3		
Atlantic cutlassfish	32,439	71.527	190		
Atlantic moonfish	8,271	32.560	1,104		
Atlantic spadefish	231	7.972	197		
Atlantic sturgeon	11	89.160	11		
Atlantic thread herring	801	12.014	292		
Atlantic threadfin	1,189	5.960	169		
Atlantic torpedo	5	78.365	5		
banded drum	250	9.117	174		
bay anchovy	35,358	72.597	2,299		
Berycidae	9	8.860	9		
bigeye scad	60	2.202	53		
blackcheek tonguefish	54	2.391	54		
blue runner	109	8.036	109		
bluespotted cornetfish	6	0.171	6		
codlings	2	0.164	2		
conger eel	1	0.035	1		
crevalle jack	18	0.959	18		
cunner	7	3.408	7		
dwarf goatfish	1	0.012	1		
Etropus sp.	7	0.133	7		
Florida pompano	1	0.105	1		
fourspot flounder	143	25.420	66		
gray triggerfish	1	0.075	1		
Gulf Stream flounder	214	5.397	87		
harvestfish	1,380	105.107	138		
hickory shad	4	0.892	4	3	3
hogchoker	141	13.766	141		
inshore lizardfish	314	31.902	230		
jellyfish spp		289.515			
king mackerel	1	4.615	1		
kingfish spp	8,026	1,254.441	1,502		
longhorn sculpin	7	0.746	7		
mantis shrimp	1	0.040	1		
northern pipefish	1	0.122	1		
northern puffer	32	4.378	32		
northern searobin	179	25.302	179		
northern sennet	211	13.948	211		
northern stargazer	13	13.843	13		

continued

Table 5. cont.

Priority D Species (cont.)					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number of Otoliths**	**Number of Stomachs**
permit	1	0.160	1		
pigfish	443	22.657	296		
pinfish	184	8.243	184		
planehead filefish	1	0.170	1		
red goatfish	1	0.012	1		
red hake	145	18.232	98		
rock crab	36	6.740	36		
rough scad	230	7.031	230		
round herring	12,503	241.994	379		
round scad	493	3.614	226		
sea raven	3	1.146	3		
sheepshead	7	27.260	7		
short bigeye	1	0.010	1		
silver anchovy	228	2.628	10		
silver jenny	1	0.054	1		
silver perch	1,793	58.038	845		
smallmouth flounder	6	0.273	6		
Spanish mackerel	14	1.962	14		
Spanish sardine	853	4.015	53		
spotfin butterflyfish	1	0.007	1		
spotted hake	1,956	182.986	1,053		
star drum	1	0.065	1		
striped anchovy	84,833	1,009.098	3,357		
striped burrfish	67	20.582	67		
striped cusk-eel	31	1.732	31		
striped searobin	425	121.508	345		
windowpane	475	79.383	410		
Total	**298,924**	**32,058.5**	**54,700**	**6,131**	**4,809**

Continued

Table 5. cont.

Priority E Species					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number of Otoliths**	**Number of Stomachs**
American lobster	352	80.580	178		
Atlantic angel shark	3	36.140	3		
Atlantic sharpnose shark	15	51.620	15		
blue crab - juvenile female	1	0.150	1		
blue crab, adult female	4	0.402	4		
brief squid	1,587	17.523	451		
brown shrimp	509	15.275	372		
dusky shark	7	17.160	7		
great white shark	1	60.000	1		
horseshoe crab	1,149	1,839.364	473		
jonah crab	3	0.820	3		
lady crab	5	0.110	5		
lesser blue crab	3	0.098	3		
Loligo squid	93,383	1,357.856	5,998		
pink shrimp	1	0.040	1		
sand tiger shark	3	188.880	3		
sandbar shark	12	35.960	12		
sea scallop	46	3.021	46		
spinner shark	1	6.900	1		
thresher shark	5	69.690	5		
white shrimp	753	19.748	267		
Total	**731,429**	**43,020.27**	**60,334**	**4,608**	**3,383**

Figure 1. NEAMAP sampling area with region boundaries and depth strata.

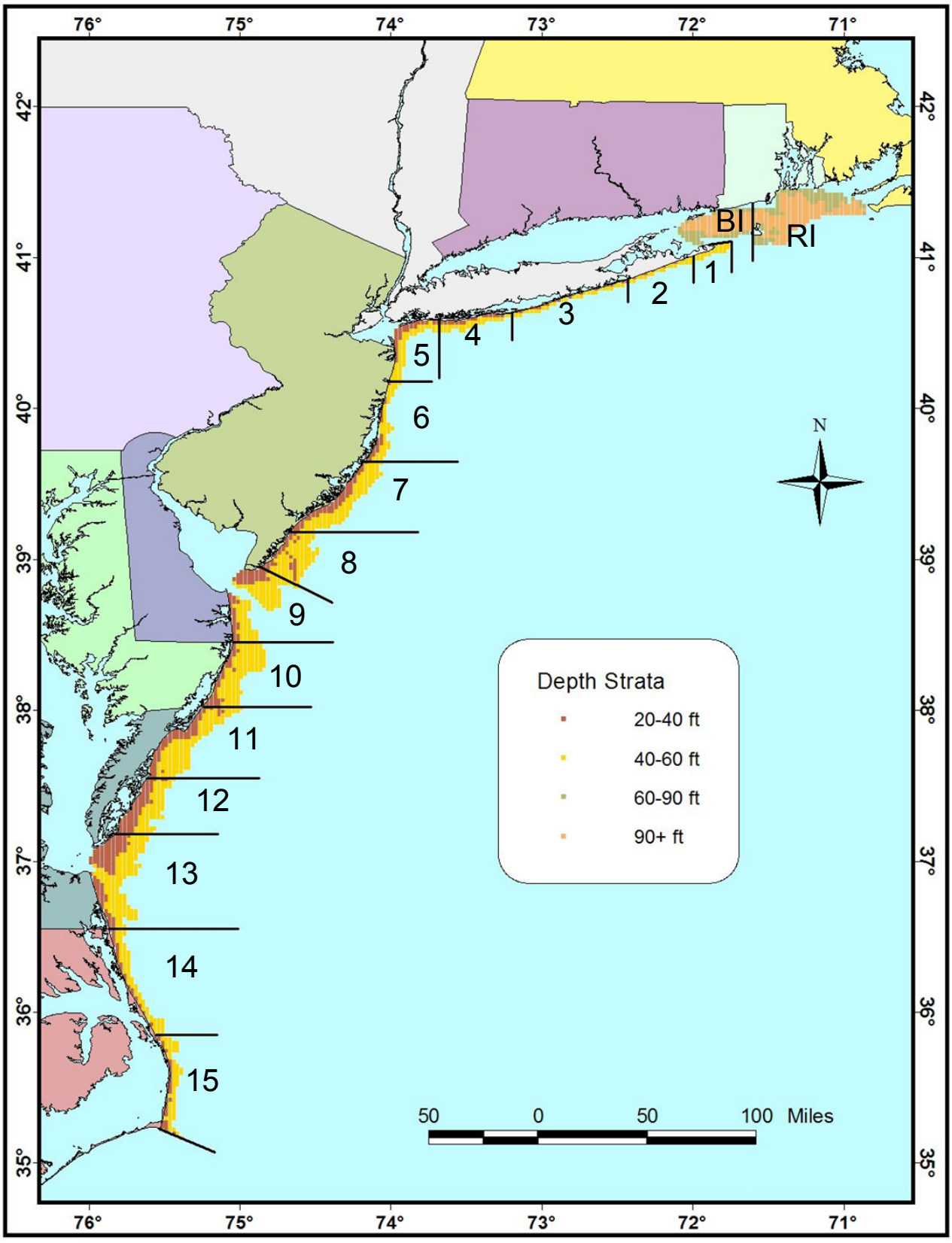


Figure 2. Chronological summary of average net performance parameters for each tow. Accepted ranges for each parameter are given by the dotted lines.

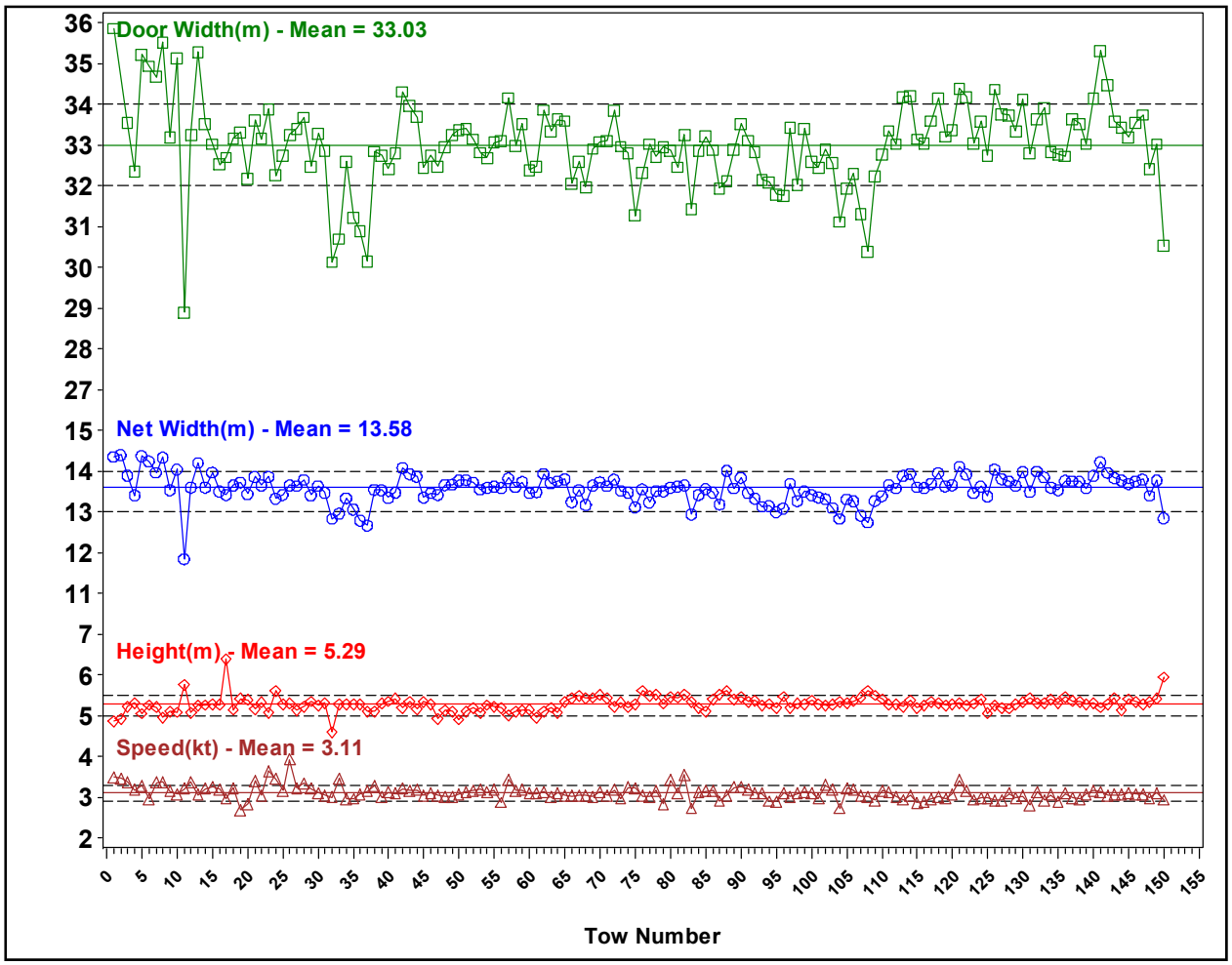


Figure 3. Frequency histogram of number of specimens captured at each station (note irregularly incremented values at the high end of the x-axis).

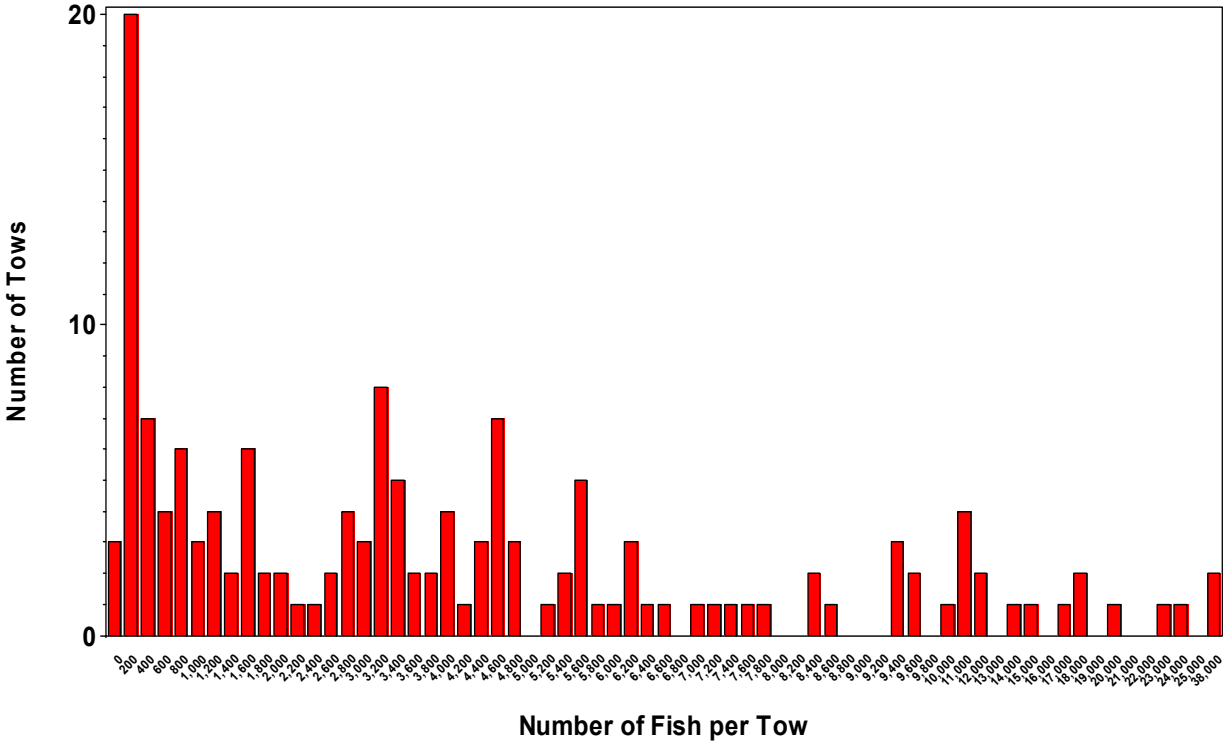


Figure 4. Frequency histogram of biomass of all specimens captured at each station (note irregularly incremented values at the high end of the x-axis).

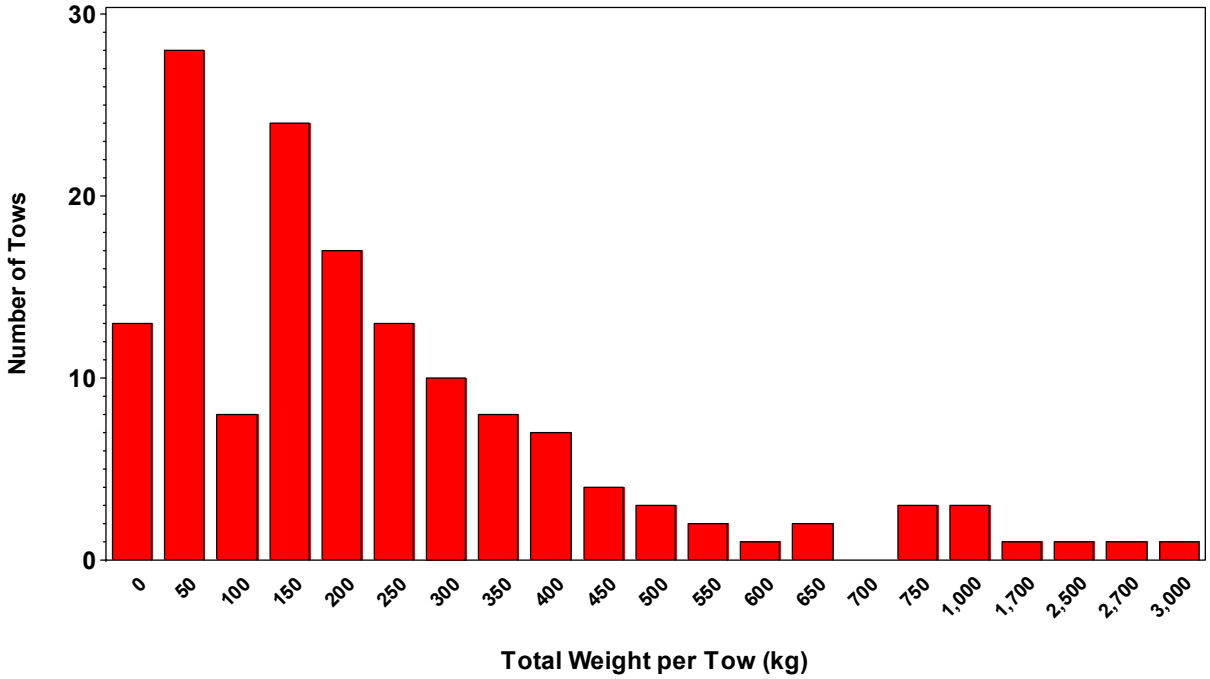
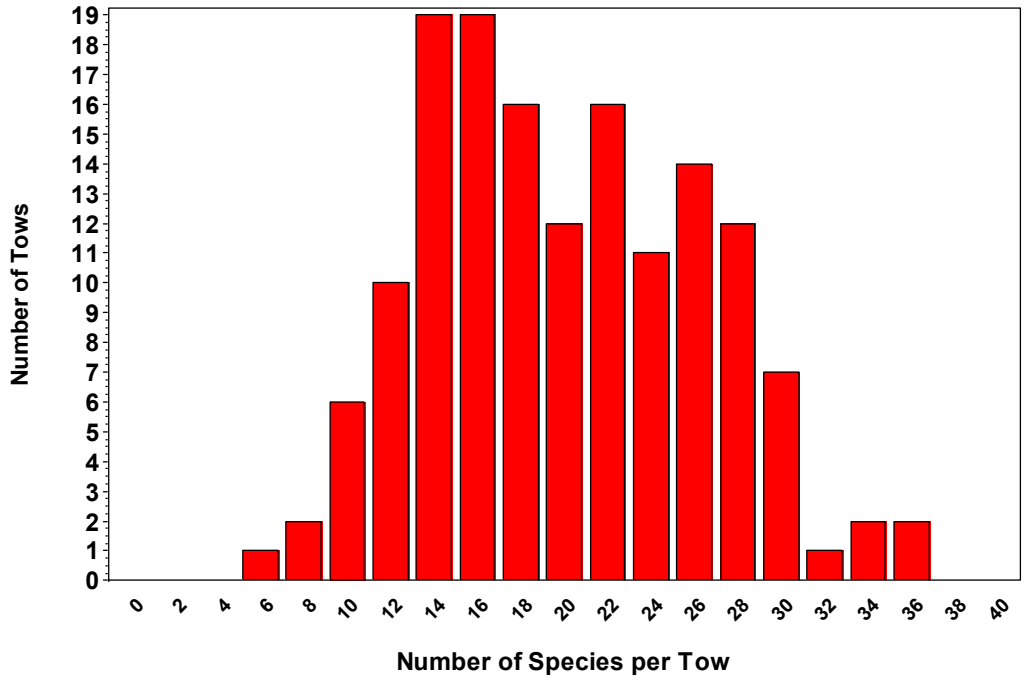


Figure 5. Frequency histogram of number of species captured at each station.



American Lobster (Priority E)

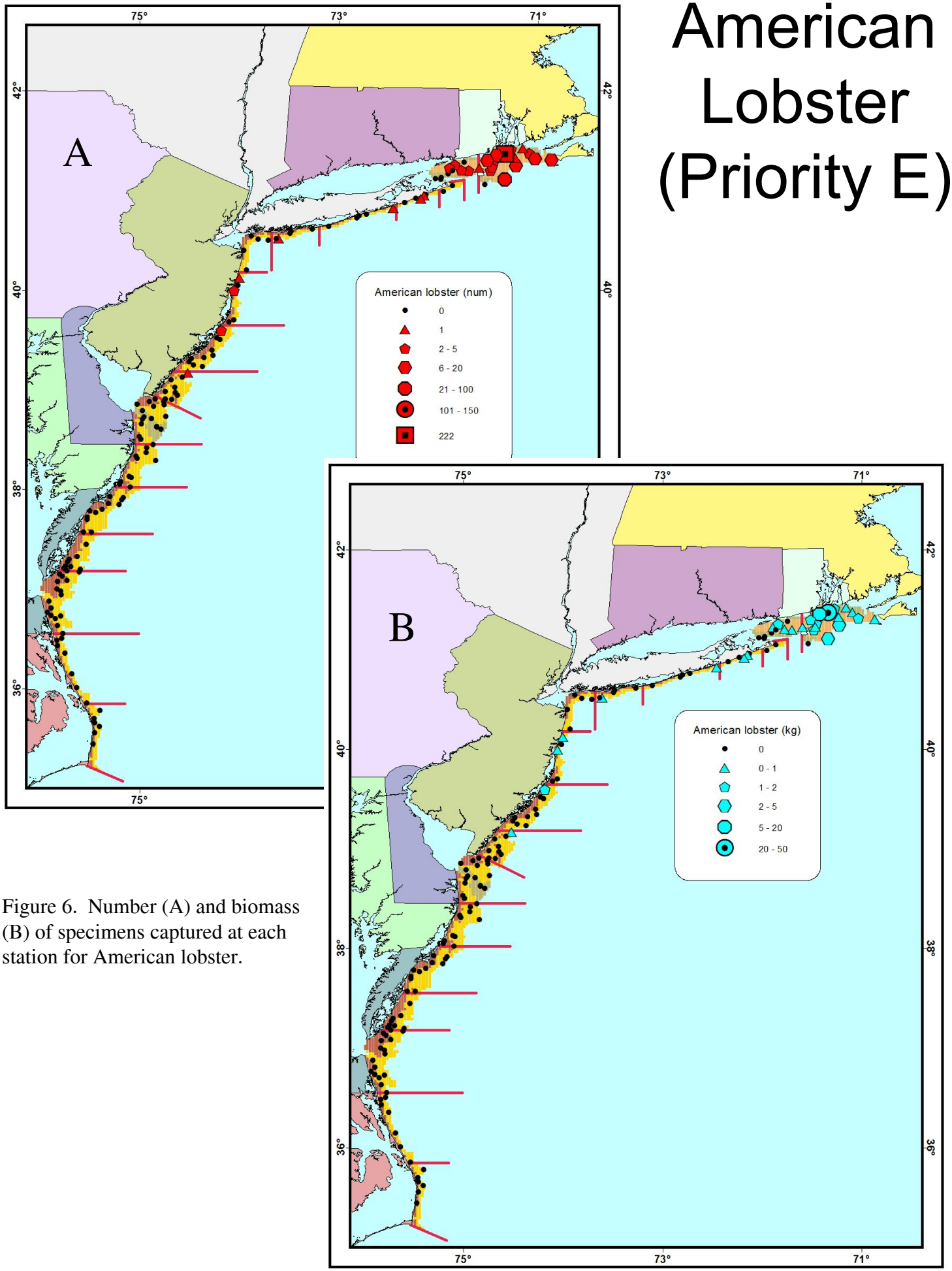


Figure 6. Number (A) and biomass (B) of specimens captured at each station for American lobster.

Table 6. Number, biomass, minimum and maximum size of specimens captured, by state and region, for American lobster.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	19	341	76.949	0	167	35	107	64	0.233	3.23	1.05
NY	22	4	4	1.256	0	4	26	84	63	0.314	0.11	0.04
NJ	24	4	7	2.375	0	7	57	101	74	0.339	0.15	0.06
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38										0.00	0.00
NC	13										0.00	0.00
Total	150	27	352	80.580	0	178	26	107	64	0.240	0.43	0.19

Figure 7. Geometric mean catch per area swept by state and overall, with summary catch rates, for American lobster.

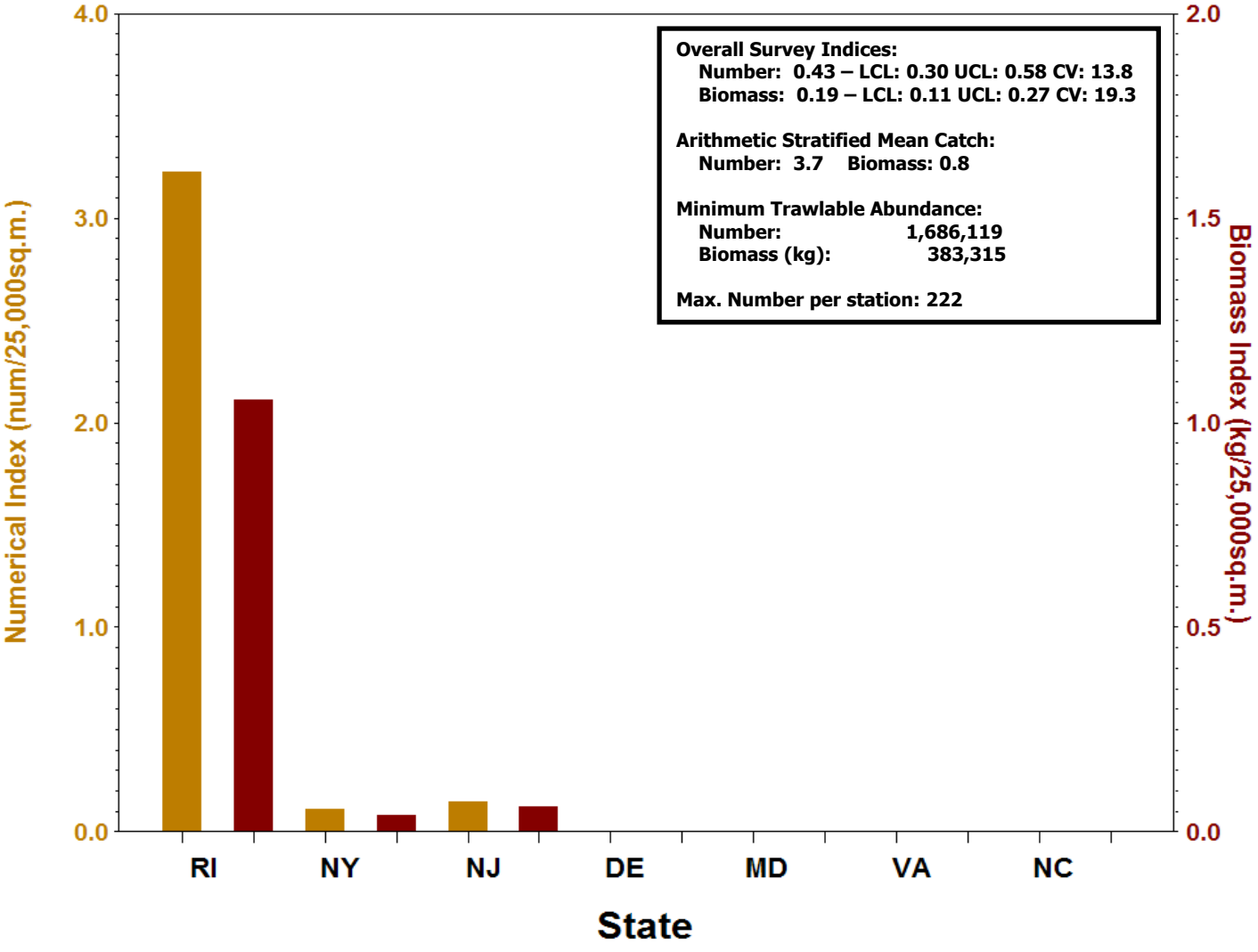


Figure 8. Length frequency histogram for American lobster.

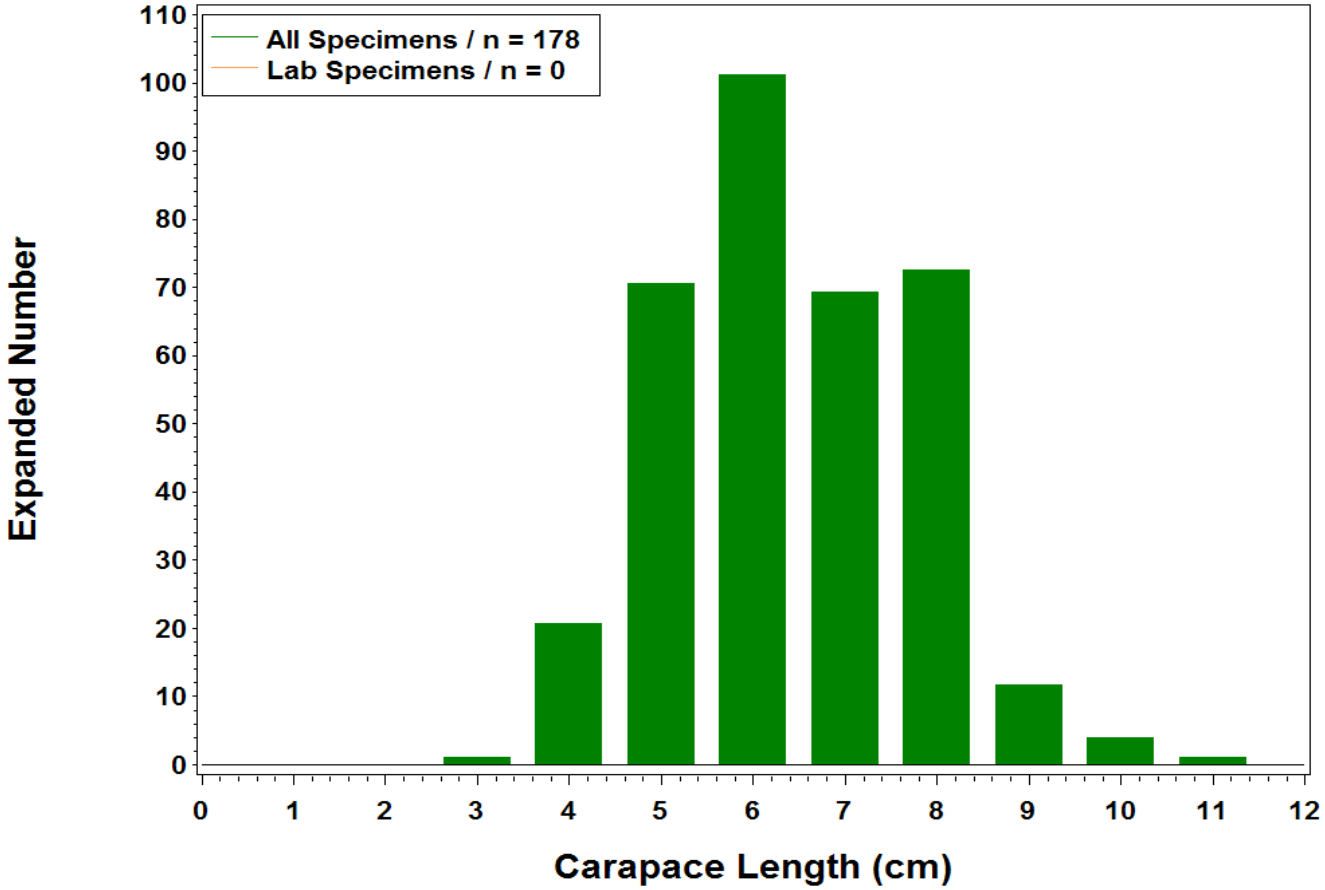


Figure 9. Sex-specific length frequencies histogram for American lobster.

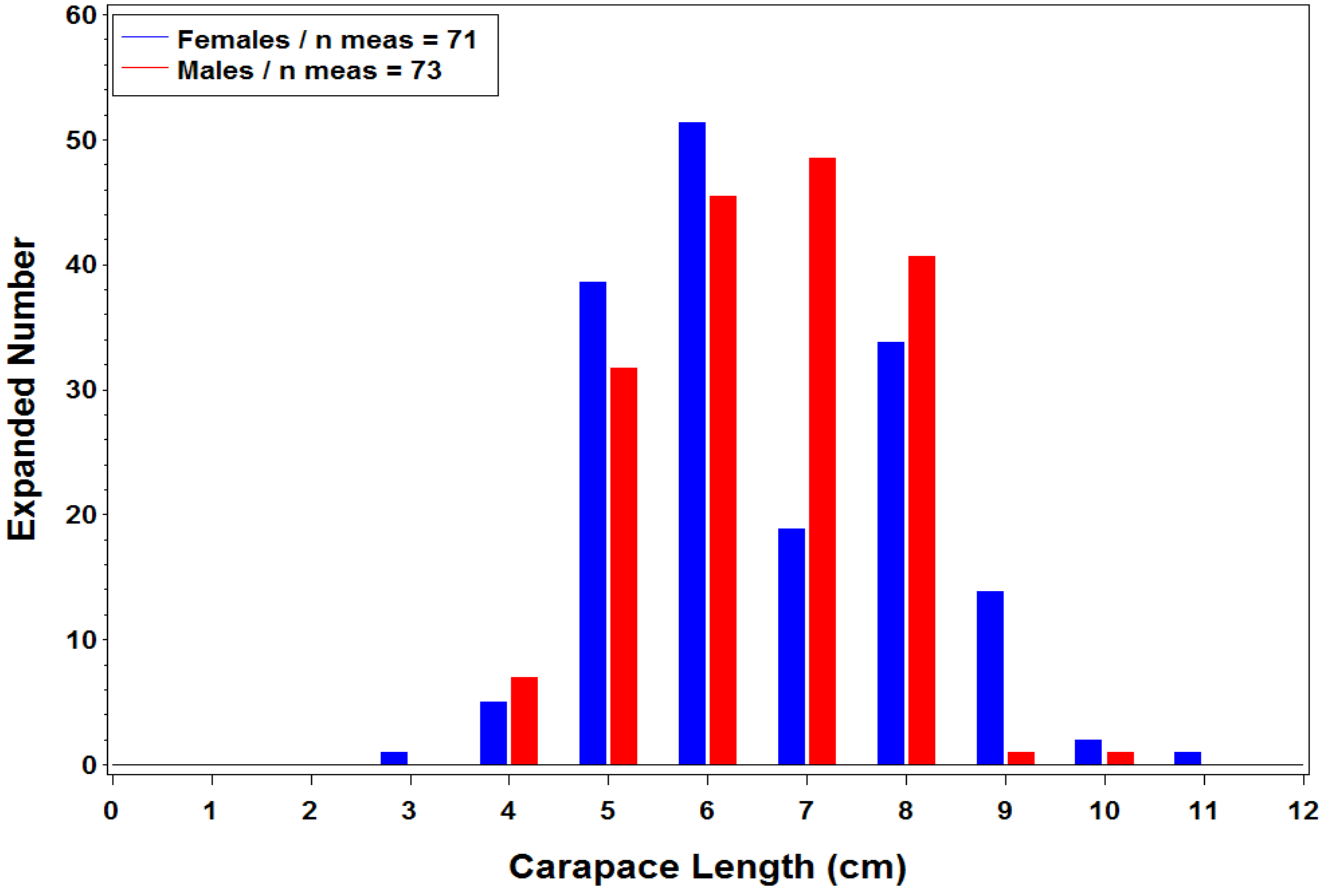
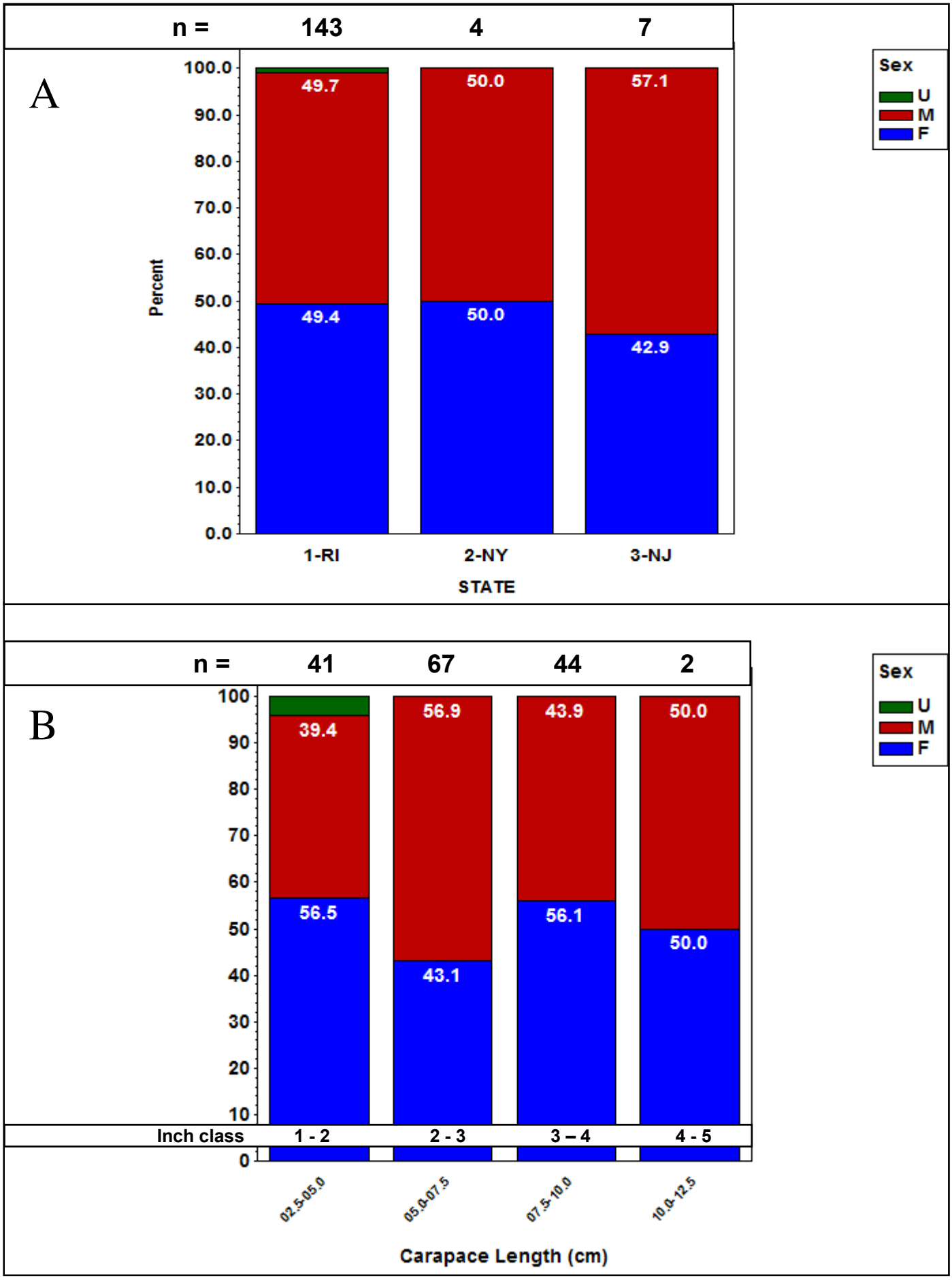


Figure 10. Sex ratios for American lobster by state (A) and length group (B).



American Shad (Priority B)

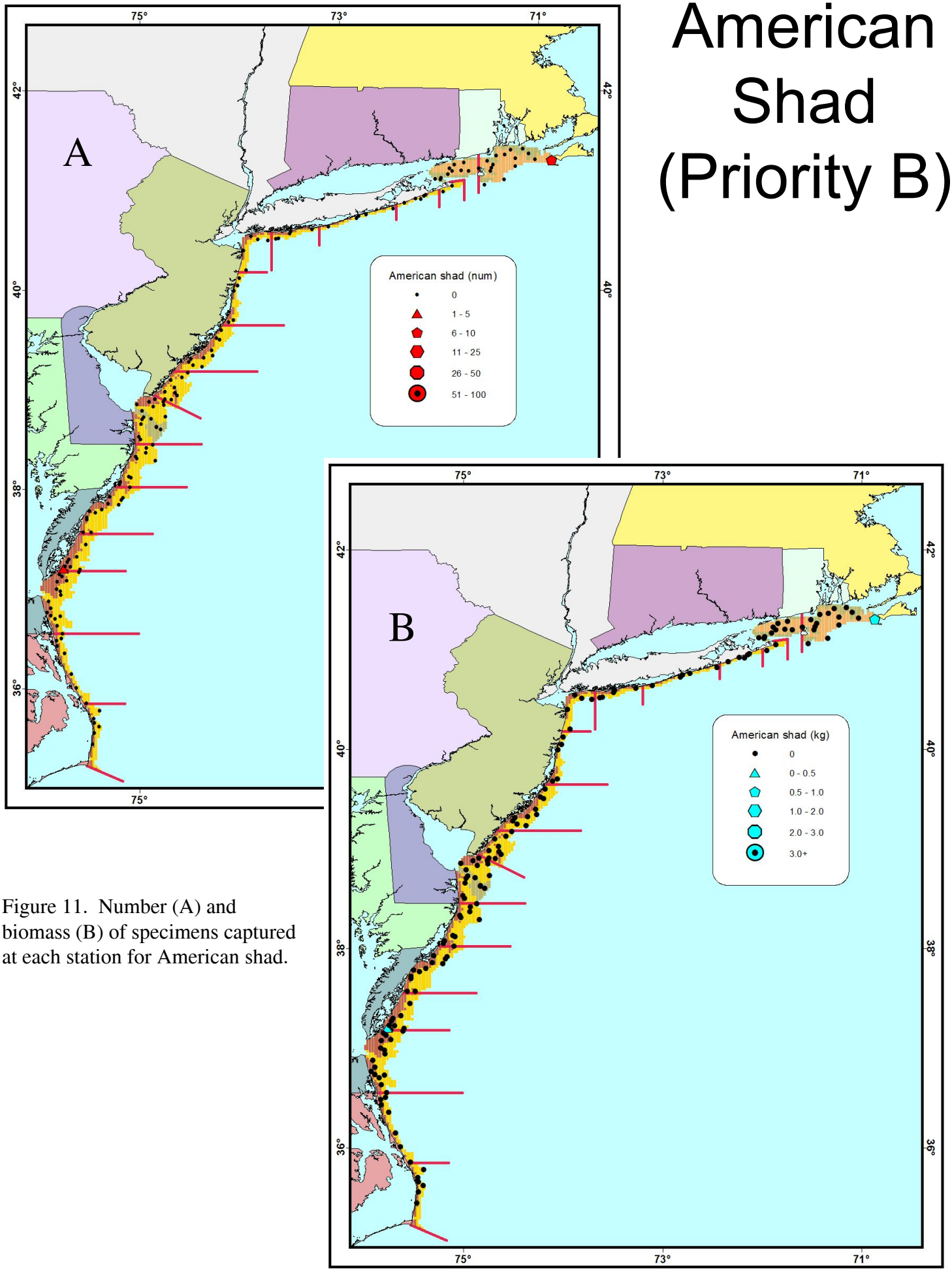


Figure 11. Number (A) and biomass (B) of specimens captured at each station for American shad.

Table 7. Number, biomass, minimum and maximum size of specimens captured, by state and region, for American shad.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	1	8	0.534	5	8	171	217	190	0.079	0.08	0.01
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38	1	1	0.008	0	1	75	75	75		0.01	0.00
NC	13										0.00	0.00
Total	150	2	9	0.542	5	9	75	217	177	0.079	0.03	0.01

Figure 12. Geometric mean catch per area swept by state and overall, with summary catch rates, for American shad.

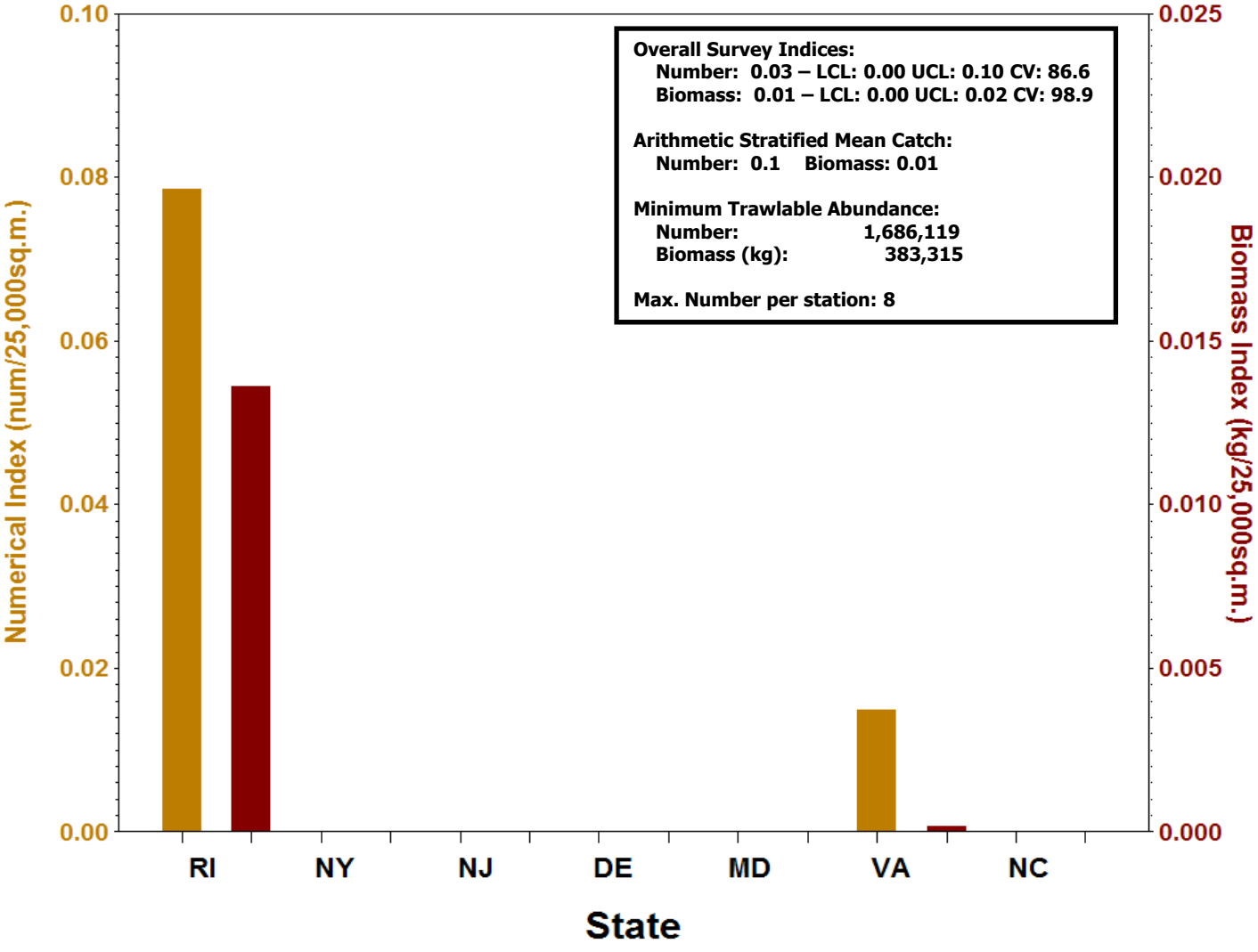


Figure 13. Length frequency histogram for American shad.

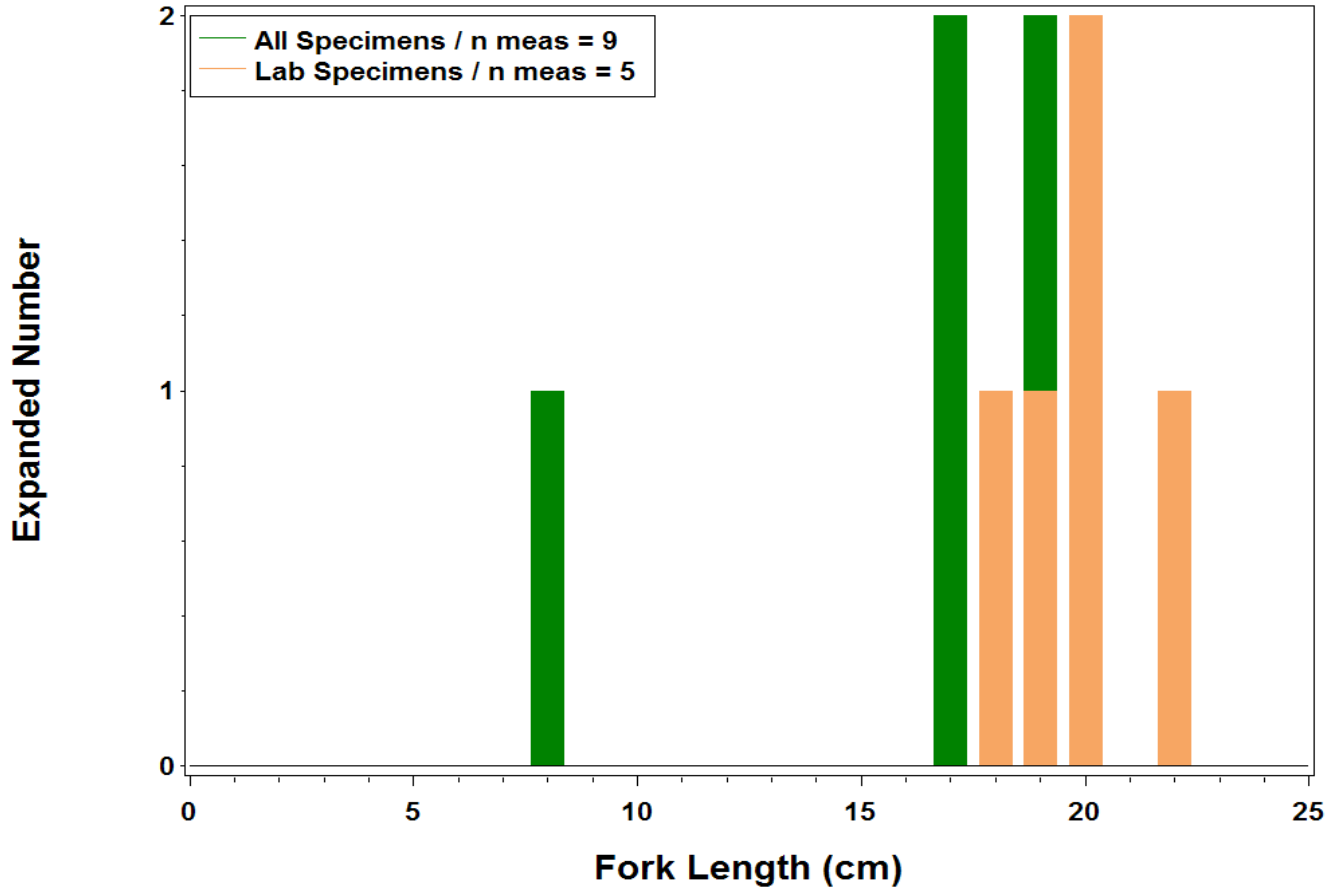
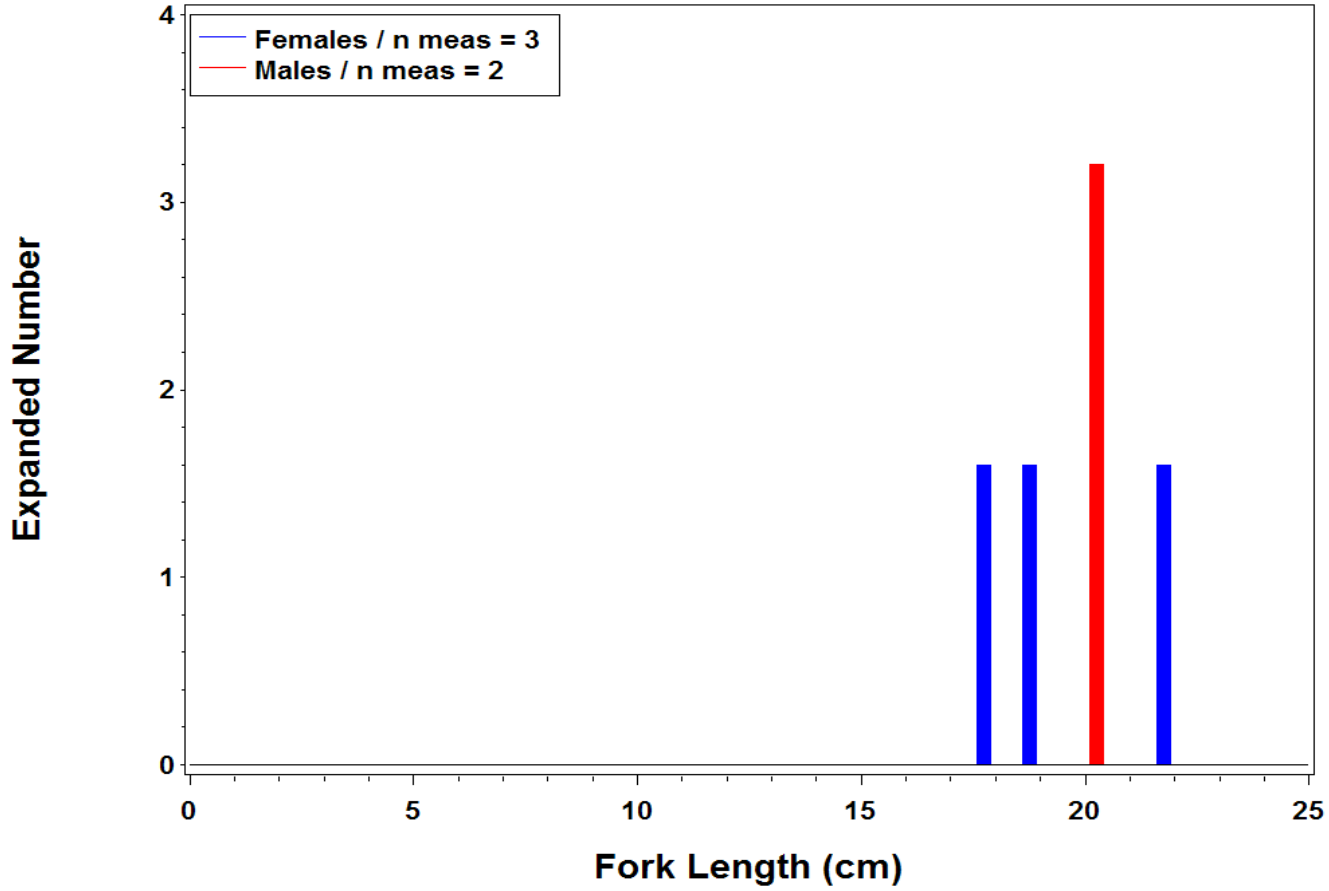


Figure 14. Sex-specific length frequencies histogram for American shad.



Atlantic Brief Squid (Priority E)

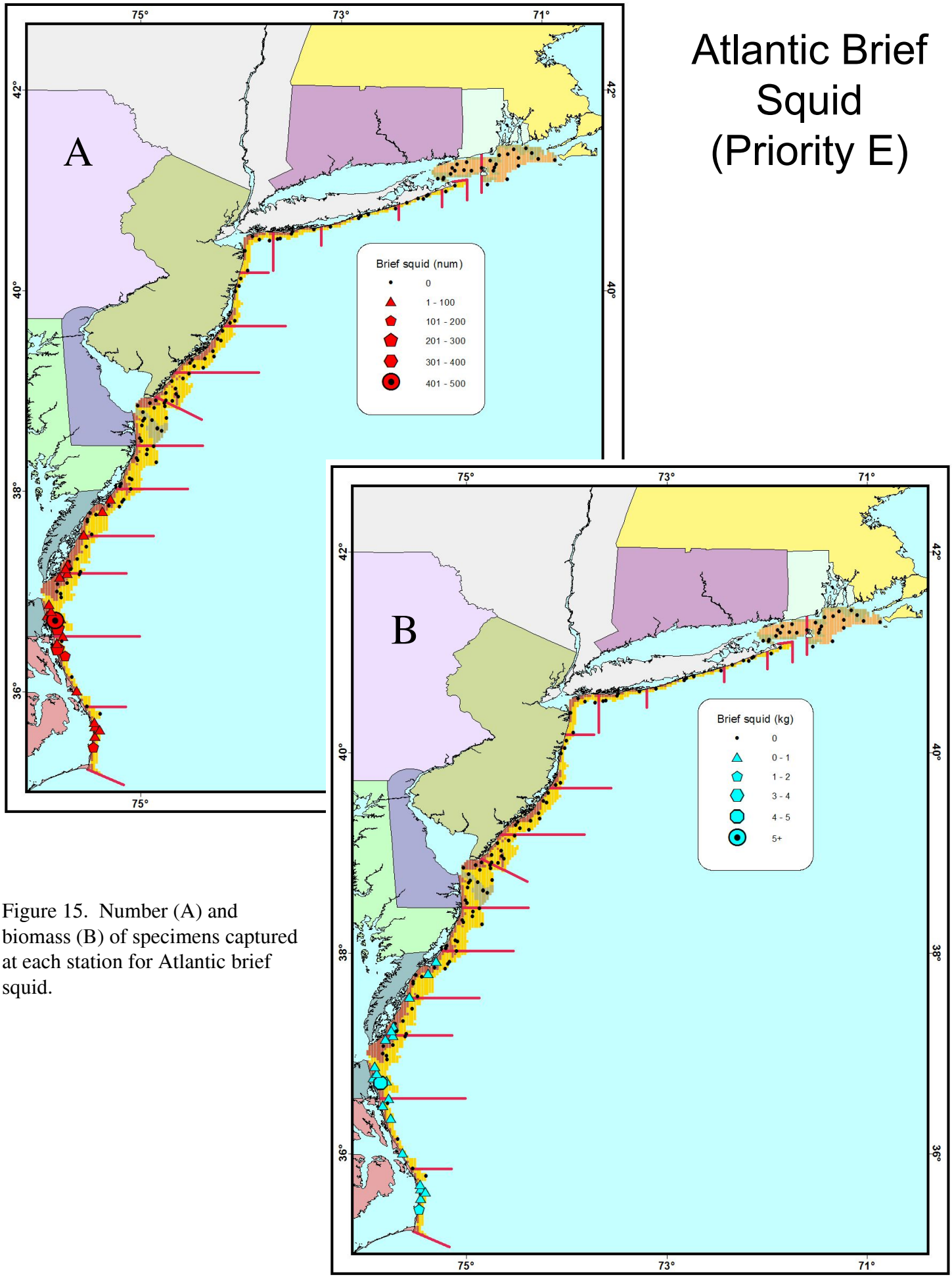


Figure 15. Number (A) and biomass (B) of specimens captured at each station for Atlantic brief squid.

Table 8. Number, biomass, minimum and maximum size of specimens captured, by state and region, for American brief squid.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38	15	945	10.122	0	233	18	106	53		2.12	0.15
NC	13	9	642	7.401	0	218	27	90	51		10.84	0.39
Total	150	24	1587	17.523	0	451	18	106	52		0.69	0.07

Figure 16. Geometric mean catch per area swept by state and overall, with summary catch rates, for Atlantic brief squid.

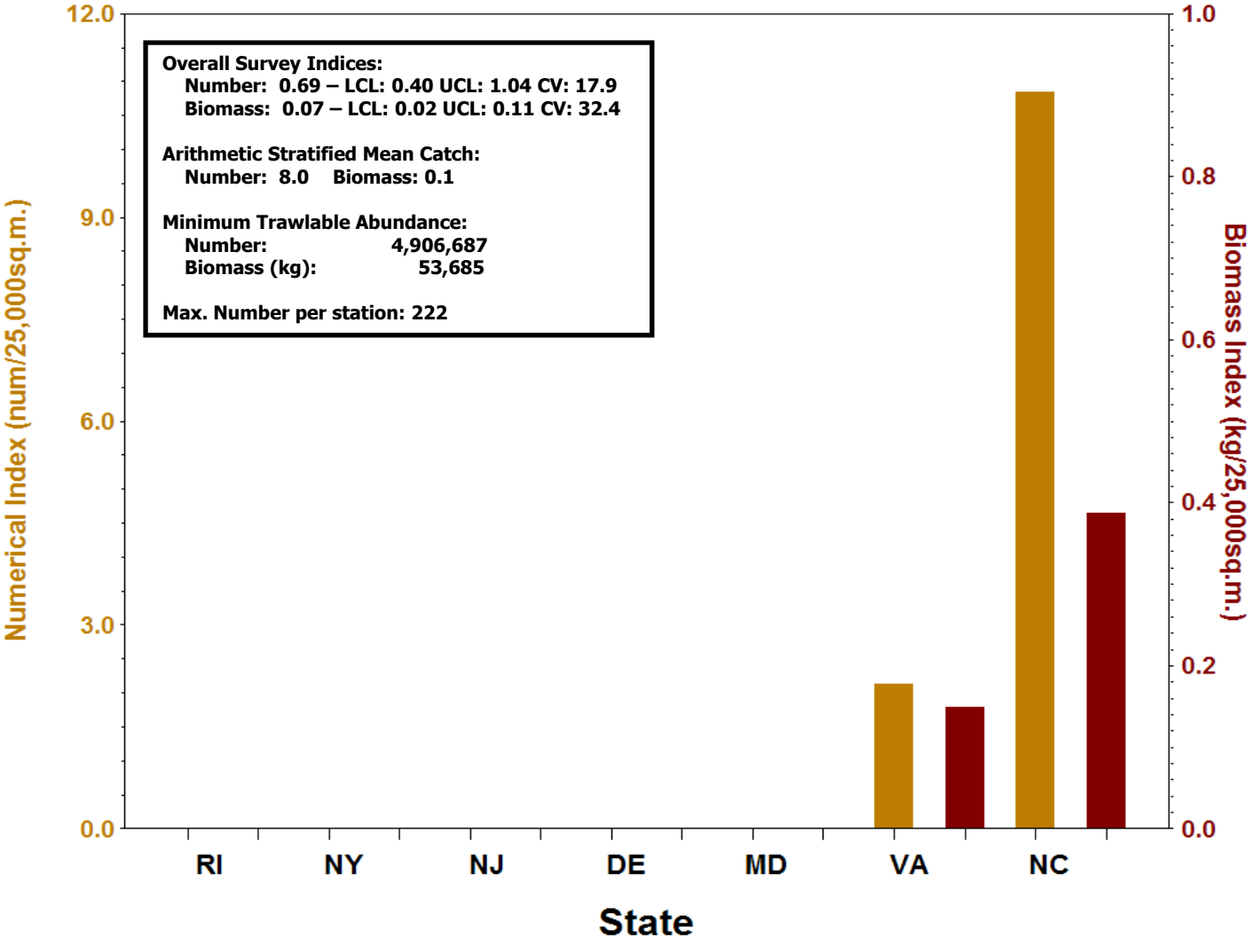
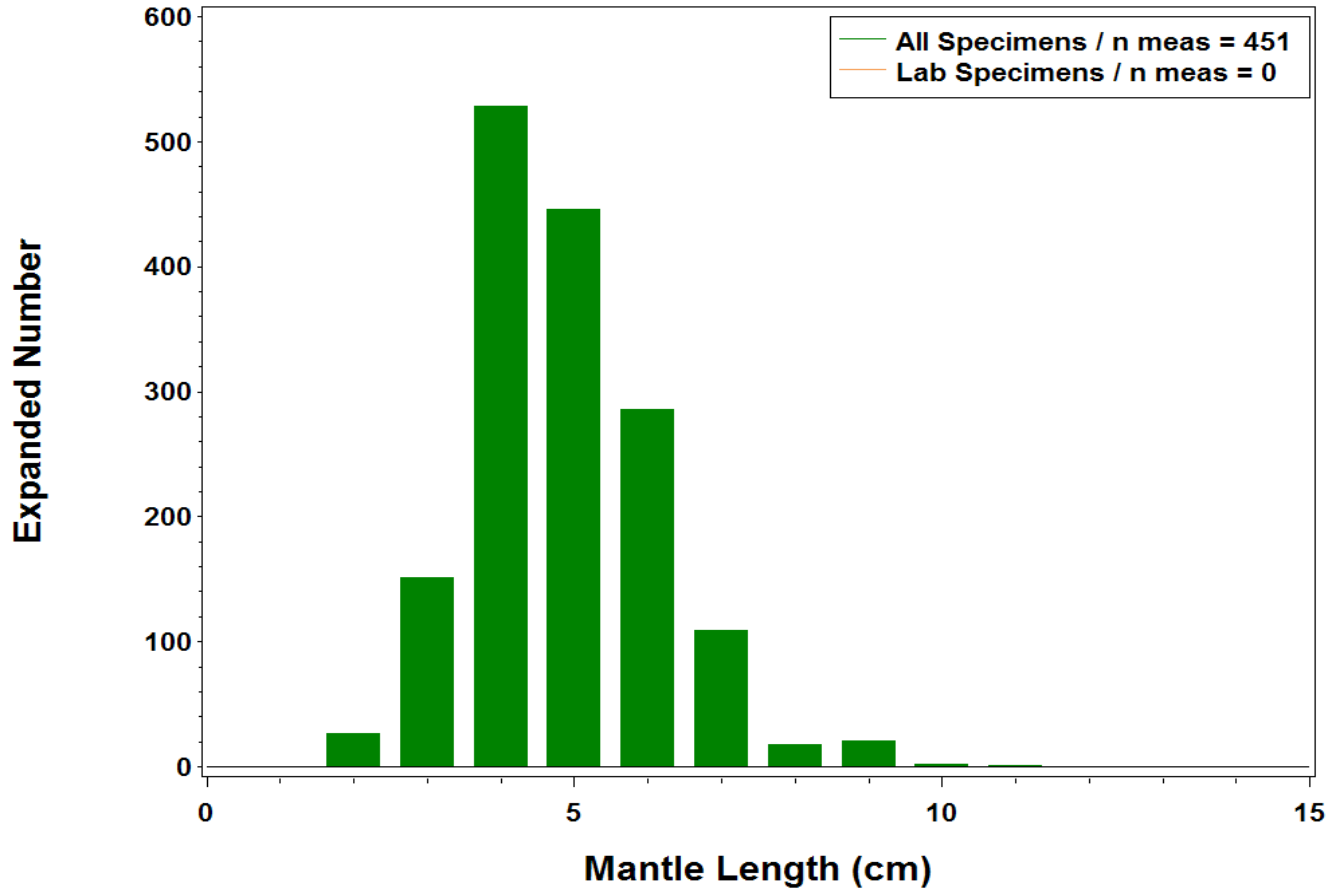


Figure 17. Length frequency histogram for Atlantic brief squid.



Atlantic Croaker (Priority B)

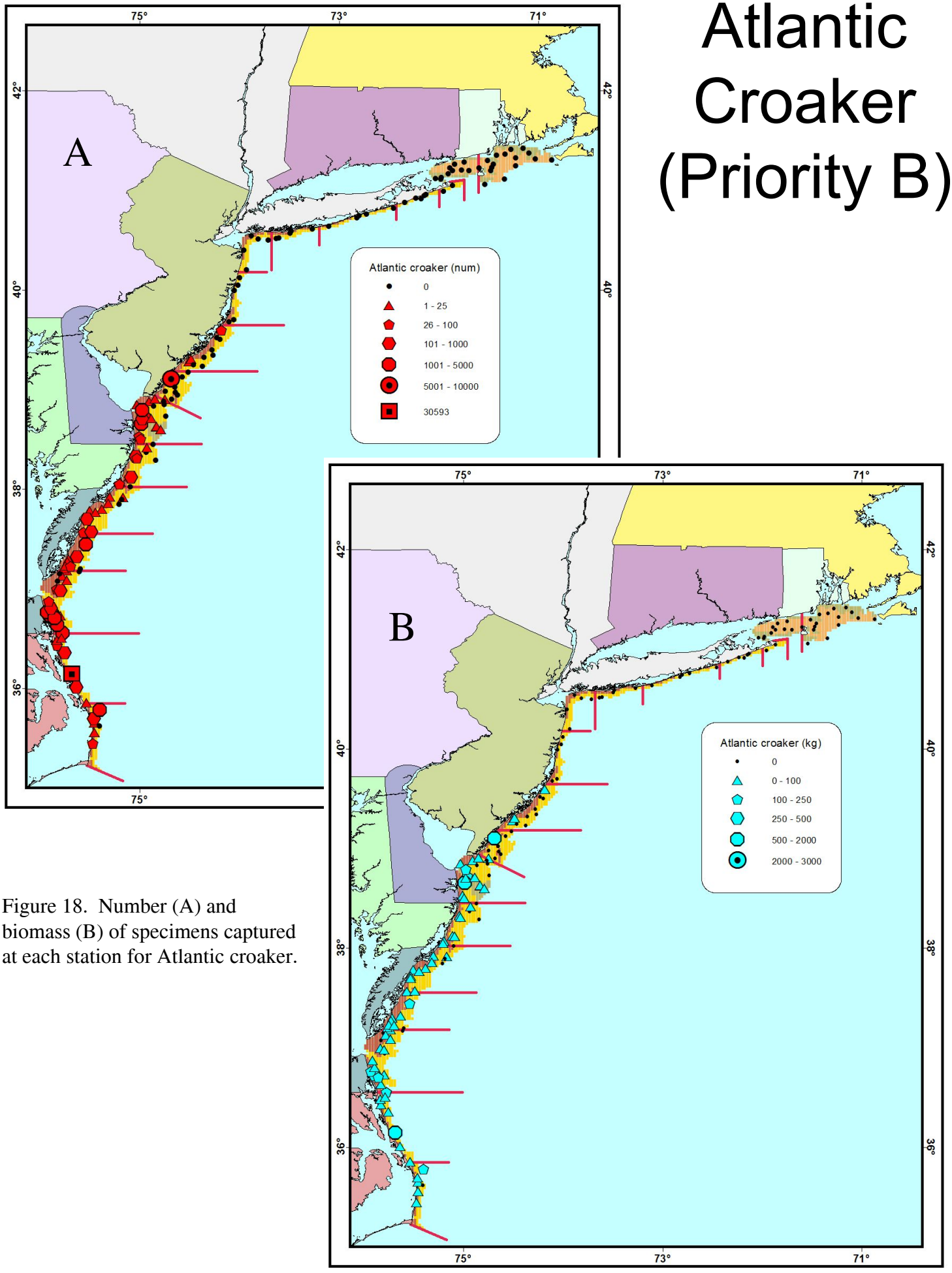


Figure 18. Number (A) and biomass (B) of specimens captured at each station for Atlantic croaker.

Table 9. Number, biomass, minimum and maximum size of specimens captured, by state and region, for Atlantic croaker.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24	5	6669	597.860	26	460	125	396	188	0.272	1.03	0.59
DE	17	13	8386	1030.832	65	949	149	444	212	0.271	149.84	27.23
MD	10	7	1421	125.802	28	173	135	317	186	0.115	11.92	2.43
VA	38	30	16868	1296.707	141	1670	135	319	177	0.112	19.61	4.06
NC	13	12	33479	2071.963	47	339	121	214	168	0.060	48.64	6.07
Total	150	67	66823	5123.164	307	3591	121	444	187	0.151	4.48	1.37

Figure 19. Geometric mean catch per area swept by state and overall, with summary catch rates, for Atlantic croaker.

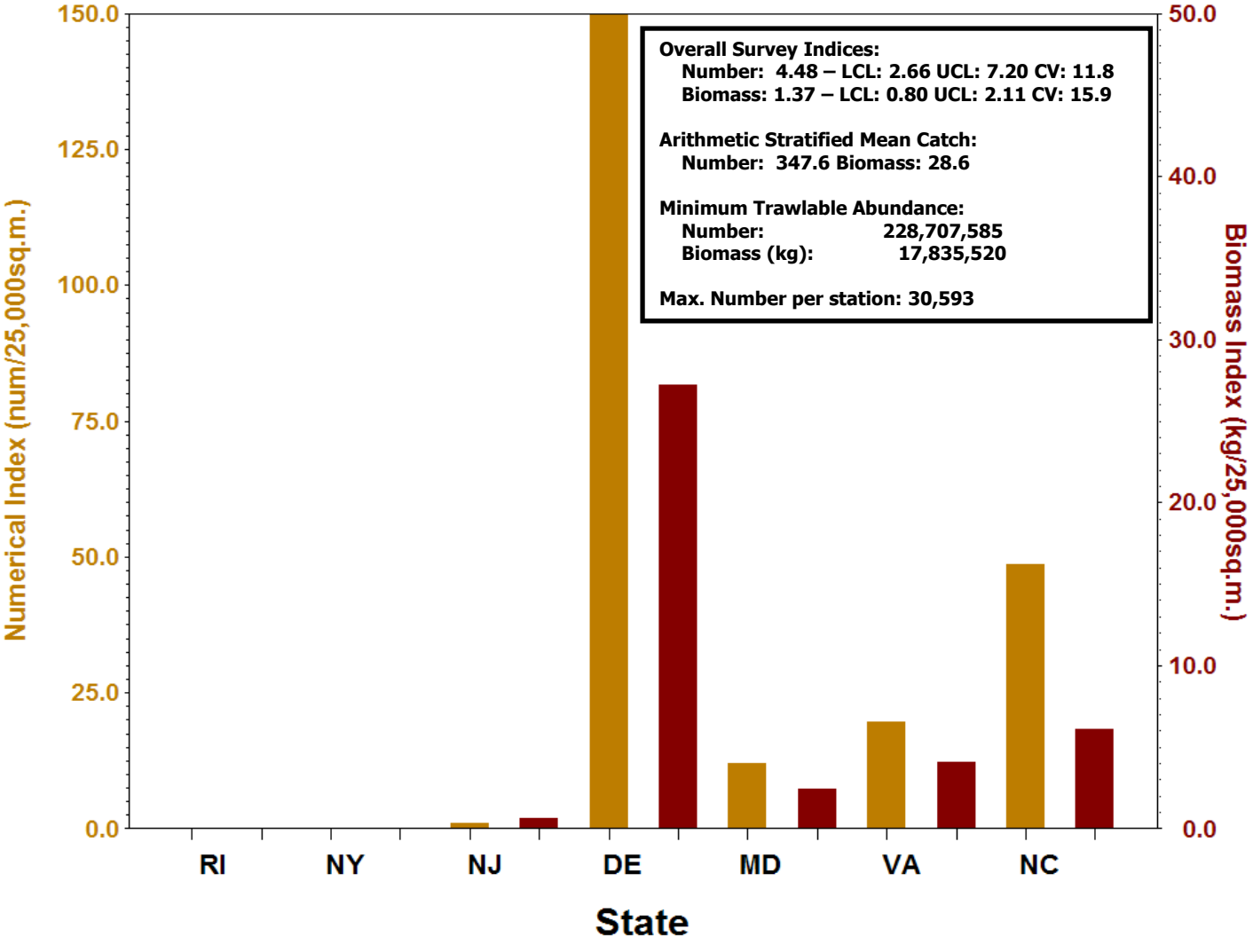


Figure 20. Length frequency histogram for Atlantic croaker.

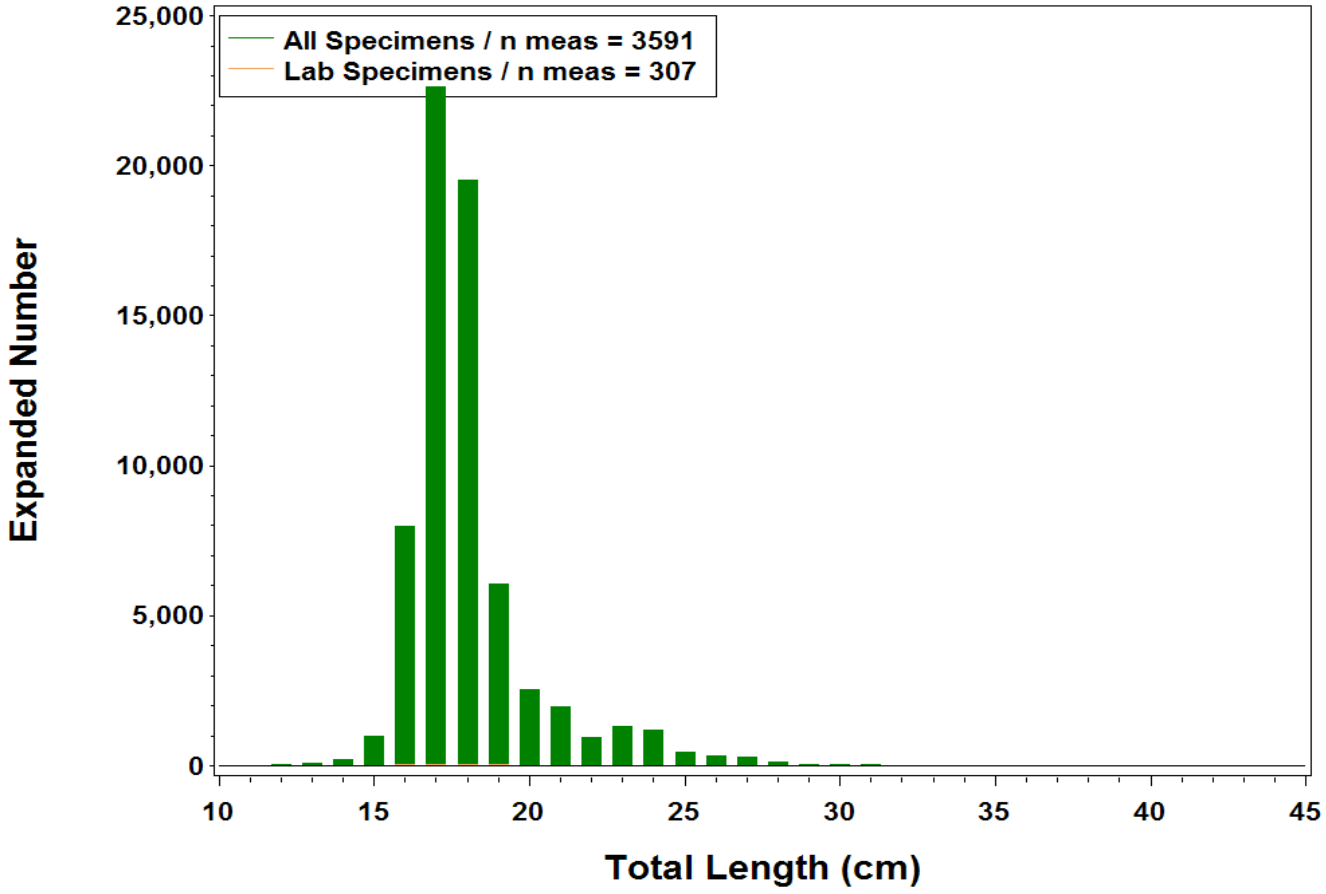


Figure 21. Sex-specific length frequencies histogram for Atlantic croaker.

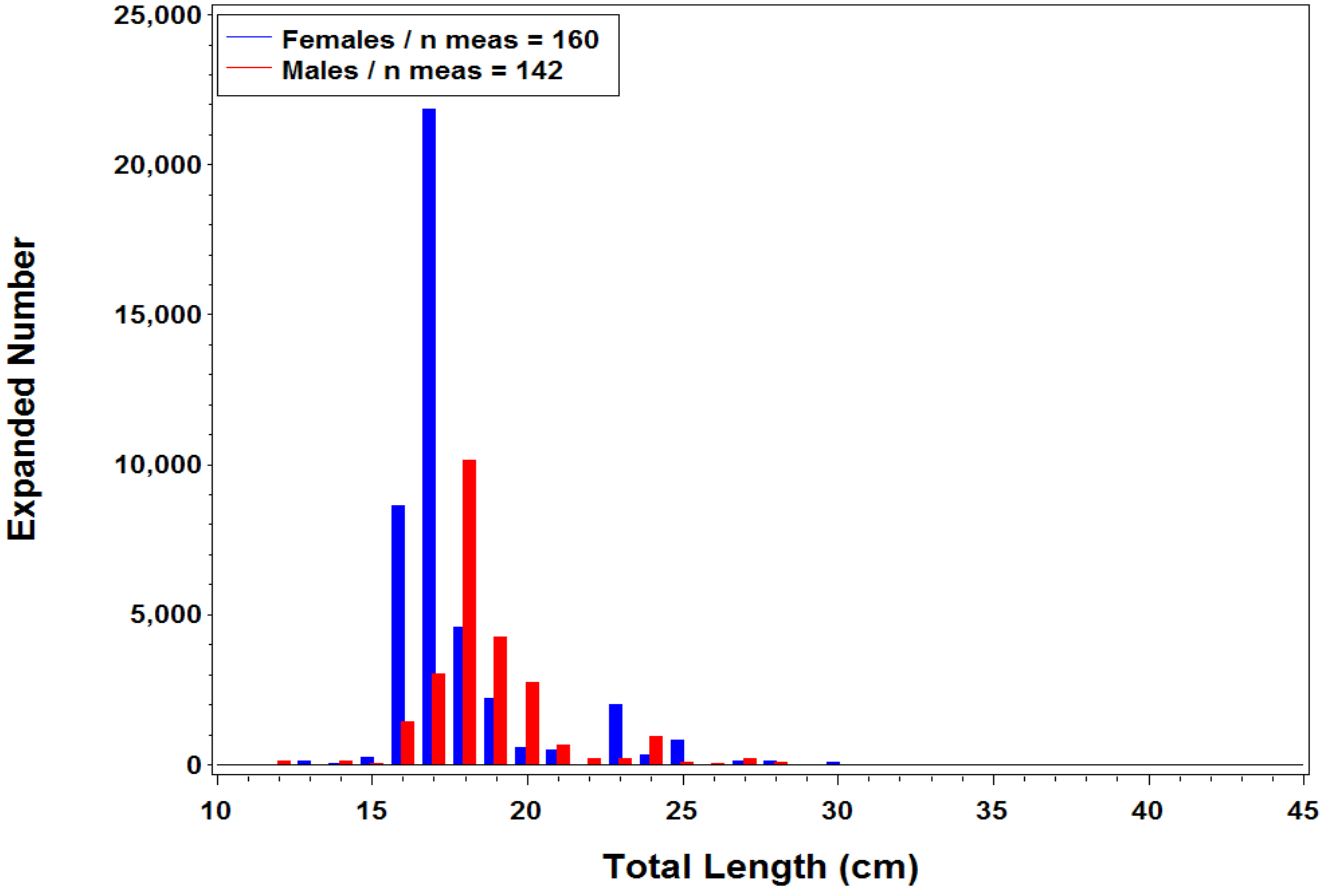
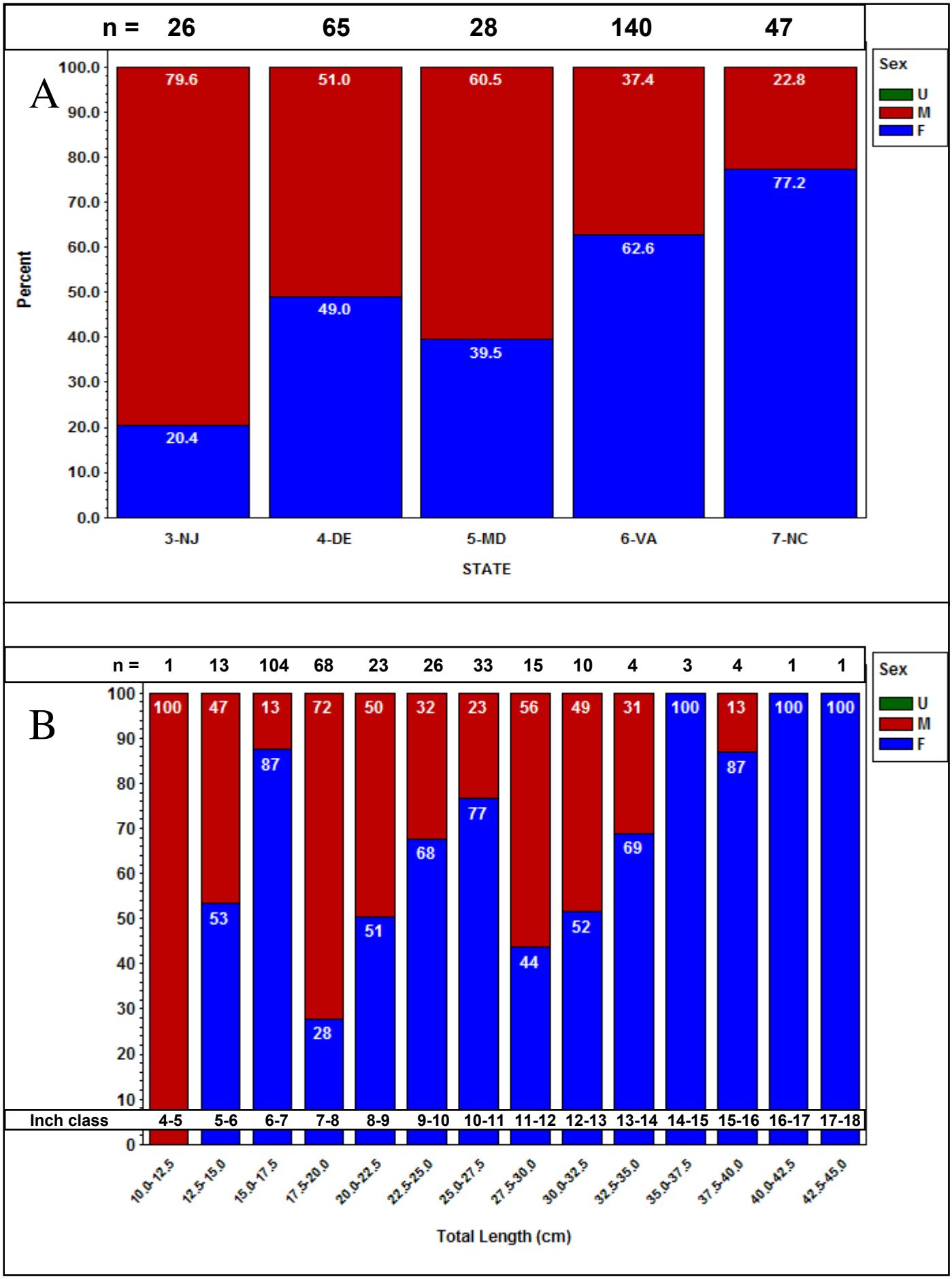


Figure 22. Sex ratios for Atlantic croaker by state (A) and length group (B).



Atlantic Menhaden (Priority B)

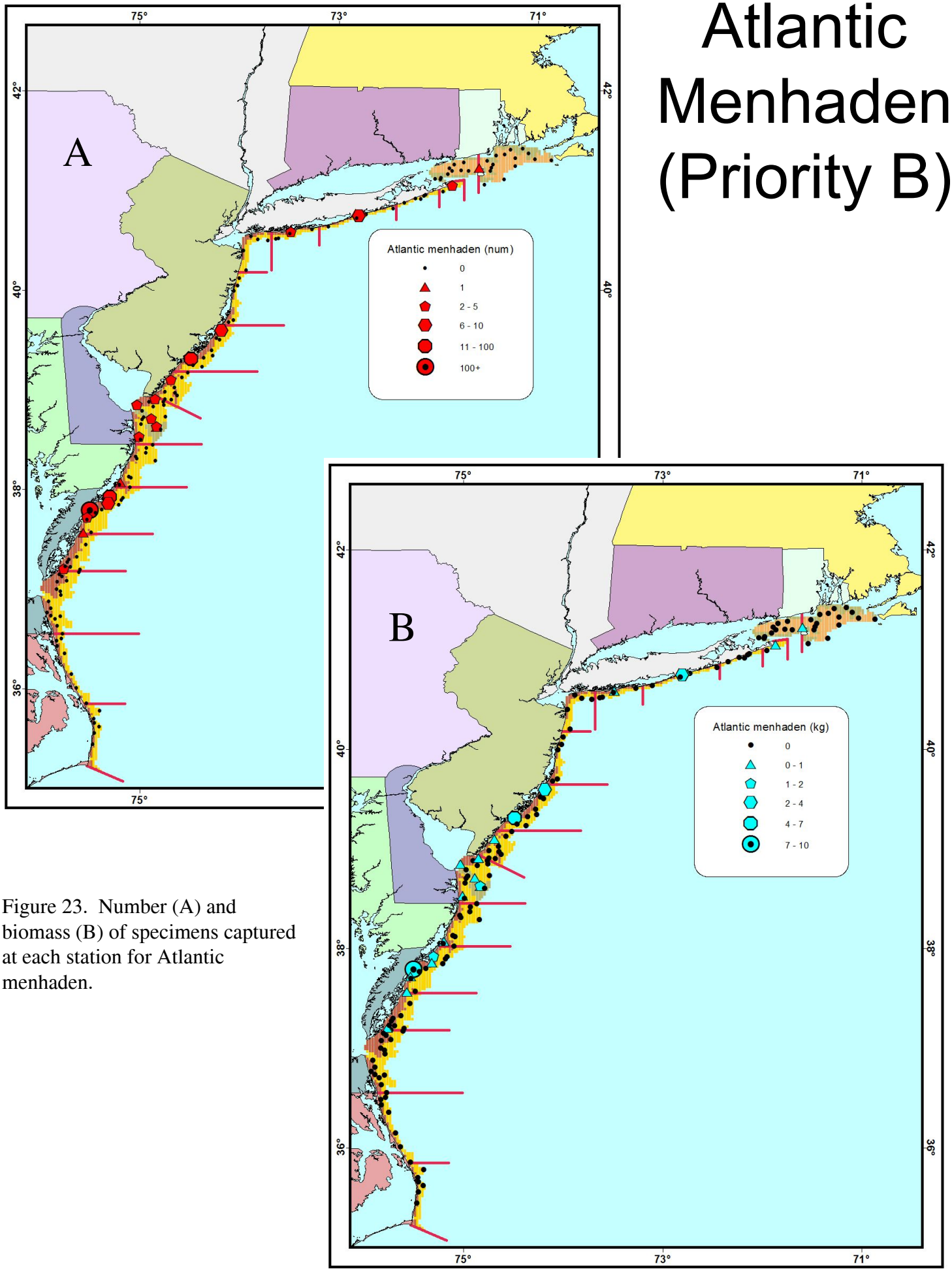


Figure 23. Number (A) and biomass (B) of specimens captured at each station for Atlantic menhaden.

Table 10. Number, biomass, minimum and maximum size of specimens captured, by state and region, for Atlantic menhaden.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	1	1	0.312	1	1	269	269	269	0.312	0.02	0.01
NY	22	3	15	3.049	14	15	105	312	209	0.190	0.22	0.07
NJ	24	3	23	7.938	13	23	241	324	281	0.365	0.27	0.15
DE	17	6	12	3.492	12	12	244	288	262	0.291	0.94	0.32
MD	10	1	1	0.042	1	1	118	118	118	0.042	0.07	0.00
VA	38	6	156	10.159	27	156	98	298	137	0.117	0.35	0.10
NC	13										0.00	0.00
Total	150	20	208	24.992	68	208	98	324	166	0.212	0.34	0.10

Figure 24. Geometric mean catch per area swept by state and overall, with summary catch rates, for Atlantic menhaden.

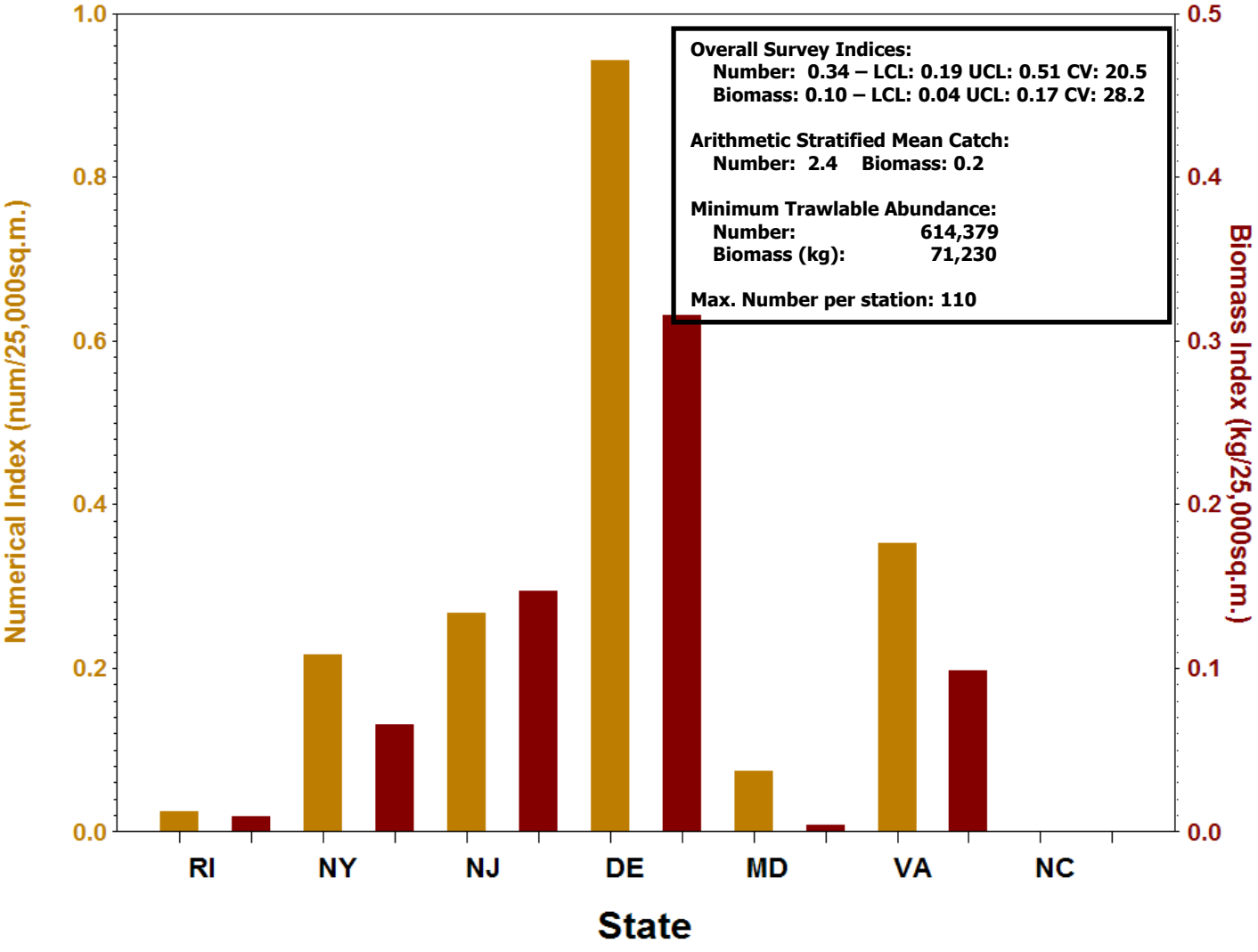


Figure 25. Length frequency histogram for Atlantic menhaden.

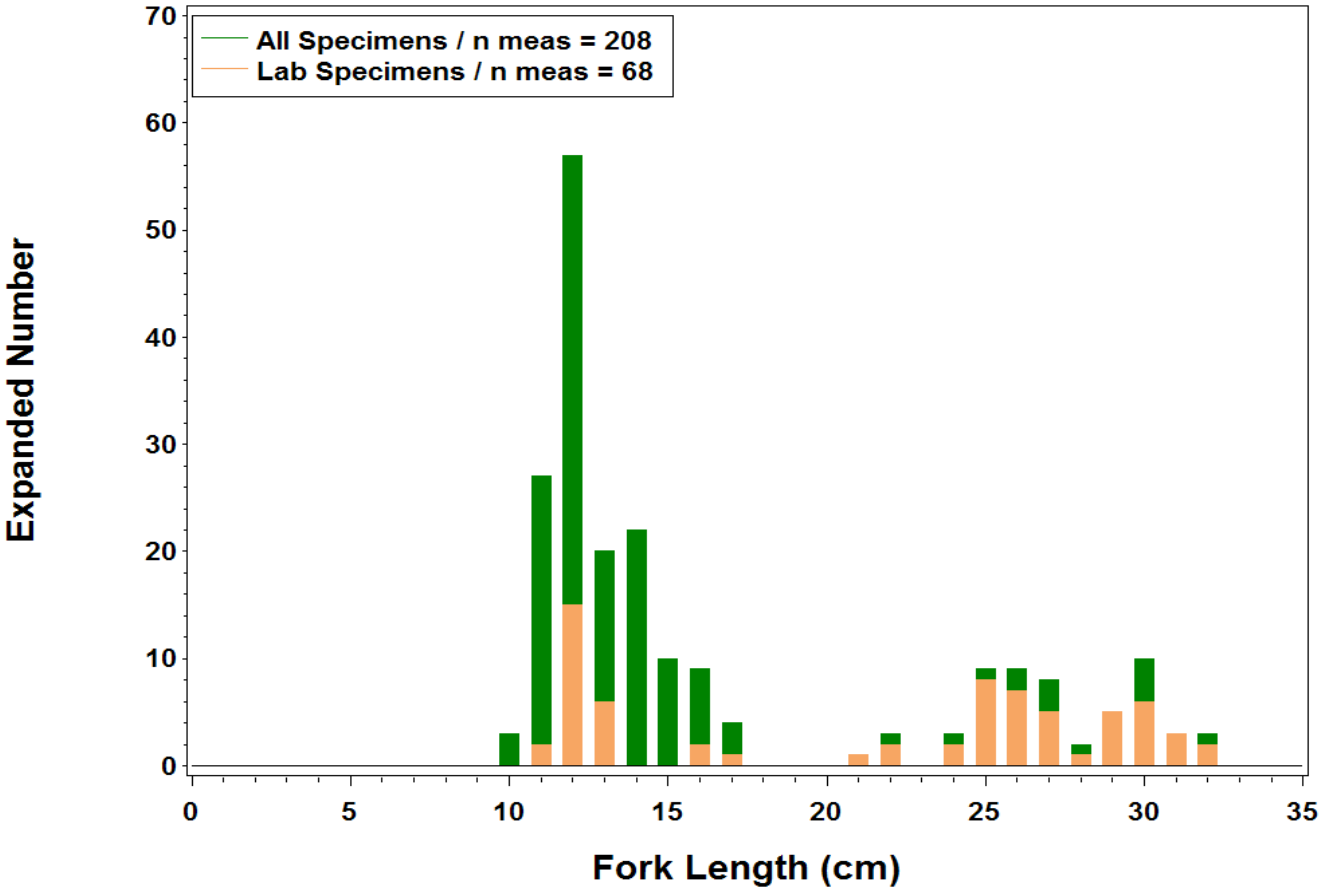


Figure 26. Sex-specific length frequencies histogram for Atlantic menhaden.

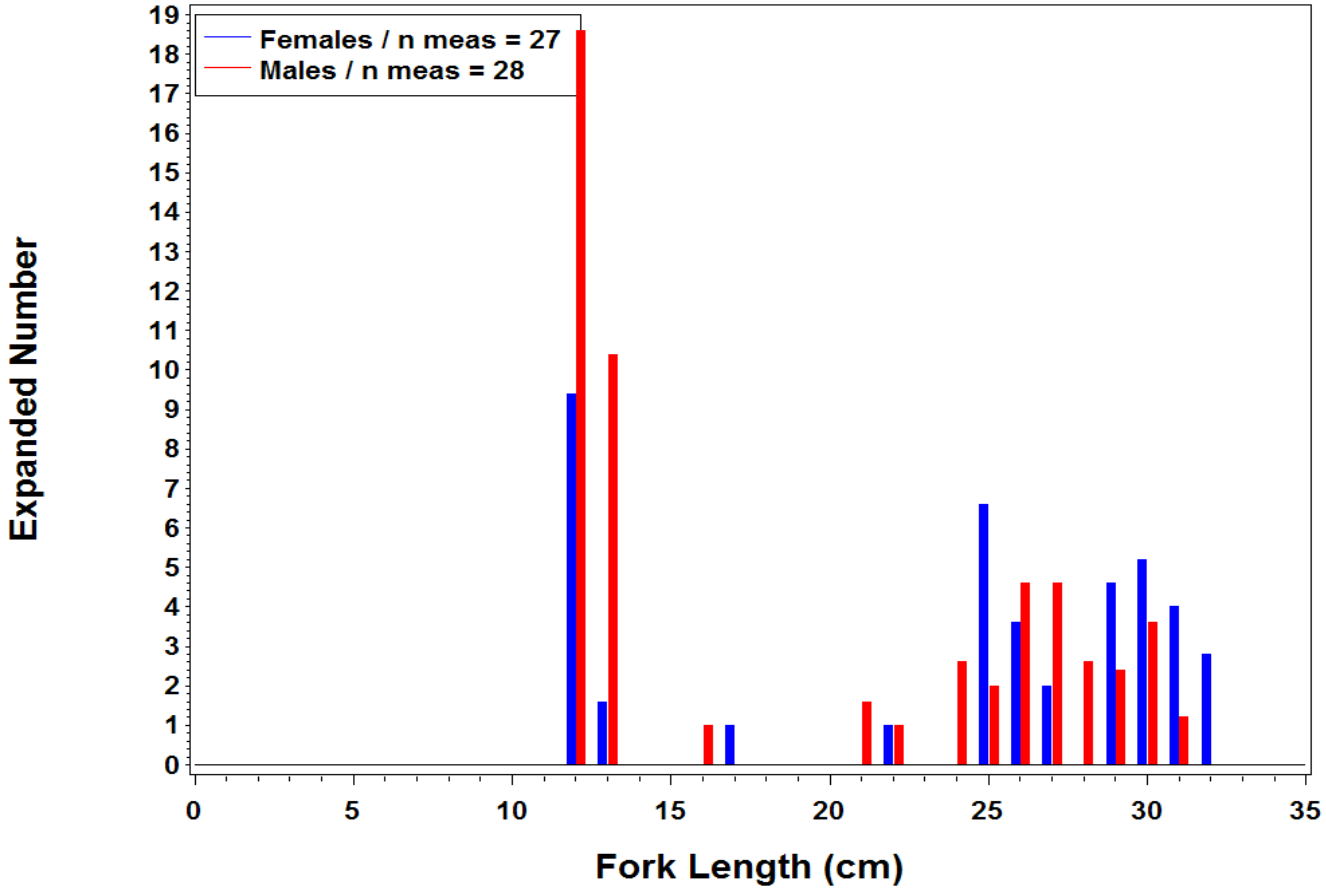
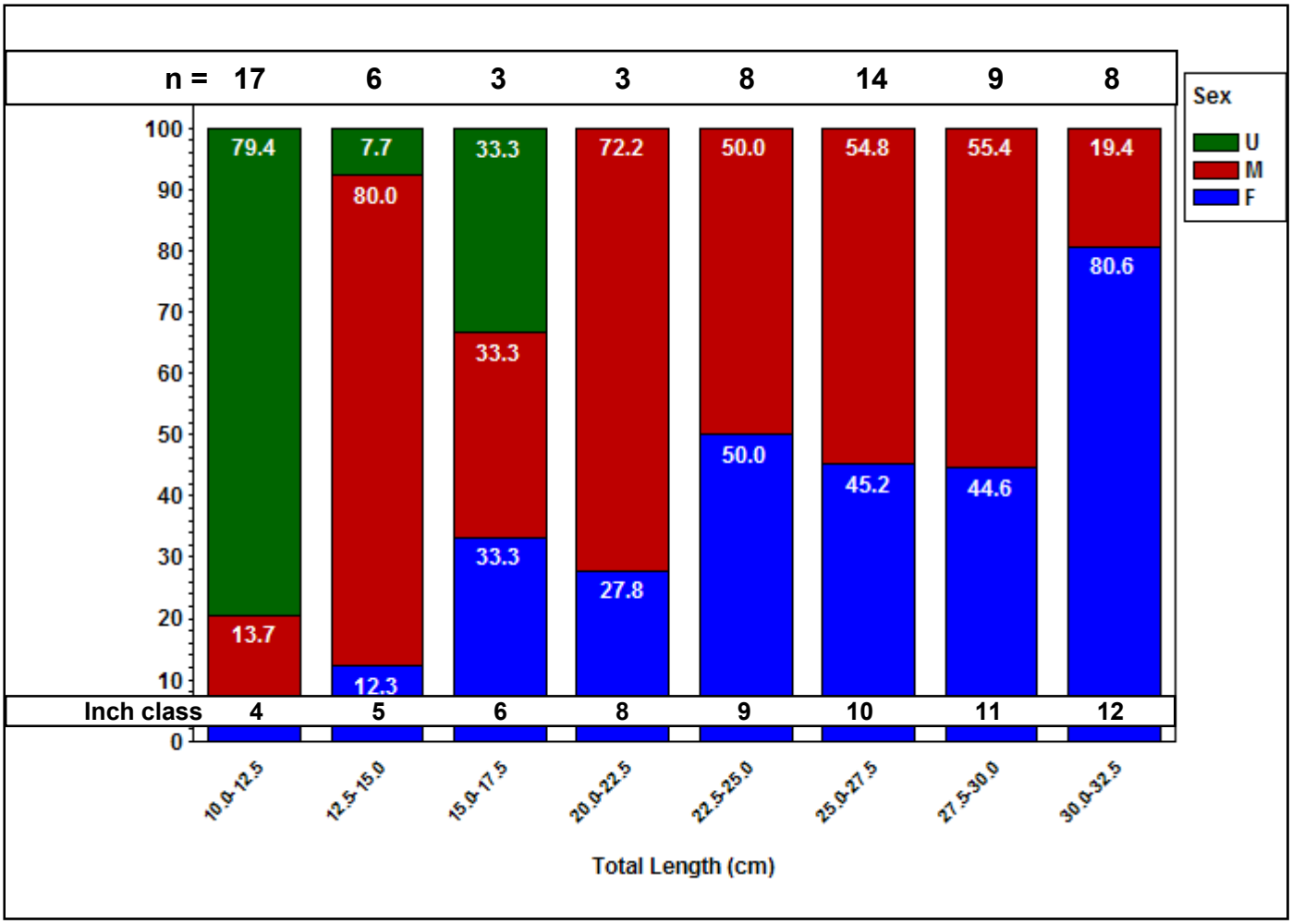


Figure 27. Sex ratios for Atlantic menhaden by length group.



Atlantic Spadefish (Priority D)

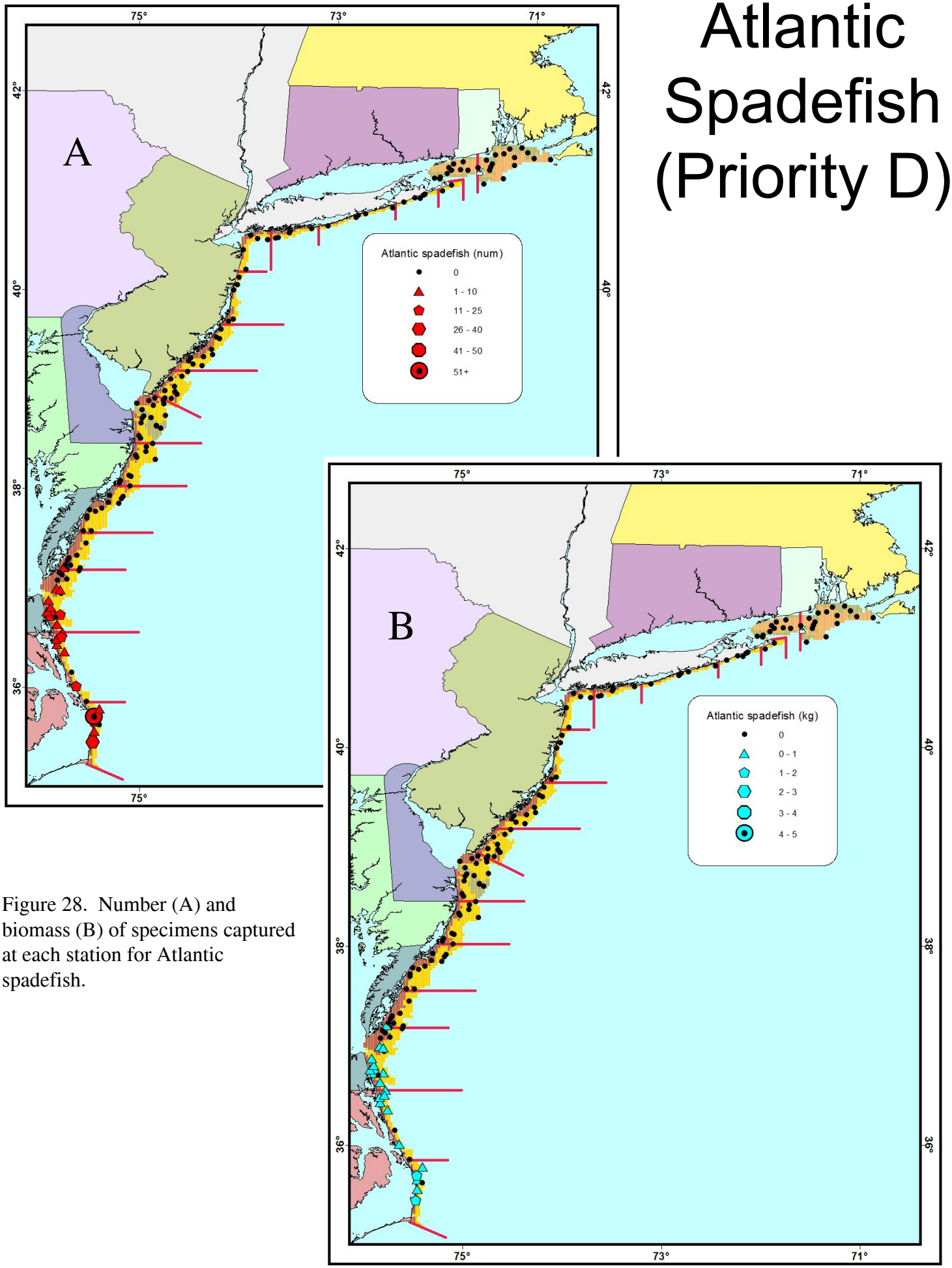


Figure 28. Number (A) and biomass (B) of specimens captured at each station for Atlantic spadefish.

Table 11. Number, biomass, minimum and maximum size of specimens captured, by state and region, for Atlantic spadefish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38	10	86	2.775	0	52	59	108	91		0.63	0.06
NC	13	10	145	5.197	0	145	68	117	93		4.69	0.33
Total	150	20	231	7.972	0	197	59	117	93		0.29	0.04

Figure 29. Geometric mean catch per area swept by state and overall, with summary catch rates, for Atlantic spadefish.

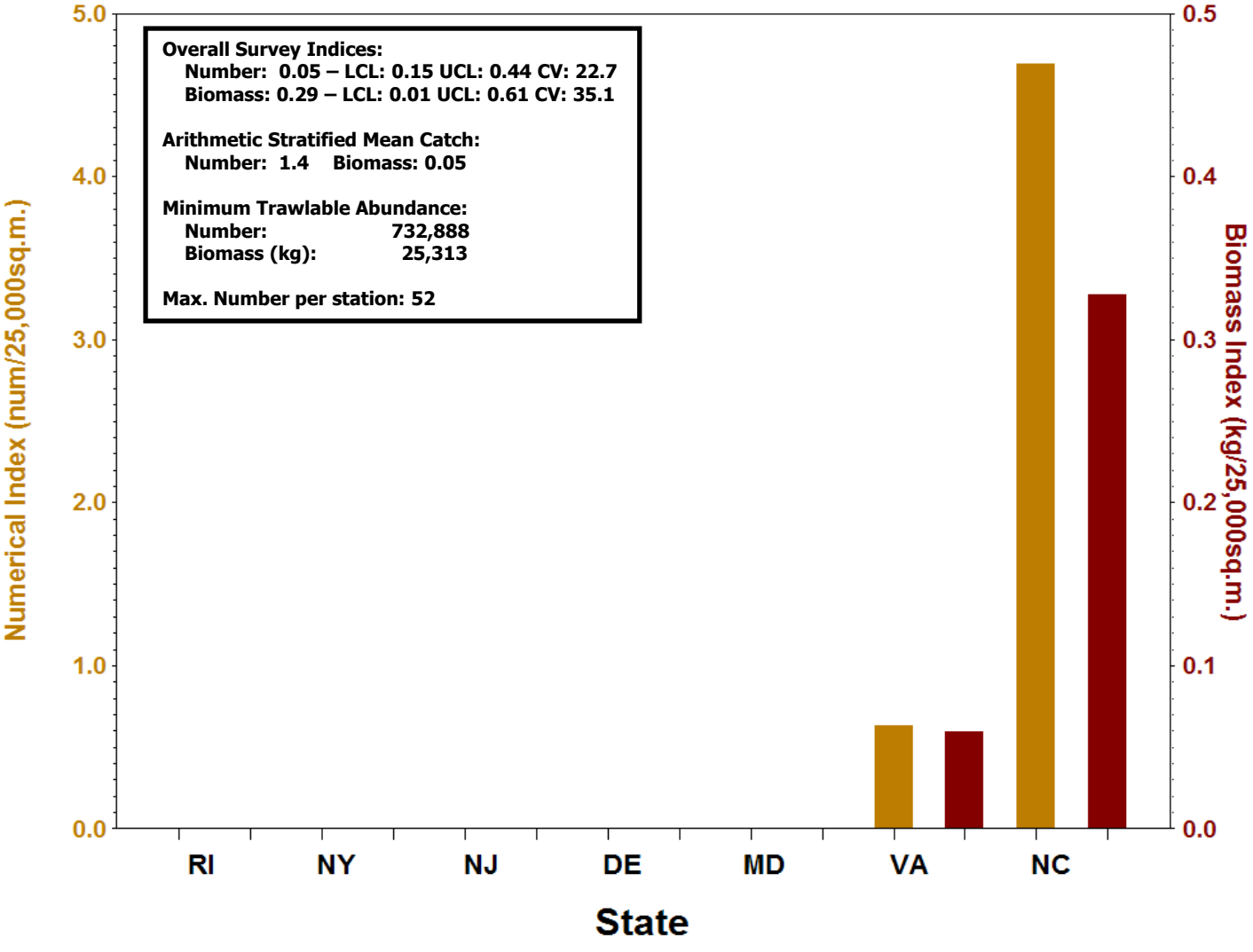
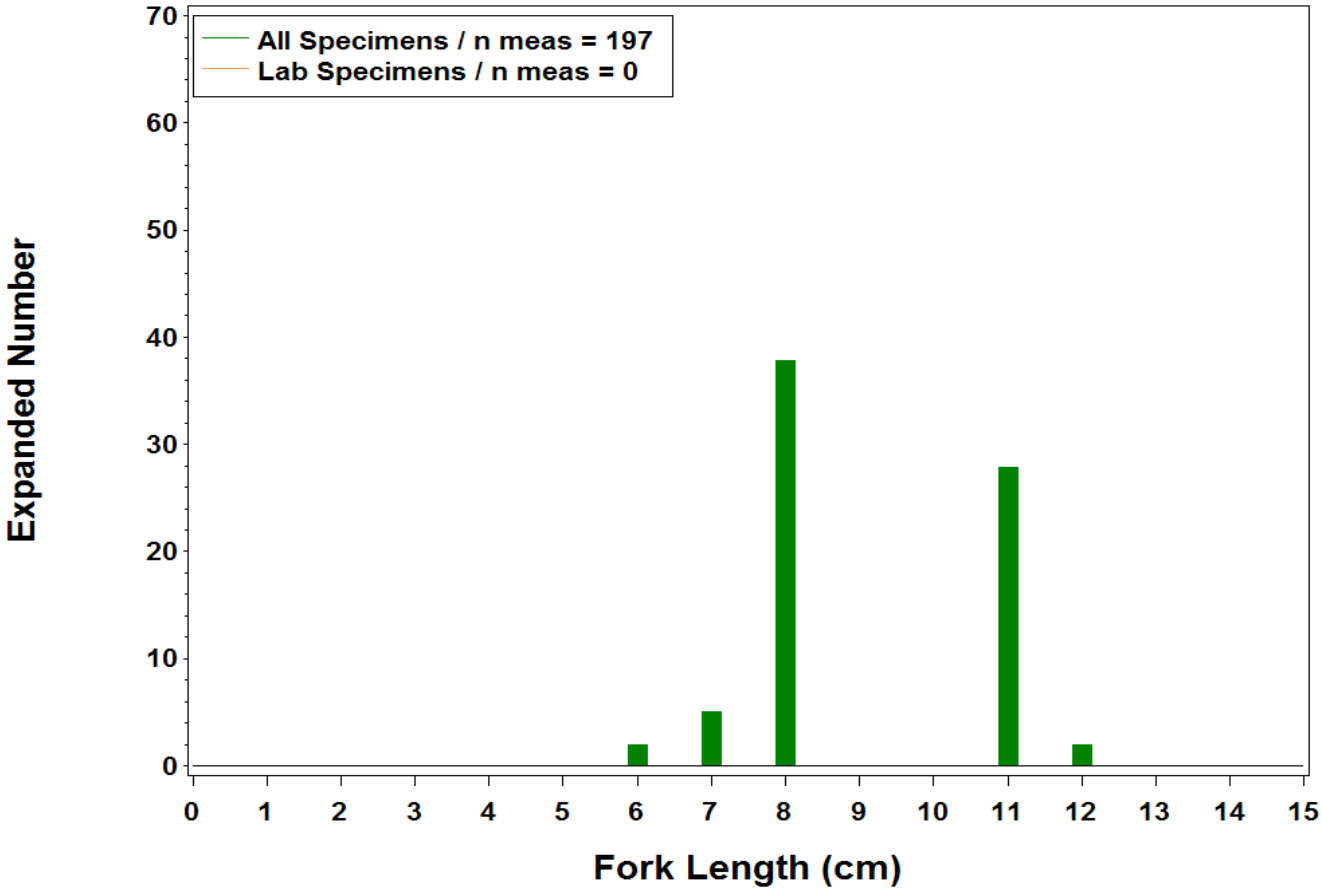


Figure 30. Length frequency histogram for Atlantic spadefish.



Atlantic Thread Herring (Priority D)

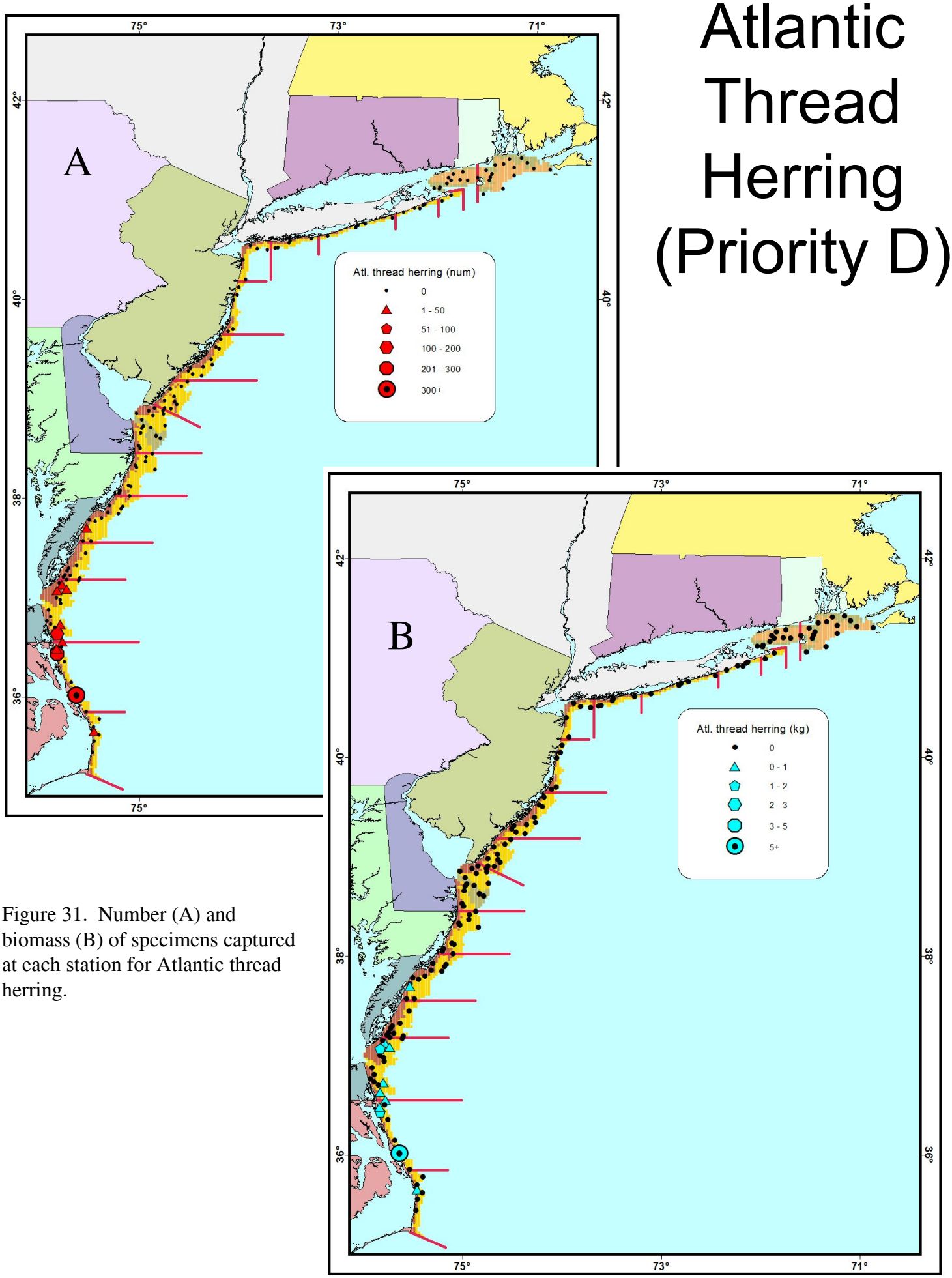


Figure 31. Number (A) and biomass (B) of specimens captured at each station for Atlantic thread herring.

Table 12. Number, biomass, minimum and maximum size of specimens captured, by state and region, for Atlantic thread herring.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38	7	156	3.288	0	85	59	241	102		0.40	0.06
NC	13	4	645	8.726	0	207	57	179	78		2.18	0.29
Total	150	11	801	12.014	0	292	57	241	85		0.26	0.04

Figure 32. Geometric mean catch per area swept by state and overall, with summary catch rates, for Atlantic thread herring.

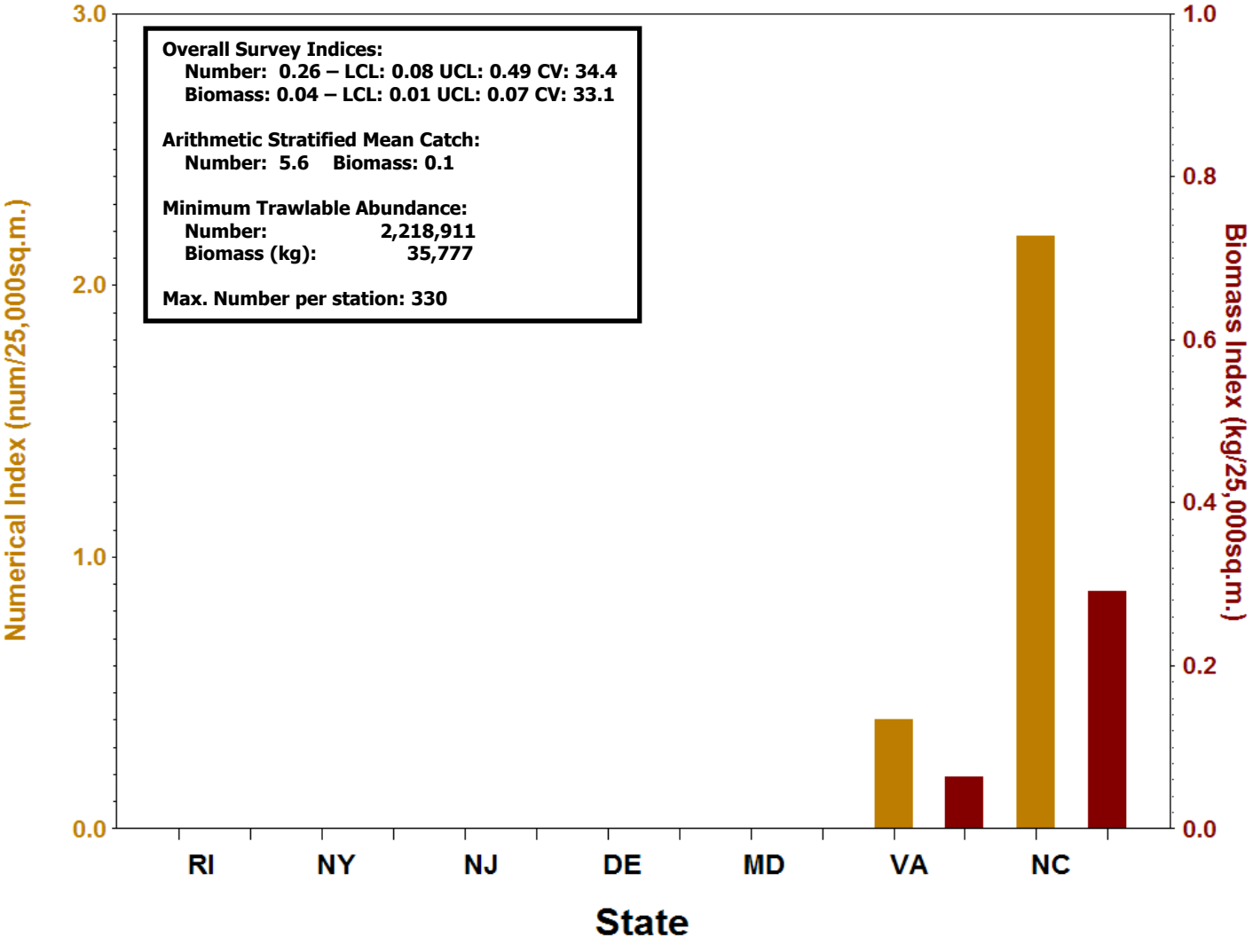
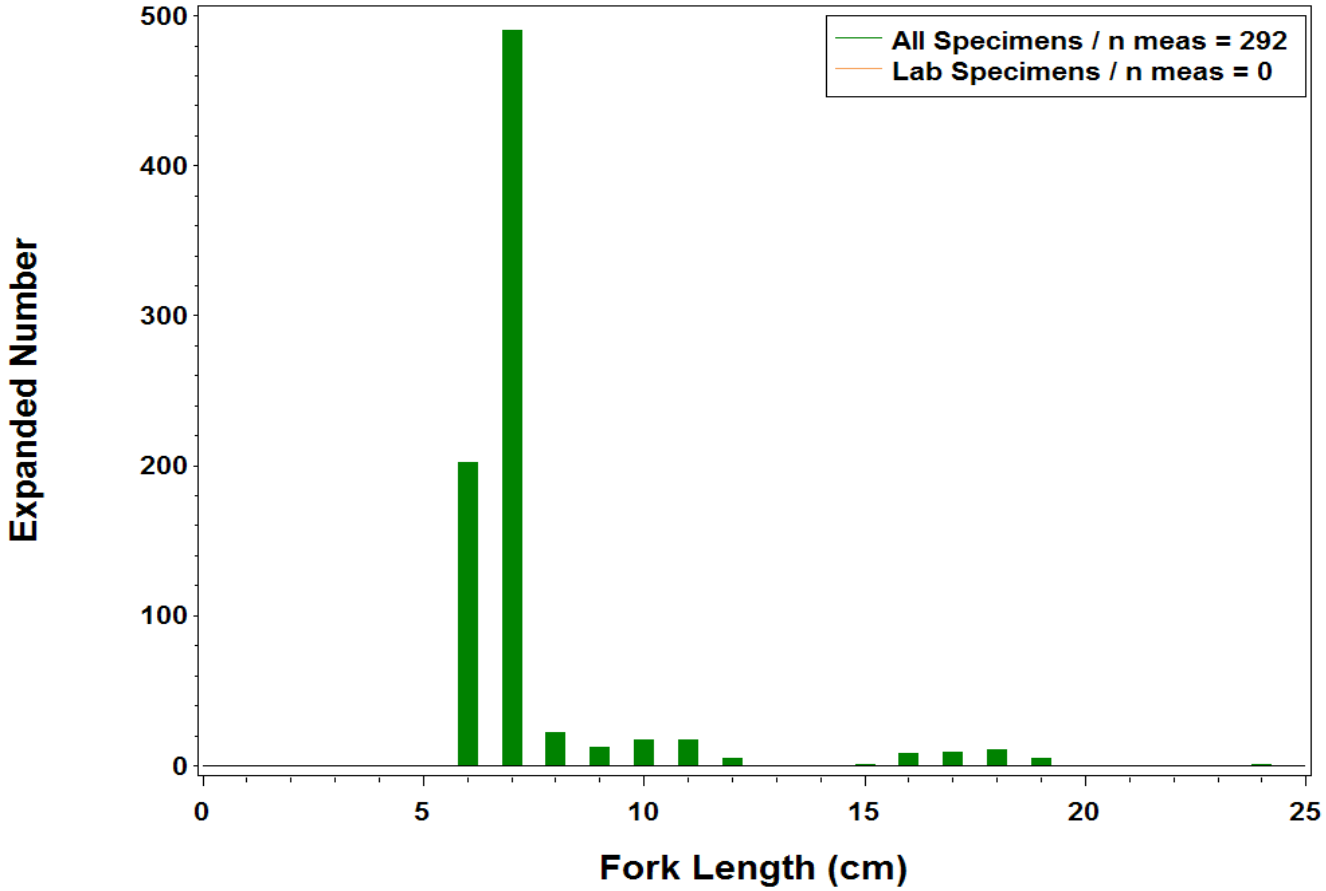


Figure 33. Length frequency histogram for Atlantic thread herring.



Bay Anchovy (Priority D)

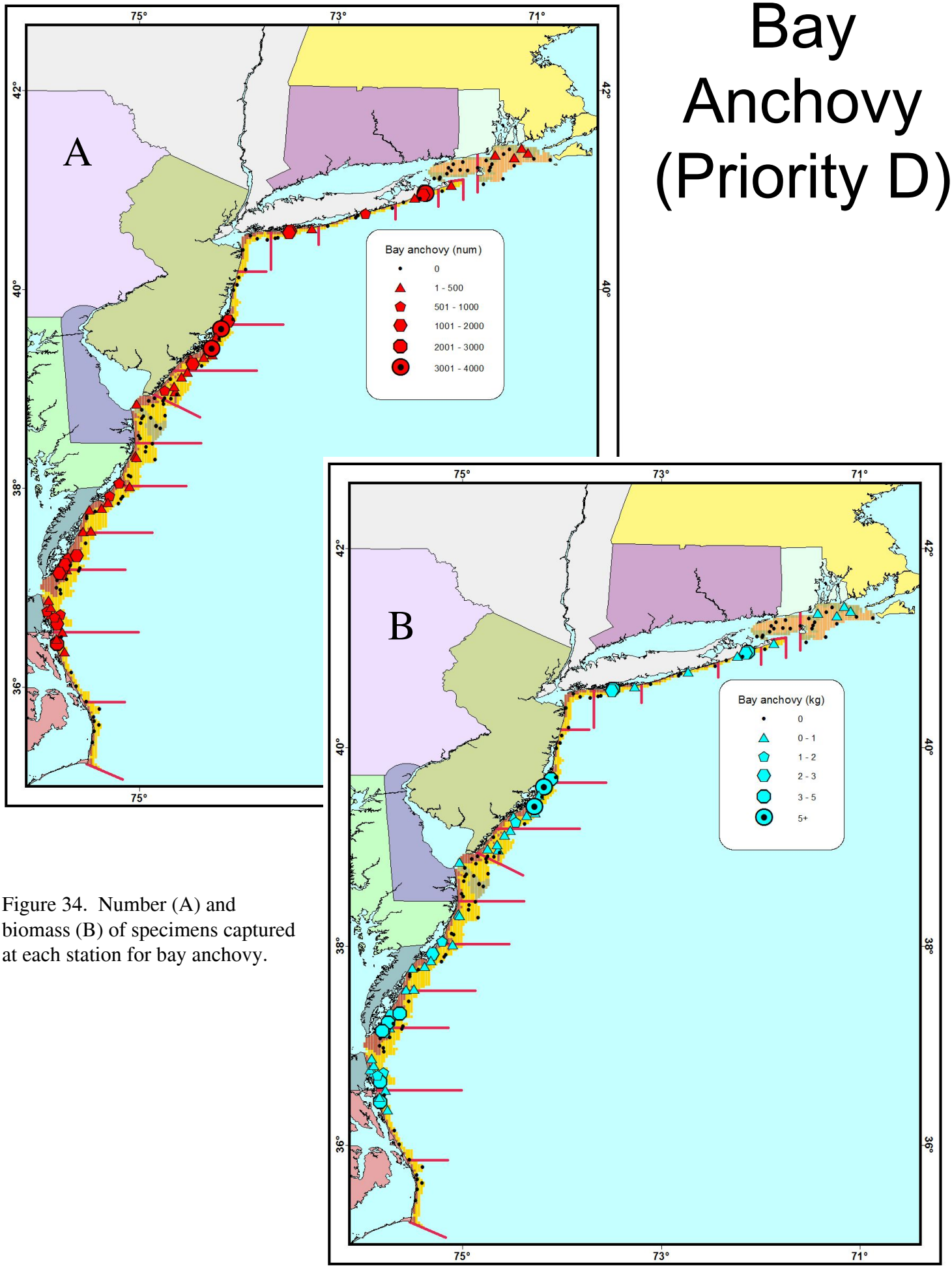


Figure 34. Number (A) and biomass (B) of specimens captured at each station for bay anchovy.

Table 13. Number, biomass, minimum and maximum size of specimens captured, by state and region, for bay anchovy.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	4	127	0.226	0	127	43	86	62		0.60	0.01
NY	22	8	8832	13.698	0	514	33	97	66		4.91	0.26
NJ	24	13	10643	21.434	0	491	38	94	66		12.08	0.36
DE	17	1	1	0.001	0	1	50	50	50		0.05	0.00
MD	10	4	1372	3.110	0	128	47	87	64		9.60	0.26
VA	38	22	12072	29.465	0	958	40	96	63		20.88	0.48
NC	13	3	2311	4.663	0	80	40	77	58		2.09	0.14
Total	150	55	35358	72.597	0	2299	33	97	64		8.84	0.32

Figure 35. Geometric mean catch per area swept by state and overall, with summary catch rates, for bay anchovy.

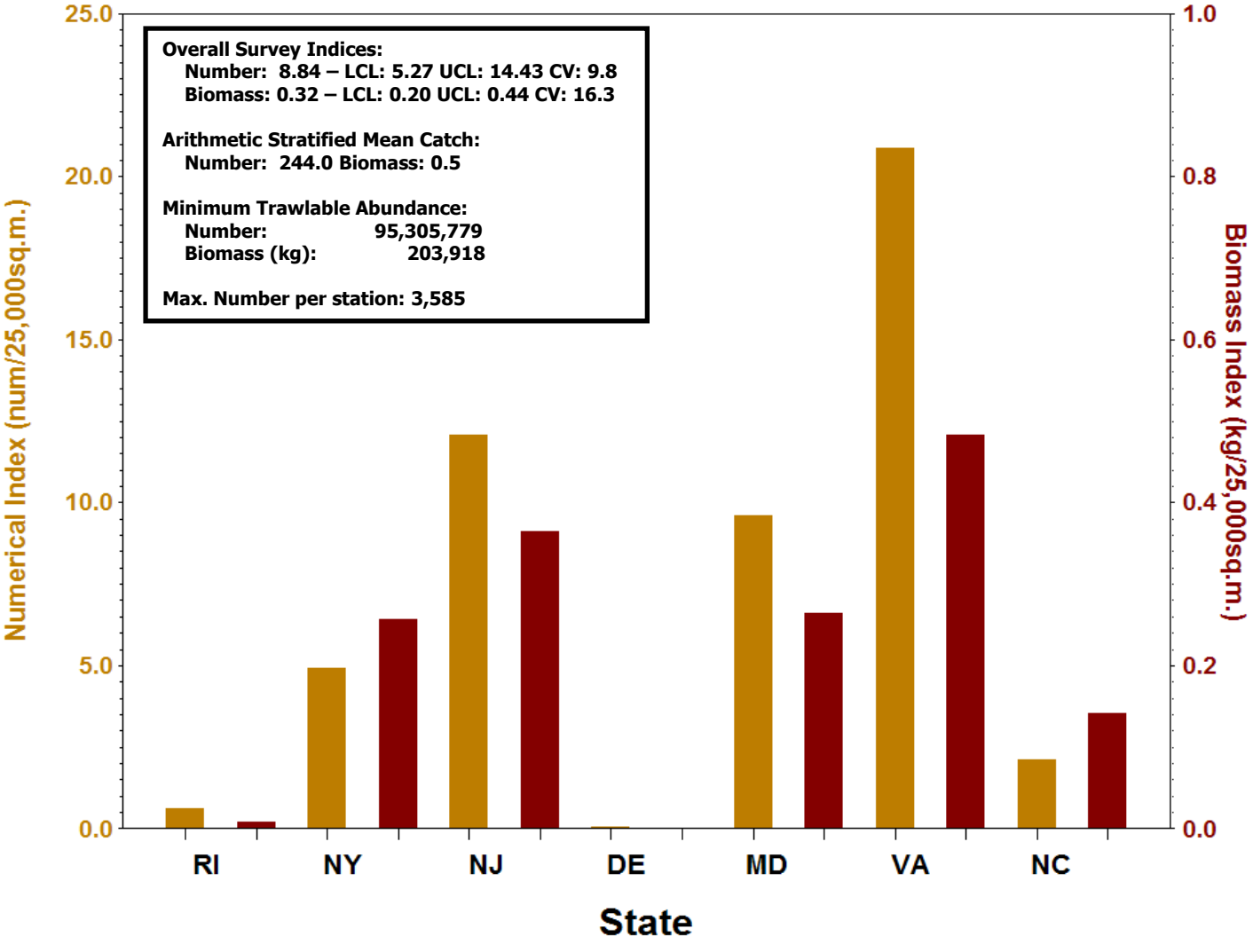
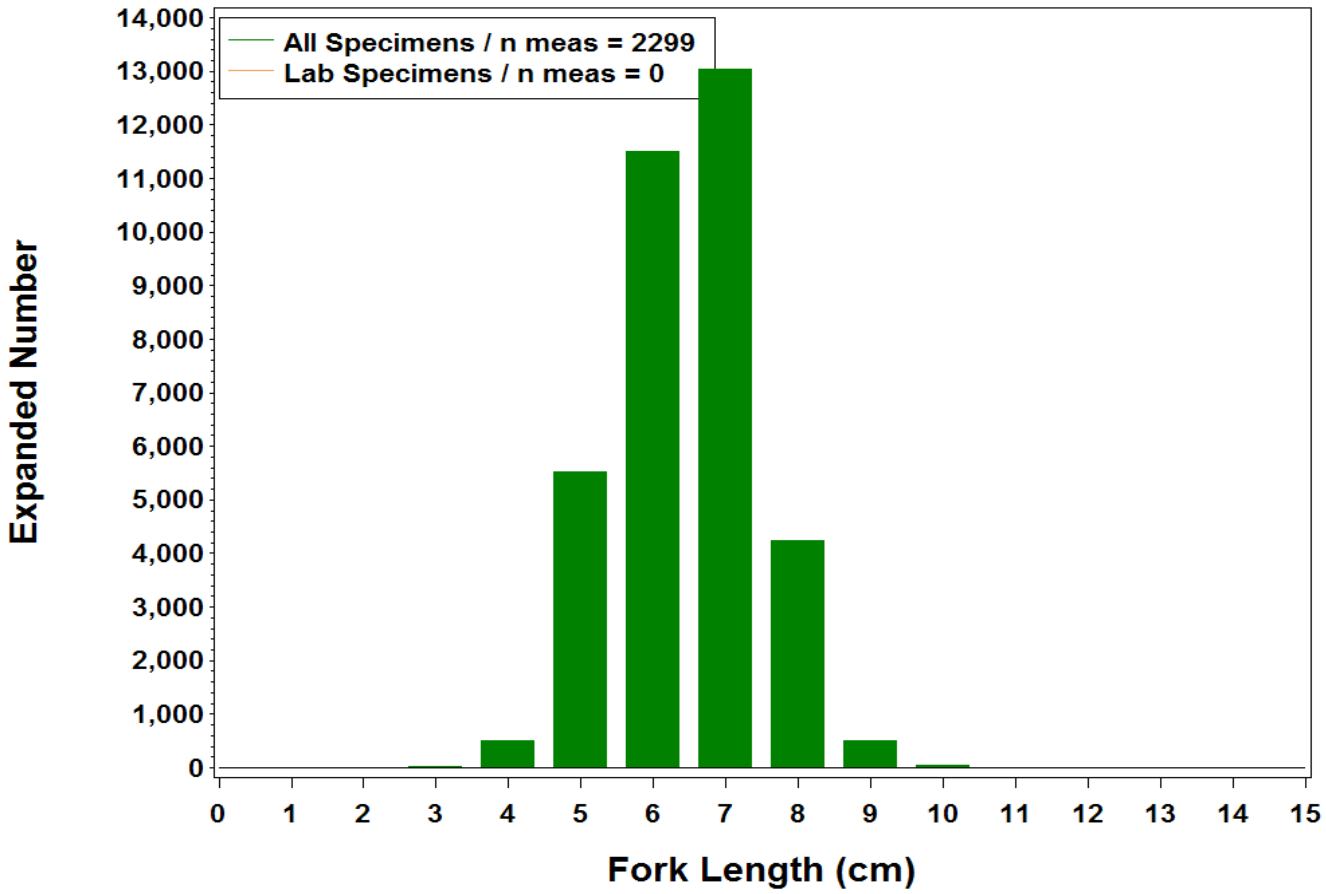


Figure 36. Length frequency histogram for bay anchovy.



Black Sea Bass (Priority A)

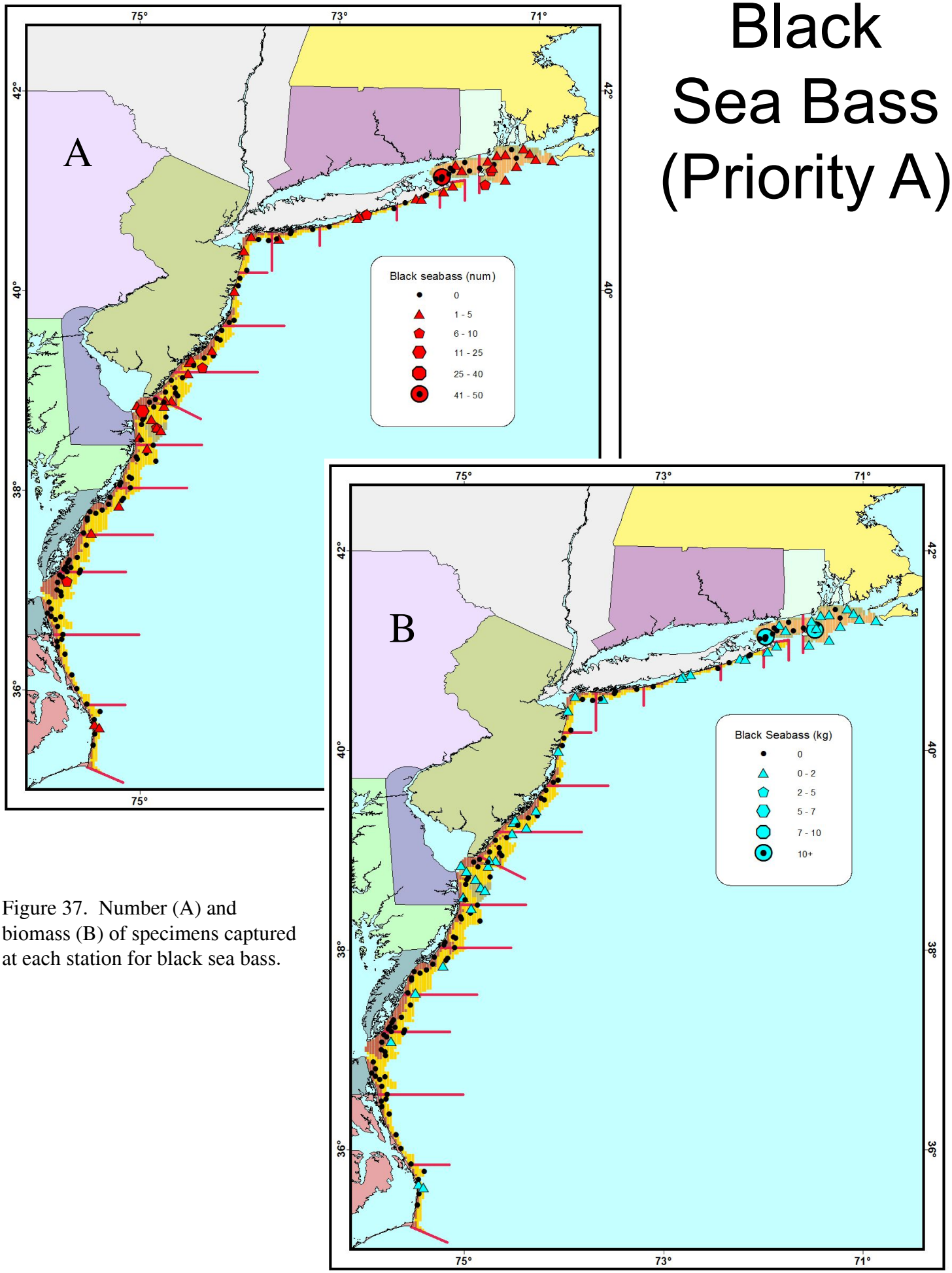


Figure 37. Number (A) and biomass (B) of specimens captured at each station for black sea bass.

Table 14. Number, biomass, minimum and maximum size of specimens captured, by state and region, for black sea bass.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	15	85	64.204	43	85	66	553	303	0.559	1.24	0.60
NY	22	10	23	4.418	22	23	60	420	183	0.198	0.63	0.17
NJ	24	8	24	2.628	19	24	153	218	186	0.111	0.46	0.09
DE	17	8	26	3.000	16	26	138	277	186	0.127	1.95	0.31
MD	10	1	3	0.198	3	3	149	188	168	0.066	0.14	0.02
VA	38	3	11	0.546	10	11	119	156	138	0.050	0.13	0.01
NC	13	2	2	0.188	2	2	161	181	171	0.094	0.11	0.01
Total	150	47	174	75.182	115	174	60	553	239	0.290	0.50	0.18

Figure 38. Geometric mean catch per area swept by state and overall, with summary catch rates, for black sea bass.

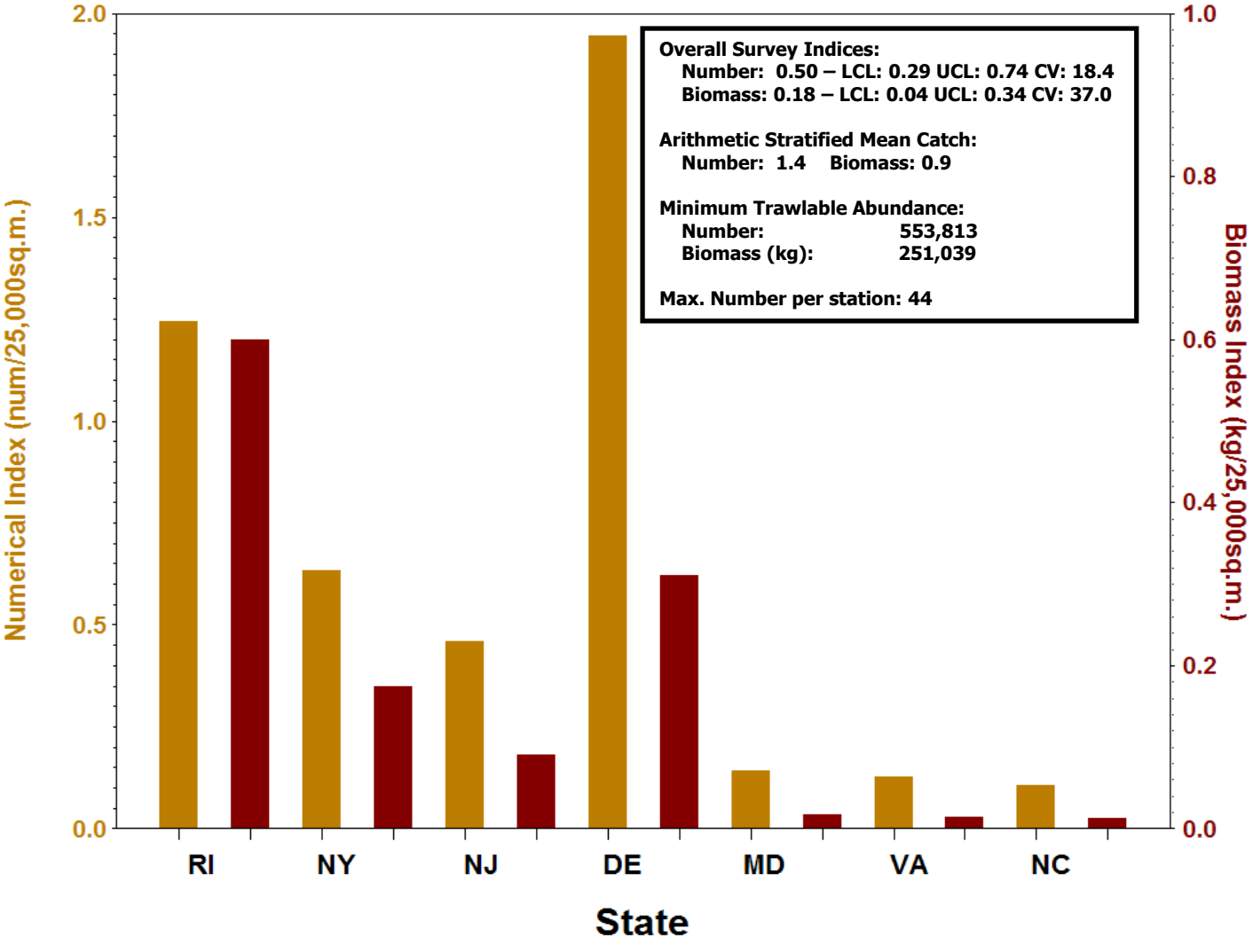


Figure 39. Length frequency histogram for black sea bass.

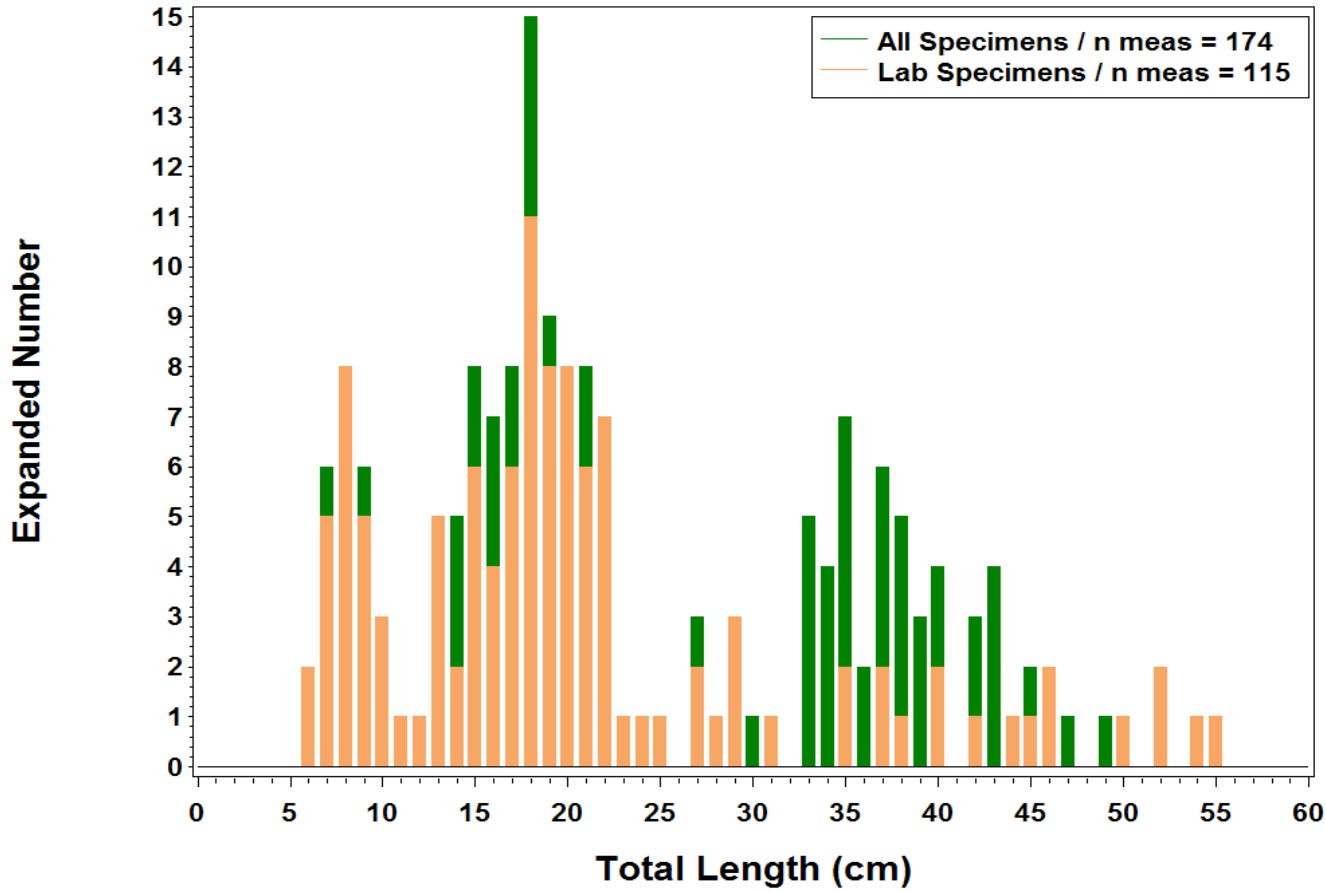


Figure 40. Sex-specific length frequencies histogram for black sea bass.

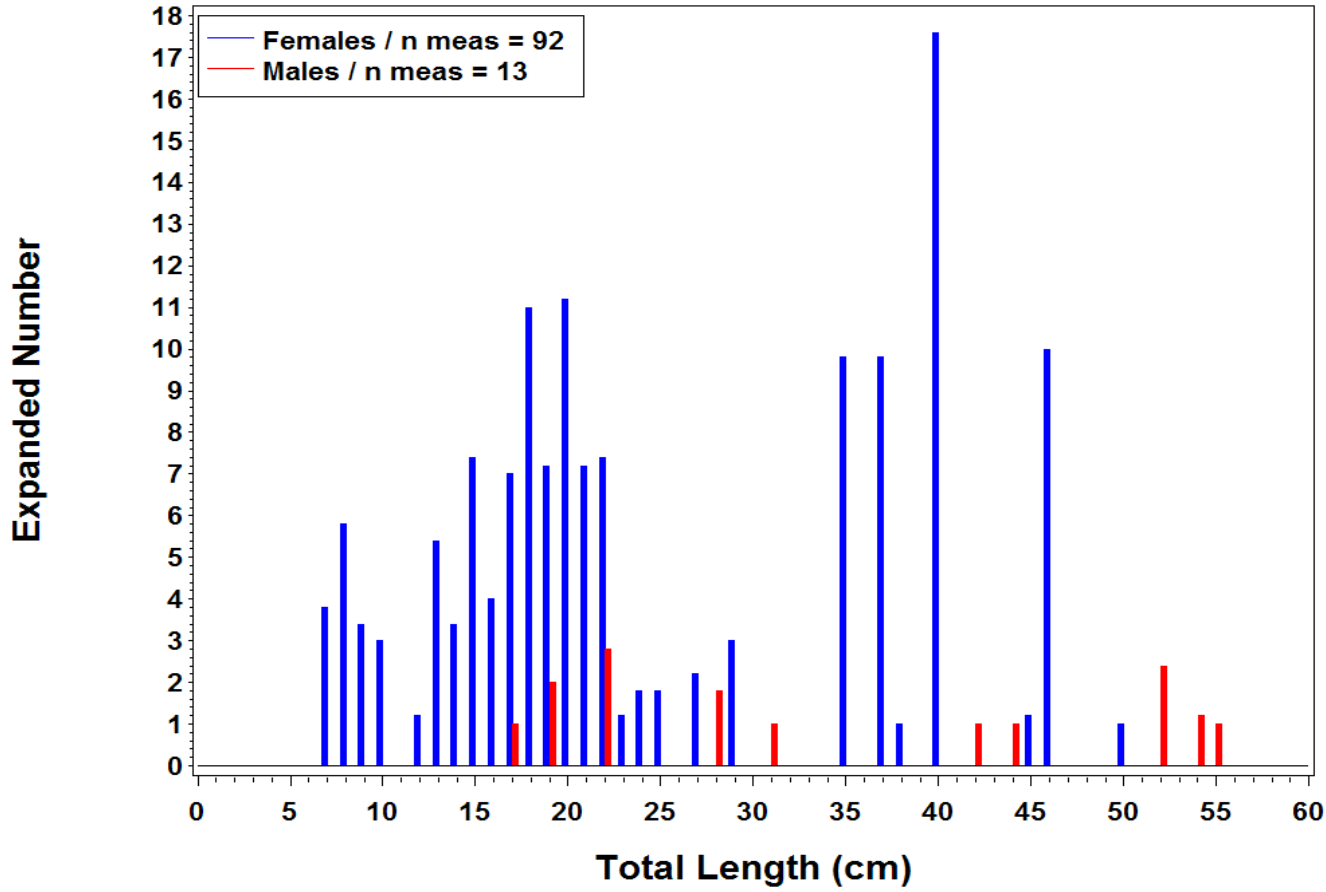
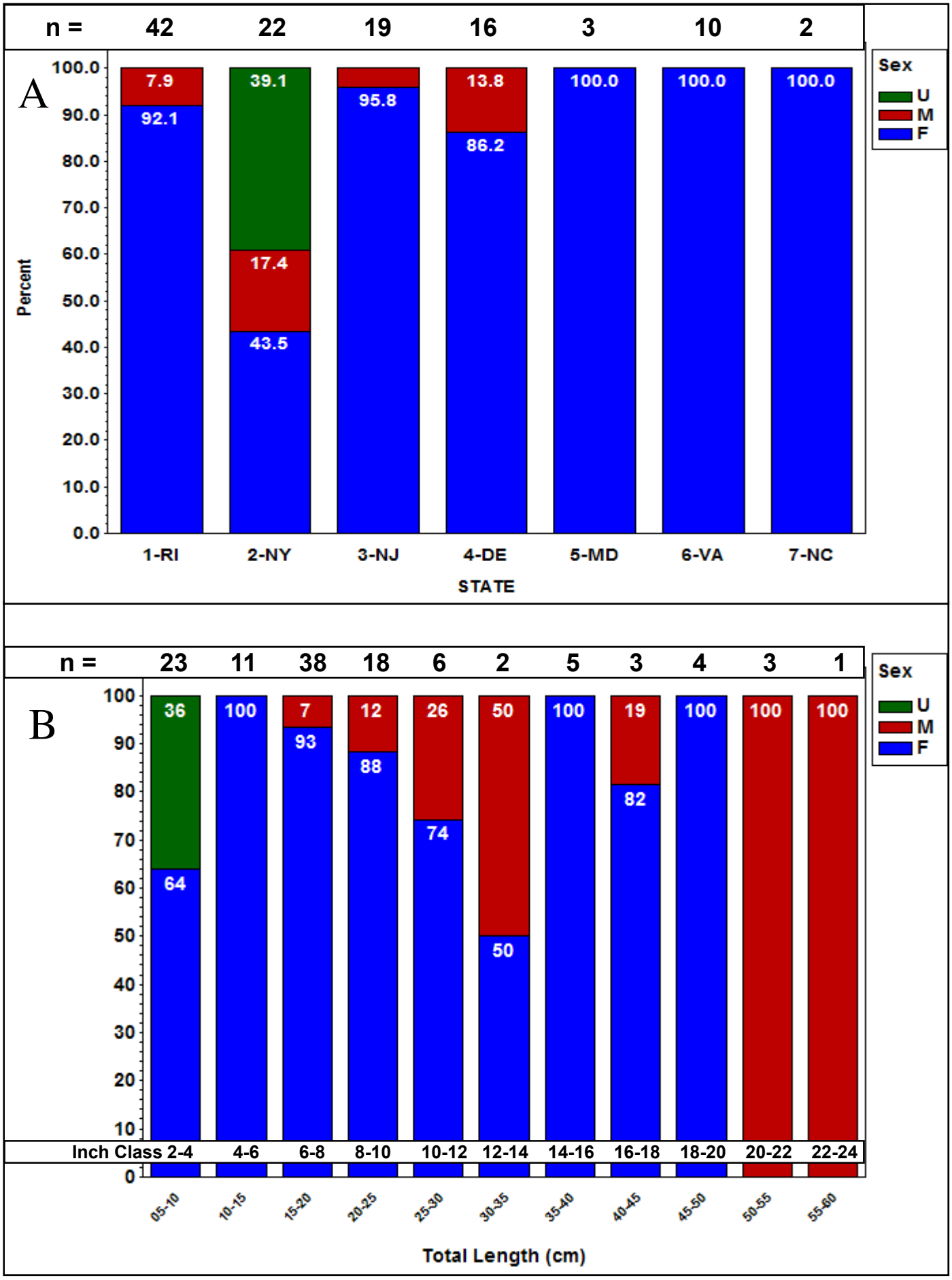


Figure 41. Sex ratios for black sea bass, by state (A) and length group (B).



Bluefish (Priority A)

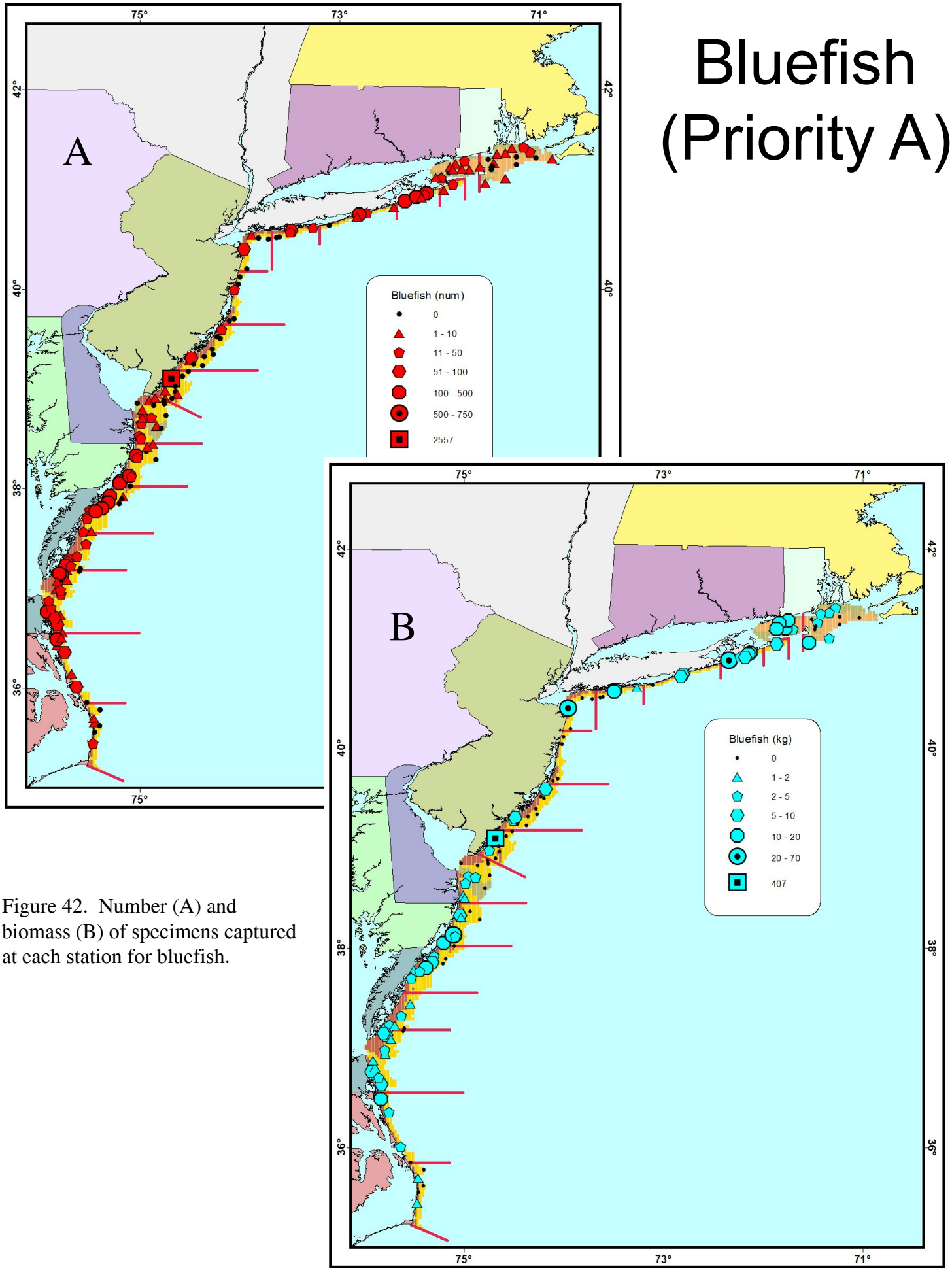


Figure 42. Number (A) and biomass (B) of specimens captured at each station for bluefish.

Table 15. Number, biomass, minimum and maximum size of specimens captured, by state and region, for bluefish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	19	105	94.410	77	105	99	710	314	1.055	2.14	1.48
NY	22	16	1090	192.954	105	333	83	712	242	0.717	5.71	2.26
NJ	24	8	2711	425.486	39	270	90	402	222	0.235	1.59	0.73
DE	17	11	117	12.946	40	117	98	343	201	0.137	7.71	1.04
MD	10	8	901	60.457	40	332	109	351	165	0.121	17.45	2.55
VA	38	33	1871	96.776	188	926	111	388	164	0.095	17.41	1.69
NC	13	9	325	25.665	40	131	117	236	184	0.096	5.12	0.86
Total	150	104	7120	908.694	529	2214	83	712	193	0.374	8.46	1.74

Figure 43. Geometric mean catch per area swept by state and overall, with summary catch rates, for bluefish.

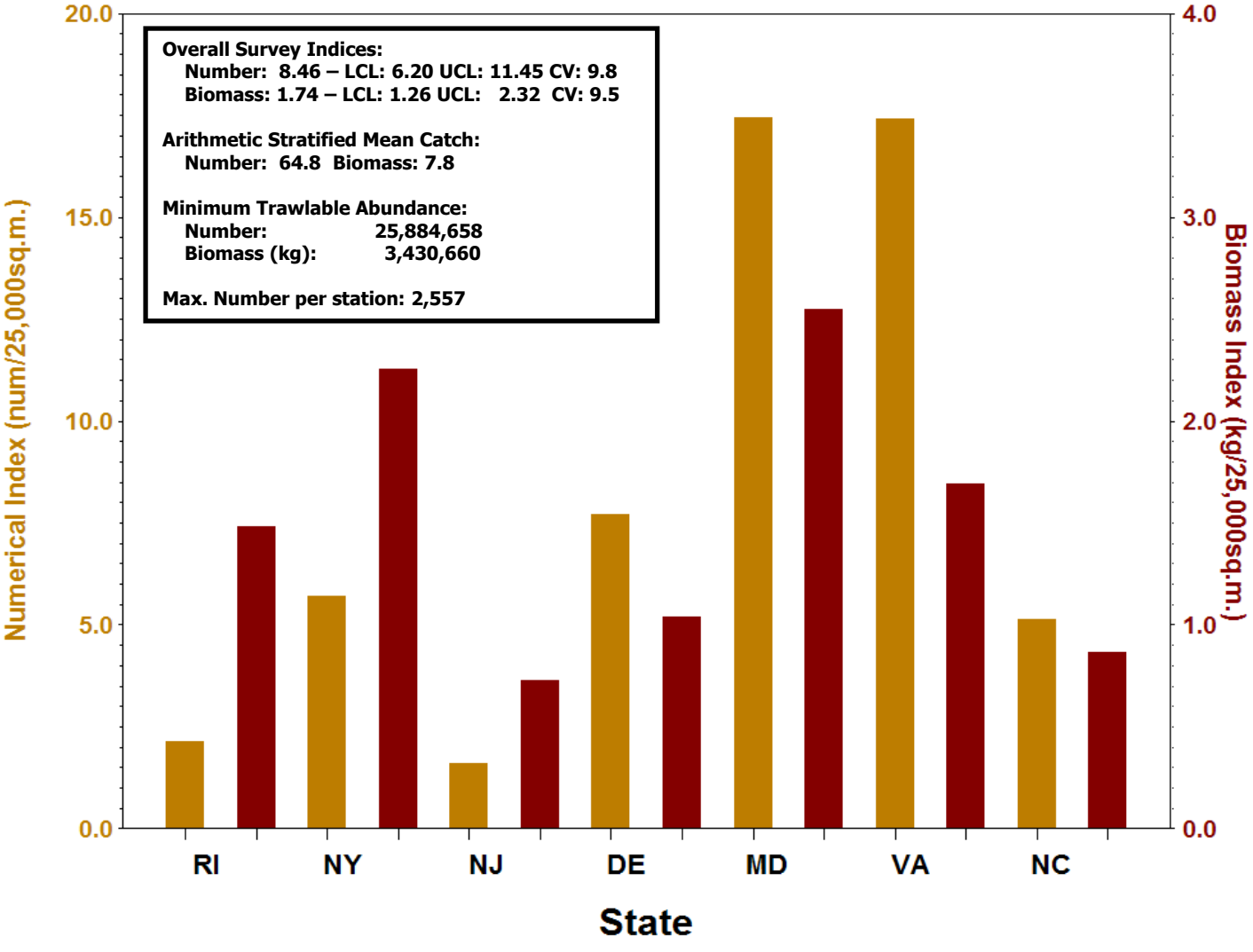


Figure 44. Length frequency histogram for bluefish.

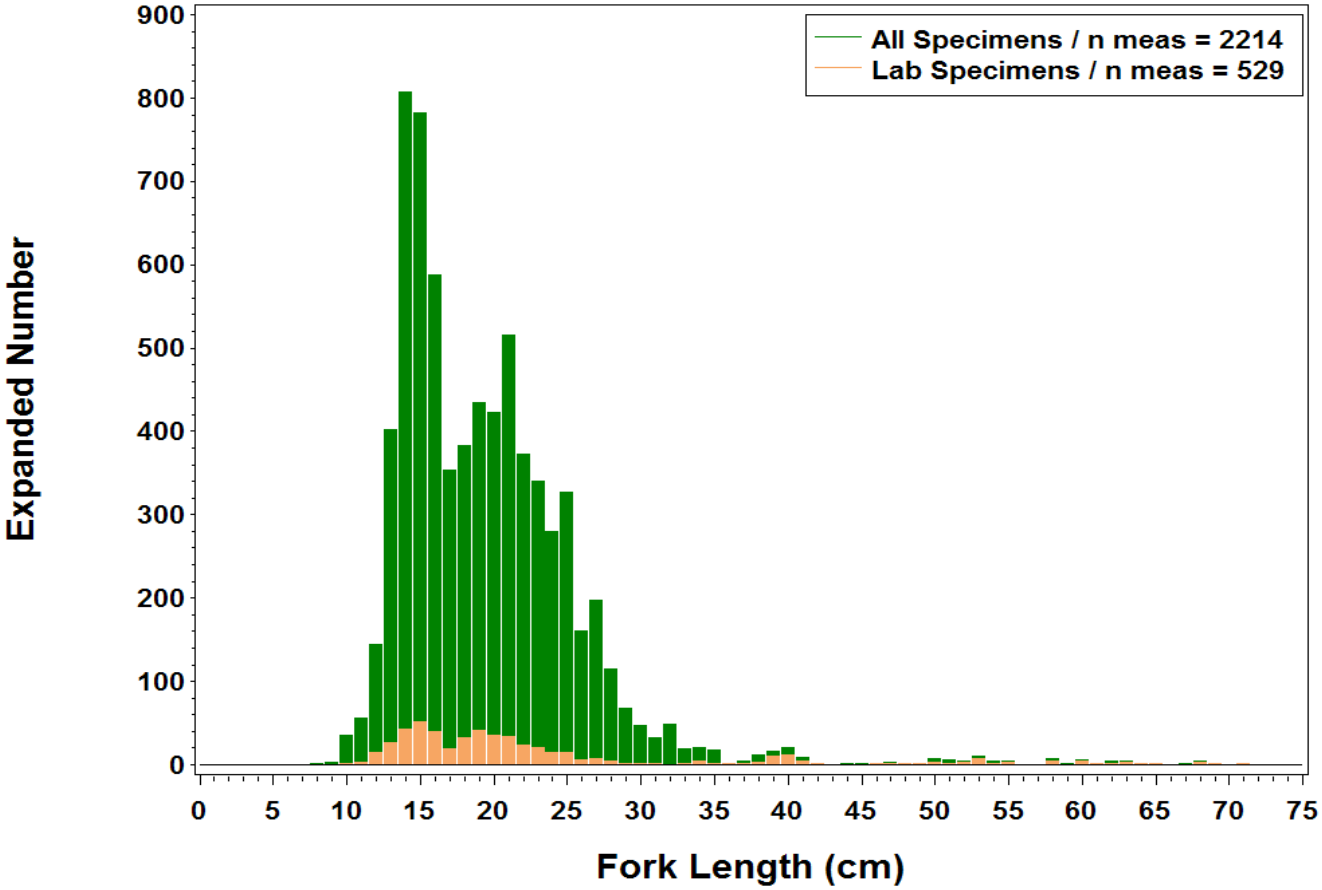


Figure 45. Sex-specific length frequencies histogram for bluefish.

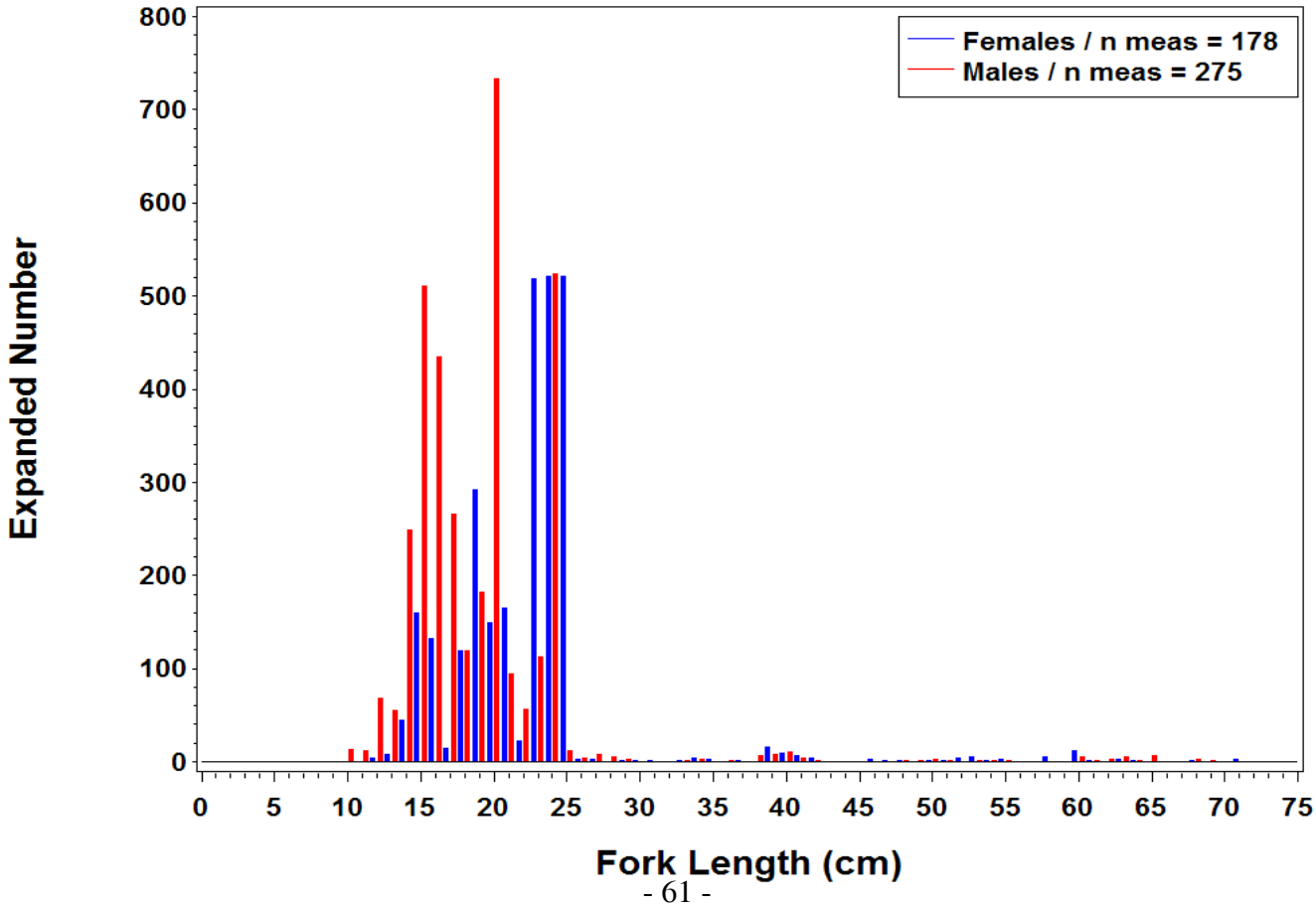
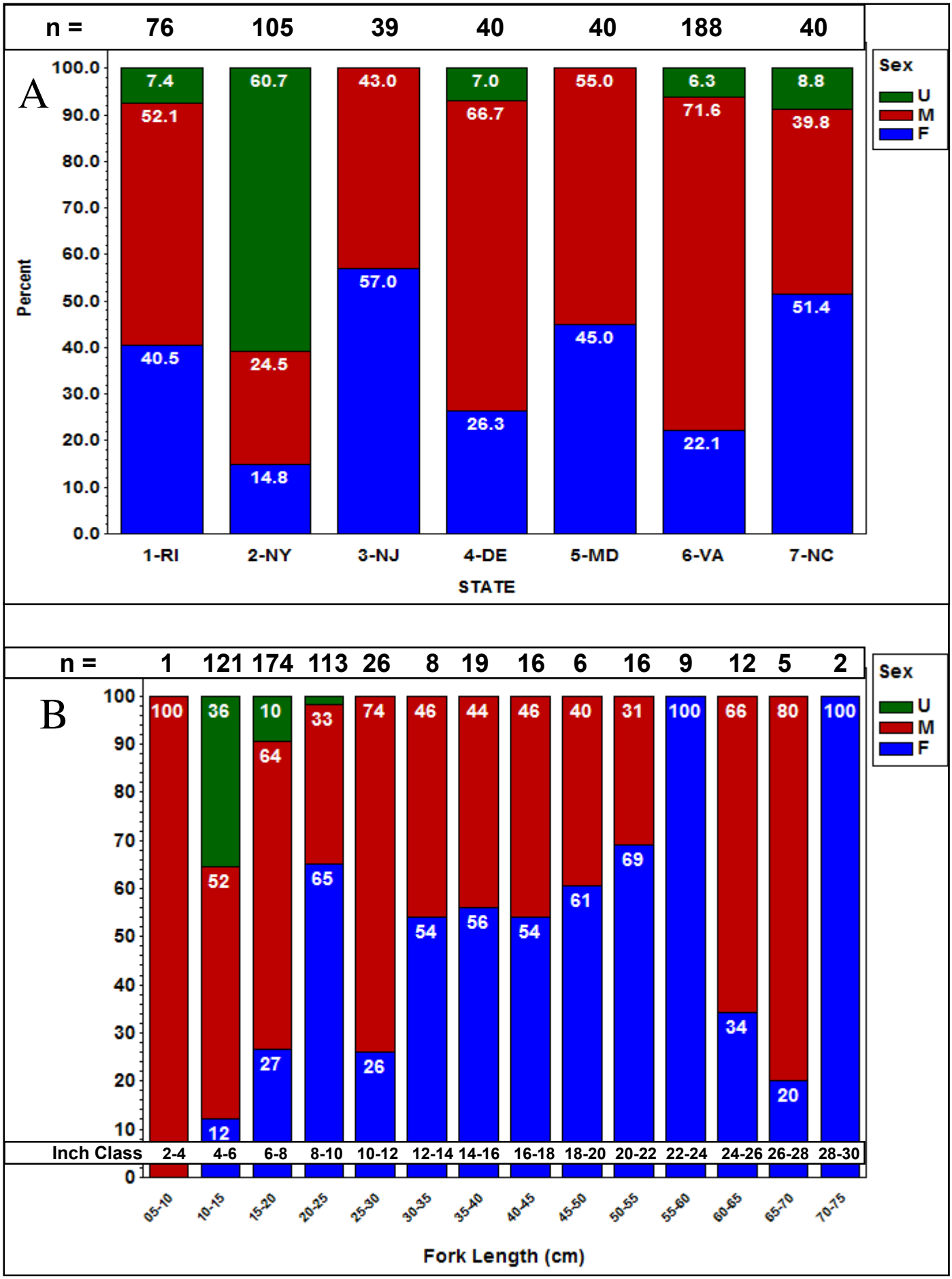


Figure 46. Sex ratios for bluefish, by state (A) and length group (B).



Bluntnose Stingray (Priority B)

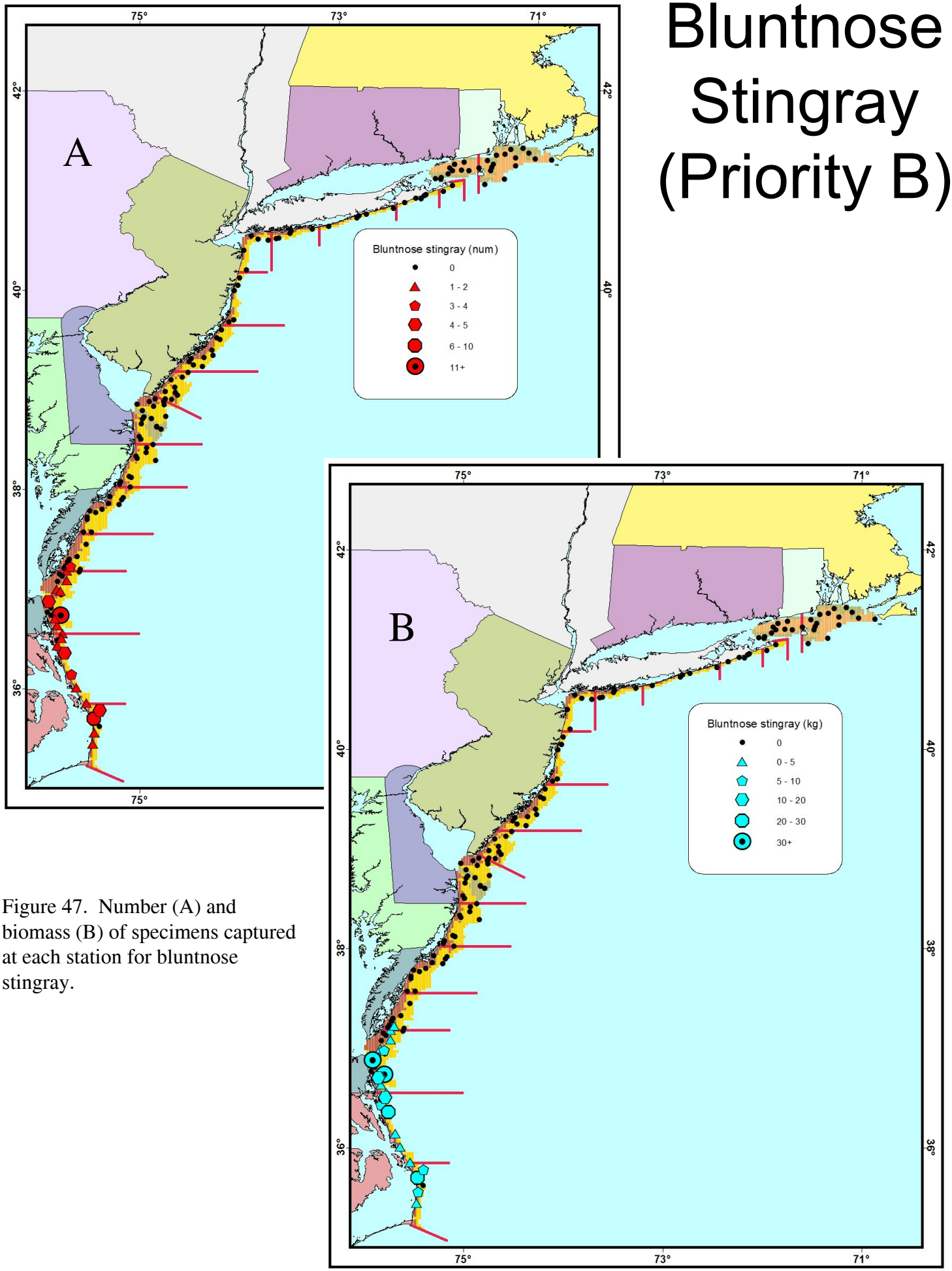


Figure 47. Number (A) and biomass (B) of specimens captured at each station for bluntnose stingray.

Table 16. Number, biomass, minimum and maximum size of specimens captured, by state and region, for bluntnose stingray.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	19	105	94.410	77	105	99	710	314	1.055	2.14	1.48
NY	22	16	1090	192.954	105	333	83	712	242	0.717	5.71	2.26
NJ	24	8	2711	425.486	39	270	90	402	222	0.235	1.59	0.73
DE	17	11	117	12.946	40	117	98	343	201	0.137	7.71	1.04
MD	10	8	901	60.457	40	332	109	351	165	0.121	17.45	2.55
VA	38	33	1871	96.776	188	926	111	388	164	0.095	17.41	1.69
NC	13	9	325	25.665	40	131	117	236	184	0.096	5.12	0.86
Total	150	104	7120	908.694	529	2214	83	712	193	0.374	8.46	1.74

Figure 48. Geometric mean catch per area swept by state and overall, with summary catch rates, for bluntnose stingray.

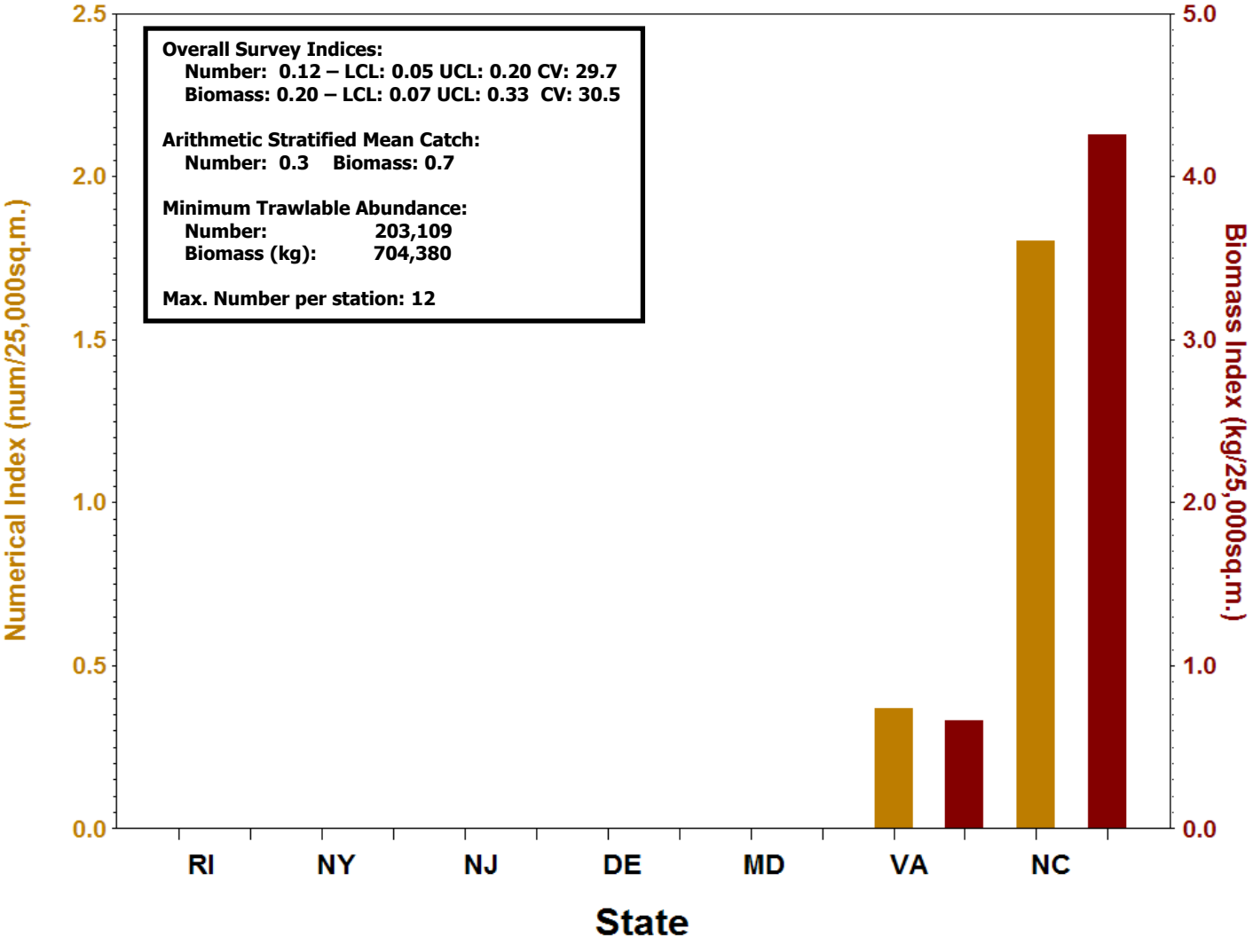


Figure 49. Width frequency histogram for bluntnose stingray.

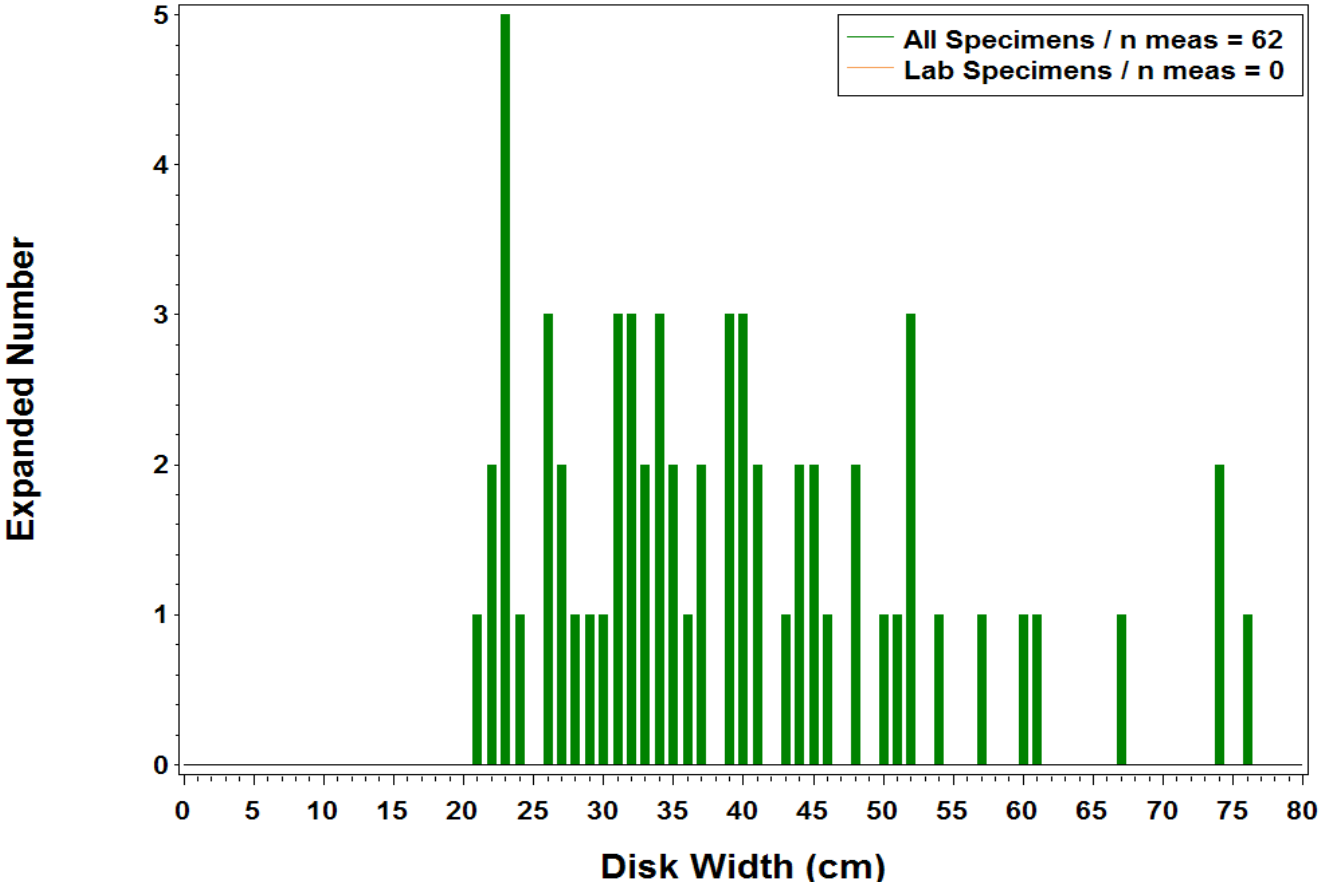
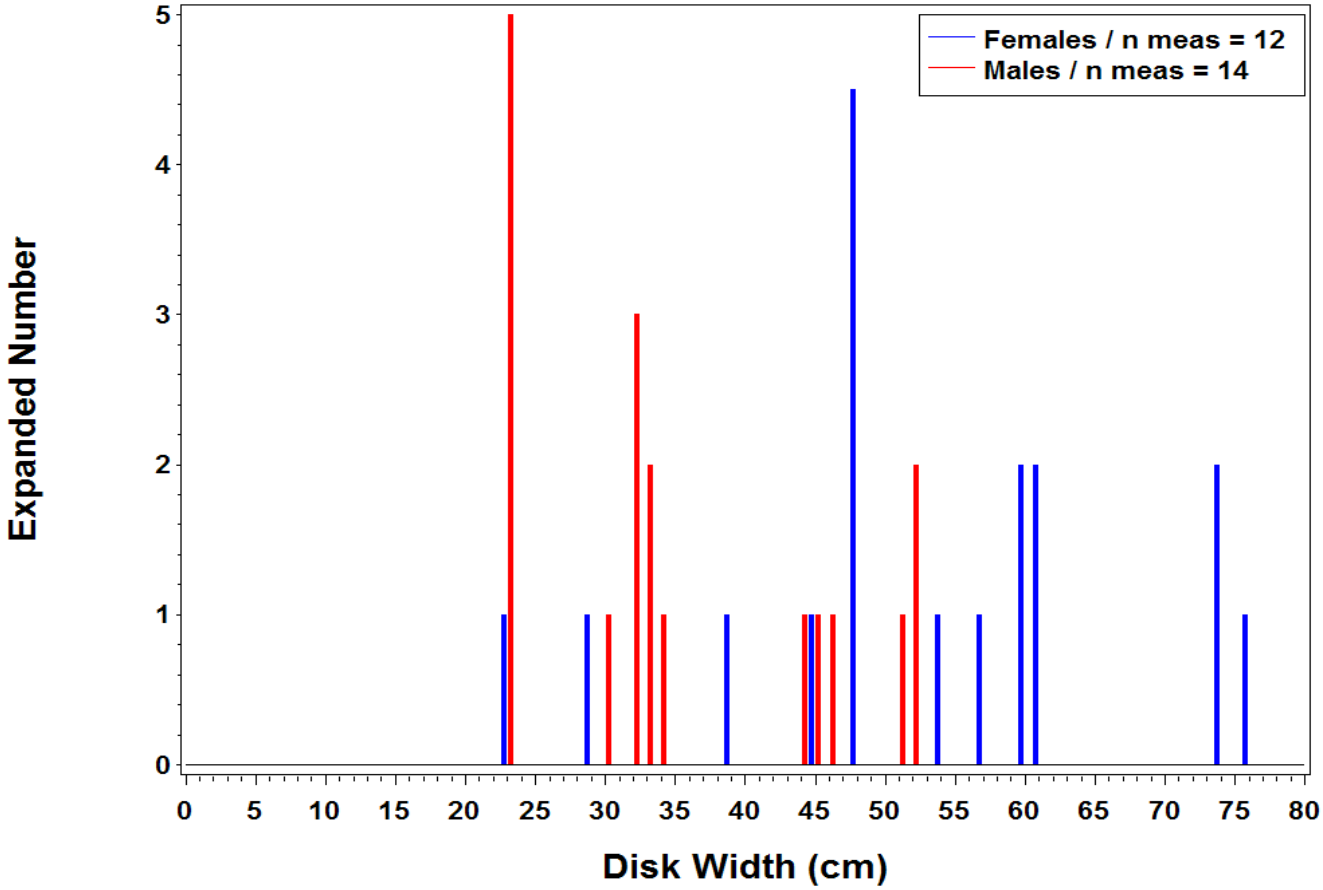


Figure 50. Sex-specific length frequencies histogram for bluntnose stingray.



Brown Shrimp (Priority E)

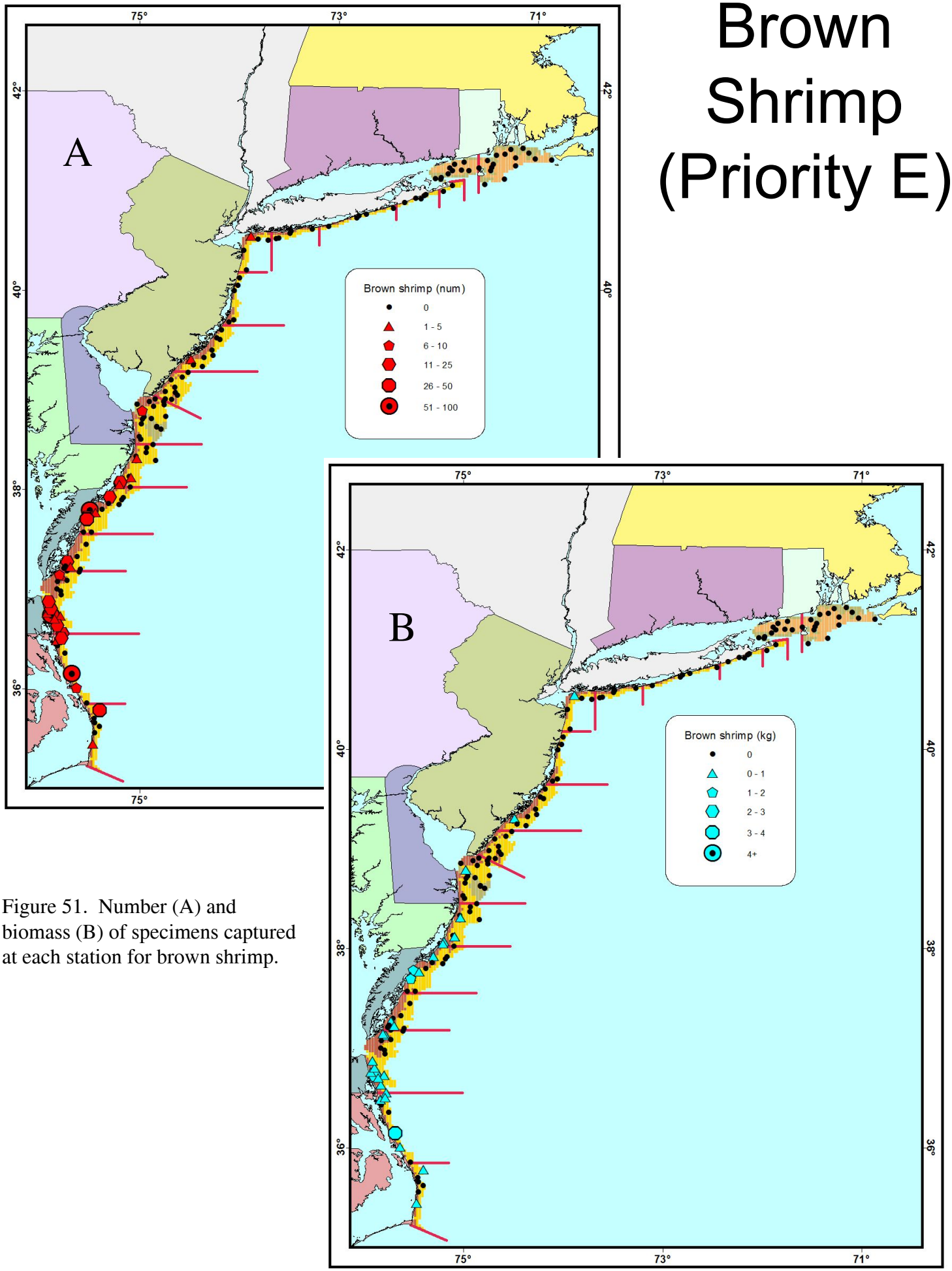


Figure 51. Number (A) and biomass (B) of specimens captured at each station for brown shrimp.

Table 17. Number, biomass, minimum and maximum size of specimens captured, by state and region, for brown shrimp.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22	1	1	0.002	0	1	144	144	144		0.05	0.00
NJ	24	1	2	0.020	0	2	124	143	134		0.04	0.00
DE	17	1	8	0.184	0	8	115	183	139		0.34	0.02
MD	10	4	34	0.817	0	34	58	198	142		1.13	0.07
VA	38	17	318	9.152	0	265	77	206	146		1.94	0.17
NC	13	6	146	5.100	0	62	76	181	149		2.56	0.26
Total	150	30	509	15.275	0	372	58	206	146		0.71	0.08

Figure 52. Geometric mean catch per area swept by state and overall, with summary catch rates, for brown shrimp.

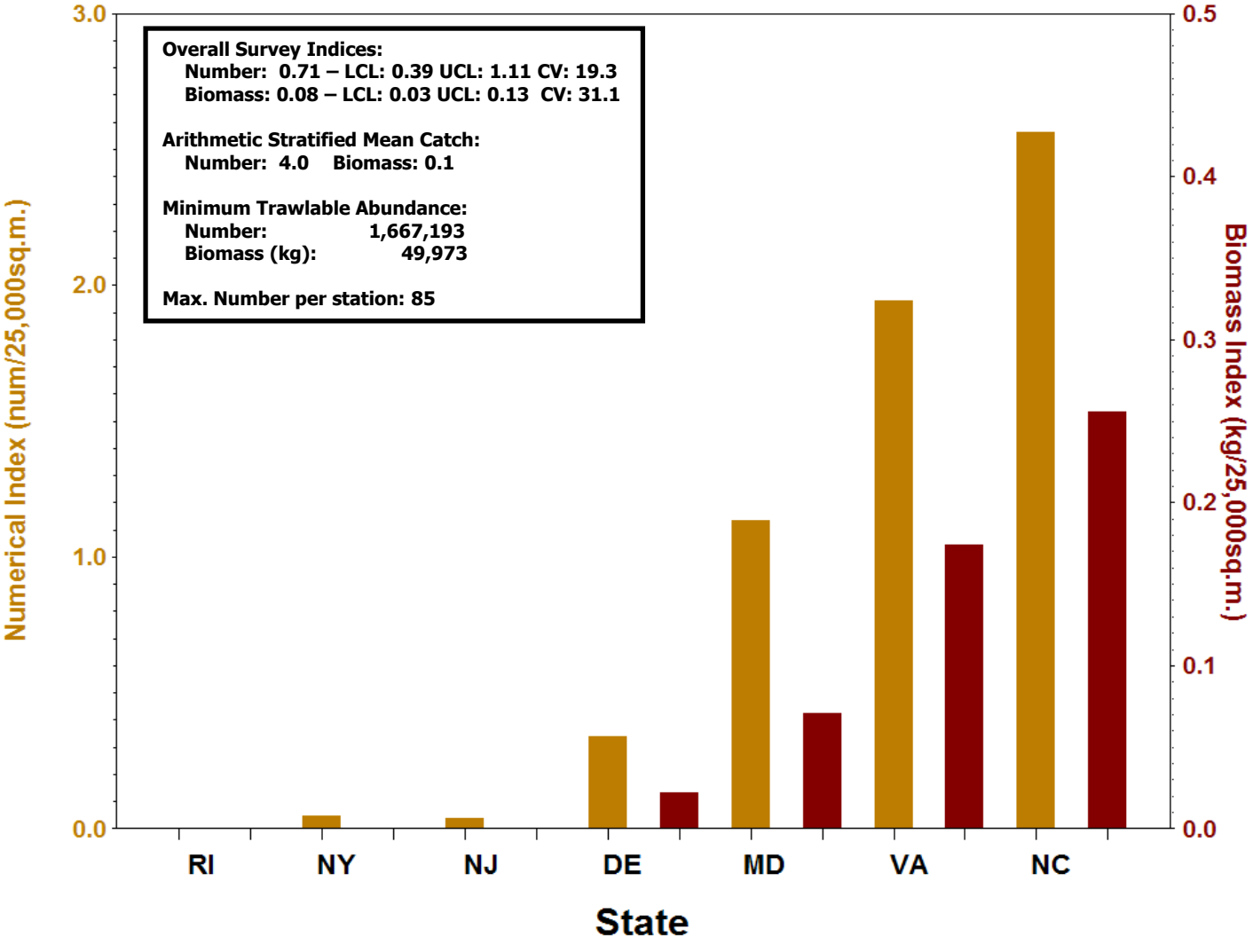
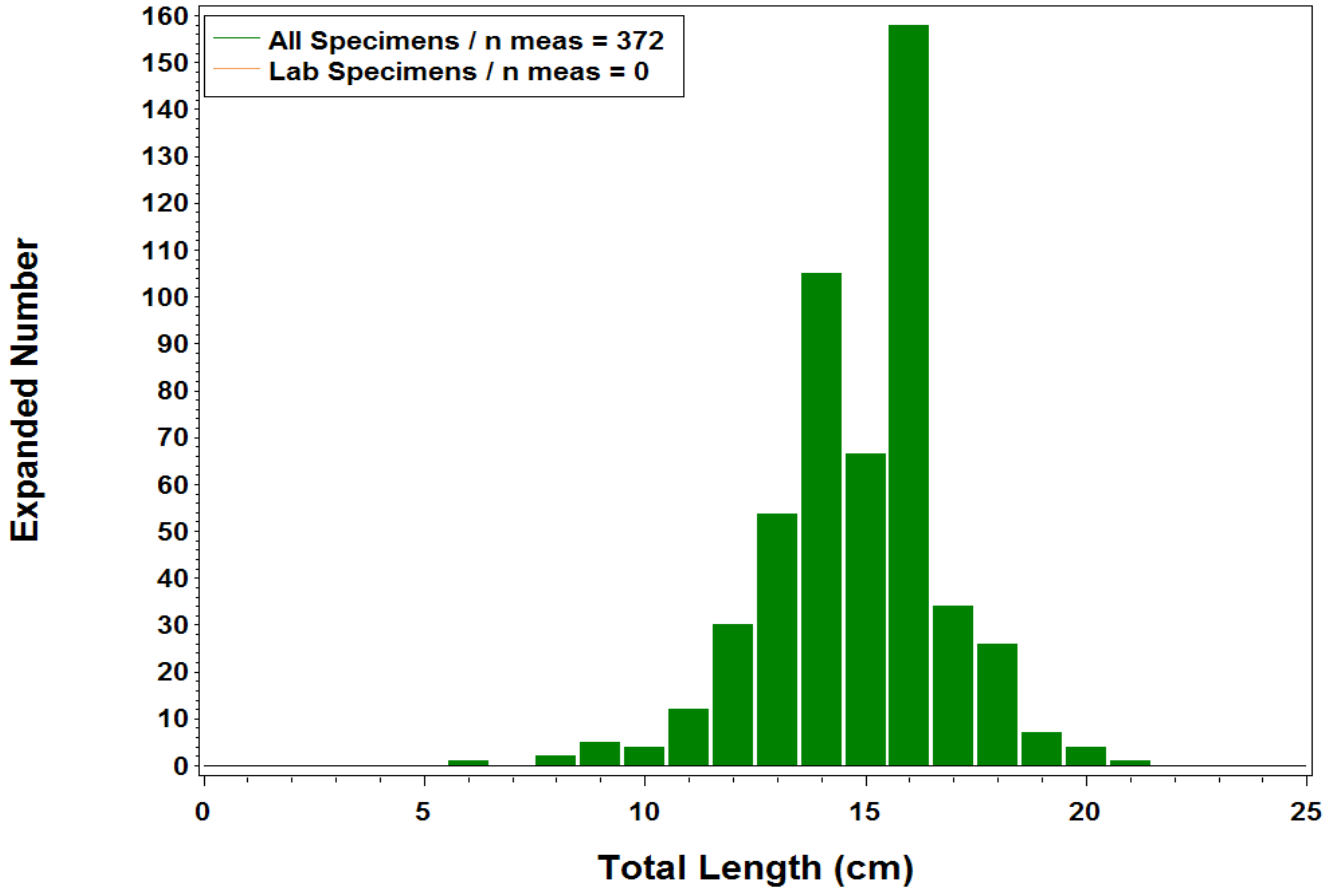


Figure 53. Length frequency histogram for brown shrimp.



Bullnose Stingray (Priority B)

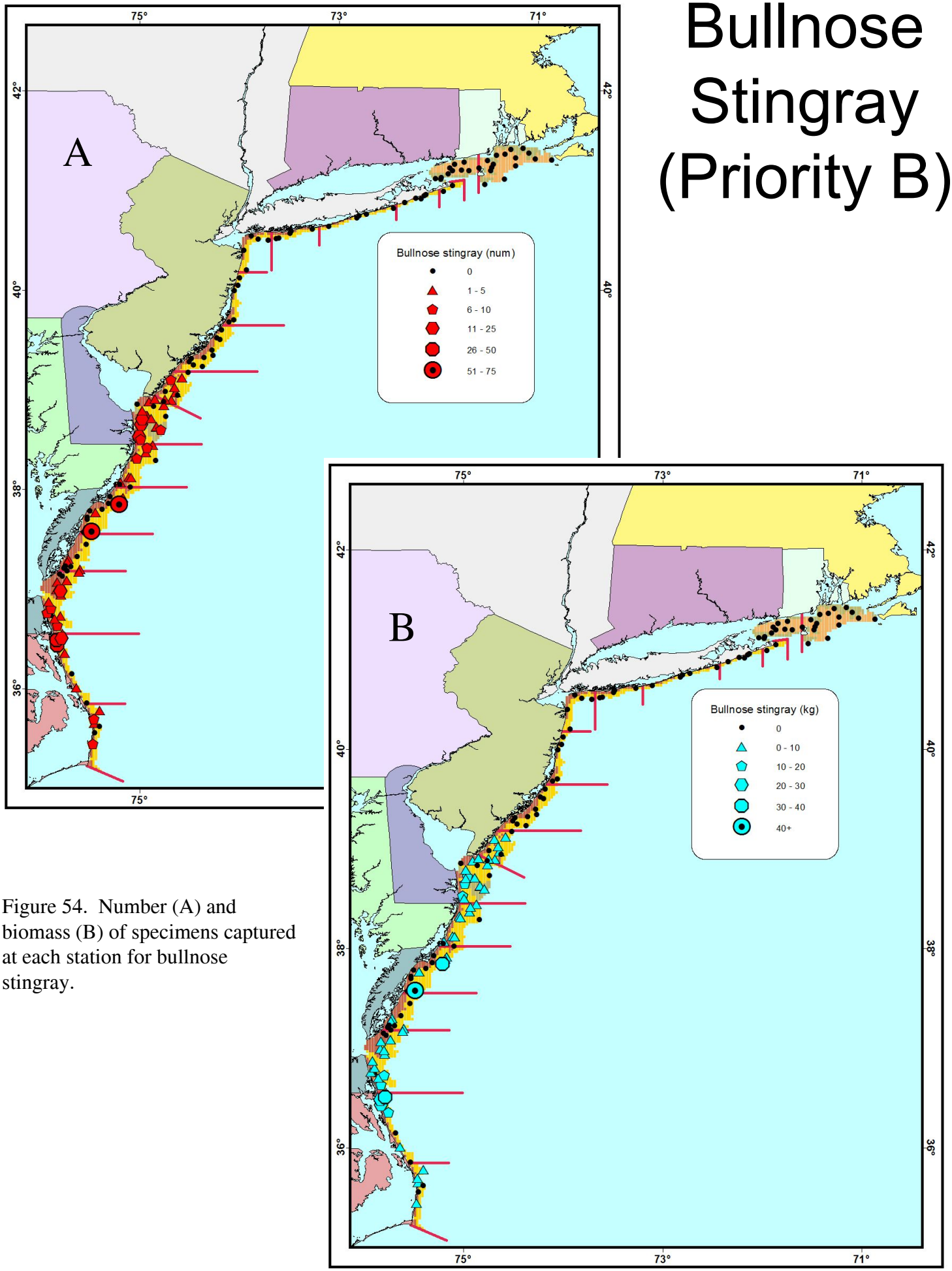


Figure 54. Number (A) and biomass (B) of specimens captured at each station for bullnose stingray.

Table 18. Number, biomass, minimum and maximum size of specimens captured, by state and region, for bullnose stingray.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24	6	20	10.096	0	20	293	394	341		0.40	0.27
DE	17	13	111	68.313	0	111	216	416	336		9.49	4.93
MD	10	8	29	20.238	0	29	265	444	348	0.763	2.05	1.53
VA	38	21	206	178.420	0	104	263	728	384	1.544	1.60	1.63
NC	13	9	113	122.845	0	56	263	725	396	0.755	3.42	4.15
Total	150	57	479	399.912	0	320	216	728	363	1.283	0.80	0.69

Figure 55. Geometric mean catch per area swept by state and overall, with summary catch rates, for bullnose stingray.

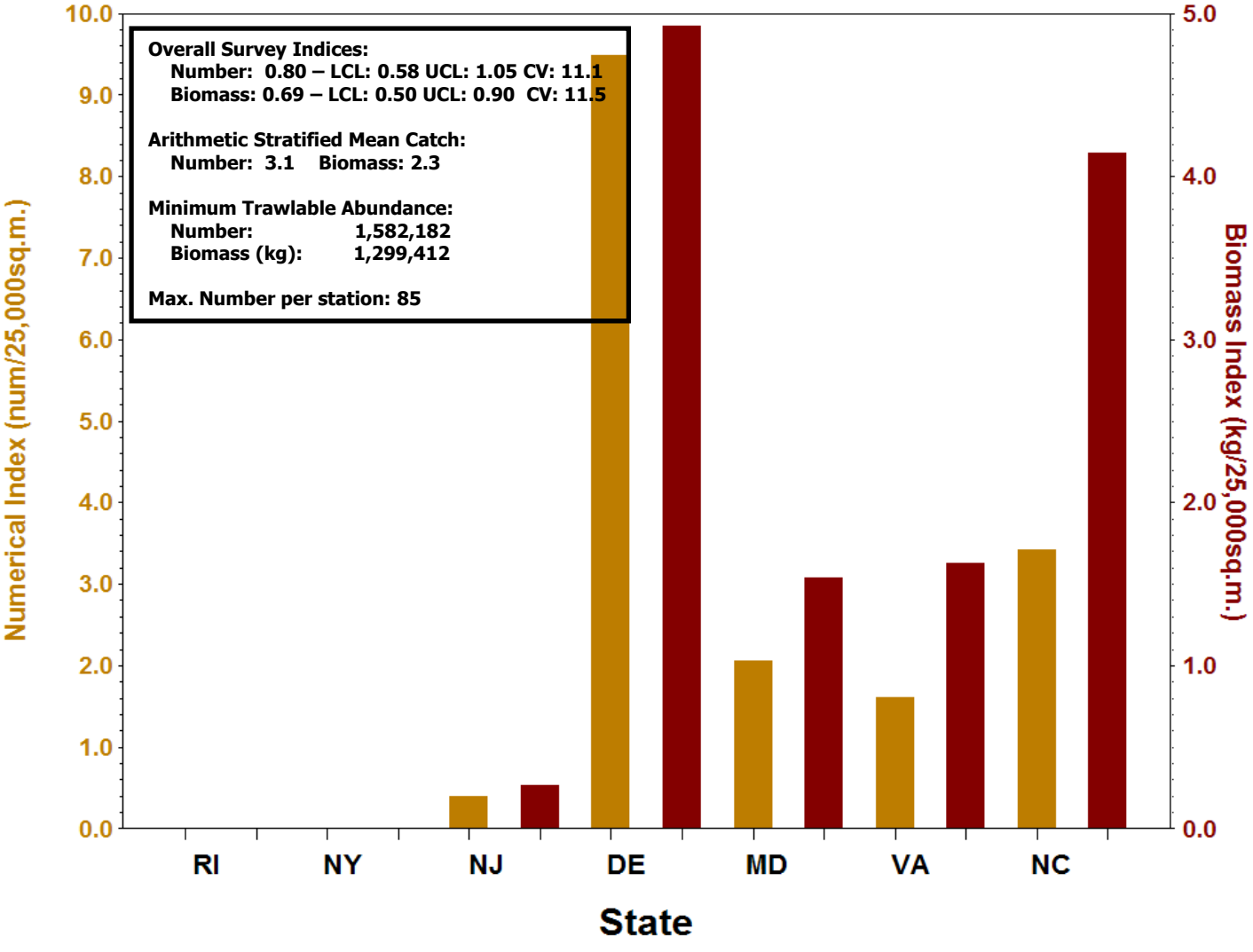


Figure 56. Width frequency histogram for bullnose stingray.

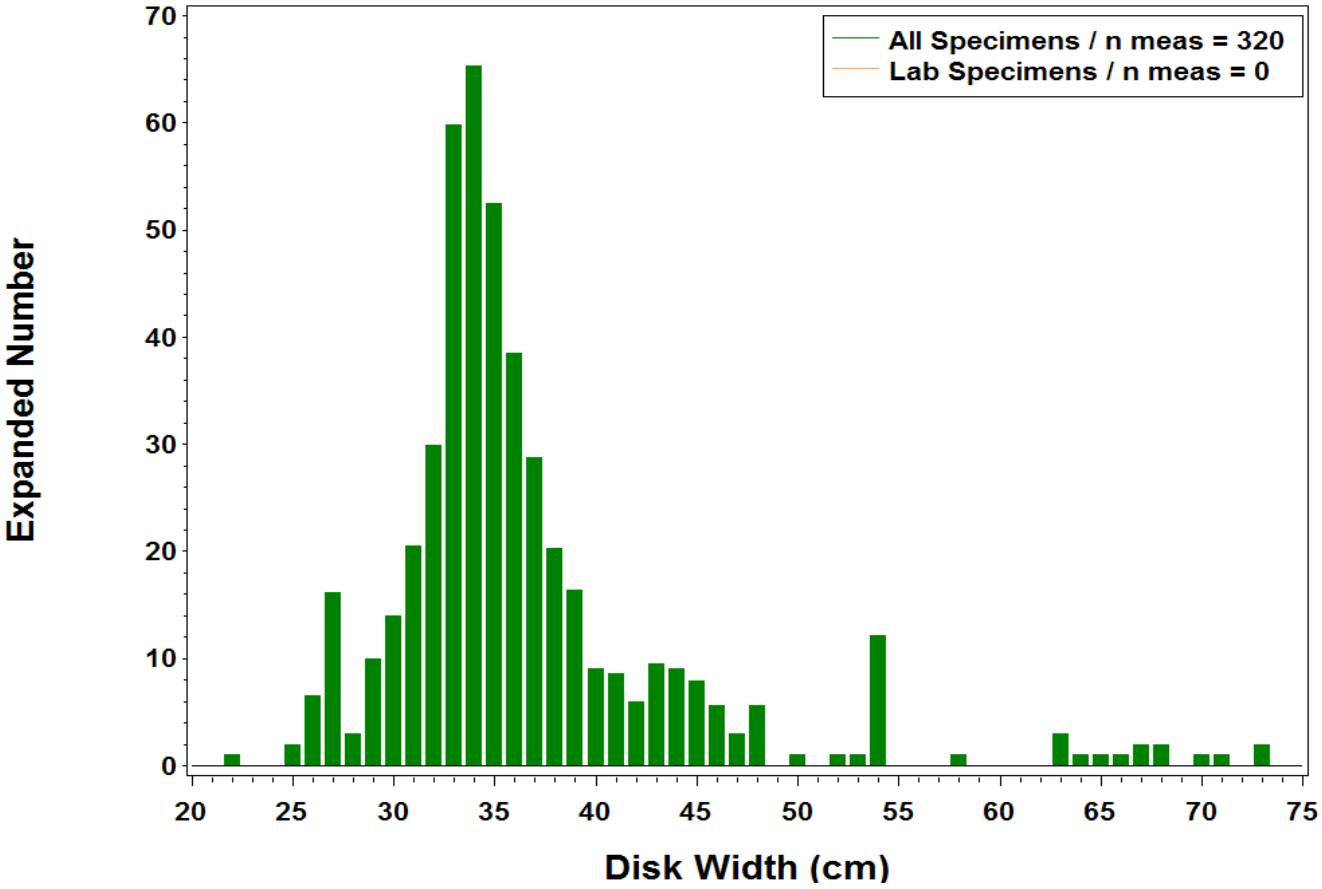
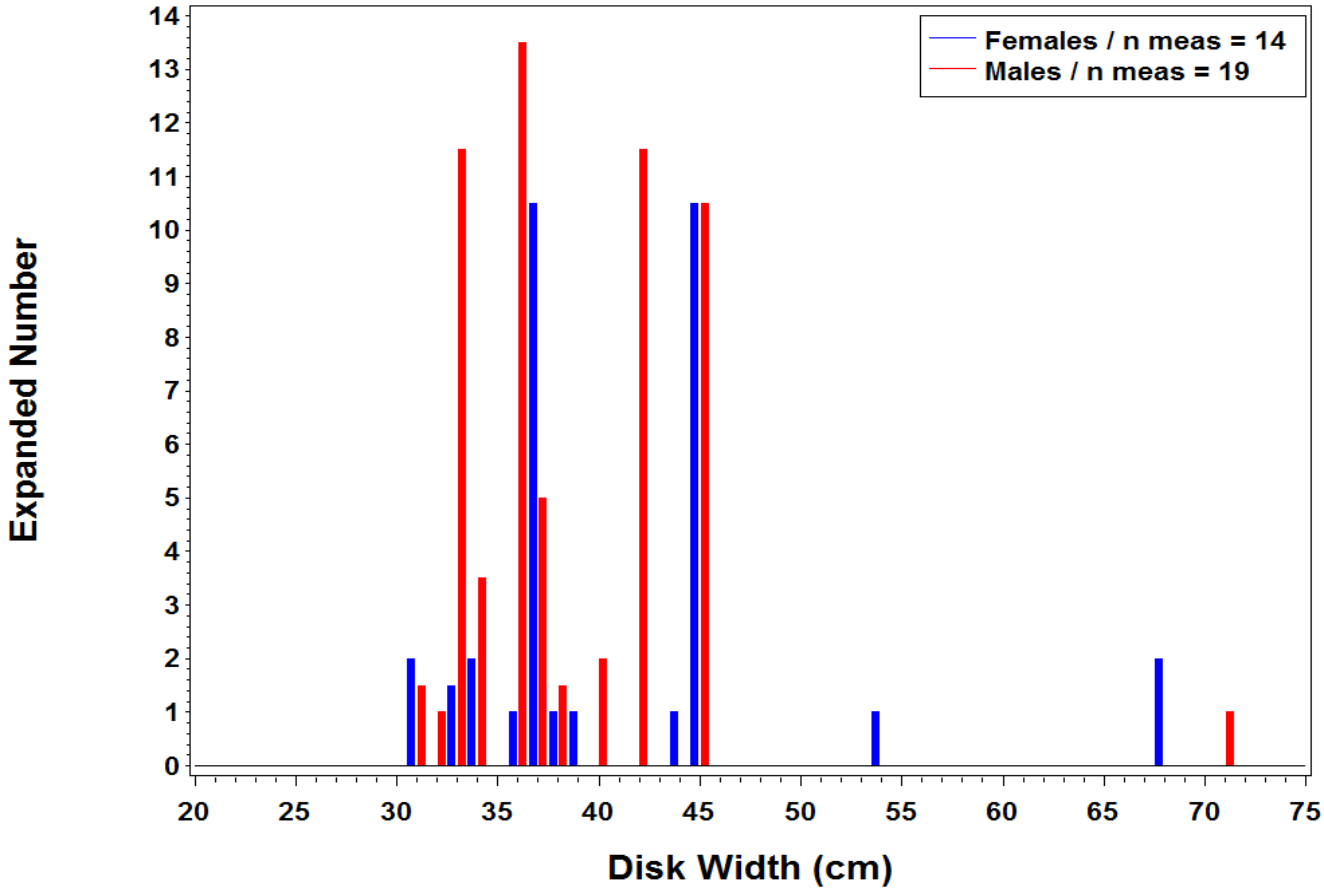


Figure 57. Sex-specific length frequencies histogram for bullnose stingray.



Butterfish (Priority A)

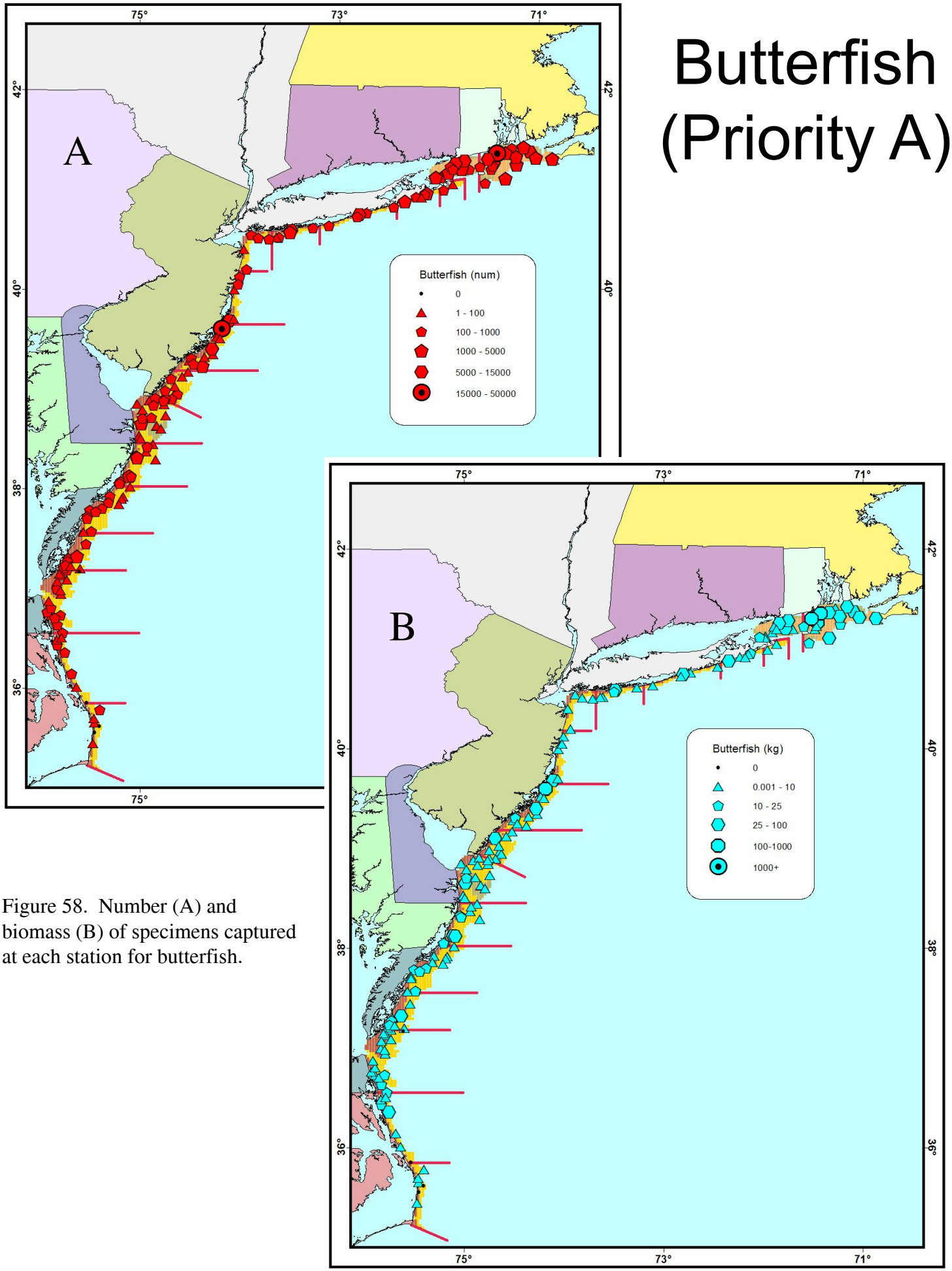


Figure 58. Number (A) and biomass (B) of specimens captured at each station for butterfish.

Table 19. Number, biomass, minimum and maximum size of specimens captured, by state and region, for butterfish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	26	85539	980.015	110	2837	31	190	88	0.035	1635.53	19.48
NY	22	22	23117	325.799	82	1349	24	204	79	0.025	261.98	2.92
NJ	24	24	38461	265.791	76	1692	24	207	76	0.020	176.27	2.88
DE	17	17	4443	94.384	57	1317	32	224	92	0.021	2667.01	6.34
MD	10	10	5532	147.602	39	833	40	186	96	0.034	272.92	6.68
VA	38	37	9014	237.023	153	1682	24	221	105	0.036	100.75	3.54
NC	13	10	2163	69.992	34	381	33	216	118	0.041	28.37	2.30
Total	150	146	168269	2120.606	551	10091	24	224	90	0.031	380.64	6.48

Figure 59. Geometric mean catch per area swept by state and overall, with summary catch rates, for butterfish.

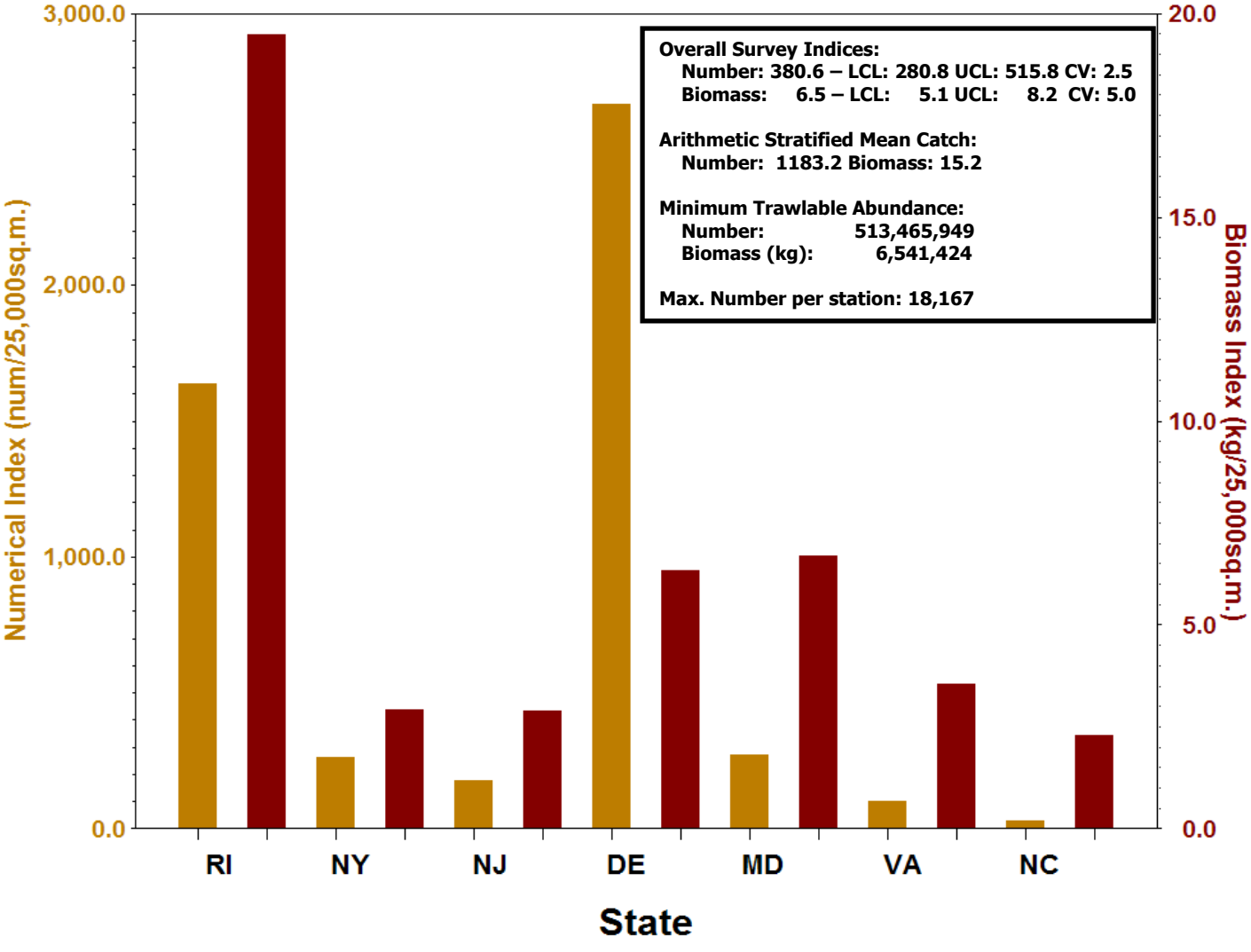


Figure 60. Length frequency histogram for butterfish.

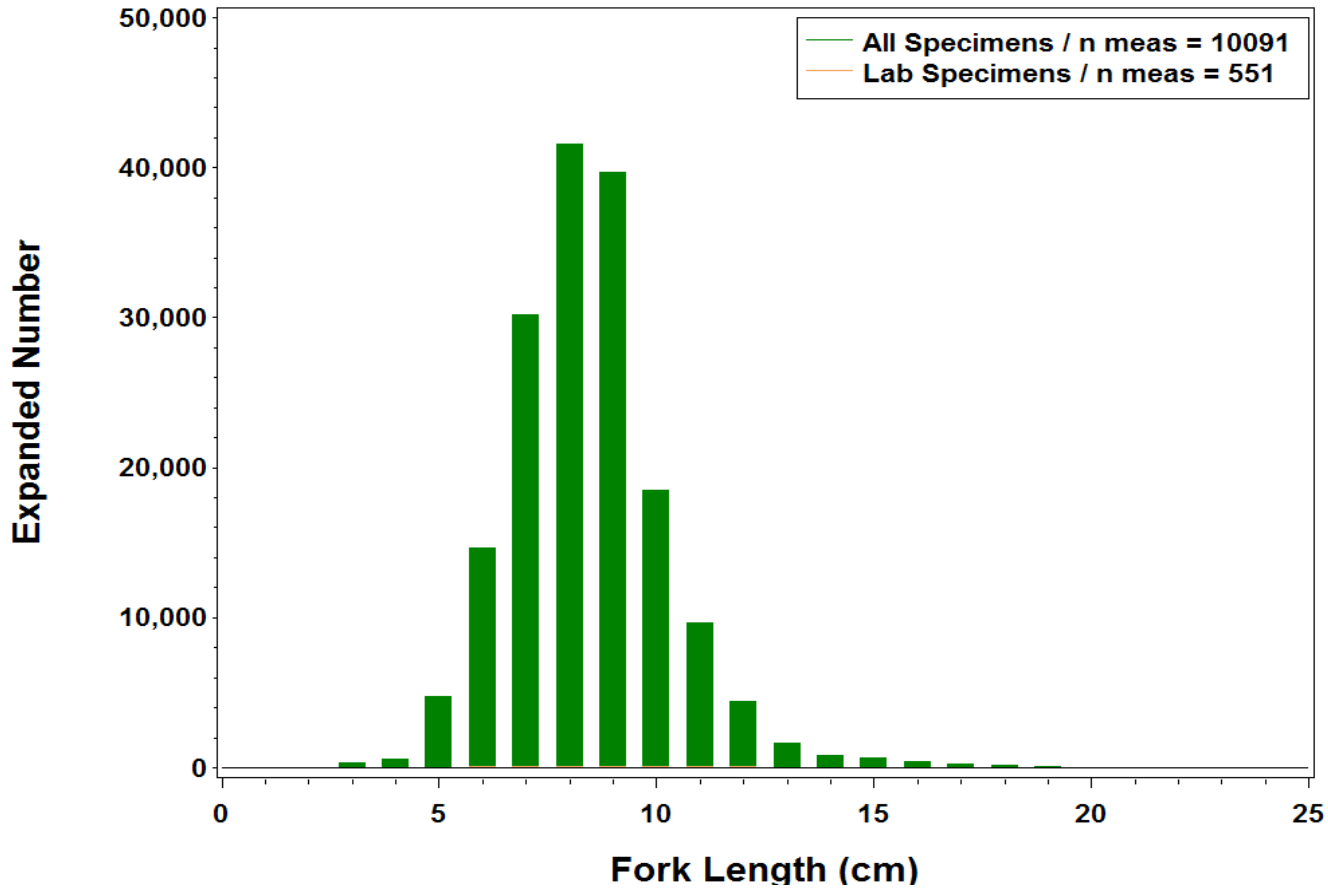


Figure 61. Sex-specific length frequencies histogram for butterfish.

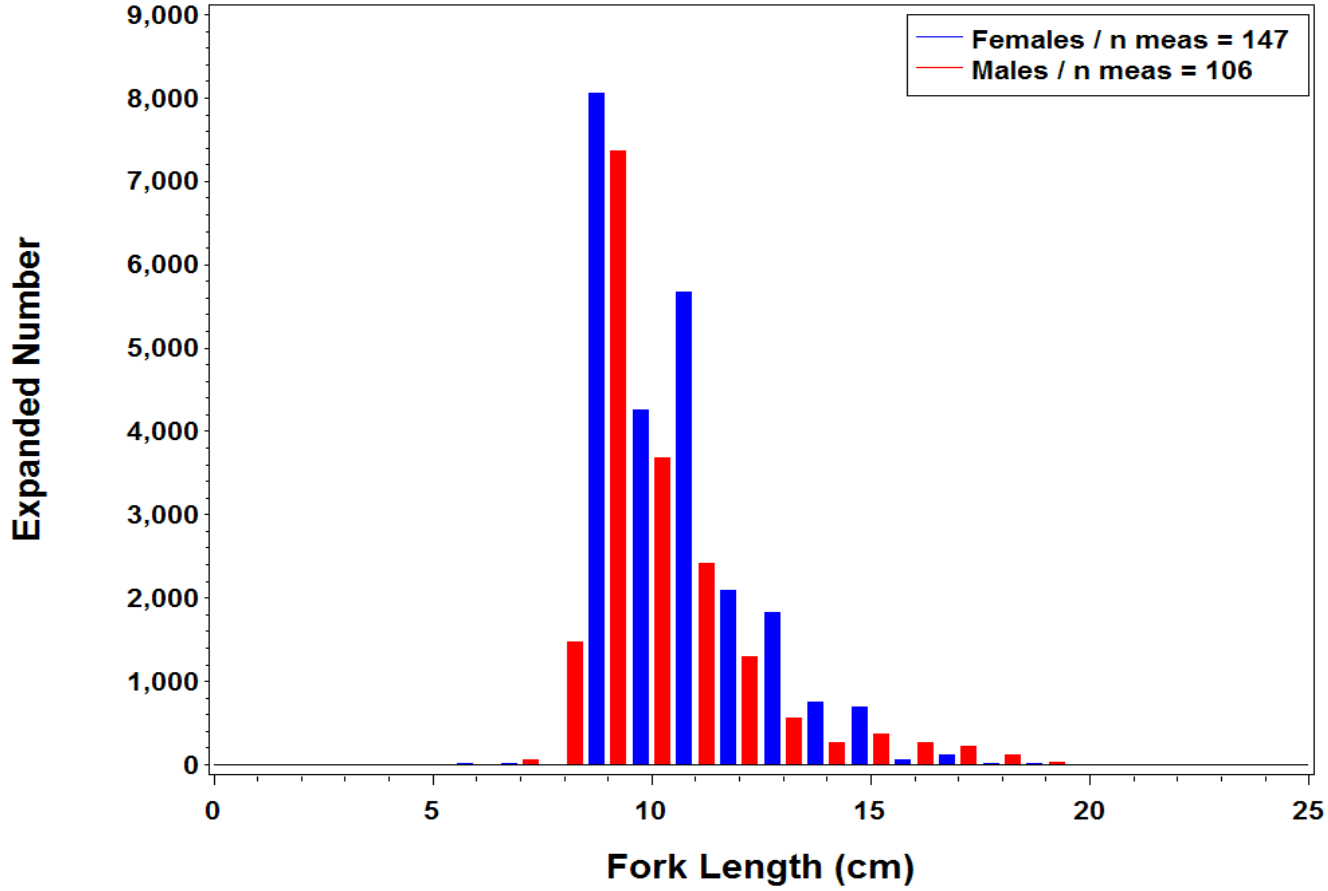
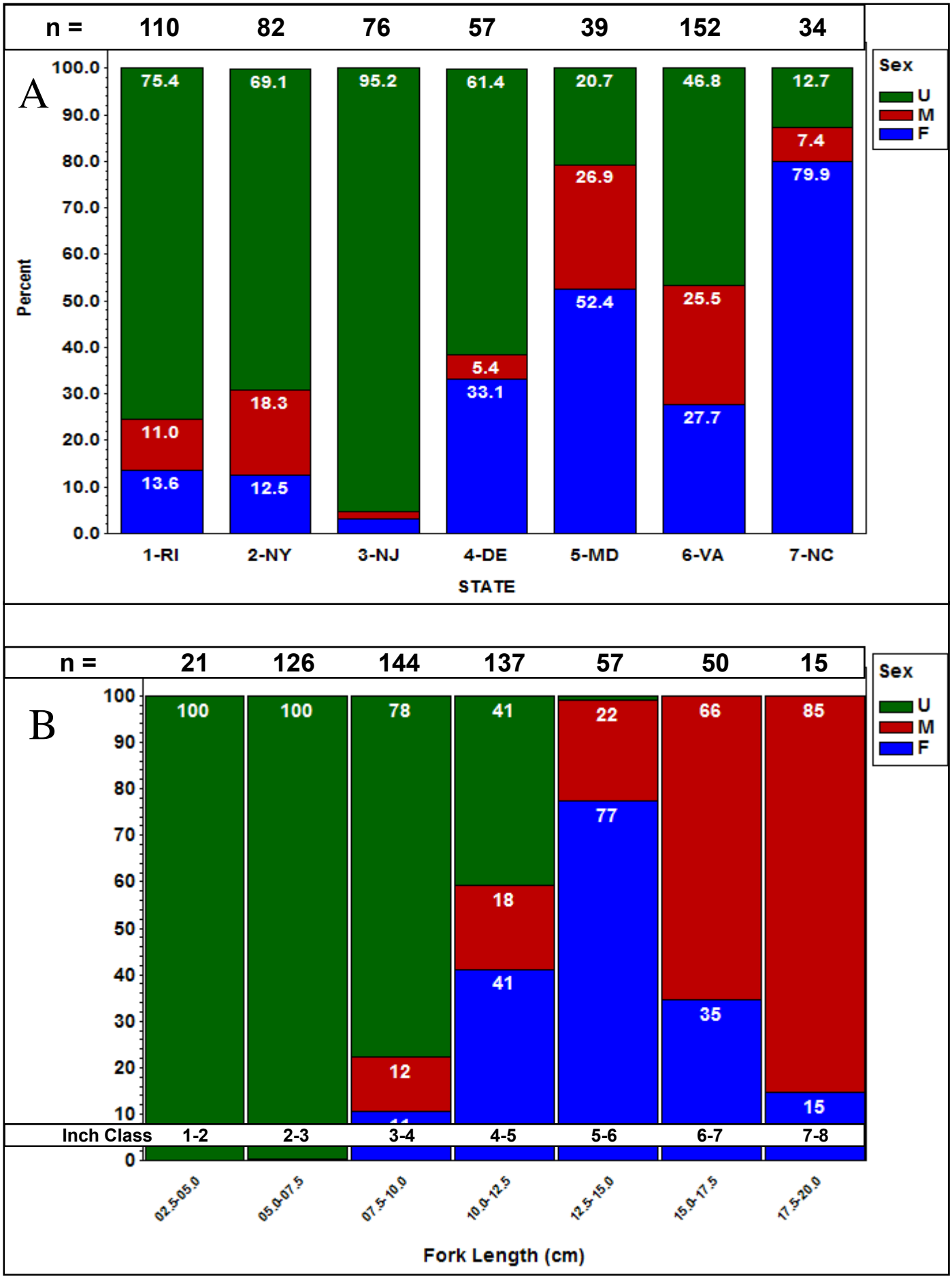


Figure 62. Sex ratios for butterfish, by state (A) and length group (B).



Clearnose Skate (Priority B)

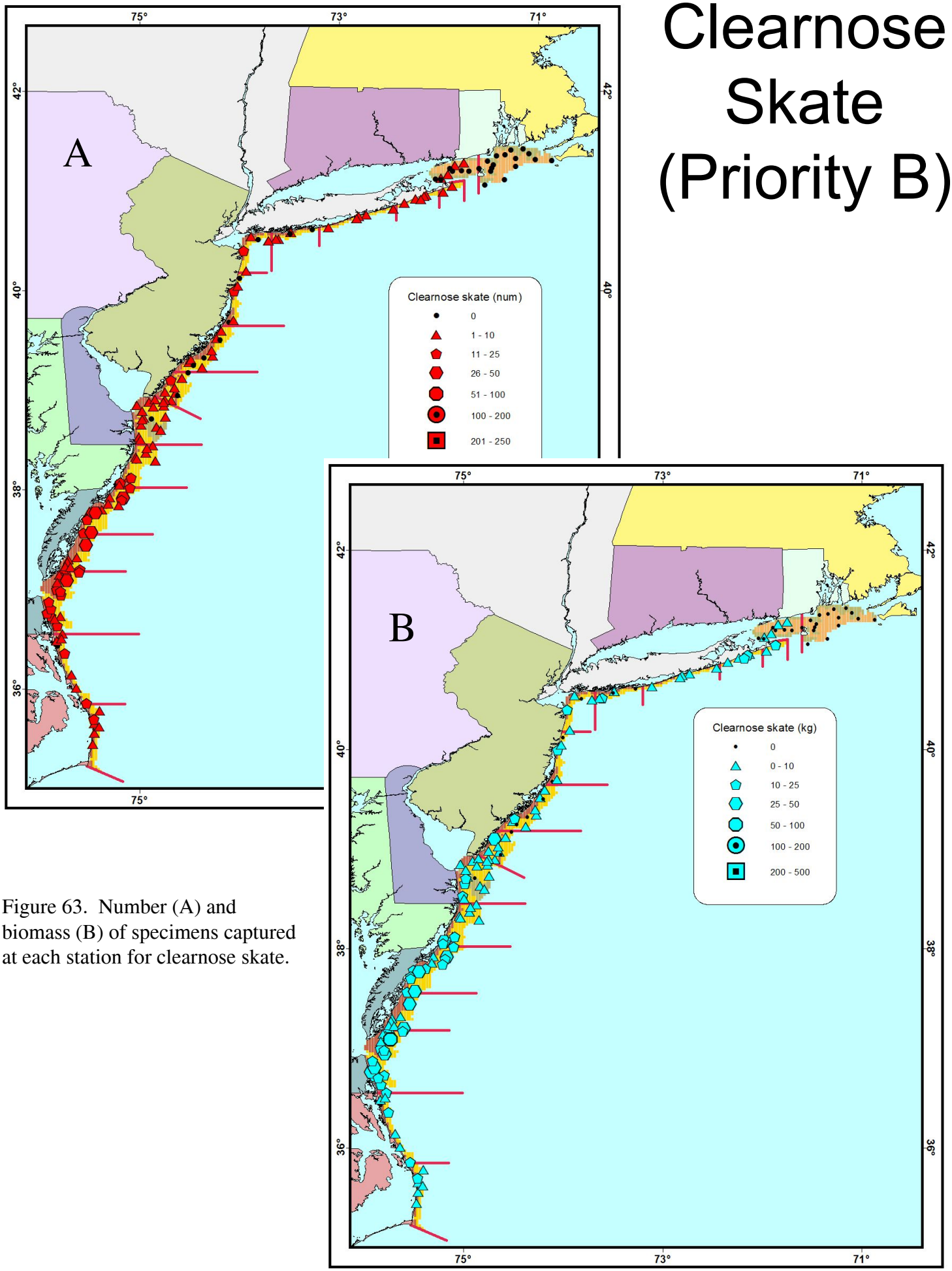


Figure 63. Number (A) and biomass (B) of specimens captured at each station for clearnose skate.

Table 20. Number, biomass, minimum and maximum size of specimens captured, by state and region, for clearnose skate.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	4	5	7.244	5	5	346	464	416	1.449	0.11	0.14
NY	22	19	69	113.232	43	69	284	503	409	1.529	2.08	3.03
NJ	24	17	86	114.422	37	86	261	467	368	1.132	1.64	1.79
DE	17	15	65	93.711	38	65	247	519	396	1.388	6.93	10.21
MD	10	10	84	96.150	28	84	229	457	377	0.986	6.82	7.29
VA	38	38	496	685.792	108	417	202	509	390	1.353	10.21	13.72
NC	13	12	80	85.632	30	80	236	515	363	1.033	4.65	4.77
Total	150	115	885	1196.183	289	806	202	519	386	1.276	3.04	3.78

Figure 64. Geometric mean catch per area swept by state and overall, with summary catch rates, for clearnose skate.

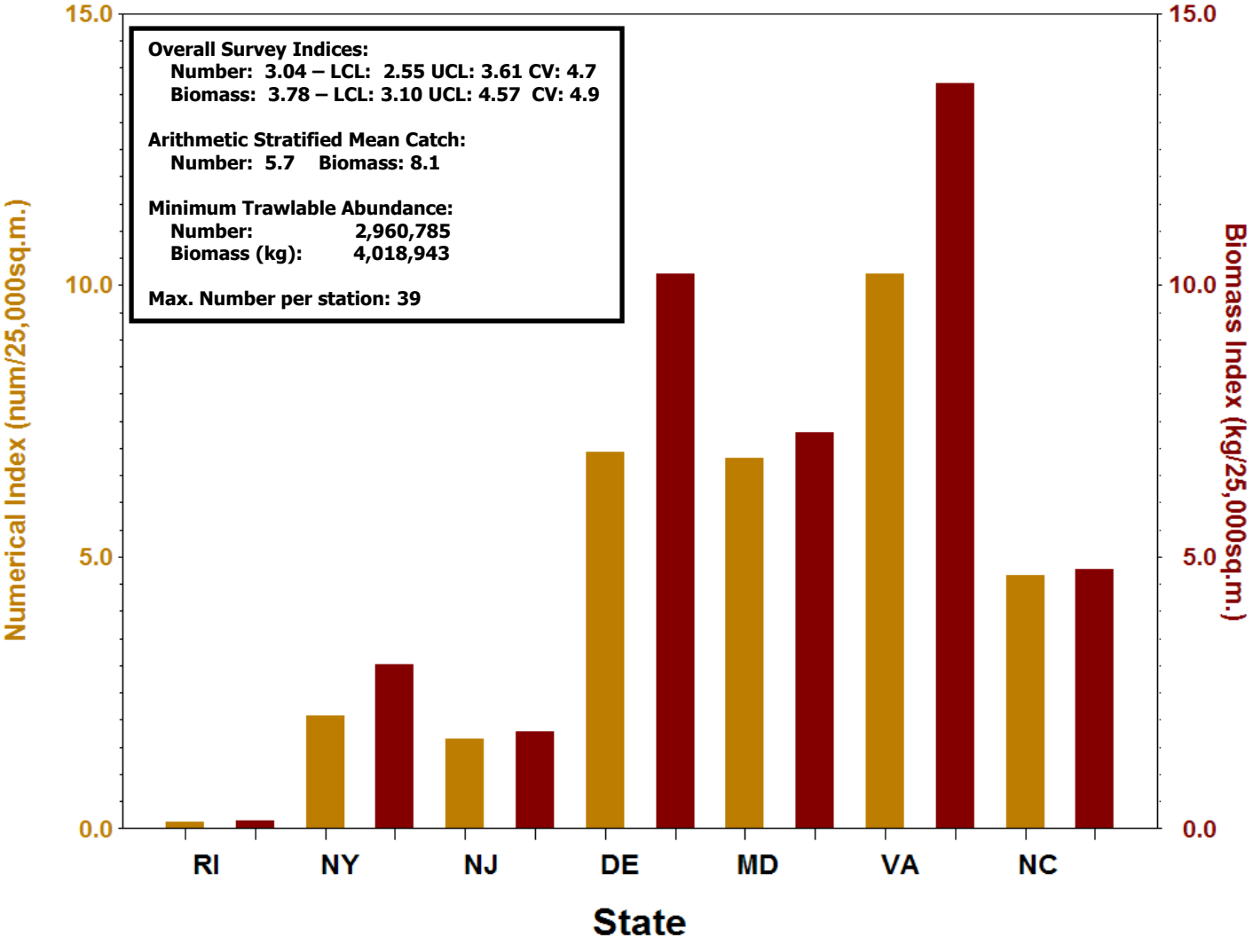


Figure 65. Width frequency histogram for clearnose skate.

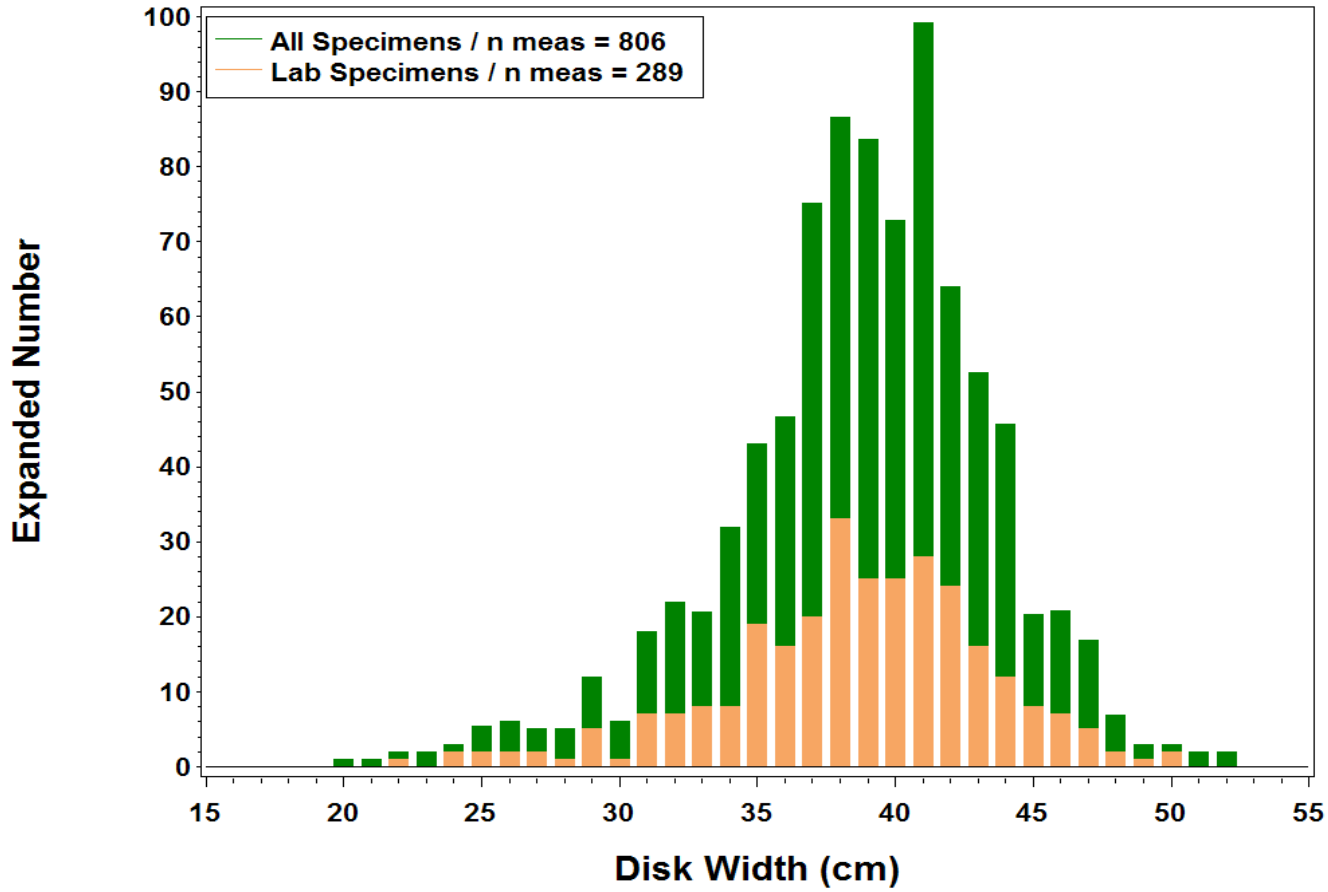


Figure 66. Sex-specific length frequencies histogram for clearnose skate.

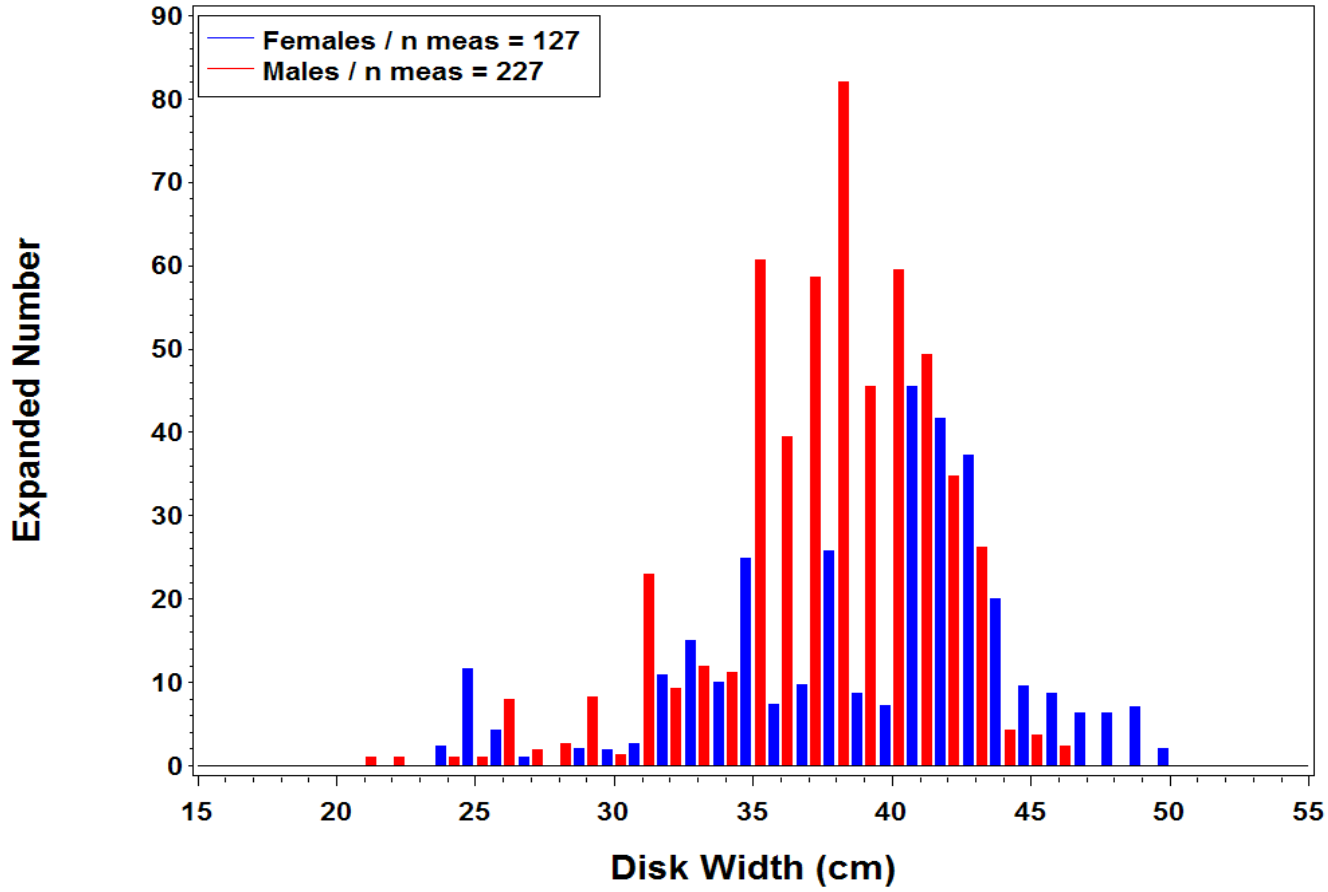
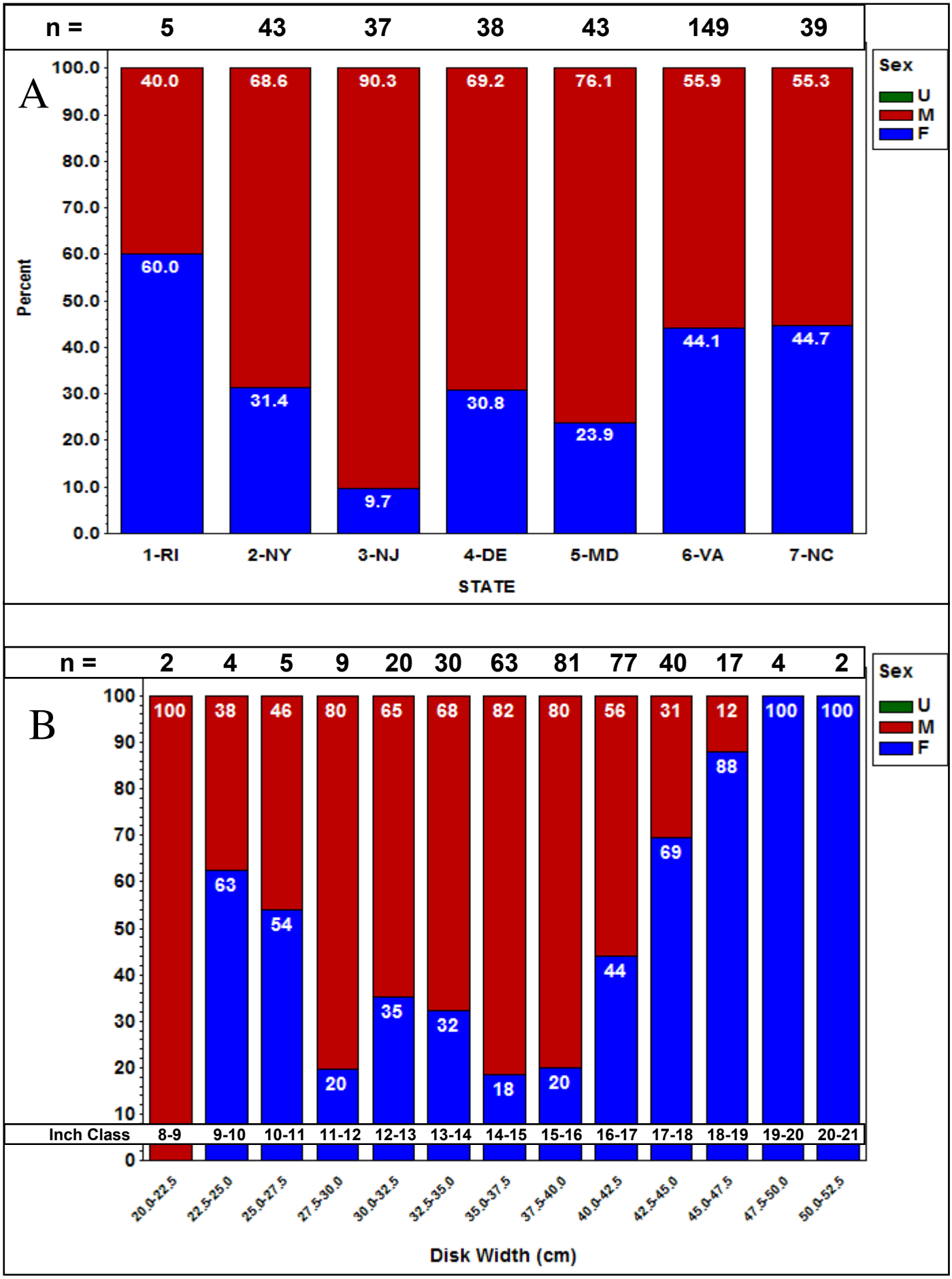


Figure 67. Sex ratios for clearnose skate, by state (A) and width group (B).



Cownose Ray (Priority B)

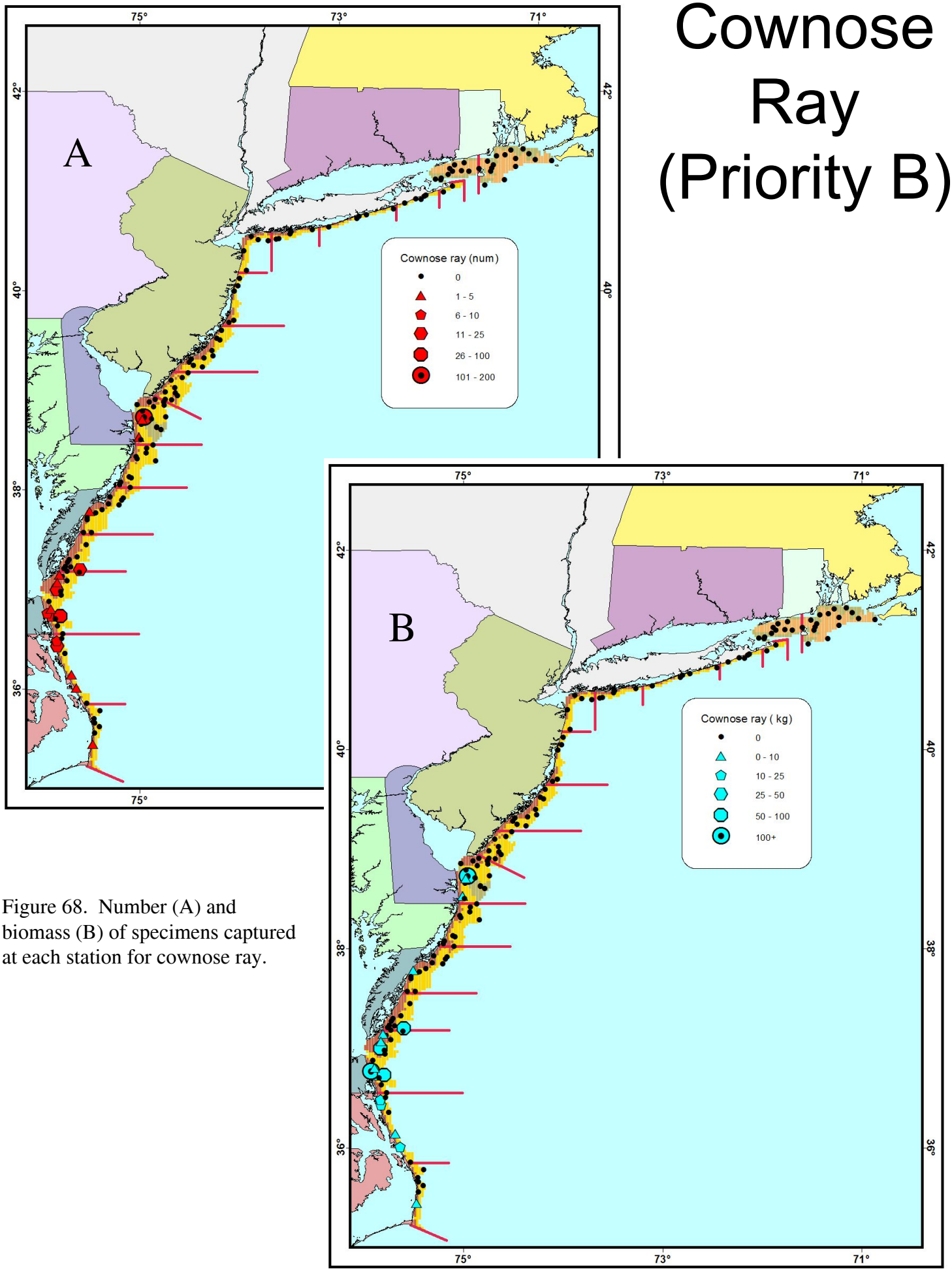


Figure 68. Number (A) and biomass (B) of specimens captured at each station for cownose ray.

Table 21. Number, biomass, minimum and maximum size of specimens captured, by state and region, for cownose ray.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17	3	106	160.133	0	27	458	765	630		0.69	0.93
MD	10										0.00	0.00
VA	38	9	104	353.149	0	67	395	937	546	6.231	0.64	1.03
NC	13	5	21	47.120	0	14	400	920	501		0.56	1.00
Total	150	17	231	560.402	0	108	395	937	561	6.231	0.34	0.51

Figure 69. Geometric mean catch per area swept by state and overall, with summary catch rates, for cownose ray.

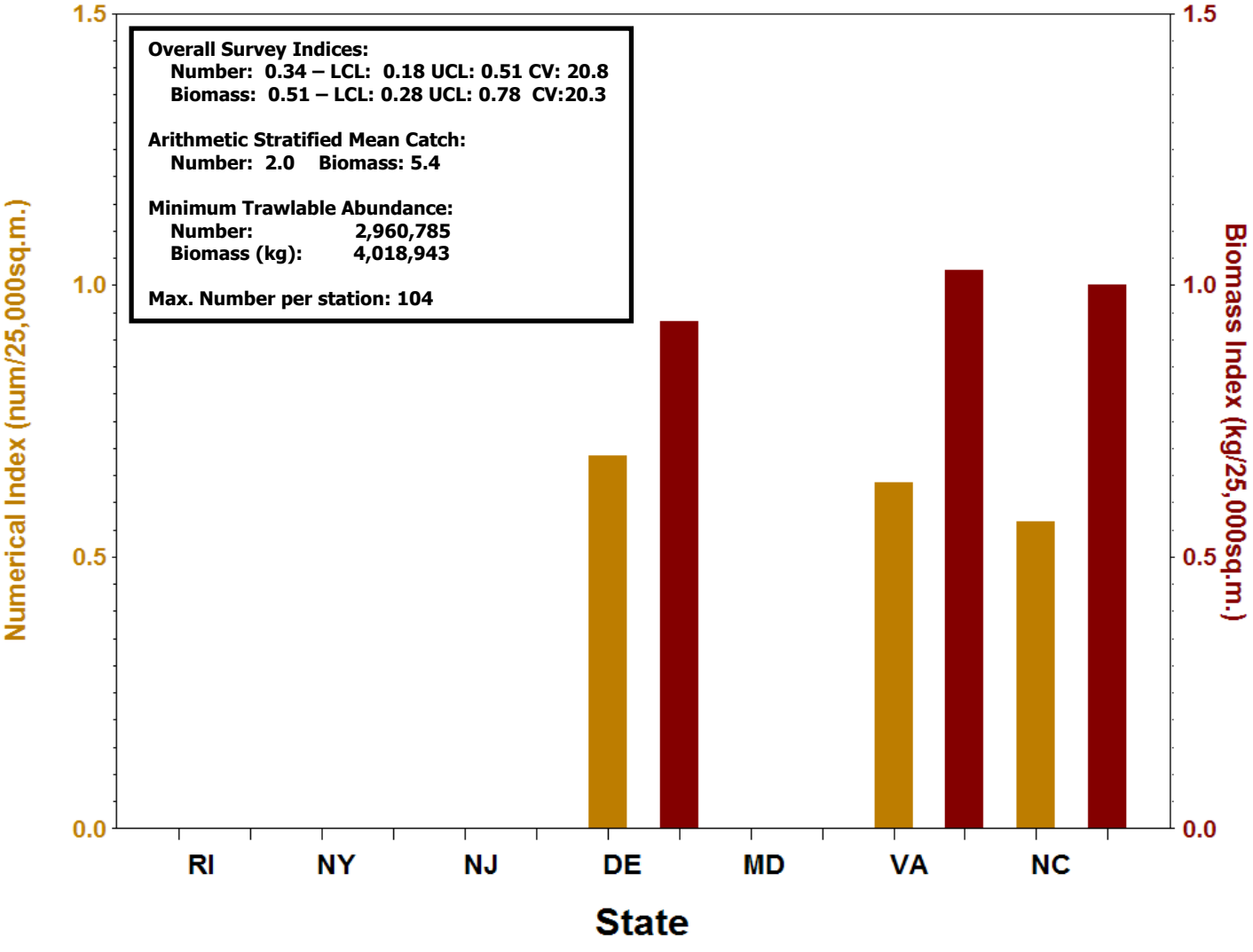


Figure 70. Width frequency histogram for cownose ray.

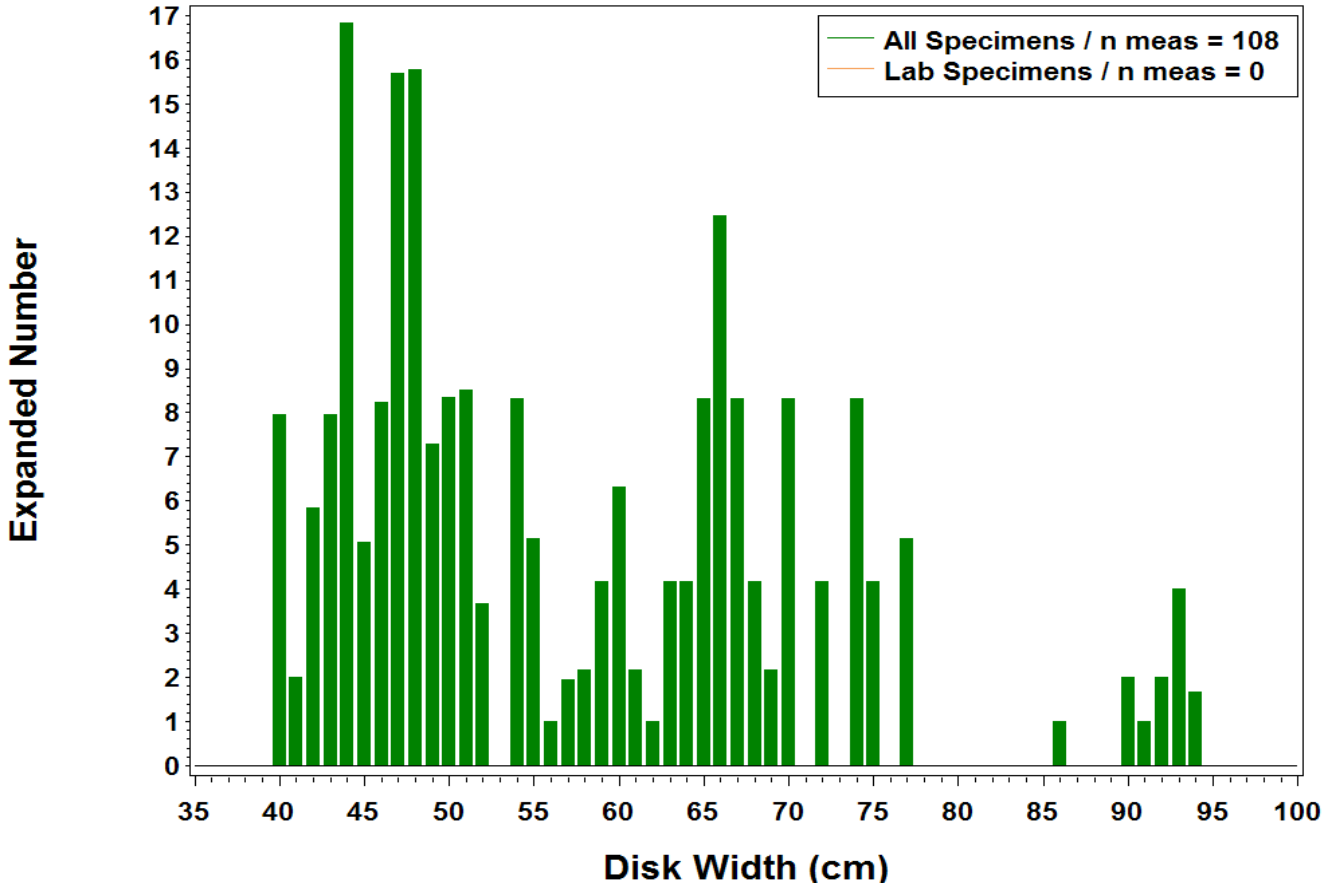
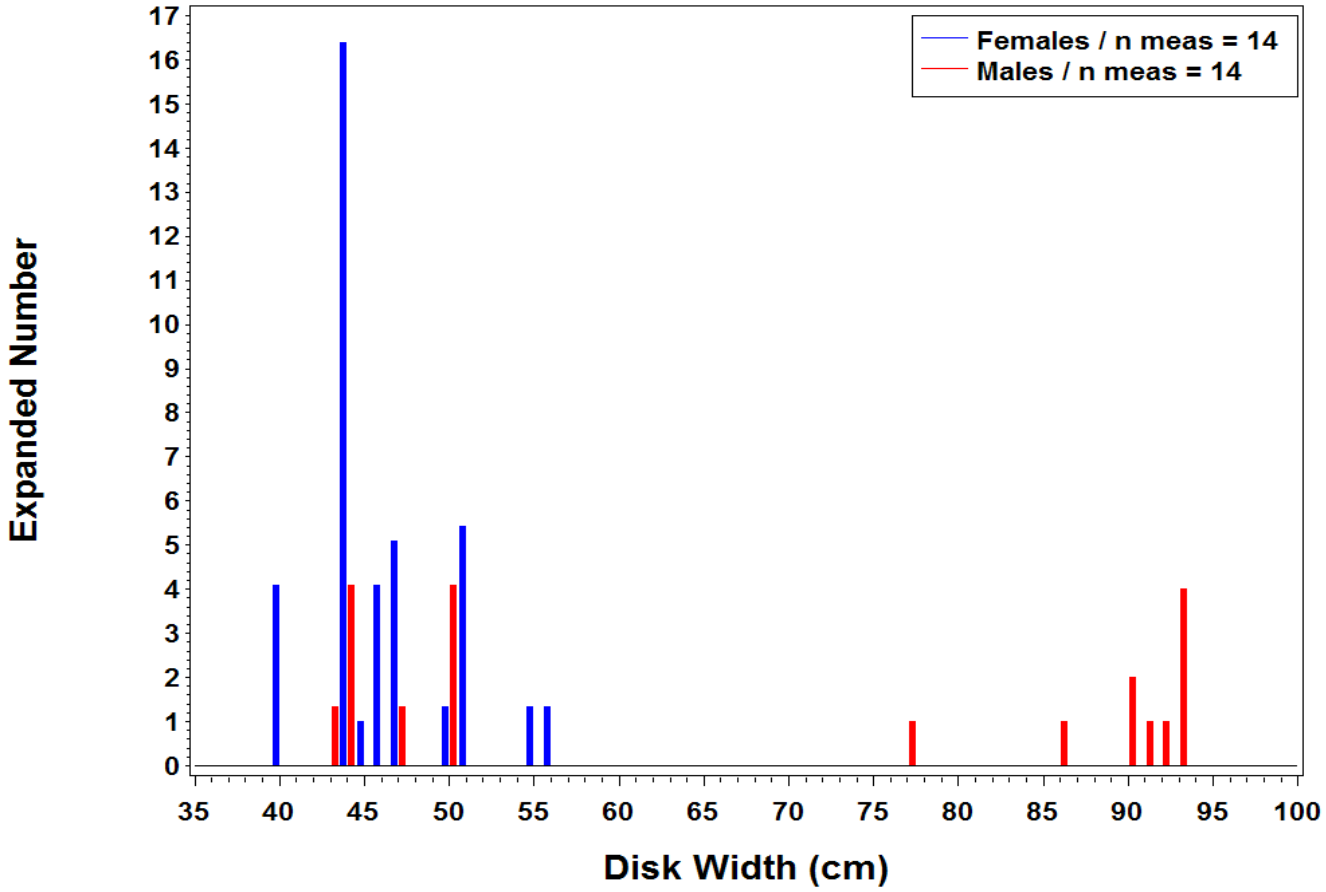


Figure 71. Sex-specific length frequencies histogram for cownose ray.



Horseshoe Crab (Priority E)

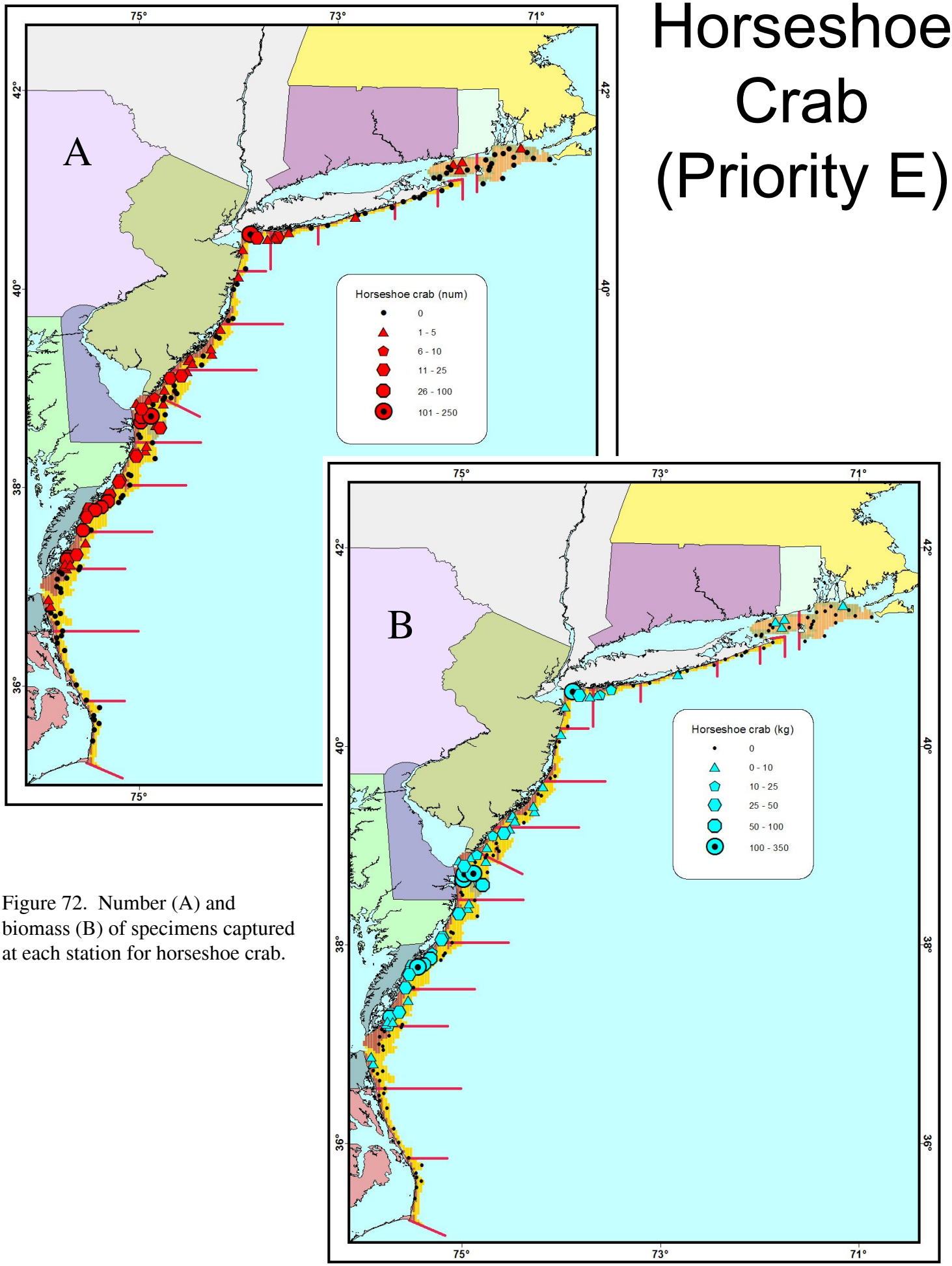


Figure 72. Number (A) and biomass (B) of specimens captured at each station for horseshoe crab.

Table 22. Number, biomass, minimum and maximum size of specimens captured, by state and region, for horseshoe crab.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	4	5	10.289	0	5	212	293	245	2.058	0.11	0.18
NY	22	8	275	415.070	0	59	180	305	232	1.685	1.81	2.39
NJ	24	11	41	71.938	0	41	196	313	251	1.674	0.78	1.09
DE	17	12	393	661.172	0	68	90	384	257	1.942	24.48	47.18
MD	10	6	79	127.122	0	79	180	305	233	1.608	3.00	4.71
VA	38	18	356	553.773	0	221	103	312	226	1.512	2.08	2.60
NC	13										0.00	0.00
Total	150	59	1149	1839.364	0	473	90	384	235	1.663	1.73	2.28

Figure 73. Geometric mean catch per area swept by state and overall, with summary catch rates, for horseshoe crab.

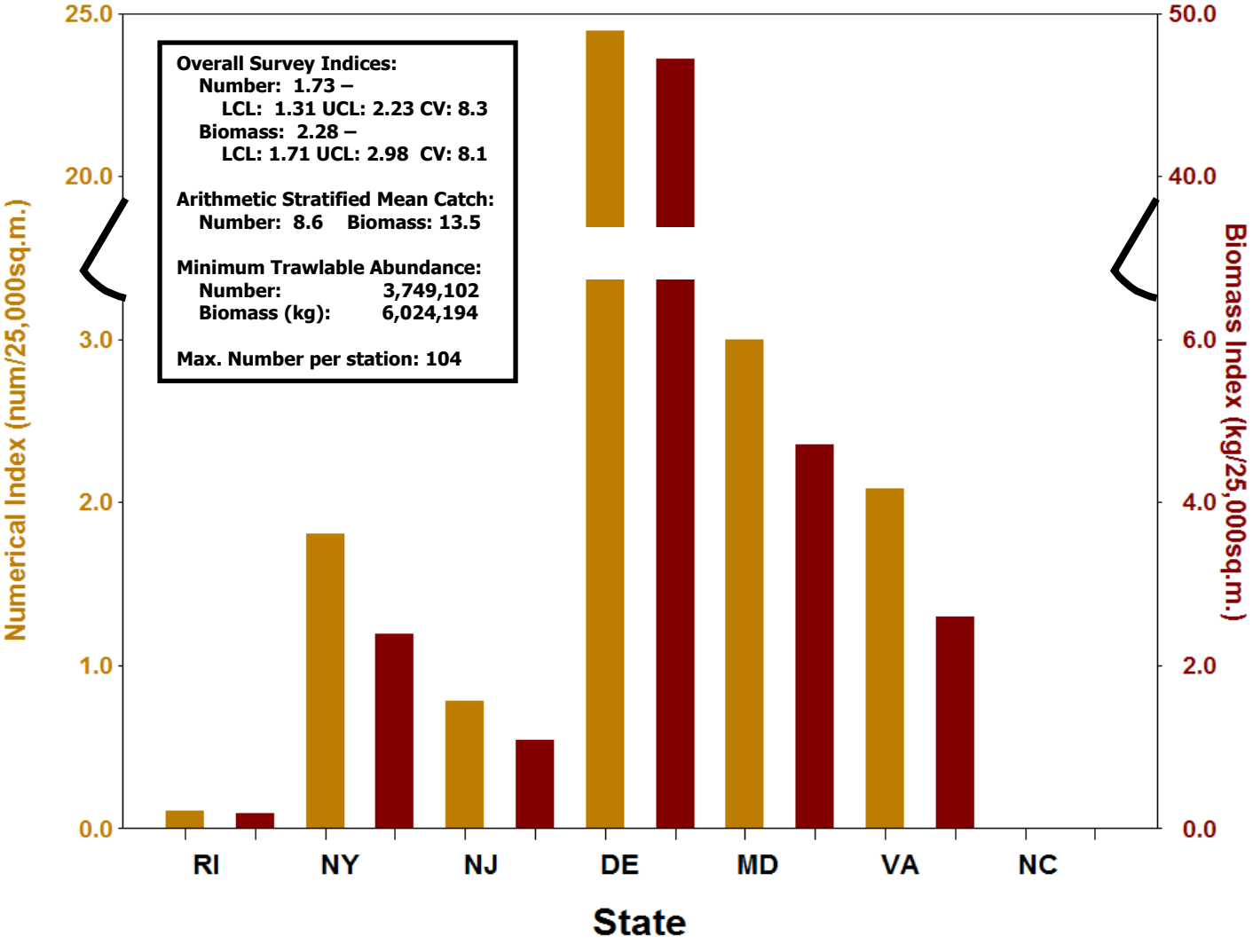


Figure 74. Width frequency histogram for horseshoe crab.

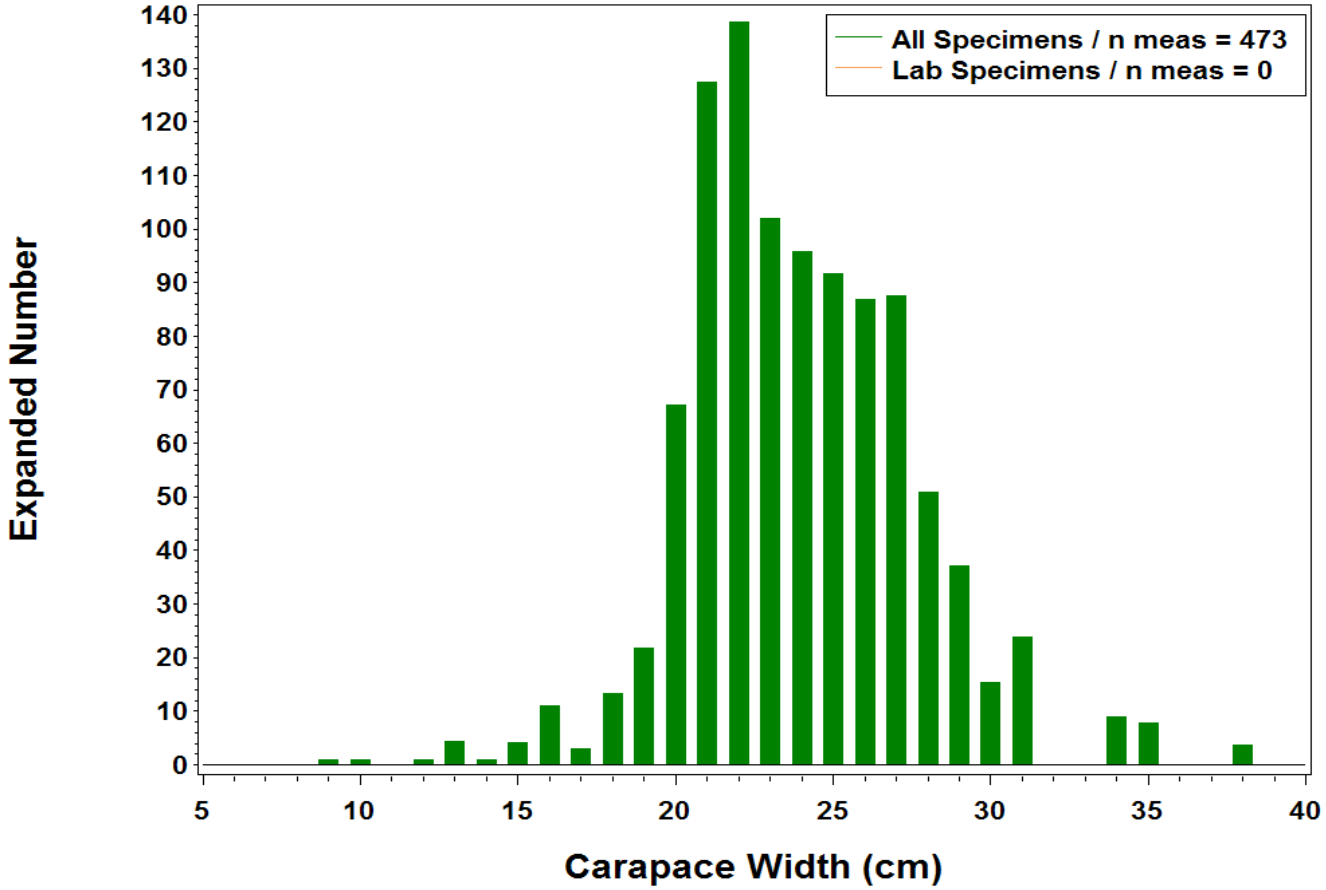


Figure 75. Sex-specific length frequencies histogram for horseshoe crab.

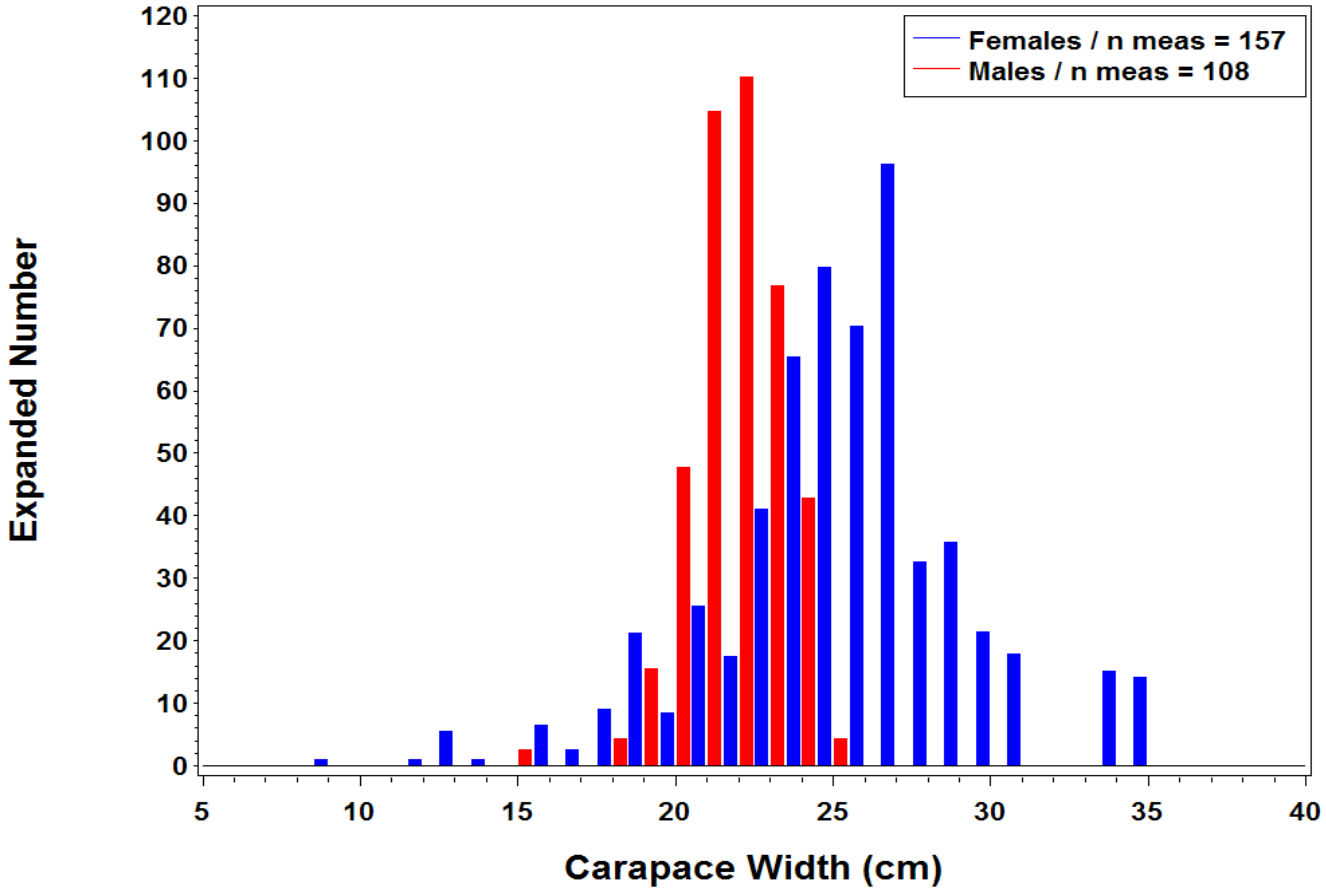
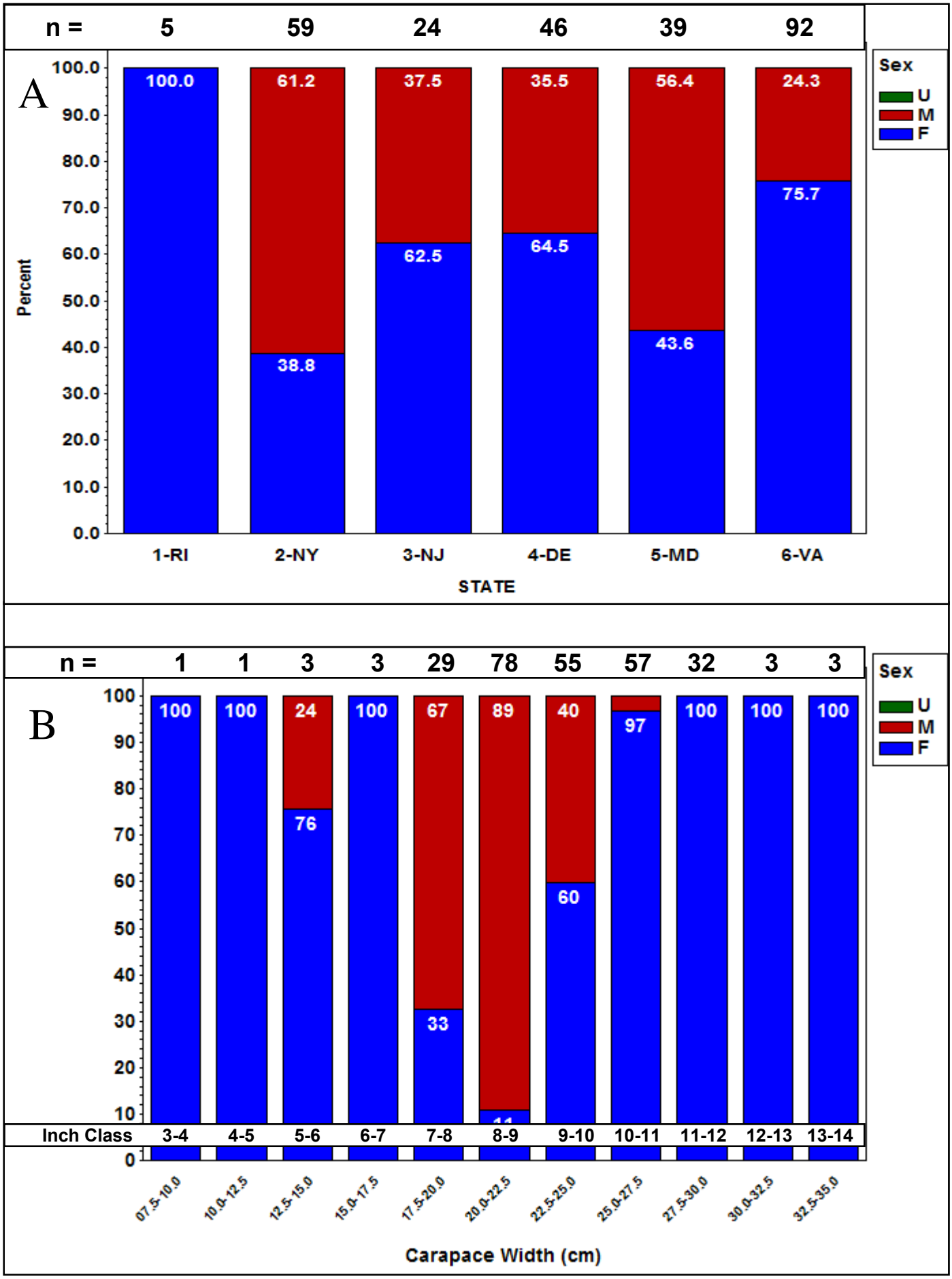


Figure 76. Sex ratios for horseshoe crab, by state (A) and width group (B).



Kingfish spp. (Priority D)

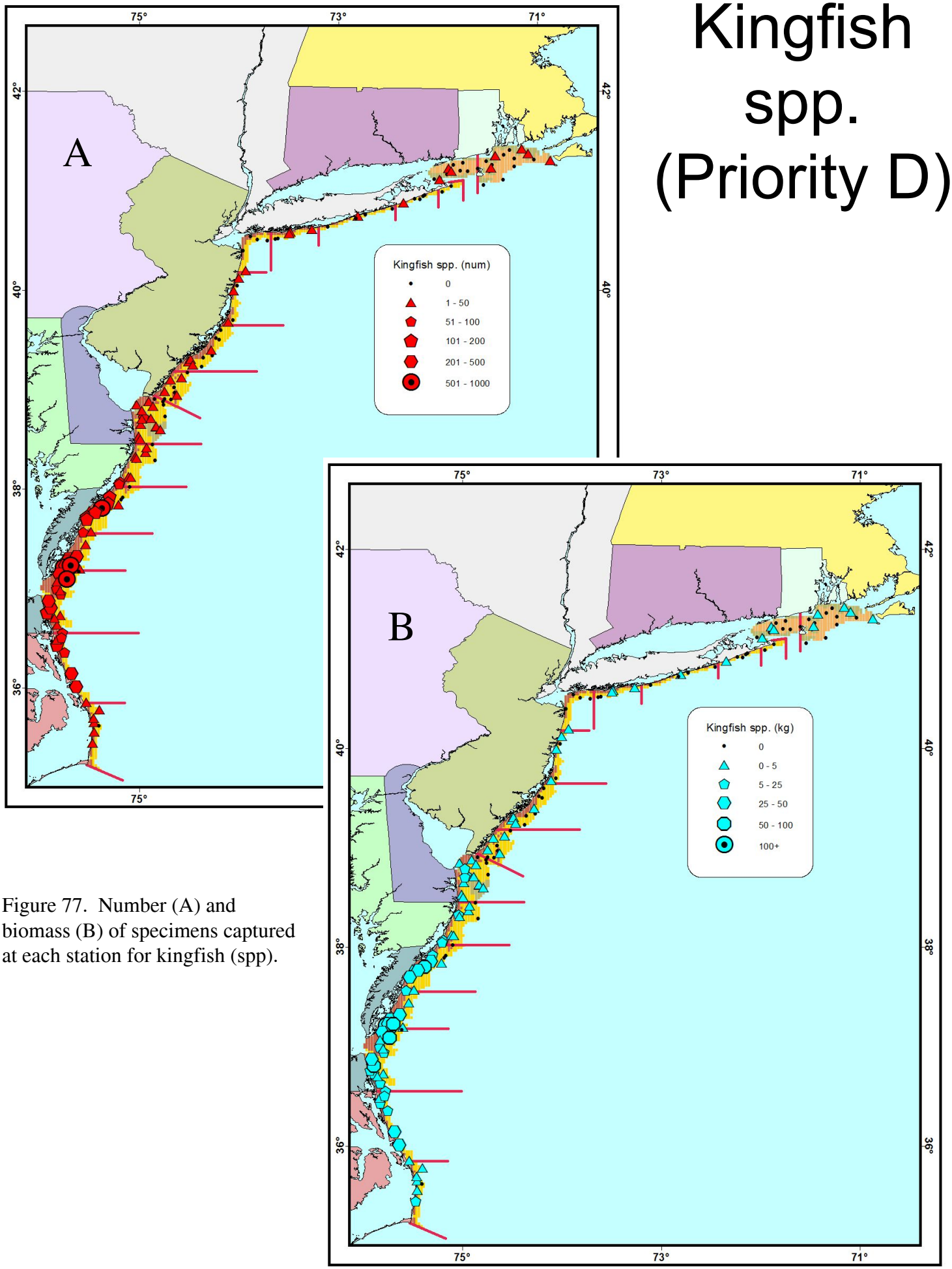


Figure 77. Number (A) and biomass (B) of specimens captured at each station for kingfish (spp).

Table 23. Number, biomass, minimum and maximum size of specimens captured, by state and region, for kingfish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	8	9	1.485	0	9	203	330	249		0.23	0.05
NY	22	6	19	2.471	0	19	154	269	236		0.32	0.07
NJ	24	11	70	12.043	0	70	134	356	235		0.86	0.27
DE	17	13	160	39.133	0	124	173	354	280		11.32	2.50
MD	10	8	191	52.419	0	87	209	339	270		5.94	2.15
VA	38	34	6716	1024.728	0	944	93	397	234		46.83	10.33
NC	13	12	861	122.162	0	249	122	337	237		18.76	4.24
Total	150	92	8026	1254.441	0	1502	93	397	240		6.44	2.20

Figure 78. Geometric mean catch per area swept by state and overall, with summary catch rates, for kingfish.

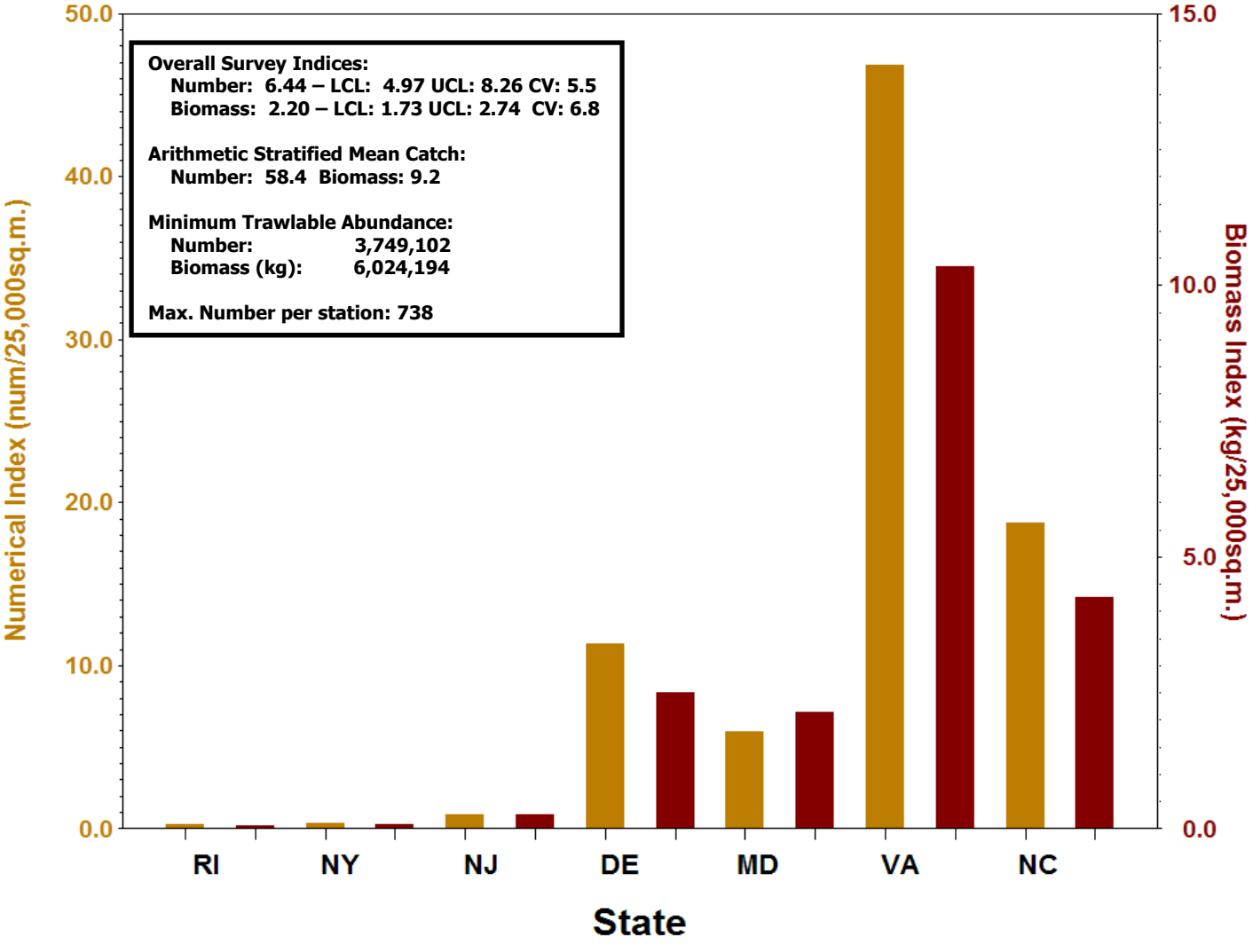
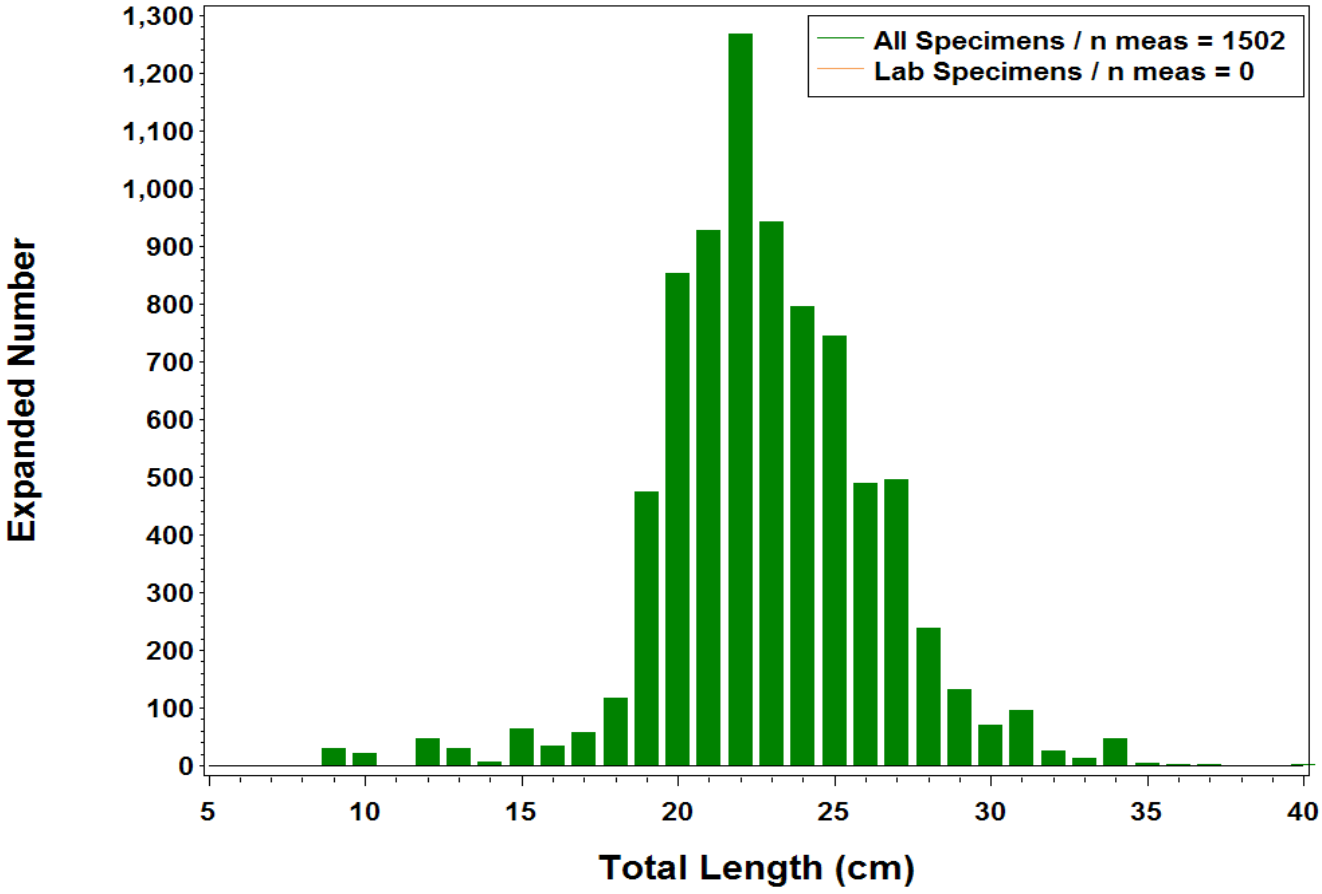


Figure 79. Length frequency histogram for kingfish (spp).



Little Skate (Priority B)

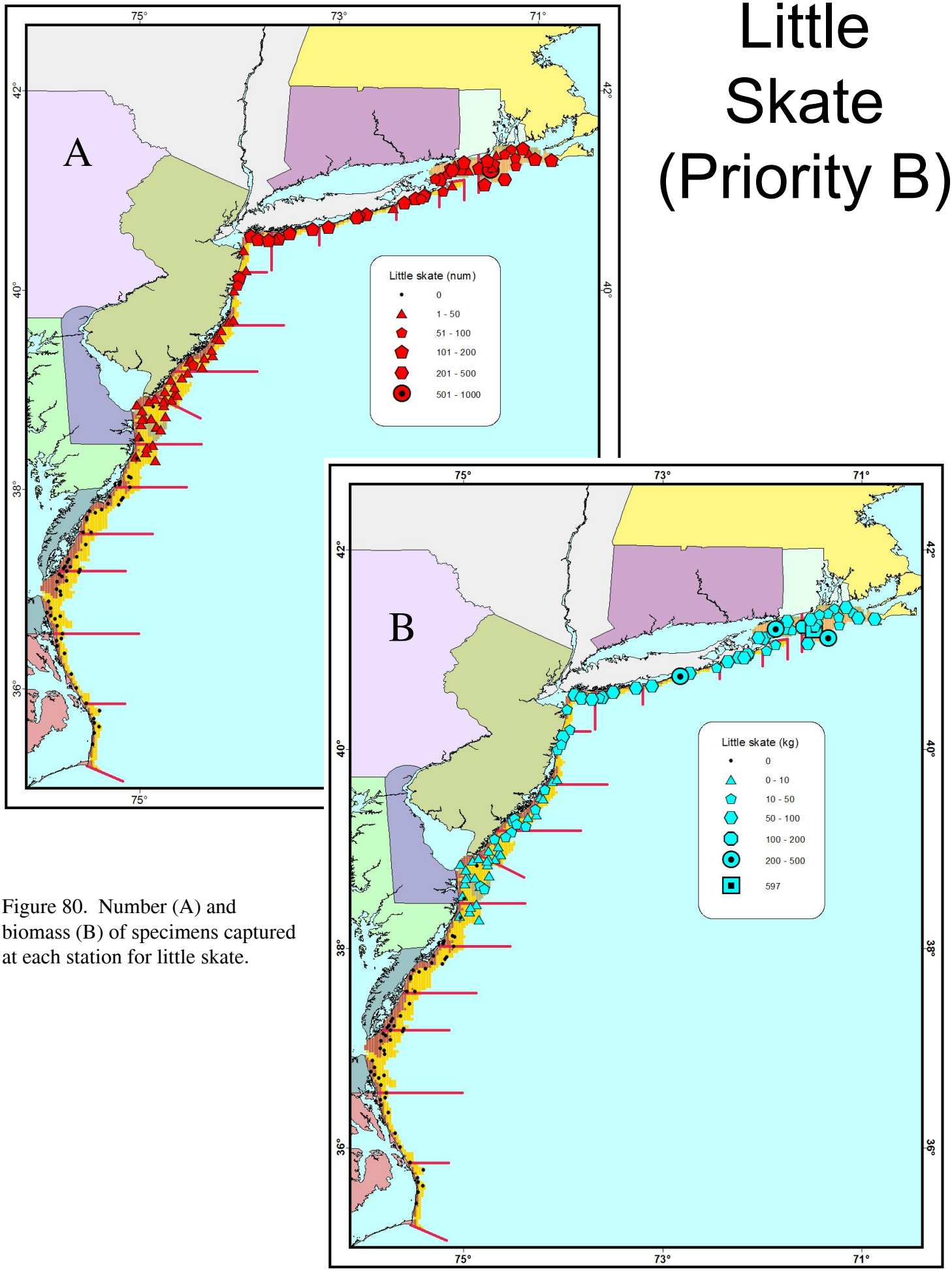


Figure 80. Number (A) and biomass (B) of specimens captured at each station for little skate.

Table 24. Number, biomass, minimum and maximum size of specimens captured, by state and region, for little skate.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	26	3843	2331.049	77	892	183	413	260	0.590	88.86	53.74
NY	22	22	2422	1349.174	66	850	153	523	253	0.510	83.28	47.44
NJ	24	24	624	353.718	71	380	205	303	261	0.579	14.51	8.61
DE	17	15	118	66.569	42	118	216	305	264	0.579	18.50	9.05
MD	10	5	7	4.264	7	7	251	289	272	0.609	0.51	0.34
VA	38										0.00	0.00
NC	13										0.00	0.00
Total	150	92	7014	4104.774	263	2247	153	523	258	0.566	8.81	6.17

Figure 81. Geometric mean catch per area swept by state and overall, with summary catch rates, for little skate.

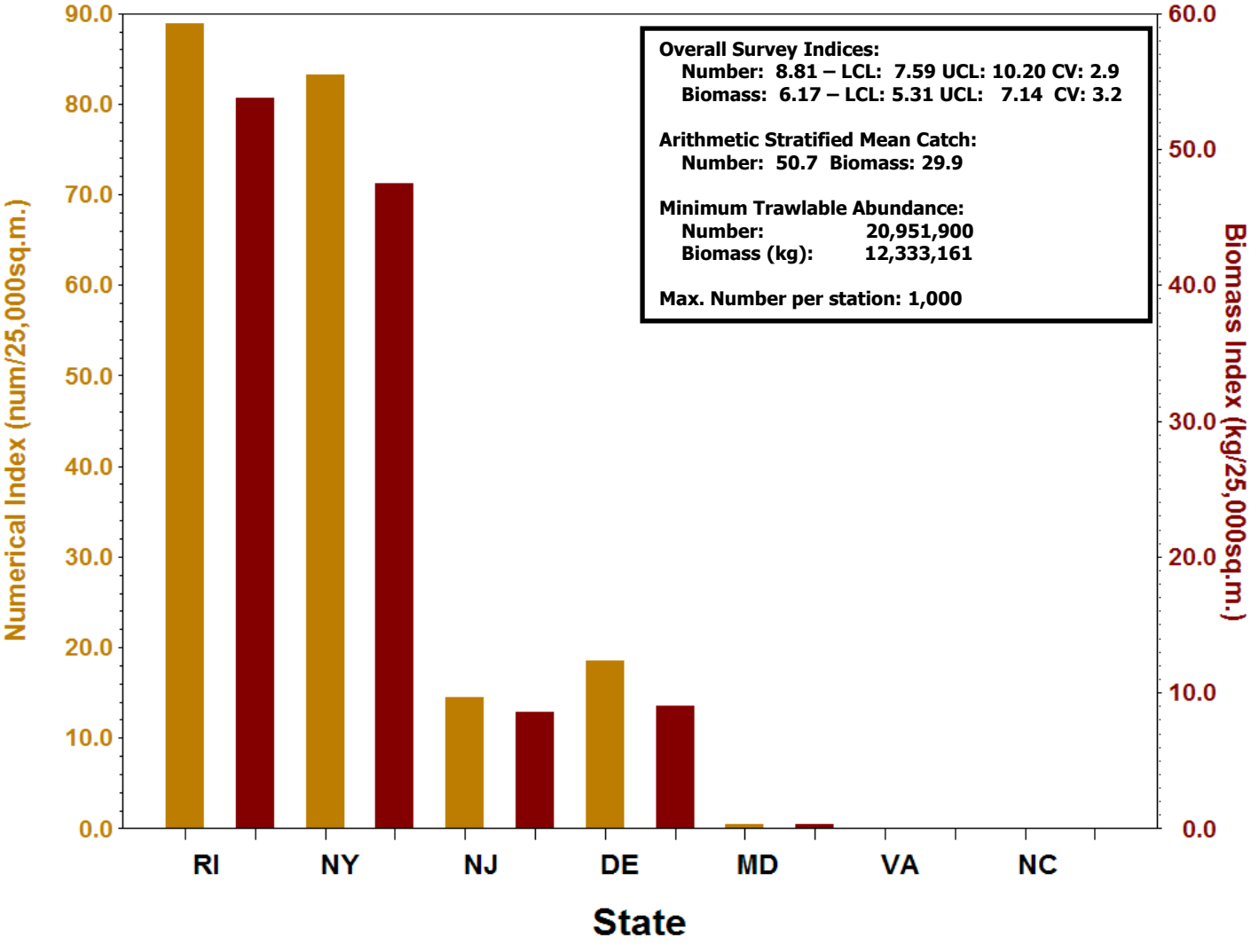


Figure 82. Width frequency histogram for little skate.

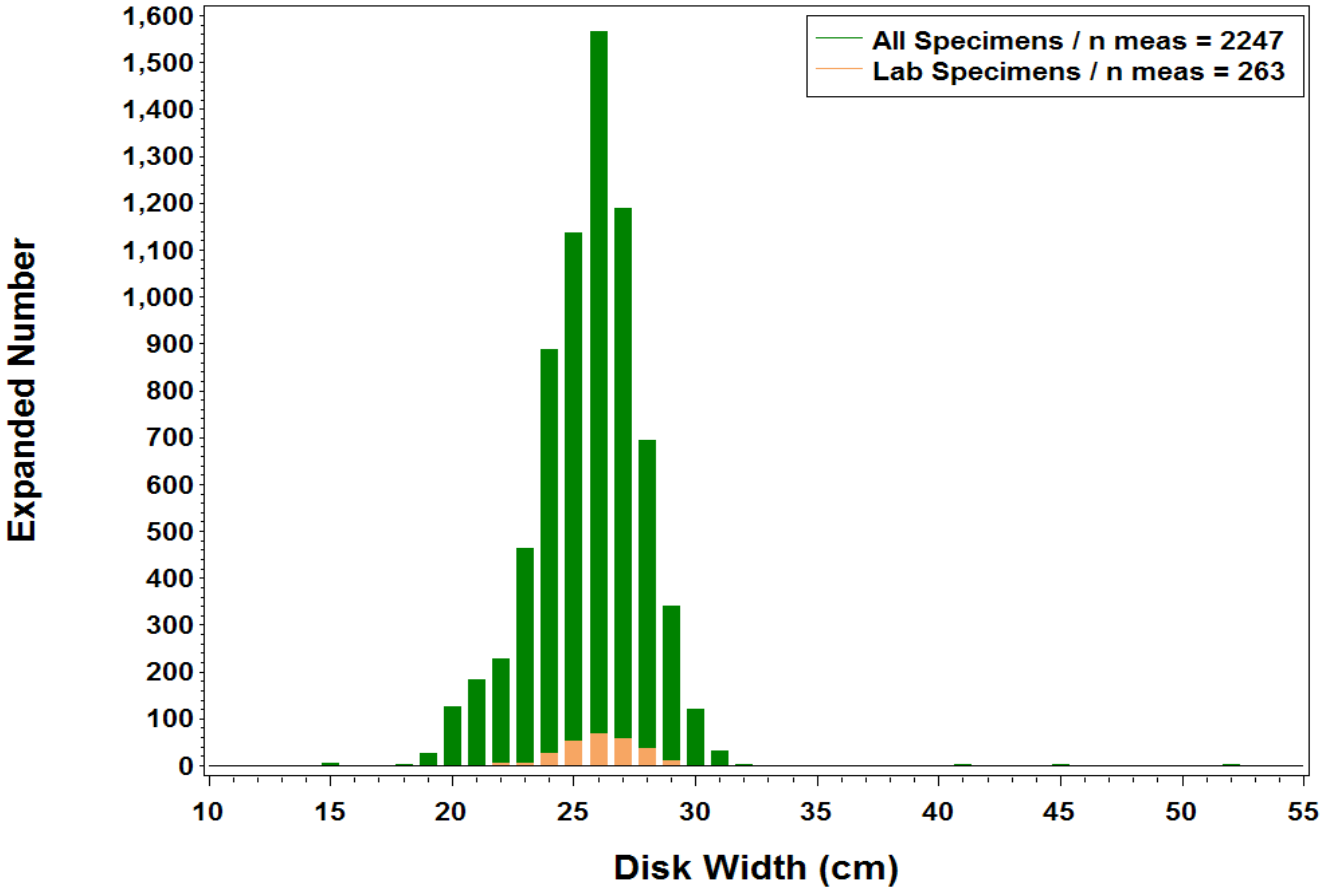


Figure 83. Sex-specific length frequencies histogram for little skate.

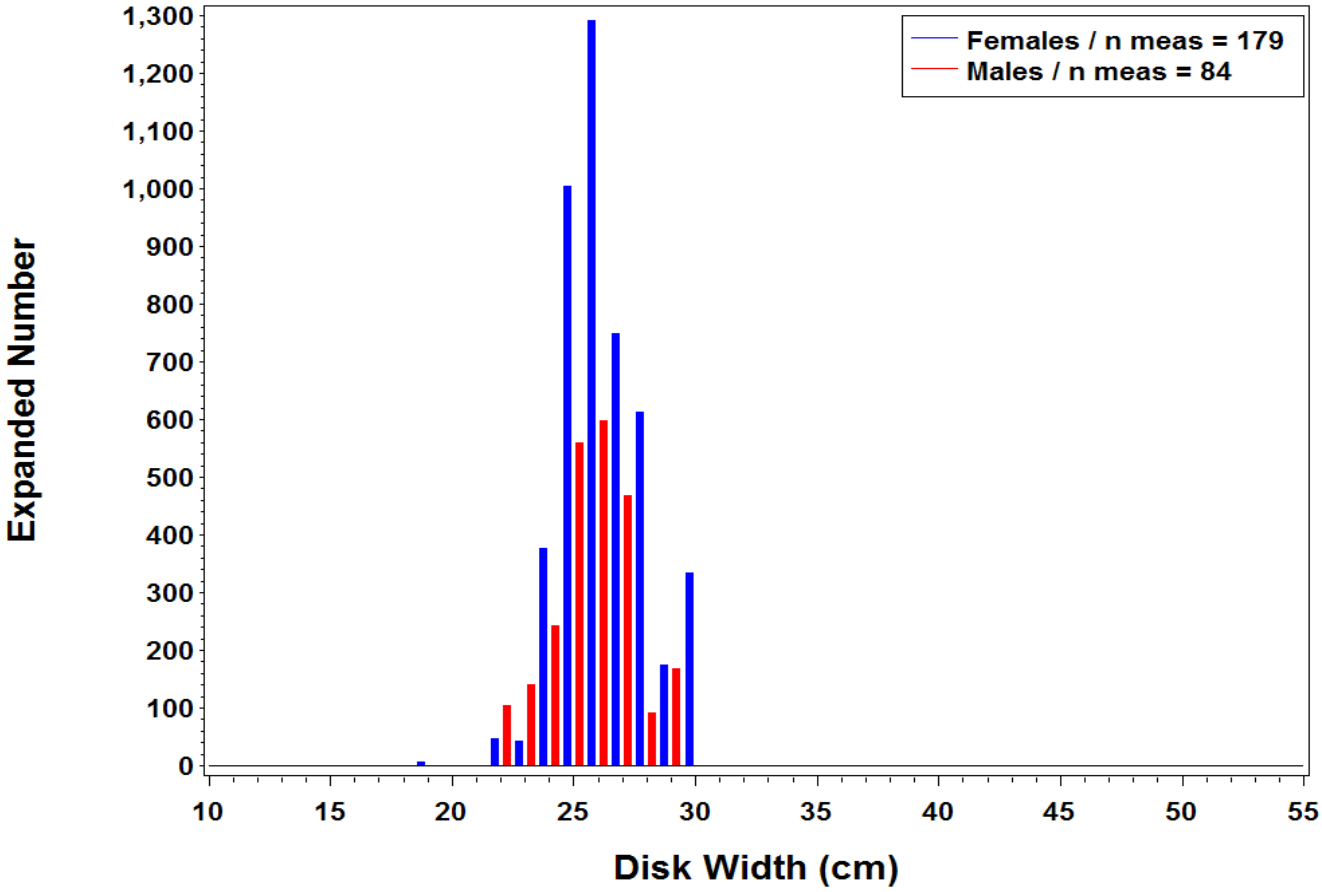
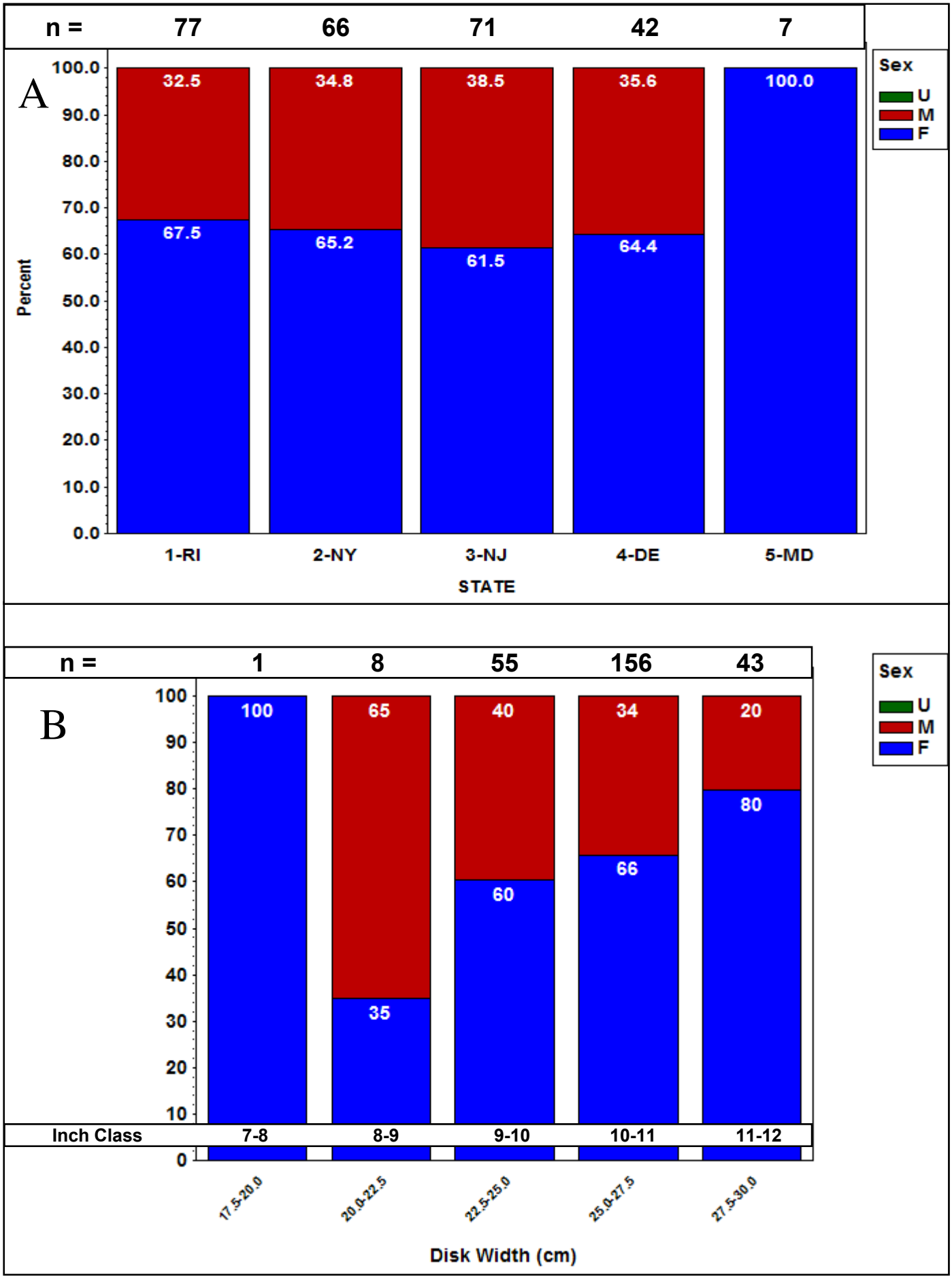


Figure 84. Sex ratios for little skate, by state (A) and width group (B).



Loligo Squid (Priority E)

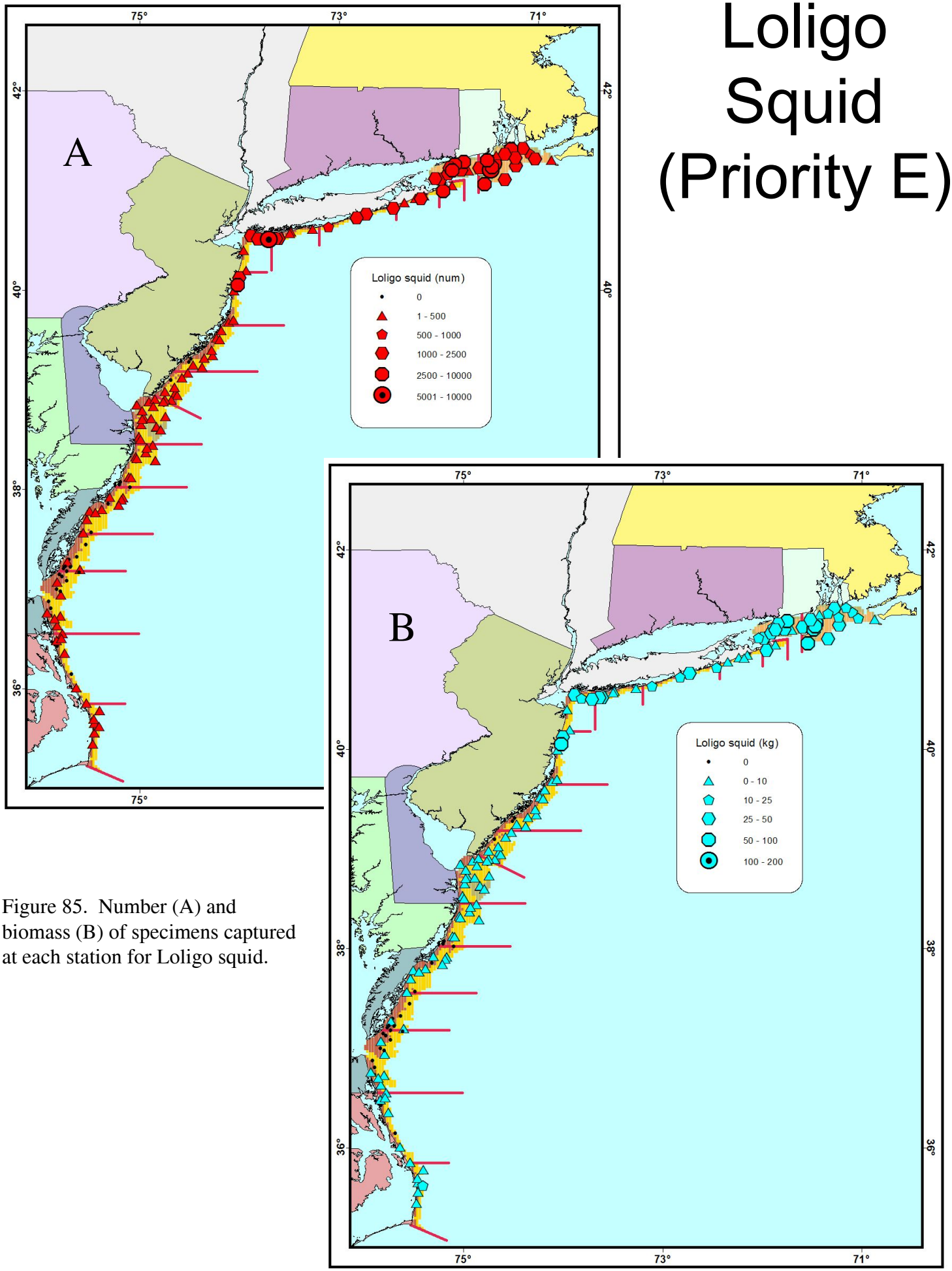


Figure 85. Number (A) and biomass (B) of specimens captured at each station for Loligo squid.

Table25. Number, biomass, minimum and maximum size of specimens captured, by state and region, for loligo squid.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	26	60040	812.495	0	2333	18	202	67		1586.53	22.10
NY	22	20	24983	311.399	0	1423	24	235	66		512.68	9.56
NJ	24	21	6501	149.589	0	1105	30	240	79		49.96	2.18
DE	17	16	523	16.679	0	362	29	293	108		111.15	1.79
MD	10	10	384	12.267	0	228	29	200	84		20.15	1.04
VA	38	27	466	29.824	0	396	32	278	119		4.77	0.60
NC	13	11	486	25.603	0	151	36	225	130		8.10	1.14
Total	150	131	93383	1357.856	0	5998	18	293	77		71.37	3.46

Figure 86. Geometric mean catch per area swept by state and overall, with summary catch rates, for Loligo squid.

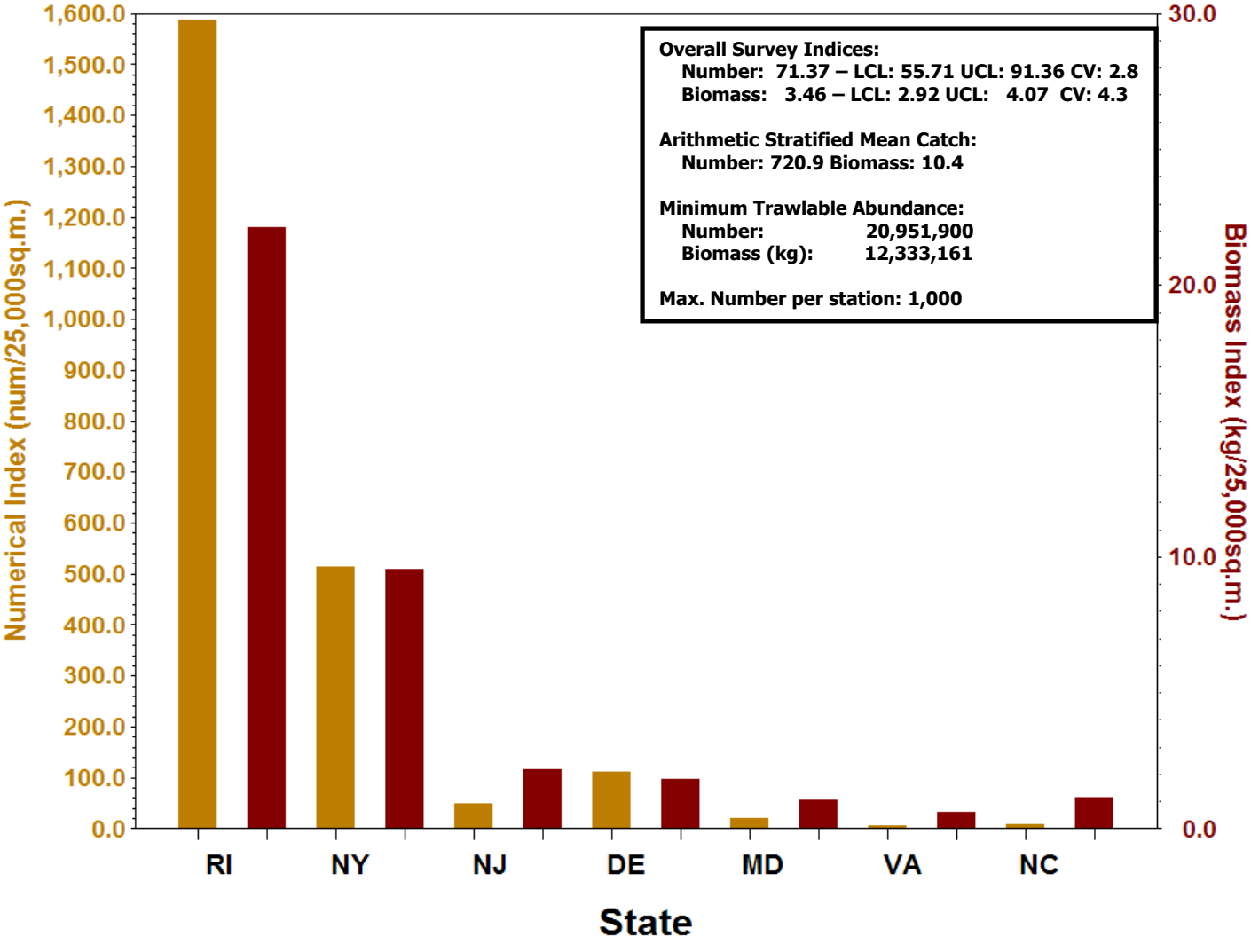
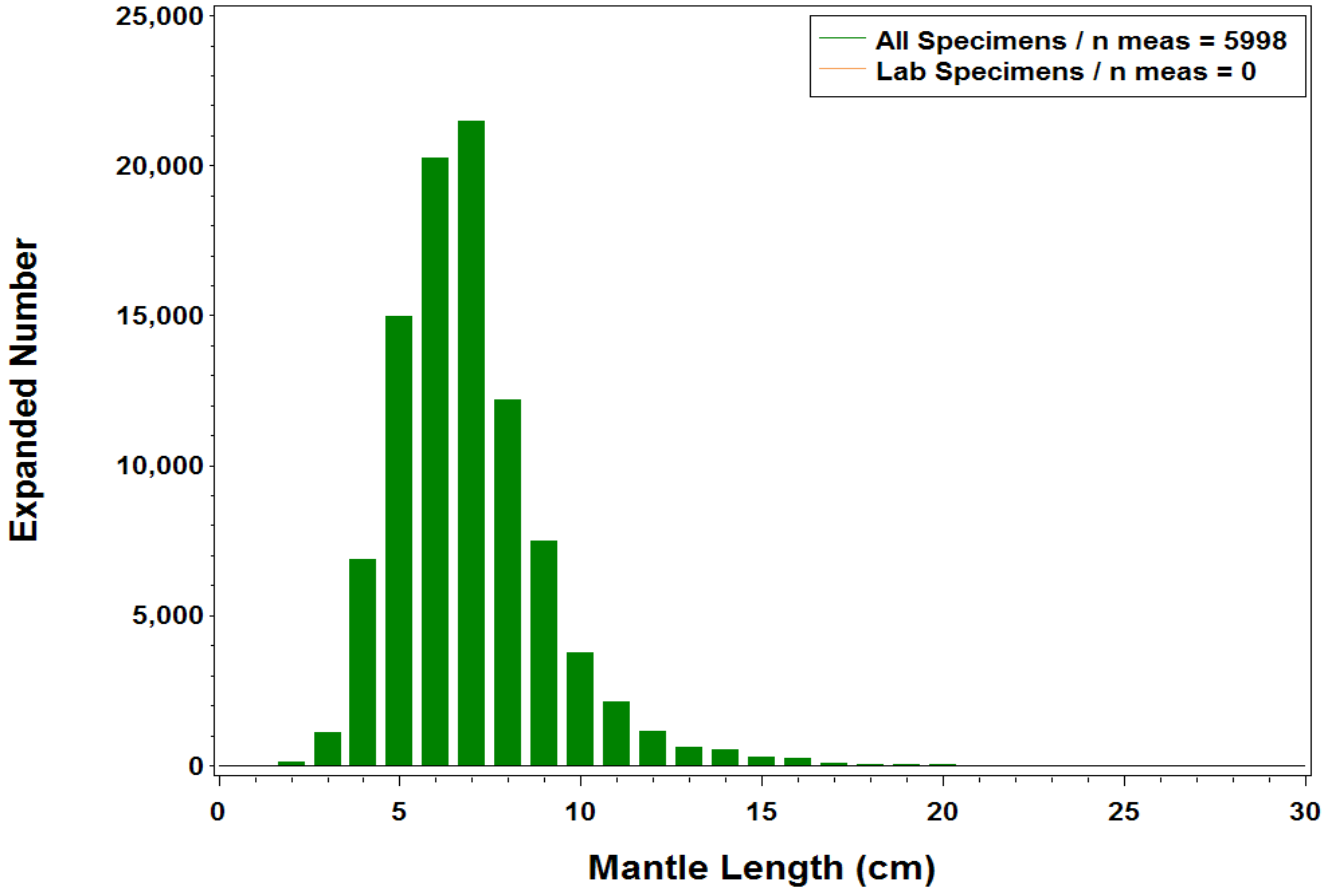


Figure 87. Length frequency histogram for Loligo squid.



Northern Searobin (Priority D)

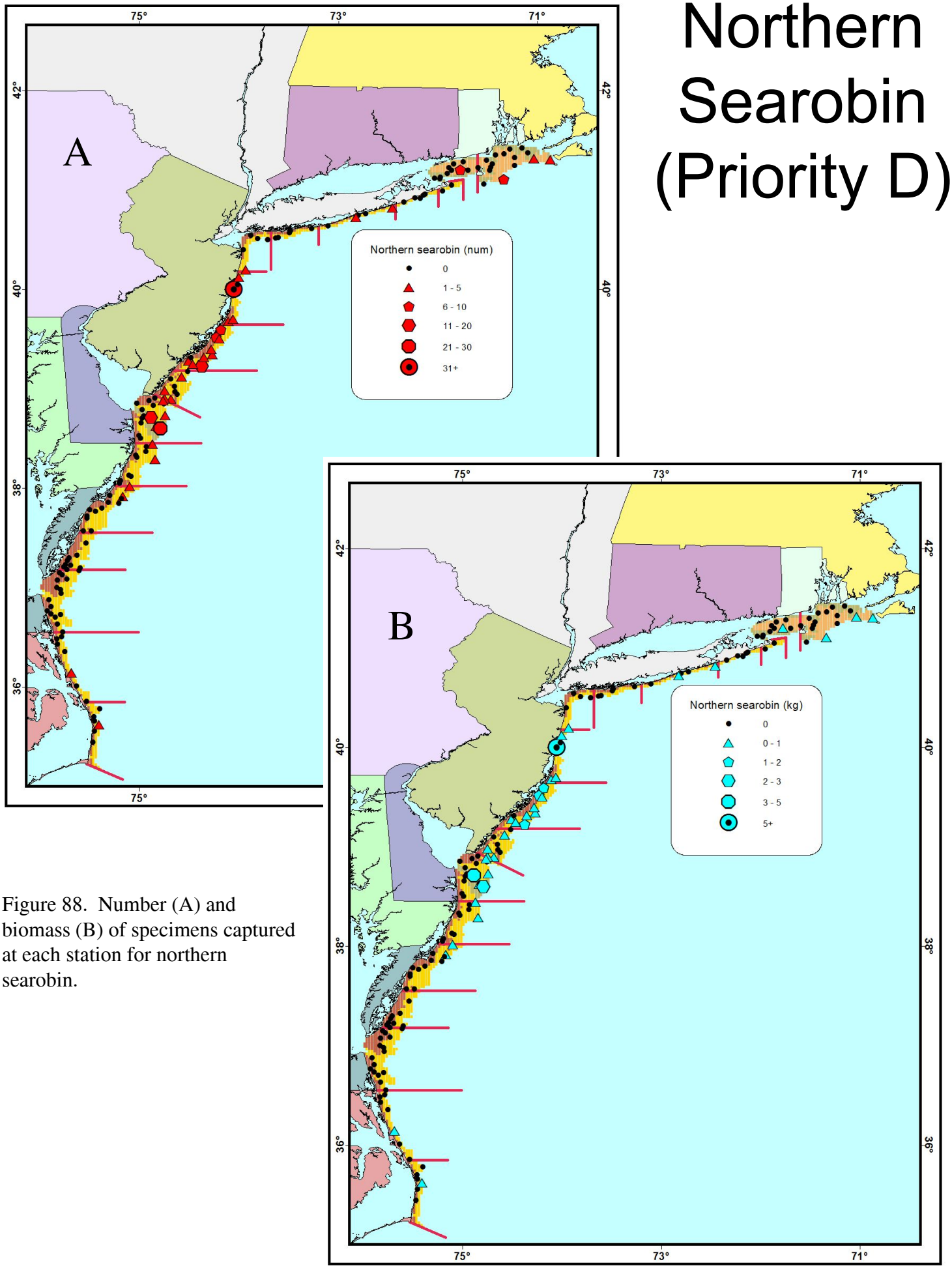


Figure 88. Number (A) and biomass (B) of specimens captured at each station for northern searobin.

Table 26. Number, biomass, minimum and maximum size of specimens captured, by state and region, for northern searobin.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	4	18	1.412	0	18	169	228	195		0.23	0.04
NY	22	3	10	1.166	0	10	107	257	205		0.25	0.05
NJ	24	17	91	14.600	0	91	151	291	246		1.64	0.35
DE	17	5	50	7.060	0	50	169	319	235		2.12	0.54
MD	10	2	4	0.510	0	4	139	263	215		0.22	0.04
VA	38	2	4	0.499	0	4	191	270	231		0.06	0.01
NC	13	2	2	0.055	0	2	116	149	133		0.12	0.00
Total	150	35	179	25.302	0	179	107	319	233		0.33	0.08

Figure 89. Geometric mean catch per area swept by state and overall, with summary catch rates, for northern searobin.

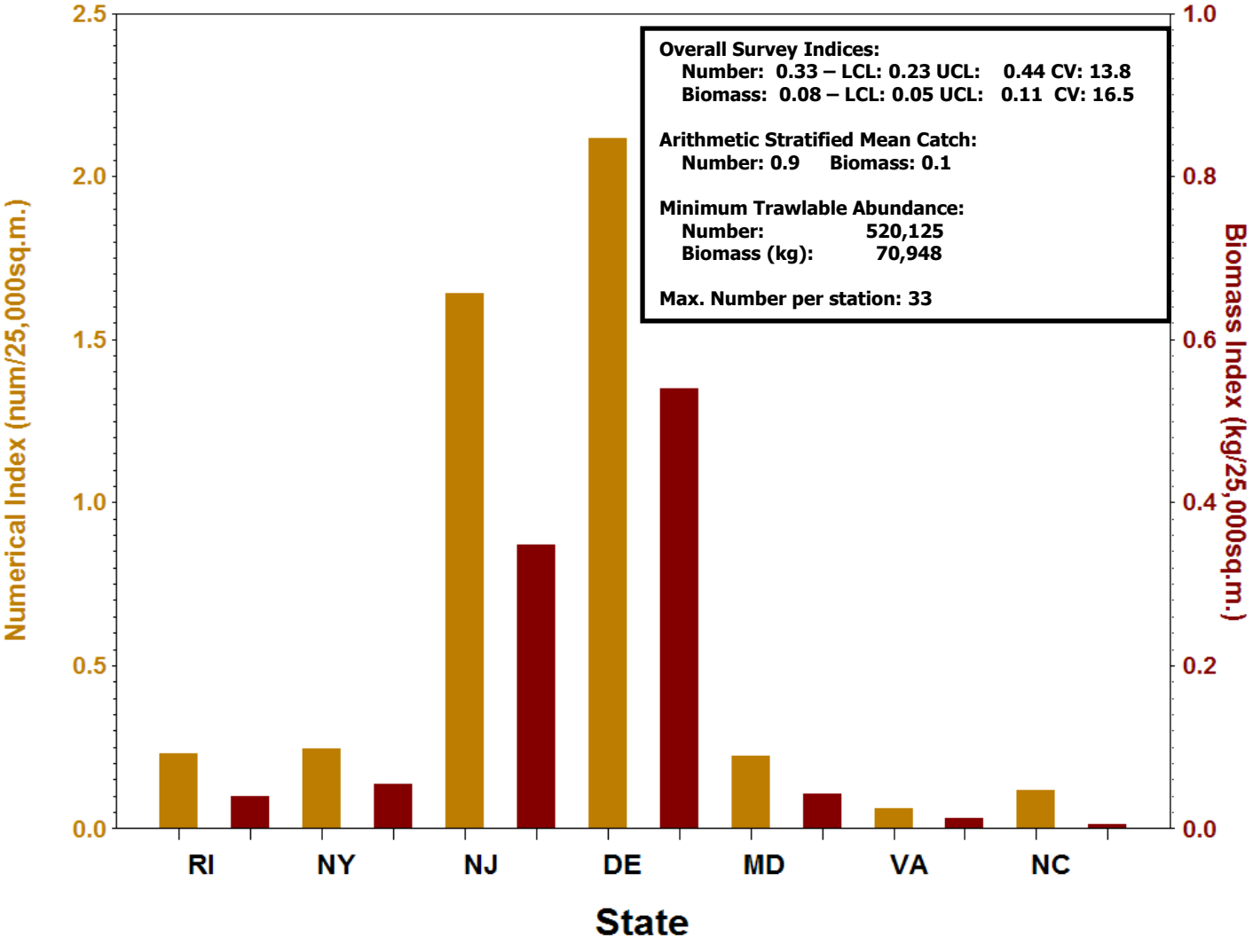
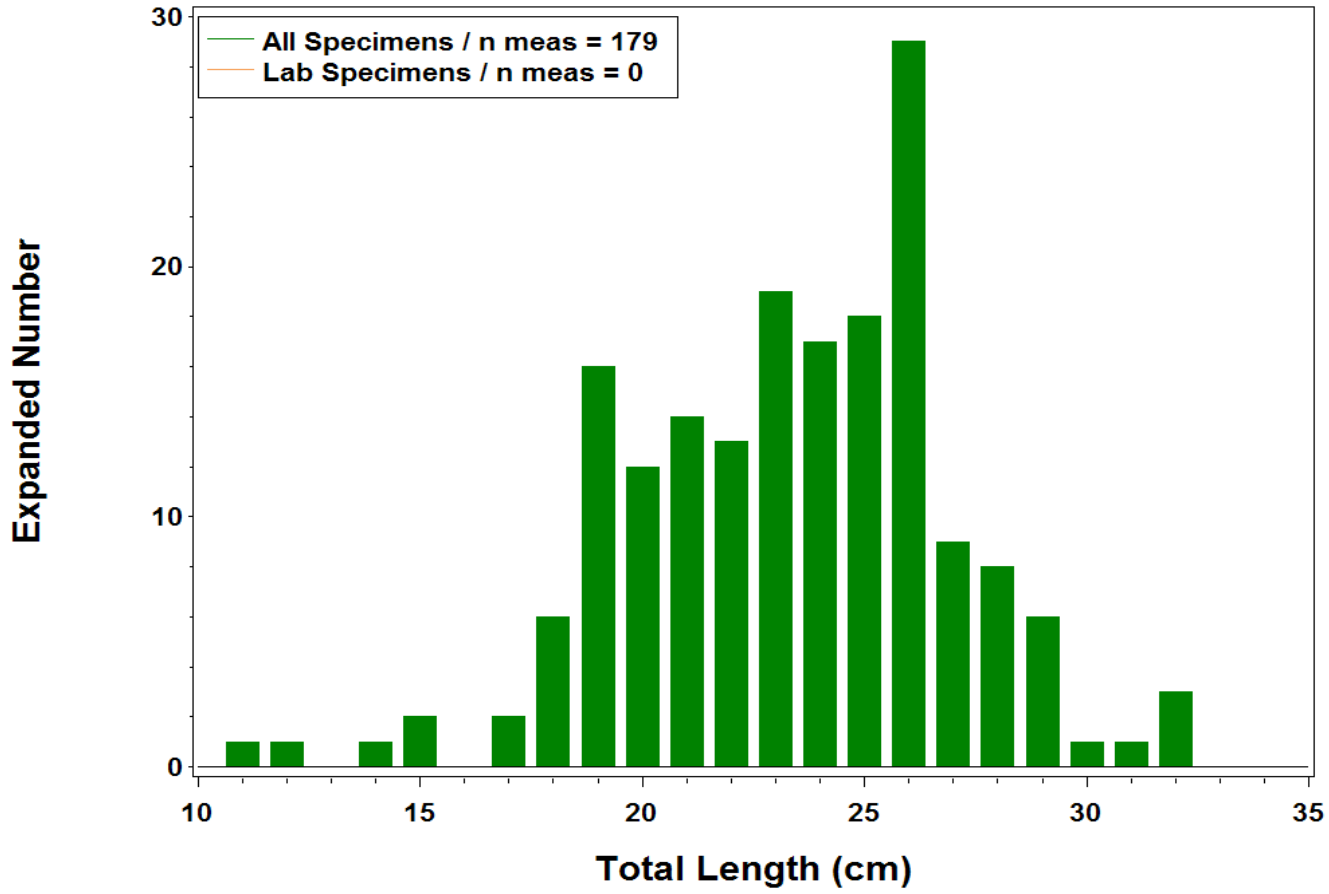


Figure 90. Length frequency histogram for northern searobin.



Pinfish (Priority D)

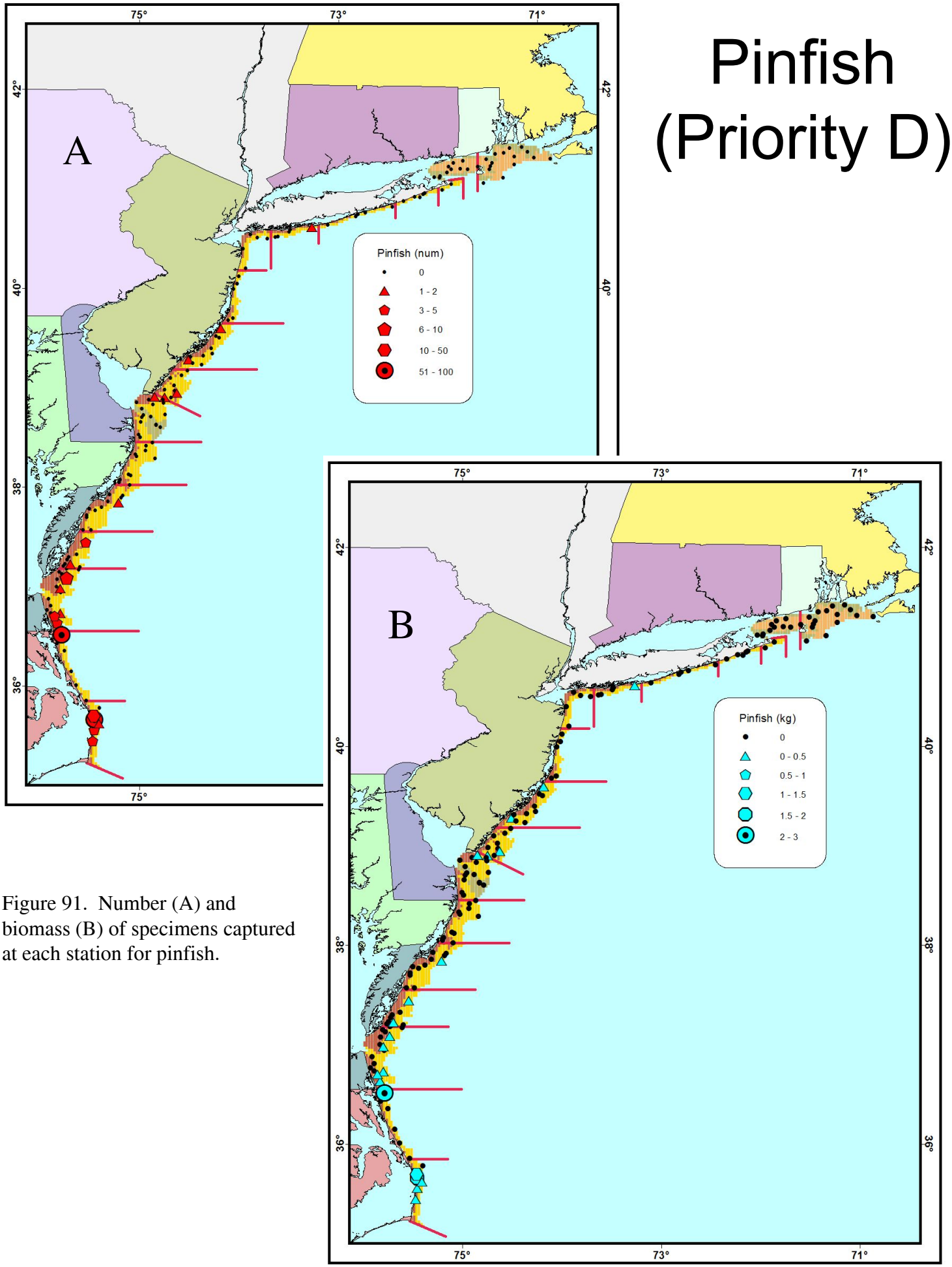


Figure 91. Number (A) and biomass (B) of specimens captured at each station for pinfish.

Table 27. Number, biomass, minimum and maximum size of specimens captured, by state and region, for pinfish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22	1	1	0.072	0	1	152	152	152		0.03	0.00
NJ	24	4	5	0.423	0	5	131	154	142		0.12	0.01
DE	17	1	1	0.080	0	1	151	151	151		0.05	0.01
MD	10										0.00	0.00
VA	38	9	31	1.668	0	31	110	163	133		0.40	0.04
NC	13	6	146	6.000	0	146	99	162	124		2.16	0.29
Total	150	21	184	8.243	0	184	99	163	126		0.21	0.03

Figure 92. Geometric mean catch per area swept by state and overall, with summary catch rates, for pinfish.

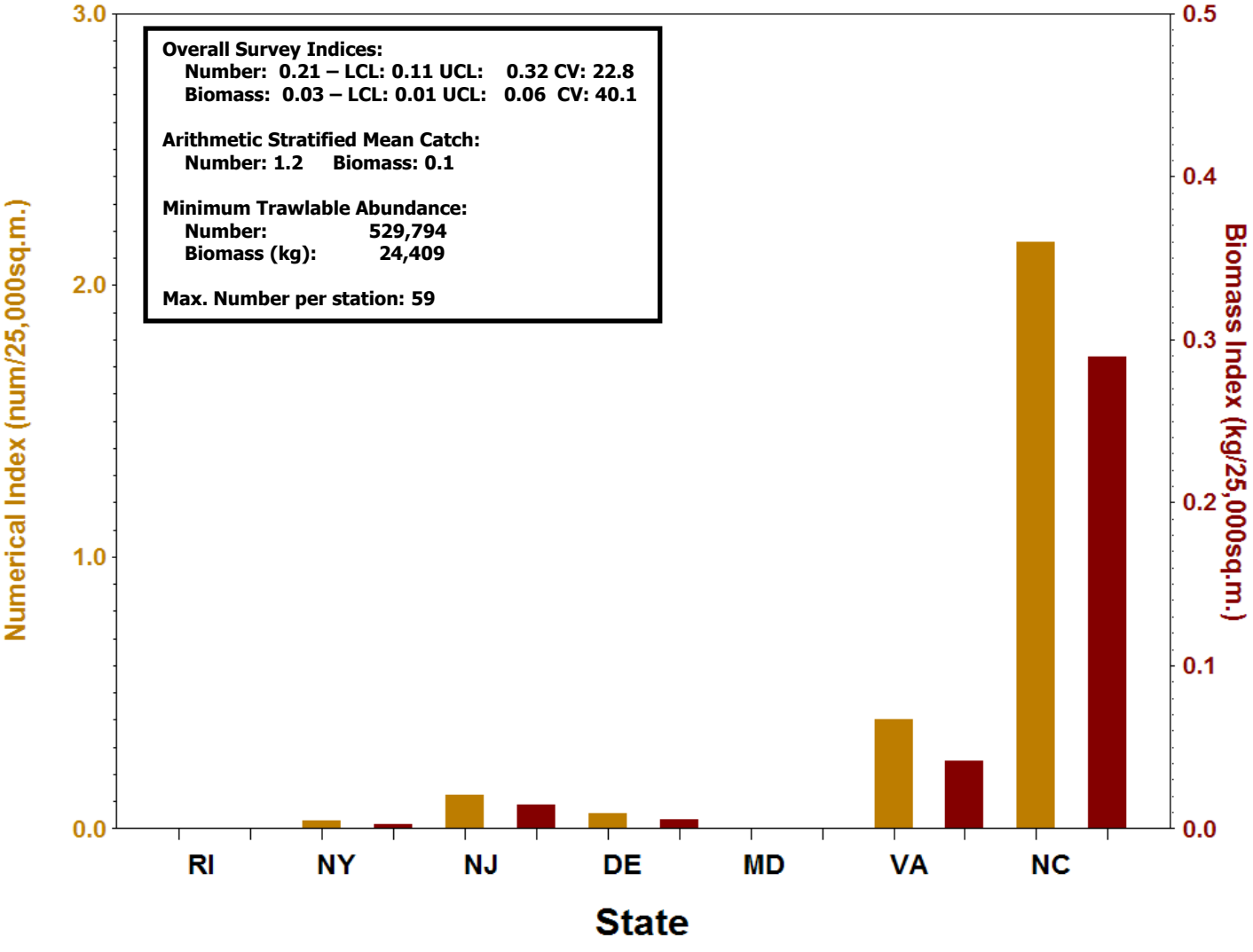
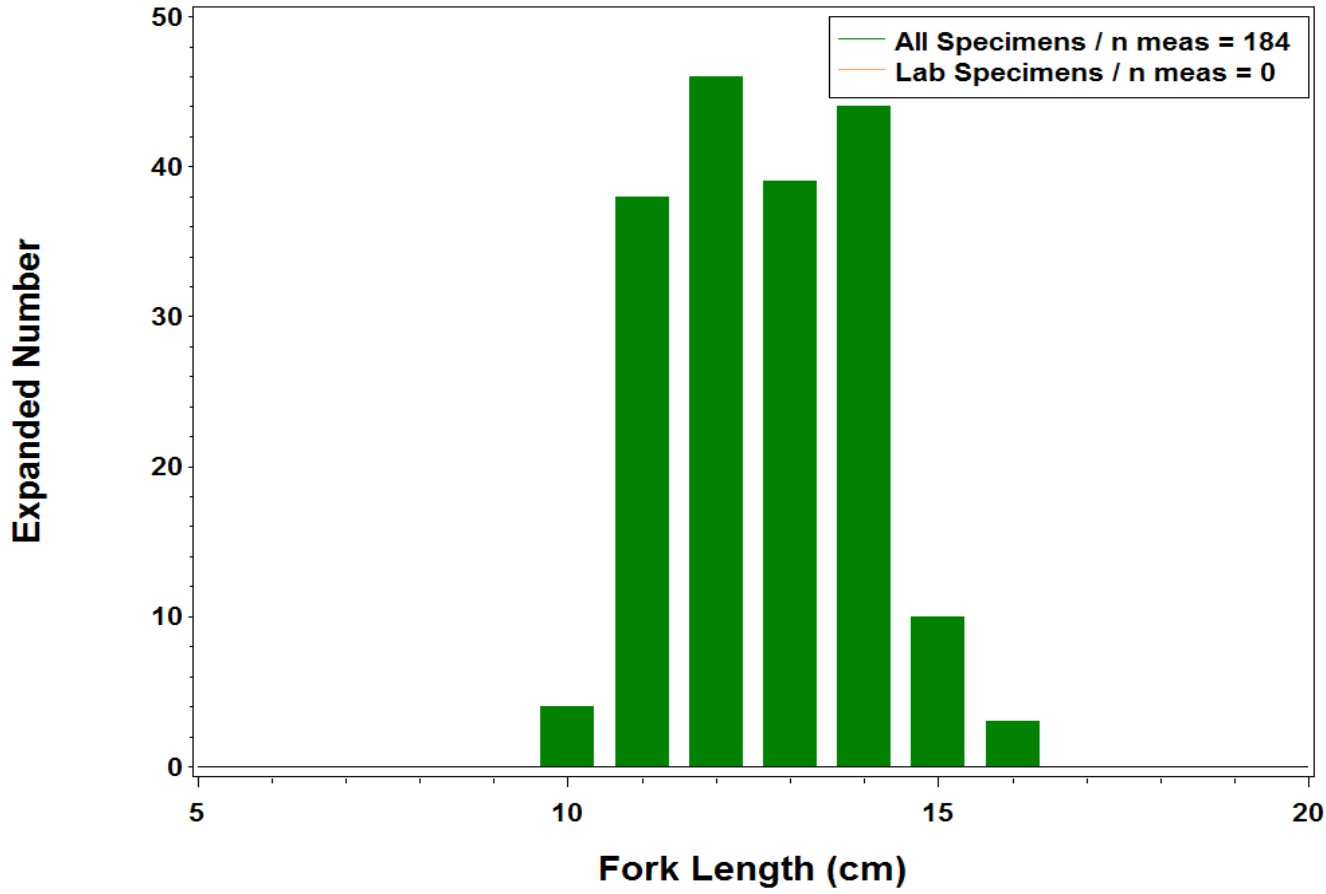


Figure 93. Length frequency histogram for pinfish.



Red Hake (Priority D)

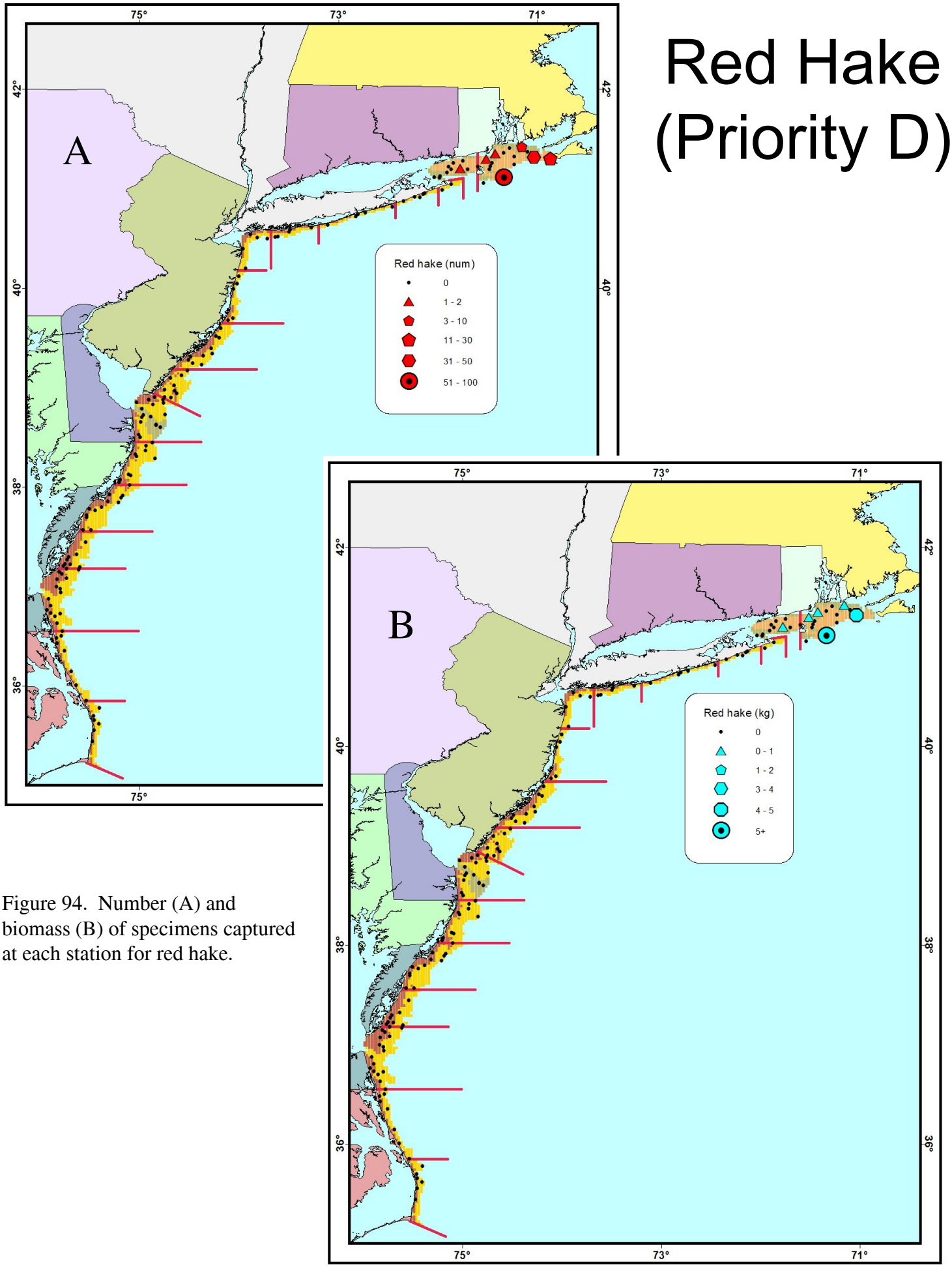


Figure 94. Number (A) and biomass (B) of specimens captured at each station for red hake.

Table 28. Number, biomass, minimum and maximum size of specimens captured, by state and region, for red hake.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	7	145	18.232	0	98	90	449	235		0.85	0.26
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38										0.00	0.00
NC	13										0.00	0.00
Total	150	7	145	18.232	0	98	90	449	235		0.17	0.06

Figure 95. Geometric mean catch per area swept by state and overall, with summary catch rates, for red hake.

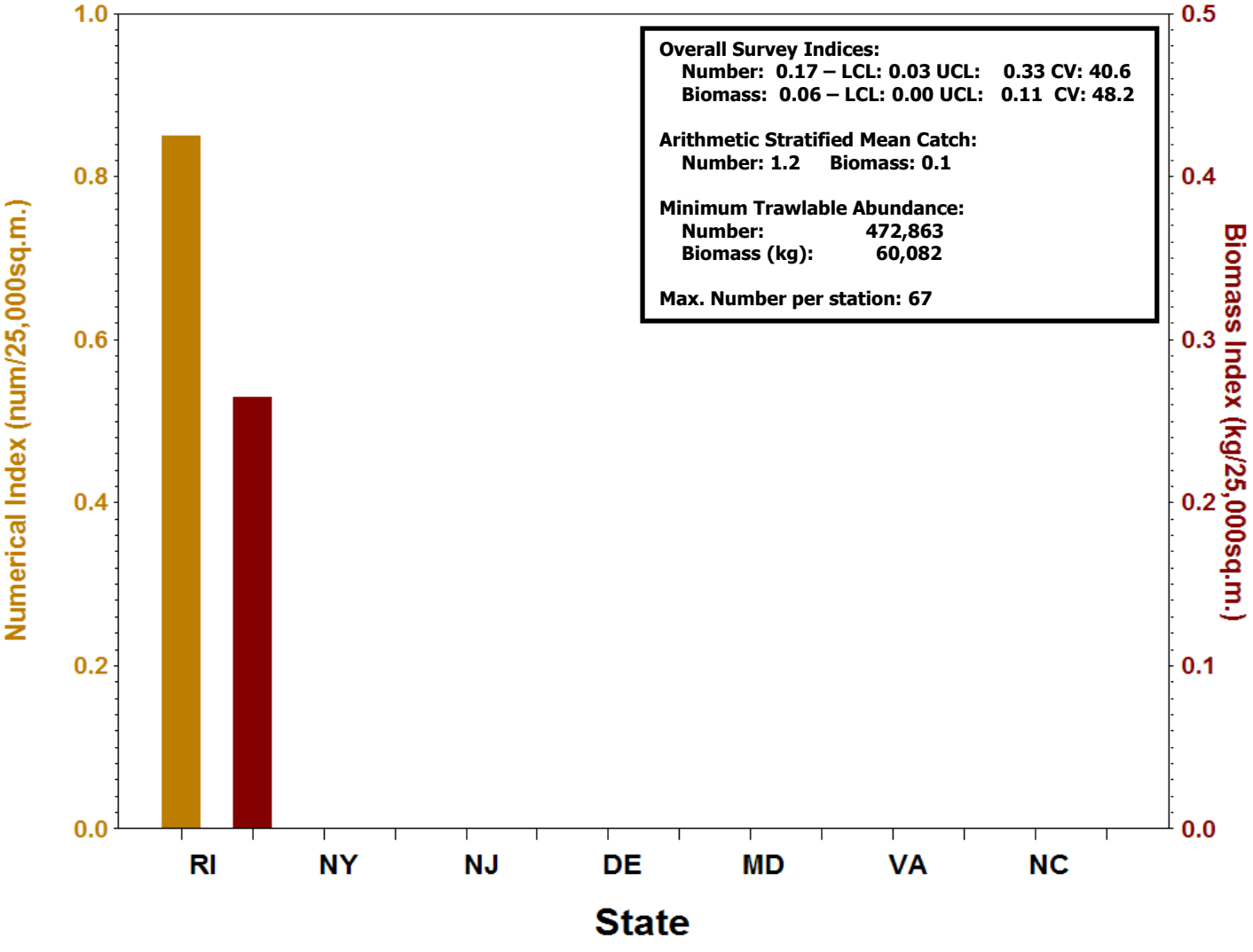
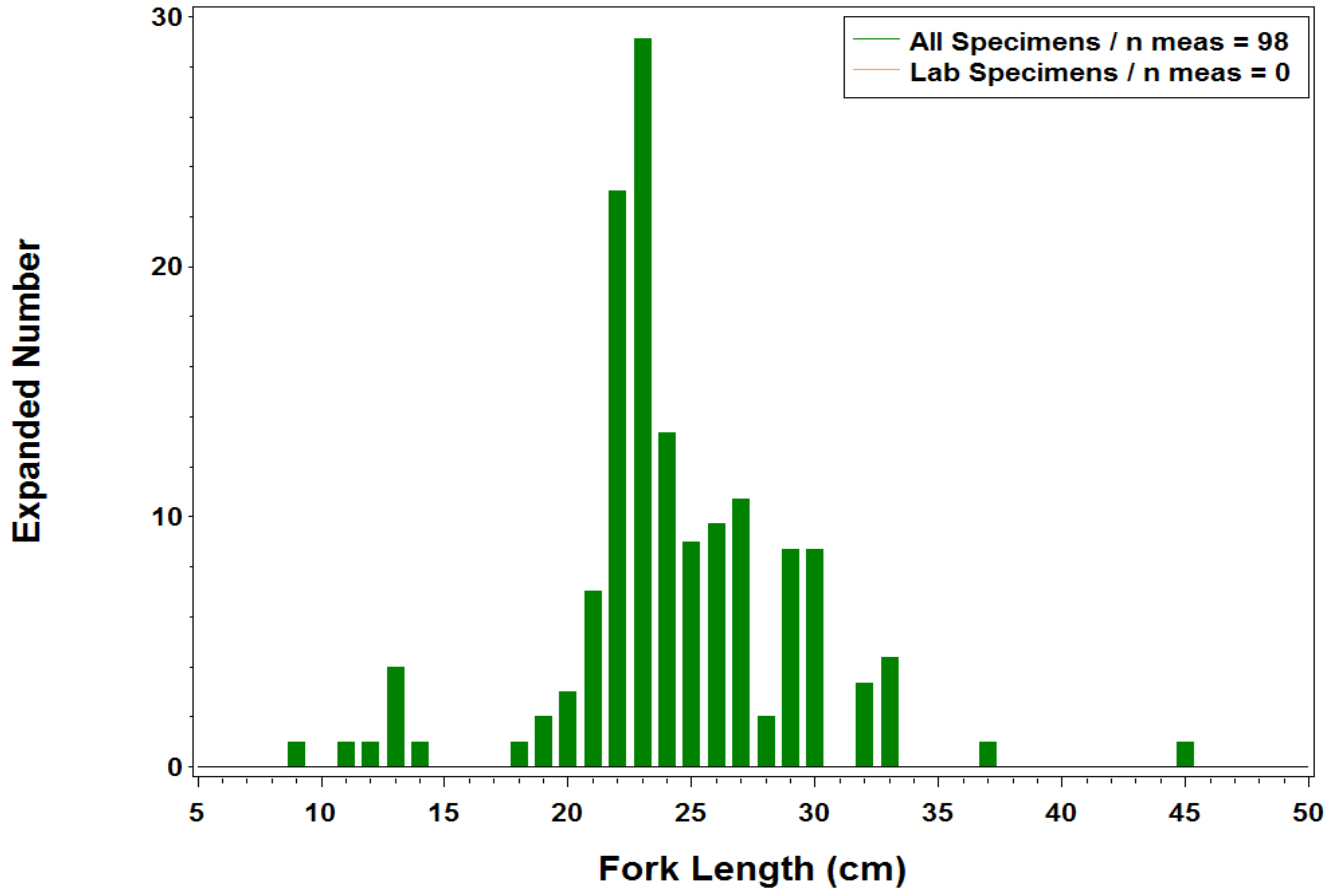


Figure 96. Length frequency histogram for red hake.



Scup (Priority A)

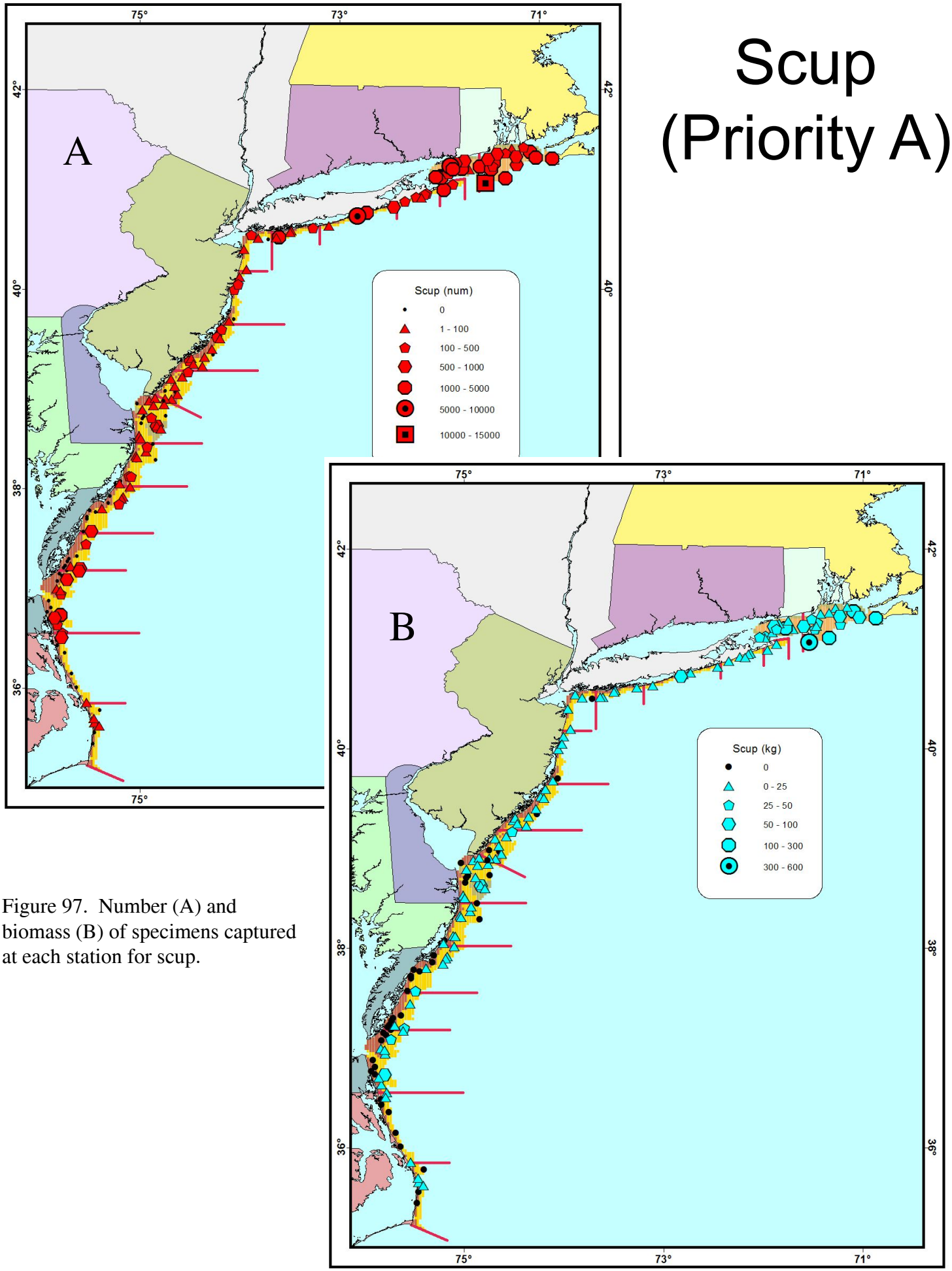


Figure 97. Number (A) and biomass (B) of specimens captured at each station for scup.

Table 29. Number, biomass, minimum and maximum size of specimens captured, by state and region, for scup.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	26	51947	1746.252	254	3002	33	365	140	0.117	848.65	27.60
NY	22	21	14258	198.957	145	1709	35	322	100	0.072	63.75	3.43
NJ	24	20	1450	113.341	105	669	59	295	149	0.092	13.44	1.93
DE	17	11	1337	85.552	42	305	93	218	155	0.067	40.93	3.94
MD	10	7	638	32.355	26	273	93	180	132	0.058	6.27	1.08
VA	38	18	7404	298.433	79	872	95	216	125	0.053	9.20	1.81
NC	13	5	824	28.292	19	116	99	179	121	0.048	2.61	0.53
Total	150	108	77858	2503.182	670	6946	33	365	129	0.088	26.08	3.34

Figure 98. Geometric mean catch per area swept by state and overall, with summary catch rates, for scup.

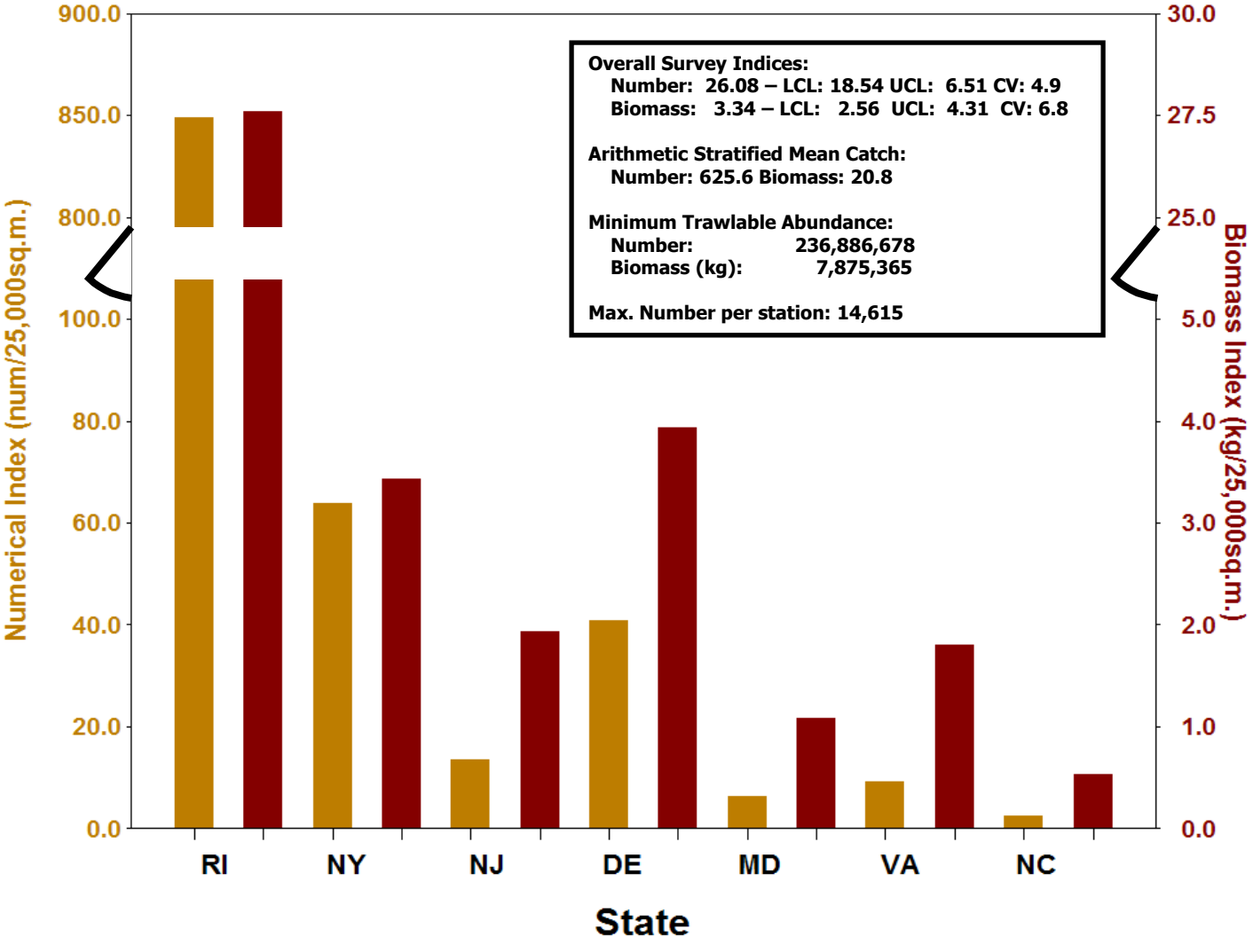


Figure 99. Length frequency histogram for scup (inset presents larger fish on a readable scale).

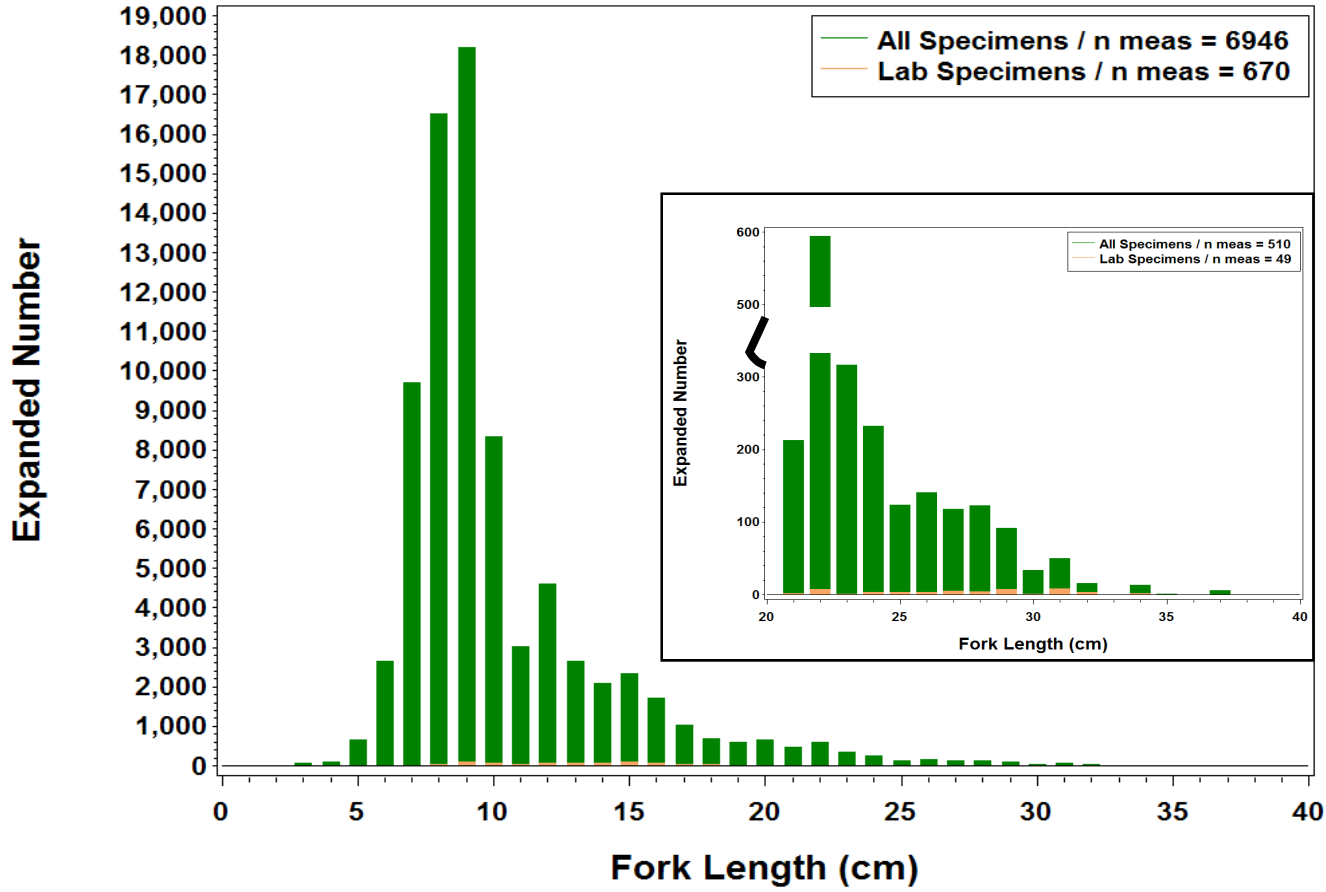


Figure 100. Sex-specific length frequencies histogram for scup.

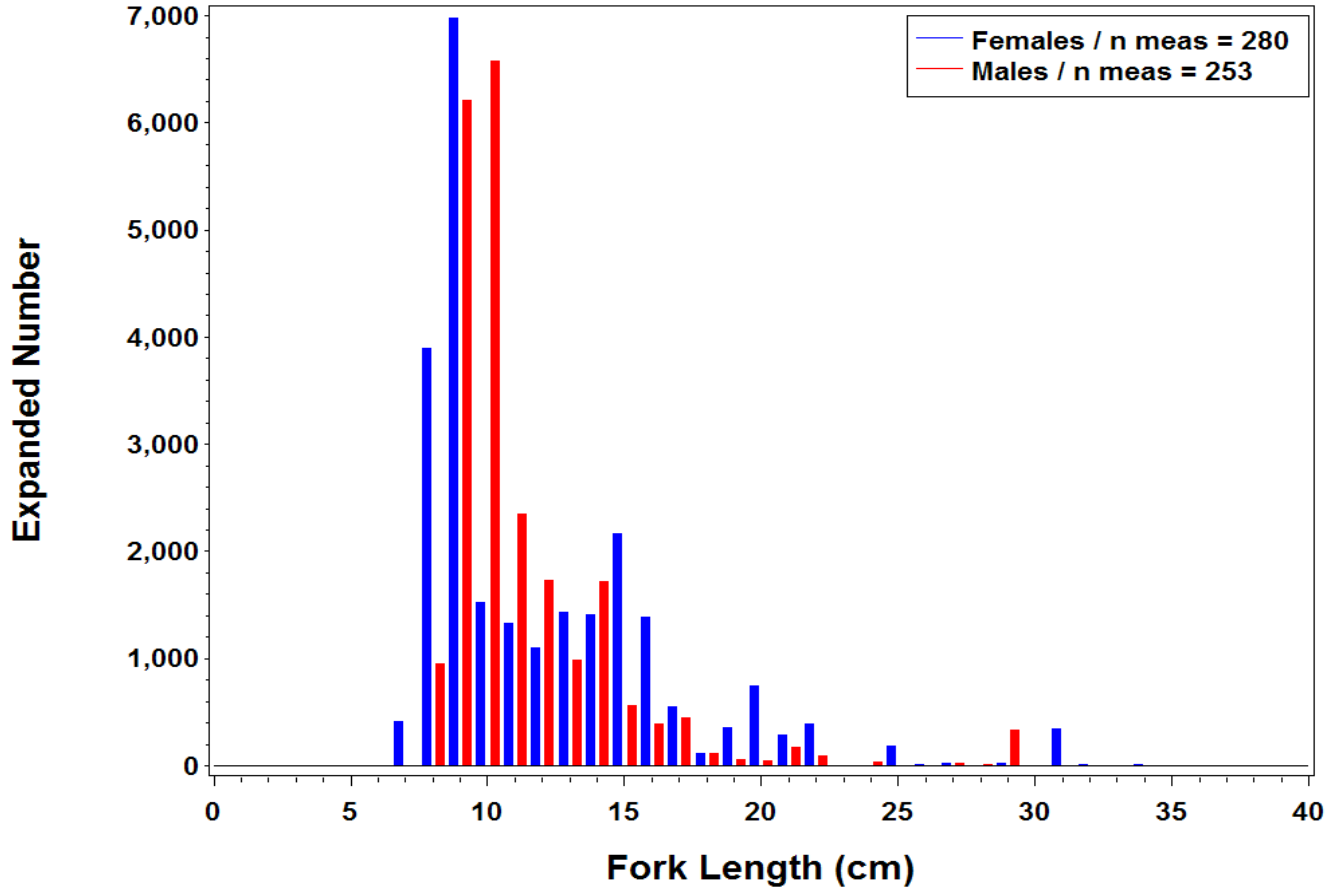
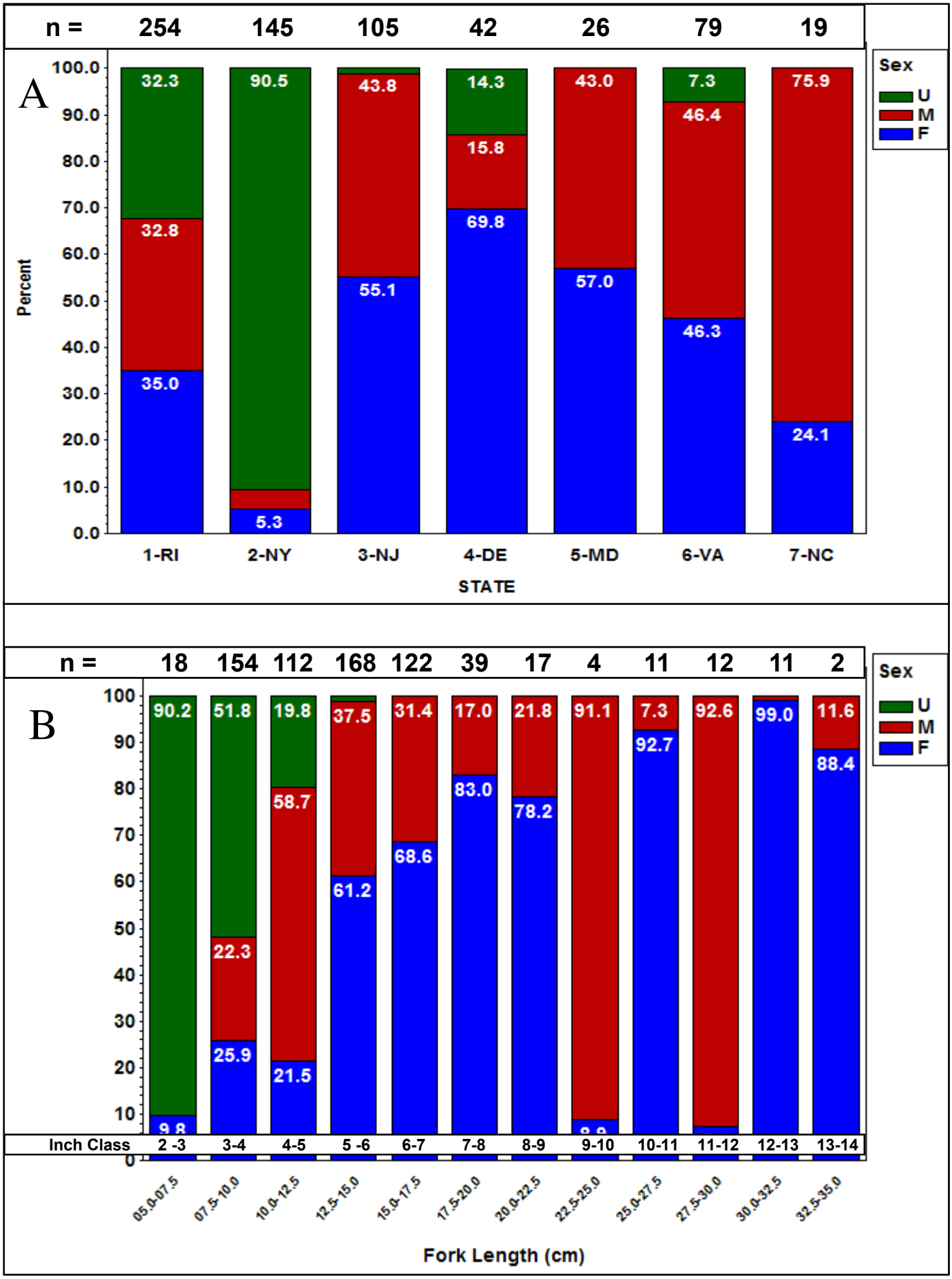


Figure 101. Sex ratios for scup by state (A) and length group (B).



Silver Hake (Whiting) (Priority A)

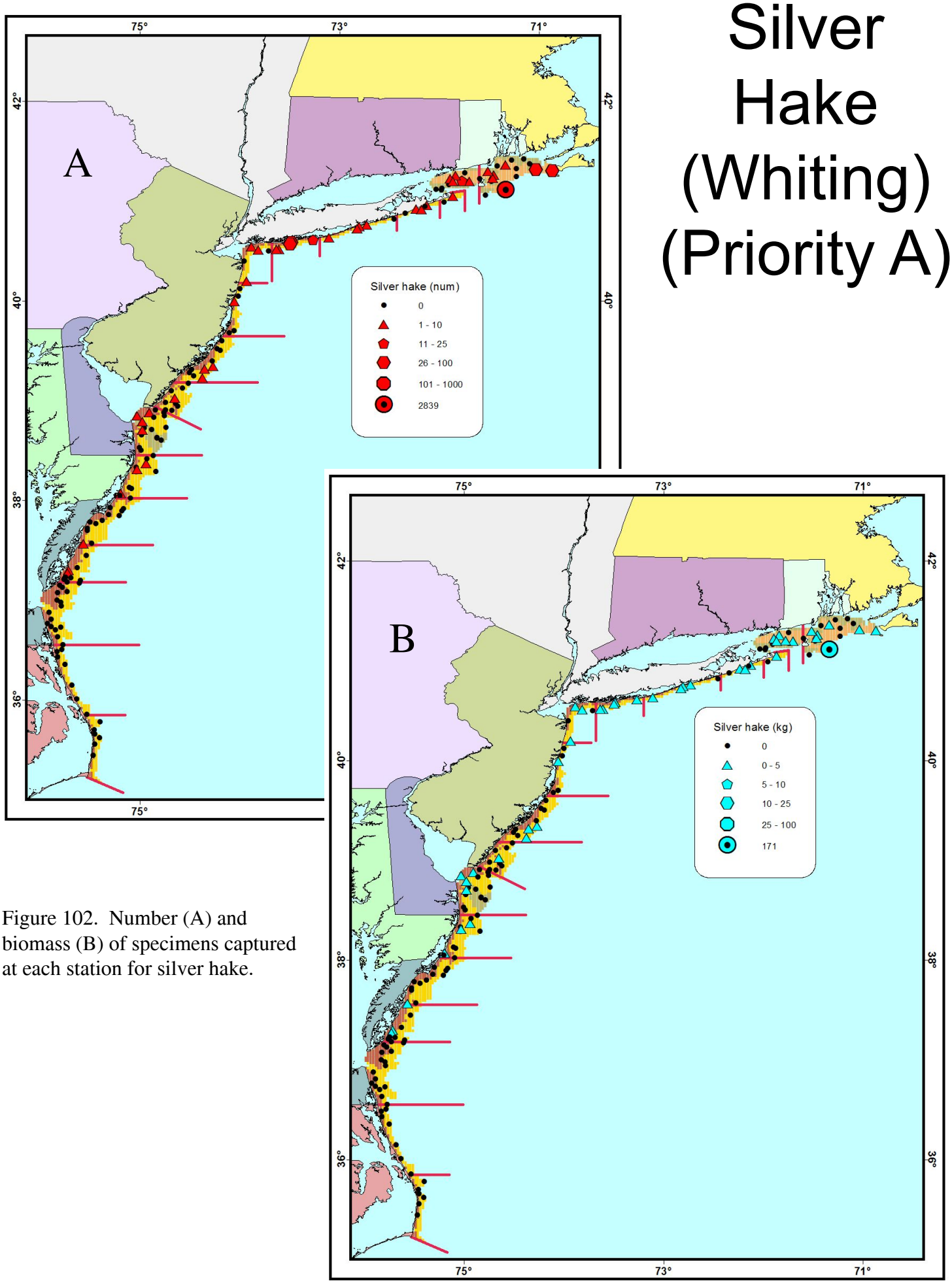


Figure 102. Number (A) and biomass (B) of specimens captured at each station for silver hake.

Table 30. Number, biomass, minimum and maximum size of specimens captured, by state and region, for silver hake.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	12	2997	182.370	38	394	40	293	203	0.090	1.92	0.52
NY	22	16	107	1.280	38	100	63	160	109	0.019	1.75	0.05
NJ	24	5	9	0.076	9	9	76	122	91	0.008	0.21	0.00
DE	17	4	5	0.048	5	5	74	163	108	0.010	0.36	0.00
MD	10	3	3	0.042	2	3	78	135	104	0.016	0.23	0.00
VA	38	3	4	0.093	4	4	137	181	150	0.023	0.06	0.00
NC	13										0.00	0.00
Total	150	43	3125	183.909	96	515	40	293	181	0.046	0.55	0.11

Figure 103. Geometric mean catch per area swept by state and overall, with summary catch rates, for silver hake.

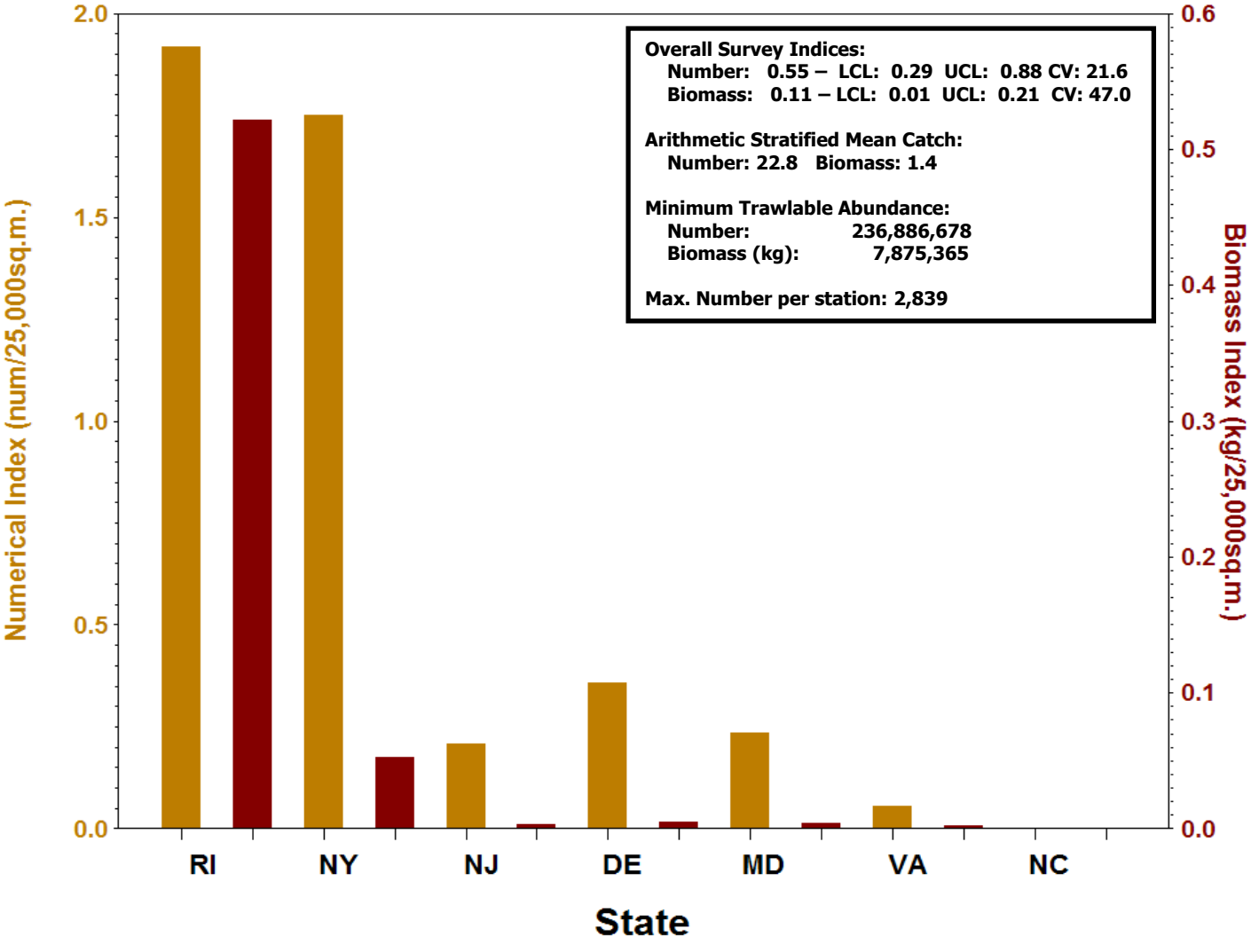


Figure 104. Length frequency histogram for silver hake.

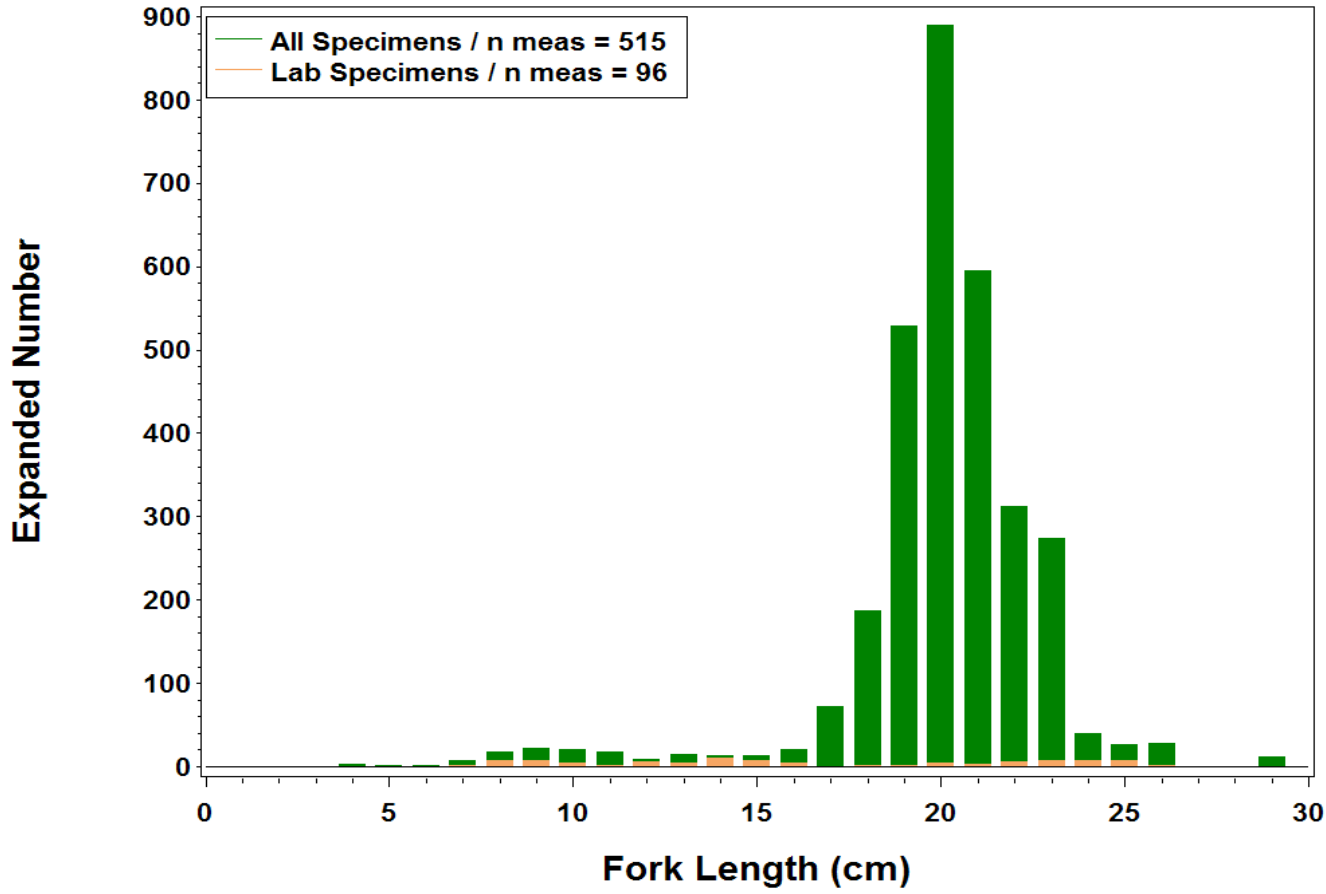


Figure 105. Sex-specific length frequencies histogram for silver hake.

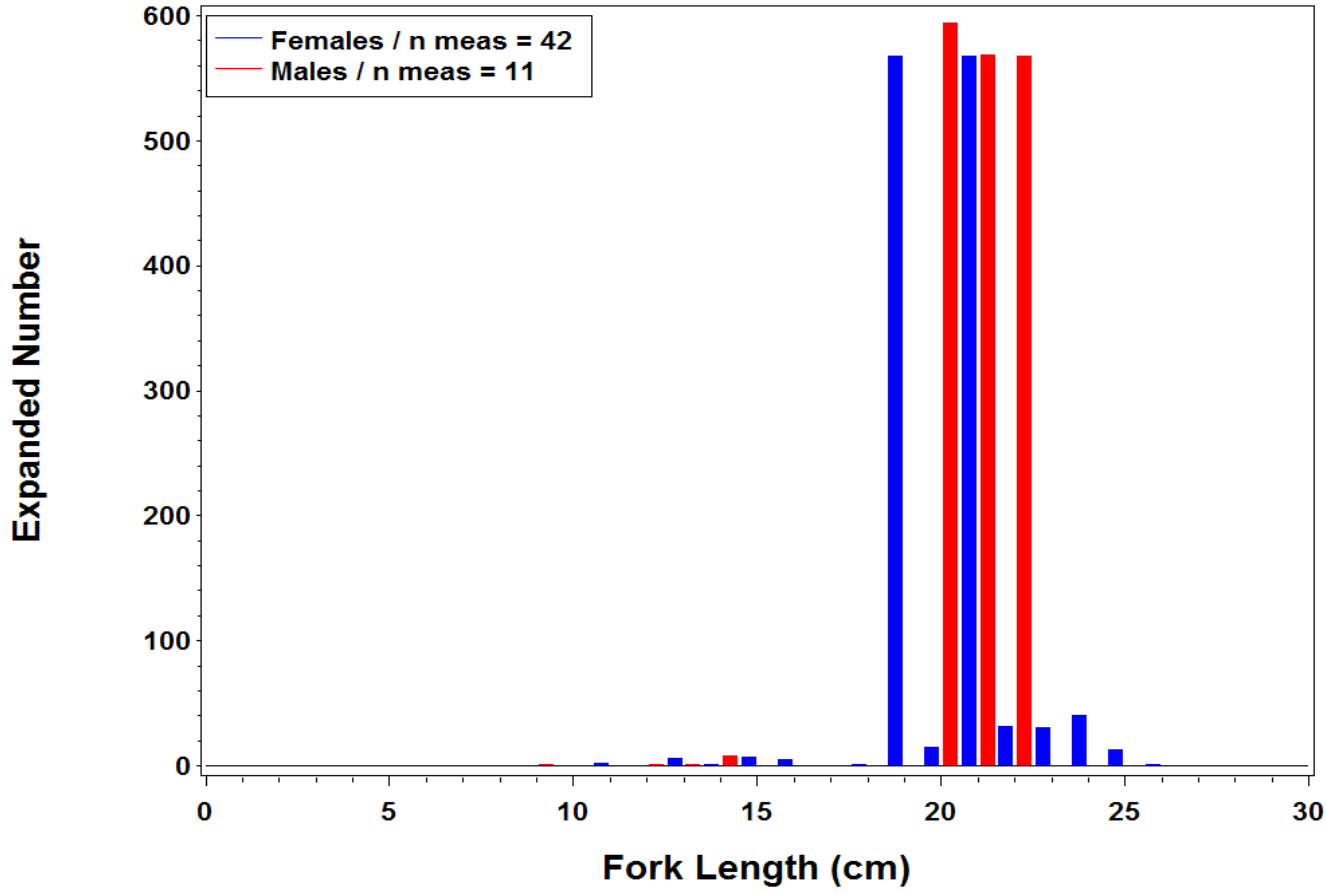
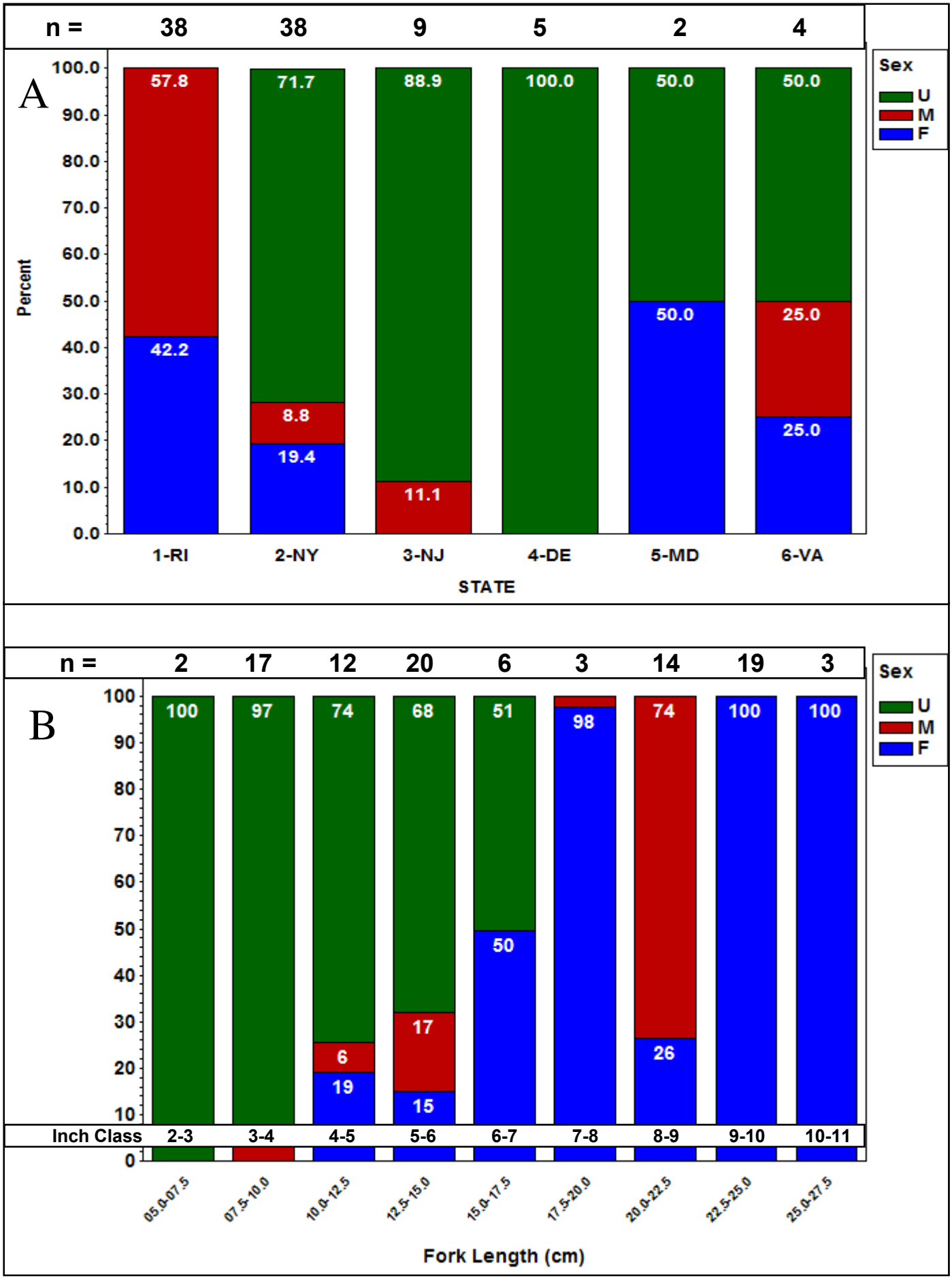


Figure 106. Sex ratios for silver hake by state (A) and length group (B).



Silver Perch (Priority D)

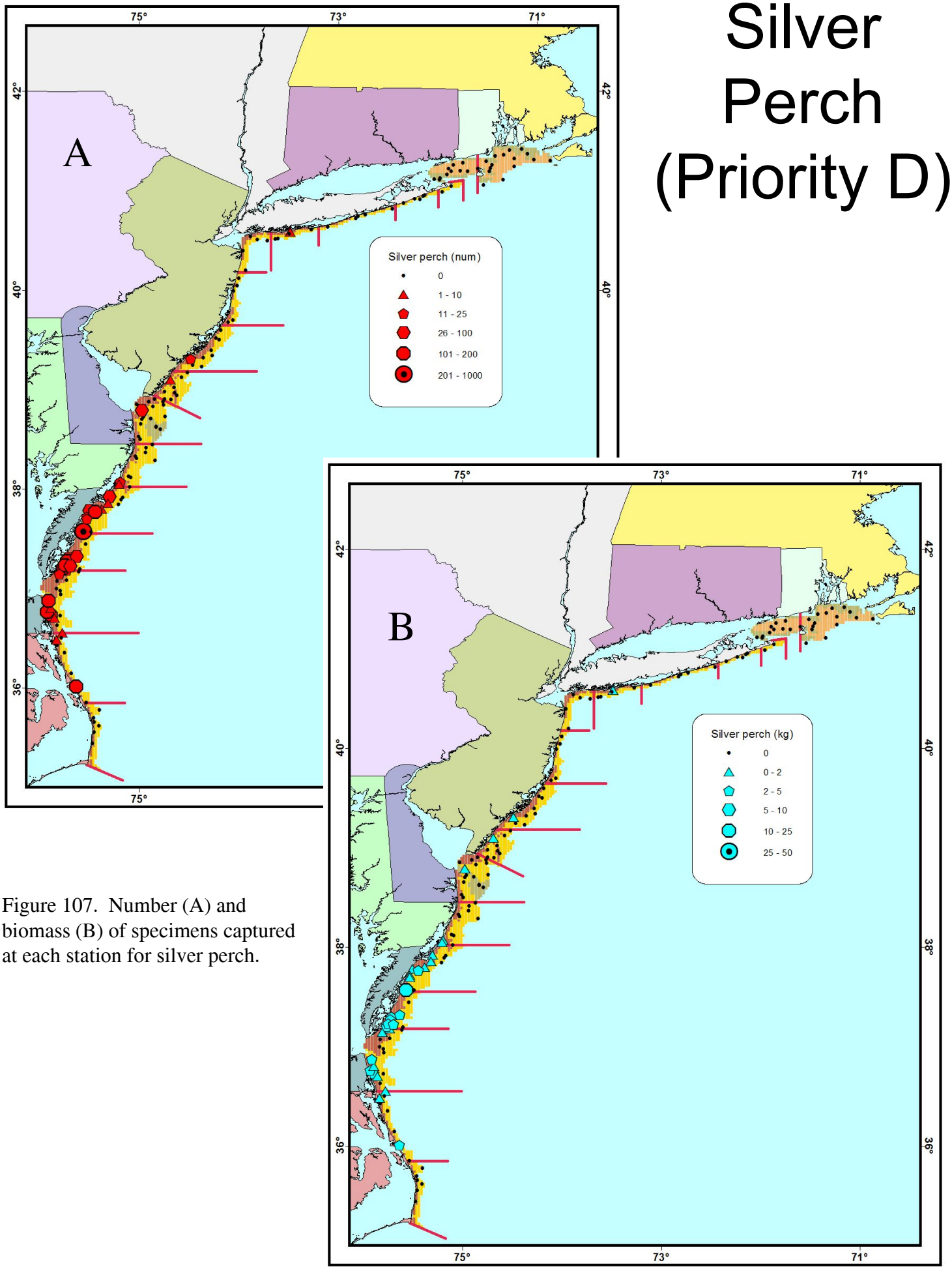


Figure 107. Number (A) and biomass (B) of specimens captured at each station for silver perch.

Table 31. Number, biomass, minimum and maximum size of specimens captured, by state and region, for silver perch.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22	1	1	0.032	0	1	135	135	135		0.03	0.00
NJ	24	2	23	0.995	0	23	138	207	154		0.23	0.04
DE	17	1	30	0.754	0	30	110	143	126		0.58	0.07
MD	10	2	32	0.972	0	30	96	179	129		0.74	0.08
VA	38	22	1602	52.370	0	731	76	226	128		6.18	0.71
NC	13	2	105	2.915	0	30	98	172	129		0.54	0.11
Total	150	30	1793	58.038	0	845	76	226	129		1.47	0.25

Figure 108. Geometric mean catch per area swept by state and overall, with summary catch rates, for silver perch.

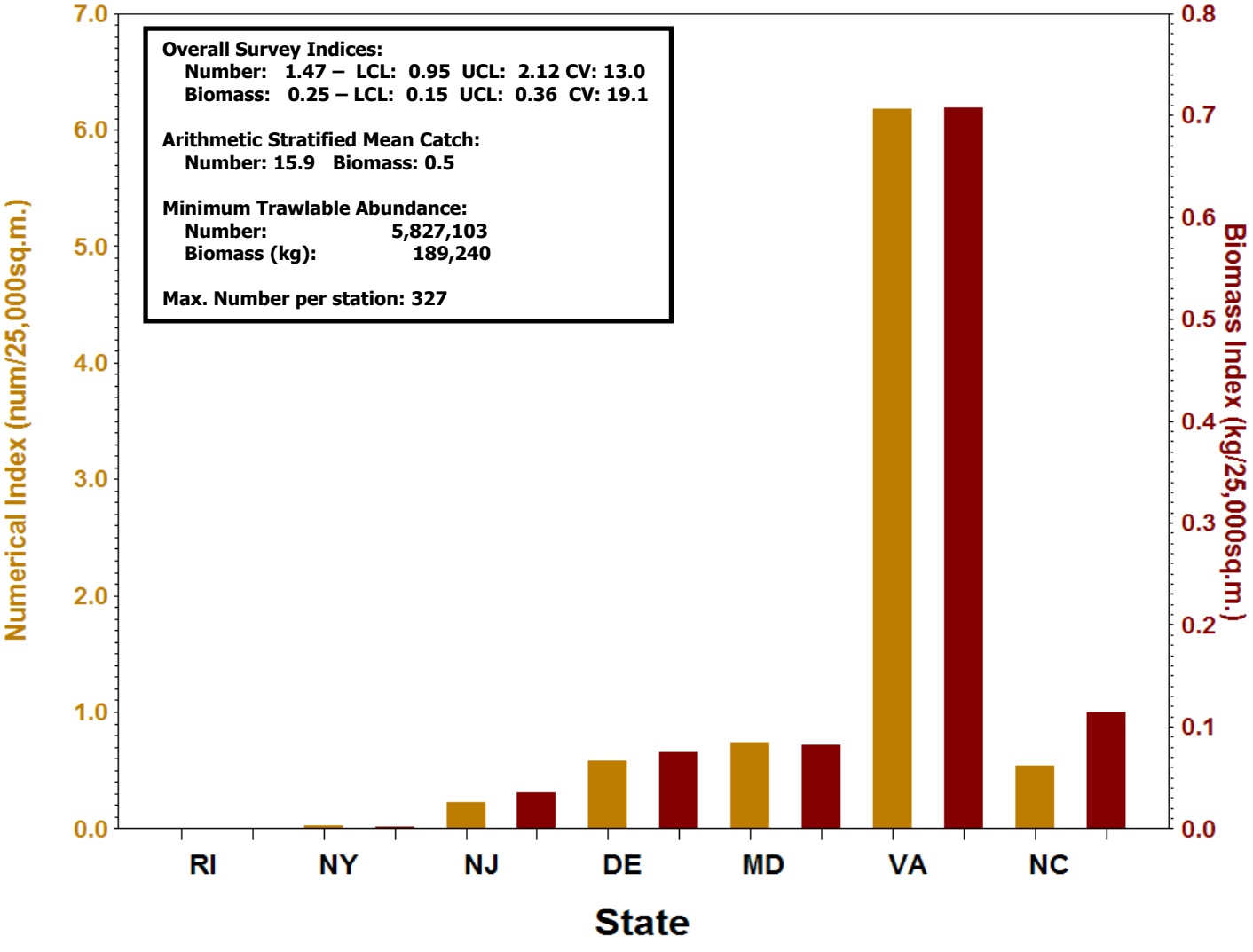
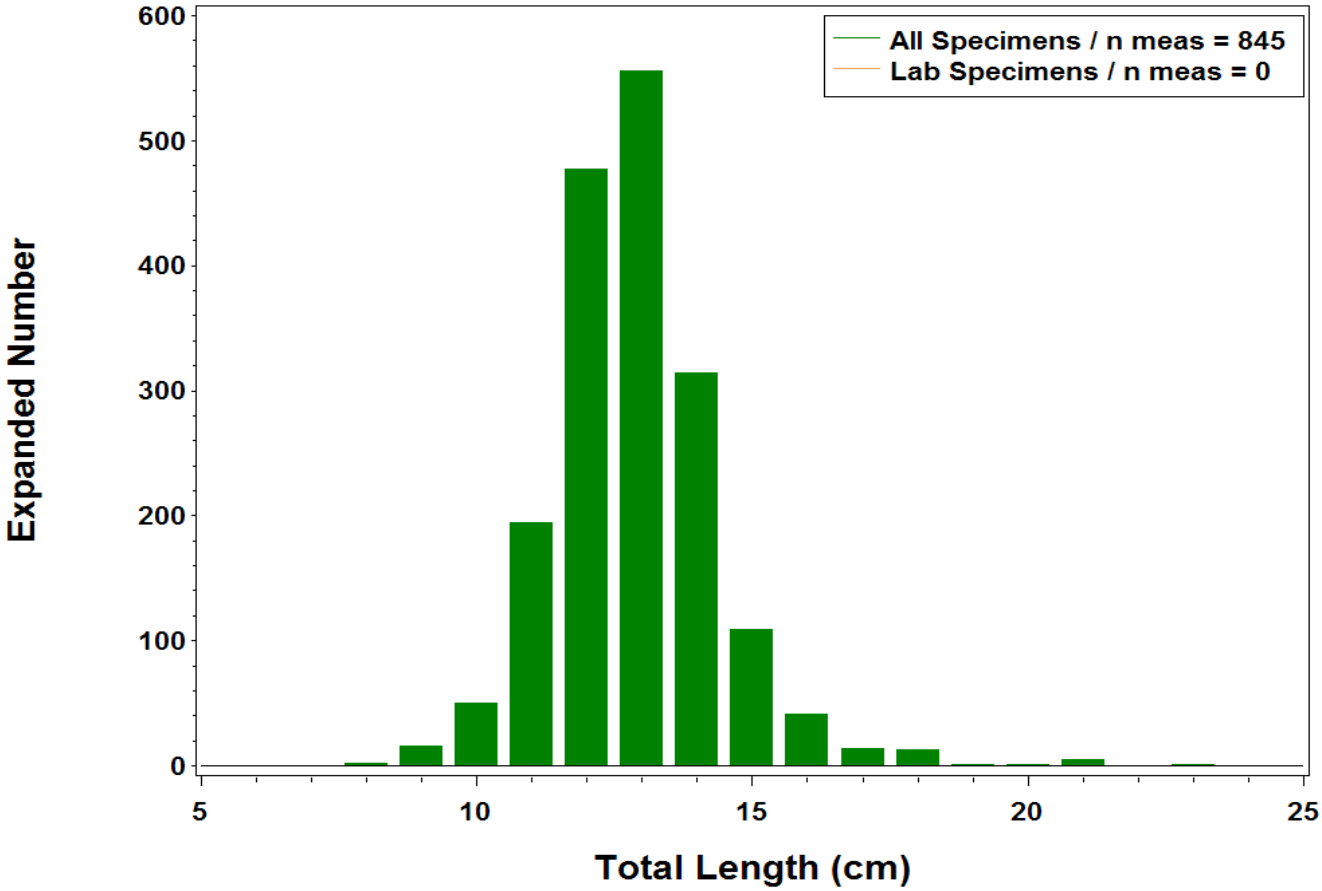


Figure 109. Length frequency histogram for silver perch.



Smooth Butterfly Ray (Priority B)

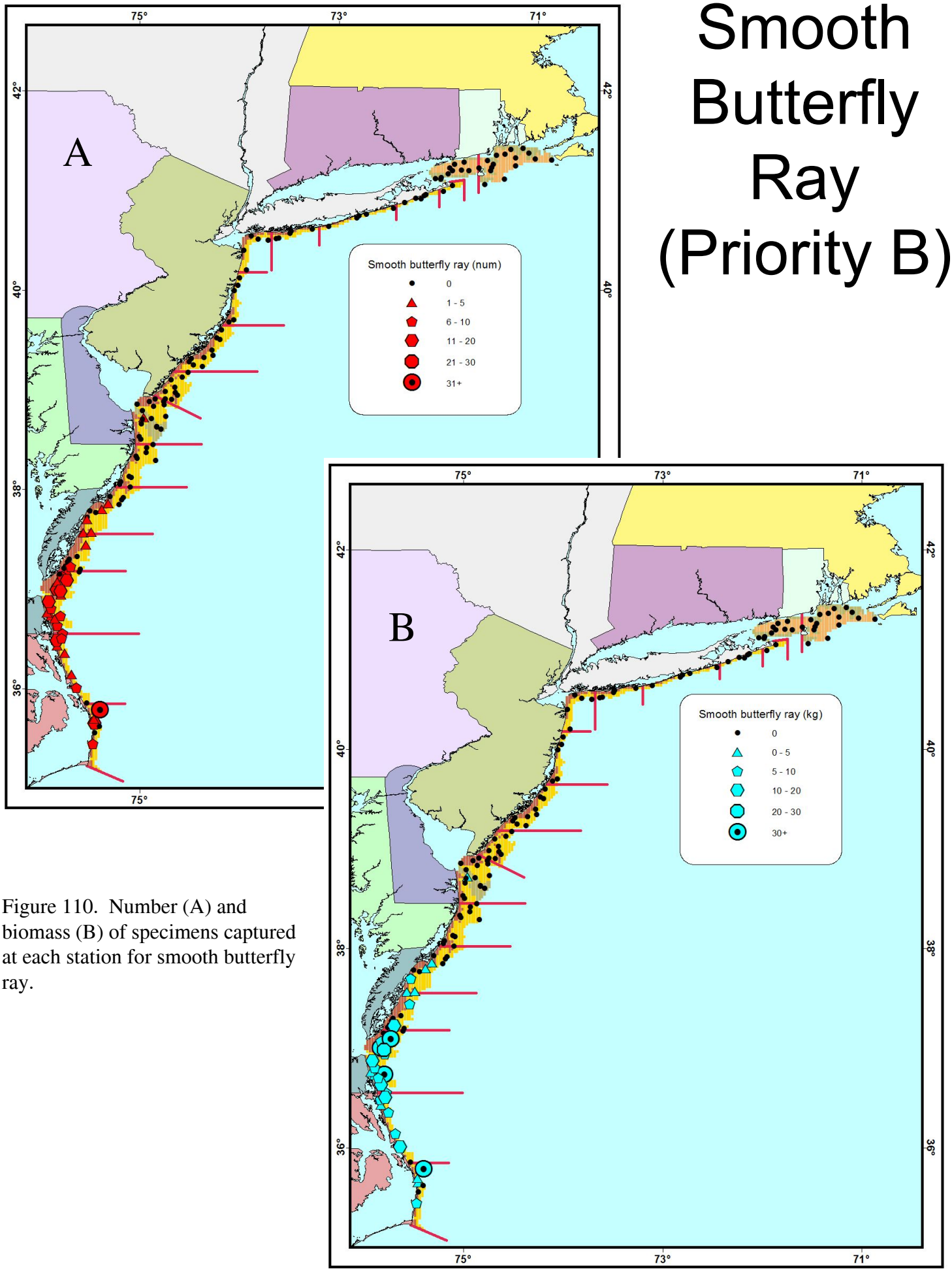


Figure 110. Number (A) and biomass (B) of specimens captured at each station for smooth butterfly ray.

Table 32. Number, biomass, minimum and maximum size of specimens captured, by state and region, for smooth butterfly ray.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17	1	1	1.545	0	1	619	619	619		0.07	0.09
MD	10										0.00	0.00
VA	38	22	131	245.028	0	124	273	835	526	2.291	1.70	2.32
NC	13	10	95	100.006	0	70	264	787	426	1.675	3.87	4.03
Total	150	33	227	346.579	0	195	264	835	490	2.224	0.44	0.44

Figure 111. Geometric mean catch per area swept by state and overall, with summary catch rates, for smooth butterfly ray.

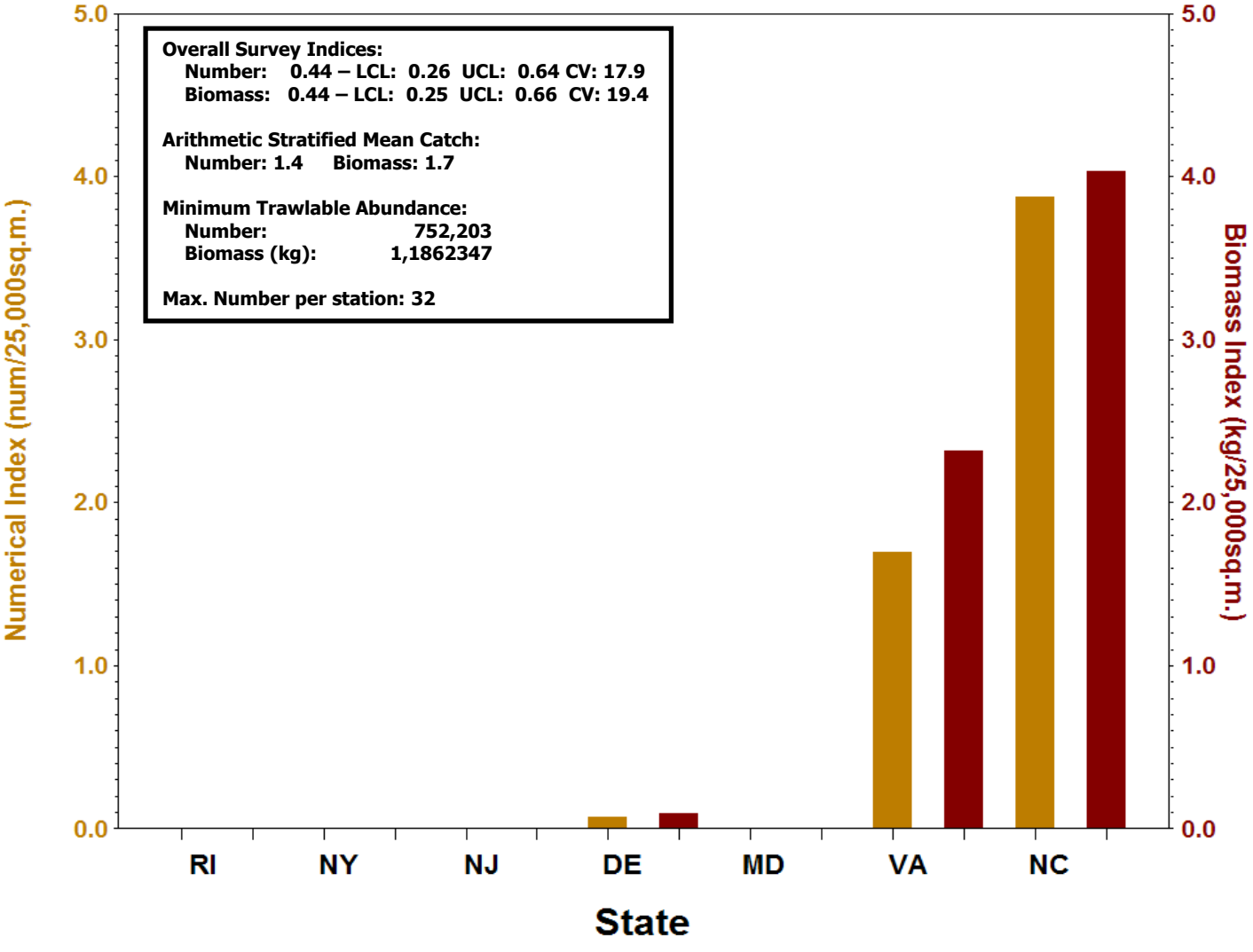
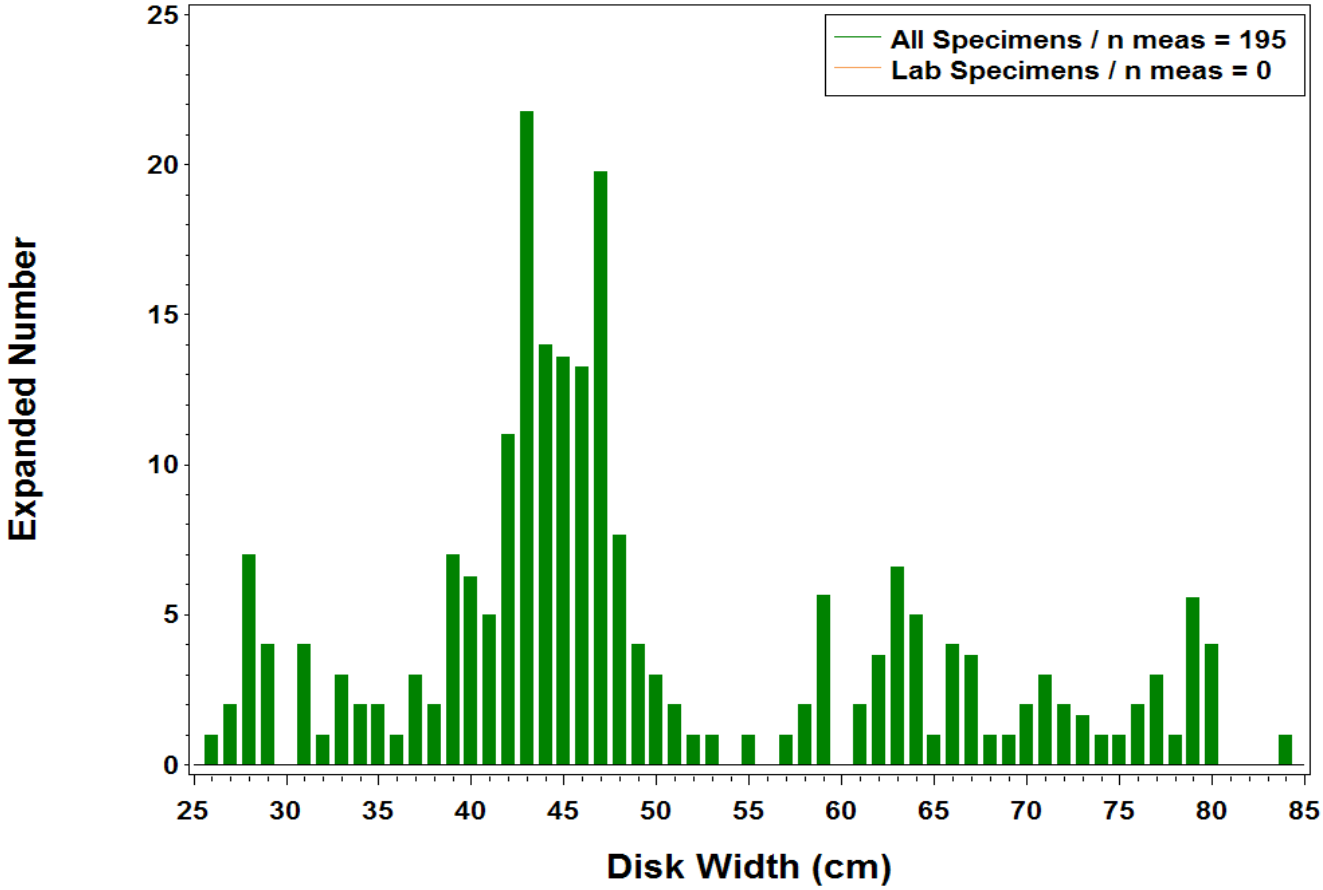


Figure 112. Width frequency histogram for smooth butterfly ray.



Smooth Dogfish (Priority B)

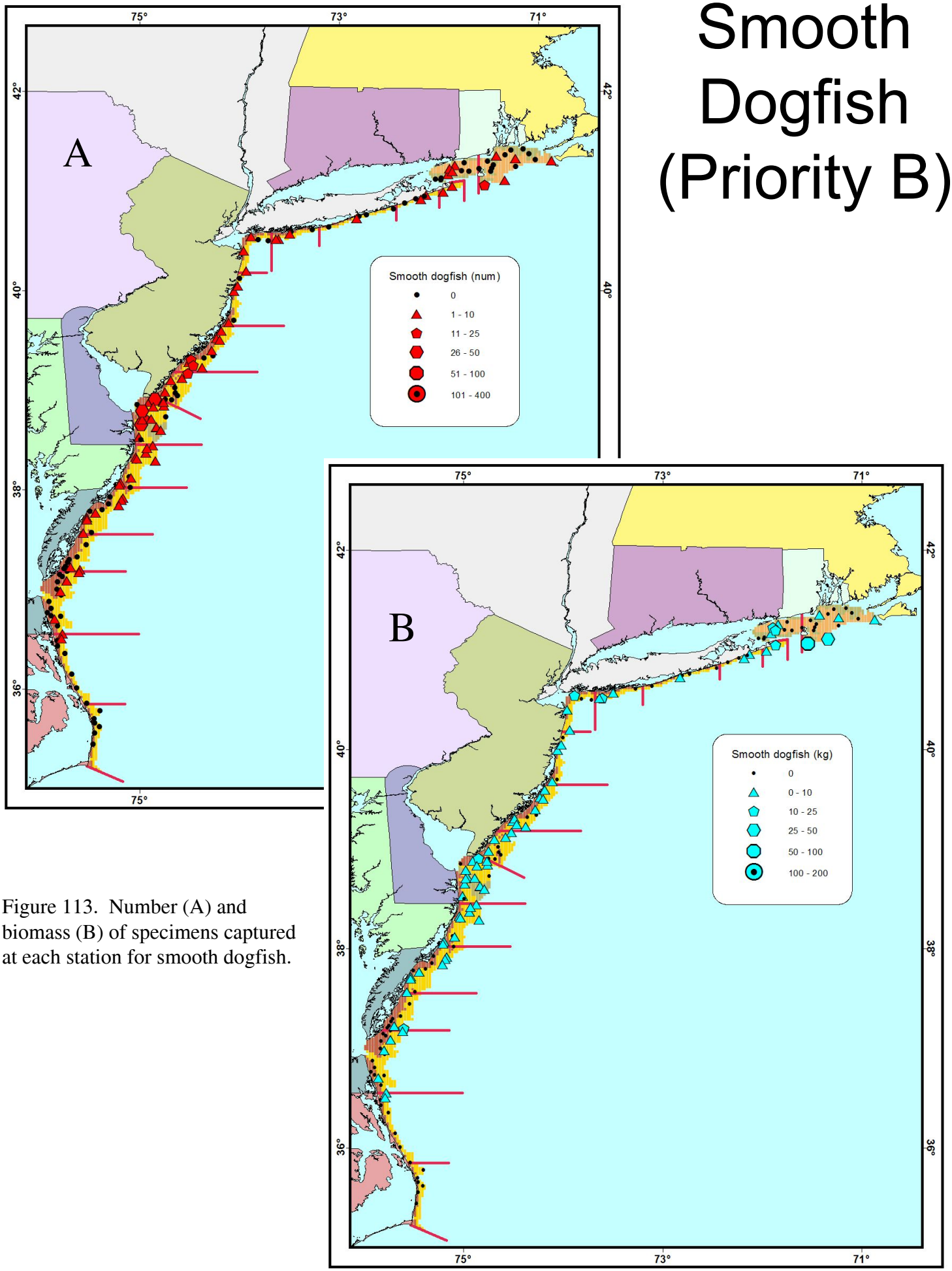


Figure 113. Number (A) and biomass (B) of specimens captured at each station for smooth dogfish.

Table 33. Number, biomass, minimum and maximum size of specimens captured, by state and region, for smooth dogfish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	9	49	146.289	21	44	616	900	744	2.955	0.64	1.16
NY	22	11	36	63.831	22	36	488	840	609	1.773	1.02	1.50
NJ	24	15	84	34.829	37	84	286	716	366	0.549	1.69	0.96
DE	17	14	186	61.954	36	163	298	890	364	0.486	19.04	6.51
MD	10	9	18	14.187	15	18	322	830	426	0.788	1.47	1.03
VA	38	14	40	43.718	30	40	324	1040	455	1.111	0.59	0.57
NC	13	1	1	0.582	1	1	488	488	488	0.582	0.05	0.04
Total	150	73	414	365.390	162	386	286	1040	443	1.225	1.00	0.92

Figure 114. Geometric mean catch per area swept by state and overall, with summary catch rates, for smooth dogfish.

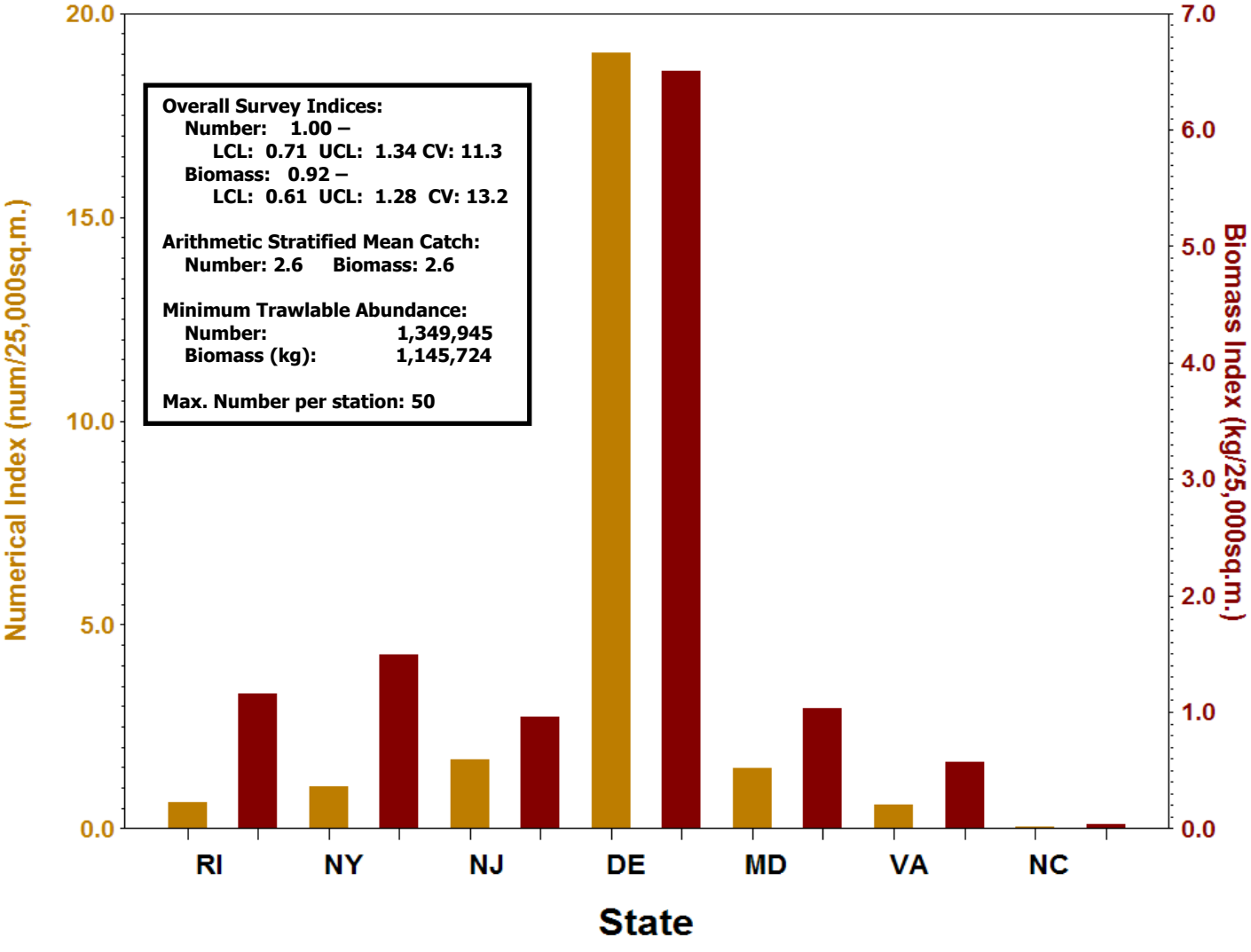


Figure 115. Length frequency histogram for smooth dogfish.

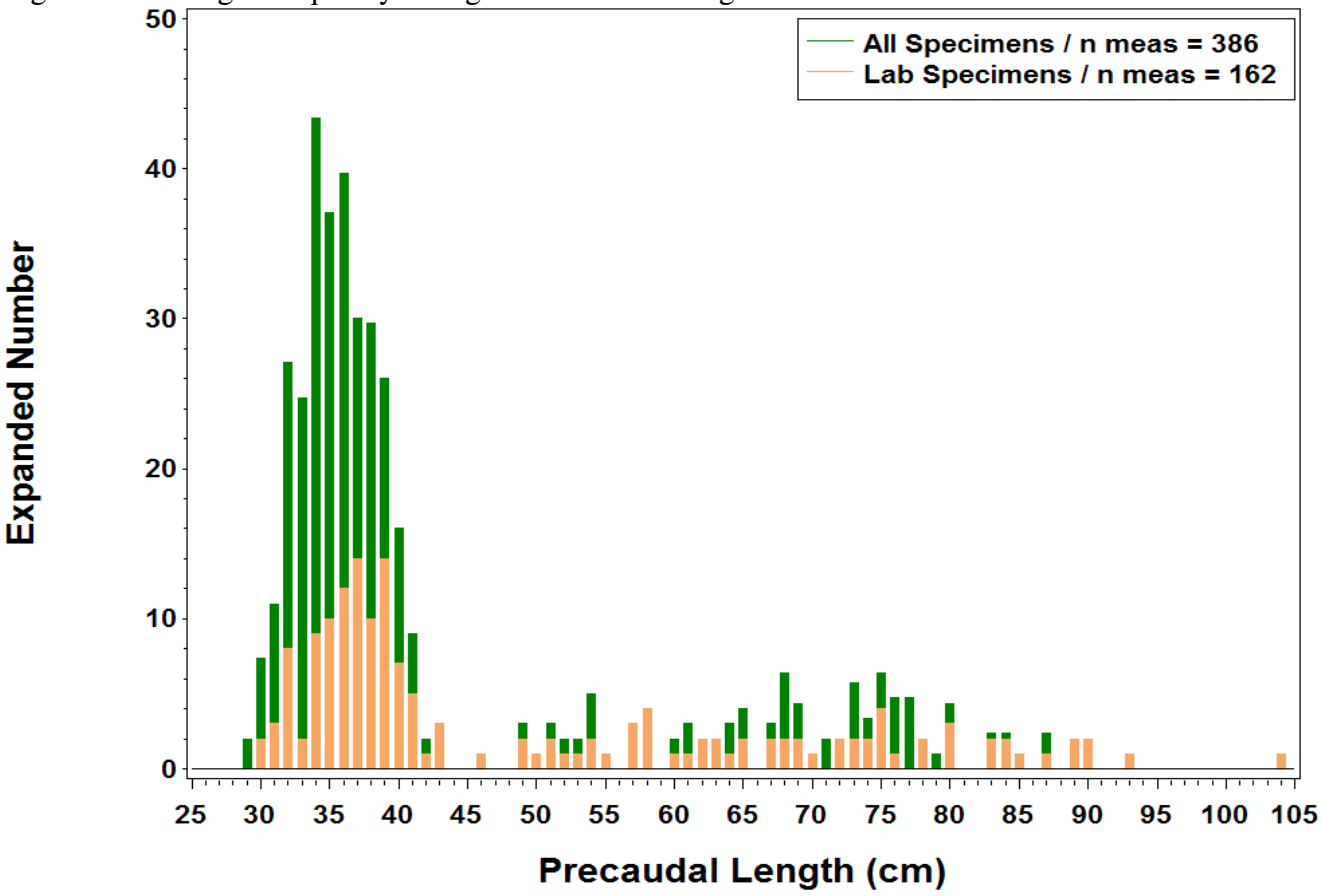


Figure 116. Sex-specific length frequencies histogram for smooth dogfish.

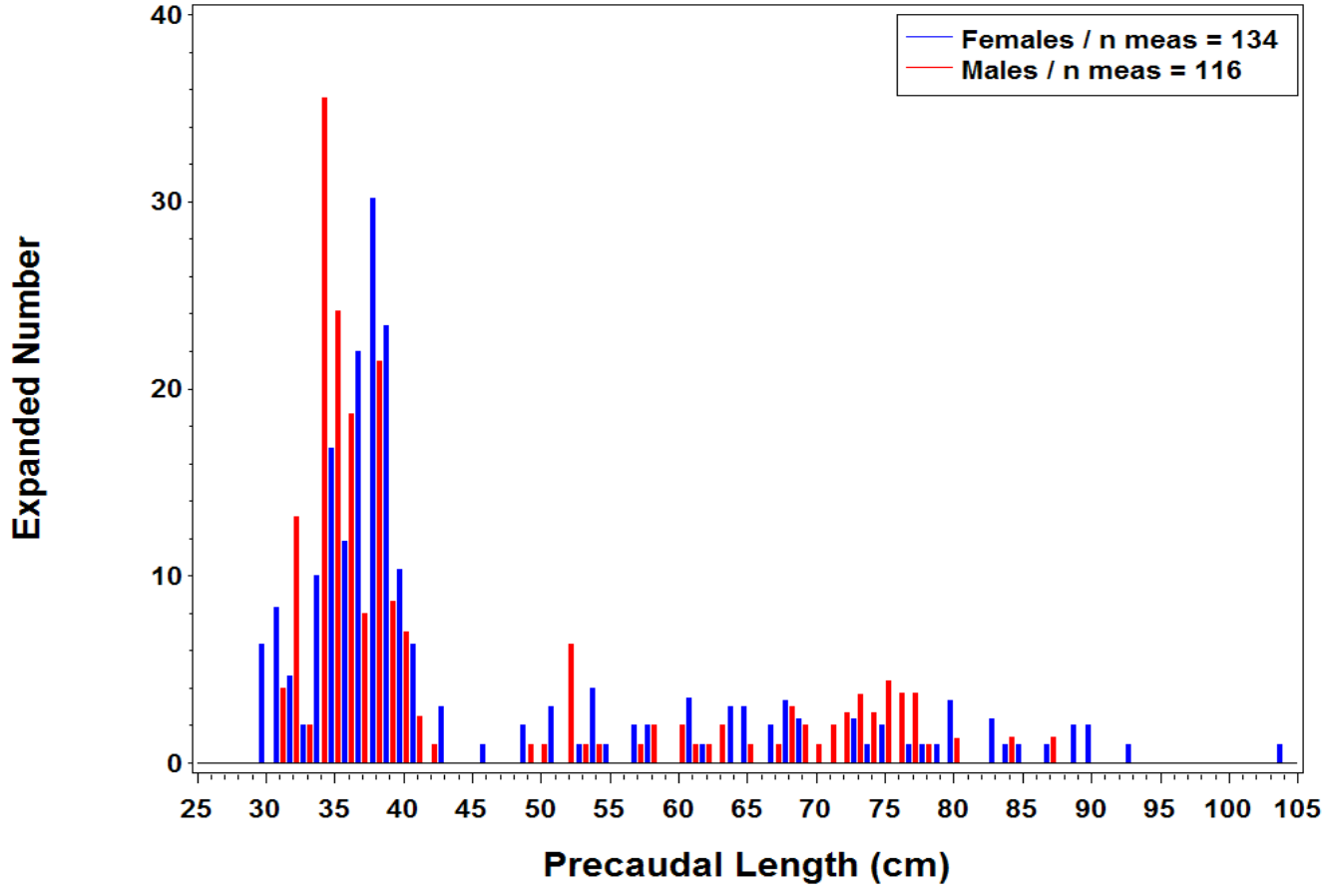
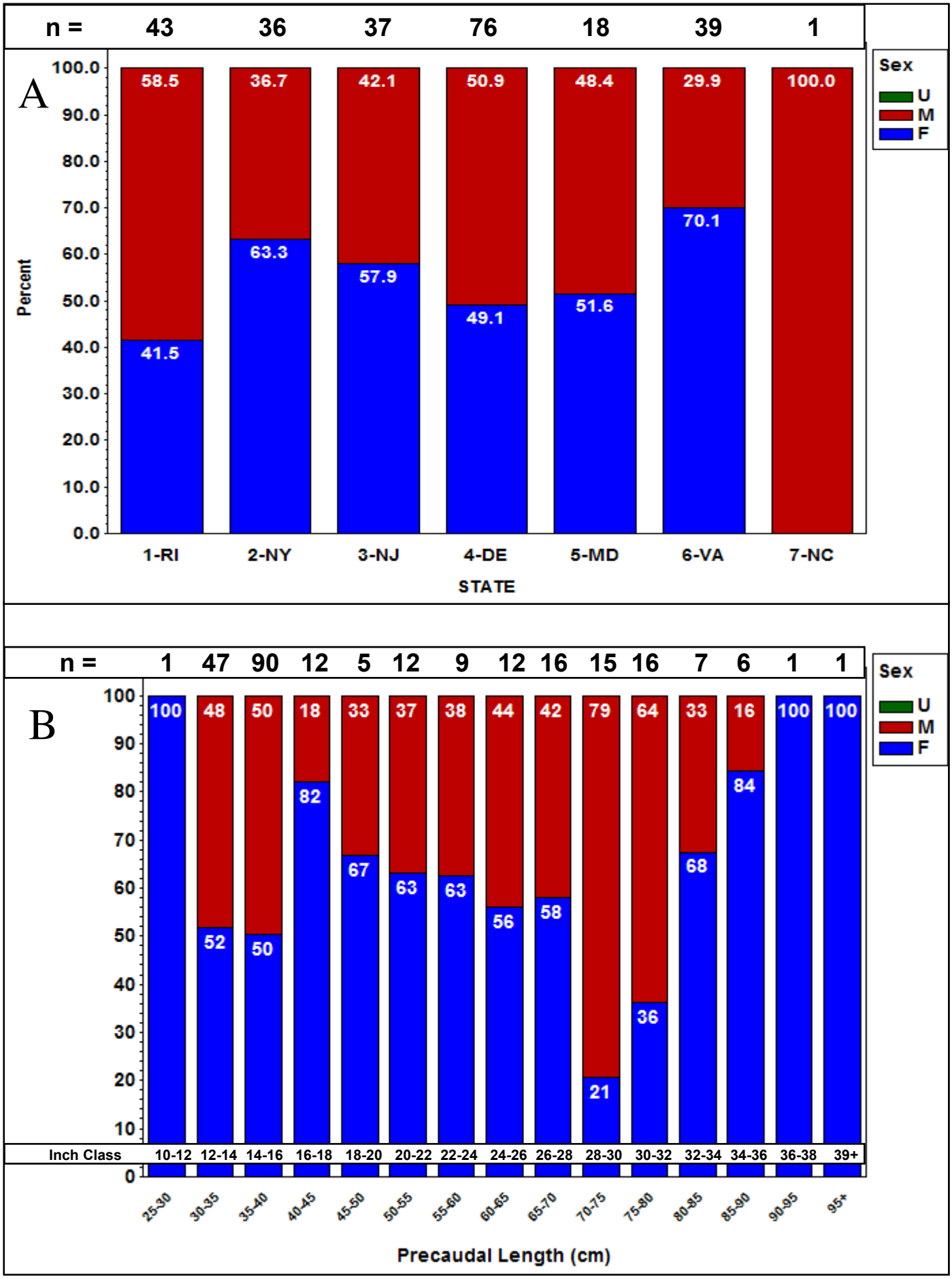


Figure 117. Sex ratios for smooth dogfish by state (A) and length group (B).



Spiny Dogfish (Priority B)

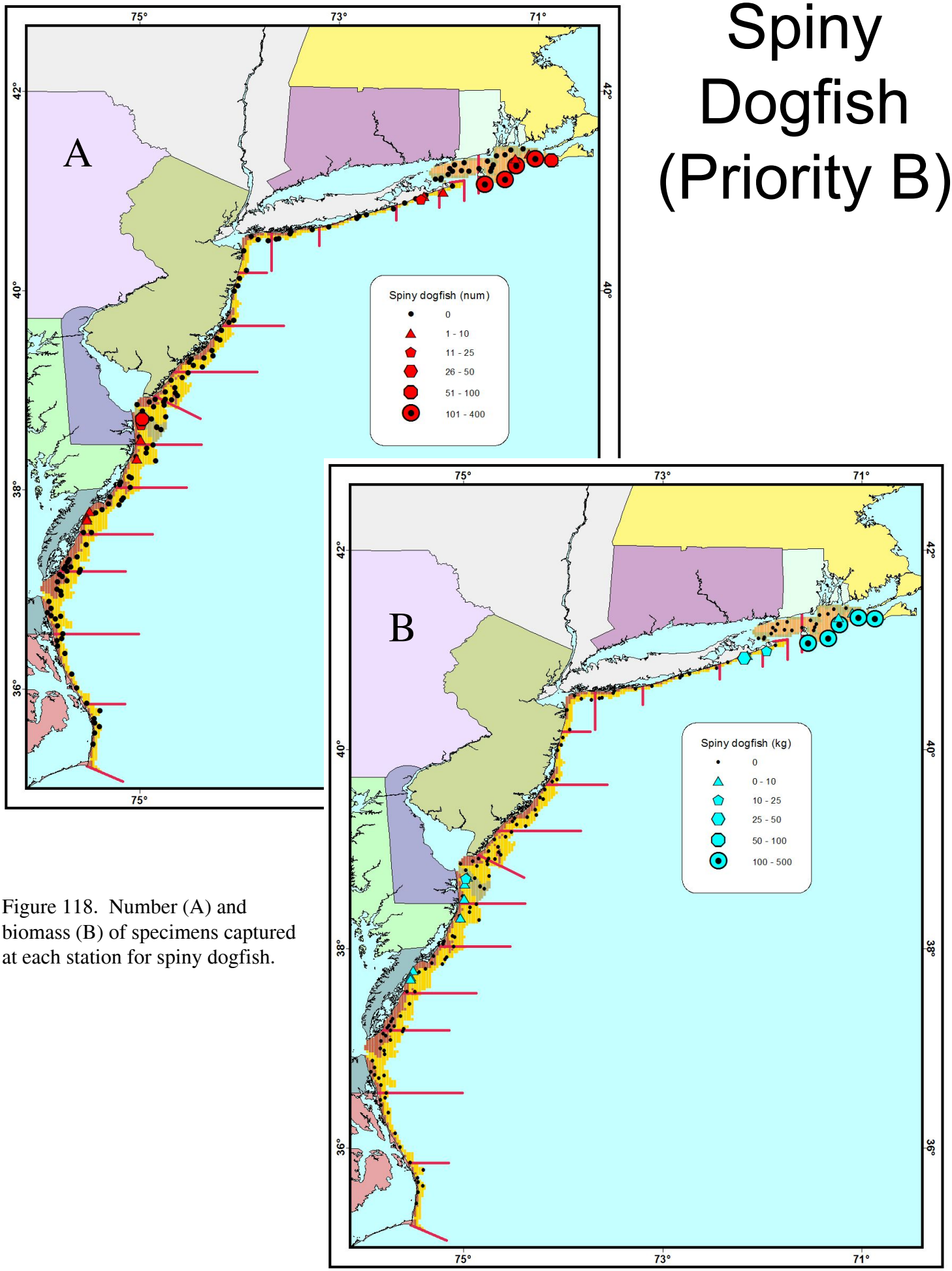


Figure 118. Number (A) and biomass (B) of specimens captured at each station for spiny dogfish.

Table 34. Number, biomass, minimum and maximum size of specimens captured, by state and region, for spiny dogfish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	7	609	1549.448	17	76	542	783	658	2.438	1.71	2.46
NY	22	3	23	51.690	9	23	523	738	623	2.247	0.23	0.33
NJ	24										0.00	0.00
DE	17	4	99	19.409	11	58	211	362	289	0.234	1.55	0.69
MD	10	1	1	0.152	1	1	265	265	265	0.152	0.07	0.01
VA	38	3	3	0.410	3	3	270	281	277	0.137	0.05	0.01
NC	13										0.00	0.00
Total	150	18	735	1621.109	41	161	211	783	511	1.955	0.47	0.50

Figure 119. Geometric mean catch per area swept by state and overall, with summary catch rates, for spiny dogfish.

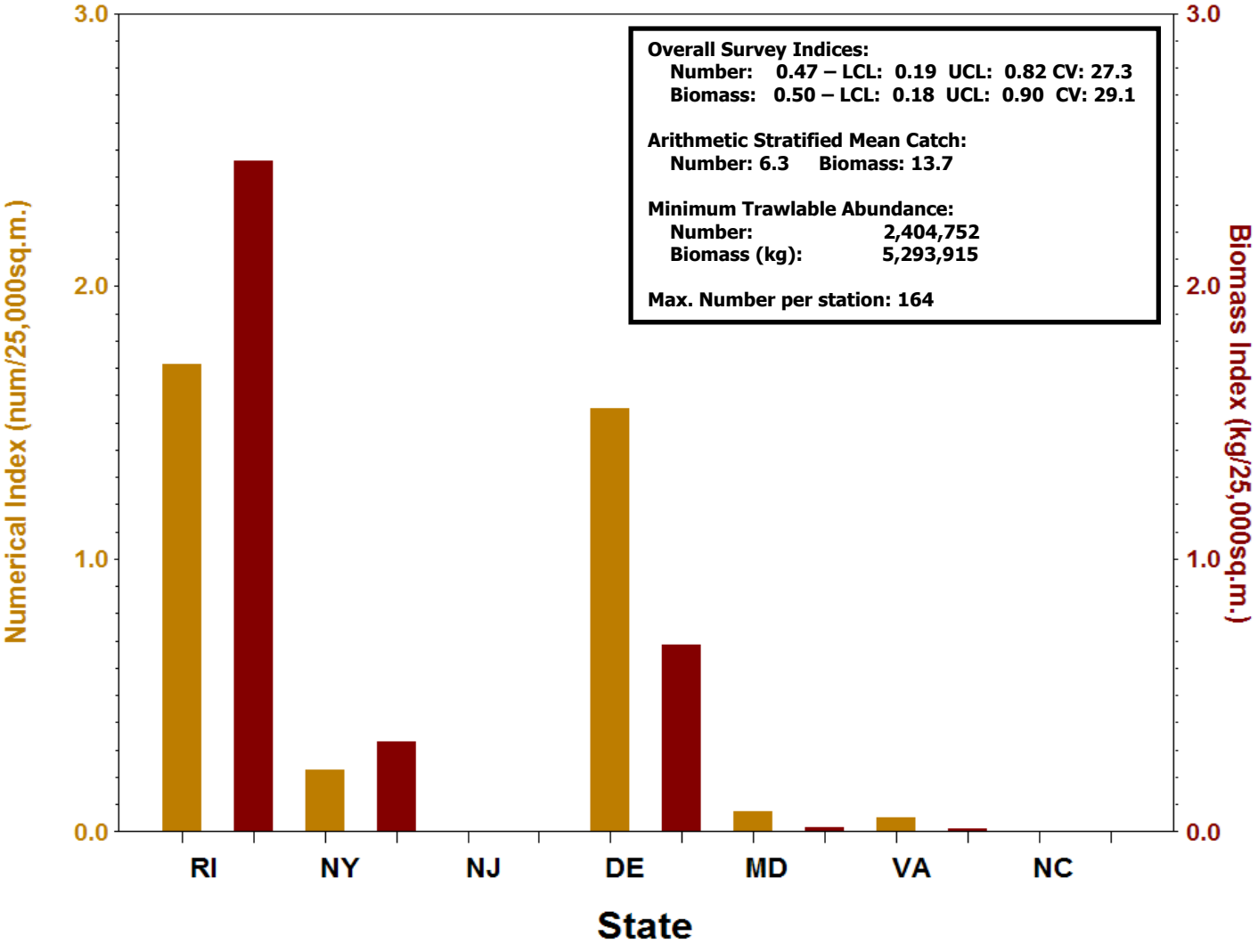


Figure 120. Length frequency histogram for spiny dogfish.

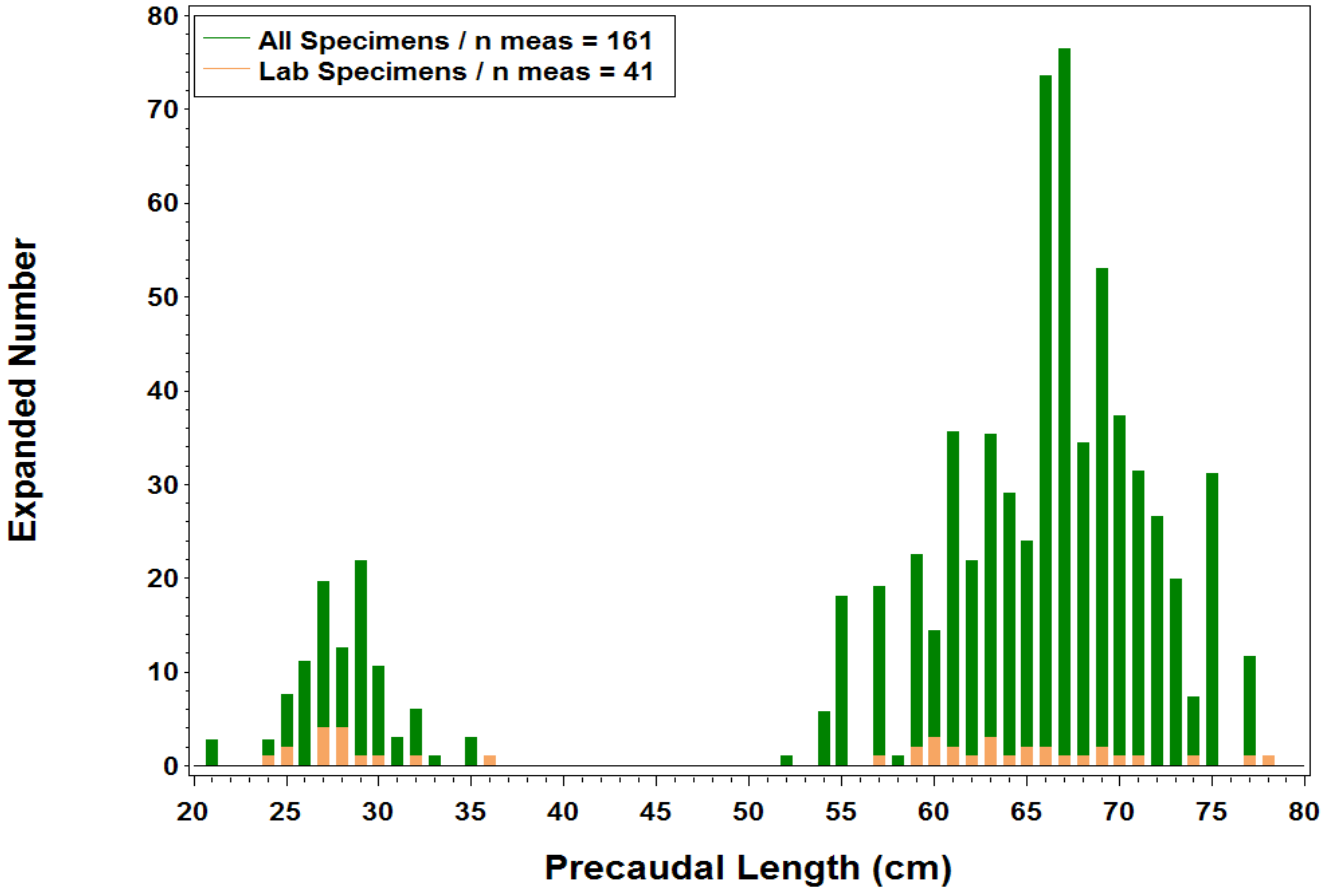


Figure 121. Sex-specific length frequencies histogram for spiny dogfish.

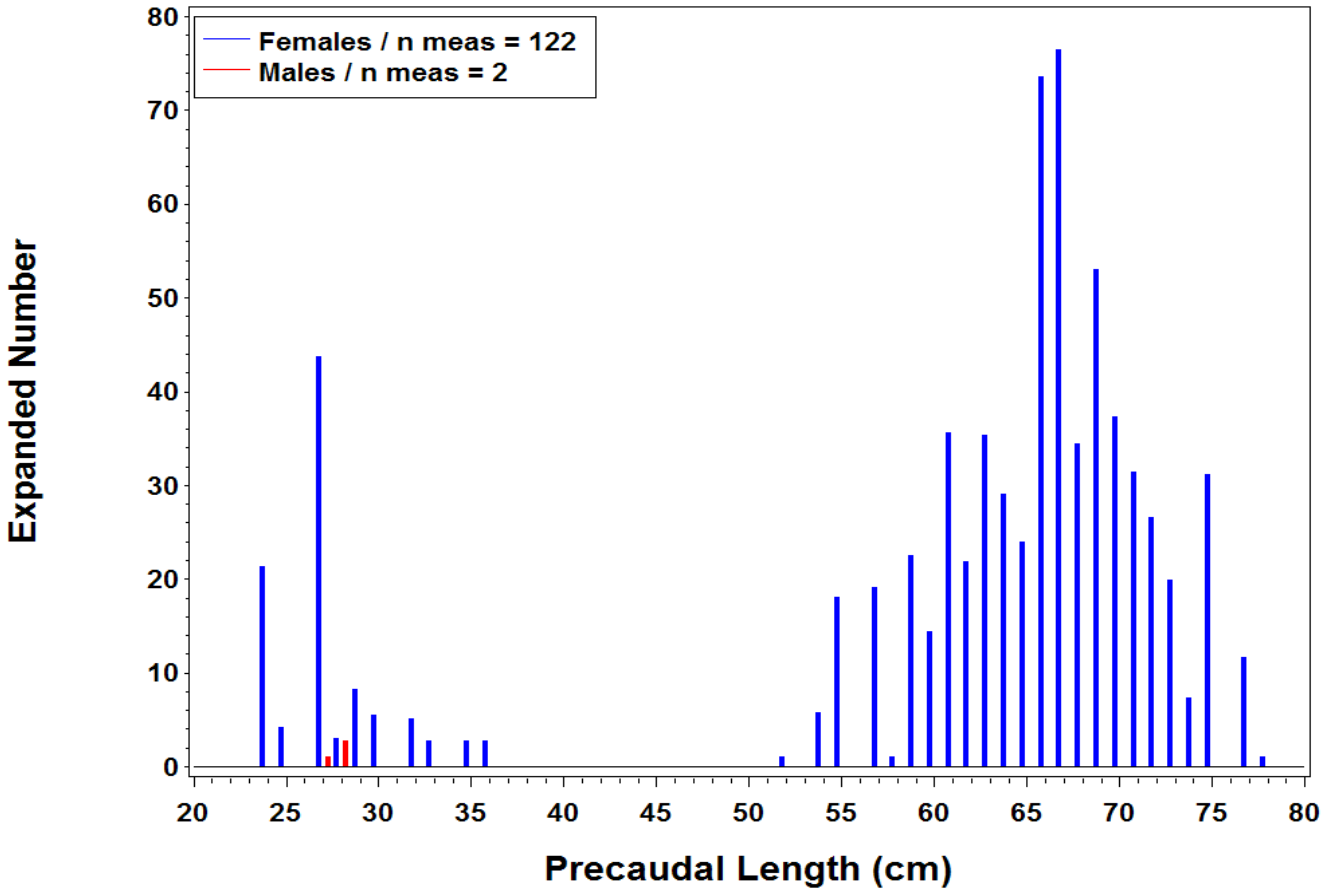
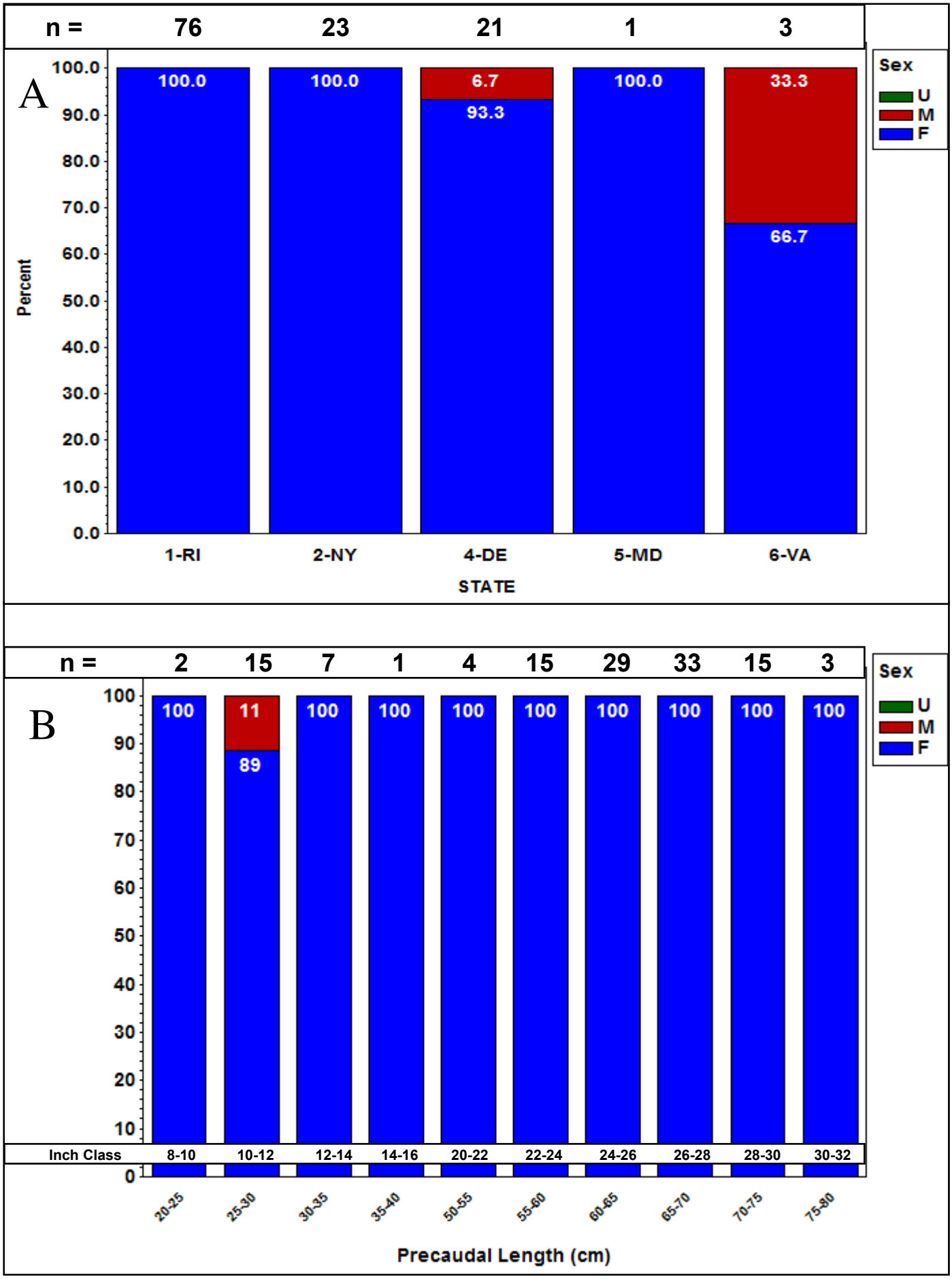


Figure 122. Sex ratios for spiny dogfish by state (A) and length group (B).



Spot (Priority B)

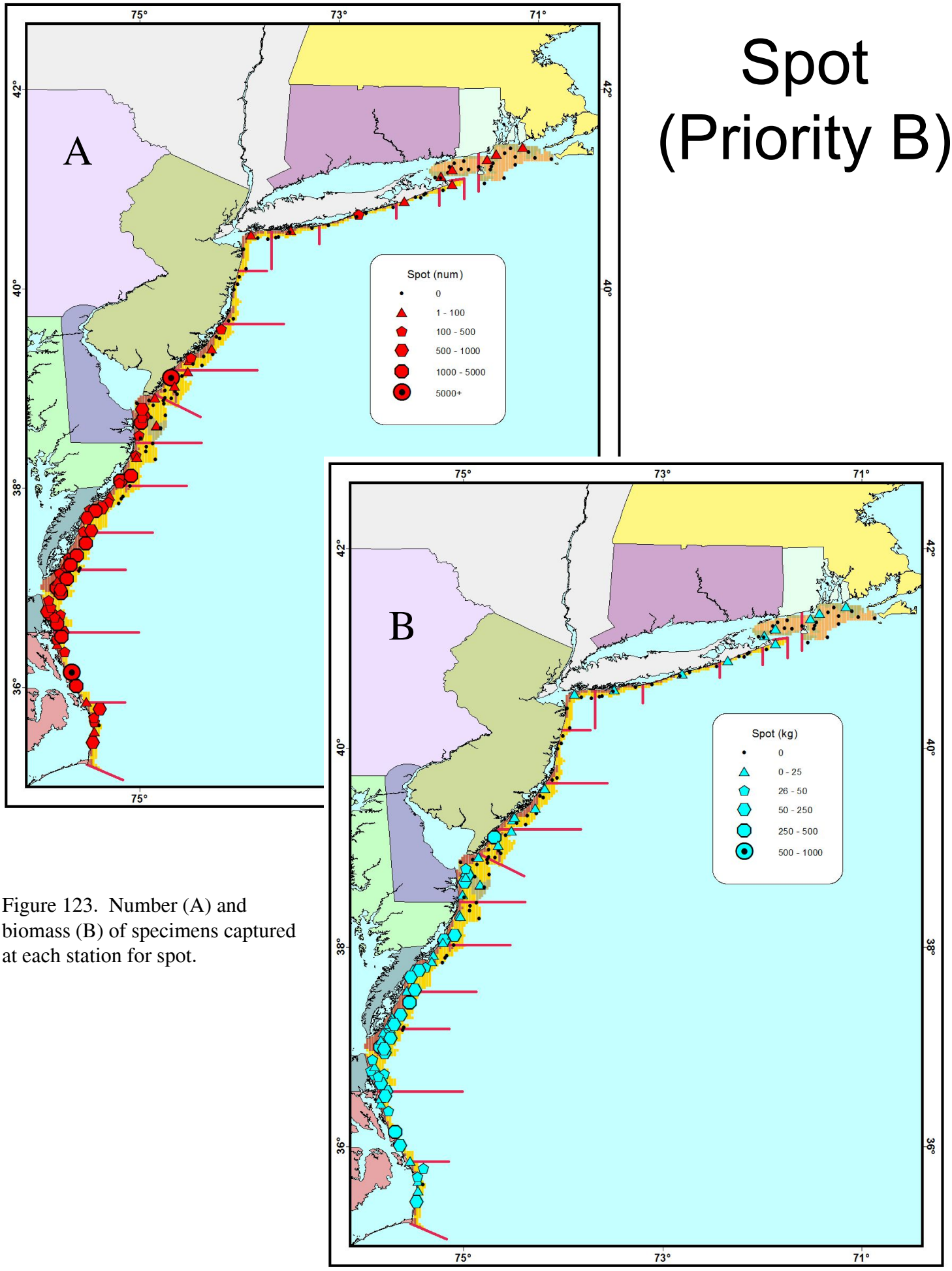


Figure 123. Number (A) and biomass (B) of specimens captured at each station for spot.

Table 35. Number, biomass, minimum and maximum size of specimens captured, by state and region, for spot.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	5	11	1.156	8	11	157	191	177	0.100	0.22	0.04
NY	22	5	188	16.451	9	95	144	199	167	0.096	0.49	0.18
NJ	24	7	6687	428.100	18	428	122	199	161	0.080	2.07	0.75
DE	17	8	3706	239.042	24	412	120	234	167	0.081	33.78	5.12
MD	10	6	4465	353.735	18	226	117	208	163	0.073	26.88	5.04
VA	38	32	29289	1980.856	98	1786	83	249	156	0.073	149.80	16.52
NC	13	12	12532	852.643	38	477	81	244	159	0.084	214.31	20.11
Total	150	75	56878	3871.983	213	3435	81	249	159	0.078	14.81	3.28

Figure 124. Geometric mean catch per area swept by state and overall, with summary catch rates, for spot.

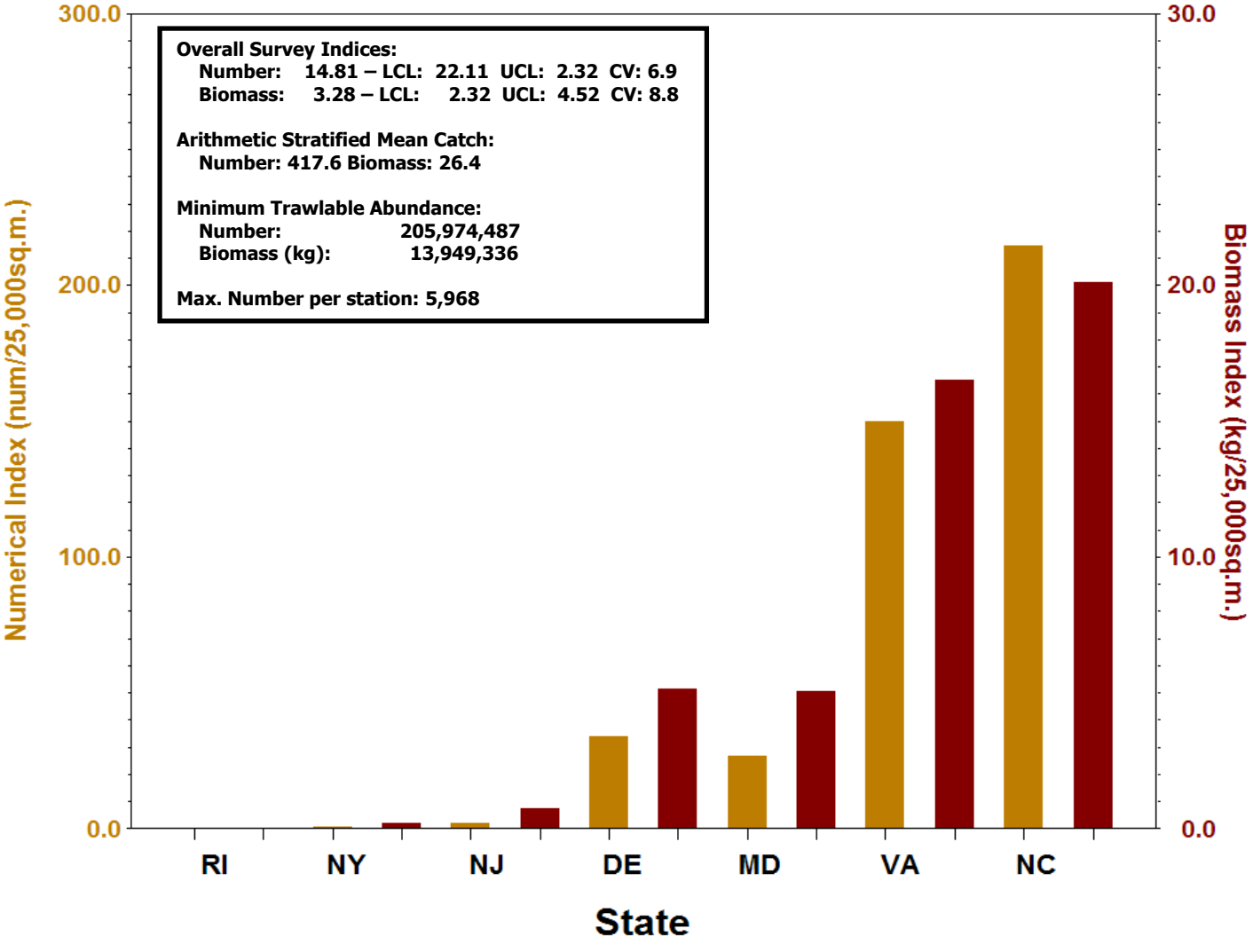


Figure 125. Length frequency histogram for spot.

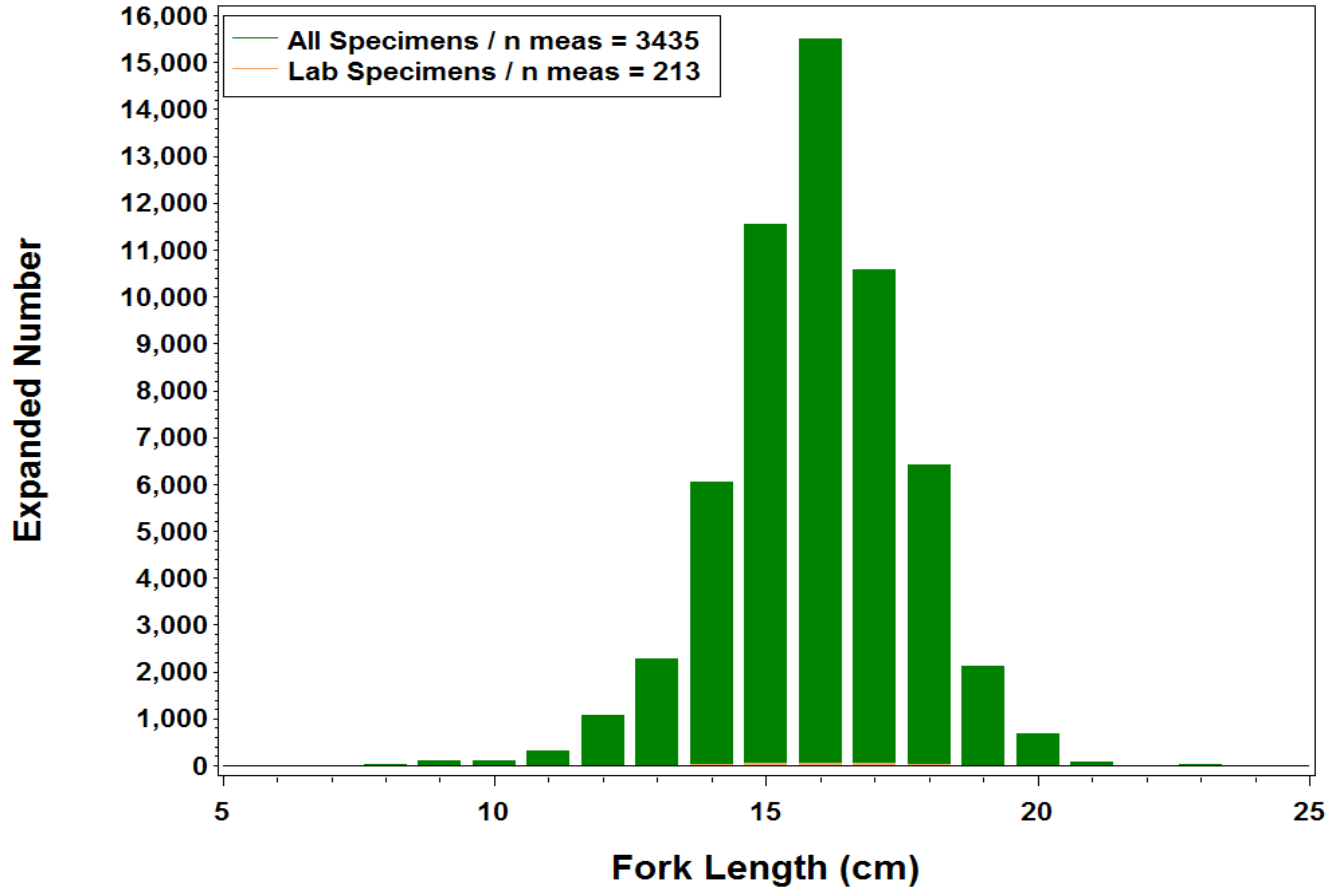


Figure 126. Sex-specific length frequencies histogram for spot.

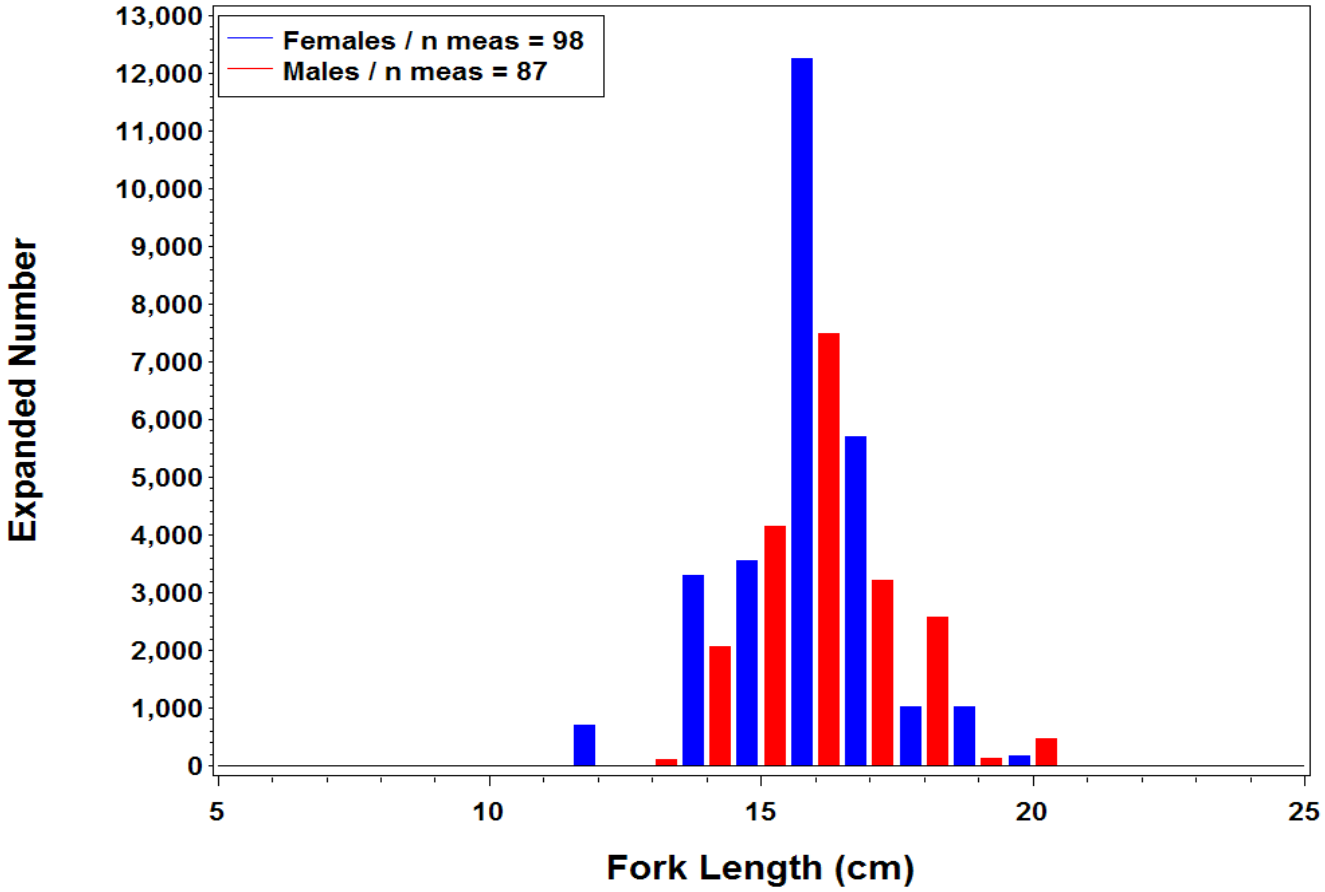
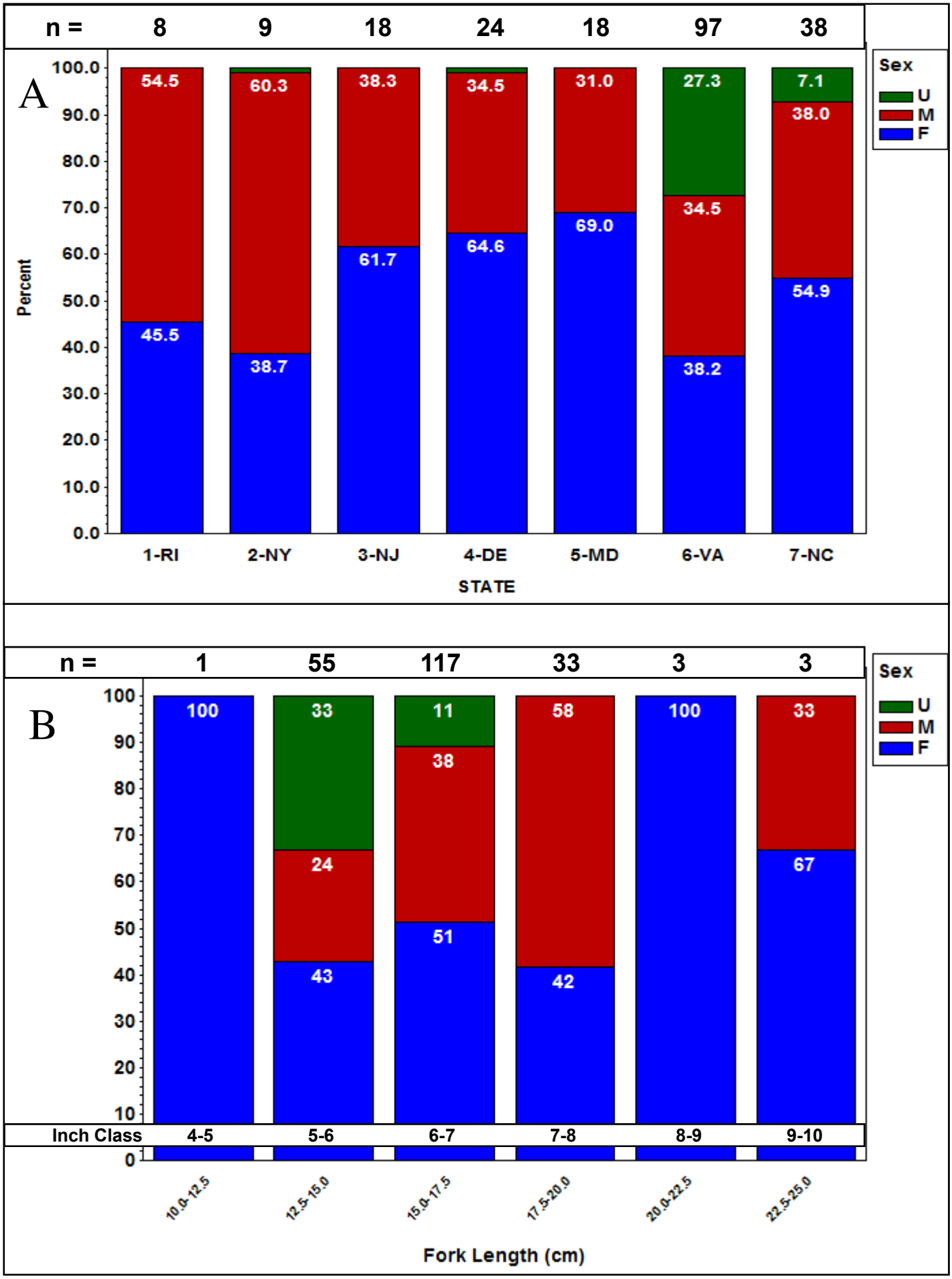


Figure 127. Sex ratios for spot by state (A) and length group (B).



Spotted Hake (Priority D)

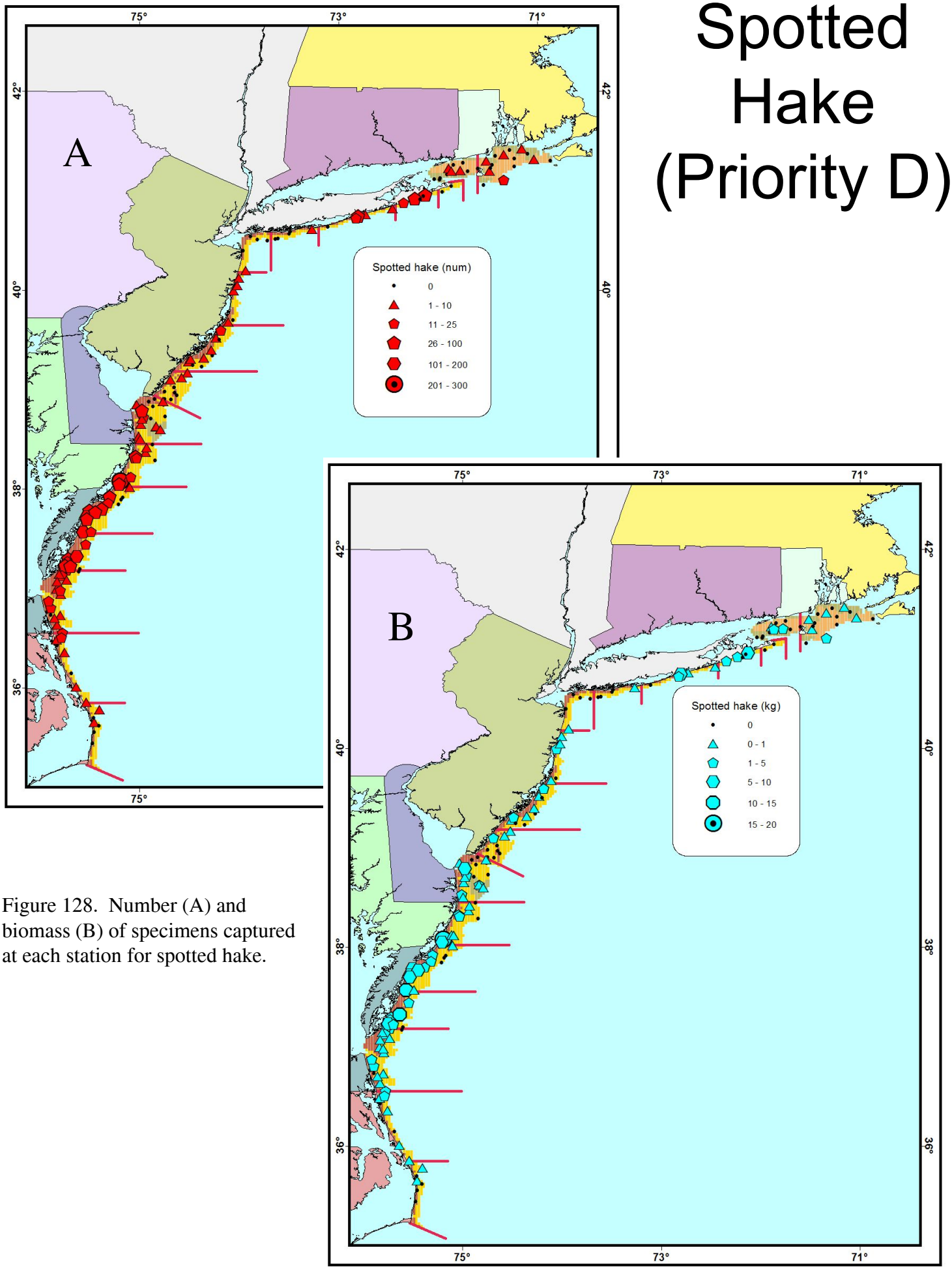


Figure 128. Number (A) and biomass (B) of specimens captured at each station for spotted hake.

Table 36. Number, biomass, minimum and maximum size of specimens captured, by state and region, for spotted hake.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	9	48	7.142	0	48	197	282	244		0.62	0.17
NY	22	9	165	19.006	0	164	93	308	226		1.12	0.32
NJ	24	13	60	9.241	0	60	203	352	253		1.06	0.26
DE	17	11	115	14.933	0	64	166	339	233	0.134	5.50	1.04
MD	10	8	362	30.750	0	118	171	284	218		7.66	1.32
VA	38	31	1181	99.102	0	574	167	343	222		9.61	1.44
NC	13	7	25	2.812	0	25	192	302	235		0.93	0.16
Total	150	88	1956	182.986	0	1053	93	352	226	0.134	3.49	0.81

Figure 129. Geometric mean catch per area swept by state and overall, with summary catch rates, for spotted hake.

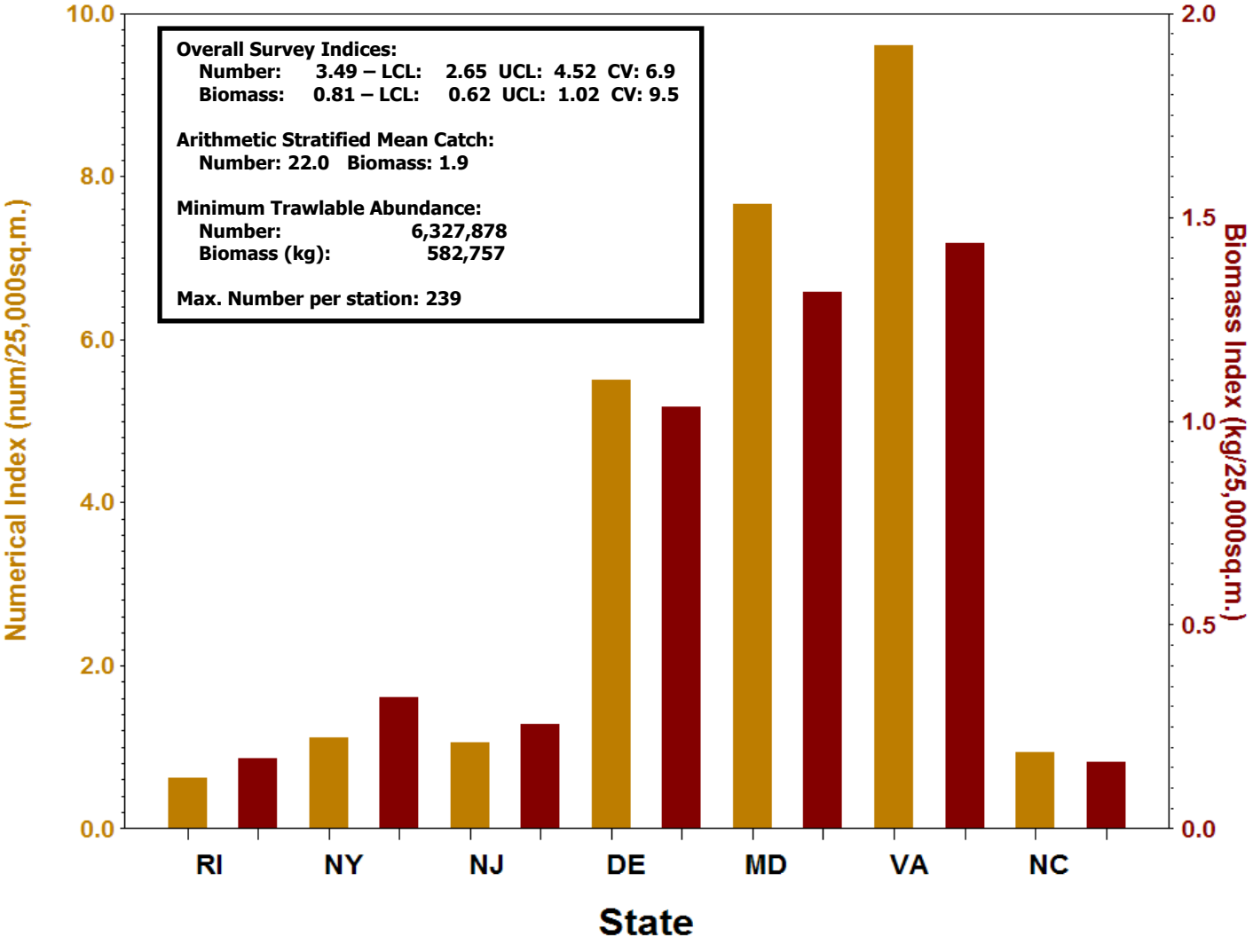
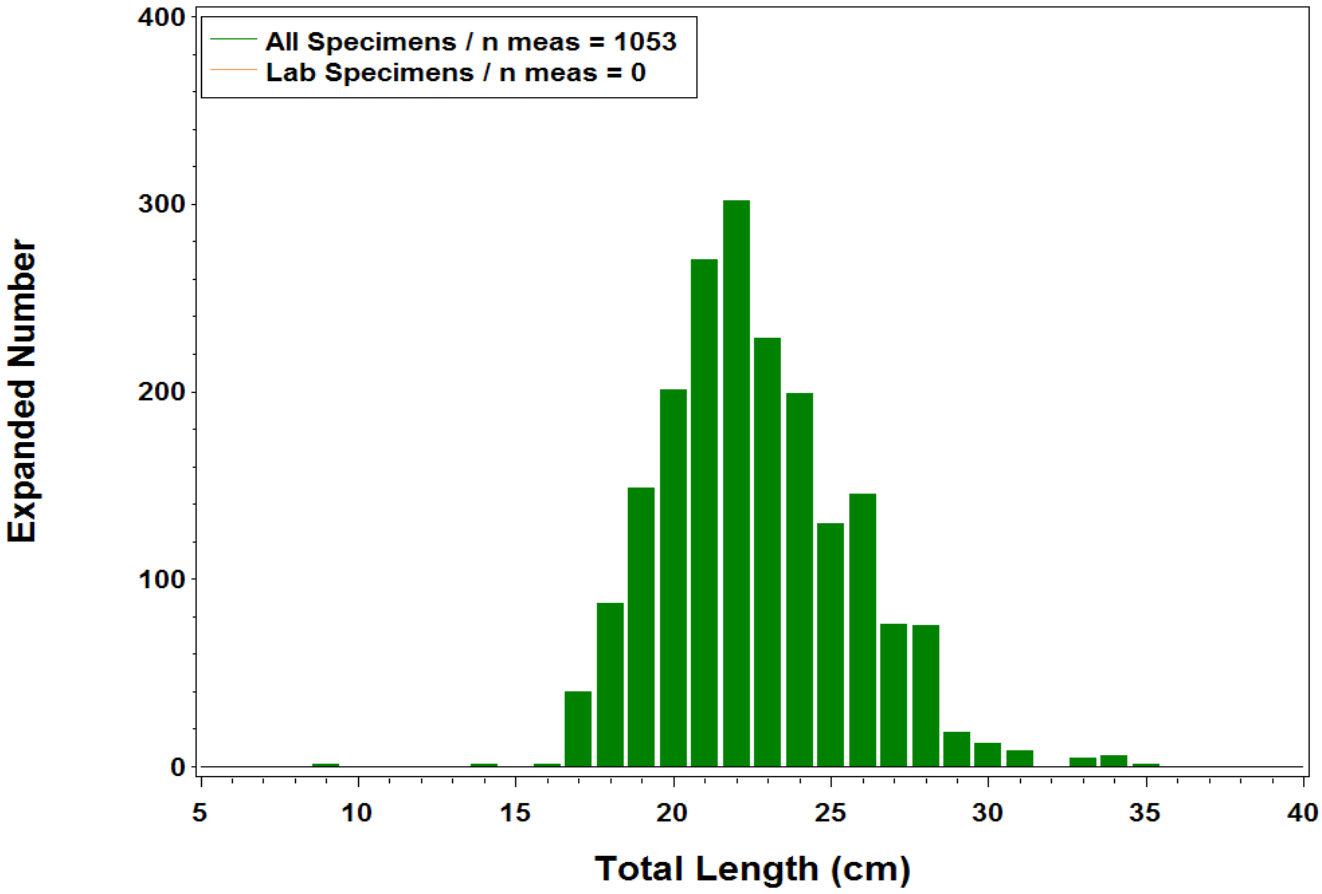


Figure 130. Length frequency histogram for spotted hake.



Striped Anchovy (Priority D)

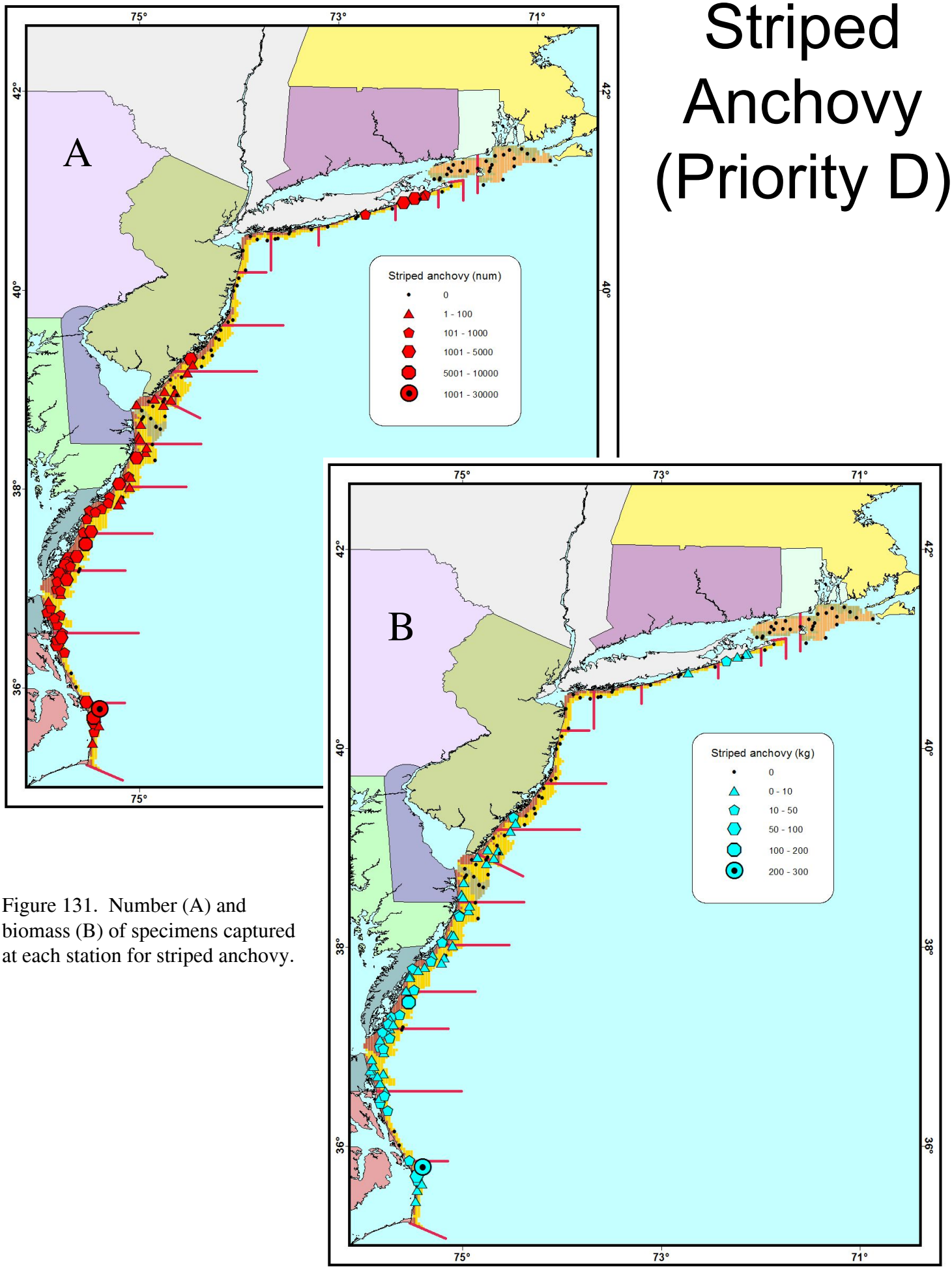


Figure 131. Number (A) and biomass (B) of specimens captured at each station for striped anchovy.

Table 37. Number, biomass, minimum and maximum size of specimens captured, by state and region, for striped anchovy.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22	5	2935	21.655	0	99	45	120	76		1.18	0.17
NJ	24	6	3077	40.541	0	134	79	135	112		1.24	0.20
DE	17	6	189	2.643	0	189	80	131	108		3.00	0.16
MD	10	8	6240	83.554	0	410	88	135	111		52.39	2.79
VA	38	35	28144	396.457	0	1909	59	186	107		189.17	4.69
NC	13	11	44248	464.248	0	616	62	123	100		242.96	6.96
Total	150	71	84833	1009.098	0	3357	45	186	105		17.42	1.65

Figure 132. Geometric mean catch per area swept by state and overall, with summary catch rates, for striped anchovy.

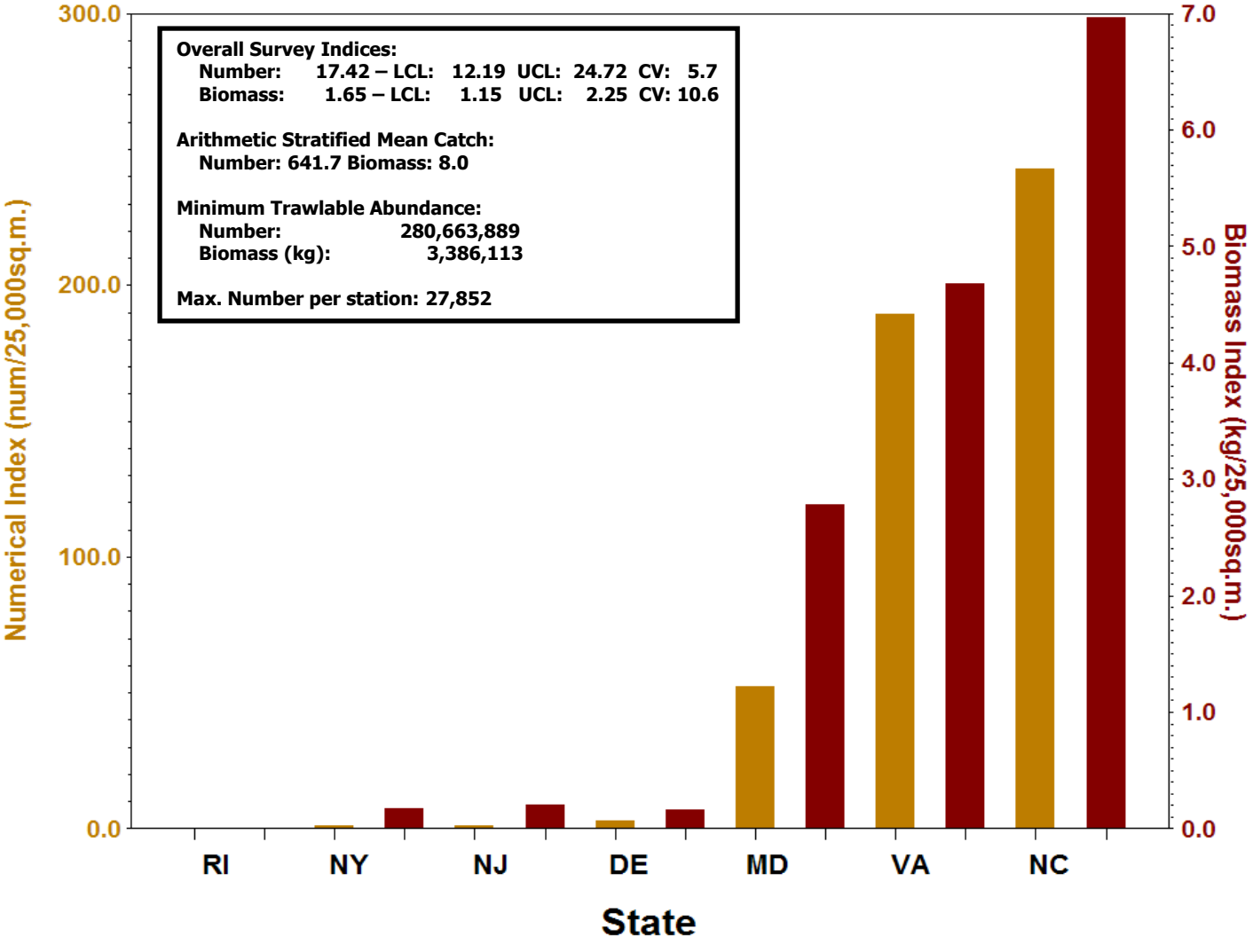
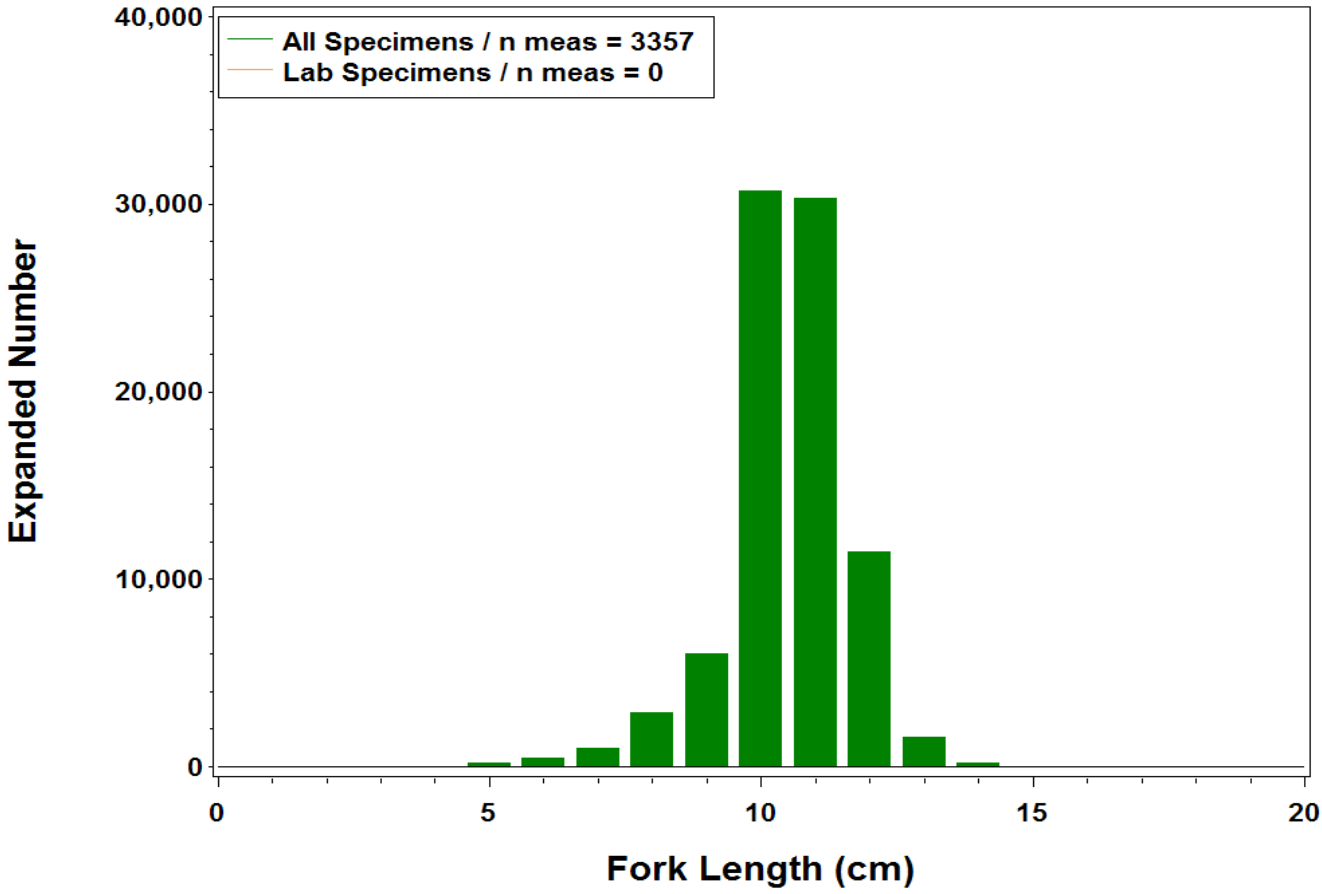


Figure 133. Length frequency histogram for striped anchovy.



Striped Bass (Priority A)

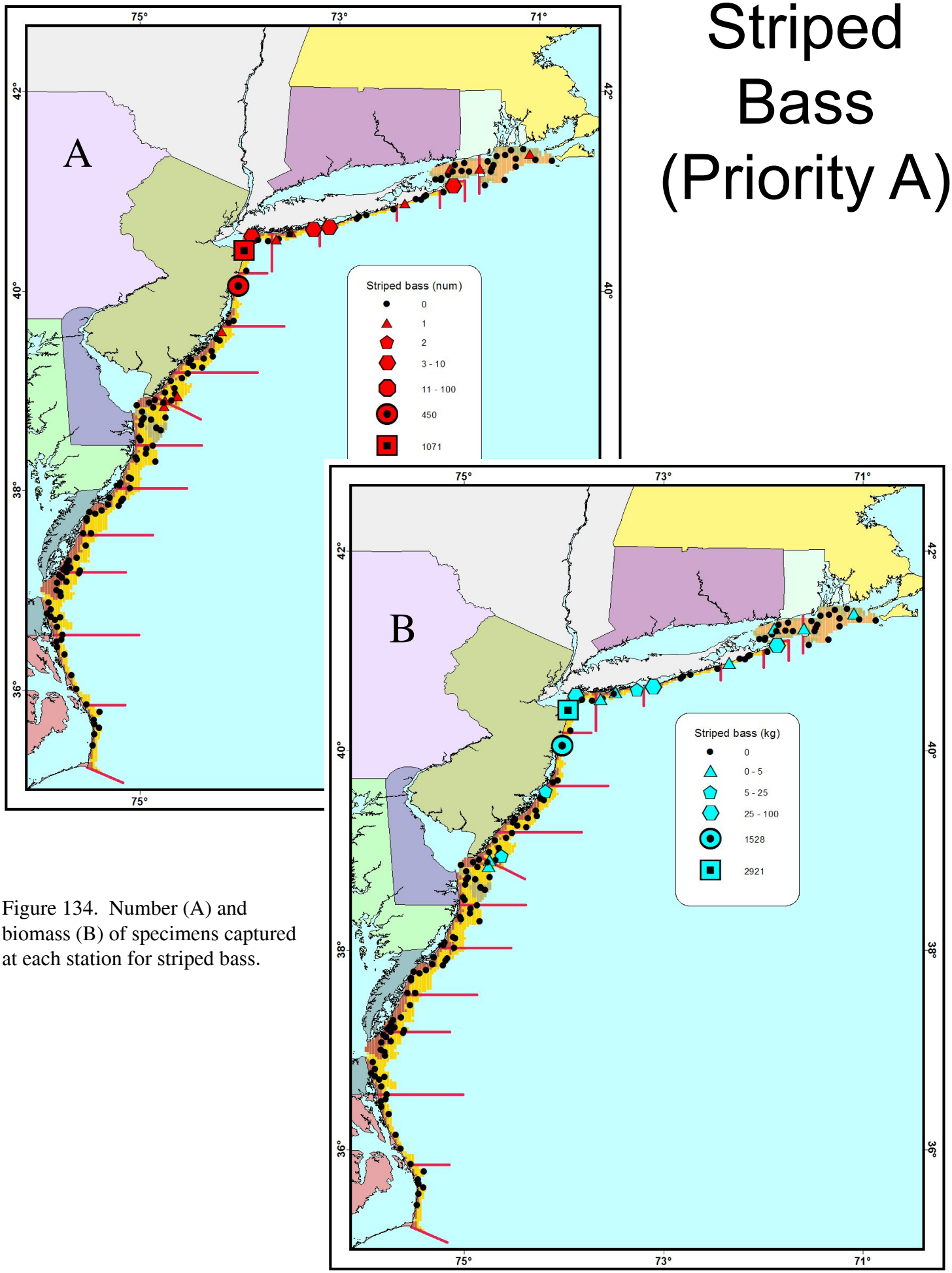


Figure 134. Number (A) and biomass (B) of specimens captured at each station for striped bass.

Table 38. Number, biomass, minimum and maximum size of specimens captured, by state and region, for striped bass.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	3	3	9.181	3	3	584	720	654	3.060	0.07	0.16
NY	22	8	1102	3046.459	26	41	561	980	690	3.980	1.50	2.70
NJ	24	4	453	1551.999	13	50	592	1110	836	9.054	0.41	0.74
DE	17	1	1	4.300	1	1	736	736	736	4.300	0.06	0.15
MD	10										0.00	0.00
VA	38										0.00	0.00
NC	13										0.00	0.00
Total	150	16	1559	4611.939	43	95	561	1110	766	6.674	0.20	0.34

Figure 135. Geometric mean catch per area swept by state and overall, with summary catch rates, for striped bass.

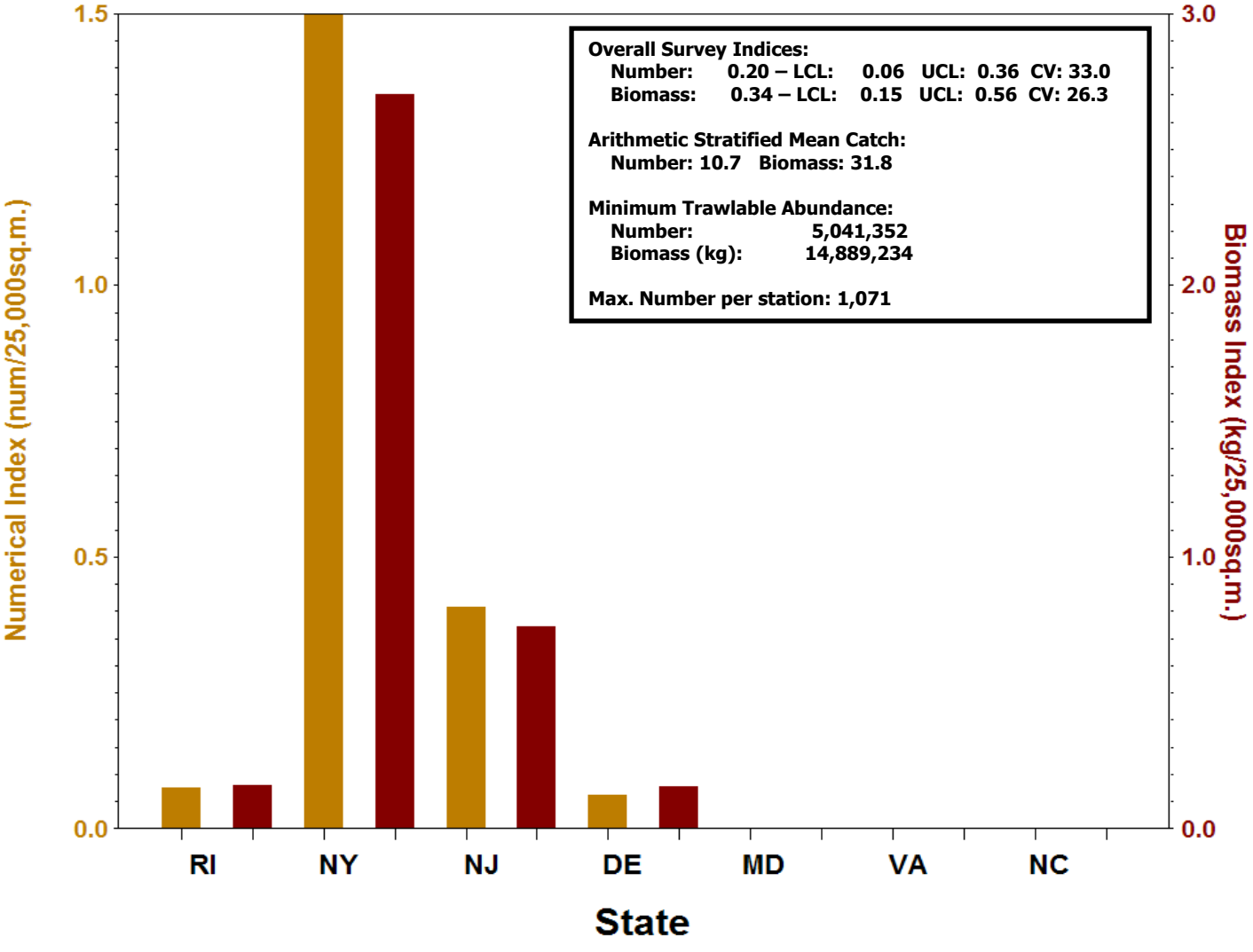


Figure 136. Length frequency histogram for striped bass.

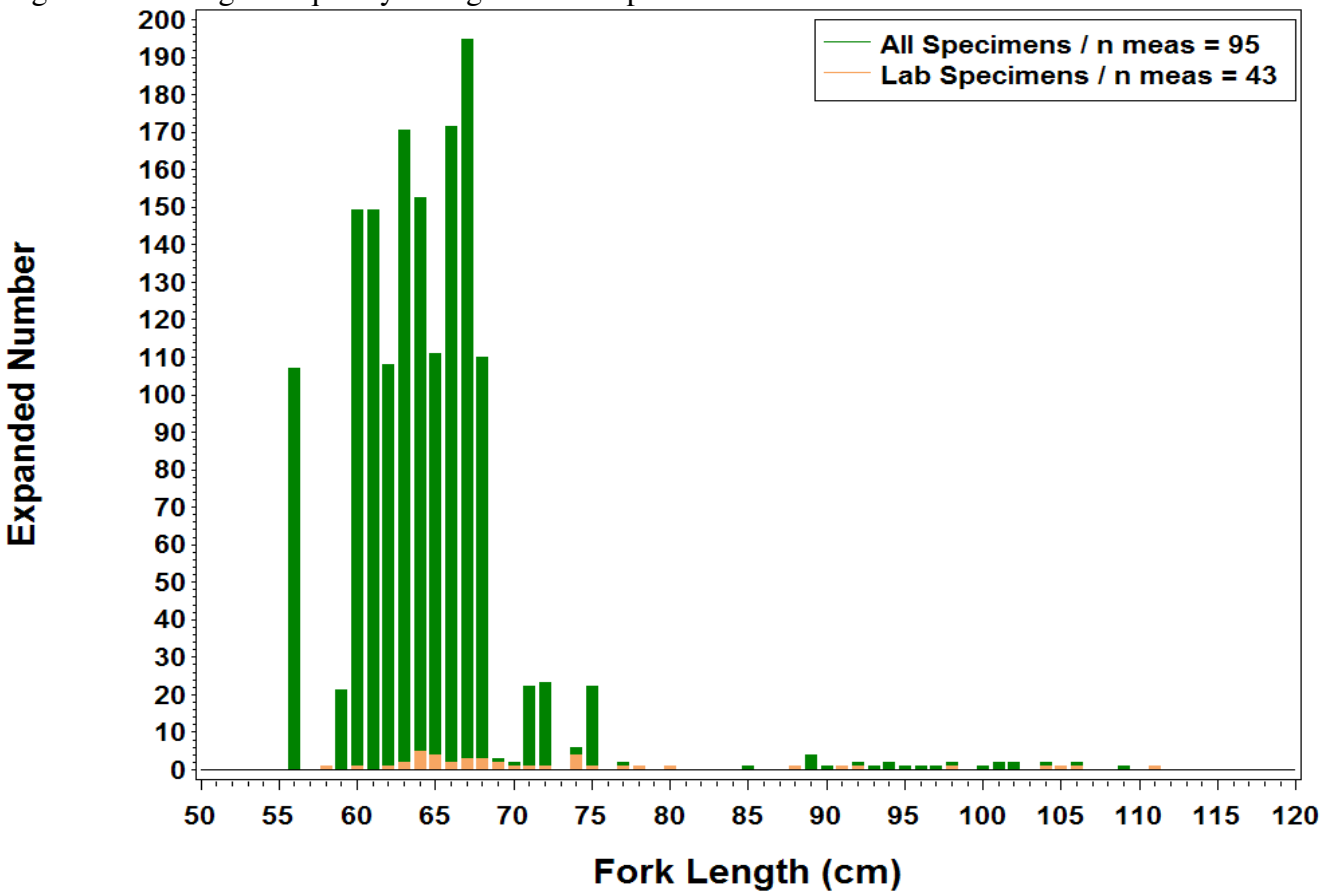


Figure 137. Sex-specific length frequencies histogram for striped bass.

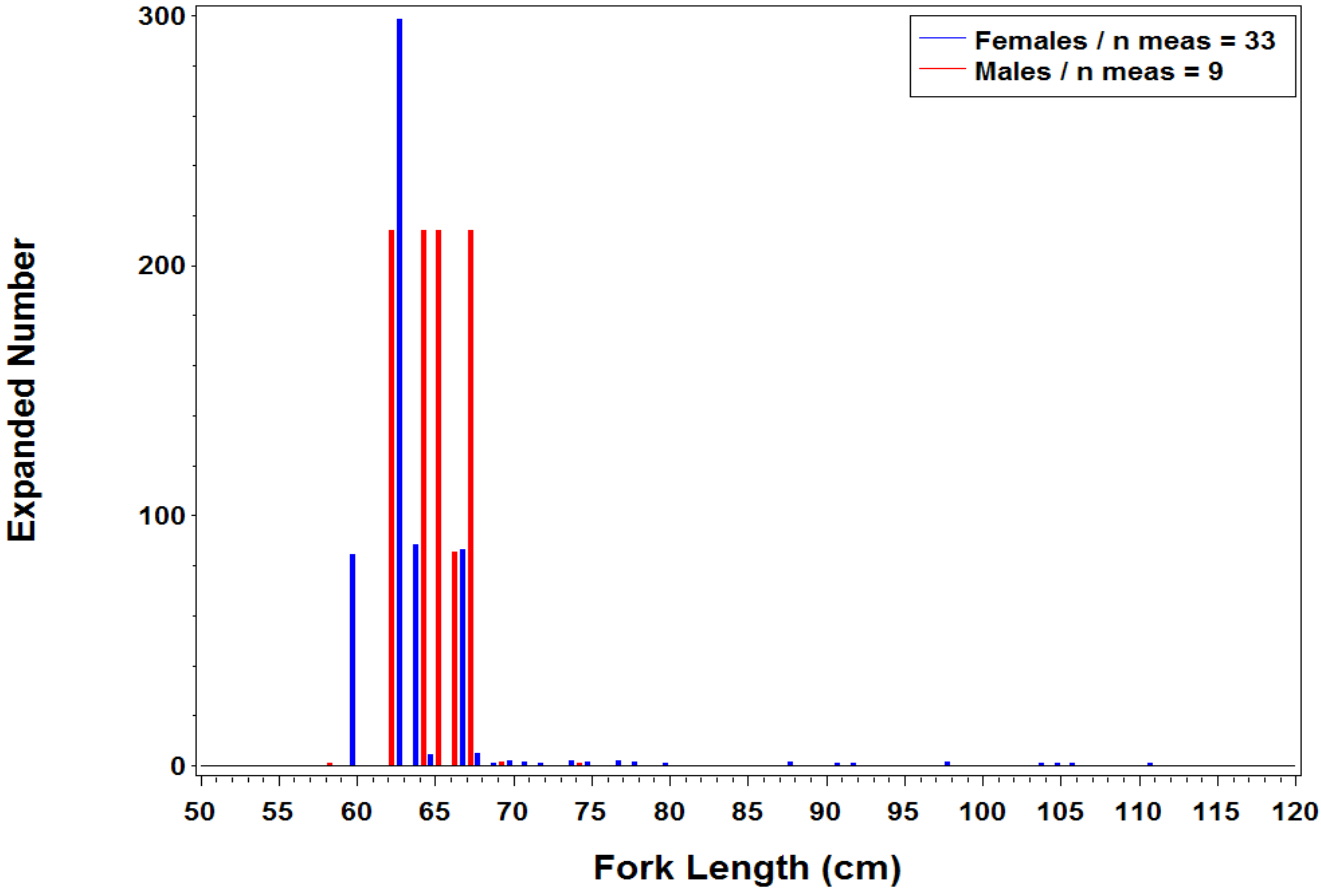
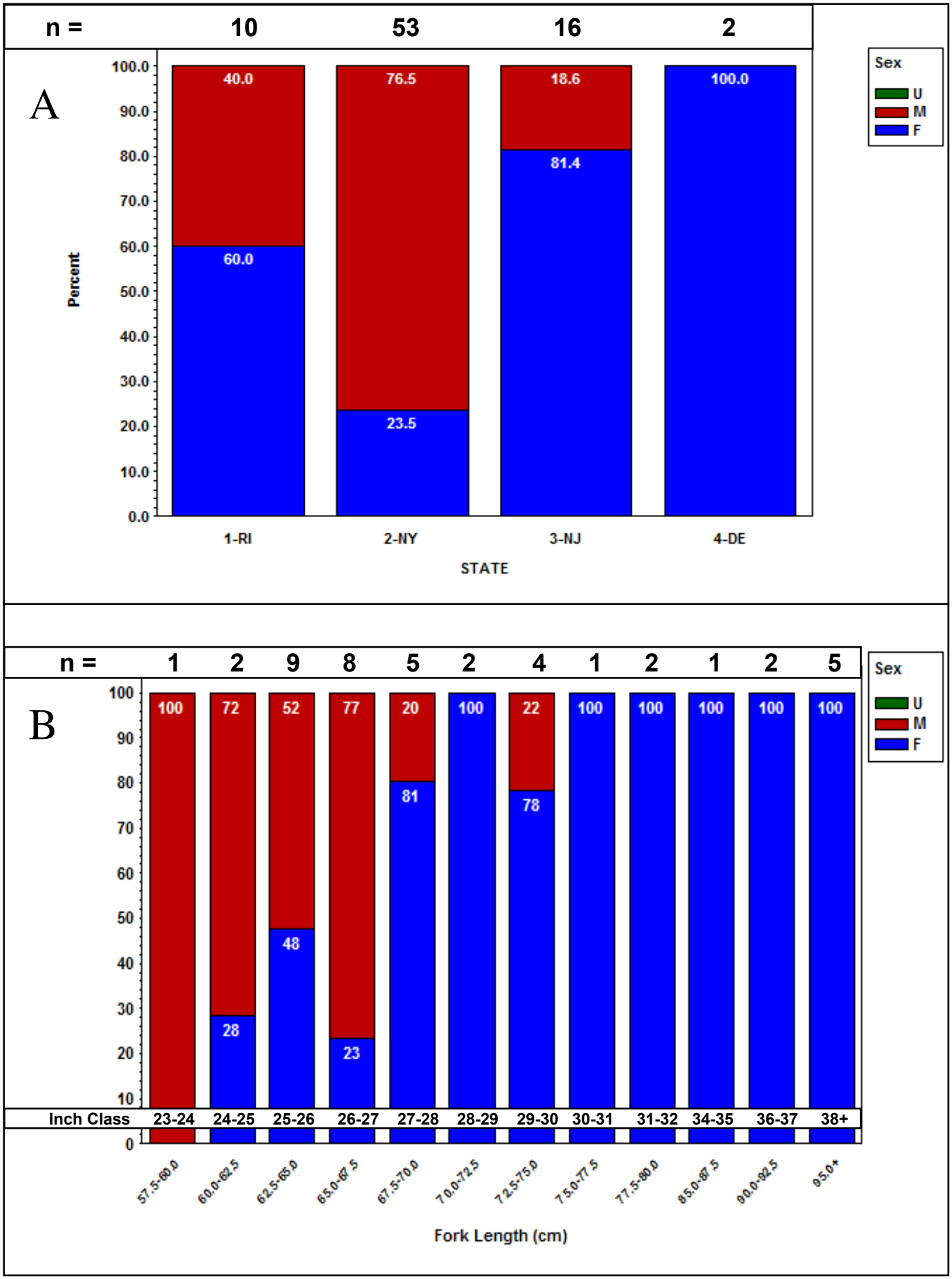


Figure 138. Sex ratios for striped bass by state (A) and length group (B).



Striped Searobin (Priority D)

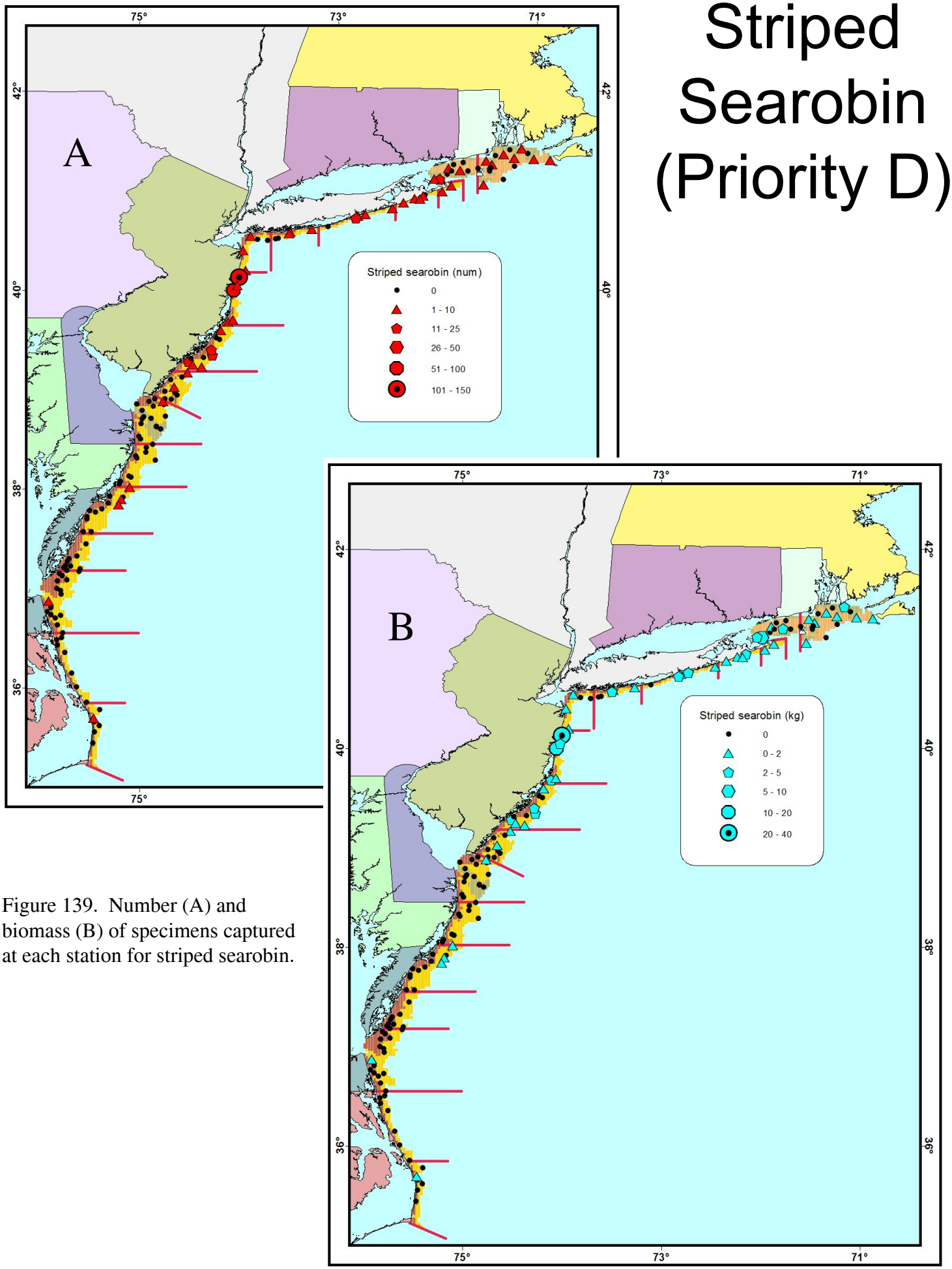


Figure 139. Number (A) and biomass (B) of specimens captured at each station for striped searobin.

Table 39. Number, biomass, minimum and maximum size of specimens captured, by state and region, for striped searobin.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	13	54	18.565	0	54	82	370	268		1.01	0.42
NY	22	16	71	24.044	0	71	88	413	269		1.76	0.62
NJ	24	13	286	76.946	0	206	153	395	262		2.36	0.93
DE	17	1	2	0.858	0	2	261	367	314		0.10	0.05
MD	10										0.00	0.00
VA	38	4	11	1.015	0	11	81	233	172		0.15	0.02
NC	13	1	1	0.080	0	1	183	183	183		0.06	0.01
Total	150	48	425	121.508	0	345	81	413	261		0.73	0.32

Figure 140. Geometric mean catch per area swept by state and overall, with summary catch rates, for striped searobin.

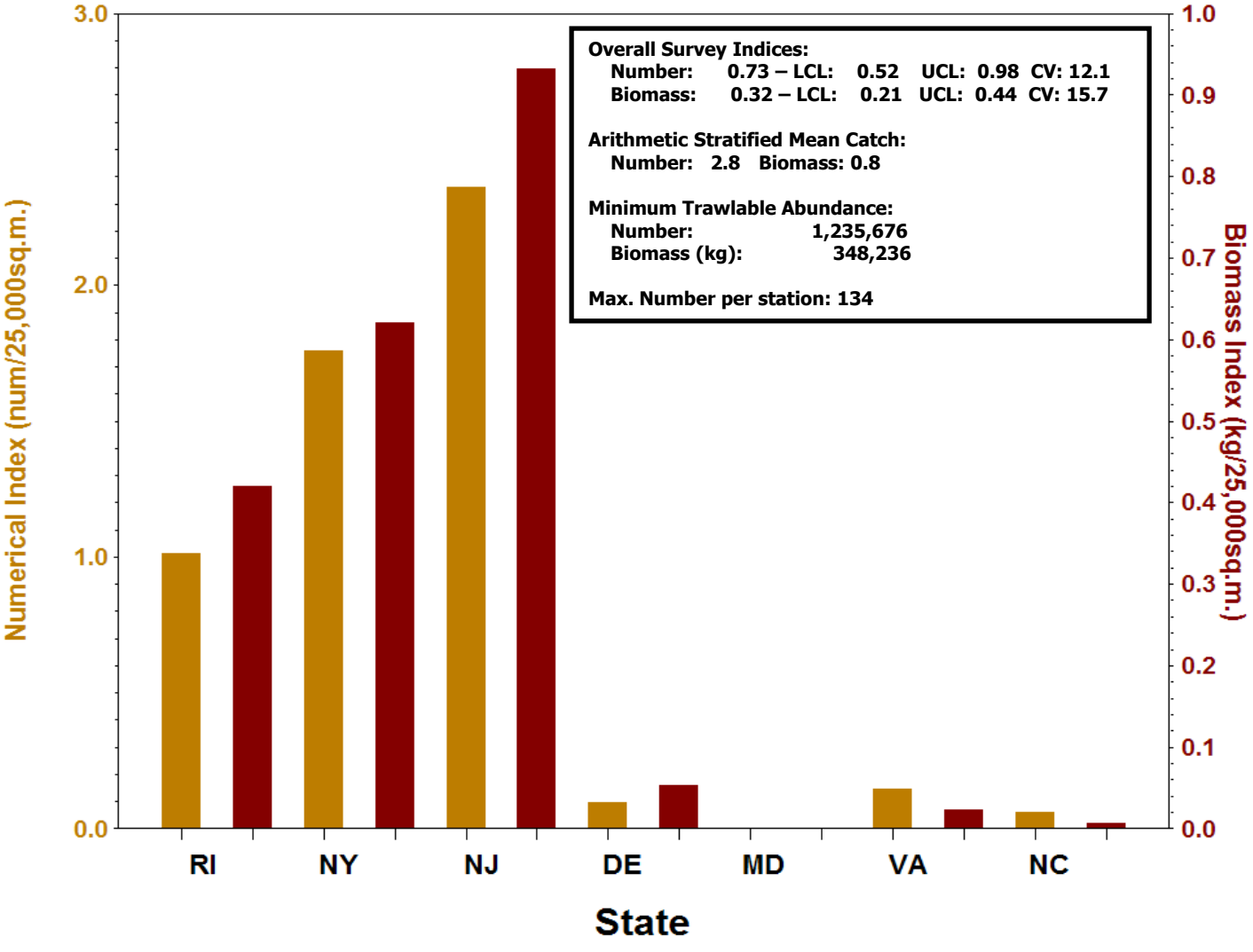
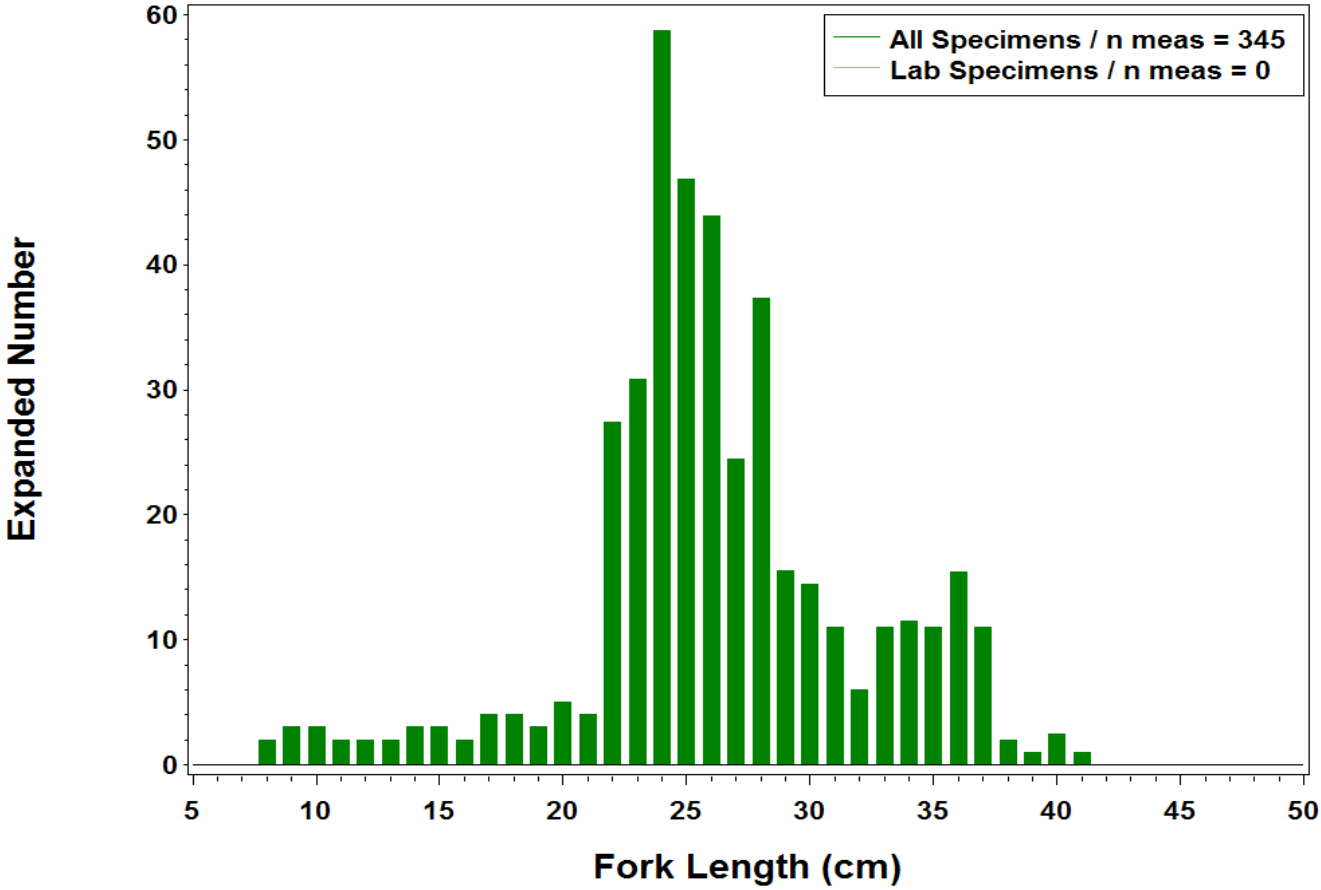


Figure 141. Length frequency histogram for striped searobin.



Summer Flounder (Priority A)

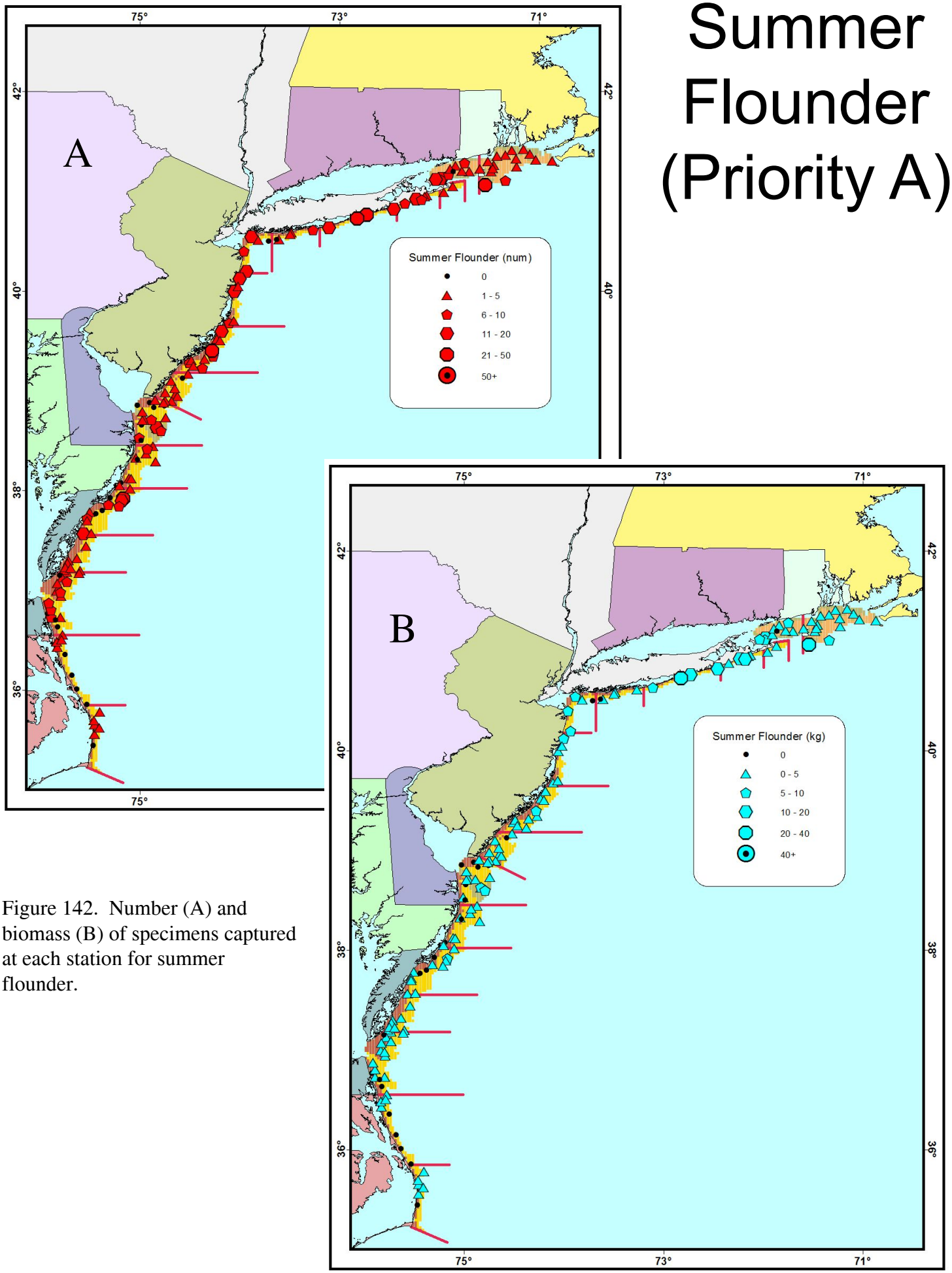


Figure 142. Number (A) and biomass (B) of specimens captured at each station for summer flounder.

Table 40. Number, biomass, minimum and maximum size of specimens captured, by state and region, for summer flounder.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	25	138	107.605	77	138	211	606	412	0.823	3.08	2.49
NY	22	20	170	145.178	83	170	248	683	411	0.905	4.74	3.71
NJ	24	23	126	50.668	79	126	174	688	324	0.480	3.25	1.59
DE	17	11	49	34.193	40	49	217	649	377	0.742	4.79	3.55
MD	10	8	24	14.72	24	24	240	662	360	0.613	1.77	1.12
VA	38	31	162	62.806	123	155	168	676	321	0.435	2.66	1.23
NC	13	8	14	2.858	14	14	192	465	252	0.204	0.81	0.20
Total	150	126	683	418.028	440	676	168	688	367	0.629	2.92	1.75

Figure 143. Geometric mean catch per area swept by state and overall, with summary catch rates, for summer flounder.

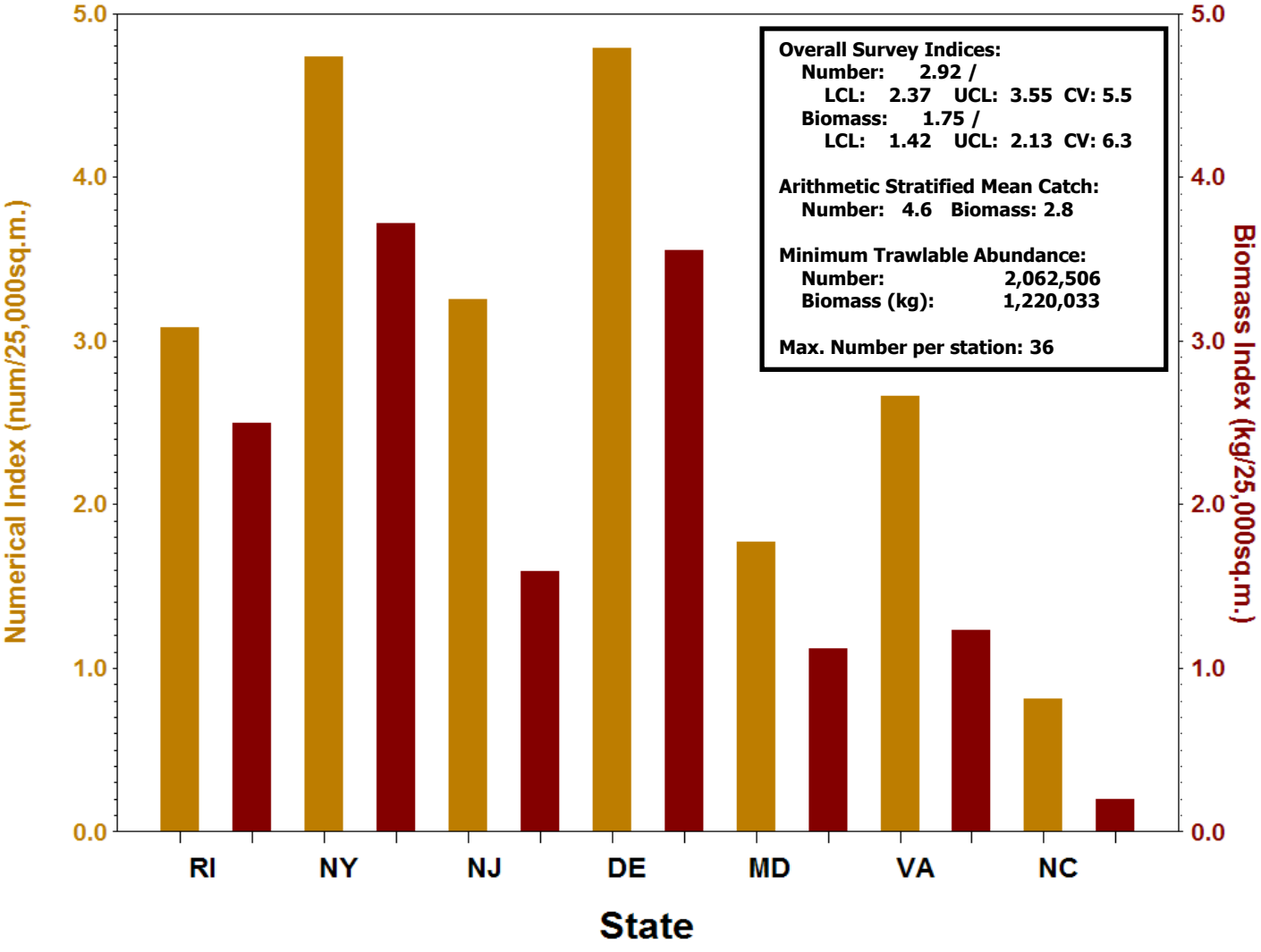


Figure 144. Length frequency histogram for summer flounder.

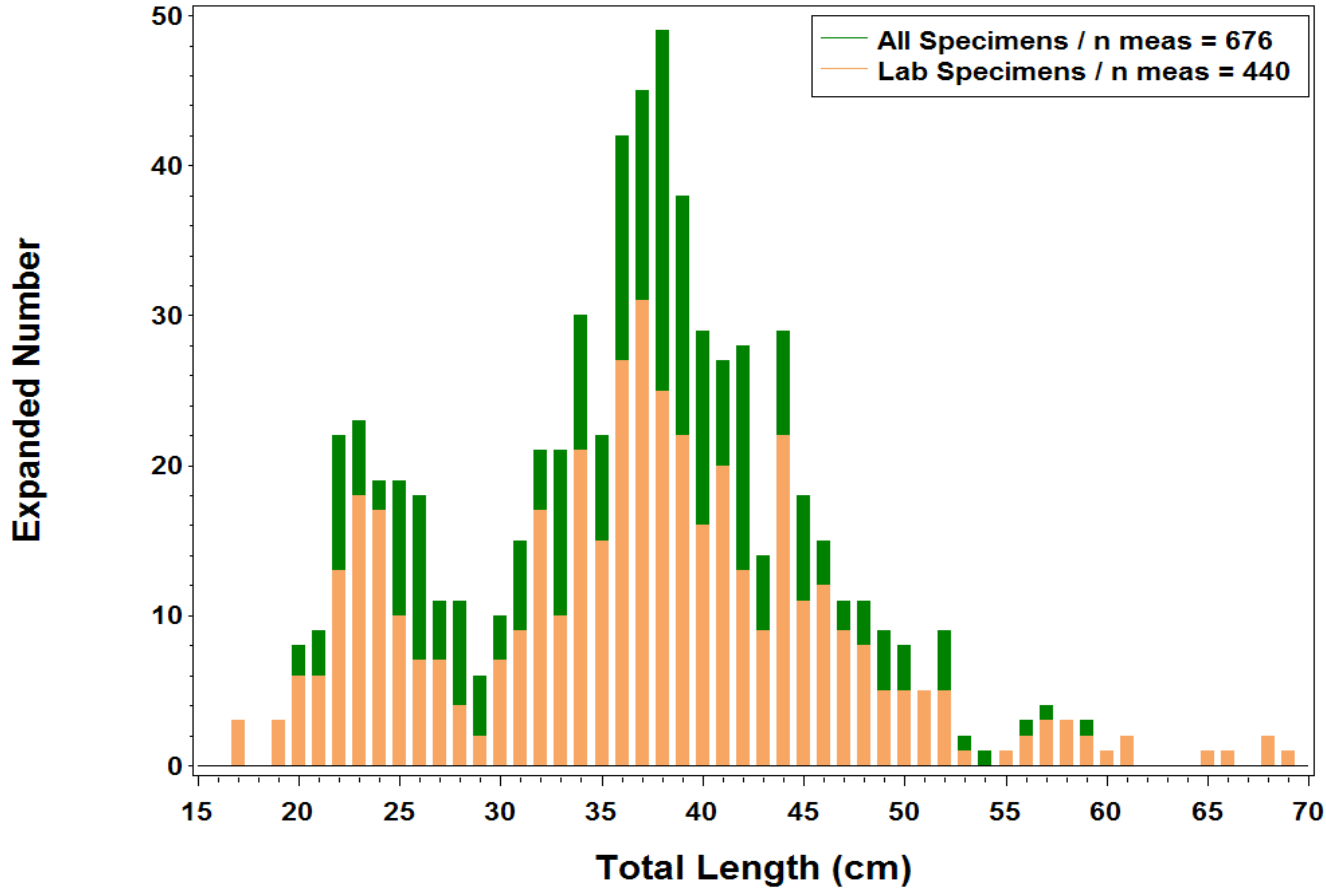


Figure 145. Sex-specific length frequencies histogram for summer flounder.

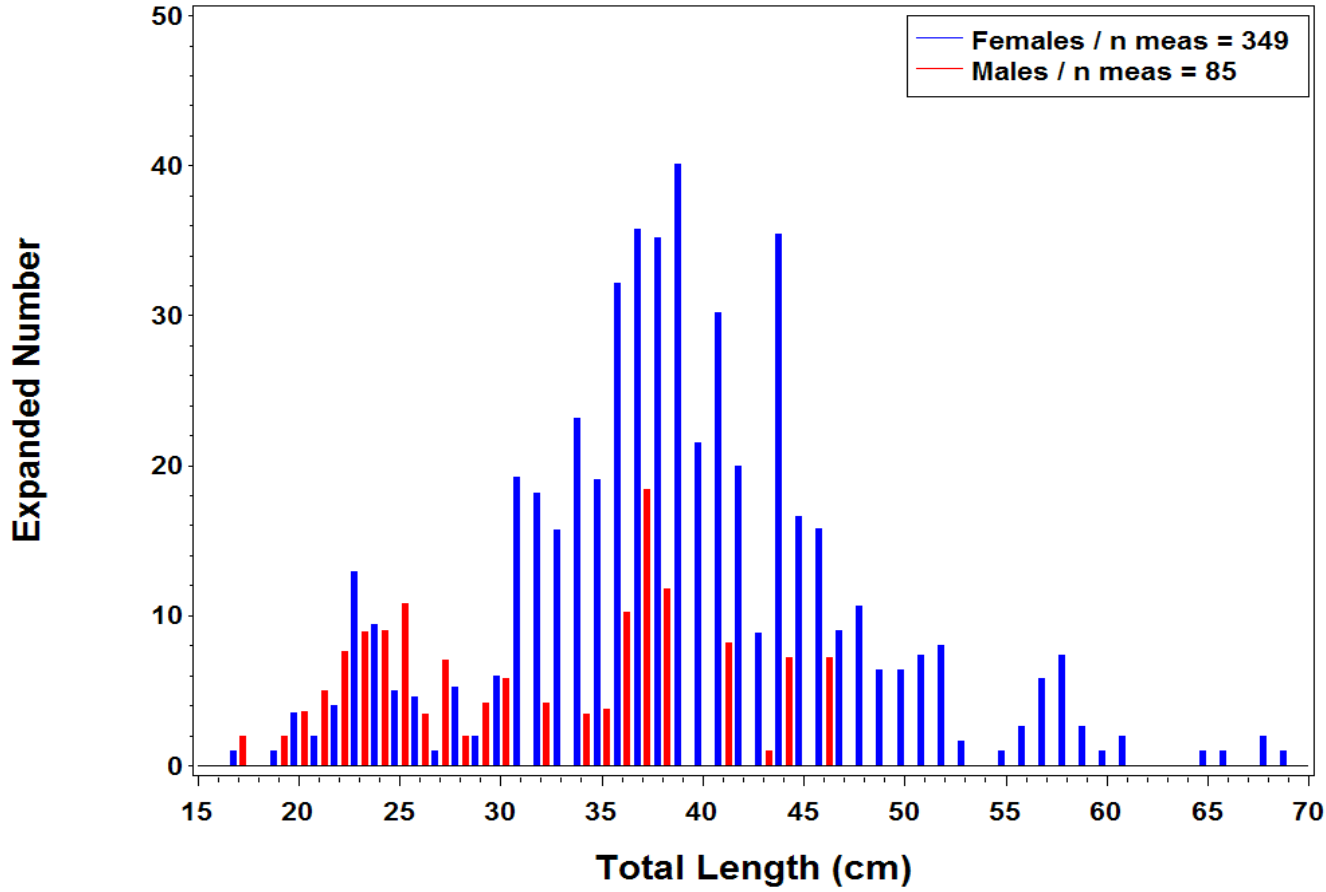
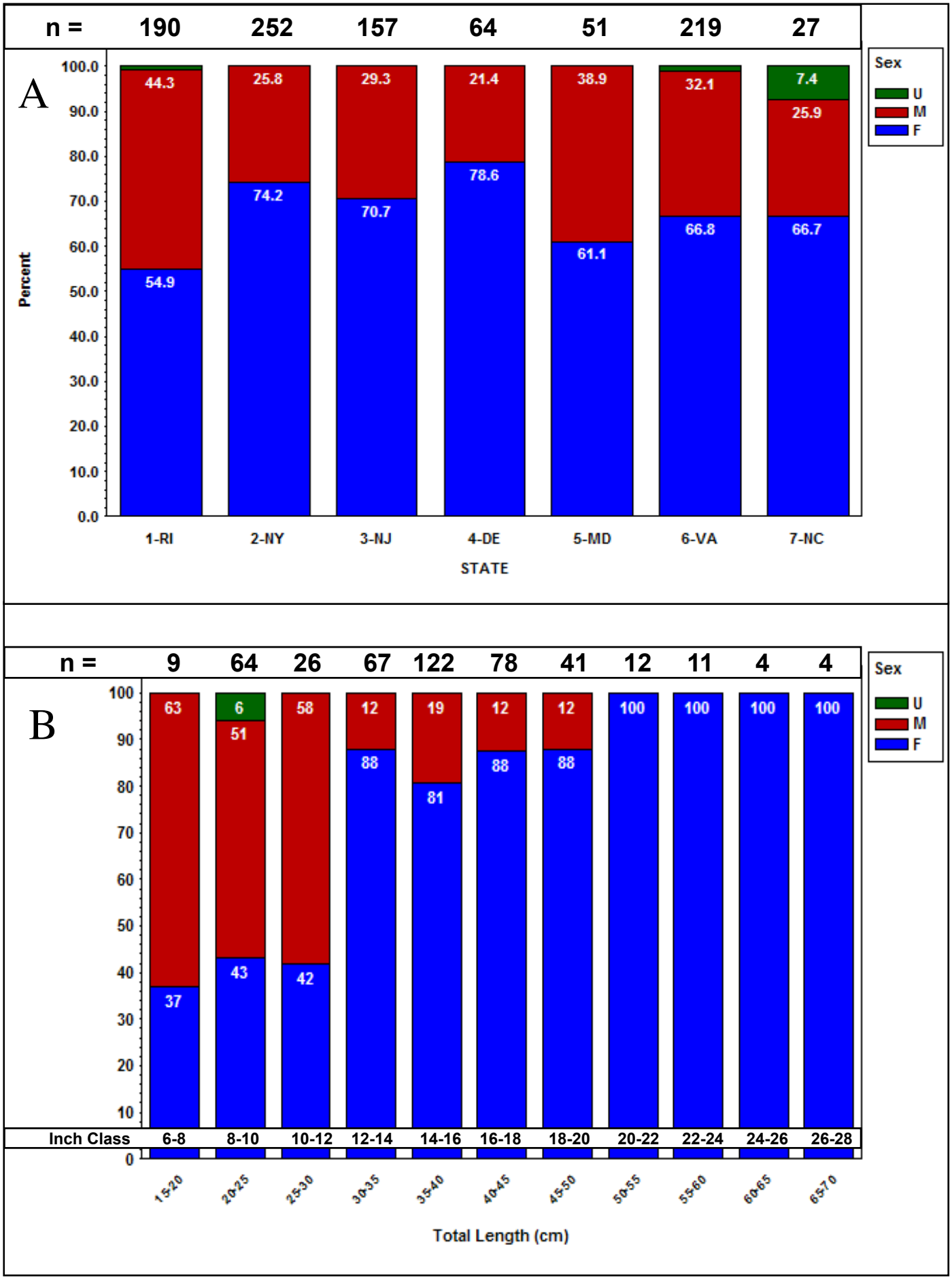


Figure 146. Sex ratios for summer flounder by state (A) and length group (B).



Weakfish (Priority A)

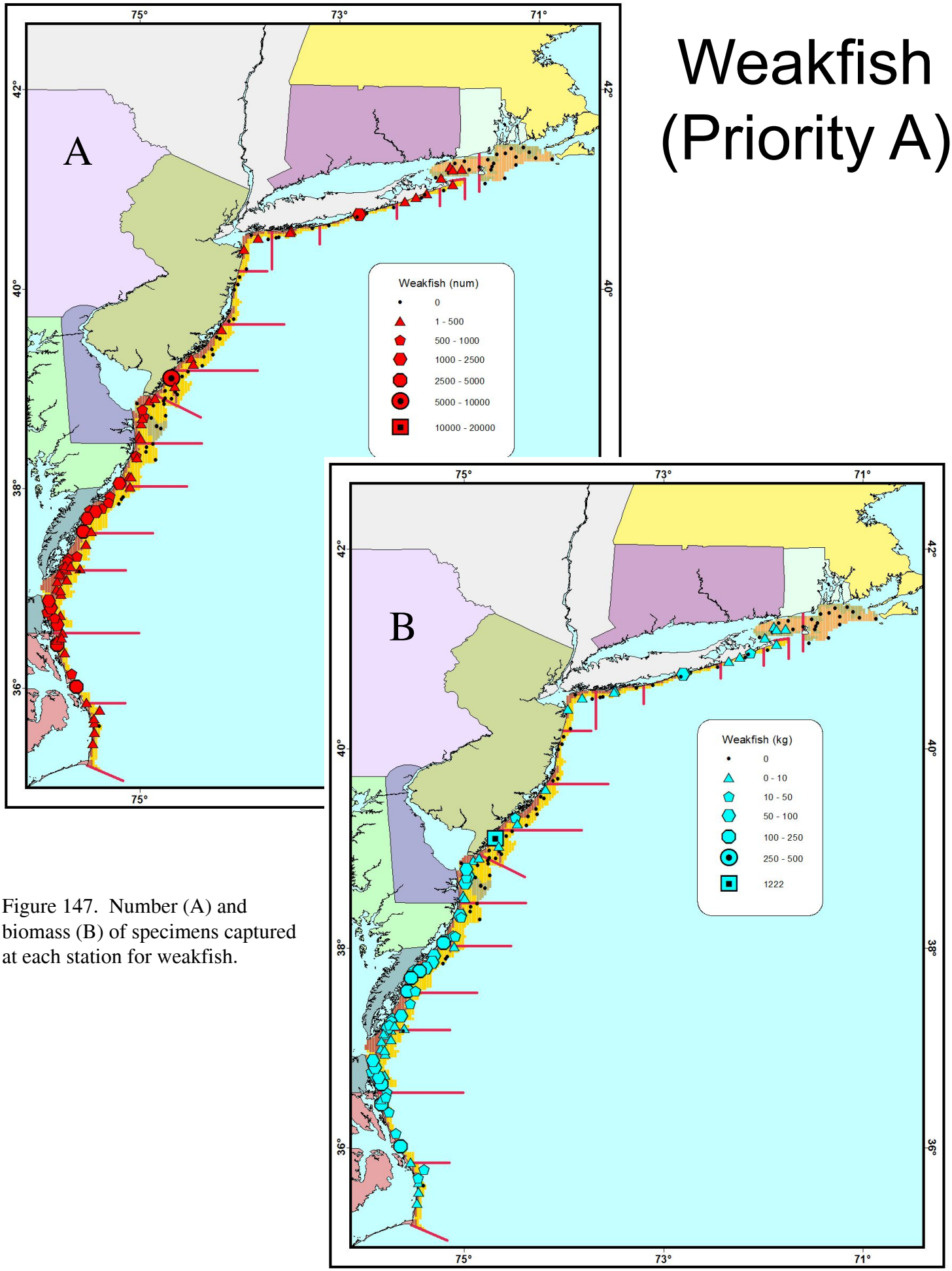


Figure 147. Number (A) and biomass (B) of specimens captured at each station for weakfish.

Table 41. Number, biomass, minimum and maximum size of specimens captured, by state and region, for weakfish.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	4	11	3.856	11	11	186	425	284	0.351	0.18	0.08
NY	22	9	1502	137.710	45	138	118	583	258	0.311	1.24	0.46
NJ	24	5	7959	1251.412	26	538	130	478	250	0.225	1.39	0.73
DE	17	8	2239	284.144	46	293	144	361	233	0.153	21.94	5.73
MD	10	6	4002	343.067	30	292	79	279	203	0.118	45.23	9.66
VA	38	34	20993	1553.551	230	2154	60	521	187	0.085	103.59	12.86
NC	13	12	8073	416.660	76	453	66	271	179	0.066	61.12	7.42
Total	150	78	44779	3990.400	464	3879	60	583	202	0.127	13.30	3.51

Figure 148. Geometric mean catch per area swept by state and overall, with summary catch rates, for weakfish.

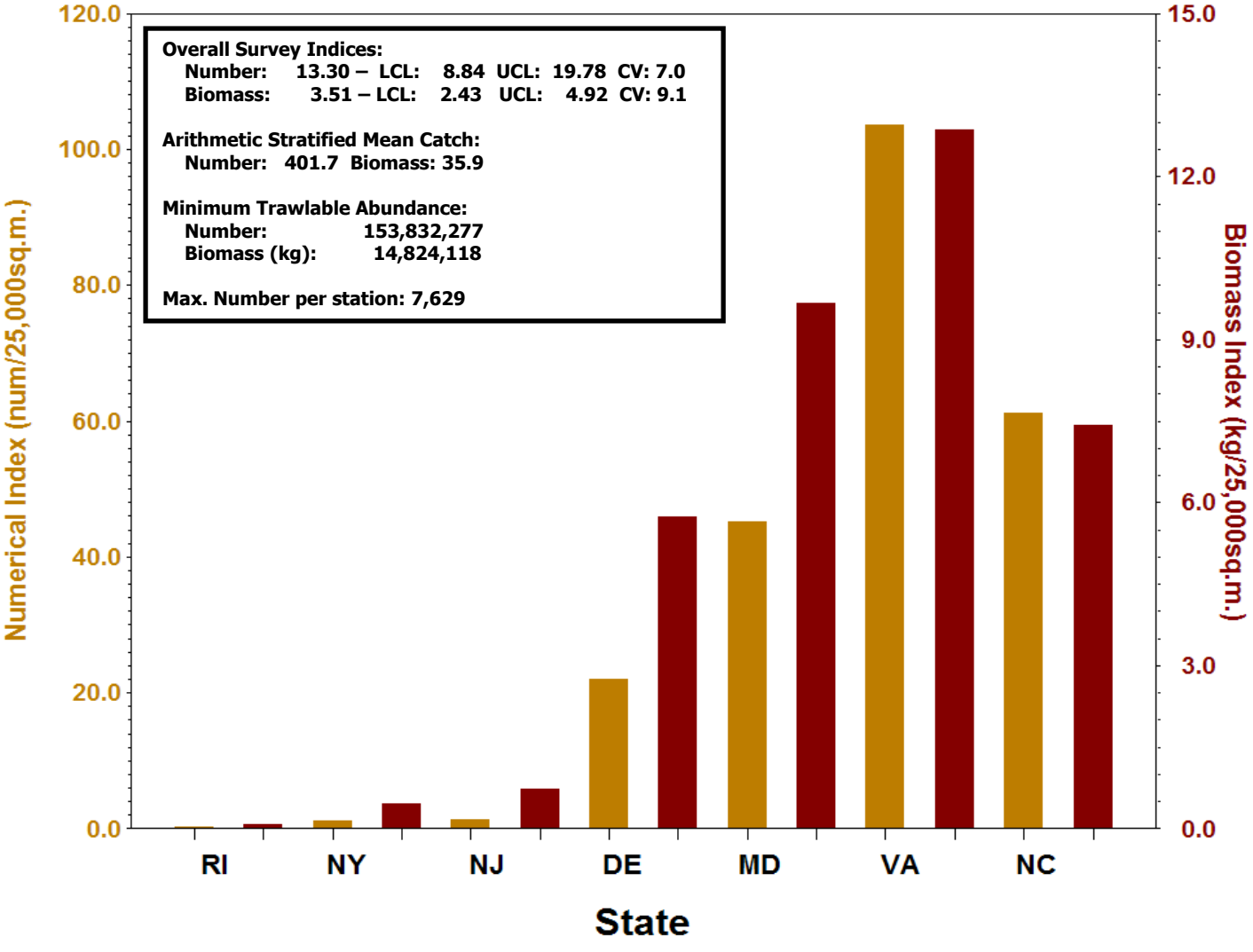


Figure 149. Length frequency histogram for weakfish.

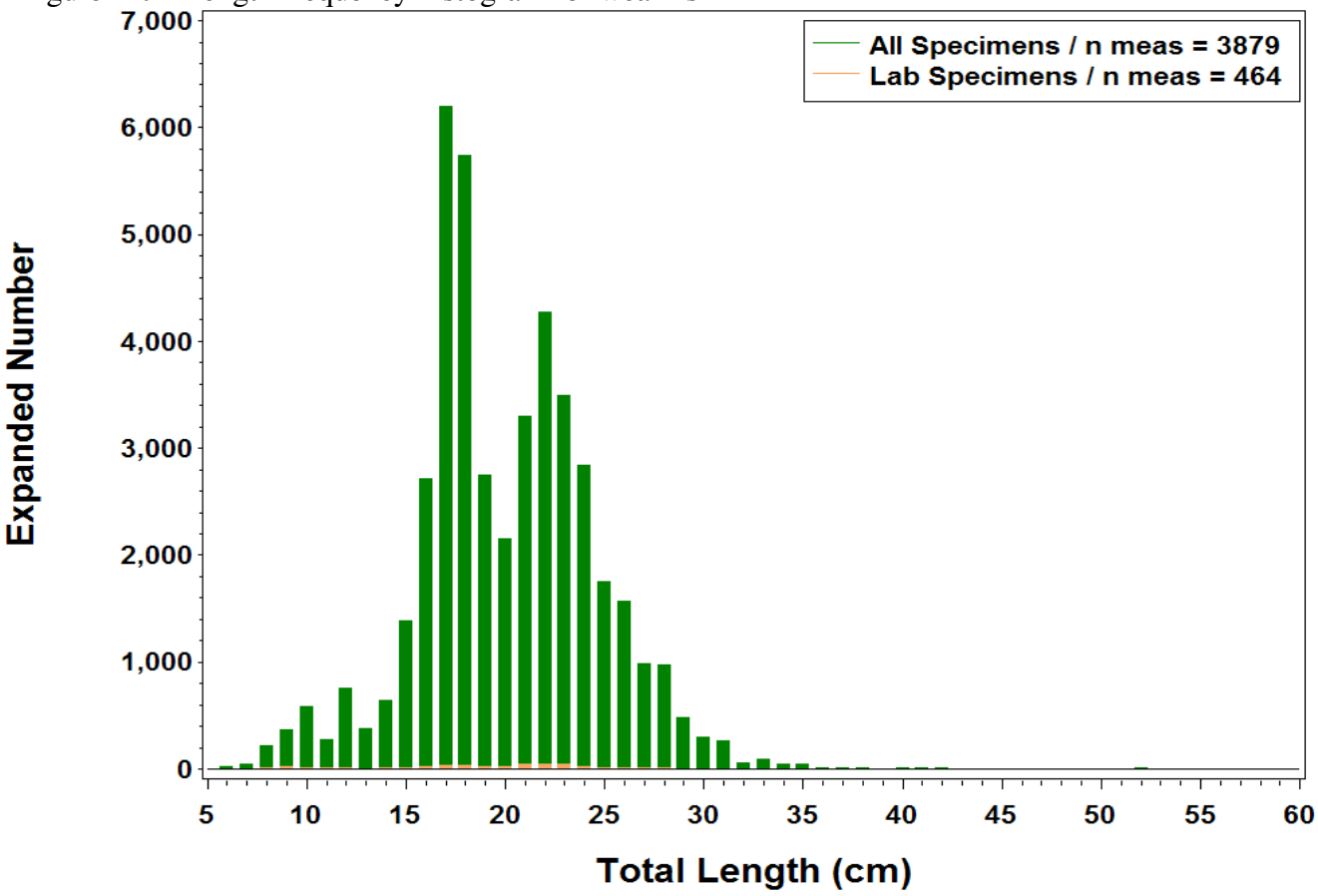


Figure 150. Sex-specific length frequencies histogram for weakfish.

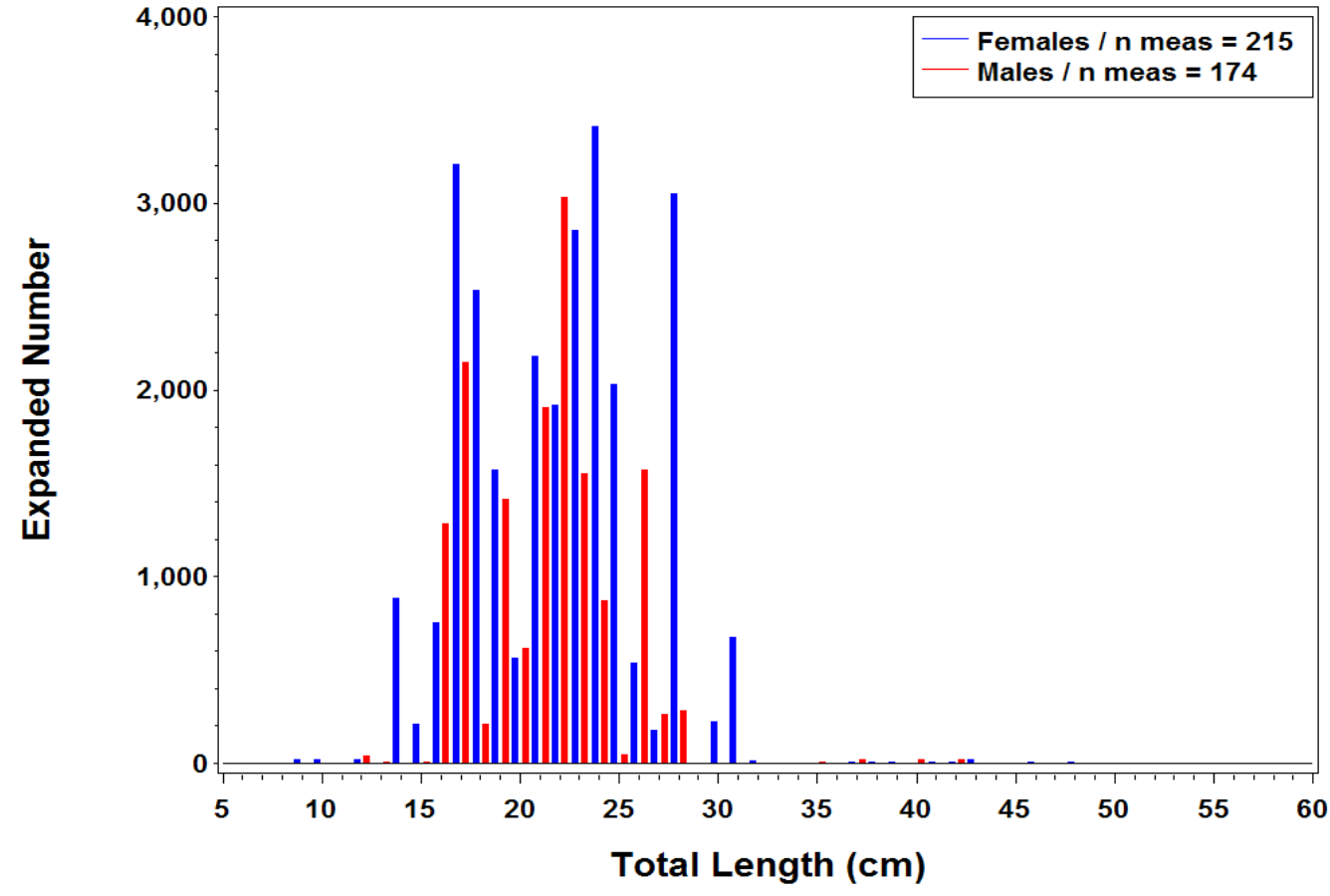
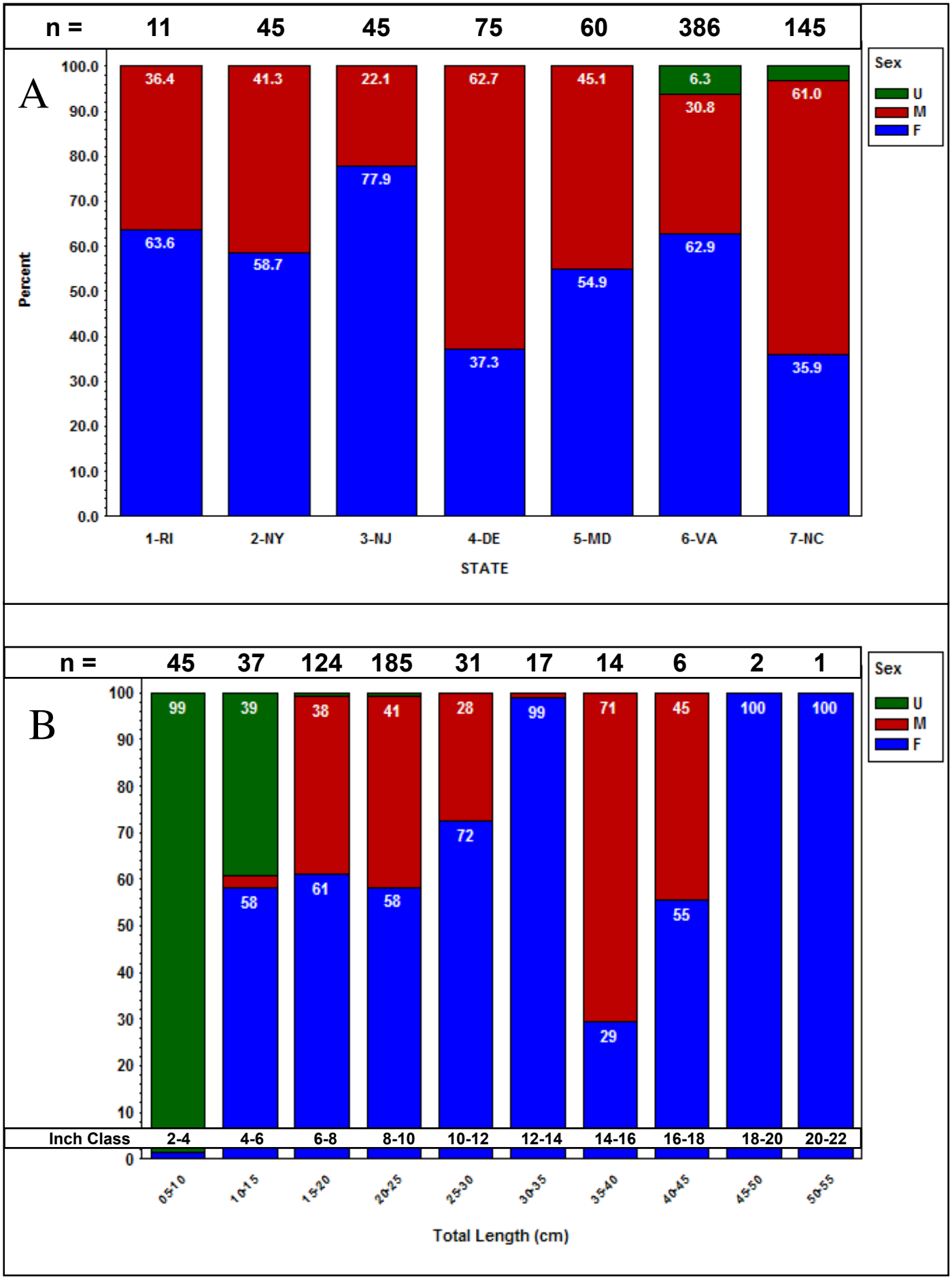


Figure 151. Sex ratios for weakfish by state (A) and length group (B).



White Shrimp (Priority E)

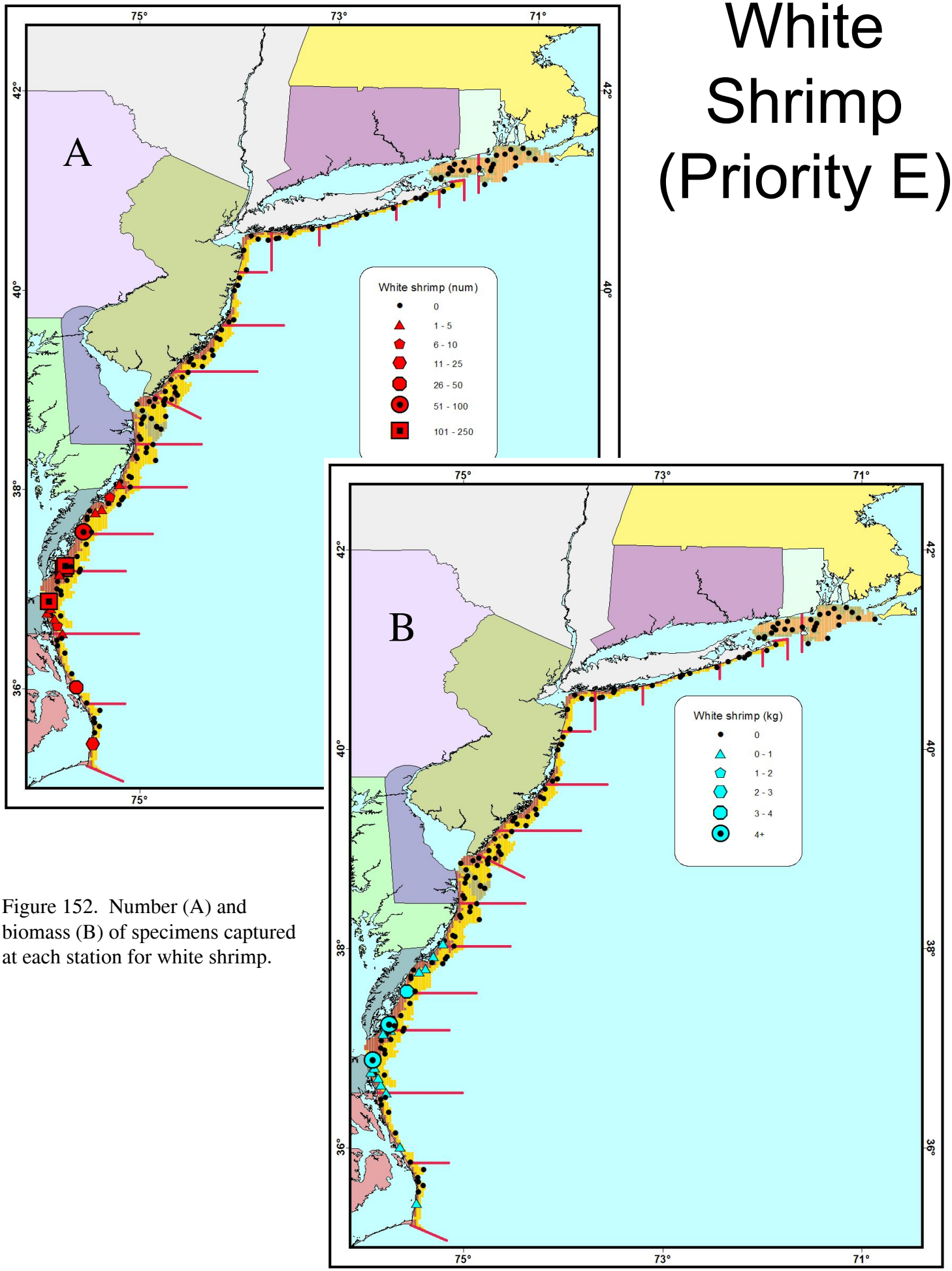


Figure 152. Number (A) and biomass (B) of specimens captured at each station for white shrimp.

Table 42. Number, biomass, minimum and maximum size of specimens captured, by state and region, for white shrimp.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26										0.00	0.00
NY	22										0.00	0.00
NJ	24										0.00	0.00
DE	17										0.00	0.00
MD	10	1	2	0.060	0	2	148	188	168		0.12	0.01
VA	38	14	702	18.097	0	216	73	235	152		1.18	0.19
NC	13	2	49	1.591	0	49	135	209	163		0.70	0.10
Total	150	17	753	19.748	0	267	73	235	154		0.31	0.06

Figure 153. Geometric mean catch per area swept by state and overall, with summary catch rates, for white shrimp.

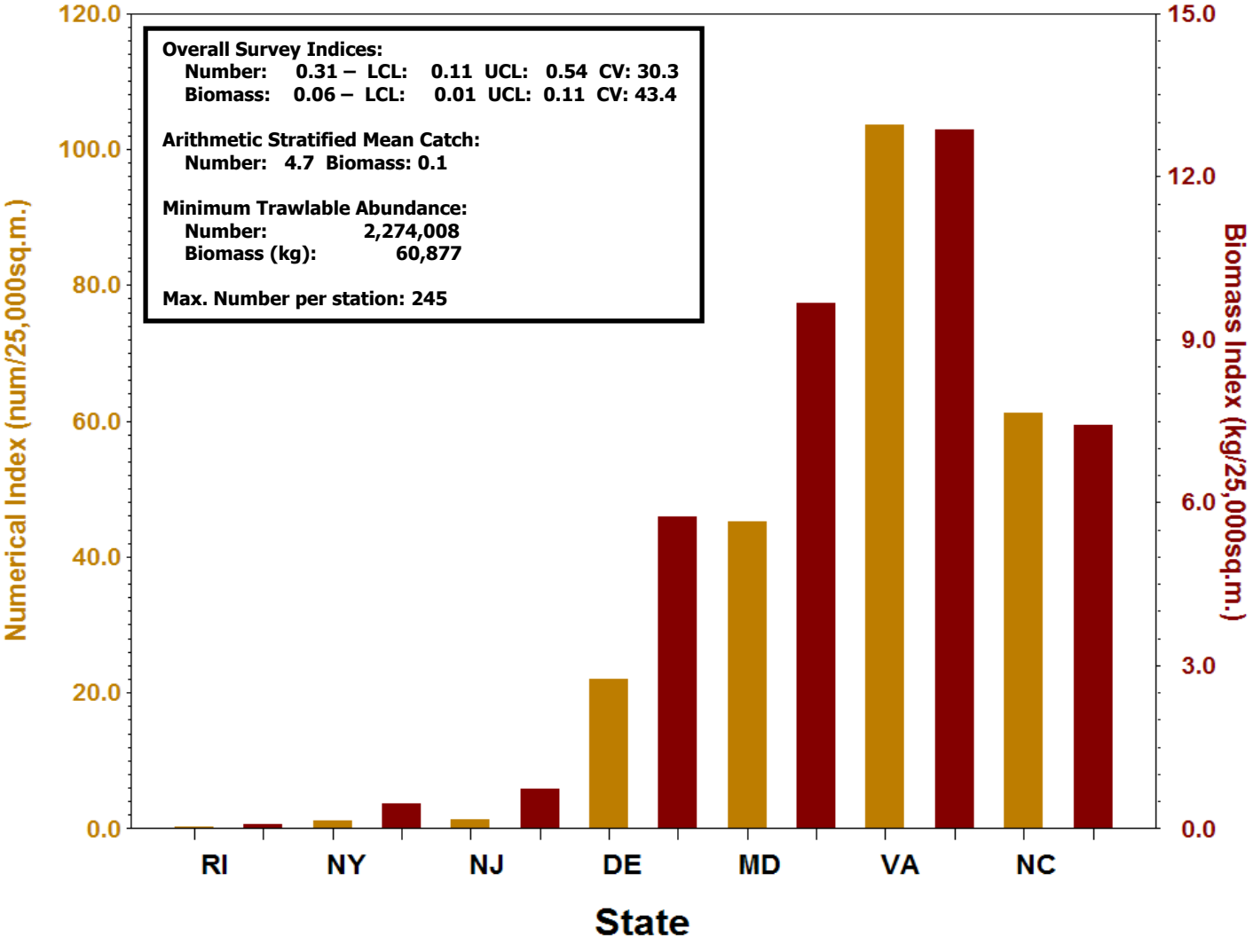
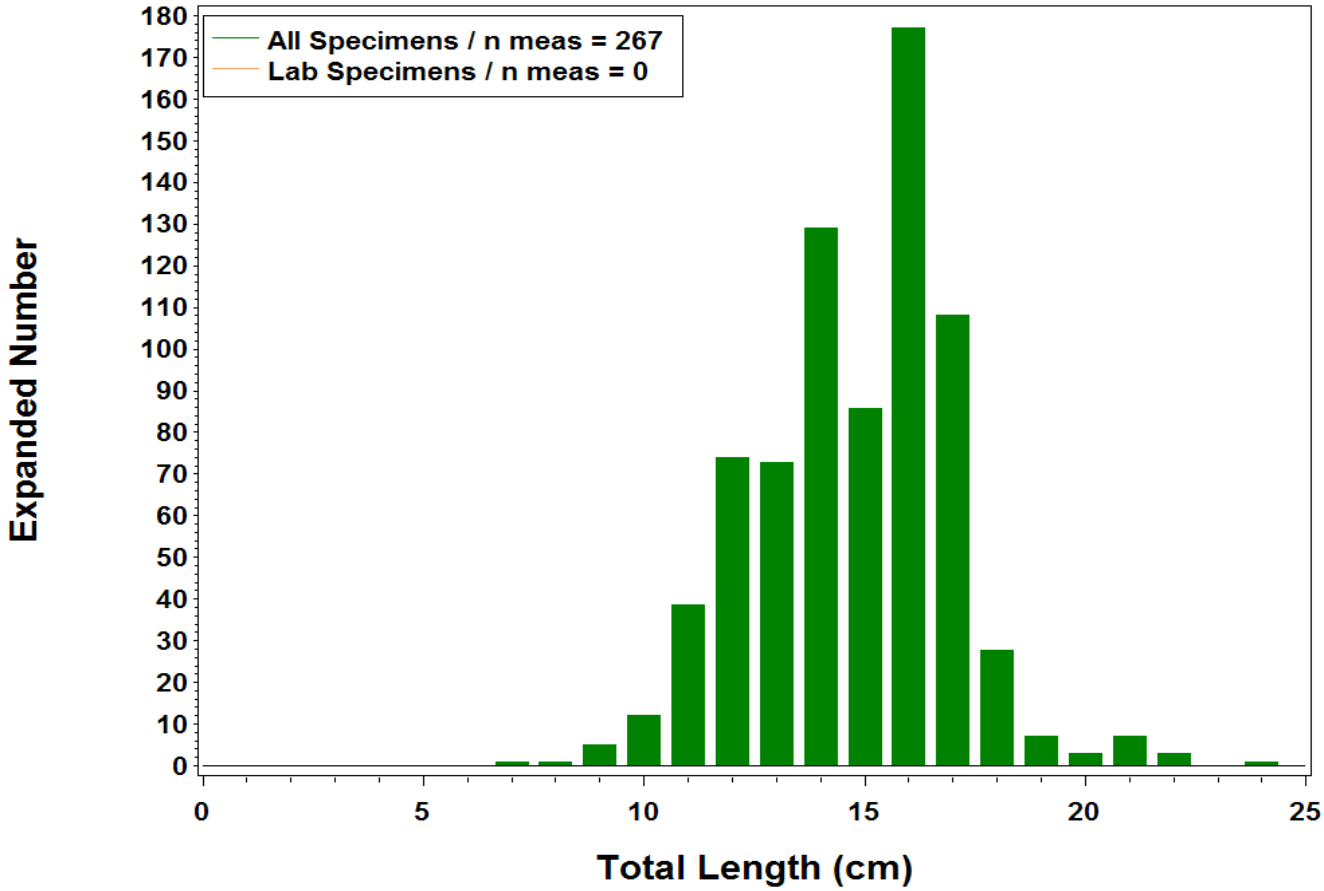


Figure 154. Length frequency histogram for white shrimp.



Windowpane Flounder (Priority D)

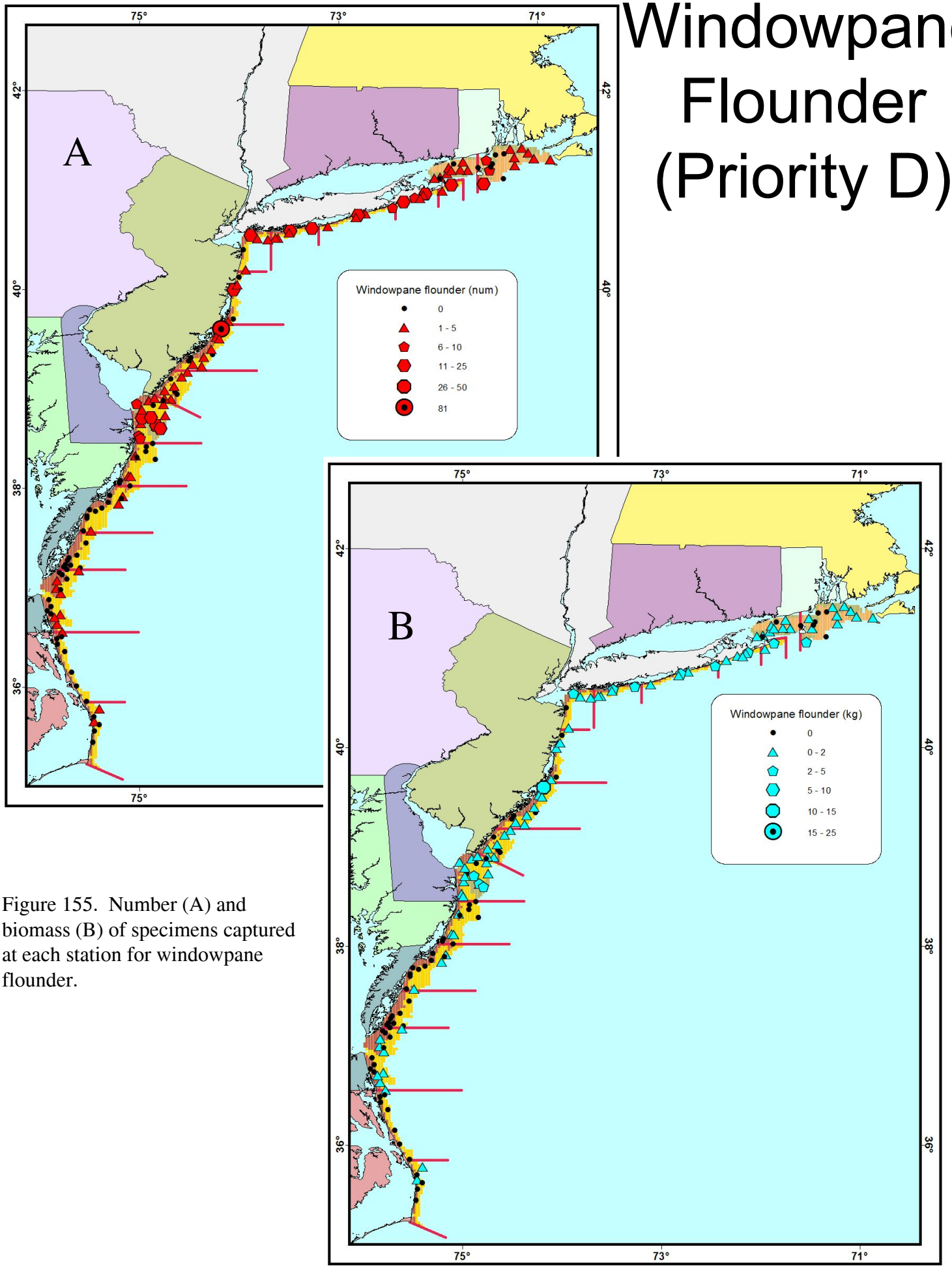


Figure 155. Number (A) and biomass (B) of specimens captured at each station for windowpane flounder.

Table 43. Number, biomass, minimum and maximum size of specimens captured, by state and region, for windowpane flounder.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	18	61	11.094	0	61	96	331	247		1.33	0.30
NY	22	21	170	34.259	0	170	105	334	238		4.07	1.05
NJ	24	16	117	18.188	0	52	172	335	231		1.19	0.31
DE	17	14	100	12.865	0	100	80	342	206		13.35	1.37
MD	10	3	8	0.990	0	8	129	254	205		0.43	0.09
VA	38	11	16	1.769	0	16	130	275	199		0.29	0.04
NC	13	2	3	0.218	0	3	170	197	182		0.15	0.02
Total	150	85	475	79.383	0	410	80	342	228		1.08	0.27

Figure 156. Geometric mean catch per area swept by state and overall, with summary catch rates, for windowpane flounder.

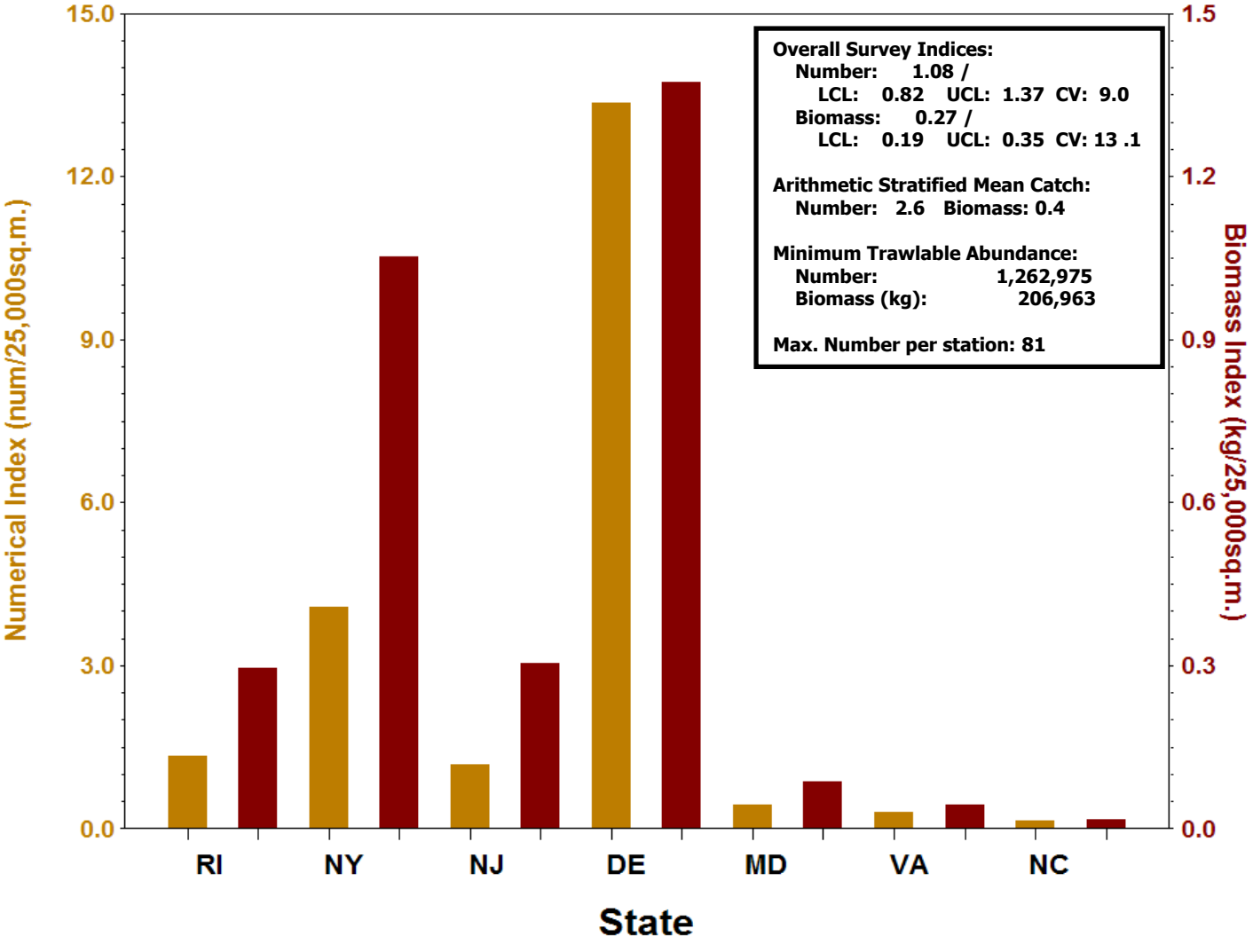
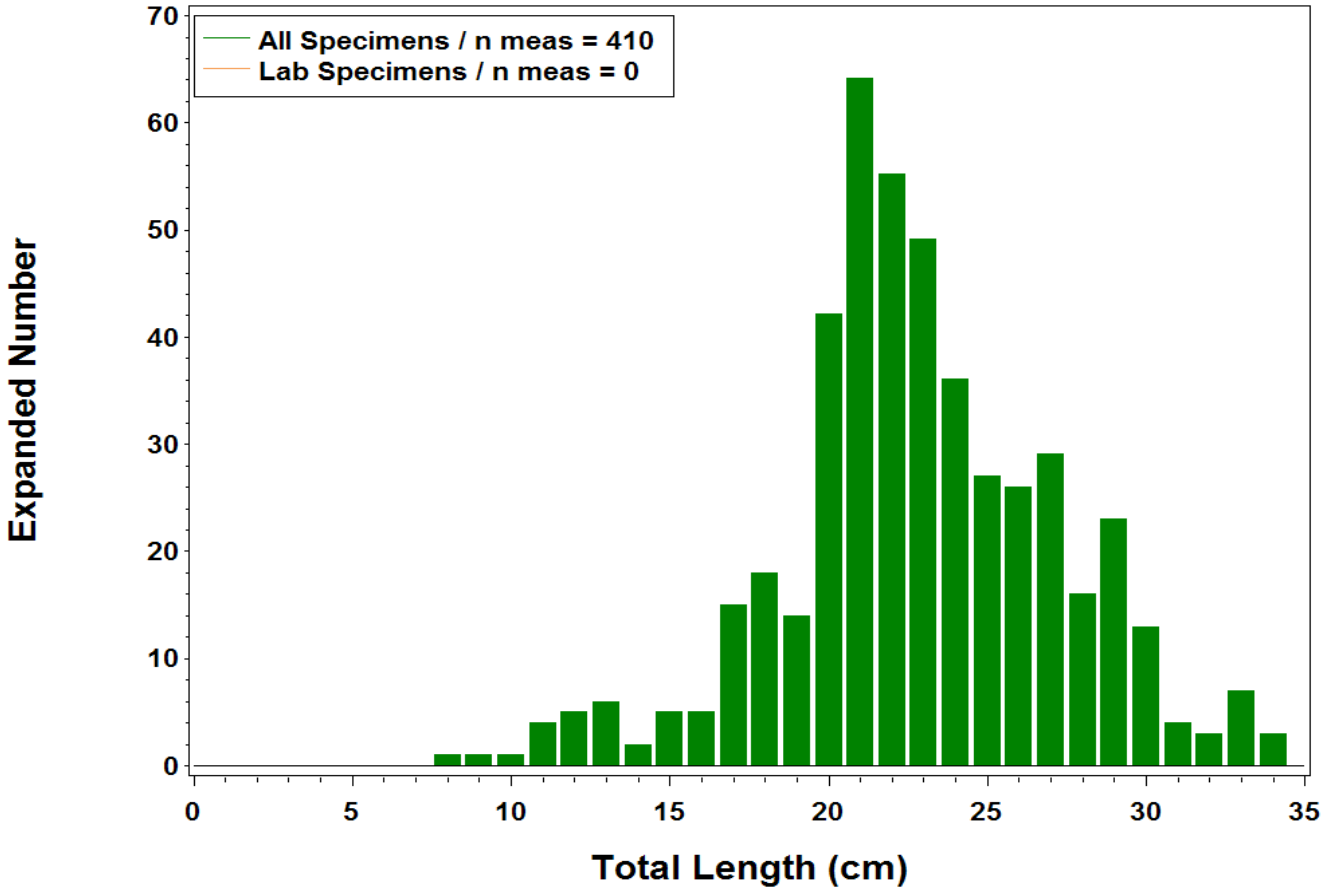


Figure 157. Length frequency histogram for windowpane flounder.



Winter Flounder (Priority A)

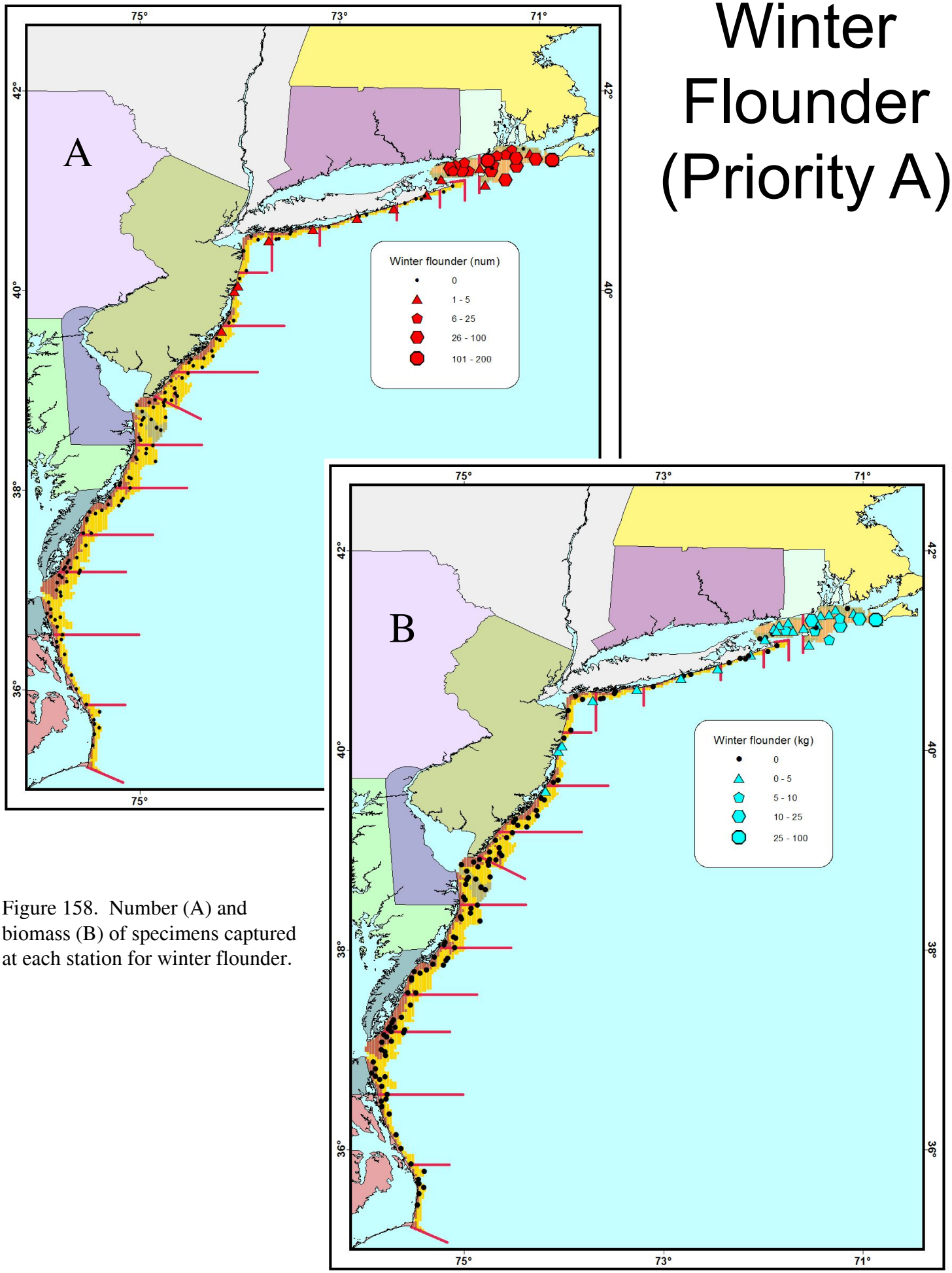


Figure 158. Number (A) and biomass (B) of specimens captured at each station for winter flounder.

Table 44. Number, biomass, minimum and maximum size of specimens captured, by state and region, for winter flounder.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	21	658	138.077	125	510	161	431	245	0.262	9.19	2.57
NY	22	5	6	1.646	6	6	247	337	275	0.274	0.19	0.07
NJ	24	3	6	2.264	6	6	223	435	273	0.377	0.12	0.06
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38										0.00	0.00
NC	13										0.00	0.00
Total	150	29	670	141.987	137	522	161	435	246	0.267	0.76	0.36

Figure 159. Geometric mean catch per area swept by state and overall, with summary catch rates, for winter flounder.

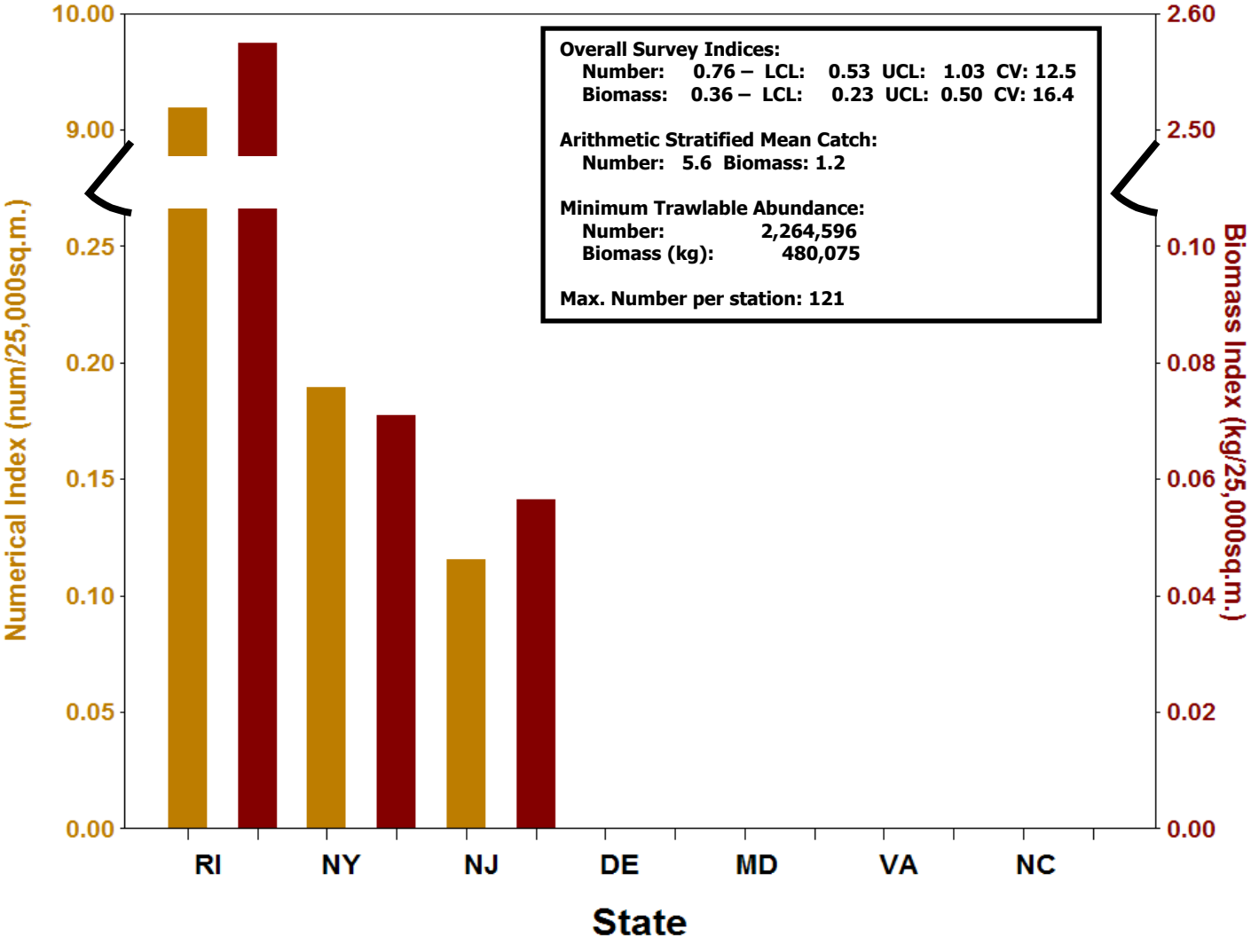


Figure 160. Length frequency histogram for winter flounder.

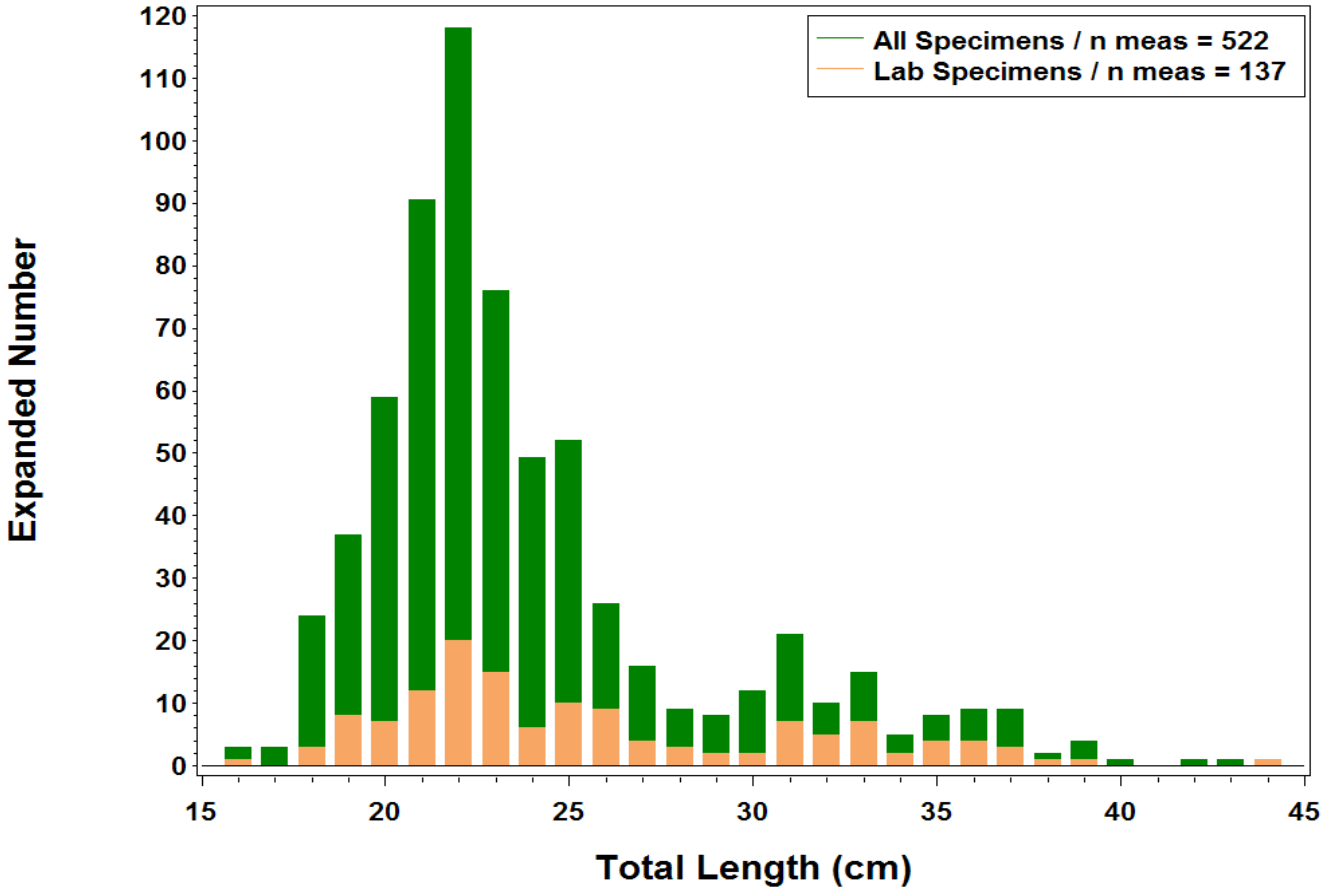


Figure 161. Sex-specific length frequencies histogram for winter flounder.

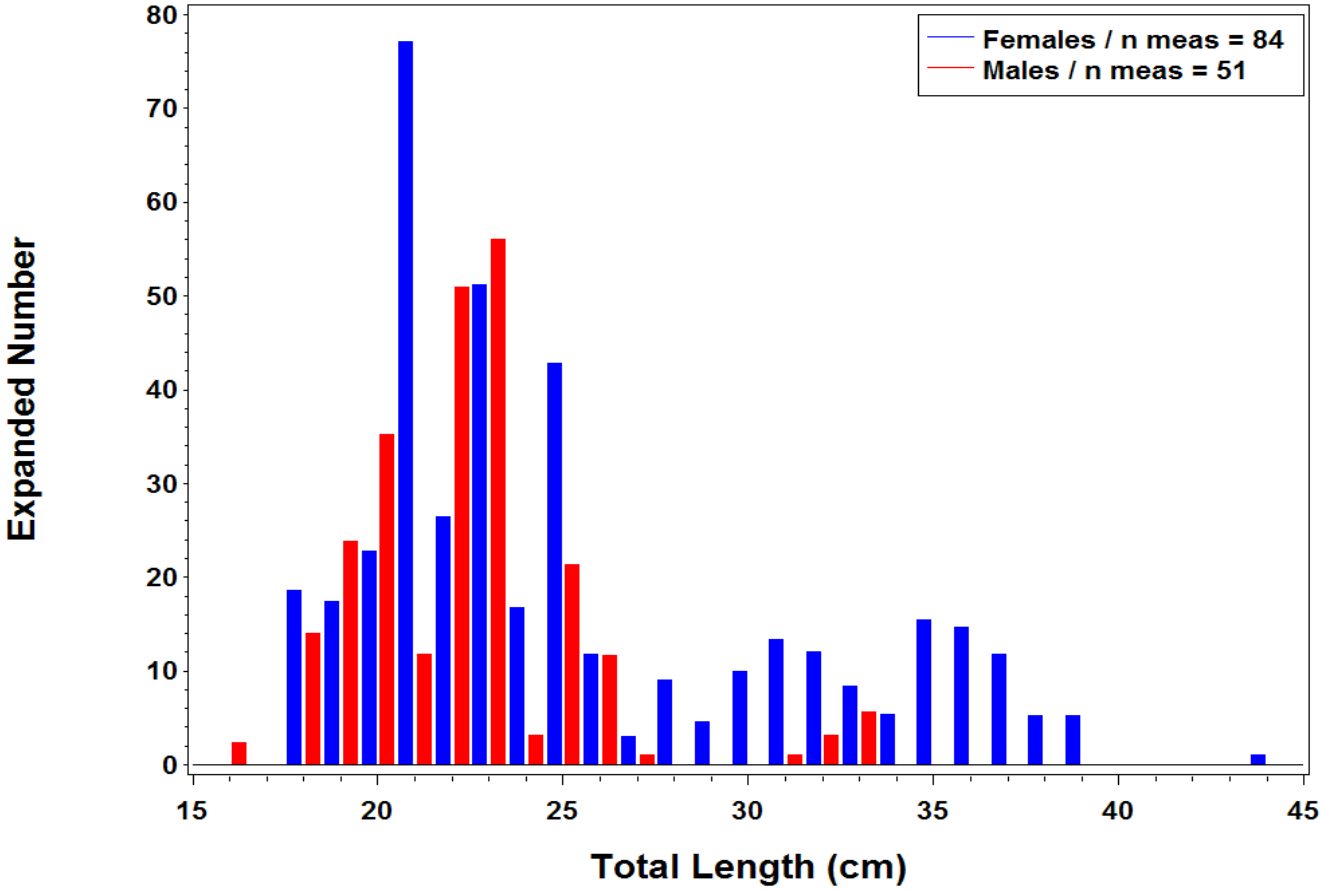
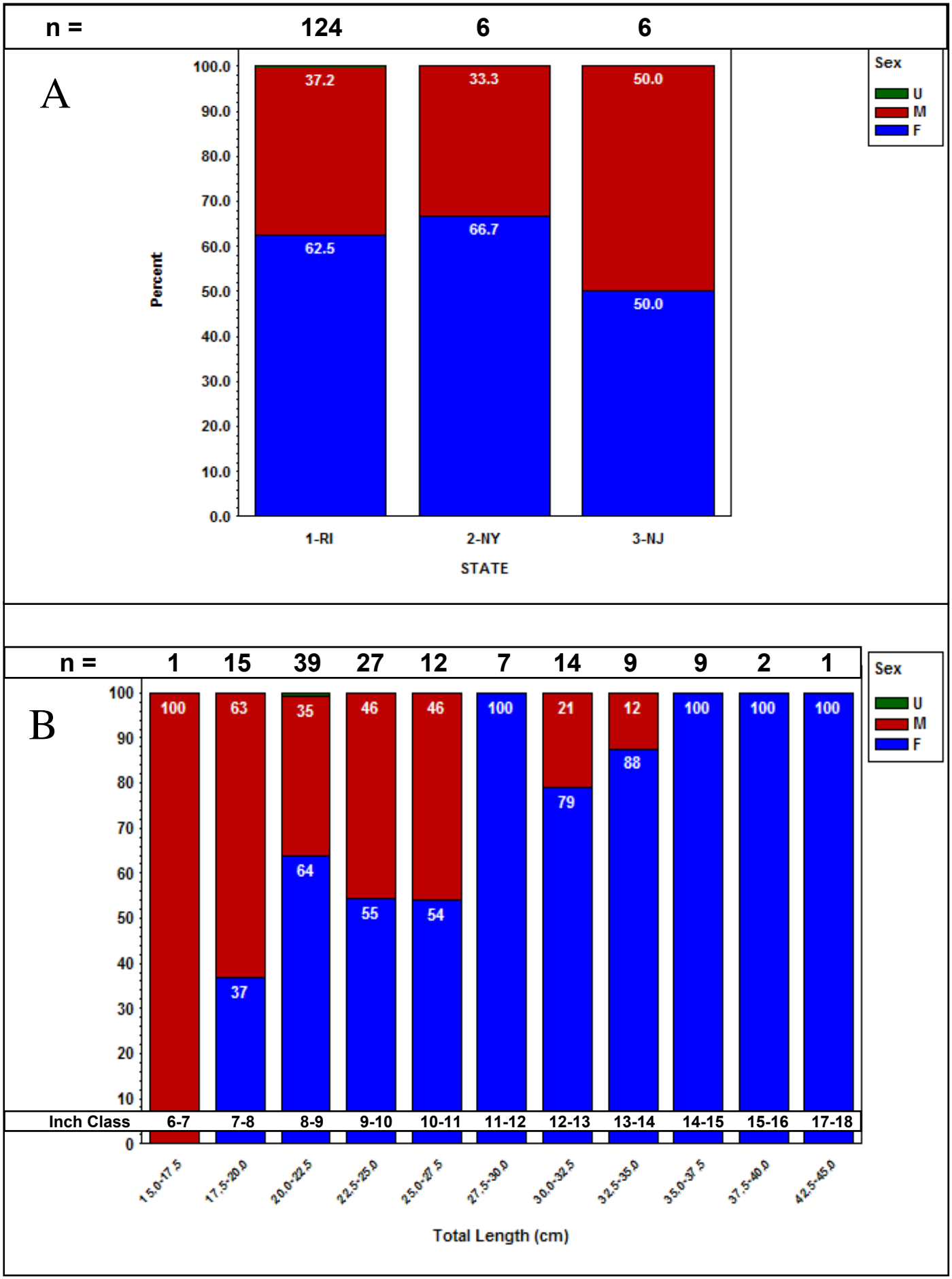
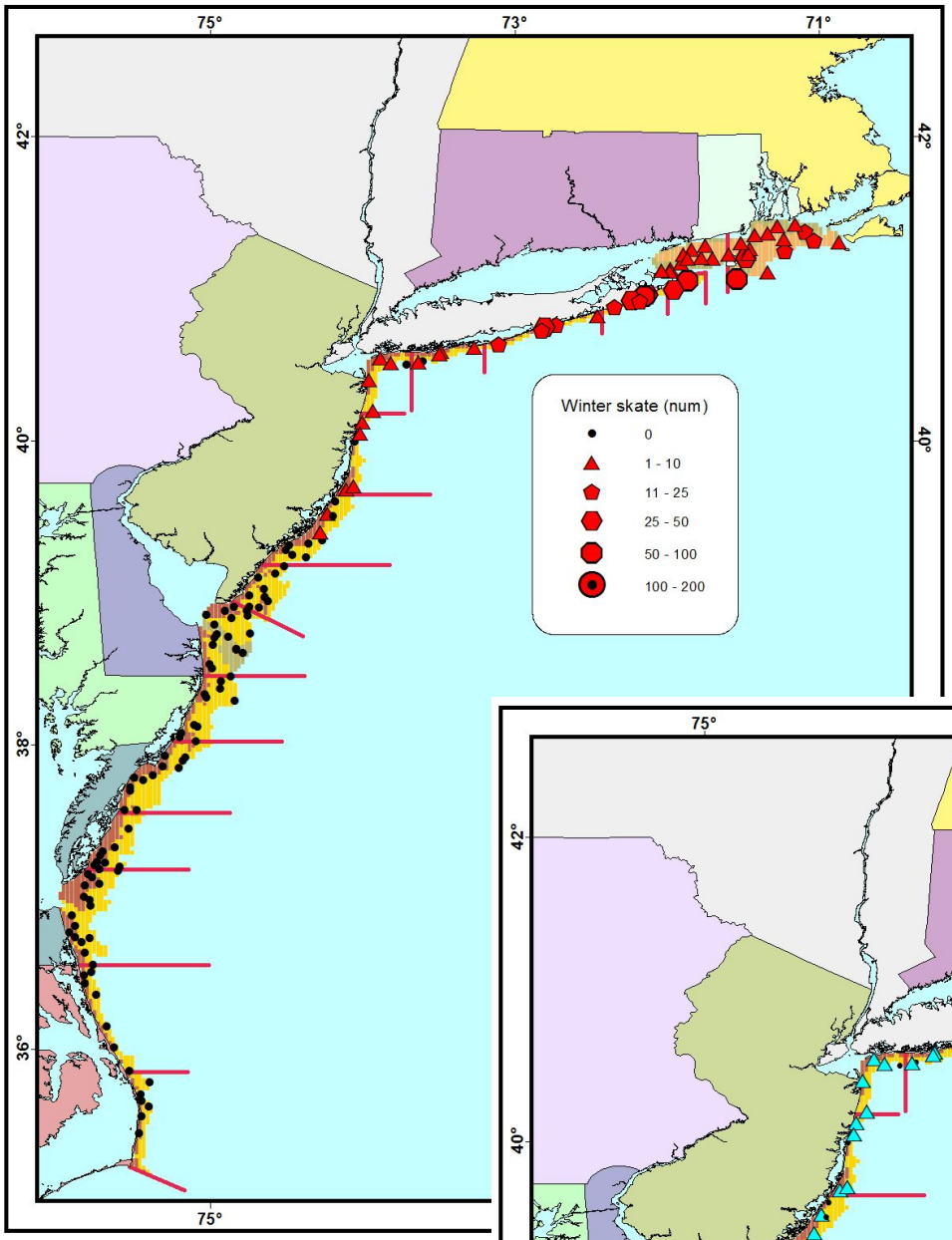


Figure 162. Sex ratios for winter flounder by state (A) and length group (B).



Winter Skate (Priority B)



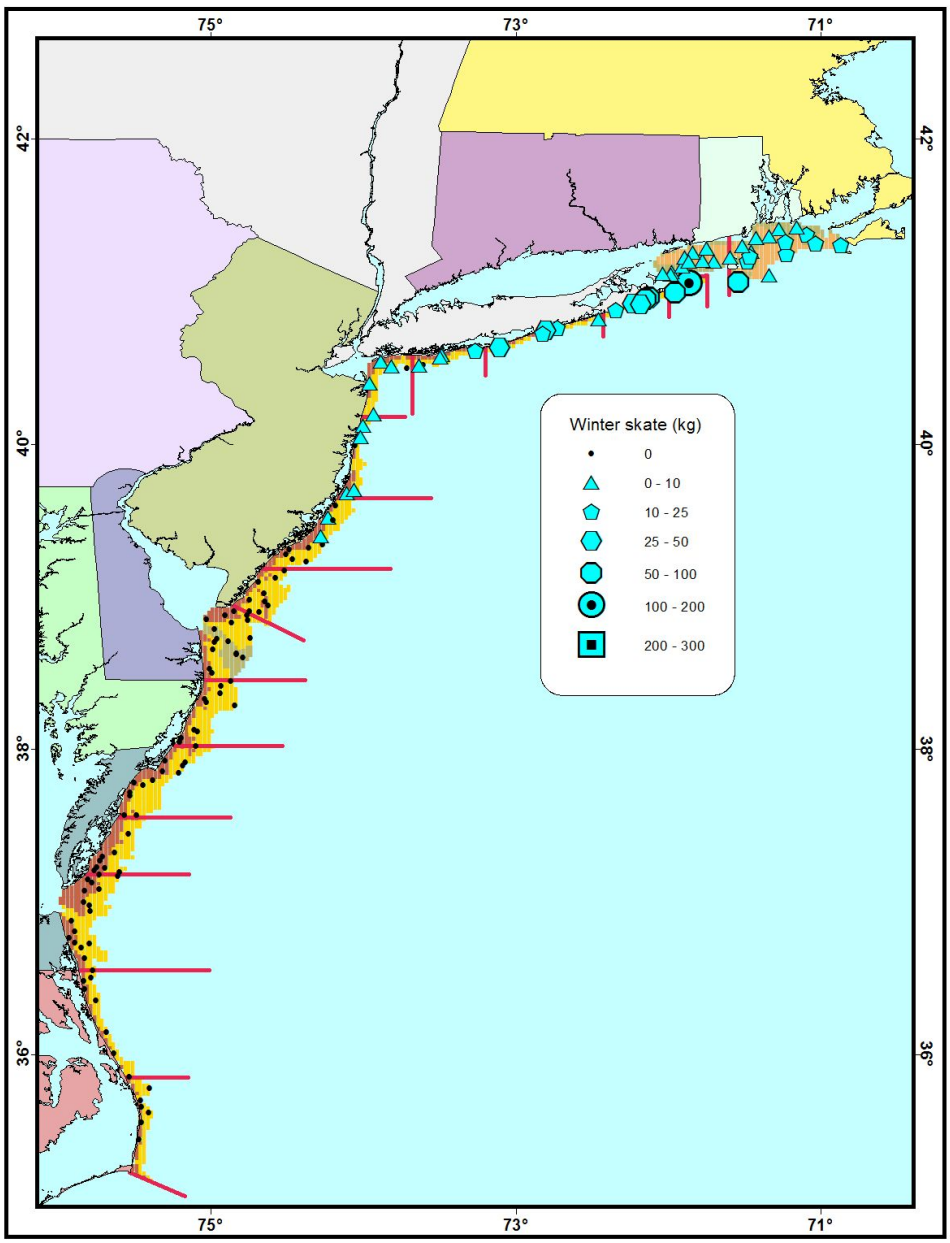


Figure 163. Number (A) and biomass (B) of specimens captured at each station for winter skate.

Table 45. Number, biomass, minimum and maximum size of specimens captured, by state and region, for winter skate.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught	Age Specimens	Number Measured	Min Length (mm)	Max Length (mm)	Avg Length (mm)	Avg Weight (kg)	Index (Number)	Index (Biomass)
RI	26	26	237	289.175	58	179	190	542	321	1.564	4.55	6.25
NY	22	20	371	608.544	52	209	169	546	335	1.630	5.76	8.35
NJ	24	6	11	23.252	10	11	275	469	392	2.059	0.26	0.39
DE	17										0.00	0.00
MD	10										0.00	0.00
VA	38										0.00	0.00
NC	13										0.00	0.00
Total	150	52	619	920.971	120	399	169	546	330	1.634	1.02	1.28

Figure 164. Geometric mean catch per area swept by state and overall, with summary catch rates, for winter skate.

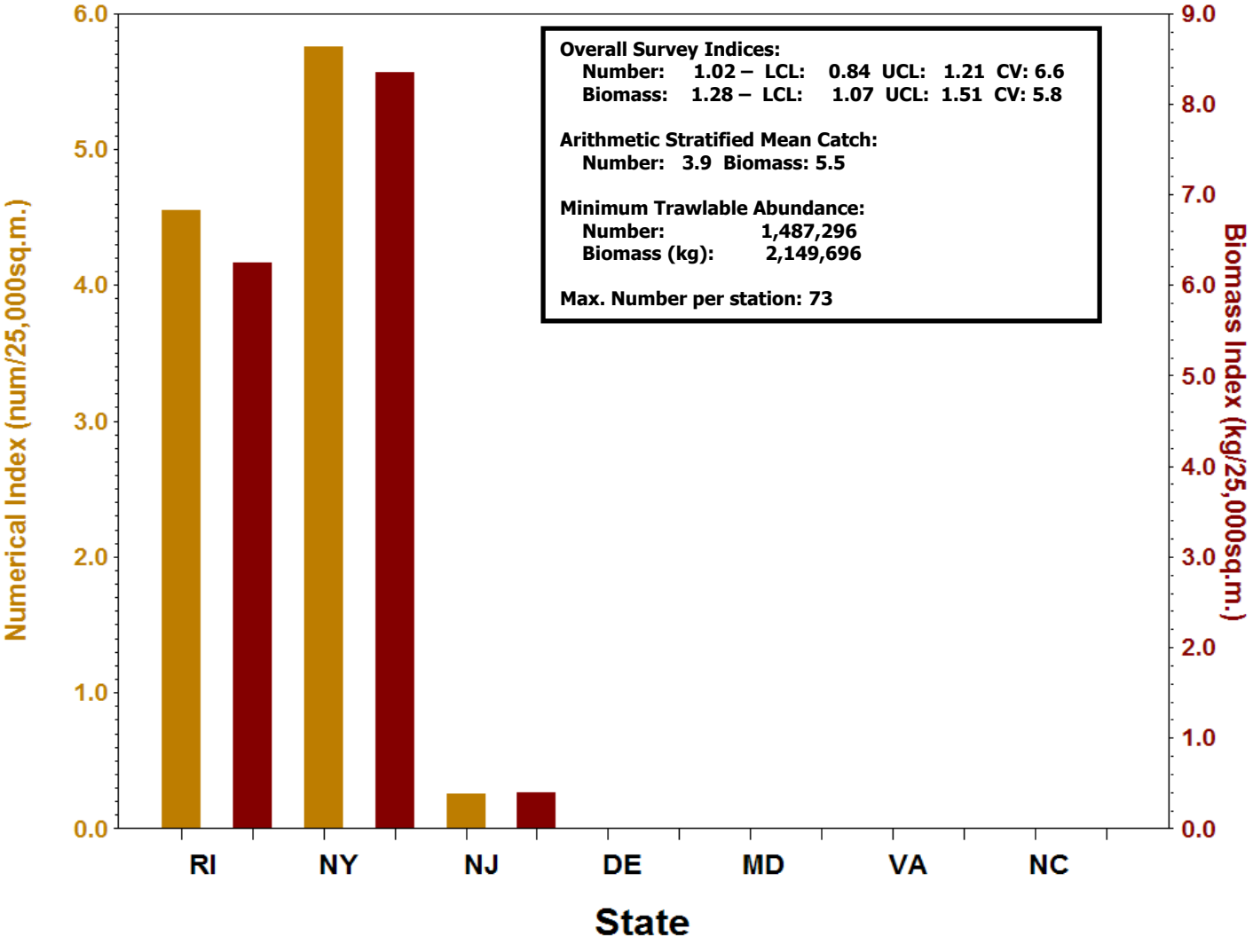


Figure 165. Width frequency histogram for winter skate.

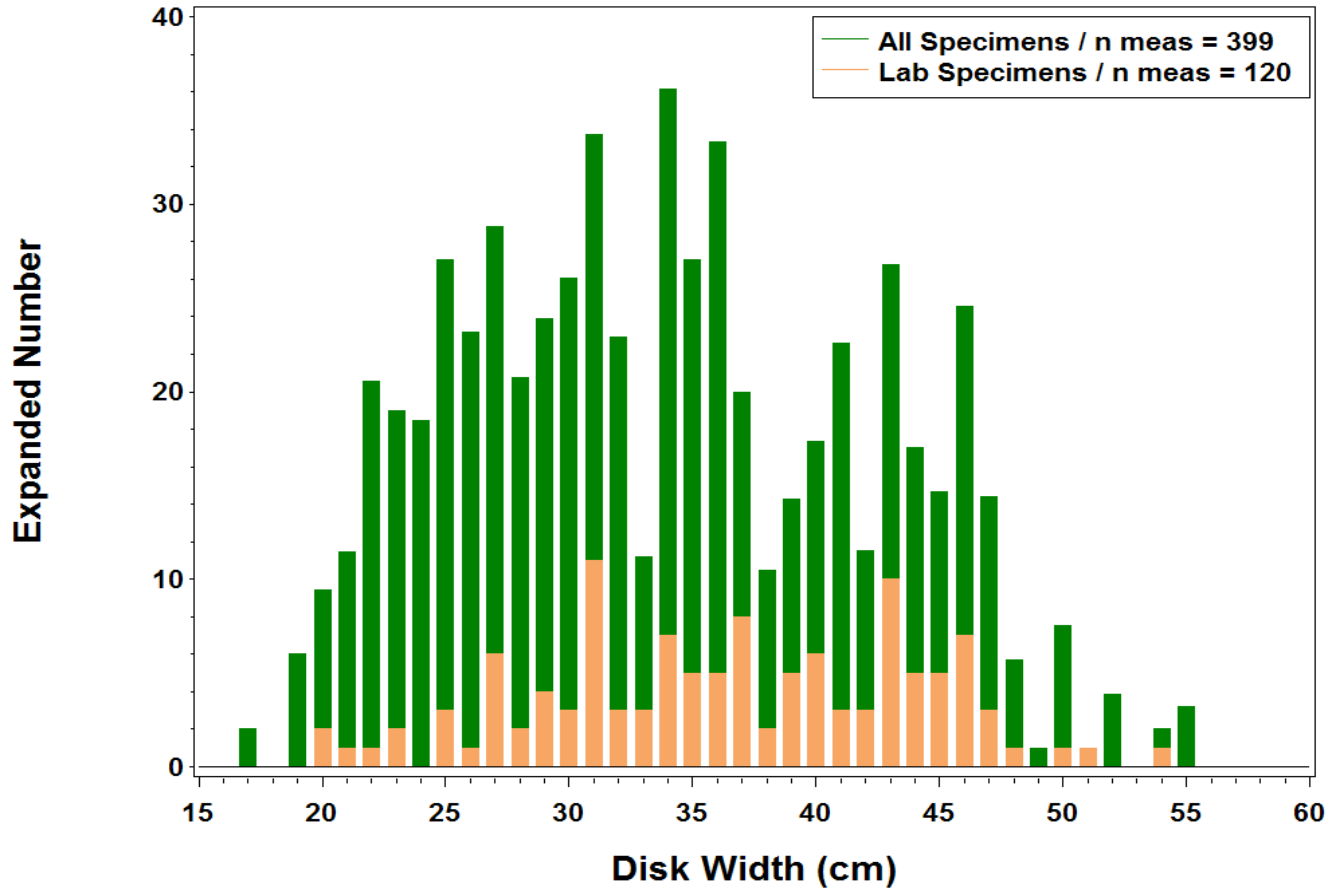


Figure 166. Sex-specific length frequencies histogram for winter skate.

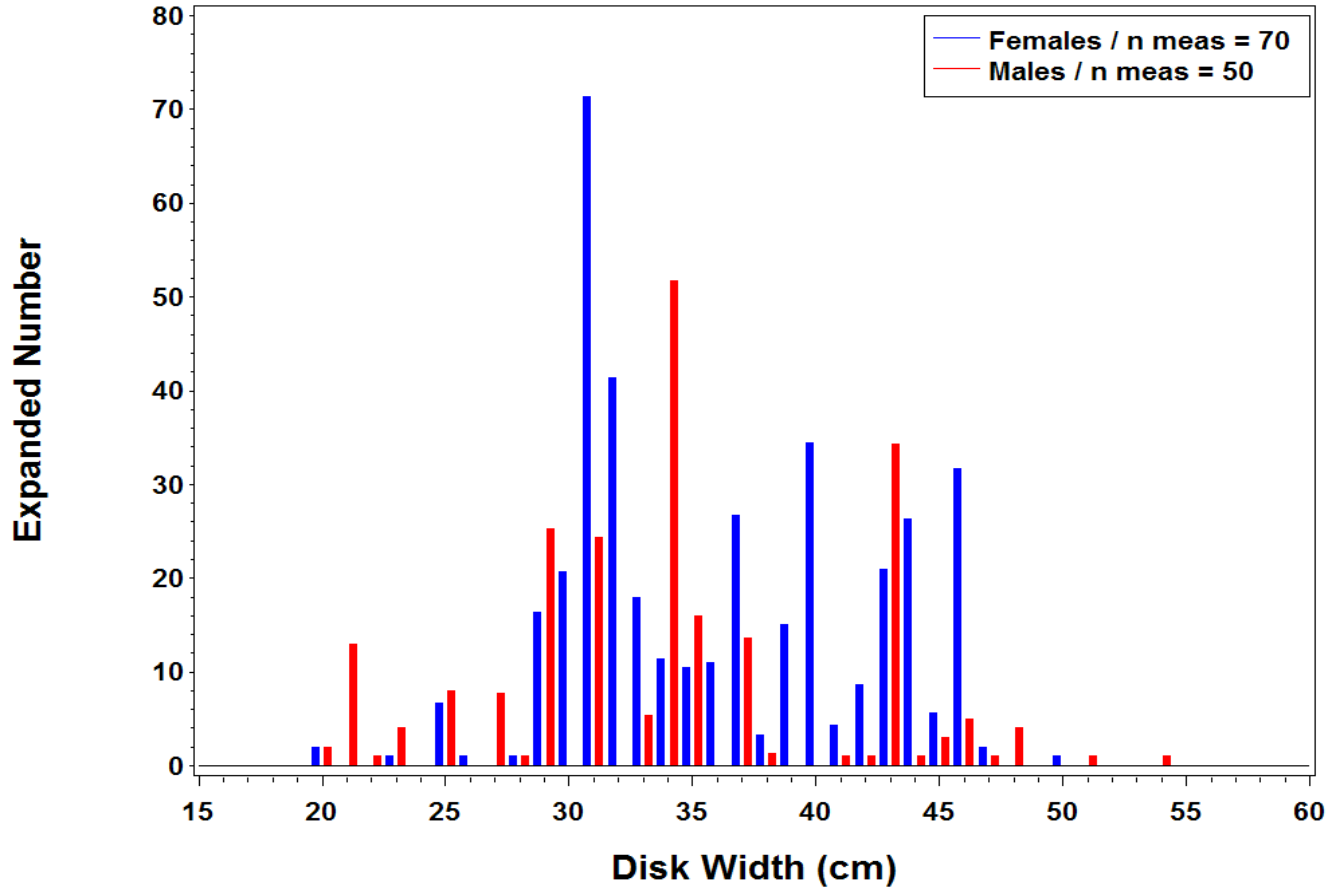


Figure 167. Sex ratios for winter skate by state (A) and length group (B).