

RESULTS OF MARMAP OTTER TRAWL INVESTIGATIONS IN
THE SOUTH ATLANTIC BIGHT. IV. WINTER-EARLY SPRING 1975¹

Charles A. Wenner, Charles A. Barans,
Bruce W. Stender and Frederick H. Berry

Marine Resources Research Institute
South Carolina Wildlife and Marine Resources Department
Charleston, South Carolina 29412

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ABSTRACT

The distribution, relative abundance, composition and species associations of South Atlantic Bight groundfish were determined from stratified random 3/4 Yankee otter trawl tows during 21 January to 10 April 1975. The stratified mean catch/tow for total groundfish was 35.053 kg. Largest mean catches of total groundfish were in the 19-27 m depth zone (53.725 kg/tow) whereas lowest values occurred in the 184-366 m zone (4.204 kg/tow).

The stratified mean catch/tow for demersal teleosts was 9.087 kg. Mean catch/tow values were highest in the 19-27 m depth zone and lowest in the 184-366 m zone. Demersal teleosts accounted for only 25% of the total groundfish catch.

The numerically-dominant demersal teleost was the southern porgy, Stenotomus aculeatus, which accounted for 70.8% of the total catch. Orange filefish, Aluterus schoepfi, contributed 20.8% of the demersal teleost weight. The most abundant pelagic species were round herring, Etrumeus teres, Cuban anchovy, Anchoa cubana, and butterfish, Peprilus triacanthus. Elasmobranchs were encountered in 61% of the trawl tows and were dominated by Dasyatis sayi and D. centroura.

Indices of species diversity were calculated for each trawl tow and species assemblages were defined by numerical classification.

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INTRODUCTION

This report is the fourth summarizing groundfish collections in the open shelf or sand bottom habitat in the South Atlantic Bight (see Wenner *et al.* 1979 a,b,c). It describes the distribution, relative abundance and species associations of groundfish from Cape Fear to Cape Canaveral in depths from 9 to 366 m. References to the literature can be found in Wenner *et al.* (1979a).

MATERIALS AND METHODS

A stratified random sampling design (Grosslein 1969) was employed to allocate trawl stations within strata which were a southward projection of the MARMAP strata utilized by the Northeast Fisheries Center of the National Marine Fisheries Service from Cape Fear to Cape Canaveral (see Wenner *et al.* 1979a for strata map). The strata were subdivisions of six depth zones: 9-18 m; 19-27 m; 28-55 m; 56-110 m; 111-183 m; 184-366 m.

A total of 77 0.5 hr otter trawl stations (Appendix I) were made with a 3/4 scale version of a Yankee No. 36 trawl (Wilk and Silverman 1976) from the R/V *Dolphin*, a 32.6-m converted tug, at a speed of 6.5 km/h from 21 January to 10 April 1975. The lack of synopticity in the sampling was caused by a major breakdown in the trawl winch. Live bottom

stations as defined in Wenner *et al.* (1979a) were not included in the analysis. Although hydrographic observations were taken at the end of each trawl tow, they were not analyzed because of the long sampling period.

Data processing was the same as in previous reports (Wenner *et al.* 1979 a,b,c). Individual stratum boundaries were collapsed within depth zones, resulting in six depth zones which were considered as individual strata for biomass estimates. The stratified mean catch/tow was calculated according to Cochran (1977) and the variance was estimated by the method of Clark and Brown (1977). Because of the non-normal distribution of trawl catches, calculations were made on transformed ($\ln [x + 1]$) (Taylor 1953; Elliott 1973) and untransformed data. Bliss' (1967) estimation of the mean was used in re-transforming data from logarithmic to arithmetic units.

In addition to estimates on total groundfish, biomass calculations were made on demersal bony fish (total - [elasmobranchs + pelagics]) since large elasmobranchs and large catches of pelagics contributed significantly to overall variation. The swept area method (Rohr and Guthertz 1977) was used to estimate biomass with 8.748 m as the sweep of the 3/4 Yankee trawl (T. Azarovitz, N.M.F.S. Woods Hole, Mass. pers. comm.) and 3.241 km as the distance of a standard tow. Swept area was 2.835 ha. Estimates have not been adjusted by availability or vulnerability factors and should be considered minimum values.

Analysis of the species associations and diversity patterns was the same as in Wenner *et al.* (1979 a,b,c).

RESULTS AND DISCUSSION

Biomass

Catch rates are in Tables 1 and 2. Although the analysis of variance showed significant differences in the transformed mean catch/tow of demersal bony fish between depth zones (Table 3), the Scheffe multiple range test to isolate significant differences between treatment means (Guenther 1964) did not indicate significant groupings (Table 4). During other surveys, catches diminished with increasing depth (Wenner *et al.* 1979 a,b,c).

Untransformed total groundfish data gave a stratified mean catch/tow of 35.053 kg with 90% confidence limits of 25.328 and 44.778 kg. The Bliss approximation of the transformed total groundfish data resulted in a stratified mean of 37.157 kg/tow with 90% confidence limits of 28.353 and 48.601 kg.

The stratified means for demersal bony fishes only were (a) untransformed data:

Table 1. Mean catch/tow (\bar{y}_h) for total trawl-caught groundfish based on untransformed and transformed [$\ln(\text{weight} + 1)$] data by depth zone for the Winter-early Spring 1975 survey in the South Atlantic Bight. The Bliss approximation of the mean was applied to the transformed values.

Depth Zone (m)	\bar{y}_h biomass (kg/tow) untransformed	\bar{y}_h biomass (kg/tow) transformed	Area of Zone (km ²)	Number of tows
9-18	35.370	44.072	18083	20
19-27	53.725	60.632	16100	15
28-55	38.001	42.230	22367	18
56-110	19.878	18.265	4775	10
111-183	25.082	34.584	3615	8
184-366	4.204	4.504	9724	6

Table 2. Mean catch/tow (\bar{y}_h) values for demersal teleosts (total groundfish - [elasmobranch + pelagics + squids]) based on untransformed and transformed [$\ln(\text{weight} + 1)$] data by depth zone for the Winter-early Spring 1975 survey in the South Atlantic Bight. The Bliss approximation of the mean was applied to the transformed values.

Depth Zone (m)	\bar{y}_h biomass (kg/tow) untransformed	\bar{y}_h biomass (kg/tow) transformed	Area of Zone (km ²)	Number of tows
9-18	4.365	4.025	18083	20
19-27	14.290	14.881	16100	15
28-55	12.647	13.451	22367	18
56-110	6.574	6.906	4775	10
111-183	7.715	8.761	3615	8
184-366	2.811	2.750	9724	6

Table 3. Analysis of variance of the transformed ($\ln(x + 1)$) catch/tow in kg of demersal bony fishes between depth zones.

Source of Variation	d.f.	Sums of Squares	Mean Square	F
Between Zones	5	16.505	3.301	3.30*
Among Zones	71	71.107	1.001	
Total	76	87.613		

*Significant at the 90% level.

Table 4. Scheffe's multiple range comparison of the transformed mean catch/tow of demersal bony fish in the six depth zones. Underscoring of treatment groups show that this test was unable to separate significant mean differences at the 90% level.

depth zone (m)	9-18	19-27	28-55	56-110	111-183	184-366
\bar{X} (ln [kg + 1])	1.111	2.046	2.185	1.751	1.849	0.956
number of tows	<u>20</u>	<u>15</u>	<u>18</u>	<u>10</u>	<u>8</u>	<u>6</u>

Table 5. Minimum standing stock estimates of South Atlantic Bight groundfish during the Winter-early Spring 1975. LCL and UCL = lower and upper 90% confidence limits.

	Metric tons ($\times 10^4$)		
	Mean	LCL	UCL
total groundfish-untransformed	9.23	6.67	11.79
total groundfish-transformed	9.79	7.47	12.80
demersal bony fish-untransformed	2.39	1.73	3.06
demersal bony fish-transformed	2.36	1.87	2.97

\bar{x} : 9.087; 90% CL: 6.571; 11.604 kg/tow;
(b) transformed data: \bar{x} : 8.959; 90%
CL: 7.084; 11.267 kg/tow. Estimated
variance decreased from 2642 to 177
when elasmobranchs, pelagic fishes and
squids were removed from untransformed
data; the removal of these from the
transformed data reduced the variance
36%. Density estimates during January-
April 1975 in kg/ha are shown below.

The density estimates as well as
the standing stock estimates (Table 5)
should be viewed as minimum since we
have no data on the efficiency of the
3/4 Yankee trawl in sampling South
Atlantic Bight groundfish.

Demersal Bony Fishes

Catches contained 27,489 demersal
bony fishes (132 species, 42 families)
(Table 6). Numerically, sparids com-
prised 71% of the demersal teleost
catch. By weight, dominant families
were the Balistidae (157.5 kg),
Sciaenidae (99.7 kg), and the Sparidae
(96.4 kg). The most speciose families
were the Bothidae (16 species) and
the Triglidae (12 species).

Southern porgy (Stenotomus aculeatus)
accounted for 70.8% of the catch (Table 7).
Orange filefish (Aluterus schoepfi) were
large (average weight 1.1 kg) and ranked
first by weight (Table 7). Species
rankings by numbers and weight are in
Tables 8 and 9, respectively.

Southern porgy: Stenotomus aculeatus

Stenotomus aculeatus, the most
numerous demersal teleost, comprised 70.8%
of the number and 11.6% of the weight of
demersal bony fish. Southern porgy were
collected from Cape Fear (33.8°N) to
northern Florida (29.5°N) (Fig. 1) in
depths from 11 to 91 m (13.2-18.2°C).
Maximum catches in numbers and weight were
in the 19-27 m depth zone, where it was
found in 7 to 15 trawls (Fig. 2A).
Juveniles (3 to 6 cm FL) were found in two
shallowest zones. Larger adults (10 to 20
cm FL) were found throughout the species
depth range (Fig. 2B). Thus it appears
that juveniles are more depth-restricted
than adults. Abundance statistics are in
Table 10.

Spotted hake: Urophycis regius

Spotted hake represented 7.4% of the
number and 4.9% of the weight of demersal
teleosts. They were found in 9 to 311 m
(7.7-19.2°C) from Cape Fear (33.8°N) to
northern Florida (30°N) (Fig. 3). Maximum
catches in numbers and weight were in the
111-183 m depth zone where U. regius
occurred in 7 of 8 trawl tows (Fig. 2C).
An increase in spotted hake size at greater
depths was apparent (Fig. 2D). Juveniles
(3-10 cm TL) were found in the two inshore
zones whereas largest U. regius were in
the deepest zones. These juveniles utilize
the inshore waters as a nursery area
during cooler months. Abundance statistics
are in Table 10.

Synagrops spinosa

Synagrops spinosa represented 1.7%
of the number and less than 1% of the
weight of demersal bony fishes. This deep
water cardinal fish was collected in 128-
265 m (10.7-17.3°C) with all but a single
specimen occurring in the 111 to 183 m
zone. Catch rate was 114 individuals
weighing 0.48 kg per hour trawl time. The
mean size was 6.4 cm FL (range: 3-9 cm FL).

Spot: Leiostomus xanthurus

Spot were collected in depths of 9 to
20 m (10.6-20.1°C) and ranked fourth in
number and third by weight of the demersal
teleost catch. About 90% of the number
and 93% of the weight occurred in the 19-
27 m zone, where the catch rate was 48
individuals with a weight of 5.65 kg/hour.
Mean size was 19.4 cm TL (range: 2-24 cm
TL).

Slender searobin: Peristedion gracile

Peristedion gracile occurred in four
of eight trawl tows in the 111-183 m depth
zone. Within this zone, depths of capture
were 128 to 146 m (13.6-17.3°C). This
triglid made up 1.4% of the number and less
than 1% of the weight of demersal teleosts.
Catch rate was 98 individuals with a
weight of 2.52 kg per hour trawl time. Mean
size was 15.5 cm TL (range: 7-18 cm TL).

	\bar{x}	lower 90% CL	upper 90% CL
total groundfish - untransformed	12.364	8.834	15.795
total groundfish - transformed	13.106	10.001	17.143
demersal bony fish - untransformed	3.205	2.318	4.093
demersal bony fish - transformed	3.160	2.499	3.974

Table 6. Ranking of families of demersal bony fishes by numerical abundance during the Winter-early Spring 1975 groundfish survey in the South Atlantic Bight.

Family	Number of Individuals	Weight (kg)	Number of Species
Sparidae	19,528	96.4	5
Gadidae	2,044	33.1	2
Synodontidae	808	40.2	6
Percichthyidae	786	3.6	3
Triglidae	640	31.9	12
Sciaenidae	578	99.7	7
Serranidae	527	35.0	7
Bothidae	463	43.0	16
Argentinidae	425	1.8	3
Balistidae	331	157.5	4
Haemulidae	262	12.0	1
Ophidiidae	262	12.3	8
Scorpaenidae	151	13.4	5
Polymixidae	120	7.8	1
Ephippidae	89	12.0	1
Ogcocephalidae	76	2.4	6
Lutjanidae	66	3.6	3
Priacanthidae	57	1.0	2
Tetraodontidae	47	5.6	7
Batrachoididae	44	0.6	1
Mullidae	26	3.2	1
Uranoscopidae	18	2.6	2
Zeidae	14	0.5	1
Ostraciidae	13	2.6	1
Chlorophthalmidae	12	0.3	1
Congridae	12	0.7	2
Gerreidae	12	0.3	1
Ophichthidae	12	1.0	4
Muraenidae	11	1.3	2
Moridae	9	0.4	1
Caproidae	7	0.4	1
Rachycentridae	7	34.5	1

Table 6. (continued).

Family	Number of Individuals	Weight (kg)	Number of Species
Diodontidae	6	1.1	1
Syngnathidae	5	0.4	3
Labridae	5	0.4	2
Cynoglossidae	5	0.1	1
Merluccidae	3	0.3	2
Muraenesocidae	3	0.2	1
Macrouridae	2	0.2	1
Branchiostegidae	1	0.1	1
Lophiidae	1	0.1	1
Soleidae	1	0.1	1
42 families	27,489	663.7	132

Table 7. Ranking by total number and total weight for demersal bony fishes in the January-April 1975 survey in the South Atlantic Bight.

Species	Number	Percent of Total Catch	Cumulative Percent	Number of Occurrences
<u>Stenotomus aculeatus</u>	19,461	70.8		22
<u>Urophycis regius</u>	2,043	7.4	78.2	31
<u>Synagrops spinosa</u>	457	1.7	79.9	5
<u>Leiostomus xanthurus</u>	401	1.5	81.4	7
<u>Peristedion gracile</u>	392	1.4	82.8	4
<u>Synodus foetens</u>	384	1.4	84.2	40
<u>Argentina striata</u>	304	1.1	85.3	2
<u>Synagrops bella</u>	282	1.0	86.3	6
<u>Haemulon aurolineatum</u>	262	1.0	87.3	7
<u>Syacium papillosum</u>	244	0.9	88.2	25

Species	Weight (kg)	Percent of Total Catch	Cumulative Percent	Number of Occurrences
<u>Aluterus schoepfi</u>	140.163	20.8		23
<u>Stenotomus aculeatus</u>	78.297	11.6	32.4	22
<u>Leiostomus xanthurus</u>	45.407	6.7	39.1	7
<u>Rachycentron canadum</u>	34.474	5.1	44.2	2
<u>Urophycis regius</u>	33.044	4.9	49.1	31
<u>Synodus foetens</u>	28.011	4.2	53.3	40
<u>Pogonias chromis</u>	27.216	4.0	57.3	1
<u>Syacium papillosum</u>	26.757	4.0	61.3	25
<u>Diplectrum formosum</u>	24.181	3.6	64.9	25
<u>Calamus nodosus</u>	16.783	2.5	67.4	2
<u>Menticirrhus americanus</u>	13.255	2.0	69.4	5

Table 8. Numerically-dominant demersal bony fish species by depth for Winter-early Spring 1975 in the South Atlantic Bight. N_1 = number of occurrences; N = total trawl tows in depth zone.

Depth Zone (m)	Species	Total Number	Percent of Total in Depth Zone	N_1/N
9-18	<u>Urophycis regius</u>	1,180	59.2	11/20
	<u>Stenotomus aculeatus</u>	326	16.4	9/20
	<u>Synodus foetens</u>	130	6.5	12/20
	<u>Chaetodipterus faber</u>	56	2.8	2/20
	<u>Menticirrhus americanus</u>	46	2.3	3/20
	<u>Leiostomus xanthurus</u>	39	2.0	4/20
	<u>Diplectrum formosum</u>	34	1.7	5/20
	<u>Prionotus scitulus</u>	25	1.2	7/20
	<u>Ophidion holbrookii</u>	18	0.9	4/20
	<u>Ophidion grayi</u>	14	0.5	4/20
19-27	<u>Stenotomus aculeatus</u>	18,705	93.4	9/15
	<u>Leiostomus xanthurus</u>	362	1.8	3/15
	<u>Synodus foetens</u>	177	0.9	12/15
	<u>Diplectrum formosum</u>	142	0.7	8/15
	<u>Microgogonias undulatus</u>	100	0.5	2/15
	<u>Ophidion beani</u>	59	0.3	4/15
	<u>Haemulon aurolineatum</u>	50	0.2	3/15
	<u>Rhomboplites aurorubens</u>	48	0.2	2/15
	<u>Syacium papillosum</u>	47	0.2	4/15
	<u>Scorpaena calcarata</u>	38	0.2	4/15
28-55	<u>Haemulon aurolineatum</u>	212	15.6	4/18
	<u>Stephanolepis hispidus</u>	141	10.4	11/18
	<u>Prionotus carolinus</u>	97	7.2	5/18
	<u>Aluterus schoepfi</u>	85	6.3	10/18
	<u>Syacium papillosum</u>	82	6.0	9/18
	<u>Trachinocephalus myops</u>	78	5.8	10/18
	<u>Stenotomus aculeatus</u>	63	4.6	3/18
	<u>Scorpaena calcarata</u>	49	3.6	5/18
	<u>Synodus poeyi</u>	48	3.5	8/18
	<u>Ophidion beani</u>	47	3.5	5/18

Table 8. (continued).

Depth Zone (m)	Species	Total Number	Percent of Total in Depth Zone	N_1/N
56-110	<u>Stenotomus aculeatus</u>	367	29.8	1/10
	<u>Urophycis regius</u>	220	17.9	3/10
	<u>Synodus poeyi</u>	144	11.7	7/10
	<u>Syacium papillosum</u>	106	8.6	8/10
	<u>Saurida brasiliensis</u>	73	5.9	4/10
	<u>Lagodon rhomboides</u>	43	3.5	1/10
	<u>Prionotus alatus</u>	32	2.6	3/10
	<u>Centropristis ocyurus</u>	31	2.5	5/10
	<u>Synodus foetens</u>	29	2.4	6/10
	<u>Trachinocephalus myops</u>	26	2.1	5/10
111-183	<u>Urophycis regius</u>	544	20.7	7/8
	<u>Synagrops spinosa</u>	456	17.3	4/8
	<u>Peristedion gracile</u>	392	14.9	4/8
	<u>Argentina striata</u>	304	11.5	2/8
	<u>Synagrops bella</u>	273	10.4	2/8
	<u>Serranus notospilus</u>	169	6.4	3/8
	<u>Polymixia lowei</u>	119	4.5	1/8
	<u>Synagrops sp.</u>	47	1.8	1/8
	<u>Leophidium cervinum</u>	33	1.2	6/8
	<u>Saurida normani</u>	32	1.2	5/8
184-366	Argentinidae	100	40.8	1/6
	<u>Urophycis regius</u>	57	23.3	5/6
	<u>Helicolenus dactylopterus</u>	34	13.9	2/6
	<u>Chlorophthalmus agassizi</u>	12	4.9	3/6
	<u>Laemonema barbatulum</u>	9	3.7	1/6
	<u>Synagrops bella</u>	8	3.3	3/6
	<u>Citharichthys arctifrons</u>	5	2.0	3/6
	<u>Hippoglossina oblonga</u>	3	1.2	2/6
	<u>Peristedion miniatum</u>	3	1.2	1/6
	<u>Coelorhynchus carminatus</u>	2	0.8	2/6

Table 9. Dominant demersal bony fish species by weight for Winter-early Spring 1975 in the South Atlantic Bight by depth zone. N_1 = number of occurrences; N = total trawl tows in depth zone.

Depth Zone (m)	Species	Total Weight (kg)	Percent of Total in Depth Zone	N_1/N
9-18	<u>Pogonias chromis</u>	27.216	31.2	1/20
	<u>Aluterus schoepfi</u>	9.525	10.9	4/20
	<u>Stenotomus aculeatus</u>	8.658	9.9	9/20
	<u>Menticirrhus americanus</u>	7.811	8.9	3/20
	<u>Chaetodipterus faber</u>	7.358	8.4	2/20
	<u>Synodus foetens</u>	5.790	6.6	12/20
	<u>Urophycis regius</u>	3.114	3.6	11/20
	<u>Leiostomus xanthurus</u>	3.022	3.5	4/20
	<u>Diplectrum formosum</u>	3.022	3.5	5/20
	<u>Menticirrhus saxatilis</u>	1.361	1.6	1/20
19-27	<u>Stenotomus aculeatus</u>	48.995	25.9	9/15
	<u>Aluterus schoepfi</u>	42.639	19.9	9/15
	<u>Leiostomus xanthurus</u>	42.385	19.8	3/15
	<u>Diplectrum formosum</u>	16.630	7.8	8/15
	<u>Micropogonias undulatus</u>	12.247	5.7	2/15
	<u>Synodus foetens</u>	10.379	4.8	12/15
	<u>Menticirrhus americanus</u>	5.444	2.5	2/15
	<u>Prionotus salmonicolor</u>	4.737	2.2	5/15
	<u>Syacium papillosum</u>	4.536	2.1	4/15
	<u>Calamus leucosteus</u>	3.175	1.5	1/15
28-55	<u>Aluterus schoepfi</u>	87.999	38.6	10/18
	<u>Rachycentron canadum</u>	34.474	15.1	2/18
	<u>Calamus nodosus</u>	14.969	6.6	1/18
	<u>Syacium papillosum</u>	11.087	4.9	9/18
	<u>Haemulon aurolineatum</u>	10.533	4.6	4/18
	<u>Stephanolepis hispidus</u>	8.411	3.7	11/18
	<u>Prionotus carolinus</u>	8.365	3.7	5/18
	<u>Synodus foetens</u>	5.844	2.6	8/18
	<u>Chaetodipterus faber</u>	4.536	2.0	1/18
	<u>Diplectrum formosum</u>	4.529	2.0	12/18

Table 9. (Continued)

Depth Zone (m)	Species	Total Weight (kg)	Percent of Total in Depth Zone	N ₁ /N
56-110	<u>Stenotomus aculeatus</u>	17.368	26.4	1/10
	<u>Syacium papillosum</u>	10.380	15.8	8/10
	<u>Synodus foetens</u>	4.637	7.1	6/10
	<u>Urophycis regius</u>	4.636	7.1	3/10
	<u>Lagodon rhomboides</u>	4.082	6.2	1/10
	<u>Balistes capricus</u>	2.268	3.4	1/10
	<u>Trachinocephalus myops</u>	2.115	3.2	5/10
	<u>Kathetostoma albigutta</u>	2.015	3.1	4/10
	<u>Synodus poeyi</u>	1.861	2.8	7/10
	<u>Calamus nodosus</u>	1.814	2.8	1/10
111-183	<u>Urophycis regius</u>	19.604	31.8	7/8
	<u>Peristedion gracile</u>	10.079	16.3	4/8
	<u>Polymixia lowei</u>	7.711	12.5	1/8
	<u>Saurida normani</u>	3.375	5.5	5/8
	<u>Mullus auratus</u>	2.721	4.4	2/8
	<u>Sphoeroides pachygaster</u>	2.368	3.8	3/8
	<u>Synagrops spinosa</u>	1.934	3.1	4/8
	<u>Serranus notospilus</u>	1.815	2.9	3/8
	<u>Synodus foetens</u>	1.361	2.2	2/8
	<u>Lepophidium cervinum</u>	1.308	2.1	6/8
184-366	<u>Helicolenus dactylopterus</u>	8.265	49.0	2/6
	<u>Urophycis regius</u>	5.190	30.8	5/6
	Argentinidae	0.454	2.7	1/6
	<u>Laemonema barbatulum</u>	0.357	2.1	1/6
	<u>Chloropthalmus agassizi</u>	0.300	1.8	3/6
	<u>Citharichthys arctifrons</u>	0.300	1.8	3/6
	<u>Synagrops bella</u>	0.300	1.8	3/6
	<u>Coelorhynchus carminatus</u>	0.200	1.2	2/6
	<u>Merluccius albidus</u>	0.200	1.2	2/6
	<u>Hippoglossina oblonga</u>	0.200	1.2	2/6

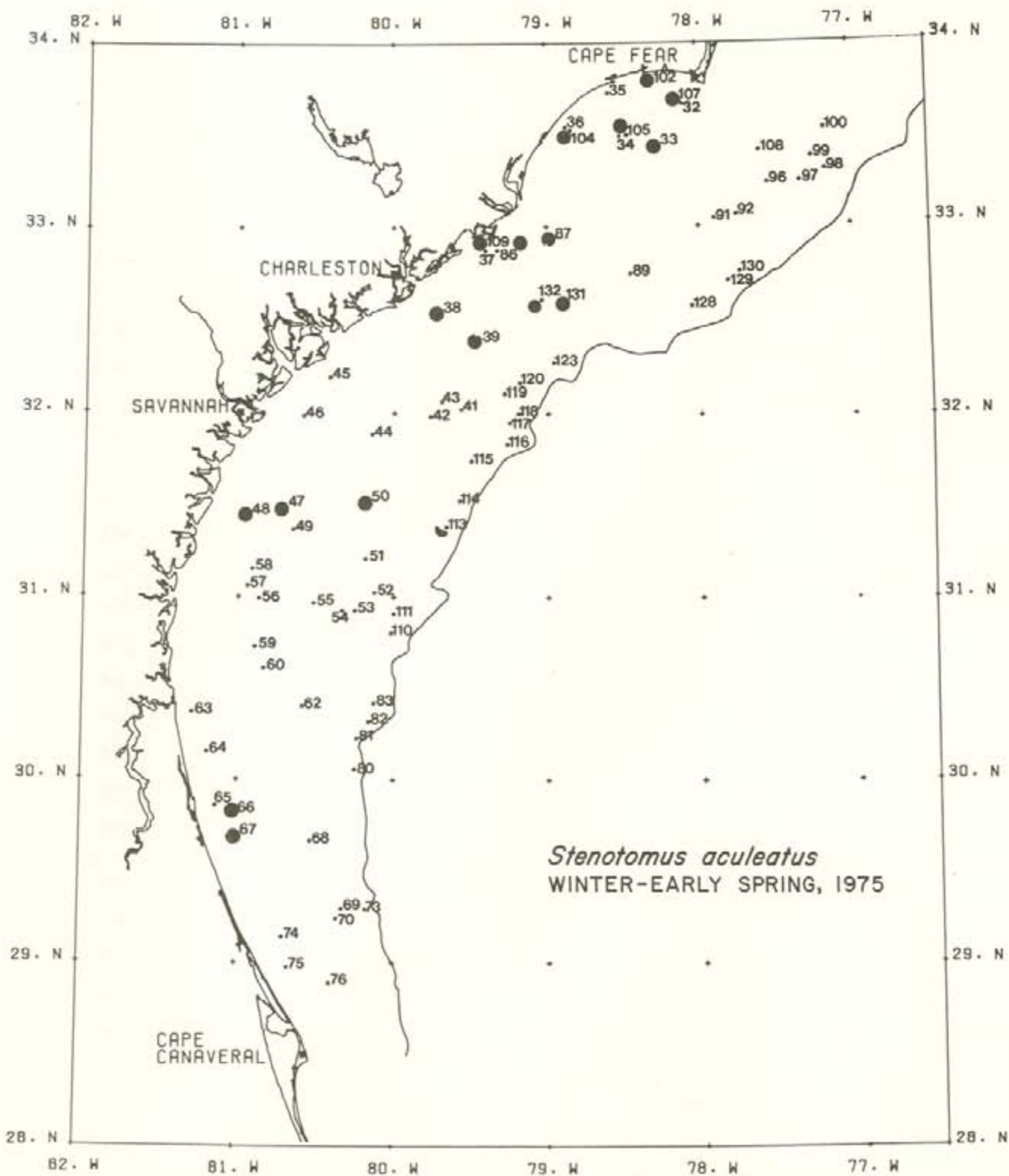


FIGURE 1. DISTRIBUTION OF SOUTHERN PORGY, *STENOTOMUS ACULEATUS*, IN THE SOUTH ATLANTIC BIGHT DURING WINTER-EARLY SPRING 1975. LARGE DOTS = SPECIES PRESENT; SMALL DOTS = SPECIES ABSENT.

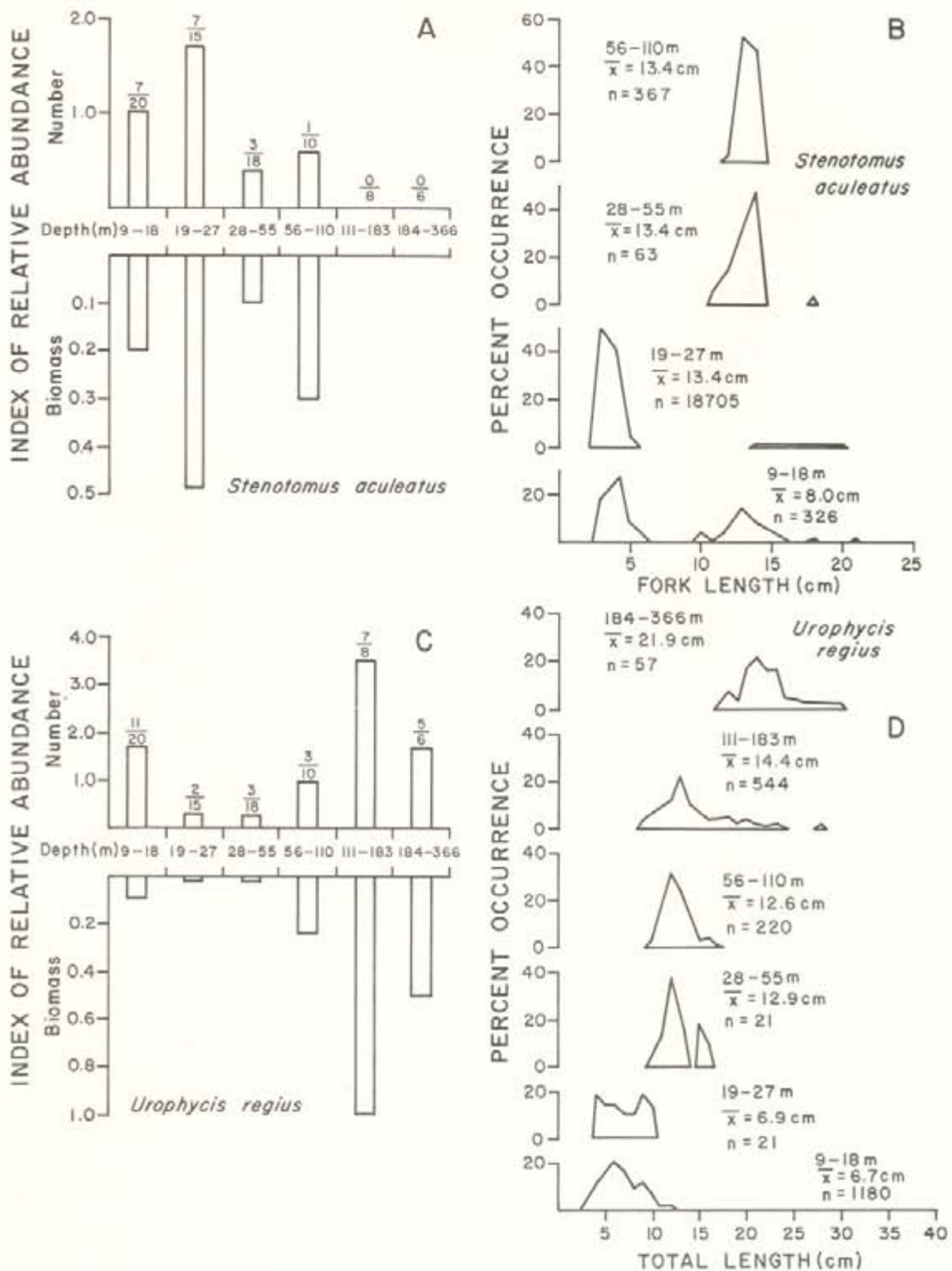


FIGURE 2. INDEX OF RELATIVE ABUNDANCE FOR (A) SOUTHERN PORGY, *STENOTOMUS ACULEATUS*, AND (C) SPOTTED HAKE, *UROPHYCIS REGIUS*, FOR THE 1975 WINTER-EARLY SPRING GROUND FISH SURVEY IN THE SOUTH ATLANTIC BIGHT. NUMERATOR IN FRACTION = NUMBER OF TRAWL TOWS IN DEPTH ZONE WITH SPECIES; DENOMINATOR = TOTAL TRAWL TOWS IN ZONE. LENGTH-FREQUENCIES FOR *S. ACULEATUS* (B) AND *U. REGIUS* (D) BY DEPTH ZONE.

Table 10. Abundance statistics for the most commonly occurring groundfish in the Winter-early Spring 1975 groundfish survey in the South Atlantic Bight. LCL and UCL = lower and upper 90% confidence limits. Values in parentheses following standing stock values are expansion factors for \bar{x} , LCL and UCL. Standing stock weight estimates are in metric tons. Stratified weights/tow are in kg.

Species		Depth Zone (m)	Stratified Mean Catch/Tow		Density (# or kg/hectare)		Standing Stock Estimates	
			Untransformed LCL < \bar{x} < UCL	Transformed LCL < \bar{x} < UCL	Untransformed LCL < \bar{x} < UCL	Transformed LCL < \bar{x} < UCL	Untransformed LCL < \bar{x} < UCL	Transformed LCL < \bar{x} < UCL
<u>Stenotomus aculeatus</u>	number	9-55	-----	9.6 < 15.4 < 24.5	-----	-----	-----	1.91 < 3.08 < 4.89 ($\times 10^7$)
	weight		0 < 1.14 < 2.35	0.36 < 0.56 < 0.85	0 < 0.40 < 0.83	0.13 < 0.21 < 0.30	--- 2.27 < 4.69 ($\times 10^3$)	0.72 < 1.17 < 1.70 ($\times 10^3$)
<u>Urophycis regius</u>	number	9-366	2.5 < 20.9 < 39.3	6.4 < 9.0 < 12.5	0.9 < 7.4 < 13.8	0.05 < 0.11 < 0.17	0.7 < 5.5 < 10.3 ($\times 10^7$)	1.7 < 2.4 < 3.3 ($\times 10^7$)
	weight		0.14 < 0.31 < 0.47	0.18 < 0.27 < 0.36	0.05 < 0.11 < 0.17	0.06 < 0.09 < 0.13	3.68 < 8.06 < 12.44 ($\times 10^6$)	4.67 < 6.98 < 9.46 ($\times 10^6$)
<u>Synodus foetens</u>	number	9-110	3.6 < 6.1 < 8.9	3.9 < 5.3 < 7.1	1.3 < 2.2 < 3.1	1.4 < 1.9 < 2.5	0.77 < 1.33 < 1.88 ($\times 10^7$)	0.84 < 1.15 < 1.54 ($\times 10^7$)
	weight		0.28 < 0.43 < 0.57	0.30 < 0.40 < 0.52	0.10 < 0.15 < 0.20	0.10 < 0.14 < 0.18	6.03 < 9.22 < 12.41 ($\times 10^6$)	6.37 < 8.73 < 11.29 ($\times 10^6$)
<u>Syacium papillosum</u>	number	9-110	2.0 < 3.4 < 4.8	2.0 < 2.7 < 3.7	0.7 < 1.2 < 1.7	0.7 < 1.0 < 1.3	4.23 < 7.35 < 10.46 ($\times 10^6$)	4.23 < 5.90 < 8.0 ($\times 10^6$)
	weight		0.21 < 0.39 < 0.57	0.25 < 0.36 < 0.48	0.08 < 0.14 < 0.20	0.09 < 0.13 < 0.17	4.59 < 8.49 < 12.39 ($\times 10^6$)	5.33 < 7.79 < 10.47 ($\times 10^6$)
<u>Aluterus schoepfi</u>	number	9-55	1.2 < 2.6 < 4.0	1.5 < 2.1 < 2.8	0.4 < 0.9 < 1.4	0.5 < 0.7 < 1.0	2.46 < 5.25 < 8.03 ($\times 10^6$)	2.95 < 4.14 < 5.62 ($\times 10^6$)
	weight		1.20 < 2.90 < 4.60	1.48 < 2.09 < 2.86	0.42 < 1.02 < 1.62	0.5 < 0.7 < 1.0	2.39 < 5.77 < 9.16 ($\times 10^6$)	2.94 < 4.17 < 5.71 ($\times 10^6$)
Loliginidae	number	9-366	-----	-----	-----	-----	-----	-----
	weight		0.74 < 0.94 < 1.14	0.76 < 0.92 < 1.10	0.25 < 0.33 < 0.42	0.26 < 0.33 < 0.40	1.95 < 2.48 < 3.02 ($\times 10^3$)	2.01 < 2.43 < 2.89 ($\times 10^3$)

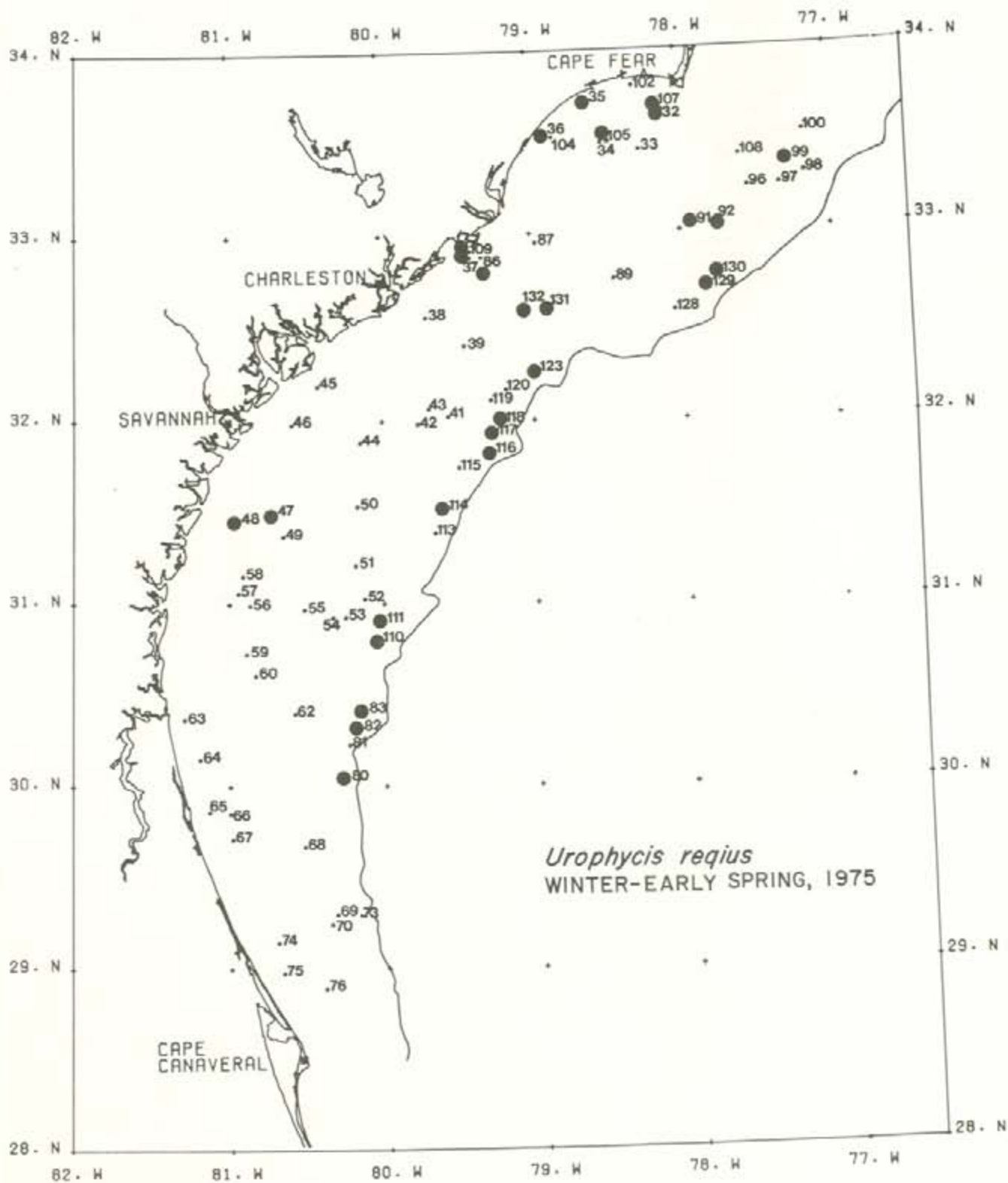


FIGURE 3. DISTRIBUTION OF SPOTTED HAKE, *UROPHYCIS REGIUS*, IN THE SOUTH ATLANTIC BIGHT DURING WINTER-EARLY SPRING 1975. LARGE DOTS = SPECIES PRESENT; SMALL DOTS = SPECIES ABSENT.

Inshore lizardfish: Synodus foetens

This synodontid was widely distributed in depths from 9 to 137 m (10.8-20.1°C) from Cape Fear (33.8°N) to Cape Canaveral (28.8°N) (Fig. 4). Maximum catches in number and weight were in the 19 to 27 m depth zone where S. foetens occurred in 12 of 15 trawl tows (Fig. 5A).

Juvenile S. foetens (6-10 cm FL) were found in the two inshore depth zones (Fig. 5B), whereas in the 28-55 m and 56-110 m depth zones only large individuals were caught. The inshore occurrence of juveniles is similar to the pattern of S. aculeatus and U. regius. Abundance statistics are in Table 10.

Striped argentine: Argentina striata

Striped argentine comprised 1.1% of the number of demersal teleosts during the survey. Because of their small size (x FL: 6.3 cm; range: 3-8 cm), A. striata contributed insignificantly to the demersal teleost biomass. All but two individuals were taken in a single haul in 128 m (17.3°C) east of Charleston (32.5°N).

Blackmouth cardinalfish: Synagrops bella

Synagrops bella accounted for 1.1% of the demersal teleost number. It was taken in one of ten tows in the 56-110 m depth zone, two of eight in the 111-183 m zone and 3 of six in the 184-366 m zone. This species' depth range was from 82 to 311 m (9.1-17.3°C), although most specimens (84%) were in a single haul 128 miles east of Charleston. Average size was 6.5 cm FL (range: 4-16 cm FL).

Tomtate: Haemulon aurolineatum

Tomtate were encountered infrequently from southeast of Cape Fear (33.5°N) to Cape Canaveral (28.8°N) in 20 to 38 m (17.5-18.4°C). Largest catches were in 4 of 18 tows in the 28-55 m zone where 81% of the number and 88% of the weight of tomtate occurred. Mean size was 12.3 cm FL (range: 6-21 cm FL).

Dusky flounder: Syacium papillosum

Dusky flounder contributed 0.9% of the number and 4% of the weight of demersal teleosts. Although S. papillosum was not abundant, it was widely distributed from southeast of Cape Fear (33.5°N) to Cape Canaveral (28.7°N) (Fig. 6). Dusky flounder were eurybathic, occurring from 15 to 232 m (15.6-20.1°C). Catches increased with increasing depth with maximum

values in the 56-110 m depth zone (Fig. 5C). Average size was 21.9 cm TL (range 8-30 cm TL) (Fig. 5D). Abundance statistics are in Table 10.

Orange filefish: Aluterus schoepfi

Although only 127 Aluterus schoepfi were collected from 33.5°N to 29°N (Fig. 7) in depths from 13 to 44 m (14.3-20.8°C), it was the top-ranking demersal teleost by weight. Orange filefish contributed 0.5% by number and 20.8% by weight to the demersal teleost catch. This species had a relatively high frequency of occurrence in the three inshore depth zones. Maximum catches were in the 28-55 m depth zone (Fig. 8A), accounting for 67% of the number and 63% of the weight of A. schoepfi. Average size was 45.7 cm TL (range: 33-58 cm TL) (Fig. 8B). Abundance statistics are in Table 10.

Sand perch: Diplectrum formosum

Two hundred twenty sand perch weighing 24.180 kg were collected from 28.7°N to 33.7°N (Fig. 9) in depths of 10 to 42 m (15.7-20.1°C). Maximum catches occurred in the 19-27 m depth zone where 64.5% of the total number and 68.8% of the total weight of D. formosum were taken (Fig. 8C). This species had a higher frequency of occurrence in tows in the 28-55 m depth zone (12 of 18 tows) but was found in fewer numbers/haul. The average size was 18.5 cm FL with a range from 7 to 24 cm FL (Fig. 8D).

Other Demersal Bony Fish Species

Results of previous cruises have shown that the planehead filefish, Stephanolepis hispidus, is one of the most widely distributed and abundant demersal fishes (Wenner et al. 1979 a,b,c). During the 1975 Winter-early Spring survey, however, only 185 individuals weighing 11.680 kg were found in 24 of 77 trawl tows. Maximum catch rates were in the 28-55 m depth zone (15.7 fish/hour, 8.410 kg/hour). Stephanolepis hispidus occurred in 11 of 18 stations in these depths. Average size was 13 cm TL (range 5-25 cm TL).

Offshore lizardfish, Synodus poeyi, were found in 17 of 77 trawl tows during the survey. This lizardfish was primarily a midshelf-upper continental slope species (28-110 m). Maximum catches of 28.8 individuals/trawl hour were in the 56-110 m depth zone where S. poeyi occurred in 7 of 10 tows. The average size was 8.6 cm FL with a range from 4 to 18 cm FL.

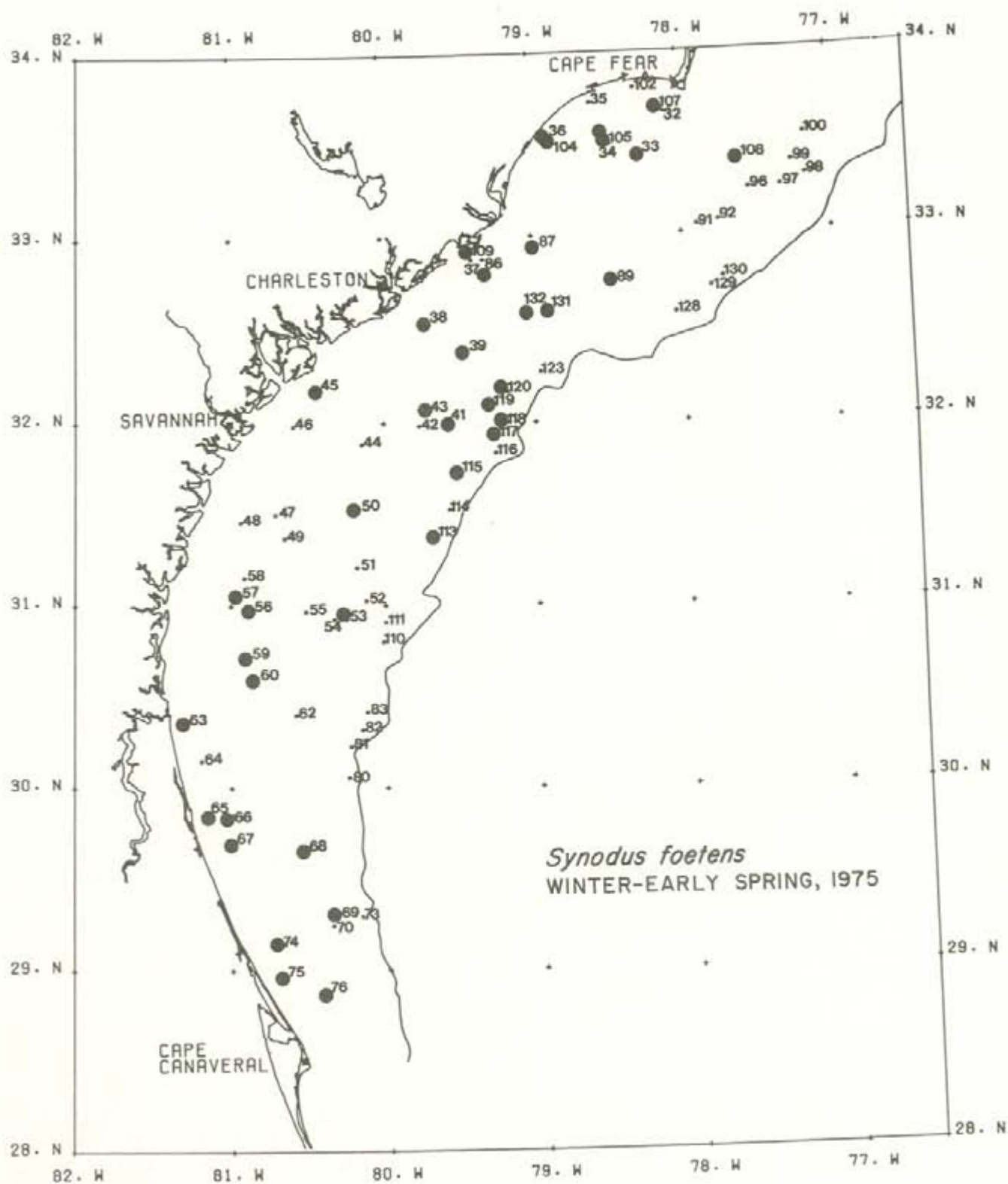


FIGURE 4. DISTRIBUTION OF INSHORE LIZARDFISH, *SYNODUS FOETENS*, IN THE SOUTH ATLANTIC BIGHT DURING WINTER-EARLY SPRING 1975. LARGE DOTS = SPECIES PRESENT; SMALL DOTS = SPECIES ABSENT.

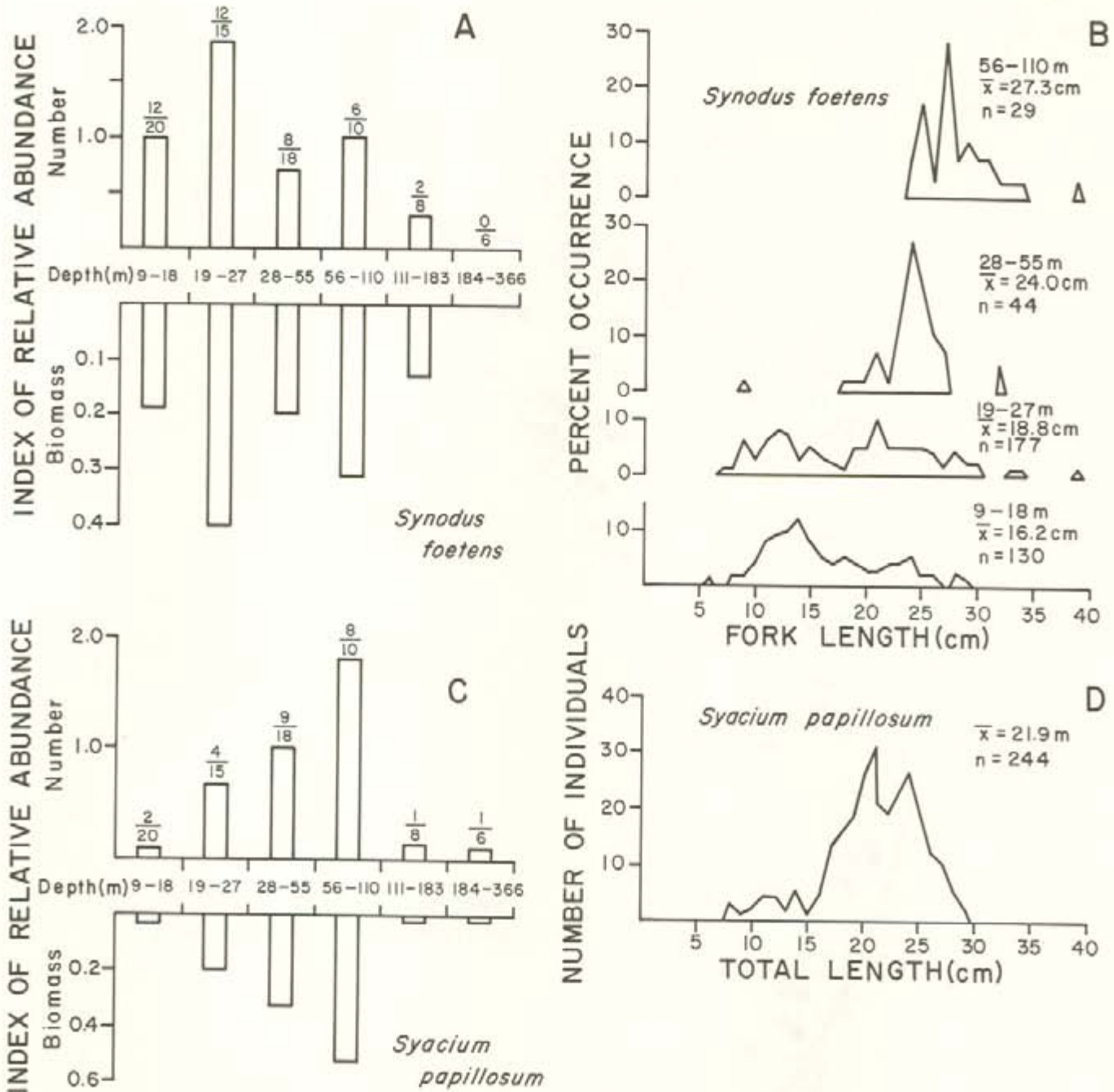


FIGURE 5. INDEX OF RELATIVE ABUNDANCE OF (A) INSHORE LIZARDFISH, *SYNODUS FOETENS*, AND (C) DUSKY FLOUNDER, *SYACIUM PAPILLOSUM*, FOR THE 1975 WINTER-EARLY SPRING GROUND FISH SURVEY IN THE SOUTH ATLANTIC BIGHT. NUMERATOR IN FRACTION = NUMBER OF TRAWL TOWS WITH SPECIES; DENOMINATOR = TOTAL TRAWL TOWS IN ZONE. LENGTH FREQUENCY BY DEPTH ZONE FOR *S. FOETENS* AND FOR ALL ZONES FOR *S. PAPILLOSUM*.

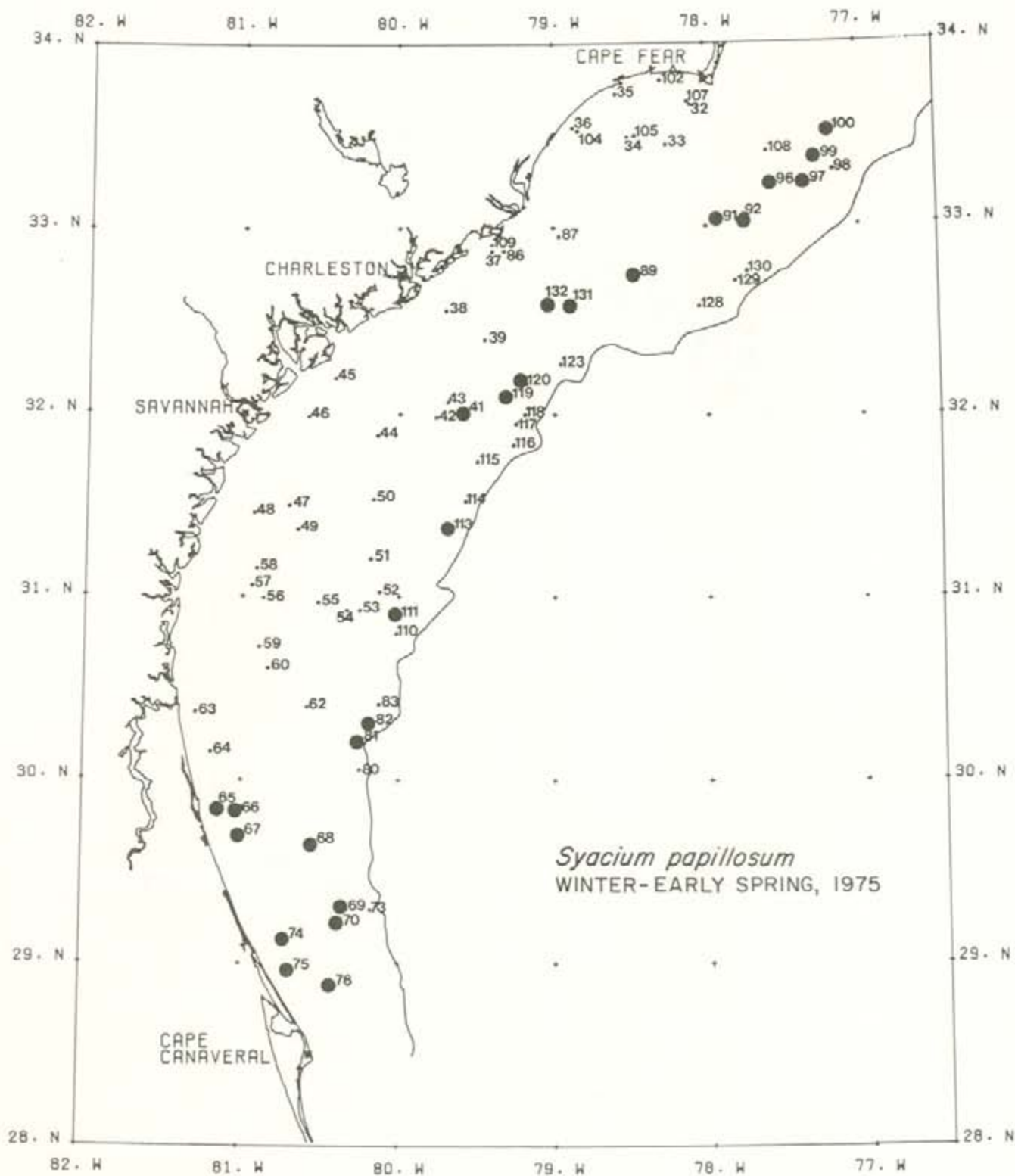


FIGURE 6. DISTRIBUTION OF DUSKY FLOUNDER, *SYACIUM PAPILLOSUM*, IN THE SOUTH ATLANTIC BIGHT DURING 1975 WINTER-EARLY SPRING. LARGE DOTS = SPECIES PRESENT; SMALL DOTS = SPECIES ABSENT.

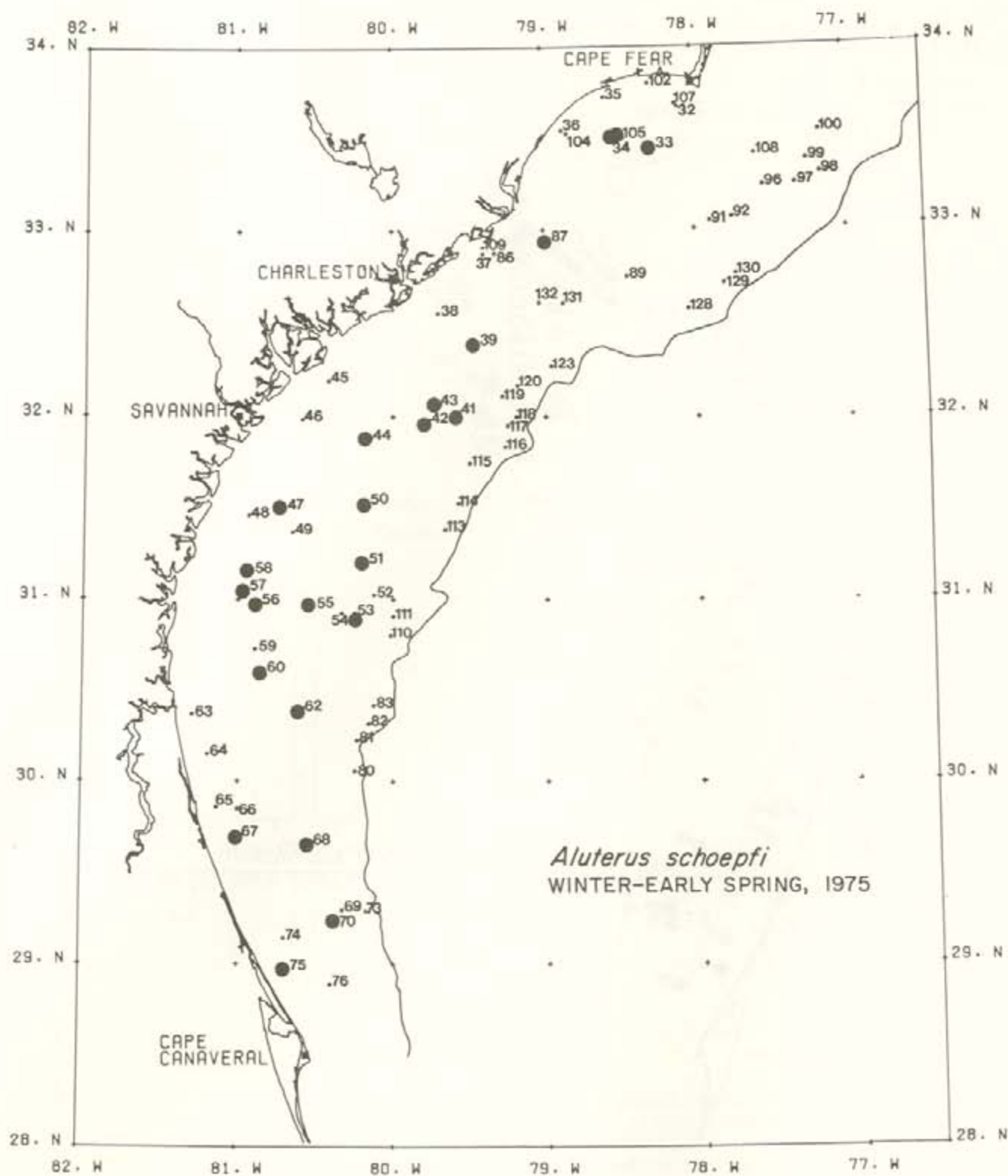


FIGURE 7. DISTRIBUTION OF ORANGE FILEFISH, *ALUTERUS SCHOEPFI*, IN THE SOUTH ATLANTIC BIGHT DURING 1975 WINTER-EARLY SPRING. LARGE DOTS = SPECIES PRESENT; SMALL DOTS = SPECIES ABSENT.

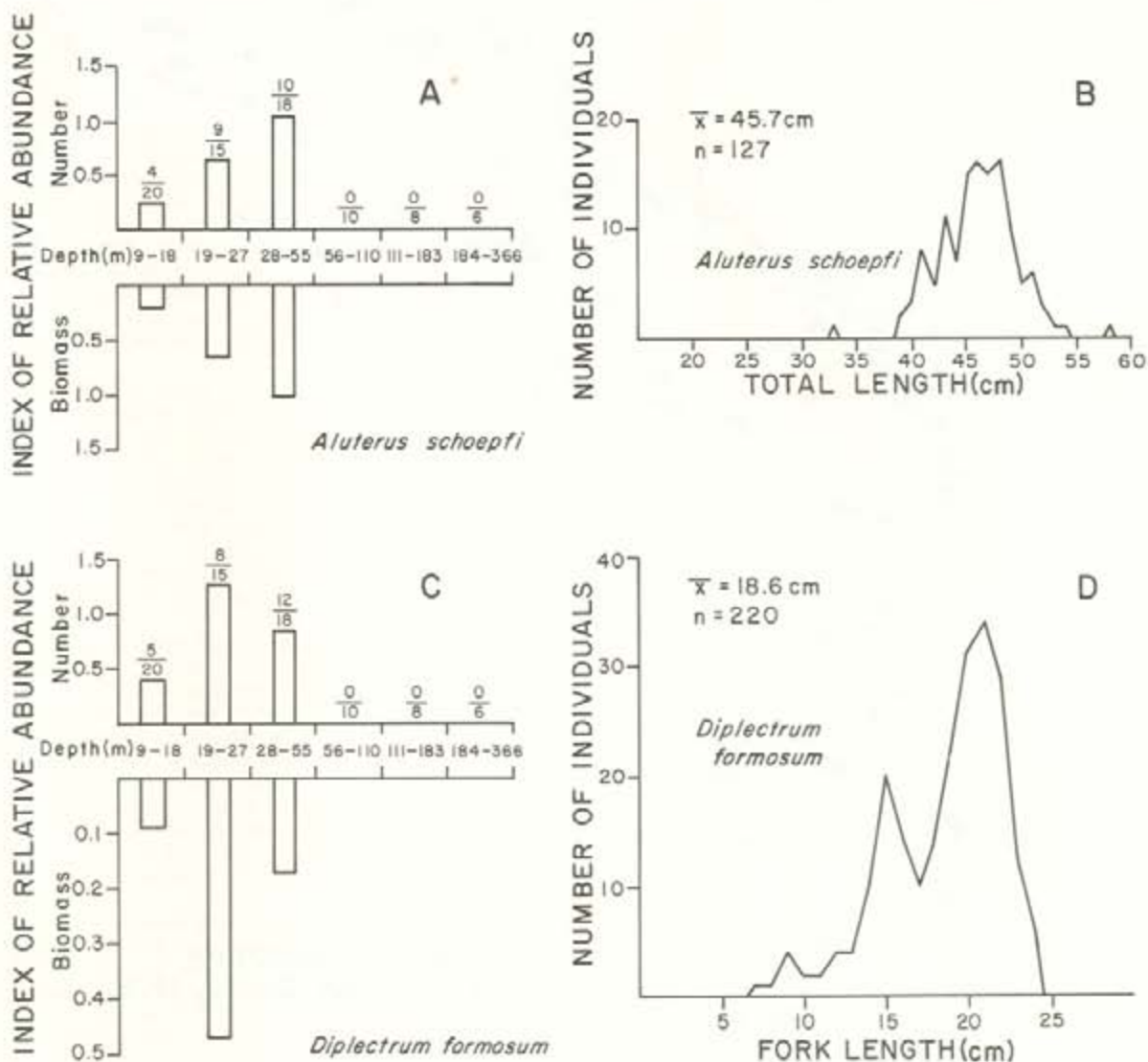


FIGURE 8. INDEX OF RELATIVE ABUNDANCE OF (A) ORANGE FILEFISH, *ALUTERUS SCHOEPFI*, AND (C) SAND PERCH, *DIPLECTRUM FORMOSUM*, FOR THE 1975 WINTER-EARLY SPRING GROUND FISH SURVEY IN THE SOUTH ATLANTIC BIGHT. NUMERATOR IN FRACTION = NUMBER OF TRAWL TOWS WITH SPECIES; DENOMINATOR = TOTAL TOWS IN ZONE. LENGTH FREQUENCY FOR *A. SCHOEPFI* (B) AND *D. FORMOSUM* (D).

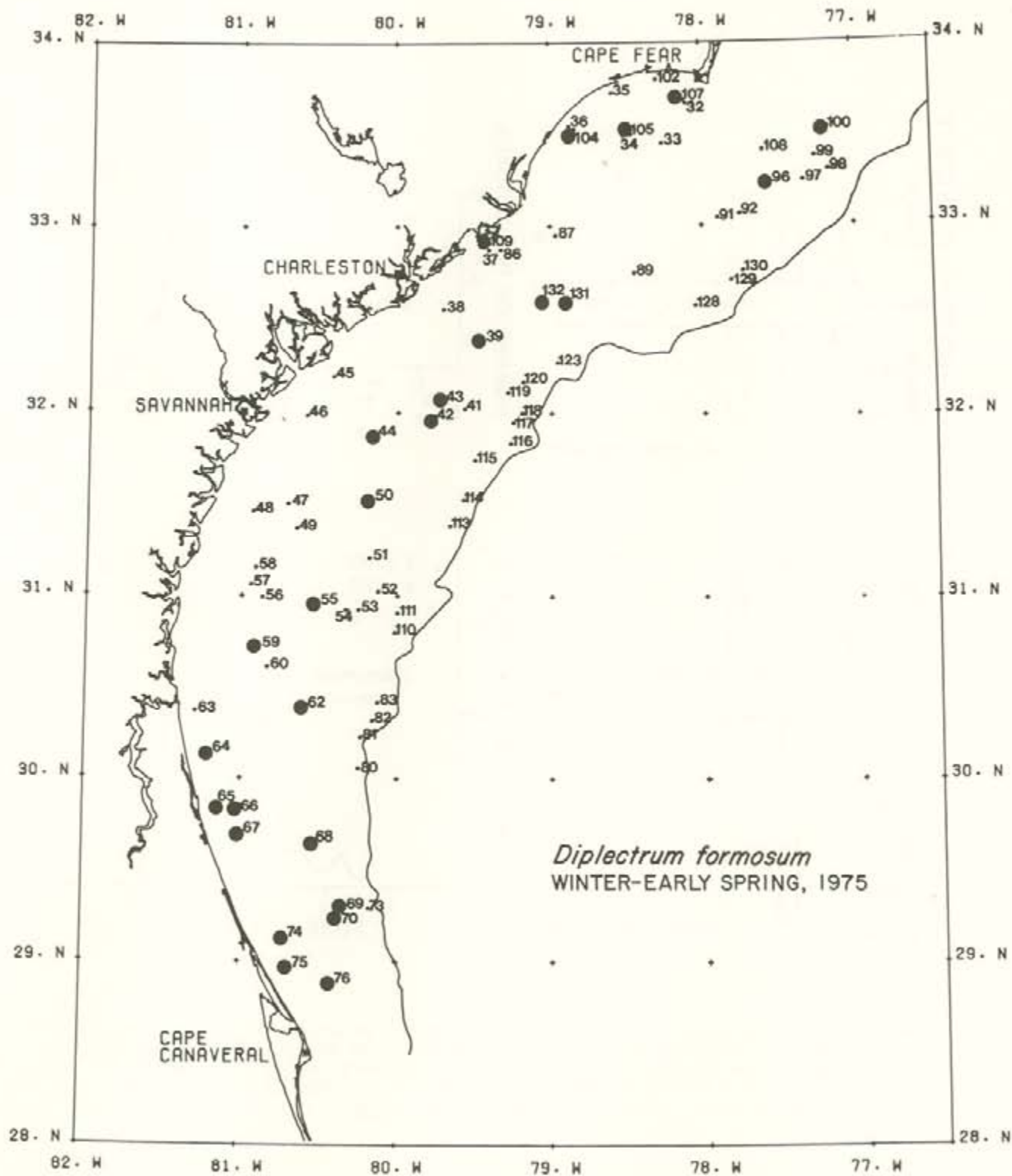


FIGURE 9. DISTRIBUTION OF SAND PERCH, *DIPLECTRUM FORMOSUM*, IN THE SOUTH ATLANTIC BIGHT DURING 1975 WINTER-EARLY SPRING. LARGE DOTS = SPECIES PRESENT; SMALL DOTS = SPECIES ABSENT.

Elasmobranchs

Most of the 230 elasmobranchs (13 species, 6 families) were large individuals with a weight of 1653.7 kg. Rankings by number caught for these families are listed below. The Dasyatidae dominated elasmobranch catches, with *Dasyatis sayi*, *D. centroura*, *D. americana* and *Gymnura micrura* accounting for 40% of the number and 79% of the weight. *Dasyatis sayi* occurred in the greatest numbers whereas *D. centroura* contributed the most biomass (Table 11).

The index of relative abundance demonstrated that elasmobranchs were most abundant in the 9-18 m and 19-27 m depth zones where they occurred in 90% and 80% of the trawl tows made in these zones (Fig. 10A). Although elasmobranchs were present in 50% of the tows made in the two deepest zones, they were small and did not contribute significantly to the overall elasmobranch biomass.

The 77 blunt nose stingrays, *Dasyatis sayi*, weighing 228.5 kg made up 33.5% of the number and 14% of the weight of all elasmobranchs. These rays were trawled in 11 to 22 m (14.0-17.7°C) from 29.7°N to 33.5°N. Maximum catches occurred in the 9-18 m depth zone where 92% of the number and 88% of the weight was taken (Fig. 10B). Mean size was 35 cm disc width (22-62 cm), with a weight of 3 kg.

The second most numerically abundant elasmobranch, the clear nose skate (*Raja eglanteria*), was found from 28.9°N to 33.8°N in 9-33 m (11.5-20.0°C). Sixty-two percent of the total number and 61% of the total weight of *R. eglanteria* was found in the 9-18 m depth zone. This zone had the highest index of relative abundance (Fig. 10C) which decreased with increasing depth. Mean size was 46 cm TL (5-60 cm TL = range), average weight 0.6 kg.

The smooth dogfish, *Mustelus canis*, was the third most abundant elasmobranch. All of the 32 specimens (13.9% of the elasmobranch catch) were caught in the 9-18 m (10.8-15.7°C) depth zone, where *M. canis* occurred in 11 of 20 hauls. This species was found from 30.5°N to 33.8°N.

The bull nose ray, *Myliobatis freminvillei*, occurred from 30°N to 33.5°N in

14-22 m (14.2-16.7°C). It was found in 5 of 35 trawl tows made in the two inshore zones (9-27 m) and comprised 7.4% by number and 3.9% by weight of the total elasmobranch catch. Mean size was 60 cm disc width (range: 38-76 cm DW), average weight 3.8 kg.

Roughtail stingrays, *Dasyatis centroura*, ranked fifth in total number (4.4%) and first in weight (60.1%) of the elasmobranch catch. Although only 10 *D. centroura* were collected during the survey, they were found most frequently in the 19-27 m and 28-55 m depth zones where they were present in 4 of 15 and 4 of 18 trawls, respectively (Fig. 10D). This large ray (mean weight = 98.2 kg) occurred from 33°N to 28.8°N in 15-69 m (16.6-20.1°C).

Pelagic Fishes

A total of 28,104 pelagic fishes with a weight of 231.9 kg from 26 species in twelve families were collected during this survey. Over 96% of the number and 86% of the weight of pelagic fishes were in the Clupeidae, Engraulidae and Stromateidae (Table 12). The most speciose family was the Engraulidae with 7 species followed by the Carangidae with 4 species. Round herring, *Etrumeus teres*, was most abundant by number (35.8% of the total pelagic catch) whereas the butterflyfish, *Peprilus triacanthus*, contributed most to total weight (40.4%) (Table 13). Rankings by number and weight for individual species by depth zones are in Table 14 and 15.

Highest catch rates, both in numbers and weight, for pelagic fishes occurred in the 111-183 m depth zone where they were taken in 6 of 8 trawl tows. (Fig. 11A). The two inshore zones (9-18 m and 19-27 m) had relatively high numerical index values but low weight values.

Round herring: *Etrumeus teres*

The numerically most abundant pelagic species, the round herring (*Etrumeus teres*) was found from 31.5 to 33.8°N. This species had its highest numerical catch rates in the 19-27 m and 111-183 m depth zones (Fig. 11B). Eighty percent of the total number were taken shallower than 55 m; however, these were small individuals (\bar{x} FL = 7.1 cm) and accounted for only 30% of the total weight of this species.

Family	No. of Species	No. of Individuals	Weight (kg)
Dasyatidae	4	93	1,285.5
Rajidae	3	77	41.6
Triakidae	1	32	148.3
Myliobatidae	2	18	86.1
Carcharhinidae	2	6	77.1
Squalidae	1	4	14.9

Table 11. Rankings of elasmobranch species by total number and total weight for 1975 Winter-early Spring groundfish survey in the South Atlantic Bight. N_1 = number of occurrences in the 77 trawl tows.

Species	Total Number	Percent of Total Elasmobranchs	N_1
<u>Dasyatis sayi</u>	77	33.5	9
<u>Raja eglanteria</u>	66	28.7	23
<u>Mustelus canis</u>	32	13.9	11
<u>Myliobatis freminvillei</u>	17	7.4	5
<u>Dasyatis centroura</u>	10	4.4	10
<u>Breviraja plutonia</u>	9	3.9	5
<u>Rhizoprionodon terraenovae</u>	5	2.2	2
<u>Squalus acanthias</u>	4	1.7	3
<u>Dasyatis americana</u>	3	1.3	2
<u>Gymnura micrura</u>	3	1.3	2
Total Number	230		

Species	Total Weight (kg)	Percent of Total Elasmobranchs	N_1
<u>Dasyatis centroura</u>	982.214	60.1	10
<u>Dasyatis sayi</u>	228.503	14.0	9
<u>Mustelus canis</u>	148.326	9.1	11
<u>Dasyatis americana</u>	72.576	4.4	2
<u>Myliobatis fremenvillei</u>	64.411	3.9	5
<u>Carcharhinus milberti</u>	45.360	2.8	1
<u>Raja eglanteria</u>	40.924	2.5	23
<u>Aetobatus narinari</u>	21.773	1.3	1
<u>Squalus acanthias</u>	14.969	0.9	3
<u>Rhizoprionodon terraenovae</u>	12.701	0.8	2
Total Weight	1,634.724		

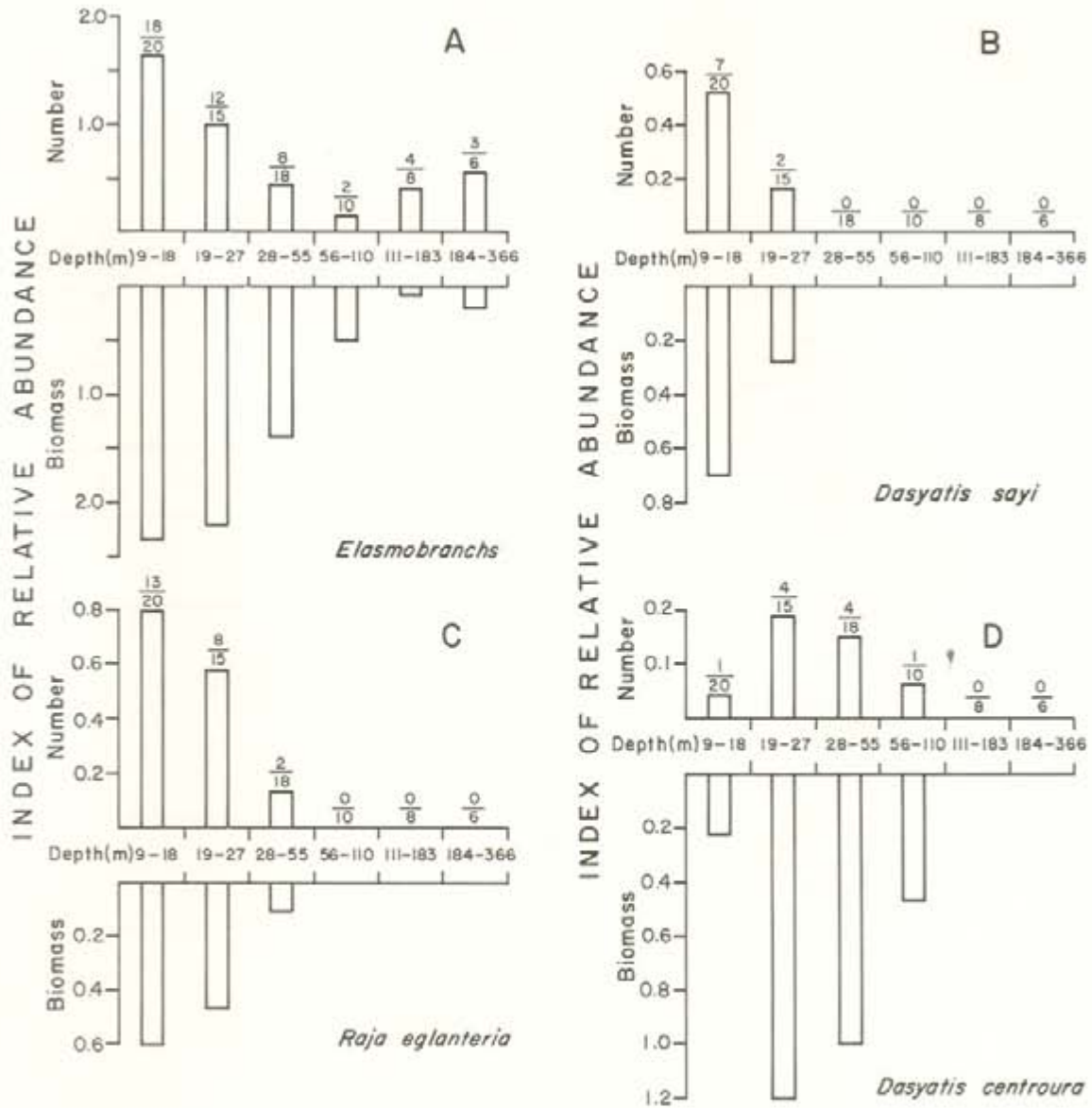


FIGURE 10. INDEX OF RELATIVE ABUNDANCE OF (A) TOTAL ELASMOBRANCHS, (B) BLUNT NOSE STINGRAY, *DASYATIS SAYI*, (C) CLEAR NOSE SKATE, *RAJA EGLANTERIA*, AND (D) ROUGH TAIL STINGRAY, *DASYATIS CENTROURA*, FOR THE 1975 WINTER-EARLY SPRING GROUND FISH SURVEY IN THE SOUTH ATLANTIC BIGHT. NUMERATOR IN FRACTION = NUMBER OF TRAWL TOWS WITH SPECIES; DENOMINATOR = TOTAL IN ZONE.

Table 12. Rankings of families of pelagic fishes by numbers and weight for the Winter-early Spring 1975 groundfish survey in the South Atlantic Bight.

Rank	Family	Total Number	Percent of Pelagic Catch	Number of Species
1	Clupeidae	10,221	36.4	3
2	Engraulidae	10,194	36.3	7
3	Stromateidae	6,618	23.5	2
4	Carangidae	793	2.8	4
5	Ariommidae	174	0.6	2
6	Scombridae	60	0.2	1
7	Gonostomatidae	28	0.1	1
8	Echeneidae	7	-	2
9	Pomatomidae	5	-	1
10	Fistulariidae	2	-	1
11	Bregmacerotidae	1	-	1
12	Myctophidae	1	-	1
		28,104	99.9	26
Rank	Family	Total Weight (kg)	Percent of Pelagic Catch	
1	Stromateidae	93.701	40.4	
2	Clupeidae	68.221	29.4	
3	Engraulidae	37.473	16.2	
4	Carangidae	16.409	7.1	
5	Ariommidae	5.943	2.5	
6	Echeneidae	4.303	1.9	
7	Scombridae	3.275	1.4	
8	Pomatomidae	1.361	0.6	
9	Fistulariidae	0.908	0.4	
10	Bregmacerotidae	0.100	-	
11	Gonostomatidae	0.100	-	
12	Myctophidae	0.100	-	
		231.894	99.9	

Table 13. Dominant pelagic fishes by number and weight for 77 bottom trawl tows in the South Atlantic Bight during Winter-early Spring 1975.

Species	Total Number	Percent of Total Pelagics	Number of Occurrences
<u>Etrumeus teres</u>	10,060	35.8	11
<u>Anchoa cubana</u>	6,758	24.1	10
<u>Peprilus triacanthus</u>	6,617	23.5	19
<u>Anchoa hepsetus</u>	1,801	6.4	10
<u>Anchoa lyolepis</u>	1,398	5.0	9
<u>Decapterus punctatus</u>	718	2.6	21
<u>Ariomma bondi</u>	172	0.6	4
<u>Engraulidae</u>	144	0.5	1
<u>Sardinella anchovia</u>	142	0.5	9
<u>Anchoa nasuta</u>	71	0.2	1
Total Number =	28,104		

Species	Total Weight (kg)	Percent of Total Pelagic Weight	Number of Occurrences
<u>Peprilus triacanthus</u>	93.601	40.4	19
<u>Etrumeus teres</u>	66.314	28.6	11
<u>Anchoa hepsetus</u>	22.373	9.6	10
<u>Decapterus punctatus</u>	14.655	6.3	21
<u>Anchoa cubana</u>	12.540	5.4	10
<u>Ariomma bondi</u>	5.743	2.5	4
<u>Echeneis naucrates</u>	3.602	1.6	5
<u>Scomber japonicus</u>	3.275	1.4	3
<u>Anchoa lyolepis</u>	2.041	0.9	9
<u>Sardinella anchovia</u>	1.707	0.7	9
Total Weight =	231.894		

Table 14. Numerically-dominant pelagic fishes for 1975 Winter-early Spring groundfish survey by depth zone. N_1 = number of occurrences; N = total number of trawls in zone.

Depth Zone (m)	Species	Total Number	Percent of Total in Zone	N_1/N
9-18	<u>Peprilus triacanthus</u>	4974	53.3	6/20
	<u>Anchoa hepsetus</u>	1797	19.3	9/20
	<u>Anchoa cubana</u>	1752	18.8	6/20
	<u>Anchoa lyolepis</u>	345	3.7	5/20
	<u>Decapterus punctatus</u>	122	1.3	5/20
19-27	<u>Etrumeus teres</u>	7957	54.3	3/15
	<u>Anchoa cubana</u>	5006	34.2	4/15
	<u>Anchoa lyolepis</u>	1053	7.2	4/15
	<u>Decapterus punctatus</u>	433	3.0	8/15
	<u>Engraulidae</u>	144	1.0	1/15
28-55	<u>Decapterus punctatus</u>	153	81.0	5/18
	<u>Sardinella anchovia</u>	29	15.3	1/18
	<u>Echeneis naucrates</u>	3	1.6	3/18
	<u>Trachurus lathamii</u>	2	1.1	2/18
	<u>Etrumeus teres</u>	1	0.5	1/18
56-110	<u>Etrumeus teres</u>	241	77.2	1/10
	<u>Scomber japonicus</u>	36	11.5	1/10
	<u>Trachurus lathamii</u>	22	7.1	2/10
	<u>Decapterus punctatus</u>	10	3.2	3/10
	<u>Anchoviella pertasciata</u>	1	0.3	1/10
111-183	<u>Etrumeus teres</u>	1773	49.6	2/8
	<u>Peprilus triacanthus</u>	1631	45.6	6/8
	<u>Ariomma bondi</u>	168	4.7	2/8
	<u>Ariomma melanum</u>	1	----	1/8
	<u>Bregmaceros atlanticus</u>	1	----	1/8
184-366	<u>Maurollicus muelleri</u>	28	51.8	1/6
	<u>Scomber japonicus</u>	19	35.2	1/6
	<u>Ariomma bondi</u>	4	7.4	2/6
	<u>Ariomma melanum</u>	1	1.8	1/6
	<u>Diaphus dumerili</u>	1	1.8	1/6

Table 15. Dominant pelagic fishes by weight for 1975 Winter-early Spring groundfish survey by depth zone. N_1 = number of occurrences; N = total number of trawl tows in zone.

Depth Zone (m)	Species	Total Weight (kg)	Percent of Total in Zone	N_1/N
9-18	<u>Anchoa hepsetus</u>	22.273	48.0	9/20
	<u>Peprilus triacanthus</u>	13.621	29.3	6/20
	<u>Decapterus punctatus</u>	4.282	9.2	5/20
	<u>Anchoa cubana</u>	3.051	6.6	6/20
	<u>Anchoa lyolepis</u>	0.582	1.2	5/20
19-27	<u>Etrumeus teres</u>	20.000	49.7	3/15
	<u>Anchoa cubana</u>	9.489	23.6	4/15
	<u>Decapterus punctatus</u>	4.683	11.6	8/15
	<u>Anchoa lyolepis</u>	1.459	3.6	4/15
	<u>Pomatomus saltatrix</u>	0.907	2.2	1/15
28-55	<u>Decapterus punctatus</u>	5.390	54.6	5/18
	<u>Echeneis naucrates</u>	2.821	28.6	3/18
	<u>Sardinella anchovia</u>	0.907	9.2	1/18
	<u>Fistularia villosa</u>	0.454	4.6	1/18
	<u>Trachurus lathami</u>	0.200	2.0	2/18
56-110	<u>Etrumeus teres</u>	4.990	70.8	1/10
	<u>Scomber japonicus</u>	0.907	12.9	1/10
	<u>Fistularia villosa</u>	0.454	6.4	1/10
	<u>Decapterus punctatus</u>	0.300	4.2	3/10
	<u>Trachurus lathami</u>	0.200	2.8	2/10
111-183	<u>Peprilus triacanthus</u>	78.926	62.9	6/8
	<u>Etrumeus teres</u>	40.824	32.5	2/8
	<u>Ariomma bondi</u>	5.543	4.4	2/8
	<u>Ariomma melanum</u>	0.100	0.1	1/8
	<u>Bregmaceros atlanticus</u>	0.100	0.1	1/8
184-366	<u>Scomber japonicus</u>	2.268	79.1	1/6
	<u>Ariomma bondi</u>	0.200	7.0	2/6
	<u>Ariomma melanum</u>	0.100	3.5	1/6
	<u>Diaphus dumerili</u>	0.100	3.5	1/6
	<u>Maurolicus muelleri</u>	0.100	3.5	1/6

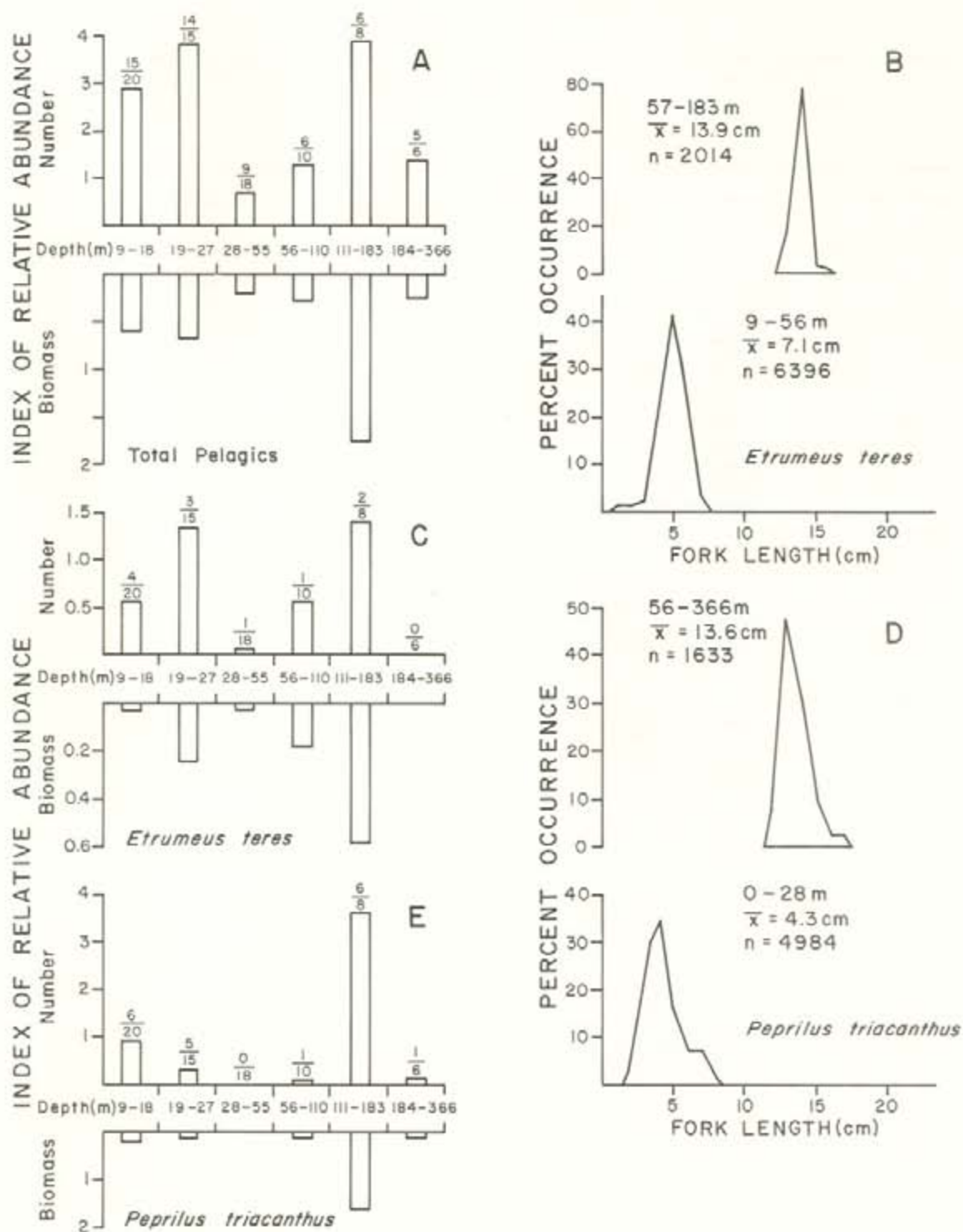


FIGURE 11. INDEX OF RELATIVE ABUNDANCE OF (A) TOTAL PELAGICS, (B) ROUND HERRING, *ETRUMEUS TERES*, (D) BUTTERFISH, *PEPRILUS TRIACANTHUS*, FOR THE 1975 WINTER-EARLY SPRING GROUND FISH SURVEY IN THE SOUTH ATLANTIC BIGHT. NUMERATOR IN FRACTION = NUMBER OF TRAWLS WITH TAXON; DENOMINATOR = TOTAL TRAWL TOWS IN ZONE. LENGTH FREQUENCY FOR (C) *E. TERES* AND (E) *P. TRIACANTHUS* BY DEPTH.

Maximum catches by weight occurred in the 111-183 m depth zone. Catches of round herring deeper than 56 m were mostly large individuals (Fig. 11C) indicating that during the Winter-early Spring a spatial separation of juveniles and adults of this species may occur with smaller fishes being found in shallower water.

Cuban anchovy: Anchoa cubana

Although the Cuban anchovy was found from Cape Fear (33.8°N) to Cape Canaveral (29°N), 99% of the total number and weight of this species was taken in coastal waters (9-27 m) off southern Georgia and northern Florida (29-30.5°N). Maximum catches in numbers (75%) and weight (76%) occurred in 19-27 m where A. cubana was found in 4 of 15 trawls. Mean size was 6.2 cm FL (range: 5-7 cm FL).

Butterfish: Peprilus triacanthus

Butterfish were collected from 33.8°N to 29°N in depths from 10 to 227 m. Maximum catches in numbers and weight were in the 111-183 m depth zone where butterfish occurred in 6 of 8 trawl tows (Fig. 11D). More than 99% of the P. triacanthus found in depths greater than 56 m were larger adults averaging 13.6 cm FL (Fig. 11E). Juvenile butterfish may invade shallower coastal waters during cooler periods, thus creating a spatial separation between juveniles and adults.

Striped anchovies, Anchoa hepsetus, were collected from 29°N to 33.8°N. This species was almost exclusively limited in its distribution to the 9-18 m depth zone with only 4 of 1,801 individuals being collected outside this range. Average size was 10.9 cm FL (range: 9-13 cm FL).

The dusky anchovy, Anchoa lyolepis, was found in 14 to 22 m from Cape Fear (33.8°N) to Florida (29°N). Although this species ranked fifth in abundance of pelagic fishes, it was contagiously distributed, occurring in 26% of the 35 trawl tows in the two inshore zones. Catch rates were highest in the 19-27 m zone (140 A. lyolepis with a weight of 0.19 kg per hour. Average size was 5.4 cm FL (range: 2-7 cm FL).

Round scad, Decapterus punctatus, were collected from 33.8°N to 28.5°N in depths of 11 to 69 m. This species was not as abundant during Winter-early Spring as it was in other seasons (Wenner *et al.* 1979 a,b,c). Only 718 individuals were encountered and 99% of these were taken in less than 55 m. The greatest number were found in the 19-27 m depth zone (60% of the total catch), however the greatest weight (37% of the total) was taken in 28-55 m. Round scad in the 19-27 m depth zone were mostly juveniles averaging 8.5 cm FL (range: 5 to 18 cm FL) whereas those in other depth zones had a greater mean size (9-18 m: \bar{x} = 14 cm FL; 28-55 m: \bar{x} = 14.3 cm FL; 56-110 m:

\bar{x} = 14.1 cm FL).

Cephalopods

We collected 11,533 squid with a weight of 81.6 kg. Squid occurred in 93.5% of the 77 stations and numerical catch rates were highest in the 19-27 m and the 28-55 m depth zone, where squids were taken in 100% of the tows (Fig. 12A).

Although four species of squids were taken (Loligo pealei, L. plei, Loliguncula brevis and Illex illecebrosus), only L. pealei and L. plei occurred in significant numbers. Fifty-five brief squid, Loliguncula brevis, with a weight of 0.6 kg were collected in 6 of 20 tows in 9-18 m. Thirty-five Illex illecebrosus with a weight of 2.6 kg were trawled from 137 to 311 m (7.7-16.0°C) on the upper continental slope. Of these, 33 were found in 4 of 6 trawls in the 184-366 m depth zone. The mean mantle length was 15.3 cm with a range from 10 to 19 cm. Field identifications of L. pealei and L. plei were inconsistent and questionable. These groups were pooled with "squid unclassified," a mixture of juveniles of these two species. The Loliginidae consists of all members of that family except brief squid.

The Loliginidae were collected in all depth zones with catch rates the highest in the 19-27 m and 28-55 m depth zones. In deeper water, catches showed a decline with increasing depth and a decrease in frequency of occurrence (Fig. 12B). Abundance statistics are in Table 10.

Size frequency distributions showed that the majority of the loliginids were small (Fig. 12C) and that the few squid greater than 10 cm mantle length occurred in deeper water.

Demersal Fish Diversity

The number of demersal fish species was lowest in the 183-366 m depth zone (Table 20). The maximum value for the mean number of species/tow was in the 111-183 m zone. It was relatively constant in the three zones between 19-110 m and lowest in the shallowest and deepest zones (Table 16). Analysis of earlier cruise data showed that the zone with the highest value of the mean number of species/tow fluctuated with fall 1973 having maximum values in the two inshore zones (9-27 m). Spring 1974 showed the 56-110 m zone to have the highest mean value whereas the inshore zone (9-18 m) had a higher mean number of species/tow during the summer of 1974. The overall average for the entire Winter-Spring survey was 10.2 species/tow with a range from 1 to 32. A great deal of variability occurred in the number of species/tow in water shallower than 100 m and a general decrease in the number of species/tow was apparent in greater depths (Fig. 13A). This is essentially the same pattern as found in previous cruises.

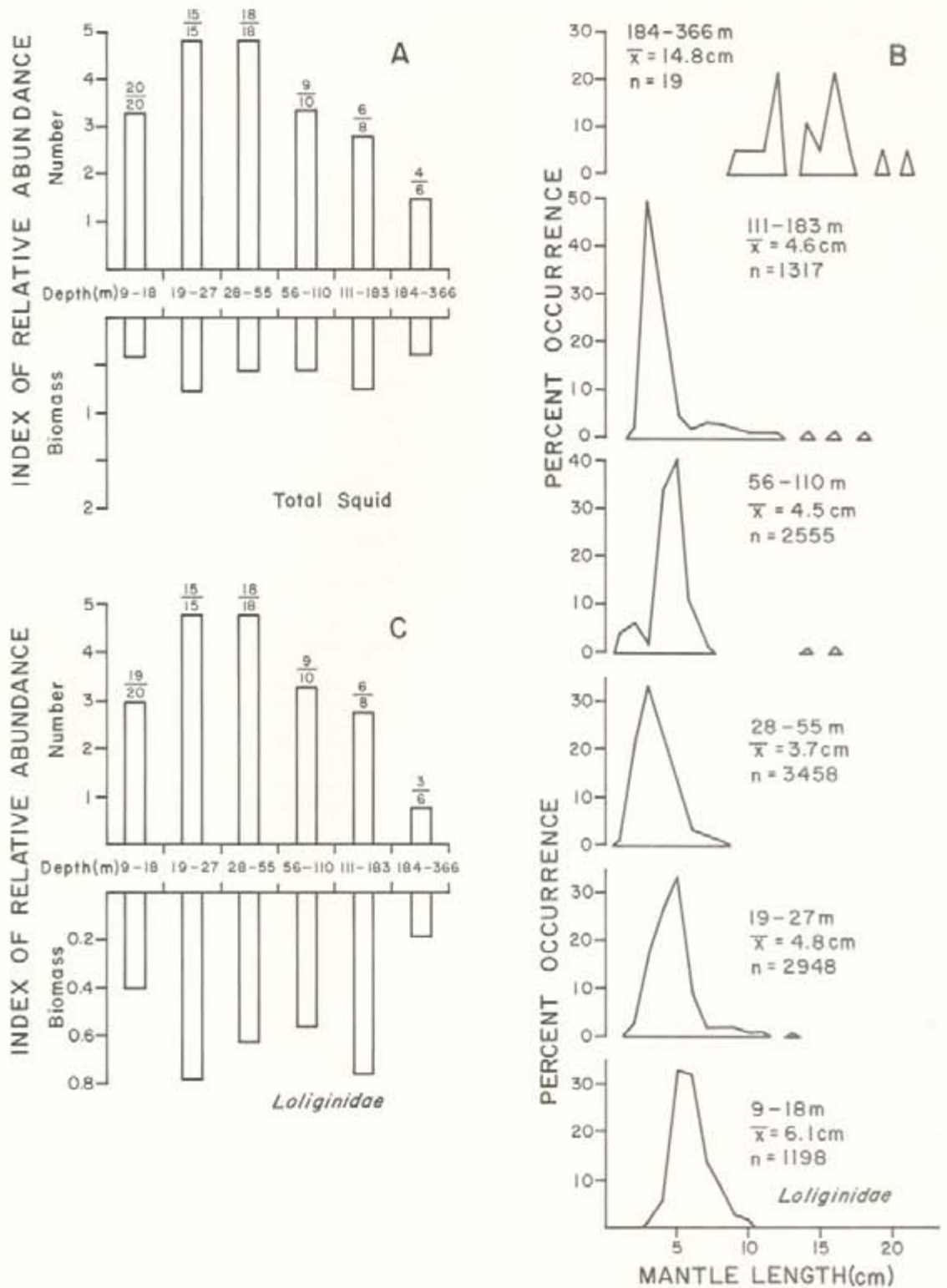


FIGURE 12. INDEX OF RELATIVE ABUNDANCE OF (A) TOTAL SQUID AND (B) LOLIGINIDAE FOR THE 1975 WINTER-EARLY SPRING GROUND FISH SURVEY IN THE SOUTH ATLANTIC BIGHT. NUMERATOR IN FRACTION = TOTAL TRAWL TOWS WITH TAXON; DENOMINATOR = TOTAL TRAWLS IN ZONE. LENGTH-FREQUENCY DISTRIBUTION OF LOLIGINIDAE (C) BY DEPTH ZONE.

Table 16. Total number of species, mean number of species/tow and mean number of individuals/tow for demersal fishes (elasmobranchs and demersal teleosts) in the South Atlantic Bight during the Winter-early Spring of 1975.

Depth Zone (m)	Total Number of Species	Mean Number of Species/tow	Mean Number of Individuals/tow	Number of Tows
9-18	57	8.3	108	20
19-27	58	10.2	1338* (115.5)	15
28-55	69	11.3	76.2	18
56-110	57	11.1	123	10
111-183	50	14.0	330	8
184-366	23	6.3	41.8	6

* The elevated value in this zone resulted from the collection of 18,454 individuals at a single station. The value in parenthesis was based on the 14 remaining trawls after the exceedingly high value was removed.

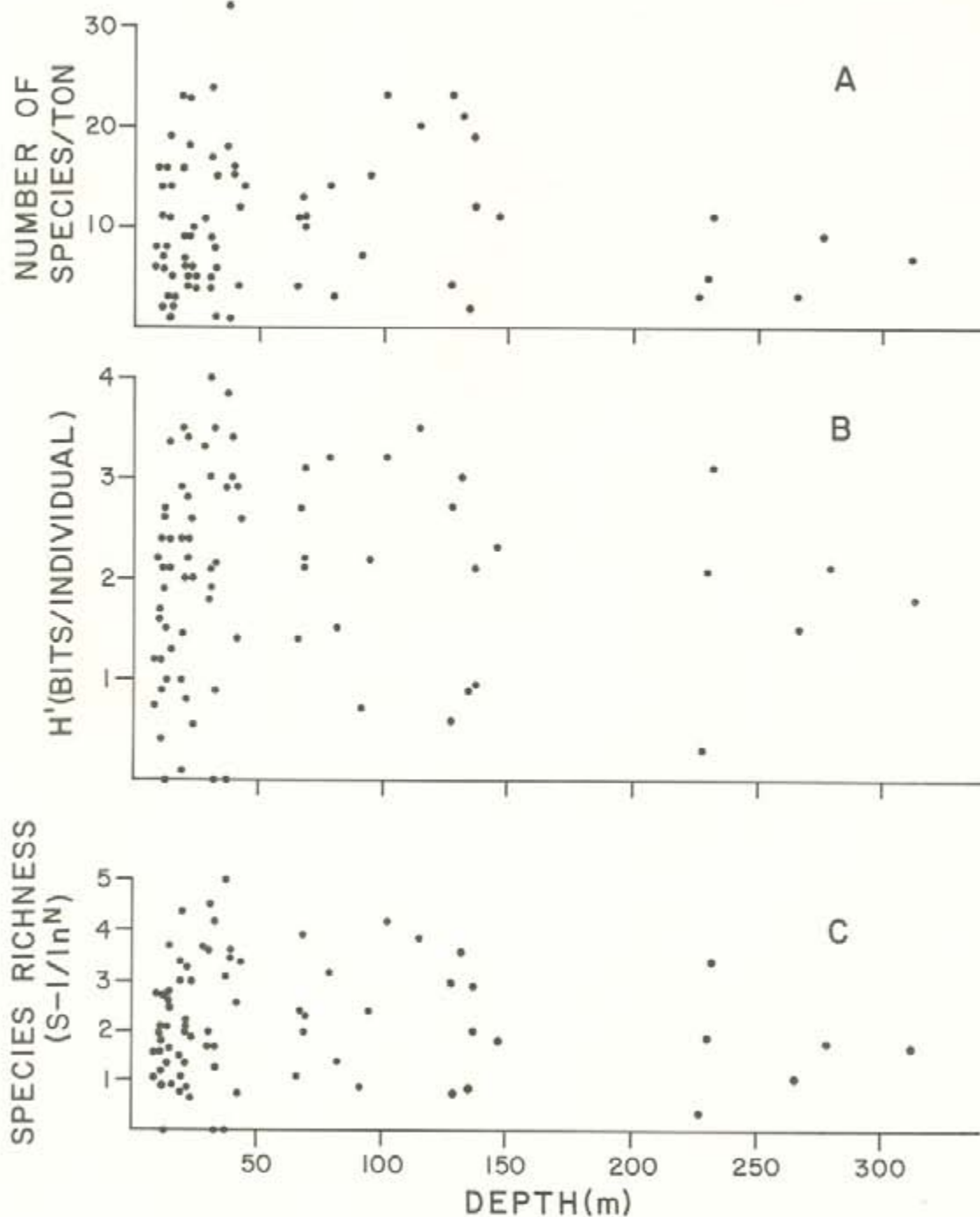


FIGURE 13. SCATTERPLOTS OF THE NUMBER OF DEMERSAL FISH SPECIES/TOW (A), SHANNON-WEAVER DIVERSITY VALUES FOR DEMERSAL FISHES (B) AND SPECIES RICHNESS (C) AGAINST TRAWL DEPTH FOR THE SAND BOTTOM HABITAT IN THE SOUTH ATLANTIC BIGHT DURING THE WINTER-EARLY SPRING 1975. DEMERSAL FISH INCLUDES ELASMOBRANCHS AND BONY FISHES ASSOCIATED WITH THE BOTTOM.

Species diversity measures (H' [Fig. 13B] and species richness [Fig. 13C]) followed the same pattern as described above with high variability inshore coupled with a trend to decrease in value with increased sample depth. The ranges for diversity values by depth zone is shown below.

The extremely low diversity values were a result of either a lack of a significant number of species in a trawl (low species richness) or the preponderance of a single species in the catch (low evenness). Values for all measurements are in Appendix IV.

The 77 successful otter trawls during the Winter-early Spring of 1975 resulted in the collection of 132 species of demersal bony fishes, 13 species of elasmobranchs and 26 species of pelagic species for a total of 171 species of fishes. This is slightly lower than previous sand bottom habitat cruises (Wenner et al. 1979 a,b,c).

Community Analysis

The use of numerical classification resulted in the broad separation of Winter-early Spring groundfish trawls into shallow and deeper water groups (Fig. 14). Site groups 7, 8 and 10 comprised the deeper stations on the upper portion of the continental slope. Cluster analysis resulted in the misclassification of two collections, 75035 and 75036. They were assigned to their own site group (9) for illustrative purposes. Both of these stations were shallow water trawls and showed a high level of similarity to each other (0.35). Station 75035 had six demersal fish species whereas 75036 had eight species. Four species, Urophycis regius, Squalus acanthias, Leiostomus xanthurus and Scophthalmus aquosus, co-occurred in both. Squalus acanthias and Scophthalmus aquosus were rare, occurring in only 3 of 74 trawl tows. Urophycis regius was eurybathic and widely

distributed during the survey. It occurred in all stations of site group 8 to which the two collections in question were linked. These two collections had little in common with other collections and because of U. regius they were mis-assigned to the deeper group.

There was a general depth related grouping of otter trawl stations, however, there was much overlap in depth distribution of stations between site groups (Table 17). Within each site group there was a wide latitudinal range (Table 17). Thus, results were comparable to previous cruises in that there is a general depth trend in site groupings with latitude showing little importance in defining groups.

Inverse analysis (species cluster) resulted in ten groups containing from 4 to 14 species (Fig. 15). Species groups I and II had several of the shallow water, frequently occurring and widely distributed species of the open shelf habitat (Raja eglanteria, Aluterus schoepfi, Stenotomus aculeatus, Diplectrum formosum, Synodus foetens) during the Winter-early Spring 1975. This group showed various levels of constancy (Fig. 16) and generally low fidelity (Fig. 17) to site groups 1 through 7 showing the wide distribution of these species.

The results of the analysis of both normal and inverse procedures are difficult to interpret due to the lack of synopticity in the sampling. Although the fish fauna of the South Atlantic Bight is relatively constant from season to season, certain species do undergo migrations in the area, i.e., Urophycis regius, Squalus acanthias, Mustelus canis and others. Since there was such a long sampling period, it is difficult if not impossible to discern distribution patterns of species and species assemblages. Thus any interpretation of fish associations during this Winter-early Spring 1975 period should be suspect.

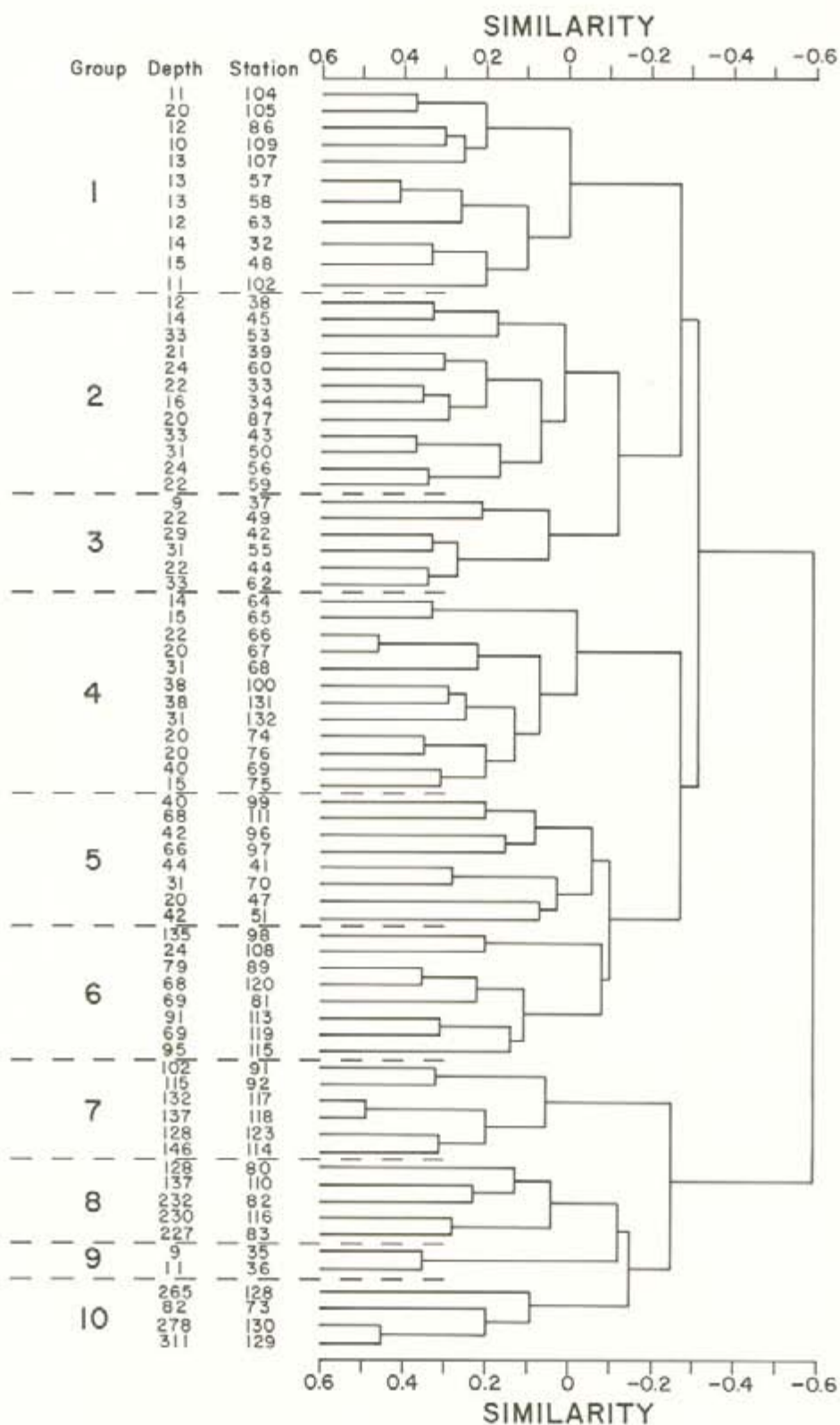


FIGURE 14. STATION CLUSTER (NORMAL ANALYSIS) FOR WINTER-EARLY SPRING 1975 SAND BOTTOM STATIONS. CANBERRA-METRIC CORRELATION, SQUARE ROOT TRANSFORMED DATA, STANDARDIZED, FLEXIBLE SORTING WITH $\rho = -0.25$.

Table 17. Characteristics of ten site groups as defined by cluster analysis for the sand bottom habitat during the Winter-early Spring of 1975.

Site Group	Number of Stations	\bar{x} Depth (m)	Depth Range (m)	Latitudinal Range of Stations
1	11	13	10-20	30.4°-33.7°
2	12	23	12-33	30.6°-32.9°
3	6	24	9-33	30.4°-32.9°
4	12	25	14-40	28.9°-33.5°
5	8	44	20-68	29.2°-33.4°
6	8	79	24-135	30.2°-33.3°
7	6	127	102-146	31.5°-33.1°
8	5	191	128-232	30.0°-31.8°
9	2	10	9-11	33.5°-33.7°
10	4	234	82-311	29.3°-32.8°

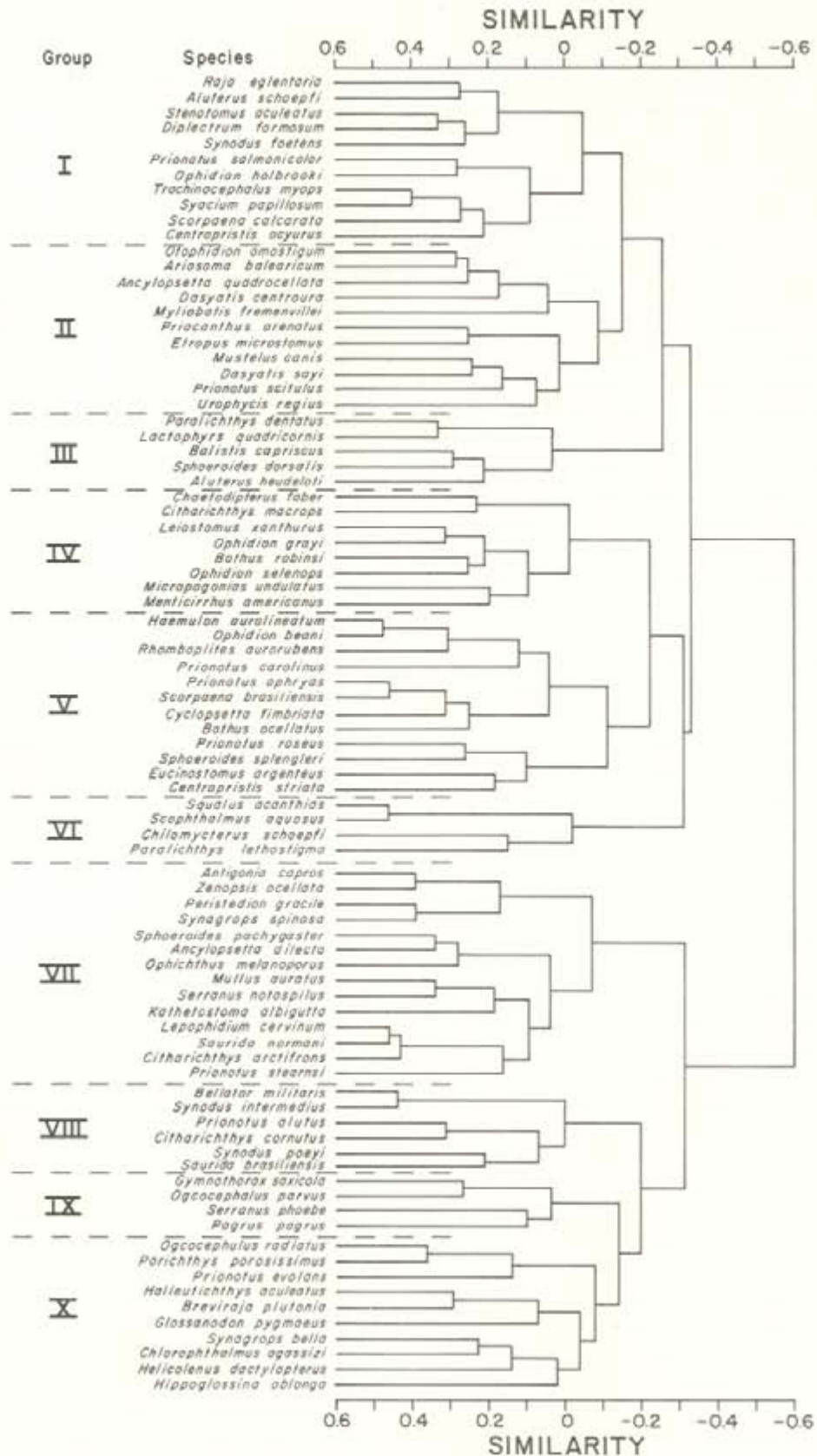


FIGURE 15. SPECIES CLUSTER (INVERSE ANALYSIS) FOR WINTER-EARLY SPRING 1975 SAND BOTTOM STATIONS. METHODOLOGY SAME AS FIGURE 14.

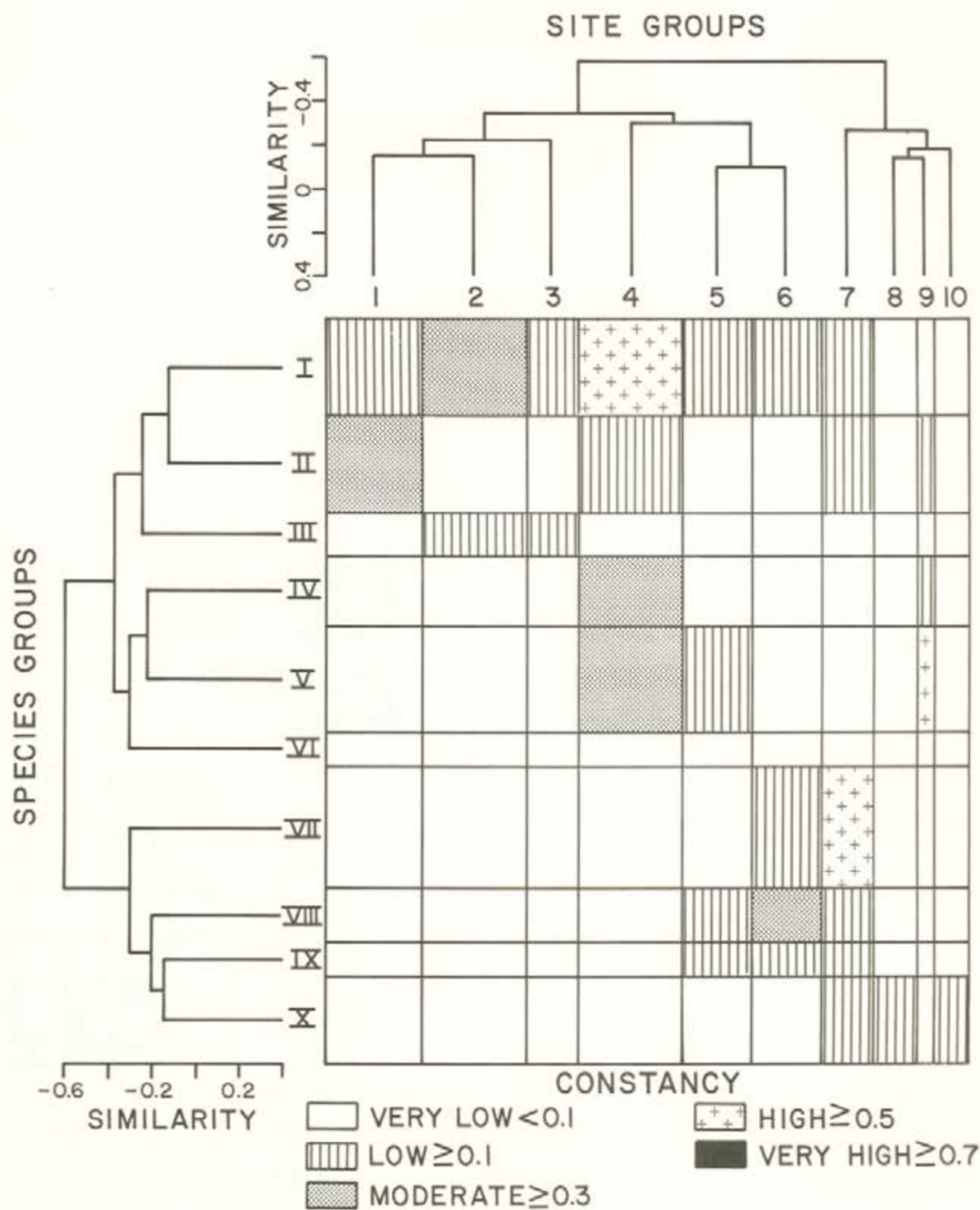


FIGURE 16. NODAL CONSTANCY IN A TWO-WAY TABLE OF SPECIES GROUPS AND SITE GROUPS FOR SAND BOTTOM STATIONS DURING WINTER-EARLY SPRING 1975.

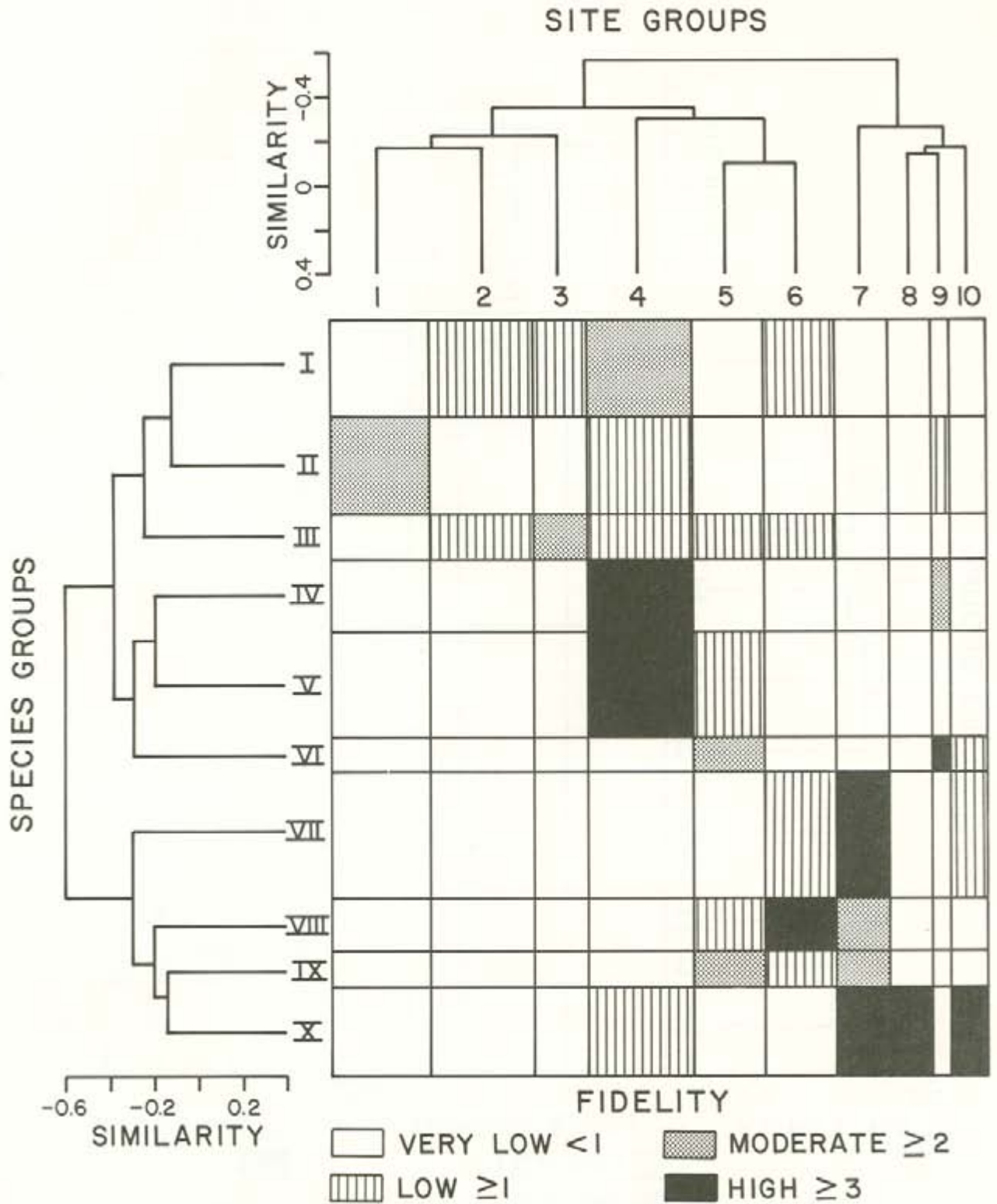


FIGURE 17. NODAL FIDELITY IN A TWO-WAY TABLE OF SPECIES GROUPS AND SITE GROUPS FOR SAND BOTTOM STATIONS DURING WINTER-EARLY SPRING 1975.

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APPENDIX I. Collection data for groundfish trawls in the South Atlantic Bight during Winter-early Spring 1975.

Collection Number	Latitude	Longitude	Depth (m)	Temperature (°C)
75032	33°40.0'N	78°05.5'W	14	11.5
75033	33°27.0'N	78°15.3'W	22	16.7
75034	33°29.5'N	78°30.5'W	16	14.4
75035	33°43.5'N	78°35.0'W	11	10.6
75036	33°32.5'N	78°52.0'W	9	10.8
75037	32°52.3'N	79°24.0'W	9	12.6
75038	32°33.0'N	79°42.0'W	12	13.2
75039	32°23.5'N	79°27.0'W	21	17.8
75041	32°00.4'N	79°34.0'W	44	17.8
75042	31°59.0'N	79°46.0'W	29	17.6
75043	32°03.0'N	79°41.5'W	33	17.6
75044	31°53.0'N	80°08.6'W	22	16.6
75045	32°11.0'N	80°25.0'W	14	12.6
75046	31°59.0'N	80°35.3'W	13	12.4
75047	31°30.0'N	80°42.5'W	20	13.7
75048	31°27.5'N	80°56.0'W	15	13.3
75049	31°22.0'N	80°39.0'W	22	14.2
75050	31°32.0'N	80°10.0'W	31	17.1
75051	31°12.5'N	80°11.0'W	42	20.8
75052	31°01.5'N	80°07.5'W	38	20.3
75053	30°55.5'N	80°15.0'W	33	19.6
75054	30°55.5'N	80°20.0'W	33	19.3
75055	30°58.0'N	80°31.0'W	31	18.3
75056	30°59.5'N	80°52.0'W	24	14.7
75057	31°03.6'N	80°56.5'W	13	14.3
75058	31°09.2'N	80°54.7'W	13	14.0
75059	30°43.5'N	80°53.5'W	22	17.9
75060	30°36.5'N	80°50.0'W	24	18.0
75062	30°24.0'N	80°35.0'W	33	19.6
75063	30°22.0'N	81°17.5'W	12	15.4
75064	30°09.0'N	81°11.5'W	14	16.1
75065	29°51.5'N	81°08.0'W	15	16.6
75066	29°51.0'N	81°00.0'W	22	17.5
75067	29°42.5'N	80°59.2'W	20	17.7
75068	29°40.0'N	80°31.6'W	31	18.7
75069	29°17.7'N	80°19.5'W	40	18.5
75070	29°14.5'N	80°21.5'W	31	18.8
75073	29°17.5'N	80°10.3'W	82	12.1
75074	29°08.5'N	80°42.0'W	20	20.1
75075	28°58.5'N	80°40.0'W	15	20.0
75076	28°53.3'N	80°24.0'W	20	19.8
75080	30°03.5'N	80°14.8'W	128	16.4
75081	30°13.6'N	80°14.0'W	69	20.0
75082	30°19.0'N	80°09.5'W	232	7.8
75083	30°25.0'N	80°07.5'W	227	7.7
75086	32°52.5'N	79°19.4'W	12	14.9
75087	32°57.0'N	78°57.8'W	20	17.2
75089	32°44.5'N	78°27.0'W	79	16.0
75091	33°02.5'N	77°53.7'W	102	16.4
75092	33°03.7'N	77°45.0'W	115	15.6
75096	33°14.0'N	77°32.5'W	42	19.5
75097	33°14.5'N	77°19.7'W	66	18.9
75098	33°18.0'N	77°09.7'W	135	17.0
75099	33°22.5'N	77°15.0'W	40	18.1
75100	33°31.6'N	77°09.7'W	38	18.4
75102	33°48.0'N	78°17.2'W	11	14.1
75104	33°31.5'N	78°50.0'W	11	15.7
75105	33°29.8'N	78°27.5'W	20	16.5
75107	33°41.0'N	78°06.6'W	13	14.6
75108	33°24.5'N	77°35.5'W	24	16.6
75109	32°53.0'N	79°24.5'W	10	16.0
75110	30°48.0'N	80°01.0'W	137	14.5
75111	30°54.5'N	80°00.0'W	68	19.2
75113	31°23.0'N	79°39.7'W	91	16.6
75114	31°31.5'N	79°34.5'W	146	13.6
75115	31°44.5'N	79°30.0'W	95	17.1

Collection Number	Latitude	Longitude	Depth (m)	Temperature (°C)
75116	31°50.0'N	79°16.0'W	230	13.0
75117	31°57.0'N	79°15.0'W	132	16.5
57118	32°00.0'N	79°11.6'W	137	16.0
75119	32°05.5'N	79°17.0'W	69	17.7
75120	32°09.0'N	79°11.0'W	68	17.6
75123	32°15.3'N	78°57.5'W	128	17.3
75128	32°33.8'N	78°03.0'W	265	10.7
75129	32°42.0'N	77°48.7'W	311	9.1
75130	32°45.0'N	77°44.0'W	278	9.9
75131	32°36.0'N	78°52.5'W	38	18.2
75132	32°36.2'N	79°02.0'W	31	17.8

APPENDIX II. Catches of demersal fishes by numbers and weight (kg) for individual depth zones for the Winter-early Spring
1975 groundfish survey in the South Atlantic Bight.

DEPTH ZONES		9-18		19-27		28-55		56-110		111-183		184-366	
FAMILY	SPECIES	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
Carcharhinidae	<u>Carcharhinus milberti</u>					1	45.4						
	<u>Rhizoprionodon terraenovae</u>					5	12.7						
Triakidae	<u>Mustelus canis</u>	32	148.3										
Squalidae	<u>Squalus acanthias</u>	3	13.6									1	1.4
Rajida	<u>Breviraja plutonia</u>									4	0.3	5	0.2
	<u>Raja eglanteria</u>	41	24.9	20	12.8	5	3.2						
	<u>Raja garmani</u>							1	0.1	1	0.1		
Dasyatidae	<u>Dasyatis americana</u>	1	15.9	2	56.7								
	<u>Dasyatis centroura</u>	1	74.8	4	426.6	4	367.4	1	113.4				
	<u>Dasyatis sayi</u>	71	200.8	6	27.7								
	<u>Cymnura micrura</u>	3	2.3										
Myliobatidae	<u>Aetobatus narinari</u>	1	21.8										
	<u>Myliobatis fremenvillei</u>	12	58.1	5	6.4								
Muraenidae	<u>Gymnothorax moringa</u>					1	0.5						
	<u>Gymnothorax saxicola</u>					5	0.3	1	0.1	5	0.4		
Muraenesocidae	<u>Hoplunnis sp.</u>									3	0.2		
Congridae	<u>Ariosoma balearicum</u>	7	0.3	2	0.1	2	0.2						
	<u>Congridae</u>									1	0.1		
Ophichthidae	<u>Myrophis sp.</u>	2	0.1										
	<u>Mystriophis intertinctus</u>			1	0.5								
	<u>Ophichthus melanoporus</u>							1	0.1	7	0.2		
	<u>Ophichthus ocellatus</u>									1	0.1		
Argentinidae	<u>Argentina striata</u>									304	1.0		
	<u>Glossanodon pygmaeus</u>									20	0.2	1	0.1
	<u>Argentinidae</u>											100	0.5
Synodontidae	<u>Saurida brasiliensis</u>					1	0.1	73	0.4	3	0.2		
	<u>Saurida normani</u>							2	0.1	32	3.4		
	<u>Synodus foetens</u>	130	5.8	177	10.4	44	5.8	29	4.6	4	1.4		
	<u>Synodus intermedius</u>					3	0.2	5	0.3				
	<u>Synodus poeyi</u>			1	0.1	48	0.8	144	1.9	1	0.1		
	<u>Trachinocephalus myops</u>	3	0.1	4	0.3	78	2.5	26	2.1				
Chlorophthalmidae	<u>Chlorophthalmus agassizi</u>											12	0.3
Batrachoididae	<u>Porichthys porosissimus</u>					8	0.2	13	0.1	23	0.3		
Lophiidae	<u>Lophius americanus</u>									1	0.1		
Ogcocephalidae	<u>Dibranchius atlanticus</u>					3	0.1			12	0.1		
	<u>Halieutichthys aculeatus</u>					12	0.2	1	0.1	7	0.2	1	0.1
	<u>Ogcocephalus corniger</u>							1	0.1				
	<u>Ogcocephalus parvus</u>					1	0.1	3	0.3	3	0.1		
	<u>Ogcocephalus radiatus</u>	1	0.1	1	0.1	5	0.3	5	0.2	15	0.3		
	<u>Zalieutes megintyi</u>									5	0.1		
Gadidae	<u>Urophycis floridanus</u>			1	0.1								
	<u>Urophycis regius</u>	1180	3.1	21	0.2	21	0.3	220	4.6	544	19.6	57	5.2
Merlucciidae	<u>Merluccius albidus</u>											2	0.2
	<u>Merluccius bilinearis</u>											1	0.1

DEPTH ZONES		9-18		19-27		28-55		56-110		111-183		184-366	
FAMILY	SPECIES	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
Moridae	<u>Laemonema barbatulum</u>											9	0.4
Macrouridae	<u>Coelorinchus carminatus</u>											2	0.2
Ophidiidae	<u>Lepophidium cervinum</u>							1	0.1	33	1.3	1	0.1
	<u>Lepophidium jeanna</u>							3	0.1	2	0.1		
	<u>Ophidion beani</u>			59	2.3	47	2.1						
	<u>Ophidion grayi</u>	14	0.4	9	0.7	4	0.2						
	<u>Ophidion holbrooki</u>	18	0.4	31	2.8	4	0.2	1	0.1	2	0.1		
	<u>Ophidion selenops</u>	12	0.2	1	0.1	5	0.2			1	0.1		
	<u>Otophidium omostigmum</u>	3	0.2	1	0.1	8	0.2						
	<u>Rissola marginata</u>	2	0.2										
Polymixiidae	<u>Polymixia lowei</u>									119	7.7	1	0.1
Zeidae	<u>Zenopsis ocellata</u>							1	0.1	13	0.4		
Caproidae	<u>Antigonia capros</u>							1	0.1	6	0.3		
Syngnathidae	<u>Corythoichthys albirostris</u>					1	0.1						
	<u>Hippocampus erectus</u>					1	0.1	2	0.1				
	<u>Syngnathus springeri</u>					1	0.1						
Percichthyidae	<u>Synagrops bella</u>							1	0.1	273	0.9	8	0.3
	<u>Synagrops spinosa</u>									456	1.9	1	0.1
	<u>Synagrops sp.</u>									47	0.3		
Serranidae	<u>Centropristis ocyurus</u>	1	0.1	18	1.1	38	1.7	31	1.7	6	0.6		
	<u>Centropristis philadelphia</u>	1	0.1										
	<u>Centropristis striata</u>	4	0.3	6	0.6	7	1.4						
	<u>Diplectrum formosum</u>	34	3.0	142	16.6	44	4.5						
	<u>Pronotogrammus aureorubens</u>											1	0.1
	<u>Serranus notospilus</u>							6	0.3	169	1.8		
	<u>Serranus phoebe</u>							19	1.1				
Priacanthidae	<u>Priacanthus arenatus</u>	8	0.4	27	0.3	17	0.1	3	0.1				
	<u>Priacanthus cruentatus</u>							2	0.1				
Branchiostegidae	<u>Caulolatilus microps</u>									1	0.1		
Rachycentridae	<u>Rachycentron canadum</u>					7	34.5						
Lutjanidae	<u>Lutjanus campechanus</u>			1	0.1			1	0.5				
	<u>Pristipomoides aquilonaris</u>									4	0.5		
	<u>Rhomboplites aurorubens</u>			48	1.8	12	0.7						
Gerreidae	<u>Eucinostomus argenteus</u>	1	0.1	11	0.2								
Haemulidae	<u>Haemulon aurolineatum</u>			50	1.5	212	10.5						
Sparidae	<u>Calamus leucosteus</u>			8	3.2			1	1.8				
	<u>Calamus nodosus</u>					10	15.0	1	1.8				
	<u>Lagodon rhomboides</u>	1	0.1					43	4.1				
	<u>Pagrus pagrus</u>	1	0.1			1	0.1	1	1.8				
	<u>Stenotomus aculeatus</u>	326	8.7	18705	39.0	63	3.3	367	17.4				
Sciaenidae	<u>Equetus lanceolatus</u>					3	0.1						
	<u>Larimus fasciatus</u>			1	0.1								
	<u>Leiostomus xanthurus</u>	39	3.0	362	42.4								
	<u>Menticirrhus americanus</u>	46	7.8	21	5.4								
	<u>Menticirrhus saxatilis</u>	4	1.4										
	<u>Micropogonias undulatus</u>	1	0.1	100	12.2								
	<u>Pogonias cromis</u>	1	27.2										
Mullidae	<u>Mullus suratus</u>	1	0.1	1	0.1	2	0.1	2	0.2	23	2.7		
Ephippidae	<u>Chaetodipterus faber</u>	56	7.4	1	0.1	32	4.5						

DEPTH ZONES		9-18		19-27		28-55		56-110		111-183		184-366	
FAMILY	SPECIES	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
Labridae	<u>Halichoeres caudalis</u>			1	0.1								
	<u>Hemipteronotus novacula</u>					4	0.3						
Uranoscopidae	<u>Astroscopus y-graecum</u>	1	0.1										
	<u>Kathetostoma albigutta</u>					2	0.2	11	2.0	4	0.3		
Scorpaenidae	<u>Helicolenus dactylopterus</u>					1	0.5					34	8.3
	<u>Pontius longispinus</u>									4	0.1		
	<u>Scorpaena agassizi</u>							5	0.1				
	<u>Scorpaena brasiliensis</u>			3	0.5	3	0.6						
	<u>Scorpaena calcarata</u>	3	0.2	38	1.2	49	1.7	11	0.1	1	0.1		
Triglidae	<u>Bellator egretta</u>							1	0.1				
	<u>Bellator militaris</u>							8	0.4				
	<u>Peristedion gracile</u>									392	10.1		
	<u>Peristedion miniatum</u>											3	0.1
	<u>Prionotus alatus</u>							32	1.6	8	0.2		
	<u>Prionotus cardinus</u>	9	0.2			97	8.4						
	<u>Prionotus evolans</u>	1	0.1			4	0.7						
	<u>Prionotus ophryas</u>					3	0.3						
	<u>Prionotus roseus</u>			1	0.1	11	0.8						
	<u>Prionotus salmonicolor</u>	2	0.6	13	4.7	4	1.1	2	0.1				
	<u>Prionotus scitulus</u>	25	0.7	3	0.2	15	0.9						
	<u>Prionotus stearnsi</u>	1	0.1	1	0.1			1	0.1	3	0.2		
Bothidae	<u>Ancylopsetta dilecta</u>							1	0.1	7	0.3		
	<u>Ancylopsetta quadrocellata</u>	7	0.9	1	0.5	5	1.9			1	0.1		
	<u>Bothus ocellatus</u>			4	0.1	30	1.4						
	<u>Bothus robbinsi</u>	4	0.1	20	0.9	15	1.2						
	<u>Citharichthys arctifrons</u>							6	0.2	22	0.6	5	0.3
	<u>Citharichthys cornutus</u>							14	0.3	31	0.2		
	<u>Citharichthys macrops</u>	3	0.2	1	0.1	3	0.2	1	0.1				
	<u>Cyclopsetta fimbriata</u>			1	0.1	4	0.7						
	<u>Etropus microstomus</u>	9	0.3					2	0.1				
	<u>Gastropsetta frontalis</u>					1	0.1						
	<u>Paralichthys dentatus</u>	4	0.9	2	0.5	2	1.0						
	<u>Paralichthys lethostigma</u>	1	0.1	2	1.4	1	0.5						
	<u>Hippoglossina oblonga</u>									2	0.2	3	0.2
	<u>Paralichthys squamilentus</u>							1	0.1				
	<u>Scopthalmus aquosus</u>	3	0.3										
	<u>Syacium papillosum</u>	6	0.6	47	4.5	82	11.1	106	10.4	2	0.1	1	0.1
Soleidae	<u>Gymnechirus melas</u>			1	0.1								
Cynoglossidae	<u>Symphurus parvus</u>							5	0.1				
Balistidae	<u>Aluterus heudeloti</u>					9	2.6						
	<u>Aluterus schoepfi</u>	11	9.5	31	42.6	85	88.0						
	<u>Balistes capricus</u>	1	0.1	4	0.1	4	0.6	1	2.3				
	<u>Stephanolepis hispidus</u>	5	1.1	36	2.1	141	8.4	3	0.1				
Ostraciidae	<u>Lactophrys quadricornis</u>	1	0.5	5	0.6	7	1.5						
Tetraodontidae	<u>Lagocephalus laevigatus</u>					1	0.9						
	<u>Sphoeroides dorsalis</u>					10	0.5	3	0.5				
	<u>Sphoeroides maculatus</u>					2	0.1						
	<u>Sphoeroides nephelus</u>			1	0.1								
	<u>Sphoeroides pachygaster</u>							3	0.3	12	2.4		
	<u>Sphoeroides spengleri</u>			2	0.5	10	0.6	1	0.1				
	<u>Sphoeroides sp.</u>					1	0.1					1	0.1
Diodontidae	<u>Chilomycterus schoepfi</u>	1	0.1	5	1.1								

APPENDIX III. Collection numbers for fishes taken during the Winter-early Spring 1975
groundfish survey in the South Atlantic Bight.

<u>Family</u>	<u>Species</u>	<u>Collection Numbers For Each Occurrence</u>		
Carcharhinidae	<u>Carcharhinus milberti</u>	75051		
	<u>Rhizoprionodon terraenovae</u>	75051	75096	
Triakidae	<u>Mustelus canis</u>	75032	75036	75045
		75048	75057	75058
		75063	75086	75102
		75104	75107	
Squalidae	<u>Squalus canthias</u>	75035	75036	75130
Rajidae	<u>Breviraja plutonia</u>	75082	75083	75110
		75117	75123	
Dasyatidae	<u>Raja eglanteria</u>	75032	75033	75034
		75037	75043	75044
		75049	75050	75056
		75057	75058	75063
		75064	75066	75067
		75075	75086	75087
		75102	75104	75105
	<u>Raja garmani</u>	75107	75109	
		75089	75092	
		75047	75048	
	<u>Dasyatis americana</u>	75039	75042	75053
		75062	75065	75074
		75076	75087	75119
		75132		
<u>Dasyatis sayi</u>		75033	75057	75058
		75063	75064	75065
	75067	75086	75104	
<u>Gymnura micrura</u>	75102	75107		
	75058			
Myliobatidae	<u>Aetobatus narinari</u>	75058		
	<u>Myliobatis freminvillei</u>	75033	75049	75064
Muraenidae	<u>Gymnothorax saxicola</u>	75065	75105	
		75043	75069	75081
		75092	75099	75117
Muraenesocidae	<u>Gymnothorax moringa</u>	75118	75123	
		75099		
	<u>Hoplunnis sp.</u>	75110	75118	
Congridae	<u>Ariosoma balearicum</u>	75064	75065	75067
		75099	75109	75132
	<u>Congridae</u>	75080		

<u>Family</u>	<u>Species</u>	<u>Collection Numbers For Each Occurrence</u>			
Ophichthidae	<u>Myrophis</u> sp.	75035			
	<u>Mystriophis</u> <u>intertinctus</u>	75067			
	<u>Ophichthus</u> <u>melanoporus</u>	75115	75118	75123	
	<u>Ophichthus</u> <u>ocellatus</u>	75110			
Clupeidae	<u>Brevoortia</u> <u>tyrannus</u>	75035	75036		
	<u>Etrumeus</u> <u>teres</u>	75032	75039	75086	
		75104	75105	75108	
		75109	75114	75115	
		75123	75131		
Engraulidae	<u>Anchoa</u> <u>cubana</u>	75037	75063	75064	
		75065	75066	75067	
		75074	75075	75076	
		75102			
	<u>Anchoa</u> <u>hepsetus</u>	75032	75063	75064	
		75065	75067	75075	
		75086	75102	75104	
		75109			
	<u>Anchoa</u> <u>lyolepis</u>	75032	75063	75064	
		75065	75066	75067	
		75074	75075	75076	
Engraulidae	<u>Anchoa</u> <u>nasuta</u>	75102			
	<u>Anchoviella</u> <u>perfasciata</u>	75086	75108	75115	
	<u>Engraulis</u> <u>eurystole</u>	75102			
	Engraulidae	75039			
	Argentinidae	<u>Argentina</u> <u>striata</u>	75118	75123	
		<u>Glossanodon</u> <u>pygmaeus</u>	75080	75082	75092
Argentinidae		75083			
Synodontidae	<u>Saurida</u> <u>brasiliensis</u>	75069	75089	75098	
		75115	75119	75120	
		75123			
	<u>Saurida</u> <u>normani</u>	75091	75092	75114	
		75117	75118	75123	
	<u>Synodus</u> <u>foetens</u>	75033	75034	75036	
		75038	75039	75041	
		75043	75045	75050	
		75053	75056	75057	
		75059	75060	75063	
		75065	75066	75067	
		75068	75069	75074	
		75075	75076	75081	
		75086	75087	75089	
		75104	75105	75107	
	75108	75109	75113		
	75115	75117	75118		
	75119	75120	75131		
	75132				

Family	Species	Collection Numbers For Each Occurrence		
Synodontidae (cont.)	<u>Synodus intermedius</u>	75089	75091	75096
		75120	75132	
	<u>Synodus poeyi</u>	75043	75051	75062
		75068	75089	75091
		75096	75098	75099
		75108	75111	75113
		75115	75119	75120
		75131	75132	
	<u>Trachinocephalus myops</u>	75041	75042	75043
		75056	75059	75069
		75070	75075	75076
		75081	75089	75096
75099		75100	75111	
75119		75120	75131	
75132				
Chlorophthalmidae	<u>Chlorophthalmus agassizi</u>	75082	75129	75130
Conostomatidae	<u>Maurolicus muelleri</u>	75116		
Batrachoididae	<u>Porichthys porosissimus</u>	75091	75092	75117
		75118	75131	75132
Lophiidae	<u>Lophius americanus</u>	75110		
Ogcocephalidae	<u>Dibranchus atlanticus</u>	75092	75100	
	<u>Halieutichthys aculeatus</u>	75082	75099	75110
		75115	75117	75131
	<u>Ogcocephalus corniger</u>	75081		
	<u>Ogcocephalus parvus</u>	75081	75092	75099
		75111	75119	
	<u>Ogcocephalus radiatus</u>	75056	75069	75073
		75075	75091	75092
		75110	75118	75131
75132				
	<u>Zalieutes mcgintyi</u>	75118		
Gadidae	<u>Urophycis floridanus</u>	75066		
	<u>Urophycis regius</u>	75032	75035	75036
		75037	75047	75048
		75057	75058	75080
		75082	75083	75086
		75091	75092	75099
		75104	75105	75107
		75109	75110	75111
		75114	75115	75116
		75117	75118	74123
		75129	75130	75131
		75132		
Merluccidae	<u>Merluccius albidus</u>	75082	75129	
	<u>Merluccius bilinearis</u>	75130		
Bregmoceratidae	<u>Bregmaceros atlanticus</u>	75080		

<u>Family</u>	<u>Species</u>	<u>Collection Numbers For Each Occurrence</u>		
Moridae	<u>Laemonema barbatulum</u>	75130		
Macrouridae	<u>Coelorhynchus carinatus</u>	75082	75116	
Ophidiidae	<u>Lepophidium cervinum</u>	75080	75091	75092
		75110	75117	75118
		75123	75130	
	<u>Lepophidium jeannae</u>	75091	75092	
	<u>Ophidion beani</u>	75066	75067	75068
		75074	75076	75099
		75100	75131	75132
	<u>Ophidion grayi</u>	75036	75037	75067
		75074	75075	75076
		75100	75109	75131
	<u>Ophidion holbrooki</u>	75064	75065	75066
		75067	75068	75074
		75075	75076	75081
		75086	75092	75132
	<u>Ophidion selenops</u>	75069	75074	75075
		75109	75117	75131
	<u>Otophidium omostigmum</u>	75064	75065	75074
		75100	75132	
	<u>Rissola marginata</u>	75107	75109	
Polymixiidae	<u>Polymixia lowei</u>	75123	75129	
Zeidae	<u>Zenopsis ocellata</u>	75114	75117	75118
		75120	75123	
Caproidae	<u>Antigonia capros</u>	75111	75114	75117
		75123		
Fistulariidae	<u>Fistularia villosa</u>	75051	75081	
Syngnathidae	<u>Corythoichthys albirostris</u>	75062		
	<u>Hippocampus erectus</u>	75100	75111	
	<u>Syngnathus springeri</u>	75131		
Percichthyidae	<u>Synagrops bella</u>	75073	75114	75123
		75128	75129	75130
	<u>Synagrops spinosa</u>	75114	75117	75118
		75123	75128	
	<u>Synagrops sp.</u>	75123		
Serranidae	<u>Centropristis ocyurus</u>	75042	75059	75064
		75066	75069	75076
		75081	75089	75100
		75113	75114	75115
		75117	75119	75131
		75132		
	<u>Centropristis philadelphia</u>	75086		

<u>Family</u>	<u>Species</u>	<u>Collection Numbers For Each Occurrence</u>		
Serranidae (cont.)	<u>Centropristis striata</u>	75064	75066	75067
		75102	75104	75131
	<u>Diplectrum formosum</u>	75039	75042	75043
		75044	75050	75055
		75059	75062	75064
		75065	75066	75067
		75068	75069	75070
		75074	75075	75076
		75096	75100	75104
		75105	75109	75131
	75132			
	<u>Pronotogrammus aureorubens</u>	75116		
	<u>Serranus notospilus</u>	75089	75091	75115
		75117	75118	75123
<u>Serranus phoebe</u>	75097	75111	75119	
Priacanthidae	<u>Priacanthus arenatus</u>	75086	75087	75089
		75096	75104	75105
		75107	75108	75109
	<u>Priacanthus cruentatus</u>	75091		
Branchiostegidae	<u>Caulolatilus microps</u>	75117		
Pomatomidae	<u>Pomatomus saltatrix</u>	75064	75076	
Rachycentridae	<u>Rachycentron canadum</u>	75053	75068	
Echeneidae	<u>Echeneis naucrates</u>	75051	75053	75070
		75074	75076	
	<u>Echeneis neucratoides</u>	75074	75076	
Carangidae	<u>Caranx crysos</u>	75044		
	<u>Chloroscombrus chrysurus</u>	75074	75075	75107
		75038	75047	75050
		75056	75059	75060
	<u>Decapterus punctatus</u>	75062	75064	75065
		75066	75067	75068
75076		75086	75087	
75100		75104	75111	
75119		75120	75132	
<u>Trachurus lathami</u>	75044	75062	75070	
	75073	75086	75087	
	75102	75104	75105	
	75111			
Lutjanidae	<u>Lutjanus campechanus</u>	75067	75111	
	<u>Pristipomoides aquilonaris</u>	75117		
	<u>Rhomboplites aurorubens</u>	75041	75066	75067
75068		75131		
Gerreidae	<u>Eucinostomus argenteus</u>	75063	75066	75067

<u>Family</u>	<u>Species</u>	<u>Collection Numbers For Each Occurrence</u>		
Haemulidae	<u>Haemulon aurolineatum</u>	75066	75067	75068
		75076	75099	75100
		75131		
Sparidae	<u>Calamus leucosteus</u>	75033	75111	
	<u>Calamus nodosus</u>	75096	75097	
	<u>Lagodon rhomboides</u>	75104	75113	
	<u>Pagrus pagrus</u>	75100	75109	75111
	<u>Stenotomus aculeatus</u>	75033	75038	75039
		75047	75048	75050
75066		75067	75086	
75087		75102	75104	
75105		75107	75109	
	75113	75131	75132	
Sciaenidae	<u>Equetus lanceolatus</u>	75131		
	<u>Larimus fasciatus</u>	75076		
	<u>Leiostomus xanthurus</u>	75035	75036	75067
		75074	75075	75076
		75102		
	<u>Menticirrhus americanus</u>	75063	75064	75074
		75075	75076	
	<u>Menticirrhus saxatilis</u>	75109		
<u>Micropogon undulatus</u>	75035	75074	75076	
<u>Pogonias cromis</u>	75086			
Mullidae	<u>Mullus auratus</u>	75074	75086	75091
		75115	75117	75118
		75131		
Ephippidae	<u>Chaetodipterus faber</u>	75050	75065	75075
		75076		
Labridae	<u>Halichoeres caudalis</u>	75087		
	<u>Hemipteronotus novacula</u>	75052	75053	75096
Uranoscopidae	<u>Astroscopus y-graecum</u>	75065		
	<u>Kathetostoma albigutta</u>	75042	75055	75091
		75092	75113	75115
75117		75118	75119	
Scombridae	<u>Scomber japonicus</u>	75083	75108	75115
Scorpaenidae	<u>Helicolenus dactylopterus</u>	75128	75130	75131
	<u>Pontinus longispinus</u>	75114		
	<u>Scorpaena agassizi</u>	75091		
	<u>Scorpaena brasiliensis</u>	75068	75076	75131

Family	Species	Collection Numbers For Each Occurrence		
Scorpaenidae (cont.)	<u>Scorpaena calcarata</u>	75043	75048	75056
		75066	75074	75075
		75076	75089	75092
		75099	75100	75131
		75132		
Stromateidae	<u>Peprilus alepidotus</u>	75049		
	<u>Peprilus triacanthus</u>	75032	75046	75049
		75056	75064	75065
		75066	75067	75076
		75080	75083	75102
		75109	75110	75111
		75114	75117	75118
		75123		
Ariommidae	<u>Ariomma bondi</u>	75083	75114	75123
		75128		
	<u>Ariomma melanum</u>	75080	75082	
Triglidae	<u>Bellator egretta</u>	75111		
	<u>Bellator militaris</u>	75081	75089	75091
		75120		
	<u>Peristedion gracile</u>	75114	75117	75118
		75123		
	<u>Peristedion miniatum</u>	75116		
	<u>Prionotus alatus</u>	75091	75110	75115
		75120	75123	
	<u>Prionotus carolinus</u>	75037	75041	75086
		75099	75100	75131
		75132		
	<u>Prionotus evolans</u>	75043	75057	75131
		75132		
	<u>Prionotus ophryas</u>	75041	75068	75131
	<u>Prionotus roseus</u>	75067	75069	75096
75100		75131		
<u>Prionotus salmonicolor</u>	75041	75049	75056	
	75059	75065	75066	
	75067	75068	75075	
	75091	75132		
<u>Prionotus scitulus</u>	75036	75057	75060	
	75065	75066	75075	
	75104	75107	75109	
	75132			
<u>Prionotus stearnsi</u>	75074	75091	75092	
	75107	75123		
Bothidae	<u>Ancylosetta dilecta</u>	75092	75115	75117
		75123		
<u>Ancylosetta quadrocellata</u>	75042	75058	75064	
	75065	75086	75087	
	75109	75123	75132	

<u>Family</u>	<u>Species</u>	<u>Collection Numbers For Each Occurrence</u>		
Bothidae (cont.)	<u>Bothus ocellatus</u>	75062	75068	75076
		75096	75099	75100
		75131		
	<u>Bothus robinsi</u>	75041	75060	75066
		75067	75069	75070
		75074	75075	75076
		75131		
	<u>Citharichthys arctifrons</u>	75073	75082	75091
		75092	75110	75114
		75117	75118	75123
		75129	75130	
	<u>Citharichthys cornutus</u>	75091	75092	75110
		75111	75115	
	<u>Citharichthys macrops</u>	75069	75075	75076
		75089	75107	75131
	<u>Cyclopsetta fimbriata</u>	75041	75076	75100
		75131		
	<u>Etropus microstomus</u>	75086	75091	75107
		75109		
	<u>Etropus rimosus</u>	75115		
	<u>Gastropsetta frontalis</u>	75099		
	<u>Paralichthys dentatus</u>	75042	75043	75107
		75108		
<u>Paralichthys lethostigma</u>	75035	75041	75047	
<u>Hippoglossina oblongua</u>	75110	75116	75118	
	75129			
<u>Paralichthys squamilentus</u>	75091			
<u>Scophthalmus aquosus</u>	75035	75036	75037	
<u>Syacium papillosum</u>	75041	75065	75066	
	75067	75068	75069	
	75070	75074	75075	
	75076	75081	75082	
	75089	75091	75092	
	75096	75097	75099	
	75100	75111	75113	
	75119	75120	75131	
	75132			
Soleidae	<u>Gymnachirus melas</u>	75076		
Cynoglossidae	<u>Symphurus parvus</u>	75091		
Balistidae	<u>Aluterus heudeloti</u>	75041	75042	75043
		75050	75053	75069
	<u>Aluterus schoepfi</u>	75033	75034	75039
		75041	75042	75043
		75044	75047	75050
		75051	75053	75054
		75056	75057	75058
		75060	75062	75067
		75068	75070	75075
		75087	75105	

<u>Family</u>	<u>Species</u>	<u>Collection Numbers For Each Occurrence</u>			
Balistidae (cont.)	<u>Balistes capricus</u>	75039	75043	75069	
		75075	75120		
	<u>Stephanolepis hispidus</u>	75033	75037	75041	
		75042	75043	75044	
		75046	75049	75050	
		75055	75056	75059	
		75060	75062	75066	
		75067	75068	75069	
		75076	75100	75107	
		75119	75131	75132	
		Ostraciidae	<u>Lactophrys quadricornis</u>	75042	75043
	75049			75055	75062
	75107				
	Tetraodontidae	<u>Lagocephalus laevigatus</u>	75041		
<u>Sphoeroides dorsalis</u>		75043	75050	75069	
		75099	75100	75120	
<u>Sphoeroides maculatus</u>		75132			
<u>Sphoeroides nephelus</u>		75056			
<u>Sphoeroides pachygaster</u>		75081	75089	75092	
		75114	75115	75123	
<u>Sphoeroides spengleri</u>		75067	75068	75096	
		75097			
<u>Sphoeroides sp.</u>	75068	75082			
Diodontidae	<u>Chilomycterus schoepfi</u>	75033	75047	75056	
		75058			

APPENDIX IV. Diversity values by depth zones for successful sand bottom trawls in the South Atlantic Bight during Winter-early Spring 1975.

Depth Zone (m)	Collection Number	Depth (m)	Number Of Species	Number of Individuals	H' Bits/Ind.	J' Evenness	Species Richness
9-18	75032	14	3	4	1.500	0.946	1.442
	75034	16	3	8	1.299	0.819	0.962
	75035	11	7	38	1.623	0.578	1.649
	75036	9	8	69	1.182	0.394	1.653
	75037	9	6	77	0.767	0.297	1.151
	75038	12	2	3	0.918	0.918	0.910
	75045	14	2	2	1.000	1.000	1.443
	75046	13	1	1	0	0	0
	75048	15	5	10	2.122	0.914	1.737
	75057	13	8	15	2.683	0.894	2.585
	75058	13	8	14	2.639	0.880	2.653
	75063	12	6	10	2.446	0.946	2.172
	75064	14	11	109	2.126	0.615	2.132
	75065	15	14	95	2.424	0.637	2.855
	75075	15	19	119	3.434	0.809	3.766
	75086	12	14	901	0.411	0.108	1.191
	75102	11	6	51	1.224	0.474	1.272
	75104	11	11	165	1.714	0.495	1.959
	75107	13	16	246	1.896	0.474	2.725
75109	10	16	223	2.277	0.569	2.774	
19-27	75033	22	9	37	2.861	0.903	2.216
	75039	21	6	33	2.036	0.788	1.430
	75044	22	4	21	0.818	0.409	0.985
	75047	20	7	171	1.028	0.366	1.167
	75049	22	5	7	2.236	0.963	2.056
	75056	24	10	19	2.641	0.795	3.057
	75059	22	6	10	2.446	0.946	2.172
	75060	24	5	8	2.000	0.861	1.924
	75066	22	18	169	3.485	0.836	3.314
	75067	20	23	148	3.614	0.799	4.402
	75074	20	16	134	2.957	0.739	3.063
	75076	20	23	648	2.478	0.548	3.398
	75087	20	9	18454	0.137	0.043	0.814
	75105	20	9	168	1.479	0.467	1.561
	75108	24	4	44	0.576	0.288	0.793
28-55	75041	44	14	43	2.588	0.680	3.456
	75042	29	11	14	3.325	0.961	3.789
	75043	33	15	28	3.652	0.935	4.201
	75050	31	9	47	1.820	0.574	2.078
	75051	42	4	34	1.433	0.717	0.851
	75052	38	1	1	0	0	0
	75053	33	6	40	0.948	0.367	1.355
	75054	33	1	5	0	0	0
	75055	31	4	5	1.922	0.961	1.864
	75062	33	8	29	2.159	0.720	2.079
	75068	31	17	83	3.028	0.741	3.621
	75069	40	16	62	3.420	0.855	3.635
	75070	31	5	10	2.171	0.935	1.737
	75096	42	12	62	2.976	0.830	2.665
	75099	40	16	72	3.053	0.763	3.507
	75100	38	18	220	2.901	0.696	3.152
	75131	38	32	465	3.956	0.791	5.047
75132	31	24	152	4.028	0.878	4.578	
56-110	75073	82	3	4	1.500	0.946	1.443
	75081	69	10	47	2.152	0.648	2.338
	75089	79	14	55	3.203	0.841	3.244
	75091	102	23	172	3.249	0.718	4.274
	75097	66	4	13	1.145	0.572	1.170
	75111	68	13	21	3.154	0.852	3.942
	75113	91	7	424	0.749	0.267	0.992
	75115	95	15	290	2.274	0.582	2.469
	75119	69	11	142	2.222	0.642	2.018
	75120	68	11	64	2.716	0.785	2.405

Depth Zone (m)	Collection Number	Depth (m)	Number Of Species	Number of Individuals	H' Bits/Ind.	J' Evenness	Species Richness
111-183	75080	128	4	40	0.619	0.310	0.813
	75092	115	20	133	3.515	0.813	3.885
	75098	135	2	3	0.918	0.918	0.910
	75110	137	12	234	0.953	0.266	2.016
	75114	146	11	211	2.356	0.681	1.868
	75117	132	21	253	3.056	0.696	3.614
	75118	137	19	465	2.188	0.515	2.930
	75123	128	23	1301	2.735	0.605	3.068
184-366	75082	232	11	18	3.149	0.910	3.460
	75083	227	3	103	0.218	0.138	0.432
	75116	230	5	8	2.156	0.928	1.924
	75128	265	3	6	1.459	0.921	1.116
	75129	311	7	34	1.856	0.661	1.702
	75130	278	9	82	2.170	0.685	1.815

APPENDIX V. Groundfish weights for otter trawls in the South Atlantic Bight during Winter-early Spring 1975.

Depth Zone (m)	Collection Number	Depth (m)	Total Weight (kg)	Pelagic Weight (kg)	Elasmobranch Weight (kg)	Squid Weight (kg)	Demersal Bony Fish Weight (kg)
9-18	75032	14	6.597	0.500	5.433	0.554	0.100
	75034	16	2.468	0	1.361	0.100	1.007
	75035	11	4.882	0.100	4.082	0.100	0.600
	75036	9	20.305	0.100	19.505	0.100	0.600
	75037	9	3.762	0.100	2.722	0.440	0.500
	75038	12	0.400	0.100	0	0.100	0.200
	75045	14	1.107	0	0.907	0.100	0.100
	75046	13	0.400	0.100	0	0.200	0.100
	75048	15	31.145	0	30.391	0.454	0.300
	75057	13	20.005	0	15.976	2.268	1.761
	75058	13	40.771	0	37.649	1.561	1.561
	75063	12	27.563	18.344	8.719	0.200	0.300
	75064	14	190.393	2.568	182.942	0.554	4.329
	75065	15	125.794	5.241	108.411	2.822	9.320
	75075	15	19.008	0.824	0.454	0.200	17.530
	75086	12	94.234	0.854	63.050	0.454	29.876
	75102	11	33.080	14.183	15.422	0.100	3.375
	75104	11	45.878	3.022	34.927	0.525	7.404
	75107	13	31.304	0.100	26.309	1.380	3.515
	75109	10	8.304	0.300	2.268	0.907	4.829
19-27	75033	22	41.378	0	31.299	1.814	8.265
	75039	21	63.550	0.200	58.968	0.553	3.829
	75044	22	32.806	0.200	0.907	0.654	31.045
	75047	20	74.495	0.100	56.700	3.080	14.615
	75049	22	5.448	0.200	3.628	1.320	0.300
	75056	24	6.743	0.200	4.536	0.300	1.707
	75059	22	3.236	0.100	0	1.828	1.308
	75060	24	3.247	0.100	0	1.840	1.307
	75066	22	17.844	4.596	1.814	3.629	7.805
	75067	20	23.358	3.518	2.268	2.608	14.964
	75074	20	136.207	2.101	124.740	0.300	9.066
	75076	20	274.485	8.539	192.950	0.525	72.471
	75087	20	93.974	0.200	49.996	0.880	42.898
	75105	20	6.089	0.200	2.268	1.760	1.861
	75108	24	23.022	20.000	0	0.100	2.922
	28-55	75041	44	9.546	0	0	0.781
75042		29	79.273	0	72.576	1.914	4.783
75043		33	7.792	0	2.268	0.440	5.084
75050		31	8.638	0.100	0.907	0.781	6.850
75051		42	67.818	1.361	55.339	2.400	8.718
75052		38	1.020	0	0	0.920	0.100
75053		33	167.751	1.814	113.400	0.980	51.557
75054		33	5.430	0	0	0.440	4.990
75055		31	2.234	0	0	1.480	0.754
75062		33	125.136	5.997	102.060	1.610	15.469
75068		31	38.517	0.100	0	1.581	36.836
75069		40	5.936	0	0	1.914	4.022
75070		31	3.652	0.200	0	0.330	3.122
75096		42	19.145	0	2.722	0.100	16.323
75099		40	6.136	0	0	0.300	5.836
75100		38	11.026	0.100	0	0.300	10.626
75131		38	31.840	0.100	0	0.200	31.540
75132	31	93.128	0.100	79.380	1.361	2.287	

Depth Zone (m)	Collection Number	Depth (m)	Total Weight (kg)	Pelagic Weight (kg)	Elasmobranch Weight (kg)	Squid Weight (kg)	Demersal Bony Fish Weight (kg)
56-110	75073	82	0.600	0.100	0	0.200	0.300
	75081	69	4.883	0.454	0	0.907	3.522
	75089	79	8.395	0	0.100	6.641	1.654
	75091	102	6.282	0	0	0.100	6.182
	75097	66	2.921	0	0	0	2.921
	75111	68	5.482	0.300	0	0.100	5.082
	75113	91	23.098	0	0	0.440	22.658
	75115	95	16.523	5.997	0	0.554	9.972
	75119	69	122.185	0.100	113.400	3.094	5.591
	75120	68	8.413	0.100	0	0.454	7.859
111-183	75080	128	7.304	2.014	0	2.268	3.022
	75092	115	2.454	0	0.100	0.100	2.254
	75098	135	0.300	0	0	0.100	0.200
	75110	137	8.357	0.907	0.100	0	7.350
	75114	146	72.161	65.419	0	1.860	4.882
	75117	132	13.902	3.629	0.100	0.907	9.266
	75118	137	47.567	28.577	0	1.914	17.076
	75123	128	48.617	24.947	0.100	5.900	17.670
184-366	75082	232	3.822	0.100	0.100	2.268	1.354
	75083	227	4.129	2.468	0.100	1.007	0.554
	75116	230	0.600	0.100	0	0	0.500
	75128	265	0.400	0.100	0	0	0.300
	75129	311	2.868	0	0	0.454	2.414
	75130	278	13.405	0.100	1.361	0.200	11.744