
Coastal and Estuarine Data Archaeology and Rescue Program

Biodiversity Study of Southern Biscayne Bay and Card Sound 1968 - 1973



Sponge, Biscayne Bay (South Florida Water Management District)

January 2002



US Department of Commerce
National Oceanic and Atmospheric
Administration
Silver Spring, MD



University of Miami
Rosenstiel School of Marine and
Atmospheric Science
Miami, FL

Biodiversity Study of Southern Biscayne Bay and Card Sound 1968 - 1973

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ABSTRACT

A multi-disciplinary investigation was conducted in southern Biscayne Bay and Card Sound from 1968 to 1973. The purpose of the investigation was to conduct an integrated study of the ecology of southern Biscayne Bay with special emphasis on the effects of the heated effluent from the Turkey Point fossil fuel power plant, and to predict the impact of additional effluent from the planned conversion of the plant to nuclear fuel. The results of this investigation have been discussed in numerous publications. This report contains the unpublished biology data that resulted from the investigation.

INTRODUCTION

A multi-disciplinary investigation was conducted in southern Biscayne Bay and Card Sound from 1968 to 1973. The purpose of the investigation was to conduct an integrated study of the ecology of southern Biscayne Bay with special emphasis on the effects of the heated effluent from the Turkey Point fossil fuel power plant, and to predict the impact of additional effluent from the planned conversion of the plant to nuclear fuel.

The results of this investigation have been discussed in numerous publications. Details of methodology and results can be found in Roessler and Tabb (1974).

This report contains the unpublished biology data that resulted from the investigation. The original documents are stored in the Marine Library, Rosenstiel School of Marine and Atmospheric Science, University of Miami.

METHODS

Most of the information in this section can be found in Roessler and Tabb (1974).

Stations

Initially 20 stations were chosen on a pattern radiating from the Turkey Point Power Plant (Figure 1). The transects were chosen to run northward along the shoreline, northeast parallel to the "Barge Canal", eastward on a line from the effluent canal to the Florida Keys and southeastward from the effluent canal to marker 14 of the Intracoastal Waterway system on the border of Card Sound. Five stations were located on each transect, approximately one

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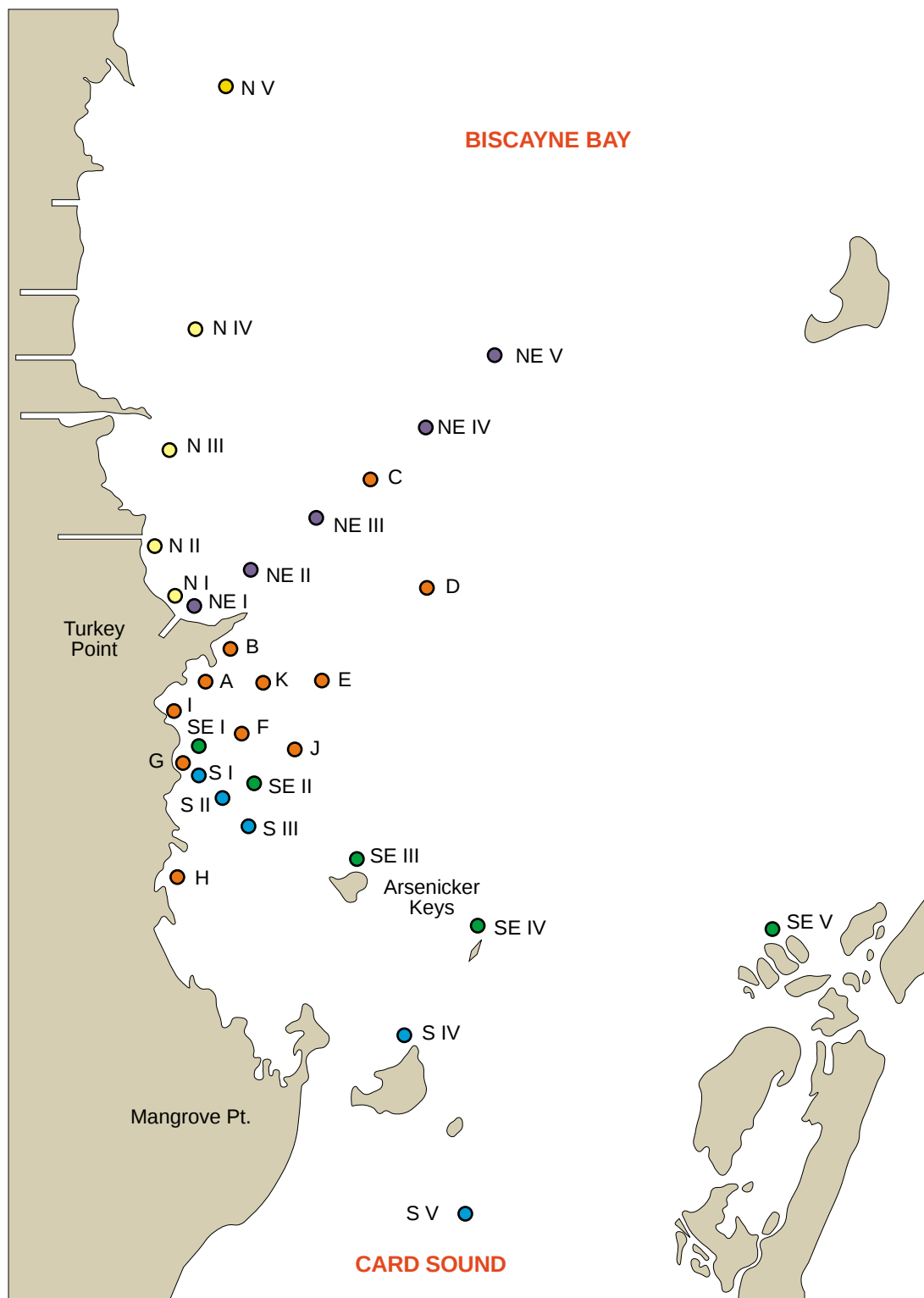


Figure 1. Sampling stations in Biscayne Bay.

quarter, one half, 1, 3, and 5 miles from the plant. Spacing of these stations varied to place them near landmarks which would facilitate finding the sites.

By the end of six months of study it was found that the effect of the thermal pollution would not reach the 3- and 5-mile stations on any of the transects while the oil burning units were in operation. However, it was still possible that the additional volume of cooling water needed for the proposed nuclear generators might increase the effected area to such an extent that the 1-mile stations would no longer serve as controls. Therefore quarterly samples were taken at the 3- and 5-mile stations from January 1969 through June 1970. An additional 8 stations (A - G) were added in Turkey Point area in order to better delineate the area of damage and to obtain controls with similar sediment type and vegetation. One of these stations, A, was added in September and routinely investigated from that period onward. This station, located off the mouth of the Little River, a minor discharge canal, showed little damage despite being close to a discharge point. This was of sufficient interest to include the area as a regular station.

In the early summer of 1969 Florida Power & Light announced a plan to change the discharge site to Card Sound. By the spring of 1970 work had begun on the extension canal to Card Sound. As a consequence stations were located in Card Sound and stations north of the plant were reduced to three control stations; B, SE IV, SE V were also discontinued. An additional 3 stations I, J, K were added in Biscayne Bay to fill in regions elevated more than 2 °C and in the mouth of the Little River where algae, *Thalassia* and *Diplanthera* were present despite high temperatures. Stations S IV and S V were reinstated as monthly stations in anticipation of potential changes when the nuclear units went on line and the discharge into Card Sound was at a peak. The sampling pattern in Biscayne Bay was adequate to monitor damage while the effluent was still discharged into Biscayne Bay and to measure if recovery occurred after the discharge was stopped. Ten stations were added in Card Sound to obtain base line data in this basin and to measure changes which probably would occur when the discharge through Model Land Company Canal begins (Figure 2).

Tables 1 and 2 are summaries of station depth, sediment type, salinity and dominant vegetation.* Four basic bottom cover types were sampled. Stations N I, N II, N III, N IV, N V, NE I, NE II, NE III, SE II, SE III, S I, S III, A, F, H, J and K were characterized by the red algae *Digenia* or *Laurencia* and the sea grass *Thalassia testudinum*. Stations B, D, E, I, NE V, SE IV, and SE V were in relatively pure turtle grass *Thalassia* communities although the grass was very sparse at NE V. Stations NE IV and C were located where there was sand and scattered *Udotea*, *Penicillus* and *Acetabularia*. Stations S IV and S V had sponges, alcyonarians and corals as the dominant bottom cover but some *Thalassia* was also present. Stations G, S I and SE I which were bare or with scattered algae and sea grasses probably belong in the first category except for the power plant effect (Zieman, 1970). Dominant vegetation varied seasonally at some stations. Species scientific and common names, and species codes listed in the original computer print outs are listed in Tables 3 and 4 sorted by scientific name as listed in the original data and common name. Currently accepted scientific names, if different from those in the original data, are listed in footnotes [Cairns *et al.* (1991); Pérez Farfante and Kensley, 1997; Robins *et al.* (1991); Turgeon *et al.* (1988); and Williams *et al.* (1988)]. An index of scientific species name is included. Representative animals were saved in the collections of the fish and invertebrate museums of the University of Miami Rosenstiel School of Marine and Atmospheric Science.

* In addition, the following parameters for the sampling stations can be found in Roessler and Tabb (1974): distance from effluent, distance from shore, sediment depth, bottom salinity (maxima and minima), bottom dissolved oxygen (maxima and minima), and bottom temperature (maxima and minima).

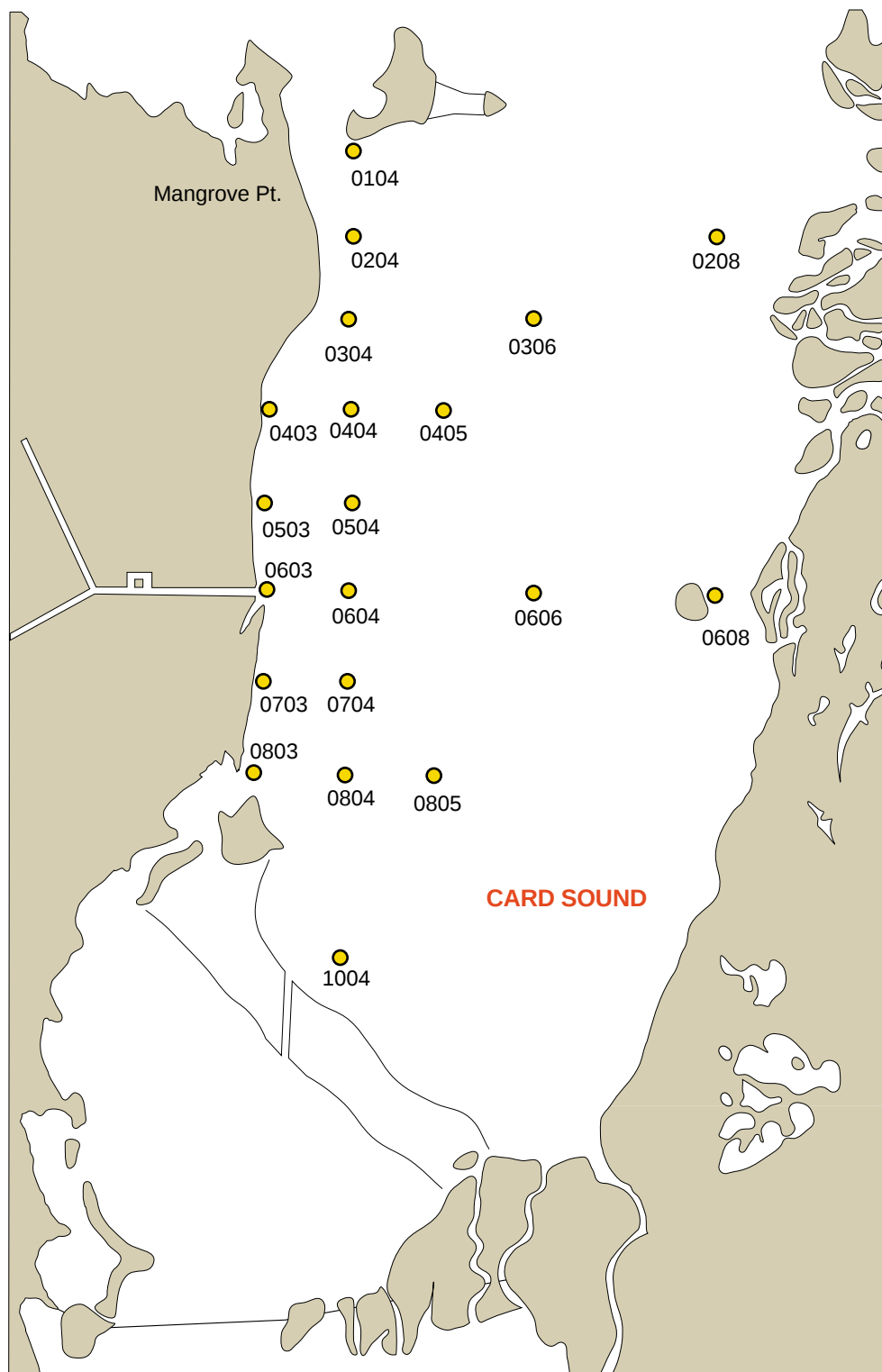


Figure 2. Sampling stations in Card Sound.

Table 1. Physical and chemical data for tow stations in southern Biscayne Bay (Roessler and Tabb, 1974).

	Sediment type	Water depth (m)	Bottom Salinity (‰)		Average pounds per tow	Dominant vegetation
			Maxima	Minima		
N I	Coarse sand and shell fragments	1.2	37.7	14.5	7.32 [◇]	<i>Laurencia, Thalassia</i> [◇]
N II	Soft mud	1.3	37.3	15.7	6.68 [◇]	<i>Laurencia, Diplanthera</i> [◇]
N III	Coarse sand, shell fragments and mud pockets	1.3	37.7	13.7	5.70 [◇]	<i>Laurencia, Thalassia</i> [◇]
N IV	Coarse sand	1.6	28.9	13.3	3.77 [◇]	<i>Laurencia, Thalassia</i> [◇]
N V	Coarse sand with some mud	1.0	20.1	5.0	17.29 [◇]	<i>Digenia, Laurencia, Thalassia</i> [◇]
NE I	Coarse sand and shell fragments	1.4	38.1	16.9	7.69 [◇]	<i>Laurencia, Diplanthera</i> [◇] and <i>Thalassia</i> [◇]
NE II	Mud and sand	1.4	38.5	18.9	9.46 [◇]	<i>Laurencia, Thalassia</i> [◇]
NE III	Coarse sand and shell fragments	1.6	38.5	20.1	5.23 [◇]	<i>Laurencia, Thalassia</i> [◇]
NE IV	Coarse sand and shell fragments	1.9	32.9	24.1	1.33 [◇]	<i>Udotea, Penicillus</i> and sponges [◇]
NE V	Sand and broken shell	2.5	32.9	24.3	0.01 [◇]	<i>Thalassia</i> [◇]
SE I	Mud and fibrous peat	1.6	38.5	19.3	1.78 [◇]	<i>Digenia</i> and peat [◇]
SE II	Sand and some mud	1.7	37.3	20.1	4.13 [◇]	<i>Laurencia, Batophora,</i> and <i>Thalassia</i> [◇]
SE III	Mud-sand	1.4	38.1	20.1	6.31 [◇]	<i>Laurencia, Thalassia</i> [◇]
SE IV	Sand and mud	1.3	34.5	23.3	1.29 [◇]	<i>Thalassia</i> and <i>Laurencia</i> [◇]
SE V	Sand and mud	1.6	35.3	27.3	0.23 [◇]	<i>Thalassia</i> [◇]

Table 1. Physical and chemical data for tow stations in southern Biscayne Bay (Roessler and Tabb, 1974) (cont.).

	Sediment type	Water depth (m)	Bottom Salinity (‰)		Average pounds per tow	Dominant vegetation
			Maxima	Minima		
S I	Soft mud	1.4	38.5	17.3	1.23 [◇]	<i>Diplanthera</i> [◇]
S II	Coarse sand and shell	1.6	38.5	19.3	3.75 [◇]	<i>Laurencia</i> and <i>Thalassia</i> [◇]
S III	Coarse sand and shell fragments	1.4	38.9	19.3	1.43 [◇]	<i>Laurencia</i> and <i>Thalassia</i> [◇]
S IV	Sand and mud with some bare rock	1.2	32.9	24.5	0.73 [◇]	Some <i>Thalassia</i> and sponges [◇]
S V	Sand	2.2	33.7	24.5	0.03 [◇]	Alcyonarians and sponges [◇]
A	Muddy sand	1.5	38.5	18.5	6.06 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
B	Sandy mud	1.4	38.5	18.9	4.53 [△]	<i>Thalassia</i> , <i>Laurencia</i> and sand [△]
C	Coarse sand and mud pockets	1.7	38.5	22.9	3.69 [△]	<i>Udotea</i> and <i>Penicillus</i> [△]
D	Sandy mud	1.0	38.5	23.3	2.00 [△]	<i>Thalassia</i> [△]
E	Sand	2.0	38.5	20.9	3.66 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
F	Sand and mud	1.7	38.5	20.1	15.79 [△]	<i>Thalassia</i> , <i>Digenia</i> and <i>Laurencia</i> [△]
G	Muddy sand and peat	1.3	38.5	18.1	0.09 [△]	<i>Acetabularia</i> (winter) and blue-green diatom mat [△]
H	Coarse sand and mud pockets	1.4	38.5	18.5	9.91 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
I	Soft mud	2.0	43.8	28.1	-	-
J	Mud and sand	1.6	43.7	30.6	-	-
K	Sand and mud	2.0	43.8	29.8	-	-

[◇] Data for July - December 1968.

[△] Data for January 1969 - June 1970

Table 2. Physical and chemical data for tow stations in Card Sound (Roessler and Tabb, 1974).

	Sediment type	Water depth (m)	Bottom _Salinity (‰)_		Average pounds per tow	Dominant vegetation
			Maxima	Minima		
0104	Muddy sand	1.5	40.9	30.4	4.57 [◇]	<i>Thalassia</i> [◇]
0204	Mud and sand	2.0	41.1	33.3	5.86 [△]	<i>Thalassia</i> and <i>Laurencia</i> [△]
0208	Calcareous sand	1.0	37.7	30.4	0.42 [◇]	<i>Thalassia</i> [◇]
0304	Sand	2.5	40.6	32.1	21.15 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
0306	Sand	2.5	39.4	35.3	4.67 [△]	<i>Thalassia</i> [△]
0403	Sand	1.0	40.8	33.7	11.47 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
0404	Sand	2.5	40.2	34.3	11.56 [△]	<i>Laurencia</i> [△]
0405	Sand	3.0	40.2	30.4	4.56 [◇]	<i>Laurencia</i> [◇]
0503	Sand and fibrous peat	1.0	41.3	30.8	10.23 [◇]	<i>Laurencia</i> [◇]
0504	Sand	3.0	40.3	30.5	7.15 [◇]	<i>Laurencia</i> [◇]
0603	Mud	2.0	41.5	30.9	3.52 [◇]	<i>Diplanthera</i> [◇]
0604	Sand	3.0	40.9	30.4	11.44 [◇]	<i>Laurencia</i> [◇]
0606	Sand and mud	3.5	40.6	35.3	10.30 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
0608	Muddy sand	2.0	41.7	30.7	0.72 [◇]	<i>Thalassia</i> [◇]
0703	Muddy sand	1.0	41.2	31.3	2.87 [◇]	<i>Laurencia</i> [◇]
0704	Sand	3.0	41.2	34.5	11.83 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
0803	Mud and sand	1.0	41.8	32.9	5.59 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
0804	Sand	3.0	41.3	34.9	18.22 [△]	<i>Laurencia</i> and <i>Thalassia</i> [△]
0805	Sand	3.0	41.2	35.3	10.75 [△]	<i>Laurencia</i> [△]
1004	Mud and sand	2.5	41.9	30.3	3.52 [◇]	<i>Laurencia</i> and <i>Thalassia</i> [◇]

[◇] Data for July 1970 - May 1971.

[△] Data for September 1970 - 1971.

Table 3. Species scientific names, codes and common names (sorted by scientific name).

Taxa 1 - Pisces

<i>Acanthostracion quadricornis</i> ¹	118520	Scrawled cowfish
<i>Achirus lineatus</i>	118020	Lined sole
<i>Acyrtops beryllinus</i>	118240	Emerald clingfish
<i>Aluterus schoepfi</i>	118340	Orange filefish
<i>Aluterus scriptus</i>	118350	Scrawled filefish
<i>Anchoa mitchilli</i>	118400	Bay anchovy
<i>Archosaurus rhomboidalis</i>	111050	Sea bream
<i>Astrapogon alutus</i>	108520	Bronze cardinalfish
<i>Astrapogon ocellata</i> ²	108521	Bluethroat pikeblenny
<i>Astrapogon stellatus</i>	108620	Conchfish
<i>Bairdiella chrysoura</i>	110660	Silver perch
<i>Balistes capriscus</i>	118370	Gray triggerfish
<i>Bothus ocellatus</i>	117410	Eyed flounder
<i>Bothus</i> sp.	117411	
<i>Calamus calamus</i>	111090	Saucereye porgy
<i>Callionymus pauciradiatus</i> ³	115720	Spotted dragonet
<i>Callionymus</i> sp.	115721	
<i>Chaenopsis ocellata</i>	115780	Bluethroat pikeblenny
<i>Chaetodipterus faber</i>	111250	Atlantic spadefish
<i>Chasmodes saburrae</i>	116130	Florida blenny
<i>Chilomycterus schoepfi</i>	118700	Stripped burrfish
<i>Citharichthys macrops</i>	117450	Spotted whiff
<i>Citharichthys spilopterus</i>	117470	Bay whiff
<i>Corythoichthys albirostris</i> ⁴	107220	Whitenose pipefish
<i>Corythoichthys brachycephalus</i> ⁵	107230	Crested pipefish
<i>Cynoscion nebulosus</i>	110700	Spotted seatrout
<i>Dactyloscopus tridigitatus</i>	115670	Sand stargazer
<i>Diplectrum formosum</i>	107820	Sand perch
<i>Eucinostomus argenteus</i>	110400	Spotfin mojarra
<i>Eucinostomus gula</i>	110410	Silver jenny
<i>Floridichthys carpio</i>	106420	Goldspotted killifish
<i>Fundulus confluentus</i>	106470	Marsh killifish
<i>Garmania macrodon</i> ⁶	112680	Margined
<i>Ginglymostoma cirratum</i>	100310	Nurse shark
<i>Gobiesox strumosus</i>	118290	Skilletfish
<i>Gobiosoma robustum</i>	112860	Code goby
<i>Gymnothorax nigromarginatus</i>	105570	Blackedge moray
<i>Haemulon aurolineatum</i>	110500	Tomtate
<i>Haemulon carbonarium</i>	110550	Caesar grunt
<i>Haemulon flavolineatum</i>	110560	French grunt

¹ *Lactophrys quadricornis*.

² *Chaenopsis ocellata*?

³ *Diplogrammus pauciradiatus*

⁴ *Cosmocampus albirostris*.

⁵ *Cosmocampus brachycephalus*.

⁶ *Gobiosoma macrodon*.

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 1 - Pisces (cont.)

<i>Haemulon parra</i>	110590	Sailors choice
<i>Haemulon plumieri</i>	110600	White grunt
<i>Haemulon sciurus</i>	110610	Bluetrsipped grunt
<i>Haemulon</i> sp. (juvenile)	110501	
<i>Harengula pensacola</i> ⁷	101690	Scaled sardine
<i>Hemipteranotus novacula</i>	111950	Pearly razorfish
<i>Hippocampus erectus</i>	107250	Lined seahorse
<i>Hippocampus zosterae</i>	107280	Dwarf seahorse
<i>Histrio histrio</i>	118880	Sargassum fish
<i>Lachnolaimus maximus</i>	111880	Hogfish
<i>Lactophrys</i> sp.	118511	
<i>Lactophrys trigonus</i>	118530	Trunkfish
<i>Lactophrys triqueter</i>	118540	Smooth trunkfish
<i>Lagodon rhomboides</i>	111150	Pinfish
<i>Lophogobius cyprinoides</i>	112910	Crested goby
<i>Lucania parva</i>	106700	Rainwater killifish
<i>Lutjanus analis</i>	108340	Mutton snapper
<i>Lutjanus apodus</i>	108350	Schoolmaster
<i>Lutjanus griseus</i>	108400	Gray snapper
<i>Lutjanus jocu</i>	108410	Dog snapper
<i>Lutjanus synagris</i>	108439	Lane snapper
<i>Micrognathus crinigerus</i> ⁸	107290	Banded pipefish?
<i>Monacanthus ciliatus</i>	118450	Fringed filefish
<i>Monacanthus hispidus</i>	118460	Planehead filefish
<i>Mycteroperca microlepis</i>	108000	Gag
<i>Narcine brasiliensis</i>	100650	Lesser electric ray
<i>Nicholsina usta</i>	111980	Emerald parrotfish
<i>Ogcocephalus nasutus</i>	118910	Shortnose batfish
<i>Ogilbia cayorum</i>	116810	Key brotula
<i>Opisthognathus maxillosus</i>	115520	Mottled jawfisf
<i>Opsanus beta</i>	118760	Gulf toadfish
<i>Orthopristis chrysoptera</i>	110620	Pigfish
<i>Paraclinus fasciatus</i>	116010	Banded blenny
<i>Paraclinus marmoratus</i>	116040	Marbled blenny
<i>Paralichthys albigutta</i>	117600	Gulf flounder
<i>Pomacanthus arcuatus</i> ⁹	111370	Gray angelfish
<i>Pomacanthus paru</i>	111360	French angelfish
<i>Porichthys porosissimus</i> ¹⁰	118810	Atlantic midshipman
<i>Prionotus scitulus</i>	113900	Leopard searobin
<i>Prionotus tribulus</i>	113930	Bighead searobin
<i>Raja texana</i>	101080	Roundel skate
<i>Rhinobatos lentiginosus</i>	100820	Atlantic guitarfish

⁷ *Harengula jaguana*?

⁸ *Micrognathus crinitus*?

⁹ *Pomacanthus aureus*?

¹⁰ *Porichthys plectrodon*?

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 1 - Pisces (cont.)

<i>Scarus coeruleus</i>	112000	Blue parrotfish
<i>Scorpaena brasiliensis</i>	113110	Barbfish
<i>Scorpaena grandicornis</i>	113140	Plumed scorpionfish
<i>Sparisoma rubripinne</i>	112080	Redfin parrotfish
<i>Sphoeroides</i> (juvenile)	118641	
<i>Sphoeroides nephelus</i>	118630	Southern puffer
<i>Sphoeroides spengleri</i>	118640	Bandtail puffer
<i>Sphoeroides testudineus</i>	118650	Checkered puffer
<i>Sphyraena barracuda</i>	117120	Great barracuda
<i>Stathmonotus hemphilli</i>	116060	Blackbelly blenny
<i>Syacium papillosum</i>	117690	Dusky flounder
<i>Symphurus plagiusa</i>	118130	Blackcheek tonguefish
<i>Syngnathus floridae</i>	107380	Dusky pipefish
<i>Syngnathus louisianae</i>	107410	Chain pipefish
<i>Syngnathus pelagicus</i>	107420	Sargassum pipefish
<i>Syngnathus scovelli</i>	107430	Gulf pipefish
<i>Synodus foetens</i>	102550	Inshore lizardfish
<i>Trinectes incriptus</i>	118040	Scrawled sole
Unidentified fish 1	100050	
Unidentified fish 2	100850	Unknown ray
Unidentified fish 3	108430	<i>Lutjanus</i> sp.
Unidentified fish 4	112951	Goby
Unidentified fish 5	120000	
Unidentified goby	112951	Goby
<i>Urolophus jamaicensis</i>	101200	Yellow stingray

Taxa 2 - Mollusca

<i>Acmaea</i> sp.	200161	
<i>Acteon punctostriatus</i> ¹¹	200430	Pitted baby bubble
<i>Aequipecten muscosus</i>	200530	Rough scallop
<i>Alabina cerithioides</i>	200551	Miniature Texas hornshell
<i>Alvania auferiana</i>	212072	West Indian alvania
<i>Alvania</i> sp.	212071	
<i>Americardia media</i>	214610	Atlantic strawberry-cockle
<i>Amygdalum papyrium</i>	200730	Atlantic papermussel
<i>Anachis avara</i>	200750	Greedy dovesnail
<i>Anachis obesa</i>	200760	Fat dovesnail
<i>Anachis pulchella</i>	200781	Beautiful dovesnail
<i>Anachis translirata</i> ¹²	200790	Well-ribbed dovesnail
<i>Anadara notabilis</i>	200910	Eared ark
<i>Anadara transversa</i>	200870	Transverse ark
<i>Anomalocardia cuneimeris</i> ¹³	201000	Pointed-venus

¹¹ *Rictaxis punctostriatus*.

¹² *Anachis lafresnayi*?

¹³ *Anomalocardia auferiana*?

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 2 - Mollusca (cont.)

<i>Anomia simplex</i>	201030	Common jingle
<i>Arca imbricata</i>	201200	Mossy ark
<i>Arca</i> sp.	201201	
<i>Arca zebra</i>	201210	Turkey wing
<i>Arcopsis adamsi</i>	201300	Adams ark
<i>Arene tricarinata</i>	201340	Gem cyclostreme
<i>Argopecten gibbus</i> ¹⁴	200470	Nucleus or Atlantic calico scallop (?)
<i>Argopecten irradians</i>	200490	Bay scallop
<i>Argopecten</i> sp.	200471	
<i>Astraea americana</i> ¹⁵	201470	American starsnail
<i>Astraea caelata</i> ¹⁶	201490	Carved starsnail
<i>Astraea phoebia</i> ¹⁷	201530	Longspined starsnail
<i>Atys caribaeus</i>	201600	Caribbean glassy-bubble
<i>Atys</i> sp.	201590	
<i>Bailya intricata</i>	201610	Intricate phos
<i>Balcis intermedia</i>	201621	Jamaican eulima
<i>Barbatia cancellaria</i>	201670	Red-brown ark
<i>Barleeia</i> sp.	212080	
<i>Batillaria minima</i>	201740	West Indian false cerith
<i>Bittium varium</i>	201810	Grass cerith
<i>Brachidontes exustus</i>	201990	Scorched mussel
<i>Bulla umbilicata</i> ¹⁸	202110	Striate bubble
<i>Bursatella leachi pleii</i>	202200	Ragged seahare
<i>Busycon spiratus</i>	202260	Pearwhelk
<i>Calliostoma adae</i>	202560	Keys topsnail
<i>Calotrophon ostrearum</i>	208940	Mauve-mouth drill
<i>Cantharus tinctus</i> ¹⁹	202500	Tinted cantharus
<i>Cardiidae</i> sp.	202531	
<i>Cardita floridana</i> ²⁰	202590	Broad-ribbed carditid
<i>Cerithidea scalariformis</i>	202830	Ladder hornsail
<i>Cerithiopsis emersoni</i>	202890	
<i>Cerithiopsis greeni</i>	202941	
<i>Cerithiopsis latum</i> ²¹	202871	Wide aclis
<i>Cerithium algicola</i>	202920	Middle-spined horn shell
<i>Cerithium eburneum</i>	202930	Ivory cerith
<i>Cerithium litteratum</i>	202950	Stocky cerith
<i>Cerithium muscarum</i>	202960	Flyspeck cerith

¹⁴ And/or *Argopecten nucleus*.

¹⁵ *Lithopoma americanum*.

¹⁶ *Lithopoma caelathum*.

¹⁷ *Astralium phoebium*.

¹⁸ *Bulla striata*?

¹⁹ *Pisania tinctoria*.

²⁰ *Carditamera floridana*.

²¹ *Aclis lata*?

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 2 - Mollusca (cont.)

<i>Cerithium</i> sp.	202971	
<i>Cerithium variable</i> ²²	202970	Variable cerith
<i>Cerodrilla thea</i>	202990	Tea drillia
<i>Chama macerophylla</i>	203020	Leafy jewelbox
<i>Chione cancellata</i>	203080	Crossed-barred venus
<i>Chione</i> sp.	203071	
<i>Chlamys benedicti</i>	203270	Benedict scallop
<i>Codakia orbicularis</i>	203530	Tiger lucine
<i>Columbella mercatoria</i>	203580	West Indian dovesnail
<i>Columbella rusticoides</i>	203590	Rusty dovesnail
<i>Columbella</i> sp. (juvenile)	203581	
<i>Congeria leucophaeata</i> ²³	203670	Dark falsemussel
<i>Conus jaspideus</i>	203780	Jasper cone
<i>Crassispira fuscescens</i>	204071	Drill
<i>Crassispira leucocyma</i> ²⁴	204072	White-knob drillia
<i>Crassispira nigrescens</i>	204073	Drill
<i>Crassispira ostrearum</i> ²⁵	204080	
<i>Crassostrea virginica</i>	204150	Eastern oyster
<i>Crenella divaricata</i>	204180	Spreading-sculpture crenella
<i>Crepidula aculeata</i>	204210	Spiny slippersnail
<i>Crepidula convexa</i> ?	201590	Convex slippersnail
<i>Crepidula fornicata</i>	204250	Common Atlantic slippersnail
<i>Crepidula glauca</i>	204220	Convex slipper shell
<i>Crepidula maculosa</i>	204240	Spotted slippersnail
<i>Crepidula plana</i>	204280	Eastern slippersnail
<i>Cumingia coarctata</i>	204390	Contracted semele
<i>Cyclostremiscus beauui</i>	204471	
<i>Cylichna krebsi</i>	204511	Bubble shell
<i>Dentalium texasianum</i>	204906	Texas tusk shell
<i>Diodora cayenensis</i>	204960	Cayenne keyhole limpet
<i>Diodora dysoni</i>	204970	
<i>Diodora listeri</i>	204980	Lister's keyhole limpet
<i>Epitonium echinaticostum</i>	205361	Wide-coil wentletrap
<i>Epitonium foliaceicostum</i>	205370	Wrinkle-rib wentletrap
<i>Epitonium rupicola</i>	205430	Brown-band wentletrap
<i>Eupleira sulcidentata</i>	205590	Sharp-rib drill
<i>Fasciolaria lilium hunteria</i>	205620	Banded tulip
<i>Fasciolaria tulipa</i>	205640	True tulip
<i>Fasciolariedae</i> sp.	205611	
<i>Felimare bayeri</i>	220001	

²² *Cerithium lutosum*?

²³ *Mytilopsis leucophaeata*.

²⁴ *Pilsbryspira leucocyma*.

²⁵ *Pyrgospira ostrearum*

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 2 - Mollusca (cont.)

<i>Gafrarium cerina</i> ²⁶	205831	Gulf pigtoe
<i>Gibberulina ovuliformis</i> ²⁷	205960	Teardrop marginella
<i>Gouldia cerina</i>	206100	Waxy gouldclam
<i>Haminoea antillarum</i>	206220	Antilles glassy-bubble
<i>Haminoea</i> sp.	206221	
<i>Heterodonax bimaculatus</i>	206290	False-bean
<i>Hyalina avena</i> ²⁸	206450	Orange-band marginella
<i>Hyalina avenacea</i> ²⁹	206460	Little oat marginella
<i>Hyalina tenuilabra</i> ³⁰	206481	Pallid marginella
<i>Hyalina torticula</i> ³¹	206490	Knave marginella
<i>Hydrobiidae</i> sp.	207410	
<i>Laevicardium laevigatum</i>	206920	Egg cockle
<i>Laevicardium mortoni</i>	206930	Morton eggcockle
<i>Lima pellucida</i>	207190	Antillean fileclam
<i>Litiopa melanostoma</i>	207411	Sargassum snail
<i>Littorina nebulosa</i>	207461	Cloudy periwinkle
<i>Lobiger souverbii</i>	207635	
<i>Lolliguncula brevis</i>	207660	Atlantic brief squid
<i>Lucapina sowerbii</i>	207680	
<i>Lucapina suffusa</i>	207690	Cancellate fleshy limpet
<i>Lyonsia beana</i> ³²	207851	Pearly entodesma
<i>Lyonsia hyalina</i>	207880	Glassy lyonsia
<i>Lyropecten antillarum</i> ³³	207890	Antillean scallop
<i>Macoma cerina</i>	207961	Waxy macoma
<i>Macoma</i> sp.	207931	
<i>Mactridae</i> sp.	208141	
<i>Mangelia</i> sp.	208131	
<i>Mangelia trilineata</i>	208152	
<i>Marginella denticulata</i>	208250	Dentate marginella
<i>Marginella</i> sp.	208239	
<i>Marginellopsis serrei</i>	208241	
<i>Microdochus</i> sp.	217071	
<i>Microdochus</i> sp.	217072	
<i>Mitra albocincta</i>	208540	Sulcate miter
<i>Mitra florida</i>	208491	Florida miter
<i>Mitra gemmata</i> ³⁴	208481	Gem miter
<i>Mitra hanlezi</i>	208482	

²⁶ *Fusconaia cerina*.

²⁷ *Granulina ovuliformis*.

²⁸ *Volvarina avena*.

²⁹ *Volvarina avenacea*?

³⁰ *Hyalina pallida*.

³¹ *Volvarina torticula*.

³² *Entodesma beana*.

³³ *Bractechlamys antillarum*.

³⁴ *Vexillum gemmatum*.

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 2 - Mollusca (cont.)

<i>Mitrella lunata</i>	208560	Lunar dovesnail
<i>Mitrella</i> sp.	208561	
<i>Modulus modiolus</i>	208630	Buttonsnail
<i>Murex cellulosus</i> ³⁵	208800	Pitted murex
<i>Murex florifer</i> ³⁶	208830	Lace murex
<i>Murex</i> sp. (juvenile)	208741	
<i>Musculus lateralis</i>	208970	Lateral mussel
<i>Nassarius albus</i>	209081	White nassa
<i>Nassarius</i> sp.	209082	
<i>Nassarius vibex</i>	209190	Bruised nassa
<i>Natica</i> sp.	209222	
<i>Neritina virginea</i>	209460	Virgin nerite
<i>Nitidella ocellata</i> ³⁷	209520	White-spot dovesnail
<i>Nitidella</i> sp.	209481	
<i>Nucula proxima</i>	209610	Atlantic nutclam
<i>Nudibranchia</i>	220000	
<i>Octopus joubini</i>	210080	Atlantic pygmy octopus
<i>Odostomia canaliculata</i>	210141	Channeled barrel-bubble
<i>Odostomia laevigata</i>	210221	
<i>Odostomia niveus</i>	210142	Milky odostome
<i>Olivella jaspidea</i> ³⁸	210350	Jasper dwarf olive
<i>Olivella mutica</i>	210321	Variable dwarf olive
<i>Oxynoe antillarum</i>	207681	Antilles oxynoe
<i>Parviturboides interruptus</i>	204471	Interrupted vitrinella
<i>Pecten ziczac</i>	210800	Zigzag scallop
<i>Persicula catenata</i>	210950	Princess marginella
<i>Persicula lavalleeana</i> ³⁹	210970	Snowflake marginella
<i>Pinctada imbricata</i>	211211	Atlantic pearl-oyster
<i>Polyplacophora</i>	230000	Chitons
<i>Prunum apicinum</i> ⁴⁰	211610	Common Atlantic marginella
<i>Prunum carneum</i> ⁴¹	211630	Orange marginella
<i>Pseudochama radians</i>	211740	Atlantic jewelbox
<i>Pteria colymbus</i>	211810	Atlantic wing-oyster
<i>Pyramidella candida</i>	211901	
<i>Pyramidella</i> sp.	211902	
<i>Pyrgocythara coxi</i> ⁴²	281501	
<i>Retusa bullata</i> ⁴³	211971	Striate barrel-bubble

³⁵ *Favartia cellulosa*.

³⁶ *Murex florifer dilectus*.

³⁷ *Mitrella ocellata*.

³⁸ *Jaspidella jaspidea*?

³⁹ *Marginella lavalleeana*.

⁴⁰ *Marginella apicina*.

⁴¹ *Marginella carnea*.

⁴² *Pyrgocythara candidissima*.

⁴³ *Acteocina bullata*.

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 2 - Mollusca (cont.)

<i>Retusa cande</i> ⁴⁴	211972	
<i>Rissoina cancellata</i>	212110	
<i>Rissoina chesneli</i> ⁴⁵	212120	
<i>Rissoina multicosata</i>	212180	
<i>Sayella crosseana</i>	212389	
<i>Seila adamsi</i>	212530	
<i>Stellatoma stellata</i>	214992	
<i>Stigmaulax sulcata</i>	209201	Grooved moonsnail
<i>Strombus costatus</i>	213220	Milk conch
<i>Tagelus plebeius</i>	213370	Stout tagelus
<i>Tegula fasciata</i>	213480	Silky tegula
<i>Teinostoma cryptospira</i>	213591	
<i>Teinostoma</i> sp.	213571	
<i>Tellina martinicensis</i>	213811	Martinique tellin
<i>Tellina mera</i>	213820	Pure tellin
<i>Tellina nitens</i>	213841	Shiny dwarf-tellin
<i>Tellina similis</i>	213890	Candystick tellin
<i>Tellina</i> sp.	213681	
<i>Tellina texana</i>	213920	Say tellin
<i>Thais haemastoma floridana</i>	214170	Florida rocksnail
<i>Trachycardium egmontianum</i>	214430	Florida pricklycockle
<i>Tricolia affinis</i>	214560	Checkered pheasant
<i>Tricolia bella</i>	214580	Shouldered pheasant
<i>Tricolia tessellata</i> ⁴⁶	214590	Checkered nerite
<i>Tridachia crispata</i>	214593	Lettuce slug
<i>Triphora nigrocincta</i>	214680	Black-line triphora
<i>Trivia quadripunctata</i>	214790	Fourspot trivia
<i>Trivia suffusa</i>	214840	Pink trivia
<i>Truncatella pulchella</i>	214861	Beautiful truncatella
<i>Turbo castanea</i>	214880	Chestnut turban
<i>Turbonilla interrupta</i>	214940	
<i>Turbonilla</i> sp.	214901	
<i>Turridae</i> sp.	214991	
Unidentified mollusk 1	210850	
Unidentified mollusk 2	217991	
<i>Venericardia</i> sp.	215170	
<i>Venericardia tridentata</i> ⁴⁷	215141	Threetooth carditid
<i>Vermicularia spirata</i>	215210	West Indian wormsnailed
<i>Volshella americanus</i> ⁴⁸	215270	American horse mussel

⁴⁴ *Acteocina cande*.

⁴⁵ *Schwartzella catesbyana*.

⁴⁶ *Nerita tessellata*?

⁴⁷ *Pleuromeris tridentata*?

⁴⁸ *Modiolus americanus*.

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 3 - Crustacea

<i>Alpheus armillatus</i>	300150	Banded snapping shrimp
<i>Alpheus formosus</i>	300160	Striped snapping shrimp
<i>Alpheus heterochaelis</i>	300170	Bigclaw snapping shrimp
<i>Alpheus normanni</i>	300190	Green snapping shrimp
Amphipoda	350000	
<i>Automate kingsleyi</i> ⁴⁹	300300	
<i>Balanus amphitrite</i>	310000	Light striped barnacle
<i>Balanus eburneus</i>	310003	Ivory barnacle
<i>Balanus improvisus</i>	310002	Bay barnacle
<i>Balanus niveus</i>	310005	Barnacle
<i>Balanus</i> sp.	310001	Barnacle
<i>Balanus tintinnabulum</i>	310004	Barnacle
<i>Callinectes ornatus</i>	300440	Shelligs
<i>Callinectes sapidus</i>	300450	Blue crab
<i>Callinectes similis</i>	300451	Lesser blue crab
<i>Callinectes</i> sp. (juvenile)	300452	Swimming crab
<i>Dromia</i> sp.	300832	Sponge crab
<i>Epialtus dilatatus</i>	300880	Winged mime crab
<i>Eucratopsis crassimanus</i>	300911	Heavyhand rubble crab
<i>Eurypanopeus depressus</i>	301010	Flatback mud crab
<i>Eurypanopeus dissimilis</i>	301011	Asymmetric mud crab
<i>Hippolysmata wurdemanni</i> ⁵⁰	301280	Peppermint shrimp
<i>Hippolyte pleuracantha</i>	301290	False zostera shrimp
<i>Latreutes fucorum</i>	301430	Slender sargassum shrimp
<i>Leander tenuicornis</i>	301450	Brown grass shrimp
<i>Lepas</i> sp.	310007	Goose barnacle
<i>Libinia dubia</i>	301510	Longnose spider crab
<i>Macrocoeloma camptoceram</i>	301640	Florida decorator crab
<i>Macrocoeloma trispinosum</i>	301650	Spongy decorator crab
<i>Menippe mercenaria</i>	301680	Florida stone crab
<i>Microphrys bicornuta</i>	301750	Speck-claw decorator crab
<i>Mithrax pleuracanthus</i>	301830	Shaggy clinging crab
<i>Mithrax spinosissimus</i>	301840	Channel clinging crab
<i>Neopanope packardii</i>	301901	Florida grassflat crab
<i>Neopanope</i> sp.	301902	
<i>Neopanope texana</i> ⁵¹	301900	Gulf grassflat crab
<i>Neopontonides beaufortensis</i>	301930	Seawhip shrimp
<i>Nibilia antilocarpa</i>	301940	Shorthorn spiny crab
<i>Paguristes tortugae</i>	302200	Bandeye hermit
<i>Pagurus bonairensis</i> ⁵²	302231	Hermit crab
<i>Palaemon floridanus</i>	302351	Florida grass shrimp
<i>Palaemonetes intermedius</i>	302410	Brackish grass shrimp

⁴⁹ *Automate evermanni*.

⁵⁰ *Lismata wurdemanni*.

⁵¹ *Dyspanopeus texana*.

⁵² *Pagurus macLaughlinae*.

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 3 - Crustacea (cont.)

<i>Panopeus herbstii</i>	302520	Atlantic mud crab
<i>Panopeus occidentalis</i>	302530	Furrowed mud crab
<i>Panulirus argus</i>	302570	Caribbean spiny lobster
<i>Pelia mutica</i>	302740	Cryptic teardrop crab
<i>Penaeus aztecus</i> ⁵³	302760	Brown shrimp
<i>Penaeus brasiliensis</i> ⁵⁴	302770	Pink-spotted shrimp
<i>Penaeus duorarum</i> ⁵⁵	302800	Pink shrimp
<i>Penaeus</i> sp. (juvenile) ⁵⁶	302821	
<i>Periclimenaeus wilsoni</i>	302890	Clear sponge shrimp
<i>Periclimenes americanus</i>	302910	American grass shrimp
<i>Periclimenes iridescens</i>	302924	
<i>Periclimenes longicaudatus</i>	302920	Longtail grass shrimp
<i>Periclimenes yucatanicus</i>	302923	Spotted cleaner shrimp
<i>Pilumnus dasypodus</i>	303040	Shortspined hairy crab
<i>Pilumnus holoserecus</i>	303061	Roseate hairy crab
<i>Pilumnus lacteus</i>	303070	Velvet hairy crab
<i>Pilumnus marshii</i>	303071	Quadrangle hairy crab
<i>Pilumnus pannosus</i>	303080	Beaded hairy crab
<i>Pilumnus spinosissimus</i>	303091	Longspined hairy crab
<i>Pitho anisodon</i>	303220	Oval urn crab
<i>Pitho mirabilis</i>	303331	
<i>Pitho therminieri</i>	303330	Broadback urn crab
<i>Podocheila riisei</i>	303380	Longfinger neck crab
<i>Portunus depressifrons</i>	303530	Flatface swimming crab
<i>Portunus gibbessi</i>	303540	Iridescent swimming crab
<i>Portunus ordwayi</i>	303560	Redhair swimming crab
<i>Portunus sebae</i>	303581	Ocellate swimming crab
<i>Portunus spinimanus</i>	303600	Blotched swimming crab
<i>Processa bermudensis</i>	303610	Bermuda night shrimp
<i>Processa</i> sp.	303611	
<i>Pseudosquilla ciliata</i>	360000	Ciliated false squilla
<i>Pycnogonida</i> ⁵⁷	320000	Sea spider
<i>Rithropanopeus harrissii</i>	303680	Harris mud crab
<i>Synalpheus fritzmuelleri</i>	304080	Speckled snapping shrimp
<i>Synalpheus longicarpus</i>	304090	
<i>Synalpheus minus</i>	304100	Minor snapping shrimp
<i>Synalpheus</i> sp.	304101	Minor snapping shrimp
<i>Synalpheus townsendi</i>	304110	Townsend snapping shrimp
<i>Thor floridanus</i>	304141	Bryozoan shrimp
<i>Tozeuma carolinense</i>	304150	Arrow shrimp
<i>Tyche emarginata</i>	304180	Fourhorn crab
<i>Uca minax</i>	304190	Redjoined fiddler

⁵³ *Farfantepenaeus aztecus*.

⁵⁴ *Farfantepenaeus brasiliensis*.

⁵⁵ *Farfantepenaeus duorarum*.

⁵⁶ *Farfantepenaeus* spp. juvenile.

⁵⁷ Class Pycnogonida included in this taxa.

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont).

Taxa 4 - Polychaeta

Ampharetidae	400100
Amphinomidae	400200
Aphroditidae	400300
Arenicolidae	400500
Capitellidae	400600
Chaetopteridae	400700
Chrysopetalidae	400800
Cirratulidae	400900
Ctenodrilidae	401000
Dorvilleidae	401100
Eunicidae	401200
Flabelligeridae	401300
Glyceridae	401400
Goniadidae	401500
Hesionidae	401600
Lumbrineridae	401700
Lysaretidae	401800
Maldanidae	402000
Naiadidae	402100
Nephtyidae	402200
Nereidae	402300
Onuphidae	402400
Opheliidae	402500
Orbiniidae	402600
Pectinariidae	402900
Phyllodocidae	403000
Polynoidae	403200
Polyodontidae	403300
Sabellariidae	403400
Sabellidae	403500
Serpulidae	403600
Sigalionidae	403700
Spionidae	403800
Syllidae	403900
Terebellidae	404000
Tomopteridae	404100

Taxa 5 - Porifera

<i>Aaptose aaptose</i>	510001	
<i>Chondrilla nucula</i>	500900	Chicken liver sponge
<i>Cinachyra cavernosa</i>	500530	
<i>Clione</i> sp.	500441	Boring sponge
<i>Dysidea etheria</i>	500141	Heavenly blue sponge
<i>Geodia gibberosa</i>	500520	White sponge
<i>Haliclona molitba</i>	500191	Purple sponge
<i>Haliclona viridis</i>	500200	Green sponge

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont.).

Taxa 5 - Porifera (cont.)

<i>Hippospongia lachne</i>	500040	Sheepswool sponge
<i>Ircinia campana</i>	500080	Vase sponge
<i>Ircinia fasciculata</i>	500070	Stinker sponge
<i>Ircinia</i> sp.	500091	
<i>Ircinia strobilina</i>	500090	Cake sponge
<i>Neopetrosia longleyi</i>	500210	Sprawling sponge
<i>Oligoceras hemorrhages</i>	500909	Bleeding sponge
<i>Scypha</i> sp.	501000	
<i>Spheciospongia vesparia</i>	500400	Loggerhead sponge
<i>Spongia barbara</i>	500010	
<i>Spongia cheiris</i>	500011	Glove sponge
<i>Spongia graminea</i>	500020	Grass sponge
<i>Tedania ignis</i>	500990	Fire sponge
<i>Tethya diploderma</i>	500480	Golf ball sponge
Unidentified sponge 1	500998	Black tar
Unidentified sponge 2	500993	Common yellow
Unidentified sponge 3	500997	Red cedar
Unidentified sponge 4	500992	Smooth brown (suede)
Unidentified sponge 5	500999	
<i>Verongia</i> sp.	500101	Branding sponge

Taxa 6 - Cnidaria

Actiniaria	600120	Anemones
<i>Aurelia aurita</i>	600111	Moon jelly
<i>Cassiopea xamachana</i>	600011	Upsidedown jellyfish
<i>Condylactis gigantea</i>	600130	Giant Caribbean anemone
<i>Erythropodium polyanthes</i> ⁵⁸	600250	Sea fan
<i>Eunicea</i> sp.	600200	
Hydrozoa	600310	
<i>Manicina areolata</i>	600010	Rose coral
<i>Millepora alcicornis</i>	600100	Fire coral
<i>Muricea elongata</i>	600240	
<i>Porites porites</i>	600020	Finger coral
<i>Pseudoptergorgia acerosa</i>	600220	Purple sea plume
<i>Pterogorgia</i> sp.	600210	Sea plume
Scyphozoa	600110	Jellyfish
<i>Siderastrea siderea</i>	600030	Massive starlet coral
<i>Solenastrea hyades</i>	600040	Knobby star coral
Unidentified gorgoniidae	600230	

⁵⁸ *Erythropodium caribaeorum*.

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont.).

Taxa 7 - Echinodermata		
<i>Amphiodia pulchella</i>	702500	Brittle star
<i>Amphioplus thrombodes</i>	702571	Brittle star
<i>Amphipholis pachybactera</i>	702480	Brittle star
<i>Amphipholis squamata</i>	702471	Brittle star
<i>Amphiura stimpsoni</i>	702420	Brittle star
<i>Chiridota rotifera</i>	704660	Sea cucumber
Cucumariidae	704301	Sea cucumber
<i>Diadema antillarum</i>	700240	Long-spined urchin
<i>Echinaster sentus</i>	701320	Thorny starfish
<i>Leptosynapta parvipatina</i>	704641	Sticky sea cucumber
<i>Ludwigothuria floridana</i>	704210	Sea cucumber
<i>Ludwigothuria floridana</i> x <i>L. mexc.</i>	704211	Sea cucumber
<i>Luidia alternata</i>	700900	Banded luidia
<i>Lytechinus variegatus</i>	700280	Variegated urchin
<i>Ophiactis savigni</i>	702650	Savigny's brittle star
<i>Ophiocomella ophiactoides</i>	702791	Coraline brittle star
<i>Ophioderma brevispinum</i>	702860	Short spine brittle star
<i>Ophionereis reticulata</i>	702760	Reticulate brittle star
<i>Ophionereis squamulosa</i>	702761	Brittle star
<i>Ophiophragmus filigraneus</i>	702440	Brittle star
<i>Ophiophragmus pulcher</i>	702443	Brittle star
<i>Ophiophragmus</i> sp.	702441	Brittle star
<i>Ophiopsila riisei</i>	702830	Brittle star
<i>Ophiostigma isacanthum</i>	702490	Brittle star
<i>Ophiothrix orstedii</i>	702690	Oersted'd brittle star
Unidentified brittlestar	701551	Brittle star
Taxa 8 - Miscellaneous worms		
Hirudinea	804110	Leaches
Nemertea	800030	Ribbon worms
<i>Platyhelminthes</i> sp.	800010	Flat worms
Sipunculids	800020	Peanut worms
Taxa 9 - Miscellaneous taxa		
Bryozoans (Ectoprocta)	900010	Moss animals
Tunicates (Ascidacea)	900011	Sea squirts

Table 4. Species scientific names, codes and common names (sorted by common name).

Taxa 1 - Pisces

	117411	<i>Bothus</i> sp.
	115721	<i>Callionymus</i> sp.
	110501	<i>Haemulon</i> sp. (juvenile)
	118511	<i>Lactophrys</i> sp.
	118641	<i>Sphoeroides</i> (juvenile)
	100050	Unidentified fish 1
	120000	Unidentified fish 5
Atlantic guitarfish	100820	<i>Rhinobatos lentiginosus</i>
Atlantic midshipman	118810	<i>Porichthys porosissimus</i>
Atlantic spadefish	111250	<i>Chaetodipterus faber</i>
Banded blenny	116010	<i>Paraclinus fasciatus</i>
Banded pipefish?	107290	<i>Micrognathus crinigerus</i>
Bandtail puffer	118640	<i>Sphoeroides spengleri</i>
Bay anchovy	118400	<i>Anchoa mitchilli</i>
Barbfish	113110	<i>Scorpaena brasiliensis</i>
Bay whiff	117470	<i>Citharichthys spilopterus</i>
Bighead searobin	113930	<i>Prionotus tribulus</i>
Blackbelly blenny	116060	<i>Stathmonotus hemphilli</i>
Blackcheek tonguefish	118130	<i>Symphurus plagiusa</i>
Blackedge moray	105570	<i>Gymnothorax nigromarginatus</i>
Blue parrotfish	112000	<i>Scarus coeruleus</i>
Bluethroat pikeblenny?	108521	<i>Astrapogon ocellata</i>
Bluethroat pikeblenny	115780	<i>Chaenopsis ocellata</i>
Bluetrapped grunt	110610	<i>Haemulon sciurus</i>
Bronze cardinalfish	108520	<i>Astrapogon alutus</i>
Caesar grunt	110550	<i>Haemulon carbonarium</i>
Chain pipefish	107410	<i>Syngnathus louisianae</i>
Checkered puffer	118650	<i>Sphoeroides testudineus</i>
Code goby	112860	<i>Gobiosoma robustum</i>
Conchfish	108620	<i>Astrapogon stellatus</i>
Crested goby	112910	<i>Lophogobius cyprinoides</i>
Crested pipefish	107230	<i>Corythoichthys brachycephalus</i>
Dog snapper	108410	<i>Lutjanus jocu</i>
Dusky flounder	117690	<i>Syacium papillosum</i>
Dusky pipefish	107380	<i>Syngnathus floridae</i>
Dwarf seahorse	107280	<i>Hippocampus zosterae</i>
Emerald clingfish	118240	<i>Acyrtops beryllinus</i>
Emerald parrotfish	111980	<i>Nicholsina usta</i>
Eyed flounder	117410	<i>Bothus ocellatus</i>
Florida blenny	116130	<i>Chasmodes saburrae</i>
French angelfish	111360	<i>Pomacanthus paru</i>
French grunt	110560	<i>Haemulon flavolineatum</i>
Fringed filefish	118450	<i>Monacanthus ciliatus</i>
Gag	108000	<i>Mycteroperca microlepis</i>
Goby	112951	Unidentified fish 4
Goby	112951	Unidentified goby
Goldspotted killifish	106420	<i>Floridichthys carpio</i>

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 1 - Pisces (cont.)

Gray angelfish	111370	<i>Pomacanthus aureus</i>
Gray snapper	108400	<i>Lutjanus griseus</i>
Gray triggerfish	118370	<i>Balistes capriscus</i>
Great barracuda	117120	<i>Sphyræna barracuda</i>
Gulf flounder	117600	<i>Paralichthys albigutta</i>
Gulf pipefish	107430	<i>Syngnathus scovelli</i>
Gulf toadfish	118760	<i>Opsanus beta</i>
Hogfish	111880	<i>Lachnolaimus maximus</i>
Inshore lizardfish	102550	<i>Synodus foetens</i>
Key brotula	116810	<i>Ogilbia cayorum</i>
Lane snapper	108439	<i>Lutjanus synagris</i>
Leopard searobin	113900	<i>Prionotus scitulus</i>
Lesser electric ray	100650	<i>Narcine brasiliensis</i>
Lined seahorse	107250	<i>Hippocampus erectus</i>
Lined sole	118020	<i>Achirus lineatus</i>
<i>Lutjanus</i> sp.	108430	Unidentified fish 3
Marbled blenny	116040	<i>Paraclinus marmoratus</i>
Margined	112680	<i>Garmania macrodon</i>
Marsh killifish	106470	<i>Fundulus confluentus</i>
Mottled jawfish	115520	<i>Opisthognathus maxillosus</i>
Mutton snapper	108340	<i>Lutjanus analis</i>
Nurse shark	100310	<i>Ginglymostoma cirratum</i>
Orange filefish	118340	<i>Aluterus schoepfi</i>
Pearly razorfish	111950	<i>Hemipteranotus novacula</i>
Pigfish	110620	<i>Orthopristis chrysoptera</i>
Pinfish	111150	<i>Lagodon rhomboides</i>
Planehead filefish	118460	<i>Monacanthus hispidus</i>
Plumed scorpionfish	113140	<i>Scorpaena grandicornis</i>
Rainwater killifish	106700	<i>Lucania parva</i>
Redfin parrotfish	112080	<i>Sparisoma rubripinne</i>
Roundel skate	101080	<i>Raja texana</i>
Sailors choice	110590	<i>Haemulon parra</i>
Sand perch	107820	<i>Diplectrum formosum</i>
Sand stargazer	115670	<i>Dactyloscopus tridigitatus</i>
Sargassum fish	118880	<i>Histrio histrio</i>
Sargassum pipefish	107420	<i>Syngnathus pelagicus</i>
Saucereye porgy	111090	<i>Calamus calamus</i>
Scaled sardine	101690	<i>Harengula pensacola</i>
Schoolmaster	108350	<i>Lutjanus apodus</i>
Scrawled cowfish	118520	<i>Acanthostracion quadricornis</i>
Scrawled filefish	118350	<i>Aluterus scriptus</i>
Scrawled sole	118040	<i>Trinectes incriptus</i>
Sea bream	111050	<i>Archosaurus rhomboidalis</i>
Shortnose batfish	118910	<i>Ogcocephalus nasutus</i>
Silver jenny	110410	<i>Eucinostomus gula</i>
Silver perch	110660	<i>Bairdiella chrysoura</i>
Skilletfish	118290	<i>Gobiesox strumosus</i>

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 1 - Pisces (cont.)

Smooth trunkfish	118540	<i>Lactophrys triqueter</i>
Southern puffer	118630	<i>Sphoeroides nephelus</i>
Spotfin mojarra	110400	<i>Eucinostomus argenteus</i>
Spotted dragonet	115720	<i>Callionymus pauciradiatus</i>
Spotted seatrout	110700	<i>Cynoscion nebulosus</i>
Spotted whiff	117450	<i>Citharichthys macrops</i>
Stripped burrfish	118700	<i>Chilomycterus schoepfi</i>
Tomtate	110500	<i>Haemulon aurolineatum</i>
Trunkfish	118530	<i>Lactophrys trigonus</i>
Unknown ray	100850	Unidentified fish 2
White grunt	110600	<i>Haemulon plumieri</i>
Whitenose pipefish	107220	<i>Corythoichthys albirostris</i>
Yellow stingray	101200	<i>Urolophus jamaicensis</i>

Taxa 2 - Mollusca

200161	<i>Acmaea</i> sp.
212071	<i>Alvania</i> sp.
201201	<i>Arca</i> sp.
200471	<i>Argopecten</i> sp.
201590	<i>Atys</i> sp.
212080	<i>Barleeia</i> sp.
202531	<i>Cardiidae</i> sp.
202890	<i>Cerithiopsis emersoni</i>
202941	<i>Cerithiopsis greeni</i>
202971	<i>Cerithium</i> sp.
203071	<i>Chione</i> sp.
203581	<i>Columbella</i> sp. (juvenile)
204080	<i>Crassispira ostrearum</i>
204471	<i>Cyclostremiscus beauii</i>
204970	<i>Diodora dysoni</i>
205611	<i>Fasciolariedae</i> sp.
220001	<i>Felimare bayeri</i>
206221	<i>Haminoea</i> sp.
207410	<i>Hydrobiidae</i> sp.
207635	<i>Lobiger souverbii</i>
207680	<i>Lucapina sowerbii</i>
207931	<i>Macoma</i> sp.
208141	<i>Mactridae</i> sp.
208131	<i>Mangelia</i> sp.
208152	<i>Mangelia trilineata</i>
208239	<i>Marginella</i> sp.
208241	<i>Marginellopsis serrei</i>
217071	<i>Microdochus</i> sp.
217072	<i>Microdochus</i> sp.
208482	<i>Mitra hanlezi</i>
208561	<i>Mitrella</i> sp.

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 1 - Mollusca (cont.)

	208741	<i>Murex</i> sp. (juvenile)
	209082	<i>Nassarius</i> sp.
	209222	<i>Natica</i> sp.
	209481	<i>Nitidella</i> sp.
	220000	Nudibranchia
	210221	<i>Odostomia laevigata</i>
	211901	<i>Pyramidella candida</i>
	211902	<i>Pyramidella</i> sp.
	281501	<i>Pyrgocythara coxi</i>
	211972	<i>Retusa cande</i>
	212110	<i>Rissoina cancellata</i>
	212120	<i>Rissoina chesneli</i>
	212180	<i>Rissoina multicostata</i>
	212389	<i>Sayella crosseana</i>
	212530	<i>Seila adamsi</i>
	214992	<i>Stellatoma stellata</i>
	213591	<i>Teinostoma cryptospira</i>
	213571	<i>Teinostoma</i> sp.
	213681	<i>Tellina</i> sp.
	214940	<i>Turbonilla interrupta</i>
	214901	<i>Turbonilla</i> sp.
	214991	<i>Turridae</i> sp.
	210850	Unidentified mollusk 1
	217991	Unidentified mollusk 2
	215170	<i>Venericardia</i> sp.
Adams ark	201300	<i>Arcopsis adamsi</i>
American horsemussel	215270	<i>Volsella americanus</i>
American starsnail	201470	<i>Astraea americana</i>
Antillean fileclam	207190	<i>Lima pellucida</i>
Antillean scallop	207890	<i>Lyropecten antillarum</i>
Antilles glassy-bubble	206220	<i>Haminoea antillarum</i>
Antilles oxynoe	207681	<i>Oxynoe antillarum</i>
Atlantic brief squid	207660	<i>Lolliguncula brevis</i>
Atlantic jewelbox	211740	<i>Pseudochama radians</i>
Atlantic nutclam	209610	<i>Nucula proxima</i>
Atlantic papermussel	200730	<i>Amygdalum papyrium</i>
Atlantic pearl-oyster	211211	<i>Pinctada imbricata</i>
Atlantic pygmy octopus	210080	<i>Octopus joubini</i>
Atlantic strawberry-cockle	214610	<i>Americardia media</i>
Atlantic wing-oyster	211810	<i>Pteria colymbus</i>
Banded tulip	205620	<i>Fasciolaria lilium hunteria</i>
Bay scallop	200490	<i>Argopecten irradians</i>
Beautiful dovesnail	200781	<i>Anachis pulchella</i>
Beautiful truncatella	214861	<i>Truncatella pulchella</i>
Benedict scallop	203270	<i>Chlamys benedicti</i>
Black-line triphora	214680	<i>Triphora nigrocincta</i>
Broad-ribbed carditid	202590	<i>Cardita floridana</i>

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 1 - Mollusca (cont.)

Brown-band wentletrap	205430	<i>Epitonium rupicola</i>
Bruised nassa	209190	<i>Nassarius vibex</i>
Bubble shell	204511	<i>Cylichna krebsi</i>
Buttonsnail	208630	<i>Modulus modulus</i>
Cancellate fleshy limpet	207690	<i>Lucapina suffusa</i>
Candystick tellin	213890	<i>Tellina similis</i>
Caribbean glassy-bubble	201600	<i>Atys caribaeus</i>
Carved starsnail	201490	<i>Astraea caelata</i>
Cayenne keyhole limpet	204960	<i>Diodora cayenensis</i>
Channeled barrel-bubble	210141	<i>Odostomia canaliculata</i>
Checkered nerite	214590	<i>Tricolia tessellata</i>
Checkered pheasant	214560	<i>Tricolia affinis</i>
Chestnut turban	214880	<i>Turbo castanea</i>
Chitons	230000	Polyplacophora
Cloudy periwinkle	207461	<i>Littorina nebulosa</i>
Common Atlantic marginella	211610	<i>Prunum apicinum</i>
Common Atlantic slippersnail	204250	<i>Crepidula fornicata</i>
Common jingle	201030	<i>Anomia simplex</i>
Contracted semele	204390	<i>Cumingia coarctata</i>
Convex slipper shell	204220	<i>Crepidula glauca</i>
Convex slippersnail	201590	<i>Crepidula convexa?</i>
Crossed-barred venus	203080	<i>Chione cancellata</i>
Dark falsemussel	203670	<i>Congerius leucophaeata</i>
Dentate marginella	208250	<i>Marginella denticulata</i>
Drill	204071	<i>Crassispira fuscescens</i>
Drill	204073	<i>Crassispira nigrescens</i>
Eared ark	200910	<i>Anadara notabilis</i>
Eastern oyster	204150	<i>Crassostrea virginica</i>
Eastern slippersnail	204280	<i>Crepidula plana</i>
Egg cockle	206920	<i>Laevicardium laevigatum</i>
False-bean	206290	<i>Heterodonax bimaculatus</i>
Fat dovesnail	200760	<i>Anachis obesa</i>
Florida miter	208491	<i>Mitra florida</i>
Florida pricklycockle	214430	<i>Trachycardium egmontianum</i>
Florida rocksnail	214170	<i>Thais haemastoma floridana</i>
Flyspeck cerith	202960	<i>Cerithium muscarum</i>
Fourspot trivia	214790	<i>Trivia quadripunctata</i>
Gem cyclostreme	201340	<i>Arene tricarinata</i>
Gem miter	208481	<i>Mitra gemmata</i>
Glassy lyonsia	207880	<i>Lyonsia hyalina</i>
Grass cerith	201810	<i>Bittium varium</i>
Greedy dovesnail	200750	<i>Anachis avara</i>
Grooved moonsnail	209201	<i>Stigmaulax sulcata</i>
Gulf pigtoe	205831	<i>Gafrarium cerina</i>
Interrupted vitrinella	204471	<i>Parviturboides interruptus</i>
Intricate phos	201610	<i>Bailya intricata</i>
Ivory cerith	202930	<i>Cerithium eburneum</i>

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 1 - Mollusca (cont.)

Jamaican eulima	201621	<i>Balcis intermedia</i>
Jasper cone	203780	<i>Conus jaspideus</i>
Jasper dwarf olive	210350	<i>Olivella jaspidea</i>
Keys topsnail	202560	<i>Calliostoma adela</i>
Knave marginella	206490	<i>Hyalina torticula</i>
Lace murex	208830	<i>Murex florifer</i>
Ladder hornsnail	202830	<i>Cerithidea scalariformis</i>
Lateral mussel	208970	<i>Musculus lateralis</i>
Leafy jewelbox	203020	<i>Chama macerophylla</i>
Lettuce slug	214593	<i>Tridachia crispata</i>
Lister's keyhole limpet	204980	<i>Diodora listeri</i>
Little oat marginella	206460	<i>Hyalina avenacea</i>
Longspined starsnail	201530	<i>Astraea phoebia</i>
Lunar dovesnail	208560	<i>Mitrella lunata</i>
Martinique tellin	213811	<i>Tellina martinicensis</i>
Mauve-mouth drill	208940	<i>Calotrophon ostrearum</i>
Middle-spined horn shell	202920	<i>Cerithium algicola</i>
Milk conch	213220	<i>Strombus costatus</i>
Milky odostome	210142	<i>Odostomia niveus</i>
Miniature Texas hornshell	200551	<i>Alabina cerithioides</i>
Morton eggcockle	206930	<i>Laevicardium mortoni</i>
Mossy ark	201200	<i>Arca imbricata</i>
Nucleus or Atlantic calico scallop (?)	200470	<i>Argopecten gibbus</i>
Orange marginella	211630	<i>Prunum carneum</i>
Orange-band marginella	206450	<i>Hyalina aven</i>
Pallid marginella	206481	<i>Hyalina tenuilabra</i>
Pearly entodesma	207851	<i>Lyonsia beana</i>
Pearwhelk	202260	<i>Busycon spiratus</i>
Pink trivia	214840	<i>Trivia suffusa</i>
Pitted baby bubble	200430	<i>Acteon punctostriatus</i>
Pitted murex	208800	<i>Murex cellulosus</i>
Pointed-venus	201000	<i>Anomalocardia cuneimeris</i>
Princess marginella	210950	<i>Persicula catenata</i>
Pure tellin	213820	<i>Tellina mera</i>
Ragged seahare	202200	<i>Bursatella leachi pleii</i>
Red-brown ark	201670	<i>Barbatia cancellaria</i>
Rough scallop	200530	<i>Aequipecten muscosus</i>
Rusty dovesnail	203590	<i>Columbella rusticoidea</i>
Sargassum snail	207411	<i>Litiopa melanostoma</i>
Say tellin	213920	<i>Tellina texana</i>
Scorched mussel	201990	<i>Brachidontes exustus</i>
Sharp-rib drill	205590	<i>Eupleira sulcidentata</i>
Shiny dwarf-tellin	213841	<i>Tellina nitens</i>
Shouldered pheasant	214580	<i>Tricolia bella</i>
Silky tegula	213480	<i>Tegula fasciata</i>
Snowflake marginella	210970	<i>Persicula lavalleana</i>
Spiny slippersnail	204210	<i>Crepidula aculeata</i>

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 1 - Mollusca (cont.)

Spotted slippersnail	204240	<i>Crepidula maculosa</i>
Spreading-sculpture crenella	204180	<i>Crenella divaricata</i>
Stocky cerith	202950	<i>Cerithium litteratum</i>
Stout tagelus	213370	<i>Tagelus plebeius</i>
Striate barrel-bubble	211971	<i>Retusa bullata</i>
Striate bubble	202110	<i>Bulla umbilicata</i>
Sulcate miter	208540	<i>Mitra albocincta</i>
Tea drillia	202990	<i>Cerodrilla thea</i>
Teardrop marginella	205960	<i>Gibberulina ovuliformis</i>
Texas tusk shell	204906	<i>Dentalium texasianum</i>
Threetooth carditid	215141	<i>Venericardia tridentata</i>
Tiger lucine	203530	<i>Codakia orbicularis</i>
Tinted cantharus	202500	<i>Cantharus tinctus</i>
Transverse ark	200870	<i>Anadara transversa</i>
True tulip	205640	<i>Fasciolaria tulipa</i>
Turkey wing	201210	<i>Arca zebra</i>
Variable cerith	202970	<i>Cerithium variable</i>
Variable dwarf olive	210321	<i>Olivella mutica</i>
Virgin nerite	209460	<i>Neritina virginea</i>
Waxy gouldclam	206100	<i>Gouldia cerina</i>
Waxy macoma	207961	<i>Macoma cerina</i>
Well-ribbed dovesnail	200790	<i>Anachis translirata</i>
West Indian alvania	212072	<i>Alvania auferiana</i>
West Indian dovesnail	203580	<i>Columbella mercatoria</i>
West Indian false cerith	201740	<i>Batillaria minima</i>
West Indian wormsail	215210	<i>Vermicularia spirata</i>
White nassa	209081	<i>Nassarius albus</i>
White-knob drillia	204072	<i>Crassispira leucocyma</i>
White-spot dovesnail	209520	<i>Nitidella ocellata</i>
Wide aclis	202871	<i>Cerithiopsis latum</i>
Wide-coil wentletrap	205361	<i>Epitonium echinaticostum</i>
Wrinkle-rib wentletrap	205370	<i>Epitonium foliaceicostum</i>
Zigzag scallop	210800	<i>Pecten ziczac</i>

Taxa 3 - Crustacea

	350000	Amphipoda
	300300	<i>Automate kingsleyi</i>
	301902	<i>Neopanope</i> sp.
	302821	<i>Penaeus</i> sp. (juvenile)
	302924	<i>Periclimenes iridescent</i>
	303331	<i>Pitho mirabilis</i>
	303611	<i>Processa</i> sp.
	304090	<i>Synalpheus longicarpus</i>
American grass shrimp	302910	<i>Periclimenes americanus</i>
Arrow shrimp	304150	<i>Tozeuma carolinense</i>
Asymmetric mud crab	301011	<i>Eurypanopeus dissimilis</i>

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 2 - Crustacea (cont.)

Atlantic mud crab	302520	<i>Panopeus herbstii</i>
Banded snapping shrimp	300150	<i>Alpheus armillatus</i>
Bandeye hermit	302200	<i>Paguristes tortugae</i>
Barnacle	310001	<i>Balanus</i> sp.
Barnacle	310004	<i>Balanus tintinnabulum</i>
Barnacle	310005	<i>Balanus niveus</i>
Bay barnacle	310002	<i>Balanus improvisus</i>
Beaded hairy crab	303080	<i>Pilumnus pannosus</i>
Bermuda night shrimp	303610	<i>Processa bermudensis</i>
Bigclaw snapping shrimp	300170	<i>Alpheus heterochaelis</i>
Blotched swimming crab	303600	<i>Portunus spinimanus</i>
Blue crab	300450	<i>Callinectes sapidus</i>
Brackish grass shrimp	302410	<i>Palaemonetes intermedius</i>
Broadback urn crab	303330	<i>Pitho therminieri</i>
Brown grass shrimp	301450	<i>Leander tenuicornis</i>
Brown shrimp	302760	<i>Penaeus aztecus</i>
Bryozoan shrimp	304141	<i>Thor floridanus</i>
Caribbean spiny lobster	302570	<i>Panulirus argus</i>
Channel clinging crab	301840	<i>Mithrax spinosissimus</i>
Ciliated false squilla	360000	<i>Pseudosquilla ciliata</i>
Clear sponge shrimp	302890	<i>Periclimenaeus wilsoni</i>
Cryptic teardrop crab	302740	<i>Pelia mutica</i>
False zostera shrimp	301290	<i>Hippolyte pleuracantha</i>
Flatback mud crab	301010	<i>Eurypanopeus depressus</i>
Flatface swimming crab	303530	<i>Portunus depressifrons</i>
Florida decorator crab	301640	<i>Macrocoeloma camptocerum</i>
Florida grass shrimp	302351	<i>Palaemon floridanus</i>
Florida grassflat crab	301901	<i>Neopanope packardii</i>
Florida stone crab	301680	<i>Menippe mercenaria</i>
Fourhorn crab	304180	<i>Tyche emarginata</i>
Furrowed mud crab	302530	<i>Panopeus occidentalis</i>
Goose barnacle	310007	<i>Lepas</i> sp.
Green snapping shrimp	300190	<i>Alpheus normanni</i>
Gulf grassflat crab	301900	<i>Neopanope texana</i>
Harris mud crab	303680	<i>Rithropanopeus harrissii</i>
Heavyhand rubble crab	300911	<i>Eucratopsis crassimanus</i>
Hermit crab	302231	<i>Pagurus bonairensis</i>
Iridescent swimming crab	303540	<i>Portunus gibbessi</i>
Ivory barnacle	310003	<i>Balanus eburneus</i>
Lesser blue crab	300451	<i>Callinectes similis</i>
Light striped barnacle	310000	<i>Balanus amphitrite</i>
Longspined hairy crab	303091	<i>Pilumnus spinosissimus</i>
Longfinger neck crab	303380	<i>Podochela riisei</i>
Longnose spider crab	301510	<i>Libinia dubia</i>
Longtail grass shrimp	302920	<i>Periclimenes longicaudatus</i>
Minor snapping shrimp	304100	<i>Synalpheus minus</i>
Minor snapping shrimp	304101	<i>Synalpheus</i> sp.

Table 4. Species scientific names, codes and common names (sorted by common name) (cont).

Taxa 2 - Crustacea (cont.)

Ocellate swimming crab	303581	<i>Portunus sebae</i>
Oval urn crab	303220	<i>Pitho anisodon</i>
Peppermint shrimp	301280	<i>Hippolysmata wurdemanni</i>
Pink shrimp	302800	<i>Penaeus duorarum</i>
Pink-spotted shrimp	302770	<i>Penaeus brasiliensis</i>
Quadrate hairy crab	303071	<i>Pilumnus marshii</i>
Redhair swimming crab	303560	<i>Portunus ordwayi</i>
Redjoined fiddler	304190	<i>Uca minax</i>
Roseate hairy crab	303061	<i>Pilumnus holoserecus</i>
Sea spider	320000	<i>Pycnogonida</i>
Seawhip shrimp	301930	<i>Neopontonides beaufortensis</i>
Shaggy clinging crab	301830	<i>Mithrax pleuracanthus</i>
Shelligs	300440	<i>Callinectes ornatus</i>
Shorthorn spiny crab	301940	<i>Nibilia antilocarpa</i>
Shortspined hairy crab	303040	<i>Pilumnus dasypodus</i>
Slender sargassum shrimp	301430	<i>Latreutes fucorum</i>
Speck-claw decorator crab	301750	<i>Microphrys bicornuta</i>
Speckled snapping shrimp	304080	<i>Synalpheus fritzmuelleri</i>
Sponge crab	300832	<i>Dromia</i> sp.
Spongy decorator crab	301650	<i>Macrocoeloma trispinosum</i>
Spotted cleaner shrimp	302923	<i>Periclimenes yucatanicus</i>
Striped snapping shrimp	300160	<i>Alpheus formosus</i>
Swimming crab	300452	<i>Callinectes</i> sp. (juvenile)
Townsend snapping shrimp	304110	<i>Synalpheus townsendi</i>
Velvet hairy crab	303070	<i>Pilumnus lacteus</i>
Winged mime crab	300880	<i>Epialtus dilatatus</i>

Taxa 4 -Polychaeta

400100	Ampharetidae
400200	Amphinomidae
400300	Aphroditidae
400500	Arenicolidae
400600	Capitellidae
400700	Chaetopteridae
400800	Chrysopetalidae
400900	Cirratulidae
401000	Ctenodrilidae
401100	Dorvilleidae
401200	Eunicidae
401300	Flabelligeridae
401400	Glyceridae
401500	Goniadidae
401600	Hesionidae
401700	Lumbrineridae
401800	Lysaretidae
402000	Maldanidae

Table 4. Species scientific names, codes and common names (sorted by common name) (cont.).

Taxa 4 -Polychaeta (cont.)

402100	Naiadidae
402200	Nephtyidae
402300	Nereidae
402400	Onuphidae
402500	Opheliidae
402600	Orbiniidae
402900	Pectinariidae
403000	Phyllodocidae
403200	Polynoidae
403300	Polyodontidae
403400	Sabellariidae
403500	Sabellidae
403600	Serpulidae
403700	Sigalionidae
403800	Spionidae
403900	Syllidae
404000	Terebellidae
404100	Tomopteridae

Taxa 5 - Porifera

	510001	<i>Aaptose aaptose</i>
	500530	<i>Cinachyra cavernosa</i>
	500091	<i>Ircinia</i> sp.
	501000	<i>Scypha</i> sp.
	500010	<i>Spongia barbara</i>
	500999	Unidentified sponge 5
Black tar	500998	Unidentified sponge 1
Bleeding sponge	500909	<i>Oligoceras hemorrhages</i>
Boring sponge	500441	<i>Clione</i> sp.
Branding sponge	500101	<i>Verongia</i> sp.
Cake sponge	500090	<i>Ircinia strobilina</i>
Chicken liver sponge	500900	<i>Chondrilla nucula</i>
Common yellow	500993	Unidentified sponge 2
Fire sponge	500990	<i>Tedania ignis</i>
Glove sponge	500011	<i>Spongia cheiris</i>
Golf ball sponge	500480	<i>Tethya diploderma</i>
Grass sponge	500020	<i>Spongia graminea</i>
Green sponge	500200	<i>Haliclona viridis</i>
Heavenly blue sponge	500141	<i>Dysidea etheria</i>
Loggerhead sponge	500400	<i>Sphediospongia vesparia</i>
Purple sponge	500191	<i>Haliclona molitba</i>
Red cedar	500997	Unidentified sponge 3
Sheepswool sponge	500040	<i>Hippospongia lachne</i>
Smooth brown (suede)	500992	Unidentified sponge 4
Sprawling sponge	500210	<i>Neopetrosia longleyi</i>
Stinker sponge	500070	<i>Ircinia fasciculata</i>
Vase sponge	500080	<i>Ircinia campana</i>
White sponge	500520	<i>Geodia gibberosa</i>

Table 4. Species scientific names, codes and common names (sorted by common name) (cont.).

Taxa 6 - Cnidaria

	600200	<i>Eunicea</i> sp.
	600310	Hydrozoa
	600240	<i>Muricea elongata</i>
	600230	Unidentified gorgoniidae
Anemones	600120	Actiniaria
Finger coral	600020	<i>Porites porites</i>
Fire coral	600100	<i>Millepora alcicornis</i>
Giant Caribbean anemone	600130	<i>Condylactis gigantea</i>
Jellyfish	600110	Scyphozoa
Knobby star coral	600040	<i>Solenastrea hyades</i>
Massive starlet coral	600030	<i>Siderastrea siderea</i>
Moon jelly	600111	<i>Aurelia aurita</i>
Purple sea plume	600220	<i>Pseudoptergorgia acerosa</i>
Rose coral	600010	<i>Manicina areolata</i>
Sea fan	600250	<i>Erythropodium polyanthes</i>
Sea plume	600210	<i>Pterogorgia</i> sp.
Upsidedown jellyfish	600011	<i>Cassiopea xamachana</i>

Taxa 7 - Echinodermata

Banded luidia	700900	<i>Luidia alternata</i>
Brittle star	701551	Unidentified brittlestar
Brittle star	702420	<i>Amphiura stimpsoni</i>
Brittle star	702440	<i>Ophiophragmus filigraneus</i>
Brittle star	702441	<i>Ophiophragmus</i> sp.
Brittle star	702443	<i>Ophiophragmus pulcher</i>
Brittle star	702471	<i>Amphipholis squamata</i>
Brittle star	702480	<i>Amphipholis pachybactera</i>
Brittle star	702490	<i>Ophiostigma isacanthum</i>
Brittle star	702500	<i>Amphiodia pulchella</i>
Brittle star	702571	<i>Amphiplus thrombodes</i>
Brittle star	702761	<i>Ophionereis squamulosa</i>
Brittle star	702830	<i>Ophiopsila riisei</i>
Coraline brittle star	702791	<i>Ophiocomella ophiactoides</i>
Long-spined urchin	700240	<i>Diadema antillarum</i>
Oersted'd brittle star	702690	<i>Ophiothrix orstedii</i>
Reticulate brittle star	702760	<i>Ophionereis reticulata</i>
Savigny's brittle star	702650	<i>Ophiactis savigni</i>
Sea cucumber	704210	<i>Ludwigothuria floridana</i>
Sea cucumber	704211	<i>Ludwigothuria floridana</i> x <i>L. mexc.</i>
Sea cucumber	704301	Cucumariidae
Sea cucumber	704660	<i>Chiridota rotifera</i>
Short spine brittle star	702860	<i>Ophioderma brevispinum</i>
Sticky sea cucumber	704641	<i>Leptosynapta parvipatina</i>
Thorny starfish	701320	<i>Echinaster sentus</i>
Variegated urchin	700280	<i>Lytechinus variegatus</i>

Table 3. Species scientific names, codes and common names (sorted by scientific name) (cont.).

Taxa 8 - Miscellaneous worms		
	800010	<i>Platyhelminthes</i> sp.
Flat worms	800010	Platyhelminthes
Leaches	804110	Hirudinea
Peanut worms	800020	Sipunculids
Ribbon worm	800030	Nemertea
Taxa 9 - Miscellaneous taxa		
Moss animals	900010	Bryozoans (Ectoprocta)
Sea squirts	900011	Tunicates (Ascidacea)

There is a relationship between the kinds and numbers of benthic invertebrates and fishes caught and the types of bottom cover present. Areas where *Laurencia* or *Digenia* occur produced the most animals. Pure *Thalassia* was less productive but had greater numbers of animals of sport or commercial value. Bare sand with scattered algae or sponge-alcyonarian areas were least productive.

Hydrographic Studies

Temperature was recorded during each trawling trip at each sampling station with a mercury thermometer or thermister probe. In addition continuous recording Ryan Model F thermographs were maintained at stations SE I, I, A, B, D, E and F (Figure 1).

Chemistry

Surface and bottom measurements of salinity and oxygen were made at each trawling station during each trawling trip. Oxygen was measured with a YSI model 54 in situ recorder. Salinity was determined with a American Optical refractometer, with a Beckman RS5-3 portable salinometer or by determination on the Wheatstone conductivity bridge.

Biology

Seven trawl samples were taken at each of the trawl stations at monthly intervals. A 3-m foot rope length otter trawl lined with 0.63-mm bar mesh was used for all samples. The tows were made with the wind and the net covered approximately 30-35 m during each tow. The net was emptied into wash tubs at the completion of each tow. After seven tows were completed the contents of each tub were rough sorted. The kind and weight of vegetation were recorded and the animals preserved in a 10% formalin solution. The reduced samples were sorted, and counts of each species made. Polychaetes were not identified or counted. Amphipods, isopods, the gastropod *Batillaria minima* and the pelecypod *Brachidontes exustus* were not counted because of their high abundance and small size which allowed escapement and inadequate sampling.

CALCULATIONS

Statistical treatment was confined to major taxa and species that comprised more than 1% of the total animal catch. For major taxa a Friedman's non parametric analysis of variance was used to detect differences among stations with the effects of month removed by coding. A simple arithmetic mean and 95% confidence limit was used to judge which stations produced high and low catches.

Exclusion and optimal temperatures

For each of the 354 species collected in the trawl samples, temperature/salinity matrix was constructed (Appendix I). The matrix was made by summing the catch for each species collected at each station each month and dividing this by the effort. A count was kept of the number of c/e entries and the average catch per tow was calculated. The use of the average catch per tow calculated by

$$\frac{\sum c/e}{N}$$

when $c \geq 1$ for the seven tows at the particular station-month combination caused no difficulty in selecting upper and lower temperatures at which the species were found. The catch per tow at extreme temperatures, however, was unjustly weighted. That is if 10 animals were caught per drag once at 40 °C and 0 per drag on 9 occasions, the result would be 10 per drag with the first method for only 1 per drag with the latter more preferred formula. The preferred $\Sigma c/\Sigma e$ was not used due to computer limitations. The mathematical weighting plus high catches of animals at stations with anomalously high temperatures in September 1968 resulted in large catches of some species at high temperatures. Exclusion and optimum temperatures, maximum catch curves were calculated for taxonomic groupings of animals in Biscayne Bay. A detailed description of the calculations and results can be found in Roessler and Tabb (1974).

Salinity at the inshore stations was variable and followed the seasonal pattern of rainfall and runoff of the area. The stations closer to the Florida Keys were more stable and remained close to 35 ppt due to the influence of tidal influxes of oceanic waters from the passes through the Keys. The salinity influenced the distribution of animals. The sponges, alcyonarians, corals and echinoderms were prevalent on the eastern side of the bay where salinities remained relatively stable but were almost absent near the mainland shore where salinities fluctuated widely and dropped to low levels following the spring and fall rainy seasons. Other crustacea such as *Portunus spinimanus*, *P. gibbesi*, and fishes *Monacanthus ciliatus*, *M. hispidus* and *Alutera schoepfi*, were also apparently restricted to the areas of high, relatively constant salinity. In this region reef and reef flat forms occasionally occurred. A number of organisms including the pelecypods, *Crassostrea virginia*, *Brachidontes exustus*, the fish *Sphoeroides testudinus*, and crustacea *Callinectes similus*, *C. ornatus*, *Alpheus normanni* and others are common only along the mainland shoreline.

Station G was characterized by temperatures 4.5 °C (9 °F) above the ambient bay water, stations S I and S II were characterized by temperatures 3.5 °C (7.2 °F) above ambient stations S II was characterized by temperatures 2.5 °C above ambient. A, F and H were characterized by temperatures between 1 and 2C above ambient, stations SE II, S III and B average between 0.7 and 2 °C above ambient, stations N I, N II, N III, N IV, N V, NE I, NE II, NE III, NE IV, NE V, SE III, SE IV, SE V, S IV, S V, C, D and E were considered controls in terms of temperature.

All of the stations in the heated area were in the zone in which sediment was relatively deep and were probably characterized by red algae and *Thalassia*, or pure *Thalassia* bottom cover. Additional data on monthly observations of temperature salinity and oxygen can be found in Roessler *et al.* (1970 and 1973).

Station N V located off Moody Canal had variable types of bottom cover. During the initial months of the study, the red alga *Digenia simplex* was dominant. During the early autumn the flood gates on Moody Canal were opened and the *Digenia* disappeared. Later when the salinity rose again the area was colonized by *Laurencia* spp.

Stations N I and NE I were located at the landward end of the Barge Canal and were separated by the width of the 100 m wide channel. The bottom type, depth and vegetation were similar. However, differences in catches could result from greater currents at N I or some recirculated discharge water passing over NE I.

Station B was located in the bight immediately south of Turkey Point. This area received less tidal mixing than other stations, and essentially was excluded from influence of the thermal plume by the geography of the area.

Station D located on the *Thalassia* flat called Pelican Bank was used as a temperature control station because it was a shallow station removed from the influence of the thermal discharge

and land runoff. Prior to the establishment of station D in January 1969, NE III was used as a measure of ambient temperatures.

Although physical and chemical data are reported for stations I, J and K they were only sampled for benthic fauna after July 1970. Insufficient data was collected to warrant analysis. However, station I which was located in the mouth of the Little River provided data which indicated a pulsed flow of hot water may be less harmful than a continuous discharge. Animal catches at this station were not as low as at those stations receiving continuous flow and the sea grasses and macro algae were present in all seasons.

The temperature varied greatly with the tide stage. On an ebb tide heated discharge water covers the station but on the flood tide the station is covered with cooler bay water. Thus the benthic community is subjected to alternating periods of warm and cool water. The temperature was affected by the solar radiation (indicated by maximum temperatures occurring when the flood-ebb transition occurs near noon) and the tidal cycle as indicated by the approximately 6 hr. periods between temperature maxima. The temperature averaged 2.64 °C above that of the control station D. However, the stage of the tide influenced this average and since the monthly observation was made during the new moon period during the morning hours when the tide was high the average difference is probably low.

The vegetation at station SE I varied seasonally and reflected the temperature on the effluent. In summer the station was almost devoid of plants except for diatoms, blue green algae, scattered *Acetabularia* and some *Digenia*. In winter and spring the area was colonized by *Diplanthera wrightii* which was often coated with the diatoms *Campylostylus* and *Synedra*. Vegetation at station G was virtually absent. A few specimens of *Acetabularia crenulata* were observed in winter and a blue green algal diatom mat was present. Occasionally the red alga *Disya* was present in the winter months.

For several stations the abundance, growth and productivity of algae and sea grasses measured by Zieman (1970) and Thorhaug (1971) or the epiphytic diatoms recorded by Sprogis (1971) were compared to our animal data because the same stations were occupied by the trawling survey. Trawl station A was located near algae station 23, trawl station F was equivalent to algae station 24. Trawl station SE II was near algae station 45. Trawl station S II was near algae station 26 and trawl station H was near algae station 16. The seasonal pattern of algae and grass production can therefore be compared with animal catches at these stations in Biscayne Bay.

Shannon General Diversity Index

The calculated indices were species richness (d_1), Shannon General Diversity Index ($\bar{H}$), and Evenness (e) (Roessler *et al.*, 1973; Odum, 1971). Species richness (d_1) is defined as

$$d_1 = \frac{S-1}{\ln N}$$

where S is the number of species and N is the number of individuals.

The Shannon General Diversity Index $\bar{H}$ is defined as

$$\bar{H} = -\sum \frac{N_i}{N} \ln \frac{N_i}{N}$$

where N_i is the number of individuals of a species and N is the total number of individuals.

Evenness (e) is defined as

$$e = \frac{\overline{H}}{\ln S}$$

where $\overline{H}$ is the Shannon General Diversity Index and S is the number of species.

RESULTS

Recent interest in historical observations on the relation between salinity and the distribution of animals in Biscayne Bay associated with the Everglades Restoration Plans has provided the impetus to organize and make available data collected during studies sponsored by the Department of Energy, the Environmental Protection Agency and Florida Power and Light. Appendix I, the catch and catch per tow of each taxa collected are summarized at one degree C and 5 ppt intervals. In Appendix II, the total numbers of each taxa collected at each station in southern Biscayne Bay and Card Sound are summarized. In Appendix III, biodiversity indices for each phylum and all animals combined are given by month and station. Photographs taken during field work are in Appendix IV.

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