

## SEAMAP-SA Shallow Water Trawl Survey Cruise Report Spring 2005

The spring cruise for the SEAMAP-South Atlantic Shallow Water Trawl Survey began on April 4 and was completed on April 28, 2005. A total of one hundred and two stations were sampled in the twenty-four shallow coastal strata in the South Atlantic Bight (Figure 1).

Preliminary analysis on species of primary importance was completed and is as follows:

### General Observations:

A total of 124 species or genera were identified in spring trawls (Table 1). *Opisthonema oglinum*, the Atlantic thread herring, was the most abundant species, constituting 17% of total abundance, followed by the Atlantic croaker, *Micropogonias undulatus* (14%); the weakfish, *Cynoscion regalis* (13%); the striped anchovy, *Anchoa hepsetus* (13%); the spot, *Leiostomus xanthurus* (9); and the southern kingfish, *Menticirrhus americanus* (4%).

Abundance of individuals collected ( $n=169,213$  individuals,  $\bar{x}/\text{tow}=1659$  individuals) in Spring 2005 decreased from the record level of spring abundance observed in 2004., whereas miscellaneous invertebrate biomass ( $n=2787$  kg,  $\bar{x}/\text{tow}=27.3$  kg) was very low, but exceeded 2004 abundance (Figure 2). The cannonball jelly, *Stomolophus meleagris*, constituted more than 35% of miscellaneous invertebrate biomass.

An increase in the number of smooth dogfish, *Mustelus canis*, taken in trawls was noted. This trend has been noted each spring since 2001.

Water temperatures ( $\bar{x}=16.2$  °C, range=8.7-21.6 °C) were considerably colder in 2005 than those measured during other spring cruises, with the exception of 1989, 1993, 1996. As would be expected, the coldest water temperatures were encountered in Raleigh Bay. Mean water temperature increased southward.

### Sciaenids:

Patterns of abundance from SEAMAP trawls in the SAB generally reflect fluctuations in the abundance of the sciaenid family, especially Atlantic croaker and spot. Greatest abundance of sciaenids was taken in the northern South Atlantic Bight in Spring 2005 (Figure 3). The Atlantic croaker, *Micropogonias undulatus*, ( $n=22,949$  individuals,  $\bar{x}/\text{tow}=225.0$  individuals) was the second most numerous species collected. The weakfish, *Cynoscion regalis*, ( $n=22,711$  individuals,  $\bar{x}/\text{tow}=222.7$  individuals), ranked fourth in abundance, the greatest spring abundance of that species in SEAMAP history. The spot, *Leiostomus xanthurus*, ( $n=14,669$  individuals,  $\bar{x}/\text{tow}=143.8$  individuals) ranked fifth, followed by the southern kingfish, *Menticirrhus americanus*, ( $n=6574$  individuals,  $\bar{x}/\text{tow}=64.5$  individuals), the sixth most numerous species overall.

Otoliths were collected from specimens of weakfish ( $n=185$ ), Atlantic croaker ( $n=141$ ), and southern kingfish ( $n=409$ ). Additionally, gonad samples were collected for verification of onboard maturity assessments.

## **Mackerel:**

The abundance of Spanish mackerel, *S. maculatus*, (n=288,  $\bar{x}/\text{tow}=2.8$ ) decreased slightly in Spring 2005 (Figure 4). Spanish mackerel were absent from collections made in Raleigh and Long Bays. Abundance of *S. maculatus* was greatest in waters off Florida (n=150,  $\bar{x}/\text{tow}=7.9$ ).

King mackerel, *Scomberomorus cavalla*, (n=4,  $\bar{x}/\text{tow}=0.04$ ) were taken only in waters off Florida.

## **Penaeid Shrimp:**

Although the white shrimp, *Litopenaeus setiferus*, was the most abundant commercially important shrimp species (n=269,  $\bar{x}/\text{tow}=2.6$ ) collected during the spring cruise, the number of white shrimp taken was lower only in 1996 (Figure 5). *L. setiferus* were taken from strata in all regions, except South Carolina. The highest mean catch per tow was taken off Florida (n=183,  $\bar{x}/\text{tow}=9.6$ ). Female white shrimp were found in all stages of development. Only 6% of the females sampled had ripe gonads (Figure 6) and none of the female specimens were found to be mated. Approximately 45% of the male white shrimp had ripe spermatophores.

The abundance of the pink shrimp, *Farfantepenaeus duorarum*, (n=108,  $\bar{x}/\text{tow}=0.2$ ) decreased from levels observed in Spring 2003-4. *F. duorarum* were taken in all regions, except Raleigh Bay. The greatest mean catch per tow was observed in Onslow Bay (n=67,  $\bar{x}/\text{tow}=3.9$ ). All of the female pink shrimp taken had undeveloped ovaries and no mated females were sampled. Approximately 94% of the males had developing spermatophores and only one individual was found with ripe spermatophores.

The spring abundance of the brown shrimp, *Farfantepenaeus aztecus*, was very low (n=17,  $\bar{x}/\text{tow}=0.17$ ). *F. aztecus* were taken only in waters off Florida. Approximately 93% of the females had undeveloped ovaries. None of the female *F. aztecus* had ripe ovaries or were mated. Most of the male brown shrimp had undeveloped spermatophores, with only 1 individual taken with a developing spermatophore.

## **Other Observations:**

The following specimens were retained and transported to SCMRD for cooperating and other investigations:

- Specimens of invertebrate species for catalogue of genetic voucher specimens for Southeastern Regional Taxonomic Center at MRRI;
- Two species of *Menticirrhus* for age-growth work;
- Specimens of Atlantic croaker taken from each region for stock identification based on parasite load;
- *Haemulon aurolineatum* specimen for age and growth research (MARMAP)
- Weakfish and bluefish specimens for age and growth analysis (MRRI/Inshore Fisheries)
- *Paralichthys dentatus* and *Paralichthys albigutta* specimens for identification of genetic markers.
- *Etropus crossotus* specimens for analysis of reproductive condition.
- *Symphurus plagiusa* specimens for verification of species identification.

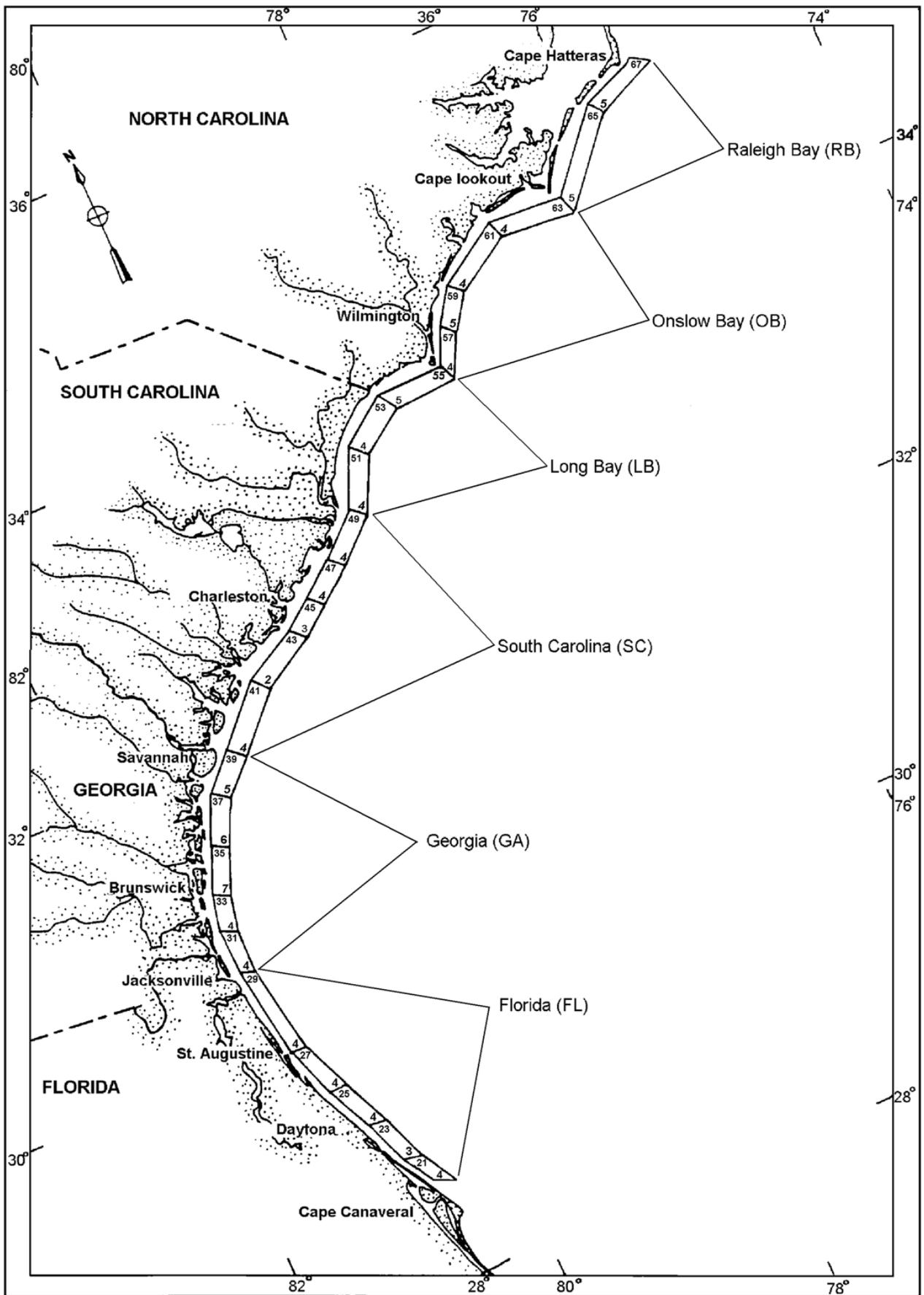
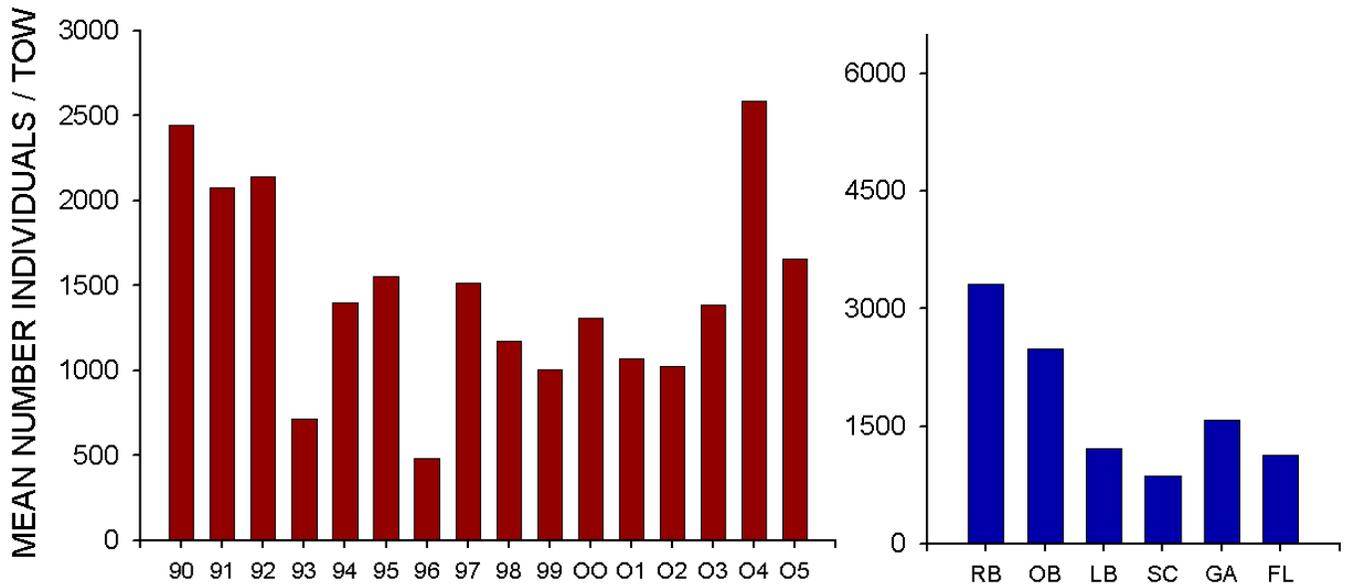


Figure 1. Stratum number is indicated at the top of each rectangle and number of trawls towed is located in the lower portion of each stratum.

Table 1. Abundance and biomass (kg) of all species collected in Spring 2004.

Rank	Species name	Individuals	Weight (kg)	Rank	Species name	Individuals	Weight (kg)	Rank	Species name	Individuals	Weight (kg)
1	<i>Opisthonema oglinum</i>	27932	383.302	42	<i>Menticirrhus littoralis</i>	179	27.189	83	<i>Trachurus lathami</i>	13	0.090
2	<i>Micropogonias undulatus</i>	22949	968.205	43	<i>Cancer irroratus</i>	175	0.722	84	<i>Callinectes sapidus</i>	13	1.873
3	<i>Cynoscion regalis</i>	22711	1986.260	44	<i>Synodus foetens</i>	168	14.315	85	<i>Caretta caretta</i>	7	303.700
4	<i>Anchoa hepsetus</i>	21630	380.891	45	<i>Harengula jaguana</i>	152	4.943	86	<i>Dasyatis centroura</i>	6	138.040
5	<i>Leiostomus xanthurus</i>	14669	702.349	46	<i>Dasyatis sayi</i>	149	197.973	87	<i>Alosa aestivalis</i>	6	0.108
6	<i>Menticirrhus americanus</i>	6574	553.602	47	<i>Libinia dubia</i>	141	1.344	88	<i>Porichthys plectrodon</i>	6	0.264
7	<i>Trichiurus lepturus</i>	4857	161.320	48	<i>Selene setapinnis</i>	138	4.185	89	<i>Chaetodipterus faber</i>	6	0.393
8	<i>Urophycis regius</i>	4473	109.323	49	<i>Citharichthys macrops</i>	118	1.741	90	<i>Aetobatus narinari</i>	5	27.890
9	<i>Brevoortia tyrannus</i>	3746	113.083	50	<i>Libinia emarginata</i>	117	4.854	91	<i>Etropus cyclosquamus</i>	5	0.044
10	<i>Stenotomus sp.</i>	3726	85.960	51	<i>Arenaeus cribrarius</i>	116	2.136	92	<i>Gymnura altavela</i>	4	115.470
11	<i>Stellifer lanceolatus</i>	3390	68.062	52	<i>Etropus crossotus</i>	114	2.455	93	<i>Arius felis</i>	4	0.480
12	<i>Prionotus carolinus</i>	3106	31.006	53	<i>Farfantepenaeus duorarum</i>	108	1.992	94	<i>Echeneis naucrates</i>	4	0.218
13	<i>Cynoscion nothus</i>	2942	54.813	54	<i>Prionotus scitulus</i>	105	3.012	95	<i>Scomberomorus cavalla</i>	4	0.599
14	<i>Lolliguncula brevis</i>	2720	26.003	55	<i>Squalus acanthias</i>	104	172.049	96	<i>Dasyatis americana</i>	3	3.542
15	<i>Anchoa mitchilli</i>	2573	4.959	56	<i>Gymnura micrura</i>	92	64.060	97	<i>Alopias vulpinus</i>	3	48.810
16	<i>Peprilus triacanthus</i>	2290	28.290	57	<i>Paralichthys dentatus</i>	88	18.042	98	<i>Odontaspis taurus</i>	2	38.170
17	<i>Mustelus canis</i>	1957	3196.443	58	<i>Sphyrna tiburo</i>	78	163.929	99	<i>Urophycis floridanus</i>	2	0.141
18	<i>Raja eglanteria</i>	1395	1474.412	59	<i>Xiphopenaeus kroyeri</i>	57	0.261	100	<i>Menidia menidia</i>	2	0.018
19	<i>Larimus fasciatus</i>	1215	35.999	60	<i>Leander tenuicornis</i>	52	0.190	101	<i>Syngnathus louisianae</i>	2	0.006
20	<i>Peprilus alepidotus</i>	1141	552.699	61	<i>Trachinotus carolinus</i>	49	7.207	102	<i>Paralichthys albigutta</i>	2	1.932
21	<i>Chloroscombrus chrysurus</i>	1112	31.655	62	<i>Pagurus pollicaris</i>	49	2.010	103	<i>Leucoraja ocellata</i>	2	4.400
22	<i>Pomatomus saltatrix</i>	912	50.928	63	<i>Paralichthys lethostigma</i>	43	15.490	104	<i>Upeneus parvus</i>	2	0.019
23	<i>Scophthalmus aquosus</i>	770	8.005	64	<i>Rimapenaeus constrictus</i>	42	0.258	105	<i>Callinectes ornatus</i>	2	0.042
24	<i>Lagodon rhomboides</i>	767	15.844	65	<i>Prionotus evolans</i>	38	0.392	106	<i>Sphyrna lewini</i>	1	1.730
25	<i>Trinectes maculatus</i>	679	16.313	66	<i>Portunus spinimanus</i>	38	0.496	107	<i>Narcine brasiliensis</i>	1	0.760
26	<i>Portunus gibbesii</i>	638	7.085	67	<i>Squilla empusa</i>	35	0.645	108	<i>Brevoortia smithi</i>	1	0.100
27	<i>Loligo sp.</i>	606	10.909	68	<i>Hepatus epheliticus</i>	32	0.833	109	<i>Archosargus probatocephalus</i>	1	0.360
28	<i>Bairdiella chrysoura</i>	581	25.322	69	<i>Prionotus tribulus</i>	31	0.408	110	<i>Menticirrhus saxatilis</i>	1	0.473
29	<i>Sardinella aurita</i>	518	6.960	70	<i>Ovalipes ocellatus</i>	29	0.268	111	<i>Mugil curema</i>	1	0.036
30	<i>Etrumeus teres</i>	479	1.568	71	<i>Rhizoprionodon terraenovae</i>	28	34.646	112	<i>Sphyrna guachancho</i>	1	0.235
31	<i>Ovalipes stephensoni</i>	420	1.412	72	<i>Centropristis striata</i>	28	1.528	113	<i>Astroscopus y-graecum</i>	1	0.018
32	<i>Myliobatis freminvillei</i>	389	1333.869	73	<i>Persephona mediterranea</i>	28	0.342	114	<i>Gobiosoma boscii</i>	1	0.001
33	<i>Sphoeroides maculatus</i>	353	29.178	74	<i>Callinectes similis</i>	28	0.254	115	<i>Scomber japonicus</i>	1	0.013
34	<i>Orthopristis chrysoptera</i>	350	25.726	75	<i>Squilla neglecta</i>	28	0.388	116	<i>Dactylopterus volitans</i>	1	0.003
35	<i>Scomberomorus maculatus</i>	288	28.612	76	<i>Menippe mercenaria</i>	19	3.169	117	<i>Chelonia mydas</i>	1	4.270
36	<i>Chilomycterus schoepfi</i>	270	79.635	77	<i>Prionotus salmonicolor</i>	18	0.227	118	<i>Dermodochelys coriacea</i>	1	200.000
37	<i>Litopenaeus setiferus</i>	269	7.814	78	<i>Astroscopus guttatus</i>	17	0.039	119	<i>Lepidochelys kempi</i>	1	19.860
38	<i>Rhinoptera bonasus</i>	217	1162.775	79	<i>Farfantepenaeus aztecus</i>	17	0.214	120	<i>Pilumnus floridanus</i>	1	0.020
39	<i>Anchoa lyolepis</i>	215	0.347	80	<i>Haemulon aurolineatum</i>	16	0.220	121	<i>Pilumnus sayi</i>	1	0.002
40	<i>Symphurus plagiusa</i>	186	6.350	81	<i>Dasyatis sabina</i>	14	20.214	122	<i>Neopanope sayi</i>	1	0.002
41	<i>Ancylopsetta quadrocellata</i>	184	3.427	82	<i>Centropristis philadelphia</i>	13	0.445				

### OVERALL ABUNDANCE



### INVERTEBRATE BIOMASS

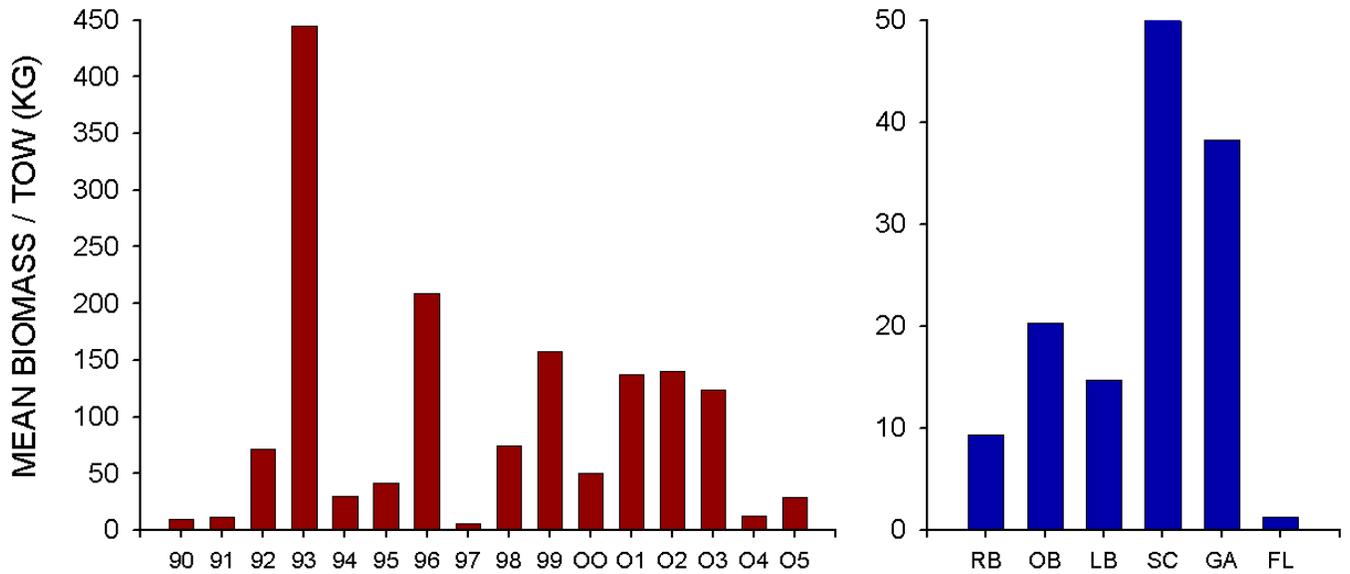


Figure 2. Annual and regional (2005) spring estimates of overall abundance and invertebrate biomass from inner strata

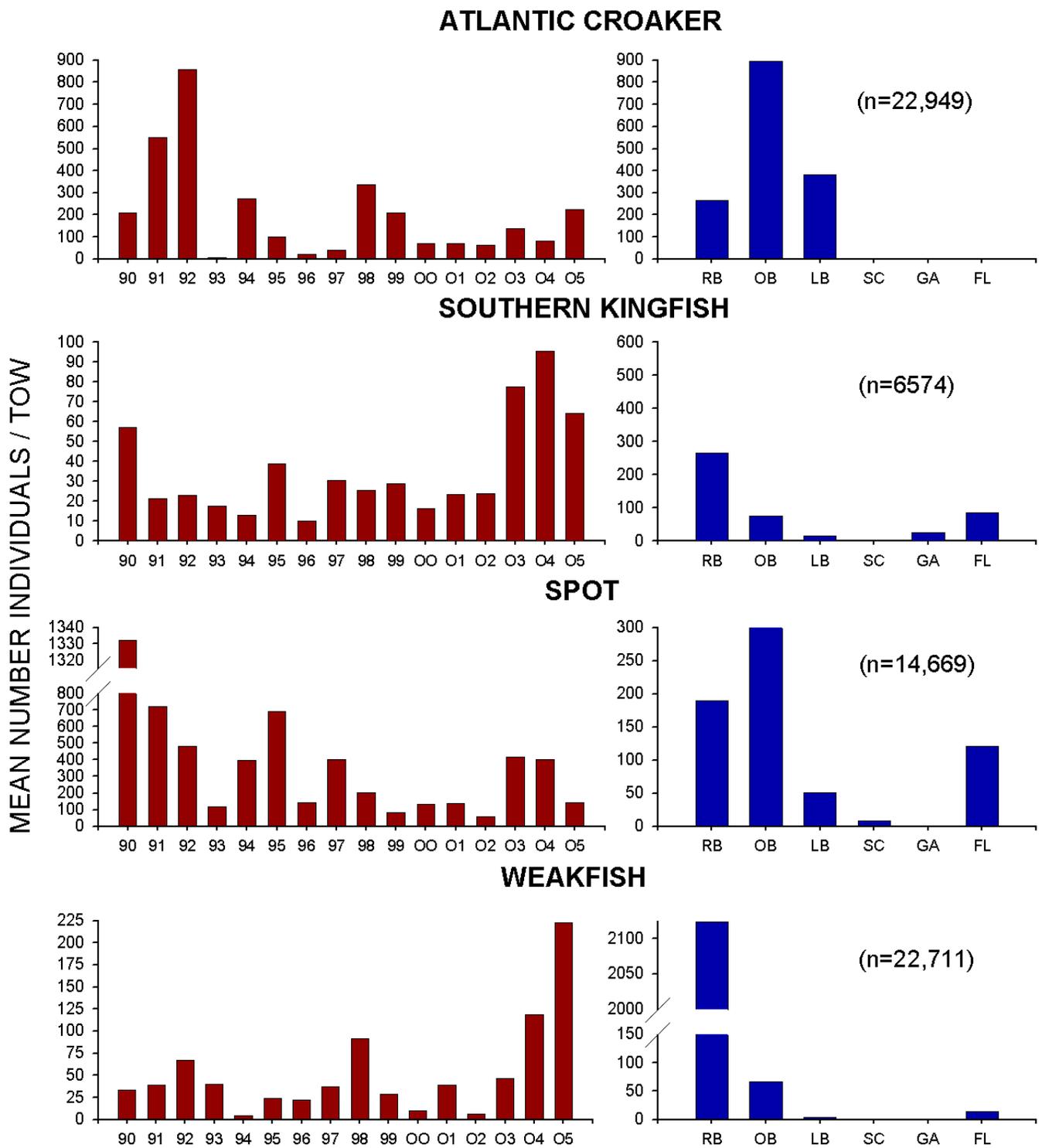


Figure 3. Annual and regional (2005) spring abundances of numerically dominant sciaenids from inner strata

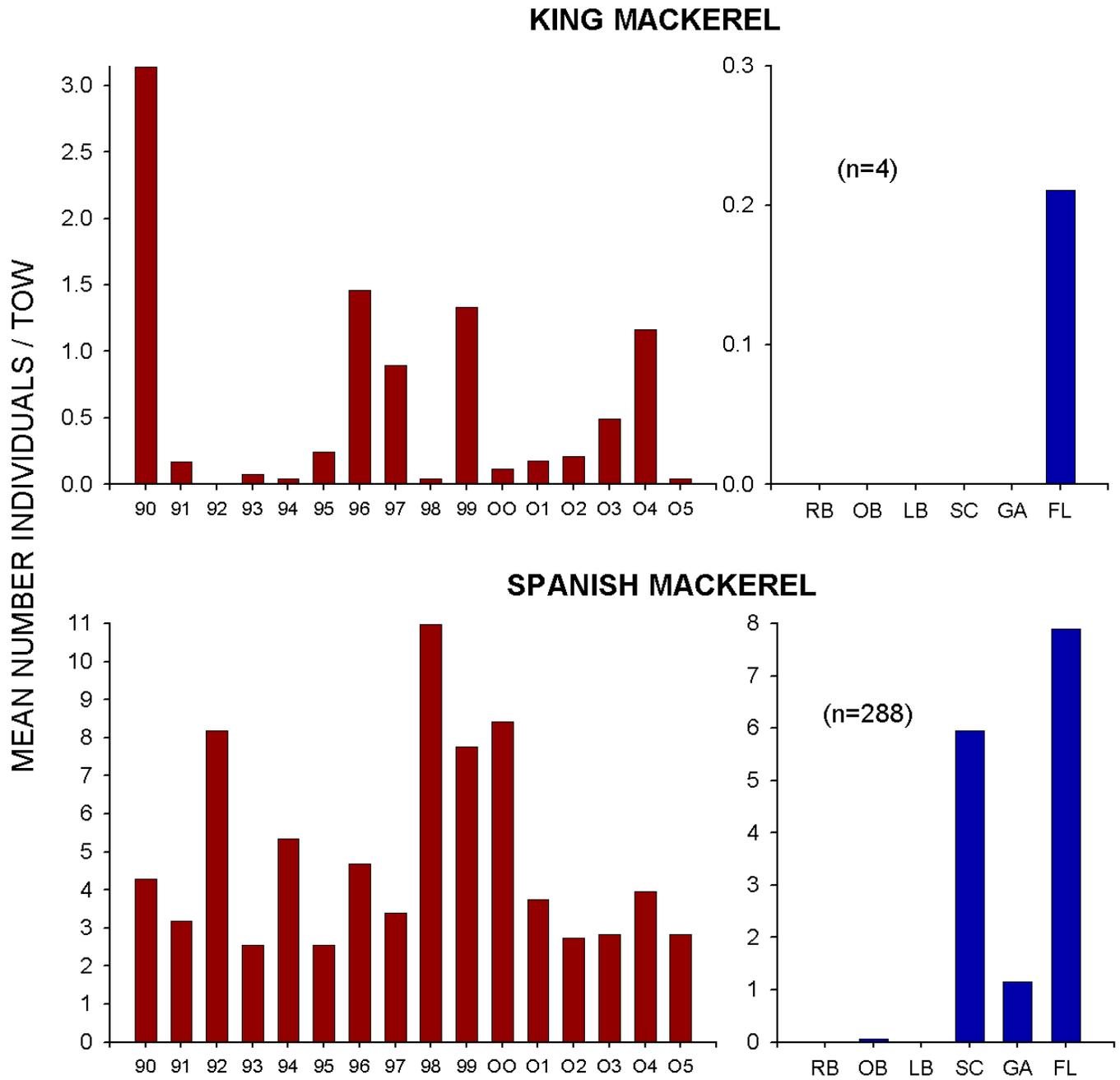


Figure 4. Annual and regional (2005) spring abundances of mackerels from inner strata

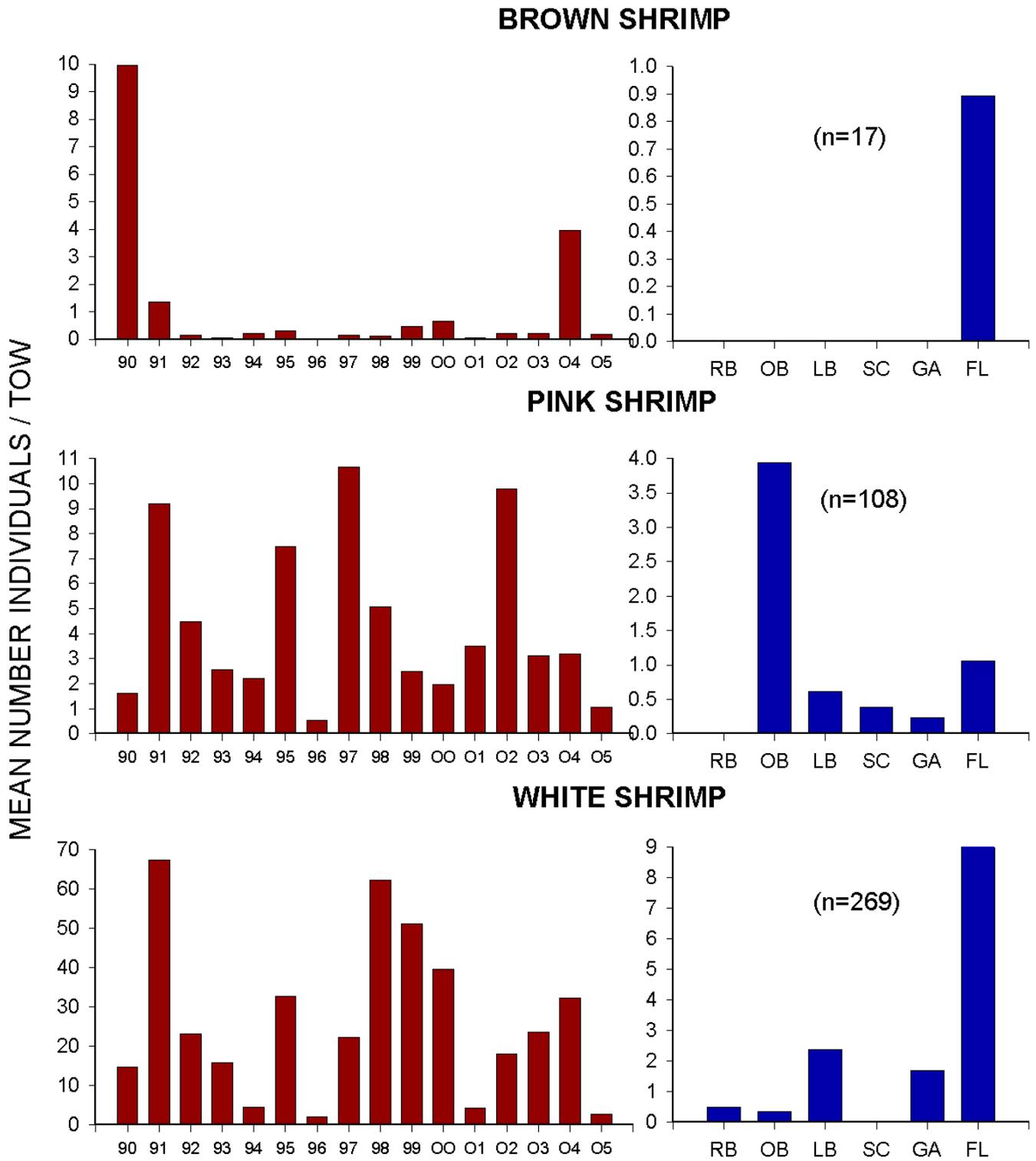


Figure 5. Annual and regional (2005) spring shrimp abundances from inner strata

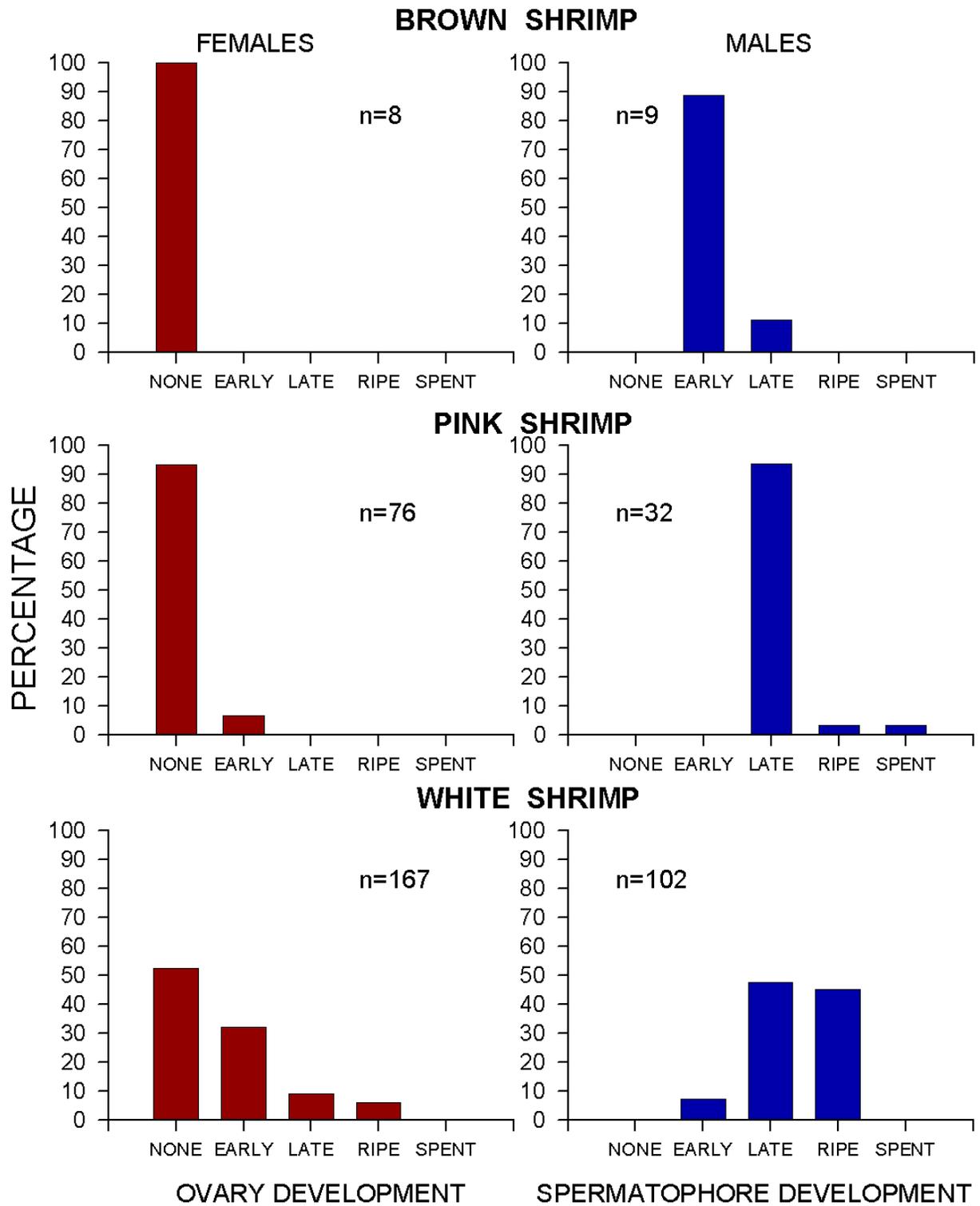


Figure 6. Shrimp gonadal development - Spring 2005