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# Estimating Relative Juvenile Abundance of Ecologically Important Finfish and Invertebrates in the Virginia Portion of Chesapeake Bay(Project No. NA03NMF4570378) June 2003 – May 2004

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ANNUAL REPORT

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## TABLE OF CONTENTS

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## DISCLAIMER

Some of the results contained in this report have recently been completed and may contain some errors and/or need further refinement. In particular, information pertaining to gear conversions and the longer time series they provide (1955-2003) should be used with some caution until further evaluation.

## LIST OF TABLES

## LIST OF FIGURES

## EXECUTIVE SUMMARY

The fisheries trawl survey conducted by the Virginia Institute of Marine Science (VIMS) is the oldest continuing monitoring program (nearly 50 years) for marine and estuarine fishes in the United States. This survey provides a monthly baseline assessment of abundance of juvenile marine and estuarine fishes and invertebrates in the tidal and mainstem areas of the Chesapeake Bay. The survey provides crucial, real time data to various state, regional and national fisheries management agencies, including the Virginia Marine Resources Commission (VMRC), the Atlantic States Marine Fisheries Commission (ASMFC), the Mid-Atlantic Fisheries Management Council (MAFMC), and the National Marine Fisheries Service (NMFS). For example, the VIMS Trawl Survey provides the ASMFC with the only spot index available on the East Coast and was the cornerstone for the 2003 ASMFC Spot FMP. The MAFMC recognizes the VIMS Trawl Survey as the only available predictor of summer flounder recruitment.

In the Virginia portion of Chesapeake Bay, several annual indices of juvenile abundance have been generated from trawl survey data for species of key ecological, commercial and recreational importance (spot, Atlantic croaker, weakfish, summer flounder, black sea bass, striped bass, white and channel catfish, American eel, blue crab and bay anchovy) and four species of secondary importance (scup, white perch, northern puffer, and silver perch).

Four different estimates of relative abundance have been developed for juvenile finfish. The Bay and River index (BRI) are only for the historic fixed station transects of the tributaries and the Bay survey established in 1988. Two indices are presented, one from the tributaries only (RO; 1979 to present) and the other for both the Bay and rivers (BRI;1988 to present). The long time series have produced converted indices (random stratified converted index - RSCI) and unconverted indices (random stratified index - RSI) for the target species discussed.

In recent years, juvenile indices for most species have declined, most often a result of overfishing, degradation of their estuarine nursery habitats, and year class failure due to natural environmental variation. For example, spot RSCI indices have declined greatly over the past 49 years, with their 1955-1978 index twice the 1979-2003 index. Croaker show the greatest interannual variability of the key species discussed, with fluctuations weather related. The Fall 2003 croaker index was the highest on record for the survey, and was due to Hurricane *Isabel*, which struck Chesapeake Bay in September 2003. There was an increasing trend in weakfish converted indices since 1994, while summer flounder have remained low, most probably due to overfishing and year class failure, which were revealed in the very low 1987 trawl index. The black sea bass index had increased since 1997, but dropped in 2002 and has been highly variable over the duration of the survey. White catfish YOY and age 1+ indices increased slightly from 2002, as did the channel catfish YOY index, while the channel catfish age 1+ index decreased in 2003. Blue catfish indices have increased since 2001. Striped bass indices were very low during the 1970's and early 1980's, rebounded in the early 1990's and remained low since 2001. White perch YOY and Age 1+ indices increased in 2003. The scup index has been highly variable and increased in 2002. Since 1988, northern puffer indices experienced a rapid and continuous decline. The silver perch index has remained consistently low since 1972. Age 1+ and adult female blue crab indices exhibited significant or nearly significant declines. Both American eel and bay anchovy indices have decreased since the early 1980’s. The Chesapeake Bay is a major nursery area for many coastal migratory fish species and an integral part of multistate management efforts along the Atlantic Coast of the United States.

## INTRODUCTION

A key element in the management of the Atlantic States' coastal fishery resources is the use of juvenile abundance estimates of important finfish and invertebrate species. Relative interannual abundance estimates of early juvenile (age 0) fish and crustaceans (i.e.,blue crab) generated from scientific (fishery-independent) survey programs provide a reliable and early estimator of future year class strength (Goodyear, 1985; Lipcius and Van Engel, 1990), and to validate management regimes. The Chesapeake Bay Stock Assessment Committee (CBSAC), a federal/state committee sponsored and funded by the National Oceanic and Atmospheric Administration (NOAA) reviewed previously available indices of juvenile abundance for important fishery resource species in the Chesapeake Bay (hereafter referred to as “Bay”) and recommended that "a unified, consistent trawl program should be one of the primary monitoring tools for finfish and crab stock assessment" (Chesapeake Bay Program Stock Assessment Plan, Chesapeake Executive Council, 1988). Subsequently, CBSAC supported pilot studies directed at developing a comprehensive trawl survey for Chesapeake Bay. The primary focus of this support in the Virginia portion of the Bay was the initiation (1988) of a monthly trawl survey of the mainstem lower Bay. This effort complimented and expanded the monthly trawl surveys of the major Virginia tributaries (James, York and Rappahannock Rivers), which had been conducted by the Virginia Institute of Marine Science (VIMS) as part of a long-term monitoring effort to assess the condition of fishery stocks in the lower Chesapeake Bay and its tributaries.

The present sampling program, which includes the Bay and its tributaries, is vital in insuring that data are of sufficient geographic resolution for the generation of annual relative estimates of recruitment success of ecologically, commercially and recreationally important finfish and crustacean species. The National Marine Fisheries Service (NMFS) Marine

Recreational Fisheries Statistics Survey (MRFSS) 2003 survey for Virginia marine recreational catches were dominated by Atlantic croaker, summer flounder, spot, black sea bass, striped bass, kingfishes, weakfish, pigfish and bluefish (Anon., 2003; see Table 1). These are the top species landed by catch (90% of the total catch) and weight (88% of the total weight; Table 1). These species depend upon the lower Chesapeake Bay and its tributaries as a nursery area, with all but bluefish highly vulnerable to bottom trawls. In addition to the key species above, past survey results indicate other species of recreational interest, including scup, white perch, silver perch, and freshwater catfishes (white, channel and blue), are taken with sufficient regularity during trawling operations to provide datasets suitable for the generation of juvenile abundance indices. Although generation of annual juvenile (young-of-year or YOY) indices is the primary focus of this project, survey results can be used to address other aspects of finfish population biology, such as habitat utilization, early growth and survival, climate and pollutant interactions, or disease prevalence. For example, climate effects such as hurricanes may affect recruitment of shelf spawning species such as Atlantic croaker, spot and summer flounder, as documented by data collected in this study (Montane and Austin, unpublished). Additionally, a high level of hurricane activity is predicted for the Chesapeake Bay for the next 10-40 years (Goldenberg et al., 2001), likely impacting different species abundance and distribution, and consequently multispecies interactions.

The development of juvenile indices requires a continuous time series of data to determine the proper area-time sequences best used in index calculations. In 1991, provisional annual juvenile abundance indices were developed for spot, weakfish, Atlantic croaker, summer flounder, and black sea bass (Colvocoresses and Geer, 1991). In 1992, a provisional index was developed for scup (Colvocoresses et al., 1992), with white perch and striped bass estimates

developed the following year (Geer et al., 1994). Indices for white and channel catfish, silver perch, northern puffer, and tautog were examined as well (Geer and Austin, 1994). A time series back to 1955 with the use of gear conversions and post stratification methods has also been produced for all species, if appropriate (Geer and Austin, 1997).

Many species of interest are captured in significant numbers across several year classes. As a result, both YOY and age 1+ indices were created for white perch, white catfish, channel catfish, blue catfish and blue crabs. For Atlantic croaker, in addition to a Fall YOY index, a recruit or Spring index (returning YOY) was created.

## METHODS

Field Sampling

Sampling protocol is described in detail in Lowery et al., (2000). Briefly, the gear remains a lined 30' (9.14m) semi-balloon otter trawl, 1.5" (38.1mm) stretched mesh and 0.25" (6.35mm) cod liner, and is towed along the bottom for five minutes during daylight hours. Marinovich Net Company (Biloxi, MS) supplied trawl nets for the survey for over thirty years before going out of business. Trawl nets are now built to survey specifications by Glavan Trawl Manufacturing Company (also of Biloxi, MS).

Sampling in the Bay remains monthly except during January and March, when few target species are available. Sampling in the tributaries also remains monthly, with both the random stratified stations and the historical fixed mid-channel station transects continuing. The stratification system is based on depth and latitudinal regions in the Bay, or depth and longitudinal regions in the rivers. Each Bay region is 15 latitudinal miles and consists of six strata; western and eastern shore shallow (4-12 ft.), western and eastern shoal (12-30 ft.), central

plain (30- 42 ft.), and deep channel ($\geq$ 42 ft.)(Table 2). Each tributary is divided into four regions of approximately ten longitudinal miles, with four depth strata in each (4-12 ft., 12-30 ft., 30-42 ft., and $\geq$ 42 ft.) (Tables 3 - 5; Figure 1). Strata are collapsed in areas where certain depths are limited. The fixed stations have been assigned a stratum according to their location and depth.

Due to funding restrictions, the exploratory monitoring of secondary water systems (Pocomoke Sound, Mobjack Bay, Piankatank and Great Wicomico Rivers) which began in 1998, was discontinued in 2001. Each system was sampled quarterly, with a rotation to assure that over a three year period, each system would have sampling events during different times of the year. A random stratified design (RSD) similar to the primary survey was used. When compared to the mainstem Bay, James, York and Rappahannock Rivers, some of these systems have shown higher catch rates of species such as summer flounder, spot and silver perch (Geer and Austin, 2000).

With the exception of the fixed river stations, trawling sites within strata are selected randomly from the National Ocean Service's Chesapeake Bay bathymetric grid, a database containing depth records measured or calculated at 15 cartographic second intervals. Two to four trawling sites are randomly selected for each Bay strata per month, the number chosen varying seasonally according to observed changes in distribution, with sampling intensity being highest in the most heavily utilized strata. Exceptions include the shallow water strata where one to two stations have been occupied for each month's survey. For each river strata, one to two stations are selected per month. The number of potential sites for the RSD of the Bay and tributaries with the approximate areas of each strata, are shown in Tables 2 - 5. The RSD of the York River which began in June 1991, has been altered slightly to make depth strata similar to

the James, Rappahannock, and mainstem Bay. Earlier investigations (Geer et al., 1994) proposed that for the tributaries, all depths $\geq$ 30 ft. be included in one stratum, and this was modified in January 1996, to create depth strata of 30-42 ft. and $\geq$ 42 ft. (Geer and Austin, 1996a). Since these random stratified tributary data were considered conditional until all three tributaries were sampled (March 1996), previous samples were assigned to the appropriate strata established January 1996.

Earlier reports listed results dating back to only 1979 due to gear and sampling changes which made earlier data difficult to use in the present sampling format. With gear and vessel conversions now available for most target species, a standard measure of relative abundance can be calculated for the pre-1979 data. Survey stations before 1979 have also been post-stratified to the present sampling scheme. Although the stratification of the mainstem Bay has not changed, that of the initial random stratified surveys of the rivers has.

The fixed channel sites on the tributaries are spaced at approximately 5 mile intervals from the river mouths up to nearly the freshwater interface in each system. The fixed stations have been sampled monthly nearly continuously since 1980. From the mid-1950's (York River) and early-1960's (James and Rappahannock Rivers) to 1972, the fixed stations were sampled monthly using an unlined 30' trawl (Gear U_N_3B_SW, gear code 010). During 1973-79, semi-annual random stratified sampling was performed by the VIMS Ichthyology Department while the VIMS Crustaceology Department continued monitoring the fixed tributary stations on a limited monthly basis (May - November). Areal weightings for the tributaries have been previously assigned by dividing each river into two approximately equal length "strata" and assuming that the stations in each strata are representative of the channel areas in those reaches (Table 6; see also Lowery and Geer, 2000). With all three tributaries now being sampled with a

random stratified design, the fixed stations have been assigned to a stratum based on location and depth. The present tributary survey (combining fixed and random stations) provides larger spatial coverage, a long-term historical reference, and is more statistically sound.

Beginning May 1998, data were collected on habitat or substrate type (Table 7). Fish distribution and abundance may be influenced by various substrates such as shell, sponge, hydroids, and sea squirts. Three dimensional structure may be used by different species for spawning, shelter, or feeding. Categories of substrates are measured at each trawling site based upon the quantity (volume in a standard container) observed in the net. Maps of substrate distribution can be developed and compared to catch rates and fish species distribution. Ctenophore volumetric measurements are also collected for each trawl station.

Gear Calibration Studies

Gear calibration analyses were completed and methods and statistical analyses applied are explained in detail by Hata (1997). Conversion values were applied to the historical data sets providing a converted catch for each observation, in most cases extending the individual species time series back to 1955.

Juvenile Index Computations

Many key target species of this study are migratory and abundance measurement presents special difficulties, particularly if the timing and duration of migration is not constant from year to year. Juvenile fishes which use estuarine nursery areas are especially vulnerable to the vagaries of climate, as many rely upon climatically dependent wind driven and tidal circulation patterns for semi-passive transport into the estuaries as larvae and early juveniles (Norcross,

1983; Bodolus, 1994; Wood, 2000) and later key their outward migration from the nursery areas on annually variable environmental cues (e.g. temperature changes). Ideally the abundance of a juvenile marine species population should be measured at that point when it is most fully recruited to the nursery area being monitored. However, in practice, this can only be accomplished if the time of maximal abundance and size of recruitment to the gear can be predicted (and surveys timed accordingly), or if surveys can be conducted on such an intense periodicity over the season of potential maximal abundance as to be certain of reasonable temporal coincidence. Neither of these two approaches is practical for this survey. The period of recruitable maximal abundance and the scope of the area being surveyed has proven to be variable between years and species. This, coupled with multi-specific monitoring objectives precludes temporally intense surveys in the face of finite resources. The multispecies nature of this program, also makes survey timing difficult to adjust in order to maximize the usefulness of the data to include all species. Consequently, the survey continues to be conducted on a regular periodicity and juvenile indices constructed as best possible.

Juvenile index calculation uses the following approach. A standard monthly cutoff value is applied to the length frequency information collected for each target species to separate the data into either young-of-year or older components. Cutoff values vary among months for each species and are based on modal analyses of historical composite monthly length frequency data and reviews of ageing studies for each species (Colvocoresses and Geer, 1991). For the earlier months of the biological year, cutoff values are usually arbitrary and fall between completely discrete modal size ranges. In the latter part of the biological year, when early spawned, rapidly growing individuals of the most recent year class may overtake late spawned, and slowly growing individuals of the previous year class, cutoff values are selected to preserve the correct

numeric proportionality between year classes despite the misclassification of individuals (Table 8). The extent of the zone of overlapping lengths and the proportion within that range attributable to each year class is estimated based on the shapes of each modal curve during the months prior to the occurrence of overlap. A length value is then selected from within that range which will result in the appropriate proportional separation. Although this process involves considerable subjectivity and ignores possible interannual variability in average growth rates, the likelihood of significant error is small, since only a very small fraction of the total number of young-of-year individuals fall within the zone of overlap and most of the data used to construct juvenile indices is drawn from months when no overlap is present. Furthermore, any error should be constant from year to year. Fish length was recorded as total length (TL), fork length (FL) or total length centerline (TLC) depending on species meristics.

After partitioning out non young-of-year individuals, monthly catch rates of target species are map-plotted and strata-specific abundances and occurrence rates calculated. Numbers of individuals caught are logarithmetically transformed (ln(n+1)) prior to abundance calculations, since the log transform best normalizes collection data for contiguously distributed organisms such as fishes (Taylor, 1953) and has been verified as the best suited transformation for Chesapeake Bay trawl collections (Chittenden, 1991). Resultant average catch rates (and the 95% confidence intervals as estimated by $\pm$ 2 standard errors) are then back-transformed to the geometric means. Coefficient of variation is expressed as the log transformed mean catch, $EY_{st}$ divided by the standard deviation, $EY_{st}$ / STD (Cochran, 1977). Plots and data matrices are then examined for area-time combinations which provide the best basis for juvenile index calculations. Criteria applied during the selection process include identification of maximal abundance levels, uniformity of distribution, minimization of overall variance, and avoidance of

periods in which distribution patterns indicate migratory behavior is occurring. Although identification of areas most suitable for index calculations (primary nursery zones) is generally clear, selection of appropriate time windows is more complex. Surveys are timed on regular monthly intervals which may or may not coincide with periods of maximal recruitment to the nursery areas. The use of a single (maximal) month's survey results is inappropriate, since using a very limited portion of the overall dataset would decrease sample size, increase confidence intervals, and increase the risk of sampling artifacts. Conversely, the temporal series of data incorporated into index calculations should not be longer than necessary to capture the period of maximal juvenile utilization of the nursery area, since indices calculated over longer time periods risk confounding temporal persistence on the nursery area with maximal utilization levels. With this approach, we can identify three or four month periods which provide realistic abundance data for the species examined (Table 8).

After area-time combinations are selected, annual juvenile indices are calculated as weighted geometric mean catch per tow. Strata-specific means and variances are calculated and then combined and weighed by stratum areas (Cochran, 1977). Since stratum areas are quite variable, a weighted mean provides an index that more closely mirrors actual population sizes.

The following indices are produced for each species, if appropriate: the original index based on the present Bay strata and the fixed mid-channel tributary stations (Bay & River Index - BRI and River Only - RO, 1979 to present); a post-stratified gear and/or vessel converted index using all spatially appropriate data (Random Stratified Converted Index - RSCI, 1955 to present); and an unconverted post-stratified index, also based on all spatially appropriate data (Random Stratified Index - RSI, 1955 to present). These multiple indices are presented for completeness, but only the RSCI and the Original Index (BRI and/or RO) will be described in detail in this

report. Results from the longer time series must be considered provisional, since concerns about missing data and conversion factors are continually being addressed. Index regressions are presented to exhibit trends over time, though fishery dependent time series data are often autocorrelated.

The advent of Hurricane *Isabel* in September 2003 has led to investigation into whether *Isabel* and other similar hurricanes in the past have affected recruitment of certain species (especially the shelf spawners, i.e., Atlantic croaker, spot and summer flounder) into the Chesapeake Bay.

## RESULTS

Our objective was to develop and produce timely annual estimates of recruitment success for important finfish and invertebrate species for the major Virginia nursery areas of Chesapeake Bay. A summary of samples collected from 1955 through May 2004 (Table 9) gives a brief synopsis of the sampling conducted since the start of the survey. For the 2003-2004 project year (June through May), 1224 stations were sampled, resulting in approximately 619,000 fishes and invertebrates identified and enumerated from 114 species collected (Table 10). The overall catch was dominated by bay anchovy and Atlantic croaker (Table 10).

Indices were calculated and described for species such as: spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), weakfish (*Cynoscion regalis*), summer flounder (*Paralichthys dentatus*), black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), striped bass (*Morone saxatilis*), white perch (*Morone americana*), white catfish *(Ictalurus catus),* channel catfish *(I. punctatus),* blue catfish (*Ictalurus furcatus*)**,** Northern puffer *(Sphoeroides maculatus),* silver perch *(Bairdiella chrysoura),* blue crab (*Callinectes sapidus*), American eel (*Anguilla rostrata*) and bay anchovy (*Anchoa mitchelli*). Detailed analyses and spatial distribution plots follow**.** VIMS Trawl Survey indices are also available on the survey website at http://www.fisheries.vims.edu/trawlseine/mainpage.htm.

**Spot** (*Leiostomus xanthurus*) - Spot has often been the most abundant of the recreational species caught by the survey, however in recent years their numbers have declined. Their distribution is wide and consistent throughout the sampling area (Figure 4, bottom). Juveniles first recruit to the gear in April and their abundance remains consistently high until December, peaking between July and October. The RSCI (1955-2003), BRI (1988-2003) and RO (1979-2003) for spot all showed significant decreases ($r^2 = 0.12$, $P = 0.014$, $r^2 = 0.53$, $P = 0.001$, and $r^2$

= 0.31, P = 0.004 respectively; see Table 11 and Figure 4). While the longer time series have shown great fluctuations, all indices show a dramatic and consistent decline from 1992 to the present (Figure 4). Initial investigation into effects of hurricanes on spot recruitment show that increased hurricane activity may have an inverse relationship to recruitment of spot to the Chesapeake Bay (Montane, unpublished).

**Atlantic Croaker** (*Micropogonias undulatus*). Croaker display high abundance in the survey catches but present a complex pattern of recruitment and distribution (Figure 5, top and bottom). Spawning takes place over a more protracted period than other species considered, and small early juveniles (<30 mm TL) can be present in catches year-round (Norcross, 1983; Colvocoresses and Geer, 1991; Colvocoresses et al., 1992; Geer et al., 1994; 1995; Land et al., 1995). During some years, peak abundance occurs in the fall with croaker less than 100 mm TL, but in other years the peak occurs the following spring and includes croaker either overwintering or recruiting from offshore waters. To separate these size cohorts, two estimates are generated: a juvenile Fall (Oct. - Dec.) index based just on the tributaries; and a Spring recruit (May - Aug.) index (Bay and tributaries combined).

Successful spawning events are evident from the very successful year classes in the fall of 1984, 1985, 1989 and 2003 (Table 12, Figure 5). However, these successful spawning events often did not result in comparably successful recruitment the following spring (Table 13 and Figure 8). There was no significant relationship between the fall YOY and spring recruit indices.

The Fall YOY RSCI (1956-2003) and RO (1979-2003) and Spring Recruit RSCI (1955-2003), BRI (1988-2003) and RO (1979-2003) for croaker were analyzed for annual trends. Only the Fall YOY RSCI (1956-2003) showed significant increases ($r^2$ = 0.15, P = 0.006; see Table 12 and Figure 5). For the Fall YOY indices, major peaks occurred in 1984, 1985, 1989 and 2003,

with minor peaks evident during 1996 and 1998 (Figure 5). This spike in the Fall 2003 YOY croaker index was caused by Hurricane *Isabel* which struck Chesapeake Bay from 18-19 September, and produced prolonged onshore winds for many days prior (NOAA, 2003). The 2003 croaker year class was influenced by both an early wind shift, which would have caused the croaker to spawn closer to Chesapeake Bay (this mechanism has been described previously by Norcross, 1983), as well as the favorable winds which resulted in a banner recruitment in 2003. The 2003 fall croaker index was 15 times greater than the 2002 index. A comparison of monthly size frequencies from August through December 2002 and 2003 reveals the enormous increase of YOY croaker less than 50 mm TL present in October 2003 compared to the same month a year before (Figure 6). There is also a notable difference between the abundance and distribution of croaker which were collected during Fall 2002 and Fall 2003 (Figure 7).

The Spring Recruit RO index has been extremely variable since 1979 (Figure 8, Table 13) with major peaks in 1991, 1993, and a minor peak in 1997. The 2002 Spring Recruit RO index was three times greater than 2001. The Spring Recruit RO index has been extremely variable since 1979 (Figure 8) with major peaks in 1983, 1991, and 1993 and minor peak in 1997. The 2003 Spring Recruit RO index was similar to the 1996 index.

**Weakfish** (*Cynoscion regalis*) - Weakfish are less abundant than spot and croaker, but are still one of the dominant species in the survey, and are found throughout the Bay and tributaries, though in 2003 were rare in the upper portion of the James River (Figure 9, bottom). Juveniles have occasionally first occurred in catches as early as late May and June, with June taken as the beginning of the biological year, but most new recruitment to the nursery areas occurs July, August and September. Weakfish indices have been highly variable, with a slight increasing trend from 1994 to the present in the RSCI index (Figure 9, Table 14). The most

striking observation of the weakfish time series is the poor recruitment between 1972 and 1977 (which were years of high precipitation in Chesapeake Bay), though before and after this period, there was successful recruitment (1970 and 1978; Figure 9, Table 14).

**Summer Flounder** (*Paralichthys dentatus*) – Summer flounder spawn during the offshore migration from late summer to midwinter (September through January) on the continental shelf with the peak occurring in October and November (Murdy et al., 1997; Able and Fahay, 1998). Peak larval abundance on the continental shelf occurs in November and December, though they can be found October through January (Able and Fahay, 1998). Flounder larvae enter the Bay and other Virginia estuaries from October through May with juveniles utilizing shallow fine substrate habitat adjacent to seagrass beds (Murdy et al., 1997; Norcross and Wyanski, 1994; Weinstein and Brooks, 1983; Wyanski, 1990). Low winter temperatures can have significant effects on early demersal individuals that enter the estuary in the winter (Able and Fahay, 1998). Juvenile summer flounder can first appear in catches as early as late March, which is used as the beginning of the biological year, but in most years were not taken in appreciable numbers until June (Figure 10). YOY summer flounder abundance continues to increase steadily throughout the summer and early fall to a late fall peak, and then shows evidence of emigration during December. September, October, and November usually encompass the three months of greatest abundance. During this period, juvenile flounder are broadly distributed across the mainstem Bay and are found in the lower rivers, but only rarely appear in catches in the upper rivers. Index calculations therefore include all Bay and the lower river strata during these three months.

The RSCI (1955-2003, BRI (1988-2003) and the RO (1979-2003) were analyzed for annual trends (Table 15). Only the RO showed a significant decrease ($r^2 = 0.43$, $P = 0.0005$)

while the BRI exhibited a decreasing trend which was nearly significant ($r^2 = 0.23$, $P = 0.058$). The RO index peaked in 1980 (mean = 1.6) and is presently (2003) at a value of 0.50. Annual index values (RSCI and RO) were highest in 1980 and 1983. Minor peaks occurred in the early nineties (1990, 1991 and 1994), but the last few years have been consistently low. Because of the long and late season spawning period of summer flounder, hurricanes may have a neutral effect on their recruitment to Chesapeake Bay (Montane, unpublished).

**Black Sea Bass** (*Centropristis striata*) - Black sea bass are seldom taken in large numbers but regularly occur in survey catches. Juveniles first appear in low numbers in August. When present, young-of-year black sea bass occur throughout the Bay strata but do not appear in the tributaries on a regular basis except the lower James River (Figure 11, bottom). Index calculations have been based on all Bay strata and the lower James stratum. Although some early juveniles appear in the Bay during their first summer and fall and then emigrate with the onset of winter, more young-of-year enter the estuary during the following spring. Black sea bass spawn in the Mid Atlantic Bight beginning in April, peaking in August, and continuing through October (Murdy et al., 1997; Able and Fahay, 1998). Though not investigated yet, their spawning history and location suggest that hurricane activity may affect their recruitment to Chesapeake Bay. For instance, during some years there is virtually no recruitment to the Chesapeake Bay by early juveniles spawned the same calendar year. Since abundances are higher and distribution much more consistent during the following late spring and early summer, juvenile index calculations are based on May through July, encompassing the three months of highest abundance. Since this index is calculated from the middle portion of the calendar year but the very end of the biological year, the resultant index is for the year class spawned the previous calendar year (i.e., the 2002 index is for the 2001 year class). When the RSCI (1954-2002), BRI (1987-2002) and the RO

(1978-2002) were analyzed for annual trends, the RSCI increased significantly ($r^2 = 0.15$, P = 0.007) with the BRI exhibiting a strong positive trend, though non-significant ($r^2 = 0.21$, P = 0.072; Figure 11; Table 16).

**Scup** (*Stenotomus chrysops*) - Scup is primarily a marine and summer spawning species and utilizes the Chesapeake Bay the same as black sea bass. The estuary is rarely used as a nursery area by early juveniles but many older juveniles can be found there during their second summer. Early juvenile scup (25-40 mm FL) occasionally appear in survey catches in June, but usually rapidly disappear thereafter. Older scup first appear in catches in May, and by June range from 50 to 215 mm FL. The original length cutoff criteria were based on ageing studies (Morse, 1978), with the collective trawl data indicating three size or year classes (age 0, age 1 and age 2+). Since the age 0 is annually variable and not persistent, and the age 2+ is only taken in very small numbers, index calculations are performed on age 1 individuals. This year class clearly remains present in the Bay and available to the gear for the remainder of the summer and early fall. While the data collected are not amenable to construction of a true YOY juvenile index, the abundance of juvenile scup just as they enter their second year can be assessed. The term, “age 1" scup was often used in earlier reports, when in actuality data were lagged one year (year - 1), referring to YOY measured in their second year. Although there has been some discussion whether animals captured in Chesapeake Bay are YOY or early age 1, based on studies along the Virginia coast, trawl catches in these size ranges represent mainly age 1 individuals (Campbell et al., unpublished manuscript).

The early age 1 nursery area is largely restricted to the two lower mainstem Bay segments (Figure 12). Catch rates for scup usually peak in July, and essentially show a July-

August dome. Since sizable numbers of late juveniles have also been collected during June and September, these months were chosen as the temporal basis for index calculation.

A regression of year vs. index for RSCI (1954-2002) was not significant, but the BRI (1987 - 2002) decreased significantly ($r^2 = 0.42$, $P = 0.007$; Figure 12, Table 17). Scup indices have been consistently low since 1993, but showed a slight increase in 2000.

**Striped Bass** (*Morone saxatilis*) - Striped bass use the upper tributaries for spawning and nursery grounds, spawning from early to mid-April through the end of May, in tidal freshwater areas just above the salt wedge. Young-of-year striped bass often appear in catches in May to July in size classes less than 50 mm FL during years of greater abundance, but then diminish in abundance until the following winter. A second, stronger, and more consistent period of abundance occurs in December and continues through to February the following year in the upper regions of the rivers (Figure 13). This is probably due to their local migration into deeper waters in colder weather.

When the RSCI (1956-2003) and RO (1982-2003) were analyzed for annual trends, only the RSCI decreased significantly ($r^2 = 0.20$, $P = 0.002$; Figure 13, Table 18). However, both the RSCI and the RO index have been highly variable since 1982. The 2000 RSCI and RO indices were the highest since 1993, but decreased slightly in 2001.

**White Perch** (*Morone americana*) - Spawning occurs in the upper tributaries from March to July with a peak occurring from late April to early May. Since white perch populations from various tributaries can exhibit significantly different growth rates (Bowen, 1987; Setzler-Hamilton, 1991a; Seaver et al., 1996), and those separations are not presently clear, for this analysis all specimens were categorized as either age 0 or age 1+. Examination of distributional data (Figures 14 and 15), reveals neither white perch cohort are found in the mainstem Bay, with

the highest abundances found in upper portions of each tributary. Therefore, index calculations are confined to the upper strata of each tributary. Index months include December to February for YOY and November to February for age 1+, though periodically some age 1+ are caught in March, and YOY caught in November and March.

The RSCI (1956-2003) and RO (1979-2003) indices for YOY showed no significant annual trends, while only the RSCI for the age 1+ during the same period decreased significantly ($r^2 = 0.21$, $P = 0.001$; Figures 14 and 15, Tables 19 and 20). The age 1+ RSCI index was fairly high from 1960-1964, and then decreased significantly. The age 1+ RSCI index from 1979 to present also decreased significantly ($r^2 = 0.20$, $P = 0.025$).

**White catfish** *(Ictalurus catus)* and **Channel catfish** *(I. punctatus)* - White and channel catfish are found in relatively high abundance in the upper portions of the tributaries (Figures 16-19). Although each river system is unique, spawning typically occurs in late May through early July in Virginia (Fewlass, 1980; Menzel, 1945); consequently June was selected as the start of the biological year. The survey typically catches both species up to 600 mm FL with juveniles 50 mm FL first recruiting to the gear in June. The temporal component seems very clear for the juveniles occurring from January to April for both species in the upriver strata only. The age 1+ index often indicates a higher, more stable trend than the juvenile index. Sampling is over several year classes which aids in stabilizing the index.

The YOY RSCI (1954-2003) and RO (1983-2003) white catfish indices decreased significantly ($r^2 = 0.10$, $P = 0.025$) and nearly so ($r^2 = 0.17$, $P = 0.063$), respectively (Tables 21-22). Only the 1+ RSCI (1954-2003) white catfish index decreased significantly ($r^2 = 0.09$, $P = 0.028$), though the decrease in the RO index was nearly significant ($r^2 = 0.18$, $P = 0.053$). Both white catfish YOY and age 1+ have exhibited extremely low indices from 1998 to the present.

The 1+ RSCI (1954-2003) and RO (1983-2003) channel catfish indices increased ($r^2$ = 0.13, P = 0.011) and decreased significantly ($r^2$ = 0.42, P = 0.001), respectively (Tables 23-24). Channel catfish YOY indices were extremely low from 1997 – 2002, but increased in 2003 (Figure 18). The channel catfish age 1+ RSCI 2001 index was the lowest since 1976, peaked in 1991, and the 2003 index was less than that of 2002 (Figure 19).

The channel catfish was introduced to Virginia in the late 1800's (Jenkins and Burkhead, 1994), and their population trends may be a result of the species becoming established and forming natural cycles as they become integrated into the ecosystem. The YOY declined dramatically since the late 1980's (with the exception of the 1989 year class), but increased in 2003 (Table 23 and Figure 18), possibly as a result of another introduced catfish, the blue catfish (*Ictalurus furcatus*). This decline in juveniles is now becoming evident in the older age classes as well (Table 24 and Figure 19).

**Blue Catfish** (*Ictalurus furcatus*)- The blue catfish is one of Virginia's largest freshwater or anadromous fishes (Jenkins and Burkhead, 1993). It was introduced to the Chesapeake Bay as a sportfish in the James, Rappahannock and Mattaponi Rivers from 1974 through 1989 (Virginia Department of Inland Game and Fisheries, 1989 as reported by Connelly, 2001) and inhabits main channels and backwaters of medium to large size rivers (Murdy et al., 1997). The blue catfish is a carnivorous bottom feeder that preys on fishes, insects, crayfish, clams, and mussels (Murdy et al., 1997). Both the YOY RSCI (1983-2003) and RO (1983-2003) blue catfish indices increased significantly ($r^2$ = 0.22, P = 0.034; $r^2$ = 0.28, P = 0.013, respectively, Tables 25 and 26, Figures 20 and 21). Similarly both the 1+ RSCI (1954-2003) and RO (1983-2003) blue catfish index increased significantly ($r^2$ = 0.37, P = 0.004; $r^2$ = 0.40, P = 0.002). The 2003 YOY RSCI index was second only to the 1997 index, and the RO index was the highest since 1983.

The 2003 age 1+ blue catfish RSCI and RO indices were double that of 2002 (Figure 21 and Table 26).

The 1+ RSCI (1954-2003) and RO (1983-2003) blue catfish indices increased ($r^2 = 0.13$, $P = 0.011$) and decreased significantly ($r^2 = 0.42$, $P = 0.001$), respectively.

**Northern Puffer** *(Sphoeroides maculatus)* - The puffer is captured in small numbers primarily in the mainstem Bay (Figure 22). Spawning occurs from May to August in nearshore waters (Murdy et al., 1997). June is the start of the biological year with puffer less than 50 mm TL collected. Puffer is first caught in the Bay in May and peaks during late summer/early fall (July to October).

When the RSCI (1955-2003) and the BRI (1988-2003) indices were analyzed for annual trends, only the BRI decreased significantly ($r^2 = 0.48$, $P = 0.003$; Figure 22, Table 27). Since 1988, northern puffer indices experienced a rapid and continuous decline until 1992, and although variable, have shown a decreasing trend in recent years (Figure 22).

**Silver Perch** *(Bairdiella chrysoura)* - Silver perch is found in all strata, but the York River often dominates catches (Figure 23). Spawning occurs in the deep waters of the Bay and offshore from May to July, and juveniles (100 mm TL) begin recruiting to the fishing gear by July (Chao and Musick, 1977; Rhodes, 1971). September to November had the highest catch rates for all years of the expanded survey except 1991, when August had slightly higher values. When the RSCI (1955-2003), BRI (1988-2003) and RO (1979-2003) indices were analyzed for annual trends, the RSCI significantly decreased ($r^2 = 0.23$, $P = 0.001$) while the RO significantly increased ($r^2 = 0.31$, $P = 0.004$; Figure 23, Table 28).

**Blue Crab** (*Callinectes sapidus*) - After mating in the oligohaline and mesohaline portions of estuaries, adult female blue crabs migrate to the mouths of estuaries or nearshore

coastal waters to overwinter and then spawn the following spring (Van Engel, 1958; Tagatz, 1968). Spawning occurs from May to September, with a minor peak in June and a major peak in July-August in temperate regions (Dittel and Epifanio, 1982; McConaugha et al., 1983).

Newly-hatched zoea larvae are advected out of the estuary in the net surface outflow (Dittel and Epifanio, 1982; Epifanio et al., 1984), and larval development proceeds in coastal waters to the postlarval stage, the megalopa (Costlow and Bookhout, 1959). Megalopae reinvade the estuary from coastal waters. The dynamics of reinvasion are not yet fully understood, but tidally-timed vertical migration appears important once megalopae reach the mouths of estuaries (Epifanio et al., 1984; Epifanio, 1988). Influx of megalopae appears associated with the neap-spring tidal cycle (van Montfrans et al., 1990) and with downwelling wind events (Goodrich et al., 1989; Little and Epifanio, 1991). Megalopae then settle into shallow water habitats and metamorphose to the first juvenile instar (Orth and van Montfrans, 1987; Mense and Wenner, 1989). Growth is rapid from spring through fall (Lippson, 1971), but blue crabs are inactive during winter. Maturity is usually attained after one year of residence in the estuary.

Since 1968, age 1+ blue crabs (crabs greater than 60 mm carapace width or cw) have shown a nearly significant decrease ($r^2 = 0.09$, $P = 0.073$), while the adult females have decreased significantly ($r^2 = 0.15$, $P = 0.019$; Figure 24, Table 29). The age 0 (crabs less than 60 mm cw) and age 1+ crabs appear to exhibit a near decadal periodicity, with the age 1+ crab index significantly related to the age 0 crab index ($r^2 = 0.30$, $P = 0.001$). This periodicity may be related to decadal oscillations in temperature, river discharge and surface winds which occur in Chesapeake Bay and may affect blue crab recruitment (Austin, 2002). The age 0 index tripled in 2003 compared to 2002. It is possible that Hurricane *Isabel* aided in the transport of megalopae

into the Bay. The adult female index has remained low since 1991, while the age 0 and age 1+ indices have steadily decreased since 1995 and 1997, respectively (Figure 24).

Age 0 blue crabs are almost exclusively found in the tributaries (Figure 25). For descriptive purposes, we have divided the age 1+ crabs into age 1 (60-120 mm cw) and age 2+ (i.e.,> 120 mm cw) classes. Age 1 crabs predominate in the tributaries, but can be found in the mainstem Bay (Figure 26, top). Crabs greater than 120 mm cw are either larger males or adult females. Few females greater than 120 mm cw are still juveniles. Adult females are usually concentrated in the Bay mainstem (especially during fall and winter; Figure 26, bottom), but can be found in the mid to upper reaches of tributaries during periods of little freshwater inflow (i.e.,droughts). Age 2+ males usually reside exclusively in the tributaries. The 2003 Fall YOY index was nearly triple that of the 2002 index (Table 29). Hurricane *Isabel* likely contributed to the increase as many crabs less than 50 mm cw were present during October and November 2003, compared to October and November 2002 (Figure 27).

**American eel** (*Anguilla rostrata*) - The American eel is a catadromous species, present along the Atlantic and Gulf coasts of North America and inland in the St. Lawrence Seaway and Great Lakes (Murdy et al., 1997). The species is panmictic and supported throughout its range by a single spawning population (Haro et al., 2000; Meister and Flagg, 1997). Spawning takes place during winter to early spring in the Sargasso Sea. The eggs hatch into leaf-shaped ribbon-like larvae called leptocephali, which are transported by the ocean currents (over 9-12 months) in a generally northwesterly direction. Within a year, metamorphosis into the next life stage (glass eel) occurs in the Western Atlantic near the East Coast of North America. Coastal currents and active migration transport the glass eels into rivers and estuaries from February to June in Virginia and Maryland. As growth continues, the eel becomes pigmented (elver stage) and

within 12 –14 months acquires a dark color with underlying yellow (yellow eel stage; Facey and Van Den Avyle, 1987). Many eels migrate upriver into freshwater rivers, streams, lakes, and ponds, while others remain in estuaries. Most of the eel's life is spent in these habitats as a yellow eel. Age at maturity varies greatly with location and latitude, and in Chesapeake Bay may range from 8 to 24 years, with most being less than ten years old (Owens and Geer, 2003). *A. rostrata* from Chesapeake Bay mature and migrate at an earlier age than eels from northern areas (Hedgepeth, 1983) Upon maturity, eels migrate back to the Sargasso Sea to spawn and die (Haro et al., 2000). Metamorphosis into the silver eel stage occurs during the seaward migration that occurs from late summer through autumn.

The current American eel index is composed of all size eels collected in the upper half of each of the major tributaries (JA 3 and 4, YK 3 and 4, and RA 3 and 4) during the months of April through June. The overall eel CPUE (Table 30) exhibits a nearly significant increasing trend ($r^2 = 0.07$, $P = 0.064$), but the index values since 1983 show a sharp significant decline ($r^2 = 0.60$, $P = 0.0005$; Figure 28, top). American eel are collected by the trawl exclusively in the tributaries (Figure 28, bottom).

**Bay Anchovy** (*Anchoa mitchilli*)- The bay anchovy is the most abundant finfish throughout Chesapeake Bay and its tributaries found in salinities ranging from 1-33 psu (Murdy et al., 1997). Bay anchovy feed mostly on zooplankton and is an important food source for many other Bay fishes (Murdy et al., 1997). In years of "normal" freshwater inflow (i.e.,1997-2000), Atlantic menhaden (*Brevoortia tyrannus*), bay anchovy and Atlantic croaker often dominate fish biomass in Chesapeake Bay (Jung, 2002). The overall bay anchovy RSI index (1955-2003) has increased slightly, while the RO index (1979-2003) has exhibited a slight decreasing trend (Table 31; Figure 29, top). Bay anchovy are ubiquitous in the trawl survey catches (Figure 29, bottom).

## DISCUSSION

Chesapeake Bay constitutes a major nursery area for most of the species examined and is one of several along the Atlantic seaboard. With the exception of weakfish and the anadromous species, all of the juveniles recruited to the Chesapeake Bay nursery areas result from spawning activities which take place outside of the Bay. Early juveniles of the four sciaenid species are thought to be estuarine dependent, but black sea bass young-of-year also utilize nearshore continental shelf waters (Musick and Mercer, 1977) and juvenile summer flounder also frequent shallow, high salinity coastal lagoons (Wyanski, 1989). Scup do not appear in the Bay in appreciable numbers until they are nearing one year old. Conceivably, Chesapeake Bay nursery zone abundances may well be reflective of overall reproductive success.

Four estimates of relative abundance were developed for juvenile finfish and blue crabs. The values reported as the Bay and River index (BRI) were only for the historic fixed stations transects of the tributaries and the Bay survey established in 1988. Two indices were presented, one from the tributaries only (RO; 1979 to present) and the other for both the Bay and rivers (BRI; 1988 to present). The long time-series have produced converted indices (random stratified converted index - RSCI) and unconverted indices (random stratified index - RSI) for the target species discussed.

Efforts continue on validating older data, and comparing these historical values against data presently being collected, and creating new indices for species of emerging ecological importance such as the bay anchovy and the blue catfish. Additionally, the now fully implemented random stratified survey of the tributaries has enhanced the ability to produce reliable estimates of juvenile abundance. These surveys have complimented and correlated with

the fixed mid-channel transects quite well since their inception in June 1991 (Geer and Austin, 1996a; Geer and Austin, 1999).

Juvenile indices collected by the VIMS trawl survey are instrumental in helping to forecast year class strength, avoid stock collapse and verify management strategies. It is imperative that any early warning signs of stock decline are recognized before commercial landings reflect the declines. For instance, the current Interstate Fisheries Management Plan for striped bass relies heavily on juvenile abundance estimates to determine action levels for the intensification or relaxation of harvest restrictions. Low year classes during much of the 1970's and mid-1980's led to a striped bass moratorium in 1985, which lasted until 1990 (Seltzer-Hamilton, 1991b). Evidence of a very poor year class of summer flounder was first detected by the VIMS Trawl Survey, is recognized by the Mid-Atlantic Fisheries Management Council (MAFMC) as the only available index of summer flounder recruitment and was instrumental in shaping more protective harvest regulations in Virginia. The VIMS Trawl Survey spot index is the only spot index available on the East Coast and was essential for the 2003 ASMFC Spot FMP (ASMFC, 2003). Though the trawl is not the preferred gear to catch American eel, VIMS Trawl eel indices will likely play a part in the upcoming 2005 ASMFC American Eel FMP. Assessment of annual recruitment success for coastal Atlantic finfish populations should involve multi-state monitoring efforts, and would validate area-specific juvenile indices.

The trawl survey is also important for monitoring interfamily interactions. For example, annual catch rates of channel catfish and white catfish have declined since 1991, while those of blue catfish (*I. furcatus*), which was introduced in Virginia during the 1970's and 1980's, to enhance sportfishing, have increased dramatically (Connelly, 2001). Additionally current bistate FMP's utilize trawl survey blue crab data as the foundation for understanding blue crab

population dynamics in the Chesapeake Bay, and were used to construct the blue crab sanctuary corridor.

Declines in catches of these important recreational species are most often due to degradation of their estuarine nursery habitats, overfishing and year class failure (Murdy et al., 1997). Spot indices have declined greatly over the past 49 years, with the RSCI 1955-1978 index twice that of the 1979-2003 index. Spot are oceanic spawners and their year class strength appears to be controlled by environmental factors occurring outside the Bay (Homer and Mihursky, 1991; Bodolus, 1994). Croaker show the greatest interannual variability of the key species discussed, with fluctuations most probably weather related, with particular correlations to hurricane activity. The timing of croaker recruitment to the Bay (August-December) corresponds with normal peak hurricane activity to the region. Norcross (1983) and Murdy et al., (1997) suggest cold winters cause increased mortality in overwintering YOY croaker and during some years may cause the spawning population to be pushed further south, preventing the postlarval fish access to Bay nursery areas. Weakfish are a prized recreational species, but their indices have remained low since the mid-1990's, and their decline may be attributed to both habitat degradation and overfishing (Murdy et al., 1997). Declines in summer flounder have been due to overfishing and year class failure (Murdy et al., 1997), and these were apparent in the very low 1987 trawl index. The black sea bass index has increased since 1997, though has been highly variable over the duration of the survey. The scup index has been highly variable as well, with the 1994-1999 indices being the lowest in 20 years.

Striped bass and white perch indices were very low during the 1970's and early 1980's. Striped bass display great recruitment variability and one or two strong year classes may dominate the population (Murdy et al., 1997). After closure of the fishery in the mid to late

1980's due to overfishing, poor recruitment and low stock abundance (Seltzer-Hamilton, 1991b), the index has increased, but remained highly variable through the present. White and channel catfish indices while variable, have decreased dramatically over the past 13-14 years, most probably due to overfishing, though some increases occurred in 2003.

The VIMS Trawl Survey is a key element for future management of fishery resources that use the Chesapeake Bay as spawning and nursery grounds. Because the Chesapeake Bay constitutes a major nursery area for many coastal migratory fish species, monitoring annual recruitment success is a key element in multi-state management efforts along the Atlantic Coast. These data will continue to provide managers with valuable predictive tools for assessing the success of present management measures.

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# TABLES

**(Note: Annual indices with an * after the year are incomplete)**

Table 1. National Marine Fisheries Service's Marine Recreational Fisheries Statistic Survey for Virginia Waters for 2003.

| SPECIES | Total Number of Fish (A + B1 + B2) | Rank by Number Caught | Number of Harvested Fish (A + B1) | Weight in kilograms (A + B1) | Rank by Weight |
|---|---|---|---|---|---|
| ATLANTIC CROAKER | 13,238,716 | 1 | 6,695,192 | 2,573,760 | 1 |
| SUMMER FLOUNDER | 3,036,650 | 2 | 451,348 | 587,001 | 3 |
| SPOT | 2,374,844 | 3 | 1,441,002 | 397,228 | 4 |
| BLACK SEA BASS | 2,006,661 | 4 | 264,983 | 177,095 | 6 |
| STRIPED BASS | 1,372,499 | 5 | 401,945 | 1,265,420 | 2 |
| KINGFISHES | 1,187,866 | 6 | 720,328 | 137,237 | 9 |
| WEAKFISH | 590,241 | 7 | 86,112 | 97,760 | 11 |
| PIGFISH | 547,954 | 8 | 98,568 | 10,381 | 18 |
| BLUEFISH | 511,905 | 9 | 171,573 | 147,534 | 7 |
| OTHER FISHES | 431,784 | 10 | 156,354 | 191,826 | 5 |
| TOADFISHES | 318,743 | 11 | 1,899 | 0 | |
| SPOTTED SEATROUT | 309,754 | 12 | 102,484 | 98,912 | 10 |
| FRESHWATER CATFISHES | 204,813 | 13 | 109,676 | 72,186 | 13 |
| SCUP | 186,251 | 14 | 7,724 | 1,371 | 27 |
| WHITE PERCH | 173,648 | 15 | 51,915 | 7,695 | 21 |
| SKATES/RAYS | 163,042 | 16 | 8,191 | 659 | 29 |
| HERRINGS | 159,142 | 17 | 143,065 | 16,336 | 16 |
| TAUTOG | 131,348 | 18 | 76,236 | 140,088 | 8 |
| PUFFERS | 129,415 | 19 | 19,648 | 5,620 | 23 |
| OTHER SHARKS | 105,872 | 20 | 7,172 | 7,965 | 20 |
| SEAROBINS | 60,711 | 21 | 0 | 0 | |
| RED DRUM | 56,986 | 22 | 13,607 | 25,952 | 15 |
| SPANISH MACKEREL | 37,602 | 23 | 17,063 | 9,993 | 19 |
| BLACK DRUM | 32,019 | 24 | 11,431 | 43,876 | 14 |
| PINFISHES | 28,612 | 25 | 1,385 | 0 | |
| FLORIDA POMPANO | 19,937 | 26 | 17,300 | 7,231 | 22 |
| EELS | 18,749 | 27 | 3,837 | 0 | |
| DOGFISH SHARKS | 13,474 | 28 | 5,935 | 2,941 | 26 |
| SILVER PERCH | 11,671 | 29 | 7,041 | 84 | 30 |
| OTHER FLOUNDERS | 10,118 | 30 | 0 | 0 | |
| SHEEPSHEAD | 8,513 | 31 | 3,907 | 13,594 | 17 |
| TRIGGERFISHES/FILEFISHES | 8,385 | 32 | 3,533 | 3,792 | 24 |
| MULLETS | 8,131 | 33 | 7,260 | 0 | |
| OTHER TUNAS/MACKERELS | 6,465 | 34 | 5,835 | 78,072 | 12 |
| OTHER JACKS | 2,496 | 35 | 0 | 0 | |
| OTHER PORGIES | 1,974 | 36 | 0 | 0 | |
| ATLANTIC MACKEREL | 1,819 | 37 | 1,819 | 1,334 | 28 |
| DOLPHINS | 1,294 | 38 | 1,294 | 3,188 | 25 |
| LITTLE TUNNY/ATLANTIC BONITO | 987 | 39 | 0 | 0 | |
| OTHER CODS/HAKES | 871 | 40 | 0 | 0 | |
| KING MACKEREL | 580 | 41 | 0 | 0 | |
| GREATER AMBERJACK | 239 | 42 | 239 | 0 | |
| RED HAKE | 46 | 43 | 46 | 18 | 31 |
| Total | 27,512,827 | | 11,116,947 | 6,126,149 | |

A = Caught and Landed
B1 = Caught by Anglers & filleted or released dead
B2 = Caught and released alive

Table 2. Number of potential Chesapeake Bay trawl sites and approximate square miles of sampling strata. '*' indicates areas which are not presently being sampled on a monthly basis with an RSD.

| Region | Stratum | Description | No .of Points | Percent of System | % of Total Sampling | Square Miles (NM) |
|---|---|---|---|---|---|---|
| Bottom Bay | 001 | West. Shoal 12-30' | 1740 | 9.38 | 7.49 | 112.33 |
| Region B1 | 002 | East. Shoal 12-30' | 863 | 4.65 | 3.26 | 55.72 |
| | 003 | Central Plain 30-42' | 910 | 4.91 | 3.44 | 58.75 |
| | 004 | Deep Channel ≥42' | 386 | 2.08 | 1.46 | 24.92 |
| | S01 | West. Shallow 4-12' | 216 | 1.16 | 0.82 | 13.94 |
| | S02 | East. Shallow 4-12' | 58 | 0.31 | 0.22 | 3.74 |
| | | | 4173 | 22.50 | 16.69 | 269.41 |
| Lower Bay | 005 | West. Shoal 12-30' | 1027 | 5.54 | 3.88 | 66.30 |
| Region B2 | 006 | East. Shoal 12-30' | 398 | 2.15 | 1.50 | 25.69 |
| | 007 | Central Plain 30-42' | 1756 | 9.47 | 6.63 | 113.37 |
| | 008 | Deep Channel ≥42' | 684 | 3.69 | 2.58 | 44.16 |
| | S05 | West. Shallow 4-12' | 215 | 1.16 | 0.81 | 13.88 |
| | S06 | East. Shallow 4-12' | 145 | 0.78 | 0.55 | 9.36 |
| | | | 4225 | 22.78 | 15.95 | 272.77 |
| Upper Bay | 009 | West. Shoal 12-30' | 768 | 4.14 | 2.90 | 49.58 |
| Region B3 | 010 | East. Shoal 12-30' | 632 | 3.41 | 2.39 | 40.80 |
| | 011 | Central Plain 30-42' | 2197 | 11.84 | 8.30 | 141.84 |
| | 012 | Deep Channel ≥42' | 844 | 4.55 | 3.19 | 54.49 |
| | S09 | West. Shallow 4-12' | 209 | 1.13 | 0.79 | 13.49 |
| | S10 | East. Shallow 4-12' | 216 | 1.16 | 0.82 | 13.94 |
| | | | 4866 | 26.23 | 18.39 | 314.15 |
| Top Bay* | 013 | West. Shoal 12-30' | 404 | 2.18 | 1.53 | 26.08 |
| Region B4 | 014 | East. Shoal 12-30' | 1533 | 8.26 | 5.79 | 98.97 |
| | 015 | Central Plain 30-42' | 1315 | 7.09 | 4.97 | 84.90 |
| | 016 | Deep Channel ≥42' | 1273 | 6.86 | 4.81 | 82.18 |
| | S13 | West. Shallow 4-12' | 164 | 0.88 | 0.62 | 10.59 |
| | S14 | East. Shallow 4-12' | 597 | 3.22 | 2.26 | 38.54 |
| | | | 5286 | 28.50 | 19.98 | 341.26 |
| Total Bay | | | 18550 | | 71.01 | 1197.59 |

Table 3. Number of potential James River trawl sites and approximate square miles of sampling strata. '*' indicates areas which are not presently being sampled with a RSD. The weight factors (No. of Points) have been altered to remove several creeks and rivers.

| Region | Stratum | Description | No .of Points | Percent of System | % of Total Sampling | Square Miles (NM) |
|---|---|---|---|---|---|---|
| Bottom James | 070 | Bottom JA 4-12' | 416 | 16.57 | 1.57 | 27.31 |
| Region J1 | 071 | Bottom JA 12-30' | 292 | 11.63 | 1.10 | 18.85 |
| | 072 | Bottom JA 30-42' | 68 | 2.71 | 0.26 | 4.39 |
| | 073 | Bot & Low JA ≥42' | 59 | 2.35 | 0.22 | 3.81 |
| | *JH1 | Hampton R. 4-12' | 5 | 0.20 | 0.02 | 0.32 |
| | *JK1 | Chuckatuck R. 4-12' | 2 | 0.08 | 0.01 | 0.13 |
| | *JN1 | Nansemond R. 4-12' | 67 | 2.67 | 0.25 | 4.33 |
| | *JN2 | Nansemond R. ≥ 12' | 16 | 0.64 | 0.06 | 1.03 |
| | | | 925 | 36.28 | 3.49 | 59.72 |
| Lower James | 074 | Lower JA 4-12' | 389 | 15.50 | 1.47 | 25.11 |
| Region J2 | 075 | Lower JA 12-30' | 230 | 9.16 | 0.87 | 14.85 |
| | 076 | Lower JA 30-42' | 25 | 1.00 | 0.09 | 1.61 |
| | *JP1 | Pagan R. 4-12' | 47 | 1.87 | 0.18 | 3.03 |
| | *JP2 | Pagan R. ≥12' | 10 | 0.40 | 0.04 | 0.65 |
| | *JW1 | Warwick R. 4-12' | 50 | 1.99 | 0.19 | 3.23 |
| | *JW2 | Warwick R. ≥ 12' | 3 | 0.12 | 0.01 | 0.19 |
| | | | 754 | 30.04 | 2.85 | 48.68 |
| Upper James | 077 | Upper JA 4-12' | 178 | 7.09 | 0.67 | 11.49 |
| Region J3 | 078 | Upper JA 12-30' | 172 | 6.85 | 0.65 | 11.10 |
| | 079 | Up & Top JA ≥ 30' | 34 | 1.35 | 0.13 | 2.20 |
| | *JS1 | Skiffles Cr. 4-12' | 25 | 1.00 | 0.09 | 1.61 |
| | *JS2 | Skiffles Cr. ≥12' | 6 | 0.24 | 0.02 | 0.39 |
| | | | 415 | 16.53 | 1.56 | 26.79 |
| Top James | 080 | Top JA 4-12' | 264 | 10.52 | 1.00 | 17.04 |
| Region J4 | 081 | Top JA 12-30' | 152 | 6.06 | 0.57 | 9.81 |
| | | | 416 | 16.58 | 1.79 | 26.86 |
| TOTAL James R. | | | 2510 | | 9.47 | 162.05 |

Table 4. Number of potential York River trawl sites and approximate square miles of sampling strata. '*' indicates areas which are not presently being sampled with a RSD.

| Region | Stratum | Description | No .of Points | Percent of System | % of Total Sampling | Square Miles (NM) |
|---|---|---|---|---|---|---|
| Bottom York | 030 | Bottom YK 4-12' | 94 | 12.18 | 0.36 | 6.07 |
| Region Y1 | 031 | Bottom YK 12-30' | 87 | 11.27 | 0.33 | 5.62 |
| | 032 | Bottom YK 30-42' | 66 | 8.55 | 0.25 | 4.26 |
| | 033 | Bot & Low YK≥42 | 71 | 9.20 | 0.27 | 4.58 |
| | | | 318 | 41.19 | 1.21 | 20.53 |
| Lower York | 034 | Lower YK 4-12' | 111 | 14.38 | 0.42 | 7.17 |
| Region Y2 | 035 | Lower YK 12-30' | 114 | 14.77 | 0.43 | 7.36 |
| | 036 | Lower YK 30-42' | 28 | 3.63 | 0.11 | 1.81 |
| | | | 253 | 32.77 | 0.96 | 16.33 |
| Upper York | 037 | Up & Top YK 4-12' | 54 | 6.99 | 0.20 | 3.49 |
| Region Y3 | 038 | Upper YK 12-30' | 71 | 9.20 | 0.27 | 4.58 |
| | 039 | Up & Top YK≥30' | 29 | 3.76 | 0.11 | 1.87 |
| | | | 154 | 19.95 | 0.58 | 9.94 |
| Top York* | 040 | Top YK 12-30' | 47 | 6.09 | 0.18 | 3.03 |
| Region Y4 | | | 47 | 6.09 | 0.18 | 3.03 |
| TOTAL York R. | | | 772 | | 2.93 | 49.83 |

Table 5. Number of potential Rappahannock River trawl sites and approximate square miles of sampling strata. '*' indicates areas which are not presently being sampled with a RSD.

| Region | Stratum | Description | No .of Points | Percent of System | % of Total Sampling | Square Miles (NM) |
|---|---|---|---|---|---|---|
| Bottom Rappahannock | 050 | Bottom RA 4-12' | 98 | 7.08 | 0.37 | 6.33 |
| Region R1 | 051 | Bottom RA 12-30' | 200 | 14.44 | 0.76 | 12.91 |
| | 052 | Bottom RA 30-42' | 66 | 4.77 | 0.25 | 4.26 |
| | 053 | Bottom RA $\geq$ 42' | 84 | 6.06 | 0.32 | 5.42 |
| | | | 448 | 32.35 | 1.70 | 28.92 |
| Lower Rappahannock | 054 | Lower RA 4-12' | 94 | 6.79 | 0.36 | 6.07 |
| Region R2 | 055 | Lower RA 12-30' | 167 | 12.06 | 0.63 | 10.78 |
| | 056 | Lower RA 30-42' | 67 | 4.84 | 0.25 | 4.33 |
| | 057 | Lower RA $\leq$ 42' | 56 | 4.04 | 0.21 | 3.62 |
| | | | 384 | 27.73 | 1.45 | 24.79 |
| Upper Rappahannock | 058 | Upper RA 4-12' | 233 | 16.82 | 0.88 | 15.04 |
| Region R3 | 059 | Upper RA 12-30' | 101 | 7.29 | 0.38 | 6.52 |
| | 060 | Up & Top RA $\geq$30' | 32 | 2.31 | 0.12 | 2.07 |
| | | | 366 | 26.43 | 1.38 | 23.63 |
| Top Rappahannock | 061 | Top RA 4-12' | 137 | 9.89 | 0.52 | 8.84 |
| Region R4 | 062 | Top RA 12-30' | 50 | 3.61 | 0.19 | 3.23 |
| | | | 187 | 13.50 | 0.71 | 12.07 |
| TOTAL Rapp. R. | | | 1385 | | 5.24 | 89.41 |
| TOTAL SITES | | | 26,474 | | | 1498.89 |

Table 6. Assignment of fixed tributary stations to potential random strata used in the original Bay-River index (BRI) calculations and assignment to strata of the random stratified design surveys. Alternating shaded areas represent the number of points and area used as a weighting factor for the BRI index calculations.

| River | River Mile | Depth (ft) | Index Strata | No. Of Points | Sq. Naut. Miles | RSD Strata |
|---|---|---|---|---|---|---|
| James R. | J01 | 25.0 | JA01 | | | 071 |
| | J05 | 20.0 | JA01 | | | 071 |
| | J13 | 30.2 | JA01 | | | 076 |
| | J17 | 22.0 | JA01 | **687** | **44.35** | 075 |
| | J24 | 35.0 | JA02 | | | 079 |
| | J27 | 28.0 | JA02 | | | 078 |
| | J35 | 29.0 | JA02 | | | 081 |
| | J40 | 12.0 | JA02 | 364 | 23.50 | 081 |
| York R. | Y02 | 35.0 | YK01 | | | 032 |
| | Y05 | 40.0 | YK01 | | | 032 |
| | Y10 | 29.9 | YK01 | | | 035 |
| | Y15 | 25.0 | YK01 | **372** | **24.02** | 035 |
| | Y20 | 20.0 | YK02 | | | 038 |
| | Y25 | 25.0 | YK02 | | | 038 |
| | Y30 | 20.0 | YK02 | | | 040 |
| | Y35 | 20.0 | YK02 | | | 040 |
| | Y40 | 13.0 | YK02 | 184 | 11.88 | 040 |
| Rappahannock R. | R02 | 60.0 | RA01 | | | 053 |
| | R10 | 60.0 | RA01 | | | 053 |
| | R15 | 50.0 | RA01 | | | 057 |
| | R20 | 50.0 | RA01 | **283** | **18.27** | 057 |
| | R25 | 29.9 | RA02 | | | 059 |
| | R30 | 20.0 | RA02 | | | 062 |
| | R35 | 20.0 | RA02 | | | 062 |
| | R40 | 12.1 | RA02 | 190 | 12.26 | 062 |

James River: JA01 - Lower $\geq$ 12ft. JA02 - Upper $\geq$ 12ft.
York River: YK01 - Lower $\geq$ 12ft. YK02 - Upper $\geq$ 12ft.
Rapp. River: RA01 - Lower $\geq$ 30ft. RA02 - Upper $\geq$ 12ft.

Table 7. Yearly comparison of substrate (habitat type) from July 1998 – May 2004.

| Substrate Description | July 1998 - June 1999 | | July 1999 - June 2000 | | July 2000 - June 2001 | | July 2001 - June 2002 | | July 2002 - June 2003 | | July 2003 - May 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percent of Stations[1] | Maximum Quantity | Percent of Stations[1] | Maximum Quantity | Percent of Stations[1] | Maximum Quantity | Percent of Stations[1] | Maximum Quantity | Percent of Stations[1] | Maximum Quantity | Percent of Stations[1] | Maximum Quantity |
| Artificial | 0.67 | 2.0 | 4.28 | 3.0 | 4.61 | 2.0 | 5.85 | 15.0 | 6.14 | 4.0 | 6.92 | 7.0 |
| Dead man's fingers (Bryozoan) | 8.22 | 5.0 | 9.01 | 4.0 | 7.75 | 5.0 | 8.99 | 6.0 | 11.83 | 16.0 | 10.15 | 1.0 |
| Detritus | 30.40 | 6.0 | 40.09 | 10.0 | 36.12 | 4.0 | 36.52 | 6.0 | 51.13 | 7.0 | 64.15 | 10.0 |
| Hydroids | 41.08 | 5.0 | 53.81 | 5.0 | 36.12 | 4.0 | 58.78 | 10.0 | 47.79 | 5.0 | 59.03 | 12.0 |
| Sea Squirts (*Mogula spp*.) | 22.40 | 5.0 | 28.90 | 12.0 | 20.37 | 14.0 | 28.69 | 18.0 | 16.26 | 5.0 | 22.01 | 9.0 |
| Seaweeds | 15.31 | 4.0 | 24.55 | 10.0 | 24.28 | 5.0 | 31.57 | 30.0 | 35.23 | 18.0 | 42.41 | 3.0 |
| Shell (oyster, clam, or mussel) | 19.79 | 3.0 | 25.71 | 4.0 | 23.24 | 5.0 | 29.10 | 8.0 | 32.52 | 4.0 | 25.16 | 3.0 |
| Sponges | 8.29 | 6.0 | 9.44 | 5.0 | 9.49 | 5.0 | 13.36 | 10.0 | 13.55 | 18.0 | 11.59 | 3.0 |
| Submerged Aquatic Vegetation | 5.00 | 3.0 | 9.59 | 1.0 | 8.88 | 2.0 | 5.77 | 2.0 | 5.69 | 1.0 | 2.43 | 0.5 |
| Worm Tubes | 6.57 | 1.0 | 10.38 | 1.0 | 9.40 | 1.0 | 10.47 | 1.0 | 11.02 | 2.0 | 13.39 | 2.0 |
| Mud [2] | 7.17 | --- | 6.75 | --- | 9.23 | --- | 5.19 | --- | 11.56 | --- | 8.45 | --- |
| Sand [2] | 10.01 | --- | 0.87 | --- | 2.00 | --- | 0.49 | --- | 0.63 | --- | 0.27 | --- |
| Unknown [3] | 12.32 | --- | 5.45 | --- | 5.05 | --- | 2.06 | --- | 2.62 | --- | 1.17 | --- |
| NUMBER OF TRAWLS: | 1,339 | | 1,377 | | 1,149 | | 1,213 | | 1,213 | | 1,113 | |

1. Based on the number of occurrences of a habitat type divided by the total number of trawls.
2. Sand and Mud are used when verification can be confirmed by direct observation.
3. Unknown is used when none of the categories are found in the trawl.

Abundance is estimated relative to the capacity of a commercial test note (internal dimensions 25.7" x 16.6" x 10", approximately 72 liters).

Categories include: 0.5 = < 1/4 bin, 1 = 1/4 bin, 2 = 1/2 bin, 3 =3/4 bin, 4 = full bin, etc.

Table 8. Spatial, temporal, and length criteria used to calculate indices.

| | VIMS Trawl Survey - Area / Time / Size Values by Species | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species - Age | VIMS | Strata Used | | | | | | | | | Month | | | | | | | | | | | | |
| | SP. CODE | Bay | | | James | | York | | Rapp | | Size Cut-off Values (mm) - Darkened Areas Represent Index Months | | | | | | | | | | | | |
| | | Bottom | Lower | Upper | Lower | Upper | Lower | Upper | Lower | Upper | January | February | March | April | May | June | July | August | September | October | November | December | |
| Atlantic Croaker Y-O-Y | 0005 | | | | ■ | ■ | ■ | ■ | ■ | ■ | 0-100 | 0-100 | 0-100 | 0-110 | 0-135 | 0-160 | 0-180 | 0-220 | 0-50 | 0-80 | 0-100 | 0-100 | |
| Atlantic Croaker Recruits | 0005 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 0-100 | 0-100 | 0-100 | 0-110 | 0-135 | 0-160 | 0-180 | 0-220 | 0-50 | 0-80 | 0-100 | 0-100 | |
| Black Seabass Y-O-Y | 0002 | ■ | ■ | ■ | ■ | | | | | | 0-110 | 0-110 | 0-110 | 0-110 | 0-110 | 0-150 | 0-175 | 0-70 | 0-85 | 0-100 | 0-105 | 0-110 | |
| Blue Catfish Y-O-Y | 0314 | | | | | ■ | | ■ | | ■ | 0-165 | 0-165 | 0-165 | 0-175 | 0-225 | 0-250 | 0-250 | 0-115 | 0-125 | 0-140 | 0-150 | 0-165 | |
| Blue Catfish 1+ | 0314 | | | | | ■ | | ■ | | ■ | >165 | >165 | >165 | >175 | >225 | >250 | >250 | >115 | >125 | >140 | >150 | >165 | |
| Blue Crab - Age 0 | 6141 / 6142 | | | | ■ | ■ | ■ | ■ | ■ | ■ | 0-60 | 0-60 | 0-60 | 0-60 | 0-60 | 0-80 | 0-90 | 0-35 | 0-50 | 0-60 | 0-60 | 0-60 | |
| Blue Crab - Age 1+ | 6141 / 6142 | | | | ■ | ■ | ■ | ■ | ■ | ■ | >60 | >60 | >60 | >60 | >60 | >80 | >90 | >35 | >50 | >60 | >60 | >60 | |
| Blue Crab - Adult Female | 6143 | ■ | ■ | ■ | ■ | | ■ | | ■ | | --- | --- | --- | --- | --- | --- | --- | any | size | crab | --- | --- | |
| Channel Catfish Y-O-Y | 0040 | | | | | ■ | | ■ | | ■ | 0-130 | 0-130 | 0-130 | 0-140 | 0-150 | 0-50 | 0-80 | 0-105 | 0-120 | 0-130 | 0-130 | 0-130 | |
| Channel Catfish 1+ | 0040 | | | | | ■ | | ■ | | ■ | >130 | >130 | >130 | >140 | >150 | >50 | >80 | >105 | >120 | >130 | >130 | >130 | |
| Northern Puffer Y-O-Y | 0050 | ■ | ■ | ■ | | | | | | | 0-140 | 0-140 | 0-140 | 0-160 | 0-185 | 0-50 | 0-85 | 0-120 | 0-130 | 0-135 | 0-140 | 0-140 | |
| Scup 1+ (?) | 0050 | ■ | ■ | | | | | | | | 90-170 | 90-170 | 90-170 | 90-170 | 35-90 | 40-100 | 50-125 | 60-145 | 75-160 | 85-170 | 90-170 | 90-170 | |
| Silver Perch Y-O-Y | 0213 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 0-160 | 0-160 | 0-160 | 0-160 | 0-165 | 0-170 | 0-100 | 0-130 | 0-150 | 0-160 | 0-160 | 0-160 | |
| Spot Y-O-Y | 0033 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 0-200 | 0-200 | 0-50 | 0-75 | 0-100 | 0-135 | 0-160 | 0-180 | 0-200 | 0-200 | 0-200 | 0-200 | |
| Striped Bass Y-O-Y | 0031 | | | | | ■ | | ■ | | ■ | 0-200 | 0-200 | 0-200 | 0-200 | 0-50 | 0-80 | 0-100 | 0-120 | 0-135 | 0-150 | 0-175 | 0-190 | |
| Summer Flounder Y-O-Y | 0003 | ■ | ■ | ■ | ■ | | ■ | | ■ | | 0-290 | 0-290 | 0-60 | 0-100 | 0-140 | 0-170 | 0-200 | 0-225 | 0-250 | 0-275 | 0-290 | 0-290 | |
| Weakfish Y-O-Y | 0007 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 0-200 | 0-200 | 0-200 | 0-225 | 0-240 | 0-90 | 0-120 | 0-150 | 0-180 | 0-200 | 0-200 | 0-200 | |
| White Catfish Y-O-Y | 0039 | | | | | ■ | | ■ | | ■ | 0-110 | 0-110 | 0-110 | 0-110 | 0-120 | 0-50 | 0-65 | 0-80 | 0-90 | 0-100 | 0-110 | 0-110 | |
| White Catfish 1+ | 0039 | | | | | ■ | | ■ | | ■ | >110 | >110 | >110 | >110 | >120 | >50 | >65 | >80 | >90 | >100 | >110 | >110 | |
| White Perch Y-O-Y | 0032 | | | | | ■ | | ■ | | ■ | 0-85 | 0-85 | 0-85 | 0-95 | 0-35 | 0-65 | 0-73 | 0-80 | 0-85 | 0-85 | 0-85 | 0-85 | |
| White Perch 1+ | 0032 | | | | | ■ | | ■ | | ■ | 86-300 | 86-300 | 86-300 | 96-300 | 36-300 | 66-300 | 74-300 | 81-300 | 86-300 | 85-300 | 86-300 | 86-300 | |

Table 9. Summary of samples collected, 1955 - May 2004. Includes sampling from the recent RSD surveys of the tributaries (June 1991 to present).

**KEY**

**Sample Type:**
- ALL — All fish species and blue crabs sampled, VIMS code 104
- CRAB — Only blue crabs sampled, VIMS code 102
- FISH — Only fish species sampled, VIMS code 090

**System:**
- CL — Lower Chesapeake Bay (Virginia Portion)
- JA — James River
- PO — Potomac River
- RA — Rappahannock River
- YK — York River
- ZZ — includes: Atlantic Ocean (AT) - 1971, 78-79; Piankatank R. (PK) - 1970-71, 98-00; Mobjack Bay (MB) - 1970-73, 98-01; Pocomoke Sound (CP) -1973-81, 98-01; Great Wicomico R. (GW) - 1998-00.

**Vessel:**
- BR — W.K. Brooks
- FH — Fish Hawk
- JS — Captain John Smith, J1 prior to 1986.
- LA — Langley
- PA — Pathfinder
- RE — Restless
- OT — Includes: Aquarius (AQ) - 1978; Investigator (IN) - 1970; Judith Ann (JA) - 1981; Langley II (LN) - 1985,2001; Sally Jean (SJ) - 1981; Outboard Skiff (SK) - 1970-71; Three Daughters (TD) - 1978; Virginia Lee (VL) - 1955-57; Edith May (EM) - 1984.

**Gear Code:**

30' Gears
- 010 — Unlined, no tickler chain, 30' bridle, 48"x22" otter board doors, U_N_3B_SW
- 033 — Lined, no tickler chain, 30' bridle, 48"x22" doors, L_N_3B_SW
- 043 — Unlined, tickler chain, 30' bridle, 54"x24" doors, U_T_3B_LW
- 068 — Lined, tickler chain, 30' bridle, 54"x24" otter board doors, L_T_3B_LW
- 070 — Lined, tickler chain, 60' bridle, 54"x24" doors, L_T_6B_LW
- 108 — Lined, tickler chain, 60' bridle, metal china-v doors, L_T_6B_CV

OT includes 3 configurations of 16 foot nets.
- 035: Lined, no tickler chain, 23' bridle, 24"x12" otter board doors, 16L_N_2B_SW. Main Gear used
- 009: Unlined, no tickler chain, 16U_N_2B_SW. 19 tows in 1972.
- 067: Lined, w/ tickler chain, 16L_T_2B_SW. 60 samples on the Elizabeth River in 1982-83.

**Station Type**:
- F - Fixed
- R - Random

**Tow Type**:
- OT is tow duration in minutes for those not listed.
- DIS is distance, always 0.25 nautical miles. Equates well to 5 minute duration.

All Codes found on table from Wojcik and Van Engel, 1988. Appendices A – C

Table 9 (cont.) Sample collection history of the VIMS Trawl Survey, 1955 – May 2004. Codes are on previous page.

| YR | TOT | SAMPLE TYPE | | | MONTH | | | | | | | | | | | | WATER SYSTEM | | | | | | RESEARCH VESSEL | | | | | | | GEAR CODE | | | | | | | STAT. TYPE | | TOW DURATION/DISTANCE | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ALL | CRAB | FISH | J | F | M | A | M | J | J | A | S | O | N | D | CL | JA | PO | RA | YK | ZZ | BR | FH | JS | LA | PA | RE | ZZ | 10 | 33 | 43 | 68 | 70 | 108 | OT | F | R | 5 | 7.5 | 15 | OT | DIS |
| 1955 | 31 | 0 | 0 | 31 | 0 | 3 | 1 | 3 | 1 | 5 | 14 | 1 | 3 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 12 | 17 | 2 | 0 |
| 1956 | 135 | 103 | 0 | 32 | 0 | 0 | 0 | 16 | 17 | 0 | 17 | 20 | 17 | 16 | 16 | 16 | 43 | 0 | 0 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 135 | 0 | 0 | 6 | 127 | 2 | 0 |
| 1957 | 141 | 113 | 0 | 28 | 12 | 16 | 16 | 0 | 12 | 0 | 4 | 16 | 17 | 16 | 16 | 16 | 46 | 0 | 0 | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 85 | 0 | 56 | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 141 | 0 | 0 | 44 | 97 | 0 | 0 |
| 1958 | 192 | 167 | 0 | 25 | 16 | 16 | 13 | 16 | 19 | 16 | 15 | 17 | 16 | 16 | 16 | 16 | 56 | 0 | 0 | 0 | 136 | 0 | 0 | 0 | 0 | 0 | 192 | 0 | 0 | 192 | 0 | 0 | 0 | 0 | 0 | 0 | 192 | 0 | 0 | 58 | 134 | 0 | 0 |
| 1959 | 117 | 86 | 2 | 29 | 0 | 0 | 0 | 14 | 3 | 16 | 19 | 16 | 16 | 16 | 17 | 0 | 32 | 0 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 117 | 0 | 0 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 0 | 0 | 34 | 83 | 0 | 0 |
| 1960 | 57 | 42 | 0 | 15 | 0 | 0 | 0 | 0 | 16 | 14 | 14 | 13 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 10 | 44 | 3 | 0 |
| 1961 | 89 | 19 | 16 | 54 | 6 | 0 | 0 | 4 | 10 | 12 | 8 | 8 | 11 | 12 | 10 | 8 | 15 | 0 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 89 | 0 | 0 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 89 | 0 | 0 | 26 | 63 | 0 | 0 |
| 1962 | 116 | 6 | 35 | 75 | 8 | 8 | 8 | 5 | 12 | 19 | 8 | 8 | 11 | 11 | 11 | 7 | 18 | 0 | 0 | 17 | 81 | 0 | 0 | 0 | 0 | 22 | 94 | 0 | 0 | 116 | 0 | 0 | 0 | 0 | 0 | 0 | 116 | 0 | 0 | 31 | 84 | 1 | 0 |
| 1963 | 142 | 25 | 45 | 72 | 6 | 8 | 9 | 13 | 16 | 18 | 14 | 9 | 19 | 13 | 9 | 8 | 19 | 0 | 0 | 22 | 101 | 0 | 0 | 0 | 0 | 63 | 79 | 0 | 0 | 142 | 0 | 0 | 0 | 0 | 0 | 0 | 142 | 0 | 0 | 37 | 102 | 3 | 0 |
| 1964 | 190 | 104 | 36 | 50 | 23 | 9 | 9 | 12 | 20 | 22 | 18 | 15 | 14 | 19 | 14 | 15 | 24 | 62 | 0 | 0 | 104 | 0 | 0 | 0 | 0 | 75 | 115 | 0 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 0 | 190 | 0 | 1 | 36 | 149 | 4 | 0 |
| 1965 | 189 | 106 | 5 | 78 | 22 | 13 | 17 | 14 | 14 | 14 | 14 | 19 | 14 | 15 | 12 | 21 | 1 | 71 | 0 | 23 | 94 | 0 | 0 | 0 | 0 | 44 | 145 | 0 | 0 | 189 | 0 | 0 | 0 | 0 | 0 | 0 | 189 | 0 | 0 | 38 | 145 | 6 | 0 |
| 1966 | 214 | 138 | 3 | 73 | 14 | 21 | 25 | 16 | 17 | 17 | 17 | 23 | 13 | 18 | 16 | 17 | 21 | 70 | 0 | 9 | 114 | 0 | 0 | 0 | 0 | 184 | 30 | 0 | 0 | 214 | 0 | 0 | 0 | 0 | 0 | 0 | 214 | 0 | 0 | 51 | 163 | 0 | 0 |
| 1967 | 259 | 195 | 2 | 62 | 15 | 17 | 31 | 17 | 17 | 24 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 67 | 0 | 61 | 108 | 0 | 0 | 0 | 0 | 16 | 243 | 0 | 0 | 259 | 0 | 0 | 0 | 0 | 0 | 0 | 259 | 0 | 0 | 58 | 192 | 9 | 0 |
| 1968 | 262 | 215 | 2 | 45 | 14 | 16 | 16 | 23 | 23 | 23 | 21 | 31 | 23 | 23 | 23 | 26 | 23 | 70 | 0 | 65 | 104 | 0 | 0 | 0 | 0 | 4 | 258 | 0 | 0 | 259 | 3 | 0 | 0 | 0 | 0 | 0 | 262 | 0 | 10 | 66 | 180 | 6 | 0 |
| 1969 | 286 | 281 | 1 | 4 | 23 | 23 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 23 | 72 | 0 | 83 | 108 | 0 | 0 | 0 | 0 | 0 | 286 | 0 | 0 | 286 | 0 | 0 | 0 | 0 | 0 | 0 | 286 | 0 | 1 | 86 | 189 | 10 | 0 |
| 1970 | 359 | 276 | 1 | 82 | 17 | 24 | 24 | 24 | 24 | 24 | 51 | 24 | 51 | 23 | 51 | 22 | 23 | 70 | 0 | 80 | 105 | 81 | 14 | 0 | 0 | 0 | 314 | 0 | 31 | 305 | 0 | 0 | 0 | 0 | 0 | 54 | 359 | 0 | 3 | 173 | 177 | 6 | 0 |
| 1971 | 804 | 346 | 57 | 401 | 51 | 18 | 51 | 55 | 61 | 63 | 103 | 82 | 74 | 82 | 82 | 82 | 24 | 80 | 0 | 96 | 449 | 155 | 154 | 0 | 0 | 50 | 358 | 234 | 8 | 372 | 0 | 32 | 0 | 0 | 0 | 400 | 572 | 232 | 440 | 172 | 189 | 3 | 0 |
| 1972 | 851 | 168 | 97 | 586 | 73 | 73 | 73 | 56 | 56 | 75 | 71 | 85 | 43 | 98 | 94 | 54 | 14 | 86 | 0 | 95 | 545 | 111 | 73 | 0 | 0 | 154 | 193 | 431 | 0 | 246 | 0 | 101 | 0 | 0 | 0 | 504 | 506 | 345 | 657 | 104 | 89 | 1 | 0 |
| 1973 | 871 | 179 | 0 | 692 | 54 | 53 | 11 | 56 | 80 | 202 | 91 | 91 | 105 | 105 | 23 | 0 | 88 | 67 | 0 | 80 | 591 | 45 | 126 | 0 | 0 | 64 | 237 | 444 | 0 | 0 | 122 | 179 | 0 | 0 | 0 | 570 | 304 | 567 | 751 | 0 | 0 | 120 | 0 |
| 1974 | 748 | 175 | 0 | 573 | 156 | 137 | 75 | 0 | 27 | 26 | 166 | 62 | 55 | 26 | 18 | 0 | 138 | 147 | 73 | 174 | 216 | 0 | 0 | 0 | 0 | 568 | 105 | 75 | 0 | 0 | 498 | 175 | 0 | 0 | 0 | 75 | 478 | 270 | 257 | 0 | 0 | 38 | 453 |
| 1975 | 795 | 435 | 7 | 353 | 194 | 128 | 16 | 0 | 18 | 18 | 349 | 18 | 18 | 18 | 18 | 0 | 162 | 148 | 60 | 194 | 231 | 0 | 117 | 0 | 0 | 429 | 176 | 73 | 0 | 0 | 535 | 126 | 0 | 0 | 0 | 134 | 126 | 669 | 471 | 0 | 0 | 2 | 322 |
| 1976 | 1141 | 308 | 0 | 833 | 184 | 141 | 23 | 40 | 40 | 40 | 525 | 40 | 40 | 36 | 32 | 0 | 174 | 340 | 60 | 318 | 249 | 0 | 230 | 0 | 6 | 466 | 262 | 177 | 0 | 0 | 426 | 308 | 0 | 0 | 0 | 407 | 308 | 833 | 816 | 0 | 0 | 0 | 325 |
| 1977 | 876 | 182 | 0 | 694 | 0 | 0 | 182 | 0 | 26 | 26 | 493 | 71 | 26 | 26 | 26 | 0 | 113 | 243 | 8 | 284 | 228 | 0 | 172 | 0 | 23 | 269 | 130 | 282 | 0 | 0 | 240 | 182 | 0 | 0 | 0 | 454 | 182 | 694 | 771 | 0 | 0 | 0 | 105 |
| 1978 | 1130 | 208 | 0 | 922 | 94 | 214 | 79 | 0 | 26 | 90 | 396 | 66 | 26 | 26 | 26 | 87 | 171 | 366 | 78 | 220 | 285 | 10 | 22 | 0 | 73 | 544 | 153 | 179 | 159 | 0 | 583 | 181 | 0 | 0 | 0 | 366 | 181 | 949 | 551 | 0 | 16 | 2 | 561 |
| 1979 | 810 | 321 | 0 | 489 | 282 | 70 | 124 | 0 | 36 | 41 | 47 | 46 | 37 | 44 | 44 | 39 | 60 | 267 | 63 | 159 | 260 | 1 | 0 | 0 | 43 | 371 | 333 | 63 | 0 | 2 | 461 | 0 | 284 | 0 | 0 | 63 | 285 | 525 | 485 | 0 | 0 | 2 | 323 |
| 1980 | 559 | 248 | 0 | 311 | 28 | 48 | 46 | 18 | 49 | 51 | 50 | 50 | 58 | 52 | 52 | 57 | 129 | 145 | 0 | 115 | 170 | 0 | 0 | 0 | 367 | 0 | 192 | 0 | 0 | 0 | 140 | 0 | 0 | 419 | 0 | 0 | 362 | 197 | 558 | 0 | 0 | 1 | 0 |
| 1981 | 486 | 243 | 1 | 242 | 41 | 34 | 52 | 17 | 52 | 46 | 52 | 24 | 39 | 42 | 38 | 49 | 52 | 146 | 18 | 97 | 173 | 0 | 0 | 0 | 424 | 0 | 16 | 0 | 46 | 0 | 0 | 0 | 0 | 486 | 0 | 0 | 295 | 191 | 478 | 0 | 0 | 8 | 0 |
| 1982 | 580 | 261 | 0 | 319 | 11 | 67 | 80 | 54 | 53 | 40 | 40 | 45 | 50 | 46 | 46 | 48 | 43 | 180 | 37 | 140 | 180 | 0 | 0 | 0 | 580 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 538 | 0 | 42 | 364 | 216 | 577 | 0 | 0 | 3 | 0 |
| 1983 | 482 | 295 | 0 | 187 | 32 | 54 | 14 | 15 | 40 | 39 | 39 | 38 | 38 | 65 | 50 | 58 | 0 | 162 | 19 | 118 | 183 | 0 | 0 | 0 | 482 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 465 | 0 | 17 | 367 | 115 | 478 | 0 | 0 | 4 | 0 |
| 1984 | 475 | 261 | 1 | 213 | 19 | 13 | 38 | 45 | 50 | 49 | 47 | 46 | 37 | 49 | 49 | 33 | 0 | 212 | 21 | 95 | 147 | 0 | 0 | 0 | 461 | 0 | 0 | 0 | 14 | 0 | 3 | 0 | 0 | 472 | 0 | 0 | 475 | 0 | 471 | 0 | 0 | 4 | 0 |
| 1985 | 335 | 191 | 0 | 144 | 36 | 26 | 26 | 26 | 35 | 12 | 38 | 39 | 27 | 45 | 0 | 25 | 0 | 120 | 17 | 75 | 123 | 0 | 0 | 0 | 285 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 335 | 0 | 0 | 335 | 0 | 333 | 0 | 0 | 2 | 0 |
| 1986 | 374 | 374 | 0 | 0 | 22 | 24 | 25 | 24 | 37 | 35 | 37 | 37 | 37 | 37 | 36 | 23 | 0 | 135 | 0 | 117 | 122 | 0 | 0 | 0 | 374 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 374 | 0 | 0 | 374 | 0 | 374 | 0 | 0 | 0 | 0 |
| 1987 | 334 | 334 | 0 | 0 | 23 | 24 | 23 | 24 | 36 | 37 | 33 | 34 | 32 | 34 | 34 | 0 | 0 | 108 | 0 | 108 | 118 | 0 | 0 | 0 | 334 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 334 | 0 | 0 | 334 | 0 | 333 | 0 | 0 | 0 | 1 |
| 1988 | 889 | 802 | 87 | 0 | 69 | 69 | 62 | 48 | 82 | 82 | 82 | 82 | 82 | 82 | 80 | 69 | 576 | 97 | 0 | 105 | 111 | 0 | 0 | 0 | 889 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 889 | 0 | 0 | 313 | 576 | 885 | 0 | 0 | 0 | 4 |
| 1989 | 840 | 749 | 91 | 0 | 61 | 61 | 61 | 66 | 76 | 76 | 76 | 76 | 76 | 76 | 76 | 59 | 479 | 108 | 0 | 124 | 129 | 0 | 0 | 0 | 840 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 840 | 0 | 0 | 361 | 479 | 840 | 0 | 0 | 0 | 0 |
| 1990 | 827 | 739 | 88 | 0 | 61 | 61 | 61 | 61 | 76 | 76 | 77 | 75 | 76 | 69 | 76 | 58 | 473 | 108 | 0 | 119 | 127 | 0 | 0 | 279 | 548 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 827 | 0 | 0 | 354 | 473 | 826 | 0 | 0 | 0 | 1 |
| 1991 | 930 | 840 | 90 | 0 | 61 | 25 | 61 | 61 | 73 | 94 | 95 | 95 | 97 | 97 | 97 | 74 | 411 | 108 | 0 | 120 | 291 | 0 | 0 | 930 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 930 | 0 | 357 | 573 | 928 | 0 | 0 | 1 | 1 |
| 1992 | 982 | 891 | 91 | 0 | 79 | 47 | 79 | 79 | 97 | 88 | 88 | 88 | 89 | 88 | 88 | 72 | 404 | 110 | 0 | 124 | 344 | 0 | 0 | 982 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 982 | 0 | 361 | 621 | 975 | 0 | 0 | 7 | 0 |
| 1993 | 915 | 824 | 91 | 0 | 40 | 73 | 40 | 71 | 88 | 89 | 88 | 88 | 88 | 88 | 87 | 75 | 370 | 110 | 0 | 126 | 309 | 0 | 0 | 915 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 915 | 0 | 365 | 550 | 914 | 0 | 0 | 1 | 0 |
| 1994 | 911 | 820 | 91 | 0 | 40 | 73 | 40 | 73 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 69 | 368 | 110 | 0 | 124 | 309 | 0 | 0 | 911 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 911 | 0 | 363 | 548 | 906 | 0 | 0 | 5 | 0 |
| 1995 | 993 | 980 | 13 | 0 | 40 | 73 | 40 | 73 | 92 | 88 | 88 | 88 | 105 | 105 | 99 | 102 | 411 | 96 | 0 | 201 | 285 | 0 | 0 | 993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 993 | 0 | 314 | 679 | 984 | 0 | 0 | 9 | 0 |
| 1996 | 1176 | 1176 | 0 | 0 | 52 | 91 | 71 | 106 | 106 | 107 | 108 | 108 | 107 | 108 | 107 | 105 | 435 | 228 | 0 | 258 | 255 | 0 | 0 | 1176 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1176 | 0 | 279 | 897 | 1168 | 0 | 0 | 6 | 2 |
| 1997 | 1220 | 1220 | 0 | 0 | 68 | 105 | 66 | 98 | 110 | 111 | 111 | 112 | 111 | 112 | 111 | 105 | 425 | 265 | 0 | 264 | 266 | 0 | 0 | 1220 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1220 | 0 | 302 | 918 | 1217 | 0 | 0 | 3 | 0 |
| 1998 | 1262 | 1262 | 0 | 0 | 66 | 105 | 66 | 105 | 111 | 111 | 128 | 59 | 138 | 124 | 130 | 119 | 388 | 265 | 0 | 256 | 264 | 89 | 0 | 1262 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1262 | 0 | 322 | 940 | 1261 | 0 | 0 | 1 | 0 |
| 1999 | 1382 | 1382 | 0 | 0 | 79 | 122 | 80 | 122 | 120 | 118 | 119 | 118 | 122 | 124 | 131 | 127 | 402 | 264 | 0 | 264 | 265 | 187 | 0 | 1382 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1382 | 0 | 363 | 1019 | 1380 | 0 | 0 | 2 | 0 |
| 2000 | 1367 | 1367 | 0 | 0 | 52 | 129 | 85 | 101 | 158 | 111 | 128 | 125 | 121 | 141 | 111 | 105 | 433 | 250 | 17 | 266 | 265 | 136 | 0 | 1367 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1367 | 0 | 363 | 1004 | 1367 | 0 | 0 | 0 | 0 |
| 2001 | 1122 | 1122 | 0 | 0 | 30 | 30 | 30 | 75 | 112 | 144 | 111 | 112 | 135 | 136 | 111 | 96 | 384 | 230 | 35 | 230 | 230 | 13 | 0 | 1017 | 0 | 0 | 0 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 1122 | 0 | 277 | 845 | 1119 | 0 | 0 | 1 | 2 |
| 2002 | 1090 | 1090 | 0 | 0 | 66 | 90 | 66 | 90 | 96 | 106 | 96 | 97 | 95 | 96 | 96 | 96 | 288 | 264 | 0 | 264 | 264 | 10 | 0 | 1090 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1090 | 0 | 300 | 790 | 1089 | 0 | 0 | 1 | 0 |
| 2003 | 1191 | 1191 | 0 | 0 | 66 | 96 | 66 | 96 | 96 | 111 | 111 | 111 | 111 | 111 | 111 | 105 | 399 | 264 | 0 | 264 | 264 | 0 | 0 | 1191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1191 | 0 | 300 | 891 | 1191 | 0 | 0 | 0 | 0 |
| 2004 | 453 | 453 | 0 | 0 | 66 | 105 | 66 | 105 | 111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 110 | 0 | 110 | 110 | 0 | 0 | 453 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 453 | 0 | 125 | 328 | 453 | 0 | 0 | 0 | 0 |
| TOT | 31980 | 23313 | 953 | 7714 | 2472 | 2653 | 2171 | 2061 | 2659 | 2738 | 4452 | 2663 | 2655 | 2721 | 2525 | 2210 | 8329 | 6421 | 506 | 6064 | 9822 | 838 | 908 | 15168 | 5729 | 3323 | 4259 | 1958 | 635 | 3342 | 3011 | 1284 | 284 | 5979 | 12260 | 3086 | 14046 | 17934 | 23586 | 1042 | 2240 | 279 | 2100 |

Table 10. VIMS Trawl Survey Pooled Catch for June 2003 to May 2004. (Number of Trawls = 1224).

Adjusted Percent of Catch Excludes Bay Anchovy and Hogchoker

| Species | Number of Fish (All) | Frequency | Percent of Catch | Catch Per Trawl | Adjusted Percent of Catch | Number of Fish YOY | Average Length (mm) | Standard Error (length) | Minimum Length (mm) | Maximum Length (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| bay anchovy | 258,852 | 895 | 41.83 | 211.48 | . | 189,793 | 60 | 0.09 | 18 | 119 |
| Atlantic croaker | 191,466 | 780 | 30.94 | 156.43 | 61.79 | 185,869 | 77 | 0.57 | 11 | 438 |
| hogchoker | 50,186 | 730 | 8.11 | 41 | . | 10,044 | 86 | 0.22 | 19 | 194 |
| white perch | 42,204 | 428 | 6.82 | 34.48 | 13.62 | 14,694 | 117 | 0.39 | 16 | 294 |
| weakfish | 14,312 | 465 | 2.31 | 11.69 | 4.62 | 13,182 | 100 | 0.62 | 13 | 391 |
| spotted hake | 8,546 | 282 | 1.38 | 6.98 | 2.76 | 8,180 | 116 | 0.58 | 22 | 332 |
| blue catfish | 8,452 | 240 | 1.37 | 6.91 | 2.73 | 4,027 | 182 | 1.33 | 20 | 589 |
| spot | 5,720 | 409 | 0.92 | 4.67 | 1.85 | 4,919 | 146 | 0.54 | 20 | 300 |
| blue crab, male | 5,461 | 632 | 0.88 | 4.46 | 1.76 | . | 60 | 0.6 | 9 | 187 |
| blue crab, juvenile female | 4,023 | 591 | 0.65 | 3.29 | 1.3 | . | 50 | 0.48 | 9 | 144 |
| kingfish spp | 3,083 | 193 | 0.5 | 2.52 | 1 | 2,911 | 75 | 1.79 | 13 | 300 |
| striped bass | 2,950 | 229 | 0.48 | 2.41 | 0.95 | 2,738 | 113 | 1.56 | 15 | 589 |
| striped anchovy | 2,273 | 101 | 0.37 | 1.86 | 0.73 | 2,244 | 77 | 0.79 | 37 | 132 |
| northern searobin | 2,054 | 234 | 0.33 | 1.68 | 0.66 | 2,021 | 89 | 0.7 | 25 | 197 |
| alewife | 1,797 | 155 | 0.29 | 1.47 | 0.58 | 1,759 | 106 | 0.69 | 38 | 259 |
| Atlantic silverside | 1,674 | 119 | 0.27 | 1.37 | 0.54 | 1,665 | 89 | 0.35 | 59 | 127 |
| blueback herring | 1,661 | 104 | 0.27 | 1.36 | 0.54 | 1,655 | 81 | 0.54 | 33 | 264 |
| smallmouth flounder | 1,189 | 187 | 0.19 | 0.97 | 0.38 | 1,060 | 81 | 0.55 | 33 | 155 |
| white catfish | 1,091 | 152 | 0.18 | 0.89 | 0.35 | 684 | 148 | 3.32 | 19 | 449 |
| Atlantic menhaden | 1,012 | 179 | 0.16 | 0.83 | 0.33 | 395 | 89 | 1.29 | 28 | 314 |
| summer flounder | 944 | 328 | 0.15 | 0.77 | 0.3 | 494 | 261 | 3.54 | 12 | 607 |
| silver perch | 791 | 129 | 0.13 | 0.65 | 0.26 | 683 | 134 | 0.95 | 39 | 220 |
| naked goby | 770 | 157 | 0.12 | 0.63 | 0.25 | . | 42 | 0.29 | 20 | 61 |
| blue crab, adult female | 729 | 258 | 0.12 | 0.6 | 0.24 | . | 144 | 0.53 | 67 | 187 |
| blackcheek tonguefish | 635 | 166 | 0.1 | 0.52 | 0.2 | 116 | 138 | 0.95 | 15 | 206 |
| scup | 597 | 113 | 0.1 | 0.49 | 0.19 | 544 | 94 | 0.84 | 53 | 198 |
| channel catfish | 578 | 72 | 0.09 | 0.47 | 0.19 | 422 | 141 | 4.22 | 31 | 512 |
| oyster toadfish | 570 | 143 | 0.09 | 0.47 | 0.18 | . | 193 | 2.72 | 23 | 363 |
| gizzard shad | 556 | 122 | 0.09 | 0.45 | 0.18 | 416 | 181 | 3.05 | 53 | 397 |
| butterfish | 529 | 135 | 0.09 | 0.43 | 0.17 | 420 | 91 | 1.8 | 16 | 181 |
| northern pipefish | 444 | 161 | 0.07 | 0.36 | 0.14 | . | 124 | 1.41 | 61 | 236 |
| black seabass | 382 | 132 | 0.06 | 0.31 | 0.12 | 184 | 124 | 2.19 | 28 | 260 |
| lady crab | 364 | 64 | 0.06 | 0.3 | 0.12 | . | . | . | . | . |
| American shad | 317 | 74 | 0.05 | 0.26 | 0.1 | 317 | 109 | 1.54 | 33 | 169 |
| blue crab, sex unknown | 254 | 19 | 0.04 | 0.21 | 0.08 | . | 18 | 1.55 | 9 | 43 |
| American eel | 211 | 92 | 0.03 | 0.17 | 0.07 | . | 334 | 6.52 | 142 | 640 |
| rock crab | 204 | 65 | 0.03 | 0.17 | 0.07 | . | 30 | 1 | 6 | 99 |
| striped searobin | 157 | 60 | 0.03 | 0.13 | 0.05 | . | 71 | 2.3 | 30 | 212 |
| spottail shiner | 154 | 29 | 0.02 | 0.13 | 0.05 | . | 77 | 0.93 | 33 | 110 |
| windowpane | 137 | 70 | 0.02 | 0.11 | 0.04 | 100 | 141 | 6.33 | 17 | 313 |
| harvestfish | 108 | 46 | 0.02 | 0.09 | 0.03 | 106 | 69 | 2.28 | 23 | 158 |
| mantis shrimp | 92 | 43 | 0.01 | 0.08 | 0.03 | . | 94 | 2.92 | 38 | 143 |
| clearnose skate | 89 | 47 | 0.01 | 0.07 | 0.03 | . | 378 | 7.25 | 111 | 495 |
| spider crab, 6 spine | 81 | 58 | 0.01 | 0.07 | 0.03 | . | . | . | . | . |
| spider crab, common | 78 | 40 | 0.01 | 0.06 | 0.03 | . | . | . | . | . |
| inshore lizardfish | 75 | 41 | 0.01 | 0.06 | 0.02 | 54 | 156 | 7.33 | 51 | 291 |
| squid spp | 75 | 36 | 0.01 | 0.06 | 0.02 | . | 40 | 1.56 | 15 | 92 |
| northern puffer | 69 | 46 | 0.01 | 0.06 | 0.02 | 25 | 130 | 6.29 | 20 | 223 |
| channel (smooth) whelk | 63 | 35 | 0.01 | 0.05 | 0.02 | . | . | . | . | . |
| bluefish | 56 | 27 | 0.01 | 0.05 | 0.02 | . | 184 | 5.9 | 79 | 286 |
| pigfish | 54 | 31 | 0.01 | 0.04 | 0.02 | . | 170 | 3.78 | 83 | 213 |
| seaboard goby | 53 | 34 | 0.01 | 0.04 | 0.02 | . | 40 | 1.04 | 27 | 55 |
| knobbed whelk | 53 | 34 | 0.01 | 0.04 | 0.02 | . | . | . | . | . |
| hickory shad | 47 | 23 | 0.01 | 0.04 | 0.02 | . | 91 | 3.68 | 58 | 156 |
| skilletfish | 45 | 31 | 0.01 | 0.04 | 0.01 | . | 53 | 1.61 | 27 | 78 |
| lined seahorse | 33 | 29 | 0.01 | 0.03 | 0.01 | . | 66 | 3.34 | 30 | 126 |

Table 10 (cont.)

| Species | Number of Fish (All) | Frequency | Percent of Catch | Catch Per Trawl | Adjusted Percent of Catch | Number of Fish YOY | Average Length (mm) | Standard Error (length) | Minimum Length (mm) | Maximum Length (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| eastern silvery minnow | 27 | 11 | 0 | 0.02 | 0.01 | . | 93 | 1.13 | 81 | 106 |
| shelligs blue crab | 26 | 9 | 0 | 0.02 | 0.01 | . | . | . | . | . |
| sea lamprey | 24 | 11 | 0 | 0.02 | 0.01 | . | 163 | 3.16 | 131 | 191 |
| black drum | 23 | 18 | 0 | 0.02 | 0.01 | . | 236 | 35.99 | 154 | 1017 |
| common carp | 23 | 13 | 0 | 0.02 | 0.01 | . | 268 | 31.23 | 119 | 760 |
| Portunid spp | 19 | 14 | 0 | 0.02 | 0.01 | . | . | . | . | . |
| green goby | 19 | 10 | 0 | 0.02 | 0.01 | . | 46 | 1.54 | 33 | 56 |
| brown bullhead | 18 | 12 | 0 | 0.01 | 0.01 | . | 120 | 12.62 | 71 | 258 |
| red hake | 18 | 7 | 0 | 0.01 | 0.01 | . | 169 | 10.49 | 98 | 270 |
| Atlantic herring | 17 | 10 | 0 | 0.01 | 0.01 | . | 224 | 23.13 | 56 | 301 |
| red drum | 15 | 10 | 0 | 0.01 | 0 | . | 63 | 7.59 | 33 | 120 |
| Atlantic thread herring | 14 | 11 | 0 | 0.01 | 0 | . | 96 | 15.11 | 43 | 175 |
| Atlantic moonfish | 13 | 12 | 0 | 0.01 | 0 | . | 70 | 5.17 | 45 | 110 |
| lesser blue crab | 13 | 7 | 0 | 0.01 | 0 | . | . | . | . | . |
| horseshoe crab | 12 | 10 | 0 | 0.01 | 0 | . | 241 | 10.82 | 190 | 304 |
| smooth dogfish | 12 | 8 | 0 | 0.01 | 0 | . | 536 | 36.26 | 348 | 745 |
| bluntnose stingray | 11 | 9 | 0 | 0.01 | 0 | . | 396 | 60.3 | 201 | 760 |
| smooth butterfly ray | 11 | 7 | 0 | 0.01 | 0 | . | 478 | 41.05 | 315 | 830 |
| longnose gar | 10 | 9 | 0 | 0.01 | 0 | . | 665 | 95.49 | 71 | 1020 |
| chain pipefish | 10 | 8 | 0 | 0.01 | 0 | . | 189 | 21.7 | 66 | 290 |
| winter flounder | 10 | 6 | 0 | 0.01 | 0 | . | 100 | 30.52 | 42 | 373 |
| blotched swimming crab | 10 | 4 | 0 | 0.01 | 0 | . | . | . | . | . |
| feather blenny | 7 | 7 | 0 | 0.01 | 0 | . | 85 | 8.48 | 49 | 109 |
| Atlantic spadefish | 7 | 6 | 0 | 0.01 | 0 | . | 278 | 82.92 | 48 | 535 |
| tautog | 7 | 4 | 0 | 0.01 | 0 | . | 292 | 37.02 | 113 | 422 |
| cownose ray | 7 | 4 | 0 | 0.01 | 0 | . | 621 | 99.86 | 326 | 970 |
| roughneck shrimp | 6 | 8 | 0 | 0 | 0 | . | . | . | . | . |
| Atlantic stingray | 6 | 6 | 0 | 0 | 0 | . | 300 | 41.65 | 160 | 433 |
| striped burrfish | 6 | 5 | 0 | 0 | 0 | . | 212 | 41.13 | 124 | 340 |
| fourspot flounder | 5 | 5 | 0 | 0 | 0 | . | 110 | 16.15 | 54 | 147 |
| threadfin shad | 5 | 5 | 0 | 0 | 0 | . | 86 | 6.93 | 65 | 108 |
| conger eel | 4 | 4 | 0 | 0 | 0 | . | 355 | 28.72 | 307 | 438 |
| northern stargazer | 4 | 4 | 0 | 0 | 0 | . | 56 | 8.87 | 40 | 74 |
| irredescent swimming crab | 4 | 4 | 0 | 0 | 0 | . | . | . | . | . |
| tessellated darter | 4 | 3 | 0 | 0 | 0 | . | 70 | 3.57 | 60 | 77 |
| inland silverside | 4 | 3 | 0 | 0 | 0 | . | 74 | 3.09 | 66 | 81 |
| fringed flounder | 4 | 3 | 0 | 0 | 0 | . | 92 | 15.6 | 70 | 138 |
| Atlantic cutlassfish | 4 | 2 | 0 | 0 | 0 | . | 566 | 72.36 | 428 | 730 |
| dusky pipefish | 3 | 3 | 0 | 0 | 0 | . | 92 | 10.21 | 76 | 111 |
| striped blenny | 3 | 3 | 0 | 0 | 0 | . | 80 | 10.58 | 64 | 100 |
| striped cusk-eel | 3 | 3 | 0 | 0 | 0 | . | 167 | 15.68 | 136 | 184 |
| bluespotted cornetfish | 3 | 2 | 0 | 0 | 0 | . | 168 | 21.03 | 145 | 210 |
| silver hake | 2 | 2 | 0 | 0 | 0 | . | 122 | 4 | 118 | 126 |
| bluegill | 2 | 2 | 0 | 0 | 0 | . | 76 | 30.5 | 45 | 106 |
| banded drum | 2 | 2 | 0 | 0 | 0 | . | 63 | 36 | 27 | 99 |
| striped mullet | 2 | 2 | 0 | 0 | 0 | . | 186 | 11 | 175 | 197 |
| flathead catfish | 1 | 1 | 0 | 0 | 0 | . | 128 | . | 128 | 128 |
| banded killifish | 1 | 1 | 0 | 0 | 0 | . | 35 | . | 35 | 35 |
| mummichog | 1 | 1 | 0 | 0 | 0 | . | 58 | . | 58 | 58 |
| southern stingray | 1 | 1 | 0 | 0 | 0 | . | 577 | . | 577 | 577 |
| spiny butterfly ray | 1 | 1 | 0 | 0 | 0 | . | 890 | . | 890 | 890 |
| bullnose ray | 1 | 1 | 0 | 0 | 0 | . | 264 | . | 264 | 264 |
| eastern mudminnow | 1 | 1 | 0 | 0 | 0 | . | 52 | . | 52 | 52 |
| Atlantic sturgeon | 1 | 1 | 0 | 0 | 0 | . | 170 | . | 170 | 170 |
| pinfish | 1 | 1 | 0 | 0 | 0 | . | 192 | . | 192 | 192 |
| bluespotted sunfish | 1 | 1 | 0 | 0 | 0 | . | 49 | . | 49 | 49 |
| pink shrimp | 1 | 1 | 0 | 0 | 0 | . | 106 | . | 106 | 106 |
| white shrimp | 1 | 1 | 0 | 0 | 0 | . | 165 | . | 165 | 165 |

All Species Combined 618,880

Table 11.

**SPOT INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1955 | 1.58 | 1.27-1.92 | 6.61 | 1.48 | 1.24-1.75 | 5.65 | 17 | | | | |
| 1956 | 98.77 | 50.85-190.95 | 7.11 | 37.41 | 19.41-71.31 | 8.67 | 62 | | | | |
| 1957 | 24.87 | 6.38-89.67 | 19.28 | 8.09 | 2.22-24.68 | 23.52 | 47 | | | | |
| 1958 | 7.22 | 3.41-14.33 | 14.78 | 2.86 | 1.15-5.93 | 21.62 | 56 | | | | |
| 1959 | 13.01 | 5.14-30.97 | 15.63 | 3.23 | 1.11-7.48 | 24.10 | 59 | | | | |
| 1960 | 9.30 | 0.33-78.52 | 43.83 | 4.56 | 0.21-24.55 | 44.45 | 27 | | | | |
| 1961 | 8.81 | 2.03-30.81 | 25.75 | 2.76 | 0.48-8.52 | 35.07 | 27 | | | | |
| 1962 | 191.03 | 30.41-1172.8 | 17.22 | 57.43 | 6.14-476.82 | 25.83 | 20 | | | | |
| 1963 | 13.25 | 1.02-99.35 | 36.74 | 5.67 | 0.48-29.06 | 39.70 | 32 | | | | |
| 1964 | 37.85 | 17.32-81.36 | 10.27 | 10.14 | 4.71-20.73 | 13.86 | 54 | | | | |
| 1965 | 2.20 | 0.86-4.49 | 23.24 | 0.96 | 0.43-1.7 | 23.69 | 52 | | | | |
| 1966 | 37.96 | 15.86-89.01 | 11.43 | 17.80 | 6.34-47.17 | 16.04 | 63 | | | | |
| 1967 | 6.02 | 1.34-20.08 | 28.22 | 2.01 | 0.4-5.45 | 34.70 | 88 | | | | |
| 1968 | 143.77 | 58.12-353.49 | 9.00 | 45.03 | 16.33-121.25 | 12.75 | 87 | | | | |
| 1969 | 52.50 | 25.53-106.89 | 8.81 | 19.38 | 9.56-38.32 | 10.90 | 91 | | | | |
| 1970 | 5.59 | 0.1-38.52 | 47.51 | 2.67 | 0-14.4 | 55.07 | 91 | | | | |
| 1971 | 82.09 | 56.47-119.15 | 4.17 | 24.26 | 16.42-35.63 | 5.75 | 265 | | | | |
| 1972 | 98.08 | 91.85-104.73 | 0.71 | 40.46 | 37.97-43.12 | 0.83 | 211 | | | | |
| 1973 | 13.57 | 9.87-18.53 | 5.46 | 11.19 | 8.26-15.06 | 5.51 | 348 | | | | |
| 1974 | 15.62 | 6.85-34.21 | 13.35 | 9.72 | 4.12-21.44 | 15.58 | 243 | | | | |
| 1975 | 33.24 | 21.82-50.36 | 5.74 | 20.90 | 13.6-31.83 | 6.56 | 334 | | | | |
| 1976 | 14.03 | 10.06-19.42 | 5.65 | 7.41 | 5.36-10.12 | 6.55 | 587 | | | | |
| 1977 | 28.75 | 20.47-40.23 | 4.81 | 15.62 | 11.39-21.31 | 5.23 | 530 | | | | |
| 1978 | 9.79 | 6.4-14.71 | 7.91 | 5.54 | 3.73-8.05 | 8.64 | 413 | | | | |
| 1979 | 49.03 | 42.94-55.95 | 1.66 | 25.68 | 22.39-29.43 | 2.00 | 127 | | | 17.29 | 123 |
| 1980 | 16.46 | 10.92-24.6 | 6.68 | 19.09 | 13.01-27.83 | 6.01 | 158 | | | 8.94 | 146 |
| 1981 | 31.69 | 25.22-39.76 | 3.16 | 44.59 | 35.32-56.23 | 2.98 | 146 | | | 31.06 | 137 |
| 1982 | 58.50 | 30.94-109.84 | 7.61 | 76.95 | 39.99-147.22 | 7.38 | 156 | | | 36.52 | 151 |
| 1983 | 14.99 | 12.06-18.59 | 3.65 | 21.42 | 17.19-26.65 | 3.37 | 151 | | | 21.51 | 151 |
| 1984 | 41.62 | 22.86-75.15 | 7.73 | 56.84 | 31.93-100.58 | 6.94 | 127 | | | 50.28 | 132 |
| 1985 | 11.90 | 6.98-19.84 | 9.38 | 15.97 | 9.46-26.55 | 8.55 | 117 | | | 19.59 | 118 |
| 1986 | 21.07 | 16.1-27.48 | 4.12 | 30.68 | 23.27-40.35 | 3.85 | 144 | | | 26.32 | 144 |
| 1987 | 8.96 | 7.1-11.24 | 4.50 | 12.96 | 10.32-16.21 | 3.97 | 133 | | | 20.45 | 133 |
| 1988 | 50.91 | 35.51-72.8 | 4.45 | 67.01 | 46.36-96.67 | 4.29 | 231 | 67.45 | 231 | 50.20 | 84 |
| 1989 | 22.46 | 17.7-28.45 | 3.60 | 31.41 | 24.51-40.18 | 3.44 | 252 | 32.27 | 252 | 54.19 | 84 |
| 1990 | 33.88 | 24.63-46.46 | 4.34 | 44.78 | 32.34-61.85 | 4.14 | 248 | 45.28 | 248 | 53.06 | 81 |
| 1991 | 16.83 | 12.78-22.08 | 4.48 | 16.83 | 12.78-22.08 | 4.48 | 334 | 16.56 | 238 | 21.44 | 83 |
| 1992 | 2.02 | 1.54-2.58 | 7.78 | 2.02 | 1.54-2.58 | 7.78 | 301 | 1.96 | 238 | 4.39 | 82 |
| 1993 | 9.99 | 7.45-13.3 | 5.48 | 9.99 | 7.45-13.3 | 5.48 | 300 | 9.74 | 240 | 11.85 | 84 |
| 1994 | 9.68 | 7.28-12.79 | 5.38 | 9.68 | 7.28-12.79 | 5.38 | 300 | 9.07 | 240 | 8.88 | 84 |
| 1995 | 1.81 | 1.39-2.3 | 7.87 | 1.81 | 1.39-2.3 | 7.87 | 352 | 1.52 | 248 | 2.37 | 92 |
| 1996 | 5.26 | 4.15-6.60 | 5.30 | 5.26 | 4.15-6.60 | 5.30 | 407 | 4.52 | 244 | 4.84 | 88 |
| 1997 | 11.50 | 9.11-14.45 | 4.20 | 11.50 | 9.11-14.45 | 4.20 | 421 | 8.63 | 256 | 19.68 | 100 |
| 1998 | 2.51 | 1.92-3.23 | 7.36 | 2.51 | 1.92-3.23 | 7.36 | 374 | 1.88 | 214 | 3.04 | 96 |
| 1999 | 4.72 | 3.63-6.07 | 6.07 | 4.72 | 3.63-6.07 | 6.07 | 402 | 3.98 | 238 | 6.61 | 100 |
| 2000 | 3.32 | 2.57-4.23 | 6.51 | 3.32 | 2.57-4.23 | 6.51 | 421 | 2.70 | 253 | 4.94 | 97 |
| 2001 | 3.09 | 2.45-3.85 | 6.06 | 3.09 | 2.45-3.85 | 6.06 | 432 | 2.83 | 264 | 3.69 | 100 |
| 2002 | 2.89 | 2.10-3.88 | 8.38 | 2.89 | 2.10-3.88 | 8.38 | 360 | 2.09 | 196 | 3.12 | 100 |
| 2003 | 2.85 | 2.25-3.56 | 6.32 | 2.85 | 2.25-3.56 | 6.32 | 420 | 2.58 | 256 | 2.32 | 100 |
| 2004 | . | . | . | . | . | . | . | . | . | . | . |

Table 12.

**FALL ATLANTIC CROAKER (YOY) INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| | | | | | | | | | | | |
| 1955 | | 0 | | | 0 | | 0 | | | | |
| 1956 | 2.68 | 1.22-5.11 | 19.41 | 3.98 | 1.92-7.52 | 16.68 | 27 | | | | |
| 1957 | 3.62 | 1.54-7.4 | 19.54 | 4.04 | 1.98-7.52 | 16.26 | 27 | | | | |
| 1958 | 1.32 | 0.41-2.81 | 29.54 | 1.6 | 0.5-3.5 | 28.67 | 27 | | | | |
| 1959 | 2.14 | 1.15-3.58 | 16.52 | 1.11 | 0.58-1.82 | 19.45 | 18 | | | | |
| 1960 | | 0 | | | 0 | | 0 | | | | |
| 1961 | 1.2 | 1.02-1.39 | 5.40 | 0.77 | 0.67-0.88 | 4.94 | 15 | | | | |
| 1962 | 0.3 | 0-1.02 | 83.36 | 0.3 | 0-1.02 | 83.36 | 12 | | | | |
| 1963 | 0.72 | 0.06-1.8 | 45.00 | 0.81 | 0.07-2.04 | 44.14 | 17 | | | | |
| 1964 | 0.67 | 0.32-1.11 | 22.99 | 0.67 | 0.33-1.11 | 22.59 | 27 | | | | |
| 1965 | 2.17 | 1.16-3.67 | 16.71 | 1.66 | 0.95-2.64 | 15.97 | 43 | | | | |
| 1966 | 2 | 1.13-3.25 | 15.73 | 1.91 | 1.09-3.05 | 15.54 | 42 | | | | |
| 1967 | 0.04 | 0-0.11 | 100.00 | 0.02 | 0-0.06 | 100.00 | 60 | | | | |
| 1968 | 2.1 | 0.57-5.12 | 30.01 | 1.45 | 0.39-3.32 | 31.69 | 60 | | | | |
| 1969 | 27.98 | 18.79-41.44 | 5.67 | 12.75 | 8.63-18.65 | 6.80 | 63 | | | | |
| 1970 | 3.4 | 1.74-6.05 | 15.97 | 1.96 | 1.03-3.32 | 17.38 | 61 | | | | |
| 1971 | 4.7 | 2.85-7.44 | 11.29 | 2.45 | 1.55-3.68 | 12.31 | 177 | | | | |
| 1972 | 6.1 | 4.59-8.02 | 6.11 | 4.94 | 3.69-6.52 | 6.63 | 188 | | | | |
| 1973 | 5.88 | 4.1-8.27 | 7.75 | 3.89 | 2.69-5.47 | 8.82 | 116 | | | | |
| 1974 | 0.87 | 0.54-1.27 | 15.46 | 0.87 | 0.54-1.27 | 15.46 | 44 | | | | |
| 1975 | 7.64 | 4.82-11.83 | 9.15 | 7.64 | 4.82-11.83 | 9.15 | 36 | | | | |
| 1976 | 5.8 | 3.6-9.05 | 10.18 | 9.09 | 5.57-14.48 | 9.26 | 68 | | | | |
| 1977 | 2.97 | 1.89-4.45 | 11.49 | 2.97 | 1.89-4.45 | 11.49 | 52 | | | | |
| 1978 | 6.91 | 5.32-8.89 | 5.41 | 5.17 | 3.97-6.66 | 5.93 | 128 | | | | |
| 1979 | 5.37 | 3.9-7.27 | 7.06 | 3.86 | 2.81-5.19 | 7.65 | 100 | | | 4.69 | 63 |
| 1980 | 3.35 | 2.33-4.67 | 9.05 | 2.01 | 1.43-2.74 | 9.76 | 117 | | | 2.53 | 70 |
| 1981 | 4.78 | 3.3-6.77 | 8.44 | 3.52 | 2.43-4.96 | 9.16 | 122 | | | 2.86 | 75 |
| 1982 | 6.19 | 4.64-8.15 | 6.13 | 4.93 | 3.72-6.45 | 6.42 | 114 | | | 3.20 | 102 |
| 1983 | 8.11 | 5.24-12.3 | 8.56 | 6.37 | 4.24-9.36 | 8.52 | 102 | | | 7.32 | 103 |
| 1984 | 54.69 | 41.51-71.95 | 3.36 | 39.91 | 30.2-52.64 | 3.65 | 83 | | | 45.77 | 86 |
| 1985 | 89.77 | 72.21-111.54 | 2.38 | 71.76 | 56.56-90.97 | 2.73 | 57 | | | 74.98 | 57 |
| 1986 | 20.53 | 13.76-30.4 | 6.15 | 15.94 | 10.5-23.97 | 6.85 | 94 | | | 12.63 | 94 |
| 1987 | 7.21 | 4.87-10.49 | 7.98 | 5.47 | 3.77-7.76 | 8.14 | 68 | | | 6.49 | 68 |
| 1988 | 9.35 | 5.76-14.84 | 9.11 | 7.46 | 4.68-11.6 | 9.33 | 65 | | | 9.05 | 65 |
| 1989 | 60.27 | 35.47-101.95 | 6.30 | 45.95 | 27.78-75.59 | 6.36 | 65 | | | 64.78 | 65 |
| 1990 | 11.68 | 7.8-17.28 | 7.20 | 9.41 | 6.36-13.74 | 7.42 | 60 | | | 13.15 | 60 |
| 1991 | 5.71 | 3.94-8.1 | 8.02 | 5.71 | 3.94-8.1 | 8.02 | 132 | | | 9.57 | 63 |
| 1992 | 10.54 | 6.95-15.75 | 7.62 | 10.54 | 6.95-15.75 | 7.62 | 112 | | | 14.60 | 67 |
| 1993 | 4.54 | 2.84-7.0 | 10.72 | 4.54 | 2.84-7.0 | 10.72 | 113 | | | 5.42 | 69 |
| 1994 | 10.45 | 6.7-16.04 | 8.15 | 10.45 | 6.7-16.04 | 8.15 | 112 | | | 13.48 | 67 |
| 1995 | 12.75 | 9.61-16.81 | 4.94 | 12.75 | 9.61-16.81 | 4.94 | 180 | | | 11.79 | 69 |
| 1996 | 32.46 | 20.05-52.17 | 6.60 | 32.46 | 20.05-52.17 | 6.60 | 191 | | | 31.06 | 69 |
| 1997 | 7.94 | 5.08-12.12 | 8.77 | 7.94 | 5.08-12.12 | 8.77 | 199 | | | 10.41 | 75 |
| 1998 | 24.15 | 16.74-34.65 | 5.41 | 24.15 | 16.74-34.65 | 5.41 | 199 | | | 21.26 | 75 |
| 1999 | 11.27 | 7.25-17.23 | 7.90 | 11.27 | 7.25-17.23 | 7.90 | 198 | | | 14.33 | 75 |
| 2000 | 7.68 | 5.50-10.60 | 6.70 | 7.68 | 5.50-10.60 | 6.70 | 197 | | | 5.96 | 74 |
| 2001 | 5.73 | 4.05-7.96 | 7.54 | 5.73 | 4.05-7.96 | 7.54 | 198 | | | 7.05 | 75 |
| 2002 | 6.84 | 4.48-10.20 | 8.68 | 6.84 | 4.48-10.20 | 8.68 | 198 | | | 10.35 | 75 |
| 2003 | 100.36 | 68.35-147.16 | 4.11 | 100.36 | 68.35-147.16 | 4.11 | 198 | | | 96.17 | 75 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 13.

**SPRING ATLANTIC CROAKER (RECRUITS) INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1955 | 0.31 | 0.17-0.45 | 20.15 | 0.45 | 0.3-0.61 | 14.47 | 20 | | | | |
| 1956 | 3.28 | 1.2-7.3 | 22.81 | 4.92 | 2.05-10.48 | 18.66 | 48 | | | | |
| 1957 | 13.62 | 0.11-191.83 | 48.08 | 11.70 | 0.15-139.59 | 47.30 | 28 | | | | |
| 1958 | 0.30 | 0-0.88 | 71.25 | 0.40 | 0-1.22 | 68.83 | 59 | | | | |
| 1959 | 0.04 | 0-0.88 | 46.61 | 0.04 | 0.01-0.07 | 41.19 | 48 | | | | |
| 1960 | 0.24 | 0-0.6 | 57.76 | 0.35 | 0-0.97 | 62.28 | 54 | | | | |
| 1961 | 0.36 | 0-1.05 | 67.92 | 0.24 | 0-0.62 | 63.83 | 28 | | | | |
| 1962 | 0.79 | 0.56-1.05 | 11.74 | 0.67 | 0.47-0.91 | 12.66 | 28 | | | | |
| 1963 | 0.01 | 0-0.04 | 86.67 | 0.01 | 0-0.03 | 70.15 | 28 | | | | |
| 1964 | 0.35 | 0.16-0.57 | 25.21 | 0.32 | 0.18-0.48 | 20.50 | 55 | | | | |
| 1965 | 4.01 | 1.98-7.4 | 16.06 | 2.93 | 1.58-4.98 | 15.33 | 48 | | | | |
| 1966 | 0.00 | 0-0.01 | . | 0.00 | 0-0.01 | . | 66 | | | | |
| 1967 | 0.34 | 0.19-0.5 | 19.83 | 0.26 | 0.15-0.38 | 19.42 | 83 | | | | |
| 1968 | 0.11 | 0.03-0.2 | 35.79 | 0.07 | 0.02-0.14 | 39.09 | 87 | | | | |
| 1969 | 0.26 | 0.15-0.39 | 20.62 | 0.18 | 0.1-0.26 | 21.44 | 91 | | | | |
| 1970 | 0.06 | 0-0.12 | 52.38 | 0.03 | 0-0.06 | 49.09 | 92 | | | | |
| 1971 | 0.23 | 0.12-0.34 | 21.94 | 0.15 | 0.08-0.24 | 24.38 | 228 | | | | |
| 1972 | 4.37 | 0-31.89 | 53.90 | 3.63 | 0-24.42 | 55.62 | 210 | | | | |
| 1973 | 0.12 | 0.09-0.16 | 14.60 | 0.09 | 0.07-0.13 | 14.98 | 417 | | | | |
| 1974 | 2.04 | 1.2-3.19 | 14.45 | 1.68 | 1.03-2.54 | 14.09 | 241 | | | | |
| 1975 | 2.63 | 1.64-3.98 | 12.28 | 2.00 | 1.29-2.94 | 12.40 | 334 | | | | |
| 1976 | 1.08 | 0.84-1.37 | 8.65 | 0.78 | 0.6-0.97 | 9.00 | 591 | | | | |
| 1977 | 0.15 | 0.1-0.2 | 16.42 | 0.11 | 0.06-0.15 | 20.39 | 530 | | | | |
| 1978 | 0.08 | 0.05-0.11 | 16.61 | 0.05 | 0.03-0.07 | 17.94 | 413 | | | | |
| 1979 | 2.18 | 1.44-3.14 | 11.43 | 1.30 | 0.9-1.79 | 11.44 | 119 | | | 2.06 | 117 |
| 1980 | 0.52 | 0.39-0.66 | 10.98 | 0.44 | 0.34-0.55 | 10.12 | 152 | | | 1.85 | 137 |
| 1981 | 0.07 | 0.04-0.1 | 19.67 | 0.07 | 0.04-0.1 | 20.36 | 140 | | | 0.24 | 132 |
| 1982 | 0.11 | 0.07-0.14 | 14.68 | 0.11 | 0.07-0.14 | 15.05 | 168 | | | 1.23 | 148 |
| 1983 | 6.59 | 4.94-8.71 | 6.06 | 6.67 | 4.98-8.84 | 6.10 | 156 | | | 9.49 | 156 |
| 1984 | 1.63 | 0.83-2.77 | 18.72 | 1.61 | 0.83-2.73 | 18.59 | 140 | | | 1.23 | 144 |
| 1985 | 4.98 | 4.18-5.92 | 4.05 | 5.33 | 4.4-6.42 | 4.31 | 106 | | | 4.07 | 106 |
| 1986 | 2.97 | 2.25-3.84 | 7.18 | 3.33 | 2.52-4.32 | 7.03 | 142 | | | 3.19 | 142 |
| 1987 | 4.24 | 3.47-5.14 | 4.81 | 4.24 | 3.47-5.14 | 4.80 | 139 | | | 5.47 | 139 |
| 1988 | 0.32 | 0.21-0.44 | 15.52 | 0.36 | 0.23-0.49 | 16.05 | 234 | 0.38 | 234 | 2.22 | 84 |
| 1989 | 0.60 | 0.38-0.85 | 15.51 | 0.65 | 0.41-0.93 | 15.63 | 252 | 0.78 | 252 | 4.63 | 84 |
| 1990 | 0.43 | 0.23-0.67 | 21.19 | 0.48 | 0.26-0.74 | 20.56 | 252 | 0.52 | 252 | 2.98 | 85 |
| 1991 | 4.41 | 3.08-6.18 | 8.36 | 4.41 | 3.08-6.18 | 8.36 | 307 | 4.35 | 238 | 12.87 | 83 |
| 1992 | 1.28 | 0.87-1.78 | 12.10 | 1.28 | 0.87-1.78 | 12.10 | 309 | 1.34 | 240 | 10.26 | 84 |
| 1993 | 2.17 | 1.5-3.02 | 10.34 | 2.17 | 1.5-3.02 | 10.34 | 301 | 2.21 | 240 | 19.40 | 84 |
| 1994 | 0.90 | 0.6-1.26 | 13.54 | 0.90 | 0.6-1.26 | 13.54 | 300 | 0.95 | 240 | 2.98 | 84 |
| 1995 | 1.06 | 0.77-1.39 | 10.40 | 1.06 | 0.77-1.39 | 10.40 | 306 | 0.93 | 246 | 5.55 | 90 |
| 1996 | 0.19 | 0.11-0.28 | 19.63 | 0.19 | 0.11-0.28 | 19.63 | 405 | 0.16 | 242 | 0.36 | 88 |
| 1997 | 1.47 | 1.15-1.85 | 7.78 | 1.47 | 1.15-1.85 | 7.78 | 419 | 0.87 | 255 | 7.78 | 100 |
| 1998 | 1.19 | 0.95-1.47 | 7.51 | 1.19 | 0.95-1.47 | 7.51 | 374 | 0.48 | 214 | 6.21 | 96 |
| 1999 | 1.50 | 1.05-2.05 | 10.83 | 1.50 | 1.05-2.05 | 10.83 | 397 | 1.28 | 232 | 4.08 | 100 |
| 2000 | 0.60 | 0.42-0.80 | 12.68 | 0.60 | 0.42-0.80 | 12.68 | 413 | 0.44 | 245 | 1.39 | 97 |
| 2001 | 0.37 | 0.25-0.49 | 14.38 | 0.37 | 0.25-0.49 | 14.38 | 420 | 0.32 | 256 | 1.18 | 100 |
| 2002 | 1.59 | 1.07-2.22 | 11.59 | 1.59 | 1.07-2.22 | 11.59 | 361 | 1.11 | 197 | 4.80 | 100 |
| 2003 | 0.49 | 0.28-0.74 | 19.19 | 0.49 | 0.28-0.74 | 19.19 | 405 | 0.52 | 241 | 0.28 | 100 |
| 2004* | 0.24 | 0.22-0.26 | 3.87 | 0.24 | 0.22-0.26 | 3.87 | 88 | 0.12 | 57 | 1.38 | 18 |

Table 14.

**WEAKFISH INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1955 | 2.35 | 0 | | 3.07 | 0 | | 4 | | | | |
| 1956 | 24.49 | 10.4-56.02 | 12.43 | 39.89 | 17.24-90.67 | 10.88 | 47 | | | | |
| 1957 | 23.10 | 13.45-39.19 | 8.03 | 29.32 | 19.76-43.28 | 5.55 | 43 | | | | |
| 1958 | 1.13 | 0.36-2.32 | 29.56 | 2.12 | 0.91-4.1 | 21.62 | 43 | | | | |
| 1959 | 18.34 | 8.33-39.11 | 12.31 | 10.10 | 1.47-48.79 | 31.19 | 42 | | | | |
| 1960 | 1.38 | 0.76-2.21 | 17.25 | 1.91 | 1.14-2.96 | 14.45 | 13 | | | | |
| 1961 | 1.77 | 0.32-4.81 | 36.44 | 3.12 | 0.79-8.47 | 29.39 | 20 | | | | |
| 1962 | 3.58 | 2.86-4.43 | 5.59 | 3.59 | 2.87-4.44 | 5.58 | 13 | | | | |
| 1963 | 6.50 | 0-88.61 | 61.59 | 9.12 | 0-188.19 | 63.23 | 24 | | | | |
| 1964 | 23.60 | 7.08-73.94 | 17.39 | 21.85 | 6.46-69.03 | 17.90 | 39 | | | | |
| 1965 | 4.19 | 2.74-6.2 | 9.97 | 4.47 | 3.04-6.4 | 8.91 | 40 | | | | |
| 1966 | 11.34 | 3.19-35.34 | 21.50 | 11.54 | 3.61-33.16 | 19.80 | 48 | | | | |
| 1967 | 0.49 | 0.13-0.96 | 34.48 | 0.45 | 0.13-0.86 | 33.93 | 66 | | | | |
| 1968 | 6.45 | 0.81-29.6 | 35.17 | 6.97 | 1.16-28.37 | 21.41 | 67 | | | | |
| 1969 | 8.96 | 3.31-22 | 18.22 | 5.02 | 0.58-21.87 | 37.22 | 68 | | | | |
| 1970 | 26.65 | 24.06-29.51 | 1.48 | 18.82 | 4.93-65.26 | 20.20 | 68 | | | | |
| 1971 | 12.10 | 8.8-16.52 | 5.64 | 11.49 | 6.96-18.61 | 8.93 | 183 | | | | |
| 1972 | 0.70 | 0.58-0.82 | 6.87 | 0.51 | 0.41-0.61 | 8.06 | 157 | | | | |
| 1973 | 1.75 | 1.2-2.43 | 10.90 | 1.05 | 0.71-1.46 | 12.59 | 267 | | | | |
| 1974 | 0.31 | 0.28-0.34 | 3.73 | 0.25 | 0.23-0.28 | 3.89 | 102 | | | | |
| 1975 | 0.20 | 0.04-0.4 | 40.21 | 0.20 | 0.04-0.4 | 40.21 | 54 | | | | |
| 1976 | 1.62 | 1.14-2.2 | 10.41 | 1.79 | 1.3-2.39 | 9.49 | 116 | | | | |
| 1977 | 1.47 | 0.92-2.17 | 13.82 | 1.01 | 0.71-1.37 | 11.75 | 114 | | | | |
| 1978 | 32.94 | 27.14-39.93 | 2.66 | 21.94 | 17.74-27.07 | 3.22 | 91 | | | | |
| 1979 | 22.62 | 20.09-25.44 | 1.79 | 22.63 | 20.1-25.46 | 1.79 | 99 | | | 7.18 | 95 |
| 1980 | 6.45 | 3.53-11.24 | 12.39 | 6.43 | 3.46-11.36 | 12.70 | 120 | | | 9.87 | 111 |
| 1981 | 30.34 | 12.11-73.89 | 12.64 | 31.27 | 12.12-78.36 | 12.95 | 104 | | | 6.02 | 99 |
| 1982 | 17.86 | 8.98-34.63 | 10.83 | 18.41 | 9.46-35 | 10.42 | 116 | | | 10.95 | 113 |
| 1983 | 11.18 | 8.8-14.15 | 4.36 | 10.82 | 8.45-13.77 | 4.52 | 112 | | | 10.85 | 112 |
| 1984 | 4.99 | 3.26-7.44 | 9.55 | 4.73 | 3.1-7.01 | 9.60 | 93 | | | 6.05 | 97 |
| 1985 | 30.23 | 20.04-45.36 | 5.74 | 29.23 | 19.36-43.88 | 5.79 | 80 | | | 37.04 | 81 |
| 1986 | 4.95 | 3.18-7.45 | 9.86 | 4.71 | 3.05-7.05 | 9.85 | 108 | | | 4.62 | 108 |
| 1987 | 12.33 | 9.53-15.88 | 4.55 | 12.58 | 9.83-16.03 | 4.34 | 100 | | | 17.85 | 100 |
| 1988 | 8.05 | 5.31-11.96 | 8.17 | 8.13 | 5.37-12.07 | 8.12 | 173 | 8.89 | 173 | 21.72 | 63 |
| 1989 | 11.91 | 8.33-16.86 | 6.34 | 11.74 | 8.18-16.88 | 6.44 | 189 | 12.22 | 189 | 21.27 | 63 |
| 1990 | 4.29 | 2.99-6.03 | 8.52 | 4.46 | 3.1-6.26 | 8.44 | 184 | 4.87 | 184 | 30.01 | 59 |
| 1991 | 3.21 | 2.38-4.25 | 7.64 | 3.21 | 2.38-4.25 | 7.64 | 252 | 3.56 | 179 | 15.32 | 62 |
| 1992 | 6.78 | 4.79-9.47 | 7.21 | 6.78 | 4.79-9.47 | 7.21 | 226 | 6.93 | 178 | 15.91 | 61 |
| 1993 | 5.84 | 4.12-8.15 | 7.55 | 5.84 | 4.12-8.15 | 7.55 | 225 | 6.12 | 180 | 15.42 | 63 |
| 1994 | 2.60 | 1.84-3.55 | 9.21 | 2.60 | 1.84-3.55 | 9.21 | 225 | 2.67 | 180 | 7.04 | 63 |
| 1995 | 6.62 | 4.89-8.86 | 6.34 | 6.62 | 4.89-8.86 | 6.34 | 275 | 6.07 | 186 | 11.00 | 69 |
| 1996 | 7.26 | 5.33-9.78 | 6.31 | 7.26 | 5.33-9.78 | 6.31 | 305 | 7.85 | 183 | 7.42 | 66 |
| 1997 | 6.81 | 5.26-8.74 | 5.38 | 6.81 | 5.26-8.74 | 5.38 | 316 | 7.15 | 192 | 14.82 | 75 |
| 1998 | 7.60 | 5.46-10.45 | 6.65 | 7.60 | 5.46-10.45 | 6.65 | 269 | 8.18 | 150 | 9.95 | 71 |
| 1999 | 6.78 | 5.01-9.06 | 6.28 | 6.78 | 5.01-9.06 | 6.28 | 303 | 7.38 | 180 | 16.25 | 75 |
| 2000 | 8.35 | 6.34-10.92 | 5.42 | 8.35 | 6.34-10.92 | 5.42 | 316 | 9.39 | 191 | 11.09 | 74 |
| 2001 | 5.09 | 3.74-6.82 | 6.93 | 5.09 | 3.74-6.82 | 6.93 | 327 | 5.14 | 200 | 11.52 | 75 |
| 2002 | 6.93 | 4.27-10.94 | 9.89 | 6.93 | 4.27-10.94 | 9.89 | 270 | 6.30 | 147 | 8.59 | 75 |
| 2003 | 9.23 | 6.72-12.54 | 6.04 | 9.23 | 6.72-12.54 | 6.04 | 315 | 9.34 | 192 | 5.42 | 75 |
| 2004 | . | . | . | . | . | . | . | . | . | . | . |

Table 15.

**SUMMER FLOUNDER INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1955 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 2 | | | | |
| 1956 | 4.44 | 2.91-6.56 | 9.76 | 1.29 | 0.75-2 | 16.26 | 29 | | | | |
| 1957 | 2.14 | 1.22 | 15.07 | 0.69 | 0.46-0.96 | 13.88 | 28 | | | | |
| 1958 | 1.48 | 0.23-4 | 38.64 | 0.42 | 0.09-0.85 | 38.03 | 27 | | | | |
| 1959 | 0.06 | 0-0.16 | 75.33 | 0.03 | 0-0.06 | 66.23 | 27 | | | | |
| 1960 | . | 0.00 | . | . | 0.00 | . | 0 | | | | |
| 1961 | 0.19 | 0-0.61 | 85.91 | 0.01 | 0-0.03 | 100.00 | 11 | | | | |
| 1962 | 0.00 | 0.00 | . | 0.00 | 0 | . | 7 | | | | |
| 1963 | 2.07 | 24.24 | 1.09 | 1.09 | 0.43-2.05 | 25.73 | 12 | | | | |
| 1964 | 0.65 | 0.55-0.77 | 6.77 | 0.39 | 0.25-0.54 | 16.05 | 16 | | | | |
| 1965 | 0.74 | 0.27-1.39 | 28.63 | 0.45 | 0.16-0.82 | 30.37 | 13 | | | | |
| 1966 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 17 | | | | |
| 1967 | 0.43 | 0-1.67 | 76.12 | 0.26 | 0-0.78 | 74.97 | 27 | | | | |
| 1968 | 0.14 | 0-0.37 | 67.30 | 0.10 | 0-0.26 | 66.24 | 27 | | | | |
| 1969 | 0.19 | 0.03-0.037 | 41.25 | 0.13 | 0.02-0.25 | 40.27 | 27 | | | | |
| 1970 | 0.03 | 0-0.07 | 79.32 | 0.02 | 0-0.06 | 82.08 | 29 | | | | |
| 1971 | 3.71 | 3.41-4.03 | 2.10 | 2.05 | 1.9-2.22 | 2.38 | 129 | | | | |
| 1972 | 0.85 | 0.79-0.92 | 2.72 | 0.80 | 0.77-0.82 | 1.31 | 84 | | | | |
| 1973 | 1.27 | 0.77-1.89 | 14.97 | 0.99 | 0.62-1.46 | 15.20 | 94 | | | | |
| 1974 | 0.82 | 0.31-1.51 | 27.15 | 0.82 | 0.31-1.51 | 27.15 | 32 | | | | |
| 1975 | 0.14 | 0-0.3 | 51.20 | 0.14 | 0-0.3 | 51.20 | 22 | | | | |
| 1976 | 0.57 | 0.32-0.86 | 19.17 | 0.65 | 0.41-0.93 | 15.75 | 68 | | | | |
| 1977 | 1.67 | 1.16-2.31 | 10.81 | 1.67 | 1.16-2.31 | 10.81 | 36 | | | | |
| 1978 | 1.24 | 0.47-2.4 | 25.89 | 1.24 | 0.47-2.4 | 25.89 | 36 | | | | |
| 1979 | 2.94 | 2.74-3.15 | 1.88 | 2.94 | 2.74-3.15 | 1.88 | 50 | | | 1.01 | 48 |
| 1980 | 10.69 | 6.49-17.25 | 9.05 | 10.25 | 6.24-16.47 | 9.09 | 70 | | | 7.60 | 58 |
| 1981 | 3.97 | 2.39-6.31 | 12.00 | 3.91 | 2.35-6.21 | 12.04 | 67 | | | 5.10 | 61 |
| 1982 | 2.27 | 1.54-3.21 | 10.66 | 2.27 | 1.54-3.21 | 10.66 | 64 | | | 4.30 | 60 |
| 1983 | 5.01 | 3.62-6.82 | 7.34 | 5.01 | 3.62-6.82 | 7.34 | 60 | | | 5.21 | 62 |
| 1984 | 1.58 | 0.96-2.39 | 14.50 | 1.58 | 0.96-2.4 | 14.46 | 41 | | | 1.90 | 45 |
| 1985 | 1.26 | 0.52-2.37 | 24.41 | 1.26 | 0.52-2.37 | 24.41 | 27 | | | 1.11 | 27 |
| 1986 | 1.26 | 0.77-1.89 | 15.00 | 1.26 | 0.77-1.89 | 15.00 | 53 | | | 1.27 | 53 |
| 1987 | 0.39 | 0.2-0.63 | 23.05 | 0.39 | 0.2-0.63 | 23.05 | 52 | | | 0.45 | 52 |
| 1988 | 0.54 | 0.35-0.75 | 14.99 | 0.54 | 0.35-0.75 | 14.99 | 143 | 0.53 | 143 | 0.54 | 36 |
| 1989 | 1.24 | 0.94-1.58 | 8.77 | 1.24 | 0.94-1.58 | 8.77 | 162 | 1.23 | 162 | 0.96 | 36 |
| 1990 | 2.54 | 2.06-3.09 | 5.73 | 2.54 | 2.06-3.09 | 5.73 | 162 | 2.54 | 162 | 2.61 | 36 |
| 1991 | 2.81 | 2.28-3.41 | 5.51 | 2.81 | 2.28-3.41 | 5.51 | 207 | 2.78 | 153 | 1.42 | 36 |
| 1992 | 0.92 | 0.7-1.16 | 9.09 | 0.92 | 0.7-1.16 | 9.09 | 187 | 0.91 | 153 | 0.49 | 36 |
| 1993 | 0.52 | 0.37-0.67 | 11.77 | 0.52 | 0.37-0.67 | 11.77 | 185 | 0.53 | 153 | 0.49 | 36 |
| 1994 | 2.50 | 1.99-3.1 | 6.30 | 2.50 | 1.99-3.1 | 6.30 | 186 | 2.50 | 153 | 1.08 | 36 |
| 1995 | 0.71 | 0.53 | 10.21 | 0.71 | 0.53-0.91 | 10.21 | 218 | 0.72 | 149 | 0.74 | 36 |
| 1996 | 0.81 | 0.62-1.02 | 9.32 | 0.81 | 0.62-1.02 | 9.32 | 224 | 0.86 | 153 | 0.62 | 36 |
| 1997 | 0.89 | 0.69-1.12 | 8.77 | 0.89 | 0.69-1.12 | 8.77 | 226 | 0.97 | 153 | 0.70 | 36 |
| 1998 | 0.73 | 0.55-0.93 | 9.92 | 0.73 | 0.55-0.93 | 9.92 | 226 | 0.78 | 153 | 0.17 | 36 |
| 1999 | 0.53 | 0.41-0.67 | 9.94 | 0.53 | 0.41-0.67 | 9.94 | 219 | 0.58 | 147 | 0.36 | 36 |
| 2000 | 0.57 | 0.43-0.73 | 10.81 | 0.57 | 0.43-0.73 | 10.81 | 227 | 0.62 | 154 | 0.52 | 36 |
| 2001 | 0.47 | 0.34-0.61 | 11.84 | 0.47 | 0.34-0.61 | 11.84 | 236 | 0.52 | 161 | 0.53 | 36 |
| 2002 | 0.77 | 0.54-1.04 | 12.21 | 0.77 | 0.54-1.04 | 12.21 | 179 | 0.80 | 107 | 0.43 | 36 |
| 2003 | 0.44 | 0.33-0.56 | 10.95 | 0.44 | 0.33-0.56 | 10.95 | 225 | 0.43 | 153 | 0.50 | 36 |
| 2004 | . | . | . | . | . | . | . | . | . | . | . |

Table 16.

**BLACK SEA BASS INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1954 | 0.11 | 0-0.36 | 100.00 | 0.11 | 0-0.36 | 100.00 | 5 | | | | |
| 1955 | 0.75 | 0.03-1.95 | 46.95 | 0.75 | 0.03-1.95 | 46.95 | 10 | | | | |
| 1956 | 0.15 | 0.15-0.15 | 0.00 | 0.15 | 0.15-0.15 | 0.00 | 5 | | | | |
| 1957 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 14 | | | | |
| 1958 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 9 | | | | |
| 1959 | 0.16 | 0-0.34 | 48.64 | 0.16 | 0-0.34 | 48.64 | 14 | | | | |
| 1960 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 6 | | | | |
| 1961 | 0.48 | 0-1.66 | 73.88 | 0.48 | 0-1.66 | 73.88 | 6 | | | | |
| 1962 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 3 | | | | |
| 1963 | 0.83 | 0-3.85 | 80.75 | 0.83 | 0-3.85 | 80.75 | 14 | | | | |
| 1964 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 7 | | | | |
| 1965 | 0.29 | 0-0.78 | 63.47 | 0.29 | 0-0.78 | 63.47 | 11 | | | | |
| 1966 | 0.03 | 0-0.08 | 100.00 | 0.03 | 0-0.08 | 100.00 | 13 | | | | |
| 1967 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 12 | | | | |
| 1968 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 12 | | | | |
| 1969 | 0.23 | 0-0.74 | 82.98 | 0.23 | 0-0.74 | 82.98 | 12 | | | | |
| 1970 | 0.38 | 0-1.35 | 81.42 | 0.38 | 0-1.35 | 81.42 | 14 | | | | |
| 1971 | 0.52 | 0.45-0.59 | 5.63 | 0.52 | 0.45-0.59 | 5.63 | 17 | | | | |
| 1972 | 0.22 | 0.08-0.37 | 30.40 | 0.13 | 0.05-0.22 | 30.25 | 102 | | | | |
| 1973 | 2.31 | 1.67-3.11 | 8.98 | 1.43 | 1.06-1.87 | 9.38 | 93 | | | | |
| 1974 | 0.89 | 0.49-1.39 | 18.60 | 0.55 | 0.32-0.83 | 18.77 | 96 | | | | |
| 1975 | 0.40 | 0.23-0.6 | 19.23 | 0.26 | 0.15-0.38 | 19.34 | 201 | | | | |
| 1976 | 1.57 | 1.13-2.1 | 9.88 | 0.91 | 0.64-1.21 | 11.51 | 182 | | | | |
| 1977 | 0.23 | 0.08-0.41 | 31.94 | 0.14 | 0.05-0.25 | 31.82 | 160 | | | | |
| 1978 | 2.75 | 0.35-9.41 | 38.61 | 2.75 | 0.35-9.41 | 38.61 | 16 | | | 0.86 | 16 |
| 1979 | 0.11 | 0-0.24 | 56.90 | 0.11 | 0-0.24 | 56.90 | 34 | | | 0.15 | 23 |
| 1980 | 1.48 | 0.87-2.31 | 15.73 | 1.48 | 0.87-2.31 | 15.73 | 31 | | | 0.31 | 23 |
| 1981 | 0.29 | 0.14-0.45 | 23.47 | 0.29 | 0.14-0.45 | 23.47 | 42 | | | 0.30 | 22 |
| 1982 | 0.46 | 0.16-0.83 | 30.13 | 0.46 | 0.16-0.83 | 30.13 | 25 | | | 0.40 | 25 |
| 1983 | 0.67 | 0.12-1.49 | 38.63 | 0.67 | 0.12-1.49 | 38.63 | 16 | | | 0.44 | 16 |
| 1984 | 1.29 | 0.63-2.21 | 20.63 | 1.29 | 0.63-2.21 | 20.63 | 12 | | | 0.73 | 12 |
| 1985 | 2.04 | 0.95-3.75 | 20.01 | 2.04 | 0.95-3.75 | 20.01 | 18 | | | 1.19 | 18 |
| 1986 | 0.61 | 0.39-0.88 | 15.68 | 0.61 | 0.39-0.88 | 15.68 | 18 | | | 0.27 | 18 |
| 1987 | 1.58 | 1.08-2.2 | 11.43 | 1.58 | 1.08-2.2 | 11.43 | 124 | 1.58 | 124 | 0.95 | 12 |
| 1988 | 0.84 | 0.59-1.13 | 11.89 | 0.84 | 0.59-1.13 | 11.89 | 138 | 0.83 | 138 | 1.04 | 12 |
| 1989 | 2.36 | 1.7-3.17 | 8.93 | 2.36 | 1.7-3.17 | 8.93 | 138 | 2.36 | 138 | 1.52 | 12 |
| 1990 | 1.12 | 0.78-1.53 | 11.63 | 1.12 | 0.78-1.53 | 11.63 | 128 | 1.12 | 128 | 0.50 | 12 |
| 1991 | 1.28 | 0.91-1.72 | 10.76 | 1.28 | 0.91-1.72 | 10.76 | 129 | 1.29 | 129 | 2.35 | 12 |
| 1992 | 0.22 | 0.13-0.32 | 18.86 | 0.22 | 0.13-0.32 | 18.86 | 129 | 0.22 | 129 | 0.19 | 12 |
| 1993 | 1.05 | 0.74-1.42 | 11.46 | 1.05 | 0.74-1.42 | 11.46 | 129 | 1.04 | 129 | 0.76 | 12 |
| 1994 | 1.06 | 0.74-1.45 | 11.85 | 1.06 | 0.74-1.45 | 11.85 | 129 | 1.06 | 129 | 0.60 | 12 |
| 1995 | 0.50 | 0.33-0.69 | 14.47 | 0.50 | 0.33-0.69 | 14.47 | 151 | 0.54 | 127 | 0.62 | 12 |
| 1996 | 0.36 | 0.22-0.52 | 17.99 | 0.36 | 0.22-0.52 | 17.99 | 152 | 0.35 | 128 | 0.38 | 12 |
| 1997 | 0.46 | 0.31-0.63 | 14.63 | 0.46 | 0.31-0.63 | 14.63 | 153 | 0.47 | 129 | 0.23 | 12 |
| 1998 | 0.57 | 0.35-0.82 | 16.40 | 0.57 | 0.35-0.82 | 16.40 | 135 | 0.59 | 111 | 0.32 | 12 |
| 1999 | 0.58 | 0.41-0.77 | 12.22 | 0.58 | 0.41-0.77 | 12.22 | 146 | 0.60 | 122 | 0.48 | 12 |
| 2000 | 0.72 | 0.48-0.99 | 13.49 | 0.72 | 0.48-0.99 | 13.49 | 152 | 0.78 | 129 | 0.93 | 12 |
| 2001 | 1.29 | 0.85-1.84 | 12.89 | 1.29 | 0.85-1.84 | 12.89 | 108 | 1.33 | 84 | 1.31 | 12 |
| 2002 | 0.64 | 0.41-0.90 | 15.16 | 0.64 | 0.41-0.90 | 15.16 | 138 | 0.69 | 114 | 0.57 | 12 |
| 2003* | 0.06 | 0.01-0.11 | 43.02 | 0.06 | 0.01-0.11 | 43.02 | 51 | 0.06 | 43 | 0.00 | 4 |
| 2004 | . | . | . | . | . | . | . | . | . | . | . |

Table 17.

**SCUP INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1954 | 0.00 | 0 | | 0.00 | 0 | | 5 | | | | |
| 1955 | 1.44 | 0.72-2.46 | 19.55 | 1.44 | 0.72-2.46 | 19.55 | 18 | | | | |
| 1956 | 2.17 | 1.02-3.98 | 19.50 | 2.17 | 1.02-3.98 | 19.50 | 15 | | | | |
| 1957 | 0.07 | 0-0.14 | 49.70 | 0.07 | 0-0.14 | 49.70 | 19 | | | | |
| 1958 | 0.01 | 0-0.03 | 100.00 | 0.01 | 0-0.03 | 100.00 | 19 | | | | |
| 1959 | 1.21 | 0.23-2.98 | 36.97 | 1.21 | 0.23-2.98 | 36.97 | 14 | | | | |
| 1960 | 2.15 | 0.18-7.39 | 42.80 | 2.15 | 0.18-7.39 | 42.80 | 7 | | | | |
| 1961 | 0.75 | 0-4.36 | 100.00 | 0.75 | 0-4.36 | 100.00 | 6 | | | | |
| 1962 | 38.44 | 15.14-95.36 | 12.15 | 38.44 | 15.14-95.36 | 12.15 | 6 | | | | |
| 1963 | 0.70 | 0-3.95 | 100.00 | 0.70 | 0-3.95 | 100.00 | 9 | | | | |
| 1964 | | | | | | | 0 | | | | |
| 1965 | 3.54 | 0.67-11.34 | 33.06 | 3.54 | 0.67-11.34 | 33.06 | 8 | | | | |
| 1966 | 0.00 | 0 | | 0.00 | 0 | | 8 | | | | |
| 1967 | 0.52 | 0.11-1.1 | 38.14 | 0.52 | 0.11-1.1 | 38.14 | 8 | | | | |
| 1968 | 0.96 | 0-3.56 | 62.53 | 0.96 | 0-3.56 | 62.53 | 8 | | | | |
| 1969 | 0.25 | 0-0.64 | 59.29 | 0.25 | 0-0.64 | 59.29 | 8 | | | | |
| 1970 | 0.08 | 0-0.2 | 68.09 | 0.08 | 0-0.2 | 68.09 | 8 | | | | |
| 1971 | 0.00 | 0 | | 0.00 | 0 | | 4 | | | | |
| 1972 | 0.00 | 0 | | 0.00 | 0 | | 58 | | | | |
| 1973 | 4.67 | 2.8-7.45 | 11.51 | 4.67 | 2.8-7.45 | 11.51 | 61 | | | | |
| 1974 | 0.00 | 0 | | 0.00 | 0 | | 53 | | | | |
| 1975 | 1.78 | 0.79-3.32 | 21.52 | 1.78 | 0.79-3.32 | 21.52 | 70 | | | | |
| 1976 | 0.64 | 0.25-1.16 | 27.55 | 0.64 | 0.25-1.16 | 27.55 | 52 | | | | |
| 1977 | 0.00 | 0 | | 0.00 | 0 | | 73 | | | | |
| 1978 | 1.65 | 0-17.52 | 100.00 | 1.65 | 0-17.52 | 100.00 | 2 | | | | |
| 1979 | 0.74 | 0.11-1.72 | 40.43 | 0.74 | 0.11-1.72 | 40.43 | 15 | | | | |
| 1980 | 5.60 | 4.4-7.07 | 5.31 | 5.60 | 4.4-7.07 | 5.31 | 6 | | | | |
| 1981 | 0.75 | 0.21-1.52 | 32.96 | 0.75 | 0.21-1.52 | 32.96 | 7 | | | | |
| 1982 | | | | | | | 0 | | | | |
| 1983 | | | | | | | 0 | | | | |
| 1984 | | | | | | | 0 | | | | |
| 1985 | | | | | | | 0 | | | | |
| 1986 | | | | | | | 0 | | | | |
| 1987 | 2.07 | 1.24-3.21 | 14.10 | 2.07 | 1.24-3.21 | 14.10 | 92 | 2.07 | 92 | | |
| 1988 | 3.06 | 2.05-4.41 | 10.20 | 3.06 | 2.05-4.41 | 10.20 | 112 | 3.06 | 112 | | |
| 1989 | 4.92 | 3.14-7.45 | 10.03 | 4.92 | 3.14-7.45 | 10.03 | 112 | 4.92 | 112 | | |
| 1990 | 1.90 | 1.11-2.99 | 14.99 | 1.90 | 1.11-2.99 | 14.99 | 103 | 1.90 | 103 | | |
| 1991 | 0.65 | 0.41-0.93 | 15.67 | 0.65 | 0.41-0.93 | 15.67 | 104 | 0.65 | 104 | | |
| 1992 | 3.36 | 2.16-5.01 | 10.90 | 3.36 | 2.16-5.01 | 10.90 | 104 | 3.36 | 104 | | |
| 1993 | 0.90 | 0.53-1.35 | 16.67 | 0.90 | 0.53-1.35 | 16.67 | 104 | 0.90 | 104 | | |
| 1994 | 0.39 | 0.21-0.59 | 21.36 | 0.39 | 0.21-0.59 | 21.36 | 104 | 0.39 | 104 | | |
| 1995 | 0.54 | 0.29-0.83 | 20.37 | 0.54 | 0.29-0.83 | 20.37 | 104 | 0.54 | 104 | | |
| 1996 | 0.21 | 0.09-0.35 | 28.00 | 0.21 | 0.09-0.35 | 28.00 | 104 | 0.21 | 104 | | |
| 1997 | 0.50 | 0.27-0.75 | 19.83 | 0.50 | 0.27-0.75 | 19.83 | 79 | 0.50 | 79 | | |
| 1998 | 0.27 | 0.06-0.52 | 37.91 | 0.27 | 0.06-0.52 | 37.91 | 88 | 0.27 | 88 | | |
| 1999 | 0.13 | 0.02-0.25 | 41.14 | 0.13 | 0.02-0.25 | 41.14 | 105 | 0.13 | 105 | | |
| 2000 | 1.34 | 0.88-1.90 | 12.80 | 1.34 | 0.88-1.90 | 12.80 | 111 | 1.33 | 111 | | |
| 2001 | 0.24 | 0.11-0.37 | 24.52 | 0.24 | 0.11-0.37 | 24.52 | 64 | 0.24 | 64 | | |
| 2002 | 0.96 | 0.58-1.42 | 15.89 | 0.96 | 0.58-1.42 | 15.89 | 104 | 0.96 | 104 | | |
| 2003 | . | . | . | . | . | . | . | . | . | | |
| 2004 | . | . | . | . | . | . | . | . | . | | |

Table 18.

**STRIPED BASS INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1954 | | | | | | | 0 | | | | |
| 1955 | | | | | | | 0 | | | | |
| 1956 | 1.47 | 0.03-4.95 | 48.65 | 1.55 | 0.06-5.14 | 46.94 | 13 | | | | |
| 1957 | 2.75 | 1.56-4.49 | 14.45 | 2.85 | 1.62-4.68 | 14.38 | 15 | | | | |
| 1958 | 6.06 | 2.02-15.53 | 21.76 | 6.53 | 1.84-18.95 | 21.14 | 5 | | | | |
| 1959 | | | | | | | 0 | | | | |
| 1960 | 2.79 | 1.74-4.25 | 12.16 | 2.79 | 1.74-4.25 | 12.16 | 4 | | | | |
| 1961 | 1.98 | 0.43-5.25 | 33.78 | 2.12 | 0.47-5.63 | 33.16 | 9 | | | | |
| 1962 | 1.21 | 0.27-2.84 | 35.04 | 1.21 | 0.27-2.84 | 35.04 | 8 | | | | |
| 1963 | 6.71 | 4.92-9.03 | 6.45 | 7.27 | 5.23-9.99 | 6.72 | 20 | | | | |
| 1964 | 1.25 | 0.51-2.36 | 24.62 | 1.26 | 0.52-2.38 | 24.50 | 23 | | | | |
| 1965 | 3.23 | 1.19-7.15 | 22.80 | 3.29 | 1.22-7.27 | 22.58 | 31 | | | | |
| 1966 | 2.13 | 1.41-3.07 | 11.50 | 2.14 | 1.41-3.08 | 11.51 | 26 | | | | |
| 1967 | 3.10 | 1.33-6.21 | 19.98 | 4.92 | 2.19-9.96 | 17.35 | 26 | | | | |
| 1968 | 1.78 | 1.16-2.58 | 12.40 | 2.92 | 1.78-4.53 | 12.54 | 39 | | | | |
| 1969 | 1.08 | 0.79-1.42 | 10.30 | 1.53 | 1.01-2.18 | 12.30 | 36 | | | | |
| 1970 | 2.04 | 1.02-3.59 | 18.48 | 2.75 | 1.42-4.8 | 16.56 | 35 | | | | |
| 1971 | 0.44 | 0.26-0.65 | 18.21 | 0.72 | 0.44-1.05 | 16.24 | 54 | | | | |
| 1972 | 0.28 | 0-1.04 | 96.90 | 0.28 | 0-1.04 | 96.90 | 50 | | | | |
| 1973 | 0.08 | 0.01-0.15 | 42.86 | 0.08 | 0.01-0.15 | 42.86 | 49 | | | | |
| 1974 | 0.02 | 0-0.05 | 100.00 | 0.02 | 0-0.05 | 100.00 | 53 | | | | |
| 1975 | 0.21 | 0.04-0.41 | 40.02 | 0.21 | 0.04-0.41 | 40.02 | 53 | | | | |
| 1976 | | | | | | | 0 | | | | |
| 1977 | 0.15 | 0.05-0.27 | 32.98 | 0.15 | 0.05-0.27 | 32.98 | 42 | | | | |
| 1978 | 0.34 | 0.13-0.58 | 28.54 | 0.34 | 0.14-0.58 | 28.36 | 109 | | | | |
| 1979 | 0.17 | 0.04-0.32 | 36.64 | 0.17 | 0.04-0.32 | 36.64 | 43 | | | | |
| 1980 | 0.42 | 0.18-0.71 | 26.35 | 0.42 | 0.18-0.71 | 26.35 | 48 | | | | |
| 1981 | 1.33 | 0.5-2.56 | 25.80 | 1.33 | 0.51-2.59 | 25.63 | 51 | | | | |
| 1982 | 0.79 | 0.11-1.9 | 41.36 | 0.79 | 0.11-1.9 | 41.36 | 38 | | | 0.37 | 7 |
| 1983 | 1.50 | 0.36-3.57 | 33.01 | 1.50 | 0.36-3.57 | 33.01 | 25 | | | 1.41 | 27 |
| 1984 | 0.43 | 0.25-0.64 | 19.16 | 0.43 | 0.25-0.64 | 19.16 | 33 | | | 0.75 | 34 |
| 1985 | 0.53 | 0.04-1.24 | 44.90 | 0.53 | 0.04-1.24 | 44.90 | 32 | | | 0.54 | 32 |
| 1986 | 0.08 | 0-0.19 | 59.02 | 0.08 | 0-0.19 | 59.02 | 33 | | | 0.17 | 33 |
| 1987 | 3.34 | 1.82-5.68 | 14.71 | 3.34 | 1.82-5.68 | 14.71 | 21 | | | 3.63 | 20 |
| 1988 | 1.24 | 0.65-2.06 | 19.19 | 1.24 | 0.65-2.06 | 19.19 | 35 | | | 1.93 | 35 |
| 1989 | 1.65 | 1.12-2.32 | 11.51 | 1.65 | 1.12-2.32 | 11.51 | 37 | | | 1.59 | 37 |
| 1990 | 1.06 | 0.49-1.84 | 22.33 | 1.06 | 0.49-1.84 | 22.33 | 36 | | | 1.14 | 36 |
| 1991 | 0.97 | 0.29-2 | 31.00 | 0.97 | 0.29-2 | 31.00 | 51 | | | 1.02 | 36 |
| 1992 | 1.28 | 0.83-1.83 | 13.18 | 1.28 | 0.83-1.83 | 13.18 | 51 | | | 2.15 | 39 |
| 1993 | 2.69 | 1.23-5.1 | 19.32 | 2.69 | 1.23-5.1 | 19.32 | 53 | | | 3.30 | 41 |
| 1994 | 1.33 | 0.88-1.88 | 12.58 | 1.33 | 0.88-1.88 | 12.58 | 51 | | | 1.07 | 39 |
| 1995 | 0.61 | 0.33-0.96 | 20.19 | 0.61 | 0.33-0.96 | 20.19 | 75 | | | 1.22 | 39 |
| 1996 | 0.61 | 0.32-0.95 | 20.56 | 0.61 | 0.32-0.95 | 20.56 | 90 | | | 1.19 | 40 |
| 1997 | 0.55 | 0.25-0.93 | 24.75 | 0.55 | 0.25-0.93 | 24.75 | 90 | | | 0.41 | 39 |
| 1998 | 0.89 | 0.44-1.47 | 21.30 | 0.89 | 0.44-1.47 | 21.30 | 90 | | | 1.22 | 39 |
| 1999 | 0.21 | 0-0.47 | 51.55 | 0.21 | 0-0.47 | 51.55 | 84 | | | 0.26 | 39 |
| 2000 | 1.54 | 0.76-2.67 | 19.70 | 1.54 | 0.76-2.67 | 19.70 | 90 | | | 2.72 | 39 |
| 2001 | 0.53 | 0.27-0.85 | 21.84 | 0.53 | 0.27-0.85 | 21.84 | 90 | | | 1.94 | 39 |
| 2002 | 0.71 | 0.42-1.07 | 17.34 | 0.71 | 0.42-1.07 | 17.34 | 90 | | | 1.68 | 39 |
| 2003 | 0.63 | 0.24-1.13 | 27.59 | 0.63 | 0.24-1.13 | 27.59 | 90 | | | 1.01 | 39 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 19.

**WHITE PERCH - YOY INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1955 | | | | | | | 0 | | | | |
| 1956 | 3.48 | 1.78-6.22 | 15.90 | 3.48 | 1.78-6.22 | 15.90 | 13 | | | | |
| 1957 | 15.46 | 9.07-25.91 | 8.77 | 15.46 | 9.07-25.91 | 8.77 | 15 | | | | |
| 1958 | 39.04 | 13.84-107.07 | 13.45 | 39.04 | 13.84-107.07 | 13.45 | 5 | | | | |
| 1959 | | | | | | | 0 | | | | |
| 1960 | 0.00 | 0 | | 0.00 | 0 | | 4 | | | | |
| 1961 | 2.72 | 0.3-9.63 | 39.91 | 2.72 | 0.3-9.63 | 39.91 | 9 | | | | |
| 1962 | 3.75 | 0.09-19.66 | 47.15 | 3.75 | 0.09-19.66 | 47.15 | 8 | | | | |
| 1963 | 19.57 | 11.86-31.92 | 7.77 | 19.57 | 11.86-31.92 | 7.77 | 20 | | | | |
| 1964 | 7.60 | 4.57-12.27 | 10.10 | 7.60 | 4.57-12.27 | 10.10 | 23 | | | | |
| 1965 | 0.70 | 0.2-1.42 | 32.95 | 0.70 | 0.2-1.42 | 32.95 | 31 | | | | |
| 1966 | 9.32 | 4.73-17.59 | 12.61 | 9.32 | 4.73-17.59 | 12.61 | 26 | | | | |
| 1967 | 9.56 | 5.11-17.25 | 11.61 | 9.56 | 5.11-17.25 | 11.61 | 26 | | | | |
| 1968 | 1.66 | 0.89-2.75 | 17.45 | 1.66 | 0.89-2.75 | 17.45 | 39 | | | | |
| 1969 | 4.63 | 2.46-8.16 | 14.07 | 4.63 | 2.46-8.16 | 14.07 | 36 | | | | |
| 1970 | 13.86 | 6.42-28.75 | 12.86 | 13.86 | 6.42-28.75 | 12.86 | 35 | | | | |
| 1971 | 2.47 | 1.36-4.08 | 15.42 | 2.31 | 1.27-3.83 | 15.79 | 54 | | | | |
| 1972 | 1.77 | 0.76-3.36 | 22.29 | 1.24 | 0.54-2.25 | 23.04 | 50 | | | | |
| 1973 | 2.33 | 1.56-3.33 | 10.93 | 1.78 | 1.18-2.55 | 11.97 | 49 | | | | |
| 1974 | 0.78 | 0.52-1.09 | 13.73 | 0.58 | 0.38-0.81 | 14.70 | 53 | | | | |
| 1975 | 1.52 | 0.81-2.49 | 17.76 | 1.03 | 0.56-1.65 | 18.76 | 53 | | | | |
| 1976 | | | | | | | 0 | | | | |
| 1977 | 4.34 | 2.4-7.4 | 13.49 | 2.84 | 1.6-4.68 | 14.52 | 42 | | | | |
| 1978 | 14.22 | 9.62-20.83 | 6.62 | 9.11 | 6.17-13.26 | 7.43 | 109 | | | | |
| 1979 | 9.00 | 5.73-13.84 | 8.58 | 5.59 | 3.53-8.57 | 9.90 | 43 | | | | |
| 1980 | 0.45 | 0.2-0.74 | 24.97 | 0.45 | 0.2-0.74 | 24.97 | 48 | | | | |
| 1981 | 1.01 | 0.65-1.44 | 13.98 | 1.01 | 0.65-1.44 | 13.98 | 51 | | | | |
| 1982 | 4.53 | 1.53-11.09 | 22.89 | 4.53 | 1.53-11.09 | 22.89 | 38 | | | 1.22 | 7 |
| 1983 | 8.61 | 3.95-17.67 | 14.66 | 8.61 | 3.95-17.67 | 14.66 | 25 | | | 9.96 | 27 |
| 1984 | 23.80 | 14.97-37.53 | 6.86 | 23.80 | 14.97-37.53 | 6.86 | 33 | | | 13.26 | 34 |
| 1985 | 2.07 | 1.23-3.24 | 14.30 | 2.07 | 1.23-3.24 | 14.30 | 32 | | | 1.86 | 32 |
| 1986 | 2.81 | 1.83-4.12 | 11.12 | 2.81 | 1.83-4.12 | 11.12 | 33 | | | 1.77 | 33 |
| 1987 | 33.58 | 18.74-59.57 | 7.91 | 42.47 | 24.73-72.42 | 6.95 | 21 | | | 42.13 | 20 |
| 1988 | 6.15 | 3.68-9.91 | 10.75 | 6.15 | 3.68-9.91 | 10.75 | 35 | | | 5.29 | 35 |
| 1989 | 12.93 | 6.69-24.25 | 11.29 | 12.93 | 6.69-24.25 | 11.29 | 37 | | | 13.33 | 37 |
| 1990 | 3.24 | 1.84-5.32 | 13.89 | 3.23 | 1.84-5.32 | 13.89 | 36 | | | 3.31 | 36 |
| 1991 | 3.40 | 1.17-7.94 | 23.89 | 3.40 | 1.17-7.94 | 23.89 | 51 | | | 2.30 | 36 |
| 1992 | 1.54 | 0.83-2.52 | 17.56 | 1.54 | 0.83-2.52 | 17.56 | 51 | | | 1.21 | 39 |
| 1993 | 17.87 | 5.3-55.51 | 18.67 | 17.87 | 5.3-55.51 | 18.67 | 53 | | | 17.91 | 41 |
| 1994 | 12.33 | 6.84-21.68 | 10.26 | 12.33 | 6.84-21.68 | 10.26 | 51 | | | 8.43 | 39 |
| 1995 | 1.92 | 0.98-3.29 | 18.01 | 1.92 | 0.98-3.29 | 18.01 | 75 | | | 4.61 | 39 |
| 1996 | 24.41 | 12.94-45.29 | 9.27 | 24.41 | 12.94-45.29 | 9.27 | 90 | | | 21.61 | 40 |
| 1997 | 9.34 | 6.04-14.19 | 8.22 | 9.34 | 6.04-14.19 | 8.22 | 90 | | | 10.00 | 39 |
| 1998 | 3.84 | 1.98-6.86 | 15.38 | 3.84 | 1.98-6.86 | 15.38 | 90 | | | 7.13 | 39 |
| 1999 | 0.74 | 0.39-1.19 | 20.54 | 0.74 | 0.39-1.19 | 20.54 | 84 | | | 2.38 | 39 |
| 2000 | 8.23 | 4.01-15.99 | 13.74 | 8.23 | 4.01-15.99 | 13.74 | 90 | | | 16.90 | 39 |
| 2001 | 1.93 | 0.95-3.39 | 18.83 | 1.93 | 0.95-3.39 | 18.83 | 90 | | | 5.99 | 39 |
| 2002 | 4.66 | 3.47-6.16 | 6.77 | 4.66 | 3.47-6.16 | 6.77 | 90 | | | 9.48 | 39 |
| 2003 | 21.98 | 9.91-47.40 | 11.89 | 21.98 | 9.91-47.40 | 11.89 | 90 | | | 15.70 | 39 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 20.

**WHITE PERCH - 1+ INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| | | | | | | | | | | | |
| 1955 | | | | | | | 0 | | | | |
| 1956 | 33.39 | 13-83.51 | 12.70 | 37.61 | 15.31-90.42 | 11.79 | 18 | | | | |
| 1957 | 50.73 | 20.87-121.39 | 10.91 | 55.62 | 23.38-130.5 | 10.44 | 20 | | | | |
| 1958 | 68.94 | 22.01-211.64 | 13.09 | 68.94 | 22.01-211.64 | 13.09 | 10 | | | | |
| 1959 | 6.17 | 2.73-12.77 | 16.56 | 6.17 | 2.73-12.77 | 16.56 | 5 | | | | |
| 1960 | 170.19 | 36.71-776.2 | 14.71 | 170.19 | 36.71-776.2 | 14.71 | 4 | | | | |
| 1961 | 60.68 | 20.85-173.14 | 12.59 | 65.41 | 23.3-180.44 | 11.98 | 12 | | | | |
| 1962 | 70.46 | 17.97-268.13 | 15.53 | 87.59 | 24.36-308.52 | 13.95 | 11 | | | | |
| 1963 | 92.10 | 39.25-214.34 | 9.25 | 101.93 | 43.68-236.15 | 9.01 | 24 | | | | |
| 1964 | 101.05 | 83.15-122.75 | 2.08 | 102.76 | 84.48-124.93 | 2.09 | 27 | | | | |
| 1965 | 32.32 | 17.11-60.32 | 8.70 | 33.64 | 17.86-62.6 | 8.57 | 38 | | | | |
| 1966 | 16.42 | 9-29.32 | 9.70 | 16.42 | 9-29.32 | 9.70 | 35 | | | | |
| 1967 | 26.62 | 15.12-46.32 | 8.11 | 47.08 | 32.22-68.61 | 4.78 | 39 | | | | |
| 1968 | 23.43 | 11.86-45.4 | 10.04 | 42.17 | 21.89-80.4 | 8.42 | 52 | | | | |
| 1969 | 6.49 | 4.08-10.05 | 9.65 | 14.17 | 9.21-21.53 | 7.28 | 50 | | | | |
| 1970 | 11.69 | 6.67-19.99 | 9.90 | 17.48 | 9.71-30.9 | 9.36 | 48 | | | | |
| 1971 | 4.55 | 3.03-6.65 | 9.37 | 6.40 | 4.26-9.42 | 8.54 | 72 | | | | |
| 1972 | 2.64 | 1.98-3.45 | 7.75 | 2.56 | 1.92-3.34 | 7.80 | 85 | | | | |
| 1973 | 3.00 | 1.94-4.45 | 11.14 | 2.71 | 1.74-4.03 | 11.57 | 60 | | | | |
| 1974 | 2.14 | 1.38-3.15 | 12.08 | 1.95 | 1.27-2.82 | 12.05 | 63 | | | | |
| 1975 | 4.22 | 2.65-6.46 | 10.82 | 3.59 | 2.33-5.34 | 10.57 | 63 | | | | |
| 1976 | 7.24 | 2.8-16.87 | 18.35 | 8.41 | 2.59-23.67 | 21.49 | 12 | | | | |
| 1977 | 4.12 | 2.74-5.99 | 9.57 | 3.74 | 2.56-5.32 | 9.21 | 56 | | | | |
| 1978 | 4.83 | 3.25-6.99 | 8.96 | 4.08 | 2.76-5.86 | 9.23 | 123 | | | | |
| 1979 | 15.78 | 8.45-28.81 | 10.18 | 13.46 | 7.44-23.77 | 10.08 | 59 | | | 3.30 | 16 |
| 1980 | 5.80 | 3.5-9.26 | 10.75 | 5.80 | 3.5-9.27 | 10.75 | 64 | | | 15.79 | 16 |
| 1981 | 24.86 | 15.15-40.42 | 7.24 | 24.86 | 15.15-40.42 | 7.24 | 68 | | | 18.88 | 17 |
| 1982 | 28.78 | 15.09-54.09 | 9.06 | 28.78 | 15.09-54.09 | 9.06 | 56 | | | 15.88 | 25 |
| 1983 | 28.86 | 18.53-44.63 | 6.25 | 28.86 | 18.53-44.63 | 6.25 | 44 | | | 26.63 | 44 |
| 1984 | 25.70 | 12.22-52.95 | 10.70 | 25.70 | 12.22-52.95 | 10.70 | 54 | | | 23.84 | 54 |
| 1985 | 33.19 | 22.39-48.98 | 5.37 | 33.19 | 22.39-48.98 | 5.37 | 32 | | | 36.76 | 32 |
| 1986 | 12.06 | 6.72-21.1 | 10.23 | 12.06 | 6.72-21.1 | 10.23 | 51 | | | 9.55 | 51 |
| 1987 | 16.57 | 9.21-29.22 | 9.46 | 18.96 | 10.49-33.68 | 9.22 | 37 | | | 21.88 | 36 |
| 1988 | 39.57 | 26.69-58.42 | 5.15 | 39.57 | 26.69-58.42 | 5.15 | 46 | | | 35.10 | 46 |
| 1989 | 22.78 | 16-32.25 | 5.29 | 22.78 | 16-32.25 | 5.29 | 46 | | | 25.86 | 46 |
| 1990 | 35.39 | 21.9-56.83 | 6.44 | 35.39 | 21.9-56.83 | 6.44 | 45 | | | 31.97 | 45 |
| 1991 | 32.45 | 23.82-44.09 | 4.25 | 32.45 | 23.82-44.09 | 4.25 | 65 | | | 29.49 | 44 |
| 1992 | 11.17 | 7.47-16.47 | 7.24 | 11.17 | 7.47-16.47 | 7.24 | 64 | | | 15.77 | 48 |
| 1993 | 10.11 | 4.69-20.69 | 13.90 | 10.11 | 4.69-20.69 | 13.90 | 66 | | | 15.04 | 50 |
| 1994 | 21.29 | 13.52-33.2 | 6.90 | 21.29 | 13.52-33.2 | 6.90 | 64 | | | 18.77 | 48 |
| 1995 | 10.76 | 6.53-17.36 | 9.04 | 10.76 | 6.53-17.36 | 9.04 | 98 | | | 40.82 | 48 |
| 1996 | 9.03 | 5.29-15.00 | 10.13 | 9.03 | 5.29-15.00 | 10.13 | 116 | | | 12.78 | 50 |
| 1997 | 19.37 | 10.56-34.90 | 9.40 | 19.37 | 10.56-34.90 | 9.40 | 120 | | | 20.25 | 52 |
| 1998 | 10.89 | 6.70-17.36 | 8.78 | 10.89 | 6.70-17.36 | 8.78 | 120 | | | 27.44 | 52 |
| 1999 | 10.34 | 5.97-17.46 | 10.03 | 10.34 | 5.97-17.46 | 10.03 | 114 | | | 22.25 | 52 |
| 2000 | 7.65 | 3.79-14.63 | 13.72 | 7.65 | 3.79-14.63 | 13.72 | 120 | | | 17.31 | 52 |
| 2001 | 4.62 | 2.54-7.92 | 13.36 | 4.62 | 2.54-7.92 | 13.36 | 120 | | | 17.09 | 52 |
| 2002 | 7.22 | 4.99-10.28 | 7.51 | 7.22 | 4.99-10.28 | 7.51 | 120 | | | 20.61 | 52 |
| 2003 | 19.13 | 9.95-36.00 | 10.14 | 19.13 | 9.95-36.00 | 10.14 | 120 | | | 27.35 | 52 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 21.

**WHITE CATFISH - YOY INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1954 | 0.41 | 0-1.83 | 100.00 | 0.41 | 0-1.83 | 100.00 | 2 | | | | |
| 1955 | 0.82 | 0.54-1.16 | 14.20 | 0.82 | 0.54-1.16 | 14.20 | 5 | | | | |
| 1956 | 1.27 | 0.46-2.53 | 26.77 | 1.27 | 0.46-2.53 | 26.77 | 13 | | | | |
| 1957 | 1.26 | 0.75-1.93 | 15.84 | 1.26 | 0.75-1.93 | 15.84 | 20 | | | | |
| 1958 | 3.31 | 0.23-14.14 | 43.03 | 3.31 | 0.23-14.14 | 43.03 | 5 | | | | |
| 1959 | | | | | | | 0 | | | | |
| 1960 | 4.77 | 0.72-18.41 | 34.61 | 4.77 | 0.72-18.41 | 34.61 | 6 | | | | |
| 1961 | 1.33 | 0.49-2.66 | 26.62 | 1.33 | 0.49-2.66 | 26.62 | 12 | | | | |
| 1962 | 0.67 | 0-1.88 | 52.77 | 0.67 | 0-1.88 | 52.77 | 14 | | | | |
| 1963 | 0.22 | 0.07-0.39 | 33.61 | 0.22 | 0.07-0.39 | 33.61 | 24 | | | | |
| 1964 | 0.55 | 0.23-0.94 | 26.22 | 0.55 | 0.23-0.94 | 26.22 | 33 | | | | |
| 1965 | 0.33 | 0.11-0.59 | 31.25 | 0.33 | 0.11-0.59 | 31.25 | 42 | | | | |
| 1966 | 0.55 | 0.19-1.02 | 30.41 | 0.55 | 0.19-1.02 | 30.41 | 43 | | | | |
| 1967 | 0.82 | 0.28-1.57 | 29.11 | 0.82 | 0.28-1.57 | 29.11 | 34 | | | | |
| 1968 | 0.32 | 0.14-0.52 | 26.80 | 0.32 | 0.14-0.52 | 26.80 | 54 | | | | |
| 1969 | 0.49 | 0.29-0.72 | 17.91 | 0.49 | 0.29-0.72 | 17.91 | 50 | | | | |
| 1970 | 0.41 | 0.07-0.85 | 40.00 | 0.41 | 0.07-0.85 | 40.00 | 50 | | | | |
| 1971 | 2.20 | 1.34-3.37 | 13.43 | 2.20 | 1.34-3.37 | 13.43 | 71 | | | | |
| 1972 | 0.05 | 0-0.12 | 60.39 | 0.05 | 0-0.12 | 60.39 | 53 | | | | |
| 1973 | 0.95 | 0.31-1.89 | 29.54 | 0.95 | 0.31-1.89 | 29.54 | 84 | | | | |
| 1974 | 0.38 | 0.15-0.65 | 28.08 | 0.38 | 0.15-0.65 | 28.08 | 53 | | | | |
| 1975 | 1.41 | 0.87-2.09 | 14.23 | 1.46 | 0.87-2.09 | 14.23 | 70 | | | | |
| 1976 | 0.04 | 0-0.09 | 57.65 | 0.04 | 0-0.09 | 57.65 | 39 | | | | |
| 1977 | 0.14 | 0.03-0.27 | 40.50 | 0.14 | 0.03-0.27 | 40.50 | 59 | | | | |
| 1978 | 2.01 | 1.41-2.76 | 10.11 | 2.01 | 1.41-2.76 | 10.11 | 95 | | | | |
| 1979 | 0.32 | 0.11-0.58 | 31.53 | 0.32 | 0.11-0.58 | 31.53 | 54 | | | | |
| 1980 | 0.12 | 0.02-0.24 | 41.75 | 0.12 | 0.02-0.24 | 41.75 | 50 | | | | |
| 1981 | 0.41 | 0.1-0.81 | 36.40 | 0.41 | 0.1-0.81 | 36.43 | 78 | | | | |
| 1982 | 0.06 | 0.01-0.11 | 41.56 | 0.06 | 0.01-0.11 | 41.56 | 41 | | | | |
| 1983 | 2.47 | 2.17-2.8 | 3.64 | 2.47 | 2.17-2.8 | 3.64 | 46 | | | 1.31 | 49 |
| 1984 | 1.11 | 0.76-1.52 | 11.93 | 1.11 | 0.76-1.52 | 11.93 | 54 | | | 1.39 | 54 |
| 1985 | 0.10 | 0.01-0.2 | 44.53 | 0.10 | 0.01-0.2 | 44.53 | 42 | | | 0.14 | 42 |
| 1986 | 0.95 | 0.64-1.32 | 12.96 | 0.95 | 0.64-1.32 | 12.96 | 44 | | | 0.67 | 44 |
| 1987 | 1.77 | 0.61-3.76 | 26.61 | 1.77 | 0.61-3.76 | 26.61 | 28 | | | 1.51 | 27 |
| 1988 | 0.25 | 0.11-0.41 | 26.68 | 0.25 | 0.11-0.41 | 26.68 | 52 | | | 0.61 | 52 |
| 1989 | 3.63 | 2.01-6.12 | 14.03 | 3.63 | 2.01-6.12 | 14.03 | 51 | | | 3.33 | 52 |
| 1990 | 0.76 | 0.57-0.97 | 9.89 | 0.76 | 0.57-0.97 | 9.89 | 52 | | | 0.82 | 52 |
| 1991 | 0.06 | 0.02-0.11 | 34.21 | 0.06 | 0.02-0.11 | 34.21 | 72 | | | 0.19 | 52 |
| 1992 | 0.74 | 0.57-0.92 | 9.04 | 0.74 | 0.57-0.92 | 9.04 | 68 | | | 0.50 | 52 |
| 1993 | 0.80 | 0.45-1.23 | 18.34 | 0.80 | 0.45-1.23 | 18.34 | 68 | | | 1.14 | 52 |
| 1994 | 0.12 | 0.06-0.19 | 25.82 | 0.12 | 0.06-0.19 | 25.82 | 68 | | | 0.34 | 52 |
| 1995 | 0.21 | 0.08-0.35 | 29.33 | 0.21 | 0.08-0.35 | 29.33 | 109 | | | 0.46 | 52 |
| 1996 | 0.36 | 0.18-0.55 | 22.23 | 0.36 | 0.18-0.55 | 22.23 | 120 | | | 1.18 | 53 |
| 1997 | 0.37 | 0.23-0.53 | 17.47 | 0.37 | 0.23-0.53 | 17.47 | 120 | | | 0.94 | 52 |
| 1998 | 0.07 | 0.04-0.10 | 22.96 | 0.07 | 0.04-0.10 | 22.96 | 120 | | | 0.34 | 52 |
| 1999 | 0.003 | 0-0.01 | 100.00 | 0.003 | 0-0.01 | 100.00 | 114 | | | 0.00 | 52 |
| 2000 | 0.05 | 0-0.12 | 58.53 | 0.05 | 0-0.12 | 58.53 | 120 | | | 0.09 | 52 |
| 2001 | 0.02 | 0-0.04 | 73.60 | 0.02 | 0-0.04 | 73.60 | 120 | | | 0.03 | 52 |
| 2002 | 0.00 | 0 | . | 0.00 | 0 | . | 120 | | | 0.00 | 52 |
| 2003 | 0.29 | 0.17-0.42 | 19.28 | 0.29 | 0.17-0.42 | 19.28 | 120 | | | 0.99 | 52 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 22.

**WHITE CATFISH - 1+ INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1954 | 0.41 | 0-1.83 | 100.00 | 0.41 | 0-1.83 | 100.00 | 2 | | | | |
| 1955 | 2.12 | 1.51-2.87 | 9.54 | 2.12 | 1.51-2.87 | 9.54 | 5 | | | | |
| 1956 | 1.72 | 0.81-3.09 | 20.34 | 1.72 | 0.81-3.09 | 20.34 | 13 | | | | |
| 1957 | 2.65 | 1.55-4.21 | 13.78 | 2.65 | 1.55-4.21 | 13.78 | 20 | | | | |
| 1958 | 8.43 | 0.38-63.2 | 42.75 | 8.43 | 0.38-63.2 | 42.75 | 5 | | | | |
| 1959 | | | | | | | 0 | | | | |
| 1960 | 9.81 | 2.31-34.25 | 24.84 | 9.81 | 2.31-34.25 | 24.84 | 6 | | | | |
| 1961 | 2.47 | 1.6-3.63 | 11.57 | 2.47 | 1.6-3.63 | 11.57 | 12 | | | | |
| 1962 | 14.14 | 5.56-33.94 | 15.40 | 14.14 | 5.56-33.94 | 15.40 | 14 | | | | |
| 1963 | 1.30 | 0.67-2.17 | 19.15 | 1.30 | 0.67-2.17 | 19.15 | 24 | | | | |
| 1964 | 1.35 | 0.85-1.98 | 13.95 | 1.35 | 0.85-1.98 | 13.95 | 33 | | | | |
| 1965 | 0.69 | 0.41-1.02 | 17.00 | 0.69 | 0.41-1.02 | 17.00 | 42 | | | | |
| 1966 | 1.68 | 1.1-2.43 | 12.48 | 1.68 | 1.1-2.43 | 12.48 | 43 | | | | |
| 1967 | 1.49 | 0.81-2.41 | 17.33 | 1.49 | 0.81-2.41 | 17.33 | 34 | | | | |
| 1968 | 0.64 | 0.29-1.08 | 24.04 | 0.64 | 0.29-1.08 | 24.04 | 54 | | | | |
| 1969 | 0.97 | 0.57-1.46 | 16.60 | 0.97 | 0.57-1.46 | 16.60 | 50 | | | | |
| 1970 | 1.38 | 0.52-2.72 | 25.82 | 1.38 | 0.52-2.72 | 25.82 | 50 | | | | |
| 1971 | 2.12 | 1.46-2.95 | 10.47 | 2.12 | 1.46-2.95 | 10.47 | 71 | | | | |
| 1972 | 1.11 | 0.49-2.01 | 23.57 | 1.11 | 0.49-2.01 | 23.57 | 53 | | | | |
| 1973 | 1.19 | 0.79-1.67 | 12.83 | 1.19 | 0.79-1.67 | 12.83 | 84 | | | | |
| 1974 | 0.71 | 0.38-1.12 | 20.24 | 0.71 | 0.38-1.12 | 20.24 | 53 | | | | |
| 1975 | 0.95 | 0.64-1.33 | 13.02 | 0.94 | 0.64-1.31 | 12.96 | 70 | | | | |
| 1976 | 0.41 | 0.16-0.71 | 28.08 | 0.41 | 0.16-0.71 | 28.08 | 39 | | | | |
| 1977 | 0.50 | 0.27-0.76 | 20.28 | 0.50 | 0.27-0.76 | 20.28 | 59 | | | | |
| 1978 | 0.29 | 0.14-0.46 | 24.02 | 0.29 | 0.14-0.46 | 24.02 | 95 | | | | |
| 1979 | 1.46 | 0.68-2.59 | 21.08 | 1.46 | 0.68-2.59 | 21.08 | 54 | | | | |
| 1980 | 0.54 | 0.28-0.87 | 21.91 | 0.55 | 0.28-0.88 | 22.05 | 50 | | | | |
| 1981 | 1.16 | 0.7-1.74 | 15.60 | 1.16 | 0.7-1.74 | 15.59 | 78 | | | | |
| 1982 | 1.91 | 0.82-3.65 | 21.93 | 1.91 | 0.82-3.65 | 21.93 | 41 | | | | |
| 1983 | 1.62 | 0.7-3.02 | 22.30 | 1.62 | 0.7-3.02 | 22.31 | 46 | | | 1.46 | 49 |
| 1984 | 2.31 | 1.35-3.67 | 14.33 | 2.31 | 1.35-3.67 | 14.33 | 54 | | | 3.53 | 54 |
| 1985 | 2.47 | 1.02-4.95 | 21.67 | 2.47 | 1.02-4.95 | 21.67 | 42 | | | 2.14 | 42 |
| 1986 | 1.77 | 1.31-2.33 | 8.99 | 1.77 | 1.31-2.33 | 8.99 | 44 | | | 2.13 | 44 |
| 1987 | 1.71 | 0.98-2.71 | 15.74 | 1.71 | 0.98-2.71 | 15.74 | 28 | | | 2.18 | 27 |
| 1988 | 1.88 | 1.29-2.62 | 10.81 | 1.88 | 1.29-2.62 | 10.81 | 52 | | | 3.16 | 52 |
| 1989 | 3.23 | 1.68-5.67 | 15.78 | 3.23 | 1.68-5.67 | 15.78 | 51 | | | 4.35 | 52 |
| 1990 | 3.46 | 2.13-5.34 | 11.82 | 3.46 | 2.13-5.34 | 11.82 | 52 | | | 6.75 | 52 |
| 1991 | 2.04 | 0.9-3.87 | 21.14 | 2.04 | 0.9-3.87 | 21.14 | 72 | | | 2.31 | 52 |
| 1992 | 3.77 | 3.03-4.63 | 5.34 | 3.77 | 3.03-4.63 | 5.34 | 68 | | | 3.97 | 52 |
| 1993 | 2.25 | 1.19-3.82 | 16.69 | 2.25 | 1.19-3.82 | 16.69 | 68 | | | 1.66 | 52 |
| 1994 | 1.59 | 1.09-2.22 | 11.37 | 1.59 | 1.09-2.22 | 11.37 | 68 | | | 2.72 | 52 |
| 1995 | 0.94 | 0.45-1.61 | 22.21 | 0.94 | 0.45-1.61 | 22.21 | 109 | | | 1.77 | 52 |
| 1996 | 1.05 | 0.76-1.40 | 10.78 | 1.05 | 0.76-1.40 | 10.78 | 120 | | | 3.11 | 53 |
| 1997 | 1.85 | 1.32-2.49 | 9.82 | 1.85 | 1.32-2.49 | 9.82 | 120 | | | 3.45 | 52 |
| 1998 | 1.21 | 0.76-1.77 | 14.40 | 1.21 | 0.76-1.77 | 14.40 | 120 | | | 2.45 | 52 |
| 1999 | 0.56 | 0.36-0.79 | 15.31 | 0.56 | 0.36-0.79 | 15.31 | 114 | | | 1.51 | 52 |
| 2000 | 0.29 | 0.15-0.45 | 22.91 | 0.29 | 0.15-0.45 | 22.91 | 120 | | | 0.66 | 52 |
| 2001 | 0.29 | 0.14-0.47 | 24.65 | 0.29 | 0.14-0.47 | 24.65 | 120 | | | 0.54 | 52 |
| 2002 | 0.36 | 0.11-0.66 | 33.57 | 0.36 | 0.11-0.66 | 33.57 | 120 | | | 0.52 | 52 |
| 2003 | 0.48 | 0.26-0.74 | 20.34 | 0.48 | 0.26-0.74 | 20.34 | 120 | | | 1.13 | 52 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 23.

**CHANNEL CATFISH - YOY INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1954 | 0.00 | 0 | | 0.00 | 0 | | 2 | | | | |
| 1955 | 0.08 | 0-0.25 | 100.00 | 0.08 | 0-0.25 | 100.00 | 5 | | | | |
| 1956 | 0.03 | 0-0.1 | 100.00 | 0.03 | 0-0.1 | 100.00 | 13 | | | | |
| 1957 | 0.09 | 0.01-0.17 | 44.17 | 0.09 | 0.01-0.17 | 44.17 | 20 | | | | |
| 1958 | 0.00 | 0 | | 0.00 | 0 | | 5 | | | | |
| 1959 | | | | | | | 0 | | | | |
| 1960 | 0.00 | 0 | | 0.00 | 0 | | 6 | | | | |
| 1961 | 0.46 | 0.06-1 | 42.06 | 0.46 | 0.06-1 | 42.06 | 12 | | | | |
| 1962 | 0.19 | 0-0.48 | 63.03 | 0.19 | 0-0.48 | 63.03 | 14 | | | | |
| 1963 | 0.87 | 0-4.83 | 90.76 | 0.87 | 0-4.83 | 90.76 | 24 | | | | |
| 1964 | 0.34 | 0.08-0.66 | 36.52 | 0.34 | 0.08-0.66 | 36.52 | 33 | | | | |
| 1965 | 0.29 | 0.06-0.58 | 38.23 | 0.29 | 0.06-0.58 | 38.23 | 42 | | | | |
| 1966 | 1.48 | 0.71-2.6 | 20.44 | 1.48 | 0.71-2.6 | 20.44 | 43 | | | | |
| 1967 | 0.12 | 0-0.33 | 74.16 | 0.12 | 0-0.33 | 74.16 | 34 | | | | |
| 1968 | 0.29 | 0-0.66 | 49.49 | 0.29 | 0-0.66 | 49.49 | 54 | | | | |
| 1969 | 0.50 | 0.21-0.84 | 25.85 | 0.50 | 0.21-0.84 | 25.85 | 50 | | | | |
| 1970 | 0.31 | 0-0.75 | 54.17 | 0.31 | 0-0.75 | 54.17 | 50 | | | | |
| 1971 | 1.88 | 1.15-2.86 | 13.83 | 1.88 | 1.15-2.86 | 13.83 | 71 | | | | |
| 1972 | 0.00 | 0 | | 0.00 | 0 | | 53 | | | | |
| 1973 | 1.18 | 0.79-1.65 | 12.65 | 1.18 | 0.79-1.65 | 12.65 | 84 | | | | |
| 1974 | 0.13 | 0.01-0.28 | 46.73 | 0.13 | 0.01-0.28 | 46.73 | 53 | | | | |
| 1975 | 0.65 | 0.28-1.12 | 25.17 | 0.79 | 0.4-1.29 | 21.34 | 70 | | | | |
| 1976 | 0.00 | 0 | | 0.00 | 0 | | 39 | | | | |
| 1977 | 0.06 | 0-0.11 | 47.28 | 0.06 | 0-0.11 | 47.28 | 59 | | | | |
| 1978 | 0.63 | 0.41-0.89 | 15.15 | 0.63 | 0.41-0.89 | 15.15 | 95 | | | | |
| 1979 | 0.71 | 0.21-1.41 | 31.96 | 0.71 | 0.21-1.41 | 31.96 | 54 | | | | |
| 1980 | 0.14 | 0.02-0.28 | 42.99 | 0.14 | 0.02-0.28 | 42.99 | 50 | | | | |
| 1981 | 0.16 | 0.08-0.24 | 24.59 | 0.16 | 0.08-0.24 | 24.59 | 78 | | | | |
| 1982 | 0.10 | 0.01-0.19 | 43.47 | 0.10 | 0.01-0.19 | 43.47 | 41 | | | | |
| 1983 | 0.33 | 0.17-0.51 | 22.71 | 0.33 | 0.17-0.51 | 22.71 | 46 | | | 0.16 | 49 |
| 1984 | 0.33 | 0.1-0.6 | 32.67 | 0.33 | 0.1-0.6 | 32.67 | 54 | | | 0.43 | 54 |
| 1985 | 0.04 | 0-0.13 | 100.00 | 0.04 | 0-0.13 | 100.00 | 42 | | | 0.04 | 42 |
| 1986 | 0.08 | 0.04-0.12 | 26.20 | 0.08 | 0.04-0.12 | 26.20 | 44 | | | 0.08 | 44 |
| 1987 | 0.09 | 0-0.25 | 79.59 | 0.09 | 0-0.25 | 79.59 | 28 | | | 0.15 | 27 |
| 1988 | 0.02 | 0-0.06 | 85.43 | 0.02 | 0-0.06 | 85.43 | 52 | | | 0.03 | 52 |
| 1989 | 1.92 | 1.03-3.22 | 17.10 | 1.92 | 1.03-3.22 | 17.10 | 51 | | | 1.27 | 52 |
| 1990 | 0.04 | 0-0.01 | 72.68 | 0.04 | 0-0.01 | 72.68 | 52 | | | 0.09 | 52 |
| 1991 | 0.03 | 0-0.08 | 100.00 | 0.03 | 0-0.08 | 100.00 | 72 | | | 0.02 | 52 |
| 1992 | 0.00 | 0 | | 0.00 | 0 | | 68 | | | 0.00 | 52 |
| 1993 | 0.04 | 0-0.12 | 77.30 | 0.04 | 0-0.12 | 77.30 | 68 | | | 0.08 | 52 |
| 1994 | 0.05 | 0-0.11 | 58.60 | 0.05 | 0-0.11 | 58.60 | 68 | | | 0.09 | 52 |
| 1995 | 0.22 | 0.07-0.40 | 33.76 | 0.22 | 0.07-0.40 | 33.76 | 109 | | | 0.40 | 52 |
| 1996 | 0.13 | 0.02-0.26 | 43.48 | 0.13 | 0.02-0.26 | 43.48 | 120 | | | 0.24 | 53 |
| 1997 | 0.05 | 0-0.12 | 63.47 | 0.05 | 0-0.12 | 63.47 | 120 | | | 0.03 | 52 |
| 1998 | 0.06 | 0-0.12 | 49.85 | 0.06 | 0-0.12 | 49.85 | 120 | | | 0.04 | 52 |
| 1999 | 0.00 | 0 | | 0.00 | 0 | | 114 | | | 0.00 | 52 |
| 2000 | 0.01 | 0-0.02 | 42.25 | 0.01 | 0-0.02 | 42.25 | 120 | | | 0.04 | 52 |
| 2001 | 0.00 | 0-0.01 | 100.00 | 0.00 | 0-0.01 | 100.00 | 120 | | | 0.00 | 52 |
| 2002 | 0.00 | 0-0.01 | 100.00 | 0.00 | 0-0.01 | 100.00 | 120 | | | 0.00 | 52 |
| 2003 | 0.32 | 0.16-0.50 | 23.67 | 0.32 | 0.16-0.50 | 23.67 | 120 | | | 0.83 | 52 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 24.

**CHANNEL CATFISH - 1+ INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1954 | 0.00 | 0 | | 0.00 | 0 | | 2 | | | | |
| 1955 | 0.00 | 0 | | 0.00 | 0 | | 5 | | | | |
| 1956 | 0.00 | 0 | | 0.00 | 0 | | 13 | | | | |
| 1957 | 0.11 | 0.01-0.22 | 45.47 | 0.11 | 0.01-0.22 | 45.47 | 20 | | | | |
| 1958 | 0.00 | 0 | | 0.00 | 0 | | 5 | | | | |
| 1959 | | | | | | | 0 | | | | |
| 1960 | 0.00 | 0 | | 0.00 | 0 | | 6 | | | | |
| 1961 | 0.86 | 0.16-1.97 | 37.79 | 0.86 | 0.16-1.97 | 37.79 | 12 | | | | |
| 1962 | 0.26 | 0-0.66 | 61.69 | 0.26 | 0-0.66 | 61.69 | 14 | | | | |
| 1963 | 0.07 | 0-0.18 | 67.11 | 0.07 | 0-0.18 | 67.11 | 24 | | | | |
| 1964 | 0.67 | 0.34-1.08 | 21.40 | 0.67 | 0.34-1.08 | 21.40 | 33 | | | | |
| 1965 | 0.29 | 0.15-0.45 | 22.93 | 0.29 | 0.15-0.45 | 22.93 | 42 | | | | |
| 1966 | 0.60 | 0.13-1.26 | 36.87 | 0.60 | 0.13-1.26 | 36.87 | 43 | | | | |
| 1967 | 0.40 | 0.08-0.81 | 38.24 | 0.40 | 0.08-0.81 | 38.24 | 34 | | | | |
| 1968 | 0.27 | 0.05-0.54 | 39.70 | 0.27 | 0.05-0.54 | 39.70 | 54 | | | | |
| 1969 | 0.50 | 0.26-0.79 | 21.78 | 0.50 | 0.26-0.79 | 21.78 | 50 | | | | |
| 1970 | 1.27 | 0.76-1.92 | 15.57 | 1.27 | 0.76-1.92 | 15.57 | 50 | | | | |
| 1971 | 0.48 | 0.19-0.85 | 27.91 | 0.48 | 0.19-0.85 | 27.91 | 71 | | | | |
| 1972 | 0.00 | 0 | | 0.00 | 0 | | 53 | | | | |
| 1973 | 1.54 | 1.09-2.1 | 10.56 | 1.54 | 1.09-2.1 | 10.56 | 84 | | | | |
| 1974 | 0.33 | 0.14-0.55 | 26.87 | 0.33 | 0.14-0.55 | 26.87 | 53 | | | | |
| 1975 | 1.03 | 0.56-1.64 | 18.45 | 0.98 | 0.53-1.57 | 18.87 | 70 | | | | |
| 1976 | 0.00 | 0 | | 0.00 | 0 | | 39 | | | | |
| 1977 | 0.38 | 0.18-0.62 | 24.65 | 0.38 | 0.18-0.62 | 24.65 | 59 | | | | |
| 1978 | 0.94 | 0.65-1.28 | 12.05 | 0.94 | 0.65-1.28 | 12.05 | 95 | | | | |
| 1979 | 1.96 | 0.82-3.81 | 22.42 | 1.96 | 0.82-3.82 | 22.39 | 54 | | | | |
| 1980 | 1.89 | 1.33-2.59 | 10.21 | 1.89 | 1.33-2.59 | 10.21 | 50 | | | | |
| 1981 | 0.54 | 0.26-0.88 | 23.22 | 0.54 | 0.26-0.88 | 23.22 | 78 | | | | |
| 1982 | 0.40 | 0-1.08 | 59.47 | 0.40 | 0-1.08 | 59.47 | 41 | | | | |
| 1983 | 1.97 | 1.36-2.75 | 10.70 | 1.97 | 1.36-2.75 | 10.70 | 46 | | | 0.91 | 49 |
| 1984 | 2.37 | 1.32-3.88 | 15.30 | 2.37 | 1.32-3.88 | 15.30 | 54 | | | 1.69 | 54 |
| 1985 | 2.92 | 1.82-4.45 | 12.03 | 2.92 | 1.82-4.45 | 12.03 | 42 | | | 1.81 | 42 |
| 1986 | 1.53 | 1.29-1.79 | 5.30 | 1.53 | 1.29-1.79 | 5.30 | 44 | | | 0.84 | 44 |
| 1987 | 0.94 | 0.36-1.77 | 26.61 | 0.94 | 0.36-1.77 | 26.61 | 28 | | | 0.85 | 27 |
| 1988 | 1.41 | 1.05-1.82 | 9.09 | 1.41 | 1.05-1.82 | 9.09 | 52 | | | 0.91 | 52 |
| 1989 | 1.10 | 0.52-1.91 | 21.82 | 1.10 | 0.52-1.91 | 21.82 | 51 | | | 1.20 | 52 |
| 1990 | 2.67 | 1.79-3.83 | 10.56 | 2.67 | 1.79-3.83 | 10.56 | 52 | | | 1.52 | 52 |
| 1991 | 3.37 | 2.27-4.82 | 9.78 | 3.37 | 2.27-4.82 | 9.78 | 72 | | | 1.73 | 52 |
| 1992 | 1.87 | 1.30-2.58 | 10.47 | 1.87 | 1.30-2.58 | 10.47 | 68 | | | 1.48 | 52 |
| 1993 | 0.83 | 0.20-1.80 | 35.01 | 0.83 | 0.20-1.80 | 35.01 | 68 | | | 1.15 | 52 |
| 1994 | 0.81 | 0.48-1.22 | 17.04 | 0.81 | 0.48-1.22 | 17.04 | 68 | | | 1.49 | 52 |
| 1995 | 0.69 | 0.39-1.05 | 18.45 | 0.69 | 0.39-1.05 | 18.45 | 109 | | | 0.58 | 52 |
| 1996 | 1.08 | 0.60-1.71 | 17.84 | 1.08 | 0.60-1.71 | 17.84 | 120 | | | 1.17 | 53 |
| 1997 | 0.84 | 0.47-1.30 | 18.21 | 0.84 | 0.47-1.30 | 18.21 | 120 | | | 1.06 | 52 |
| 1998 | 0.79 | 0.46-1.19 | 17.60 | 0.79 | 0.46-1.19 | 17.60 | 120 | | | 0.68 | 52 |
| 1999 | 0.33 | 0.13-0.56 | 28.23 | 0.33 | 0.13-0.56 | 28.23 | 114 | | | 0.77 | 52 |
| 2000 | 0.25 | 0.11-0.41 | 26.84 | 0.25 | 0.11-0.41 | 26.84 | 120 | | | 0.31 | 52 |
| 2001 | 0.17 | 0.04-0.33 | 38.79 | 0.17 | 0.04-0.33 | 38.79 | 120 | | | 0.16 | 52 |
| 2002 | 0.37 | 0.16-0.61 | 26.31 | 0.37 | 0.16-0.61 | 26.31 | 120 | | | 0.36 | 52 |
| 2003 | 0.28 | 0.15-0.44 | 22.78 | 0.28 | 0.15-0.44 | 22.78 | 120 | | | 0.37 | 52 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 25.

**BLUE CATFISH – YOY INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1983 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 46 | | | 0.00 | 49 |
| 1984 | 0.05 | 0.0-0.14 | 100.00 | 0.05 | 0.0-0.14 | 100.00 | 54 | | | 0.02 | 54 |
| 1985 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 42 | | | 0.00 | 42 |
| 1986 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 44 | | | 0.00 | 44 |
| 1987 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 28 | | | 0.00 | 27 |
| 1988 | 0.00 | 0.00-0.01 | 100.00 | 0.00 | 0.00-0.01 | 100.00 | 52 | | | 0.01 | 52 |
| 1989 | 0.43 | 0.00-1.24 | 61.91 | 0.43 | 0.00-1.24 | 61.91 | 51 | | | 0.25 | 52 |
| 1990 | 0.14 | 0.02-0.28 | 42.14 | 0.14 | 0.02-0.28 | 42.14 | 52 | | | 0.29 | 52 |
| 1991 | 0.37 | 0.25-0.50 | 14.11 | 0.37 | 0.25-0.50 | 14.11 | 72 | | | 0.19 | 52 |
| 1992 | 0.33 | 0.15-0.54 | 24.87 | 0.33 | 0.15-0.54 | 24.87 | 68 | | | 0.26 | 52 |
| 1993 | 0.18 | 0.07-0.30 | 28.51 | 0.18 | 0.07-0.30 | 28.51 | 68 | | | 0.45 | 52 |
| 1994 | 0.16 | 0.03-0.32 | 40.81 | 0.16 | 0.03-0.32 | 40.81 | 68 | | | 0.38 | 52 |
| 1995 | 0.64 | 0.34-1.00 | 20.18 | 0.64 | 0.34-1.00 | 20.18 | 109 | | | 0.91 | 52 |
| 1996 | 0.92 | 0.40-1.63 | 24.21 | 0.92 | 0.40-1.63 | 24.21 | 120 | | | 1.24 | 53 |
| 1997 | 2.40 | 1.55-3.54 | 11.81 | 2.40 | 1.55-3.54 | 11.81 | 120 | | | 2.33 | 52 |
| 1998 | 0.31 | 0.14-0.52 | 26.57 | 0.31 | 0.14-0.52 | 26.57 | 120 | | | 0.54 | 52 |
| 1999 | 0.14 | 0.04-0.25 | 36.47 | 0.14 | 0.04-0.25 | 36.47 | 114 | | | 0.30 | 52 |
| 2000 | 0.22 | 0.00-0.60 | 66.93 | 0.22 | 0.00-0.60 | 66.93 | 120 | | | 0.10 | 52 |
| 2001 | 0.02 | 0.00-0.04 | 67.15 | 0.02 | 0.00-0.04 | 67.15 | 120 | | | 0.02 | 52 |
| 2002 | 0.61 | 0.14-1.28 | 36.48 | 0.61 | 0.14-1.28 | 36.48 | 120 | | | 0.50 | 52 |
| 2003 | 1.33 | 0.75-2.10 | 16.88 | 1.33 | 0.75-2.10 | 16.88 | 120 | | | 2.50 | 52 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 26.

**BLUE CATFISH - 1+ INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1983 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 46 | | | 0.00 | 49 |
| 1984 | 0.12 | 0.00-0.26 | 53.80 | 0.12 | 0.00-0.26 | 53.80 | 54 | | | 0.06 | 54 |
| 1985 | 0.01 | 0.00-0.04 | 100.00 | 0.01 | 0.00-0.04 | 100.00 | 42 | | | 0.03 | 42 |
| 1986 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 44 | | | 0.00 | 44 |
| 1987 | 0.00 | 0.00 | . | 0.00 | 0.00 | . | 28 | | | 0.00 | 27 |
| 1988 | 0.02 | 0.00-0.05 | 100.00 | 0.02 | 0.00-0.05 | 100.00 | 52 | | | 0.05 | 52 |
| 1989 | 0.10 | 0.00-0.28 | 82.29 | 0.10 | 0.00-0.28 | 82.29 | 51 | | | 0.10 | 52 |
| 1990 | 0.26 | 0.10-0.45 | 29.18 | 0.26 | 0.10-0.45 | 29.18 | 52 | | | 0.61 | 52 |
| 1991 | 0.80 | 0.48-1.19 | 16.69 | 0.80 | 0.48-1.19 | 16.69 | 72 | | | 0.42 | 52 |
| 1992 | 1.09 | 0.65-1.66 | 16.17 | 1.09 | 0.65-1.66 | 16.17 | 68 | | | 0.84 | 52 |
| 1993 | 0.47 | 0.06-1.03 | 42.59 | 0.47 | 0.06-1.03 | 42.59 | 68 | | | 0.57 | 52 |
| 1994 | 0.50 | 0.15-0.95 | 32.59 | 0.50 | 0.15-0.95 | 32.59 | 68 | | | 1.03 | 52 |
| 1995 | 0.48 | 0.14-0.93 | 33.56 | 0.48 | 0.14-0.93 | 33.56 | 109 | | | 0.62 | 52 |
| 1996 | 1.38 | 0.62-2.49 | 22.11 | 1.38 | 0.62-2.49 | 22.11 | 120 | | | 2.32 | 53 |
| 1997 | 3.85 | 2.41-5.89 | 11.17 | 3.85 | 2.41-5.89 | 11.17 | 120 | | | 4.41 | 52 |
| 1998 | 1.99 | 0.95-3.59 | 19.57 | 1.99 | 0.95-3.59 | 19.57 | 120 | | | 3.34 | 52 |
| 1999 | 1.06 | 0.54-1.75 | 19.96 | 1.06 | 0.54-1.75 | 19.96 | 114 | | | 1.73 | 52 |
| 2000 | 0.88 | 0.33-1.65 | 27.38 | 0.88 | 0.33-1.65 | 27.38 | 120 | | | 0.89 | 52 |
| 2001 | 0.55 | 0.30-0.85 | 20.39 | 0.55 | 0.30-0.85 | 20.39 | 120 | | | 0.98 | 52 |
| 2002 | 0.96 | 0.42-1.70 | 23.81 | 0.96 | 0.42-1.70 | 23.81 | 120 | | | 0.84 | 52 |
| 2003 | 1.81 | 0.94-3.08 | 18.02 | 1.81 | 0.94-3.08 | 18.02 | 120 | | | 2.38 | 52 |
| 2004 | . | . | . | . | . | . | . | | | . | . |

Table 27.

**NORTHERN PUFFER INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| | | | | | | | | | | | |
| 1955 | 0.00 | 0 | | 0.00 | 0 | | 4 | | | | |
| 1956 | 0.05 | 0-0.11 | 53.96 | 0.05 | 0-0.11 | 53.96 | 23 | | | | |
| 1957 | 0.08 | 0-0.18 | 59.03 | 0.08 | 0-0.18 | 59.03 | 20 | | | | |
| 1958 | 0.00 | 0 | | 0.00 | 0 | | 19 | | | | |
| 1959 | 0.00 | 0 | | 0.00 | 0 | | 19 | | | | |
| 1960 | 0.02 | 0-0.07 | 100.00 | 0.02 | 0-0.07 | 100.00 | 10 | | | | |
| 1961 | 0.22 | 0-0.8 | 100.00 | 0.22 | 0-0.8 | 100.00 | 7 | | | | |
| 1962 | 0.18 | 0-0.63 | 100.00 | 0.18 | 0-0.63 | 100.00 | 4 | | | | |
| 1963 | 0.21 | 0-0.53 | 61.24 | 0.21 | 0-0.53 | 61.24 | 8 | | | | |
| 1964 | 0.44 | 0-1.44 | 72.14 | 0.44 | 0-1.44 | 72.14 | 8 | | | | |
| 1965 | | | | | | | 0 | | | | |
| 1966 | 0.23 | 0-0.71 | 82.25 | 0.23 | 0-0.71 | 82.25 | 8 | | | | |
| 1967 | 0.18 | 0-0.44 | 58.66 | 0.18 | 0-0.44 | 58.66 | 8 | | | | |
| 1968 | 1.35 | 0.75-2.14 | 17.08 | 1.35 | 0.75-2.14 | 17.08 | 8 | | | | |
| 1969 | 0.42 | 0-1.04 | 51.09 | 0.42 | 0-1.04 | 51.09 | 8 | | | | |
| 1970 | 0.16 | 0-0.41 | 69.83 | 0.16 | 0-0.41 | 69.83 | 8 | | | | |
| 1971 | 0.57 | 0.12-1.19 | 37.57 | 0.57 | 0.12-1.19 | 37.57 | 8 | | | | |
| 1972 | 0.28 | 0 | | 0.28 | 0 | | 2 | | | | |
| 1973 | | | | | | | 0 | | | | |
| 1974 | 0.00 | 0 | | 0.00 | 0 | | 76 | | | | |
| 1975 | 0.02 | 0-0.06 | 71.82 | 0.02 | 0-0.06 | 71.82 | 74 | | | | |
| 1976 | 0.00 | 0 | | 0.00 | 0 | | 90 | | | | |
| 1977 | 0.00 | 0 | | 0.00 | 0 | | 68 | | | | |
| 1978 | 0.00 | 0 | 100.00 | 0.00 | 0 | 100.00 | 95 | | | | |
| 1979 | 0.00 | 0 | | 0.00 | 0 | | 4 | | | | |
| 1980 | 0.36 | 0-1.02 | 65.81 | 0.36 | 0-1.02 | 65.81 | 15 | | | | |
| 1981 | 0.00 | 0 | | 0.00 | 0 | | 9 | | | | |
| 1982 | 0.00 | 0 | | 0.00 | 0 | | 5 | | | | |
| 1983 | | | | | | | 0 | | | | |
| 1984 | | | | | | | 0 | | | | |
| 1985 | | | | | | | 0 | | | | |
| 1986 | | | | | | | 0 | | | | |
| 1987 | | | | | | | 0 | | | | |
| 1988 | 0.84 | 0.58-1.15 | 12.43 | 0.84 | 0.58-1.15 | 12.43 | 147 | 0.84 | 147 | | |
| 1989 | 0.79 | 0.61-0.99 | 9.00 | 0.79 | 0.61-0.99 | 9.00 | 168 | 0.79 | 168 | | |
| 1990 | 0.68 | 0.49-0.90 | 11.83 | 0.68 | 0.49-0.90 | 11.83 | 167 | 0.68 | 167 | | |
| 1991 | 0.45 | 0.32-0.59 | 12.78 | 0.45 | 0.32-0.59 | 12.78 | 155 | 0.45 | 155 | | |
| 1992 | 0.11 | 0.06-0.17 | 22.68 | 0.11 | 0.06-0.17 | 22.68 | 156 | 0.11 | 156 | | |
| 1993 | 0.17 | 0.10-0.24 | 18.28 | 0.17 | 0.10-0.24 | 18.28 | 156 | 0.17 | 156 | | |
| 1994 | 0.10 | 0.05-0.16 | 26.01 | 0.10 | 0.05-0.16 | 26.01 | 156 | 0.1 | 156 | | |
| 1995 | 0.08 | 0.04-0.12 | 24.11 | 0.08 | 0.04-0.12 | 24.11 | 156 | 0.08 | 156 | | |
| 1996 | 0.14 | 0.08-0.22 | 22.94 | 0.14 | 0.08-0.22 | 22.94 | 156 | 0.14 | 156 | | |
| 1997 | 0.20 | 0.12-0.28 | 18.18 | 0.20 | 0.12-0.28 | 18.18 | 156 | 0.2 | 156 | | |
| 1998 | 0.09 | 0.04-0.14 | 27.44 | 0.09 | 0.04-0.14 | 27.44 | 118 | 0.09 | 118 | | |
| 1999 | 0.25 | 0.15-0.34 | 17.59 | 0.25 | 0.15-0.34 | 17.59 | 138 | 0.24 | 138 | | |
| 2000 | 0.13 | 0.08-0.19 | 18.81 | 0.13 | 0.08-0.19 | 18.81 | 156 | 0.13 | 156 | | |
| 2001 | 0.32 | 0.21-0.44 | 16.06 | 0.32 | 0.21-0.44 | 16.06 | 164 | 0.32 | 164 | | |
| 2002 | 0.16 | 0.08-0.25 | 24.26 | 0.16 | 0.08-0.25 | 24.26 | 96 | 0.16 | 96 | | |
| 2003 | 0.04 | 0.01-0.08 | 34.96 | 0.04 | 0.01-0.08 | 34.96 | 156 | 0.04 | 156 | | |
| 2004 | . | . | . | . | . | . | . | . | . | | |

Table 28.

**SILVER PERCH INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| | | | | | | | | | | | |
| 1955 | 13.34 | 0 | | 33.71 | 0 | | 3 | | | | |
| 1956 | 7.30 | 2.69-17.67 | 19.14 | 18.43 | 7.62-42.81 | 13.70 | 43 | | | | |
| 1957 | 15.59 | 6.92-33.74 | 13.16 | 30.16 | 15.46-57.99 | 9.28 | 43 | | | | |
| 1958 | 2.75 | 0.54-8.11 | 33.61 | 6.60 | 2-18.22 | 22.88 | 42 | | | | |
| 1959 | 5.02 | 0.42-24.49 | 40.20 | 11.74 | 1.98-53.44 | 28.53 | 42 | | | | |
| 1960 | | | | | | | 0 | | | | |
| 1961 | 3.70 | 0.84-11.01 | 30.29 | 12.22 | 4.48-30.9 | 17.06 | 20 | | | | |
| 1962 | 1.29 | 0.77-1.98 | 15.67 | 1.82 | 1.27-2.5 | 10.51 | 13 | | | | |
| 1963 | 29.70 | 11.61-73.79 | 13.00 | 51.20 | 18.17-141.17 | 12.67 | 24 | | | | |
| 1964 | 1.04 | 0-3.4 | 54.15 | 2.02 | 0.59-4.72 | 28.91 | 34 | | | | |
| 1965 | 0.49 | 0.28-0.73 | 18.81 | 1.35 | 0.87-1.94 | 13.19 | 38 | | | | |
| 1966 | 0.47 | 0-1.28 | 57.83 | 1.04 | 0-3.69 | 58.13 | 42 | | | | |
| 1967 | 0.40 | 0.11-0.75 | 33.92 | 0.55 | 0.2-1.01 | 29.62 | 66 | | | | |
| 1968 | 1.45 | 0-7.86 | 71.84 | 2.07 | 0-13.14 | 67.96 | 66 | | | | |
| 1969 | 3.10 | 0-16.68 | 51.88 | 3.80 | 0-25.02 | 53.89 | 69 | | | | |
| 1970 | 11.12 | 2.62-39.64 | 24.24 | 23.53 | 8.08-65.26 | 15.53 | 68 | | | | |
| 1971 | 4.16 | 3.54-4.86 | 3.88 | 8.61 | 7.26-10.19 | 3.36 | 183 | | | | |
| 1972 | 0.69 | 0.51-0.91 | 11.14 | 0.69 | 0.51-0.91 | 11.14 | 161 | | | | |
| 1973 | 0.34 | 0.23-0.47 | 15.30 | 0.34 | 0.23-0.47 | 15.30 | 209 | | | | |
| 1974 | 0.06 | 0.01-0.11 | 41.36 | 0.06 | 0.01-0.11 | 41.36 | 73 | | | | |
| 1975 | 0.05 | 0-0.11 | 52.59 | 0.05 | 0-0.11 | 52.59 | 54 | | | | |
| 1976 | 0.26 | 0.07-0.48 | 34.39 | 0.19 | 0.07-0.48 | 34.39 | 108 | | | | |
| 1977 | 0.03 | 0-0.06 | 48.53 | 0.03 | 0-0.06 | 48.53 | 78 | | | | |
| 1978 | 0.07 | 0-0.19 | 76.37 | 0.07 | 0-0.19 | 76.37 | 78 | | | | |
| 1979 | 0.05 | 0.02-0.08 | 27.64 | 0.05 | 0.02-0.08 | 27.64 | 97 | | | 0.17 | 95 |
| 1980 | 0.06 | 0-0.17 | 72.55 | 0.12 | 0-0.26 | 56.21 | 121 | | | 0.07 | 112 |
| 1981 | 0.00 | 0 | 66.82 | 0.15 | 0-0.48 | 88.03 | 118 | | | 0.06 | 112 |
| 1982 | 0.02 | 0-0.03 | 40.87 | 0.05 | 0.02-0.09 | 29.57 | 118 | | | 0.16 | 114 |
| 1983 | 0.00 | 0 | | 0.06 | 0.01-0.1 | 37.52 | 113 | | | 0.06 | 113 |
| 1984 | 0.00 | 0 | | 0.02 | 0-0.05 | 73.77 | 95 | | | 0.02 | 99 |
| 1985 | 0.16 | 0.06-0.27 | 31.13 | 0.34 | 0.17-0.54 | 23.50 | 58 | | | 0.68 | 59 |
| 1986 | 0.10 | 0.03-0.17 | 33.23 | 0.26 | 0.13-0.4 | 23.44 | 107 | | | 0.34 | 107 |
| 1987 | 0.24 | 0.11-0.37 | 24.38 | 0.42 | 0.25-0.62 | 18.37 | 100 | | | 0.53 | 100 |
| 1988 | 0.39 | 0.22-0.59 | 20.46 | 0.61 | 0.35-0.92 | 18.30 | 172 | 0.65 | 172 | 1.02 | 65 |
| 1989 | 0.28 | 0.16-0.41 | 19.62 | 0.53 | 0.33-0.76 | 16.32 | 189 | 0.56 | 189 | 1.63 | 63 |
| 1990 | 0.40 | 0.28-0.54 | 13.36 | 0.69 | 0.49-0.92 | 11.94 | 185 | 0.75 | 185 | 4.08 | 59 |
| 1991 | 0.36 | 0.22-0.51 | 17.33 | 0.36 | 0.22-0.51 | 17.33 | 251 | 0.40 | 179 | 1.47 | 62 |
| 1992 | 0.80 | 0.49-1.16 | 15.80 | 0.80 | 0.49-1.16 | 15.80 | 226 | 0.86 | 178 | 1.95 | 61 |
| 1993 | 0.43 | 0.28-0.61 | 16.01 | 0.43 | 0.28-0.61 | 16.01 | 224 | 0.45 | 180 | 0.60 | 63 |
| 1994 | 0.25 | 0.12-0.4 | 25.42 | 0.25 | 0.12-0.4 | 25.42 | 225 | 0.26 | 180 | 0.37 | 63 |
| 1995 | 0.62 | 0.39-0.89 | 15.65 | 0.62 | 0.39-0.89 | 15.65 | 291 | 0.65 | 180 | 1.81 | 67 |
| 1996 | 0.59 | 0.38-0.84 | 15.63 | 0.59 | 0.38-0.84 | 15.63 | 304 | 0.58 | 183 | 1.18 | 66 |
| 1997 | 0.71 | 0.50-0.94 | 12.07 | 0.71 | 0.50-0.94 | 12.07 | 316 | 0.79 | 192 | 1.43 | 75 |
| 1998 | 0.24 | 0.15-0.33 | 16.77 | 0.24 | 0.15-0.33 | 16.77 | 316 | 0.24 | 192 | 0.53 | 75 |
| 1999 | 0.70 | 0.49-0.94 | 12.42 | 0.70 | 0.49-0.94 | 12.42 | 309 | 0.74 | 186 | 2.51 | 75 |
| 2000 | 0.68 | 0.46-0.93 | 13.56 | 0.68 | 0.46-0.93 | 13.56 | 317 | 0.76 | 192 | 2.12 | 74 |
| 2001 | 0.70 | 0.47-0.97 | 13.77 | 0.70 | 0.47-0.97 | 13.77 | 327 | 0.85 | 200 | 3.17 | 75 |
| 2002 | 0.44 | 0.24-0.67 | 20.16 | 0.44 | 0.24-0.67 | 20.16 | 269 | 0.41 | 146 | 1.67 | 75 |
| 2003 | 0.63 | 0.40-0.90 | 15.49 | 0.63 | 0.40-0.90 | 15.49 | 315 | 0.66 | 192 | 0.71 | 75 |
| 2004 | . | . | . | . | . | . | . | . | . | . | . |

Table 29.

## BLUE CRAB INDICES

| BLUE CRAB AGE 0 | | | | | BLUE CRAB AGE 1+ | | | | BLUE CRAB ADULT FEMALES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Converted Random Stratified Index (RSCI) | | | | | Converted Random Stratified Index (RSCI) | | | | Converted Random Stratified Index (RSCI) | | | |
| Year | Geo. Mean | 95% C.I.'s | C.V. | N | Geo. Mean | 95% C.I.'s | C.V. | N | Geo. Mean | 95% C.I.'s | C.V. | N |
| 1968 | 6.24 | 3.66-10.25 | 11.14 | 60 | 4.15 | 2.37-6.87 | 12.93 | 53 | 2.22 | 1.48-3.17 | 11.15 | 25 |
| 1969 | 1.04 | 0.66-1.50 | 14.47 | 63 | 17.58 | 10.67-28.57 | 7.96 | 63 | 1.19 | 0.13-3.24 | 42.20 | 27 |
| 1970 | 12.89 | 8.37-19.59 | 7.48 | 60 | 19.56 | 15.75-24.23 | 3.39 | 61 | 7.60 | 6.57-8.76 | 2.95 | 24 |
| 1971 | 8.87 | 6.79-11.49 | 5.15 | 93 | 36.64 | 27.53-48.67 | 3.82 | 94 | 10.89 | 8.68-13.60 | 4.15 | 50 |
| 1972 | 2.20 | 1.77-2.69 | 6.20 | 81 | 7.21 | 5.68-9.10 | 4.91 | 64 | 3.46 | 3.05-3.90 | 3.21 | 36 |
| 1973 | 2.38 | 1.37-3.81 | 14.49 | 75 | 5.51 | 4.29-7.00 | 5.51 | 78 | 0.83 | 0.33-1.52 | 26.51 | 36 |
| 1974 | 0.32 | 0.18-0.48 | 20.73 | 70 | 2.53 | 1.58-3.84 | 12.49 | 78 | 0.83 | 0.29-1.60 | 29.03 | 36 |
| 1975 | 0.87 | 0.59-1.19 | 12.68 | 54 | 1.81 | 1.05-2.86 | 15.24 | 54 | 0.19 | 0-0.46 | 56.57 | 24 |
| 1976 | 1.64 | 0.96-2.54 | 15.22 | 108 | 2.54 | 1.94-3.27 | 7.35 | 116 | 0.62 | 0.38-0.90 | 16.84 | 72 |
| 1977 | 5.35 | 3.38-8.22 | 10.06 | 78 | 8.41 | 5.83-11.98 | 7.17 | 78 | 1.00 | 0.15-2.47 | 39.86 | 36 |
| 1978 | 4.15 | 3.18-5.34 | 6.35 | 78 | 10.91 | 7.95-14.85 | 5.77 | 77 | 2.20 | 0.83-4.62 | 24.14 | 35 |
| 1979 | 0.34 | 0.20-0.50 | 18.54 | 94 | 7.79 | 5.73-10.49 | 6.14 | 94 | 4.29 | 3.16-5.73 | 7.22 | 52 |
| 1980 | 11.97 | 8.39-16.91 | 6.30 | 108 | 15.86 | 12.41-20.21 | 4.06 | 108 | 3.78 | 2.48-5.58 | 10.17 | 57 |
| 1981 | 11.27 | 9.08-13.94 | 3.92 | 112 | 27.23 | 22.41-33.04 | 2.80 | 100 | 4.56 | 3.17-6.41 | 8.38 | 53 |
| 1982 | 5.11 | 3.39-7.50 | 9.12 | 113 | 14.61 | 11.31-18.80 | 4.33 | 112 | 3.84 | 2.44-5.81 | 10.82 | 59 |
| 1983 | 10.29 | 7.11-14.71 | 6.83 | 113 | 18.14 | 14.97-21.93 | 3.06 | 111 | 4.03 | 3.11-5.17 | 6.29 | 60 |
| 1984 | 3.96 | 2.92-5.28 | 7.34 | 95 | 12.96 | 9.91-16.87 | 4.68 | 93 | 1.79 | 1.07-2.77 | 14.66 | 41 |
| 1985 | 5.53 | 4.19-7.22 | 6.14 | 58 | 12.84 | 10.61-15.49 | 3.34 | 80 | 2.83 | 2.01-3.87 | 9.00 | 39 |
| 1986 | 3.46 | 2.52-4.64 | 7.92 | 107 | 6.85 | 5.44-8.57 | 4.81 | 108 | 2.43 | 1.63-3.45 | 10.67 | 54 |
| 1987 | 3.68 | 2.37-5.50 | 10.64 | 100 | 7.56 | 5.20-10.83 | 7.53 | 100 | 3.30 | 1.76-5.70 | 15.17 | 52 |
| 1988 | 3.80 | 2.46-5.64 | 10.39 | 100 | 11.95 | 8.61-16.47 | 5.84 | 102 | 4.84 | 3.45-6.66 | 7.70 | 164 |
| 1989 | 17.79 | 13.04-24.14 | 4.96 | 101 | 12.57 | 9.71-16.20 | 4.54 | 102 | 4.89 | 3.78-6.25 | 5.87 | 180 |
| 1990 | 12.40 | 8.99-16.99 | 5.67 | 95 | 29.68 | 22.86-38.45 | 3.67 | 95 | 8.02 | 6.13-10.40 | 5.33 | 179 |
| 1991 | 7.07 | 4.88-10.08 | 7.58 | 102 | 9.08 | 6.89-11.89 | 5.31 | 99 | 2.73 | 2.05-3.56 | 7.64 | 171 |
| 1992 | 4.88 | 3.20-7.22 | 9.46 | 100 | 8.17 | 5.92-11.16 | 6.36 | 100 | 0.86 | 0.60-1.16 | 11.99 | 171 |
| 1993 | 5.85 | 3.91-8.55 | 8.63 | 102 | 3.21 | 2.30-4.38 | 8.49 | 102 | 1.38 | 0.94-1.93 | 11.96 | 171 |
| 1994 | 2.72 | 1.82-3.89 | 10.45 | 102 | 2.82 | 1.98-3.88 | 9.19 | 102 | 0.88 | 0.64-1.15 | 10.65 | 171 |
| 1995 | 11.33 | 7.49-16.90 | 7.43 | 67 | 6.63 | 4.99-8.71 | 5.96 | 69 | 0.39 | 0.27-0.52 | 13.78 | 153 |
| 1996 | 5.87 | 3.43-9.66 | 11.38 | 187 | 8.59 | 7.20-10.21 | 3.46 | 188 | 1.41 | 1.08-1.78 | 8.28 | 224 |
| 1997 | 4.38 | 3.33-5.69 | 6.46 | 199 | 9.70 | 8.12-11.56 | 3.37 | 199 | 0.88 | 0.63-1.16 | 11.11 | 226 |
| 1998 | 8.42 | 6.21-11.30 | 5.95 | 199 | 5.41 | 4.22-6.88 | 5.56 | 190 | 0.37 | 0.23-0.53 | 17.31 | 187 |
| 1999 | 2.90 | 2.35-3.54 | 5.58 | 198 | 6.43 | 4.83-8.48 | 6.07 | 198 | 0.54 | 0.37-0.74 | 13.87 | 213 |
| 2000 | 3.05 | 2.30-3.96 | 7.31 | 199 | 3.78 | 2.67-5.23 | 8.47 | 199 | 0.46 | 0.32-0.62 | 13.42 | 226 |
| 2001 | 2.64 | 2.07-3.33 | 6.65 | 202 | 4.58 | 3.36-6.15 | 7.17 | 202 | 0.48 | 0.34-0.63 | 12.67 | 236 |
| 2002 | 2.66 | 1.96-3.53 | 8.19 | 198 | 4.16 | 3.42-5.02 | 4.71 | 198 | 0.39 | 0.26-0.52 | 14.19 | 180 |
| 2003 | 8.39 | 5.89-11.80 | 6.90 | 198 | 5.53 | 4.61-6.60 | 4.06 | 198 | 0.32 | 0.21-0.43 | 14.80 | 225 |
| 2004 | . | . | . | . | . | . | . | . | . | . | . | . |

Table 30.

**AMERICAN EEL INDICES**

| | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1955 | 6.55 | 0.19-46.82 | 45.65 | 2 | | | | |
| 1956 | 1.86 | 0.55-4.26 | 29.16 | 10 | | | | |
| 1957 | 0.16 | 0-0.55 | 100.00 | 5 | | | | |
| 1958 | 1.96 | 1.02-3.34 | 17.58 | 17 | | | | |
| 1959 | 0.53 | 0-1.57 | 61.08 | 11 | | | | |
| 1960 | 0.18 | 0.06-0.33 | 33.86 | 10 | | | | |
| 1961 | 1.77 | 0.44-4.30 | 31.93 | 8 | | | | |
| 1962 | 1.10 | 0.01-3.33 | 49.03 | 9 | | | | |
| 1963 | 0.60 | 0-1.68 | 54.48 | 12 | | | | |
| 1964 | 0.84 | 0-2.89 | 61.30 | 17 | | | | |
| 1965 | 0.27 | 0-1.06 | 100.00 | 21 | | | | |
| 1966 | 0.35 | 0.08-0.68 | 37.08 | 27 | | | | |
| 1967 | 0.73 | 0.11-1.71 | 40.78 | 32 | | | | |
| 1968 | 1.36 | 0.83-2.05 | 14.84 | 39 | | | | |
| 1969 | 1.17 | 0.54-2.04 | 21.99 | 42 | | | | |
| 1970 | 0.17 | 0-0.38 | 49.36 | 41 | | | | |
| 1971 | 1.41 | 0.97-1.94 | 11.35 | 42 | | | | |
| 1972 | 0.54 | 0.3-0.83 | 19.75 | 59 | | | | |
| 1973 | 0.80 | 0.48-1.19 | 16.76 | 89 | | | | |
| 1974 | 0.35 | 0.11-0.64 | 33.05 | 29 | | | | |
| 1975 | 0.83 | 0.19-1.81 | 35.31 | 20 | | | | |
| 1976 | 0.42 | 0.23-0.65 | 21.04 | 46 | | | | |
| 1977 | 1.06 | 0.69-1.51 | 13.64 | 28 | | | | |
| 1978 | 0.96 | 0.61-1.41 | 14.85 | 28 | | | | |
| 1979 | 2.14 | 0.49-5.61 | 32.59 | 29 | | | 1.55 | 29 |
| 1980 | 4.76 | 3.02-7.26 | 10.26 | 38 | | | 5.09 | 32 |
| 1981 | 2.15 | 1.32-3.28 | 13.33 | 38 | | | 3.46 | 32 |
| 1982 | 2.44 | 1.08-4.68 | 20.28 | 62 | | | 2.67 | 36 |
| 1983 | 10.00 | 5.49-17.65 | 11.01 | 42 | | | 9.63 | 35 |
| 1984 | 6.67 | 5.1-8.66 | 5.65 | 56 | | | 7.25 | 59 |
| 1985 | 8.19 | 4.78-13.61 | 10.45 | 37 | | | 6.36 | 37 |
| 1986 | 4.83 | 3.64-6.33 | 6.47 | 47 | | | 4.90 | 47 |
| 1987 | 3.91 | 1.99- 7.05 | 15.56 | 45 | | | 7.01 | 45 |
| 1988 | 1.26 | 0.48-2.46 | 26.08 | 18 | | | 2.30 | 18 |
| 1989 | 7.93 | 4.62-13.18 | 10.57 | 31 | | | 8.82 | 31 |
| 1990 | 4.85 | 3.25-7.04 | 9.02 | 30 | | | 6.67 | 31 |
| 1991 | 2.07 | 0.81-4.21 | 23.58 | 37 | | | 2.12 | 31 |
| 1992 | 7.41 | 5.62-9.69 | 5.62 | 46 | | | 4.01 | 31 |
| 1993 | 3.19 | 2.21-4.47 | 9.30 | 43 | | | 3.68 | 31 |
| 1994 | 2.22 | 1.11-3.90 | 18.02 | 43 | | | 2.48 | 31 |
| 1995 | 2.35 | 1.78-3.03 | 7.72 | 45 | | | 2.44 | 33 |
| 1996 | 2.57 | 1.77-3.59 | 9.94 | 84 | | | 2.81 | 33 |
| 1997 | 2.29 | 1.11-4.13 | 18.69 | 90 | | | 1.37 | 39 |
| 1998 | 2.00 | 1.0-3.51 | 18.49 | 90 | | | 2.30 | 39 |
| 1999 | 1.25 | 0.58-2.19 | 21.67 | 90 | | | 1.14 | 39 |
| 2000 | 1.42 | 0.75-2.35 | 18.42 | 90 | | | 1.15 | 38 |
| 2001 | 0.79 | 0.18-1.72 | 35.92 | 90 | | | 0.46 | 39 |
| 2002 | 0.80 | 0.30-1.52 | 28.11 | 90 | | | 0.93 | 39 |
| 2003 | 0.79 | 0.22-1.61 | 32.68 | 90 | | | 0.60 | 39 |

Table 31.

**BAY ANCHOVY INDICES**

| | Converted Index (RSCI) | | | Unconverted Index (RSI) | | | | Original Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Geo. Mean | 95% C.I.'s | C.V. | Geo. Mean | 95% C.I.'s | C.V. | N | Bay & River (BRI) | N | River Only | N |
| 1955 | | | | 0.09 | 0-0.2 | 53.87 | 17 | | | | |
| 1956 | | | | 18.09 | 4.57-64.50 | 20.9 | 90 | | | | |
| 1957 | | | | 23.95 | 7.26-74.34 | 17.18 | 75 | | | | |
| 1958 | | | | 13.53 | 3.93-41.84 | 20.2 | 84 | | | | |
| 1959 | | | | 23.35 | 6.98-73.31 | 17.47 | 73 | | | | |
| 1960 | | | | 1.62 | 0.66-3.13 | 23.78 | 27 | | | | |
| 1961 | | | | 69.42 | 44.51-107.96 | 5.13 | 41 | | | | |
| 1962 | | | | 4.48 | 0.8-15.72 | 32.77 | 33 | | | | |
| 1963 | | | | 3.99 | 0.3-18.19 | 41.89 | 45 | | | | |
| 1964 | | | | 0.49 | 0.21-0.84 | 26.03 | 74 | | | | |
| 1965 | | | | 0.85 | 0.51-1.27 | 16.57 | 81 | | | | |
| 1966 | | | | 1.03 | 0-3.52 | 56.62 | 93 | | | | |
| 1967 | | | | 11.48 | 6.19-20.66 | 10.93 | 132 | | | | |
| 1968 | | | | 3.27 | 1.55-6.12 | 17.68 | 131 | | | | |
| 1969 | | | | 9.61 | 3.4-24.58 | 18.63 | 137 | | | | |
| 1970 | | | | 1.34 | 0.76-2.11 | 16.71 | 135 | | | | |
| 1971 | | | | 2.66 | 1.51-4.34 | 14.58 | 387 | | | | |
| 1972 | | | | 1.91 | 1.6-2.25 | 5.2 | 327 | | | | |
| 1973 | | | | 1.76 | 1.24-2.41 | 10.38 | 371 | | | | |
| 1974 | | | | 1.1 | 0.51-1.91 | 22.07 | 261 | | | | |
| 1975 | | | | 0.26 | 0.14-0.39 | 21.88 | 352 | | | | |
| 1976 | | | | 0.27 | 0.18-0.36 | 15.01 | 619 | | | | |
| 1977 | | | | 0.33 | 0.26-0.40 | 9.11 | 556 | | | | |
| 1978 | | | | 0.28 | 0.23-0.33 | 8.43 | 515 | | | | |
| 1979 | | | | 18.58 | 7.29-45.27 | 14.46 | 198 | | | 1.61 | 155 |
| 1980 | | | | 124.76 | 83.81-185.48 | 4.07 | 254 | | | 8.83 | 181 |
| 1981 | | | | 1.99 | 0.89-3.71 | 20.8 | 233 | | | 12.04 | 174 |
| 1982 | | | | 3.42 | 2.8-4.15 | 5.11 | 232 | | | 9.53 | 214 |
| 1983 | | | | 10.87 | 7.44-15.70 | 6.9 | 217 | | | 12.04 | 218 |
| 1984 | | | | 6.76 | 3.83-11.45 | 11.55 | 174 | | | 7.07 | 181 |
| 1985 | | | | 10.25 | 5.87-17.44 | 10.21 | 141 | | | 13.95 | 142 |
| 1986 | | | | 26.43 | 17.86-38.90 | 5.66 | 202 | | | 26.85 | 202 |
| 1987 | | | | 103.04 | 70.25-150.92 | 4.08 | 167 | | | 54.07 | 167 |
| 1988 | | | | 18.25 | 12.17-27.15 | 6.42 | 346 | 18.06 | 346 | 32.66 | 128 |
| 1989 | | | | 52.47 | 36.27-75.71 | 4.54 | 374 | 51.59 | 374 | 22.74 | 128 |
| 1990 | | | | 6.79 | 4.41-10.22 | 8.89 | 369 | 6.65 | 369 | 8.78 | 124 |
| 1991 | 19.86 | 13.39-29.23 | 6.11 | 19.86 | 13.39-29.23 | 6.11 | 491 | 22.83 | 350 | 33.41 | 125 |
| 1992 | 35.06 | 23.92-51.17 | 5.15 | 35.06 | 23.92-51.17 | 5.15 | 448 | 40.79 | 355 | 14.53 | 128 |
| 1993 | 36.83 | 24.72-54.65 | 5.31 | 36.83 | 24.72-54.65 | 5.31 | 449 | 42.71 | 360 | 28.93 | 132 |
| 1994 | 13.1 | 8.93-19.02 | 6.63 | 13.1 | 8.93-19.02 | 6.63 | 444 | 14.36 | 354 | 19.86 | 130 |
| 1995 | 13.26 | 9.48-18.41 | 5.8 | 13.26 | 9.48-18.41 | 5.8 | 540 | 18.52 | 362 | 18.57 | 138 |
| 1996 | 15.31 | 11.20-20.82 | 5.21 | 15.31 | 11.20-20.82 | 5.21 | 607 | 16.91 | 363 | 5.11 | 135 |
| 1997 | 18.96 | 13.63-26.23 | 5.19 | 18.96 | 13.63-26.23 | 5.19 | 625 | 17.33 | 378 | 12.64 | 150 |
| 1998 | 30.26 | 20.75-43.93 | 5.27 | 30.26 | 20.75-43.93 | 5.27 | 579 | 30.47 | 336 | 9.7 | 146 |
| 1999 | 15.47 | 11.20-21.22 | 5.35 | 15.47 | 11.20-21.22 | 5.35 | 606 | 14.38 | 360 | 21.26 | 150 |
| 2000 | 36.58 | 26.69-49.99 | 4.21 | 36.58 | 26.69-49.99 | 4.21 | 619 | 40.36 | 369 | 16.24 | 147 |
| 2001 | 9.55 | 6.93-13.04 | 6.06 | 9.55 | 6.93-13.04 | 6.06 | 627 | 9.23 | 377 | 4.56 | 150 |
| 2002 | 5.51 | 3.58-8.24 | 9.36 | 5.51 | 3.58-8.24 | 9.36 | 540 | 4.09 | 294 | 9.3 | 150 |
| 2003 | 18.03 | 13.17-24.56 | 5.01 | 18.03 | 13.17-24.56 | 5.01 | 624 | 20.65 | 378 | 3.41 | 150 |
| 2004 | . | . | . | . | . | . | . | . | . | . | . |

# FIGURES

Figure 1. The VIMS Trawl Survey random stratified design of the Chesapeake Bay. Transect lines indicate geographic regions as designated below. (* indicates areas not presently sampled).

| | | |
|---|---|---|
| Chesapeake Bay | B1 | Bottom Bay |
| | B2 | Lower Bay |
| | B3 | Upper Bay |
| | B4 | Top Bay |
| James River | J1 | Bottom James |
| | J2 | Lower James |
| | J3 | Upper James |
| | J4 | Top James |
| | J5* | Freshwater James 1 |
| | J6* | Freshwater James 2 |
| | JE* | Elizabeth River (sampled for EFH 11/99-5/00) |
| | JC* | Chickahominy River |
| York River | Y1 | Bottom York |
| | Y2 | Lower York |
| | Y3 | Upper York |
| | Y4 | Top York (lower Pamunkey River) |
| | PM* | Pamunkey River |
| | MP1* | Lower Mattaponi |
| | MP2* | Upper Mattaponi |
| Rappahannock River | R1 | Bottom Rappahannock |
| | R2 | Lower Rappahannock |
| | R3 | Upper Rappahannock |
| | R4 | Top Rappahannock |
| | R5* | Freshwater Rappahannock |
| | RC* | Corrotoman River |
| Potomac River | P1* | Potomac (River Mile 0-10) |
| | P2* | Potomac (River Mile 10-20) |
| | P3* | Potomac (River Mile 20-30) |
| Mobjack Bay | MB* | (re-established July 1998; discontinued 2001) |
| Atlantic Ocean | AT* | |
| Piankatank River | PK* | (re-established as of July 1998; discontinued 2001) |
| Pocomoke Sound | CP* | (re-established as of July 1998; discontinued 2001) |
| Great Wicomico River | GW* | (as of July 1998; discontinued 2001) |

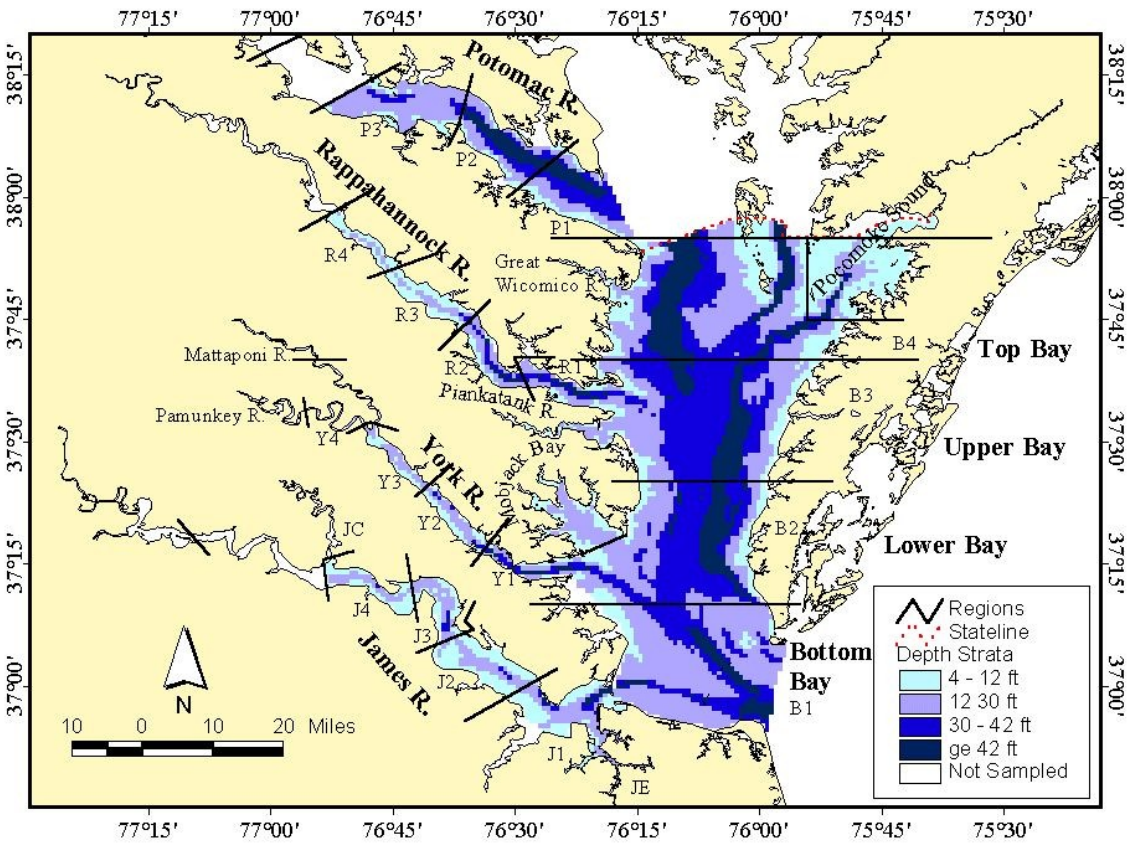
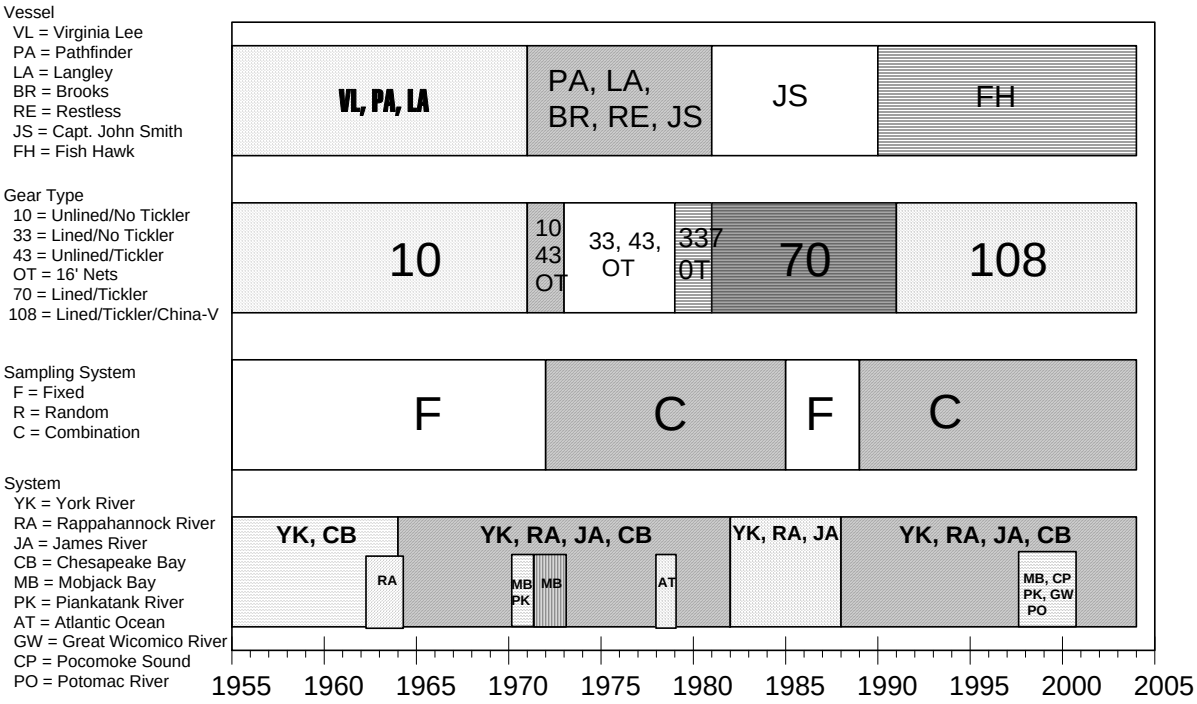
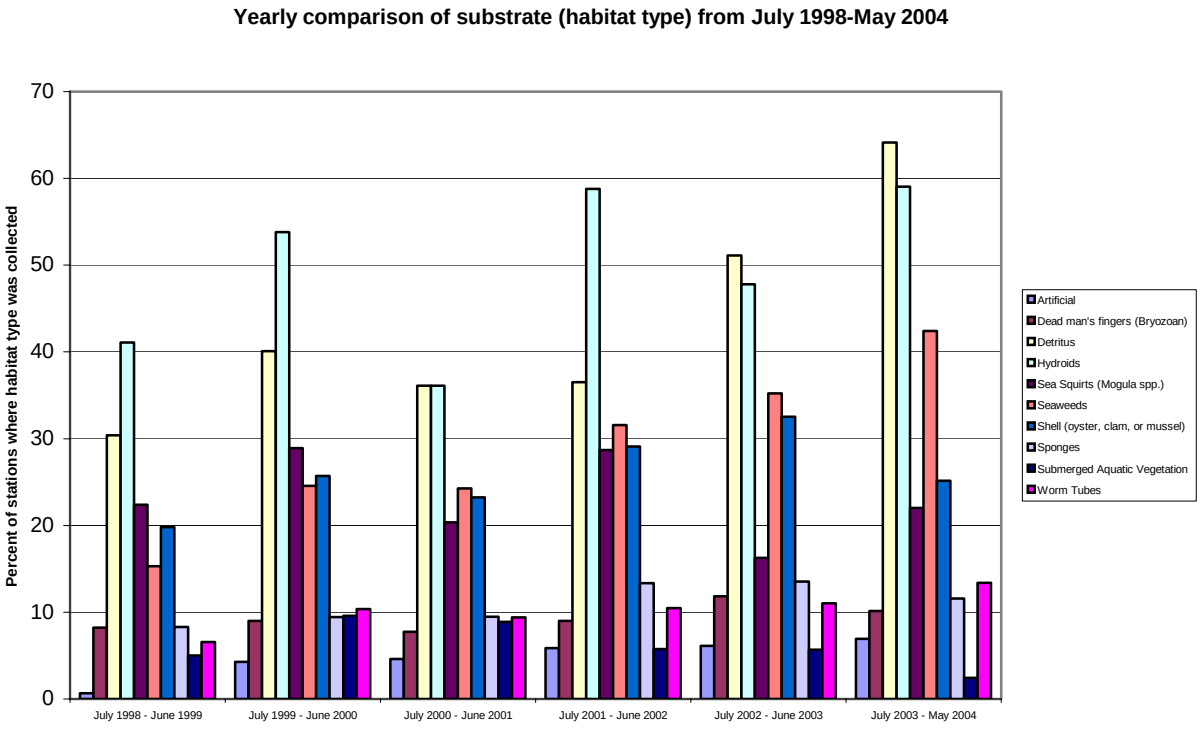

77°15'
77°00'
76°45'
76°30'
76°15'
76°00'
75°45'
75°30'
38°15'
38°00'
37°45'
37°30'
37°15'
37°00'
Potomac R.
Rappahannock R.
York R.
James R.
Mattaponi R.
Pamunkey R.
Great Wicomico R.
Pocomoke Sound
Piankatank R.
Tobiack Bay
P1
P2
P3
R1
R2
R3
R4
Y1
Y2
Y3
Y4
JC
J1
J2
J3
J4
JE
B1
B2
B3
B4
Top Bay
Upper Bay
Lower Bay
Bottom Bay
N
10 0 10 20 Miles
Regions
Stateline
Depth Strata
4 - 12 ft
12 30 ft
30 - 42 ft
ge 42 ft
Not Sampled

Figure 2. VIMS Juvenile Fish Trawl Survey Sampling Ch
(1955-2004)




Gear Type is 30 foot otter trawl if not specified.

Figure 3.


Yearly comparison of substrate (habitat type) from July 1998-May 2004
Percent of stations where habitat type was collected
0
10
20
30
40
50
60
70
July 1998 - June 1999
July 1999 - June 2000
July 2000 - June 2001
July 2001 - June 2002
July 2002 - June 2003
July 2003 - May 2004
Artificial
Dead man's fingers (Bryozoan)
Detritus
Hydroids
Sea Squirts (Mogula spp.)
Seaweeds
Shell (oyster, clam, or mussel)
Sponges
Submerged Aquatic Vegetation
Worm Tubes

Spot

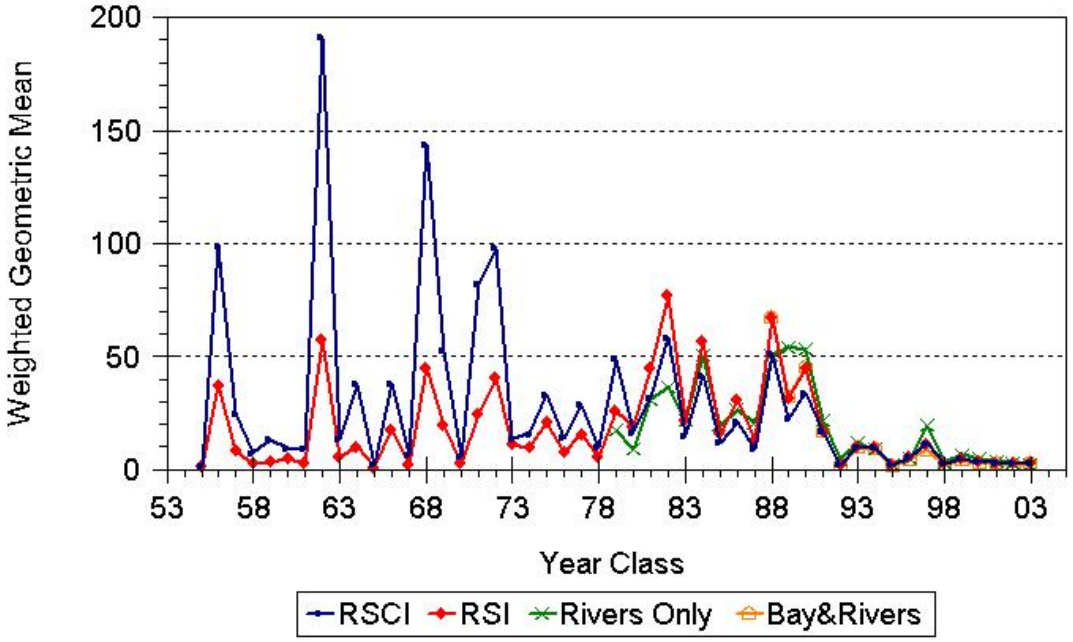
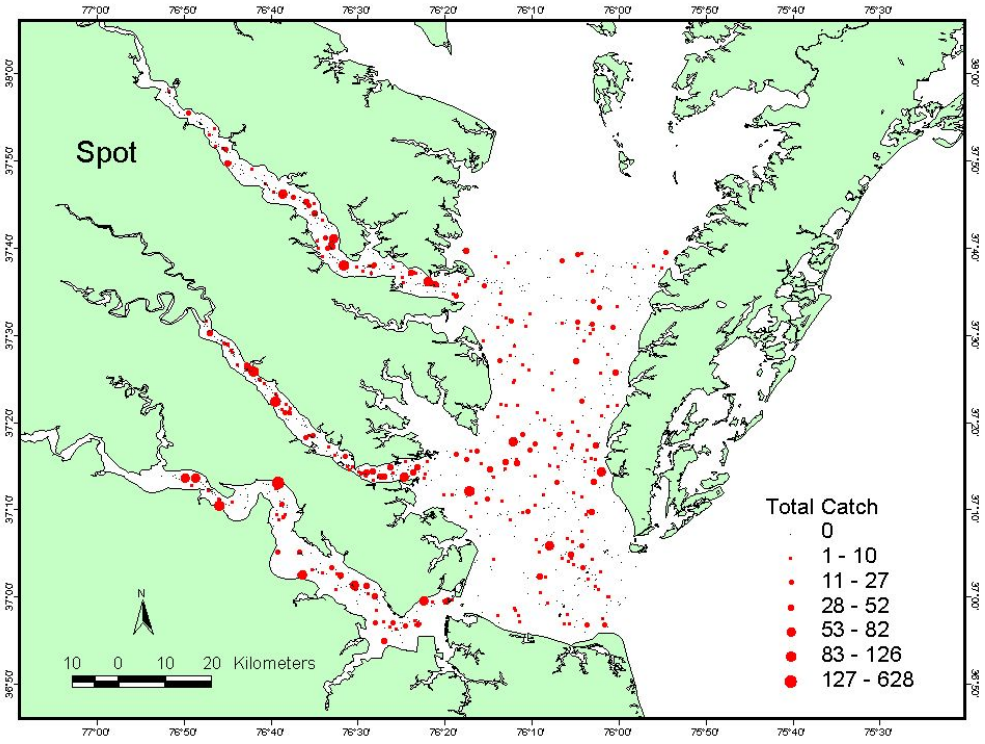



Figure 4. YOY spot random stratified (RSI), random stratified converted (RSCI), fixed transect (Rivers Only), and Bay and fixed river station (BRI) indices (**top**), and distribution of YOY spot from June 2003 through May 2004 (**bottom**).



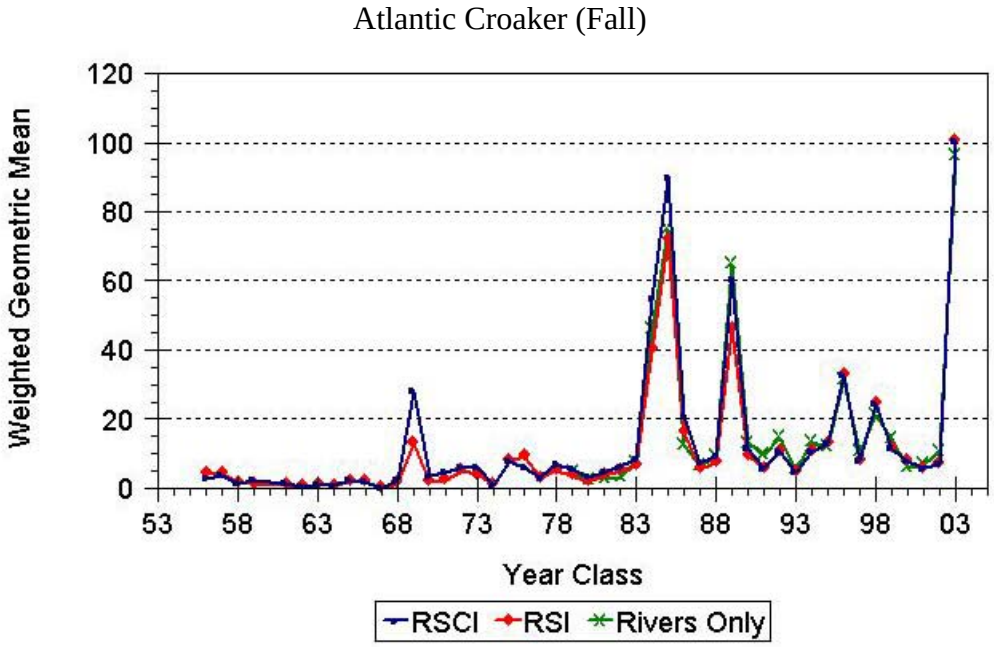



Figure 5. Fall YOY Atlantic croaker random stratified (RSI), random stratified converted (RSCI), fixed transect (Rivers Only), and Bay and fixed river station (BRI) indices (**top**), and distribution of fall YOY Atlantic croaker from September 2003 to February 2004 (**bottom**).

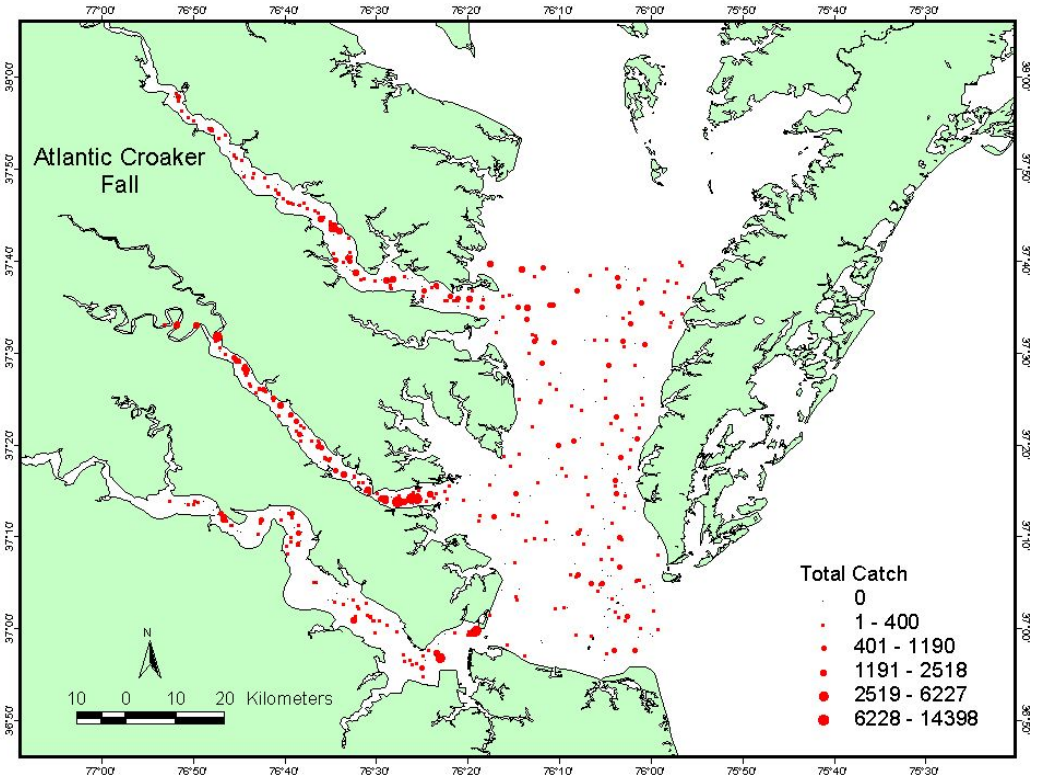


Figure 6. Fall YOY Atlantic croaker size frequencies for August through December 2002 and 2003.

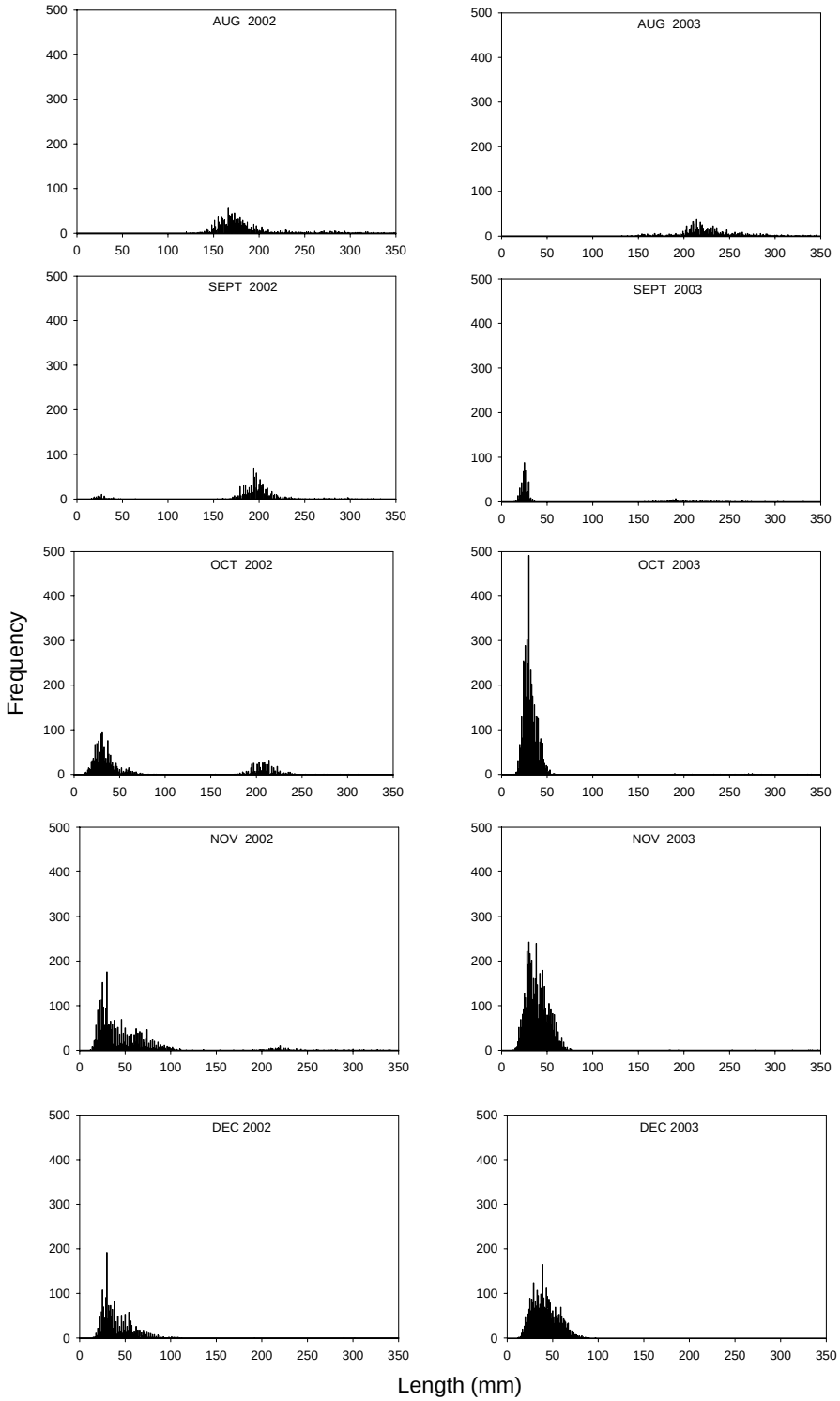
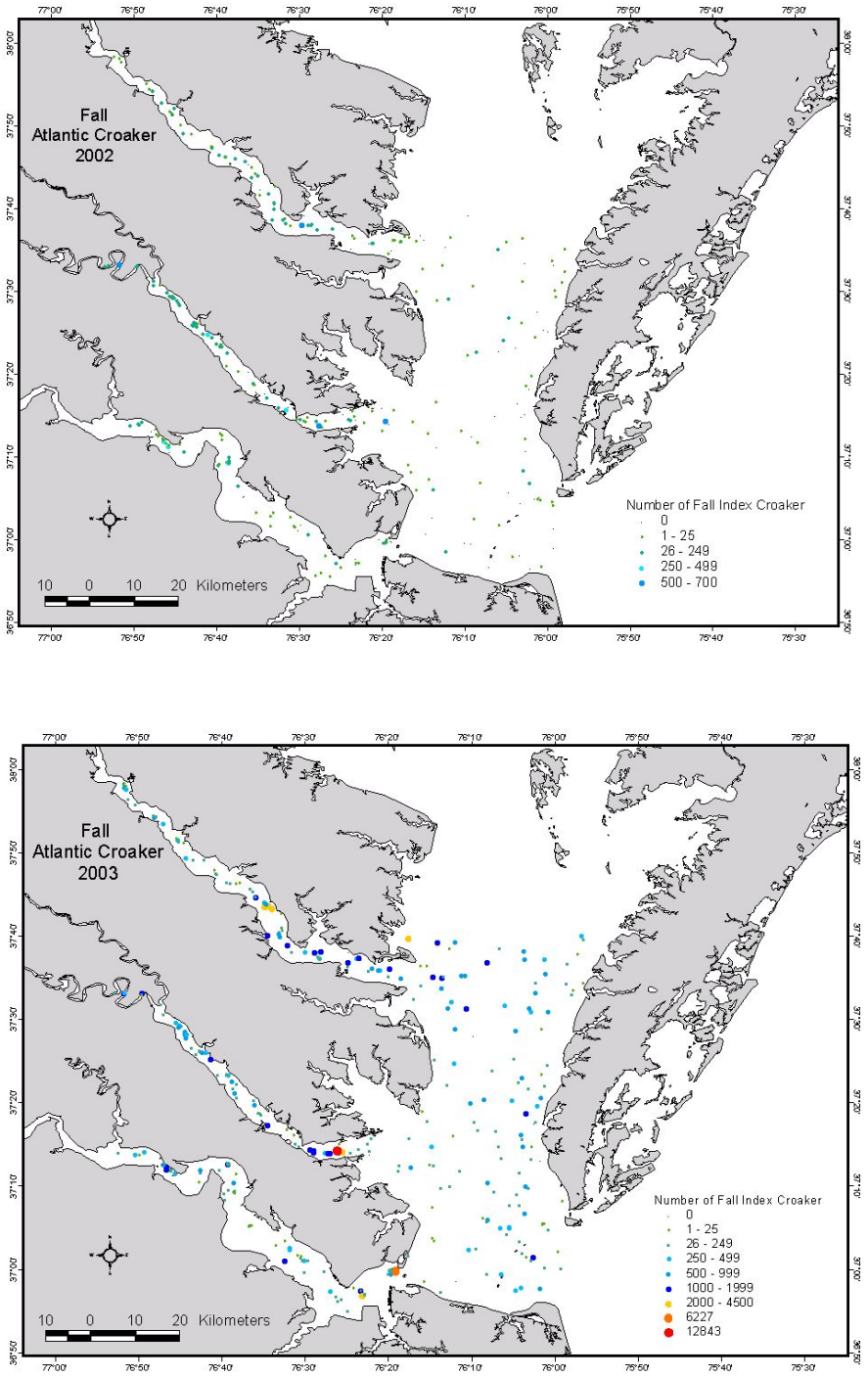


Figure 7. Comparison of abundance and distribution of Atlantic croaker collected during the Fall of 2002 (top) and Fall 2003 (bottom).



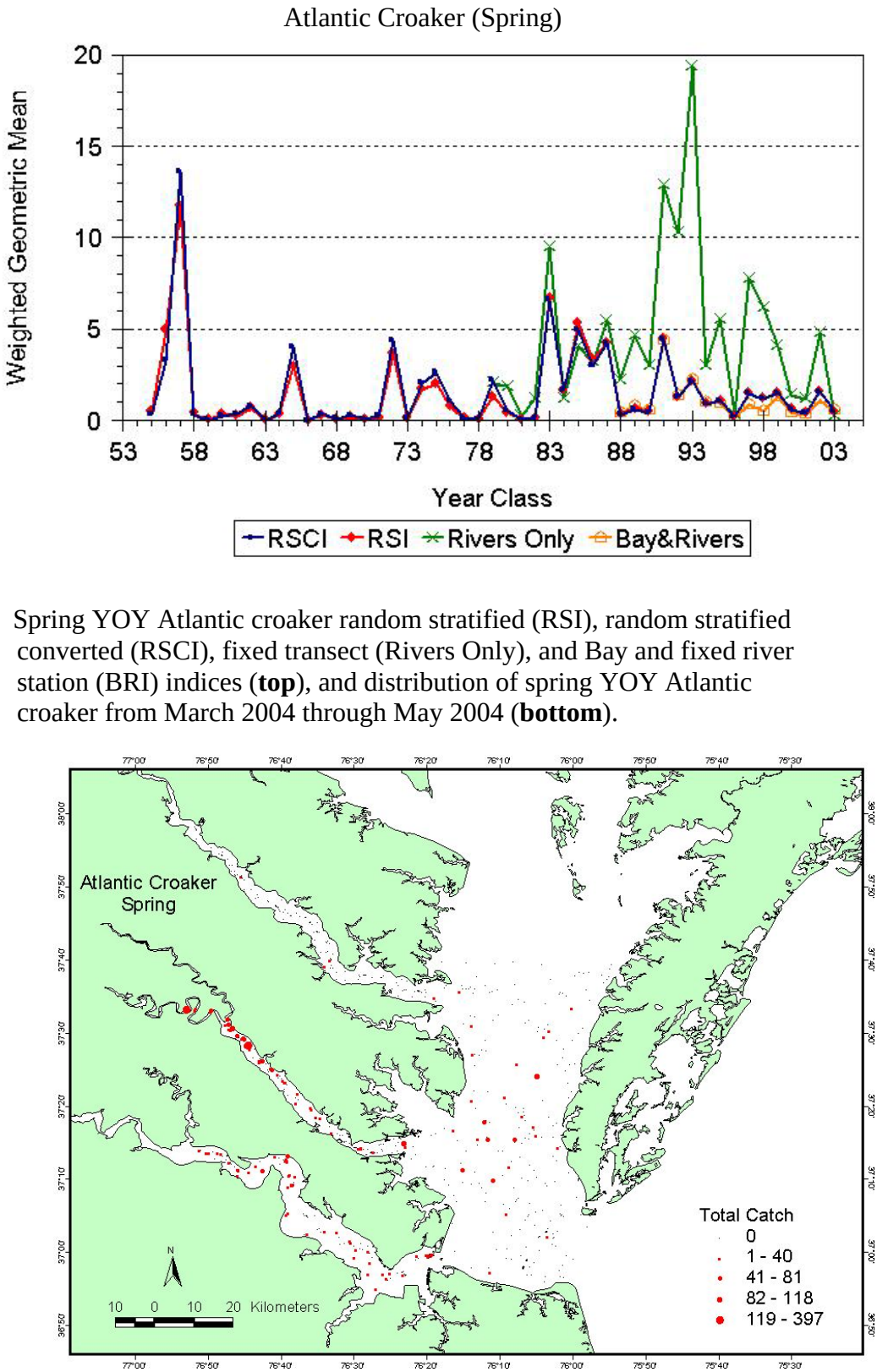



Figure 8. Spring YOY Atlantic croaker random stratified (RSI), random stratified converted (RSCI), fixed transect (Rivers Only), and Bay and fixed river station (BRI) indices (**top**), and distribution of spring YOY Atlantic croaker from March 2004 through May 2004 (**bottom**).

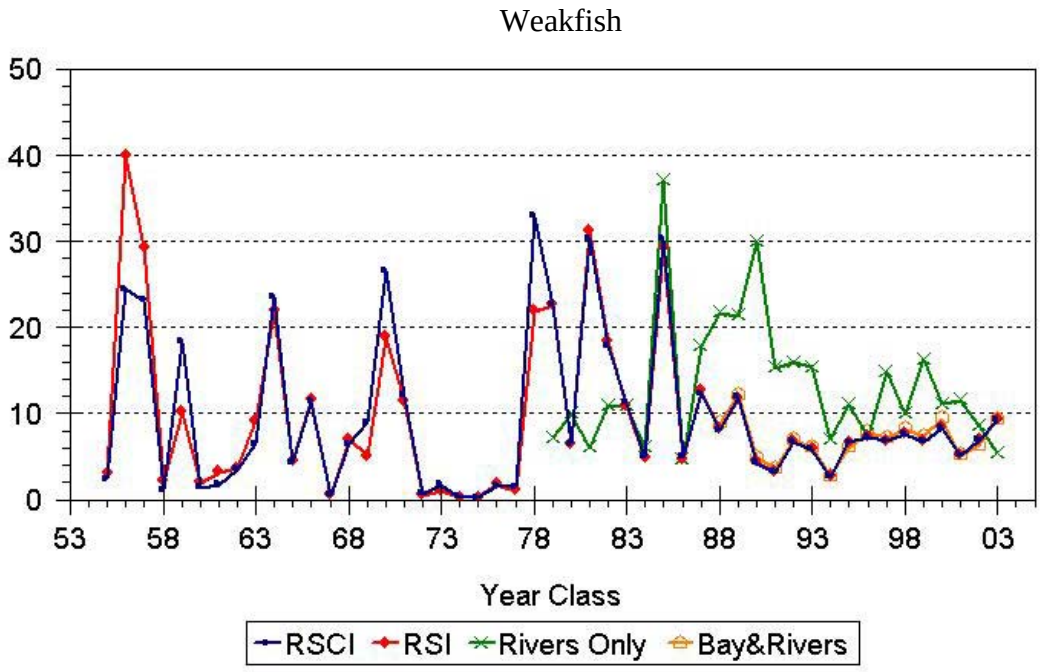
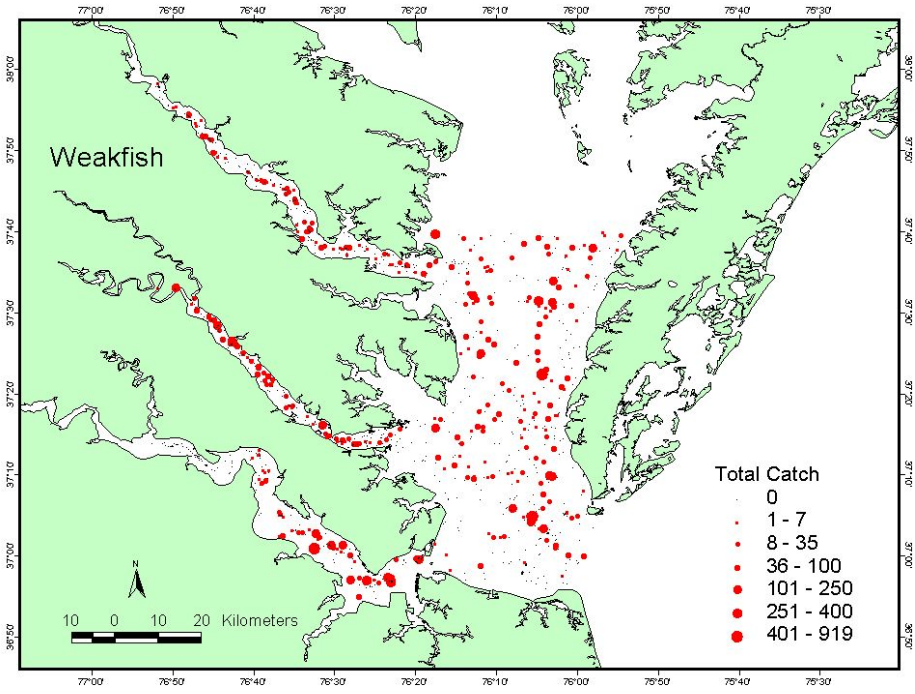



Figure 9. YOY weakfish random stratified (RSI), random stratified converted (RSCI), fixed transect (Rivers Only), and Bay and fixed river station (BRI) indices (**top**), and distribution of YOY weakfish from June 2003 through May 2004 (**bottom**).



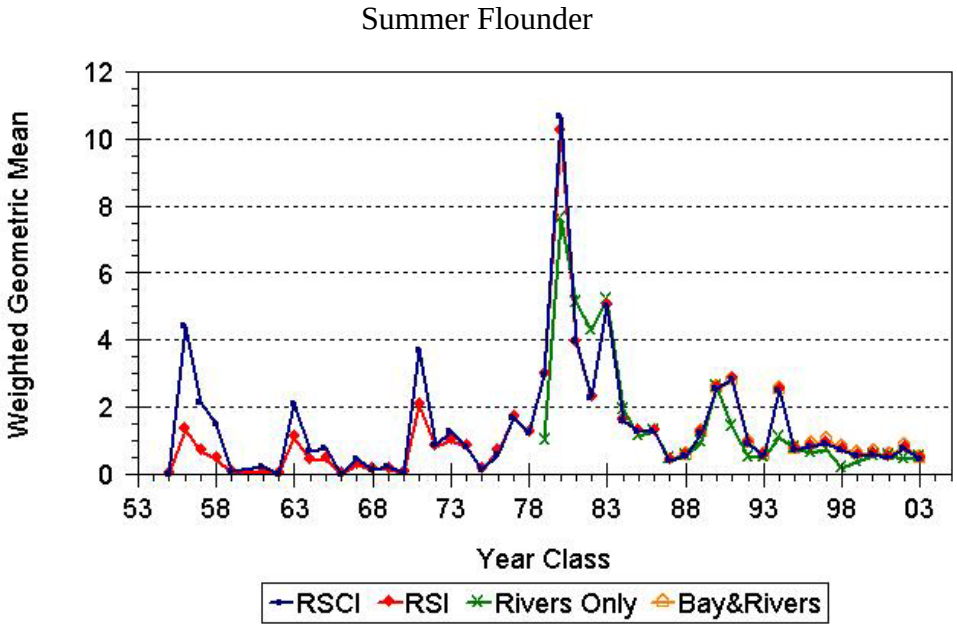
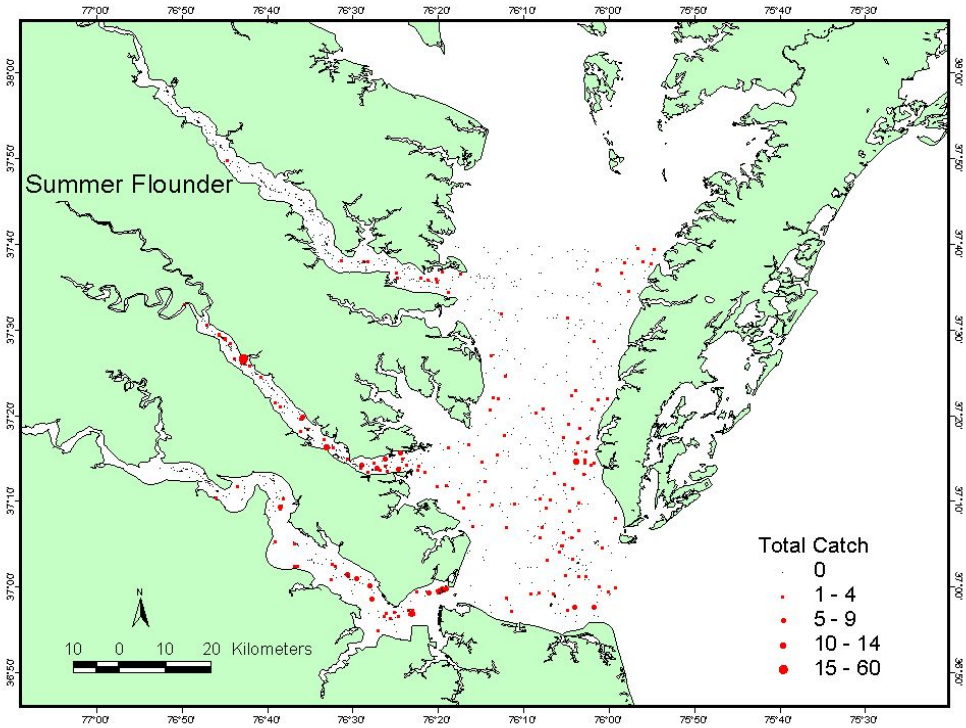



Figure 10. YOY summer flounder random stratified (RSI), random stratified converted (RSCI), fixed transect (Rivers Only), and Bay and fixed river station (BRI) indices (**top**), and distribution of YOY summer flounder from June 2003 through May 2004 (**bottom**).



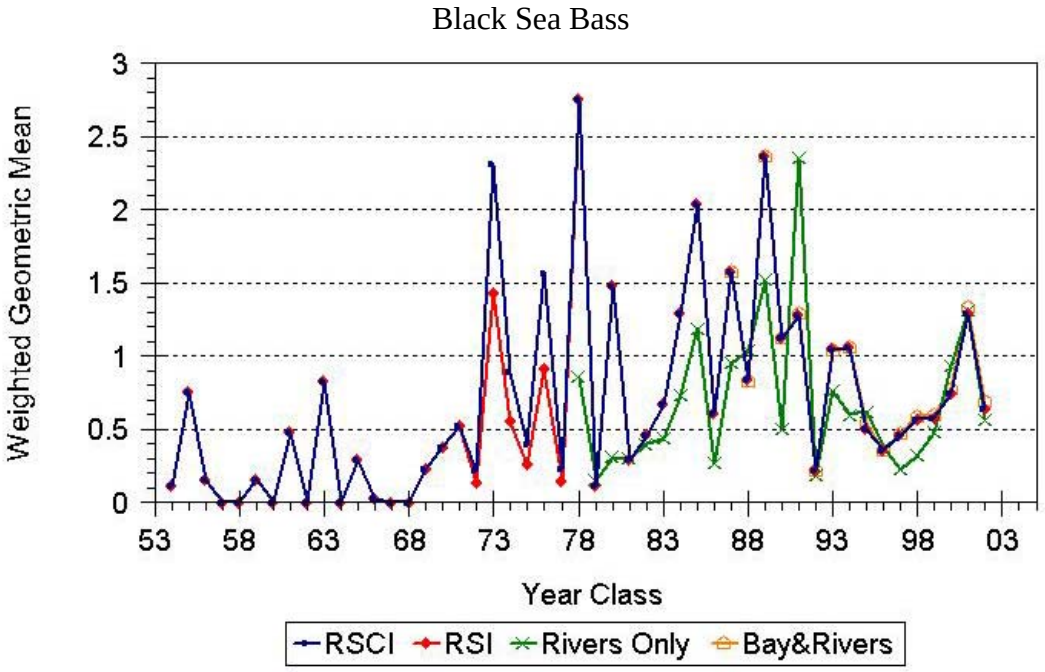
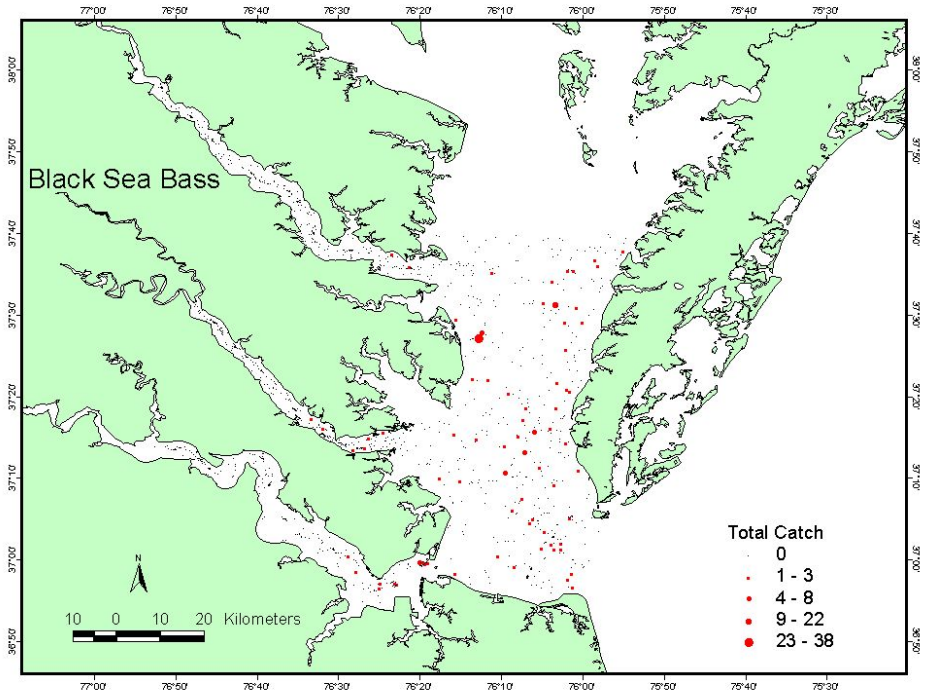



Figure 11. YOY black sea bass random stratified (RSI), random stratified converted (RSCI), fixed transect (Rivers Only), and Bay and fixed river station (BRI) indices (**top**), and distribution of YOY black sea bass from June 2003 through May 2004 (**bottom**).



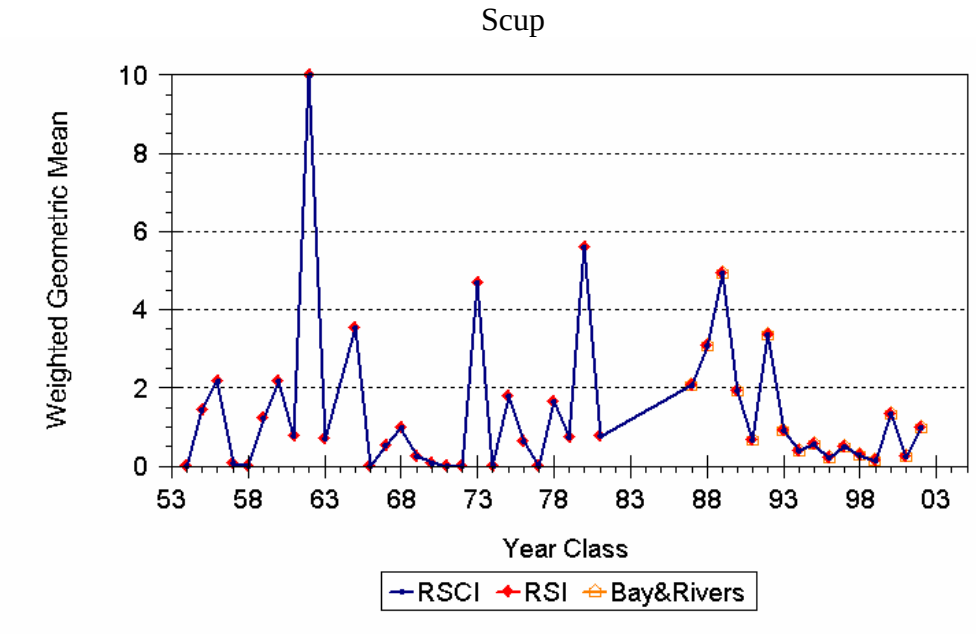
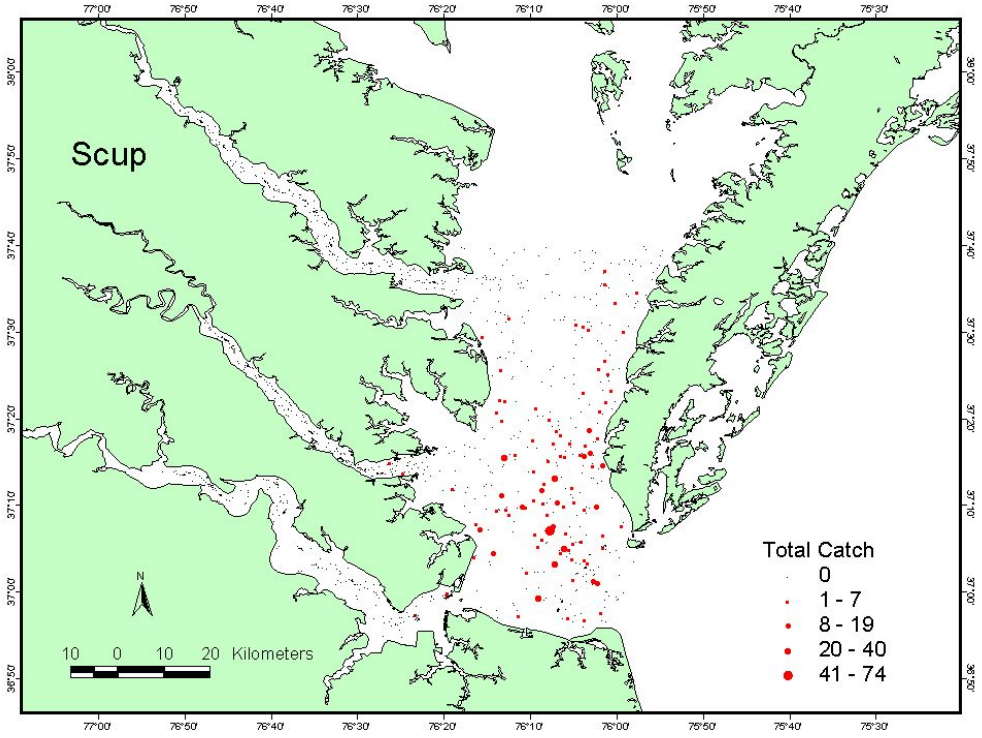



Figure 12. YOY scup random stratified (RSI), random stratified converted (RSCI), and Bay and fixed river station (BRI) indices (**top**), and distribution of YOY scup from June 2003 through May 2004 (**bottom**).



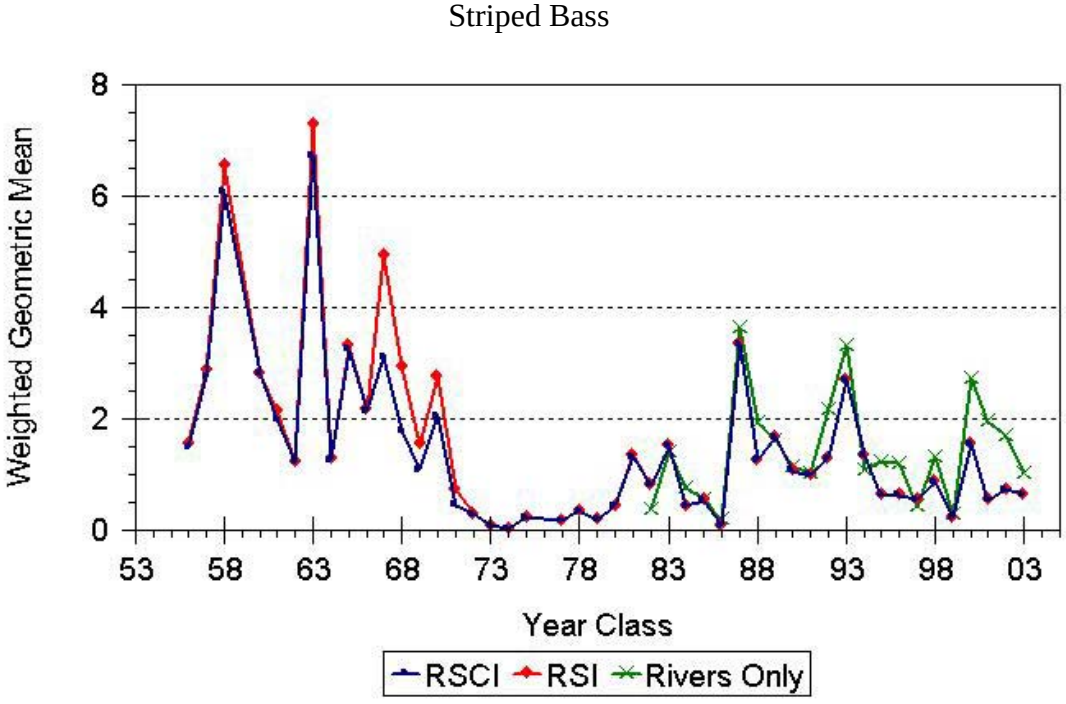
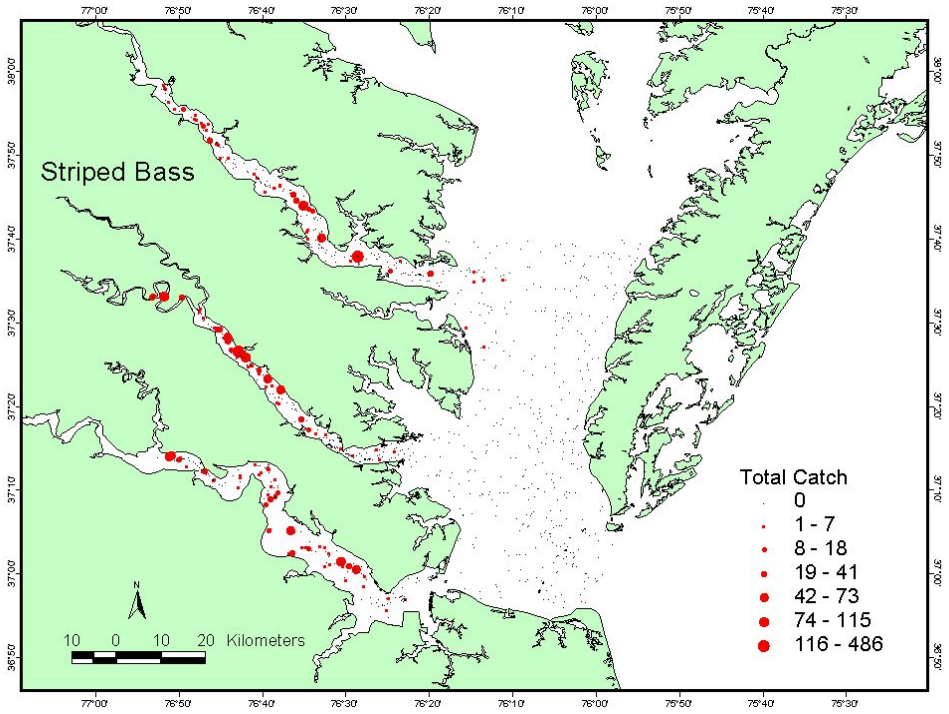



Figure 13. YOY striped bass random stratified (RSI), random stratified converted (RSCI), and fixed transect (Rivers Only) indices (**top**), and distribution of YOY striped bass from June 2003 through May 2004 (**bottom**).



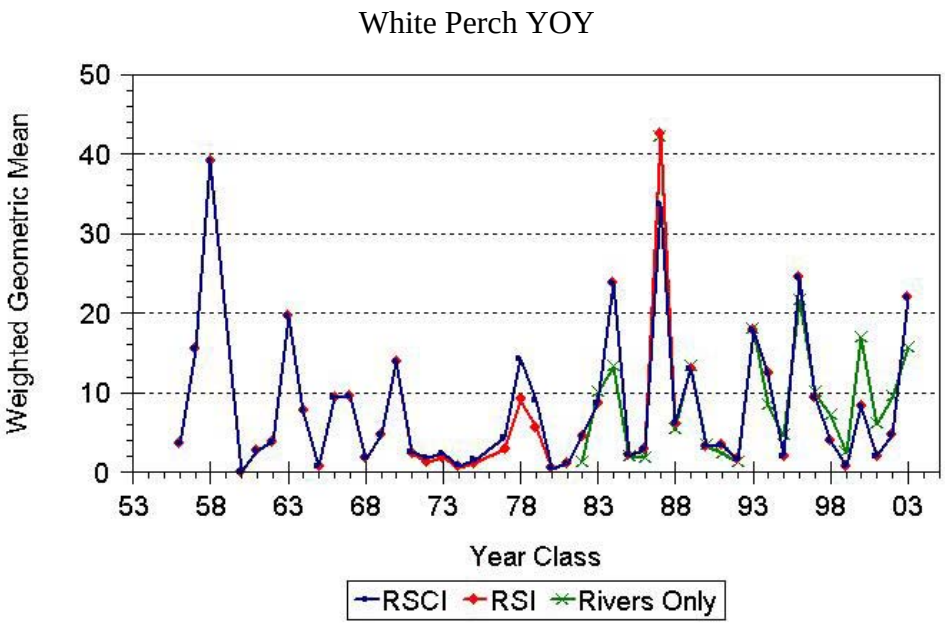
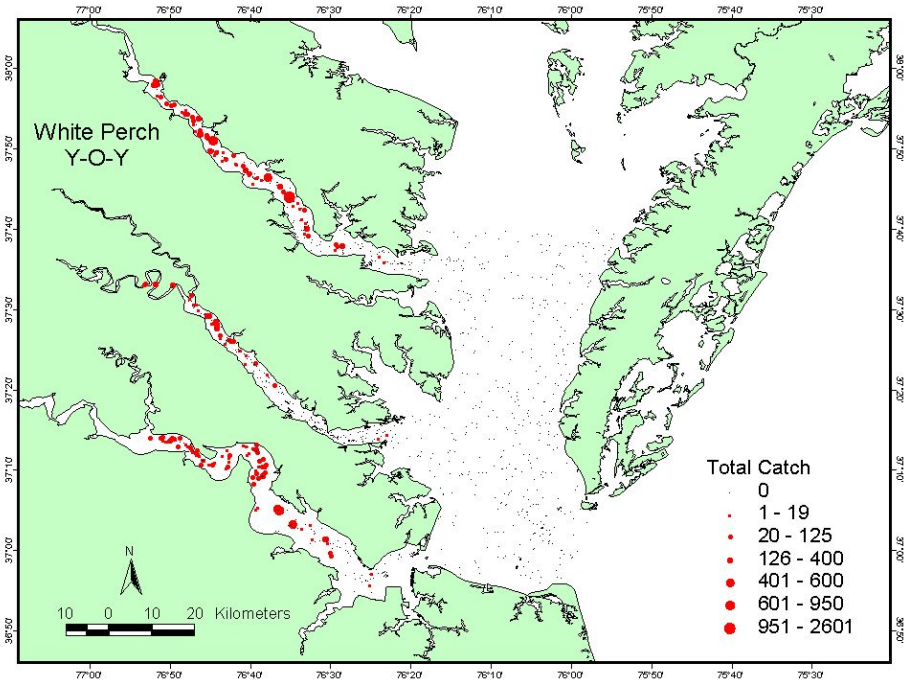



Figure 14. YOY white perch random stratified (RSI), random stratified converted (RSCI), and fixed transect (Rivers Only) indices (**top**), and distribution of YOY white perch from June 2003 through May 2004 (**bottom**).



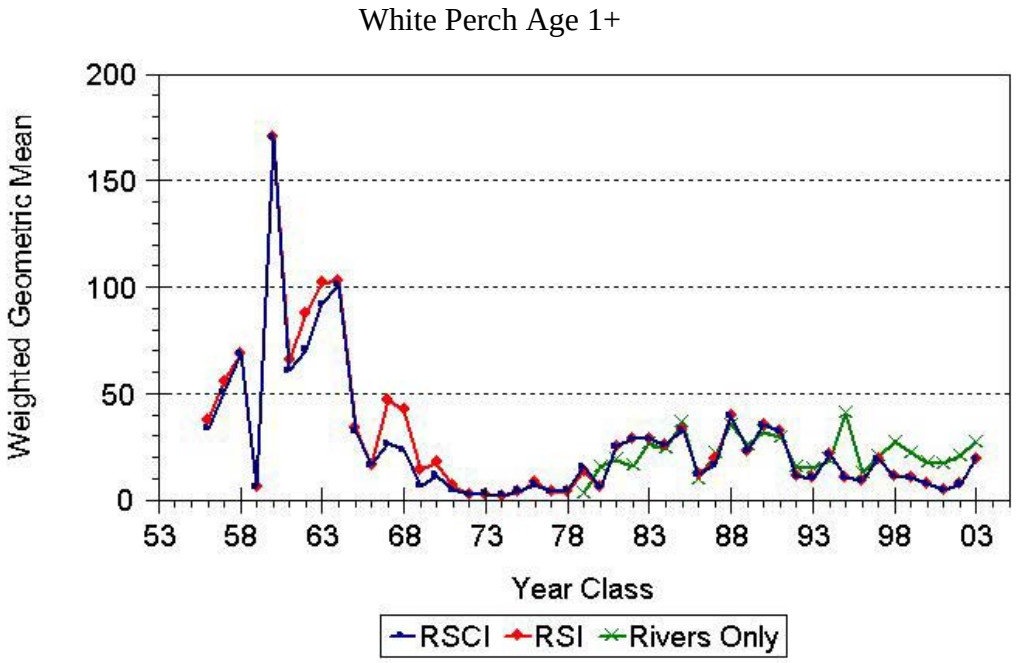
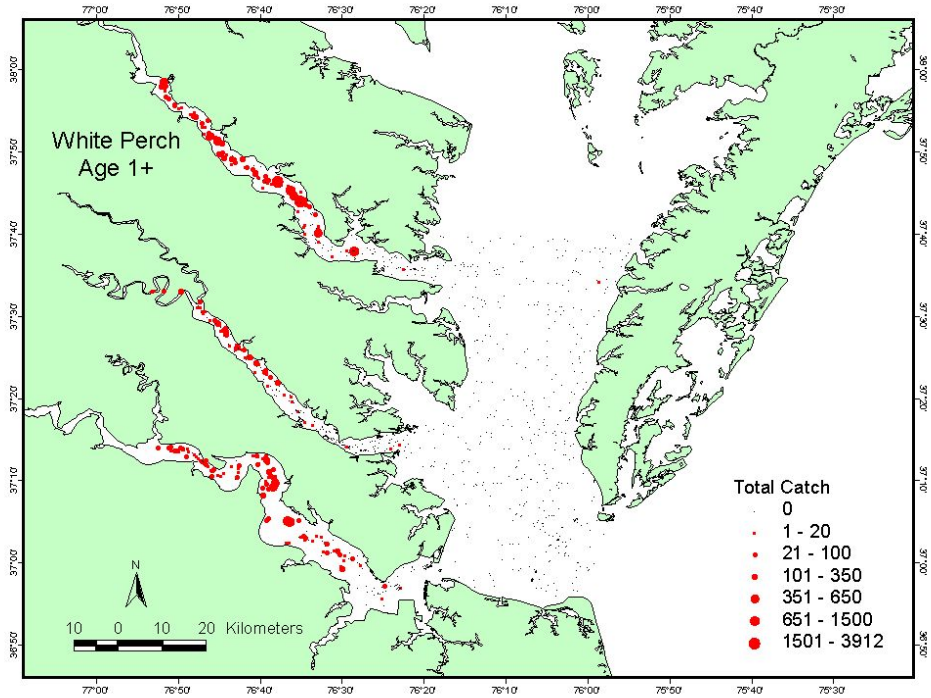



Figure 15. Age 1+ white perch random stratified (RSI), random stratified converted (RSCI), and fixed transect (Rivers Only) indices (**top**), and distribution of age1+ white perch from June 2003 through May 2004 (**bottom**).



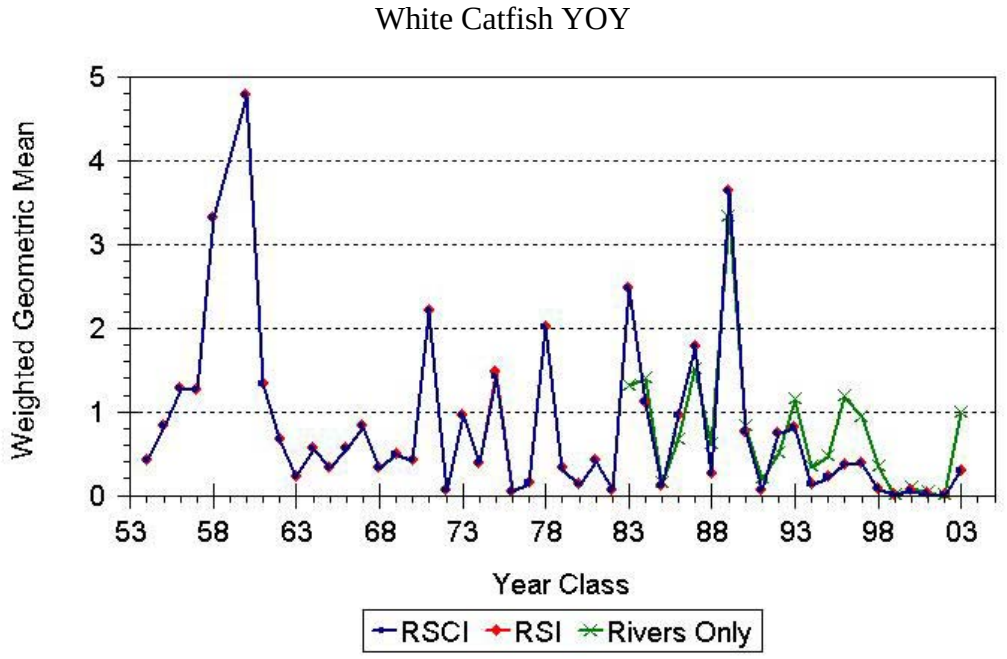
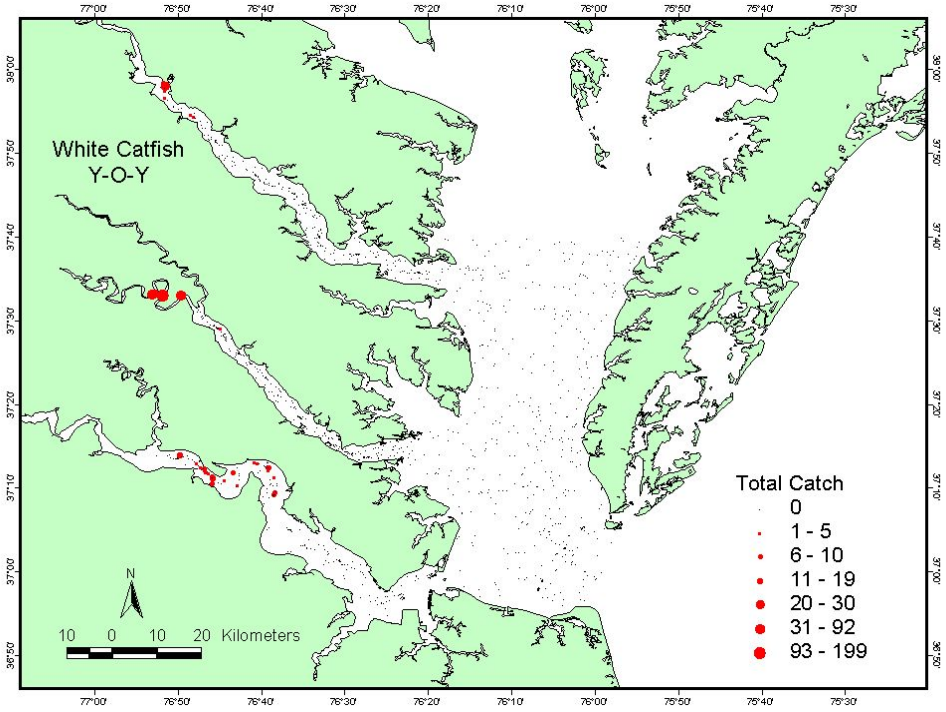



Figure 16. YOY white catfish random stratified (RSI), random stratified converted (RSCI), and fixed transect (Rivers Only) indices (**top**), and distribution of YOY white catfish from June 2003 through May 2004 (**bottom**).



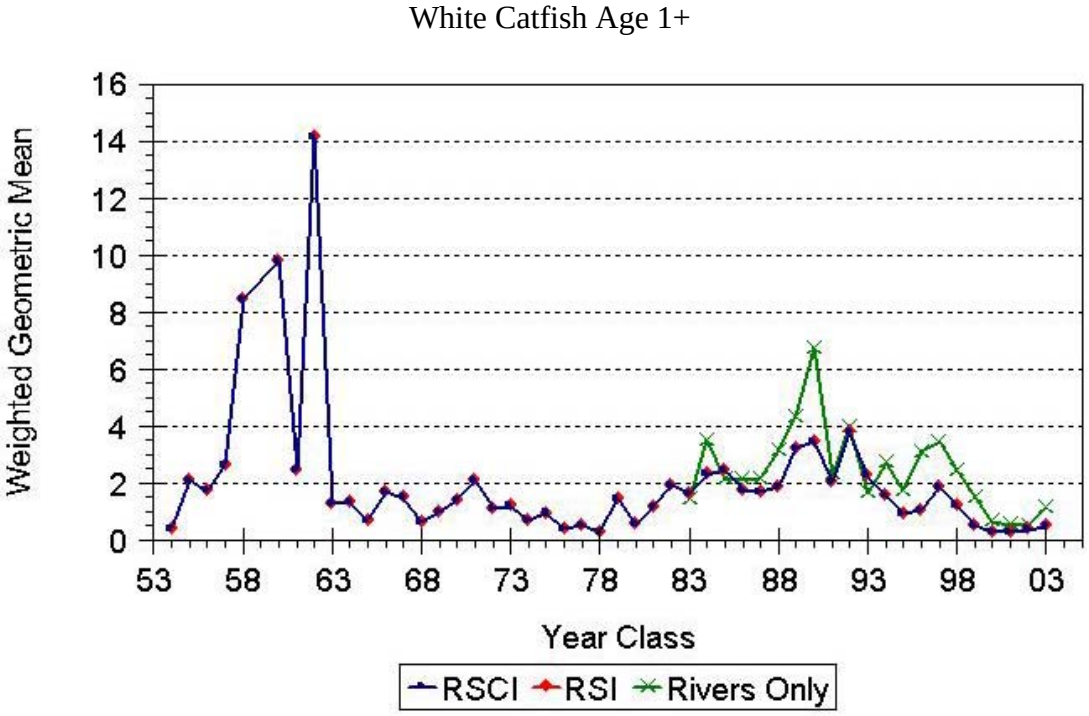
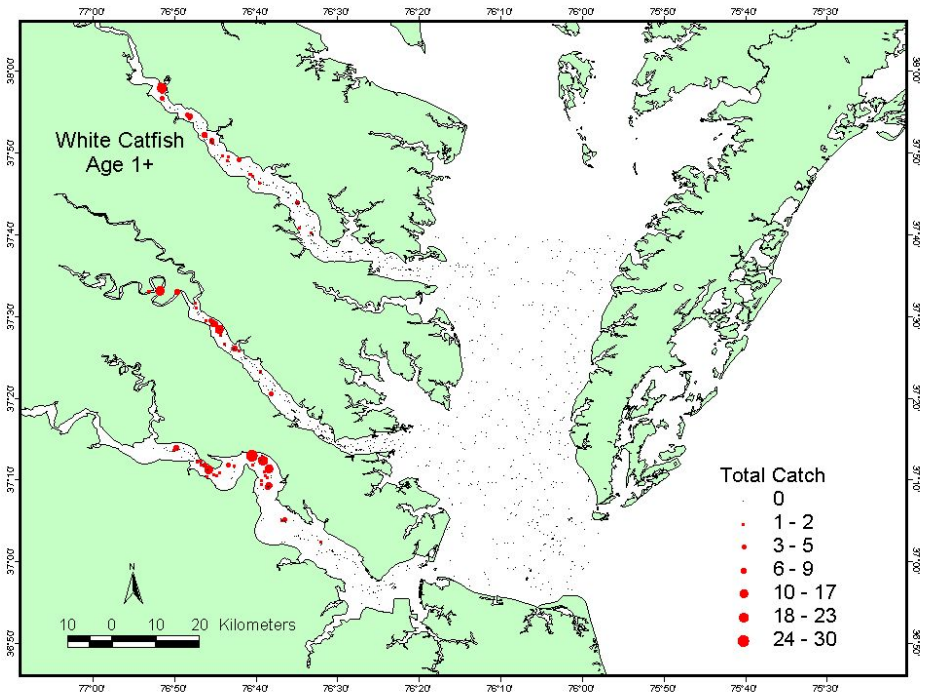



Figure 17. Age 1+ white catfish random stratified (RSI), random stratified converted (RSCI), and fixed transect (Rivers Only) indices (**top**), and distribution of age 1+ white catfish from June 2003 through May 2004 (**bottom**).



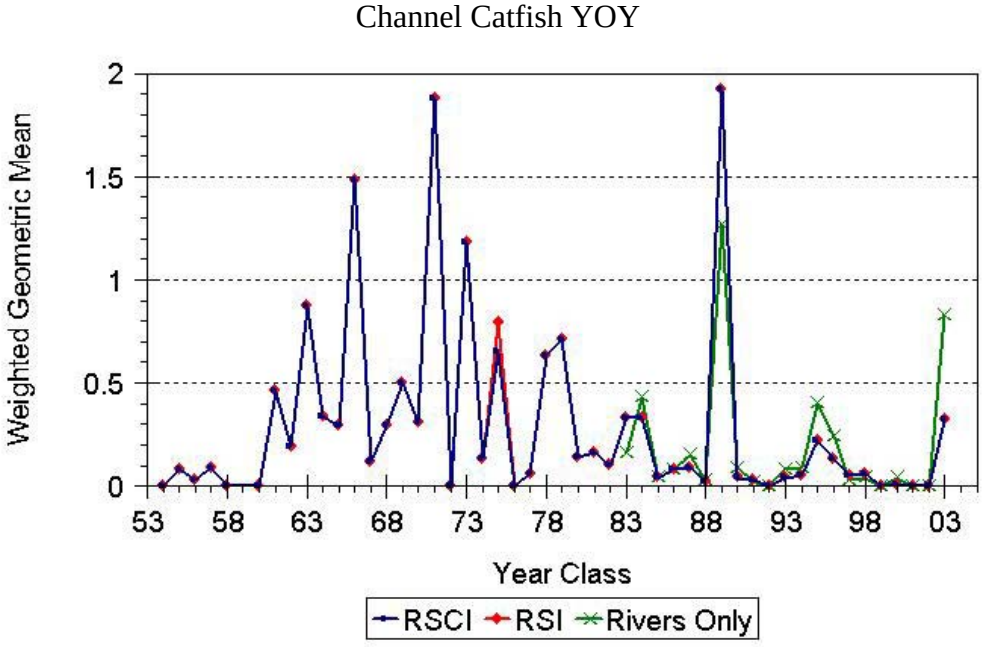
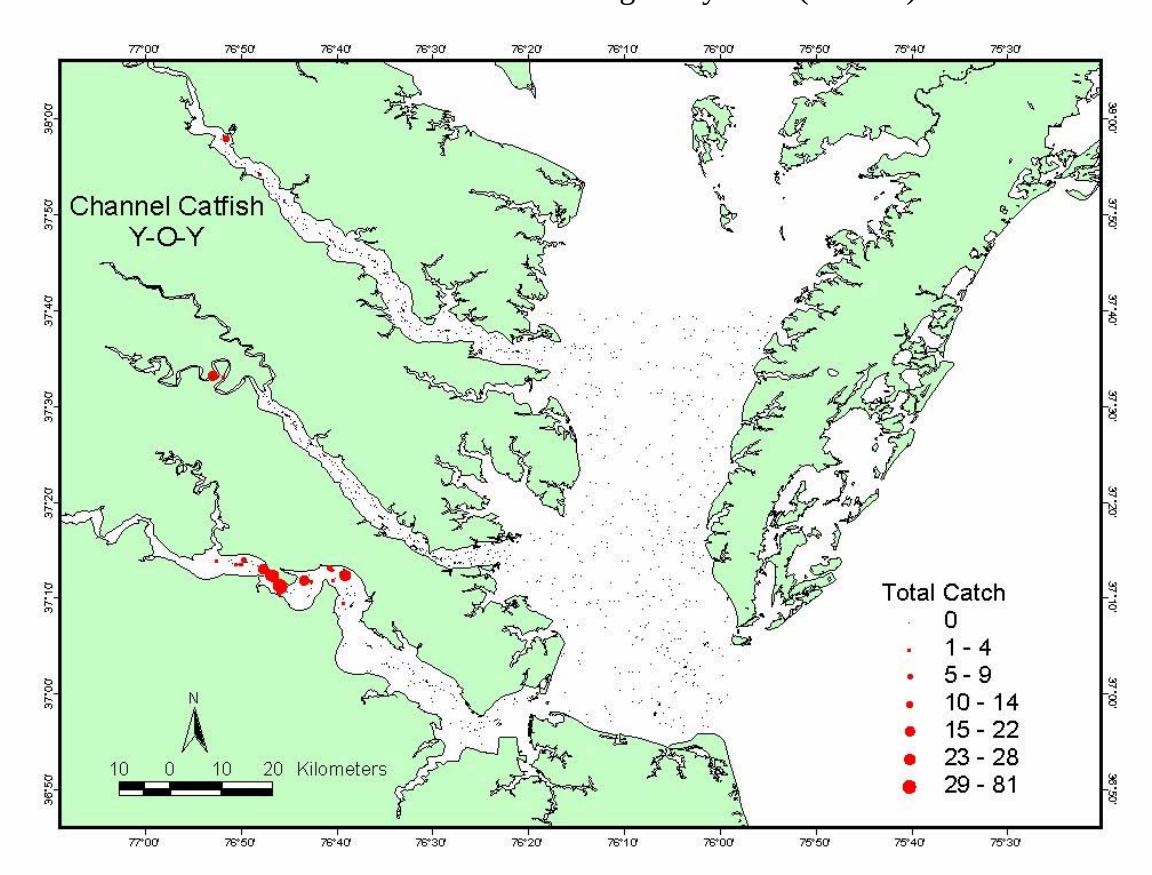



Figure 18. YOY channel catfish random stratified (RSI), random stratified converted (RSCI), and fixed transect (Rivers Only) indices (**top**), and distribution of YOY channel catfish from June 2003 through May 2004 (**bottom**).



Channel Catfish Age 1+

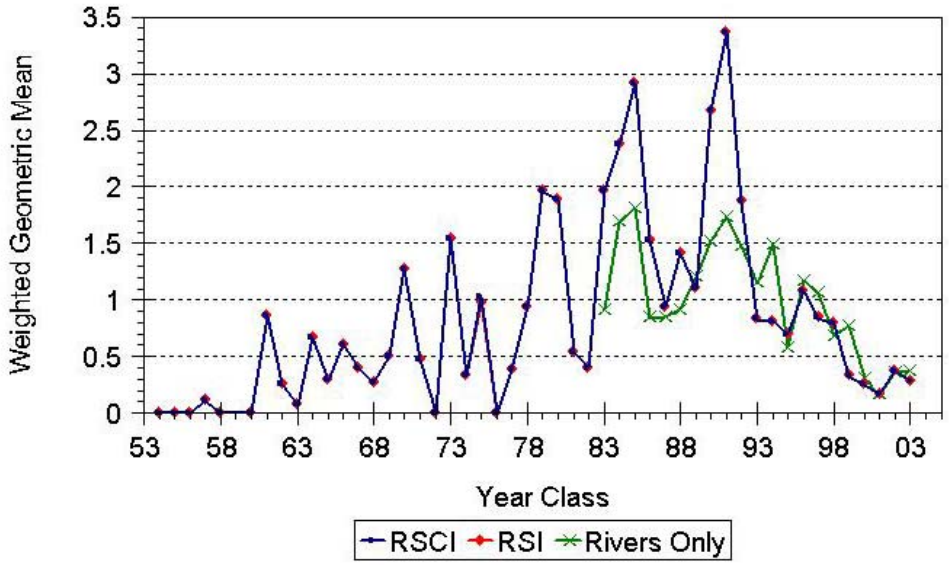
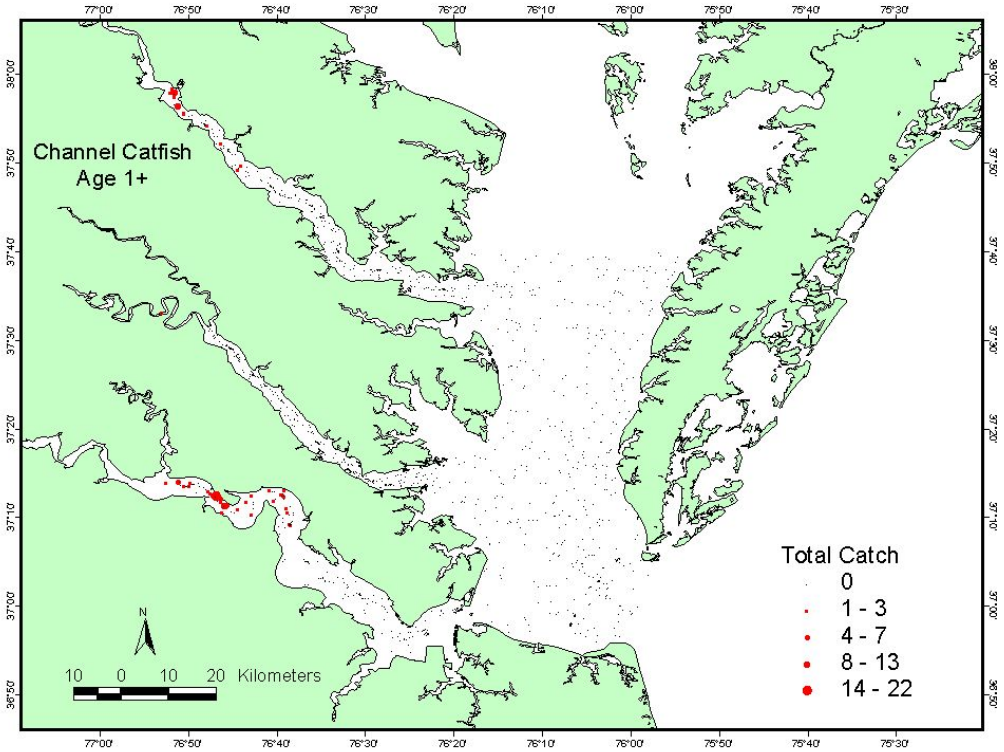



Figure 19. Age 1+ channel catfish random stratified (RSI), random stratified converted (RSCI), and fixed transect (Rivers Only) indices (**top**), and distribution of age 1+ channel catfish from June 2003 through May 2004 (**bottom**).



Blue Catfish YOY

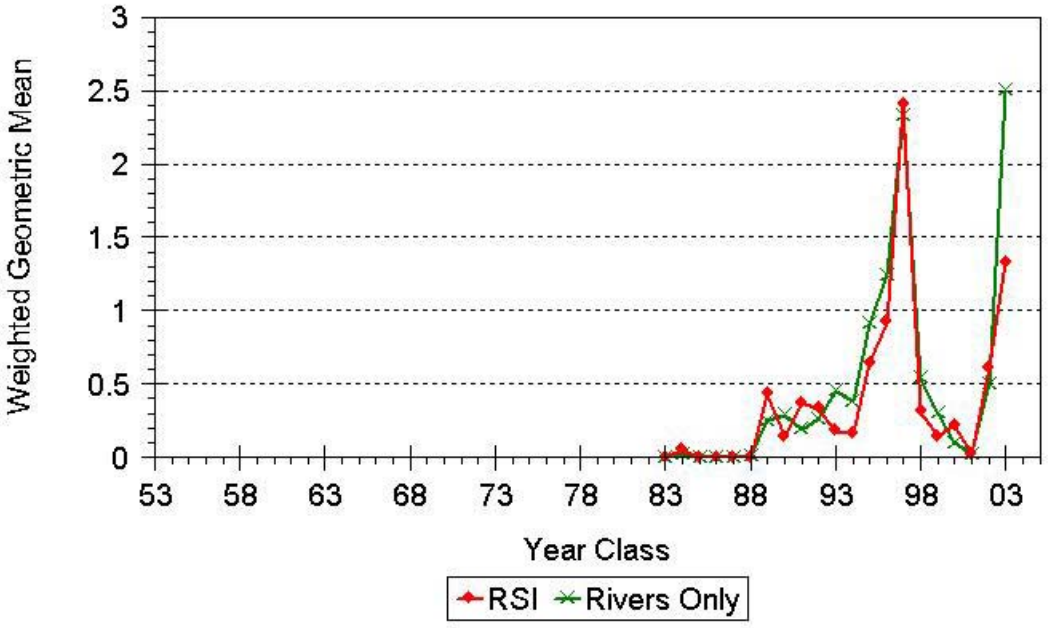
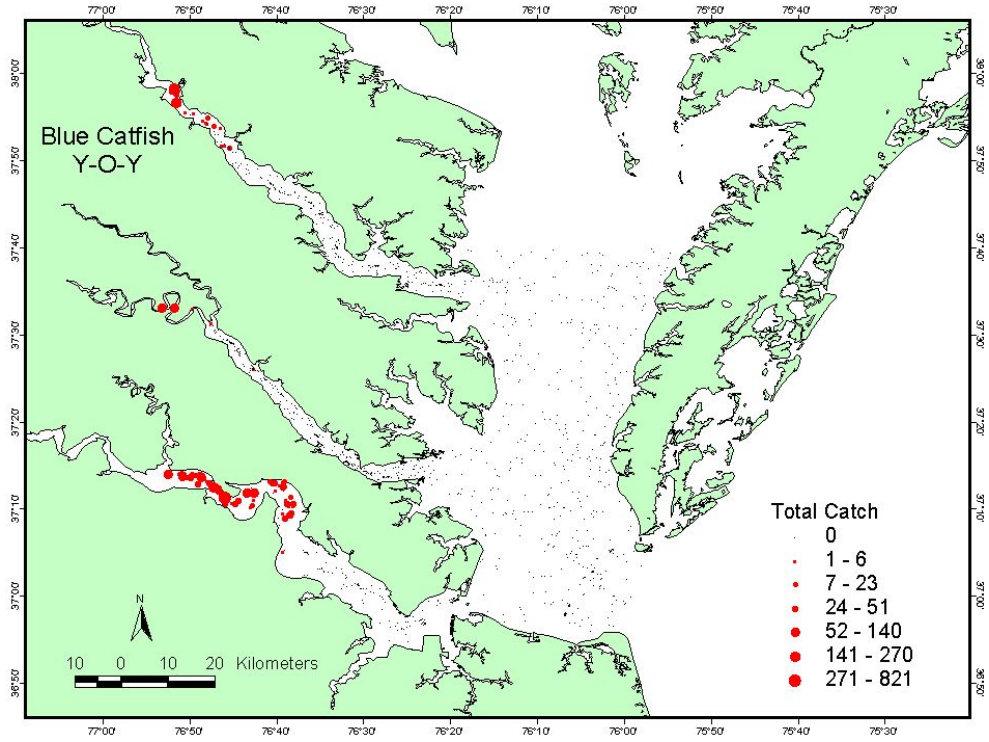



Figure 20. YOY blue catfish random stratified (RSI), and fixed transect (Rivers Only) indices (**top**), and distribution of YOY blue catfish from June 2003 through May 2004 (**bottom**).



Blue Catfish Age 1+

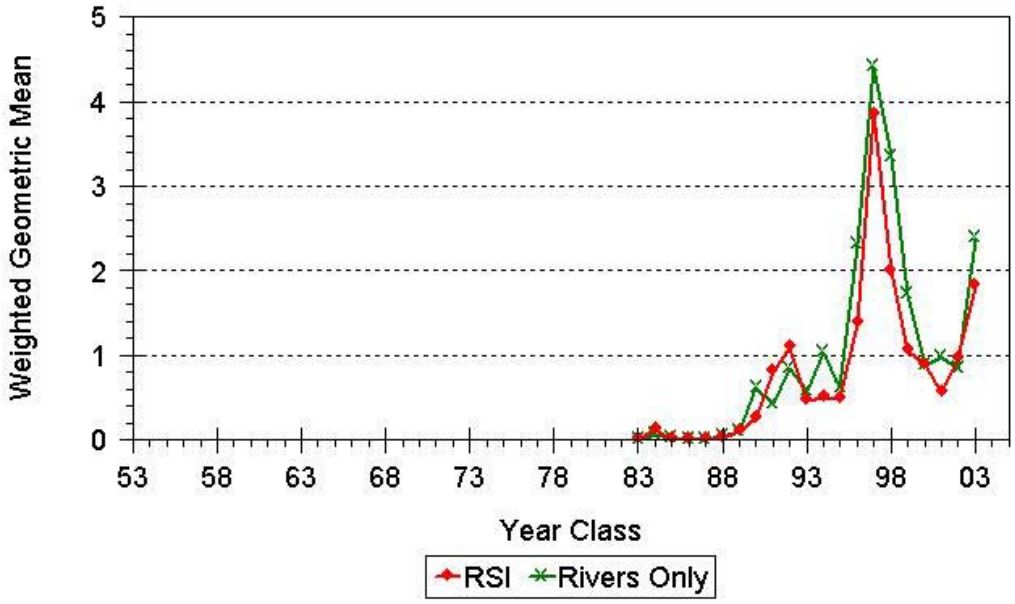
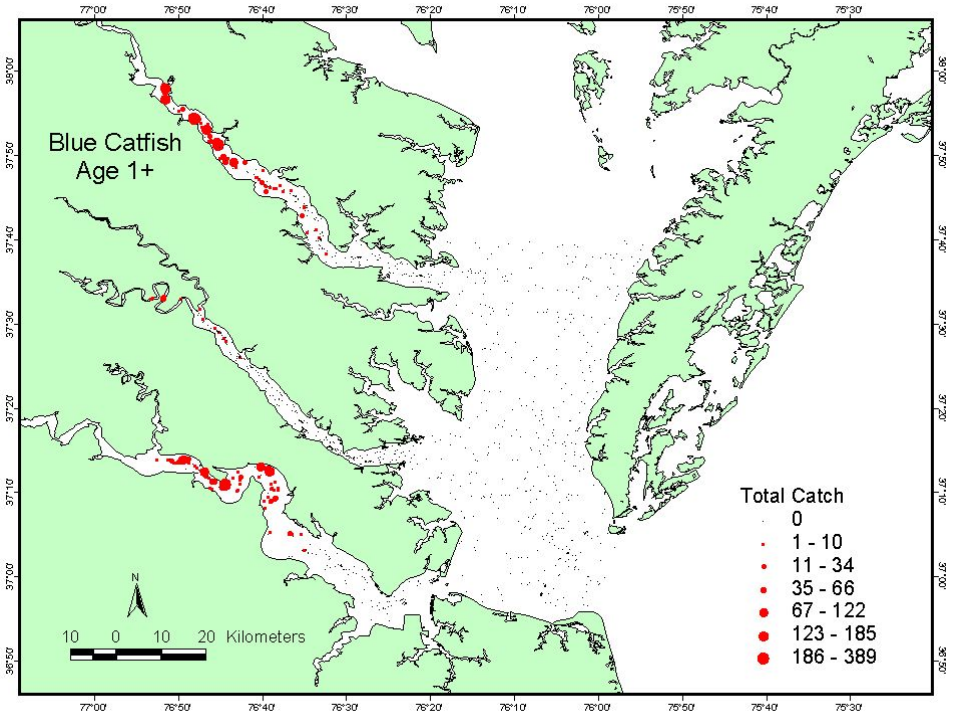



Figure 21. Age 1+ blue catfish random stratified (RSI), and fixed transect (Rivers Only) indices (**top**), and distribution of age 1+ blue catfish from June 2003 through May 2004 (**bottom**).



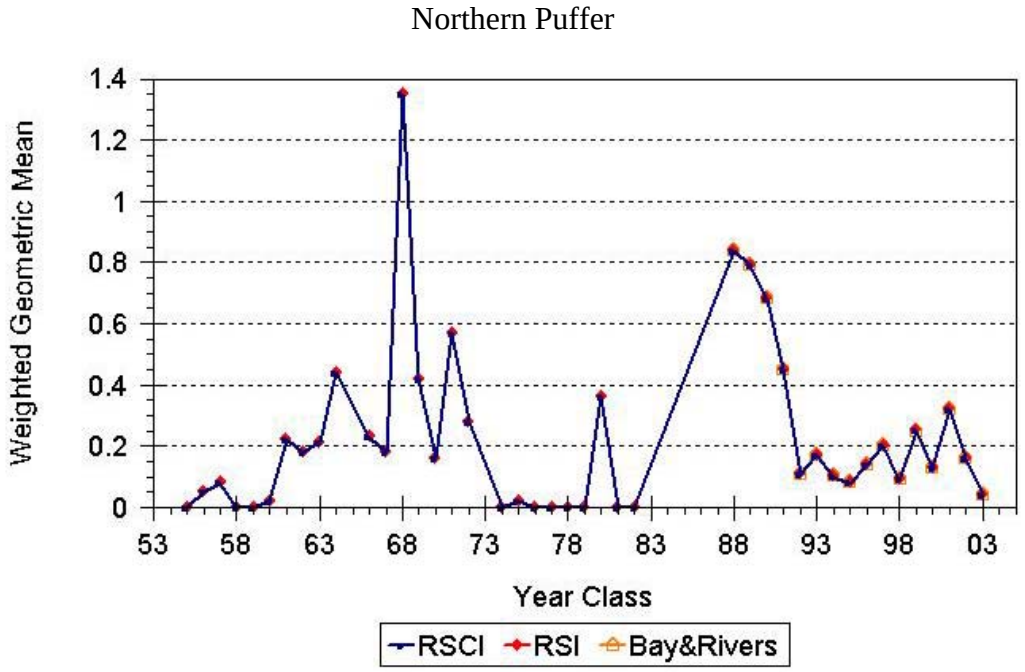
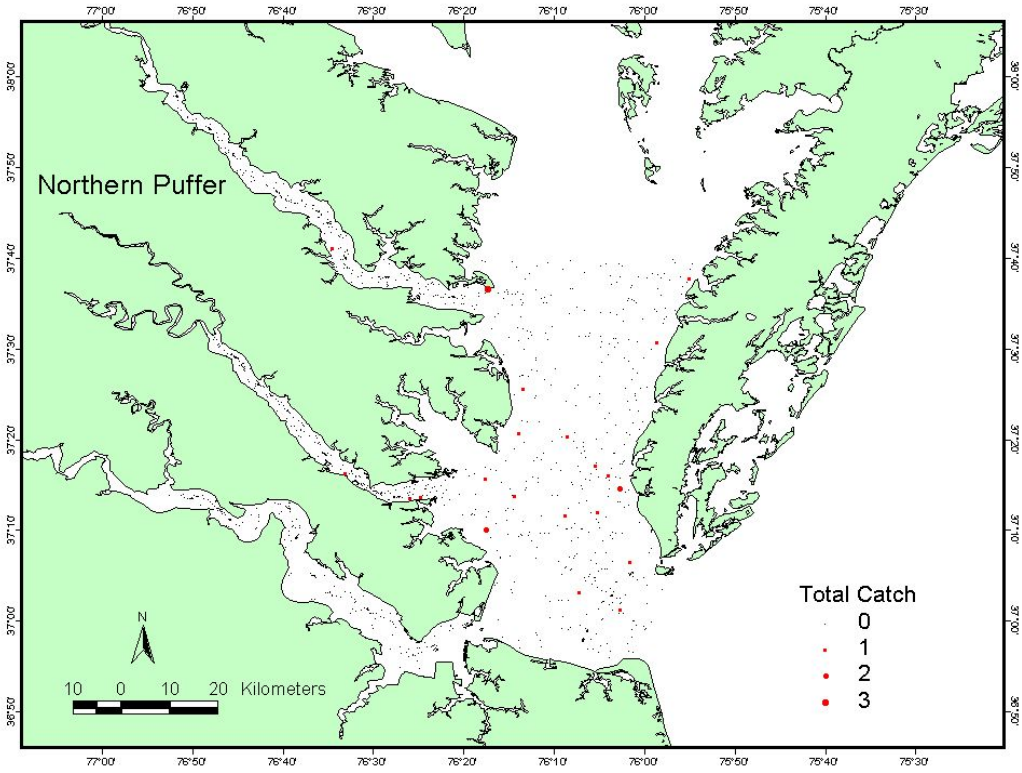



Figure 22. YOY northern puffer random stratified (RSI), random stratified converted (RSCI), and Bay and fixed river station (BRI) indices (**top**), and distribution of YOY northern puffer from June 2003 through May 2004 (**bottom**).



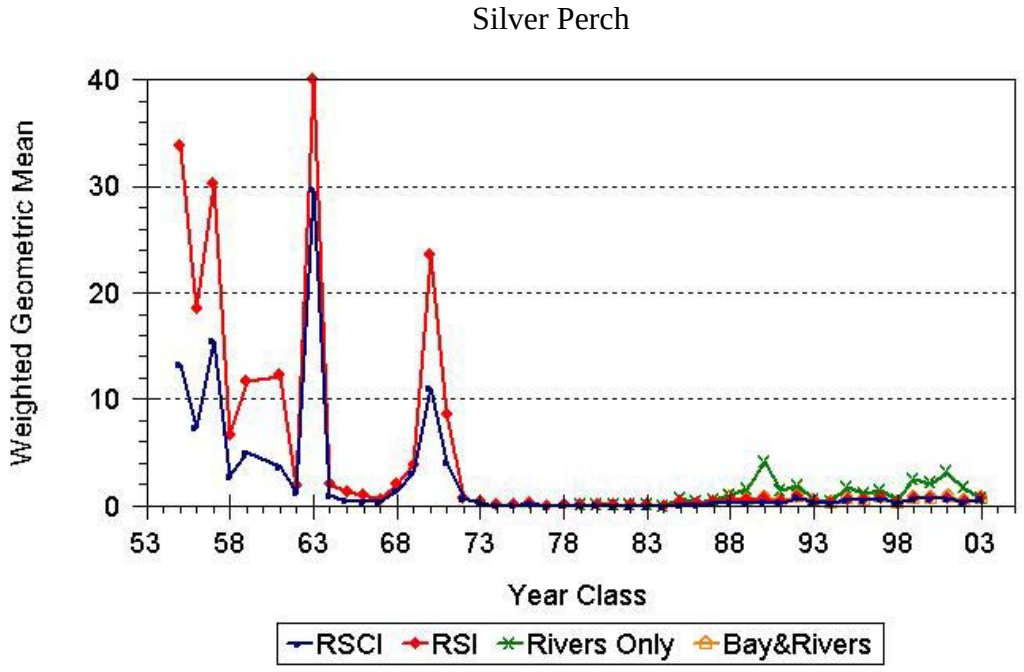
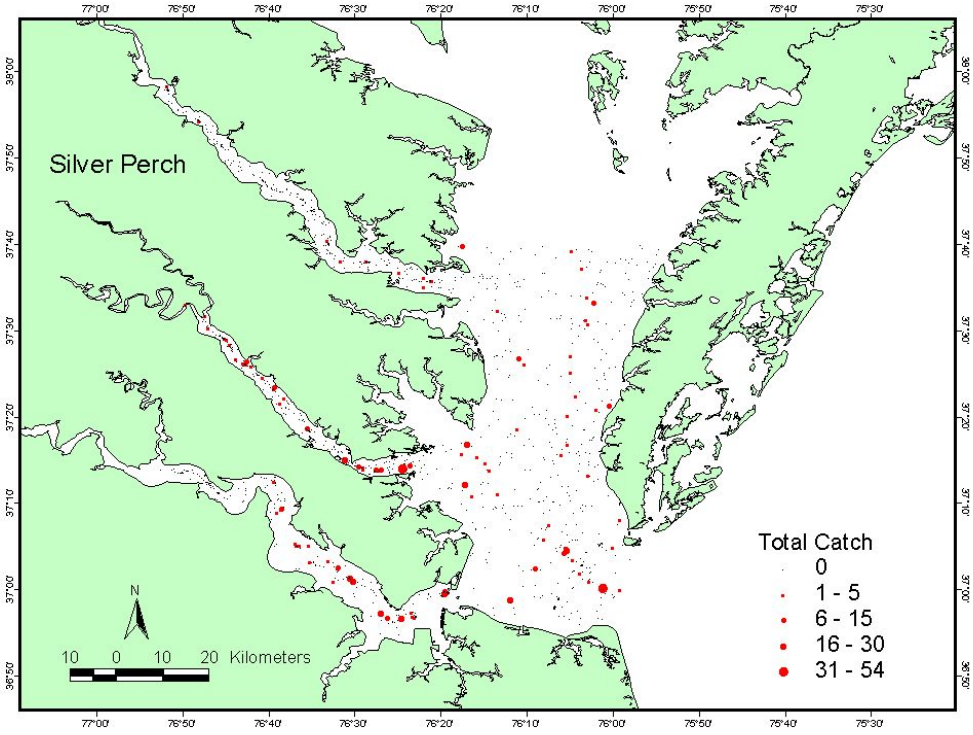



Figure 23. YOY silver perch random stratified (RSI), random stratified converted (RSCI), fixed transect (Rivers Only), and Bay and fixed river station (BRI) indices (**top**), and distribution of YOY silver perch from June 2003 through May 2004 (**bottom**).



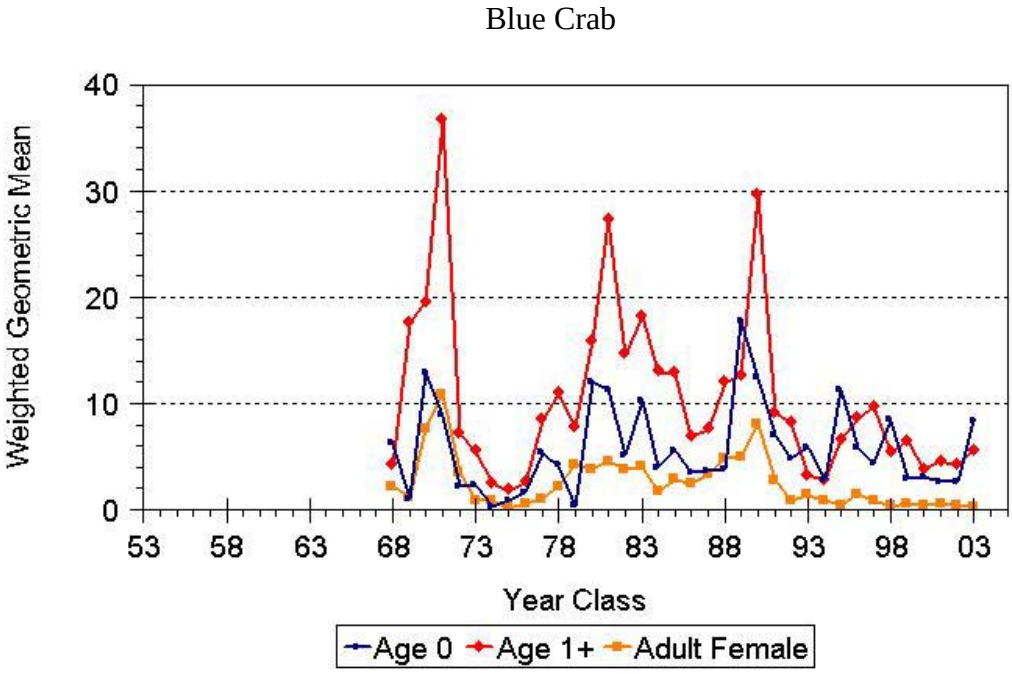



Figure 24. Age 0 (YOY), Age 1+, and adult female blue crab random stratified converted (RSCI) indices.

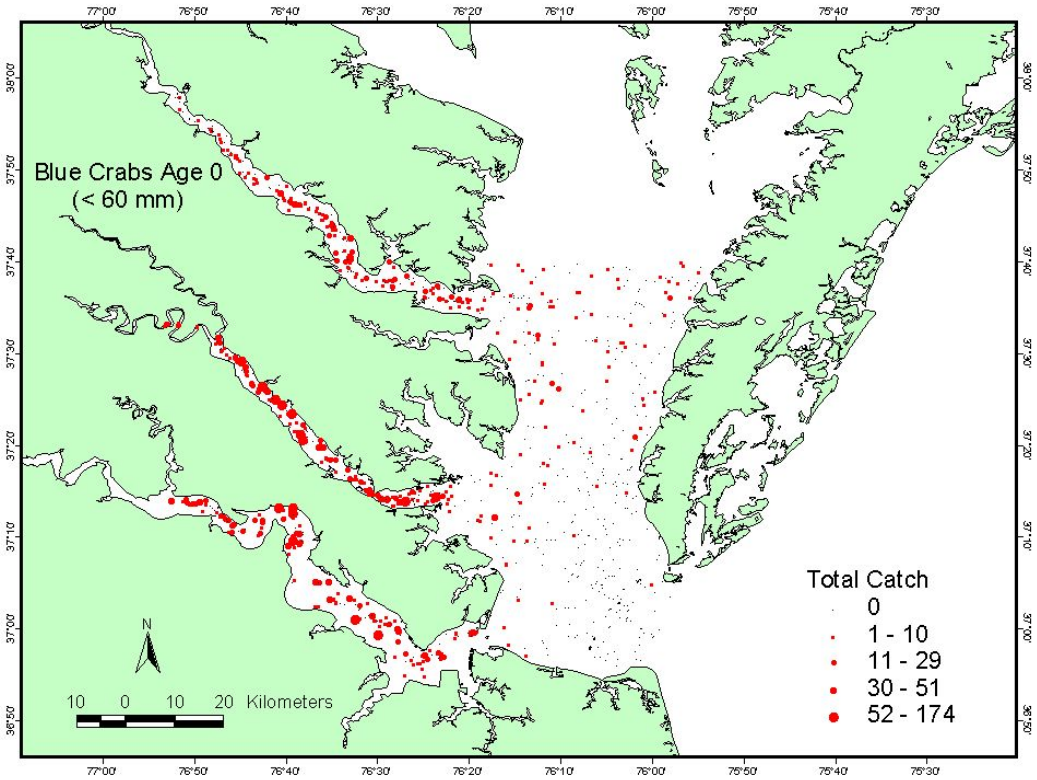



Figure 25. Distribution of Age 0 blue crabs from June 2003 through May 2004.

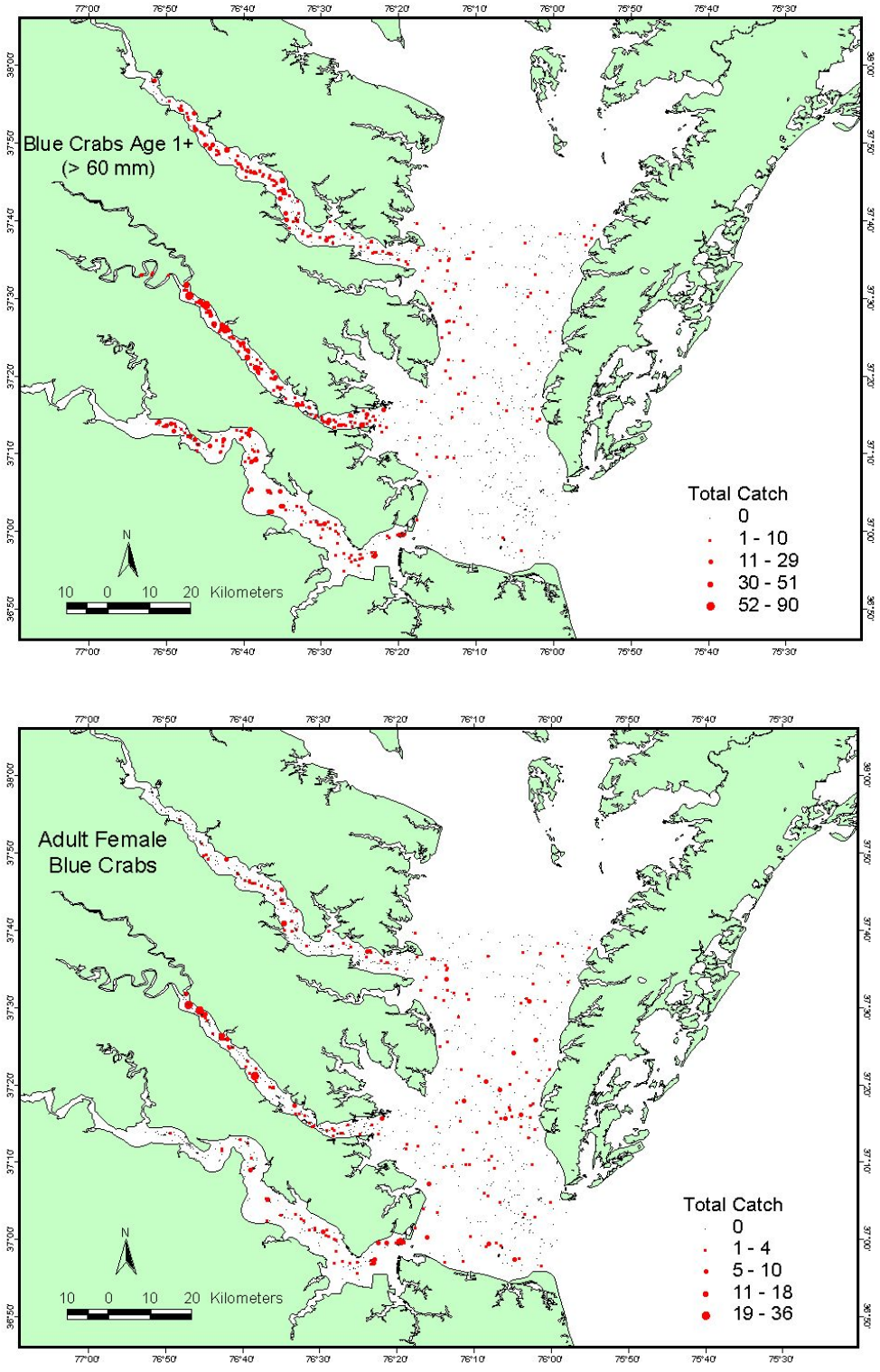
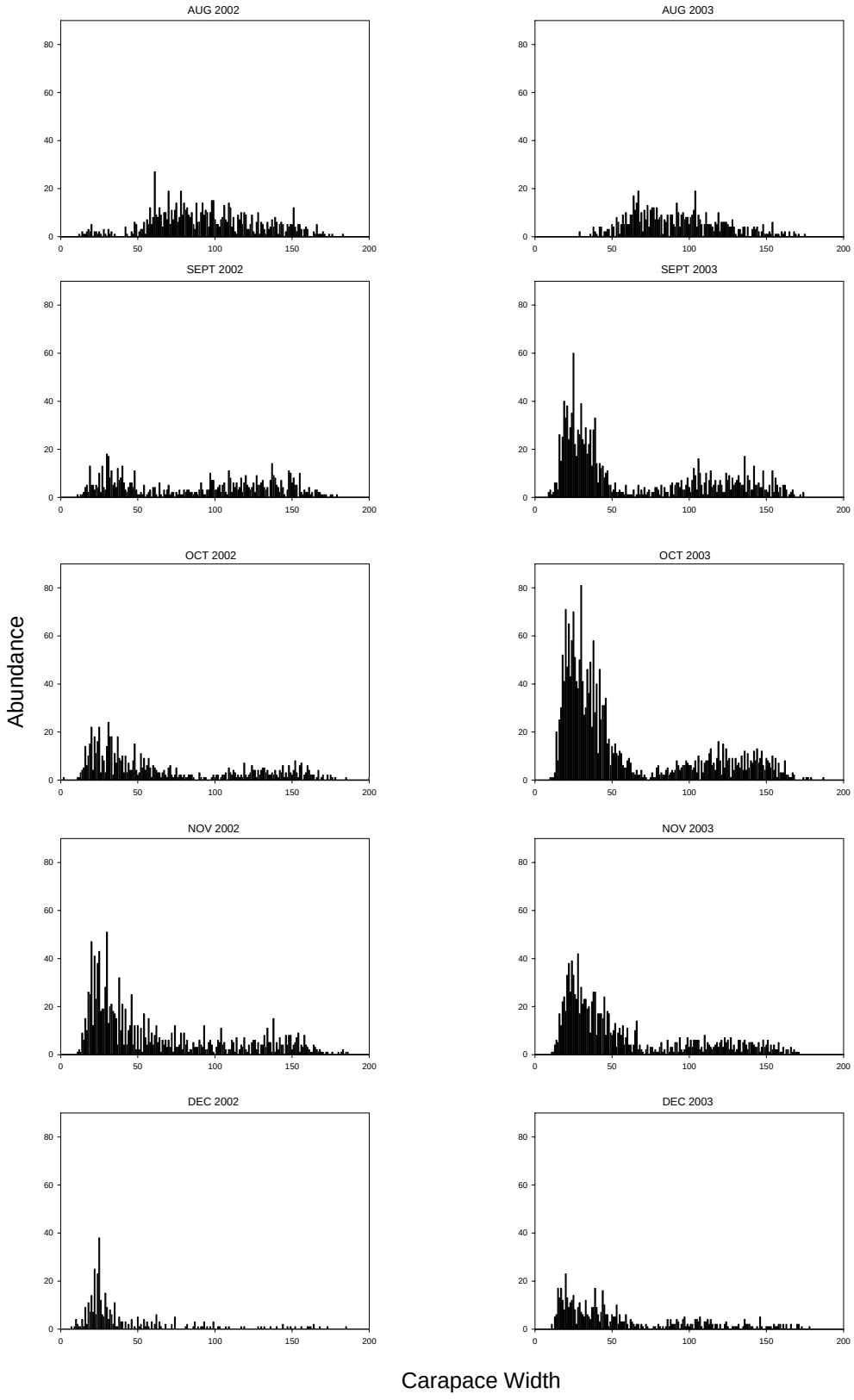



Figure 26. Distribution of Age 1+ blue crabs (**top**), and adult female blue crabs (**bottom**), from June 2003 through May 2004.

Figure 27. Fall YOY blue crab size frequencies for August through December 2002 (**left**) and 2003 (**right**).



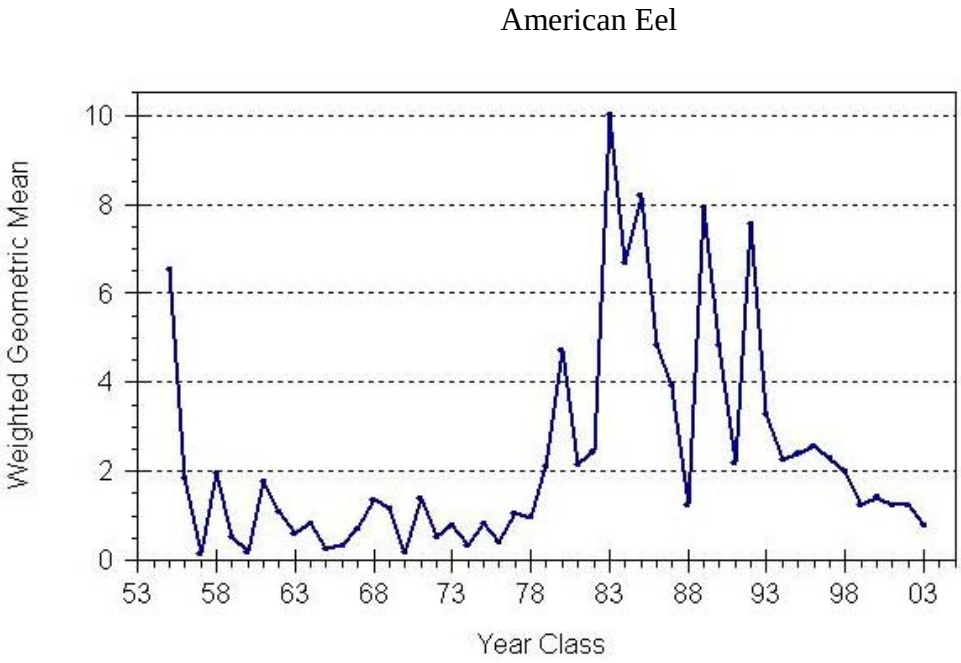
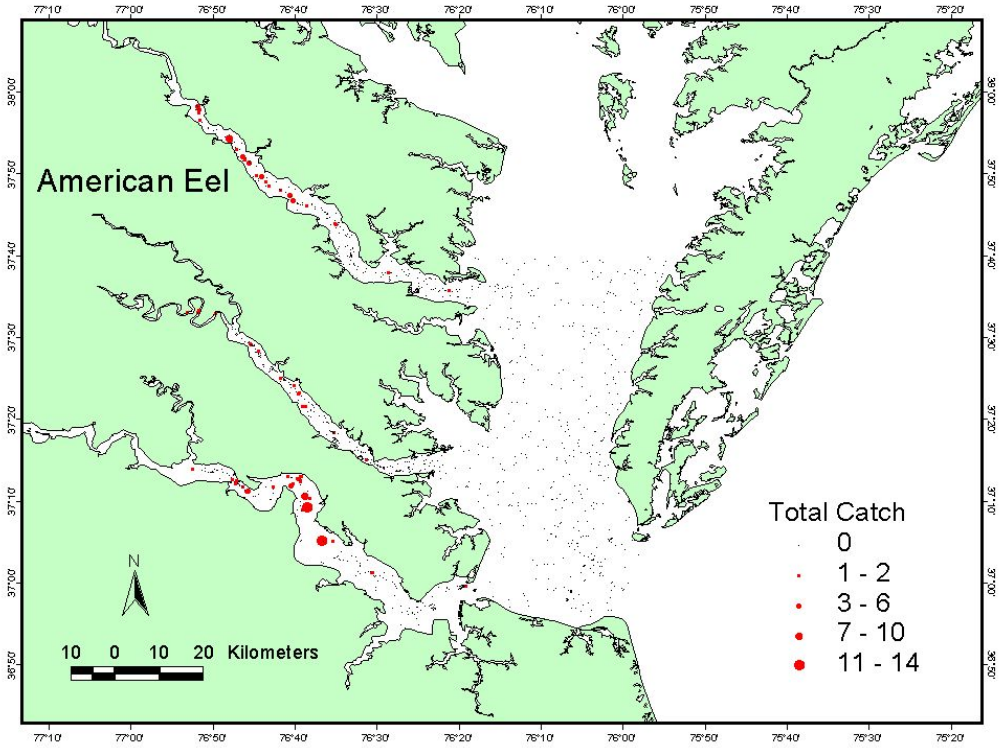



Figure 28. American eel random stratified converted index (RSCI) index (**top**) and distribution of American eel (all year classes combined; **bottom**) from June 2003-May 2004.



Bay Anchovy

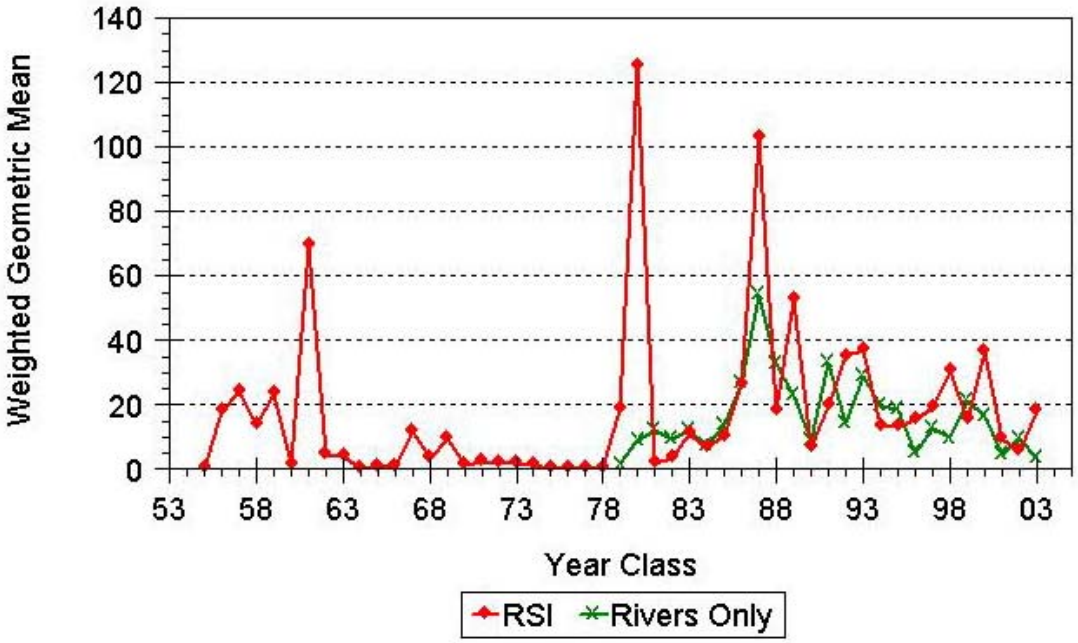



Figure 29. Bay anchovy random stratified (RSI) and river only (RO) index (**top**) and distribution of YOY bay anchovy from June 2003 through May 2004 (**bottom).**