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Northeast Area Monitoring and Assessment Program (NEAMAP) Data collection and analysis in support of single and multispecies stock assessments in the Mid-Atlantic: Northeast Area Monitoring and Assessment Program Near Shore Trawl Program

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Introduction

Concerns regarding the status of fishery-independent data collection from 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 of 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 has 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 among 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 that would operate in the coastal zone (i.e., between the 6.1 m and 27.4 m depth contours) of the Mid-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 had been sampling from Cape Hatteras to the U.S. / Canadian border in waters less than 460 m since 1963, few sites were sampled inshore of the 27.4 m contour due to the sizes of the sampling area and research 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). The NEAMAP Near Shore Trawl Survey was therefore developed to address this gap in fishery-independent survey coverage, which is consistent with the program goals. Further, the main objectives of this new survey were defined to include the estimation of abundance, biomass, length frequency distribution, age-structure, diet composition, and various other assessment-related parameters for fishes and select invertebrates inhabiting the survey area.

In early 2005, the ASMFC received $250,000 through the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) and made these funds available for pilot work designed to assess the viability of the NEAMAP Near Shore Trawl Survey. The Virginia Institute of Marine Science (VIMS) provided the sole response to the Commission's request for proposals and was awarded the contract for this work in August 2005. VIMS conducted two brief pre-pilot cruises and a full pilot survey in 2006 (Bonzek et al. 2007).

Following a favorable review of the pilot sampling, the ASMFC bundled funds from a combination of sources in an effort to provide the resources necessary to support the initiation of full-scale sampling operations for NEAMAP. The ASMFC awarded VIMS this new contract in the late spring of 2007, and the first full NEAMAP cruise was scheduled for fall 2007.

Two significant changes to the NEAMAP survey area were implemented prior to this first full-scale cruise:

- In 2007, the NEFSC took delivery of the *FSV Henry B. Bigelow*, began preliminary sampling operations with this new vessel, and determined that this boat could safely operate in waters as shallow as 18.3 m. NEFSC personnel then determined that future surveys would likely extend inshore to that contour (R. Brown, NMFS, pers. comm.). The NEAMAP Operations Committee subsequently decided that the offshore boundary of the NEAMAP survey between Montauk and Cape Hatteras should be realigned to coincide with the inshore boundary of the NEFSC survey, and that NEAMAP should discontinue sampling between the 18.3 m and 27.4 m contours in these waters.
- The NEFSC contributed significant funds toward NEAMAP full implementation with the provision that Block Island Sound (BIS) and Rhode Island Sound (RIS), regions that were under-sampled at the time, be added to the NEAMAP sampling area. These waters are deeper than those sampled along the coast by NEAMAP; however, the offshore extent of sampling in the Sounds (with respect to distance from shore) is consistent with that along the coast. The NEAMAP Survey has sampled BIS and RIS since the fall of 2007 and intends to continue to do so.

VIMS acquired funding for full sampling in 2008 (i.e., two cruises, one in the spring and one in the fall, each covering the entire survey range) from two sources, ASMFC "Plus-up" funds and Research Set-Aside (RSA) quota provided by the Mid-Atlantic Fishery Management Council and the National Oceanographic and Atmospheric Administration (NOAA). ASMFC "Plus-up" was used for the spring survey, while the proceeds derived from the auction of RSA quota supported the fall sampling. This report therefore summarizes results of the fall 2008 survey cruise.

Methods

The following protocols and procedures were developed by the ASMFC NEAMAP Operations Committee, NEAMAP Trawl Technical Committee, and survey personnel at VIMS and were approved through an external peer review of the NEAMAP Trawl Survey. This peer review was conducted in December 2008 in Virginia Beach, Virginia (ASMFC 2009).

Stratification of the Survey Area / Station Selection
Consistency with the stratification boundaries used by the NEFSC Bottom Trawl Surveys was the primary consideration when designing the stratification of the NEAMAP survey area. Because it was known that the former would be redesigned and re-stratified in the near future, however, a new stratification scheme for the inshore waters (i.e., NEAMAP survey area) was open for consideration as well.

Examination of existing NEFSC strata revealed that the major divisions among survey regions (latitudinal divisions from New Jersey to the south, longitudinal divisions off of Long Island and in BIS and RIS) generally corresponded well with major estuarine outflows. These boundary definitions were therefore used for the NEAMAP Survey with minor modifications that aligned these regional boundaries more closely with state borders. The examination of the current NEFSC depth stratum definitions, however, revealed that in some areas (primarily off of the southern states) current stratum boundaries did not correspond well to actual depth contours.

Depth stratum assignments were therefore redrawn using depth sounding data from the National Ocean Service and depth strata of 6.1 m - 12.2 m and 12.2 m - 18.3 m from Montauk to Cape Hatteras, and 18.3 m - 27.4 m and 27.4 m - 36.6 m in BIS and RIS (Figure 1). Finally, each stratum was subdivided into a grid pattern, with each cell of each grid measuring 1.5 x 1.5 minutes (2.25 nm^2) and representing a potential sampling site. The number of sites (cells) selected for sampling from each region/depth stratum for each cruise was assigned by proportional allocation according to surface area within the stratum, with a minimum of two sites sampled per stratum per cruise.

Species Priority Lists

During the survey design phase, the NEAMAP Operations Committee developed a set of species priority lists (Table 1). Priority 'A' species are to be taken for full processing (see *Procedures at Each Station* below) at each sampling site in which they are collected. Several species were added to the Priority 'A' list following the 2006 pilot survey, a result of the expansion of the survey area (added species of management interest in Southern New England) and requests by the Mid-Atlantic Fishery Management Council. Priority 'B' species are to be sampled for full processing at each sampling site if time permits following the processing of 'A' list species. Priority 'C' species are only to be taken for full processing if the sampling of 'A' and 'B' will not be affected. In practice, because survey personnel work quickly and efficiently, time constraints are not an issue and it is not necessary to eliminate any of the Priority 'B' or 'C' species from full processing. All species on each of these lists are effectively treated as though they are 'A' species. At a minimum, aggregate weights and individual length measurements are recorded for all other fishes (here called Priority 'D'). A fifth category ('E') includes species which require special handling, such as sharks (other than dogfish) and sturgeon, which are measured, tagged, and released. Select invertebrates of management interest are also Priority 'E' species; individual length, weight, and sex are recorded, at a minimum, from these.

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	*Pseudopleuronectes americanus*

B LIST	
American shad	*Alosa sapidissima*
Atlantic menhaden	*Brevoortia tyrannus*
Atlantic croaker	*Micropogonias undulatus*
Monkfish	*Lophius americanus*
All skate 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

The NEAMAP Survey uses the 400 x 12 cm, three-bridle four-seam bottom trawl designed by the Mid-Atlantic / New England Fishery Management Council Trawl Survey Advisory Panel for all sampling operations. This net is paired with a set of Thyboron, Type IV 66" doors. Wingspread, doorspread, and headrope height were monitored during each tow of the fall 2008 cruise using a digital Netmind® Trawl Monitoring System. Wingspread sensors were positioned on the middle 'jib' of the net, which is consistent with NEFSC procedures for this net, and doorspread sensors were mounted in the trawl doors according to manufacturer specifications. The headrope sensor was attached at the center of the headline. A catch sensor was mounted in the cod-end, and set to signal when the catch reached approximately 2,200 kg. GPS coordinates and vessel speed were recorded every 2 seconds using chart-plotting software. These data were used to plot tow tracks for each station.

Procedures at Each Sampling Site

All fishing operations were conducted during daylight hours. Each tow was 20 minutes in duration with a target tow speed of 3.1 kts. Two tows were truncated at 16 minutes due to known hangs in the tow path, while three were terminated at 15 minutes following the triggering of the catch sensor.

At each station, several standard variables were recorded. These included:

- Station identification parameters (date, station number, region, depth stratum, water depth).

- Tow parameters (beginning and ending GPS position for the tow, beginning and ending tow times, compass course, speed over ground, engine RPMs, amount of trawl warp deployed).
- Gear identification parameters (net type code and net number, door type code and door numbers).
- Atmospheric and weather data (air temperature, wind speed and direction, barometric pressure, general weather condition, sea state).
- Hydrographic data at the surface and at the bottom (water temperature, salinity, pH, and dissolved oxygen).

Upon arrival at a sampling site, the Captain and Chief Scientist jointly determined the desired starting point and path for the tow. Flexibility was allowed with regard to these parameters so that a complete tow (i.e., 20 minutes in duration) could be executed while remaining within the boundaries of the defined cell.

Hydrographic data were recorded at the end of each tow while the vessel was stationary and the fishing crew emptied the catch. This protocol was developed as a time-saving mechanism; these data were collected prior to setting the gear in past cruises, resulting in a pause in net streaming (and therefore survey operations) while instruments were deployed and these data were recorded. Measurements were taken at approximately 1 m below the surface and 0.5 m to 1 m above the bottom.

Vessel crew were responsible for all of the fishing-related aspects of the survey (gear handling, maintenance, repair, etc.). Due to the relatively shallow waters in the survey area, no more than 183 m of trawl warp was deployed at any given station. One scientist was present in the wheelhouse during deployment and retrieval of the trawl. For the set-out, the Captain would signal when the winch breaks were engaged; this marked the beginning time of the tow. At this point, the scientist would activate the Netmind software, the tow track recording software, and the countdown timer clock. At the conclusion of each tow, the scientist signaled the Captain when the clock reached zero time, haul-back commenced, and the Netmind and tow track programs were stopped. Vessel crew dumped the catch into one of two sorting pens (depending on the size of the catch) for processing.

Each catch was sorted by species and modal size group (i.e., small, medium, and large size) within species. Aggregate biomass (kg) and individual length measurements were recorded for each species-size group combination of the Priority 'D' species. For Priority 'A', 'B', and 'C' species, a subsample of five individuals from each size group was selected for full processing (see next paragraph). For some very common Priority 'B' species including spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), skates, and dogfishes, only three individuals per size group were sampled for full processing.

Data collected from each of these subsampled specimens included individual length (mm fork length where appropriate, mm total length for species lacking a forked caudal fin, mm pre-caudal length for sharks and dogfishes, mm disk width for skates), individual whole and eviscerated weights (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; previous sampling indicated that little useful data could be obtained from the stomach contents of these species) 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. For the Priority 'A', 'B', and 'C' species, all specimens not selected for the full processing were weighed (aggregate weight), and individual length measurements were recorded as described for Priority 'D' species above. In the event of large catches, appropriate subsampling methods were used.

Laboratory Methods

Otoliths and other appropriate ageing structures were (and are in the process of being) prepared according to methodology established by the NEFSC, Old Dominion University, and VIMS. 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, perpendicular to the sulcal groove, using two *Buehler* diamond wafering blades and a low speed *Isomet* saw. The resulting section was mounted on a glass slide and covered with *Crystal Bond*. If necessary, the sample was wet-sanded to an appropriate thickness before being covered. Some smaller, fragile otoliths were read whole. Both sectioned and whole otoliths were most commonly viewed using transmitted light under a dissecting microscope. Ages were assigned as the mode of three independent readings, one by each of three readers, and were adjusted as necessary to account for the timing of sample collection and mark formation.

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

Analytical Methods (Abundance)

One measure of the relative abundance of a species is minimum trawlable number or biomass, which is expressed according to the general formula:

$$\boldsymbol{N} = \frac{\boldsymbol{cA}}{\boldsymbol{a}}, \tag{1}$$

where N is the minimum number (or biomass) of the species present within the survey area and susceptible to the sampling gear, c is the mean number (or weight) of individuals of that species 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:

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

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 catch per area-swept of that species in stratum s. The latter is given by:

$$\hat{\bar{N}}_s = \frac{\sum_{i=1}^{n_{t,s}} \frac{c_i}{\hat{a}_i}}{n_{t,s}} \quad . \tag{3}$$

In Equation (3), c_i and $\hat{a}_i$ represent the catch (number or weight) of the species and an estimate of the trawl area-swept at sampling location i, respectively, while $n_{t,s}$ 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 monitoring gear for wingspread as a measure of tow width (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 summed across strata to produce estimates for the entire survey area. Because regional stratum boundaries were drawn to generally correspond with state borders, estimates of abundance and certain other stock parameters can be (and in previous project reports, were) produced on a state-specific basis. While usually not biologically meaningful, it was considered worthwhile to present state-specific results for some parameters due to the potential value to fishery managers. State-specific estimates of abundance can be misleading, however, because the sampling area off the coast of each state is variable. For example, a state with a low catch rate for a particular species but a large sampling area may have a greater estimate of minimum trawlable abundance for that species than another state with a higher catch rate but smaller sampling area. As a result, state-specific estimates of minimum trawlable abundance have been excluded from this report.

In addition to the overall minimum trawlable abundance estimates discussed above, survey-wide and state-specific estimates of abundance are presented as stratified geometric means of catch per unit area swept (catch rates per area swept were standardized to 25,000 m^2, which is roughly the area swept for a typical 20 minute NEAMAP tow). Preliminary evidence indicates that NEAMAP catch data are log-normally distributed, making the geometric mean the appropriate catch per unit effort (CPUE) metric. Efforts to determine the most appropriate overall and region-specific estimates of abundance will continue and may result in the presentation of different estimates in future reports. Further, we are currently investigating several methods for the computation of age-specific indices, and the results of these investigations will be included in future reports.

Analytical Methods (Length Frequency)

Length frequency histograms were constructed using 10 mm length bins. These bins were labeled using the bin midpoint (e.g., a 250 mm bin represents individuals ranging from 245 mm to 254 mm in length). For this and several other stock parameters, data from specimens taken as a subsample (either for full processing or in the event of a large catch) are expanded to the entire sample (i.e., catch level) for parameter estimation. Because of the potential for differential rates of subsampling among size groups of a given species, failure to account for such factors would

bias resulting stock parameter estimates. In the NEAMAP database, each specimen is assigned a calculated expansion factor which indicates the number of fish that the individual represents in the total catch at the station in which it was collected.

Analytical Methods (Sex Ratios)
Sex ratios were generated by summation of the data from specimens taken for full processing, using the expansion factors described above.

Results

Gear Performance
As was observed during the pilot survey and prior full-scale cruises, the NEAMAP survey gear performed consistently and within expected ranges during the fall 2008 sampling (Figure 2). The net used for the fall 2008 survey was the same used for the pilot work and the fall 2007 cruise. A different net (with the exact design and specifications of the one employed for the other cruises) was used during the spring 2008 sampling. No substantial tear-ups occurred during the fall 2008 survey, though due to normal wear-and-tear the bottom bellies of that net will be replaced, and the net will be recertified, prior to its next use. No appreciable deviations in gear performance have been observed among surveys or between the two nets that have been used.

Stations Sampled
The ASMFC NEAMAP Trawl Technical Committee had recommended a sampling intensity of one station per 30 nm^2 for this survey, which translates into the sampling of 150 sites per cruise (2,006 cells x 2.25 nm^2 per cell / 30 nm^2 = 150 cells). The number of stations available in each stratum and the number to be sampled per stratum per cruise are given (Table 2).

The fall 2008 survey began on 22 September 2009 and ended on 17 October 2009 (sampling dates - 29 September through 17 October), and all 150 sites were sampled during this time. Of the 150 sites, 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, fixed gear, and vessel traffic. The rates at which alternate sites were substituted for primaries were greatest for BIS (4 out of 10) and RIS (5 out of 17) due to unfamiliarity with the area and the relatively small number of towable locations in these Sounds. Fewer substitutions of alternates for primaries were needed in these waters relative to previous surveys, however. This is the direct result of the continued accumulation of known towable locations through cooperation with local industry representatives. A region-by-region summary of the number of primary and alternate sites sampled in each stratum is presented (Table 3).

Table 2. Number of available sampling sites (Num. cells) in each region/depth stratum along with the number selected for sampling per stratum per cruise (Stations sampled). Totals for each region, along with surface area (nm^2) and sampling intensity (nm^2 per Station) are also given.

Region	State*	Stations Sampled								Totals			nm^2 per Station
		6.1m-12.2m		12.2m – 18.3m		18.3m – 27.4m		27.4m –36.6m					
		Stations sampled	Num. cells	Stations sampled	Num. cells	Stations sampled	Num. cells	Stations sampled	Num. cells	Stations sampled	Num. cells	nm^2**	
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 sampled in each region during fall 2008.

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**

For the17 full sampling days (i.e., no long steam times or port calls), an average of 8.2 stations were sampled per day. Counting all 22 days at sea, including transit days and partial sampling days, the number of sites sampled per day averaged 6.8. Day-by-day vessel activities and work summaries are presented (Table 4).

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

Hours Worked and Stations Sampled Each Day

Date	Time of Day	No. Station
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 731,429 specimens weighing 43,020 kg were collected during the fall 2008 cruise. These specimens represented 134 species, including 7 not previously collected by NEAMAP. Individual length measurements were recorded for approximately 60,334 individuals. Ageing structures (otoliths, vertebrae, scales, etc.) were taken from 4,608 fishes while 3,383 stomachs containing prey were sampled for diet composition. On average at each station, 4,876 (range 52 – 62,226) specimens were collected (Figure 3) weighing 287 kg (range 9 kg – 3,056 kg) (Figure 4), 402 specimens were measured (range 52 – 1,674), and 31 were taken for full processing (range 8 – 65). An average of 19.5 species was captured at each sampling site (range 6 – 36) (Figure 5). The number of specimens collected and processed for each species, presented separately for each priority category, is summarized in Table 5.

Species Data Summaries

Several graphical data summaries are provided for a number of species collected during the fall 2008 survey (Figures 6-167). Species are organized alphabetically. Due to the relatively short period of time between the end of the fall 2008 cruise and the due date for this report, fewer analyses are presented for each species compared to previously generated NEAMAP reports.

Additional analyses will be available to both NOAA/NMFS/NEFSC and the Mid-Atlantic Fishery Management Council upon request in the near future, however.

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

- GIS figures showing total catch by number and biomass at each sampling site.
- A table presenting, for each state, the number of sites sampled, the number of these stations at which the species was captured, total number of specimens caught, total biomass of these individuals, number of specimens taken for full processing (including age and stomach analysis), number of individuals measured along with minimum, maximum, and average lengths, average weight of the specimens, and state-specific abundance indices in terms of 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 at a station.
- Length frequency histogram, including the number of specimens for which individual length measurements were recorded and the number taken for full processing.
- Sex-specific length frequency histogram, annotated with the number measured by sex.
- Histograms of sex ratio by state and sex ratio by size group (when sample sizes permit), annotated with the number of specimens examined in each category. Note that for lower priority species, sex ratio data may not be available.

These data summaries are numbered as follows:

- Red hake – Page 111 - Table 28, Figures 94-96.
- Scup – Page 115 - Table 29, Figures 97-101.
- Silver hake – Page 119 - Table 30, Figures 102-106.
- Silver perch – Page 123 - Table 31, Figures 107-109.
- Smooth butterfly ray – Page 127 - Table 32, Figures 110-112.
- Smooth dogfish – Page 131 - Table 33, Figures 113-117.
- Spiny dogfish – Page 135 - Table 34, Figures 118-122.
- Spot – Page 139 - Table 35, Figures 123-127.
- Spotted hake – Page 143 - Table 36, Figures 128-130.
- Striped anchovy – Page 147 - Table 37, Figures 131-133.
- Striped bass – Page 151 - Table 38, Figures 134-138.
- Striped searobin – Page 155 - Table 39, Figures 139-141.
- Summer flounder – Page 159 - Table 40, Figures 142-146.
- Weakfish – Page 163 - Table 41, Figures 147-151.
- White shrimp – Page 167 - Table 42, Figures 152-154.
- Windowpane flounder – Page 171 - Table 43, Figures 155-157.
- Winter flounder – Page 175 - Table 44, Figures 158-162.
- Winter skate – Page 179 - Table 45, Figures 163-167.

Public Outreach

During 2008, presentations of survey activities and results were made as follows:

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

Further, approximately 120 individuals including representatives of the recreational and commercial fishing communities, fishery managers, and local and national political leaders observed survey operations both in port and in the field during layovers in New Bedford, Massachusetts, Point Judith, Rhode Island, Montauk, New York, Cape May, New Jersey and Hampton, Virginia during the fall 2008 cruise. Brief news stories highlighting the NEAMAP Survey have appeared on local television in Providence, Rhode Island, and Long Island, New York, 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*.

Literature Cited

Atlantic States Marine Fisheries Commission (ASMFC). 2002. Development of a Cooperative State/Federal Fisheries Independent Sampling Program. ASMFC Document, Washington, DC.

Atlantic States Marine Fisheries Commission (ASMFC). 2009. Terms of Reference & Advisory Report of the NEAMAP Near Shore Trawl Survey Peer Review. ASMFC Report 09-01, Washington, DC.

Bonzek, C.F., J. Gartland, and R.J. Latour. 2007. Northeast Area Monitoring and Assessment Program (NEAMAP) Mid-Atlantic Nearshore Trawl Program Pilot Survey Completion Report. ASMFC. 97pp.

Byrne, Don. 2004. Counting the fish in the ocean. Online. Internet. <http://www.state.nj.us/dep/fgw/artoceancount.htm>

Hyslop, E.J. 1980. Stomach contents analysis – a review of methods and their application. Journal of Fish Biology 17:411-429.

NEFSC. 1988. An evaluation of the bottom trawl survey program of the Northeast Fisheries Center. *NOAA Tech. Memo*. NMFS-F/NEC-52, p. 83.

Rester, J.K. 2001. Annual report to the Technical Coordinating Committee Gulf States Marine Fisheries Commission. Report of the Southeast Area Monitoring and Assessment Program (SEAMAP) to the Gulf States Marine Fisheries Commission, Ocean Springs, Mississippi.

Table 5. For each species collected during the NEAMAP fall 2008 cruise, the total number and biomass of specimens caught, number measured for individual length, number sampled for ageing, and number of stomachs collected that contained prey. Species are grouped by priority level.

Priority 'A' Species					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number for Ageing**	**Number of Stomachs**
Black sea bass	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 for Ageing**	**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	0	0
Barndoor skate	3	1.094	3	3	3
Bluntnose stingray	62	214.961	62	0	0
Bullnose ray	479	399.912	320	0	0
Clearnose skate	885	1,196.183	806	289	287
Cownose ray	231	560.402	108	0	0
Little skate	7,014	4,104.774	2,247	263	259
Monkfish	6	26.178	6	6	6
Rosette skate	1	1.846	1	0	0
Roughtail stingray	30	411.062	30	0	0
Skate spp.(winter & little)	116	22.627	115	0	0
Smooth butterfly ray	227	346.579	195	0	0
Smooth dogfish	414	365.390	386	162	161
Southern stingray	2	20.860	2	0	0
Spiny butterfly ray	79	809.340	79	0	0
Spiny dogfish	735	1,621.109	161	41	39
Spot	56,878	3,871.983	3,435	213	0
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 for Ageing**	**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	0	0
Tautog	137	59.188	69	27	26

Table 5. cont.

Priority 'D' Species					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number for Ageing**	**Number of Stomachs**
African pompano	1	0.062	1	0	0
American eel	8	15.950	8	0	0
American sand lance	1	0.004	1	0	0
Atlantic bumper	3	0.022	3	0	0
Atlantic cutlassfish	32,439	71.527	190	0	0
Atlantic moonfish	8,271	32.560	1,104	0	0
Atlantic spadefish	231	7.972	197	0	0
Atlantic thread herring	801	12.014	292	0	0
Atlantic threadfin	1,189	5.960	169	0	0
Atlantic torpedo	5	78.365	5	0	0
Banded drum	250	9.117	174	0	0
Bay anchovy	35,358	72.597	2,299	0	0
Berycidae	9	8.860	9	0	0
Bigeye scad	60	2.202	53	0	0
Blackcheek tonguefish	54	2.391	54	0	0
Blue runner	109	8.036	109	0	0
Bluespotted cornetfish	6	0.171	6	0	0
Codlings (uncl. hakes)	2	0.164	2	0	0
Conger eel	1	0.035	1	0	0
Crevalle jack	18	0.959	18	0	0
Cunner	7	3.408	7	0	0
Dwarf goatfish	1	0.012	1	0	0
Etropus spp.	7	0.133	7	0	0
Florida pompano	1	0.105	1	0	0
Fourspot flounder	143	25.420	66	0	0
Gray triggerfish	1	0.075	1	0	0
Gulf Stream flounder	214	5.397	87	0	0
Harvestfish	1,380	105.107	138	0	0
Hickory shad	4	0.892	4	3	3
Hogchoker	141	13.766	141	0	0
Inshore lizardfish	314	31.902	230	0	0
Jellyfish spp.		289.515		0	0
King mackerel	1	4.615	1	0	0
Kingfish spp.	8,026	1,254.441	1,502	0	0
Longhorn sculpin	7	0.746	7	0	0
Mantis shrimp	1	0.040	1	0	0
Northern pipefish	1	0.122	1	0	0
Northern puffer	32	4.378	32	0	0
Northern searobin	179	25.302	179	0	0
Northern sennet	211	13.948	211	0	0
Northern stargazer	13	13.843	13	0	0

Table 5. cont.

Priority 'D' Species (cont.)					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number for Ageing**	**Number of Stomachs**
Permit	1	0.160	1	0	0
Pigfish	443	22.657	296	0	0
Pinfish	184	8.243	184	0	0
Planehead filefish	1	0.170	1	0	0
Red goatfish	1	0.012	1	0	0
Red hake	145	18.232	98	0	0
Rough scad	230	7.031	230	0	0
Round herring	12,503	241.994	379	0	0
Round scad	493	3.614	226	0	0
Sea raven	3	1.146	3	0	0
Sheepshead	7	27.260	7	0	0
Short bigeye	1	0.010	1	0	0
Silver anchovy	228	2.628	10	0	0
Silver jenny	1	0.054	1	0	0
Silver perch	1,793	58.038	845	0	0
Smallmouth flounder	6	0.273	6	0	0
Spanish mackerel	14	1.962	14	0	0
Spanish sardine	853	4.015	53	0	0
Spotfin butterflyfish	1	0.007	1	0	0
Spotted hake	1,956	182.986	1,053	0	0
Star drum	1	0.065	1	0	0
Striped anchovy	84,833	1,009.098	3,357	0	0
Striped burrfish	67	20.582	67	0	0
Striped cusk-eel	31	1.732	31	0	0
Striped searobin	425	121.508	345	0	0
Windowpane	475	79.383	410	0	0

Table 5. cont.

Priority E Species					
Species	**Total Number Caught**	**Total Species Weight (kg)**	**Number Measured**	**Number for Ageing**	**Number of Stomachs**
American lobster	352	80.580	178	0	0
Atlantic angel shark	3	36.140	3	0	0
Atlantic sharpnose shark	15	51.620	15	0	0
Atlantic sturgeon	11	89.160	11	0	0
Blue crab, juv. female	1	0.150	1	0	0
Blue crab, adult female	4	0.402	4	0	0
Brief squid	1,587	17.523	451	0	0
Brown shrimp	509	15.275	372	0	0
Dusky shark	7	17.160	7	0	0
Great white shark	1	60.000	1	0	0
Horseshoe crab	1,149	1,839.364	473	0	0
Jonah crab	3	0.820	3	0	0
Lady crab	5	0.110	5	0	0
Lesser blue crab	3	0.098	3	0	0
Loligo squid	93,383	1,357.856	5,998	0	0
Pink shrimp	1	0.040	1	0	0
Rock crab	36	6.740	36	0	0
Sand tiger shark	3	188.880	3	0	0
Sandbar shark	12	35.960	12	0	0
Sea scallop	46	3.021	46	0	0
Spinner shark	1	6.900	1	0	0
Thresher shark	5	69.690	5	0	0
White shrimp	753	19.748	267	0	0
Fall 2008 Totals	**731,429**	**43,020.27**	**60,334**	**4,608**	**3,383**

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

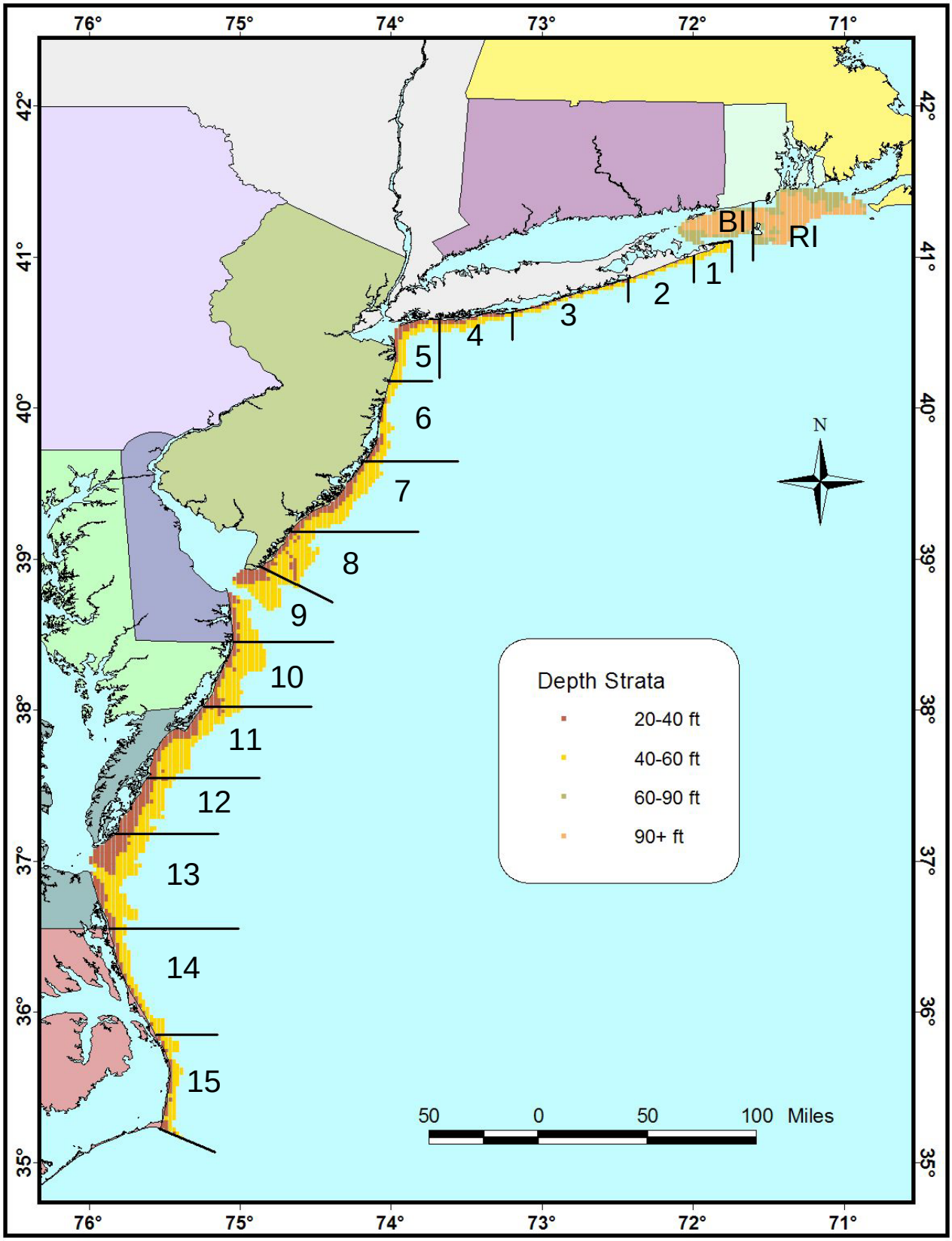


Figure 2. Performance of the NEAMAP Near Shore Trawl Survey sampling gear during the fall 2008 survey cruise. Tows are numbered sequentially along the y-axis; the first tow made during the fall 2008 survey is given as 1, while the last tow of the cruise is 150. Points on the graph are tow averages for each of the respective parameters. Average doorspreads (m) for each tow are given in green, average vessel speeds over ground (kts) in brown, average wingspreads (m) in blue, and average headline heights (m) in red. Optimal ranges for each parameter are represented by the horizontal dotted lines. Optimal doorspreads are 32.0 m - 34.0 m, vessel speeds over ground are 2.9 kts - 3.3 kts, wingspreads are 13.0 m - 14.0 m, and headline heights are 5.0 m - 5.5 m.

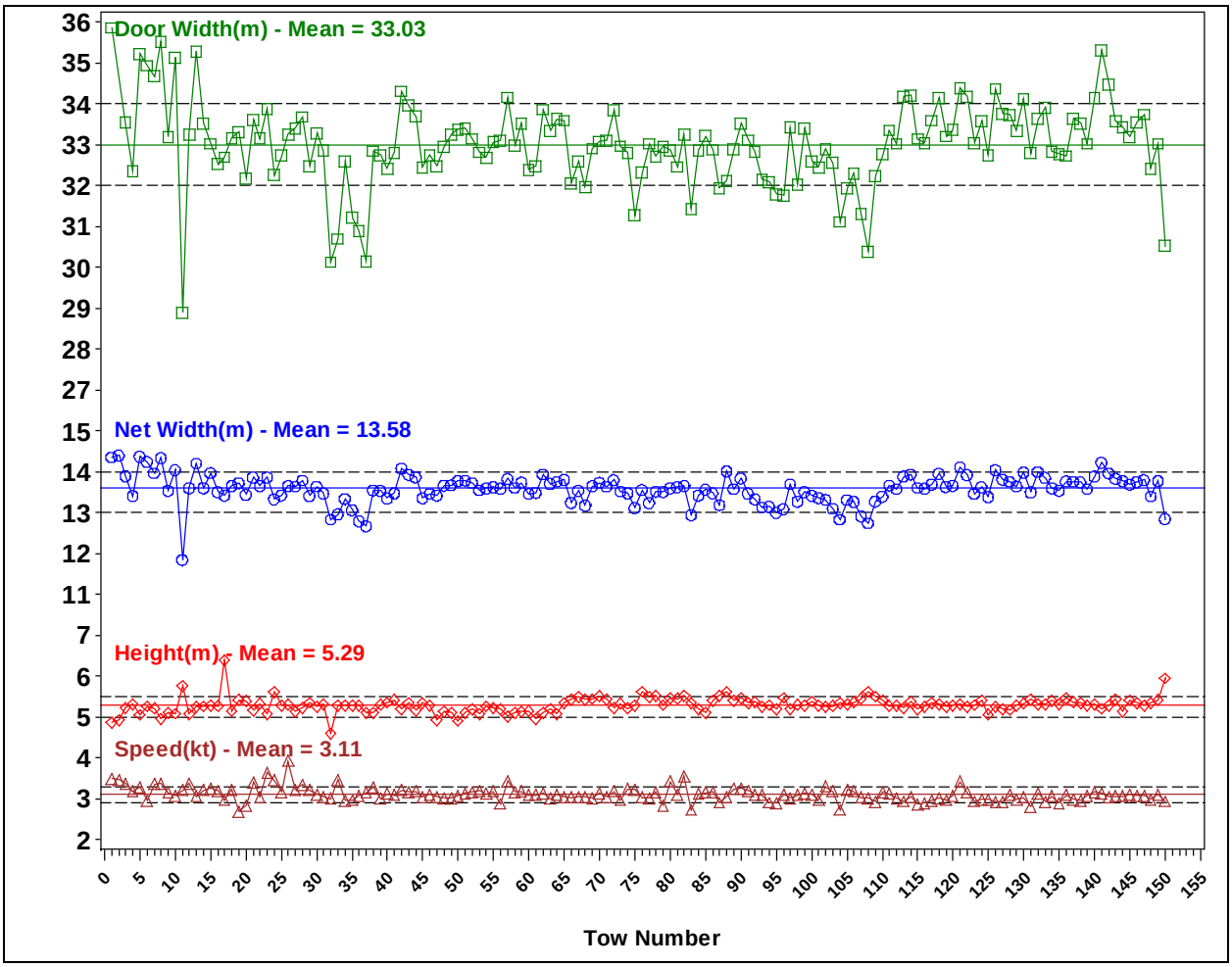


Figure 3. Frequency histogram of the number of specimens collected at each station. The number of fish caught in a tow is given on the x-axis (note irregularly incremented values at the high end of this axis) while the number of tows for each catch amount is represented on the y-axis.

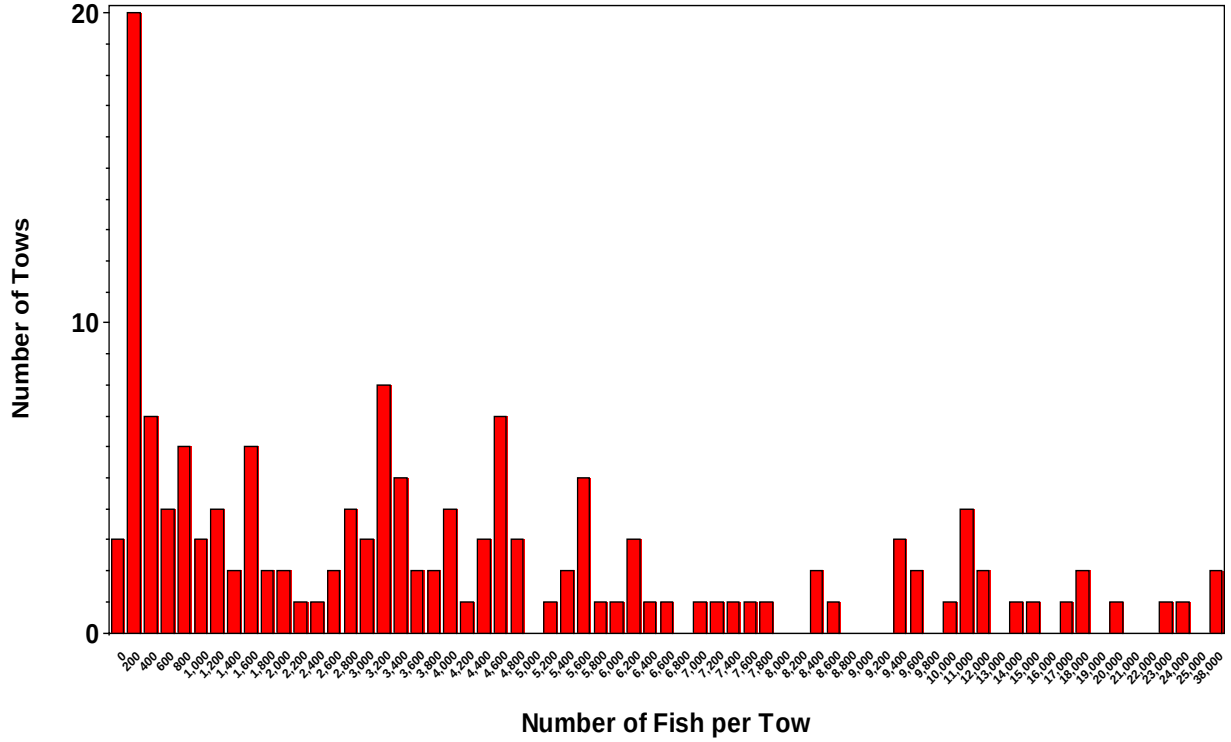


Figure 4. Frequency histogram of the biomass of all specimens collected at each station. The total biomass of fish caught in a tow is given on the x-axis (note irregularly incremented values at the high end of this axis) while the number of tows for each catch amount is represented on the y-axis.

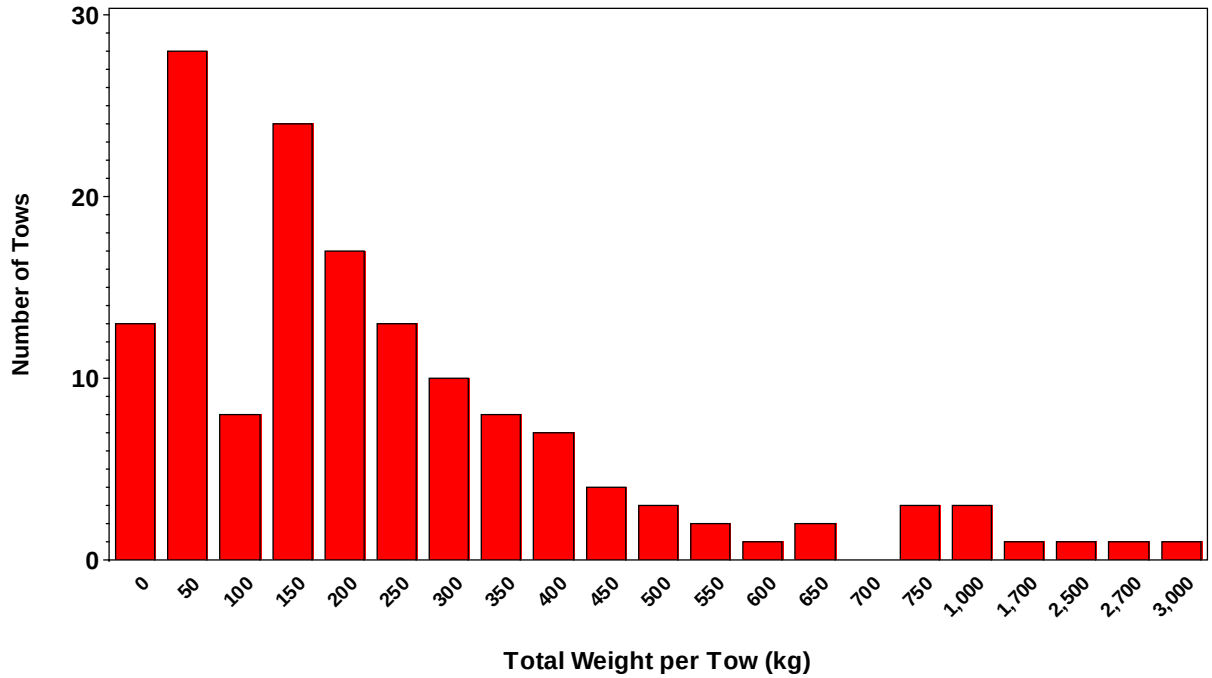
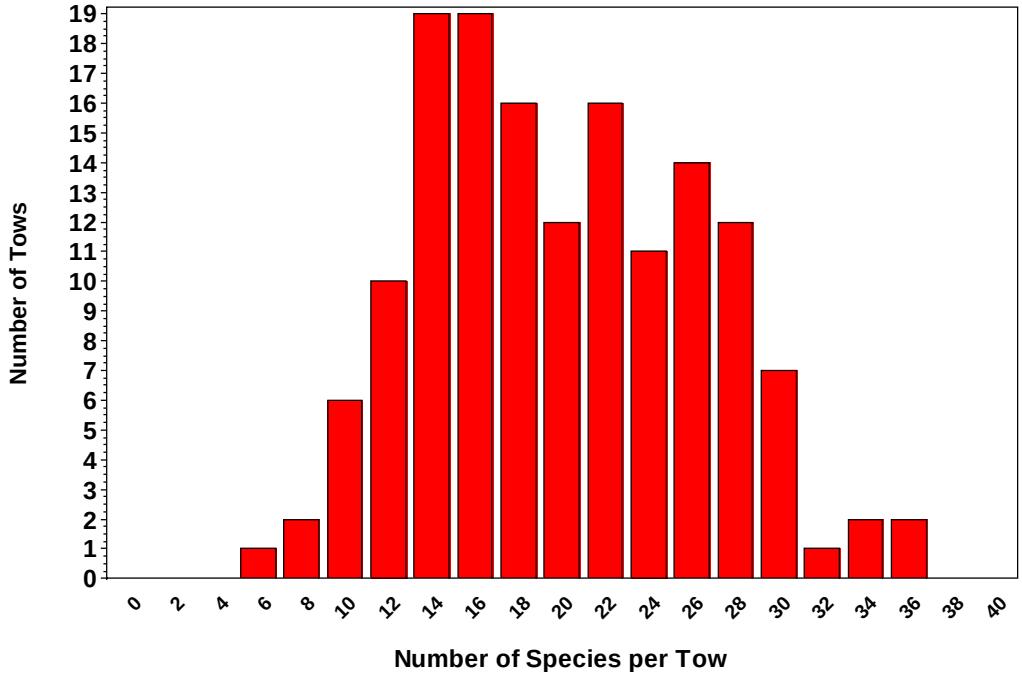


Figure 5. Frequency histogram of the number of species collected at each sampling site. The number of species caught in a tow is given on the x-axis while the number of tows for each species count is represented on the y-axis.



American Lobster (Priority E)

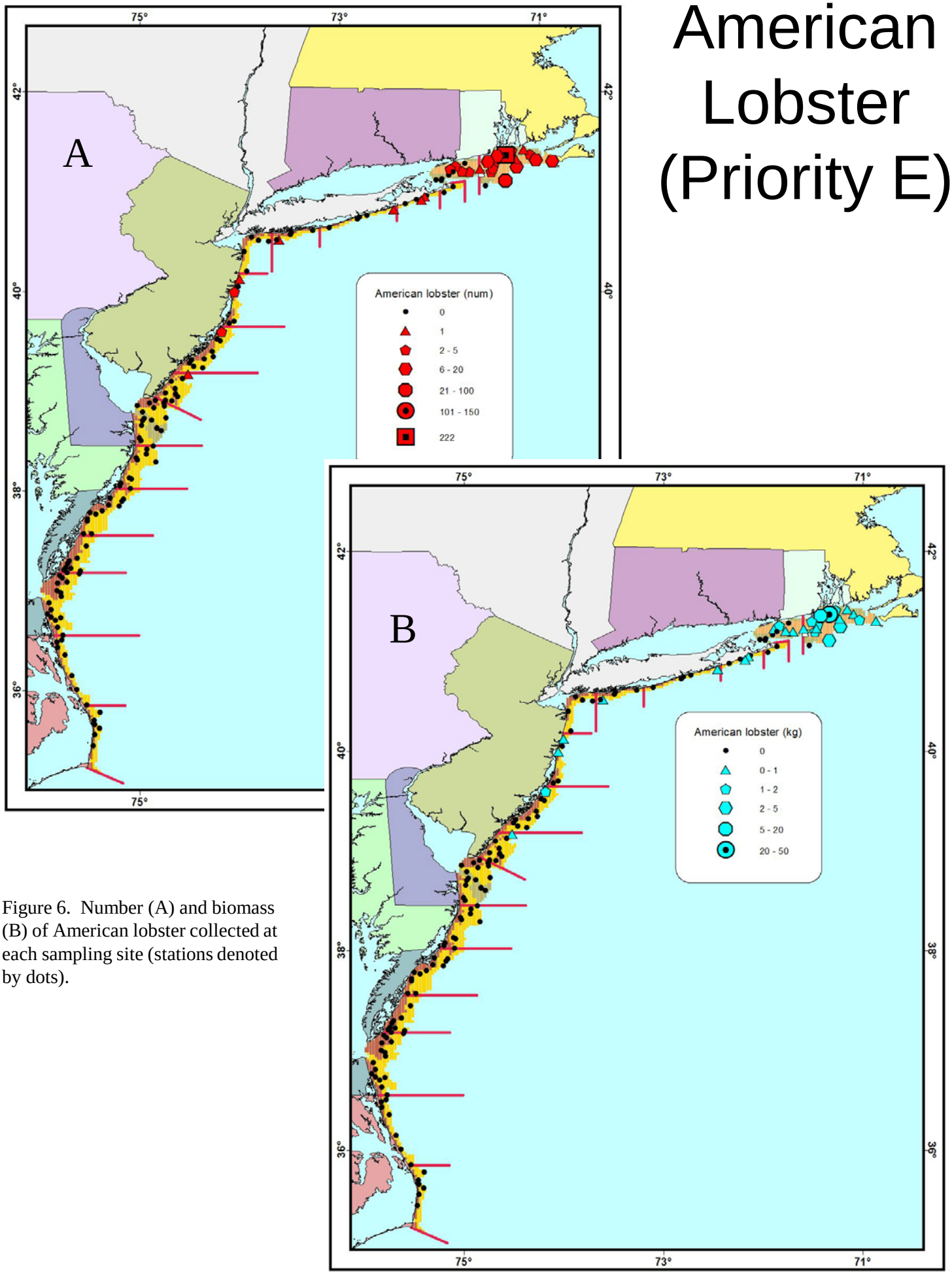


Figure 6. Number (A) and biomass (B) of American lobster collected at each sampling site (stations denoted by dots).

Table 6. For each state, the number of sites sampled and the number at which American lobster were collected. The number and biomass of lobster caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum lobster length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm CL)	Max. Length (mm CL)	Avg. Length (mm CL)	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	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NC	13	0	0	0	0	0	N/A	N/A	N/A	N/A	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, for American lobster. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

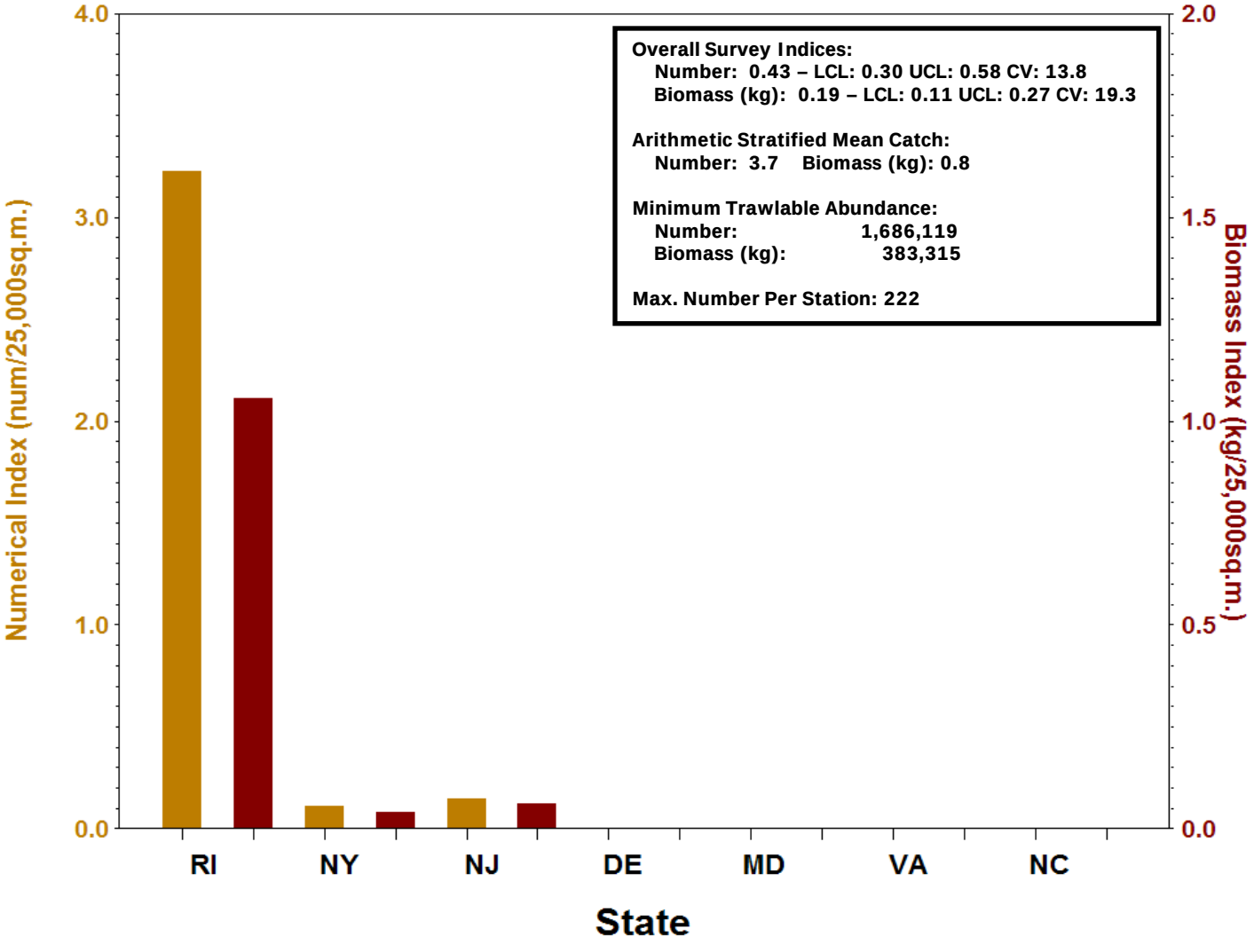


Figure 8. Length frequency histogram for American lobster. Carapace length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

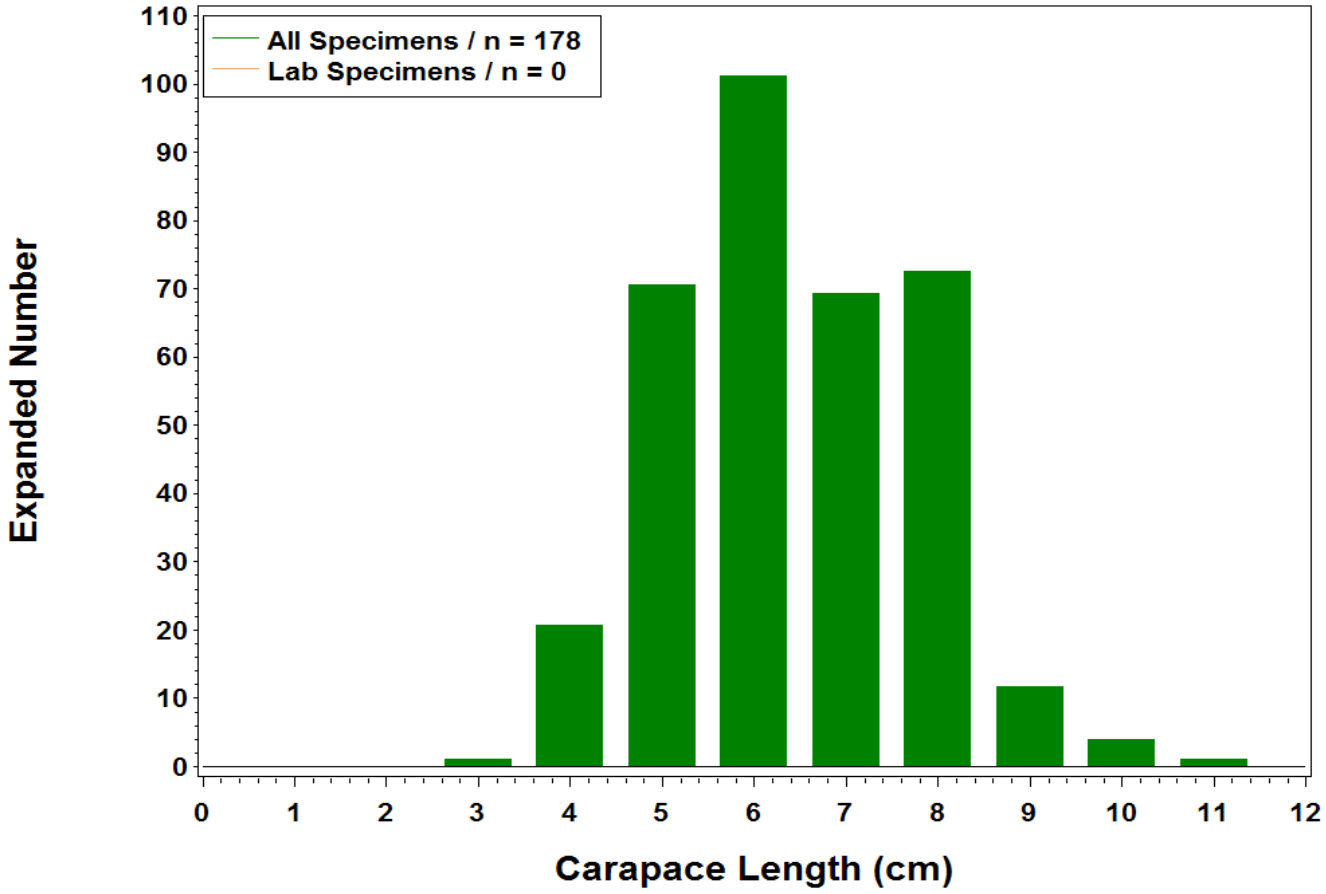


Figure 9. Sex-specific length frequency histogram for American lobster. Carapace length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

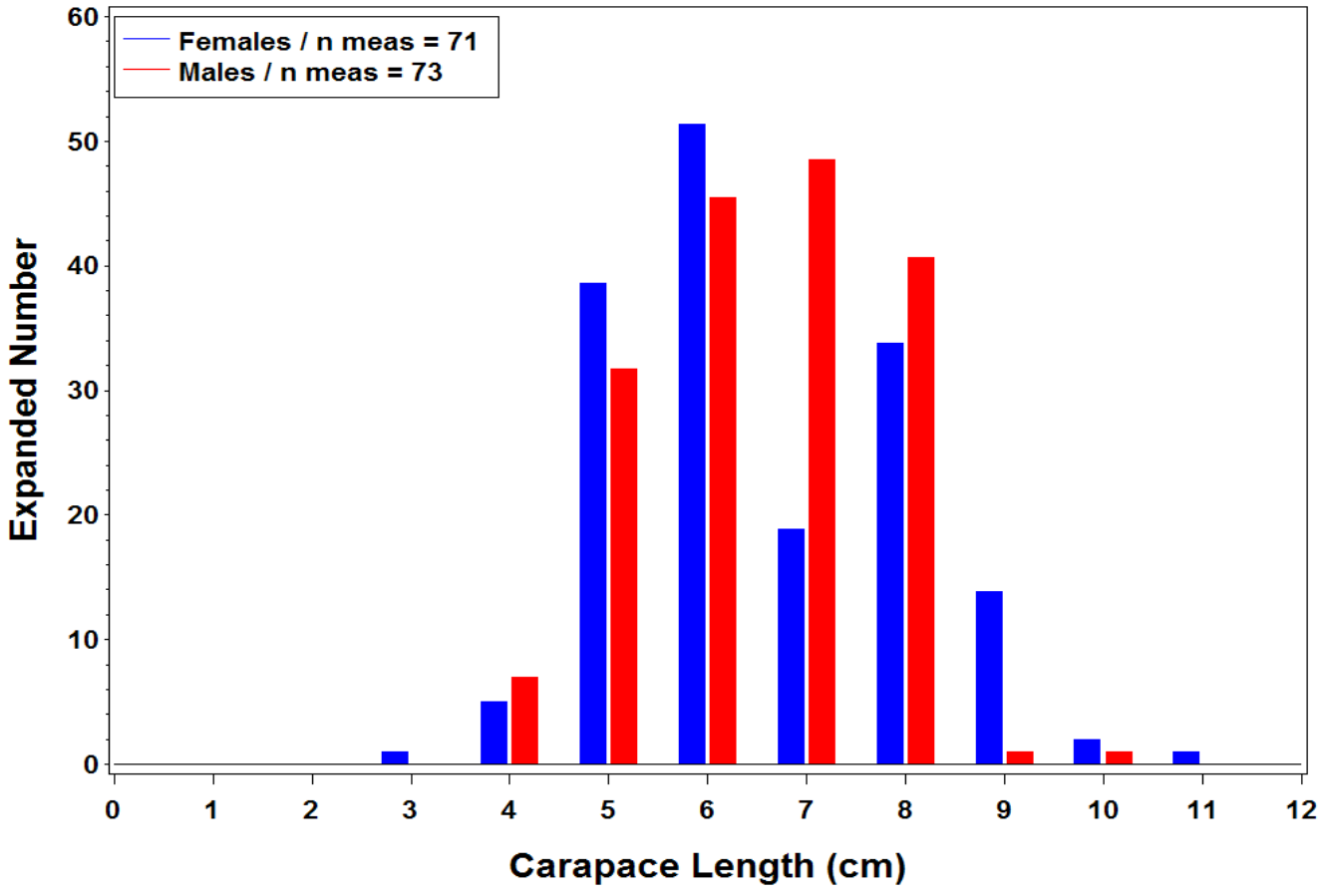
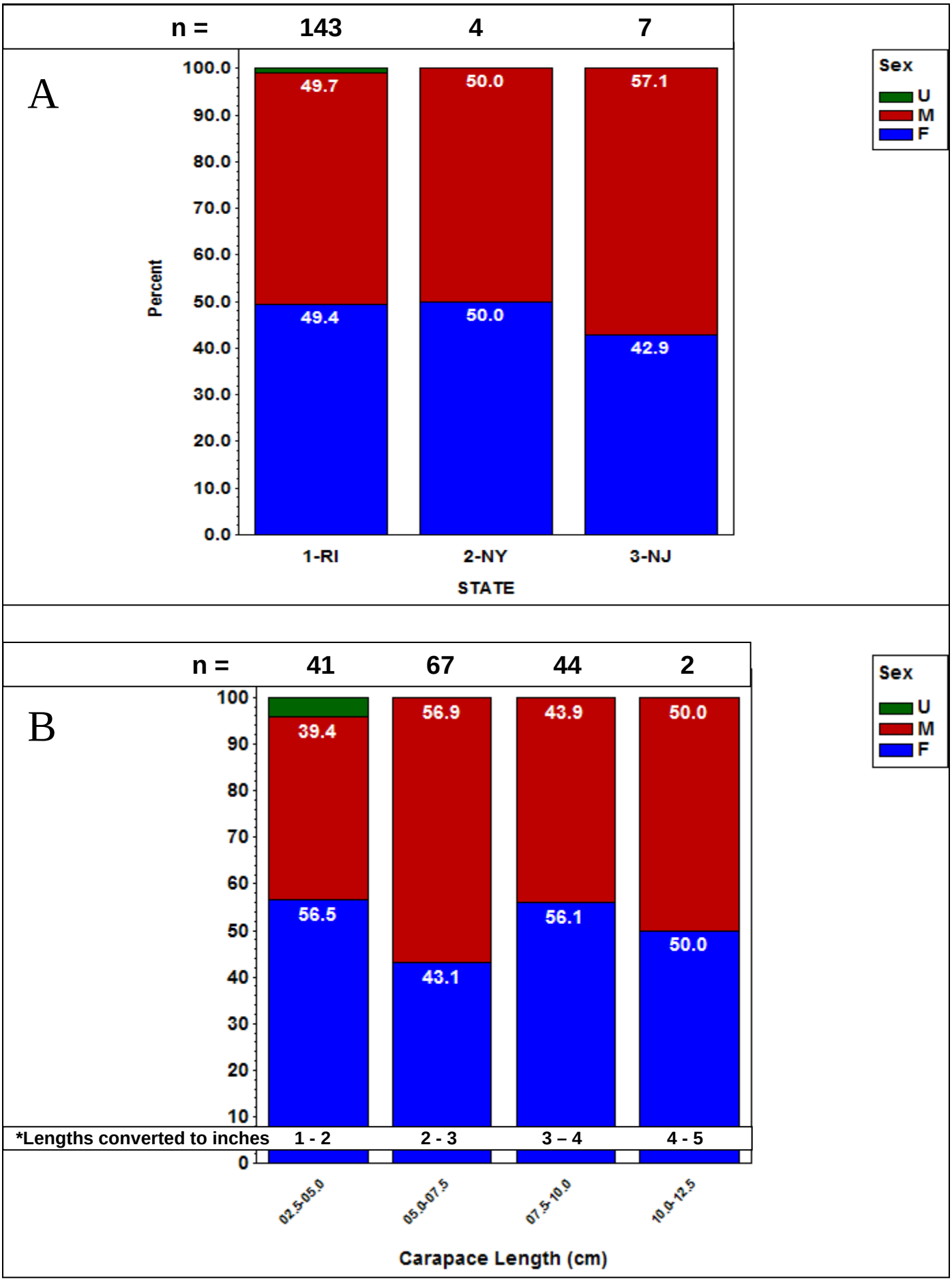


Figure 10. Sex ratios for American lobster by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



American Shad (Priority B)

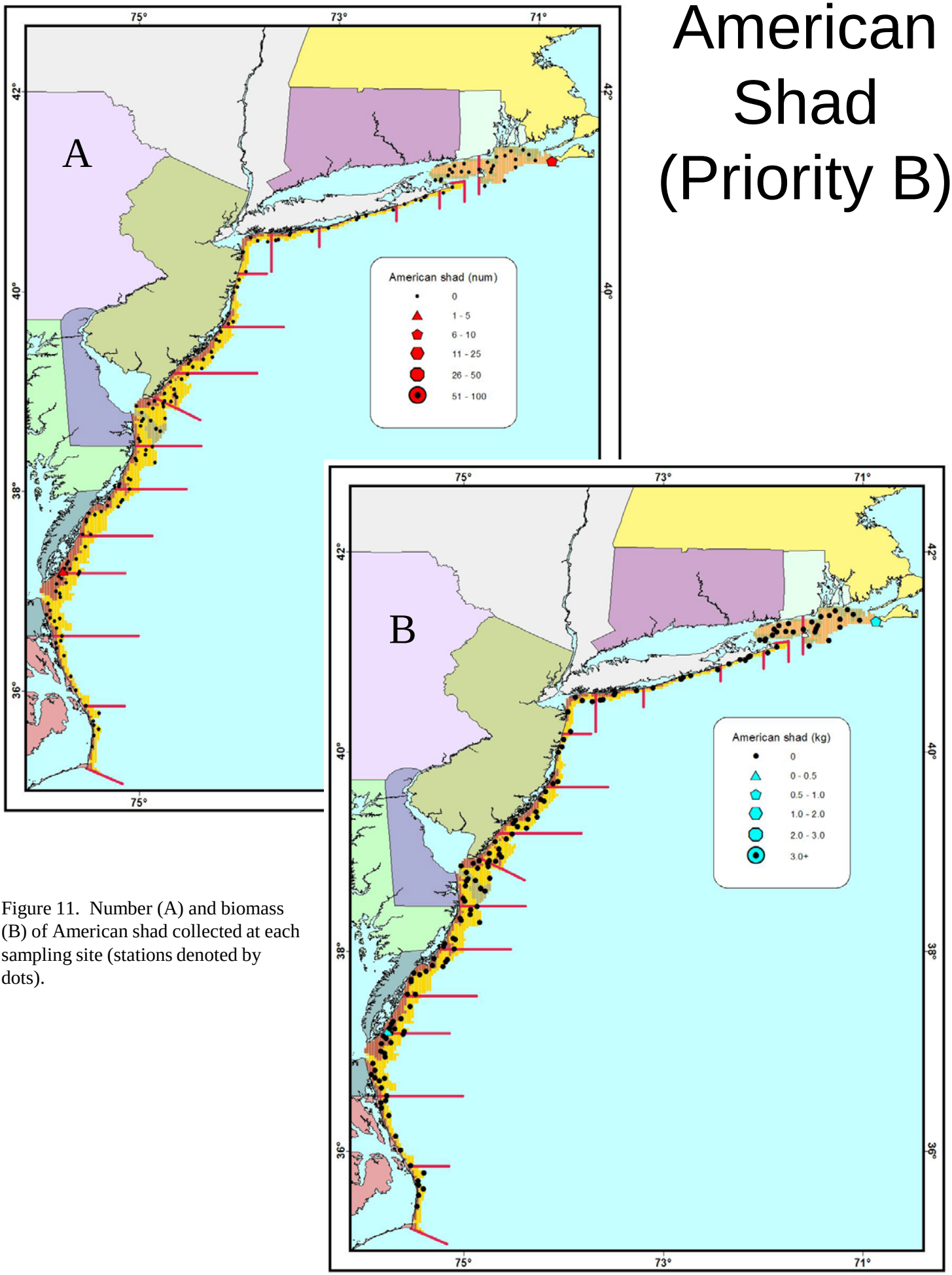


Figure 11. Number (A) and biomass (B) of American shad collected at each sampling site (stations denoted by dots).

Table 7. For each state, the number of sites sampled and the number at which American shad were collected. The number and biomass of shad caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum shad length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	1	1	0.008	0	1	75	75	75	0.008	0.01	0.00
NC	13	0	0	0	0	0	N/A	N/A	N/A	N/A	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, for American shad. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

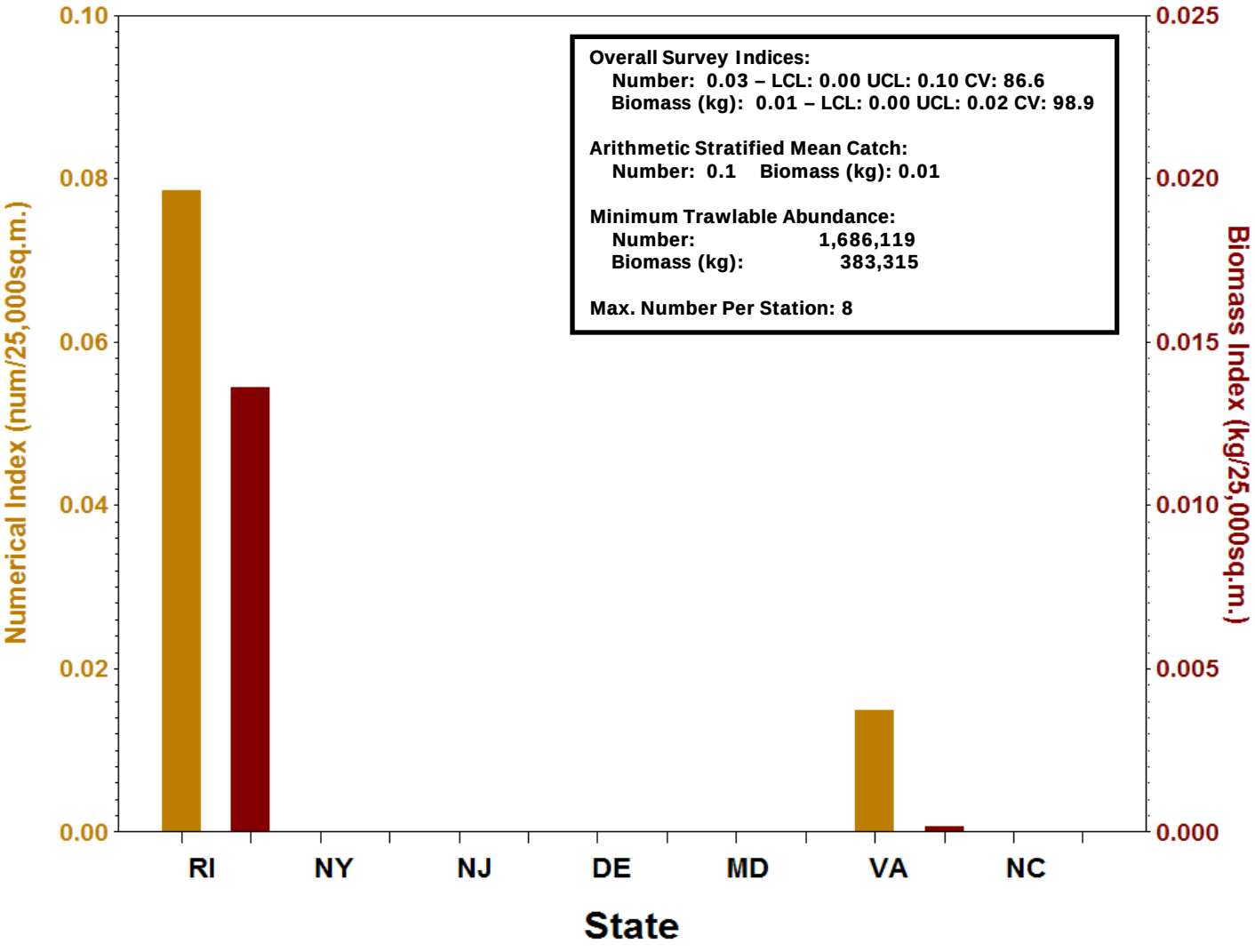


Figure 13. Length frequency histogram for American shad. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

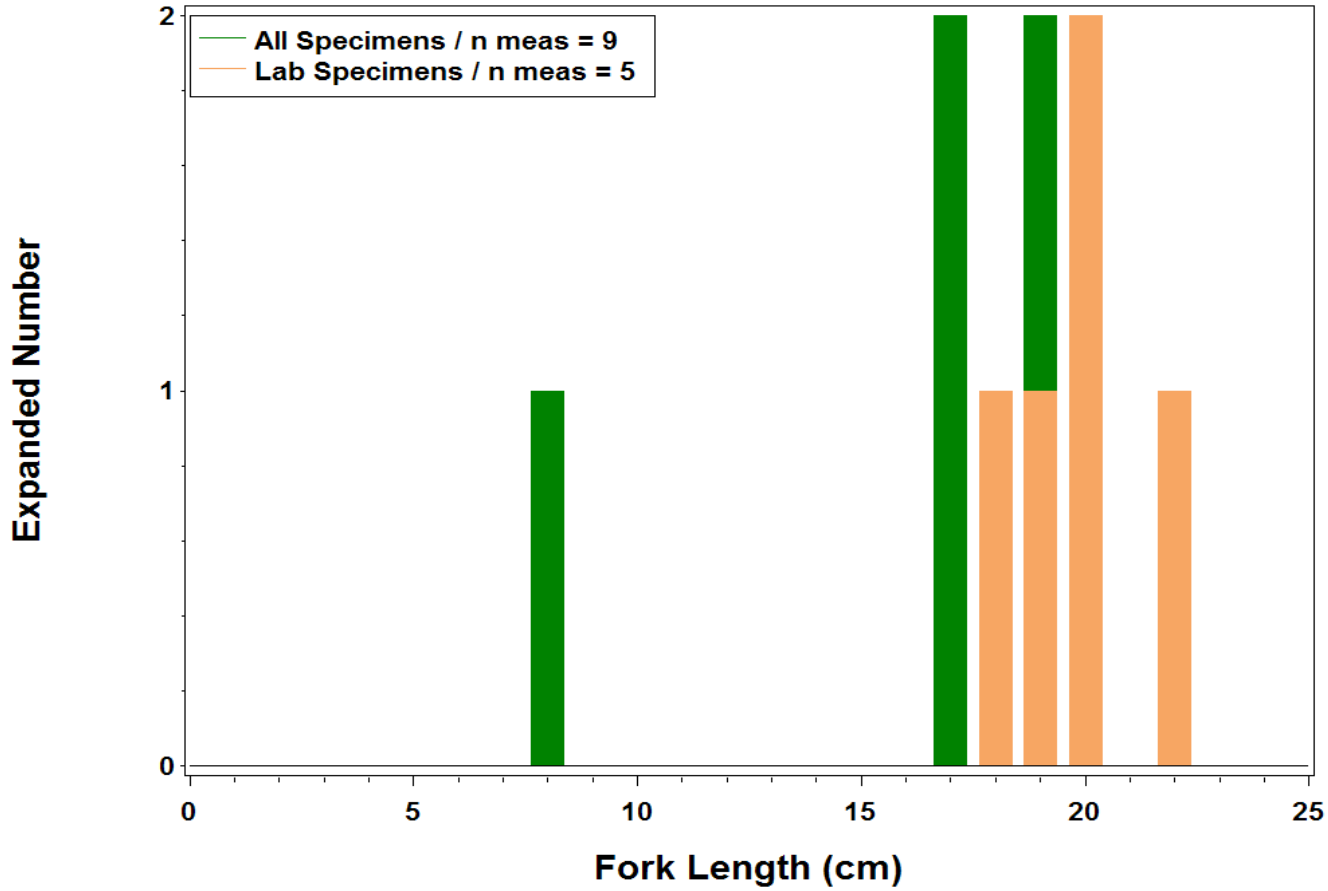
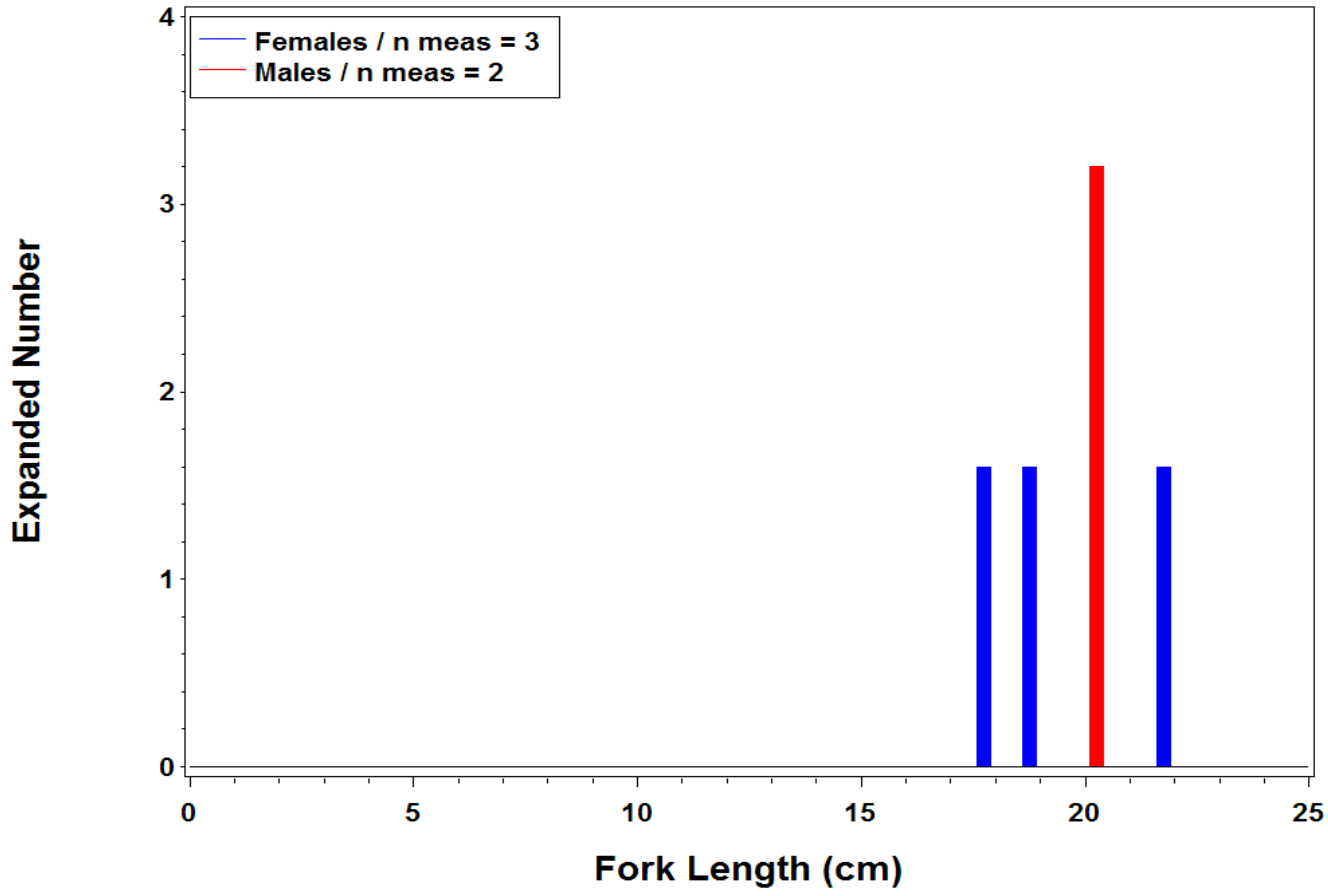


Figure 14. Sex-specific length frequency histogram for American shad. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.



Atlantic Brief Squid (Priority E)

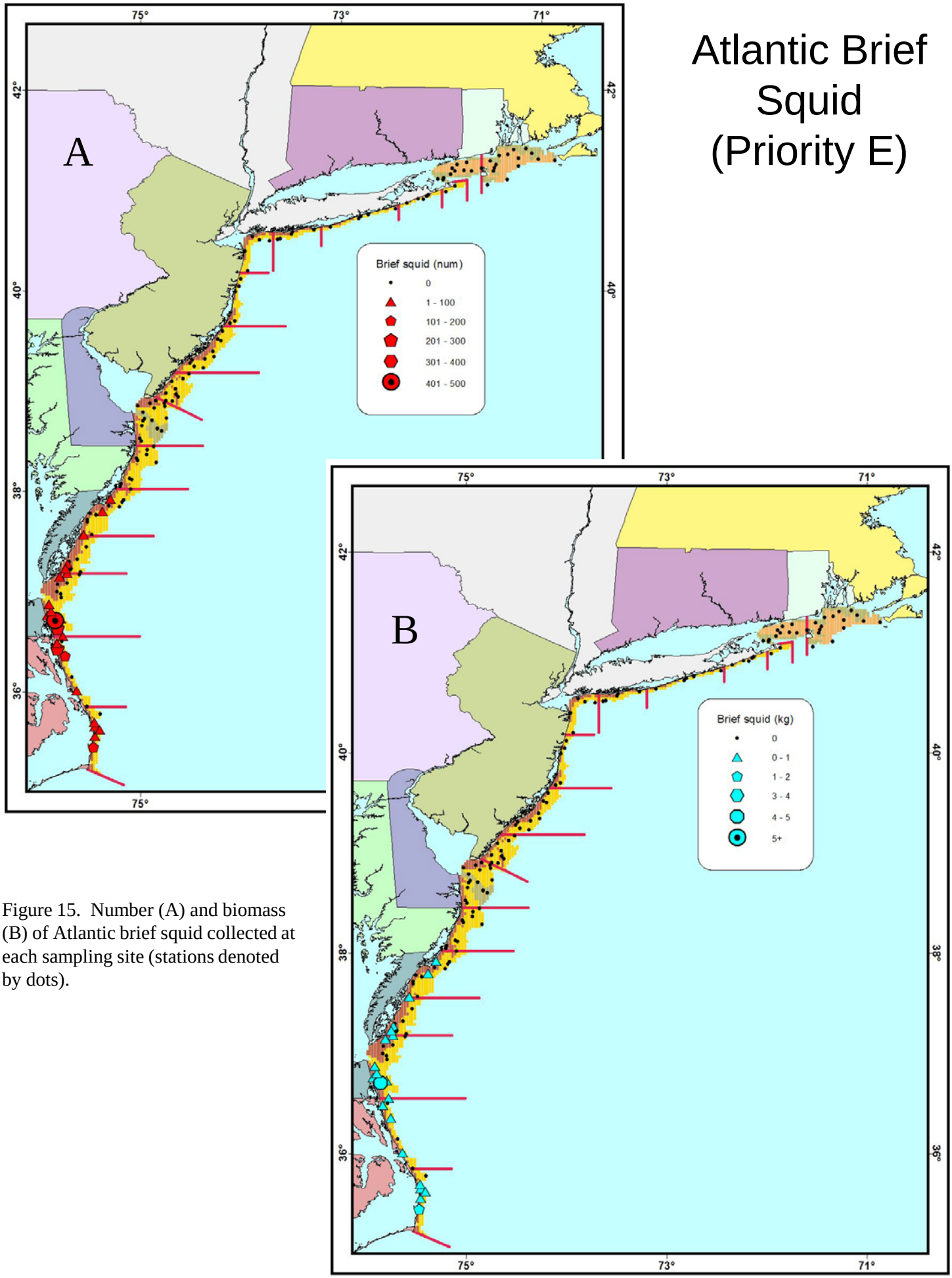


Figure 15. Number (A) and biomass (B) of Atlantic brief squid collected at each sampling site (stations denoted by dots).

Table 8. For each state, the number of sites sampled and the number at which Atlantic brief squid were collected. The number and biomass of brief squid caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum squid length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm ML)	Max. Length (mm ML)	Avg. Length (mm ML)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	15	945	10.122	0	233	18	106	53	0.011	2.12	0.15
NC	13	9	642	7.401	0	218	27	90	51	0.012	10.84	0.39
Total	150	24	1587	17.523	0	451	18	106	52	0.011	0.69	0.07

Figure 16. Geometric mean catch per area swept, by state, for Atlantic brief squid. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

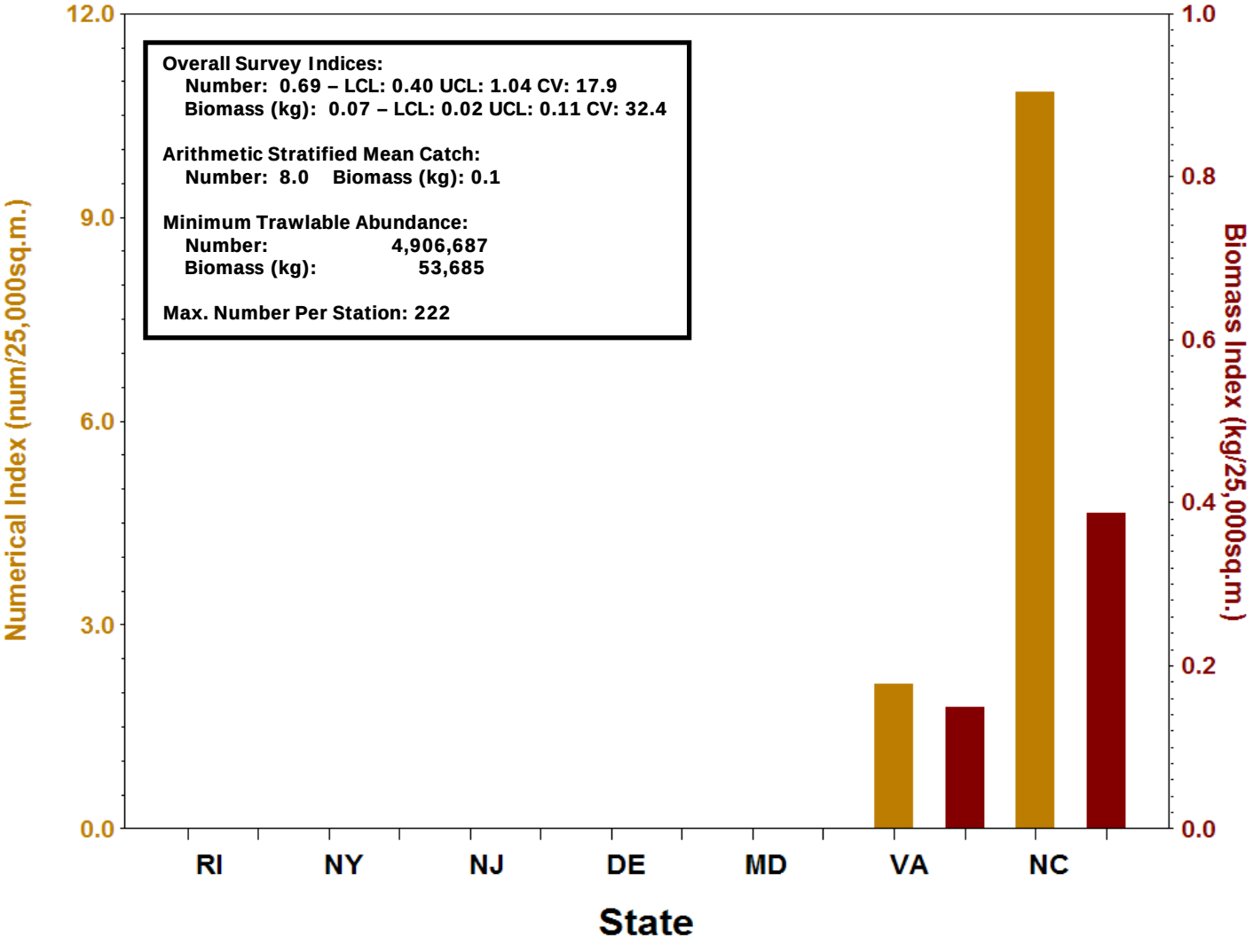
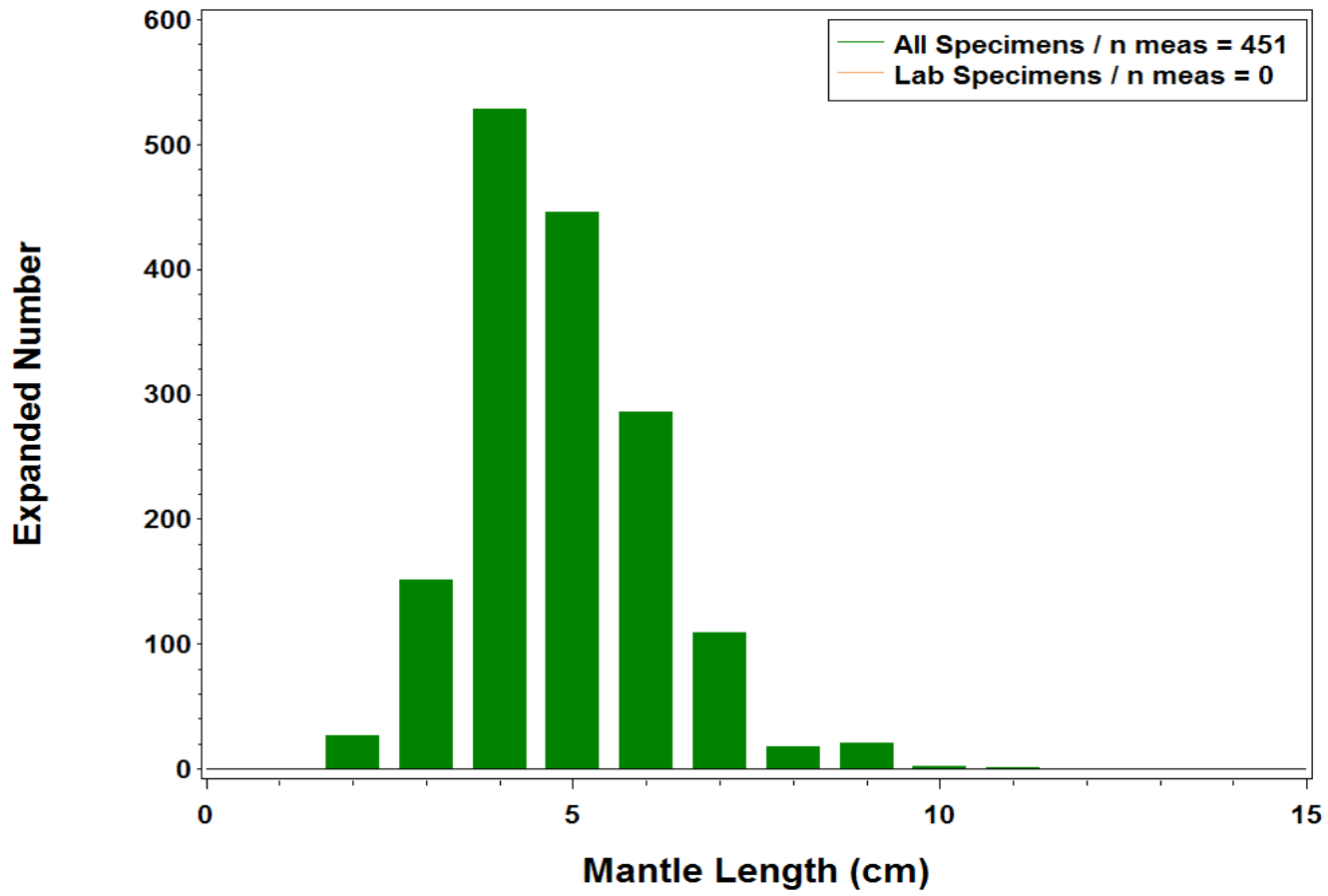


Figure 17. Length frequency histogram for Atlantic brief squid. Mantle length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Atlantic Croaker (Priority B)

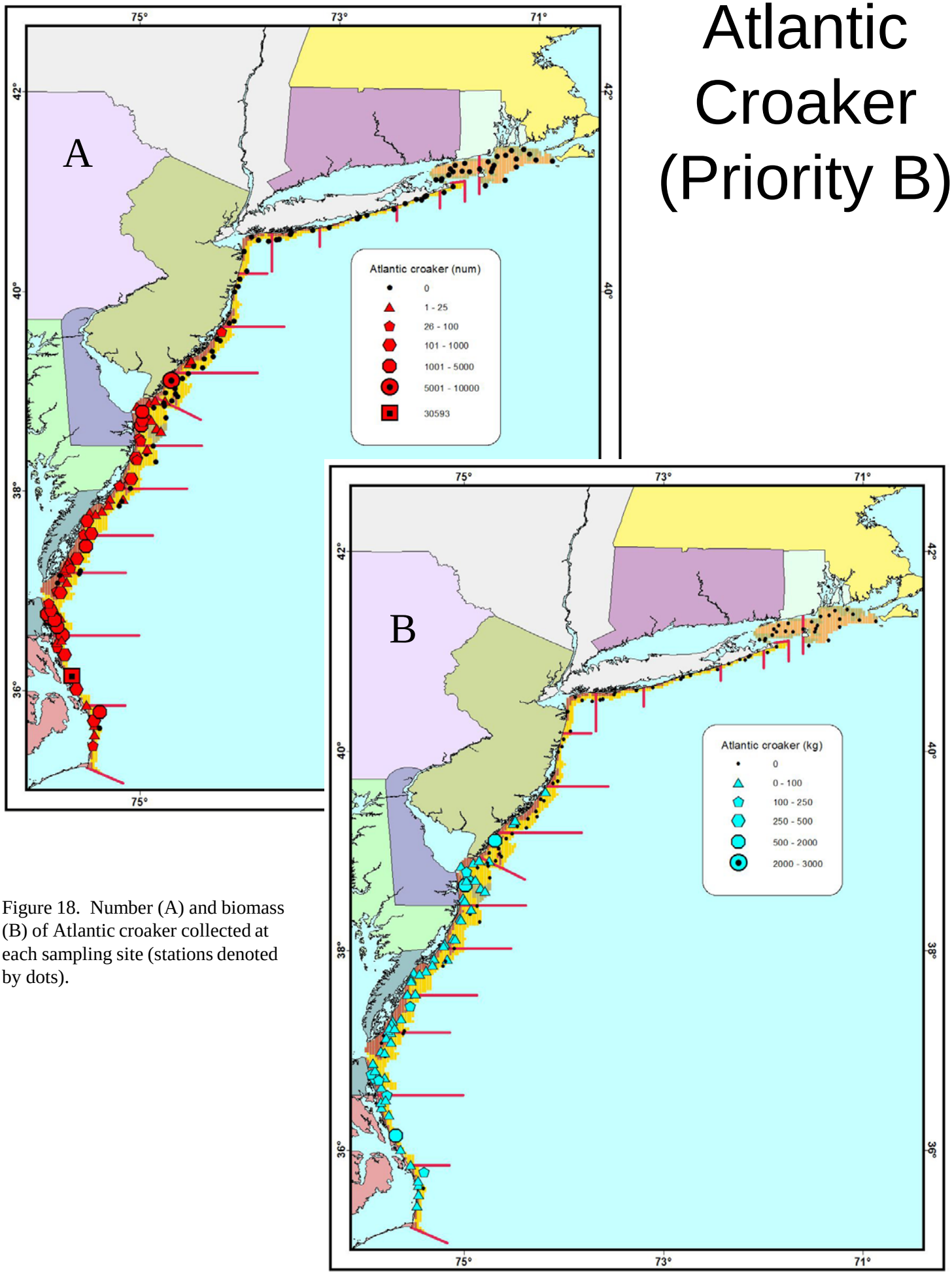


Figure 18. Number (A) and biomass (B) of Atlantic croaker collected at each sampling site (stations denoted by dots).

Table 9. For each state, the number of sites sampled and the number at which Atlantic croaker were collected. The number and biomass of croaker caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum croaker length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	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, for Atlantic croaker. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

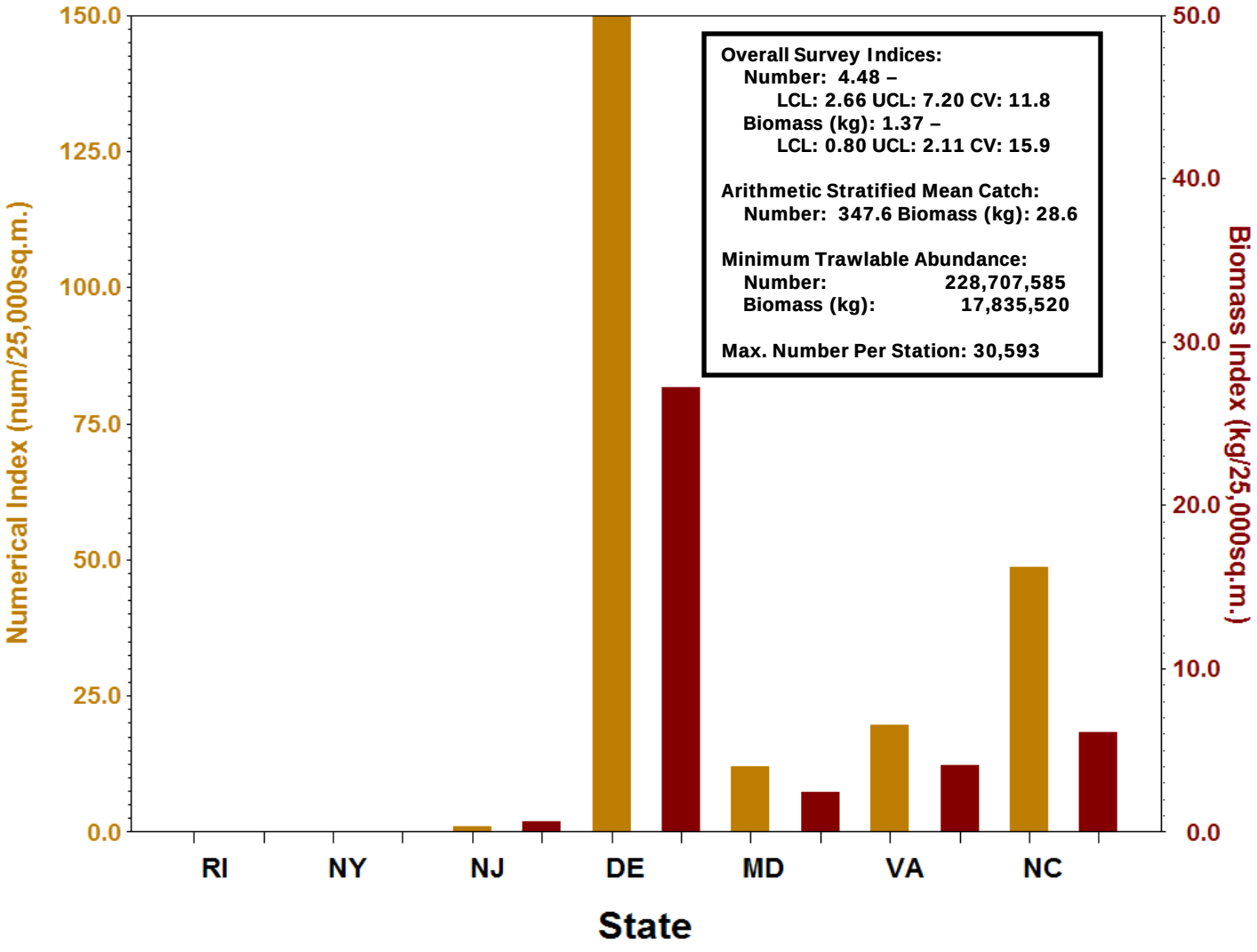


Figure 20. Length frequency histogram for Atlantic croaker. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

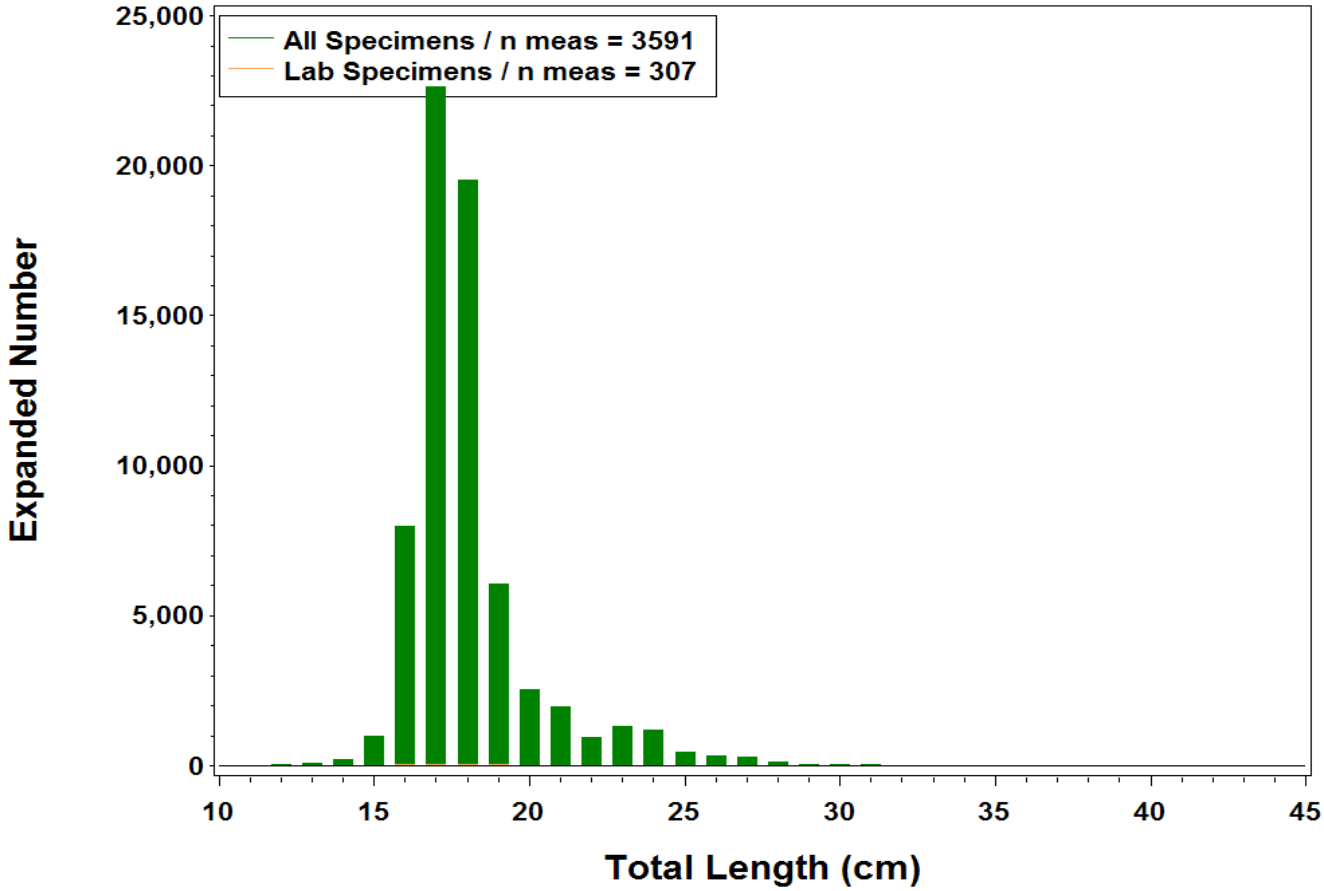


Figure 21. Sex-specific length frequency histogram for Atlantic croaker. Total length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

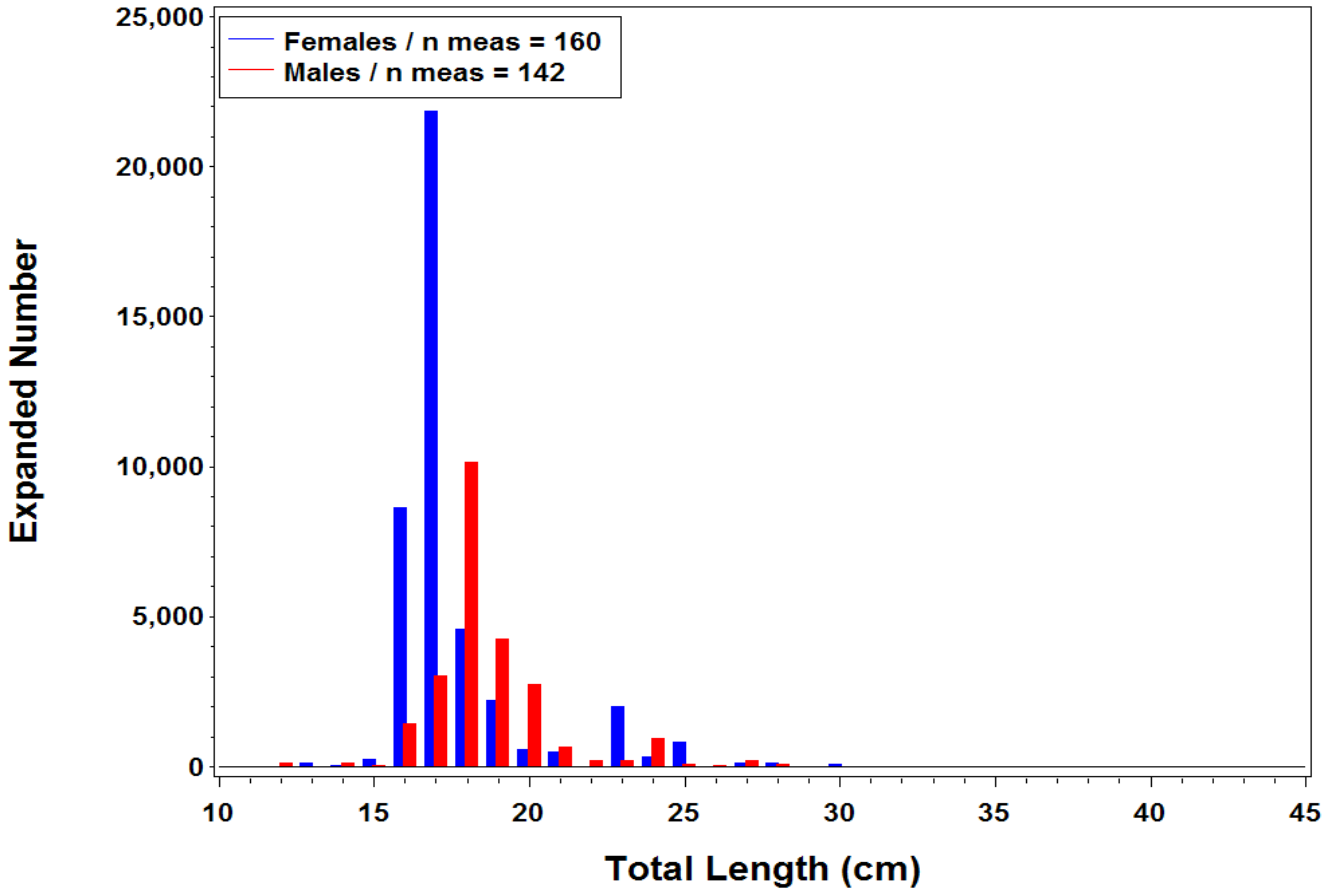
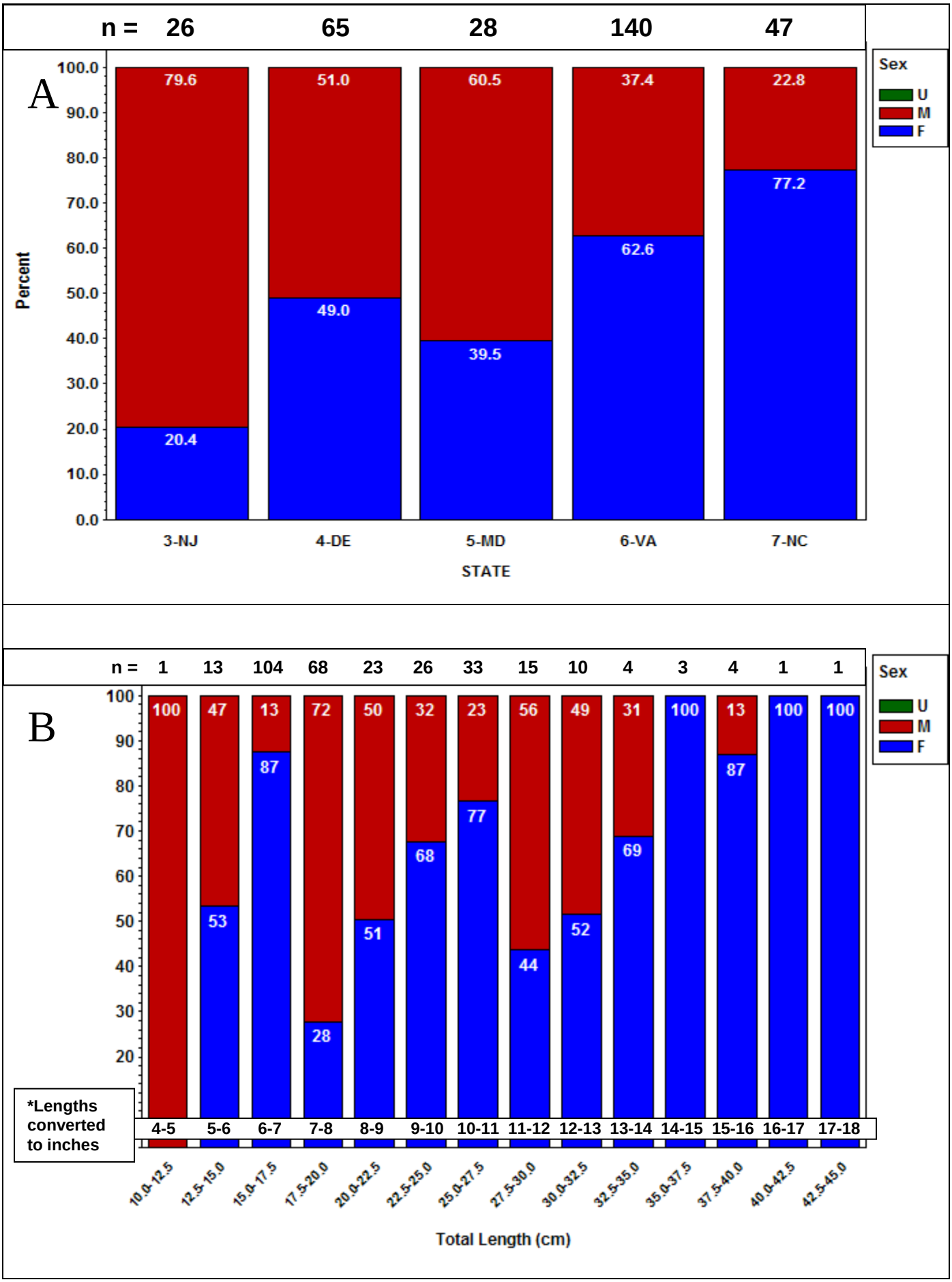


Figure 22. Sex ratios for Atlantic croaker by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Atlantic Menhaden (Priority B)

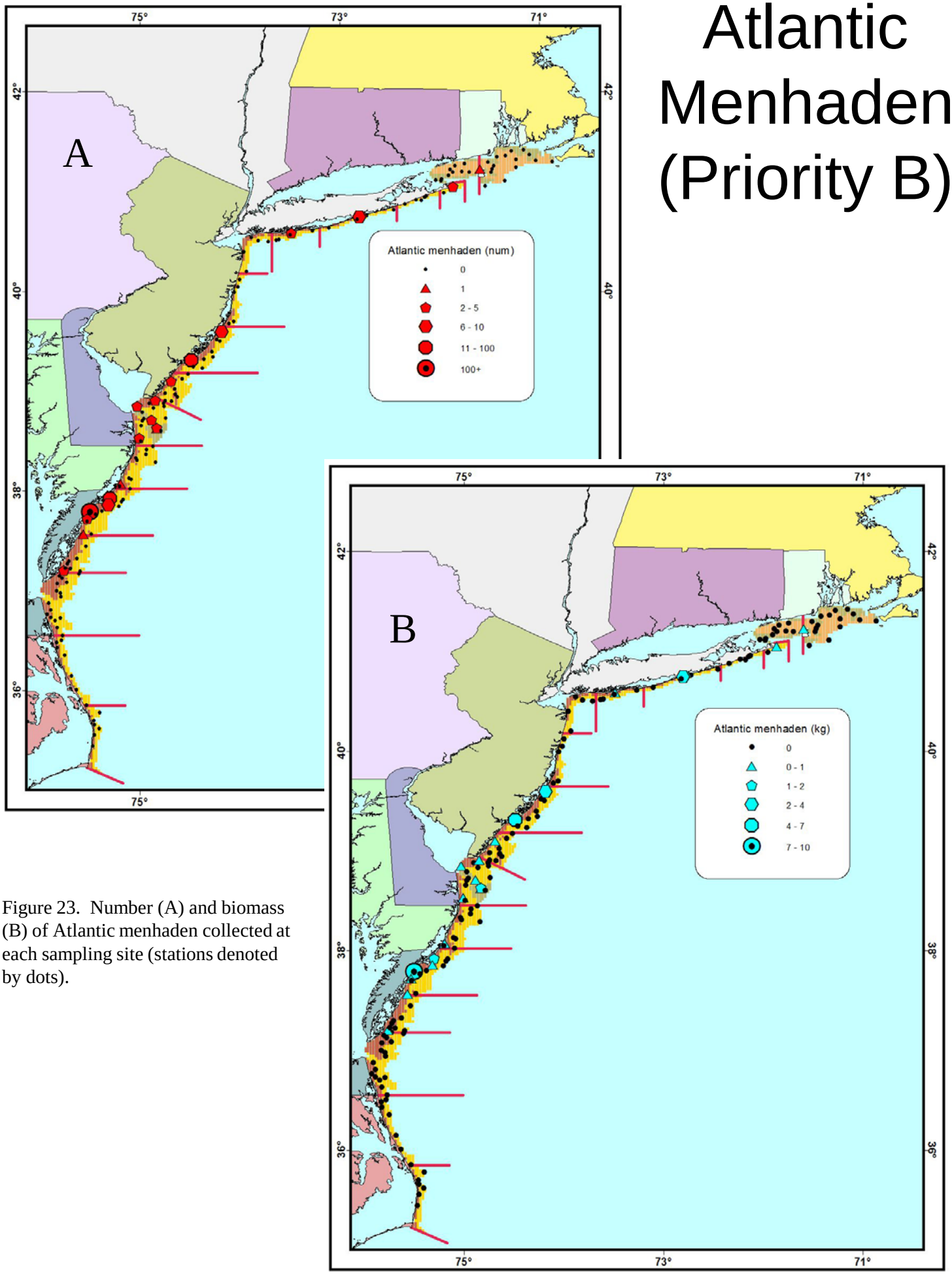


Figure 23. Number (A) and biomass (B) of Atlantic menhaden collected at each sampling site (stations denoted by dots).

Table 10. For each state, the number of sites sampled and the number at which Atlantic menhaden were collected. The number and biomass of menhaden caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum menhaden length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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	0	0	0	0	N/A	N/A	N/A	N/A	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, for Atlantic menhaden. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

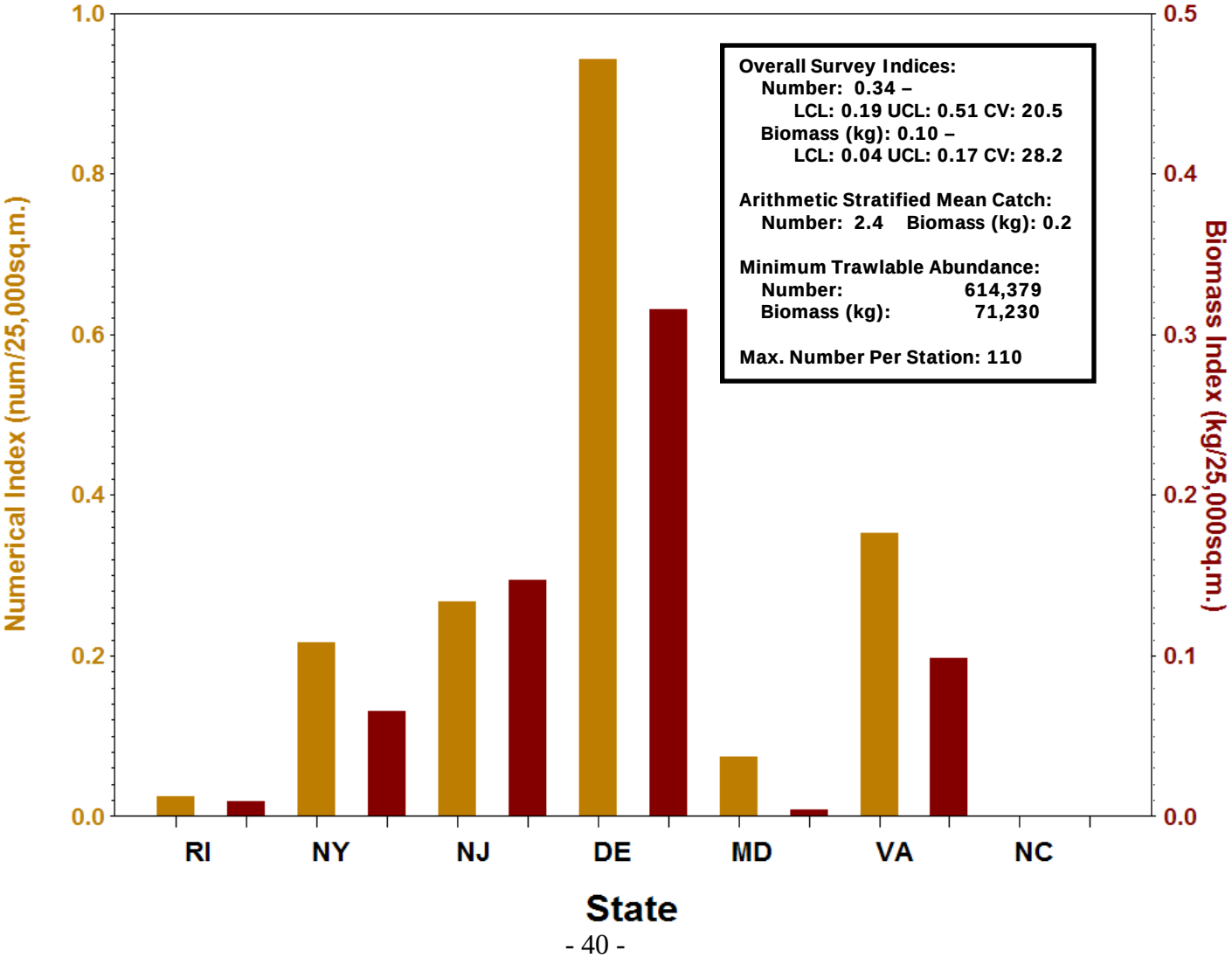


Figure 25. Length frequency histogram for Atlantic menhaden. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

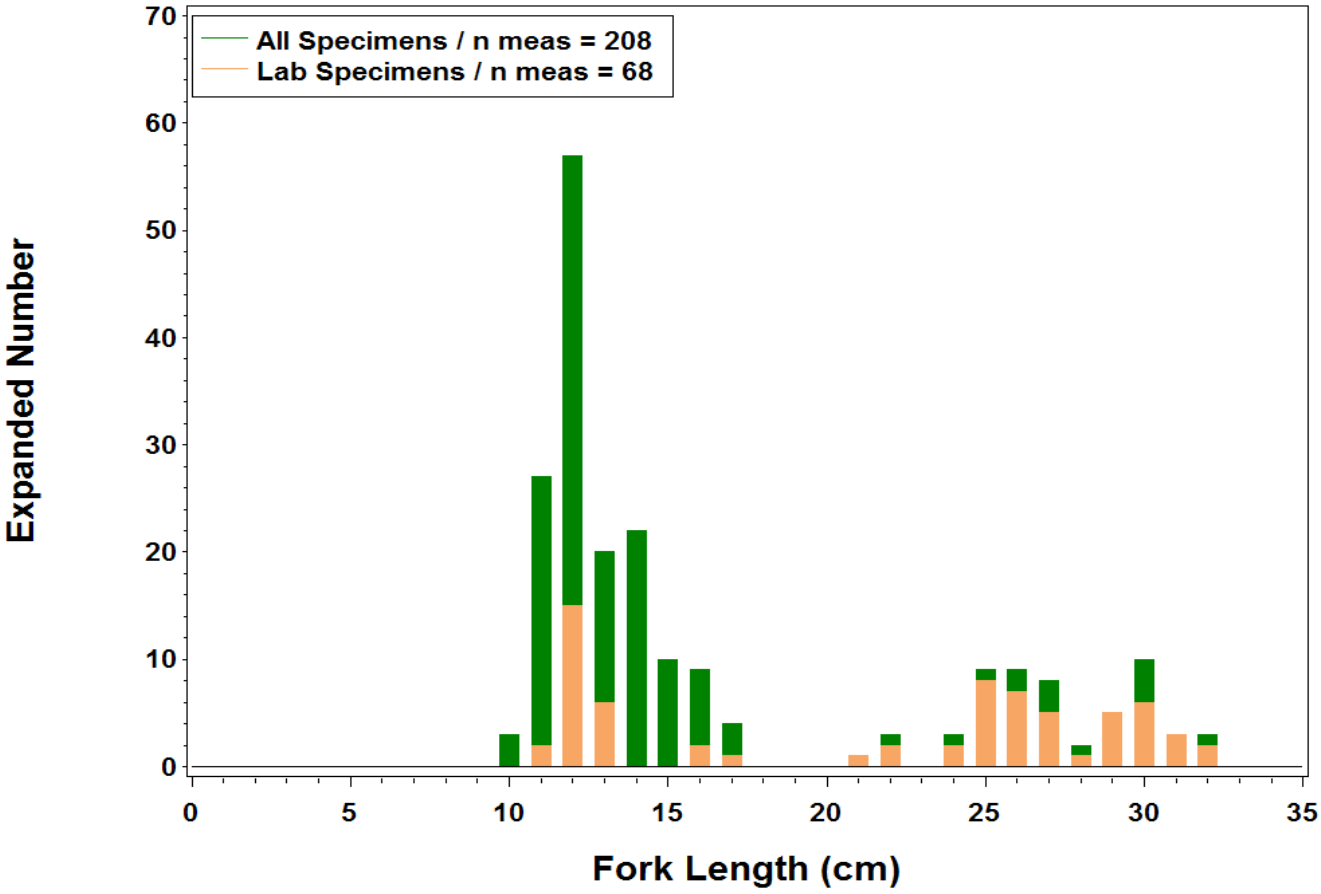


Figure 26. Sex-specific length frequency histogram for Atlantic menhaden. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

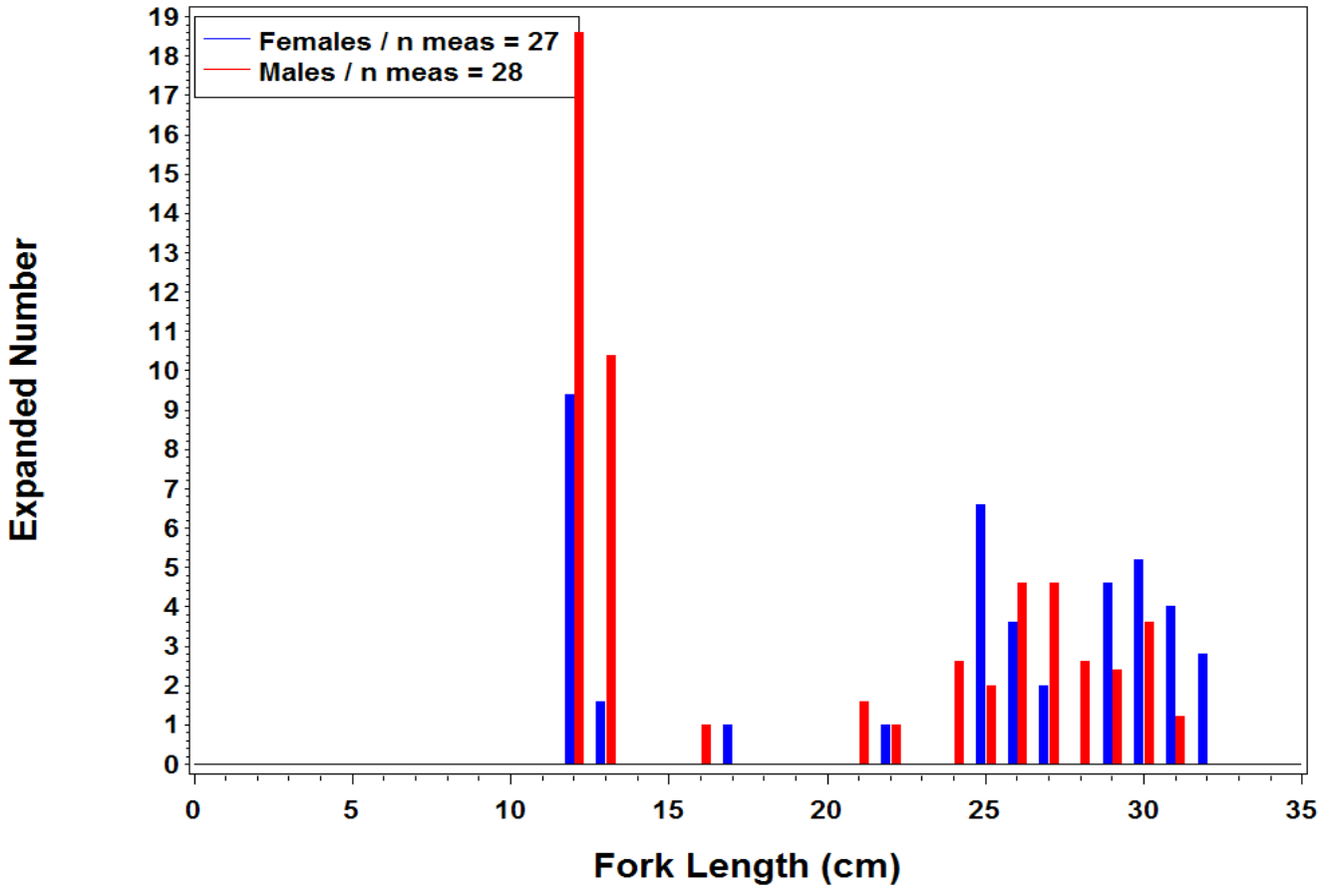
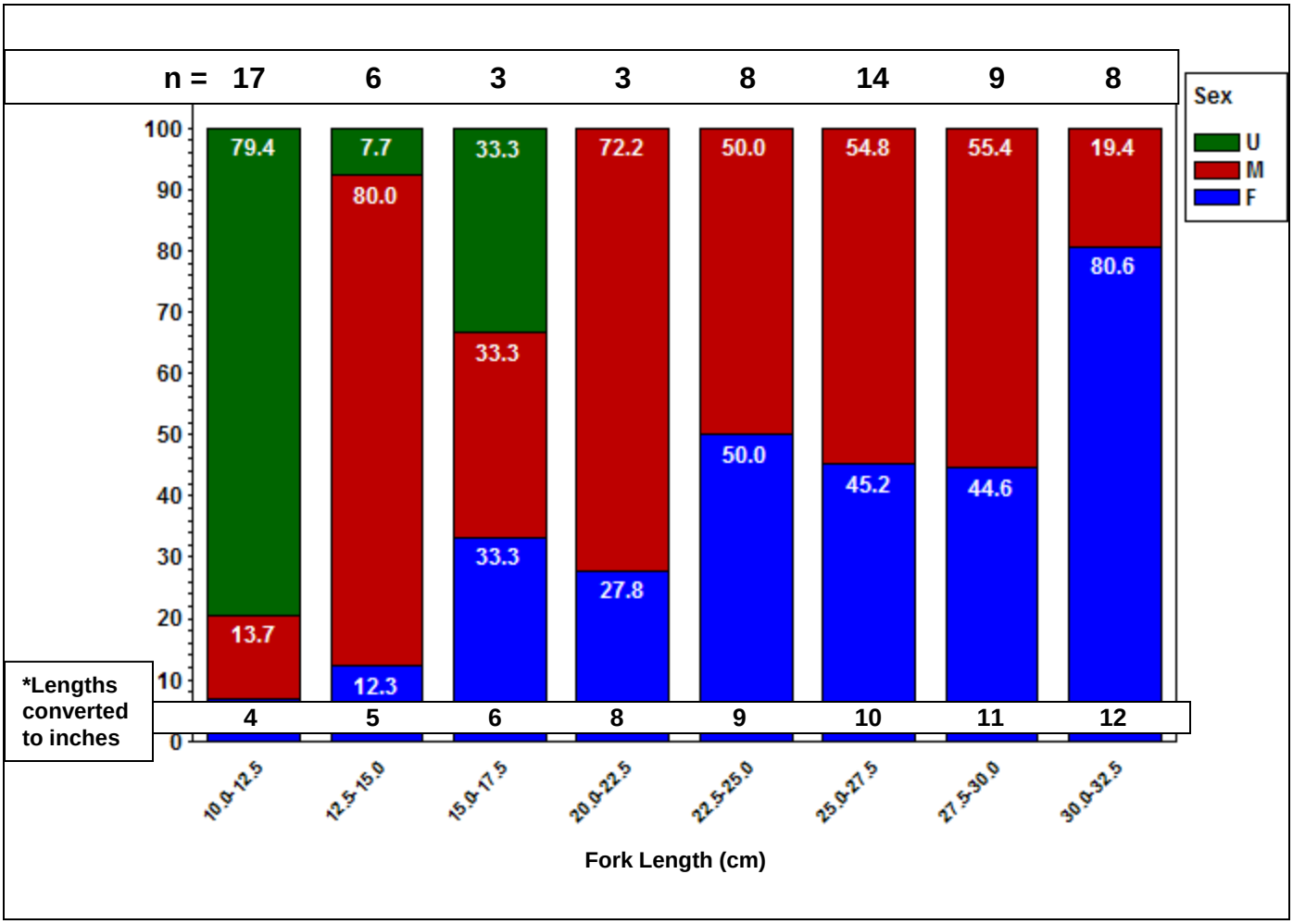


Figure 27. Sex ratios for Atlantic menhaden by length group. Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Atlantic Spadefish (Priority D)

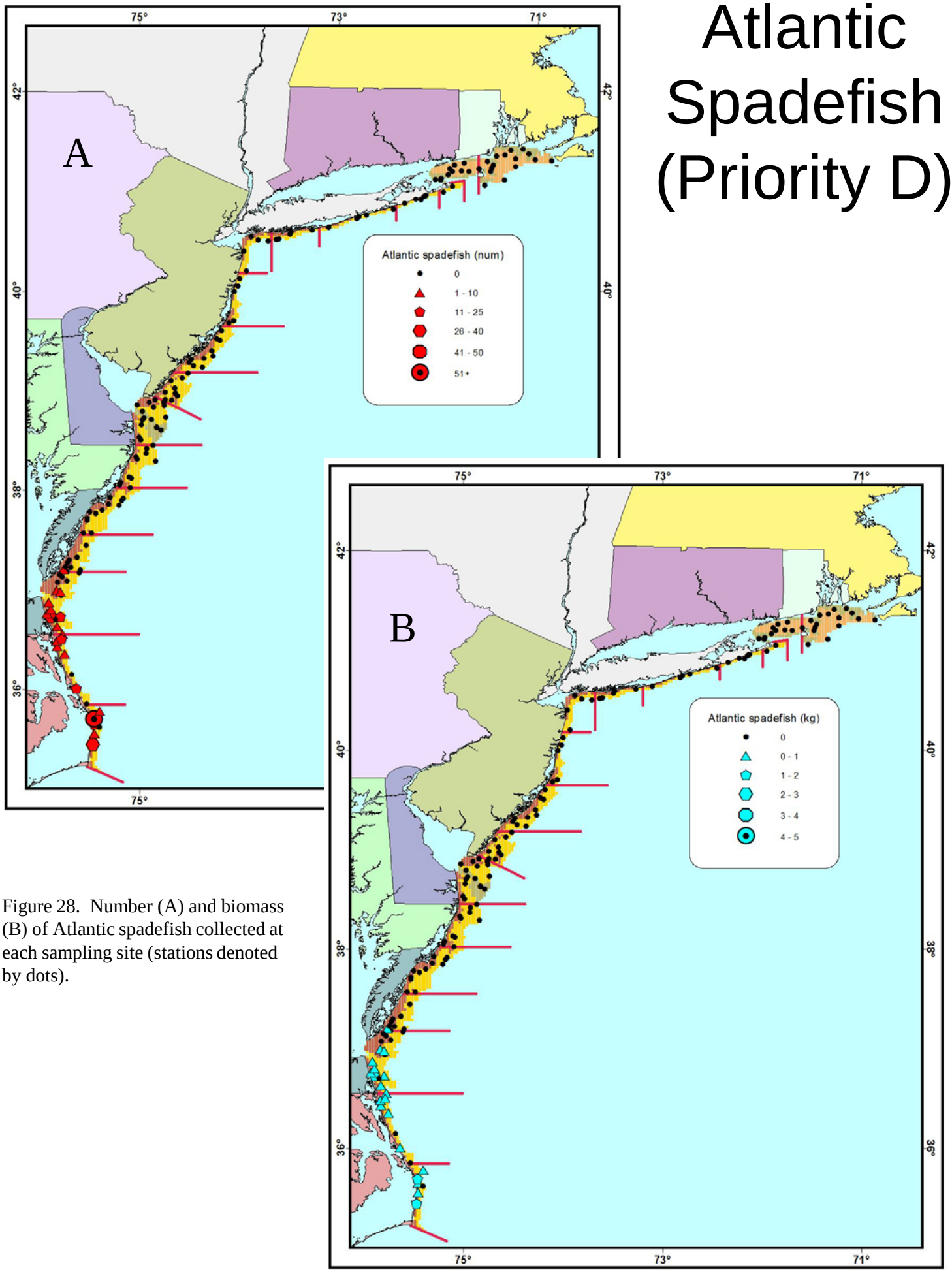


Figure 28. Number (A) and biomass (B) of Atlantic spadefish collected at each sampling site (stations denoted by dots).

Table 11. For each state, the number of sites sampled and the number at which Atlantic spadefish were collected. The number and biomass of spadefish caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum spadefish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	10	86	2.775	0	52	59	108	91	0.032	0.63	0.06
NC	13	10	145	5.197	0	145	68	117	93	0.036	4.69	0.33
Total	150	20	231	7.972	0	197	59	117	93	0.035	0.29	0.04

Figure 29. Geometric mean catch per area swept, by state, for Atlantic spadefish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

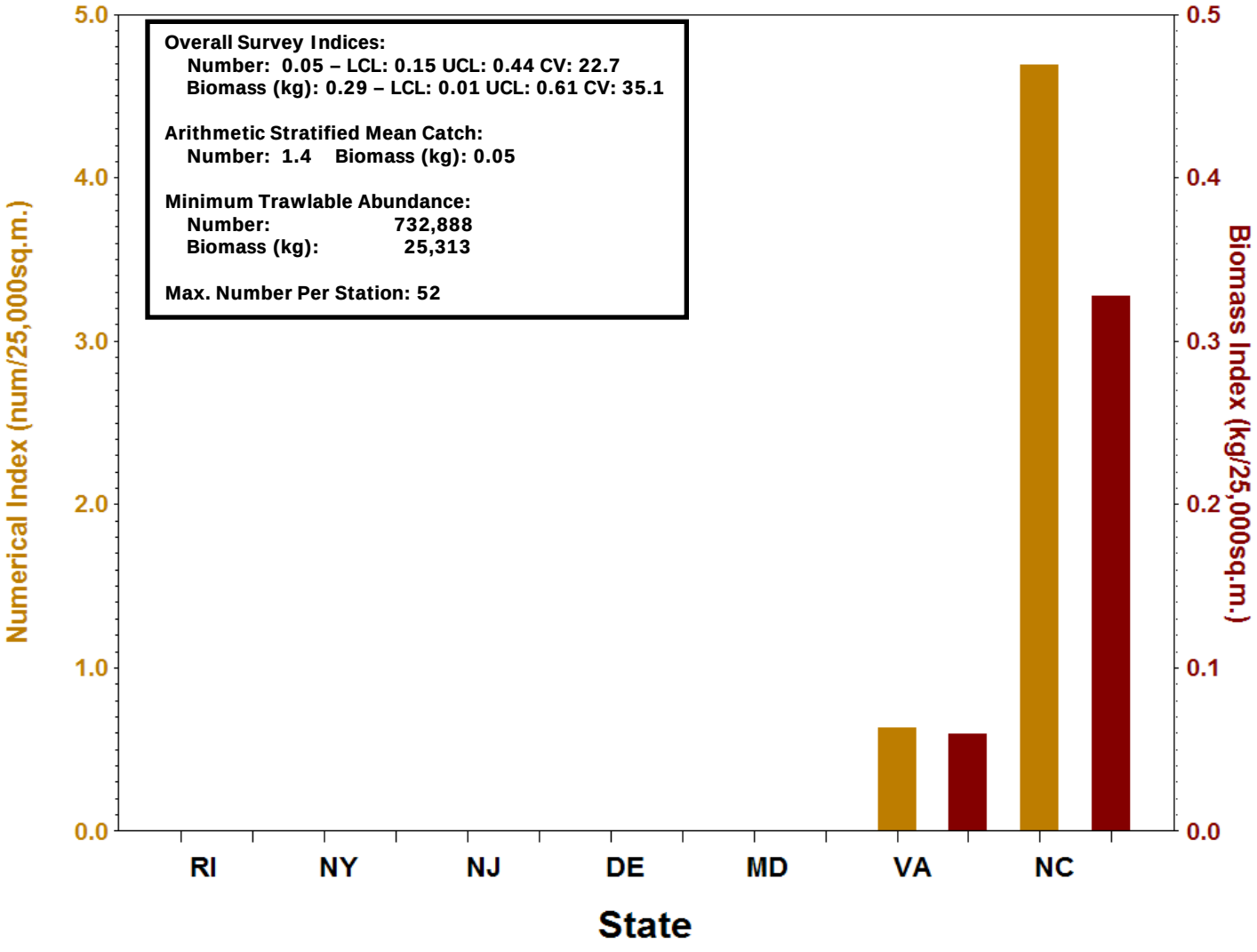
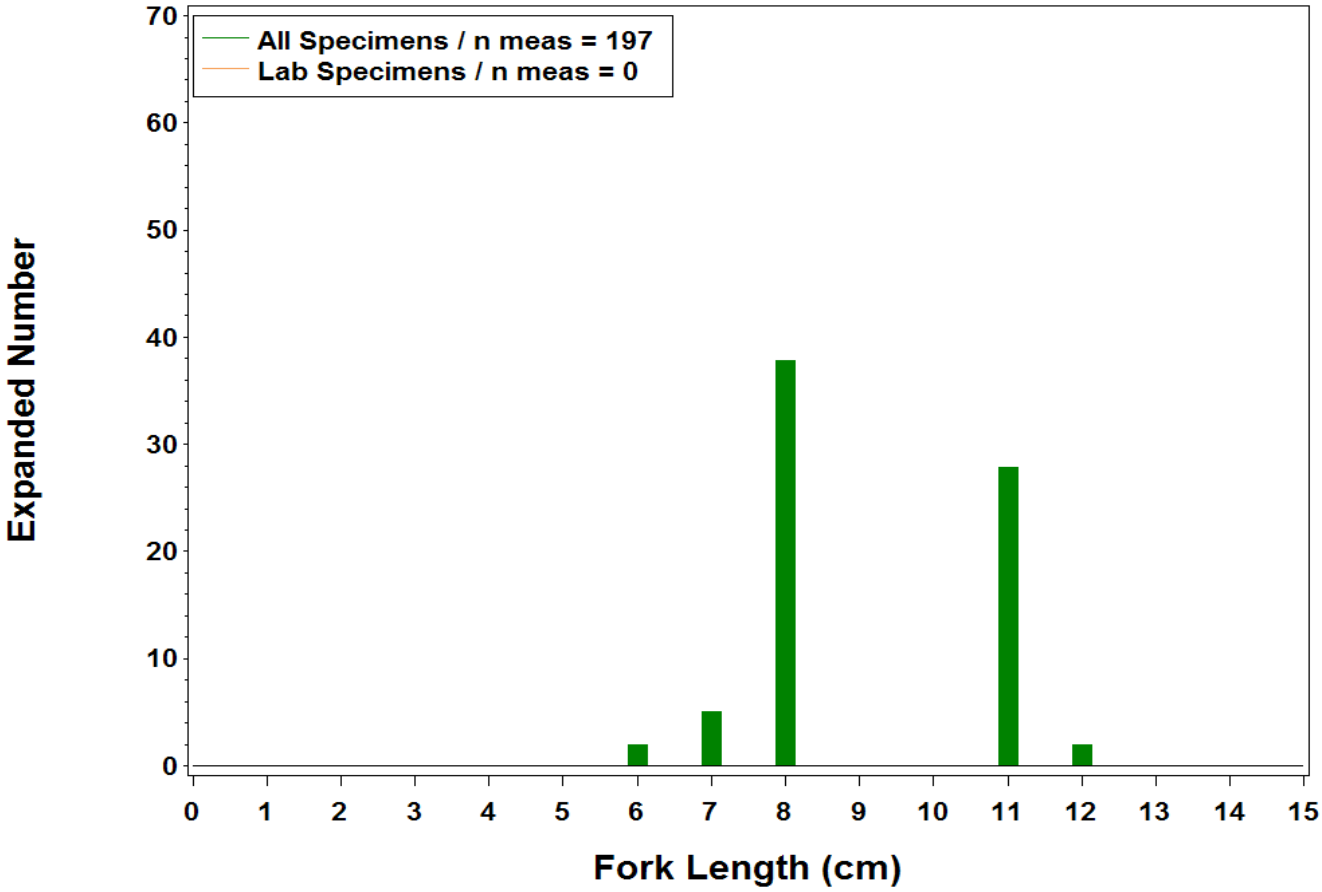


Figure 30. Length frequency histogram for Atlantic spadefish. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Atlantic Thread Herring (Priority D)

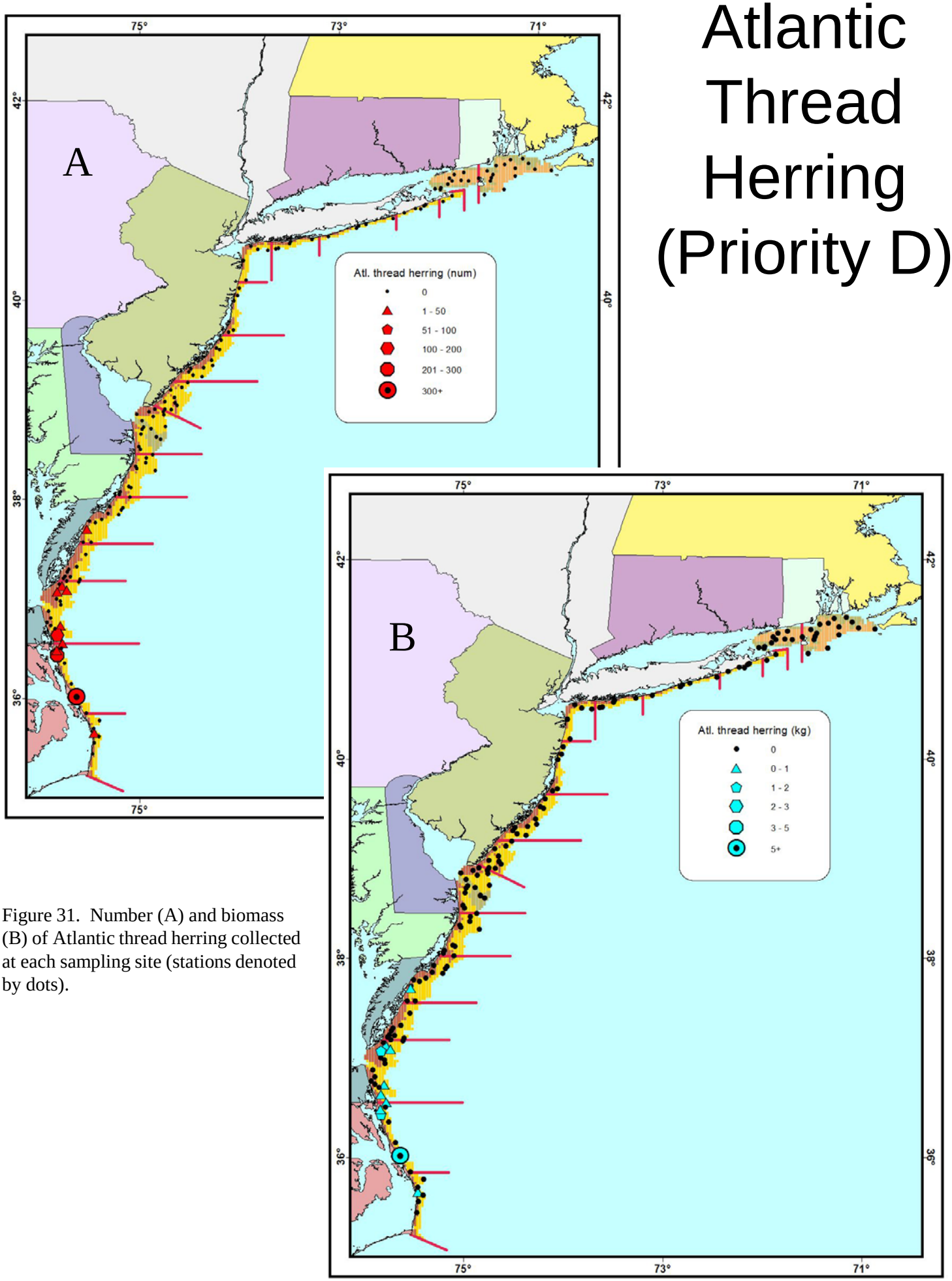


Figure 31. Number (A) and biomass (B) of Atlantic thread herring collected at each sampling site (stations denoted by dots).

Table 12. For each state, the number of sites sampled and the number at which Atlantic thread herring were collected. The number and biomass of thread herring caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum thread herring length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	7	156	3.288	0	85	59	241	102	0.021	0.40	0.06
NC	13	4	645	8.726	0	207	57	179	78	0.014	2.18	0.29
Total	150	11	801	12.014	0	292	57	241	85	0.015	0.26	0.04

Figure 32. Geometric mean catch per area swept, by state, for Atlantic thread herring. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

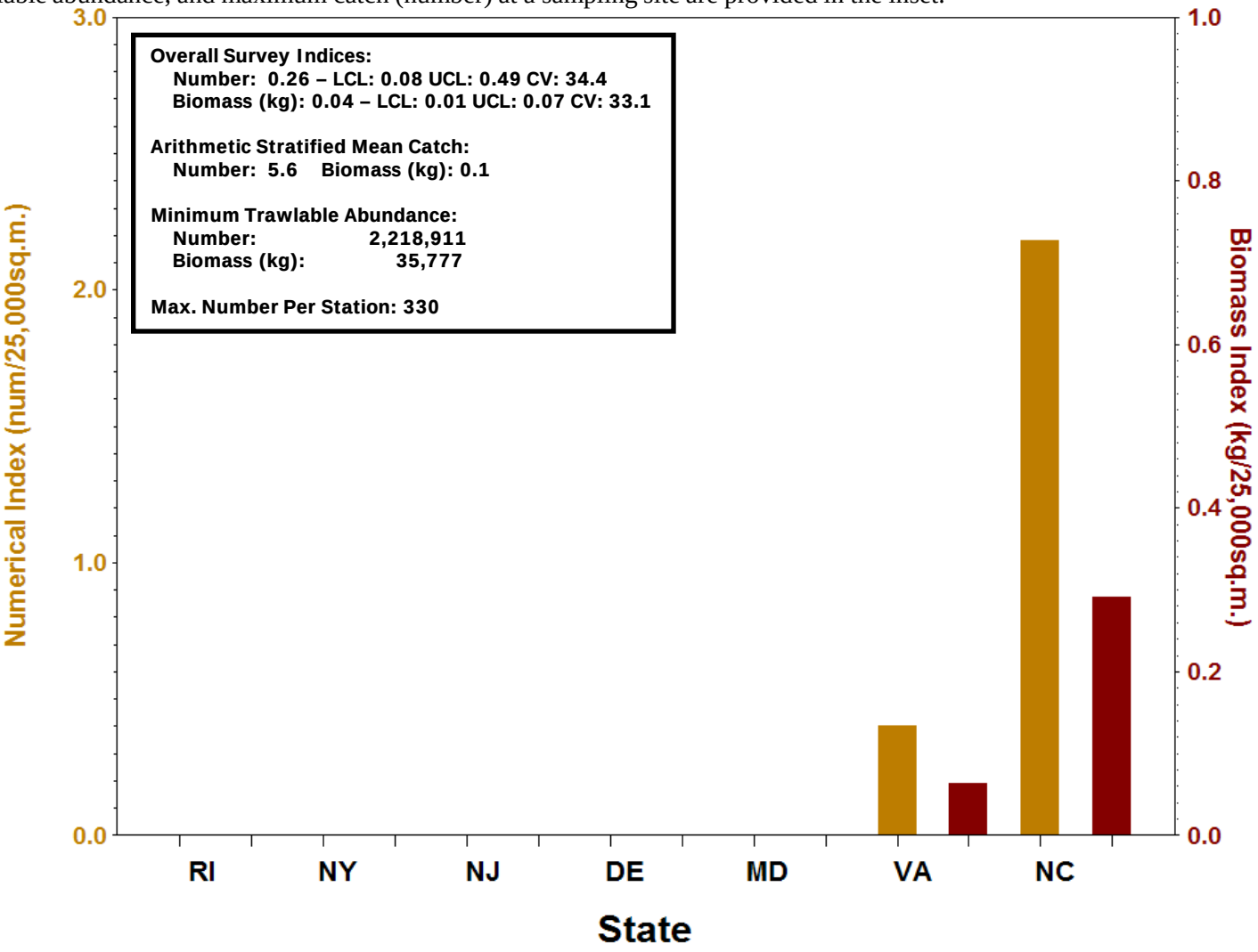
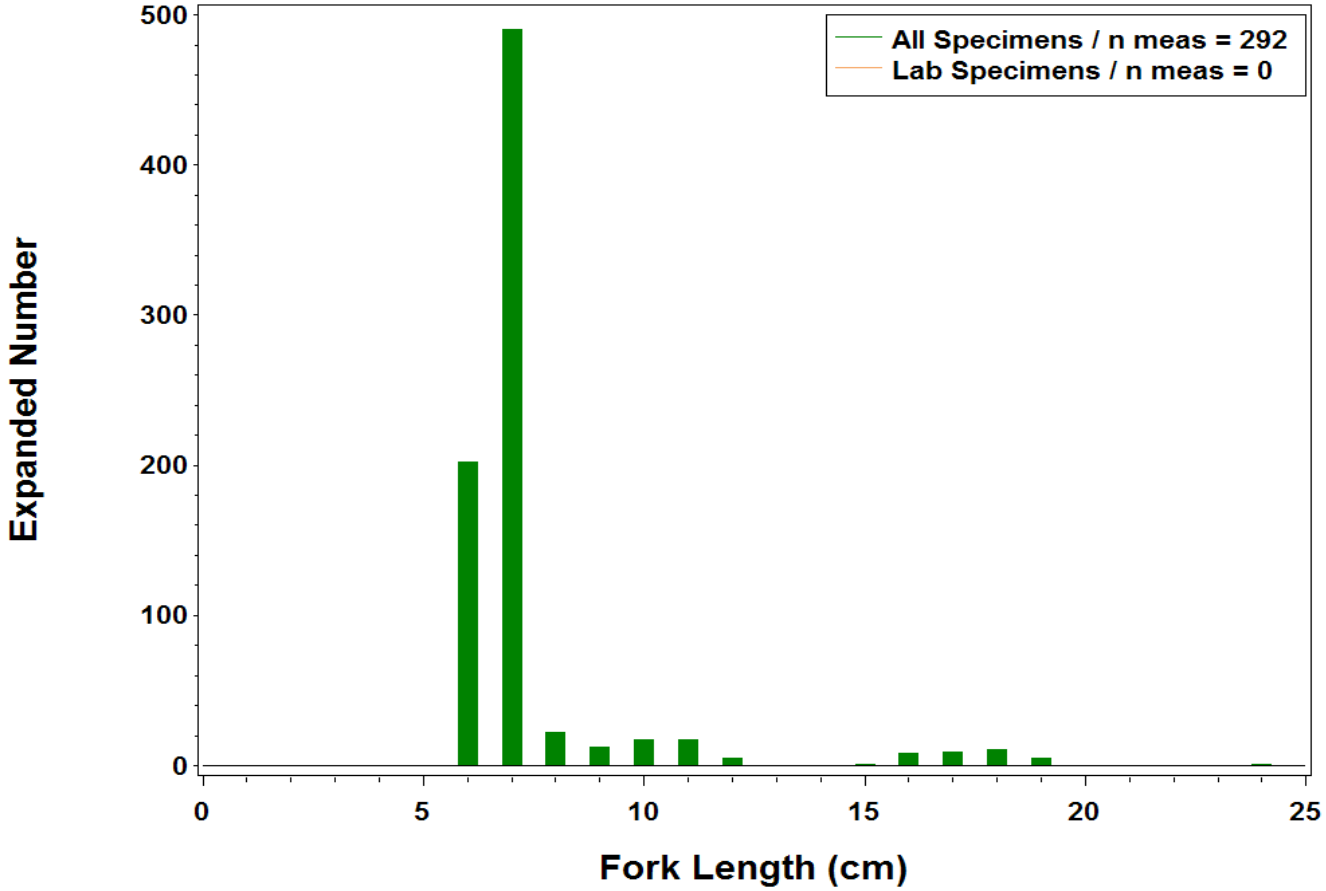


Figure 33. Length frequency histogram for Atlantic thread herring. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Bay Anchovy (Priority D)

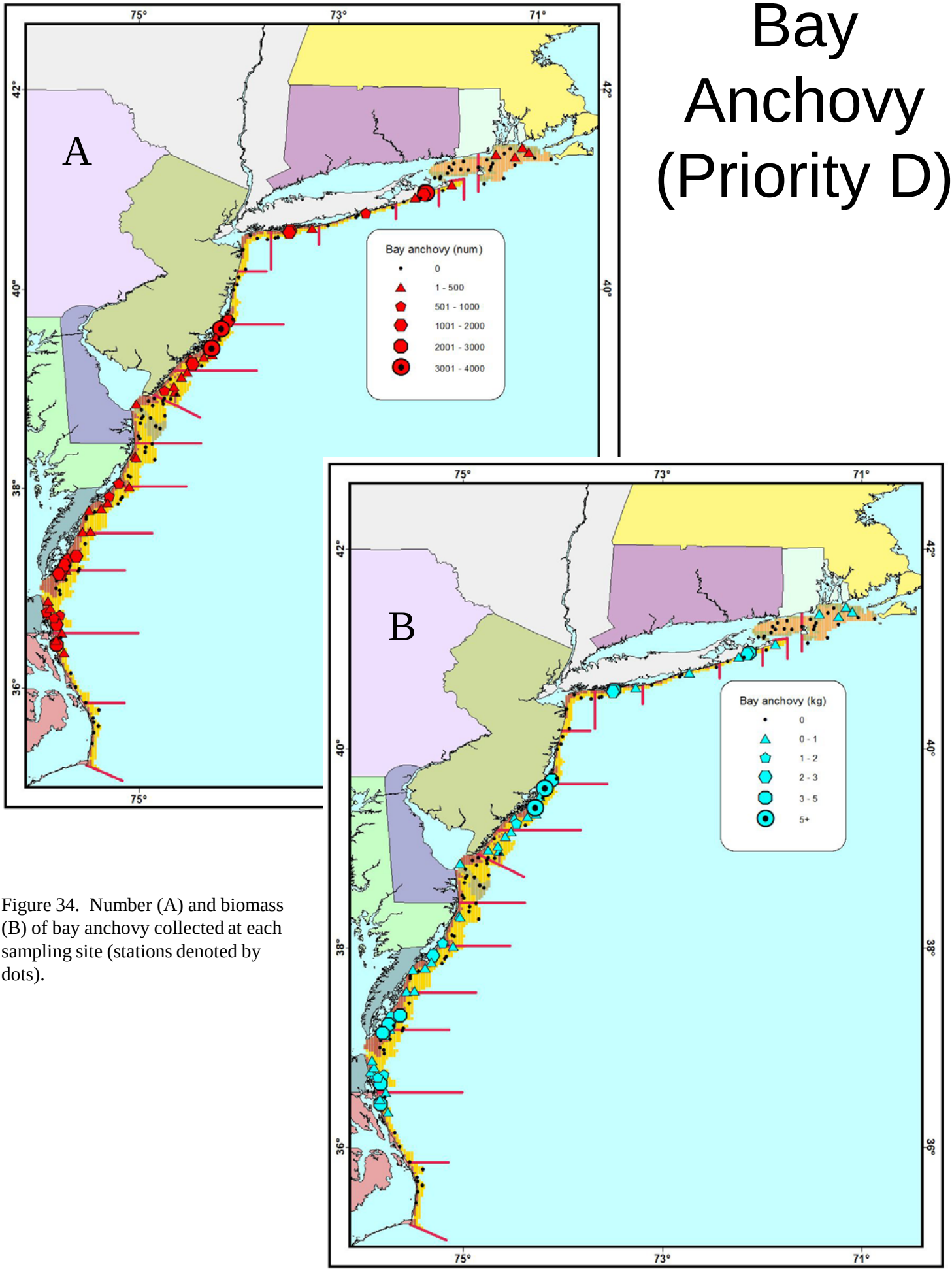


Figure 34. Number (A) and biomass (B) of bay anchovy collected at each sampling site (stations denoted by dots).

Table 13. For each state, the number of sites sampled and the number at which bay anchovy were collected. The number and biomass of anchovy caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum anchovy length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	4	127	0.226	0	127	43	86	62	0.002	0.60	0.01
NY	22	8	8832	13.698	0	514	33	97	66	0.002	4.91	0.26
NJ	24	13	10643	21.434	0	491	38	94	66	0.002	12.08	0.36
DE	17	1	1	0.001	0	1	50	50	50	0.001	0.05	0.00
MD	10	4	1372	3.110	0	128	47	87	64	0.002	9.60	0.26
VA	38	22	12072	29.465	0	958	40	96	63	0.002	20.88	0.48
NC	13	3	2311	4.663	0	80	40	77	58	0.002	2.09	0.14
Total	150	55	35358	72.597	0	2299	33	97	64	0.002	8.84	0.32

Figure 35. Geometric mean catch per area swept, by state, for bay anchovy. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

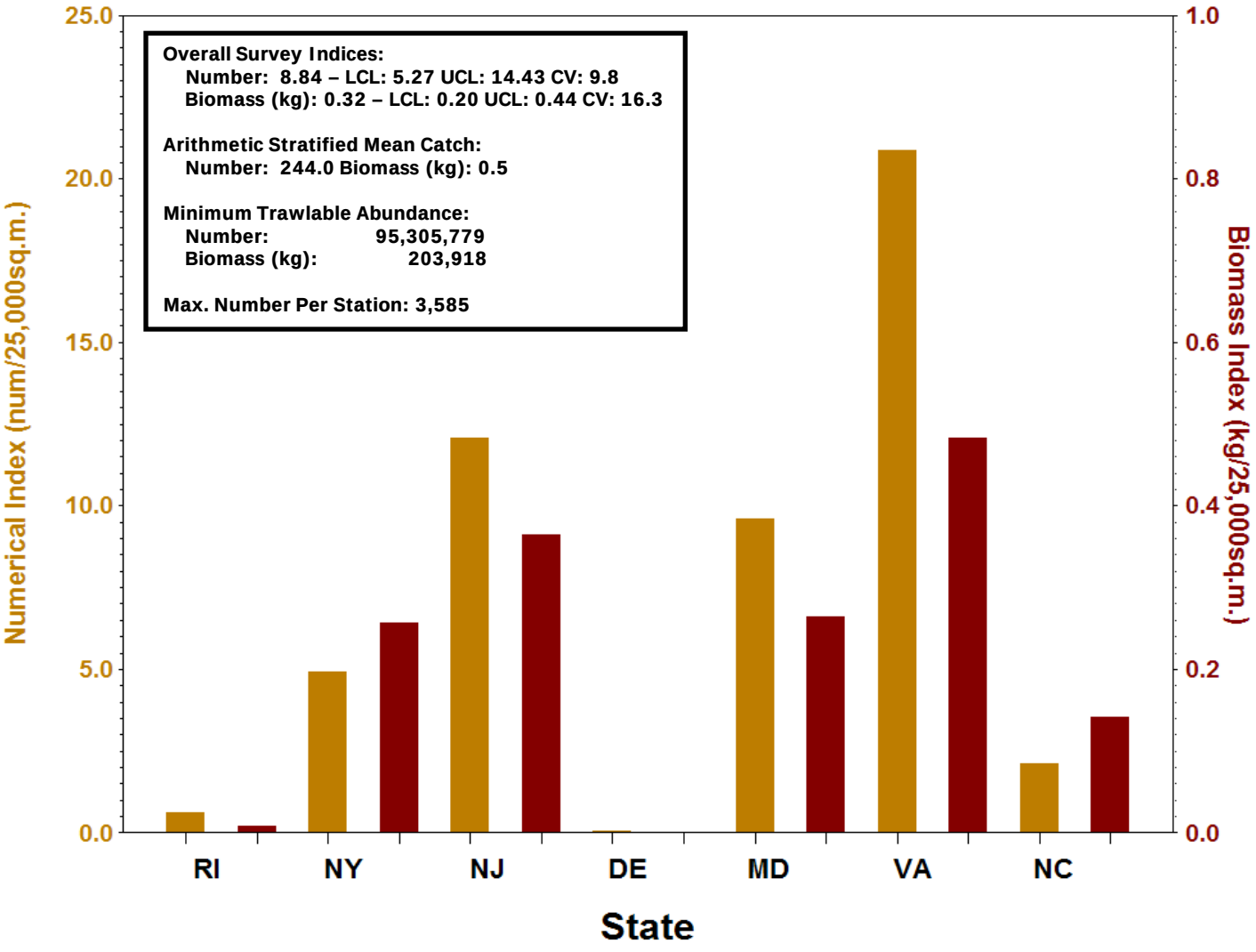
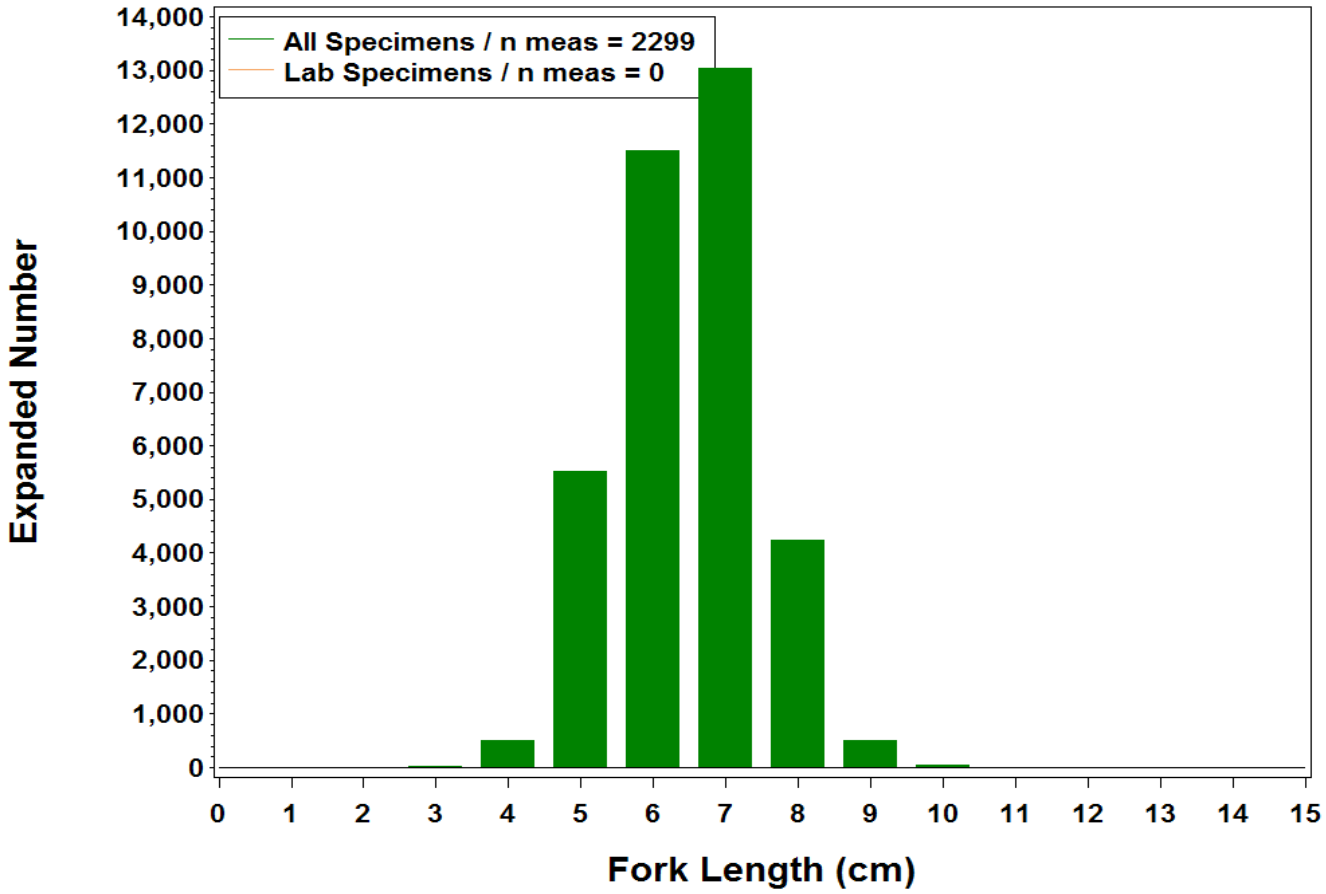


Figure 36. Length frequency histogram for bay anchovy. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Black Sea Bass (Priority A)

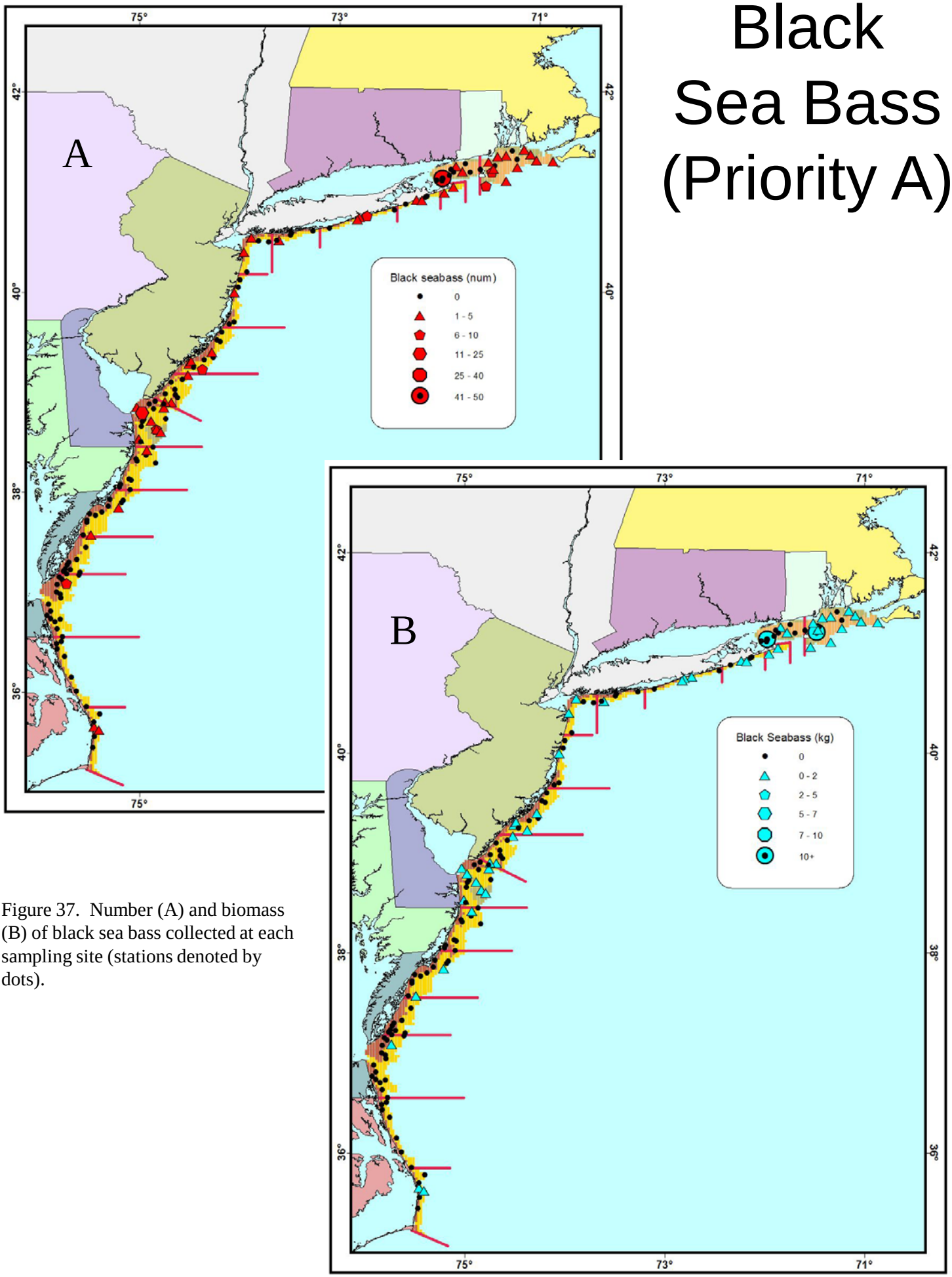


Figure 37. Number (A) and biomass (B) of black sea bass collected at each sampling site (stations denoted by dots).

Table 14. For each state, the number of sites sampled and the number at which black sea bass were collected. The number and biomass of sea bass caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum sea bass length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	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, for black sea bass. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

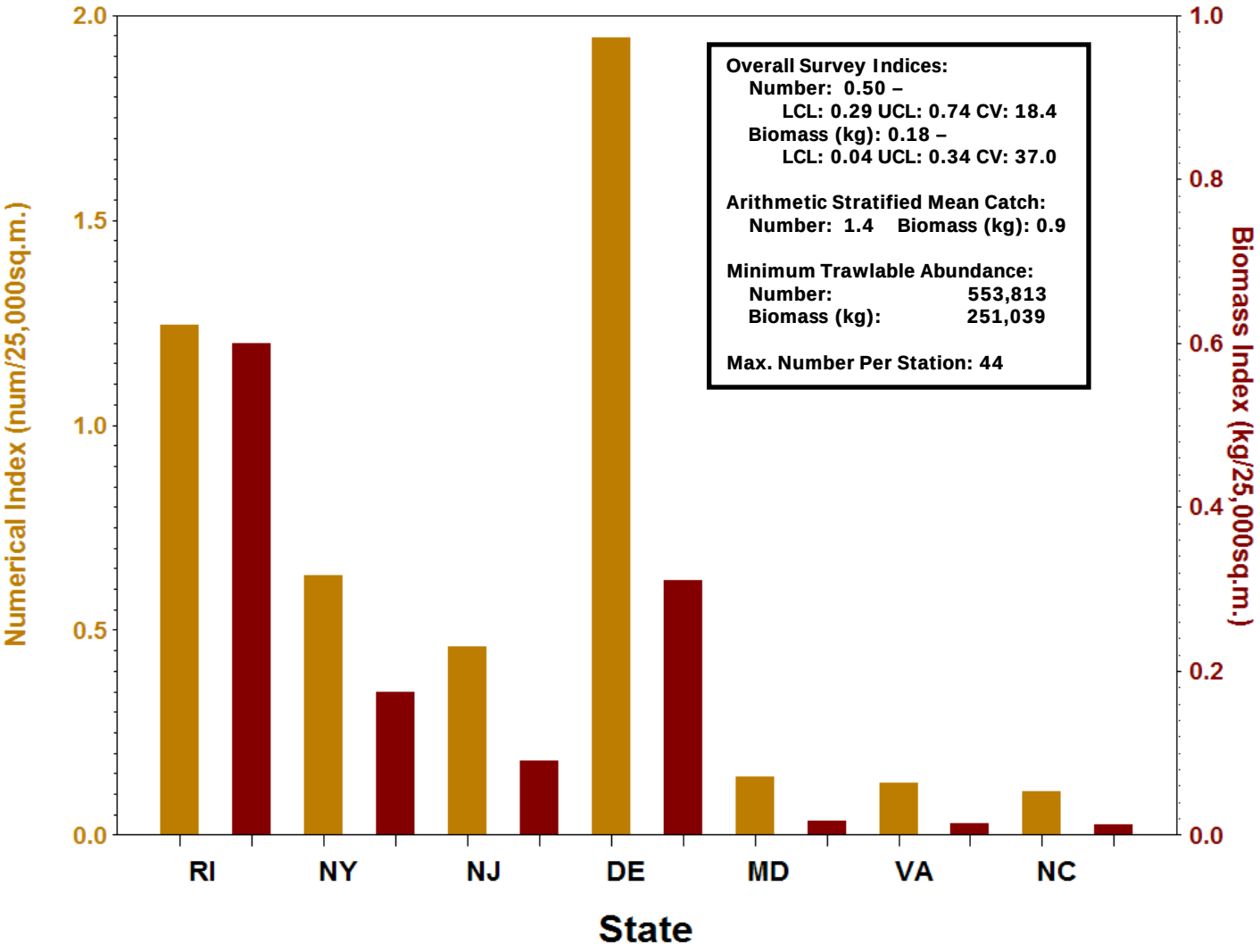


Figure 39. Length frequency histogram for black sea bass. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

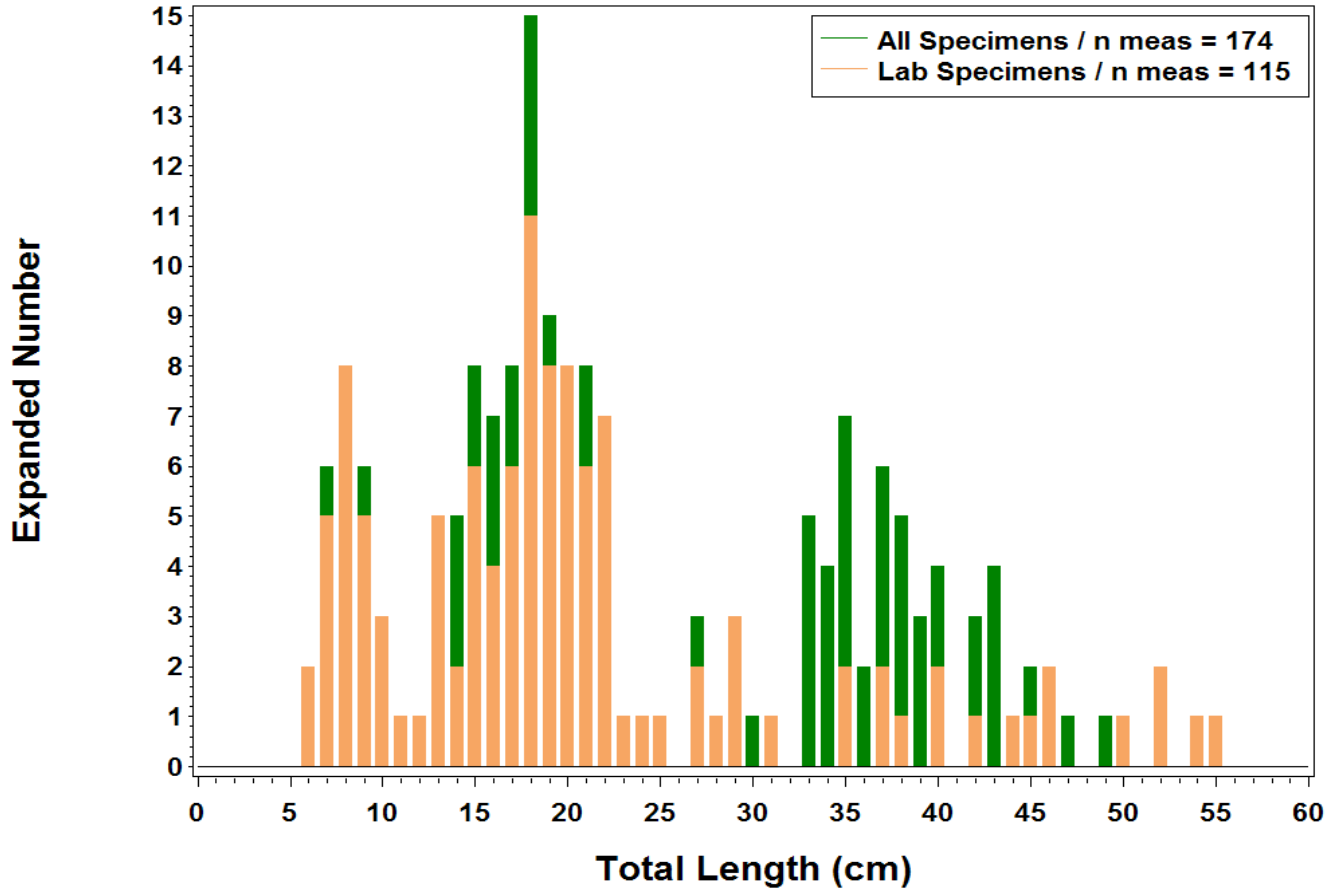


Figure 40. Sex-specific length frequency histogram for black sea bass. Total length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

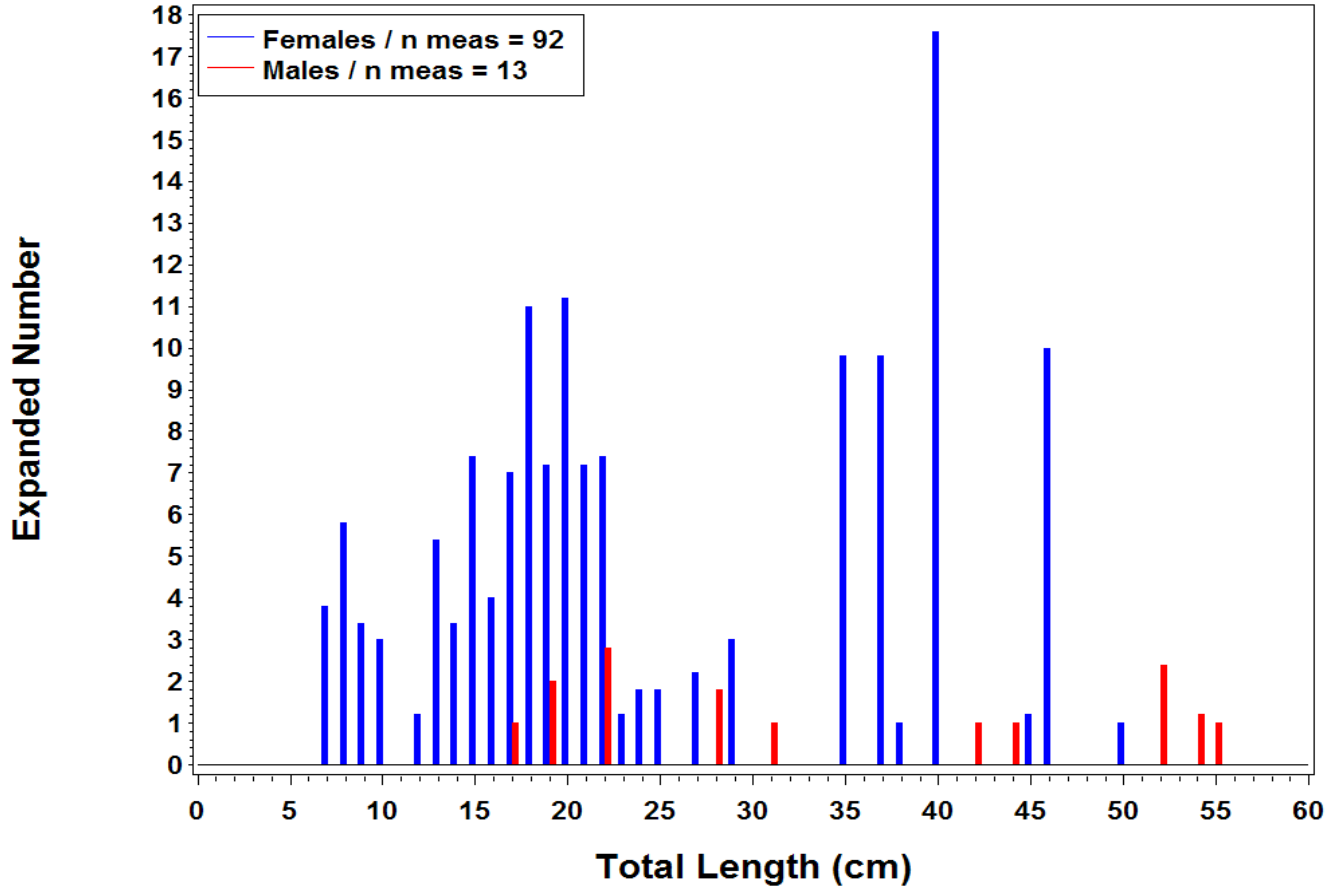
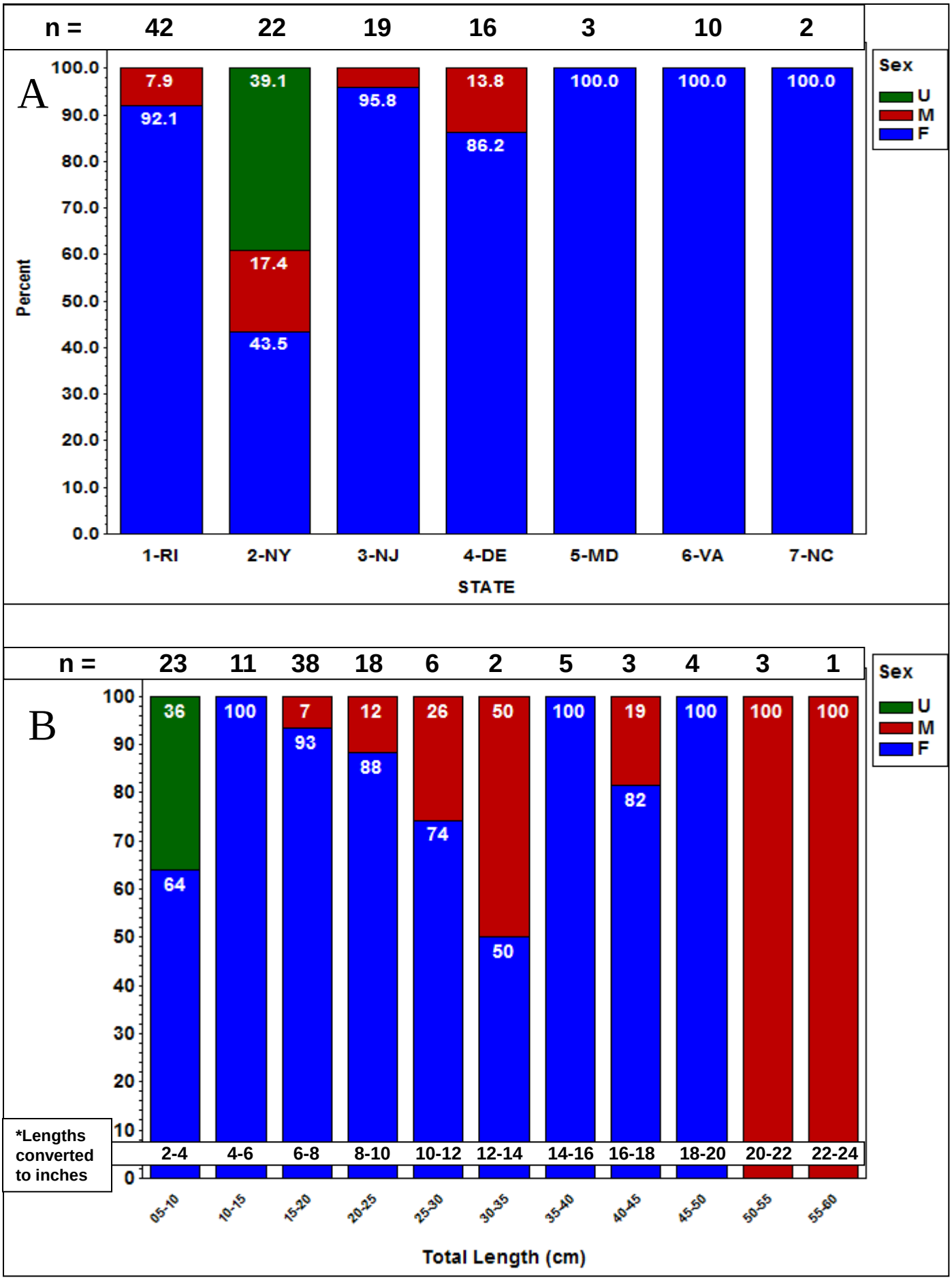


Figure 41. Sex ratios for black sea bass by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Bluefish (Priority A)

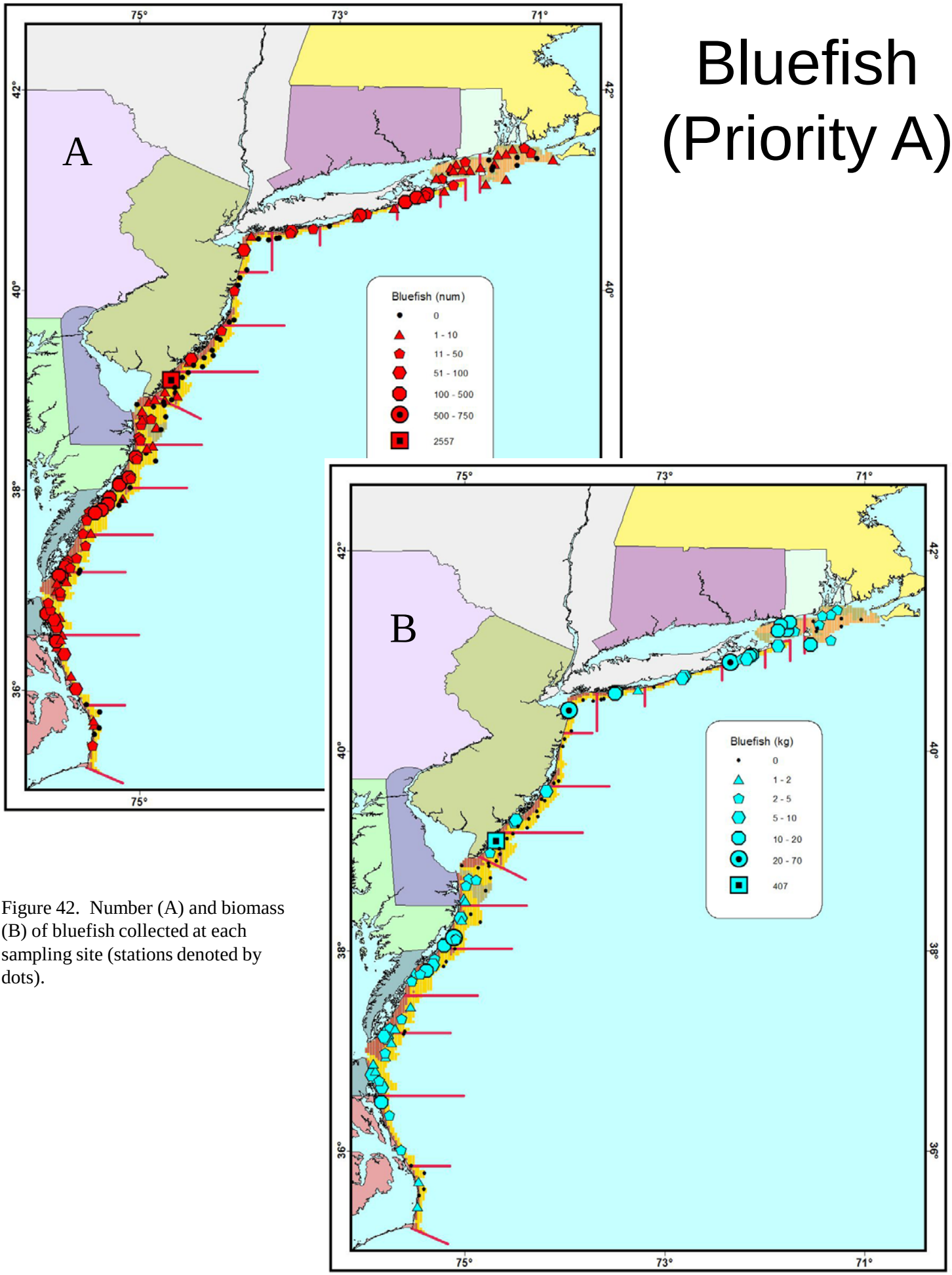


Figure 42. Number (A) and biomass (B) of bluefish collected at each sampling site (stations denoted by dots).

Table 15. For each state, the number of sites sampled and the number at which bluefish were collected. The number and biomass of bluefish caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum bluefish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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, for bluefish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

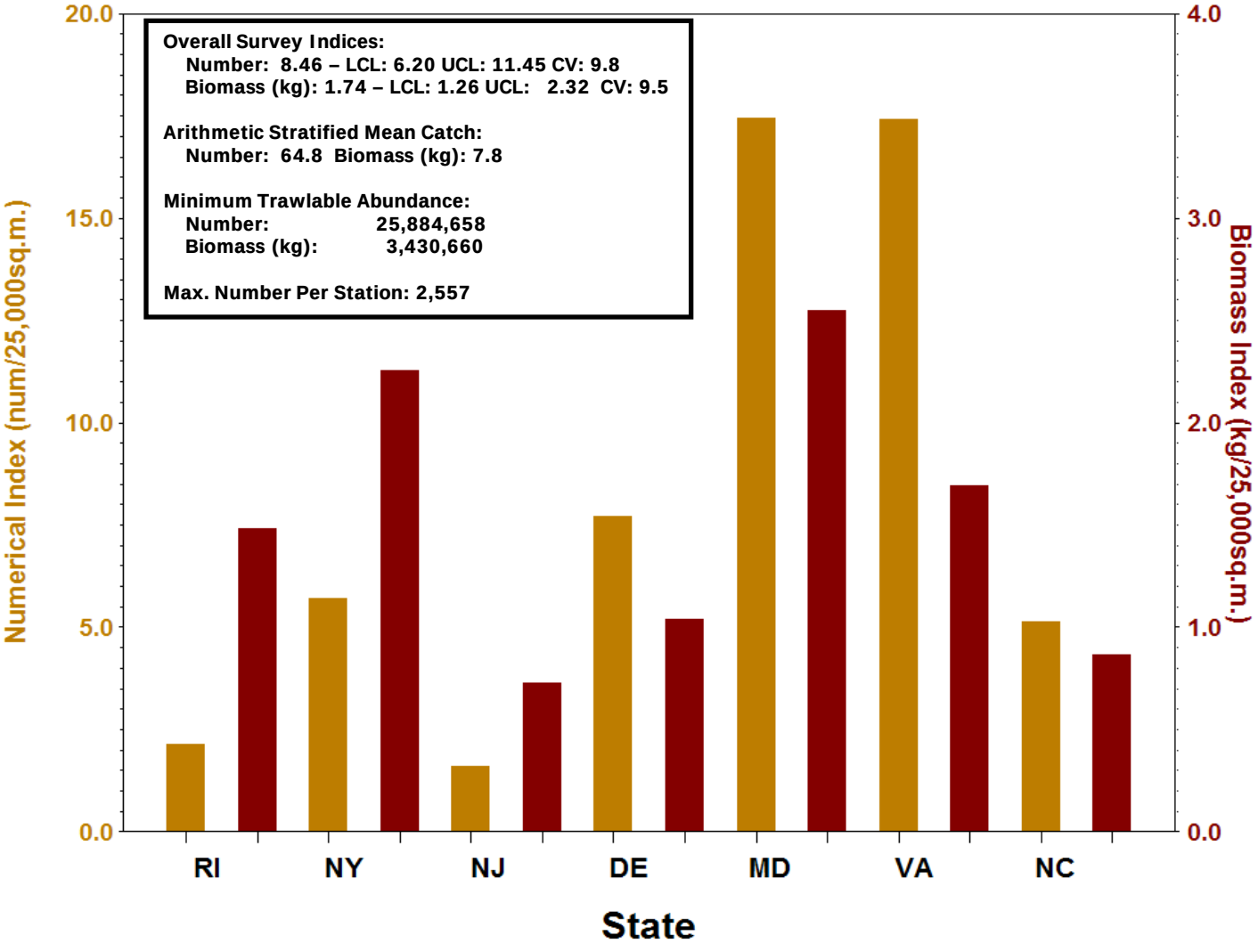


Figure 44. Length frequency histogram for bluefish. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

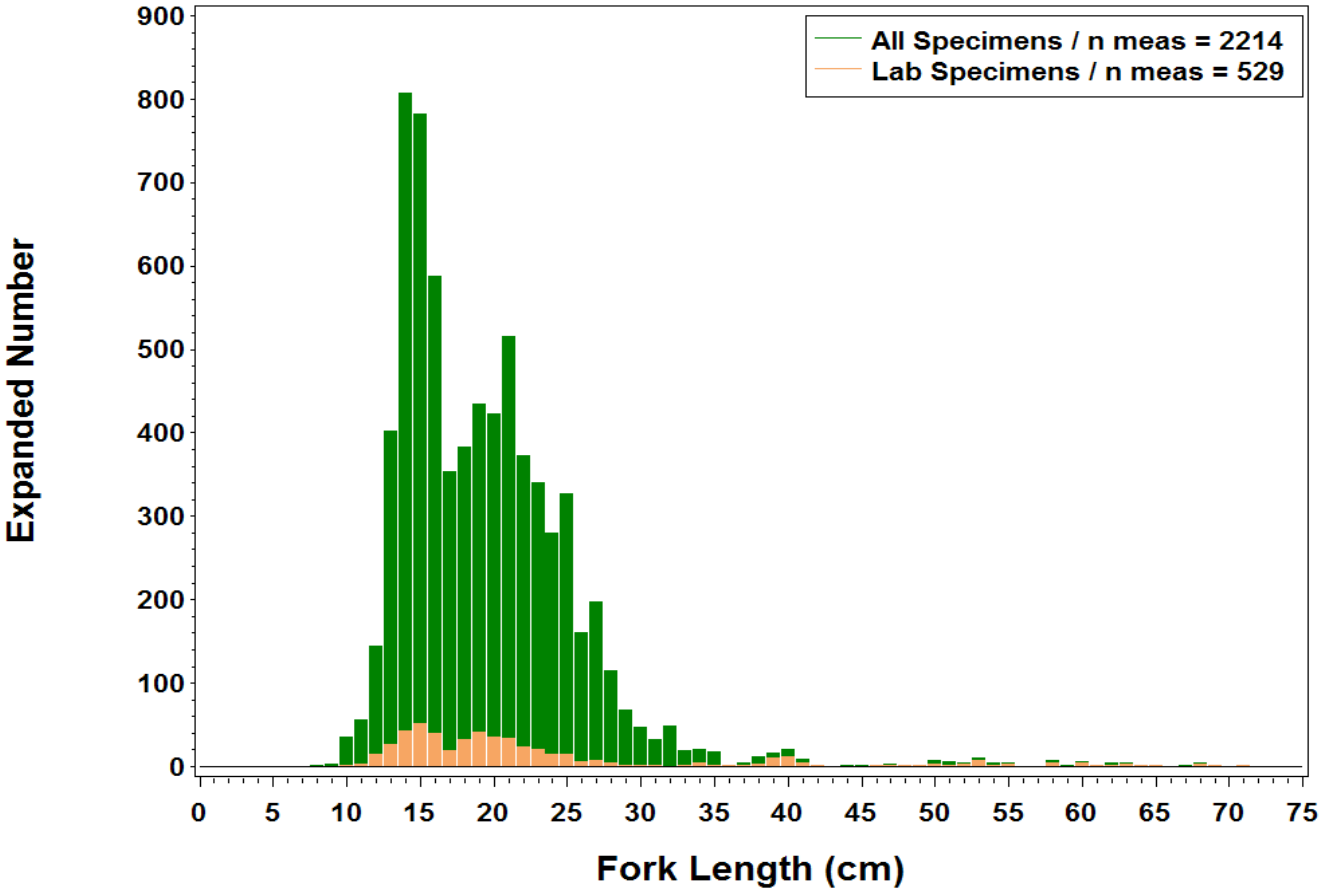


Figure 45. Sex-specific length frequency histogram for bluefish. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

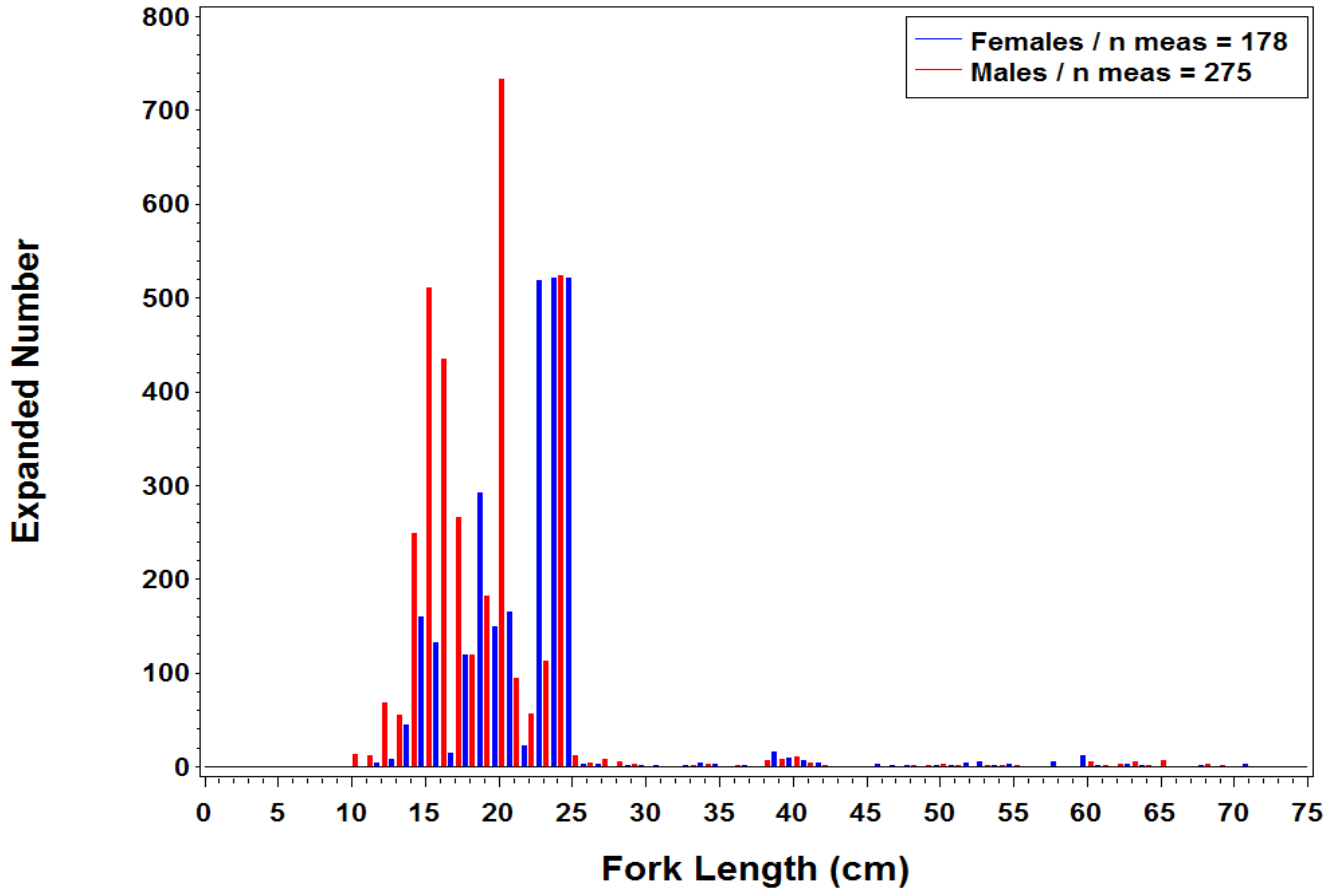
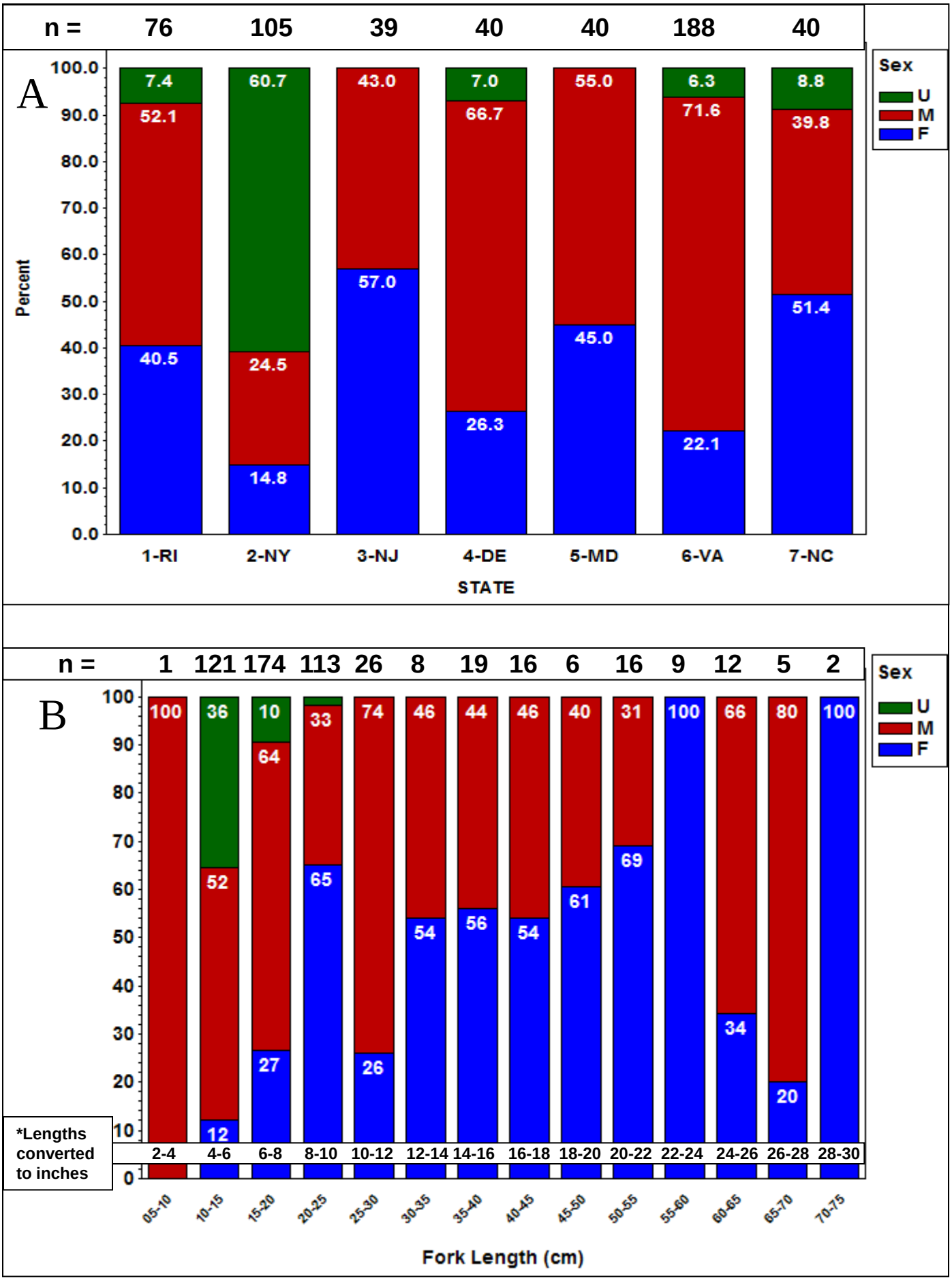


Figure 46. Sex ratios for bluefish by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Bluntnose Stingray (Priority D)

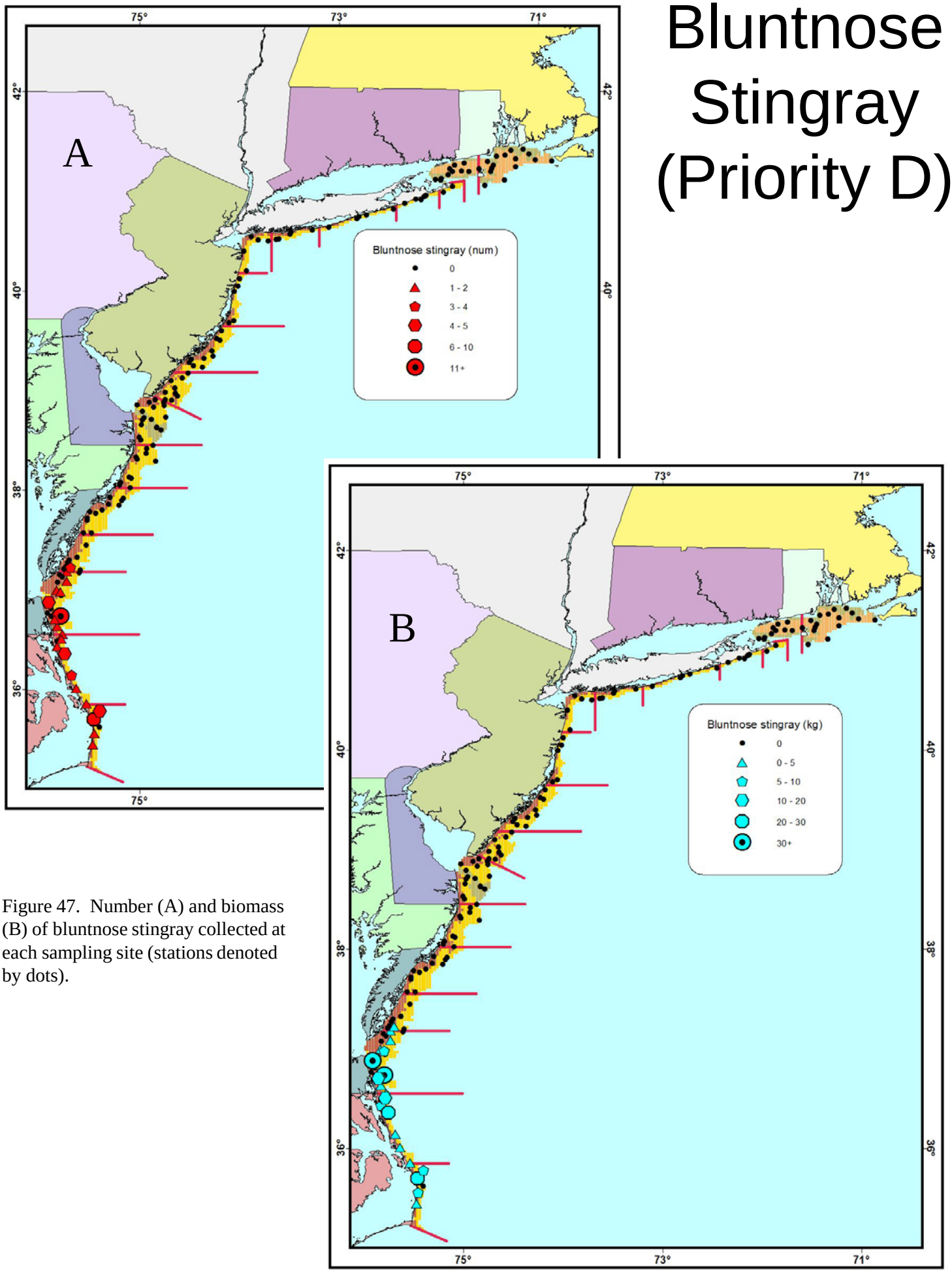


Figure 47. Number (A) and biomass (B) of bluntnose stingray collected at each sampling site (stations denoted by dots).

Table 16. For each state, the number of sites sampled and the number at which bluntnose stingray were collected. The number and biomass of these stingrays caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum stingray width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm DW)	Max. Width (mm DW)	Avg. Width (mm DW)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	19	105	94.410	0	105	99	710	314	1.055	2.14	1.48
NY	22	16	1090	192.954	0	333	83	712	242	0.717	5.71	2.26
NJ	24	8	2711	425.486	0	270	90	402	222	0.235	1.59	0.73
DE	17	11	117	12.946	0	117	98	343	201	0.137	7.71	1.04
MD	10	8	901	60.457	0	332	109	351	165	0.121	17.45	2.55
VA	38	33	1871	96.776	0	926	111	388	164	0.095	17.41	1.69
NC	13	9	325	25.665	0	131	117	236	184	0.096	5.12	0.86
Total	150	104	7120	908.694	0	2214	83	712	193	0.374	8.46	1.74

Figure 48. Geometric mean catch per area swept, by state, for bluntnose stingray. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

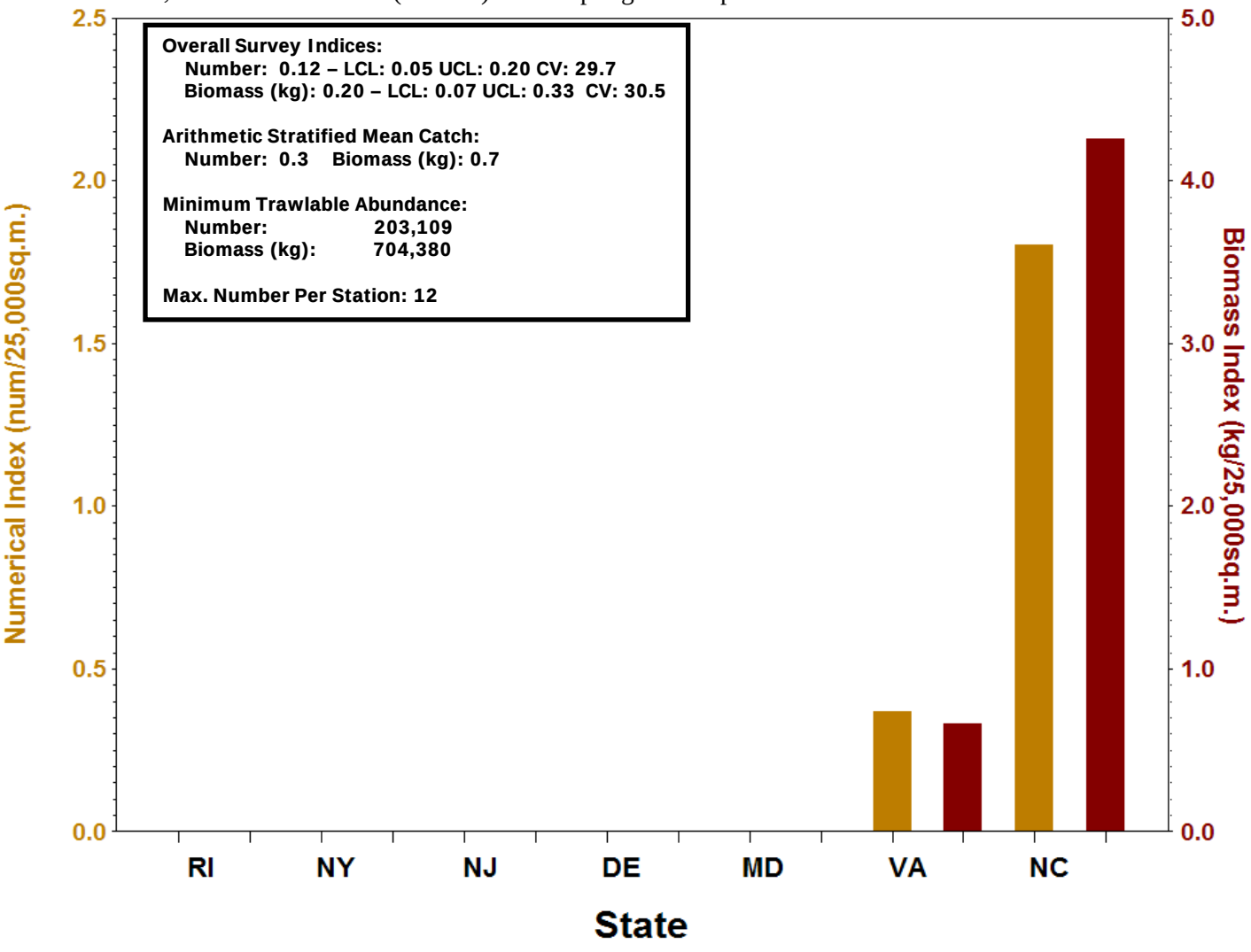


Figure 49. Width frequency histogram for bluntnose stingray. Disk width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

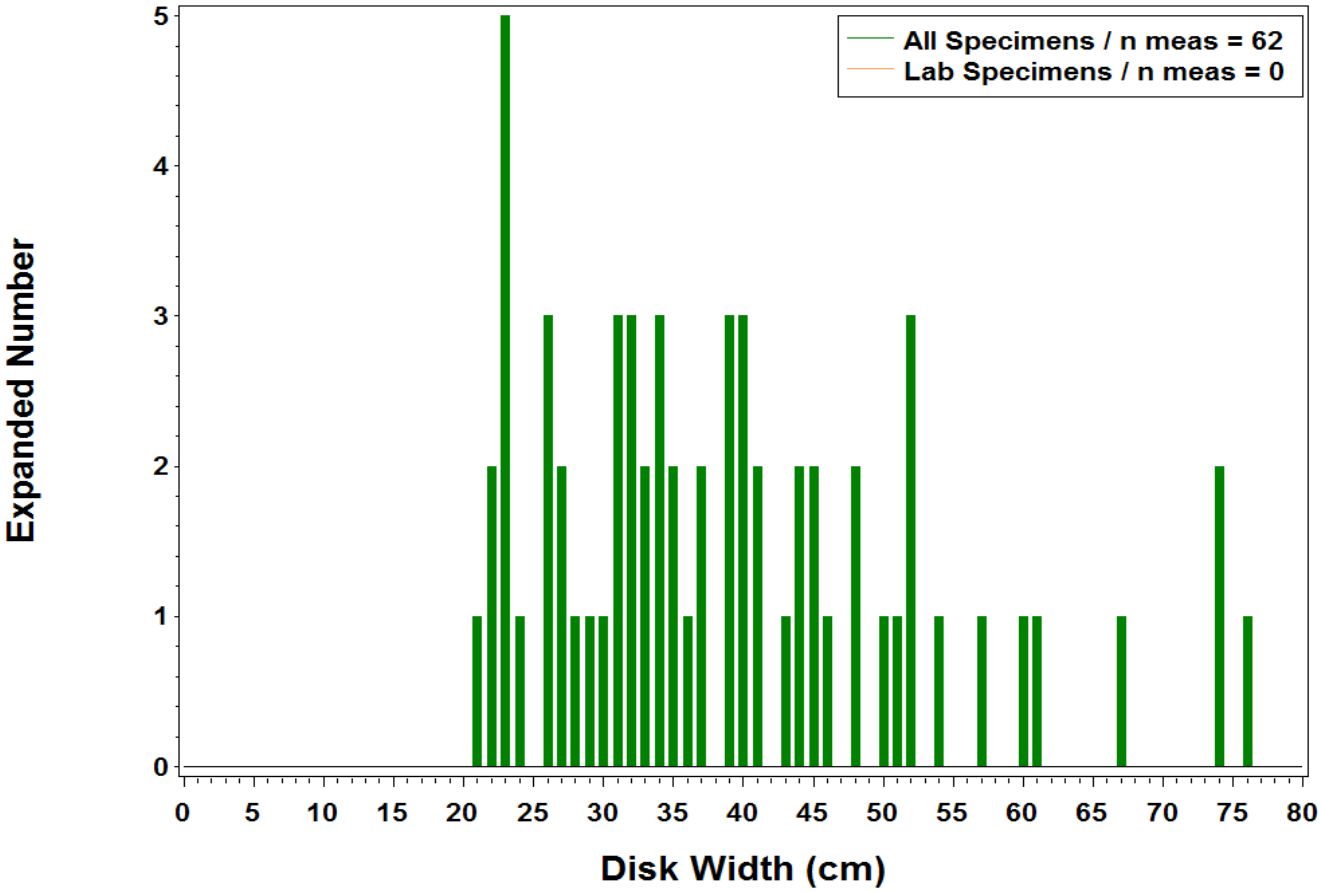
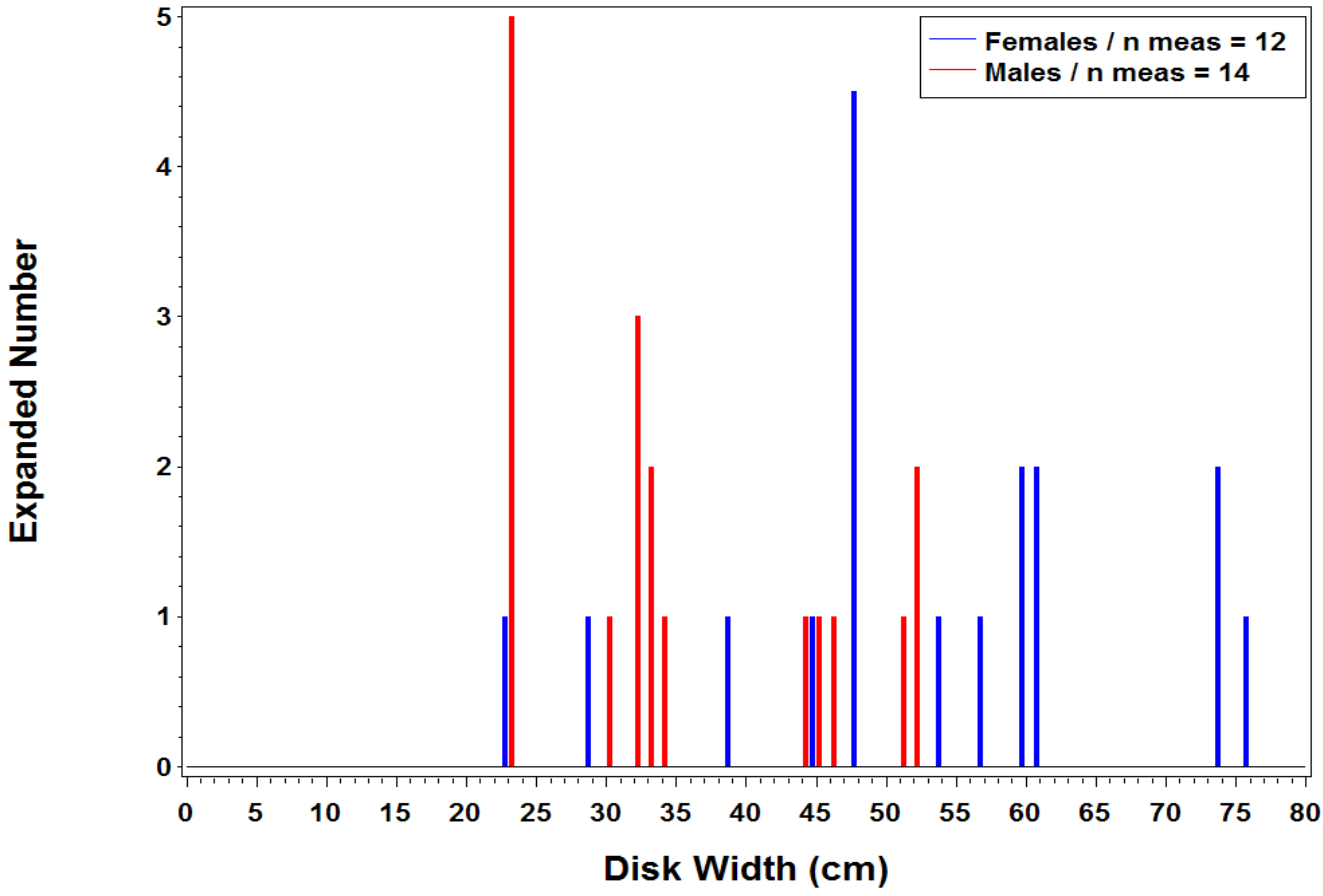


Figure 50. Sex-specific width frequency histogram for bluntnose stingray. Disk width (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.



Brown Shrimp (Priority E)

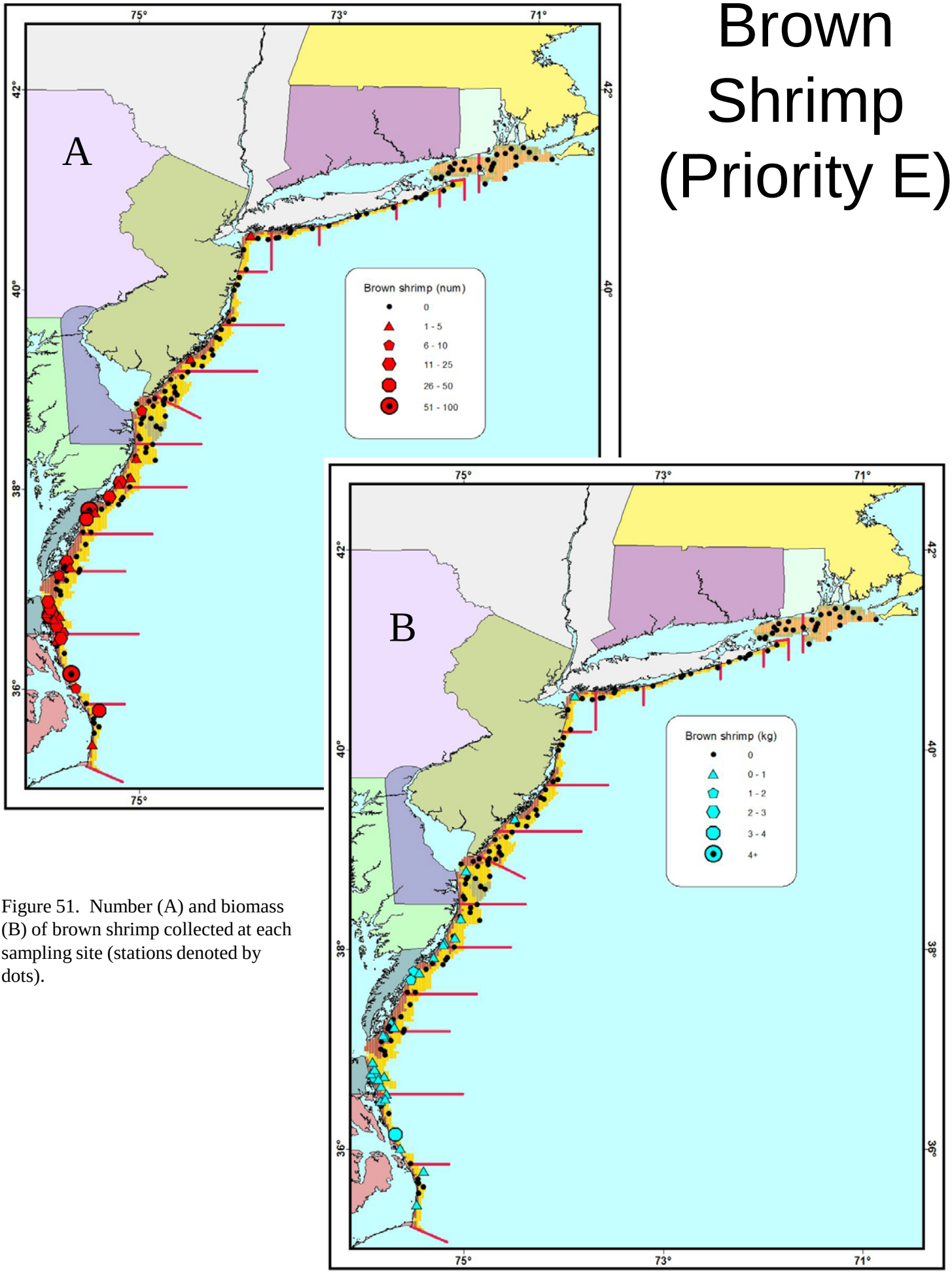


Figure 51. Number (A) and biomass (B) of brown shrimp collected at each sampling site (stations denoted by dots).

Table 17. For each state, the number of sites sampled and the number at which brown shrimp were collected. The number and biomass of shrimp caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum shrimp length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	1	1	0.002	0	1	144	144	144	0.002	0.05	0.00
NJ	24	1	2	0.020	0	2	124	143	134	0.010	0.04	0.00
DE	17	1	8	0.184	0	8	115	183	139	0.023	0.34	0.02
MD	10	4	34	0.817	0	34	58	198	142	0.024	1.13	0.07
VA	38	17	318	9.152	0	265	77	206	146	0.029	1.94	0.17
NC	13	6	146	5.100	0	62	76	181	149	0.035	2.56	0.26
Total	150	30	509	15.275	0	372	58	206	146	0.030	0.71	0.08

Figure 52. Geometric mean catch per area swept, by state, for brown shrimp. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

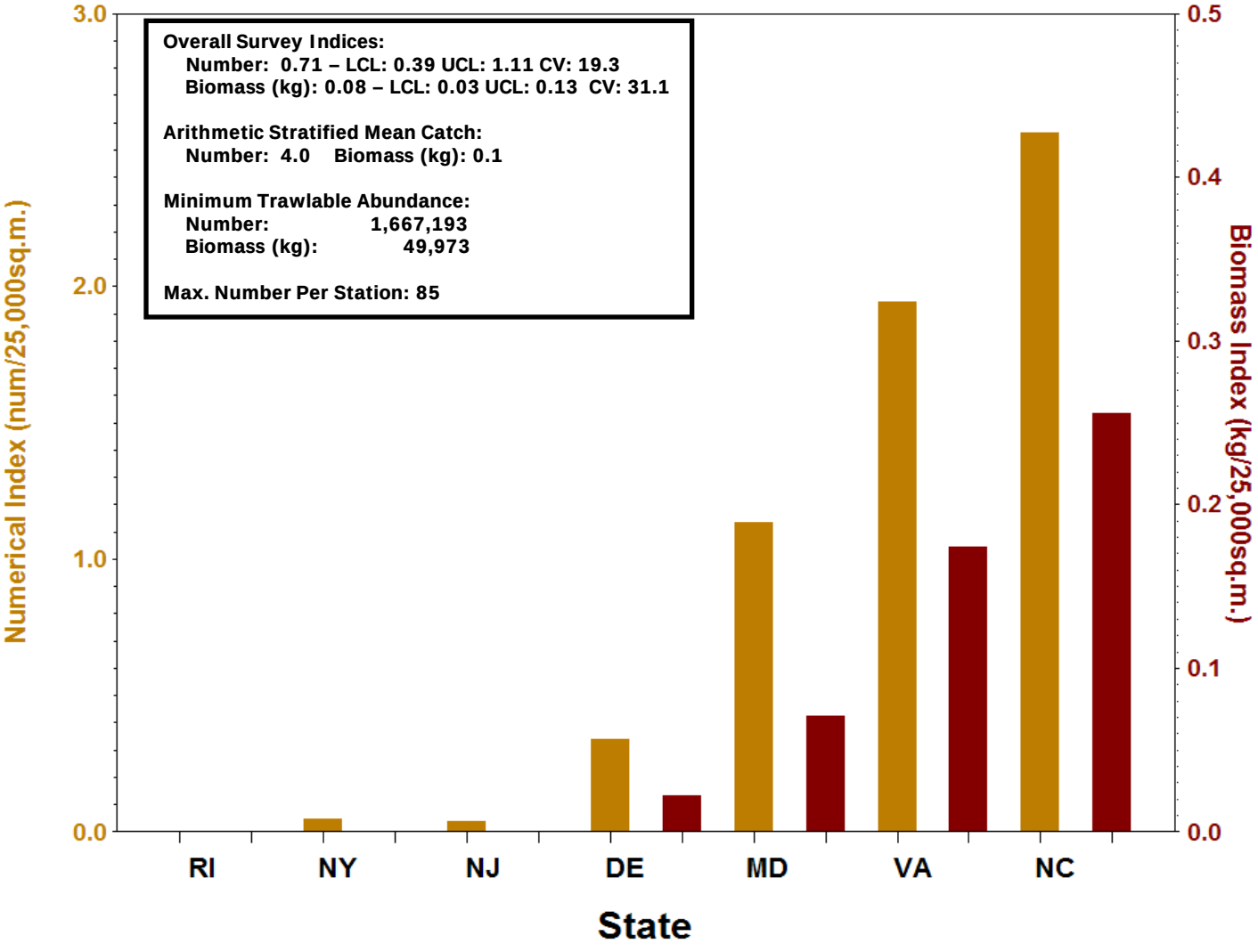
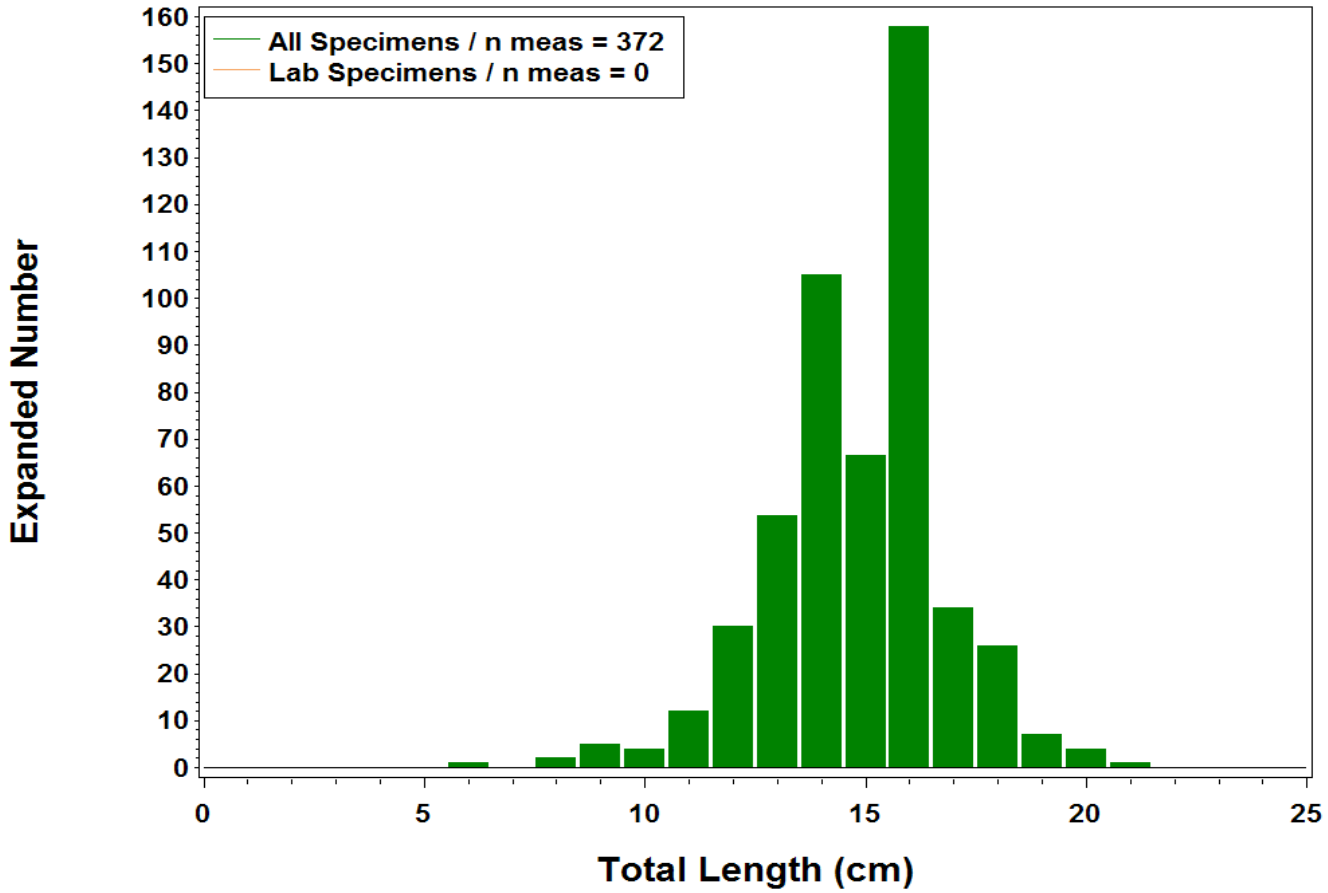


Figure 53. Length frequency histogram for brown shrimp. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Bullnose Stingray (Priority D)

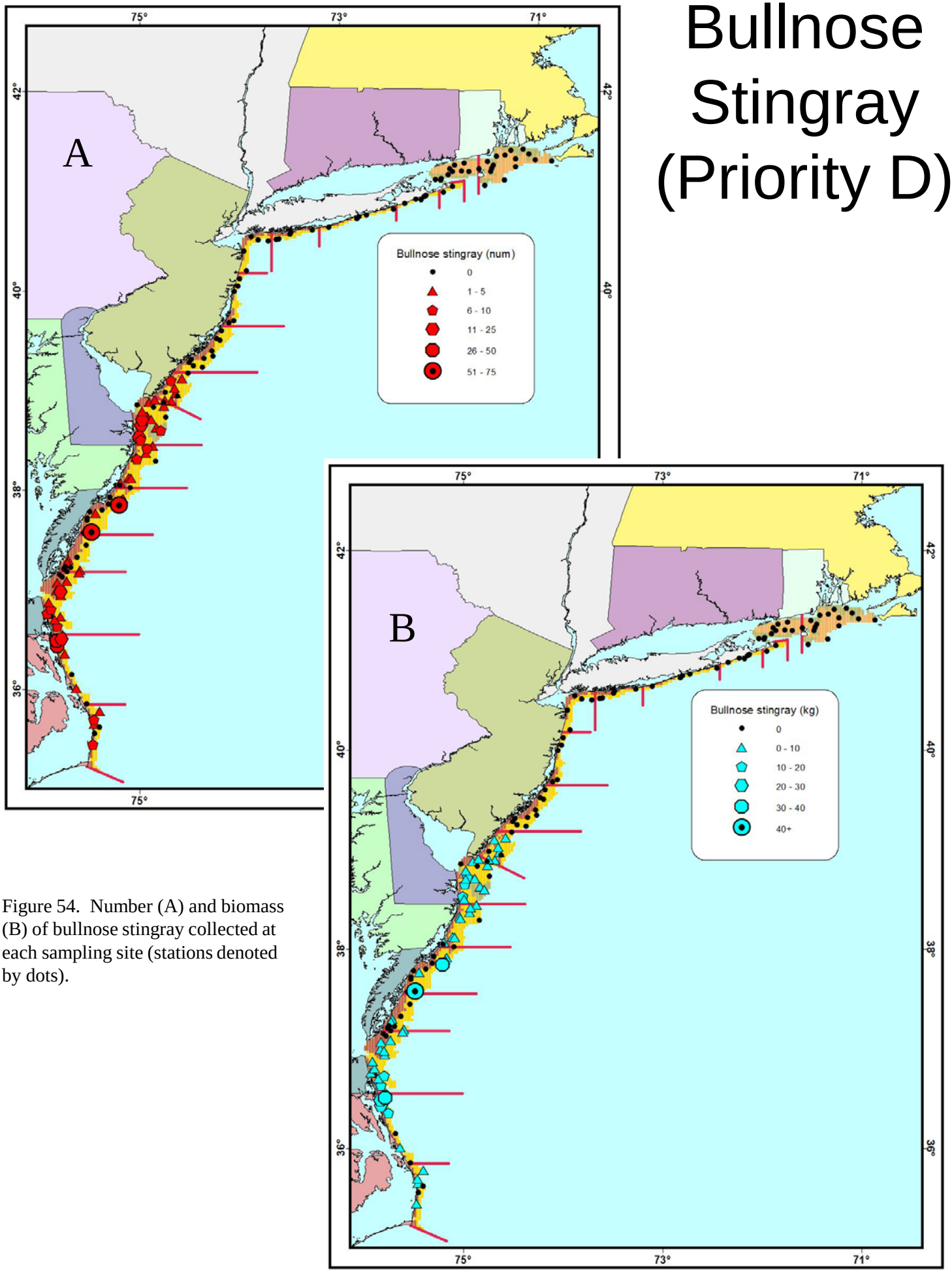


Figure 54. Number (A) and biomass (B) of bullnose stingray collected at each sampling site (stations denoted by dots).

Table 18. For each state, the number of sites sampled and the number at which bullnose stingray were collected. The number and biomass of these stingrays caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum stingray width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm DW)	Max. Width (mm DW)	Avg. Width (mm DW)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	6	20	10.096	0	20	293	394	341	0.505	0.40	0.27
DE	17	13	111	68.313	0	111	216	416	336	0.615	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, for bullnose stingray. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

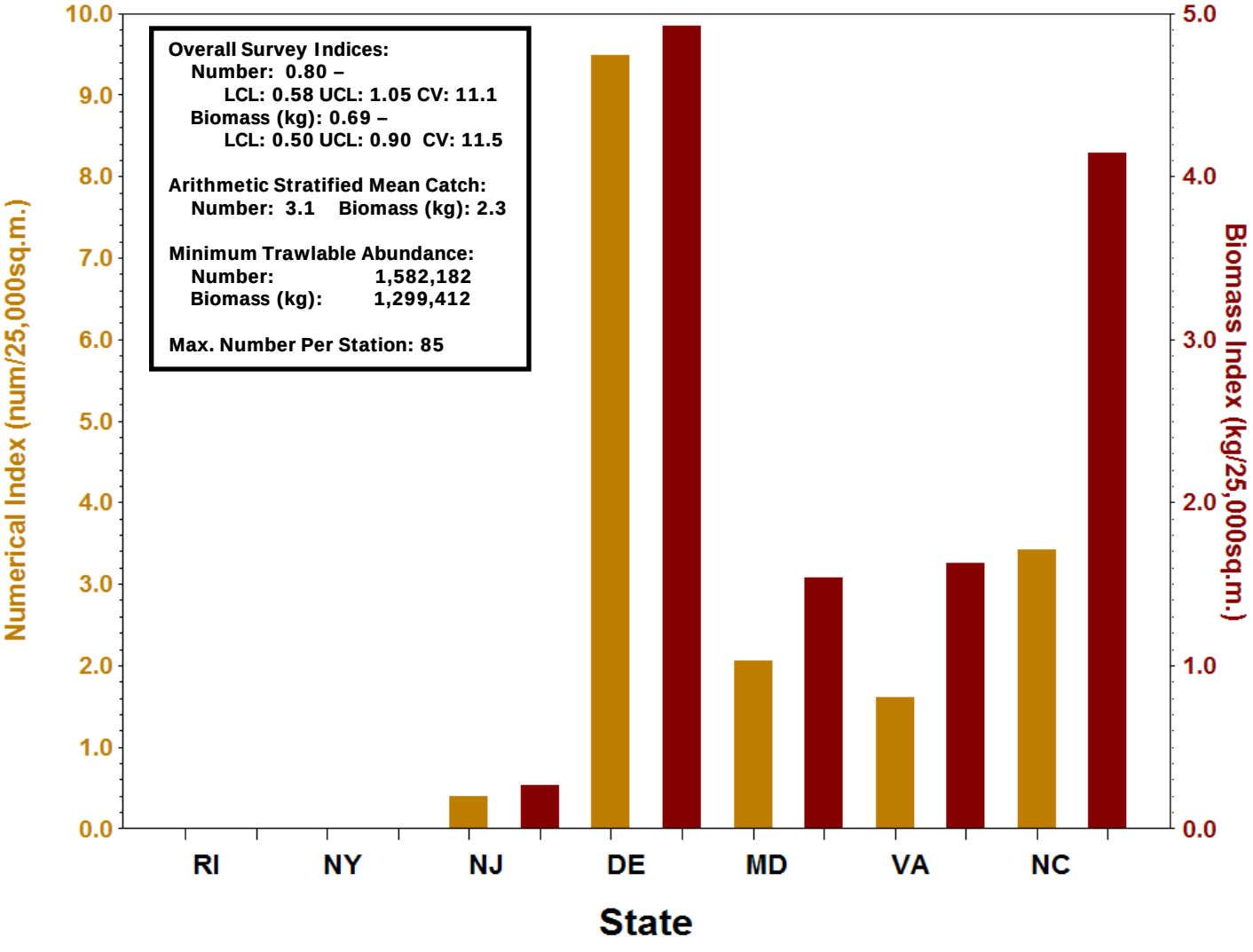


Figure 56. Length frequency histogram for bullnose stingray. Disk width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

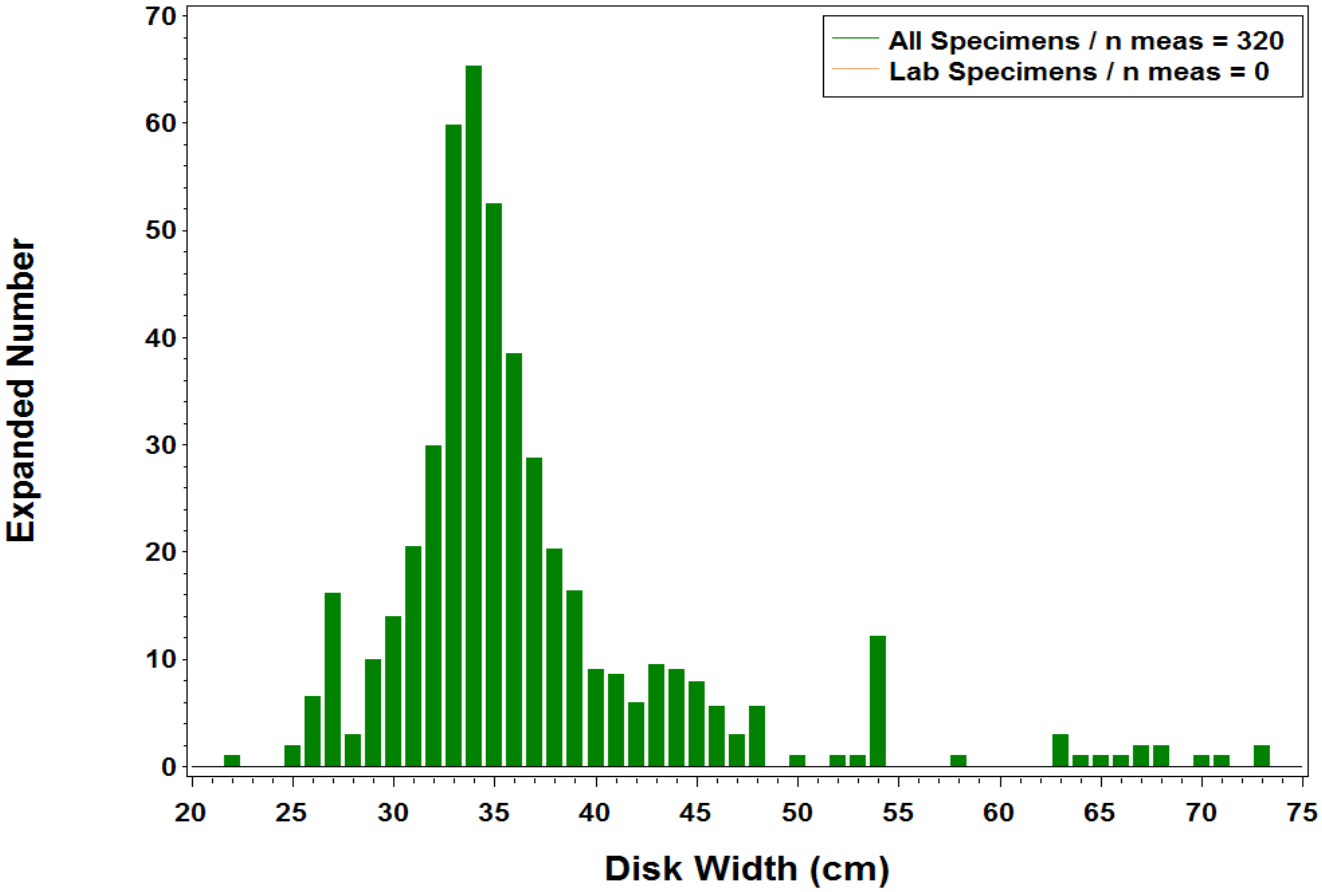
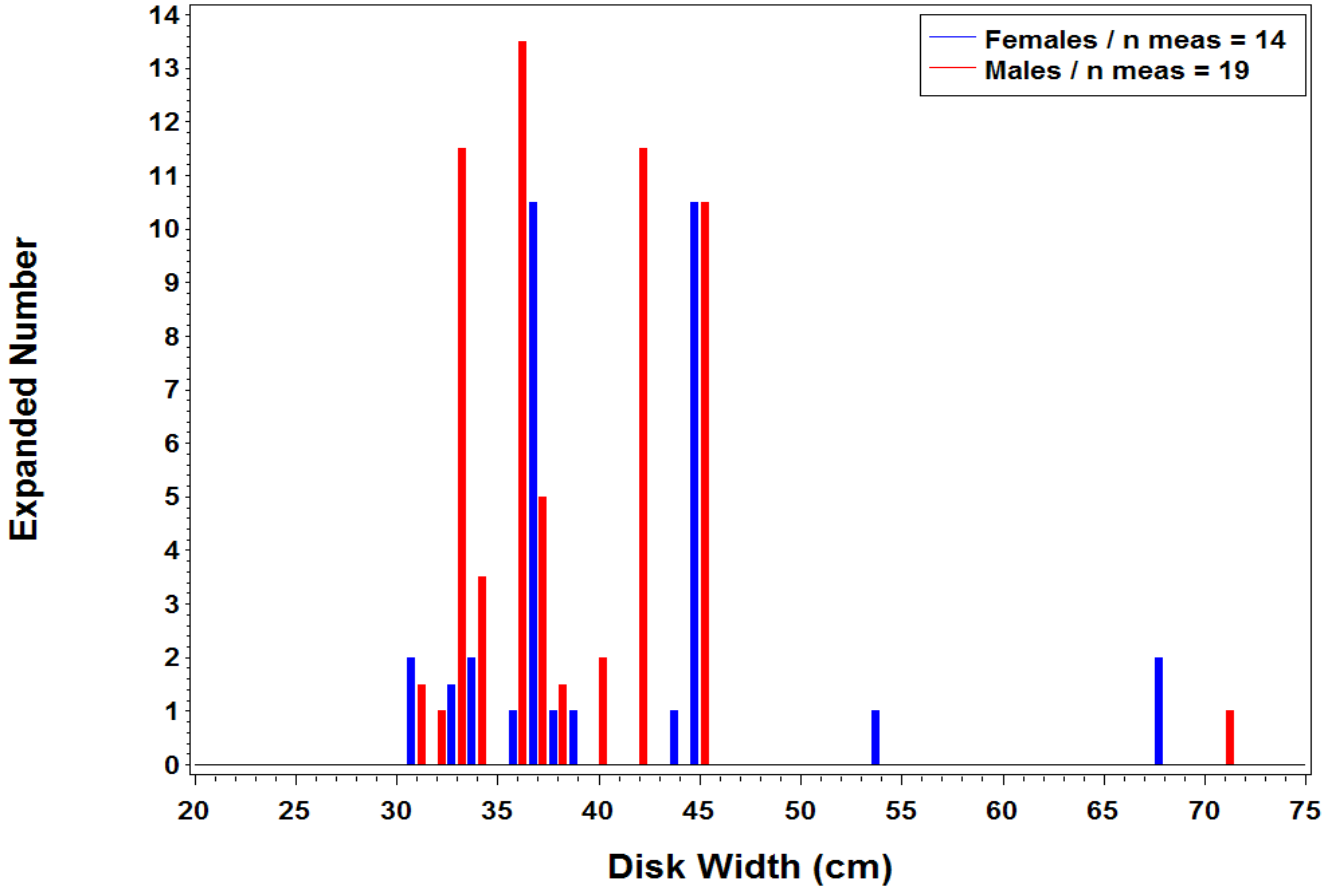


Figure 57. Sex-specific length frequency histogram for bullnose stingray. Disk width (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.



Butterfish (Priority A)

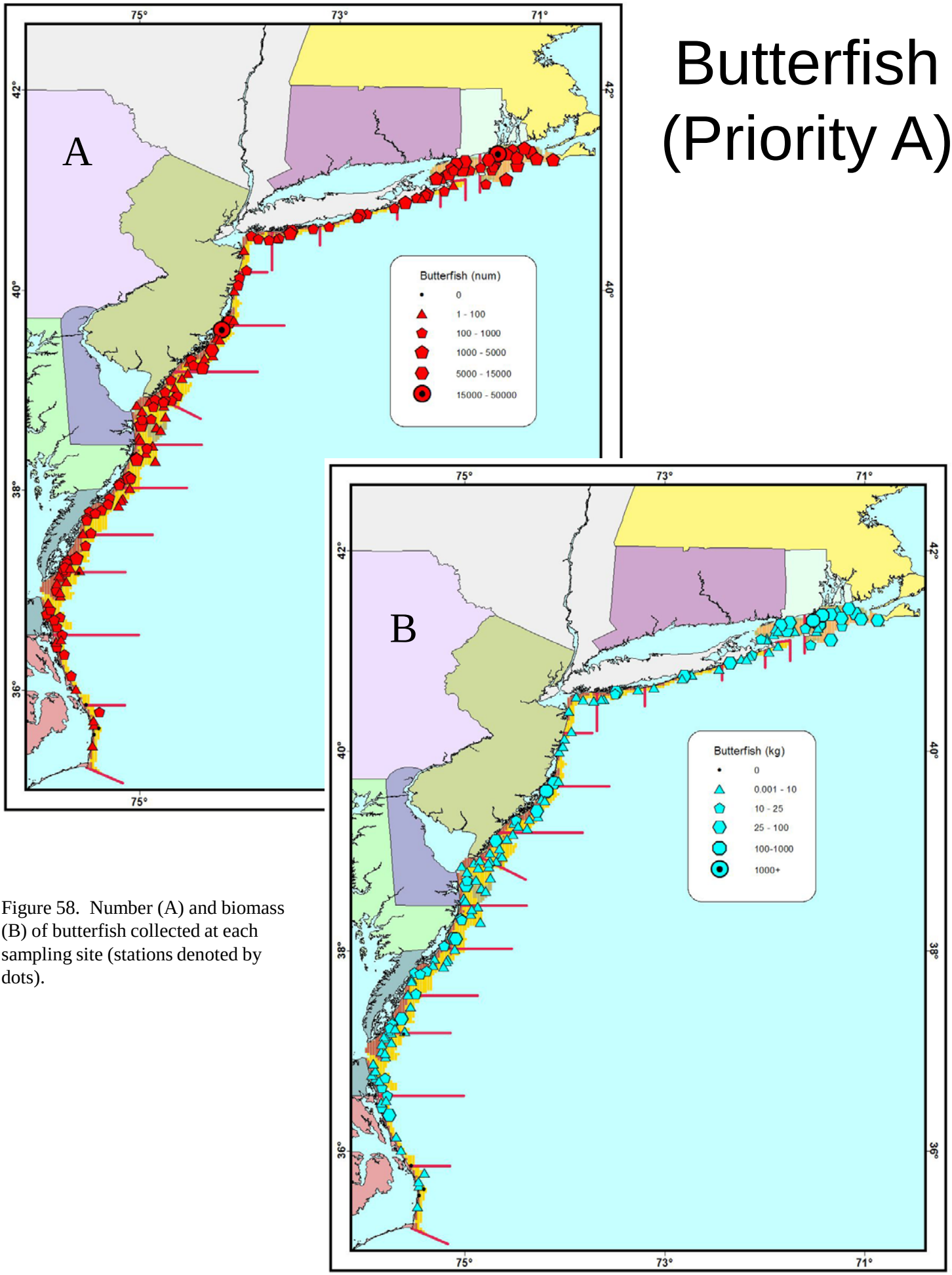


Figure 58. Number (A) and biomass (B) of butterfish collected at each sampling site (stations denoted by dots).

Table 19. For each state, the number of sites sampled and the number at which butterfish were collected. The number and biomass of butterfish caught in each state, and the number taken for age analysis and individual length measurements, are also given. Minimum and maximum butterfish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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, for butterfish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

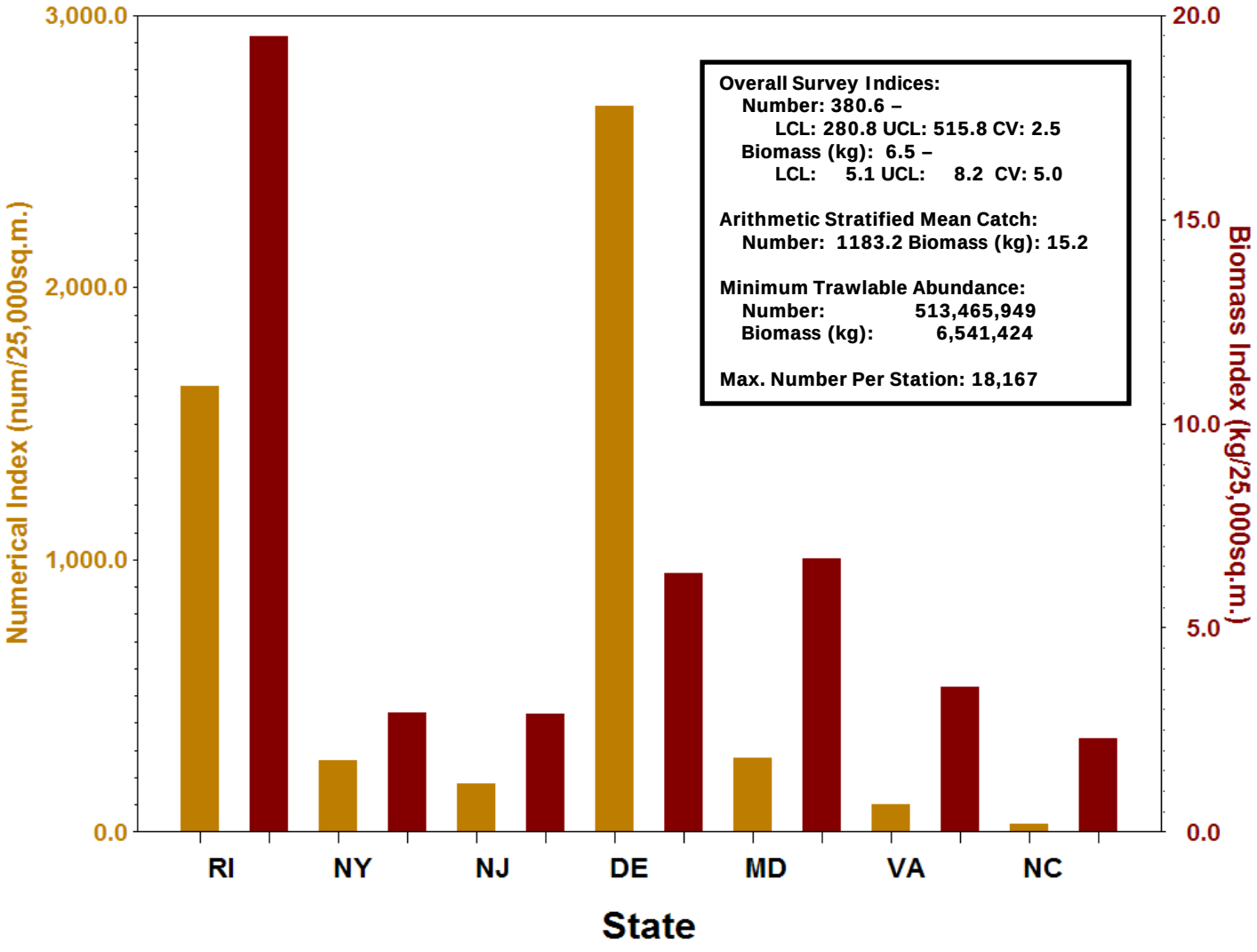


Figure 60. Length frequency histogram for butterfish. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

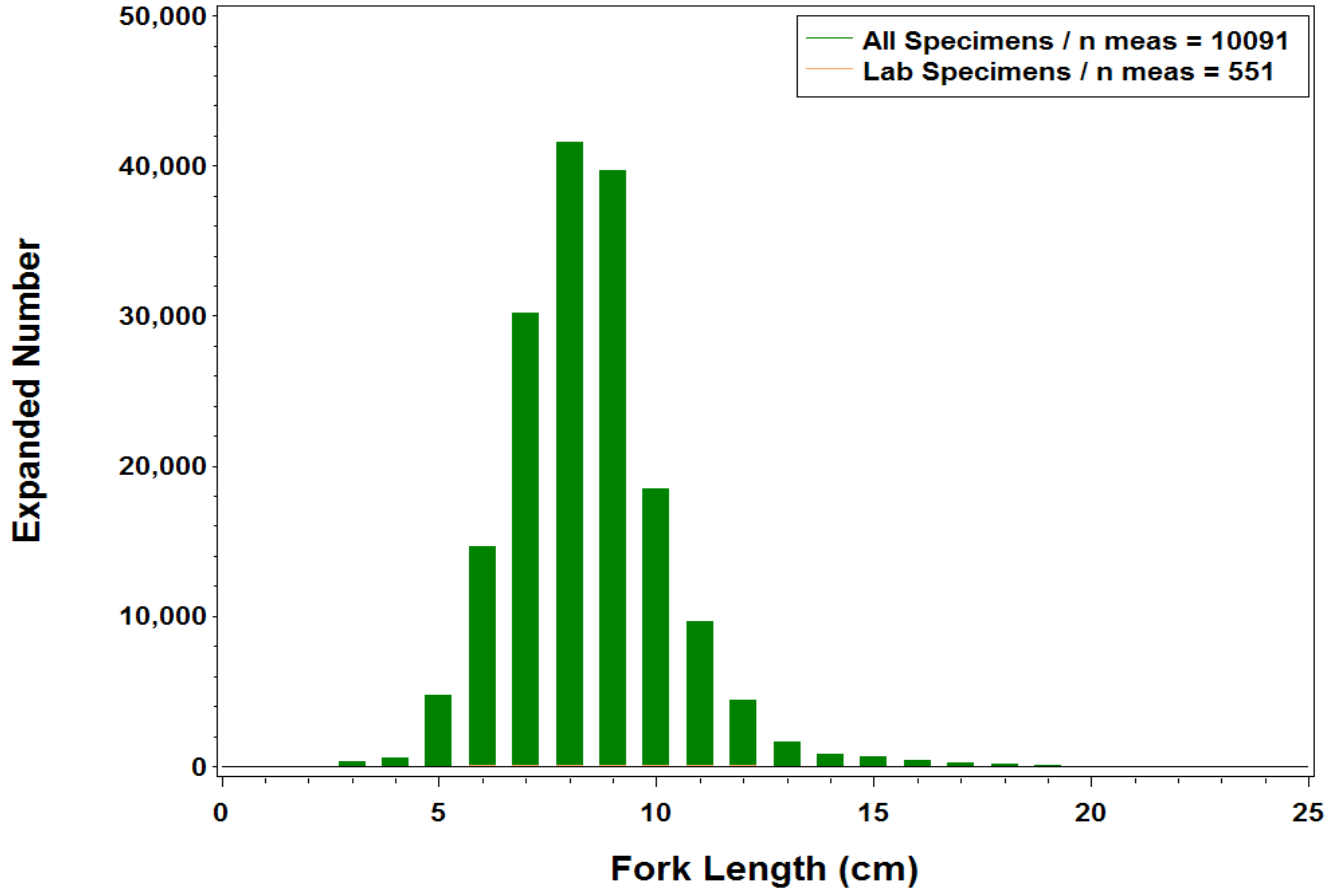


Figure 61. Sex-specific length frequency histogram for butterfish. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

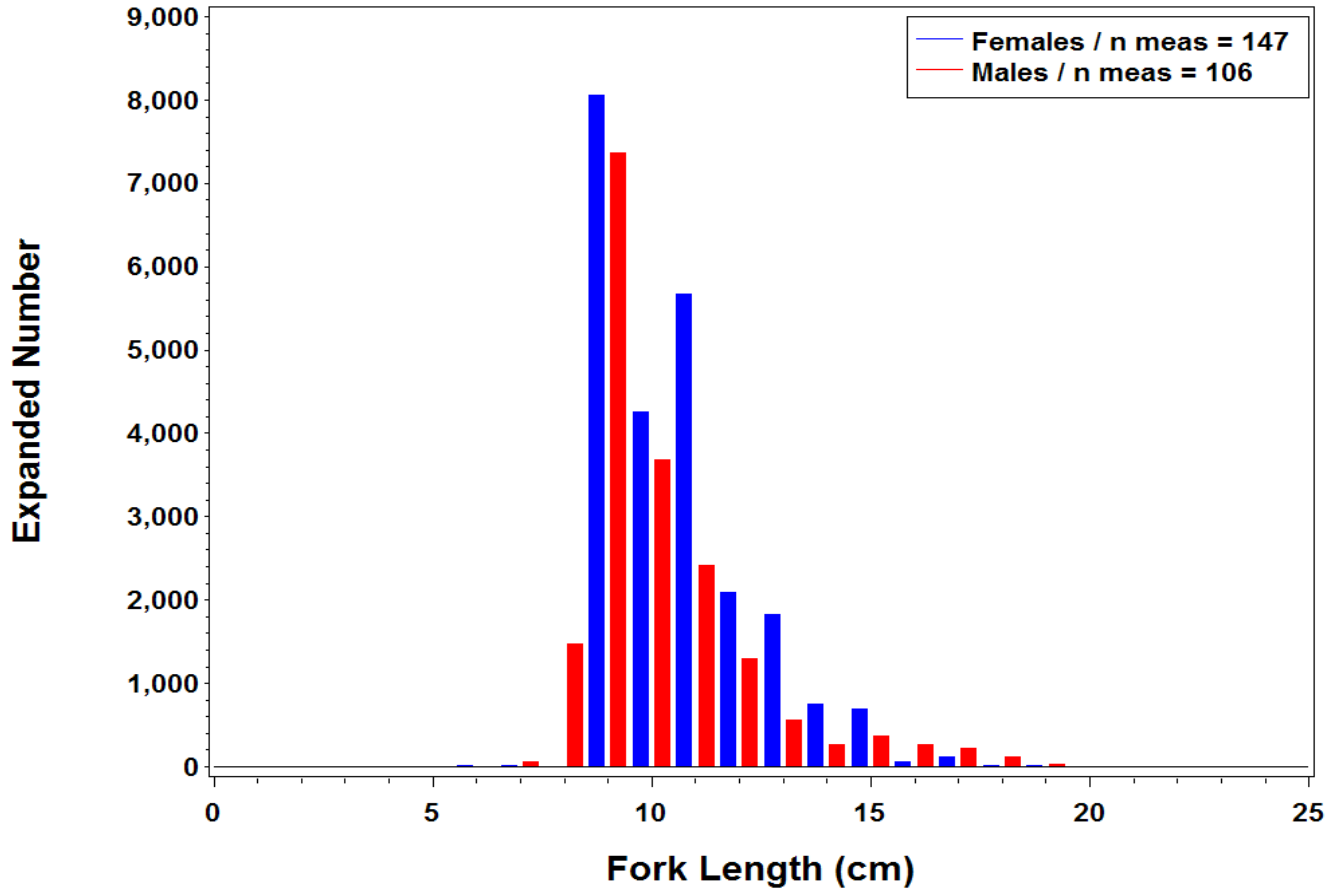
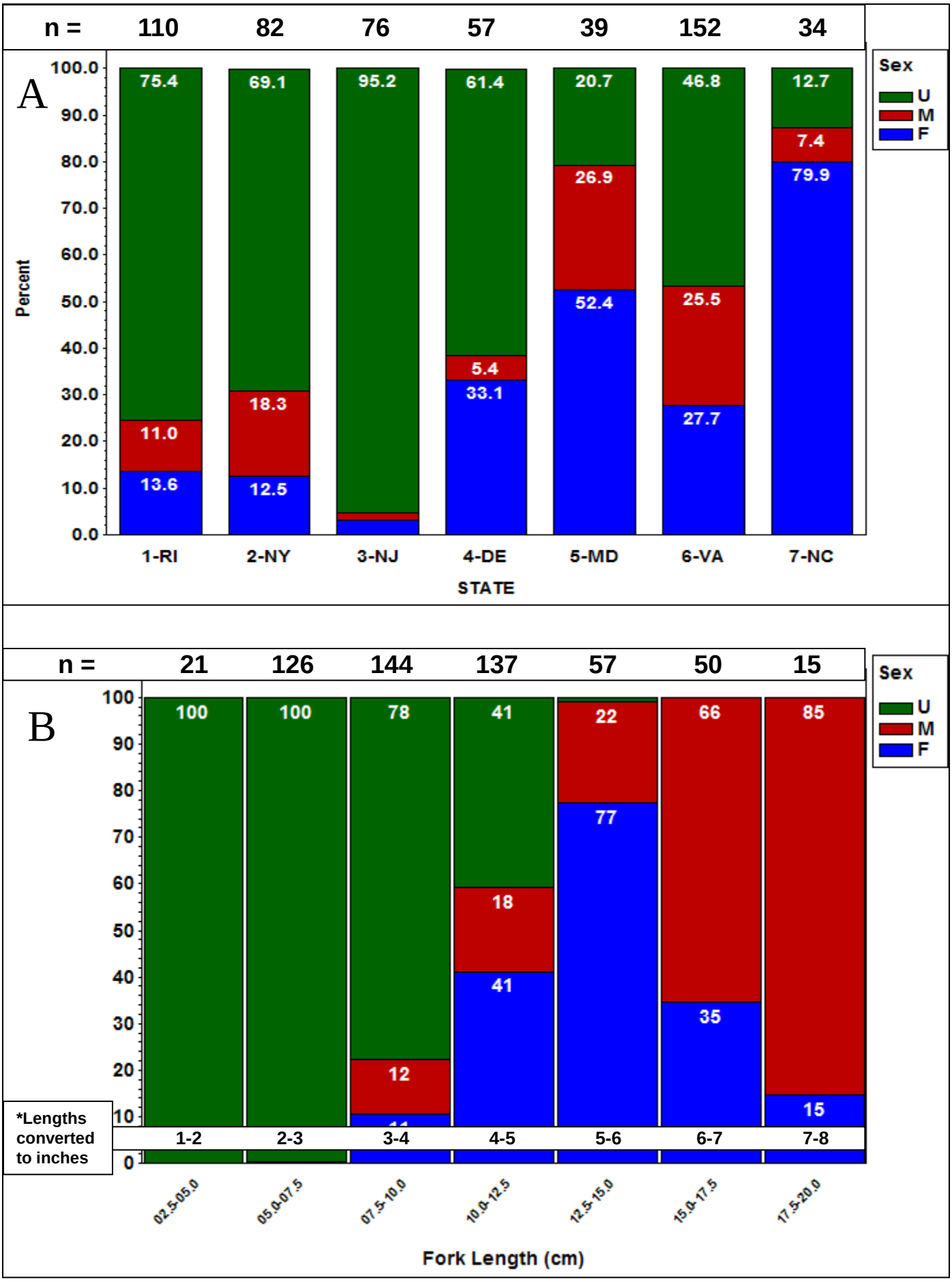


Figure 62. Sex ratios for butterfish by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Clearnose Skate (Priority B)

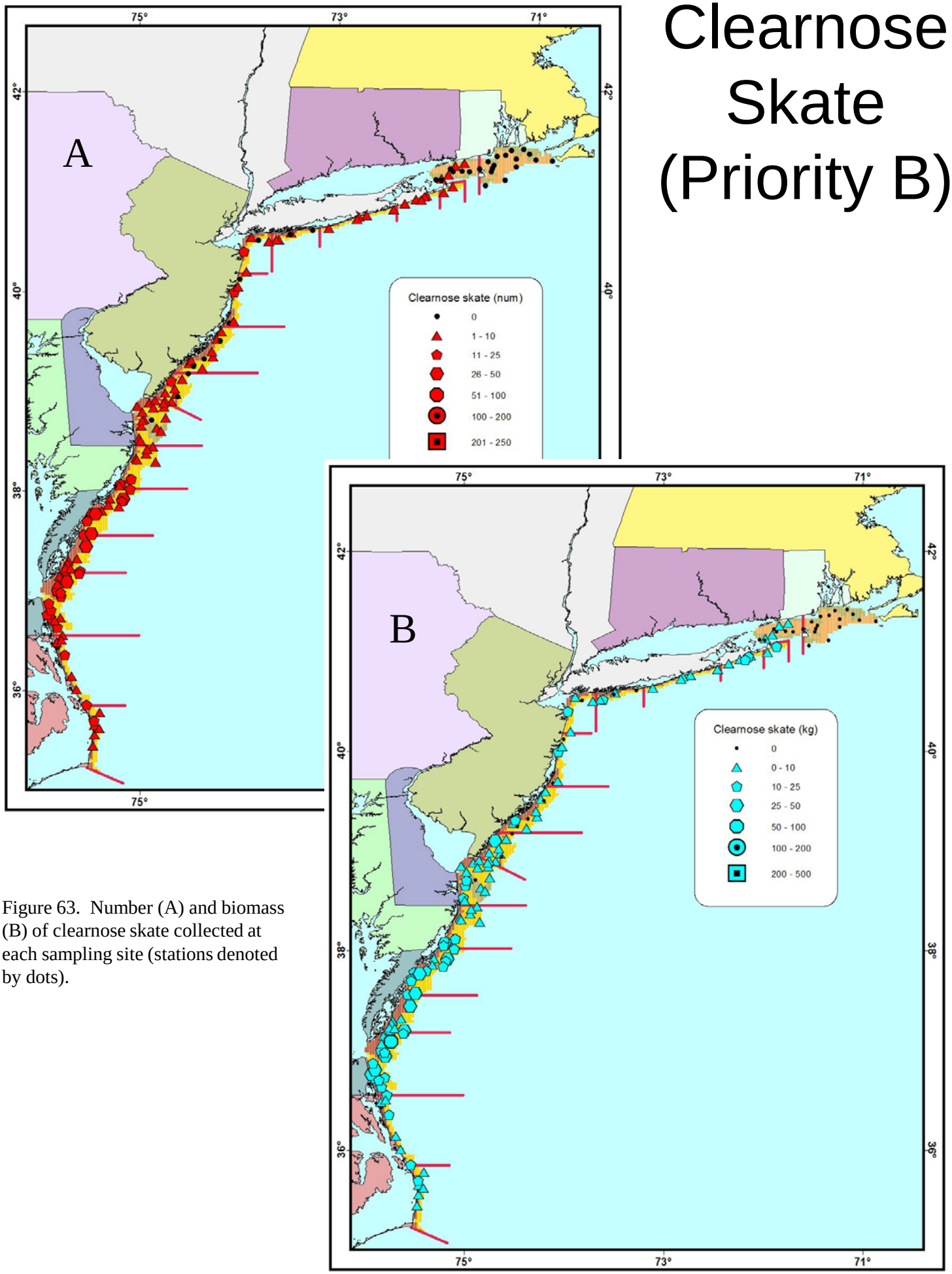


Figure 63. Number (A) and biomass (B) of clearnose skate collected at each sampling site (stations denoted by dots).

Table 20. For each state, the number of sites sampled and the number at which clearnose skate were collected. The number and biomass of these skates caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum skate width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm DW)	Max. Width (mm DW)	Avg. Width (mm DW)	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, for clearnose skate. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

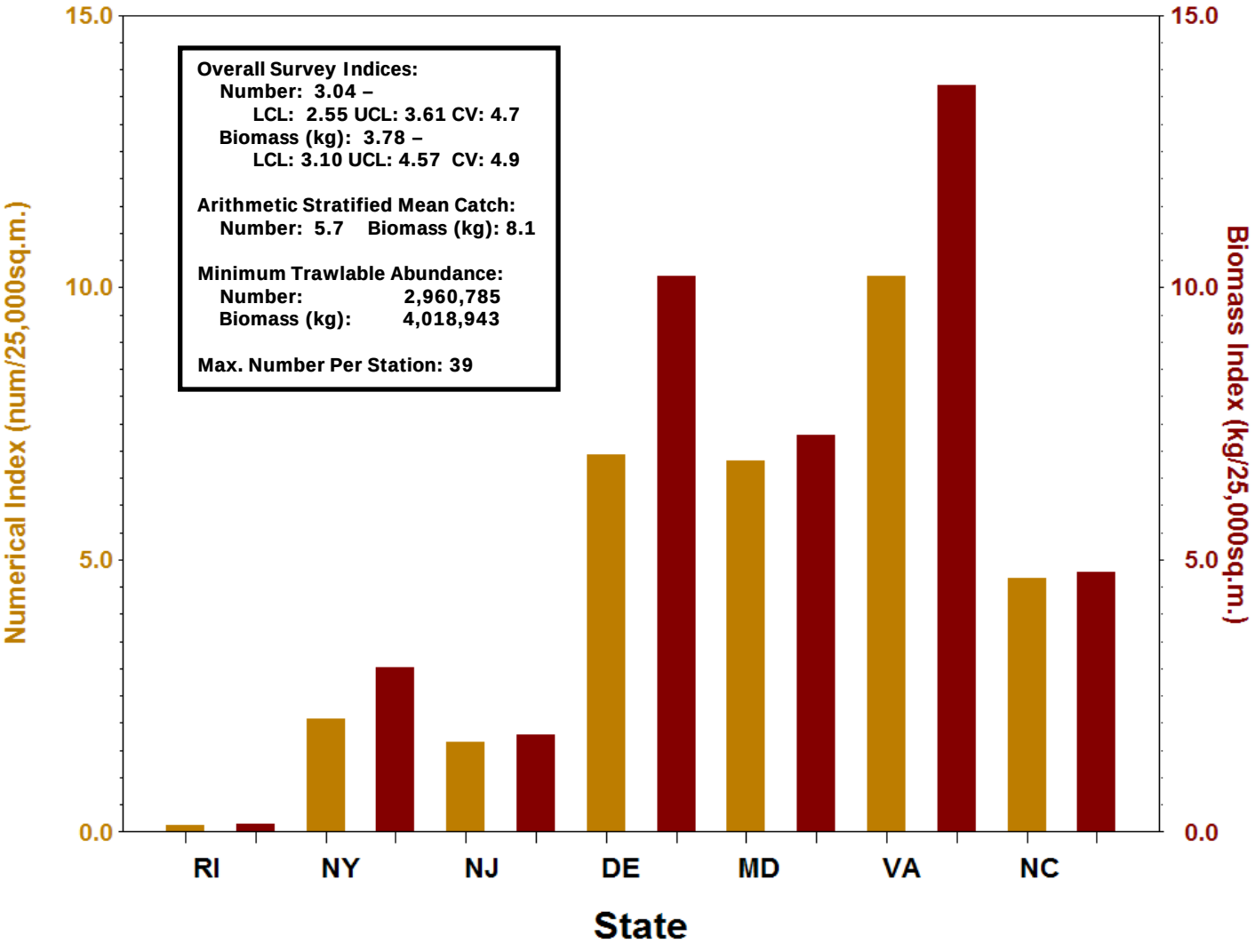


Figure 65. Width frequency histogram for clearnose skate. Disk width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

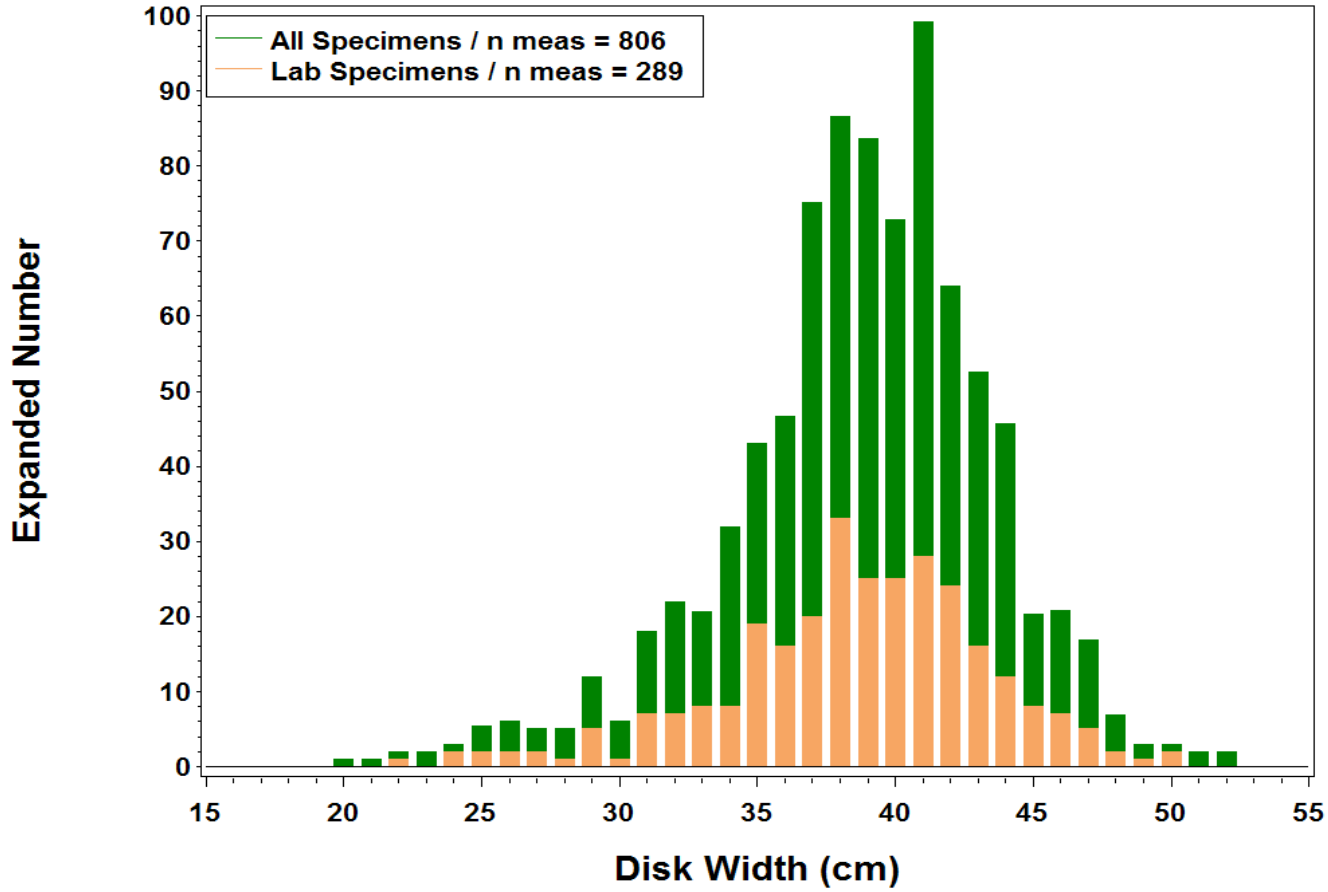


Figure 66. Sex-specific width frequency histogram for clearnose skate. Disk width (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

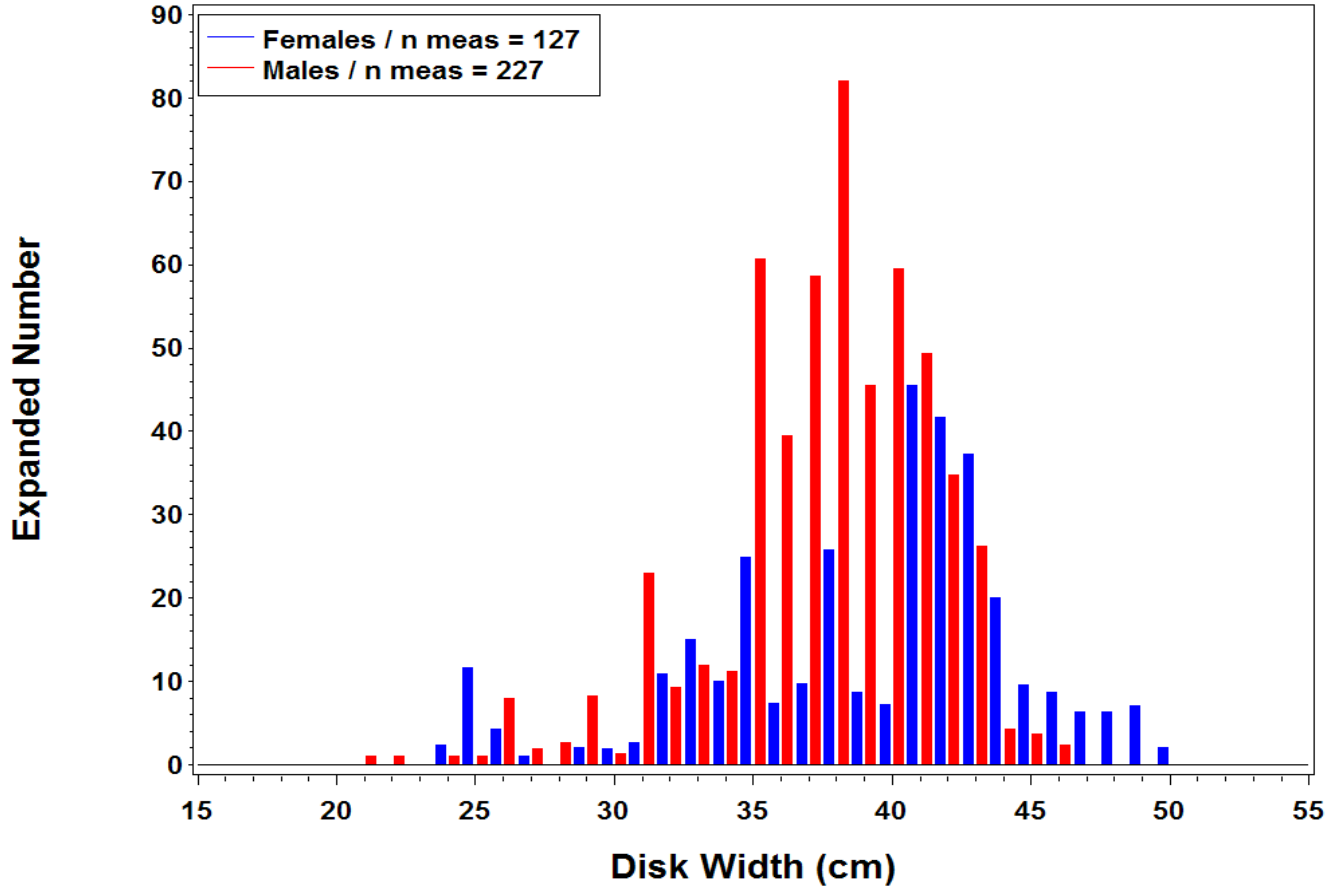
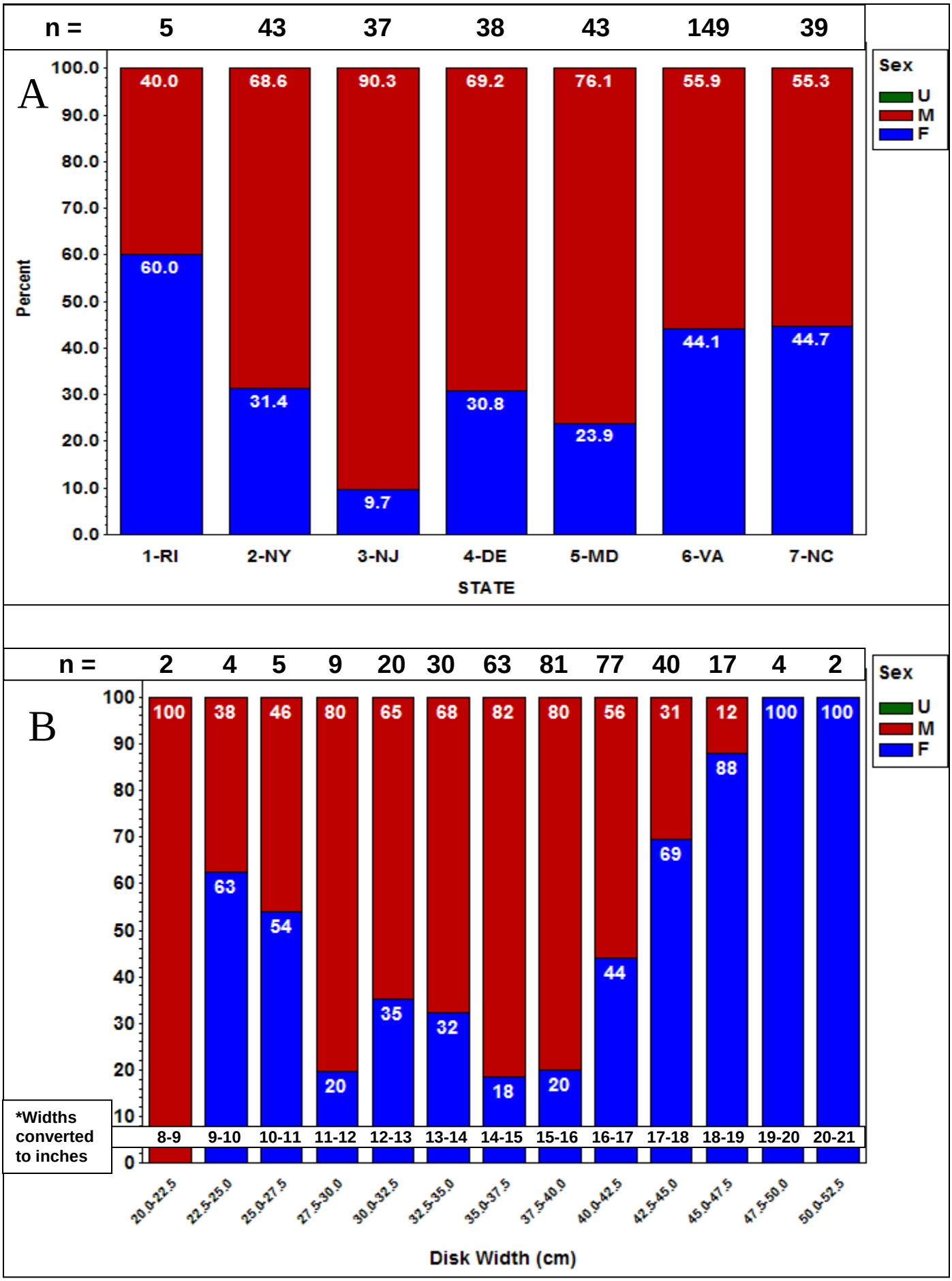


Figure 67. Sex ratios for clearnose skate by state (A) and width group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Cownose Ray (Priority D)

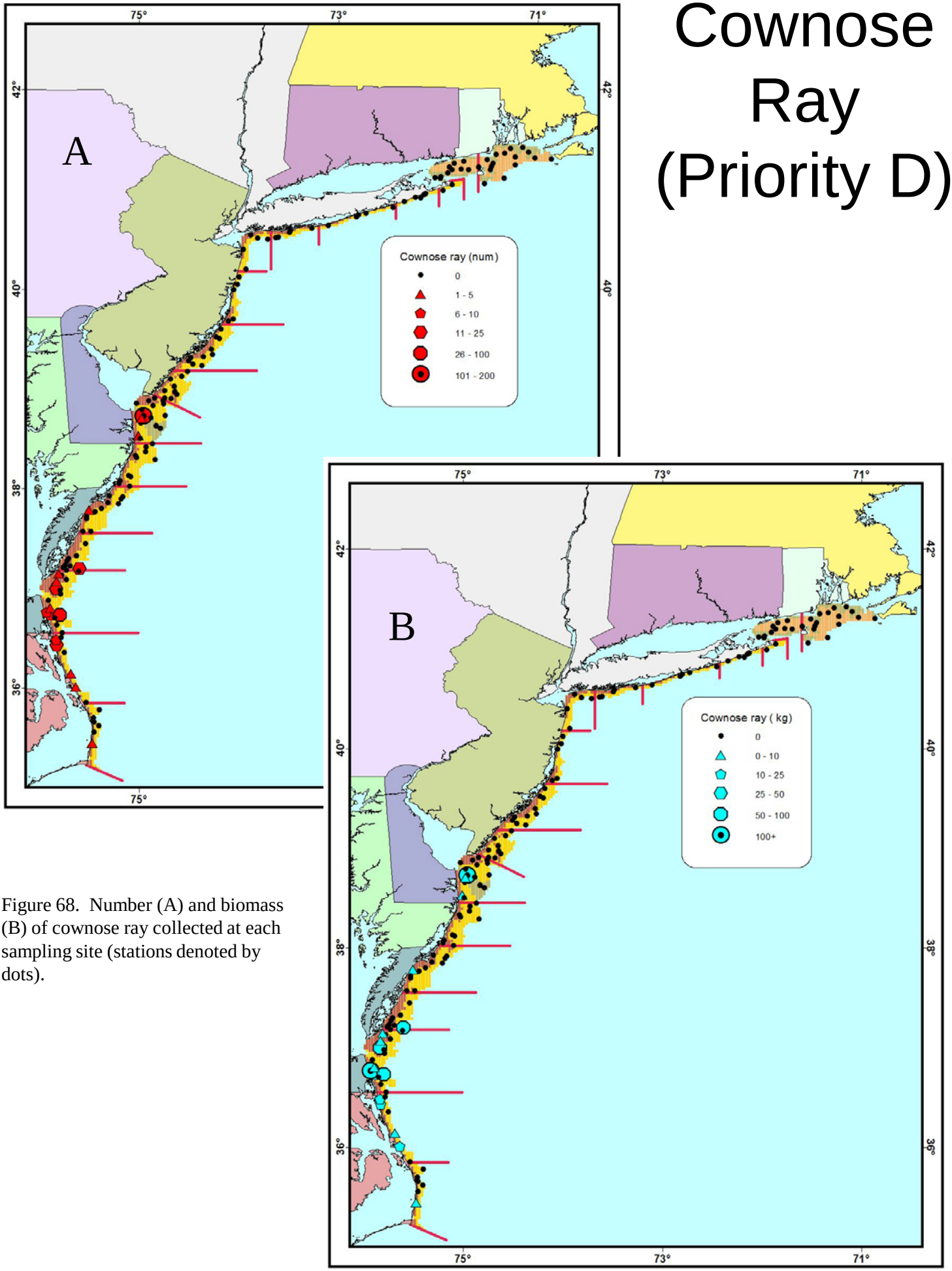


Figure 68. Number (A) and biomass (B) of cownose ray collected at each sampling site (stations denoted by dots).

Table 21. For each state, the number of sites sampled and the number at which cownose ray were collected. The number and biomass of rays caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum ray width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm)	Max. Width (mm)	Avg. Width (mm)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	3	106	160.133	0	27	458	765	630	1.511	0.69	0.93
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	9	104	353.149	0	67	395	937	546	3.396	0.64	1.03
NC	13	5	21	47.120	0	14	400	920	501	2.244	0.56	1.00
Total	150	17	231	560.402	0	108	395	937	561	2.426	0.34	0.51

Figure 69. Geometric mean catch per area swept, by state, for cownose ray. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

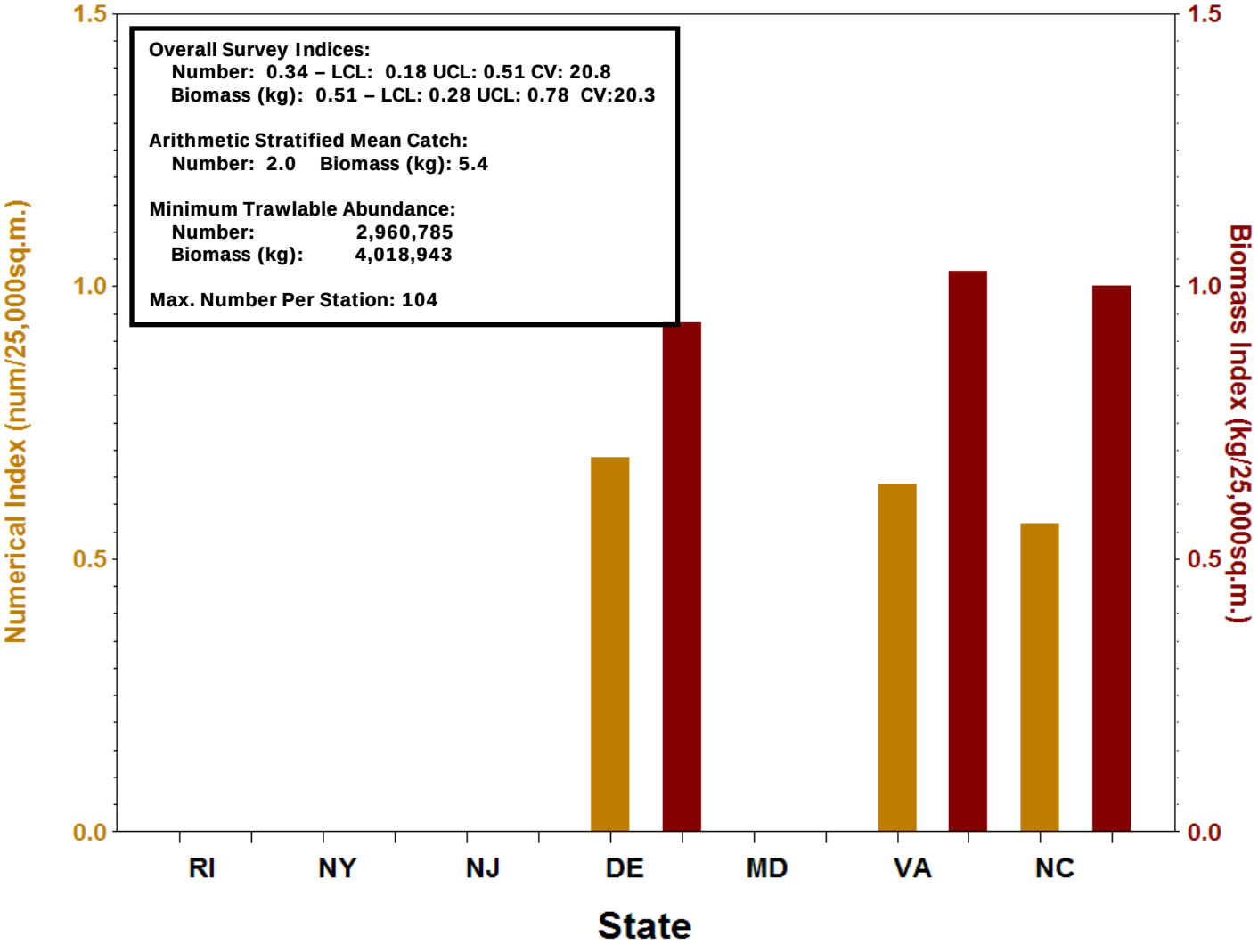


Figure 70. Width frequency histogram for cownose ray. Disk width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

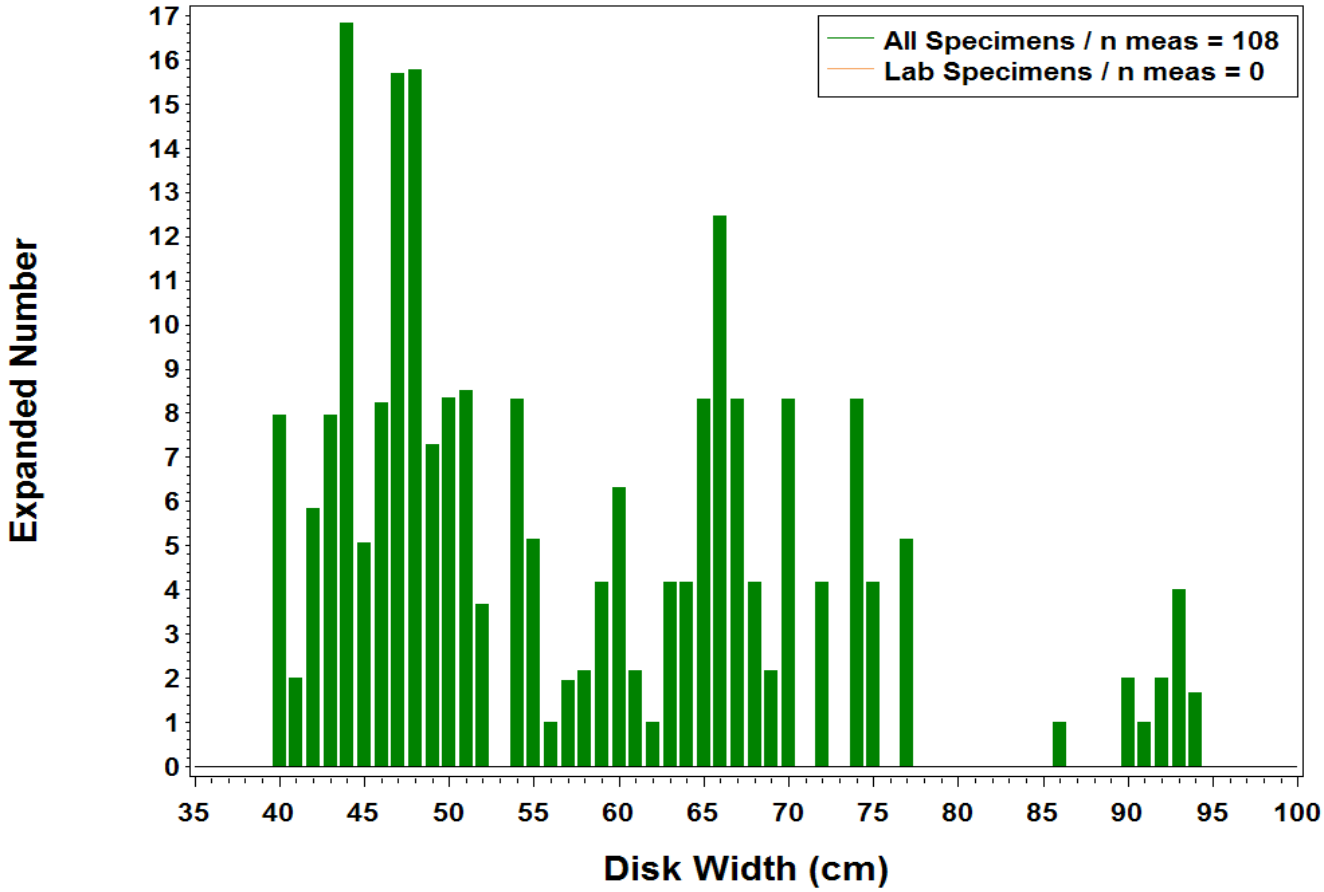
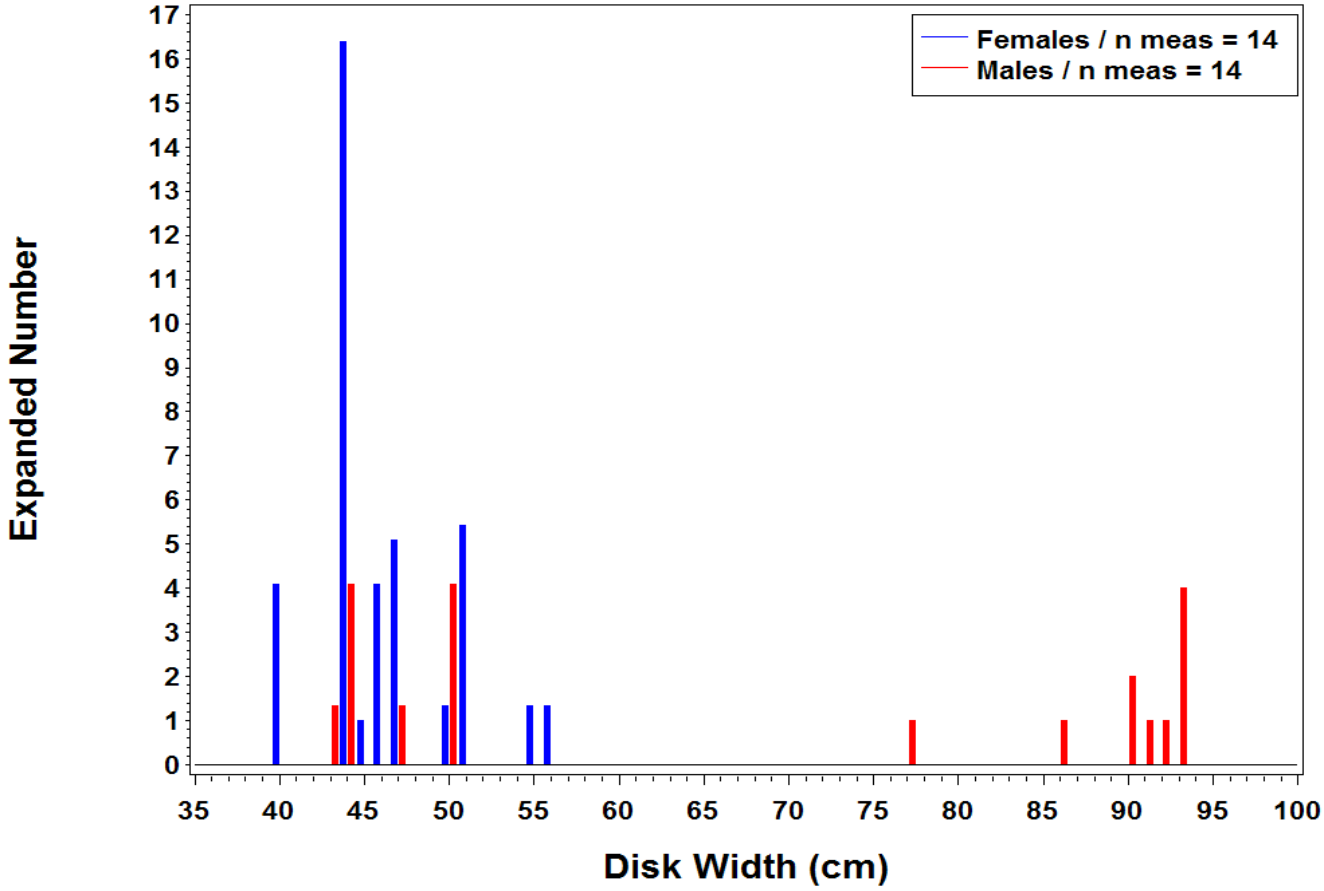


Figure 71. Sex-specific width frequency histogram for cownose ray. Disk width (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.



Horseshoe Crab (Priority E)

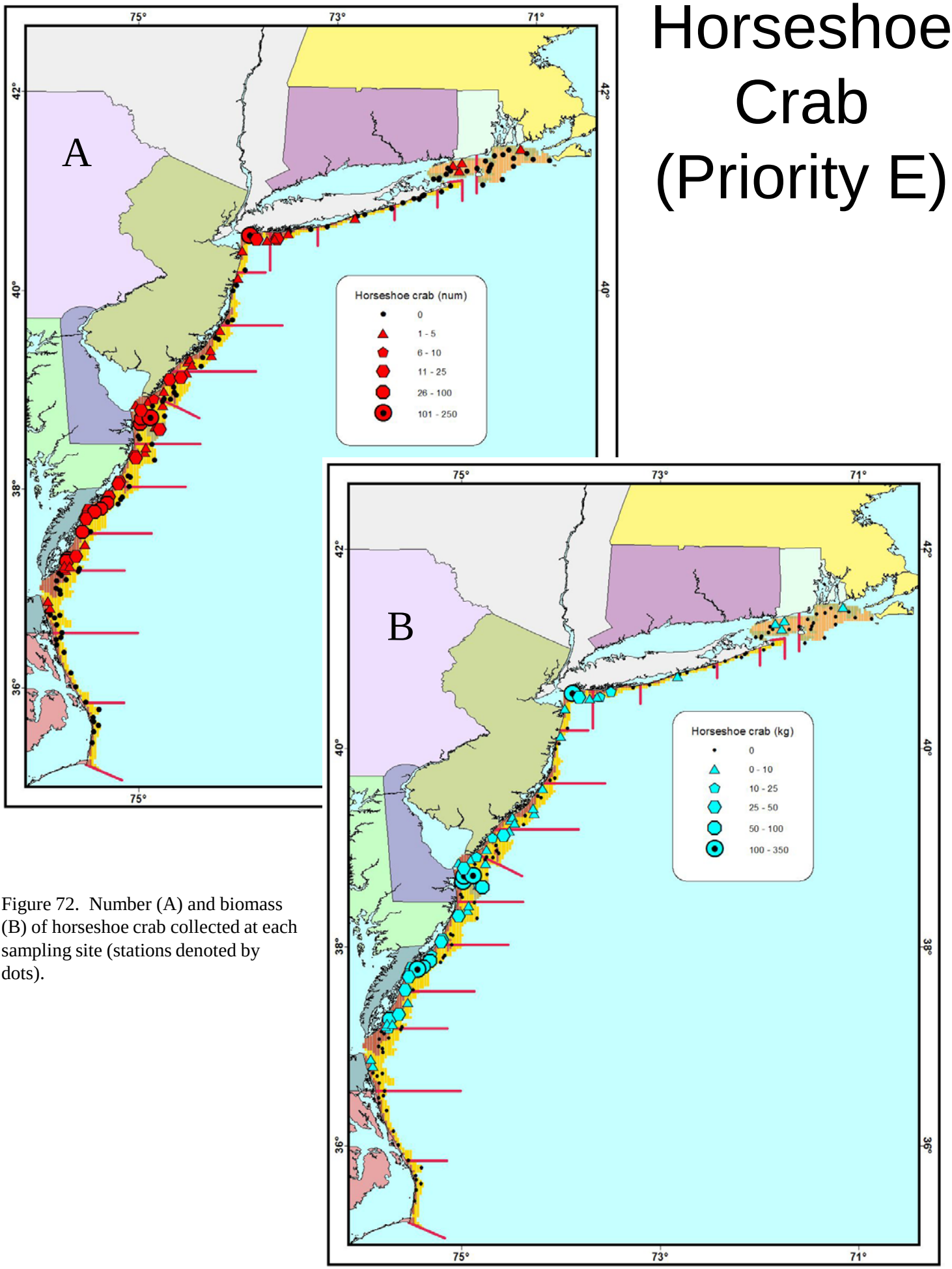


Figure 72. Number (A) and biomass (B) of horseshoe crab collected at each sampling site (stations denoted by dots).

Table 22. For each state, the number of sites sampled and the number at which horseshoe crabs were collected. The number and biomass of horseshoe crabs caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum crab width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm DW)	Max. Width (mm DW)	Avg. Length (mm DW)	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	0	0	0	0	N/A	N/A	N/A	N/A	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, for horseshoe crab. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

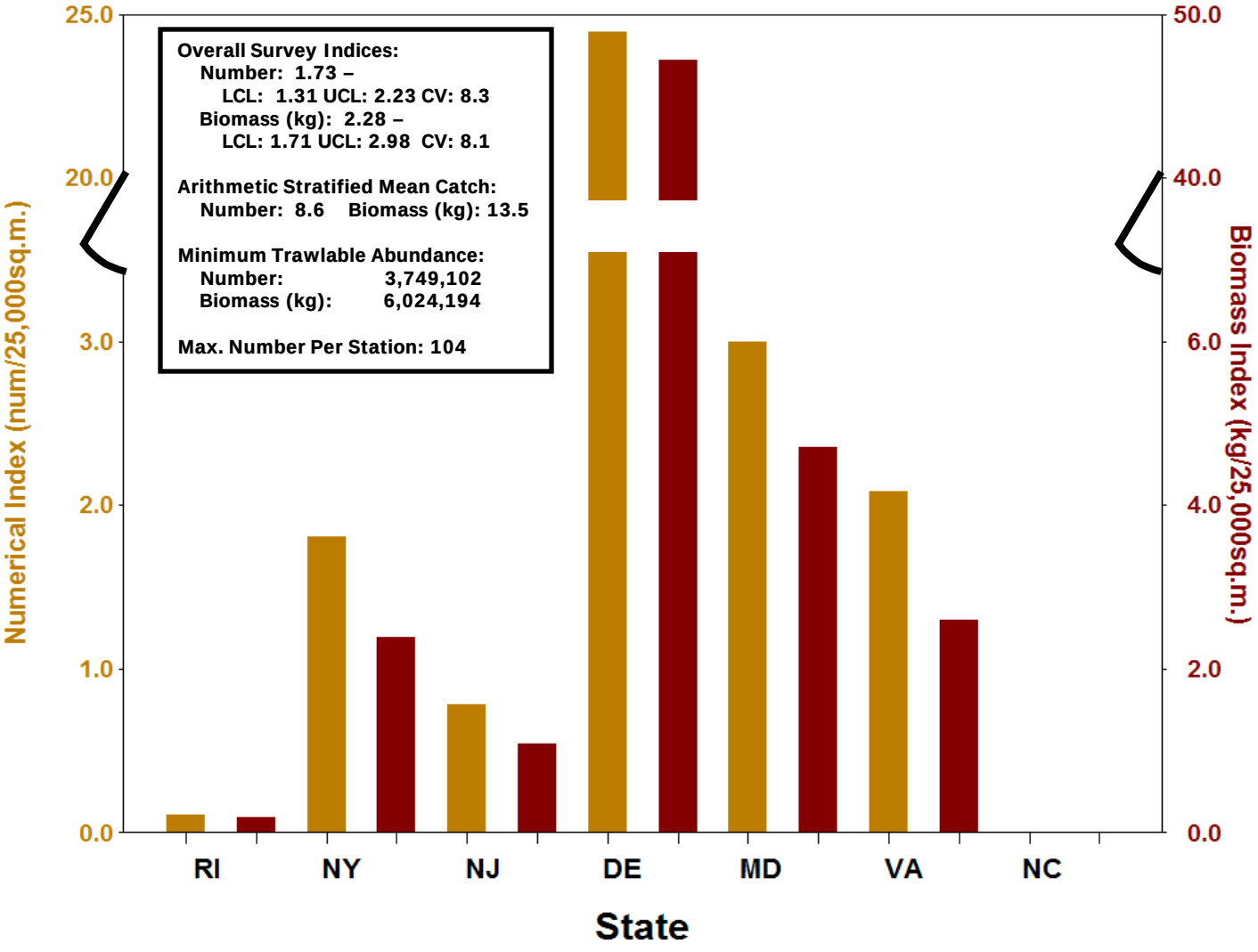


Figure 74. Width frequency histogram for horseshoe crab. Carapace width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

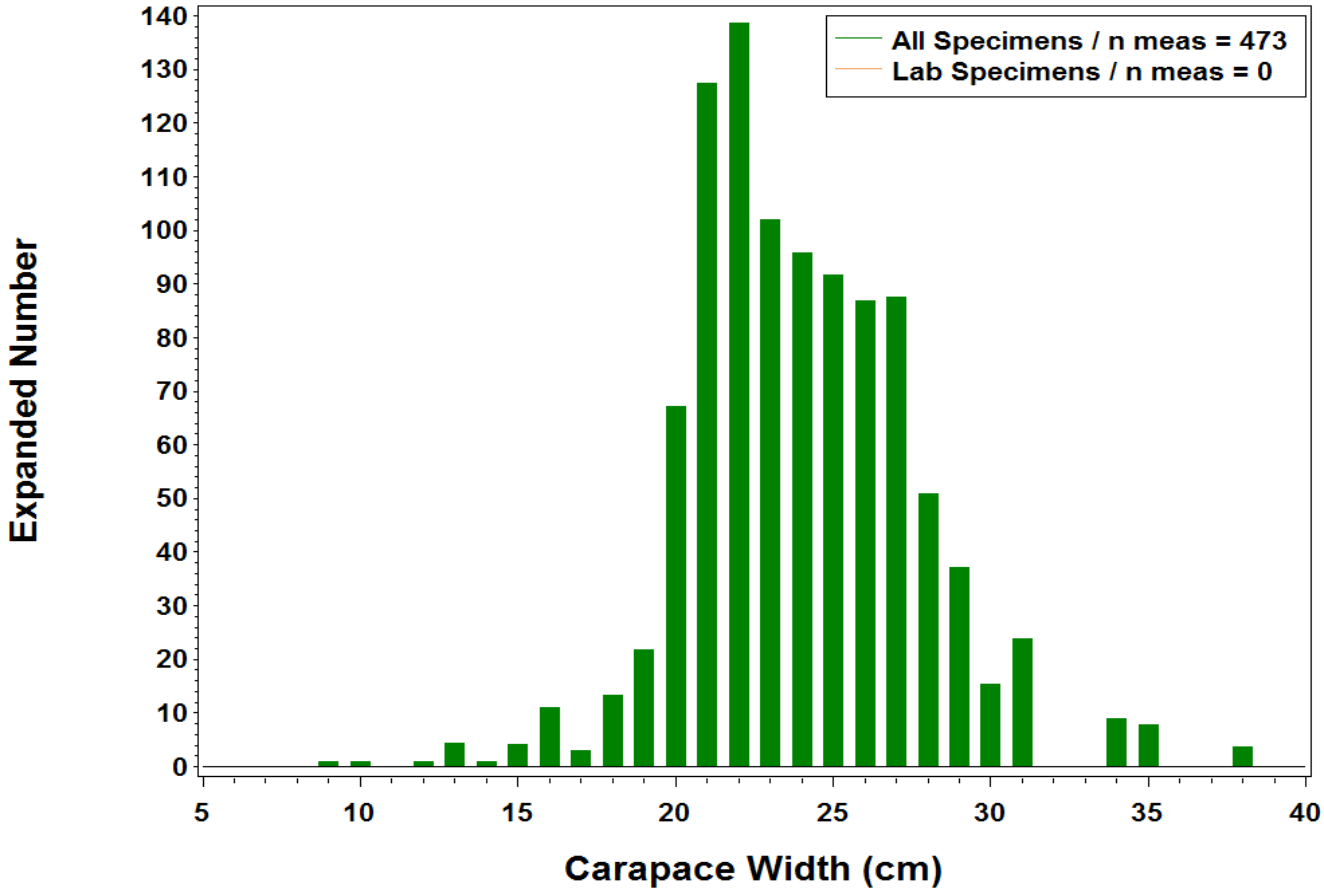


Figure 75. Sex-specific width frequency histogram for horseshoe crab. Carapace width (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

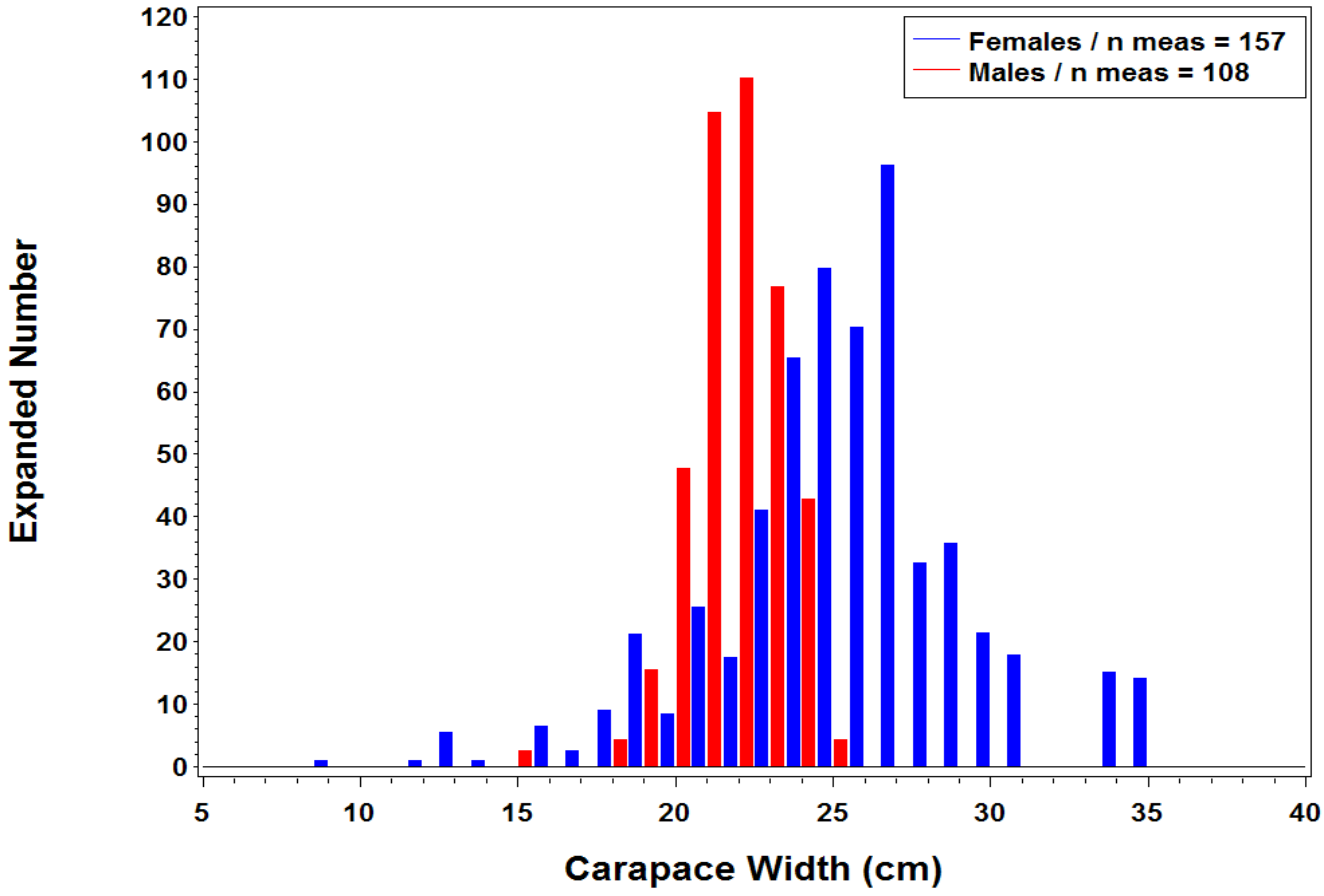
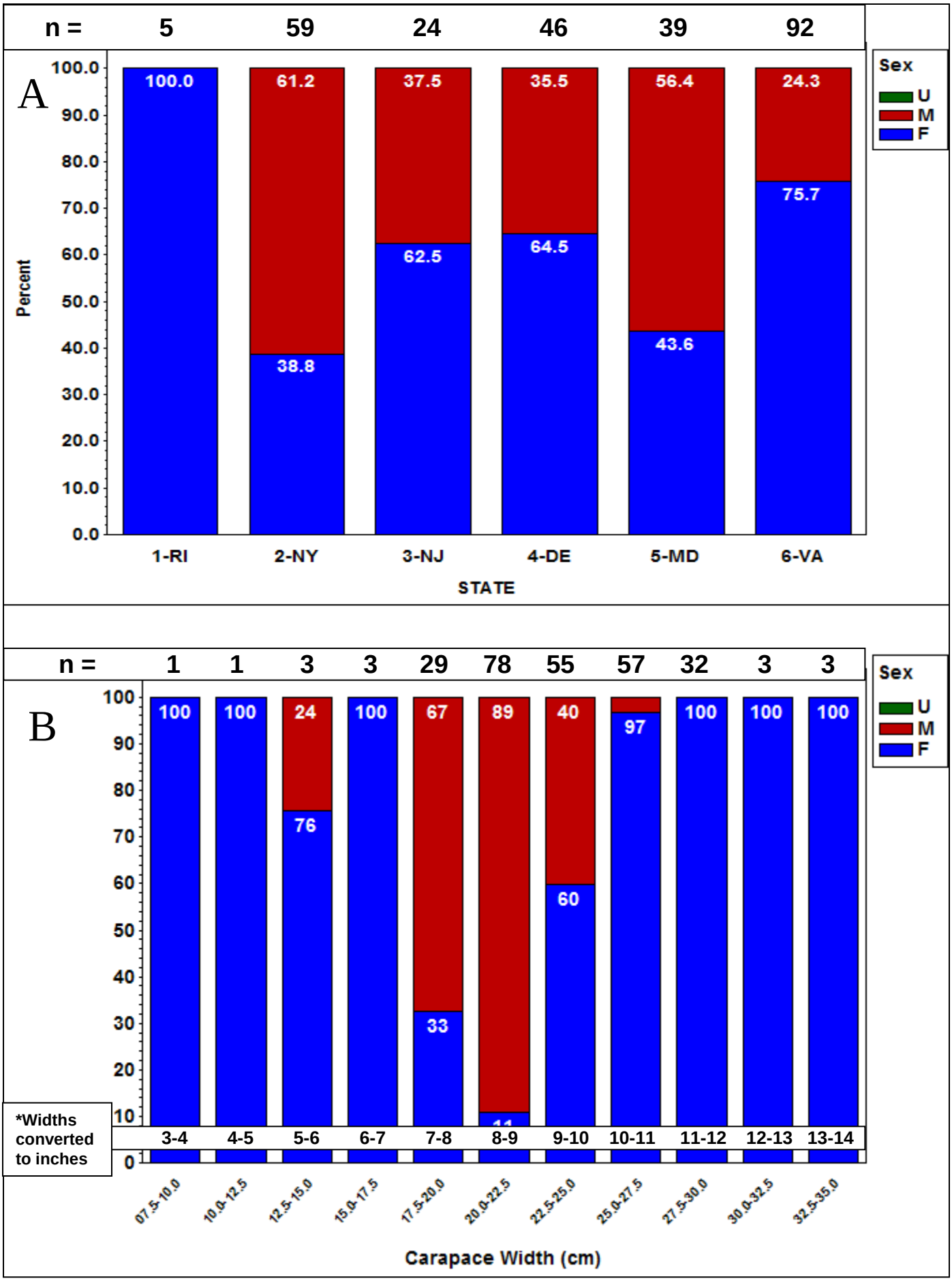


Figure 76. Sex ratios for horseshoe crab by state (A) and width group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Kingfish spp. (Priority D)

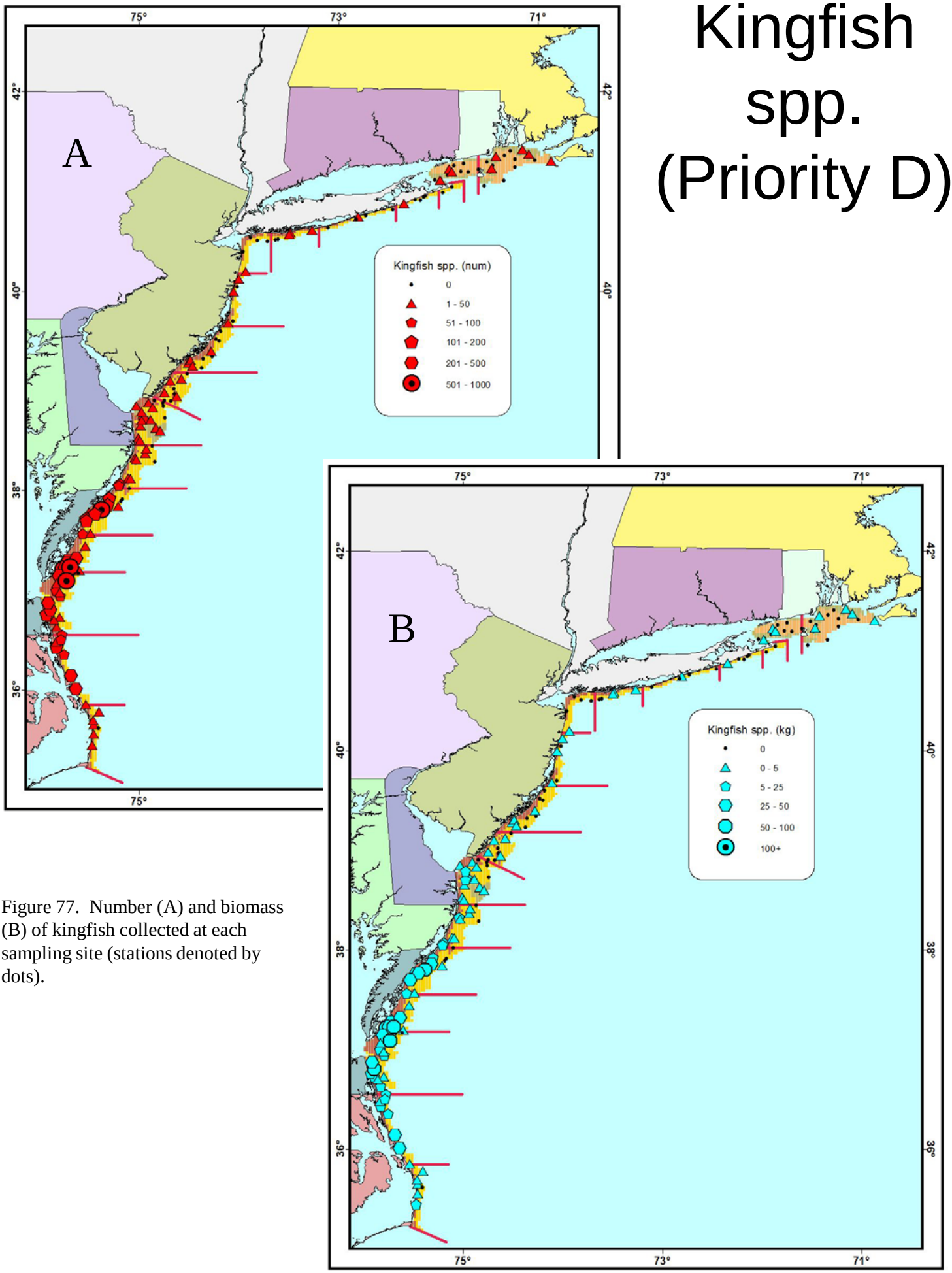


Figure 77. Number (A) and biomass (B) of kingfish collected at each sampling site (stations denoted by dots).

Table 23. For each state, the number of sites sampled and the number at which kingfish were collected. The number and biomass of kingfish caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum kingfish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	8	9	1.485	0	9	203	330	249	0.165	0.23	0.05
NY	22	6	19	2.471	0	19	154	269	236	0.130	0.32	0.07
NJ	24	11	70	12.043	0	70	134	356	235	0.172	0.86	0.27
DE	17	13	160	39.133	0	124	173	354	280	0.245	11.32	2.50
MD	10	8	191	52.419	0	87	209	339	270	0.274	5.94	2.15
VA	38	34	6716	1024.728	0	944	93	397	234	0.153	46.83	10.33
NC	13	12	861	122.162	0	249	122	337	237	0.142	18.76	4.24
Total	150	92	8026	1254.441	0	1502	93	397	240	0.156	6.44	2.20

Figure 78. Geometric mean catch per area swept, by state, for kingfish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

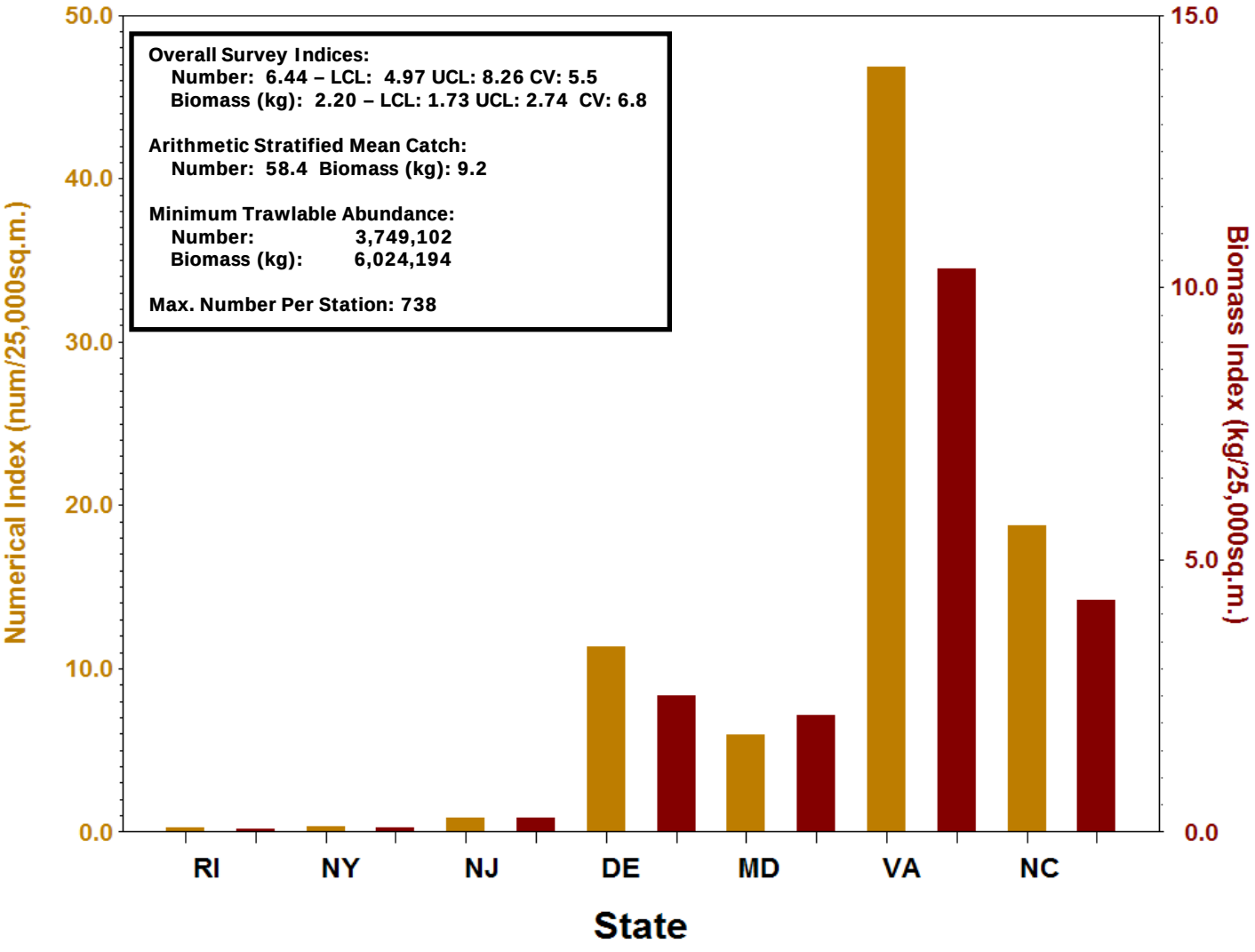
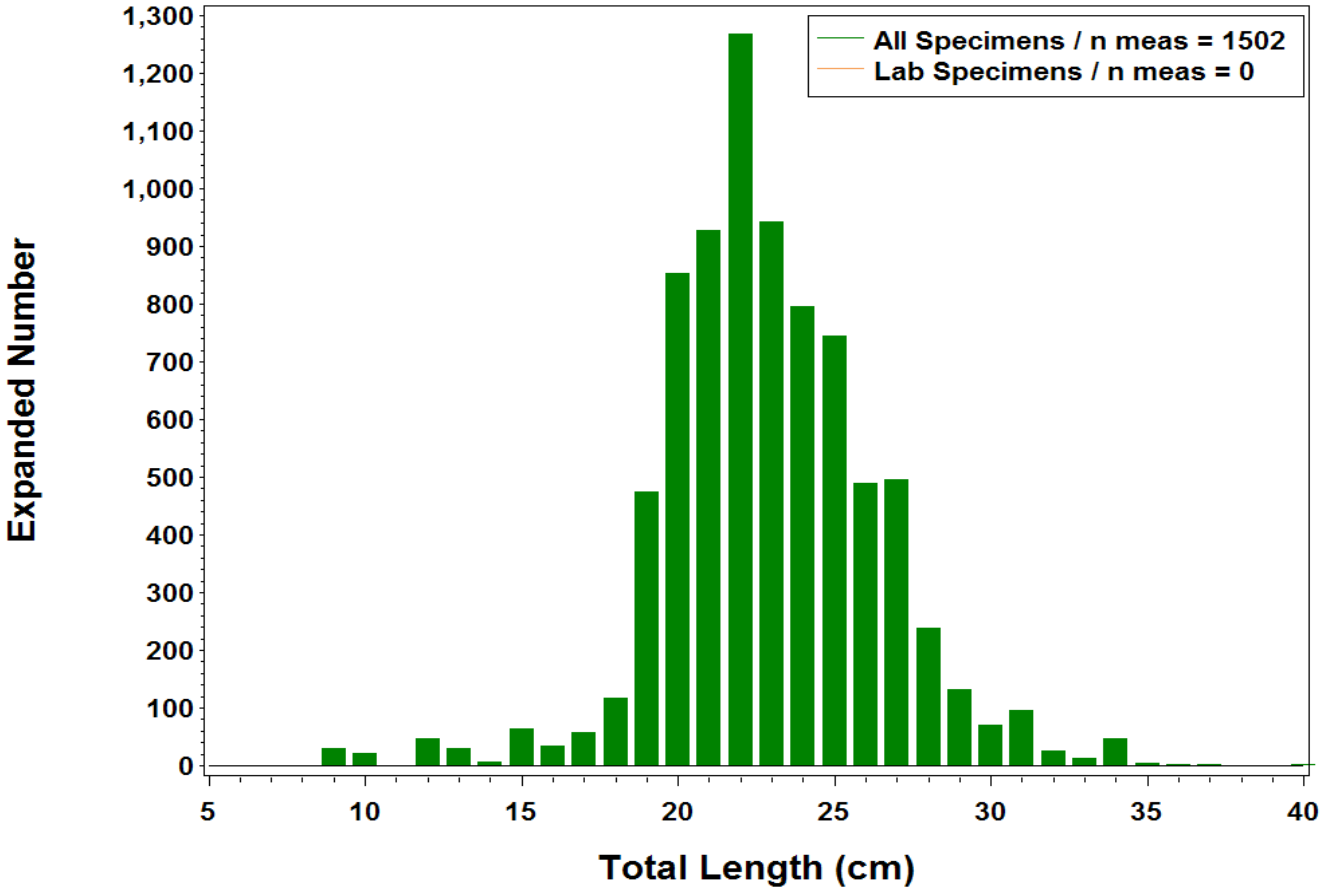


Figure 79. Length frequency histogram for kingfish. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Little Skate (Priority B)

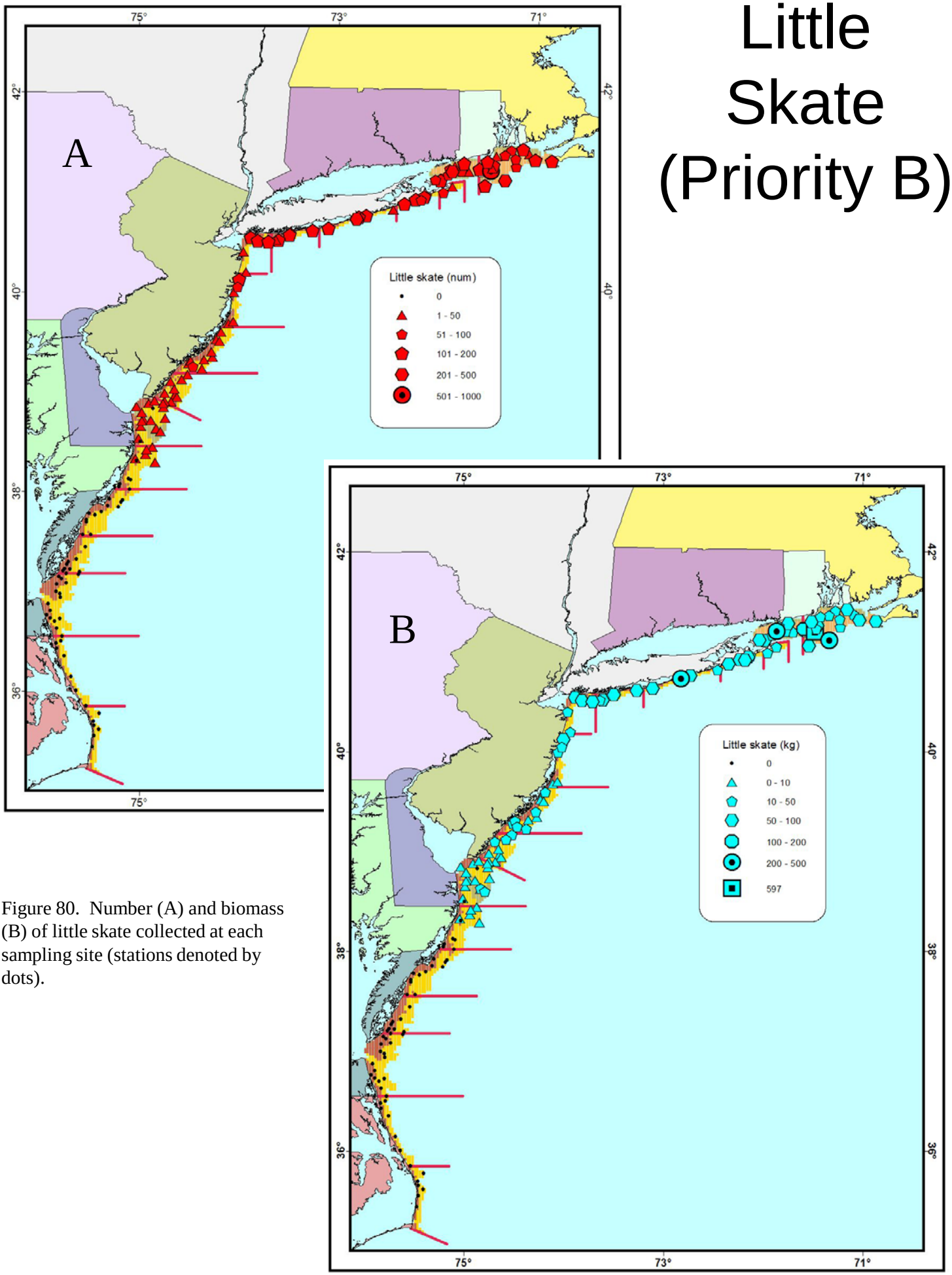


Figure 80. Number (A) and biomass (B) of little skate collected at each sampling site (stations denoted by dots).

Table 24. For each state, the number of sites sampled and the number at which little skate were collected. The number and biomass of these skates caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum skate width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm DW)	Max. Width (mm DW)	Avg. Width (mm DW)	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	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NC	13	0	0	0	0	0	N/A	N/A	N/A	N/A	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, for little skate. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

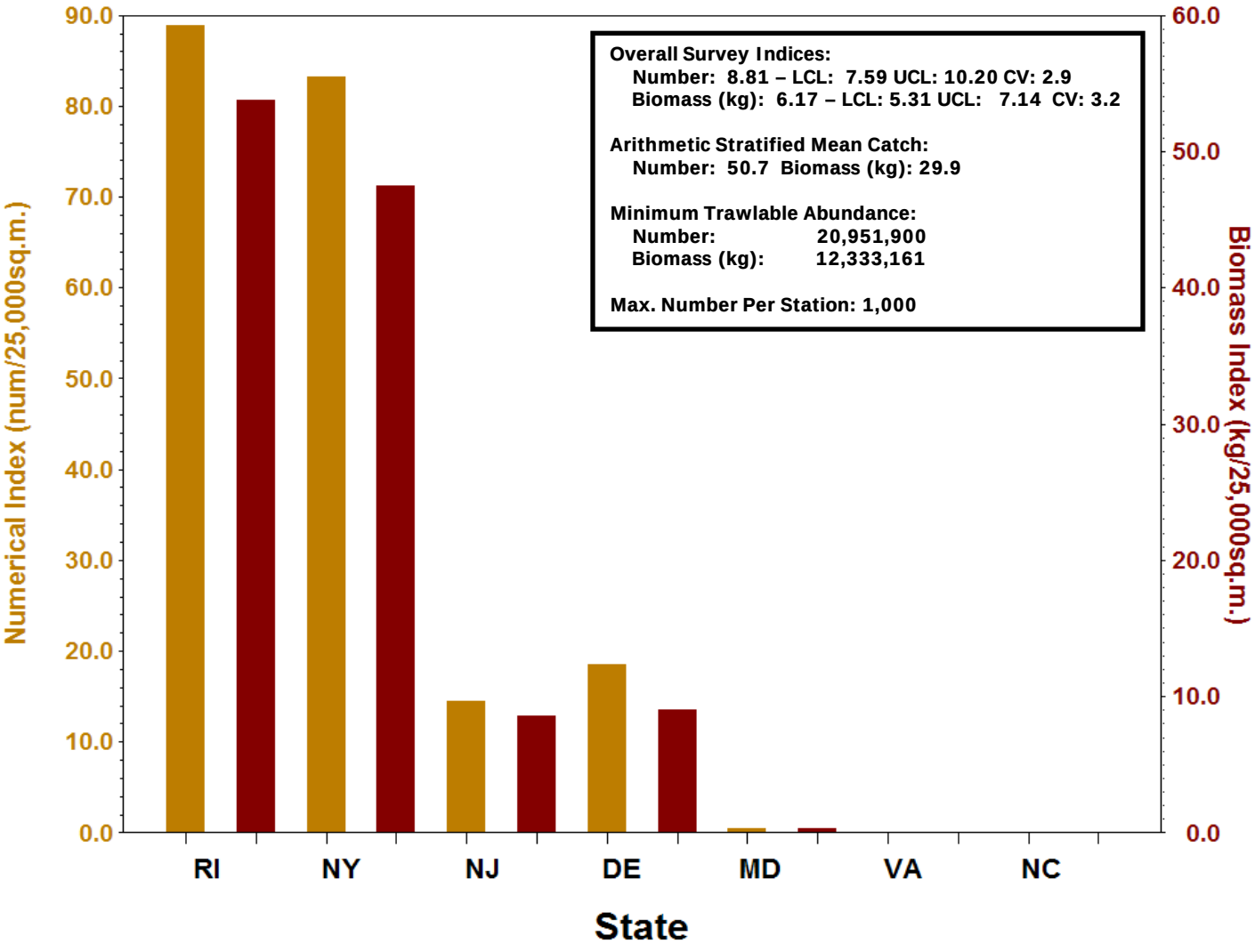


Figure 82. Width frequency histogram for little skate. Disk width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

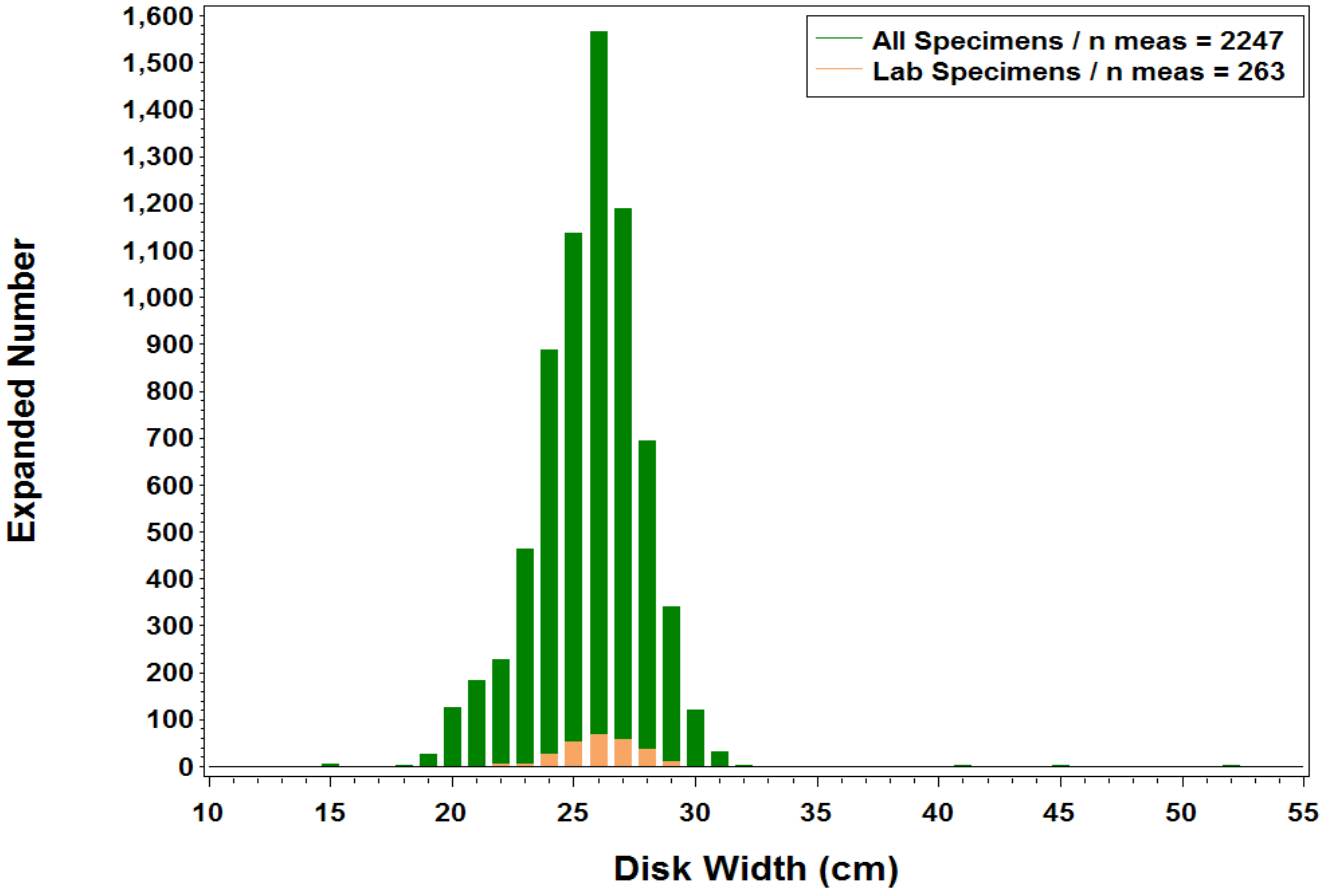


Figure 83. Sex-specific width frequency histogram for little skate. Disk width (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

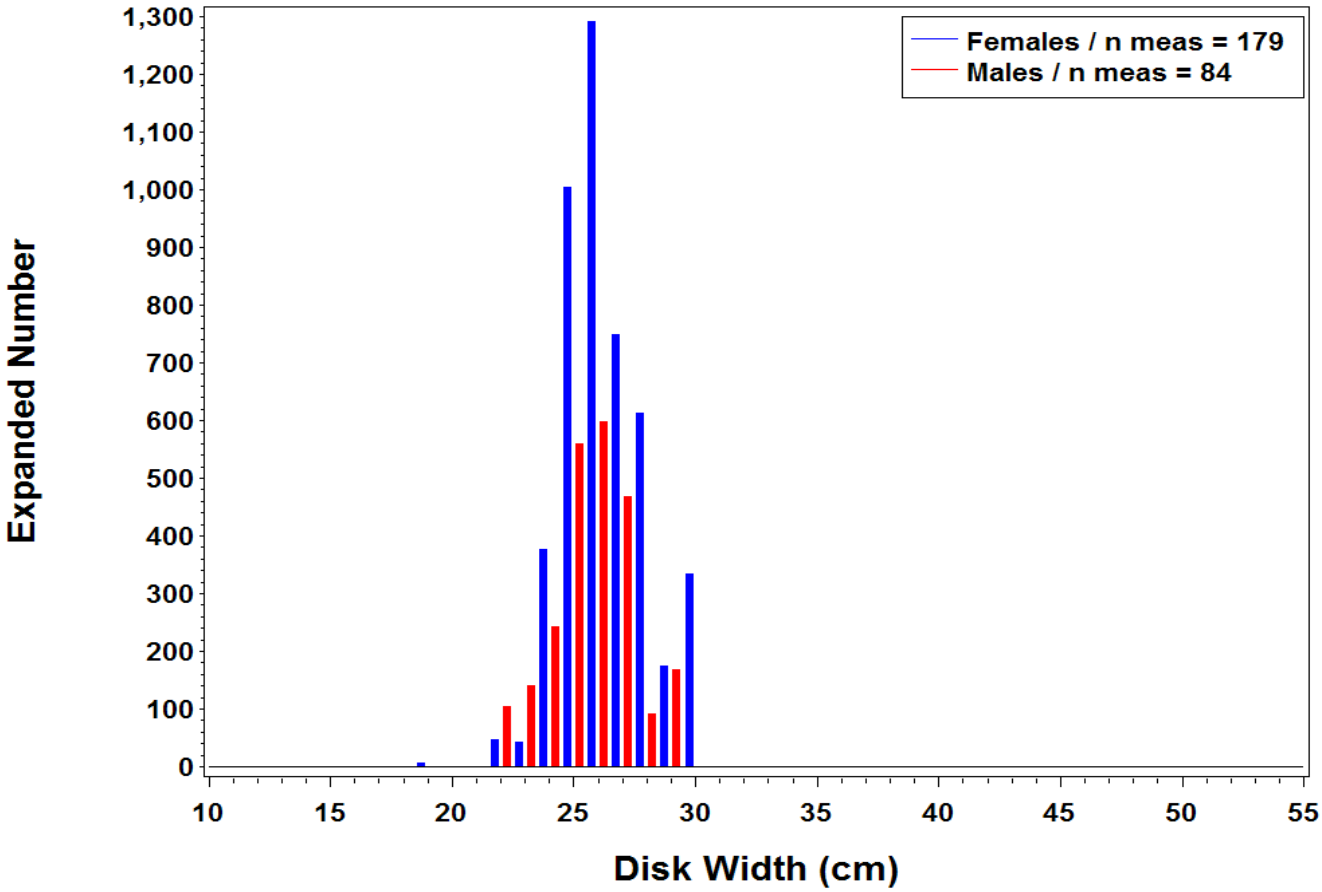
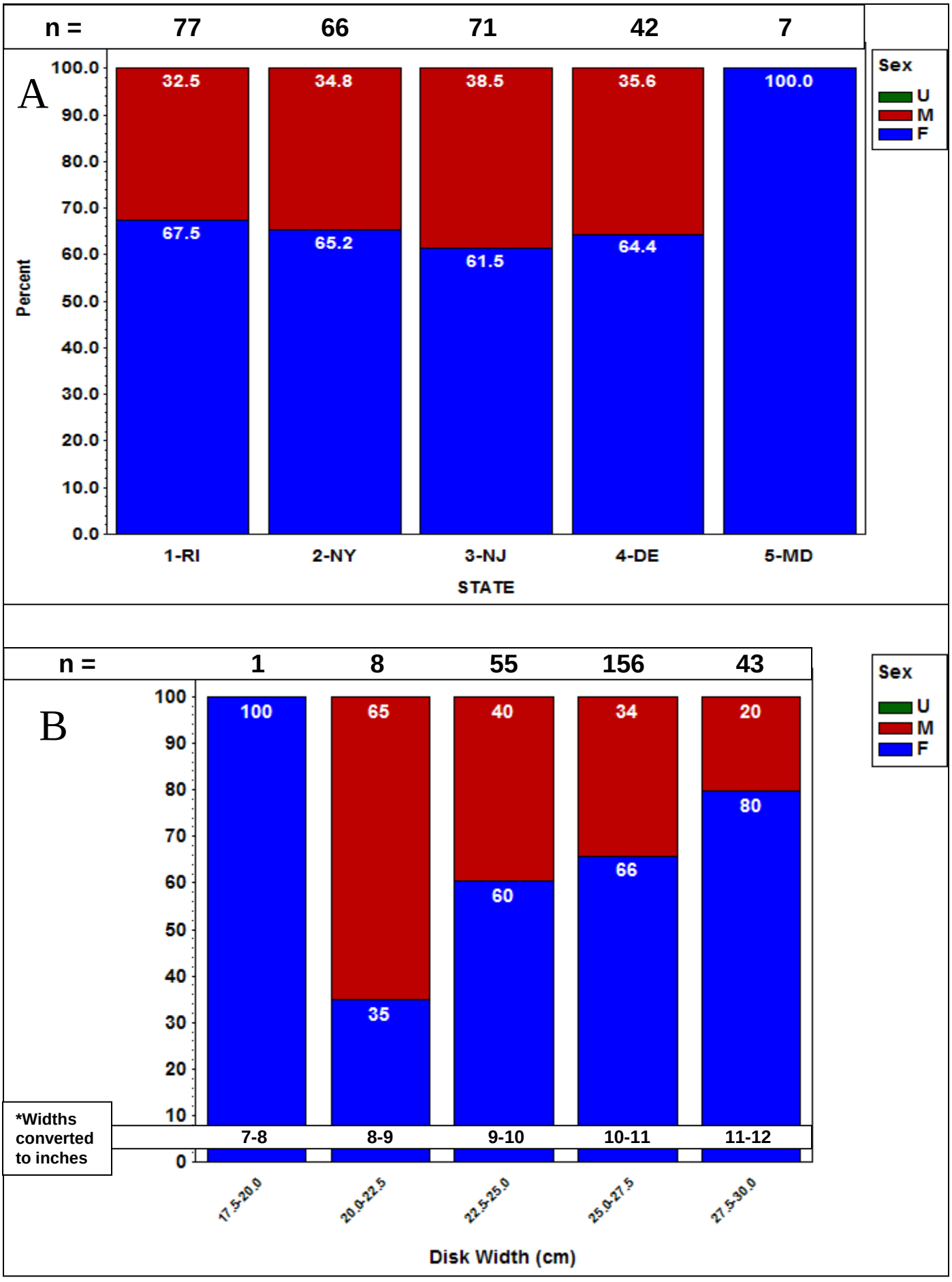


Figure 84. Sex ratios for little skate by state (A) and width group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Loligo Squid (Priority E)

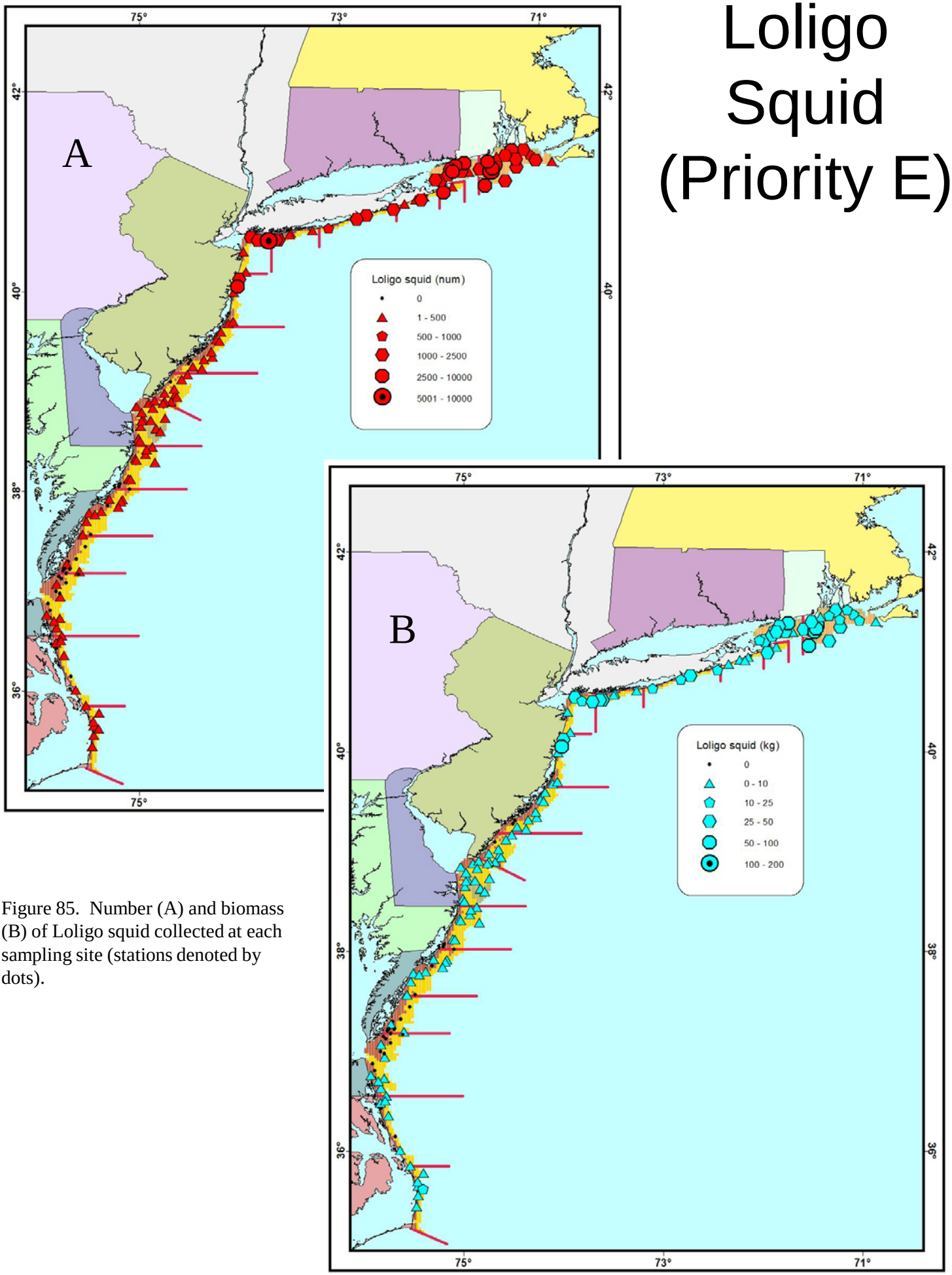


Figure 85. Number (A) and biomass (B) of Loligo squid collected at each sampling site (stations denoted by dots).

Table 25. For each state, the number of sites sampled and the number at which Loligo squid were collected. The number and biomass of squid caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum squid length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm ML)	Max. Length (mm ML)	Avg. Length (mm ML)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	26	60040	812.495	0	2333	18	202	67	0.014	1586.53	22.10
NY	22	20	24983	311.399	0	1423	24	235	66	0.012	512.68	9.56
NJ	24	21	6501	149.589	0	1105	30	240	79	0.023	49.96	2.18
DE	17	16	523	16.679	0	362	29	293	108	0.034	111.15	1.79
MD	10	10	384	12.267	0	228	29	200	84	0.032	20.15	1.04
VA	38	27	466	29.824	0	396	32	278	119	0.064	4.77	0.60
NC	13	11	486	25.603	0	151	36	225	130	0.053	8.10	1.14
Total	150	131	93383	1357.856	0	5998	18	293	77	0.015	71.37	3.46

Figure 86. Geometric mean catch per area swept, by state, for Loligo squid. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

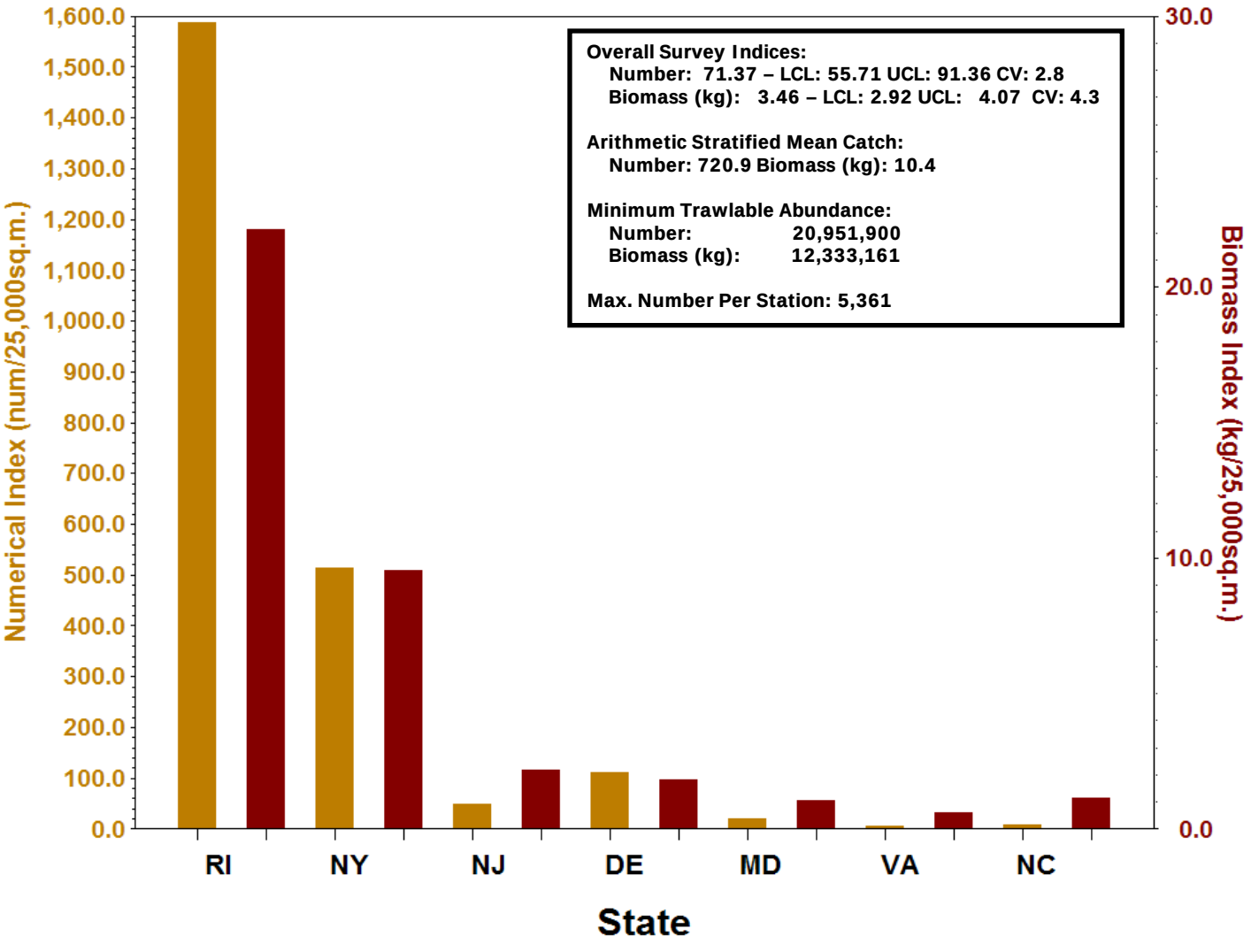
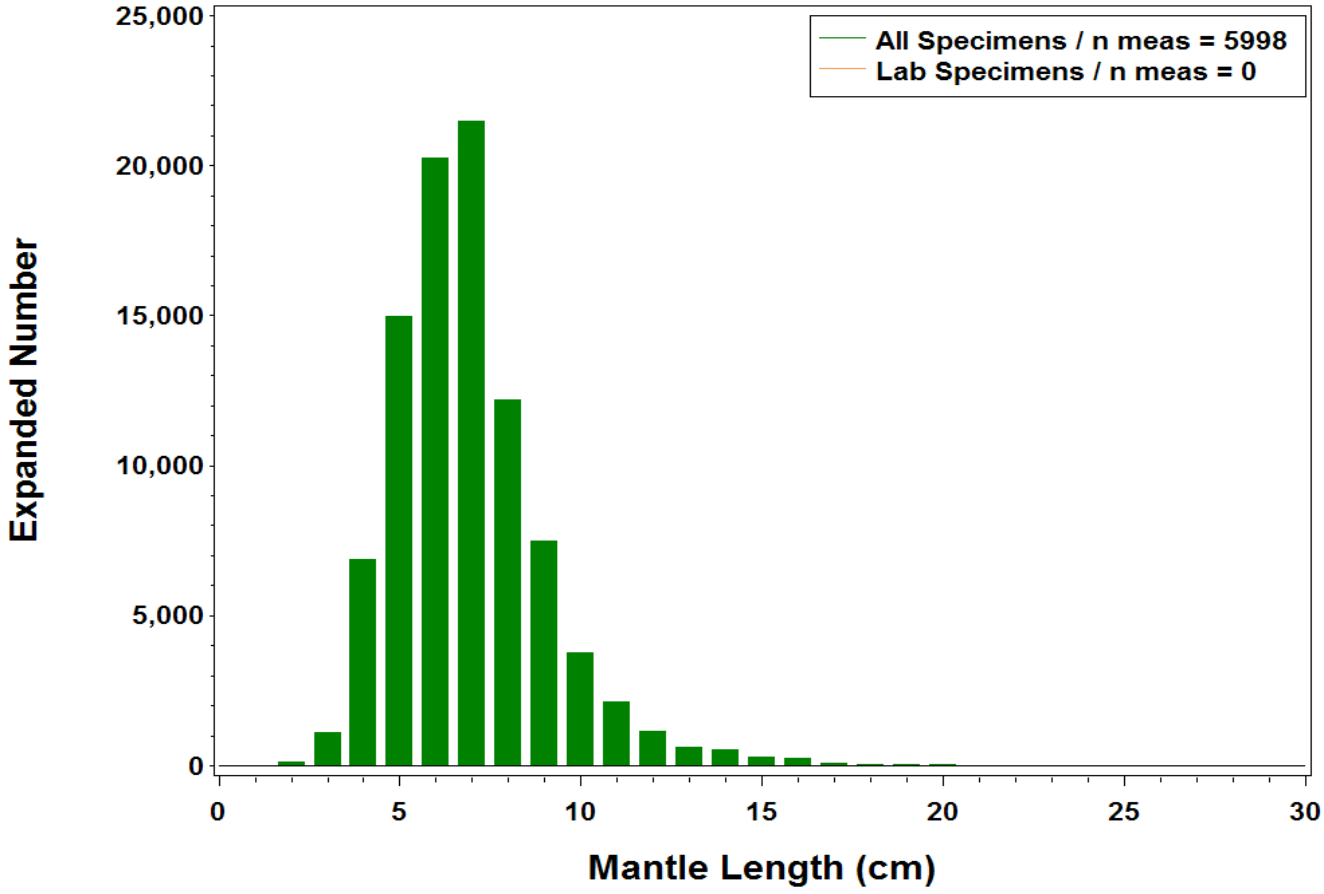


Figure 87. Length frequency histogram for Loligo squid. Mantle length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Northern Searobin (Priority D)

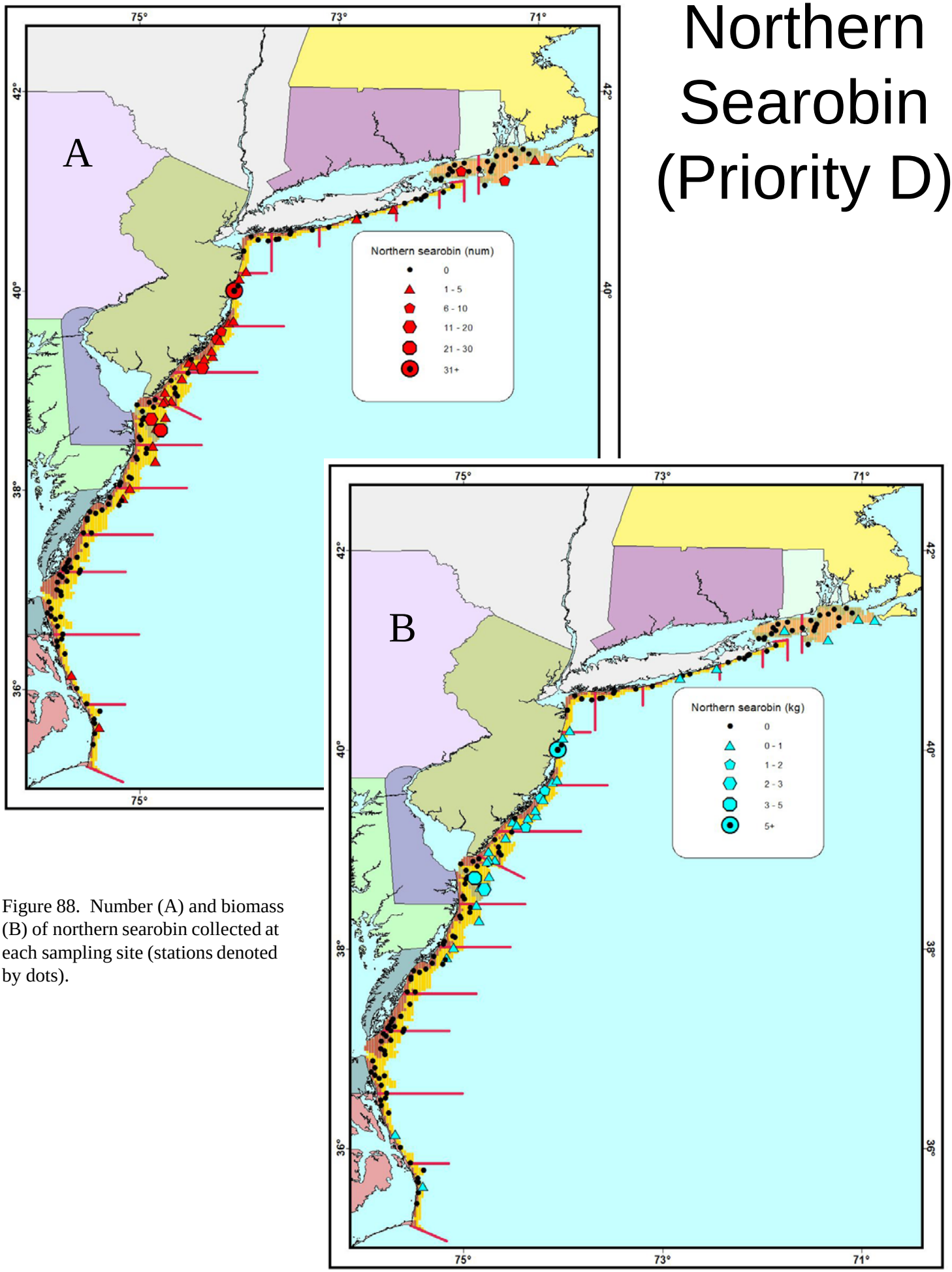


Figure 88. Number (A) and biomass (B) of northern searobin collected at each sampling site (stations denoted by dots).

Table 26. For each state, the number of sites sampled and the number at which northern searobin were collected. The number and biomass of searobin caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum searobin length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	4	18	1.412	0	18	169	228	195	0.078	0.23	0.04
NY	22	3	10	1.166	0	10	107	257	205	0.117	0.25	0.05
NJ	24	17	91	14.600	0	91	151	291	246	0.160	1.64	0.35
DE	17	5	50	7.060	0	50	169	319	235	0.141	2.12	0.54
MD	10	2	4	0.510	0	4	139	263	215	0.128	0.22	0.04
VA	38	2	4	0.499	0	4	191	270	231	0.125	0.06	0.01
NC	13	2	2	0.055	0	2	116	149	133	0.028	0.12	0.00
Total	150	35	179	25.302	0	179	107	319	233	0.141	0.33	0.08

Figure 89. Geometric mean catch per area swept, by state, for northern searobin. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

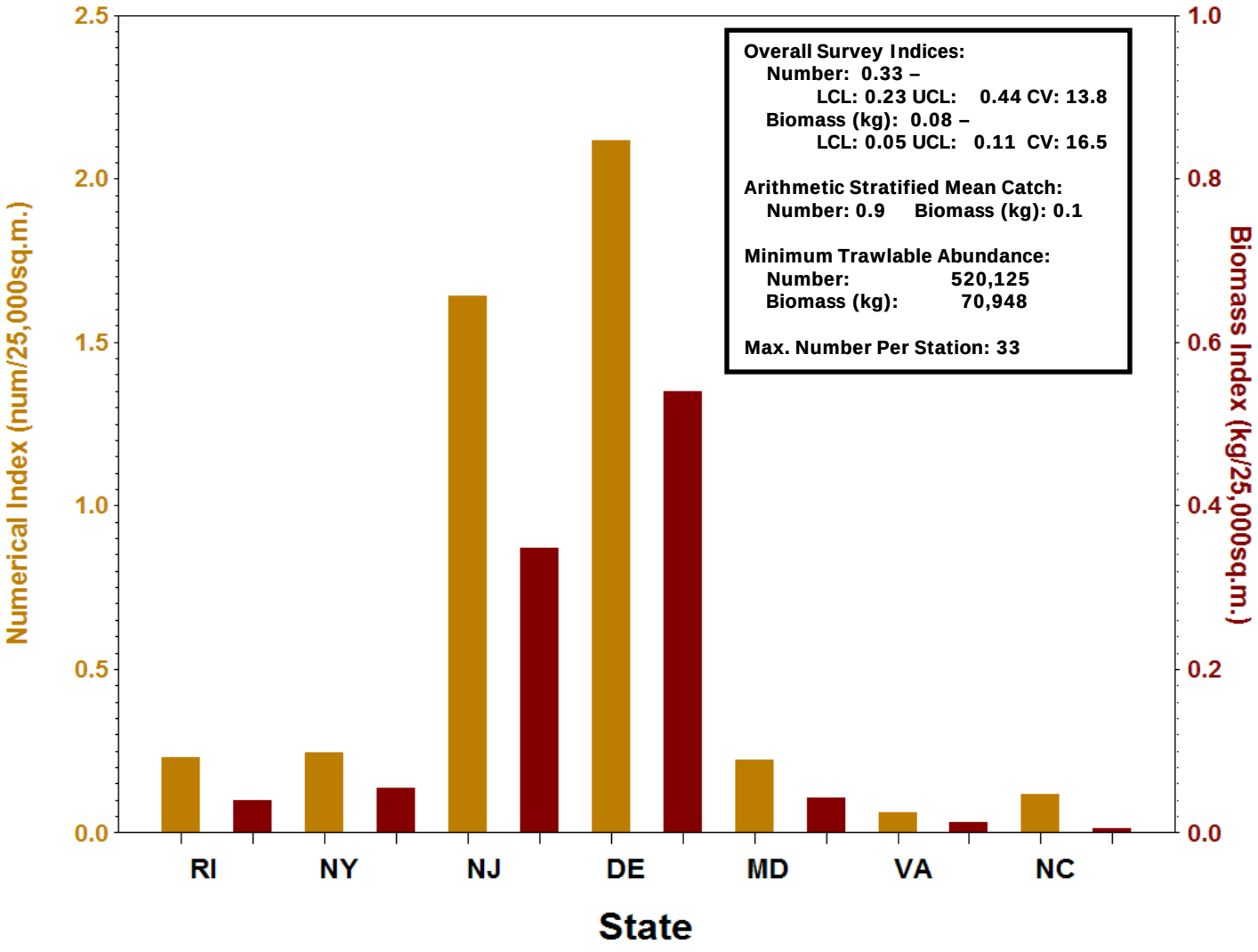
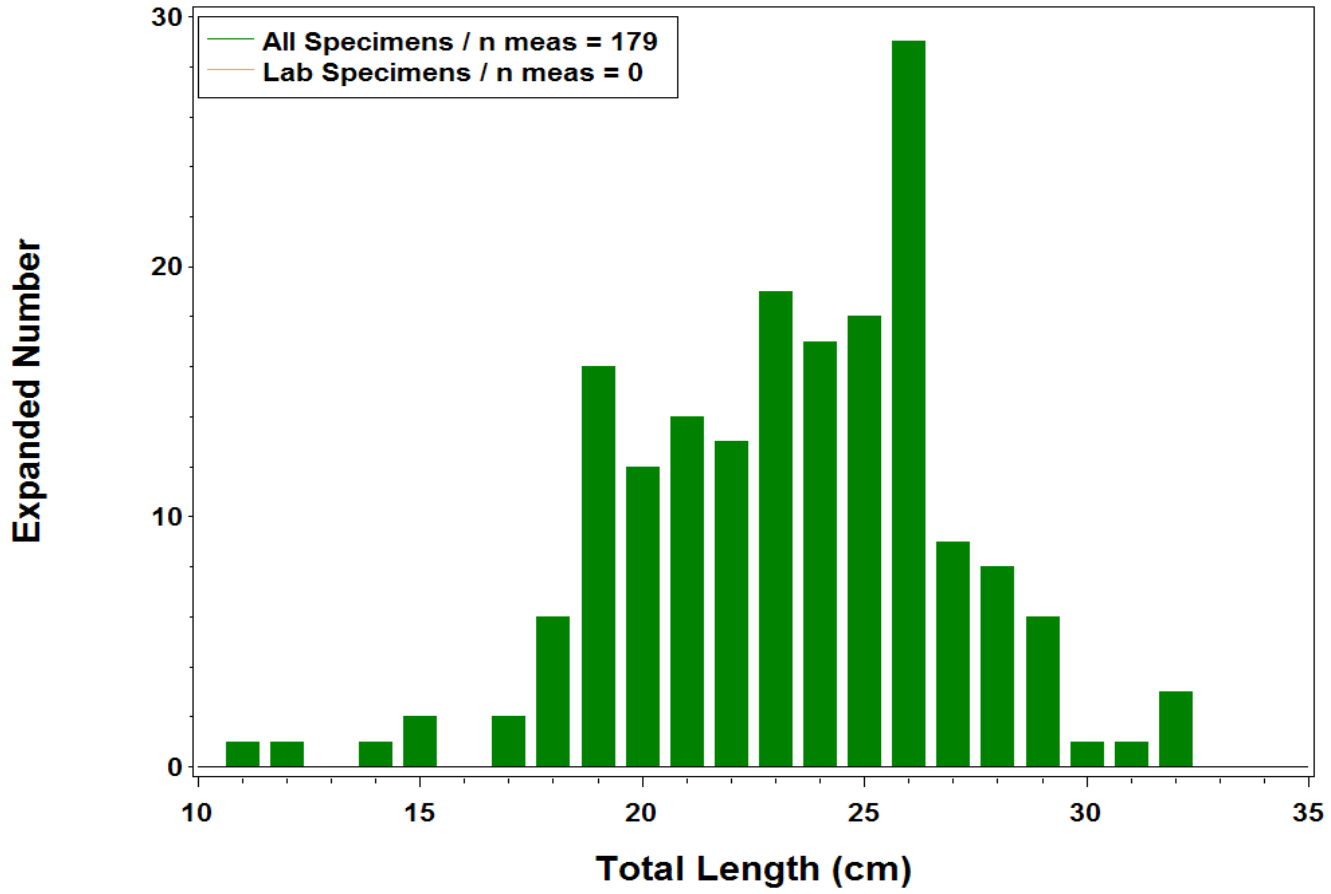


Figure 90. Length frequency histogram for northern searobin. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Pinfish (Priority D)

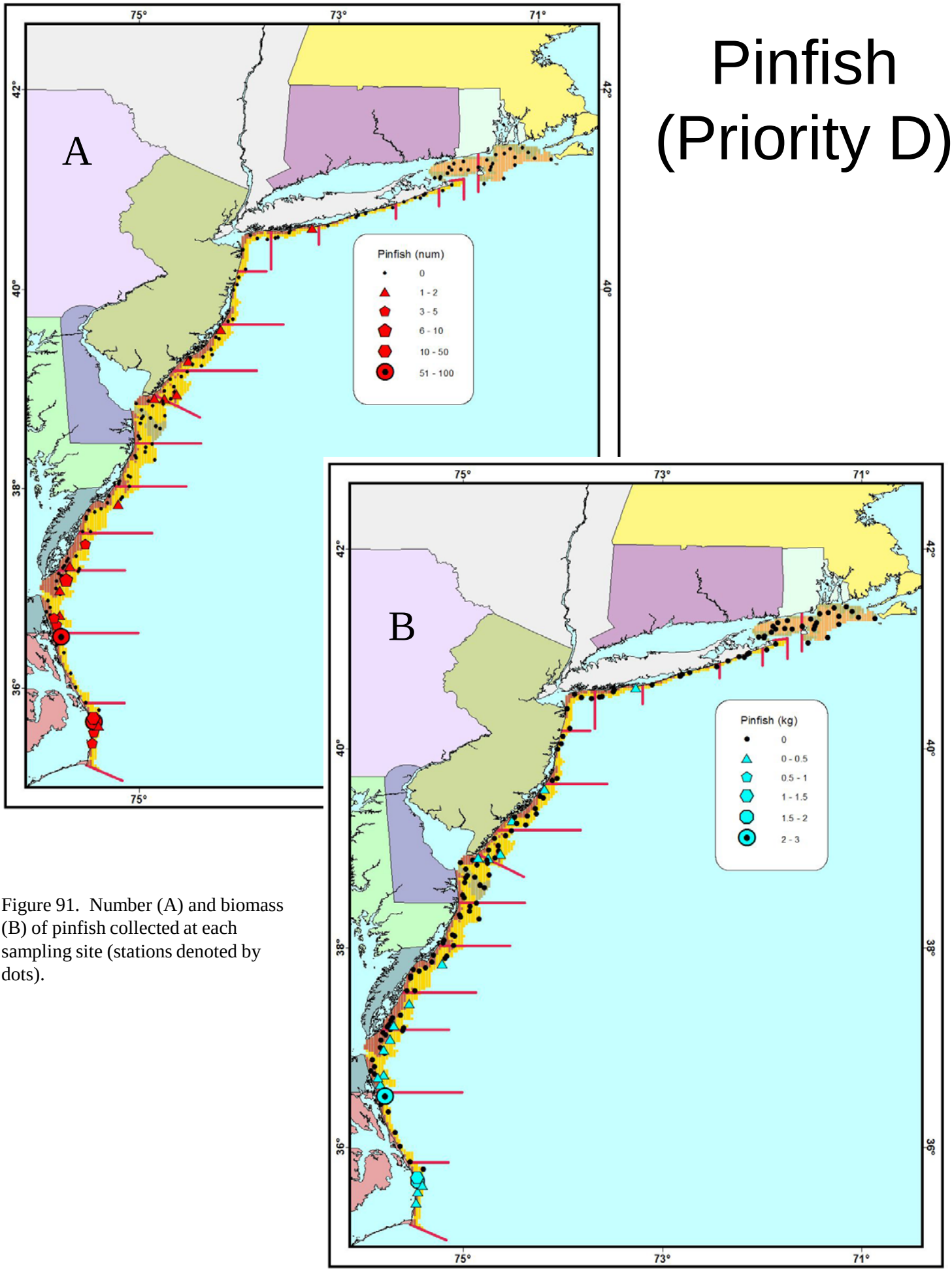


Figure 91. Number (A) and biomass (B) of pinfish collected at each sampling site (stations denoted by dots).

Table 27. For each state, the number of sites sampled and the number at which pinfish were collected. The number and biomass of pinfish caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum pinfish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	1	1	0.072	0	1	152	152	152	0.072	0.03	0.00
NJ	24	4	5	0.423	0	5	131	154	142	0.085	0.12	0.01
DE	17	1	1	0.080	0	1	151	151	151	0.080	0.05	0.01
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	9	31	1.668	0	31	110	163	133	0.054	0.40	0.04
NC	13	6	146	6.000	0	146	99	162	124	0.041	2.16	0.29
Total	150	21	184	8.243	0	184	99	163	126	0.045	0.21	0.03

Figure 92. Geometric mean catch per area swept, by state, for pinfish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

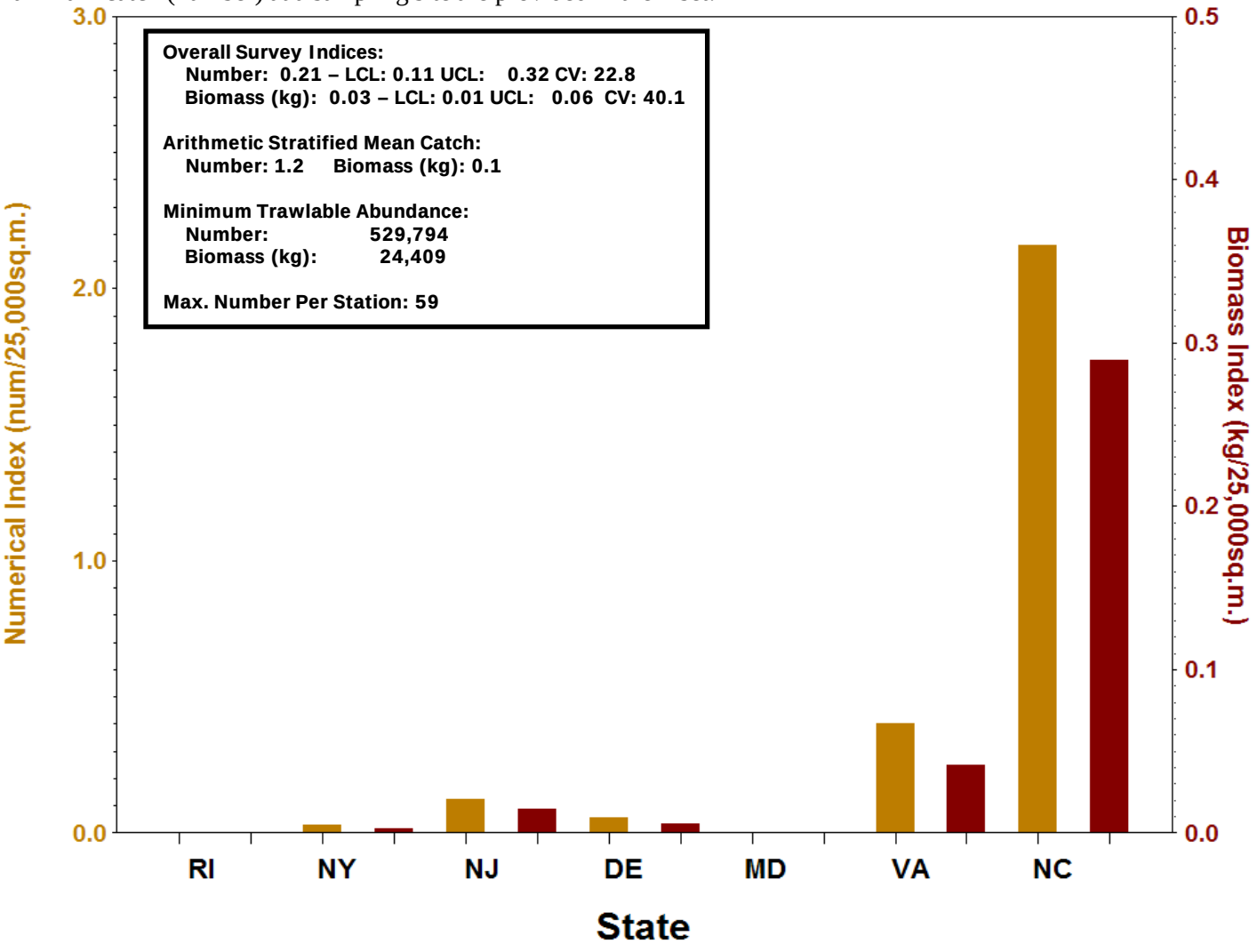
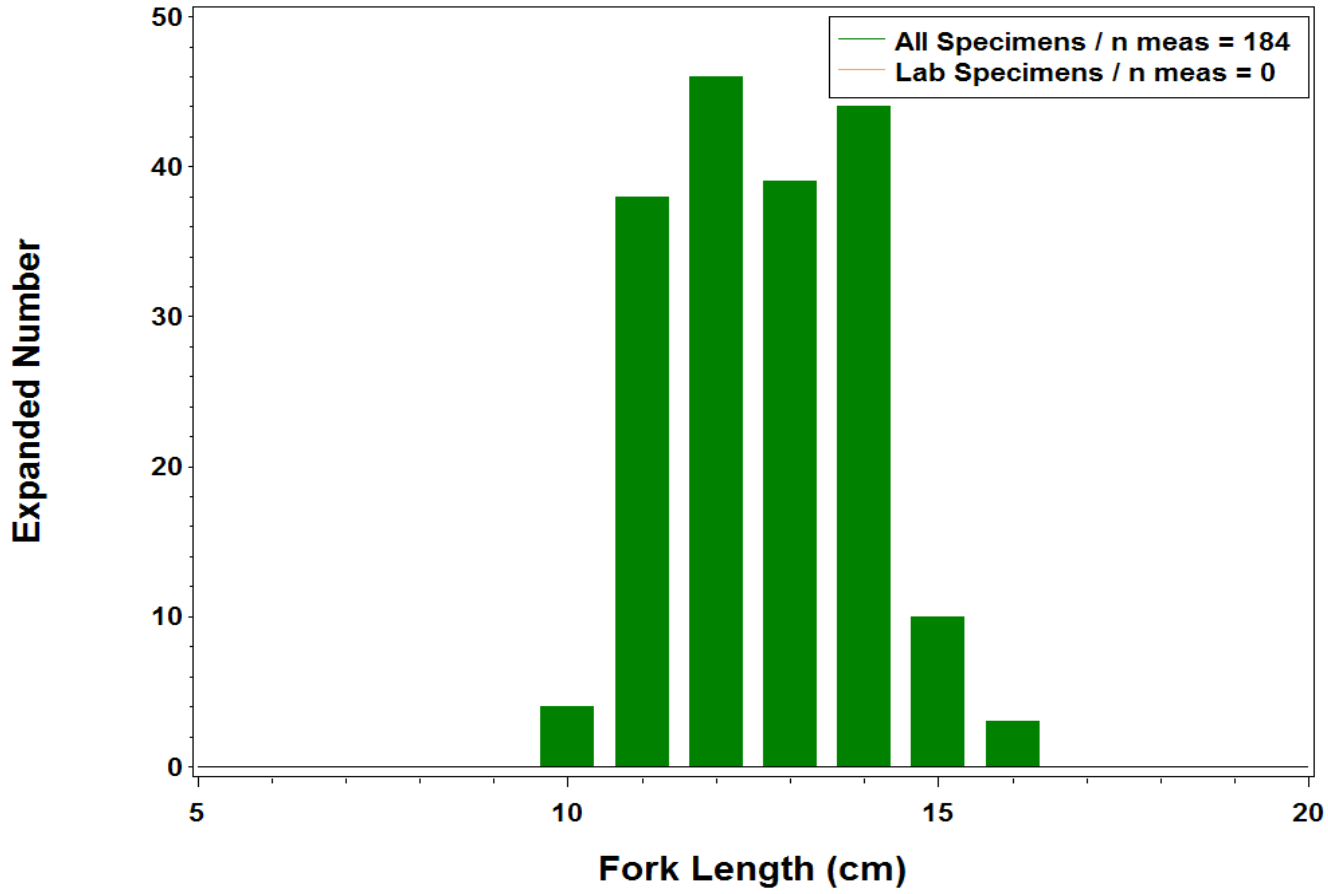


Figure 93. Length frequency histogram for pinfish. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Red Hake (Priority D)

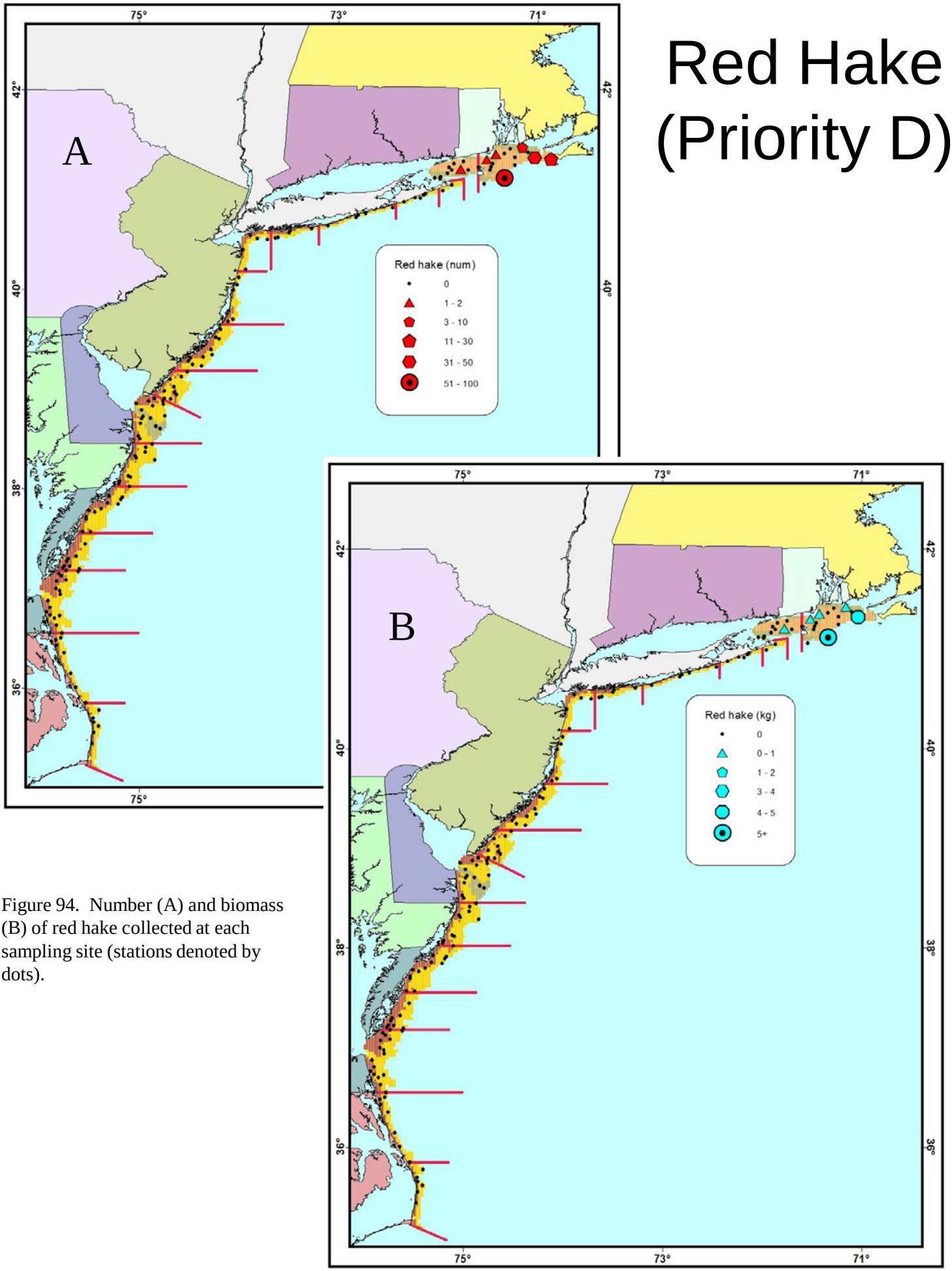


Figure 94. Number (A) and biomass (B) of red hake collected at each sampling site (stations denoted by dots).

Table 28. For each state, the number of sites sampled and the number at which red hake were collected. The number and biomass of these hake caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum hake length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	7	145	18.232	0	98	90	449	235	0.126	0.85	0.26
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NC	13	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
Total	150	7	145	18.232	0	98	90	449	235	0.126	0.17	0.06

Figure 95. Geometric mean catch per area swept, by state, for red hake. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

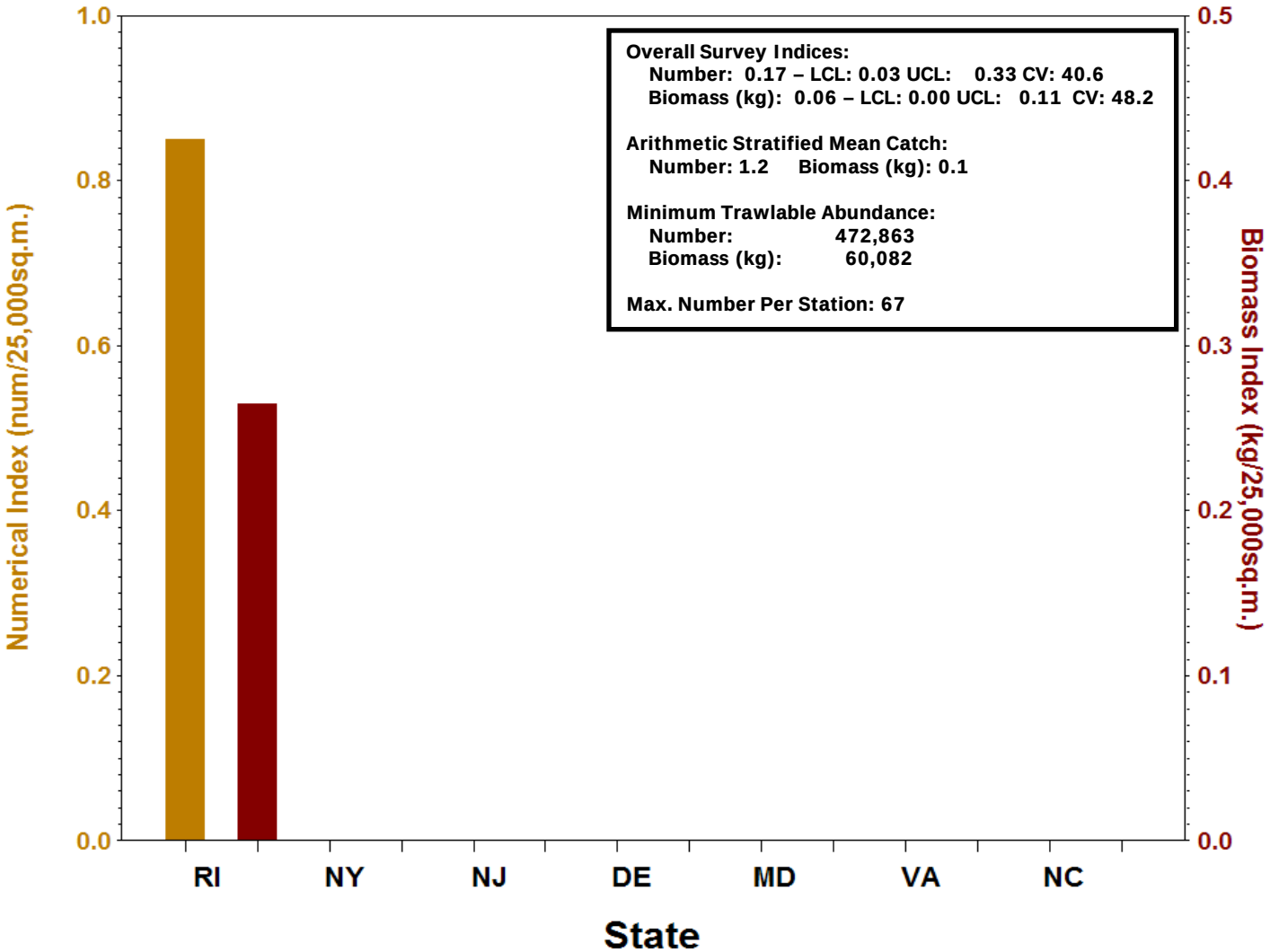
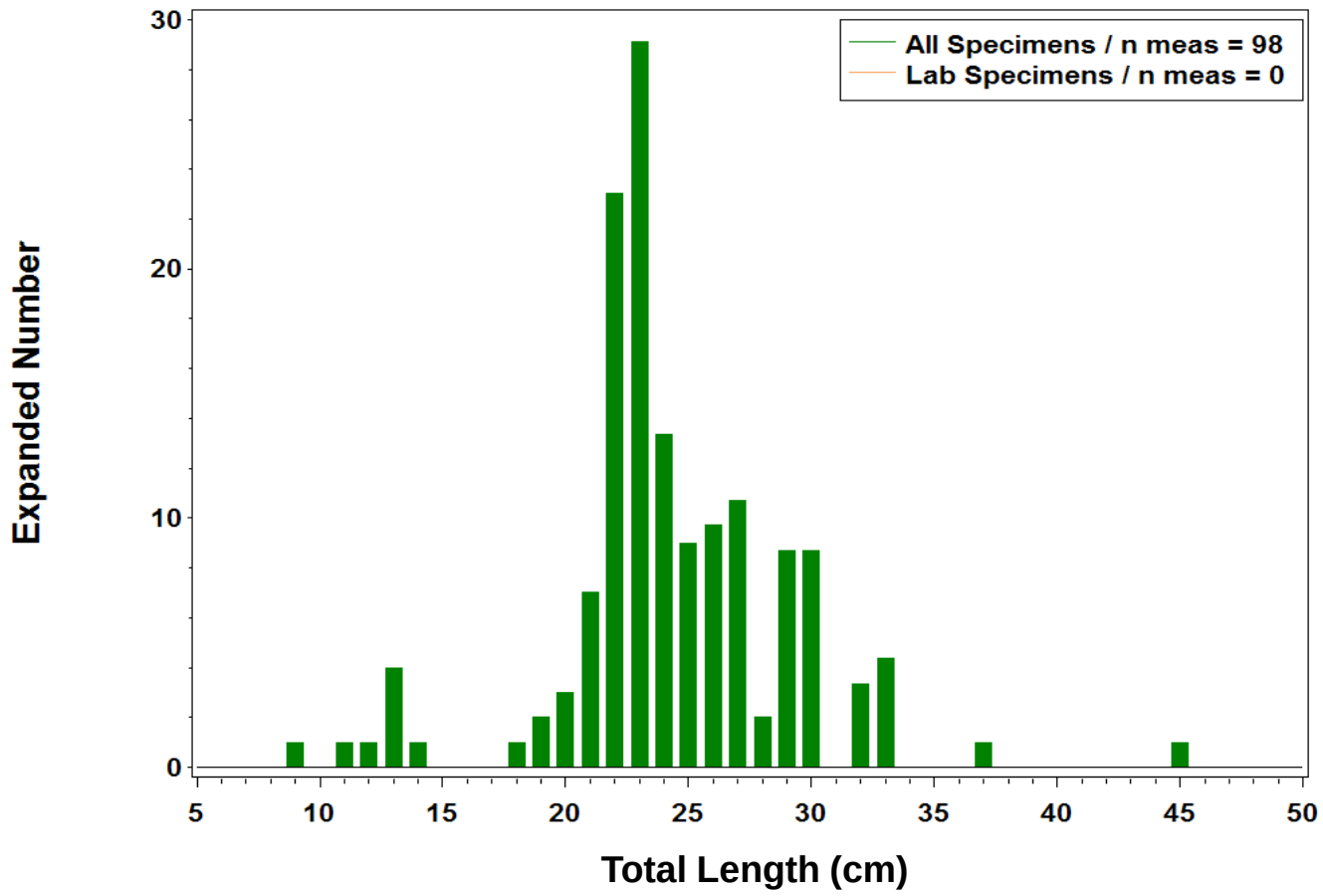


Figure 96. Length frequency histogram for red hake. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Scup (Priority A)

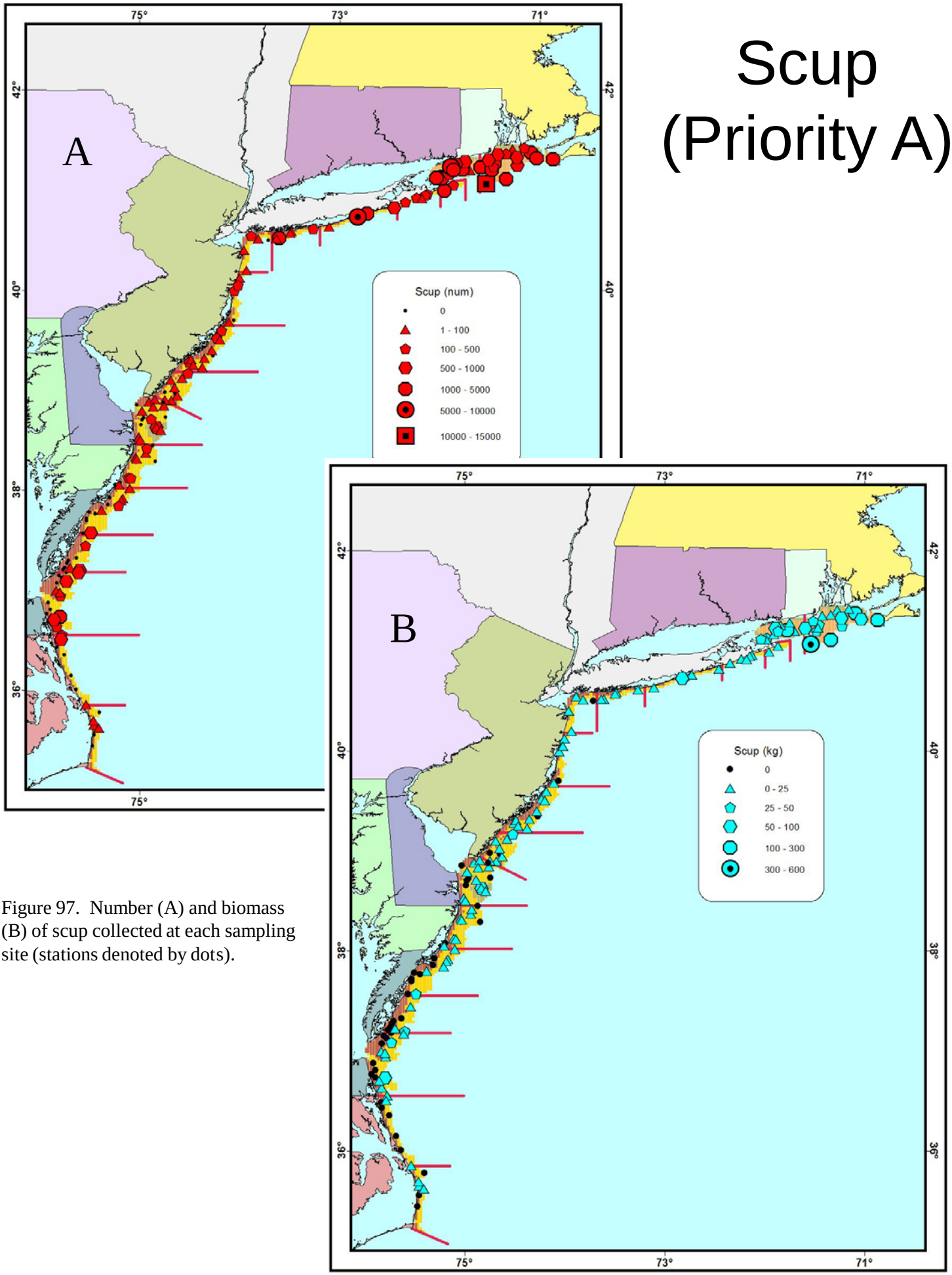


Figure 97. Number (A) and biomass (B) of scup collected at each sampling site (stations denoted by dots).

Table 29. For each state, the number of sites sampled and the number at which scup were collected. The number and biomass of scup caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum scup length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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, for scup. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

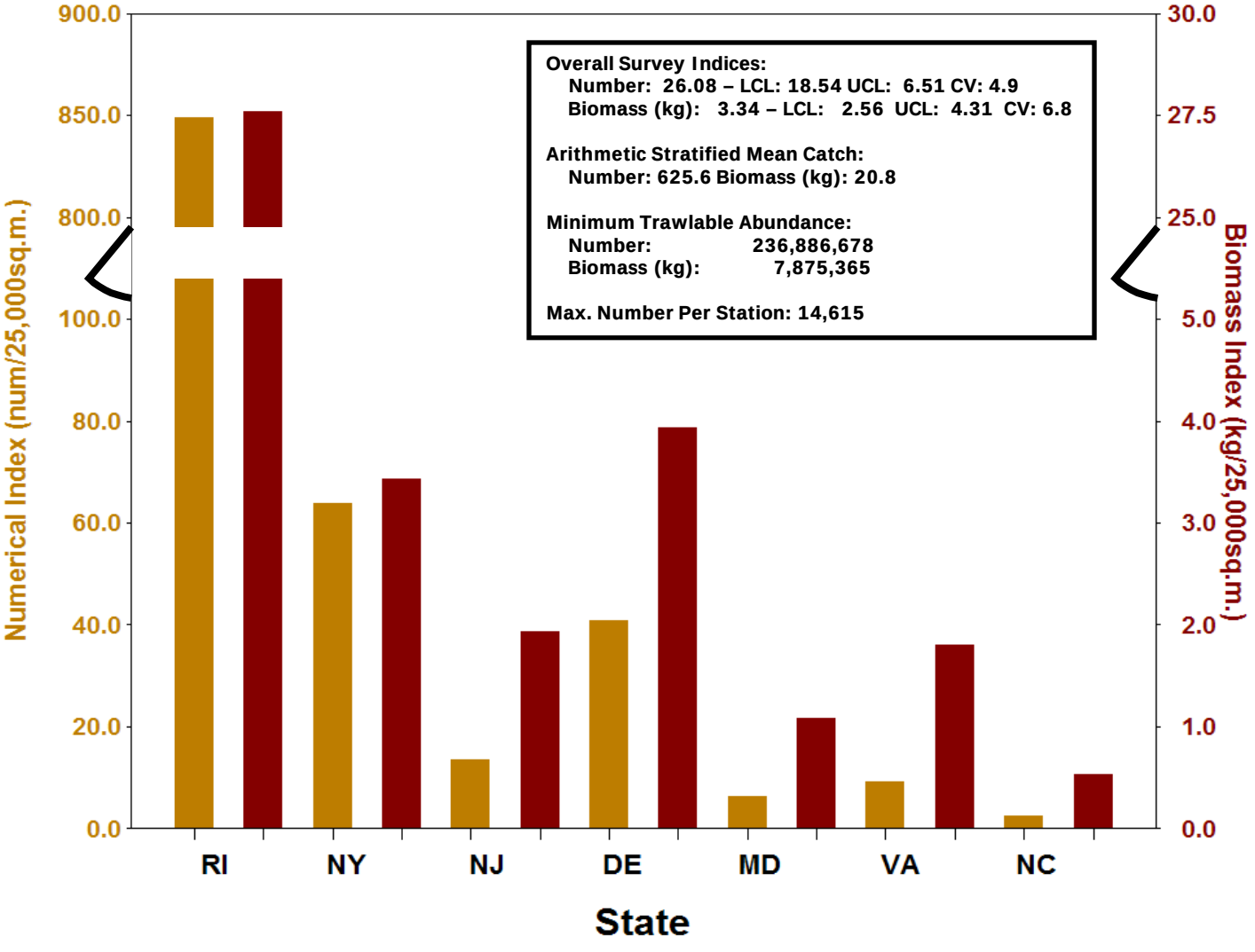


Figure 99. Length frequency histogram for scup. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis. Length frequency of scup larger than 20cm is also given in the inset.

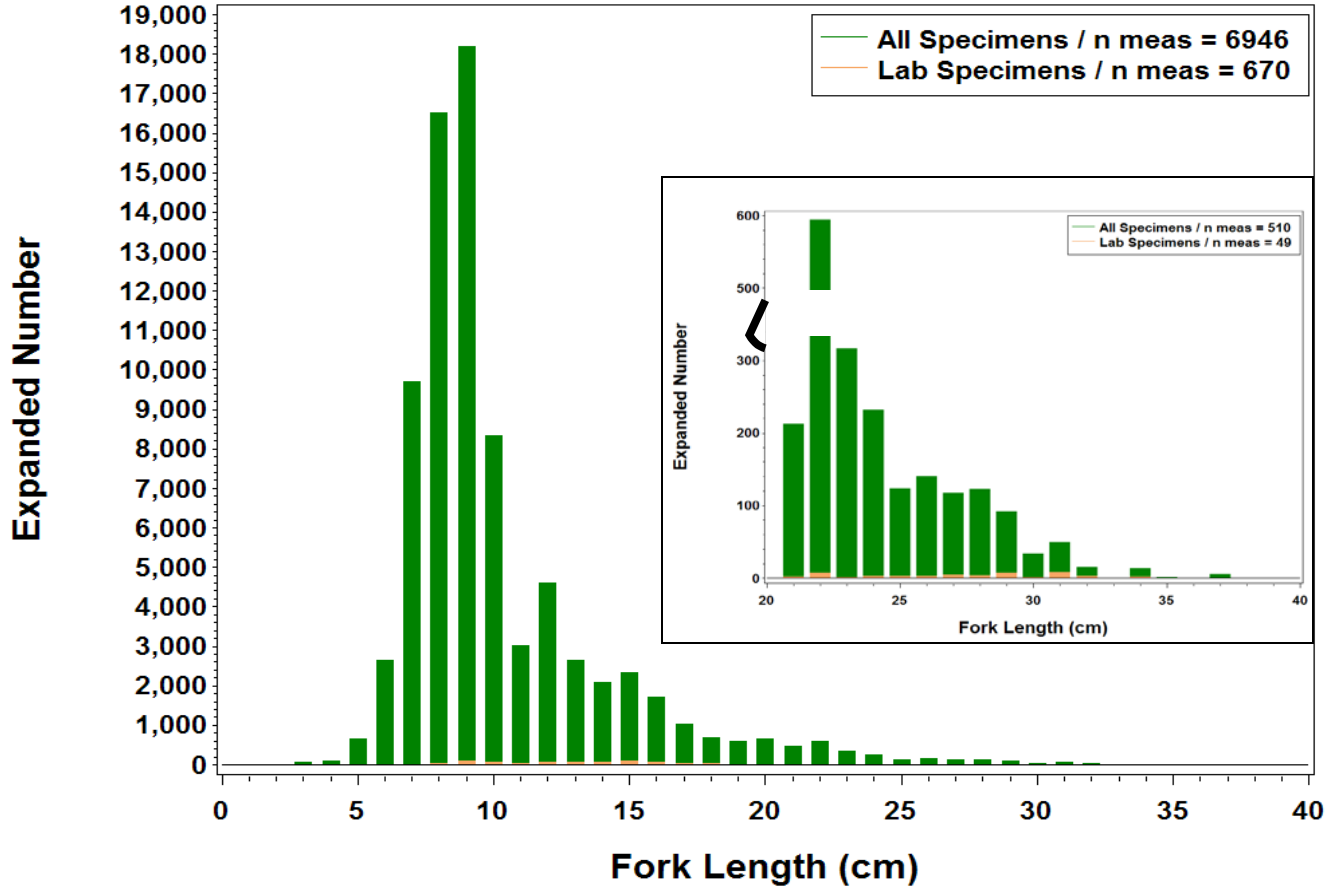


Figure 100. Sex-specific length frequency histogram for scup. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

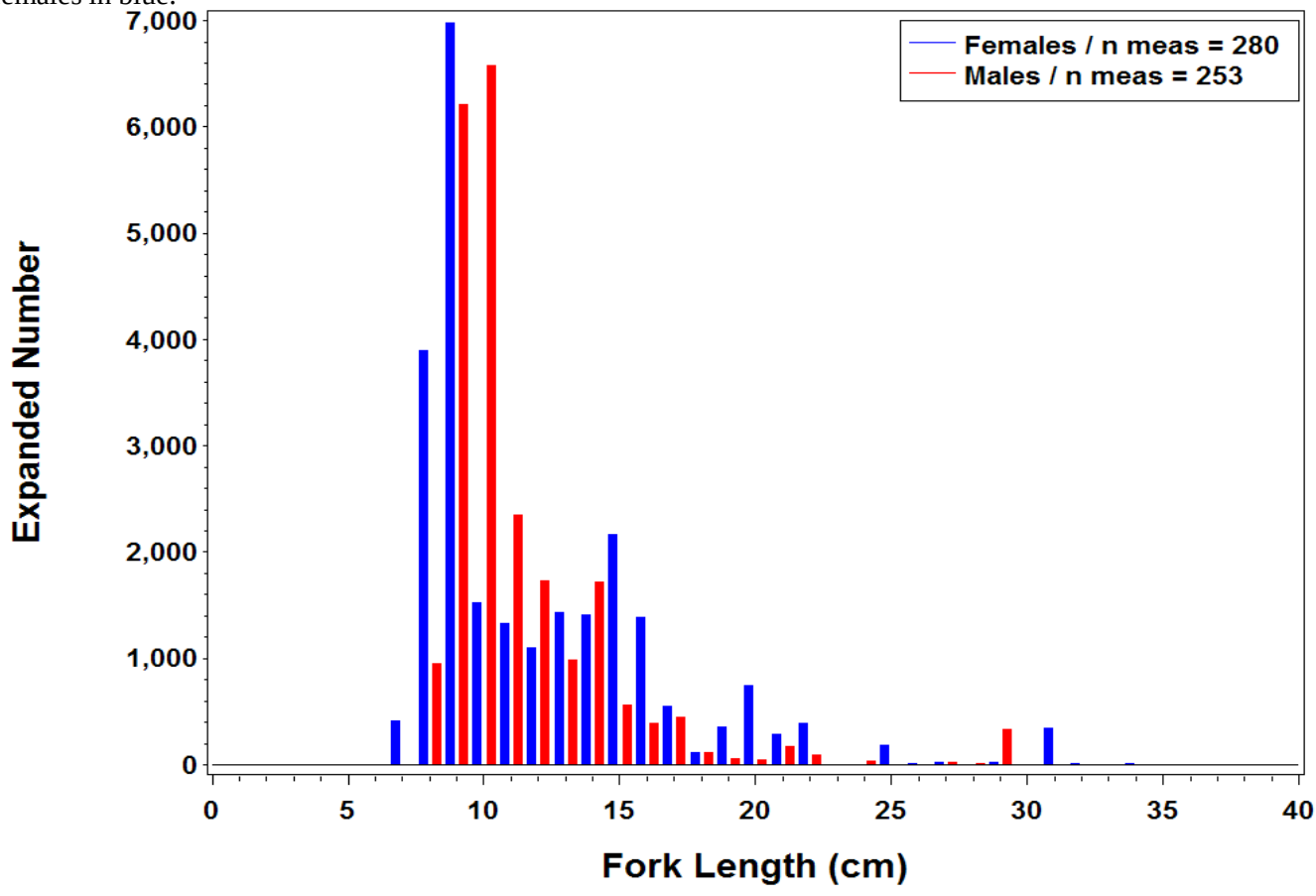
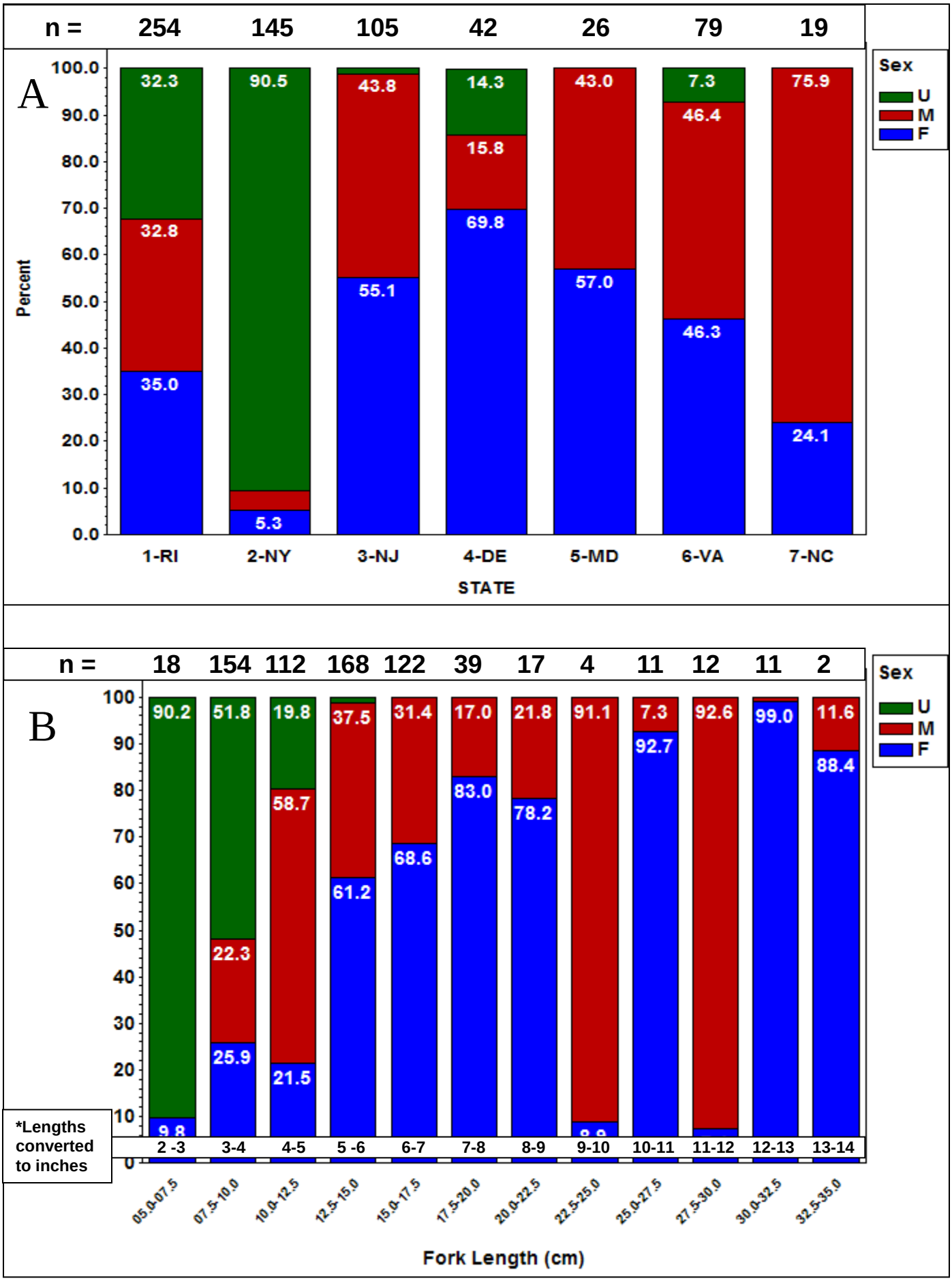


Figure 101. Sex ratios for scup by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Silver Hake (Whiting) (Priority A)

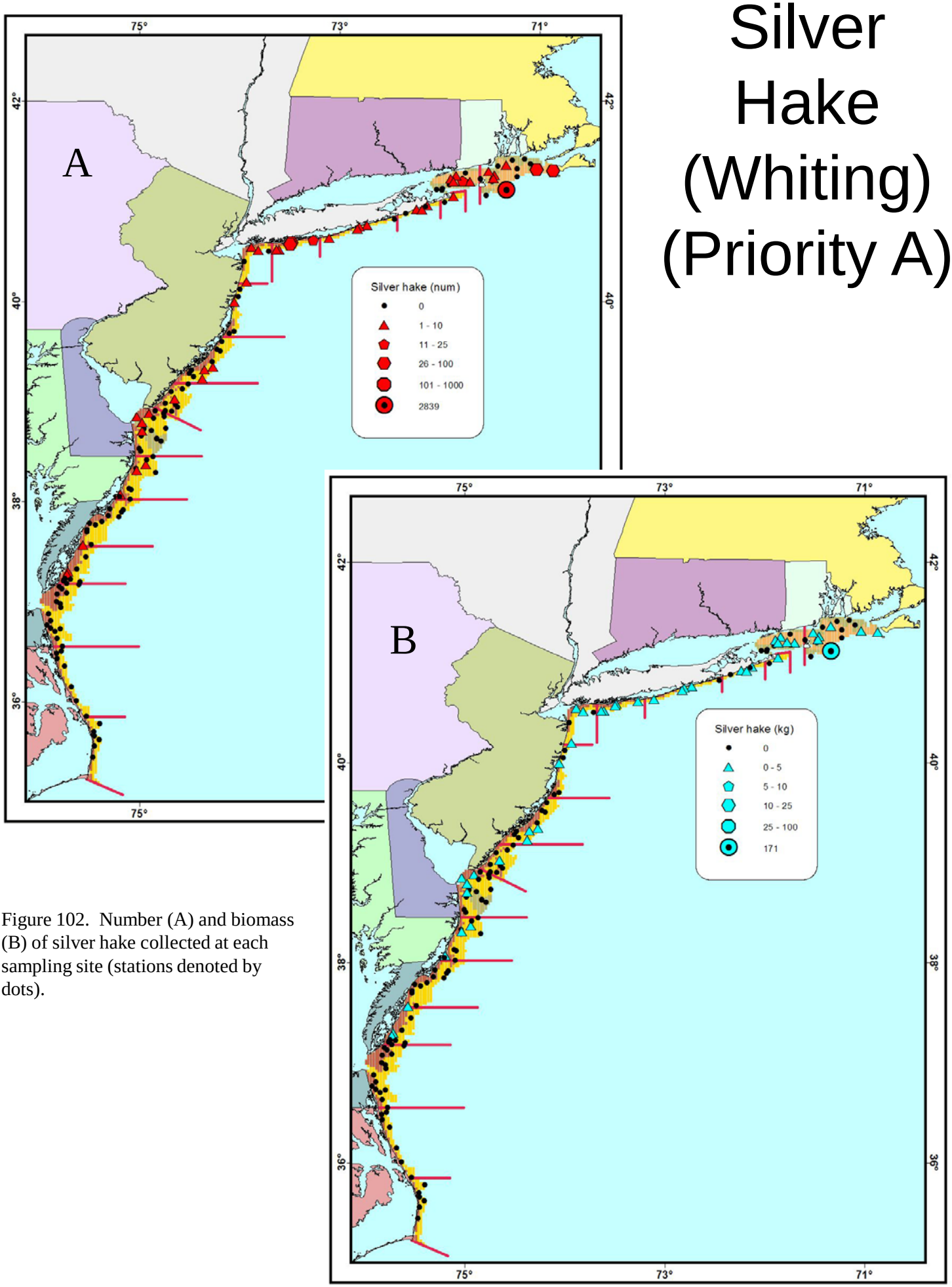


Figure 102. Number (A) and biomass (B) of silver hake collected at each sampling site (stations denoted by dots).

Table 30. For each state, the number of sites sampled and the number at which silver hake were collected. The number and biomass of hake caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum hake length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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	0	0	0	0	N/A	N/A	N/A	N/A	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, for silver hake. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

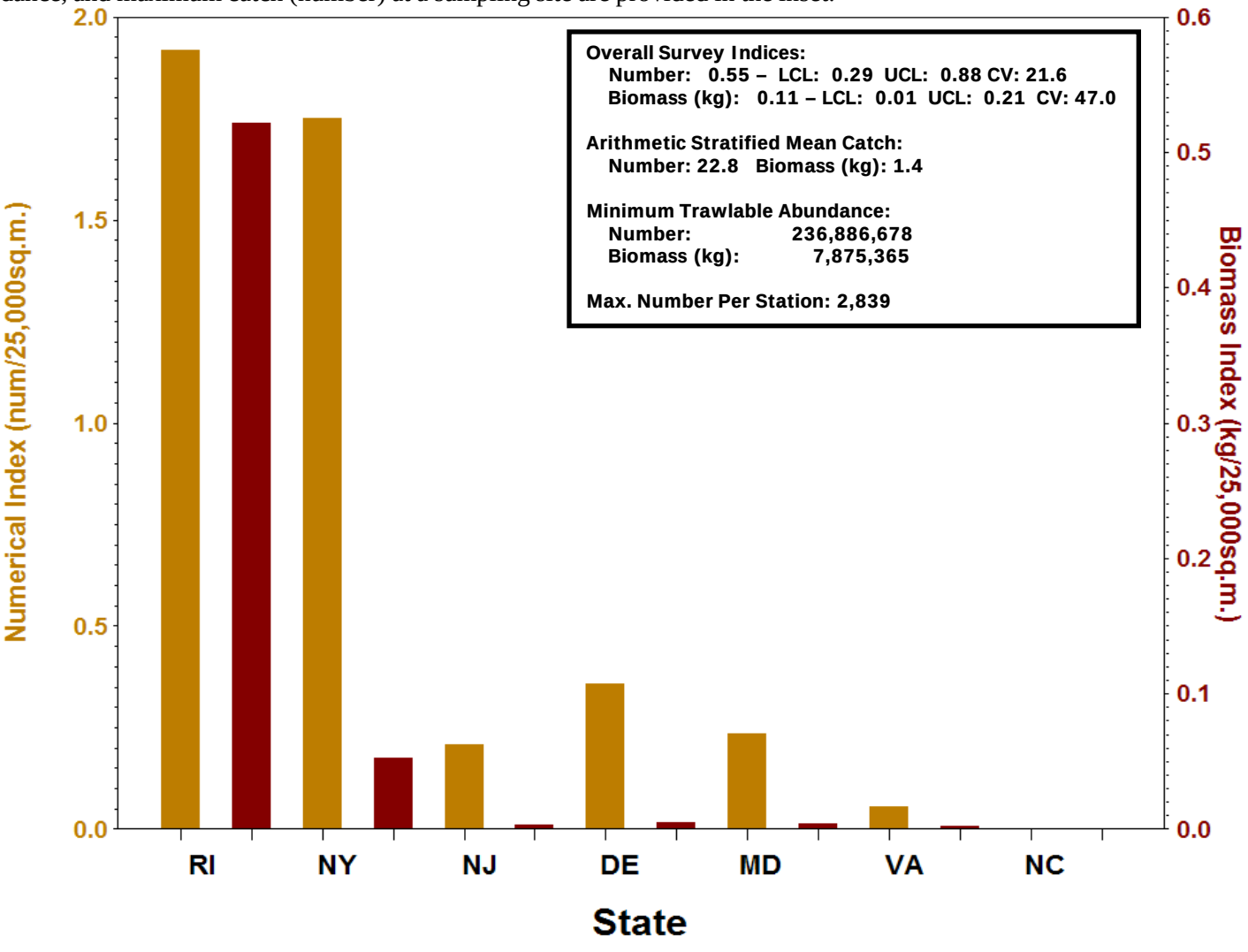


Figure 104. Length frequency histogram for silver hake. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

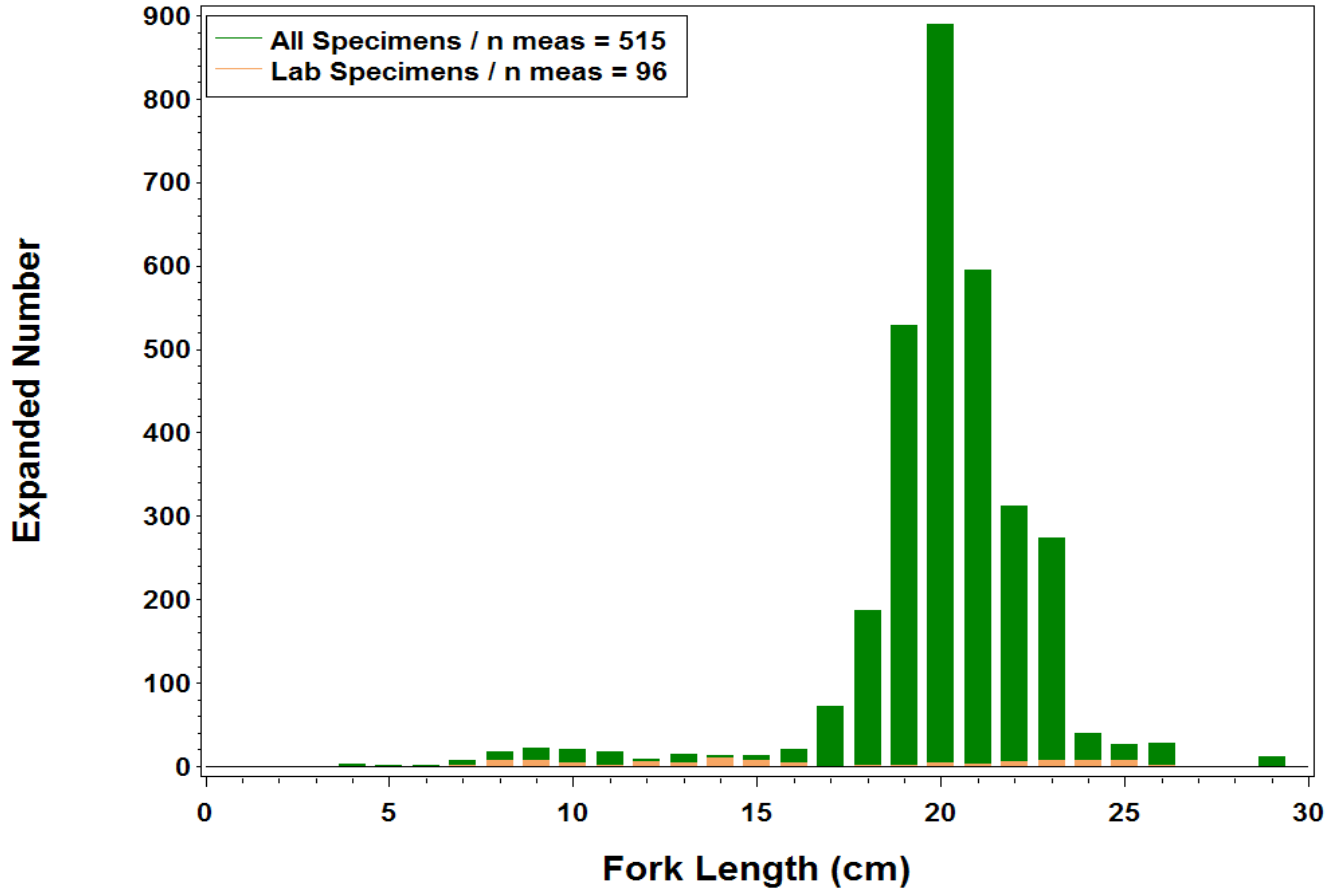


Figure 105. Sex-specific length frequency histogram for silver hake. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

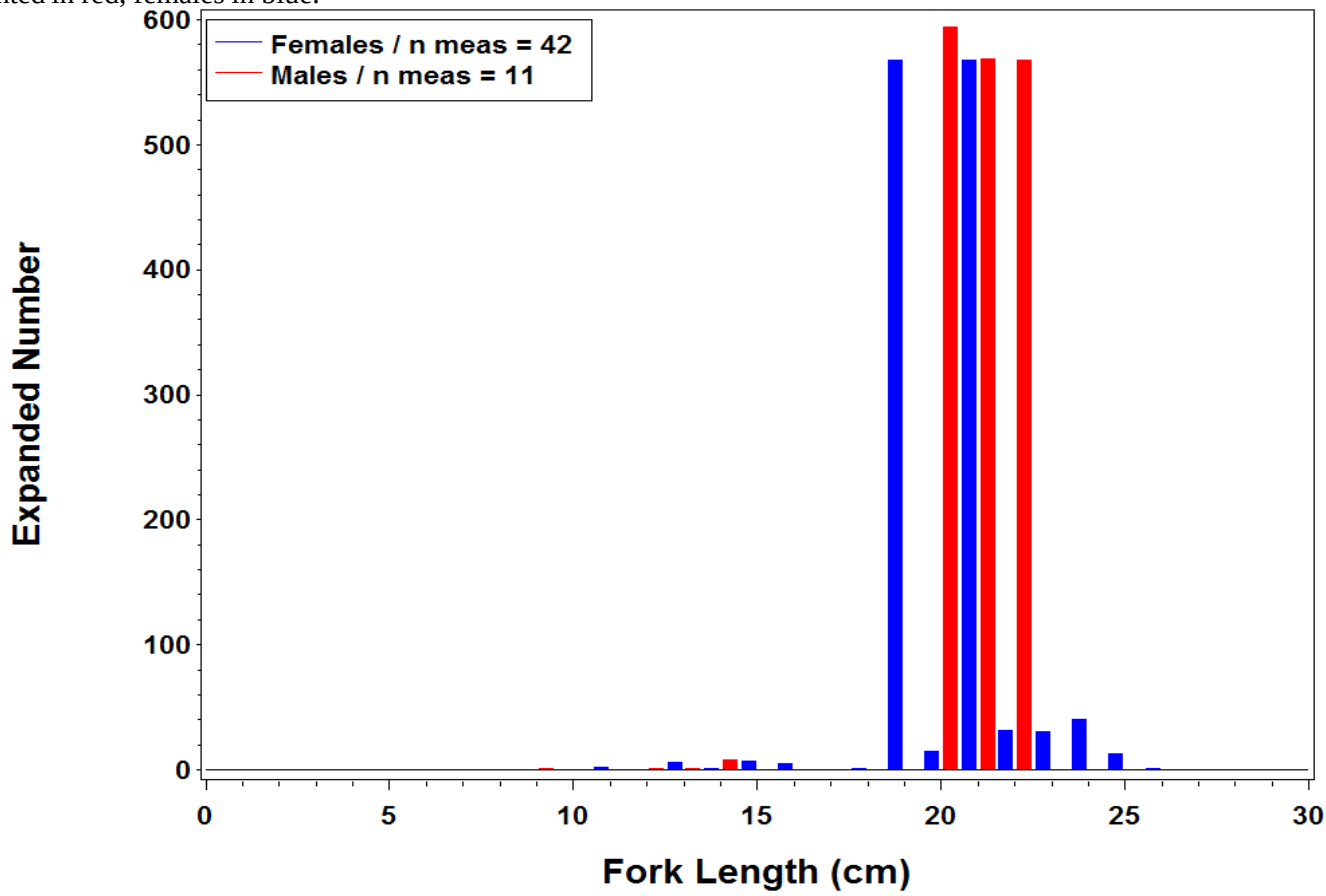
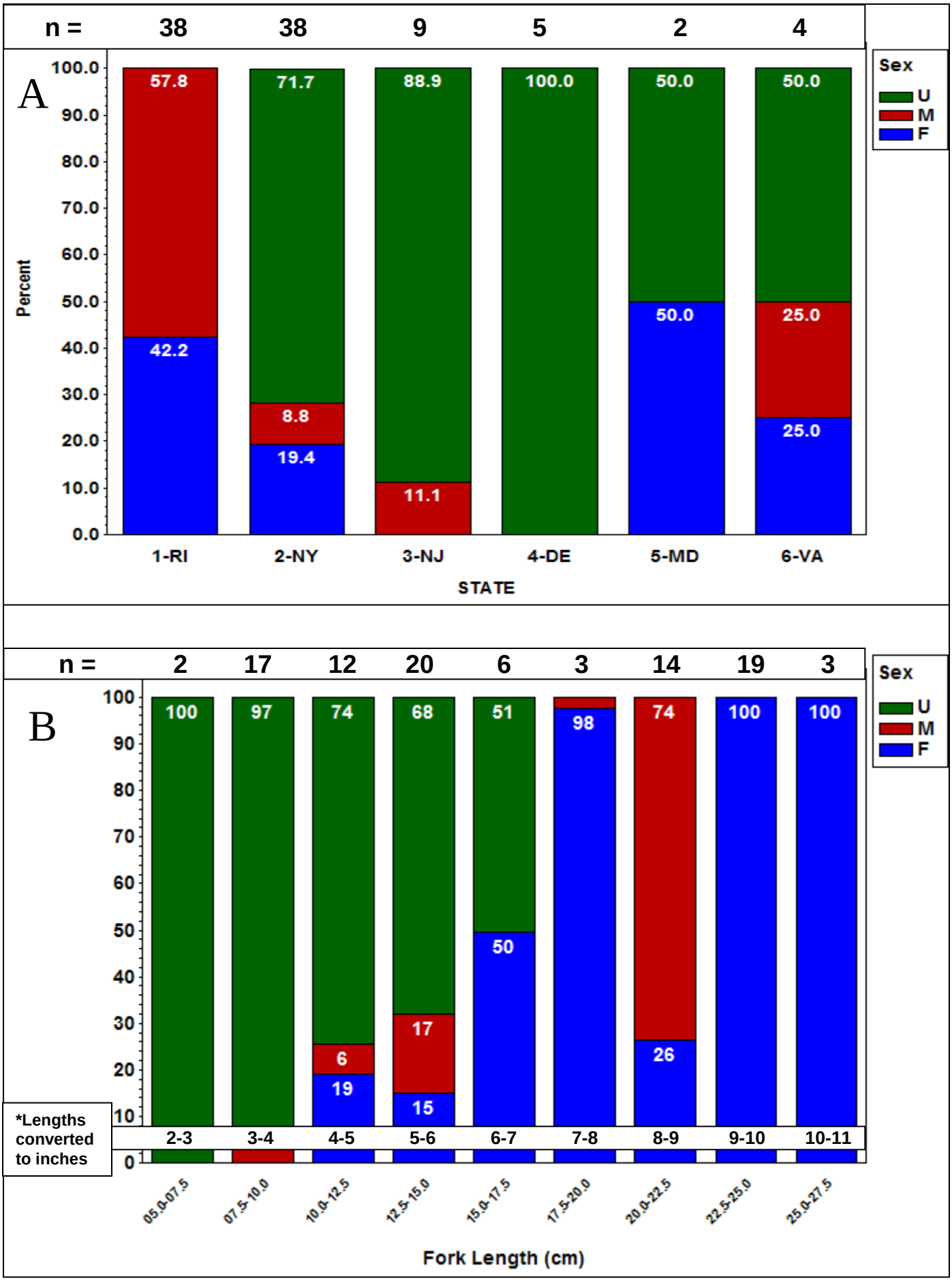


Figure 106. Sex ratios for silver hake by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Silver Perch (Priority D)

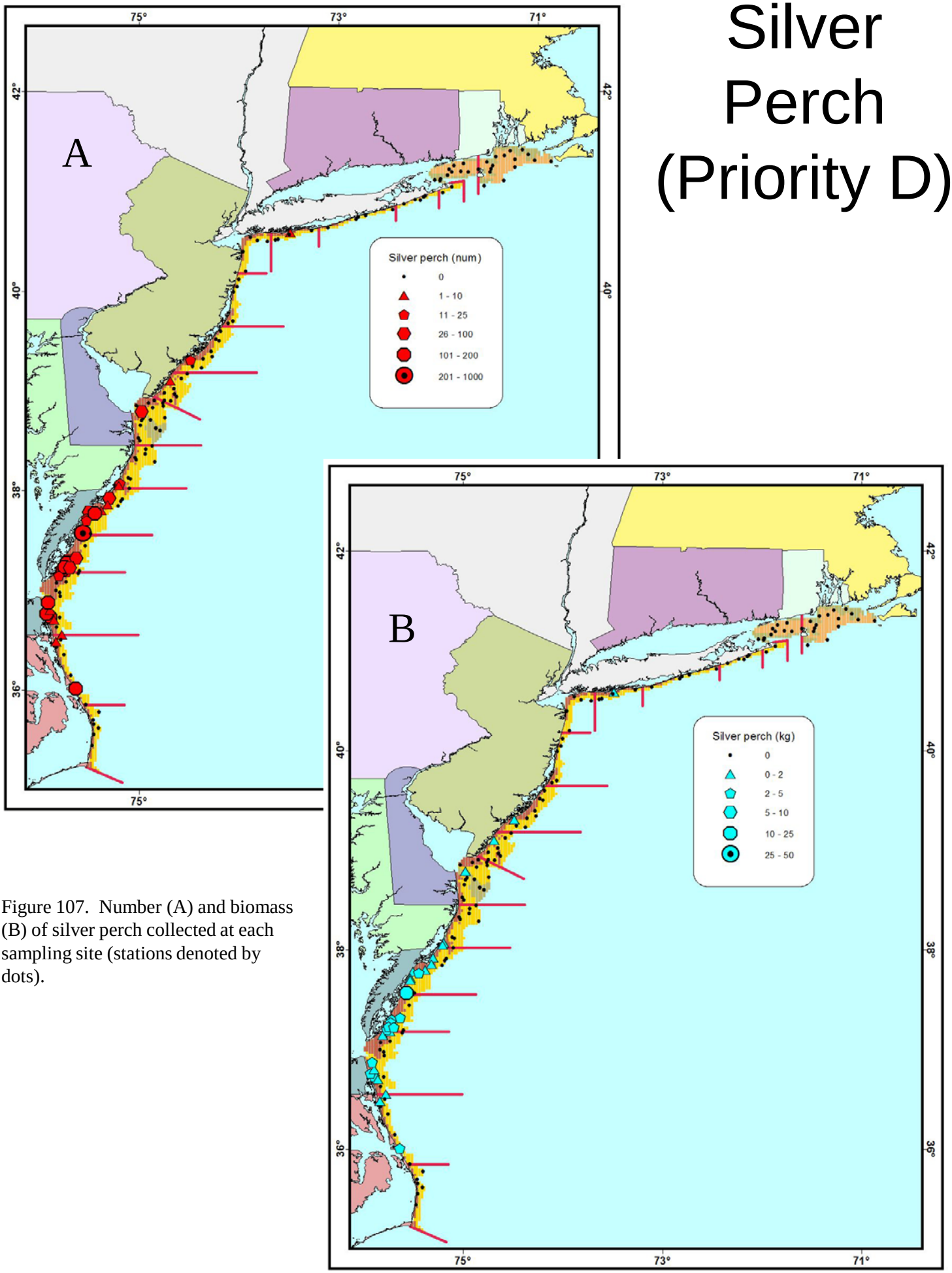


Figure 107. Number (A) and biomass (B) of silver perch collected at each sampling site (stations denoted by dots).

Table 31. For each state, the number of sites sampled and the number at which silver perch were collected. The number and biomass of perch caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum perch length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	1	1	0.032	0	1	135	135	135	0.032	0.03	0.00
NJ	24	2	23	0.995	0	23	138	207	154	0.043	0.23	0.04
DE	17	1	30	0.754	0	30	110	143	126	0.025	0.58	0.07
MD	10	2	32	0.972	0	30	96	179	129	0.030	0.74	0.08
VA	38	22	1602	52.370	0	731	76	226	128	0.033	6.18	0.71
NC	13	2	105	2.915	0	30	98	172	129	0.028	0.54	0.11
Total	150	30	1793	58.038	0	845	76	226	129	0.032	1.47	0.25

Figure 108. Geometric mean catch per area swept, by state, for silver perch. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

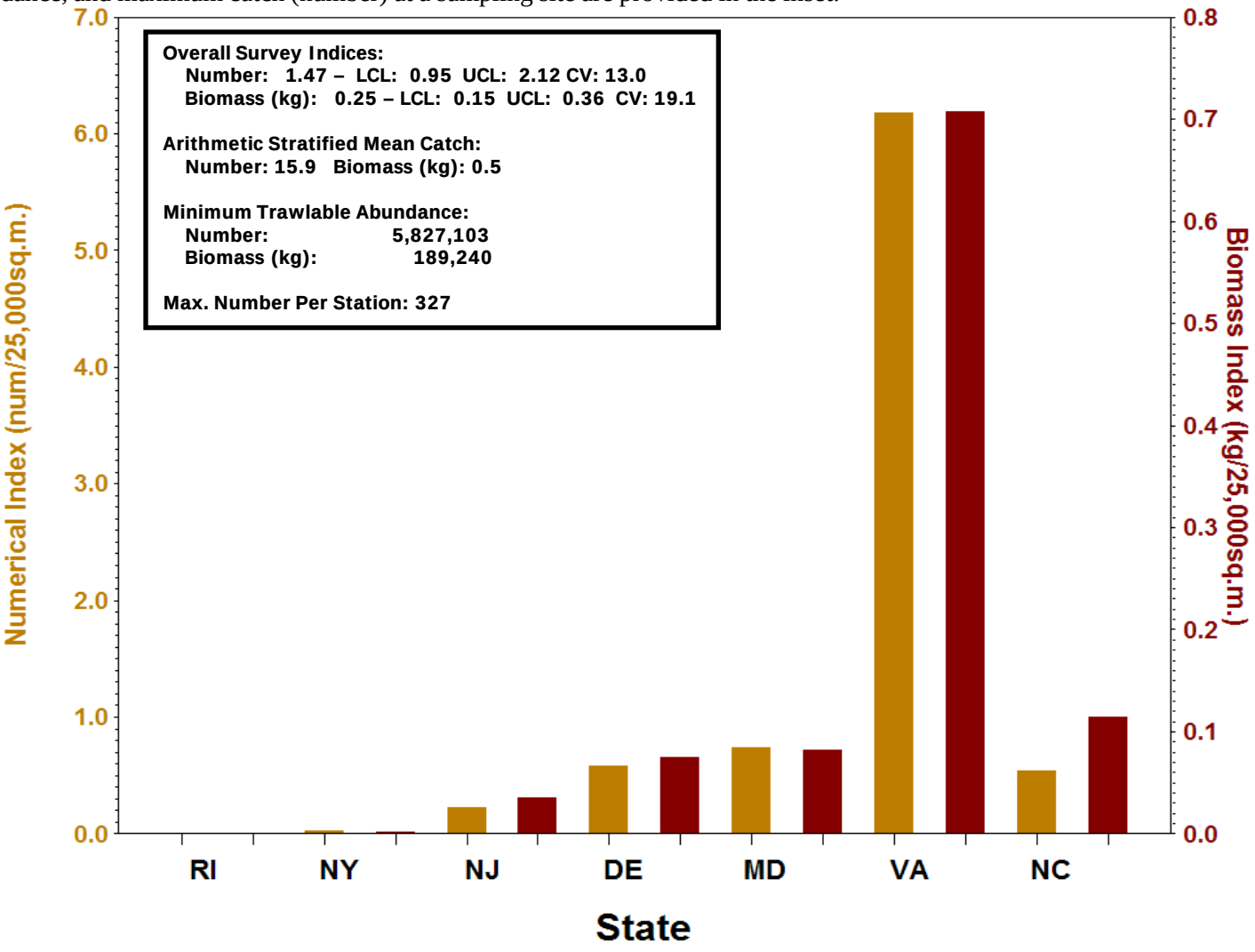
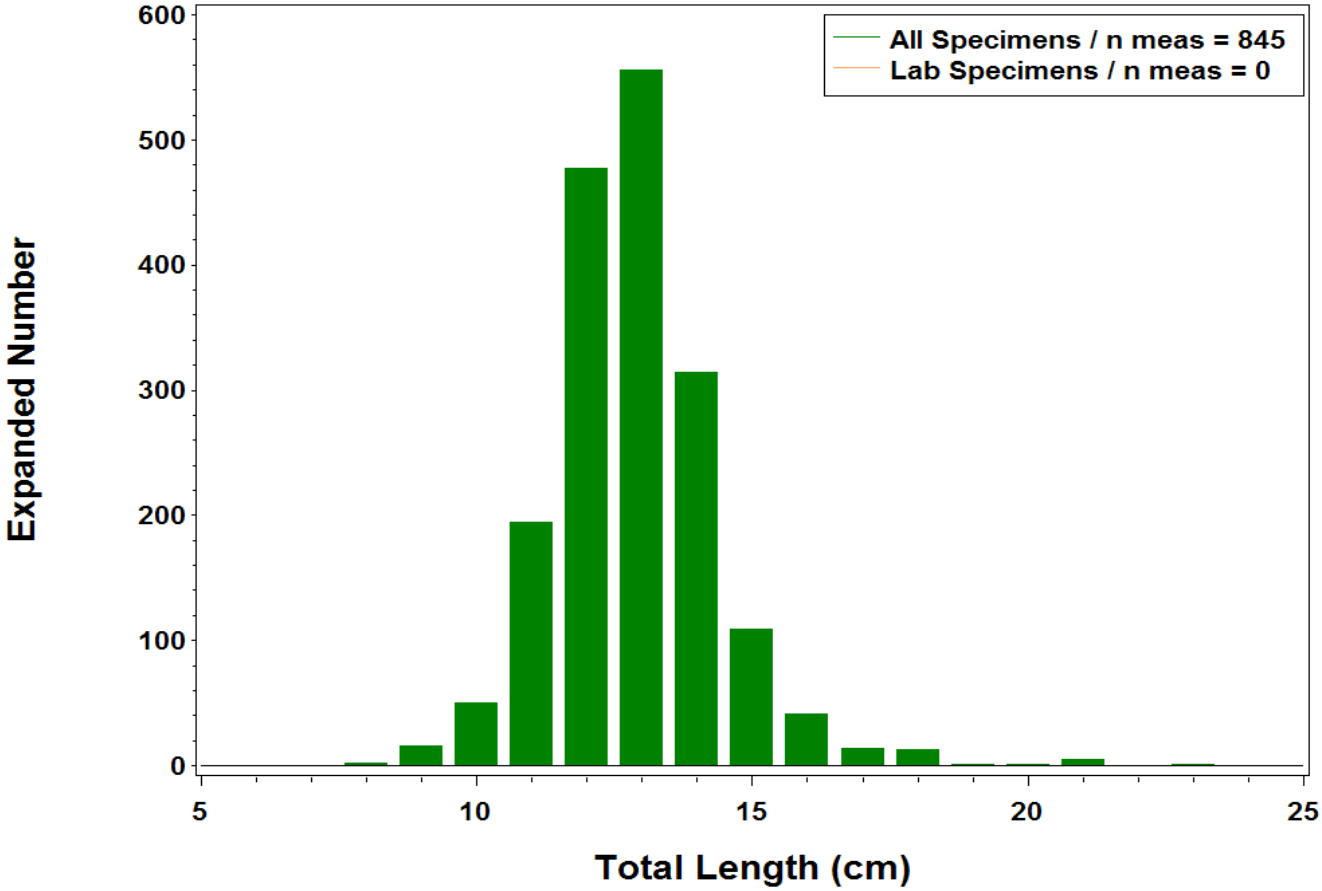


Figure 109. Length frequency histogram for silver perch. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Smooth Butterfly Ray (Priority D)

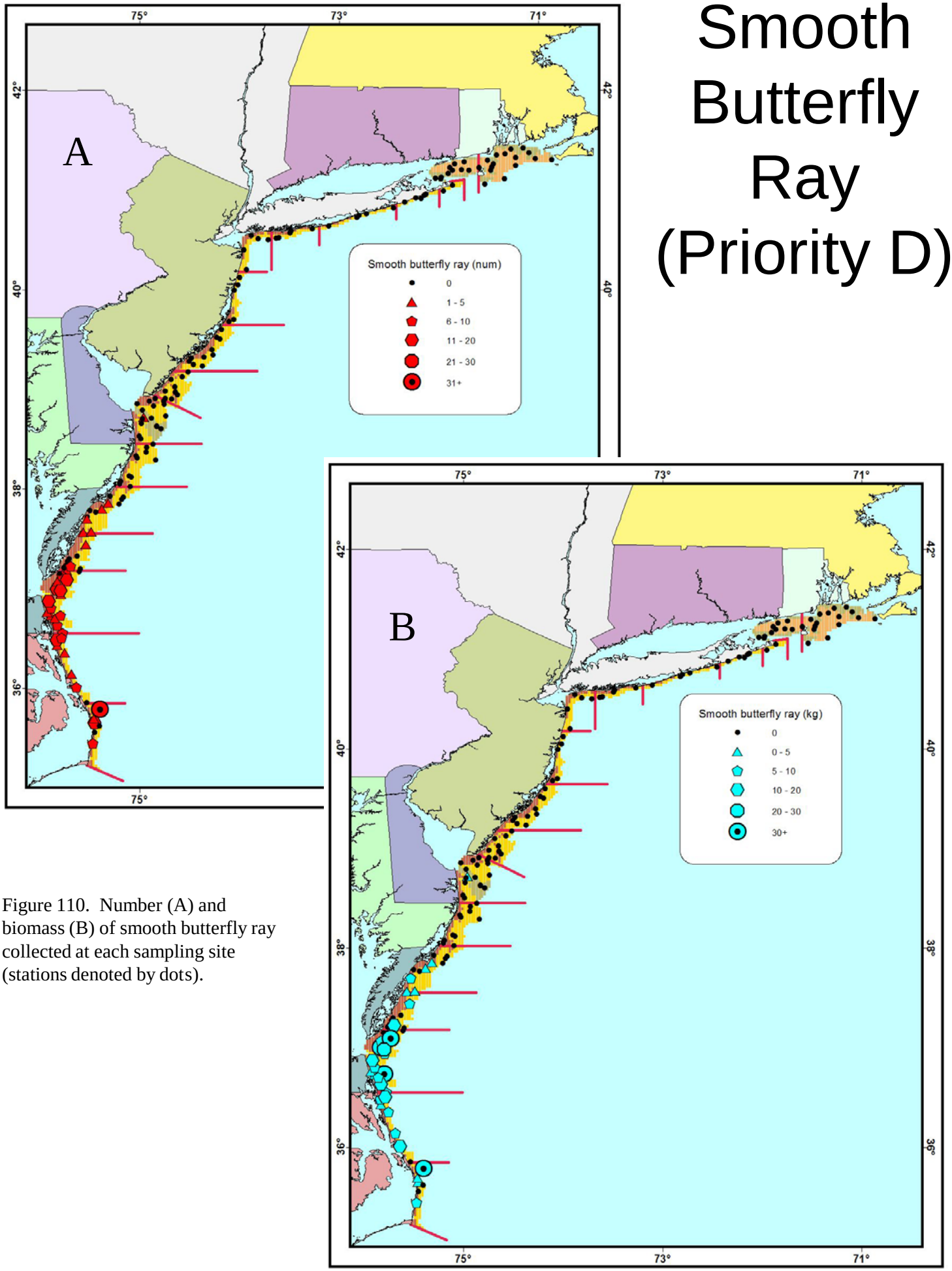


Figure 110. Number (A) and biomass (B) of smooth butterfly ray collected at each sampling site (stations denoted by dots).

Table 32. For each state, the number of sites sampled and the number at which smooth butterfly ray were collected. The number and biomass of rays caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum ray width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm DW)	Max. Width (mm DW)	Avg. Width (mm DW)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	1	1	1.545	0	1	619	619	619	1.545	0.07	0.09
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	22	131	245.028	0	124	273	835	526	1.870	1.70	2.32
NC	13	10	95	100.006	0	70	264	787	426	1.053	3.87	4.03
Total	150	33	227	346.579	0	195	264	835	490	1.523	0.44	0.44

Figure 111. Geometric mean catch per area swept, by state, for smooth butterfly ray. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

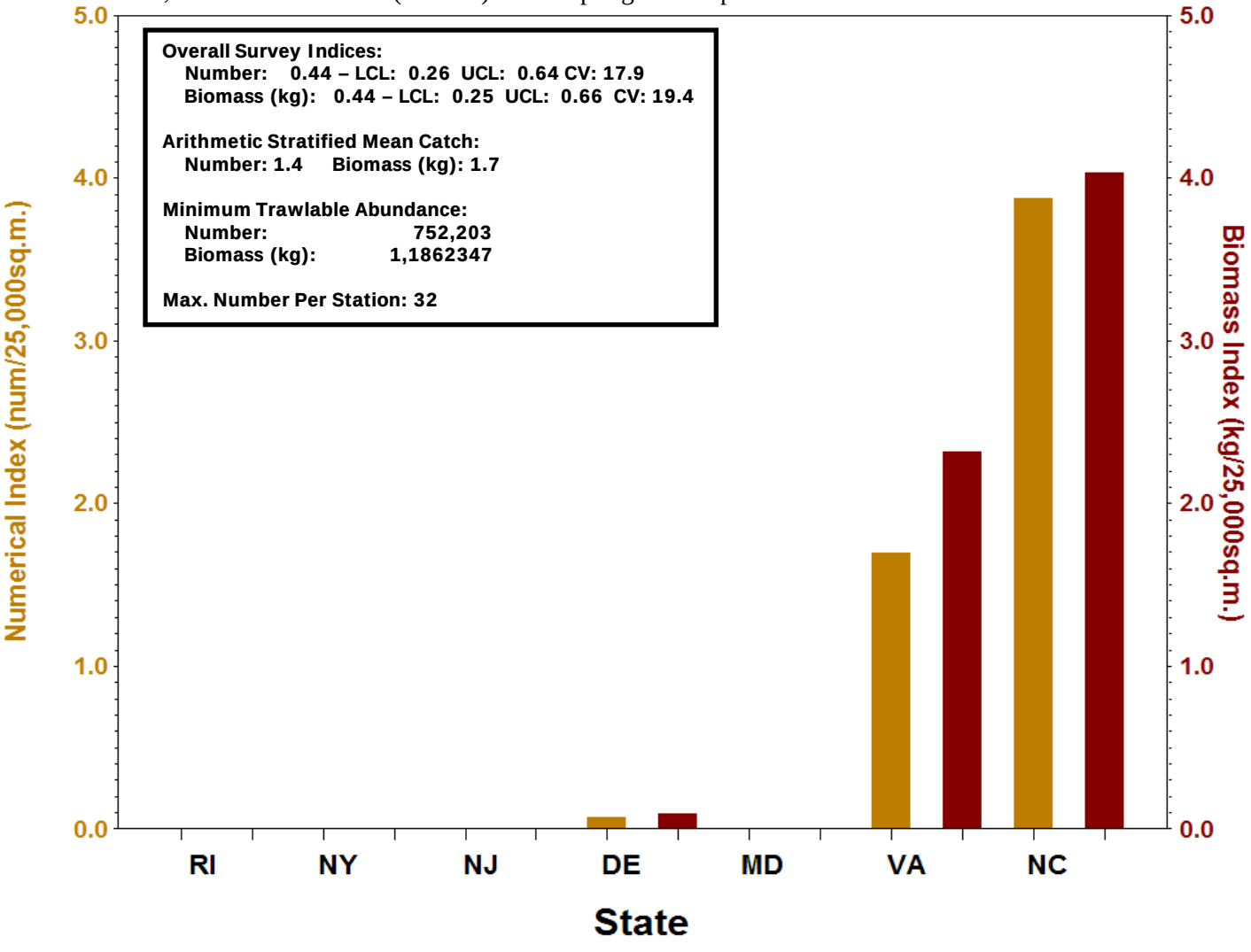
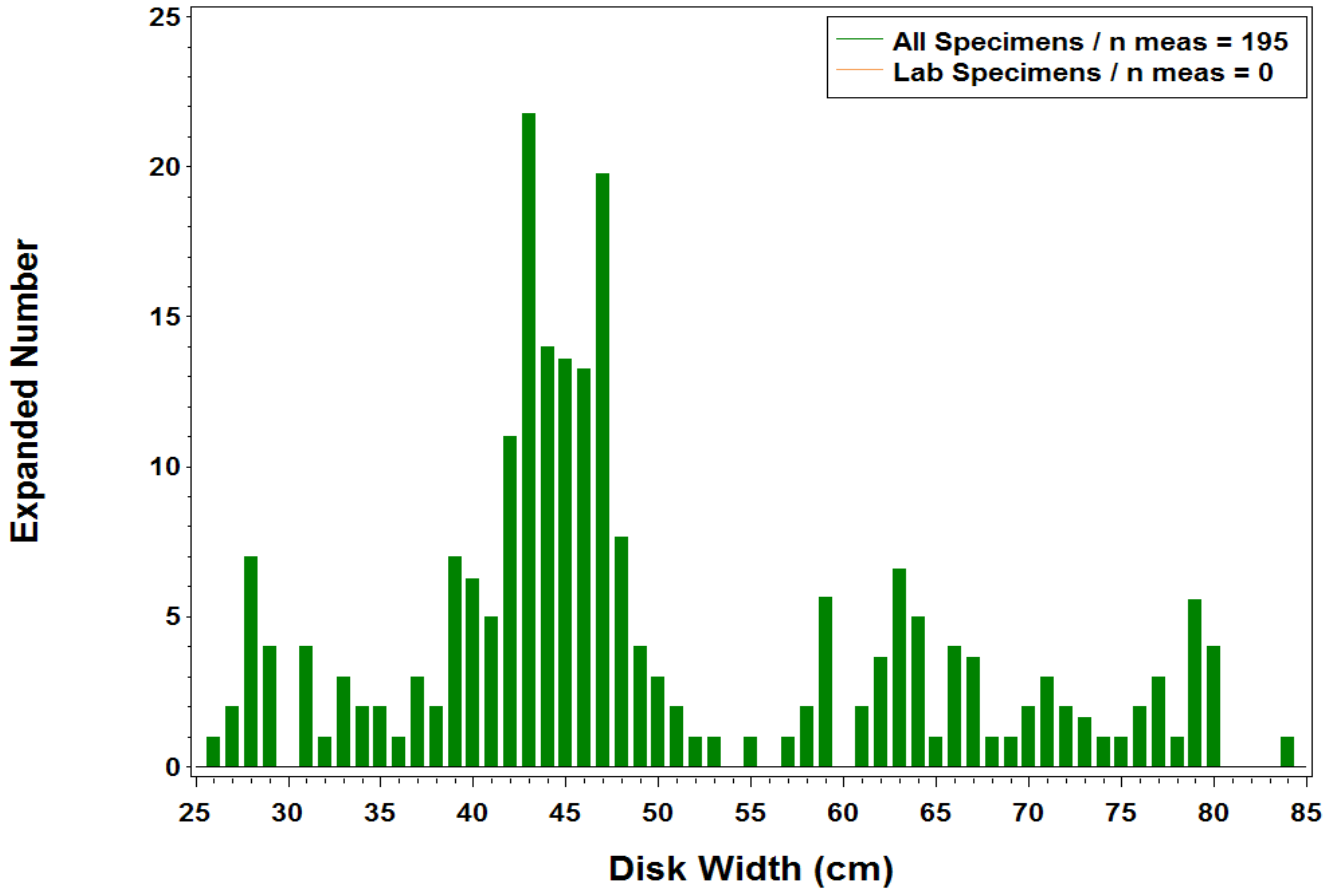


Figure 112. Width frequency histogram for smooth butterfly ray. Disk width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Smooth Dogfish (Priority B)

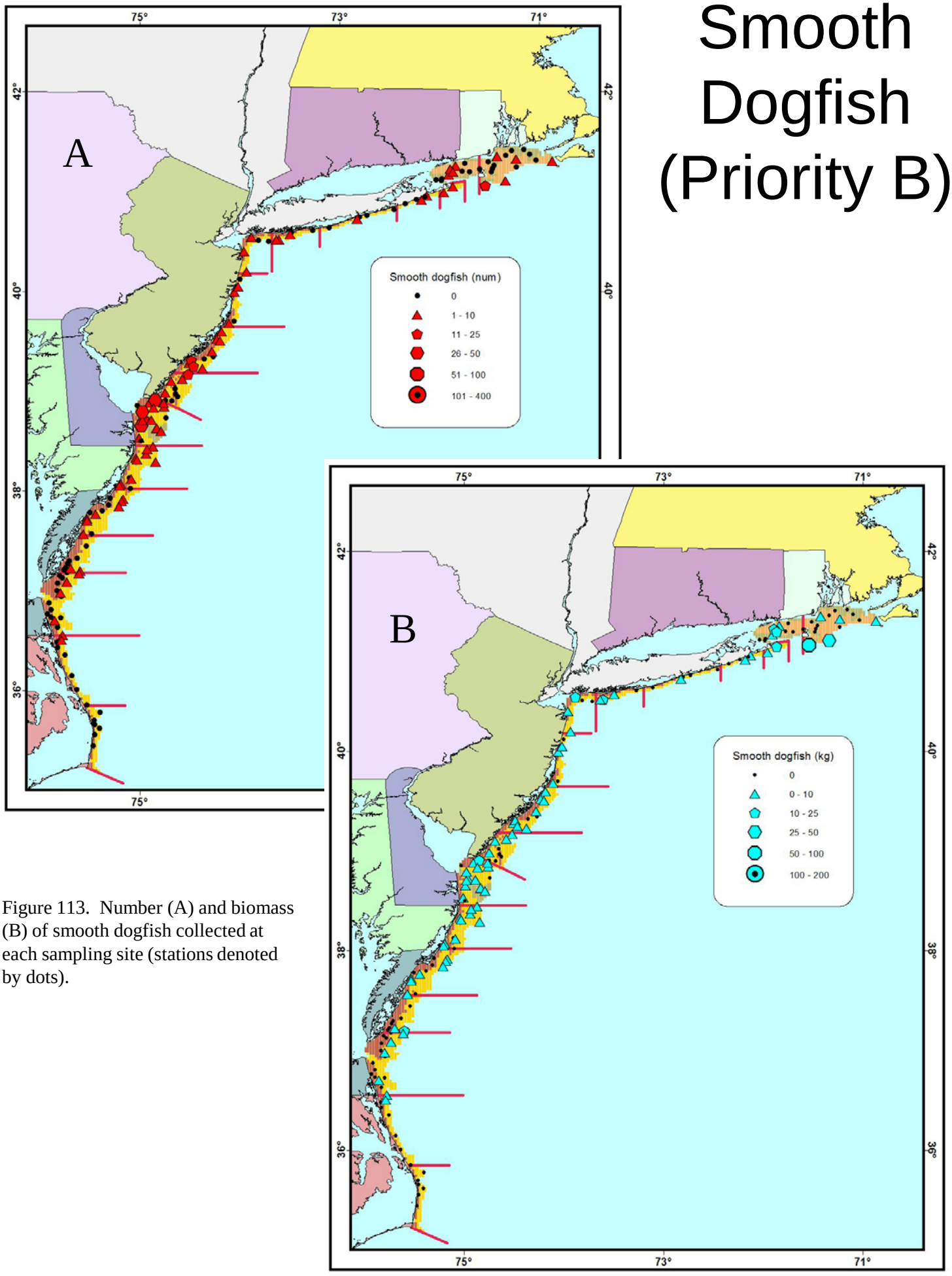


Figure 113. Number (A) and biomass (B) of smooth dogfish collected at each sampling site (stations denoted by dots).

Table 33. For each state, the number of sites sampled and the number at which smooth dogfish were collected. The number and biomass of dogfish caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum dogfish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Diet/Age	Number Measured	Min. Length (mm PCL)	Max. Length (mm PCL)	Avg. Length (mm PCL)	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	0.415	1.69	0.96
DE	17	14	186	61.954	36	163	298	890	364	0.333	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	0.883	1.00	0.92

Figure 114. Geometric mean catch per area swept, by state, for smooth dogfish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

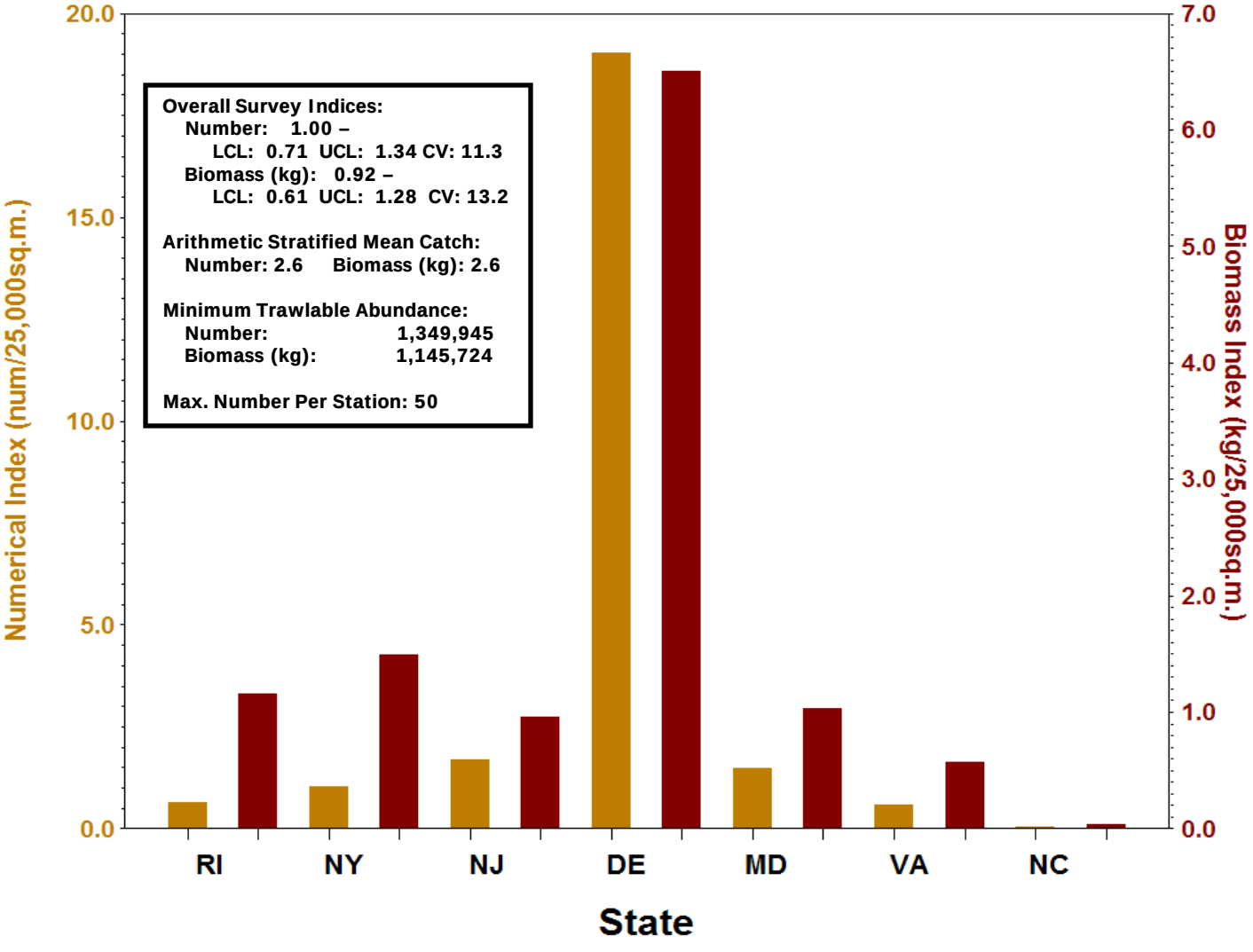


Figure 115. Length frequency histogram for smooth dogfish. Precaudal length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

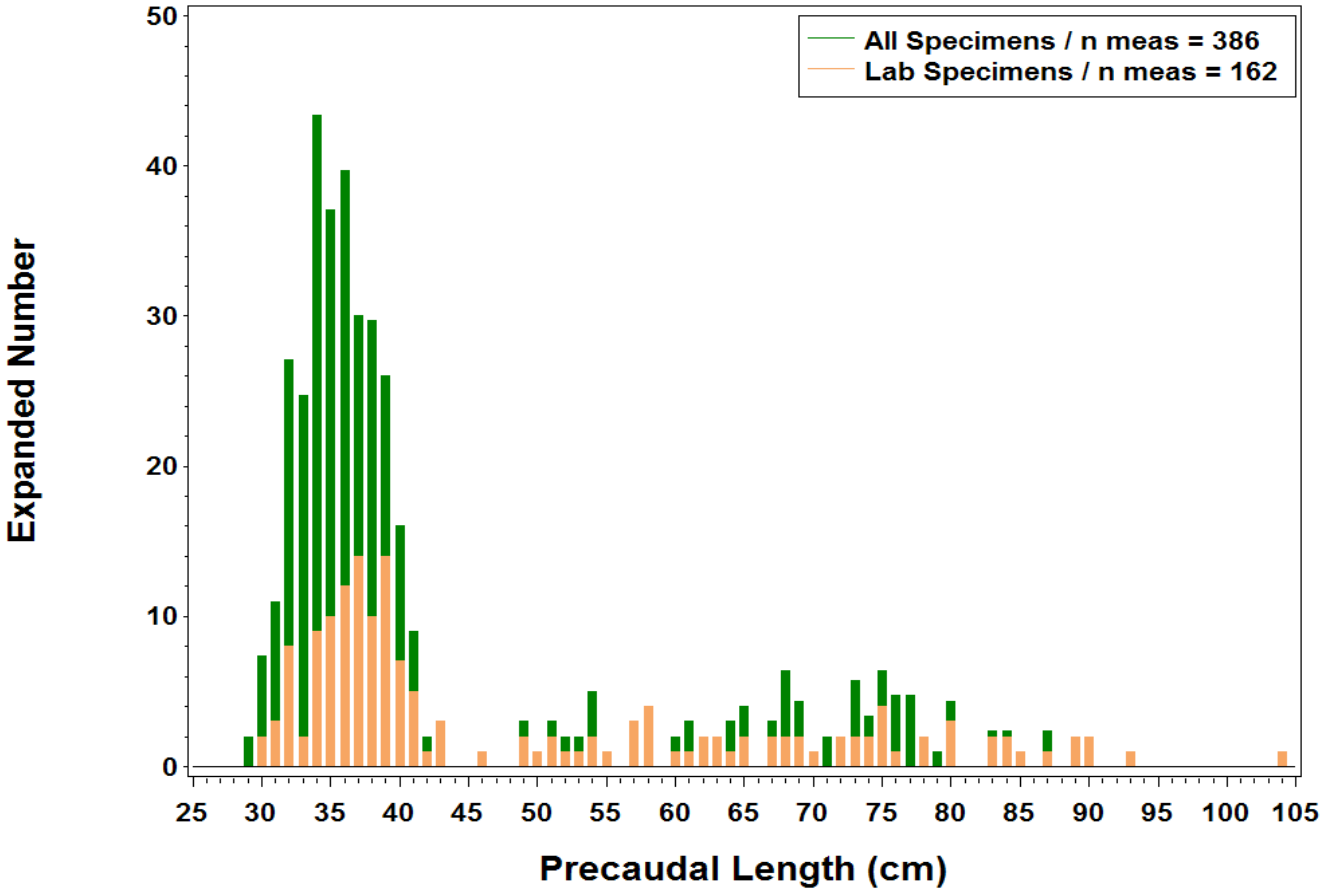


Figure 116. Sex-specific length frequency histogram for smooth dogfish. Precaudal length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

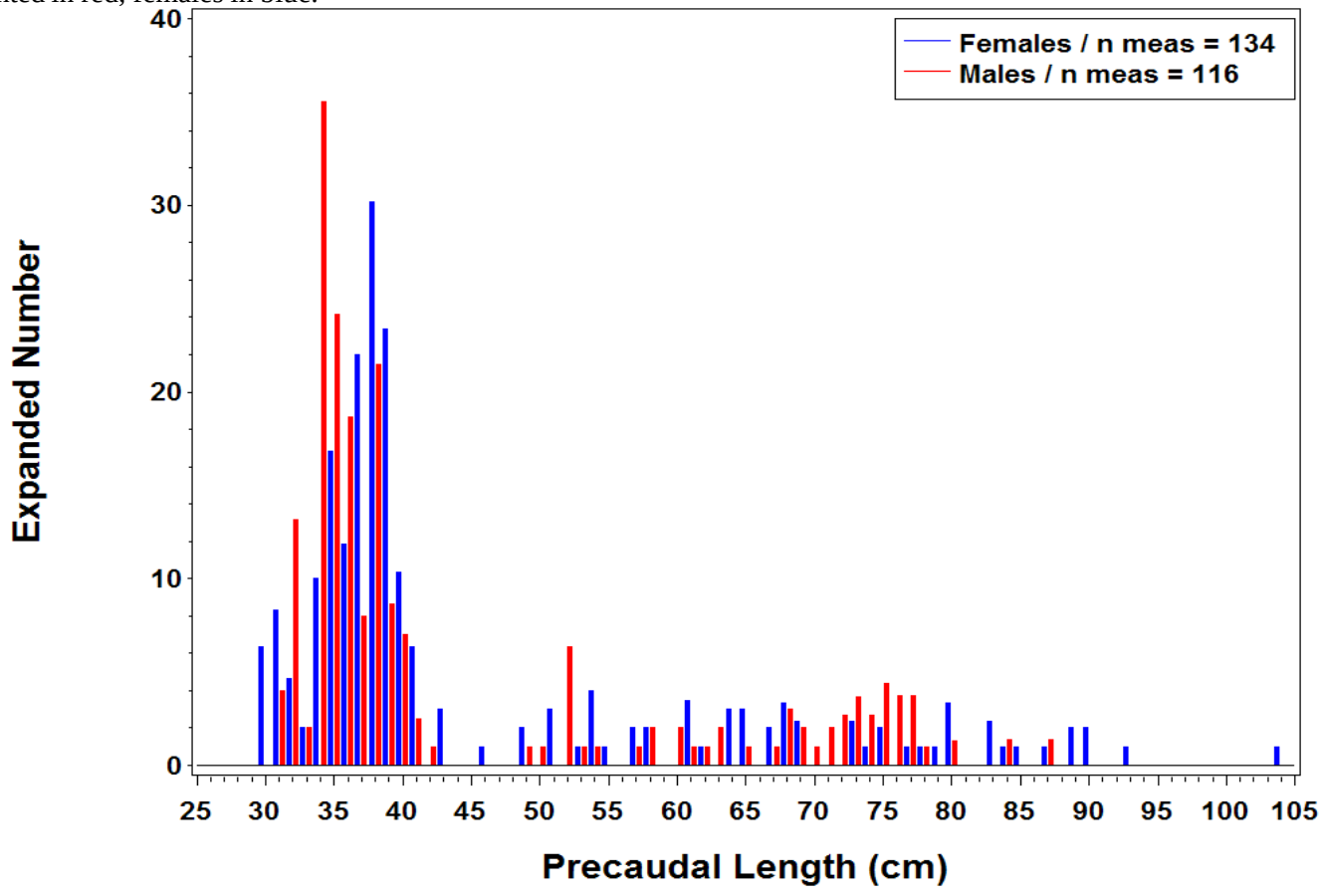
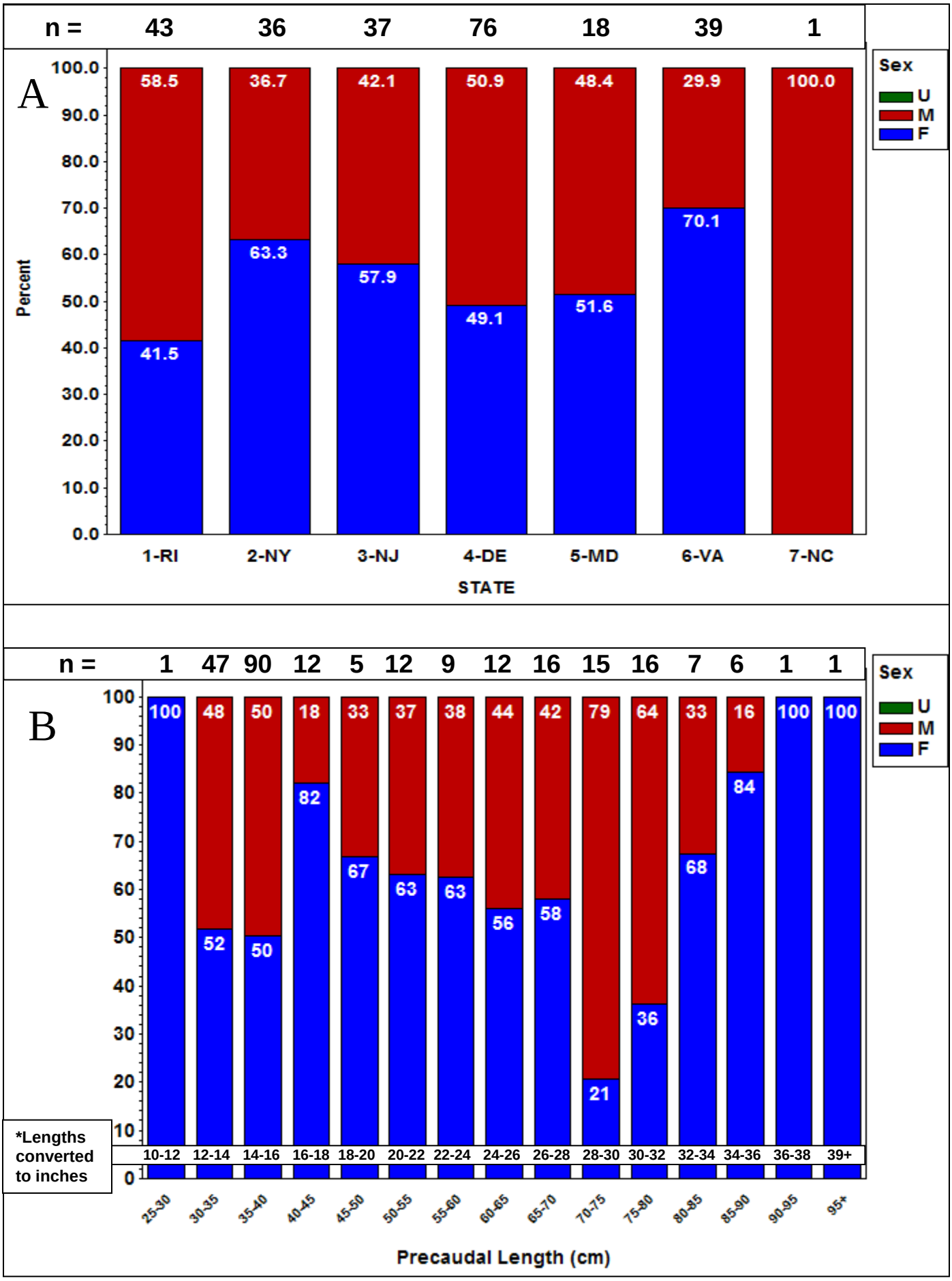


Figure 117. Sex ratios for smooth dogfish by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Spiny Dogfish (Priority B)

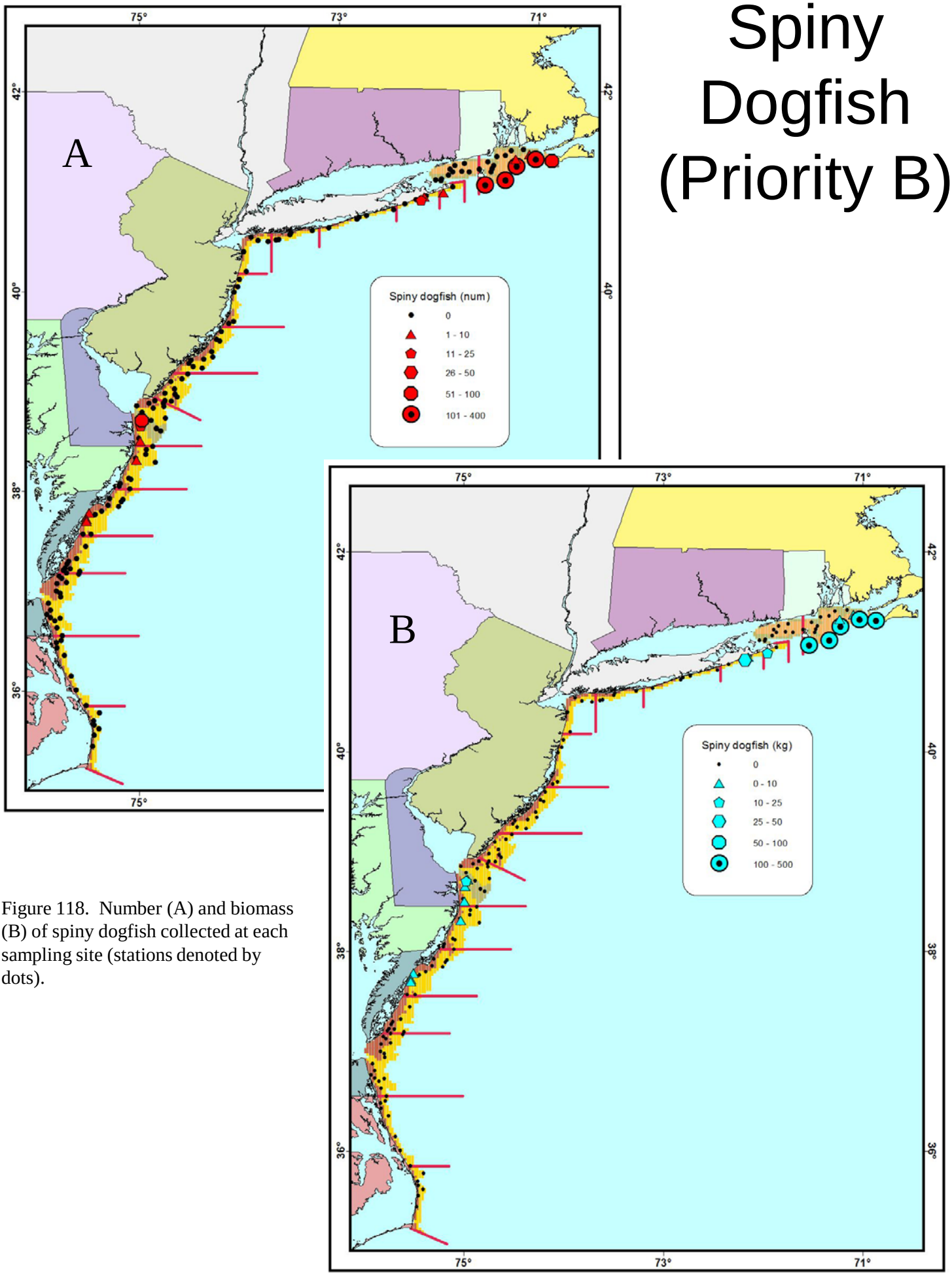


Figure 118. Number (A) and biomass (B) of spiny dogfish collected at each sampling site (stations denoted by dots).

Table 34. For each state, the number of sites sampled and the number at which spiny dogfish were collected. The number and biomass of dogfish caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum dogfish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm PCL)	Max. Length (mm PCL)	Avg. Length (mm PCL)	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	0	0	0	0	N/A	N/A	N/A	N/A	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	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
Total	150	18	735	1621.109	41	161	211	783	511	2.206	0.47	0.50

Figure 119. Geometric mean catch per area swept, by state, for spiny dogfish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

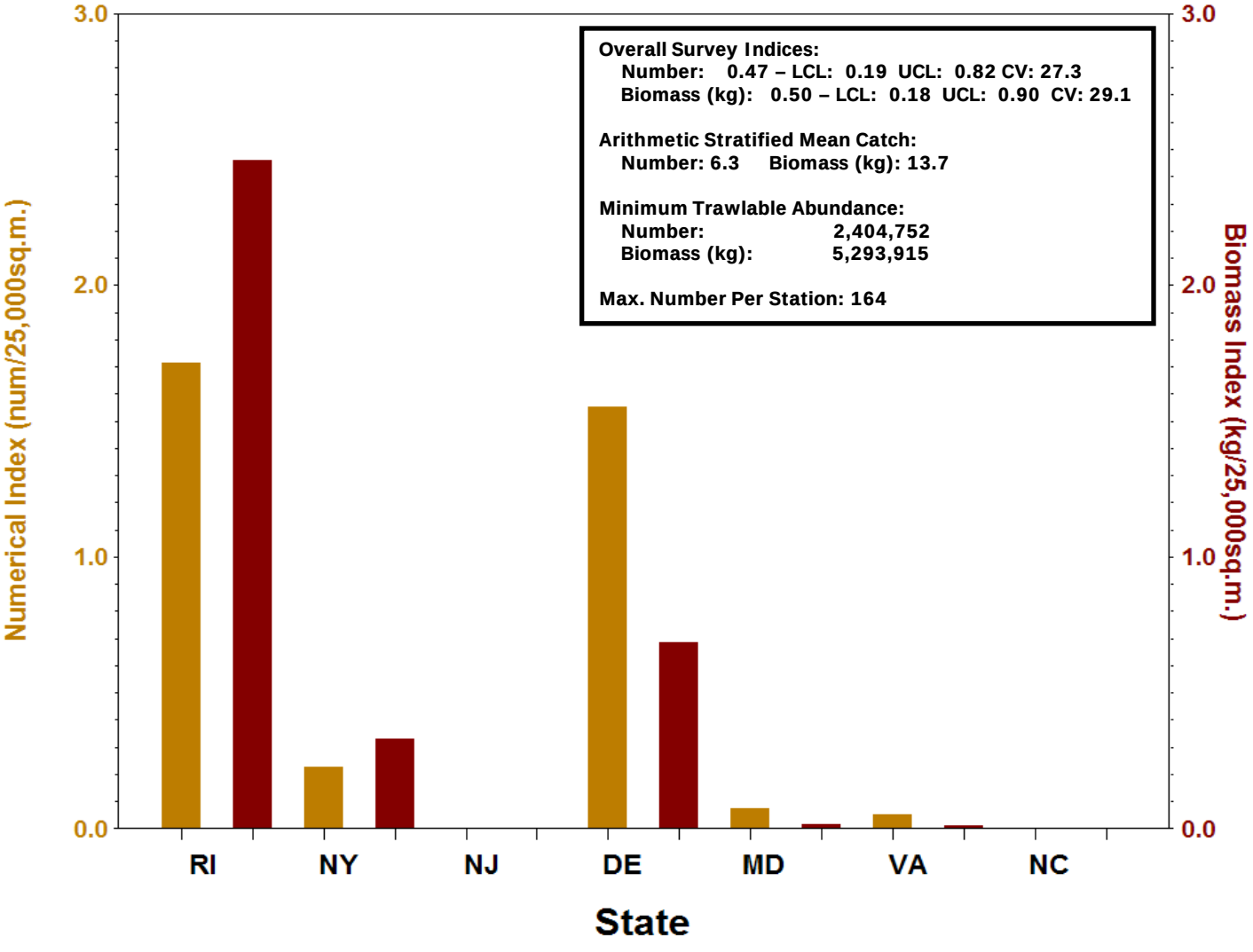


Figure 120. Length frequency histogram for spiny dogfish. Precaudal length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

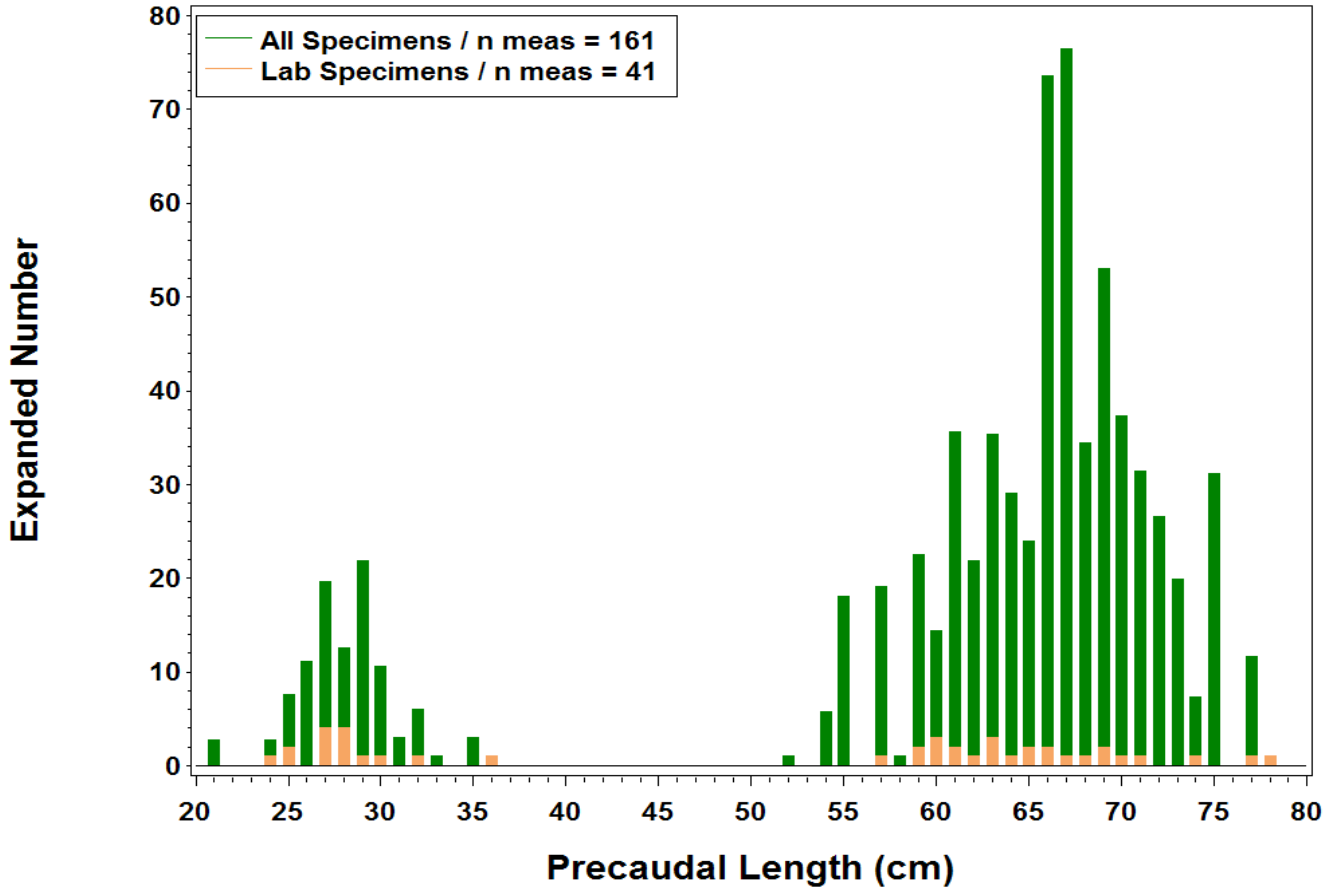


Figure 121. Sex-specific length frequency histogram for spiny dogfish. Precaudal length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

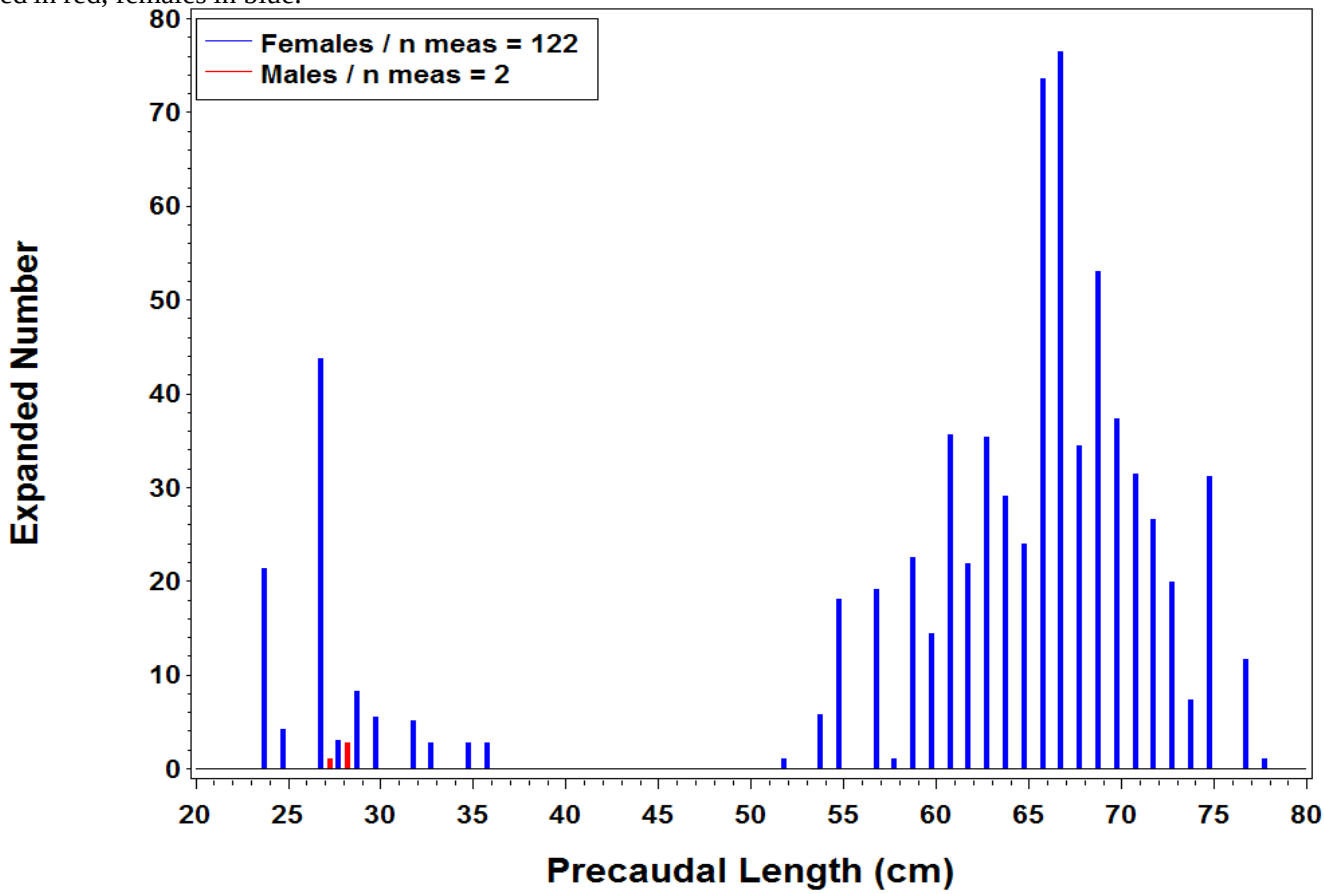
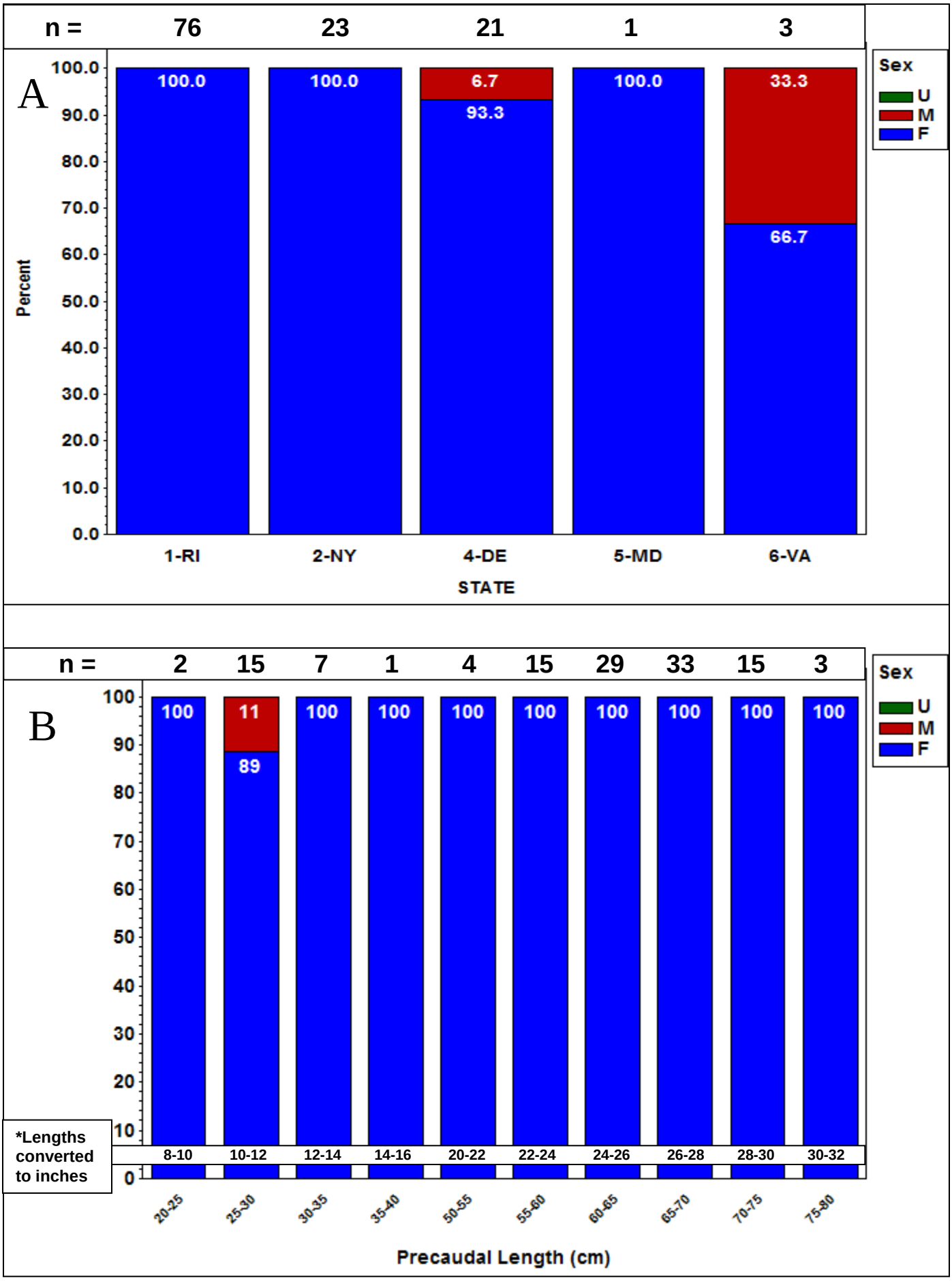


Figure 122. Sex ratios for spiny dogfish by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Spot (Priority B)

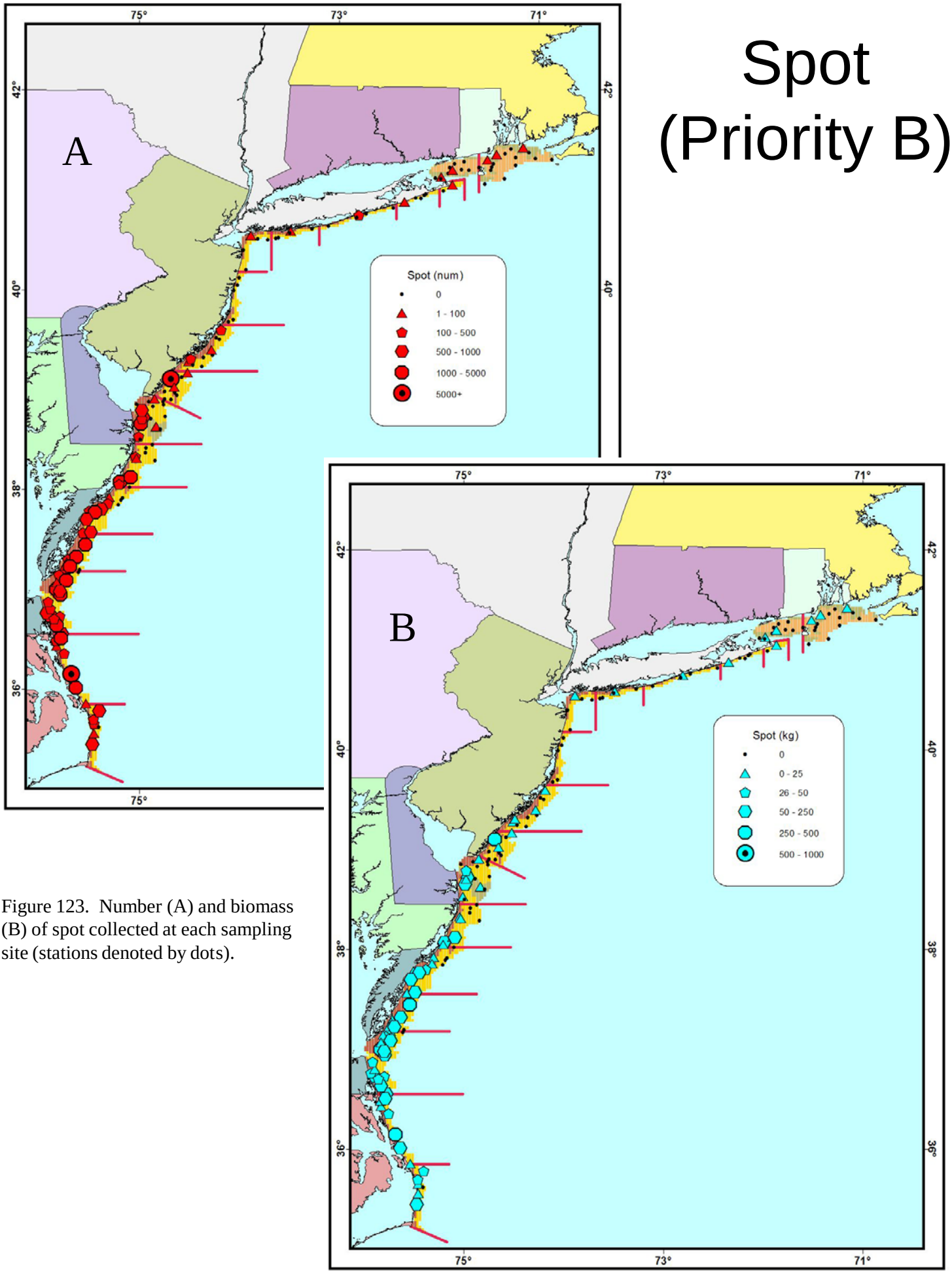


Figure 123. Number (A) and biomass (B) of spot collected at each sampling site (stations denoted by dots).

Table 35. For each state, the number of sites sampled and the number at which spot were collected. The number and biomass of spot caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum spot length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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, for spot. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

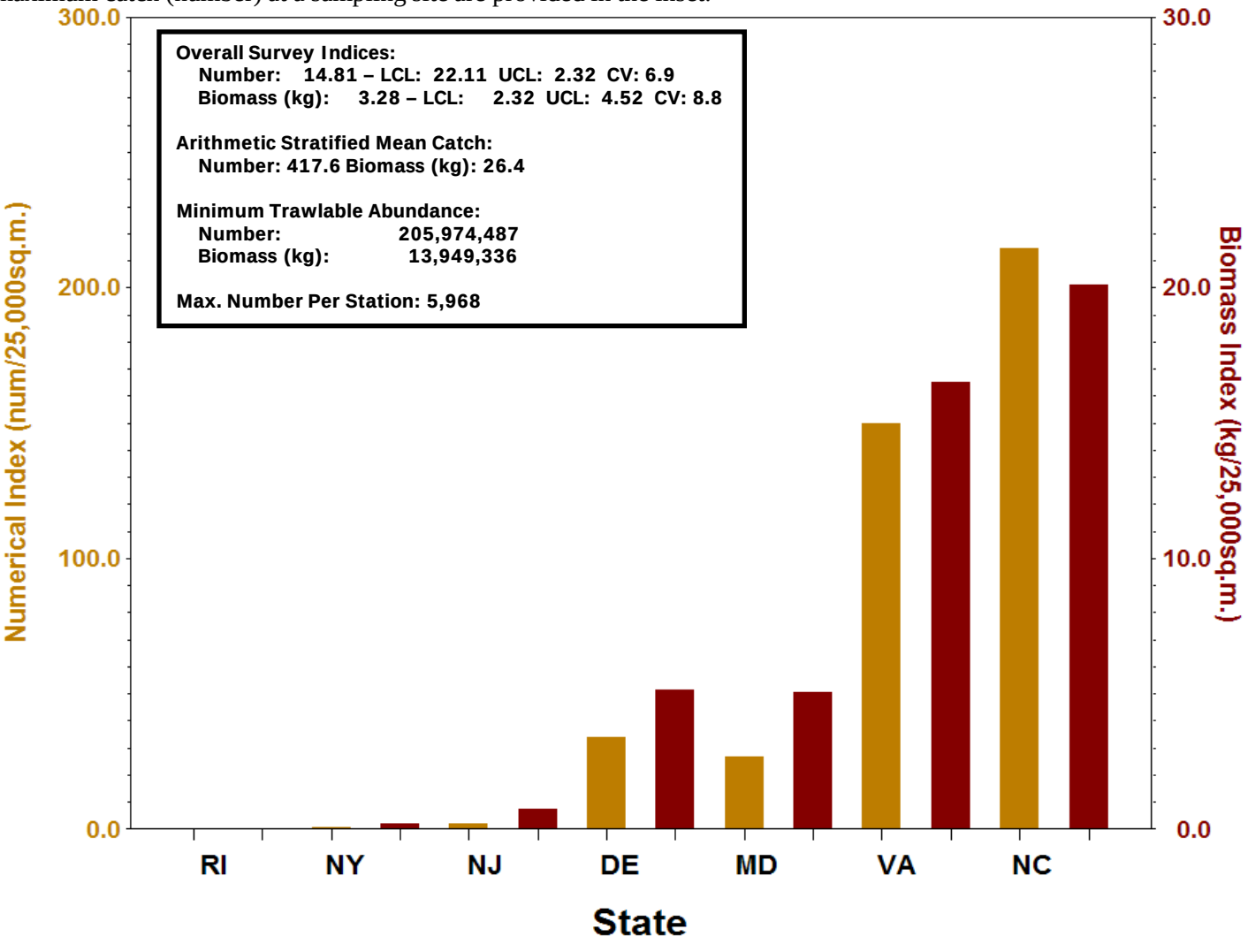


Figure 125. Length frequency histogram for spot. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

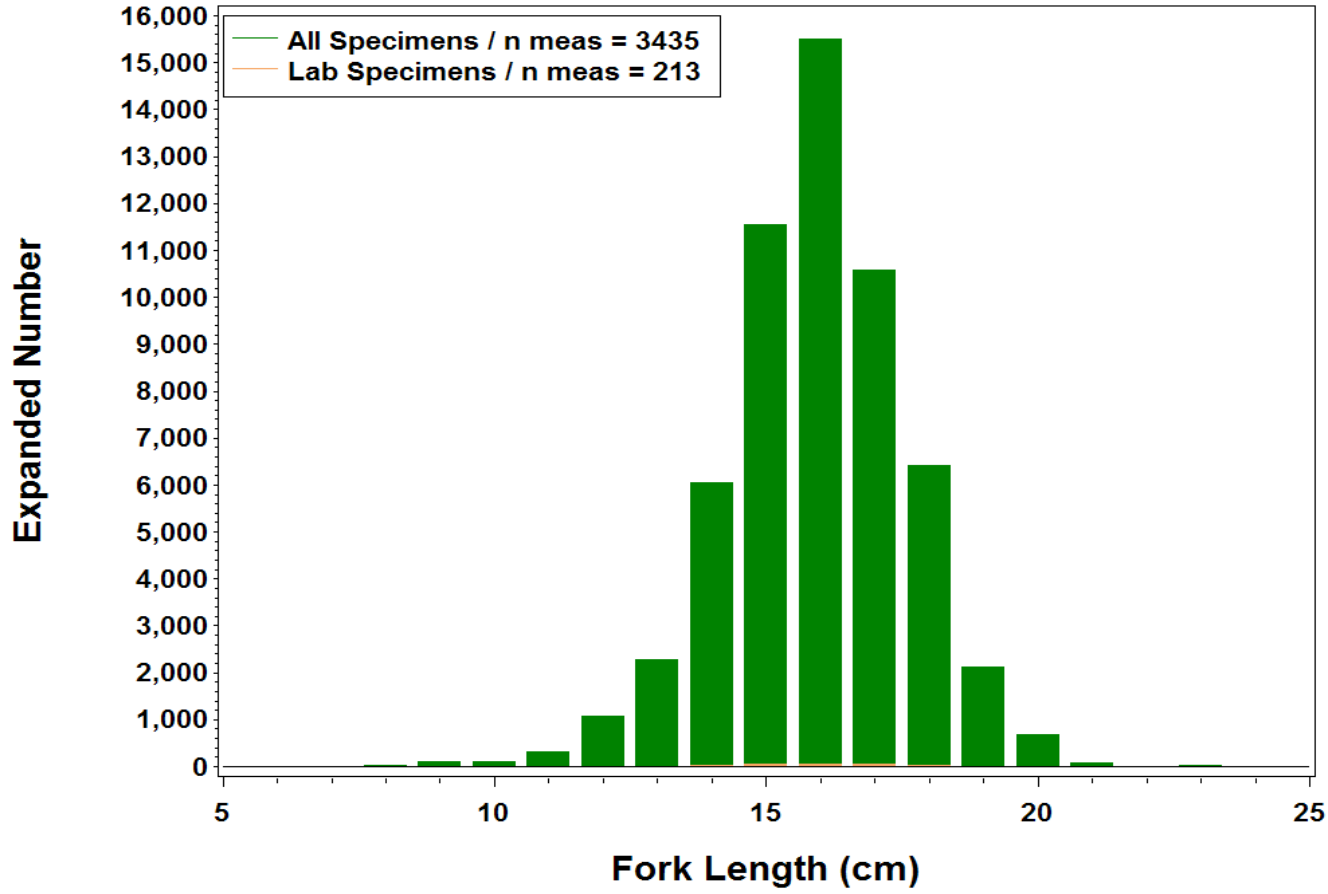


Figure 126. Sex-specific length frequency histogram for spot. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

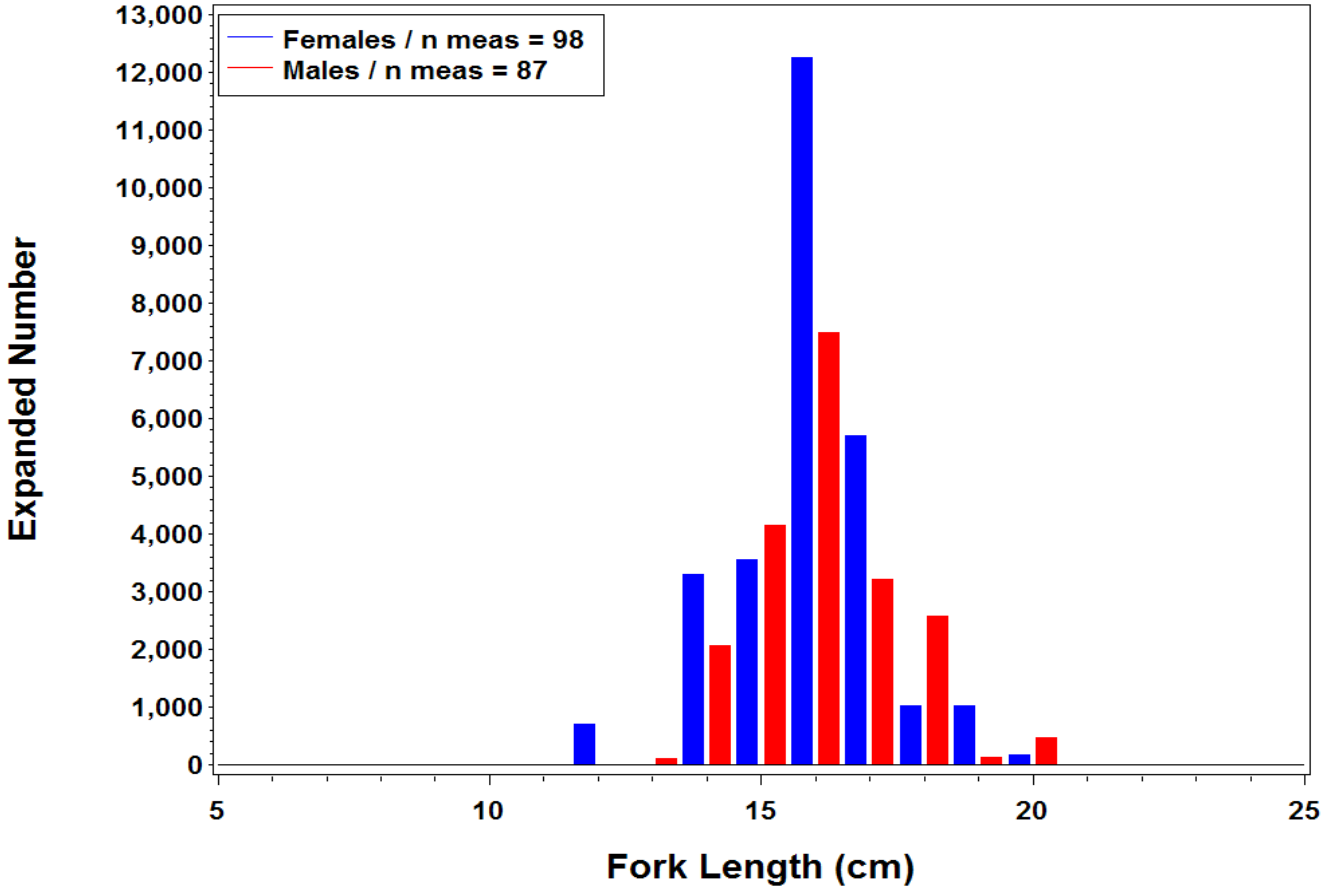
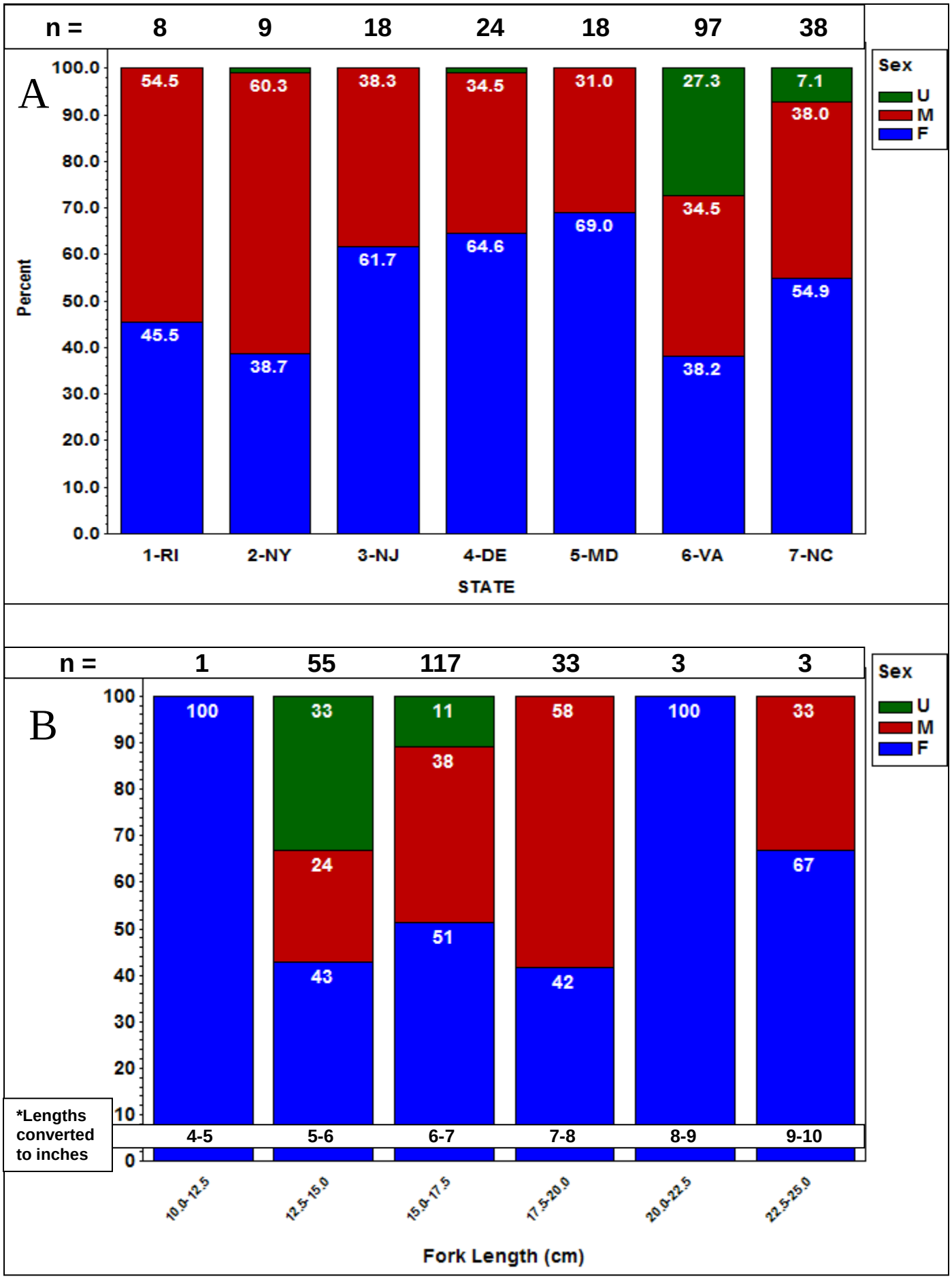


Figure 127. Sex ratios for spot by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Spotted Hake (Priority D)

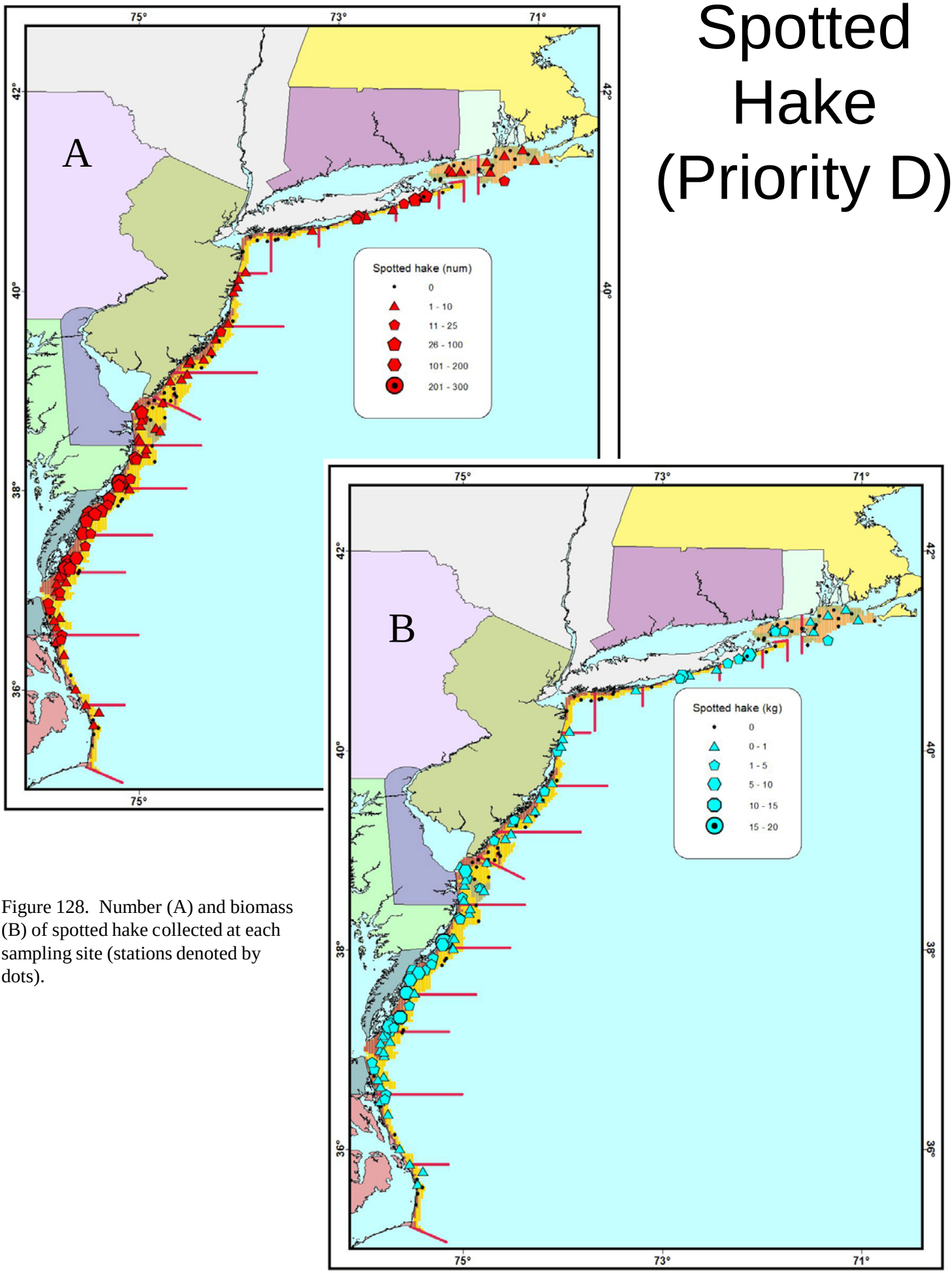


Figure 128. Number (A) and biomass (B) of spotted hake collected at each sampling site (stations denoted by dots).

Table 36. For each state, the number of sites sampled and the number at which spotted hake were collected. The number and biomass of hake caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum hake length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	9	48	7.142	0	48	197	282	244	0.149	0.62	0.17
NY	22	9	165	19.006	0	164	93	308	226	0.116	1.12	0.32
NJ	24	13	60	9.241	0	60	203	352	253	0.154	1.06	0.26
DE	17	11	115	14.933	0	64	166	339	233	0.130	5.50	1.04
MD	10	8	362	30.750	0	118	171	284	218	0.085	7.66	1.32
VA	38	31	1181	99.102	0	574	167	343	222	0.084	9.61	1.44
NC	13	7	25	2.812	0	25	192	302	235	0.112	0.93	0.16
Total	150	88	1956	182.986	0	1053	93	352	226	0.094	3.49	0.81

Figure 129. Geometric mean catch per area swept, by state, for spotted hake. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

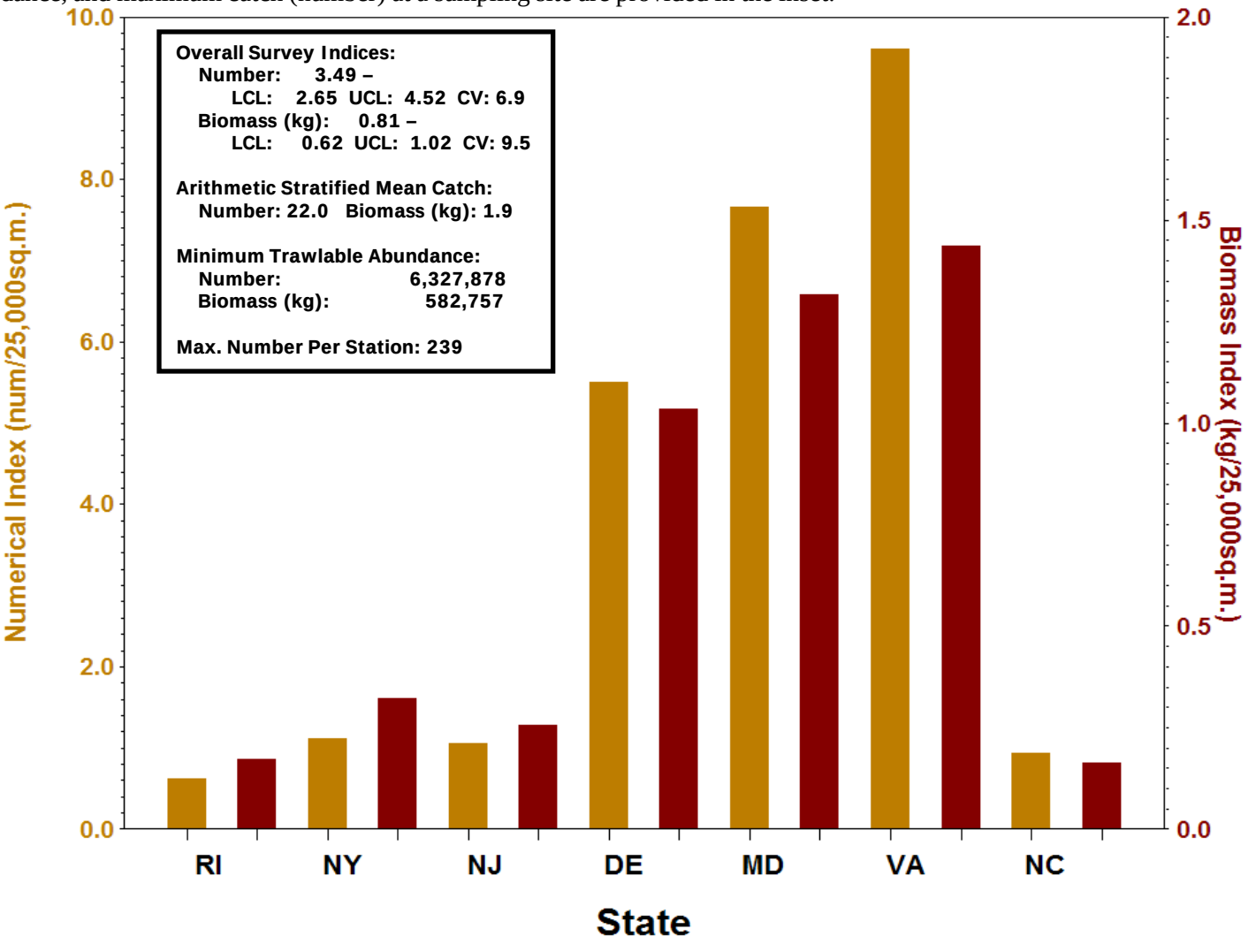
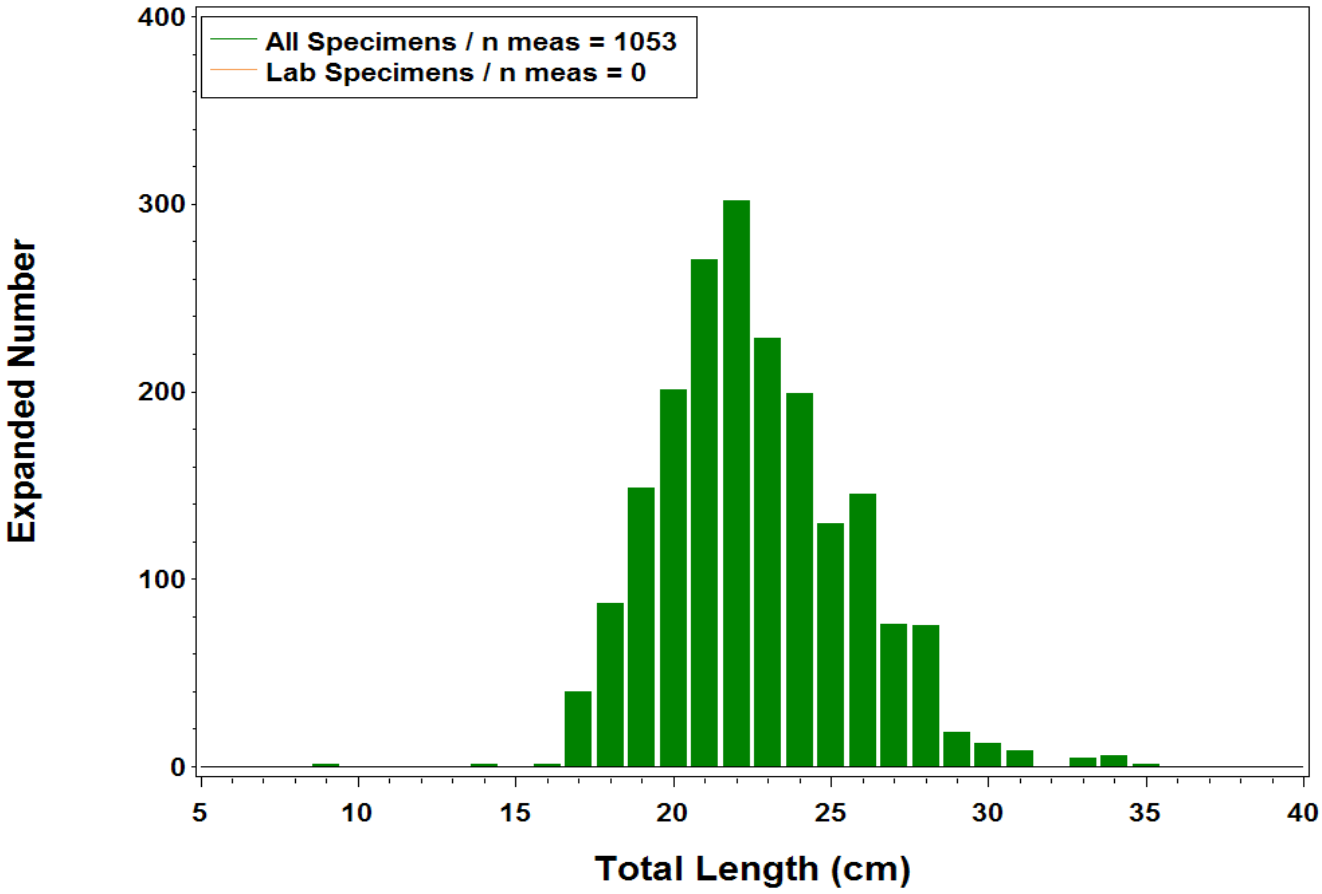


Figure 130. Length frequency histogram for spotted hake. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Striped Anchovy (Priority D)

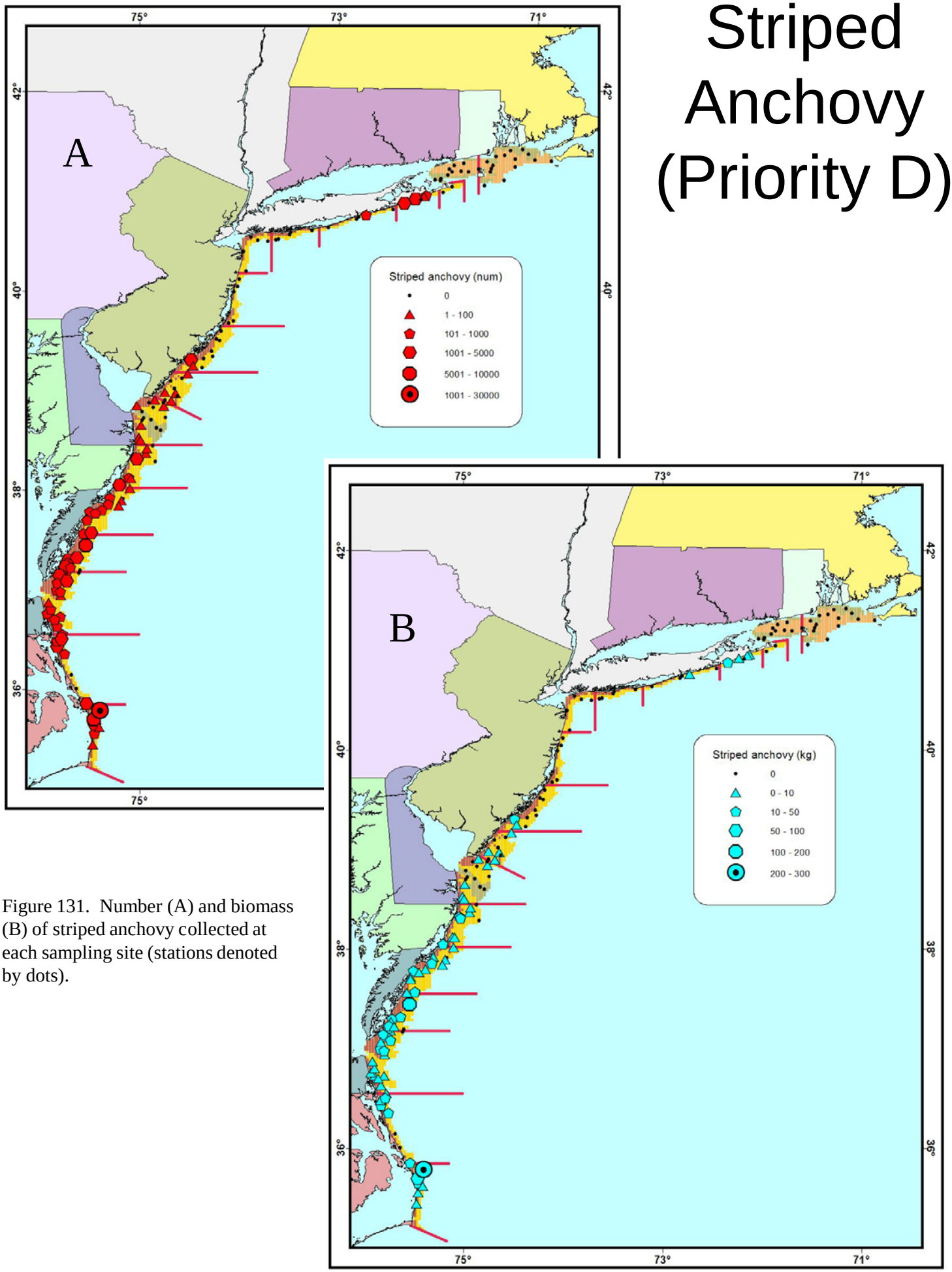


Figure 131. Number (A) and biomass (B) of striped anchovy collected at each sampling site (stations denoted by dots).

Table 37. For each state, the number of sites sampled and the number at which striped anchovy were collected. The number and biomass of anchovy caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum anchovy length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	5	2935	21.655	0	99	45	120	76	0.007	1.18	0.17
NJ	24	6	3077	40.541	0	134	79	135	112	0.013	1.24	0.20
DE	17	6	189	2.643	0	189	80	131	108	0.014	3.00	0.16
MD	10	8	6240	83.554	0	410	88	135	111	0.013	52.39	2.79
VA	38	35	28144	396.457	0	1909	59	186	107	0.014	189.17	4.69
NC	13	11	44248	464.248	0	616	62	123	100	0.010	242.96	6.96
Total	150	71	84833	1009.098	0	3357	45	186	105	0.012	17.42	1.65

Figure 132. Geometric mean catch per area swept, by state, for striped anchovy. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

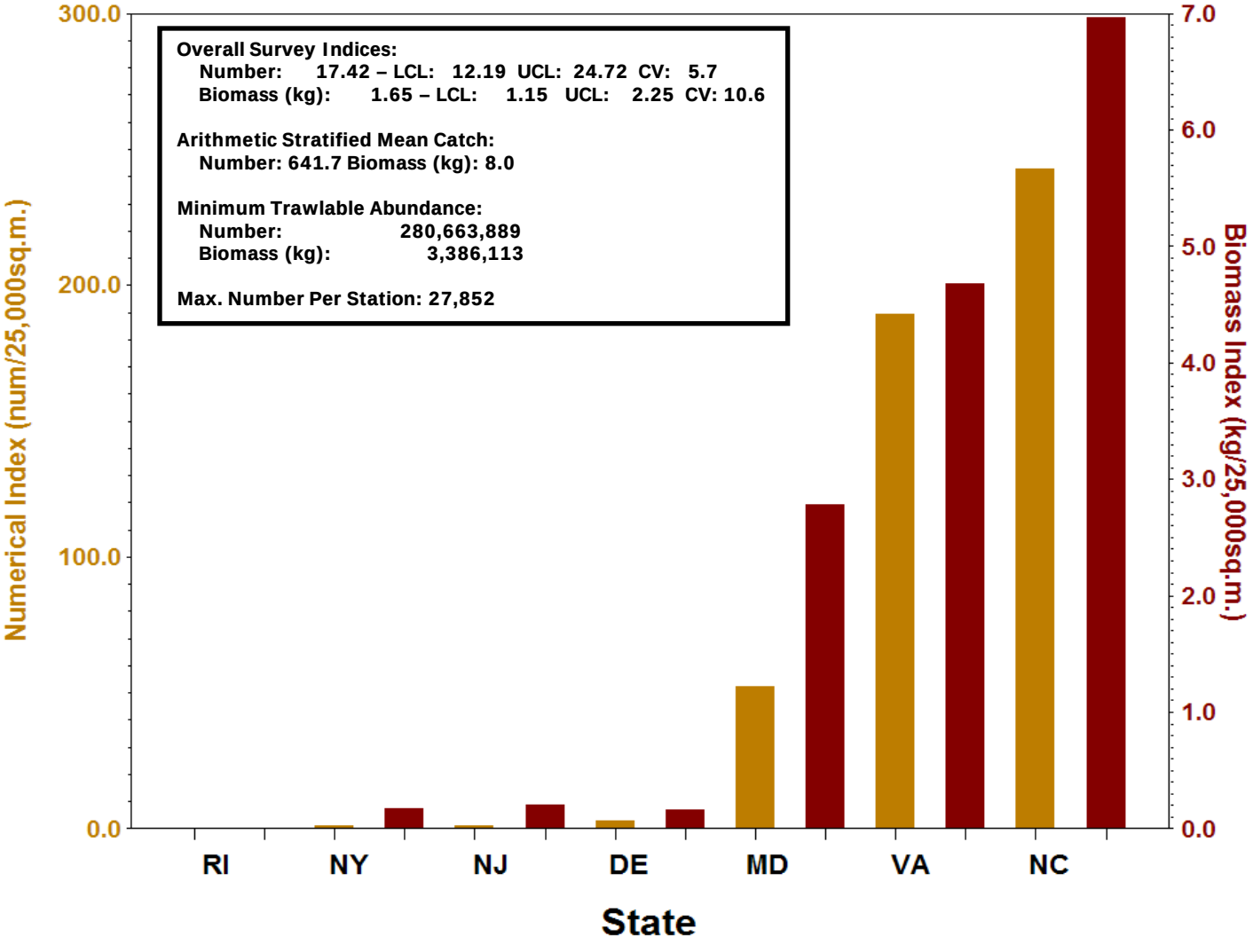
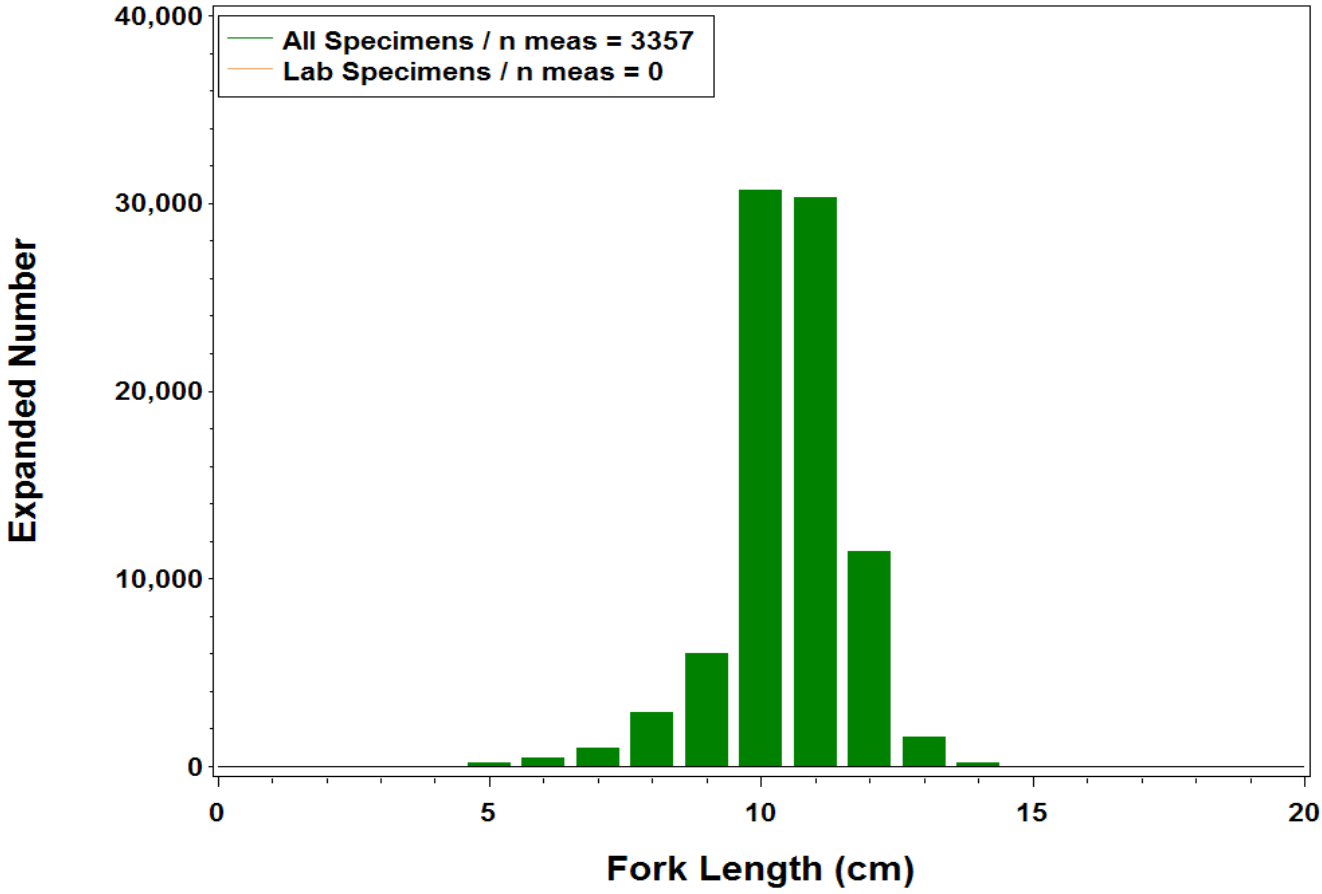


Figure 133. Length frequency histogram for striped anchovy. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Striped Bass (Priority A)

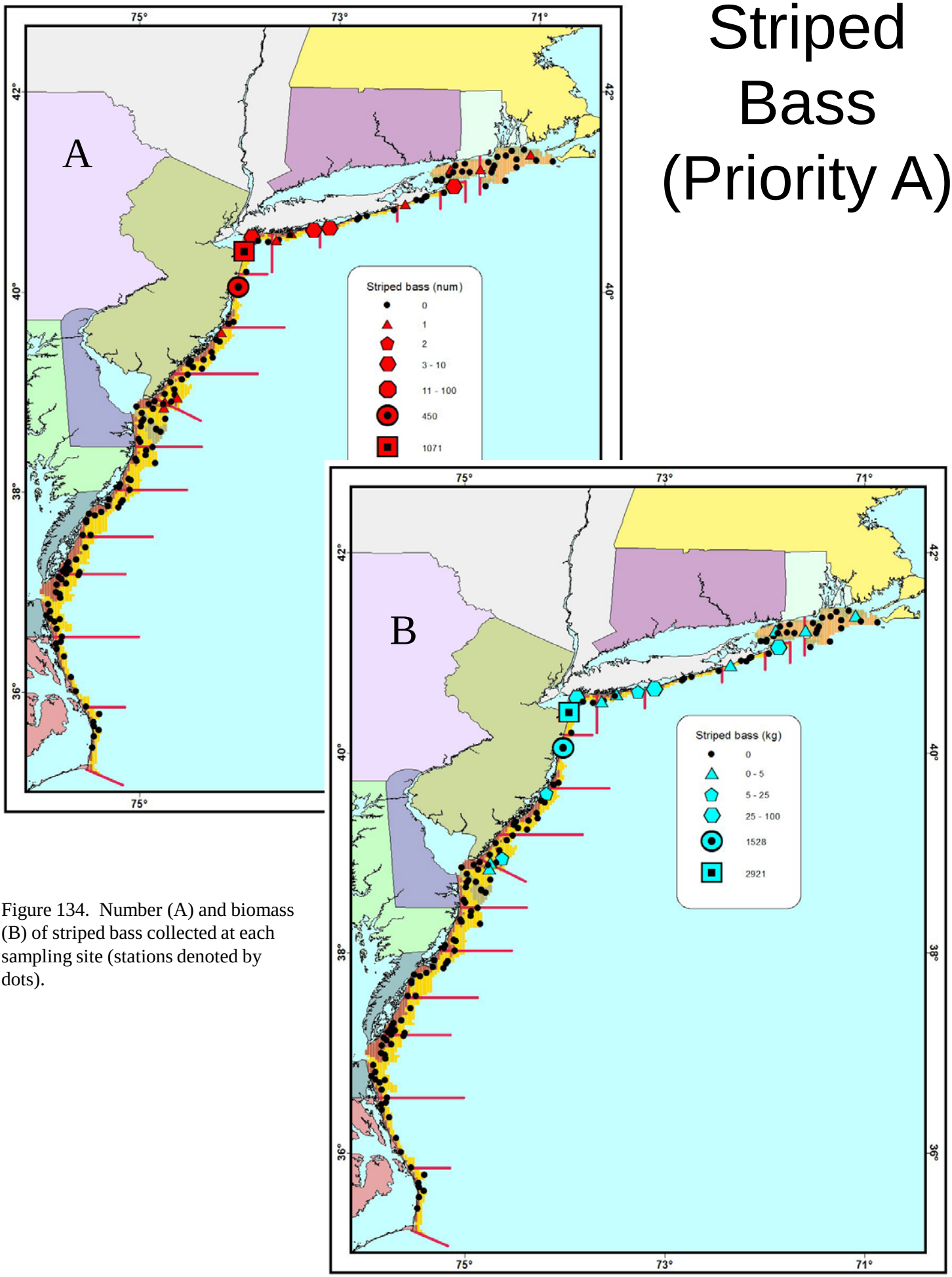


Figure 134. Number (A) and biomass (B) of striped bass collected at each sampling site (stations denoted by dots).

Table 38. For each state, the number of sites sampled and the number at which striped bass were collected. The number and biomass of stripers caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum striper length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	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	2.764	1.50	2.70
NJ	24	4	453	1551.999	13	50	592	1110	836	3.426	0.41	0.74
DE	17	1	1	4.300	1	1	736	736	736	4.300	0.06	0.15
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NC	13	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
Total	150	16	1559	4611.939	43	95	561	1110	766	2.958	0.20	0.34

Figure 135. Geometric mean catch per area swept, by state, for striped bass. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

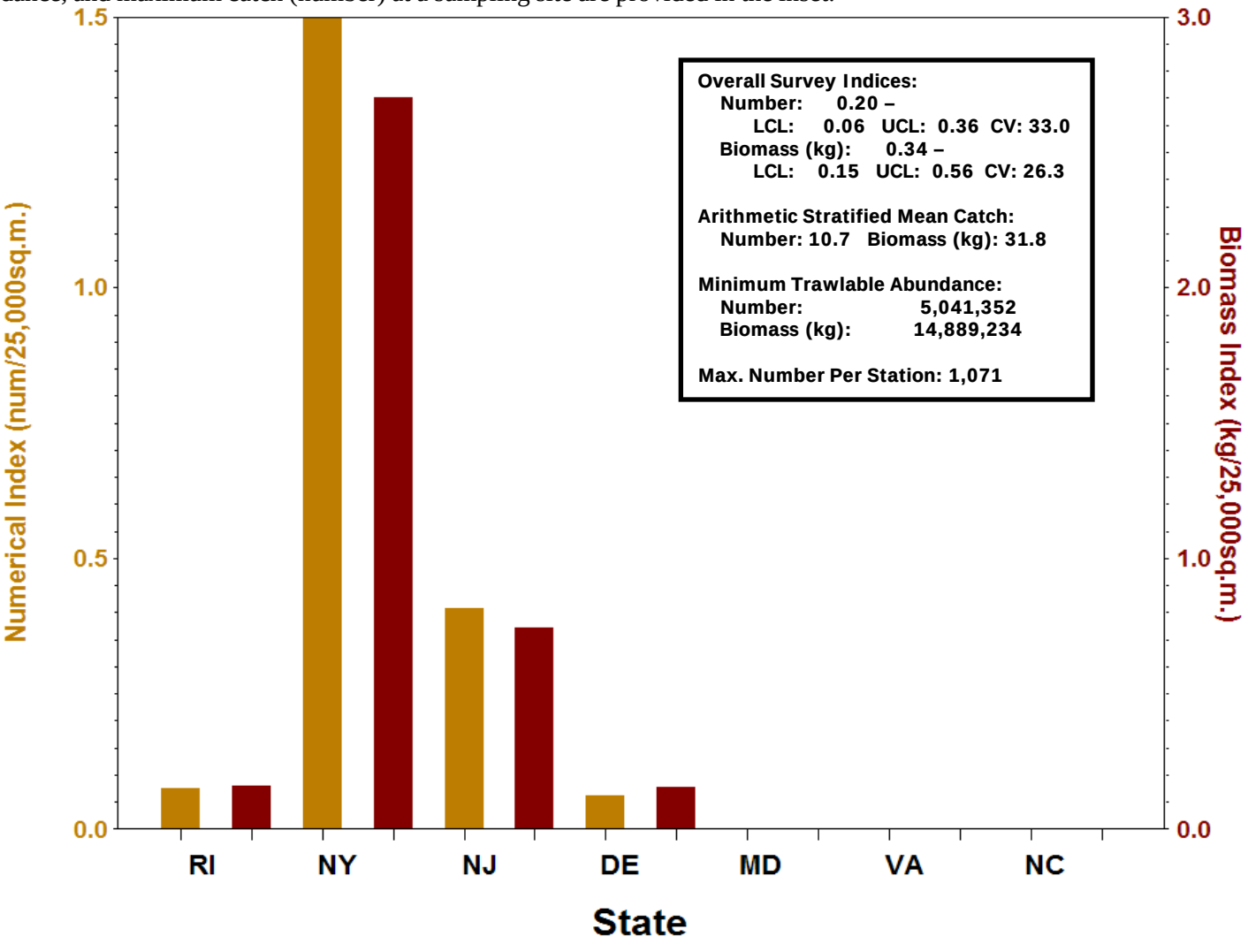


Figure 136. Length frequency histogram for striped bass. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

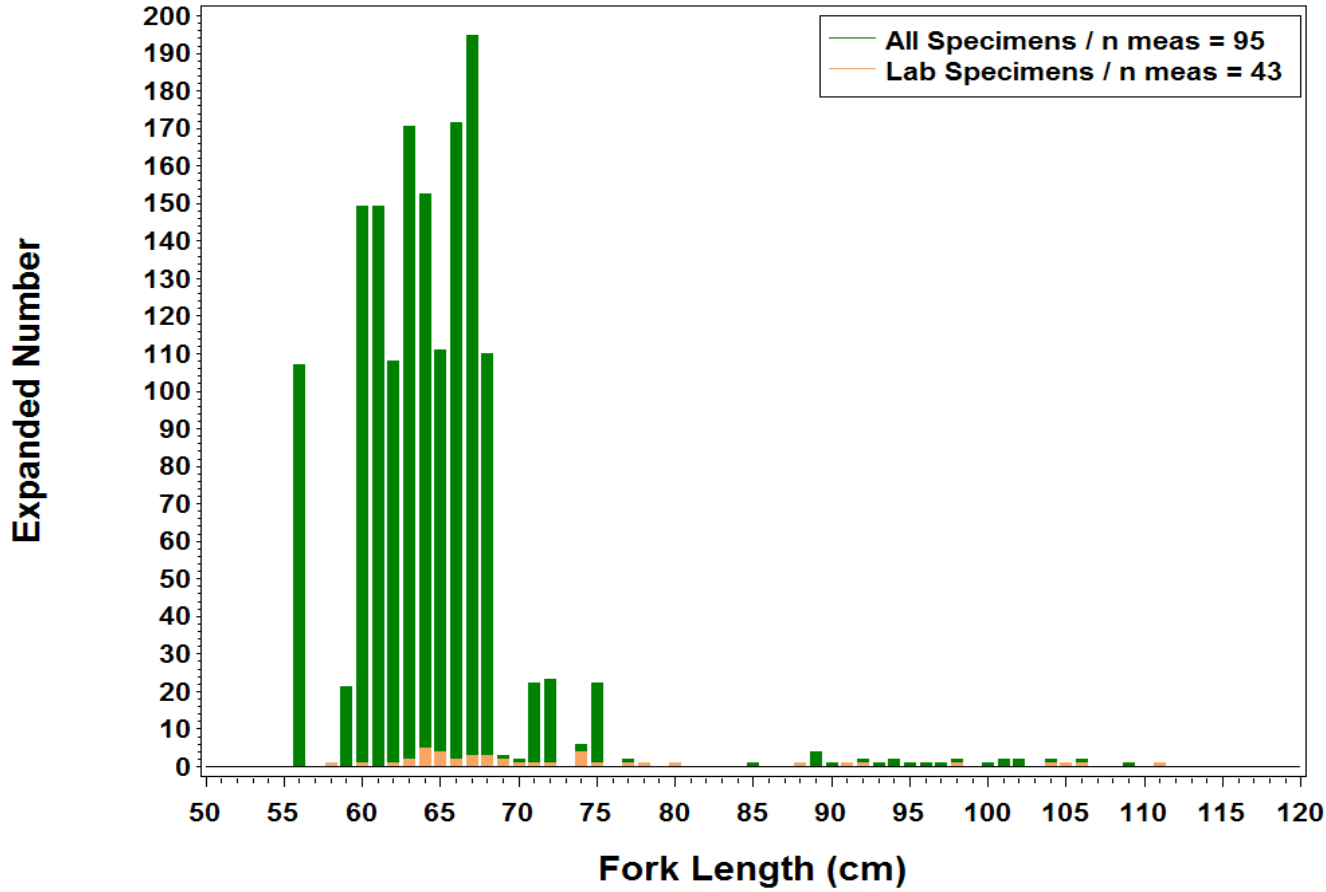


Figure 137. Sex-specific length frequency histogram for striped bass. Fork length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

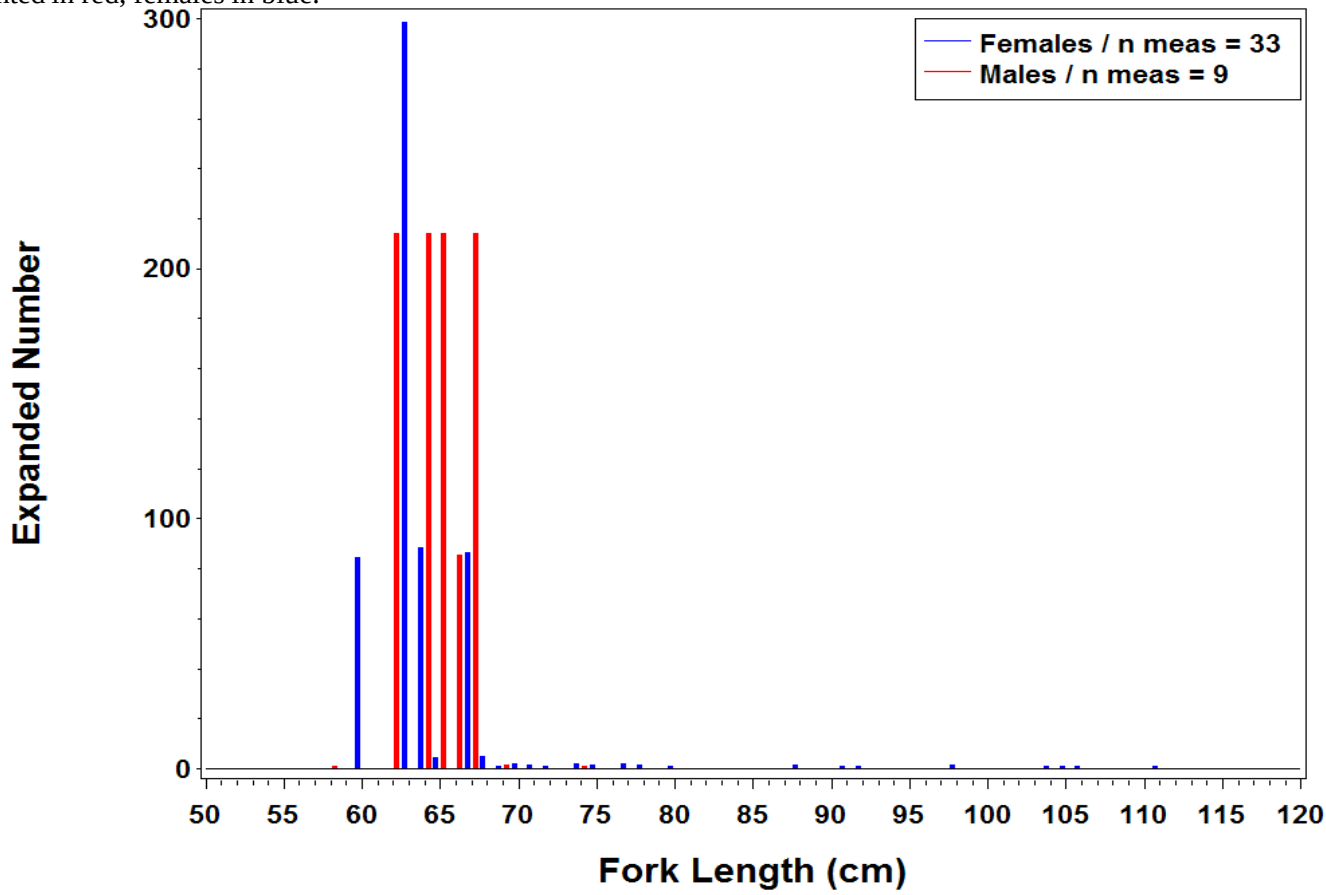
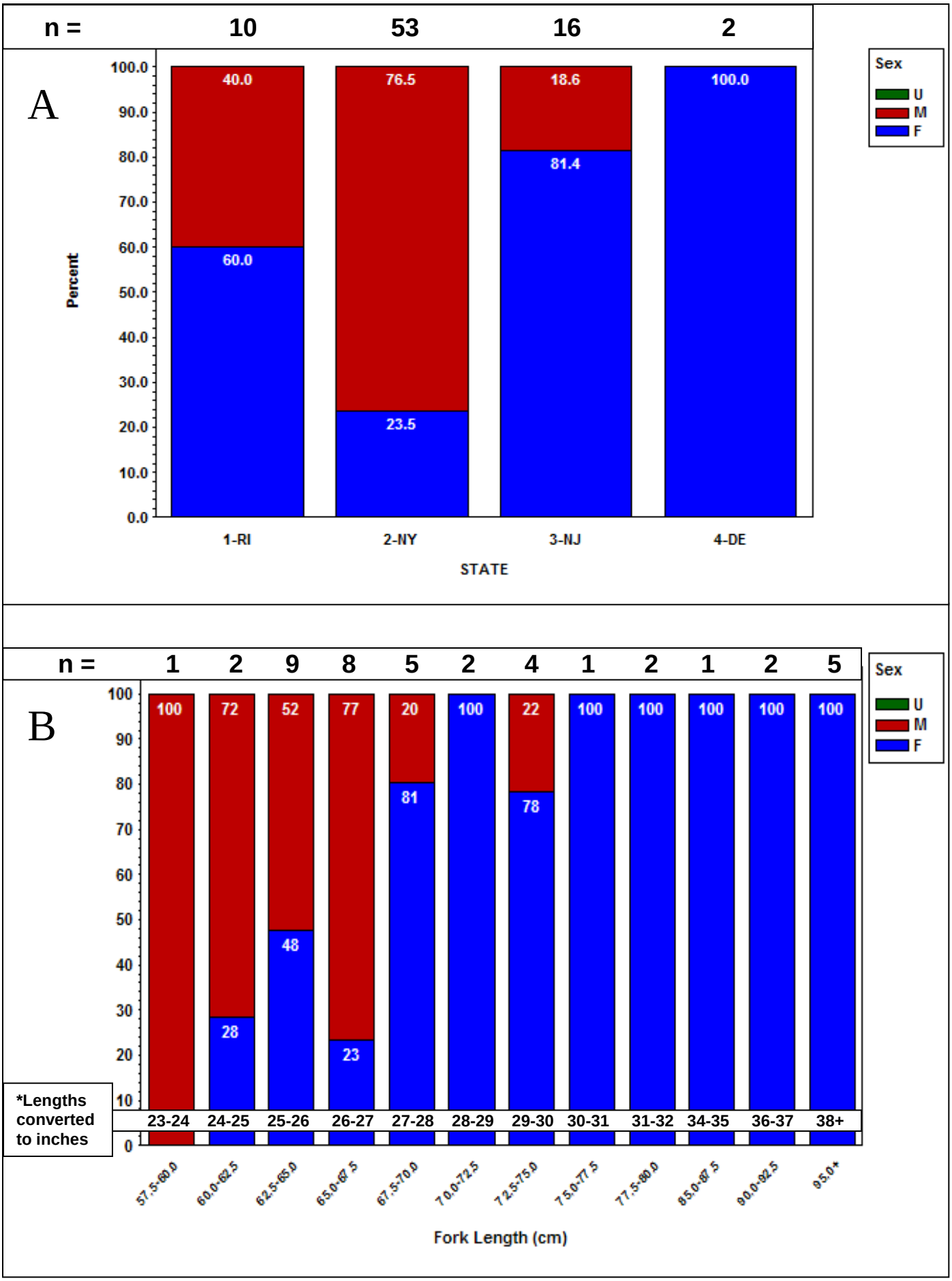


Figure 138. Sex ratios for striped bass by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Striped Searobin (Priority D)

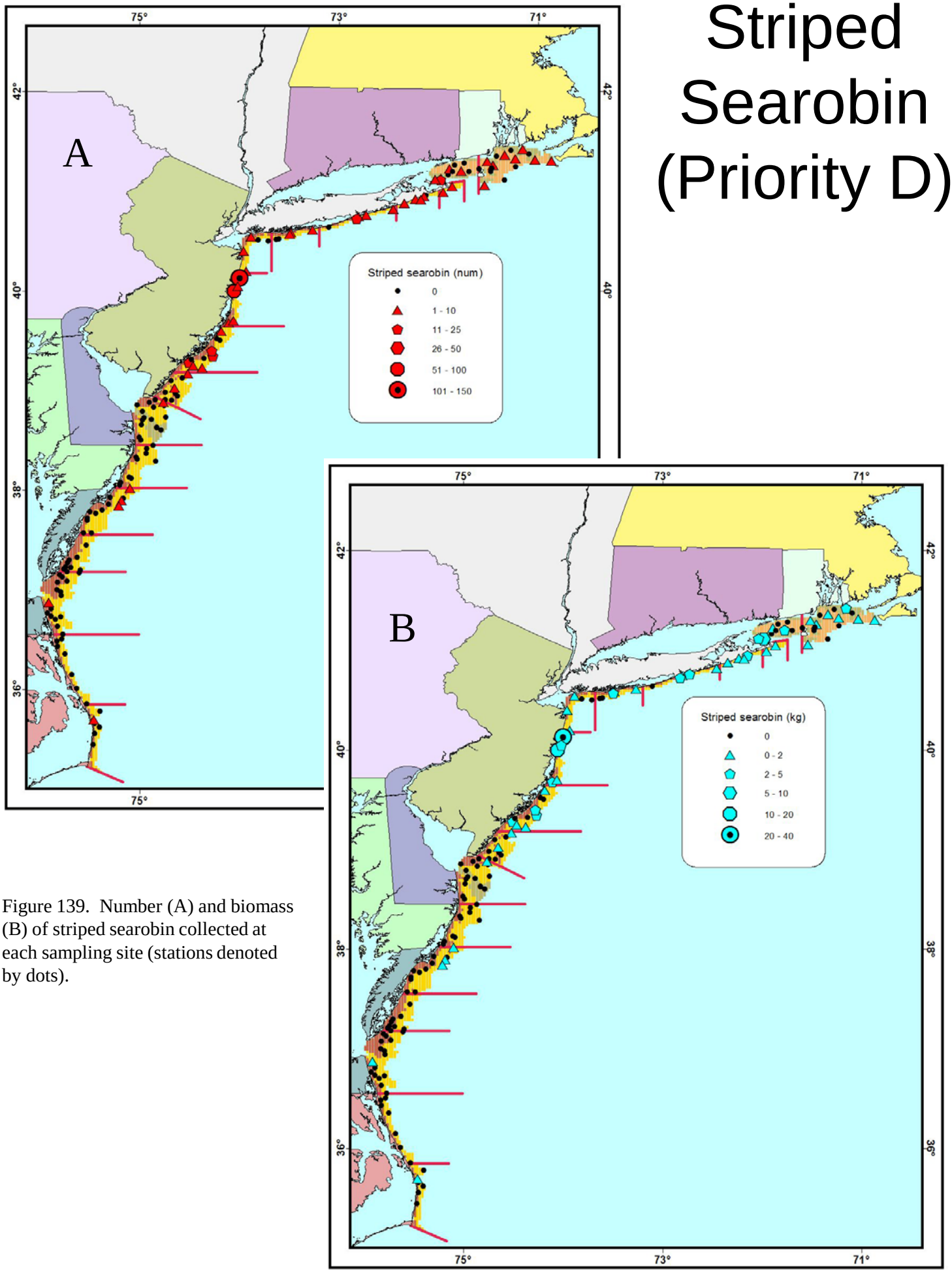


Figure 139. Number (A) and biomass (B) of striped searobin collected at each sampling site (stations denoted by dots).

Table 39. For each state, the number of sites sampled and the number at which striped searobin were collected. The number and biomass of searobins caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum searobin length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm FL)	Max. Length (mm FL)	Avg. Length (mm FL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	13	54	18.565	0	54	82	370	268	0.344	1.01	0.42
NY	22	16	71	24.044	0	71	88	413	269	0.339	1.76	0.62
NJ	24	13	286	76.946	0	206	153	395	262	0.269	2.36	0.93
DE	17	1	2	0.858	0	2	261	367	314	0.429	0.10	0.05
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	4	11	1.015	0	11	81	233	172	0.100	0.15	0.02
NC	13	1	1	0.080	0	1	183	183	183	0.080	0.06	0.01
Total	150	48	425	121.508	0	345	81	413	261	0.286	0.73	0.32

Figure 140. Geometric mean catch per area swept, by state, for striped searobin. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

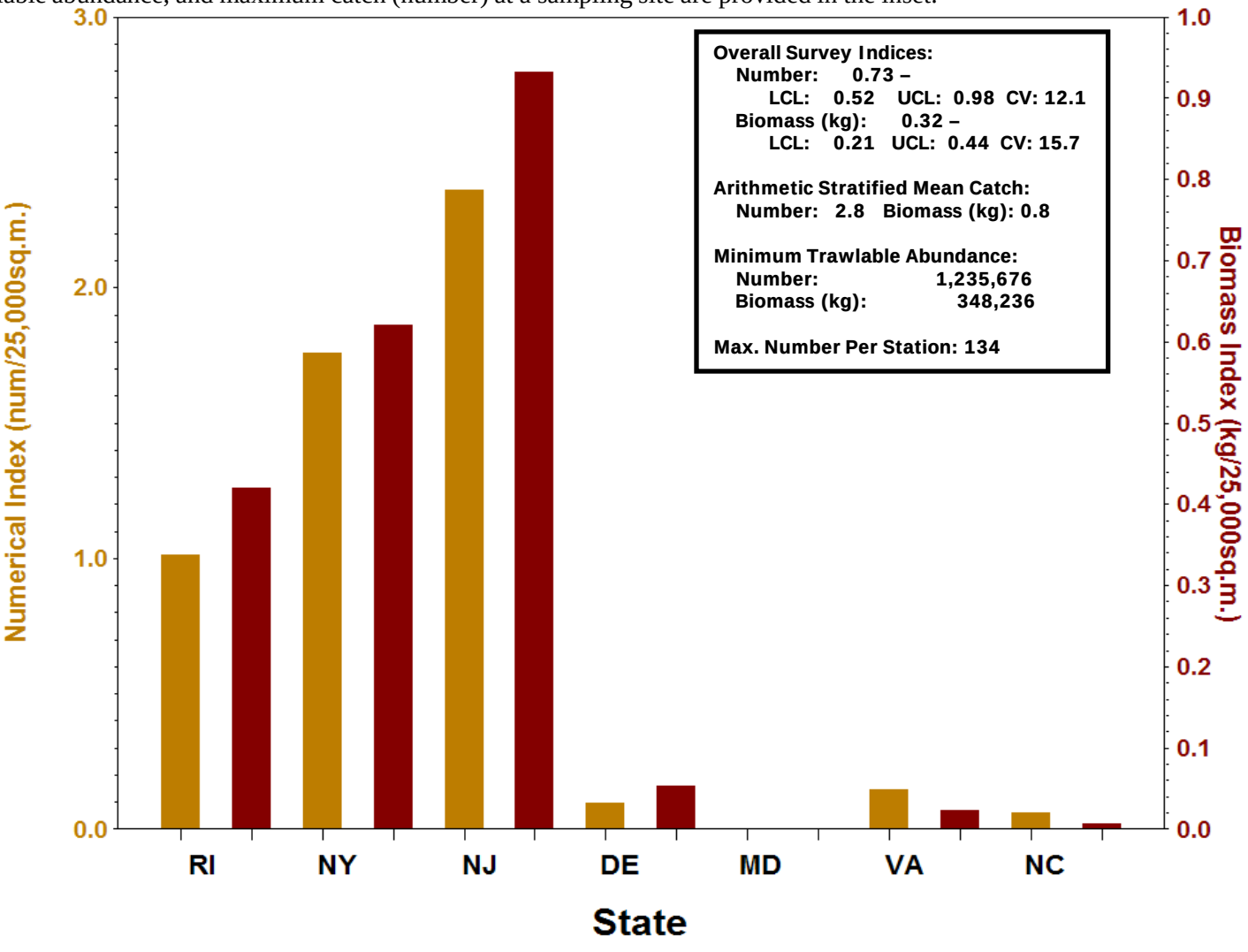
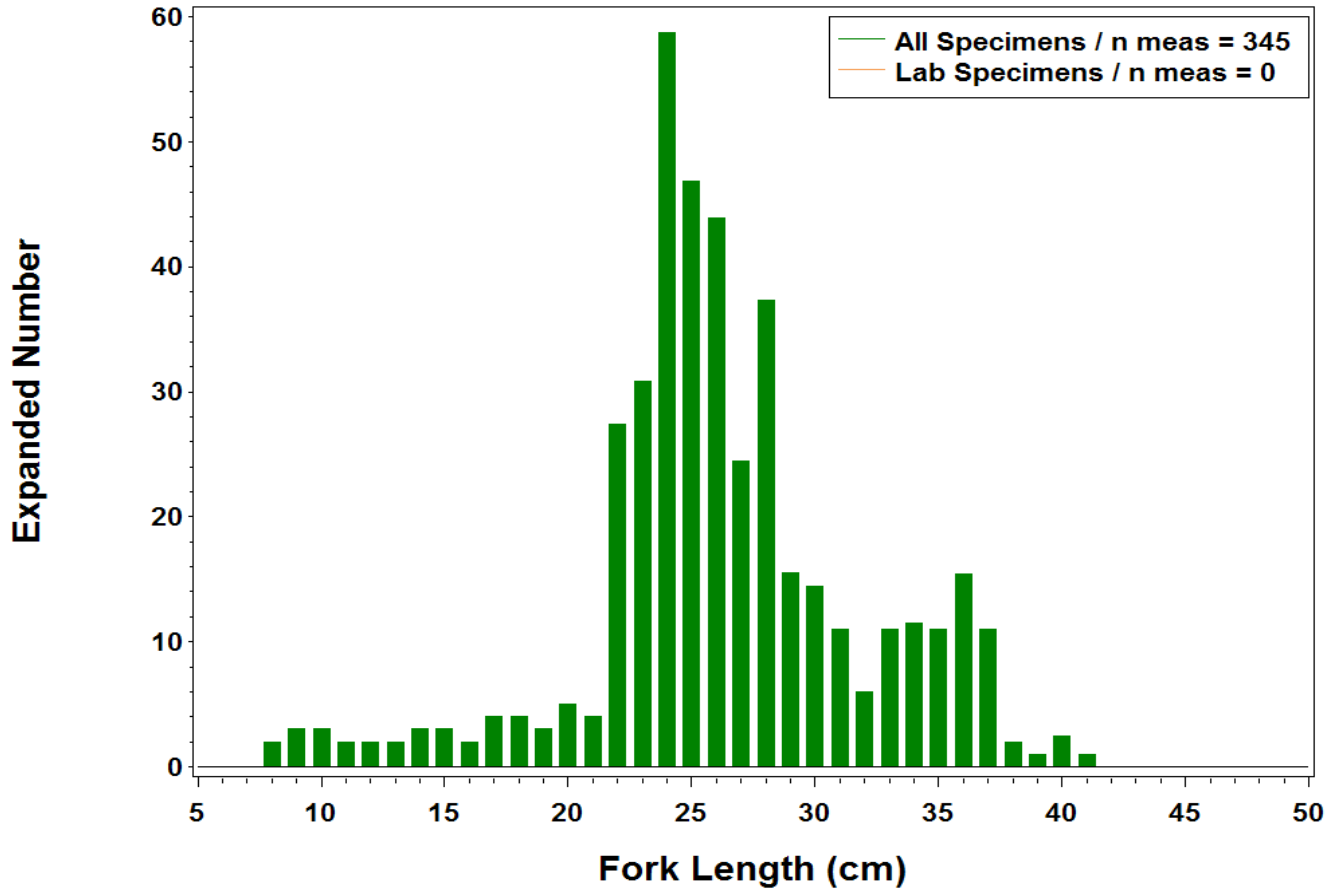


Figure 141. Length frequency histogram for striped searobin. Fork length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Summer Flounder (Priority A)

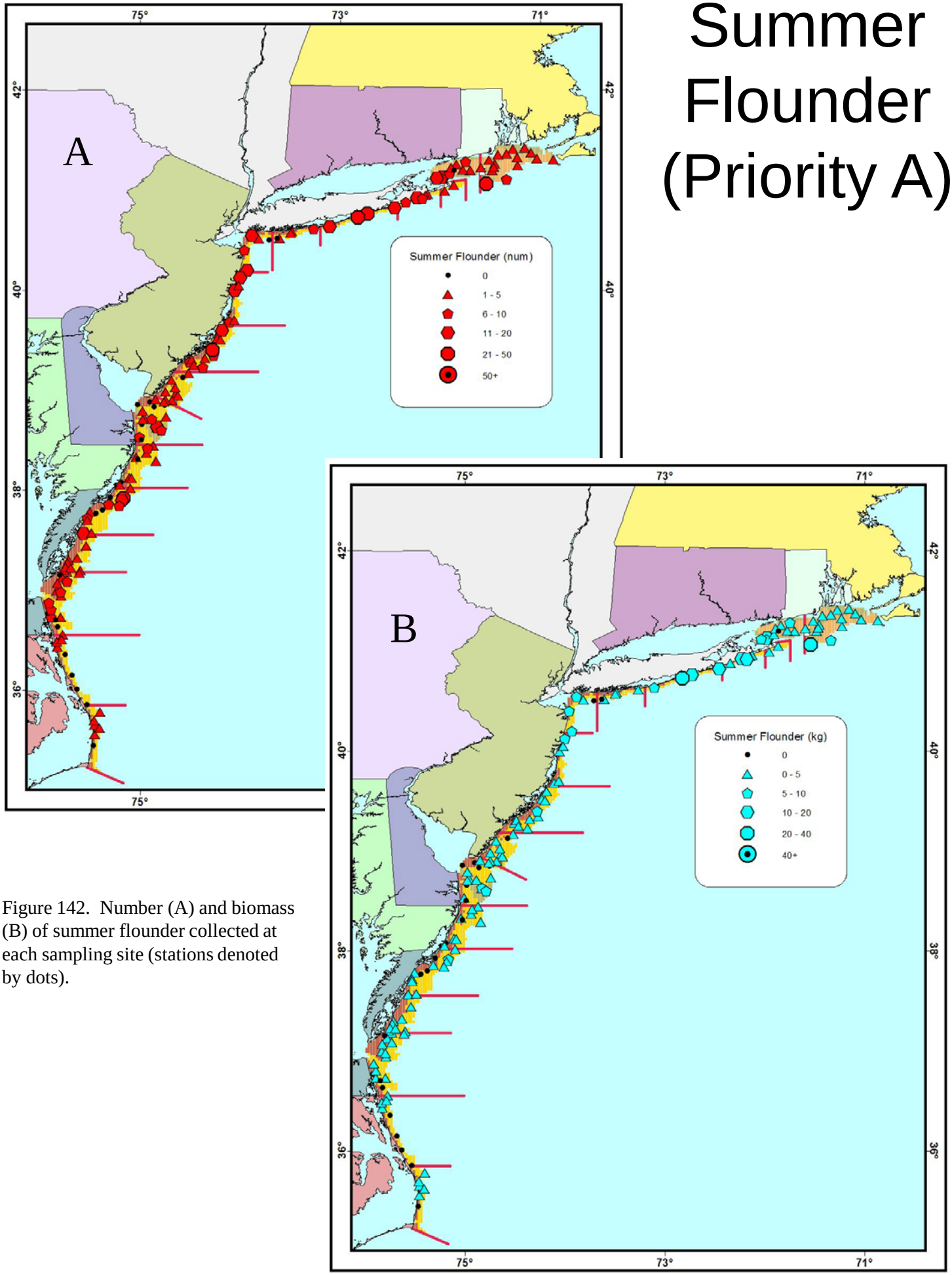


Figure 142. Number (A) and biomass (B) of summer flounder collected at each sampling site (stations denoted by dots).

Table 40. For each state, the number of sites sampled and the number at which summer flounder were collected. The number and biomass of flounder caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum flounder length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	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, for summer flounder. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

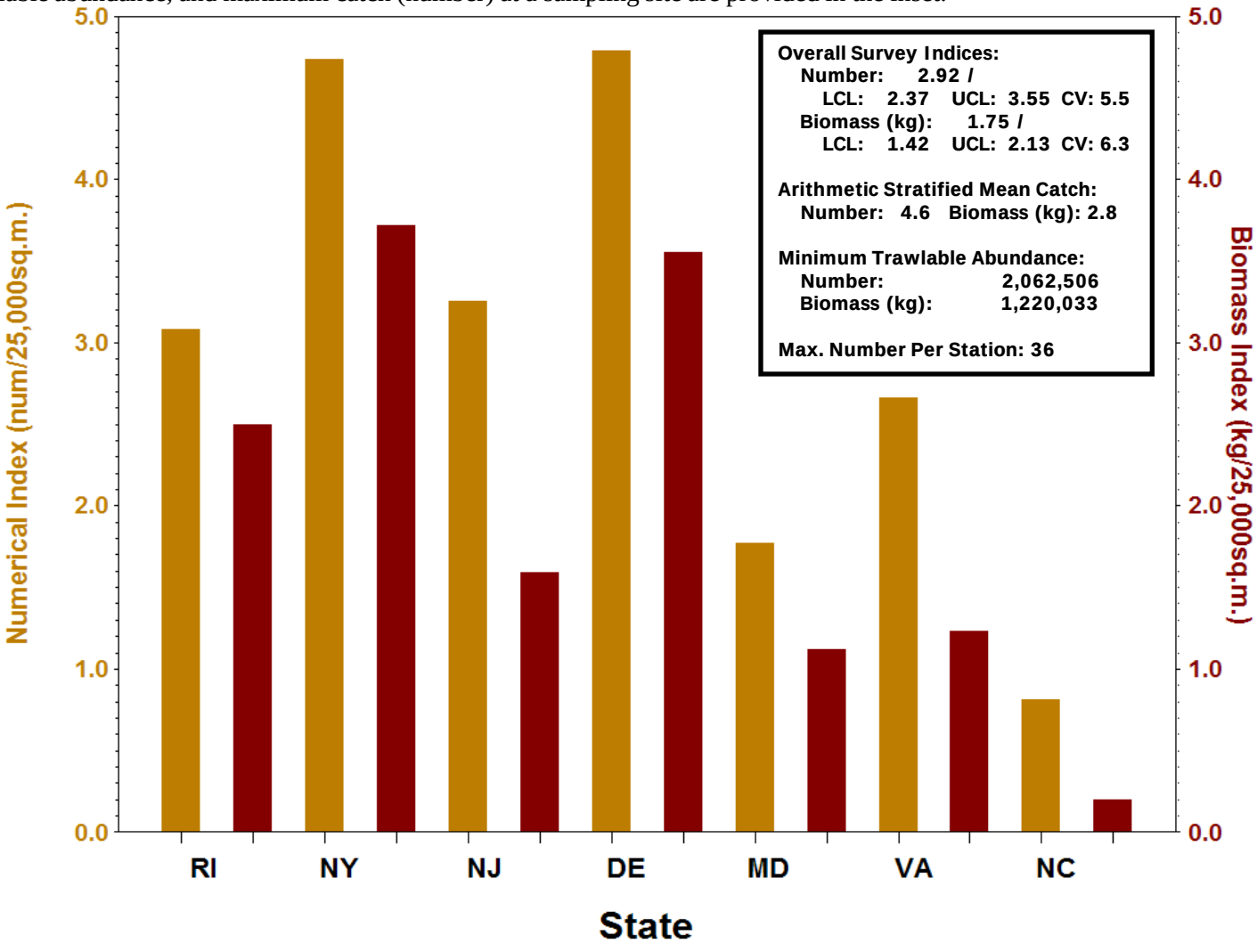


Figure 144. Length frequency histogram for summer flounder. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

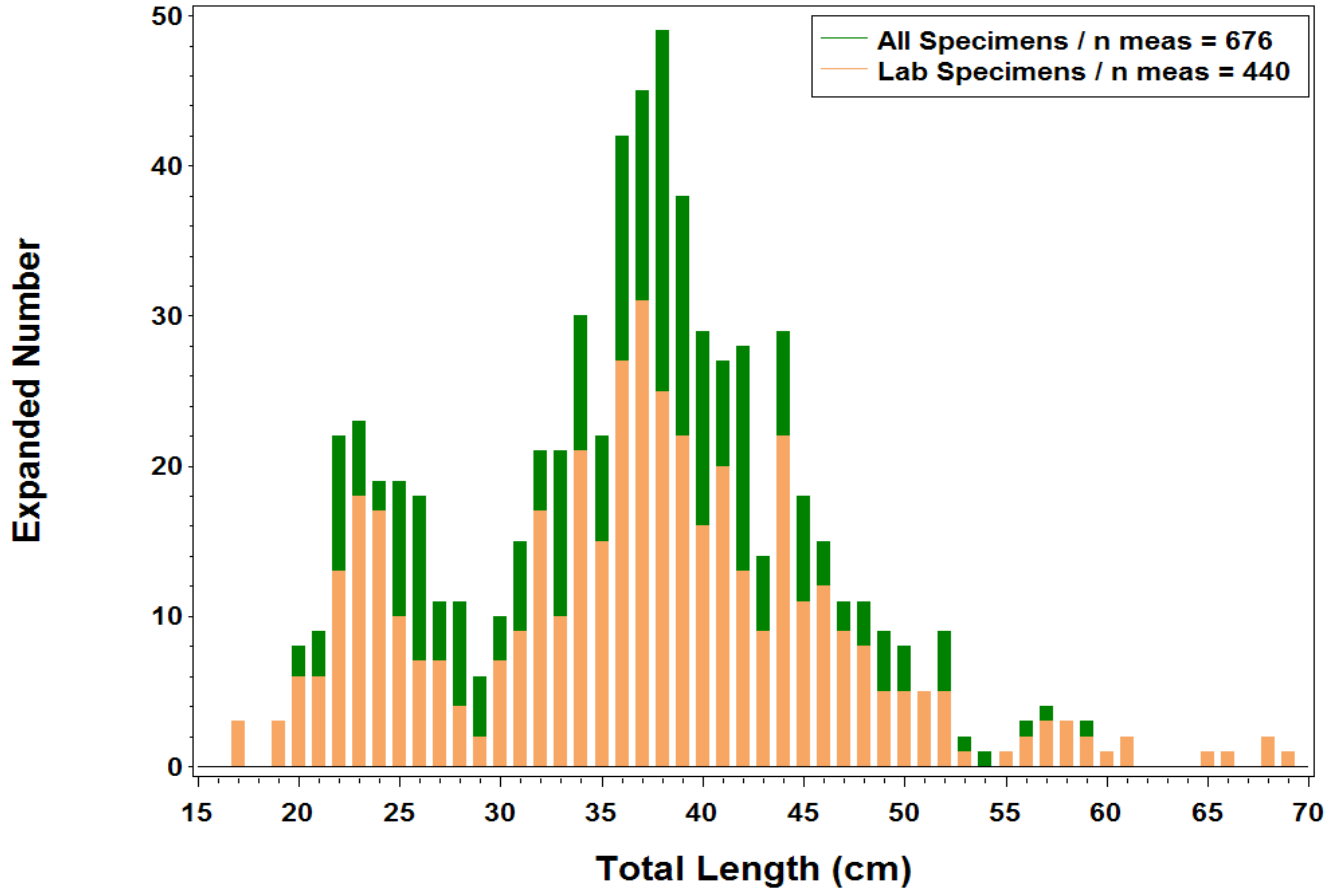


Figure 145. Sex-specific length frequency histogram for summer flounder. Total length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

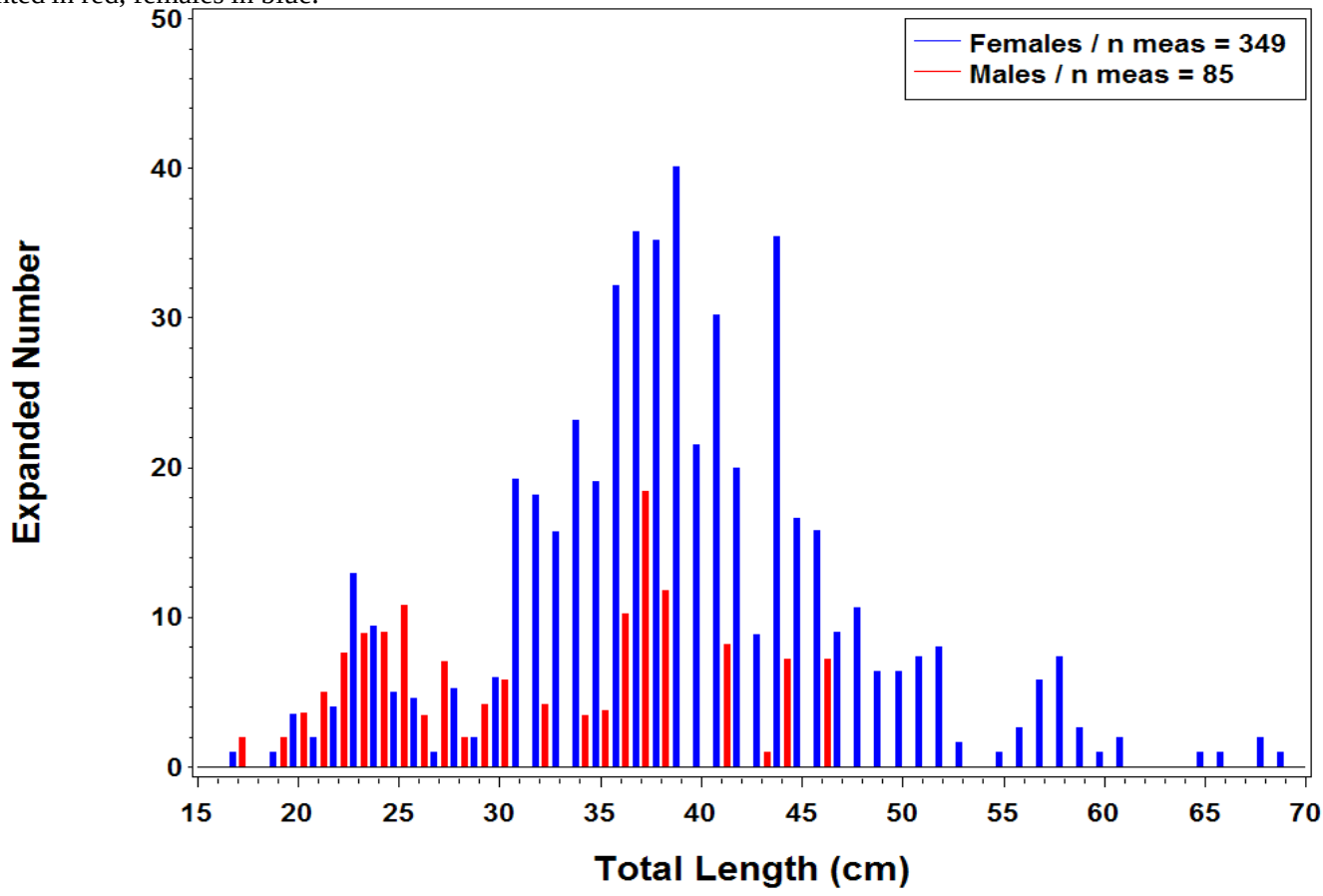
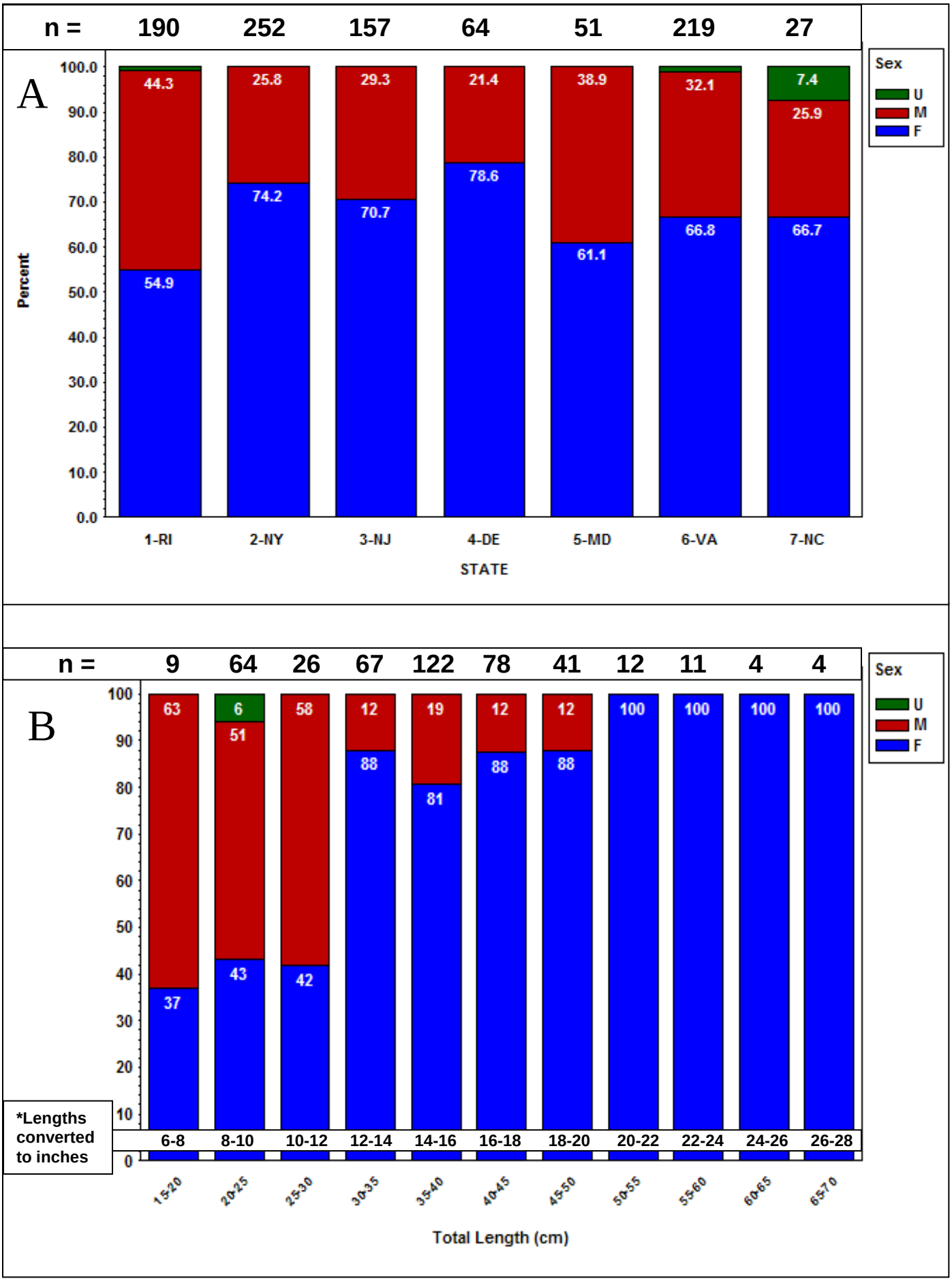


Figure 146. Sex ratios for summer flounder by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Weakfish (Priority A)

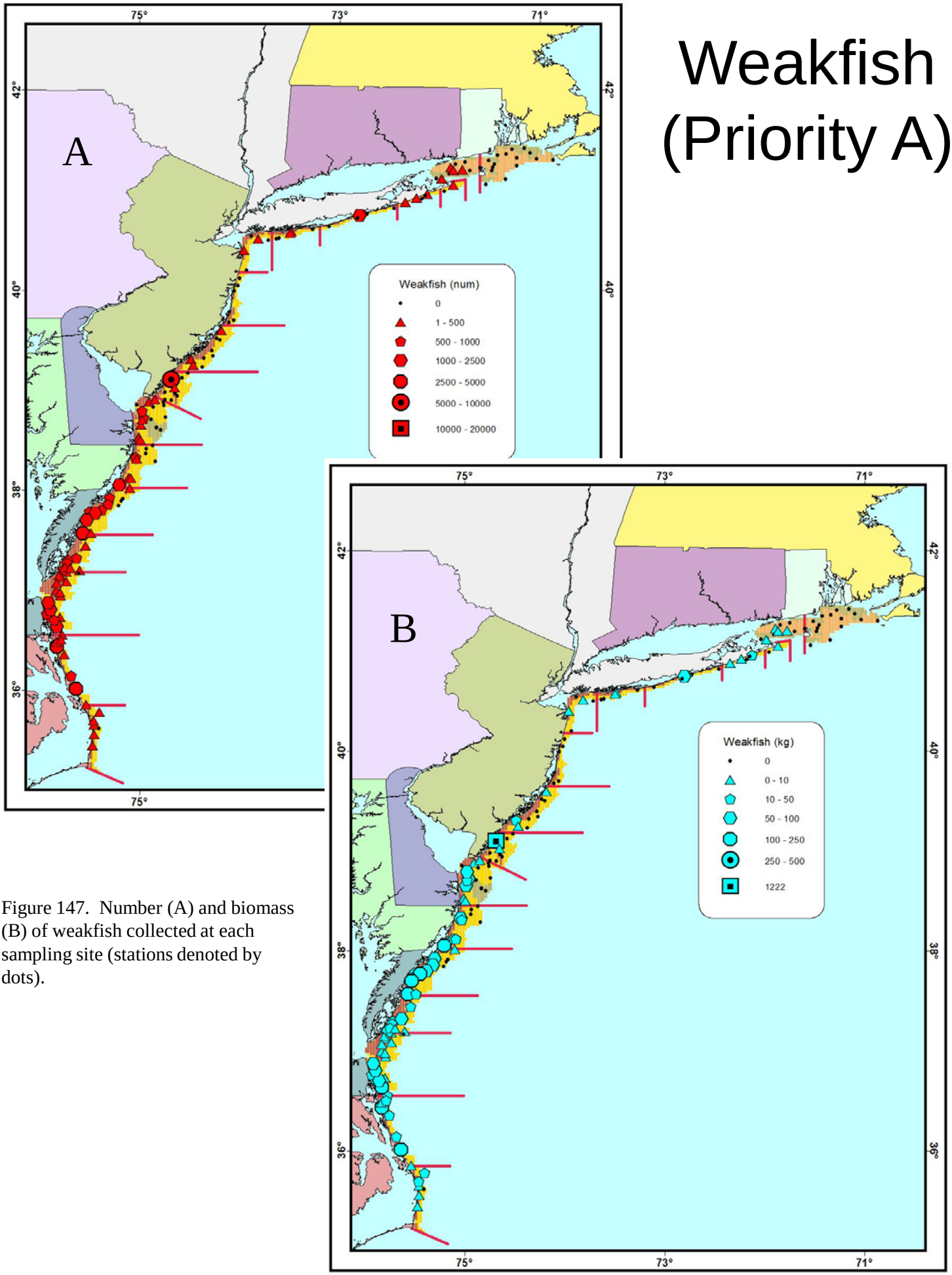


Figure 147. Number (A) and biomass (B) of weakfish collected at each sampling site (stations denoted by dots).

Table 41. For each state, the number of sites sampled and the number at which weakfish were collected. The number and biomass of weakfish caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum weakfish length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	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, for weakfish. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

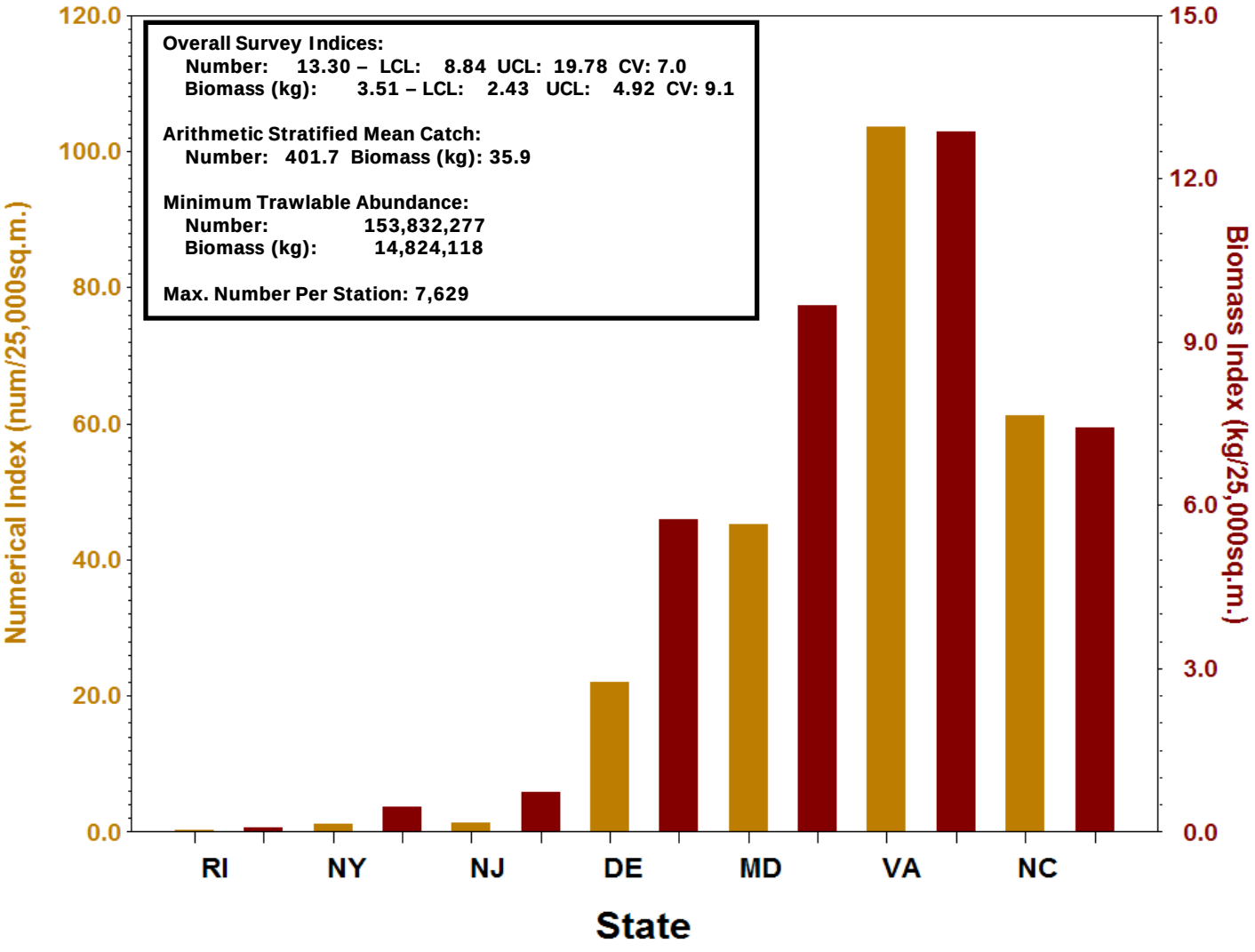


Figure 149. Length frequency histogram for weakfish. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

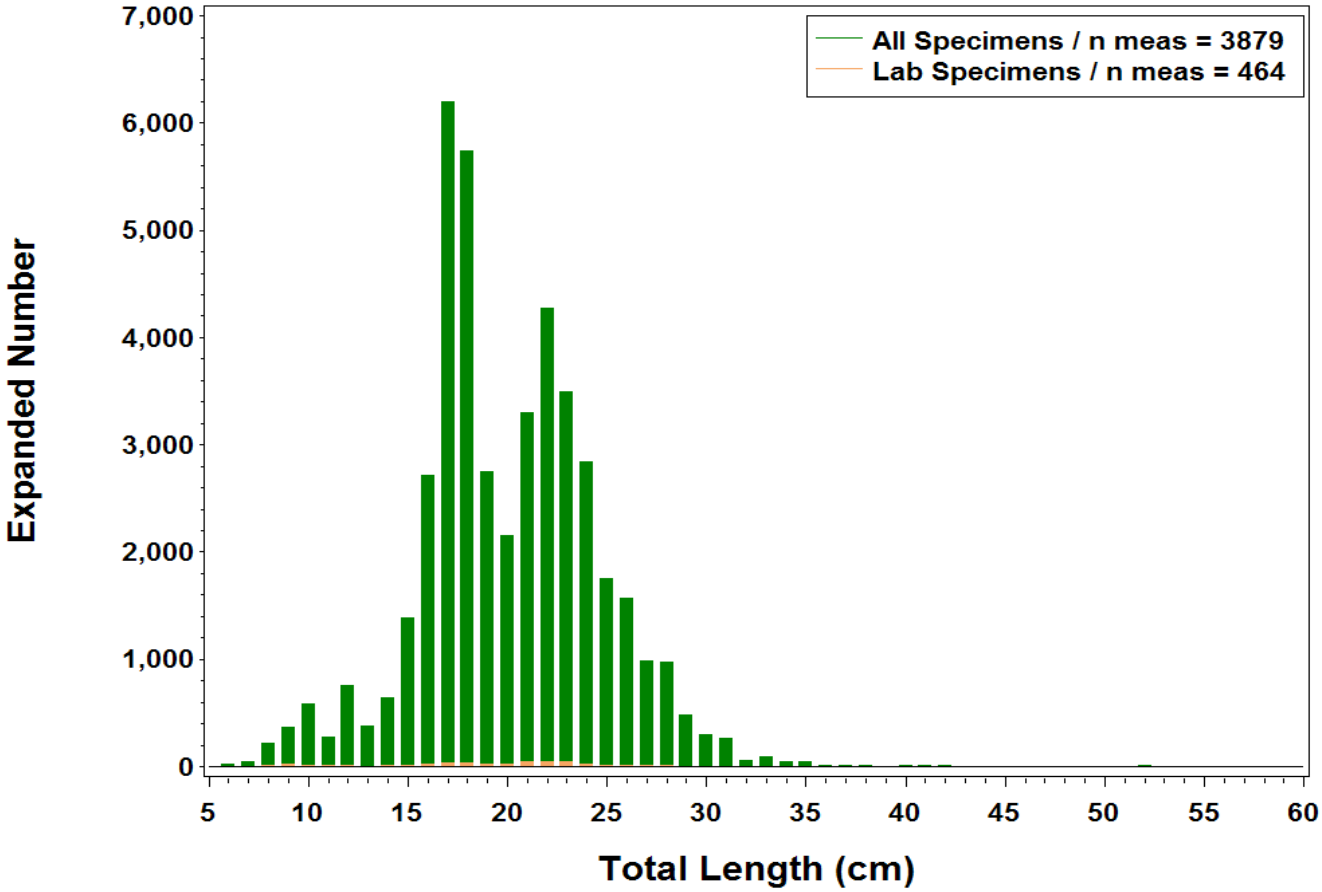


Figure 150. Sex-specific length frequency histogram for weakfish. Total length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

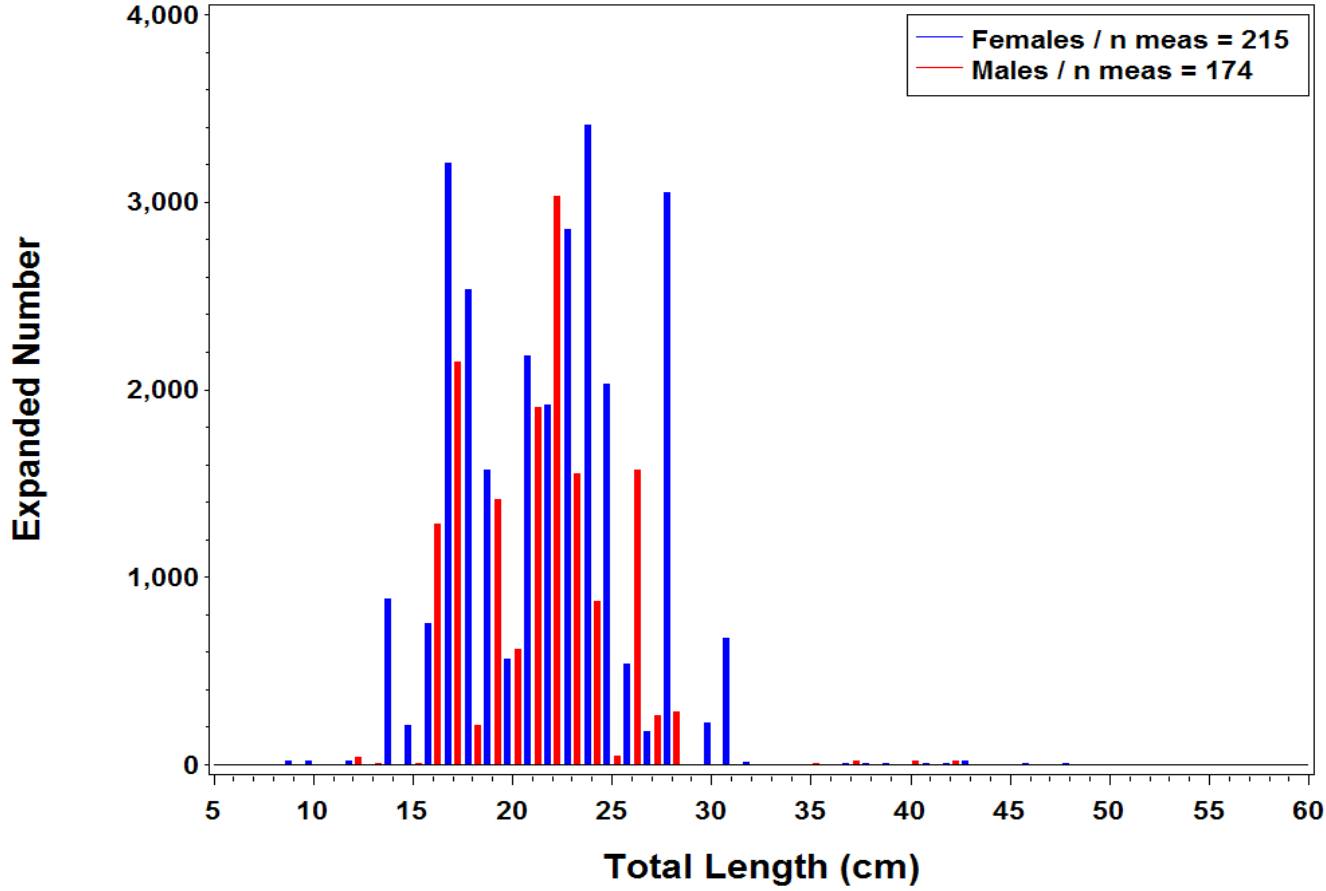
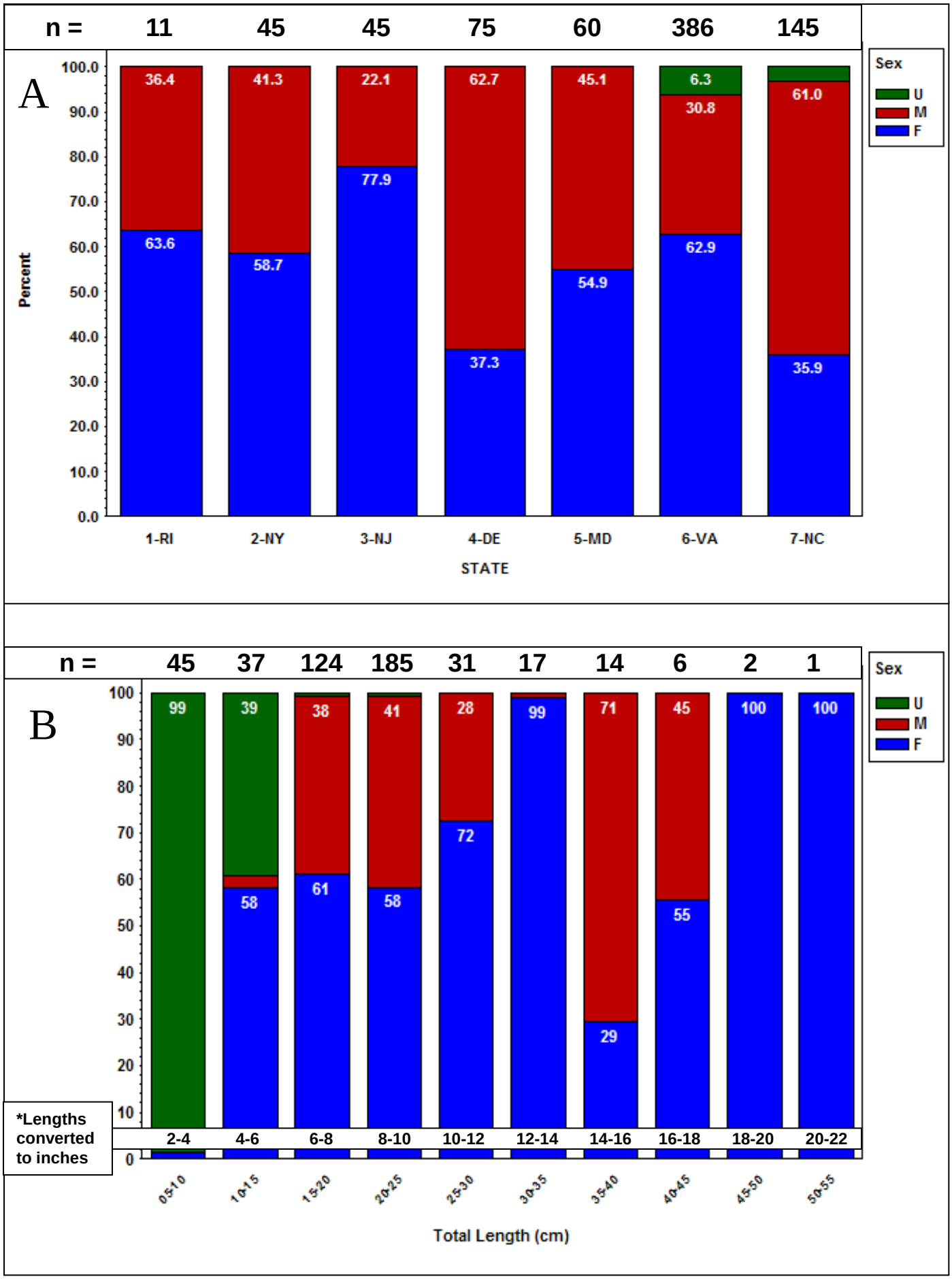


Figure 151. Sex ratios for weakfish by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



White Shrimp (Priority E)

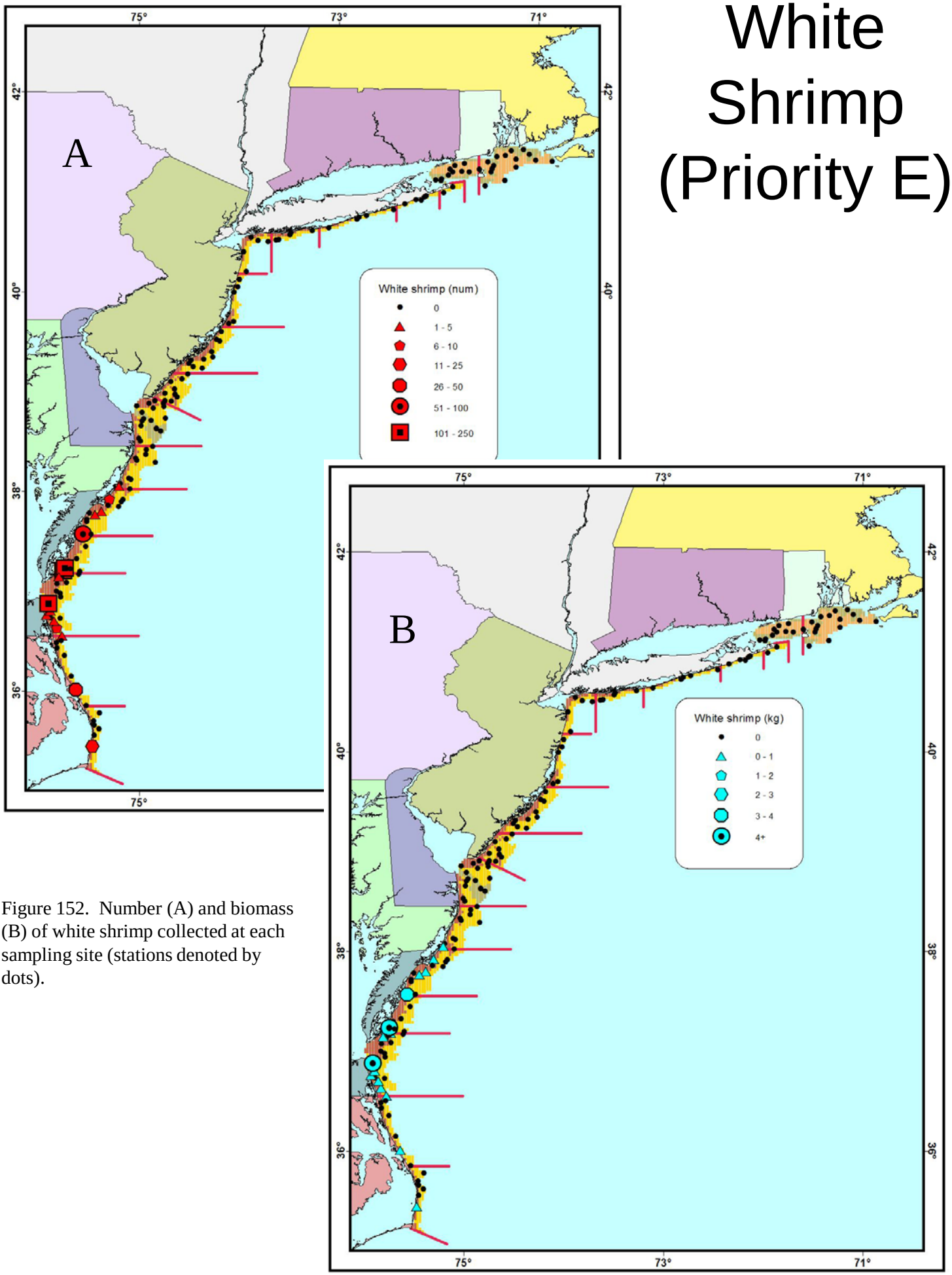


Figure 152. Number (A) and biomass (B) of white shrimp collected at each sampling site (stations denoted by dots).

Table 42. For each state, the number of sites sampled and the number at which white shrimp were collected. The number and biomass of shrimp caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum shrimp length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Diet/Age	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NY	22	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NJ	24	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
DE	17	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	1	2	0.060	0	2	148	188	168	0.030	0.12	0.01
VA	38	14	702	18.097	0	216	73	235	152	0.026	1.18	0.19
NC	13	2	49	1.591	0	49	135	209	163	0.032	0.70	0.10
Total	150	17	753	19.748	0	267	73	235	154	0.026	0.31	0.06

Figure 153. Geometric mean catch per area swept, by state, for white shrimp. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

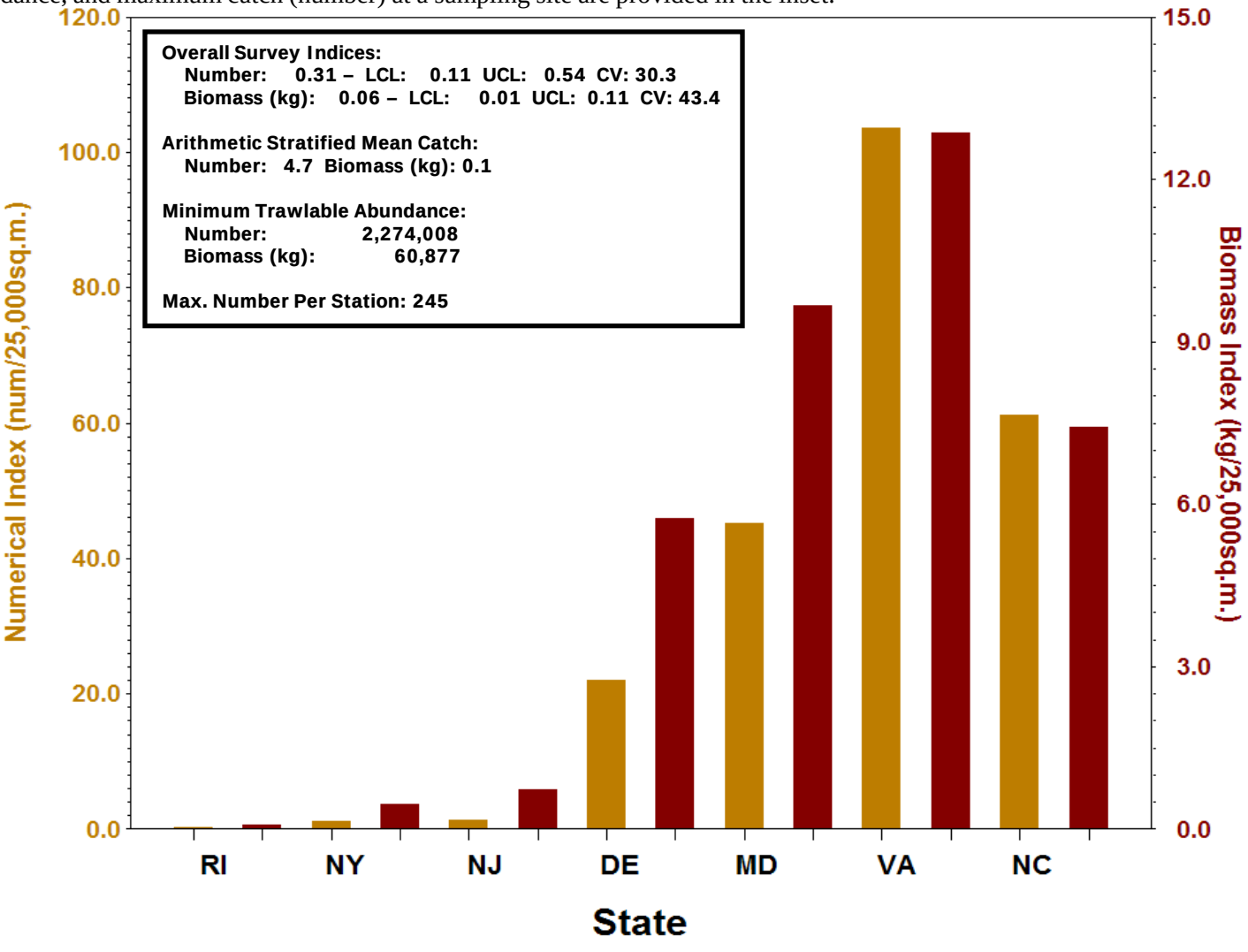
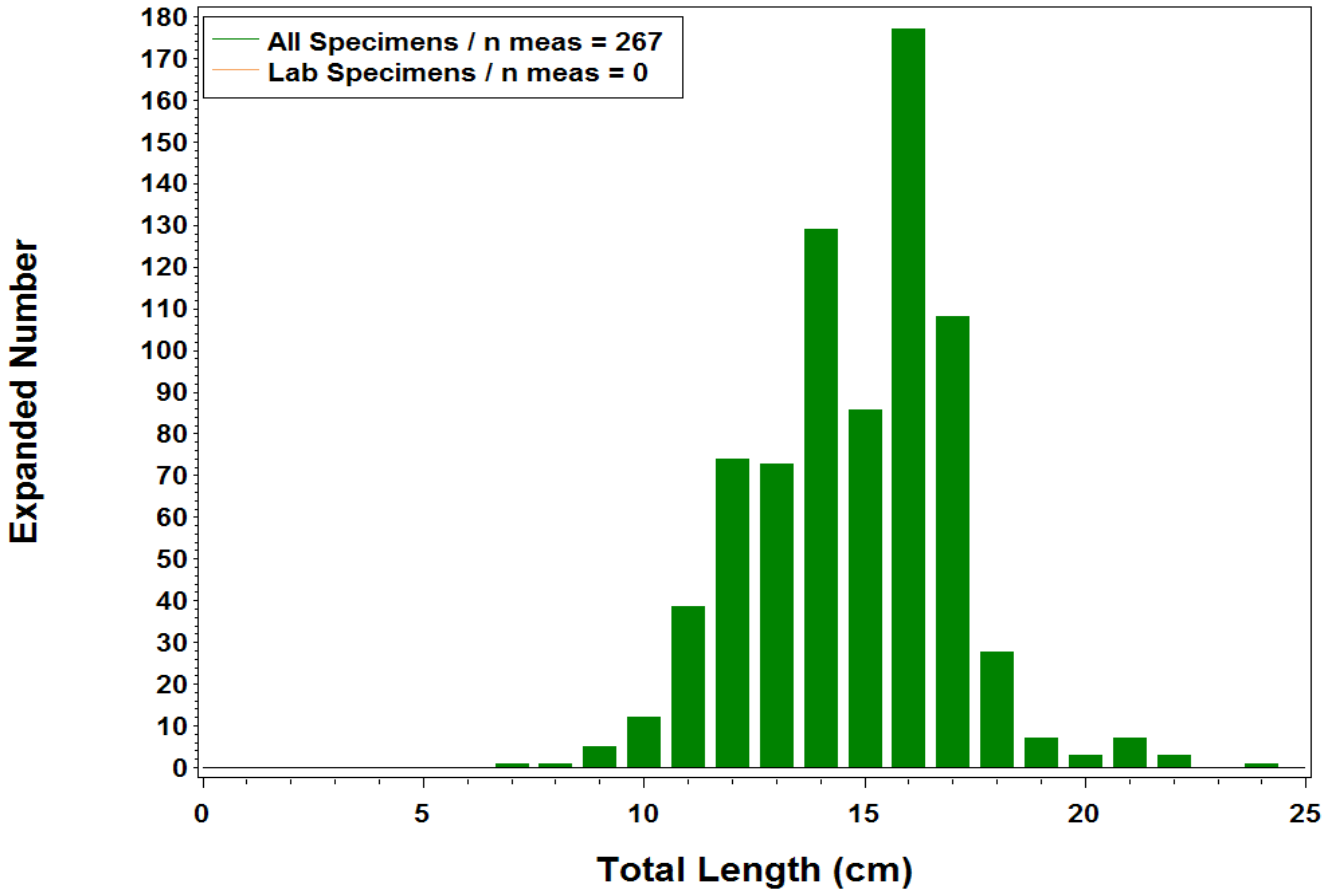


Figure 154. Length frequency histogram for white shrimp. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Windowpane Flounder (Priority D)

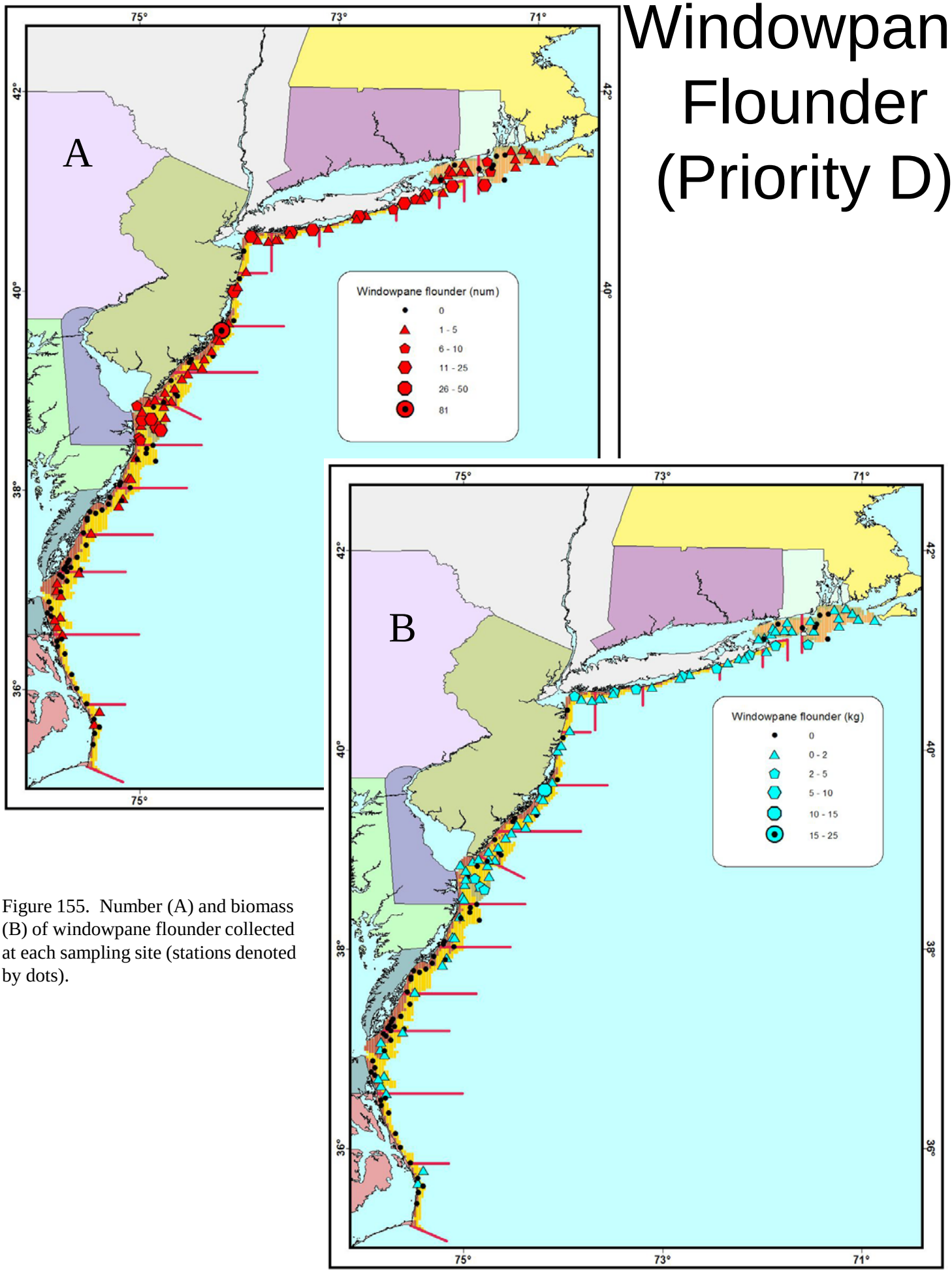


Figure 155. Number (A) and biomass (B) of windowpane flounder collected at each sampling site (stations denoted by dots).

Table 43. For each state, the number of sites sampled and the number at which windowpane flounder were collected. The number and biomass of flounder caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum flounder length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	Avg. Weight (kg)	Index (Number)	Index (Biomass)
RI	26	18	61	11.094	0	61	96	331	247	0.182	1.33	0.30
NY	22	21	170	34.259	0	170	105	334	238	0.202	4.07	1.05
NJ	24	16	117	18.188	0	52	172	335	231	0.155	1.19	0.31
DE	17	14	100	12.865	0	100	80	342	206	0.129	13.35	1.37
MD	10	3	8	0.990	0	8	129	254	205	0.124	0.43	0.09
VA	38	11	16	1.769	0	16	130	275	199	0.111	0.29	0.04
NC	13	2	3	0.218	0	3	170	197	182	0.073	0.15	0.02
Total	150	85	475	79.383	0	410	80	342	228	0.167	1.08	0.27

Figure 156. Geometric mean catch per area swept, by state, for windowpane flounder. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

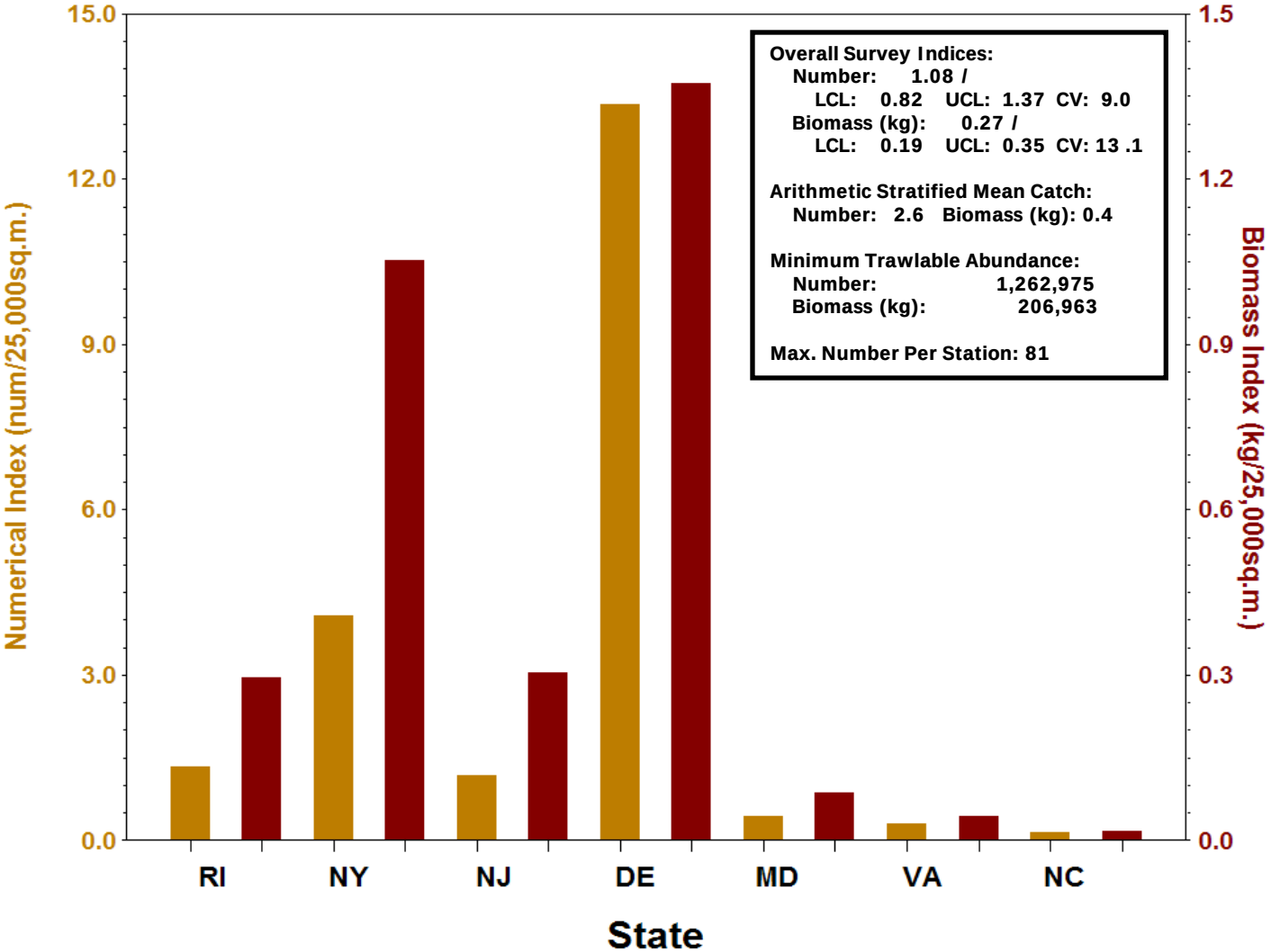
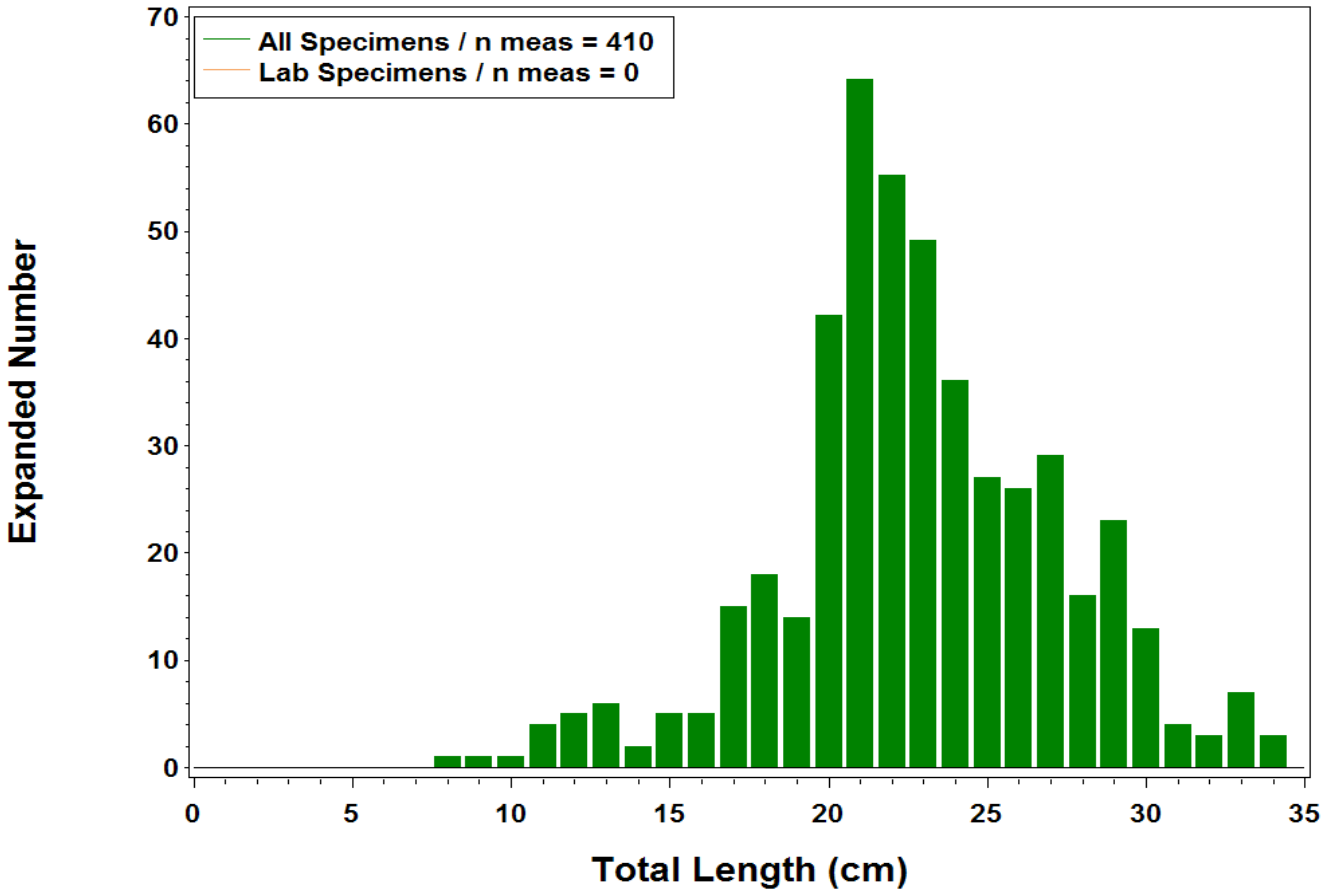


Figure 157. Length frequency histogram for windowpane flounder. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.



Winter Flounder (Priority A)

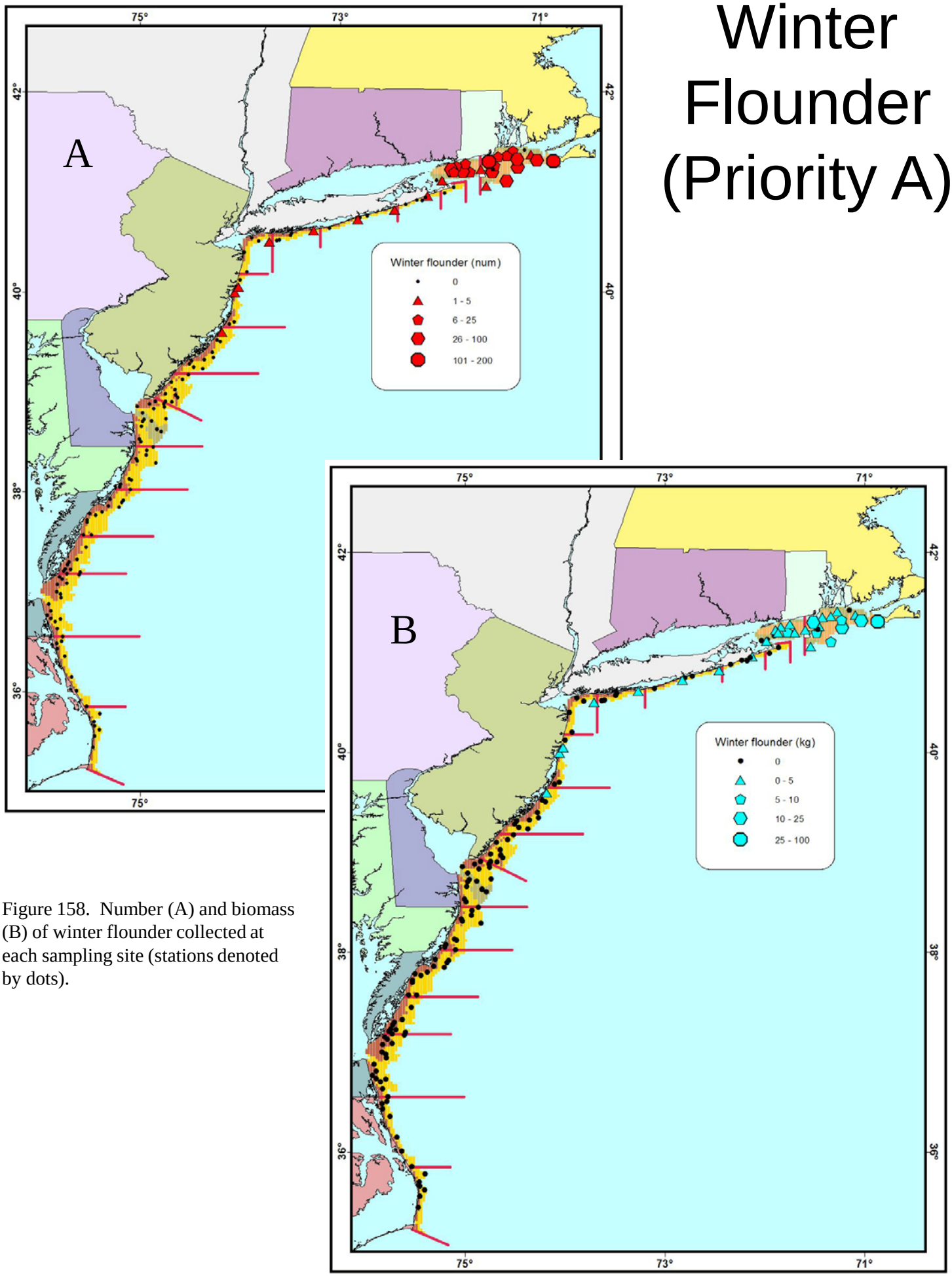


Figure 158. Number (A) and biomass (B) of winter flounder collected at each sampling site (stations denoted by dots).

Table 44. For each state, the number of sites sampled and the number at which winter flounder were collected. The number and biomass of flounder caught in each state, and the number taken for age/diet analysis and individual length measurements, are also given. Minimum and maximum flounder length, along with average length, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Length (mm TL)	Max. Length (mm TL)	Avg. Length (mm TL)	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	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NC	13	0	0	0	0	0	N/A	N/A	N/A	N/A	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, for winter flounder. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

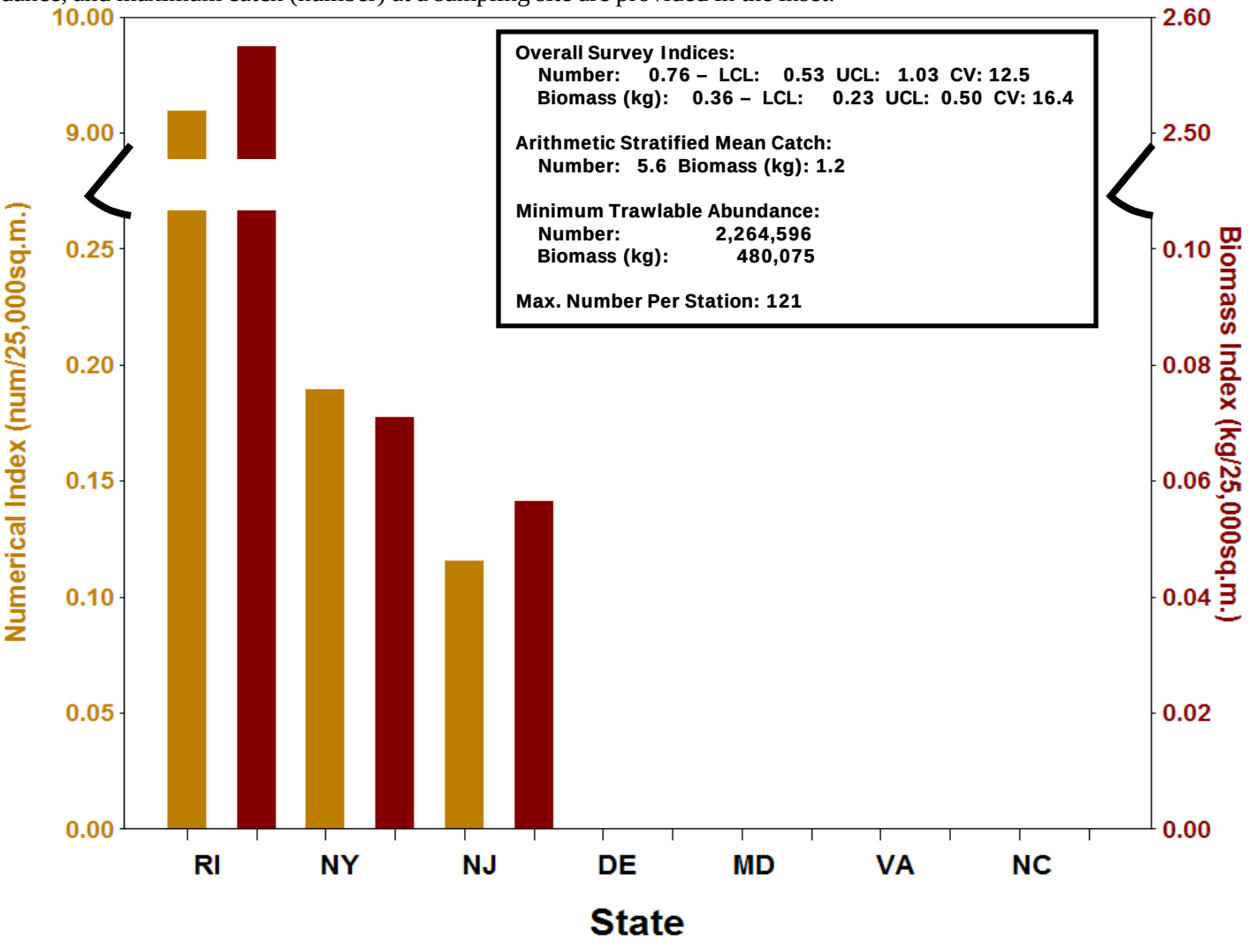


Figure 160. Length frequency histogram for winter flounder. Total length (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

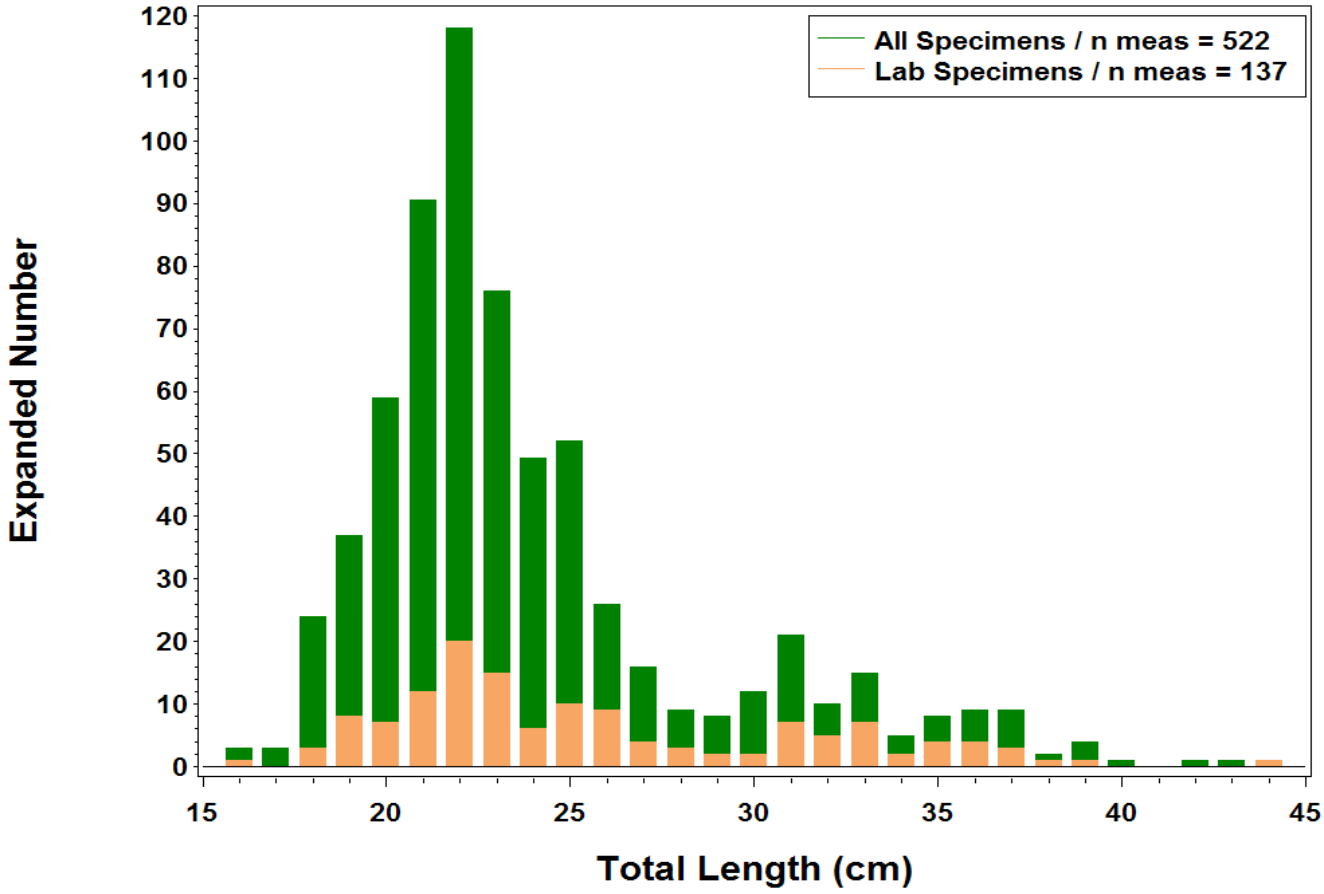


Figure 161. Sex-specific length frequency histogram for winter flounder. Total length (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

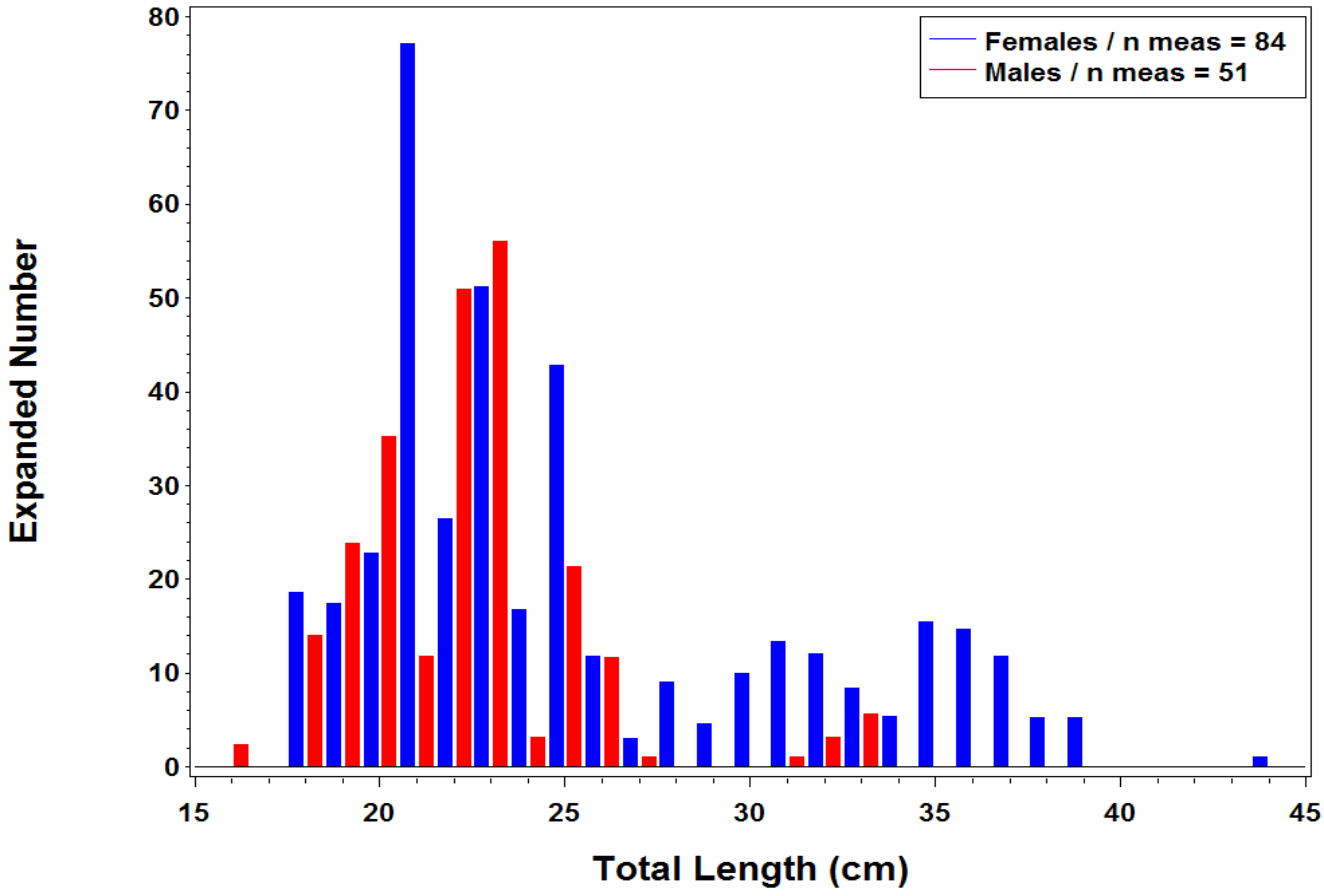
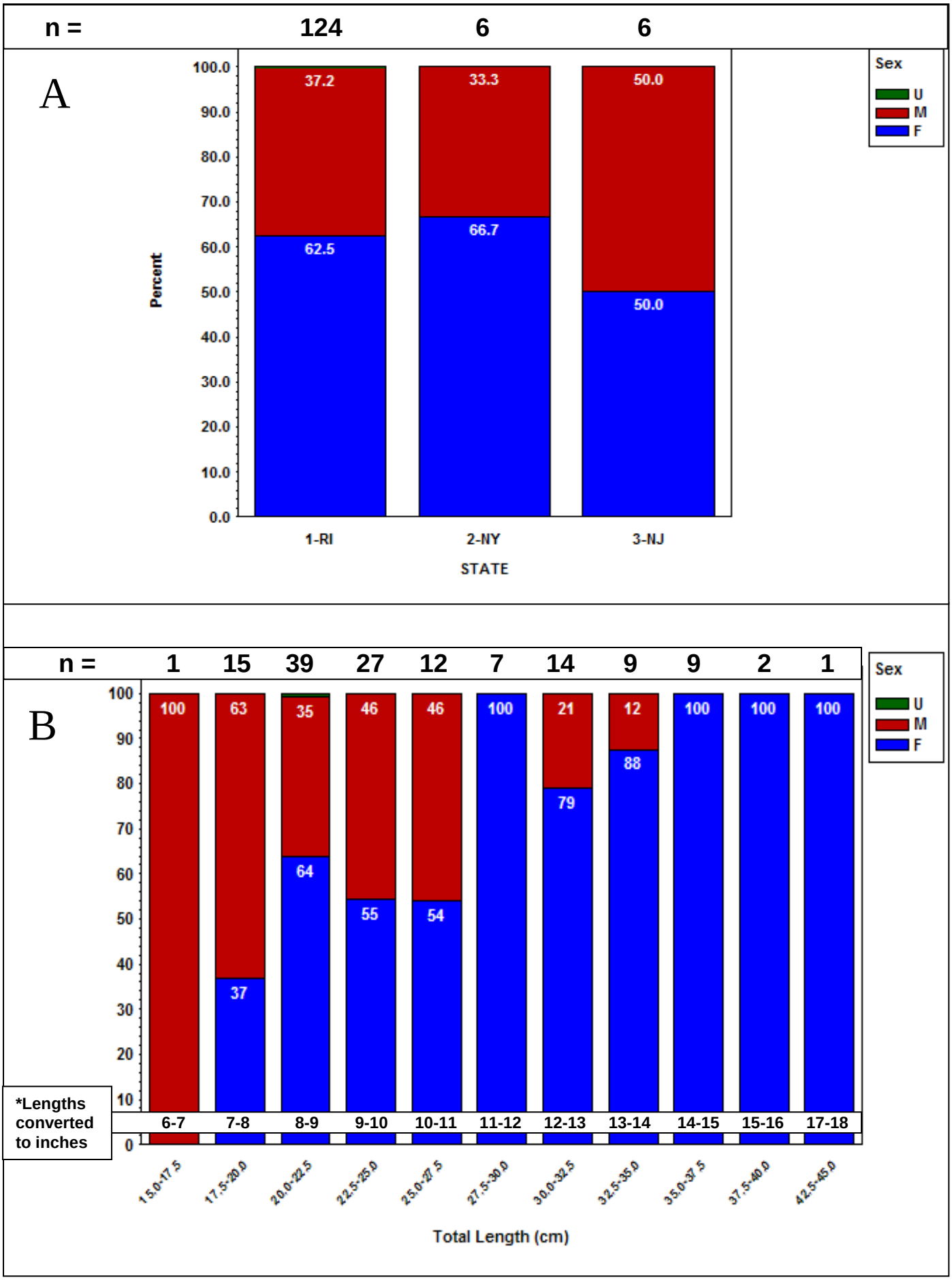
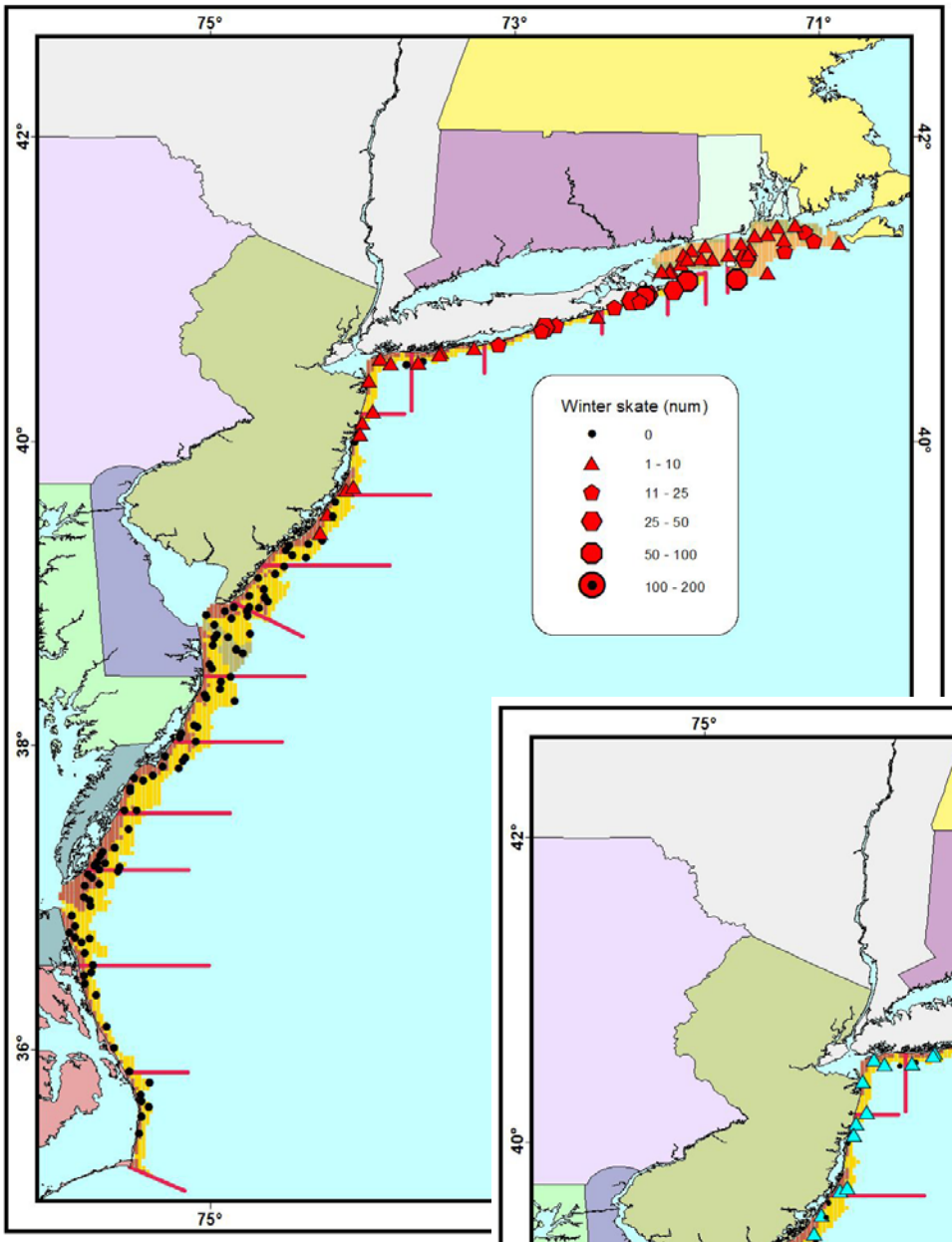


Figure 162. Sex ratios for winter flounder by state (A) and length group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.



Winter Skate (Priority B)



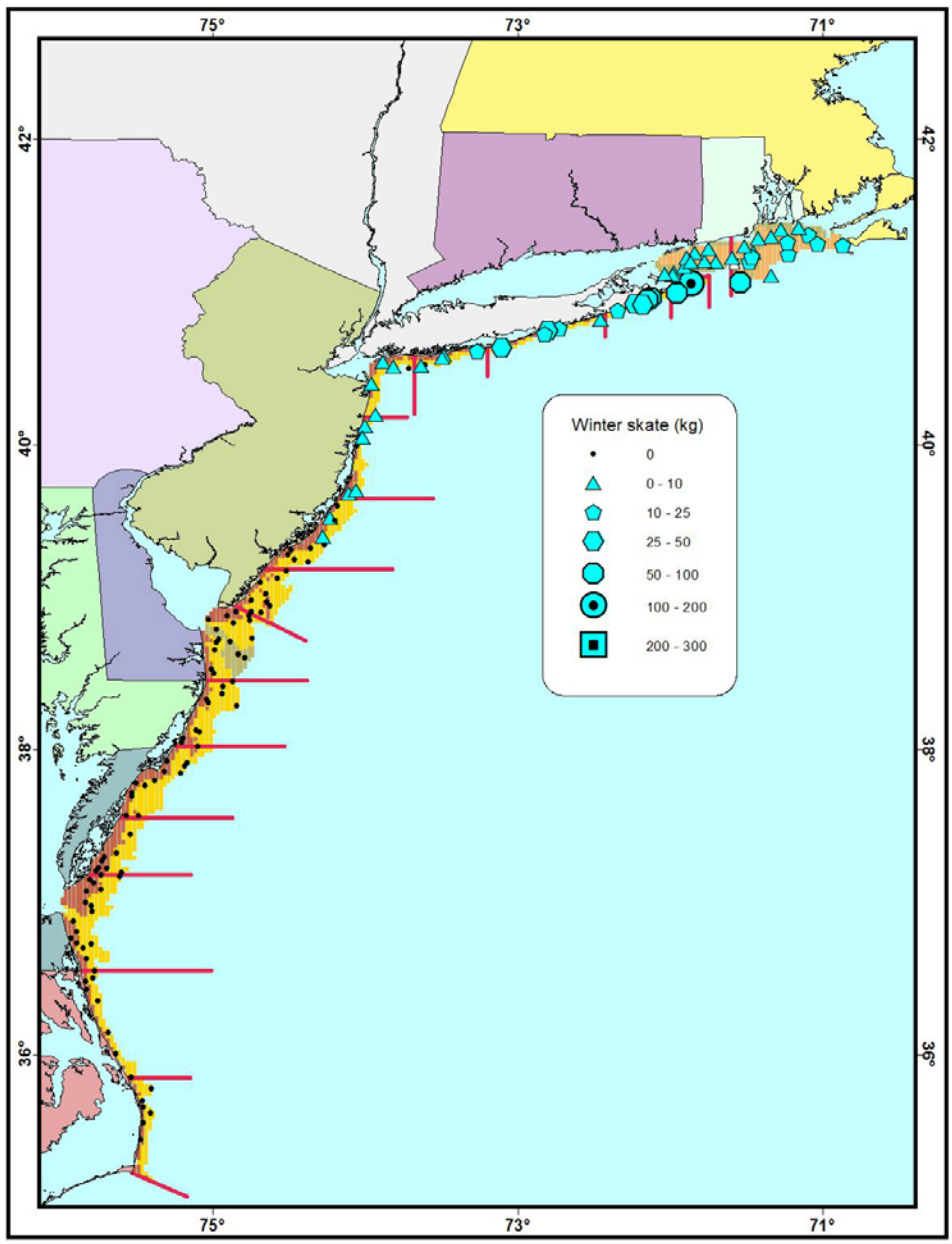


Figure 163. Number (A) and biomass (B) of winter skate collected at each sampling site (stations denoted by dots).

Table 45. For each state, the number of sites sampled and the number at which winter skate were collected. The number and biomass of skate caught in each state, and the number taken for age/diet analysis and individual width measurements, are also given. Minimum and maximum skate width, along with average width, weight, and geometric mean catch per area swept (index - number and biomass) are included for each state. Totals for each category are also provided.

State	Number of Stations	Stations Where Caught	Number Caught	Biomass Caught (kg)	Specimens for Age/Diet	Number Measured	Min. Width (mm DW)	Max. Width (mm DW)	Avg. Width (mm DW)	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	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
MD	10	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
VA	38	0	0	0	0	0	N/A	N/A	N/A	N/A	0.00	0.00
NC	13	0	0	0	0	0	N/A	N/A	N/A	N/A	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, for winter skate. Overall geometric mean catch per area swept (survey indices & associated measures of variability) along with arithmetic mean catch per area swept, minimum trawlable abundance, and maximum catch (number) at a sampling site are provided in the inset.

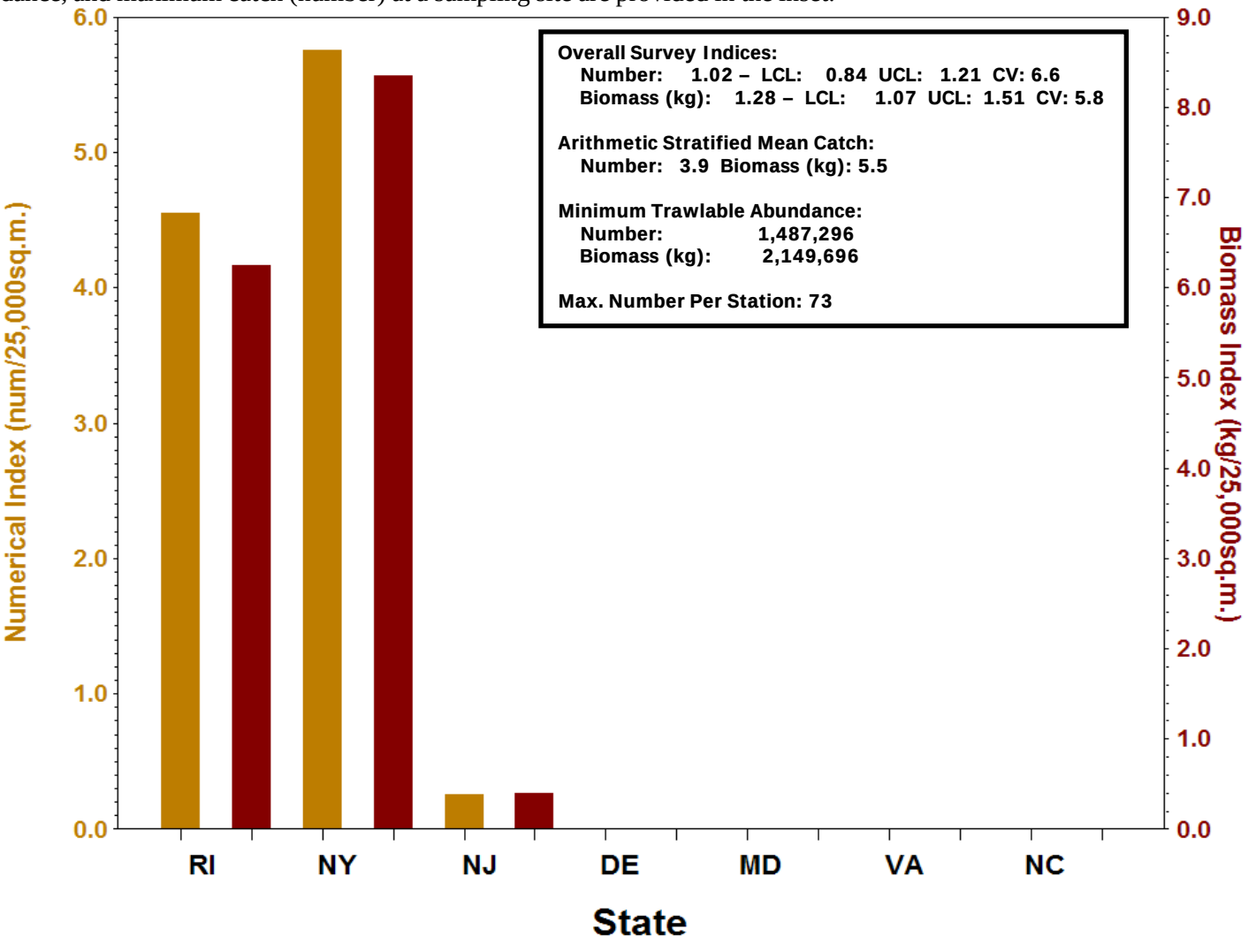


Figure 165. Width frequency histogram for winter skate. Disk width (cm) is given on the x-axis while the total number collected at each size during the fall 2008 cruise (expanded number) is given on the y-axis.

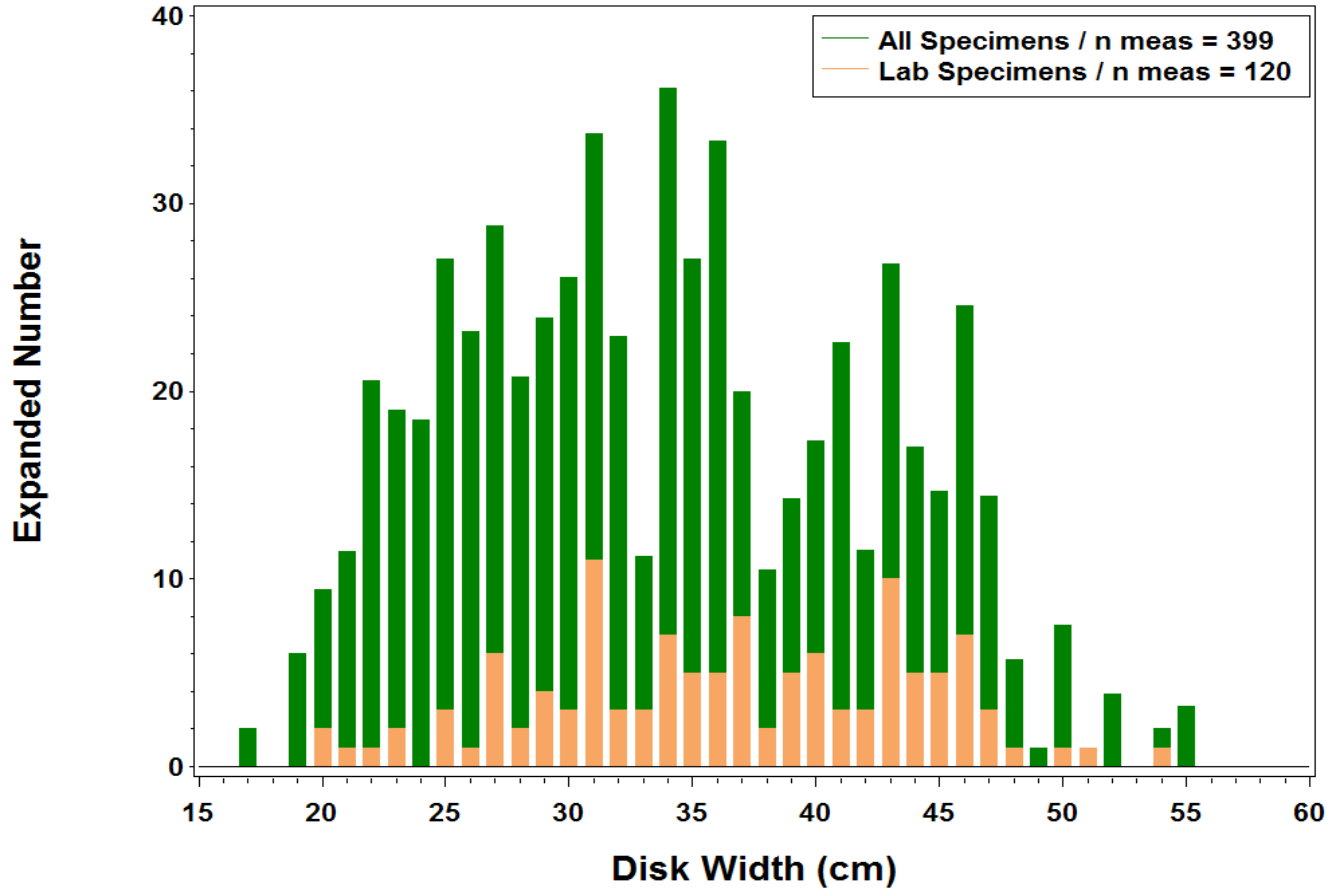


Figure 166. Sex-specific width frequency histogram for winter skate. Disk width (cm) is given on the x-axis while the total number collected at each size for each sex during the fall 2008 cruise (expanded number) is given on the y-axis. Males are represented in red, females in blue.

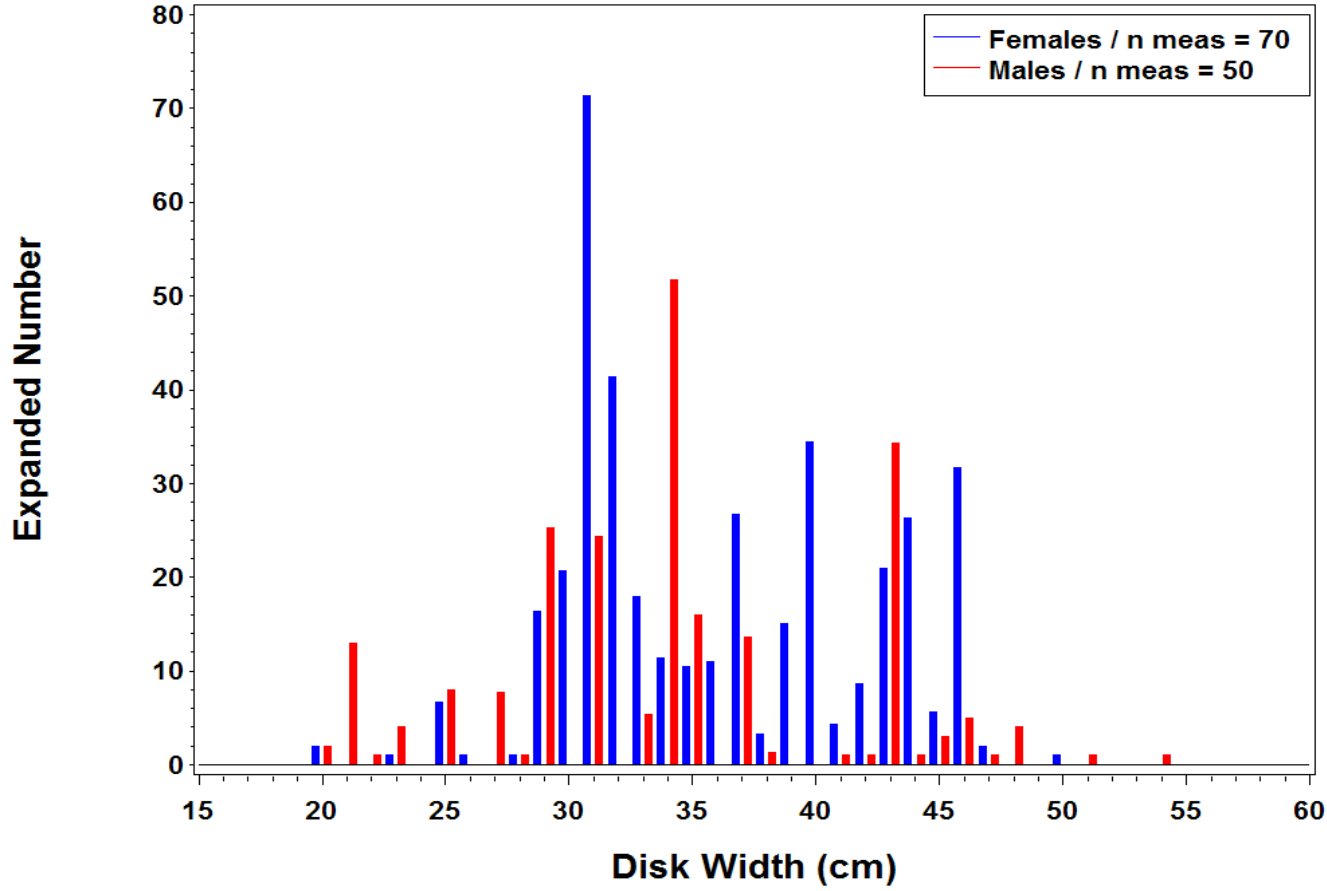


Figure 167. Sex ratios for winter skate by state (A) and width group (B). Sample sizes for each category are given above each bar; males are shown in red, females in blue, and unknown specimens in green.