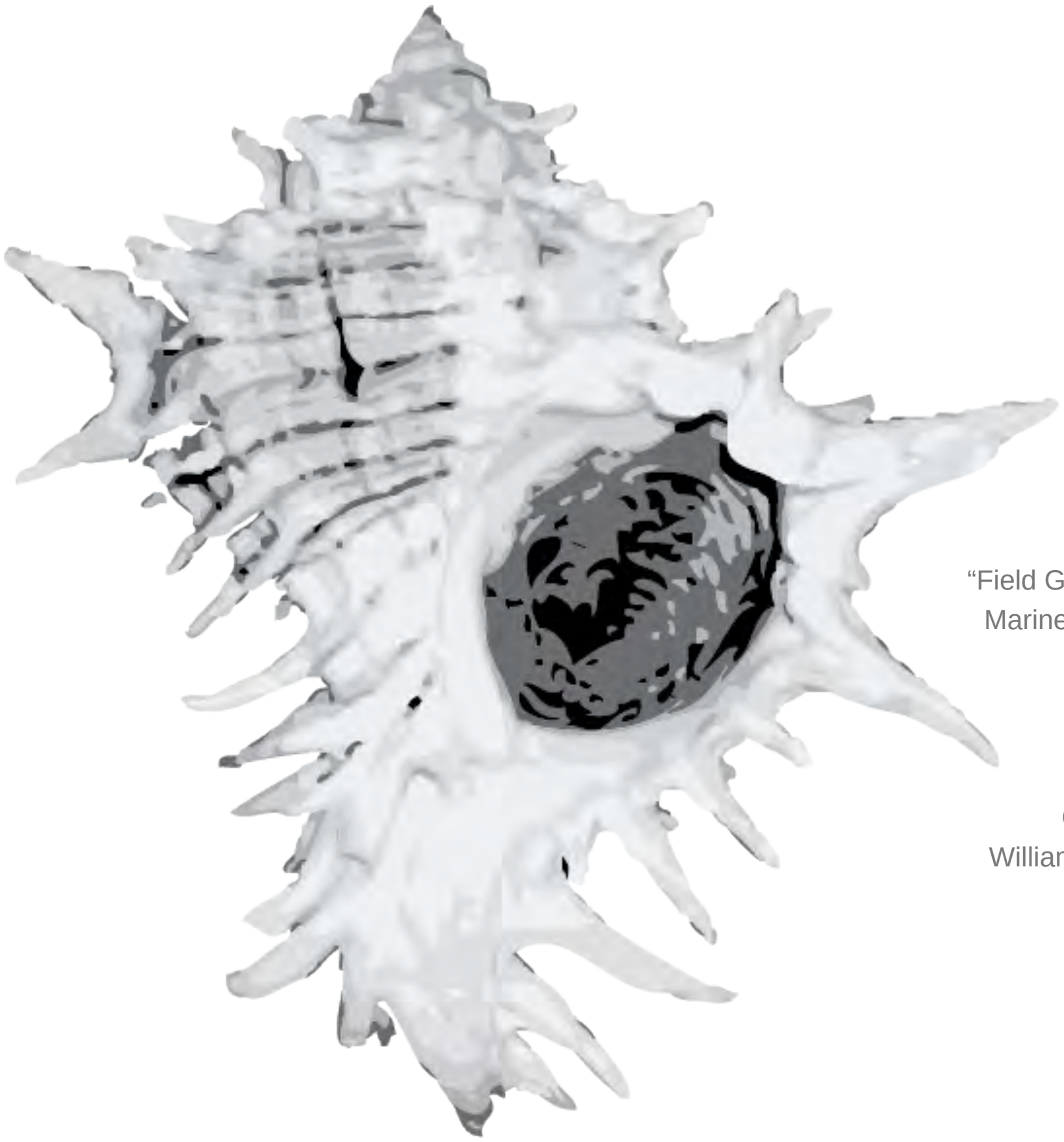
COMMON MARINE INVERTEBRATES OF BEAUFORT, N.C.



Original Title:
“Field Guide to Common Marine Invertebrates of Beaufort, NC”

by

Cindy Van Dover
William W. Kirby-Smith
1979

Digital Edition
Humberto Diaz, David W. Johnston and Daniel Rittschof,

Sea Grant North Carolina

NICHOLAS SCHOOL OF THE ENVIRONMENT
DUKE UNIVERSITY
duke university marine lab

COMMON MARINE INVERTEBRATES OF BEAUFORT, N.C.

Based upon the original Title:

"Field Guide to Common Marine Invertebrates of Beaufort, NC"

by

Cindy Van Dover

William W. Kirby-Smith

1979

Edited by: Humberto Diaz, David W. Johnston and Daniel Rittschof

Sea Grant North Carolina

NICHOLAS SCHOOL OF THE ENVIRONMENT
DUKE UNIVERSITY
duke university marine lab

INTRODUCTION

The marine plants and animals of Beaufort, North Carolina, consist of species from tropical waters, species from north temperate waters, and a few species found only in the Carolinas. The mixed biogeography of the region is in part the result of the great seasonal variation in temperature. The water temperature in the Beaufort Channel varies from a winter low of approximately 3°C to a summer high of approximately 30°C. The variation in water temperature is accompanied by an annual cycle in the presence and abundance of many of the species found in this area. Some of the free-swimming species undergo seasonal migrations, either with latitude (many fishes), or with water depth (many crustaceans and fishes). There is a marked seasonal change in the organisms on pilings and jetties. In contrast, the assemblages of animals on the mud and sand flats undergo little seasonal change in species composition; however, activities like feeding, locomotion, reproduction and population density are seasonal.

In places where salt and fresh water mix (estuaries), salinities are an important variable in the environment of many plants and animals. In general, the bays and sounds in the Beaufort region receive very little fresh water inflow, and, therefore, the water of most of the habitats commonly visited has a salinity near that of the open sea (35 parts per thousand). The normal variation in the salinity of the Beaufort Channel is 30-35 p.p.t. The Newport River is a small estuary with a gradient of 0-35 p.p.t. and some of the salt marshes receive fresh water from drainage ditches which have been dug for mosquito control. Even though the salinity is normally high, there are unpredictable periods of heavy rainfall which can precipitously lower the salinity in the shallow water and intertidal habitats. During the summer, the salinity in the bays and sounds may rise above normal to 38-40 p.p.t. due to evaporation from the marshes and shallow waters.

The Beaufort region is dominated by soft bottom habitats with their associated infaunal (animals living within the substratum) assemblages of animals. Many of the infaunal species are quite small and/or superficially unremarkable, even though they are very important in the ecology of the area. The hard bottom habitats are few, but the ease of collecting and the obvious nature of the epifaunal (surface living) organisms make these habitats especially attractive. Attached algae (seaweeds) are common on hard bottoms. Most of the hard bottom habitats are man-made (sea walls, pilings, jetties), although a few natural hard bottoms can be found. These include oyster "rocks" or beds which commonly occur near mud flats and have many epifaunal animals associated with them. Submerged vegetation (eel grass and algae) and the surfaces of other animals (scallops, for instance) provide natural hard bottoms. Often the surface of one animal (shell, exoskeleton, tube) serves as a hoMe for another species, providing the basis for many commensal relationships.

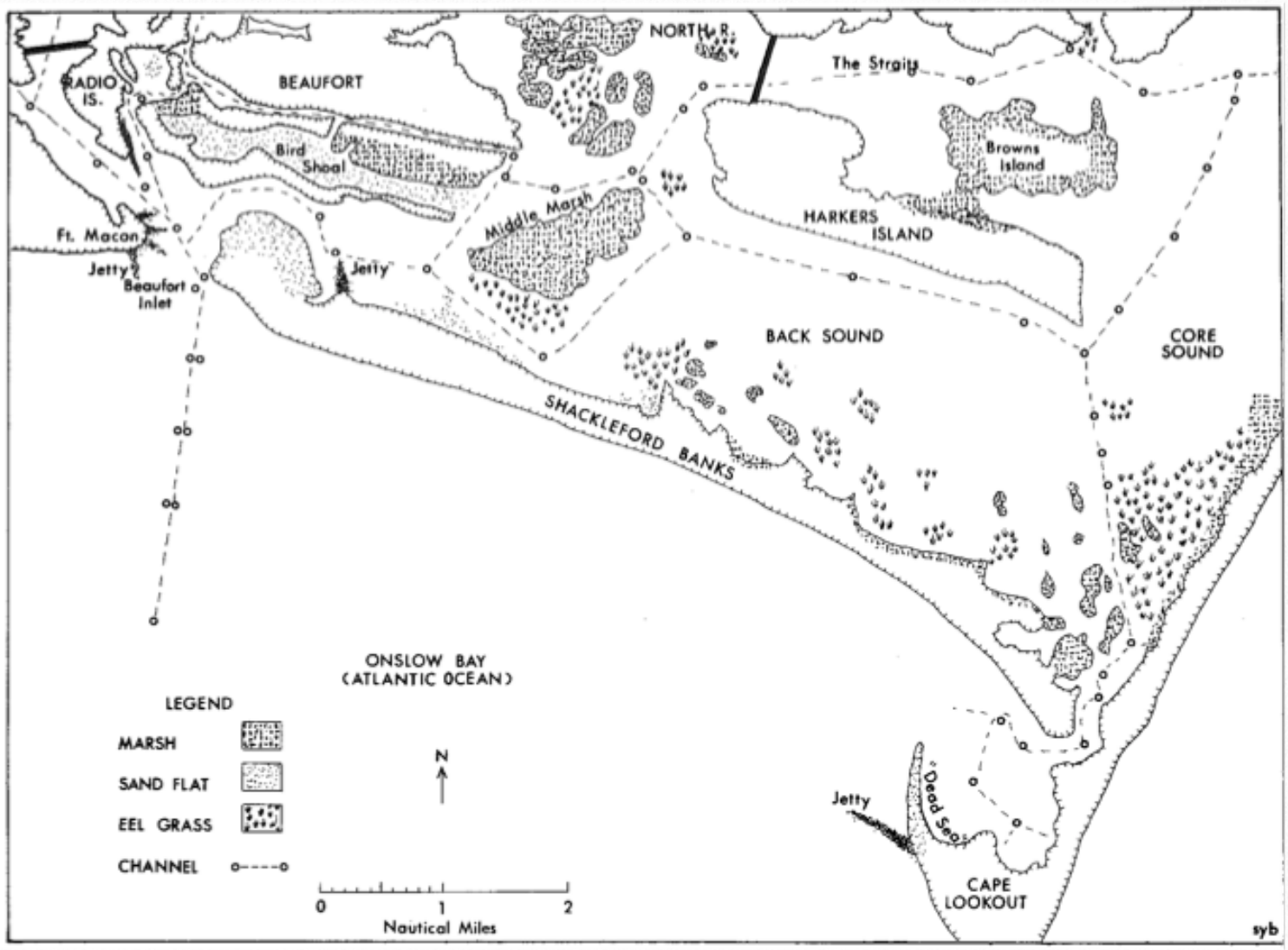
The normal tidal range in Beaufort is approximately 1 meter. The tidal range varies over the lunar cycle from approximately 0.7 meter at neap tides (first and third quarter) to approximately 1.3 meters at spring tides (new and full moon). The spring tides are greatest in April-May (2 meters) and least in October-November (1 meter). For walking field trips, the lower the tide the better, and to have a successful trip to the sand flats, mud flats, and eel grass beds, a good low tide is a necessity. The tides also vary with the winds, and a strong or persistent northeast wind will tend to raise the water level, resulting in a higher high tide and a higher low tide. A north west wind usually results in lower than normal tides. A dead calm, which usually occurs only in the early morning or late afternoon, greatly increases the visibility in the shallow water and thus allows observations of animal activity below the low tide mark.

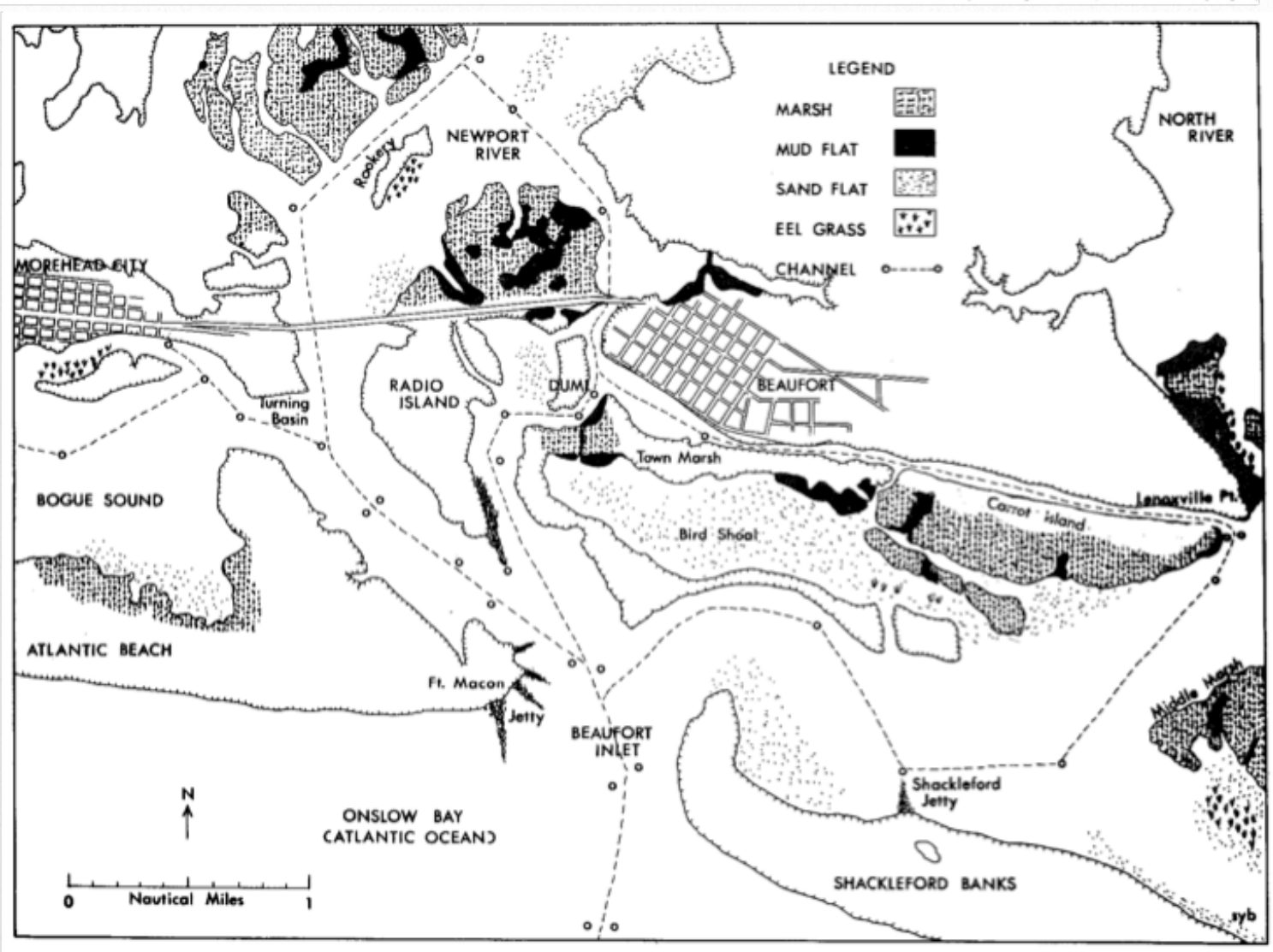
Reproductive activity among the marine species in the Beaufort region is great during the spring and early summer, tapering off in the late summer and autumn. The eggs masses of annelids and molluscs are frequently encountered and many are easy to identify. Ovigerous crustaceans are common in the late spring. Sea urchins can be spawned from April through

Photo: Sam Bland, *samb@nccoast.org*

HABITATS AND COLLECTION

Beaufort, NC, area in 1979. Different habitats locations are shown





OUTER BEACHES

Collecting intertidal animals on wave exposed beaches is most easily done by sieving sand through a box sieve (1/16 inch mesh) and picking out the animals retained by the sieve. For large fish and swimming crabs, a long, coarse mesh seine can be hauled through the water beyond and through the breakers. A small, fine mesh seine is good for catching small fish and crabs in the wash zone. Small amphipods can be caught by stirring up the sand in a small pool of water in the wash zone and then quickly sweeping the water with a hand net made of #1 plankton netting. The meiofauna is extremely abundant in beach sand; copepods, nematodes, etc., can be caught by placing some intertidal beach sand (down to about 20 cm depth) in a plastic bucket, filling the bucket about 2/3 full of water, mixing the sand and water by hand, and decanting the water through a zooplankton net. A hand lens or dissecting microscope is necessary to see the animals. The supra-tidal fauna, such as ghost crabs and large amphipods, are active at night; however, during the day, the amphipods can be found hiding under a drift and ghost crabs can be dug from their burrows.

Road on the Outer Banks, near Cape Hatteras. Photo source: http://www.outerbanks.org

Glasswort, as a halophyte, this plant can tolerate high salinities, they are found along the N.C. coast, and collectively referred to as pickleweed. Photos by Sam Bland, samb@nccoast.org

SALT MARSHES

Marshes are often bordered by mud flats which are treated here as a separate habitat. Salt marshes are characterized by dense growths of marsh plants on a muddy substrate. Most of the animals in the marsh are epifaunal and can be found sitting or crawling on the surface of the mud and marsh grass. A shovel is necessary to dig crabs from their burrows. Swimming crabs, shrimp, and small fish can be seined from the tidal creeks with a short, fine mesh seine. Insects can be captured with a sweep net during the summer and autumn (through November). A good coating of insect repellent is frequently a necessity.

Mud flat at the Rachel Carlson Reserve Photo: Humberto Díaz

MUD FLATS

Mud flats are found in areas of slow water current, frequently along the edges of salt marshes. Most of the animals of the mud flats are infaunal and many build semi-permanent burrows which can be exposed with a shovel. A short handled, narrow-blades hovel digs deeper and is less likely to break than the long handled variety. Sieving with a box sieve is most productive in sandy mud. Carefully picking up clumps of oysters will reveal sponges, anemones, bryozoans, mud crabs, and snapping shrimp. A few snails and clams can be found at the surface of the mud. As in the marshes, insect repellent is a good idea in the summer and autumn. Buried oyster shells can be dangerous to feet, ankles and fingers.

SAND FLATS

Sand flats are found in areas with strong tidal currents. There are two major approaches to collecting on sand flats. The first is to wander slowly across the flat near the low tide line and look for the trails, tracks and exposed parts of the animals. Several species of snails, sand dollars, crabs and the eggs cases of molluscs and polychaetes can usually be found.

The second approach is to use the shovel and sieve, digging at random and sieving the sediment. Holes, castings and surface irregularities often suggest places to dig. Several polychaetes build permanent tubes which protrude above the surface and these can be dug by hand or with a shovel. Often the populations on the sand flats are very patchy so that far ranging exploration is better than intense digging in any one spot.

Sand flat at the Rachel Carlson Reserve Photo: Humberto Díaz

EEL GRASS

Eel grass (*Zostera marina*) beds are common in protected sounds and bays. They are extremely productive and harbor a very diverse community of animals. Collecting in eel grass beds presents certain problems. Sieving is possible, but requires a great deal of sorting to pick animals from the grass retained in the sieve. Seining with a small mesh net can capture many fish, crabs and shrimp. A roller push-net is most effective; the roller in front pushes down the grass and stirs up the animals which are then captured in the small net attached behind the roller. One of the best methods of collecting is to feel along the bottom in between the grass blades. Scallops, clams, pen shells, hermit crabs, spider crabs, and brittle stars can be caught, but beware the occasional sea urchin, blue crab, or toadfish. For quantitative sampling a 1-gallon paint thinner can, with the bottom cut out and the screw cap removed, is pushed into the sediment, the cap screwed back on, and the can pulled from the sediment (the vacuum holds the sample in the can). When the screw cap is again removed, the sample will come out of the can and can be bagged or sieved. Although eel grass beds are unstable from year to year, there are usually extensive beds behind Core and Shackleford Banks.

PILINGS, JETTIES AND SEA WALLS

Collecting from pilings usually includes the use of a piling scraper which allows collecting below the low tide mark. The scraper is a long handled (3 meters)instrument which has a small net attached to a curved, iron frame on one end. The scraper is pulled up the surface of the pilings and the animals scraped off are caught in the net. The small animals in the scraping can be collected by placing the material in a shallow, enamel pan. Cover the material with sea water and leave it for a couple of hours. As the oxygen is depleted many small polychaetes, flatworms, nemerteans and nudi-branchs will collect at the air/water interface. Collecting on jetties and sea walls requires gloves and an oyster knife. The smaller rocks on the jetties can be carefully turned over and the animals observed. Be sure to replace the rock to its original position. Sea walls are excellent for qualitative and quantitative exercises in intertidal zonation, as the numbers and kinds of animals are clearly visible.

Jetty at Fort Macon, NC Image by Humberto Diaz

Sampling dredge of RV Susan Hudson, DUML. Photo by Humberto Diaz

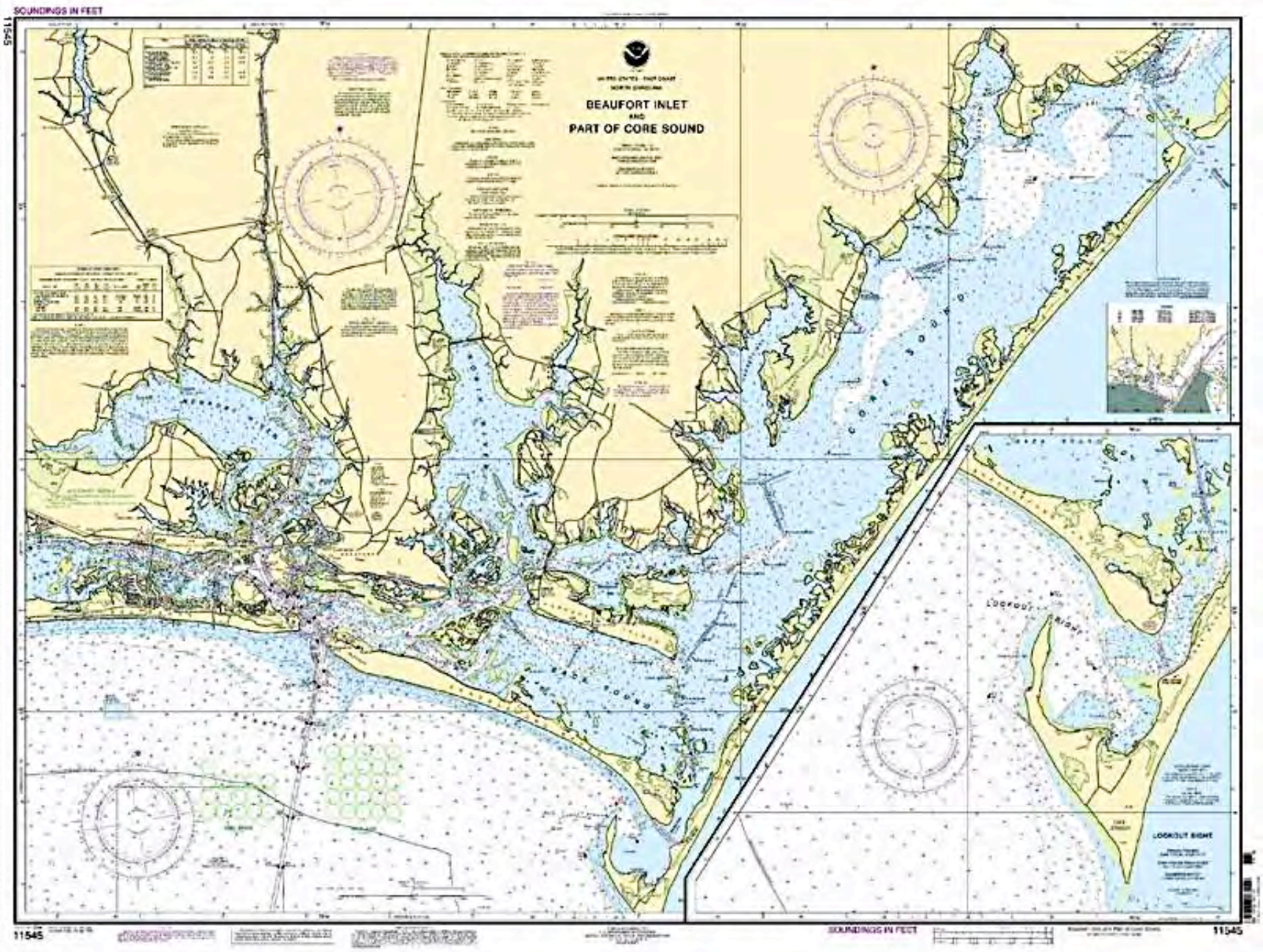
DREDGING (IN THE SOUND)

The subtidal bottoms of the sounds and bays are composed of many different substrata. The animals listed here are those found on shell rubble bottoms. A scallop dredge is frequently used on laboratory boats to collect animals from subtidal areas in the bays and sounds where the bottom is uneven and obstructed. The design of the dredge has changed little since the late 1800's and is used by commercial fisherman for scalloping in shallow water. The material caught in the dredge is usually a mixture of shells and epibenthic animals. Many species of small animals can be found attached to the shell rubble. Large, empty clam shells can be broken apart, revealing a number of boring and burrowing species.

Bogue Sound from HW 58 bridge. Photo by Humberto Diaz

TRAWLING (NEWPORT RIVER ESTUARY, ONSLOW BAY)

The Otter Trawl is pulled only over soft bottoms which are free of rocks and other objects which might catch and rip the large net. The trawl consists of a large funnel-shaped net attached to two wooden "doors." The doors hold the mouth of the net open and on the bottom as the net is pulled through the water. Frequently a "tickler" chain is placed between the doors and in front of the net. The chain serves to stir up the shrimp, crabs, and fish which are buried just under the surface of the bottom. The trawl captures animals swimming above the bottom as well as those on the bottom. The laboratory boats use a small net that is called a "Try Trawl", because it is used to "try" for shrimp before the larger nets are pulled. The invertebrate fauna caught in a trawl in the estuary (Newport River)is very different from that caught in the ocean (Onslow Bay).



By using the interface below, users can compare a 1944 map from the Beaufort area with a current satellite image.

http://www.lib.unc.edu/dc/ncmaps/interactive/MC_167_B374_1944u.html

A PLEA FOR CONSERVATION

An extremely important problem relating to most hard bottom and many soft bottom habitats is the direct influence of collecting, by students, on the number of specimens available, At the Duke Laboratory alone, approximately 1000 students from 30 institutions use the region as a field laboratory. Especially subject to depredation are the rock jetties (PLEASE TURN THE ROCKS BACK OVER AFTER LOOKING UNDER THEM) and the dredging grounds in the Morehead City turning basin (FOR ANY ONE GROUP OR CLASS, PLEASE REMOVE ONLY ONE OR TWO SPECIMENS OF EACH SPECIES). In the future, these areas will be more and more frequently used and a real effort at conservation will be necessary to maintain them.

PHYLUM MOLLUSCA

CLASS

BIVALVIA
(scallops, clams, mussels,

MONOPLACOPHORA
(“limpet-like living fossils”)

GASTROPODA
(snails, slugs, limpets, sea hares)

CEPHALOPODA
(squids, octopuses, nautilius, ammonites)

SCAPHOPODA
(tusk shells)

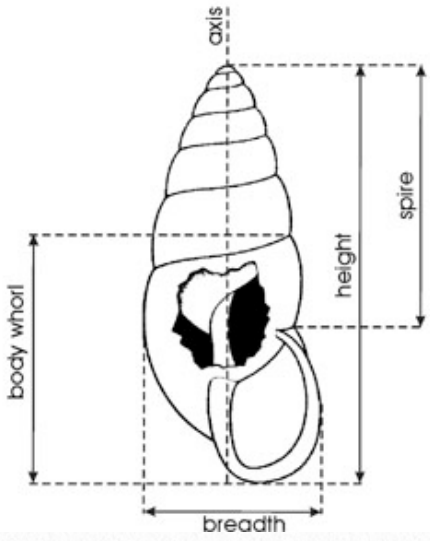
APLACOPHORA
(spicules-covered, worm-like animals)

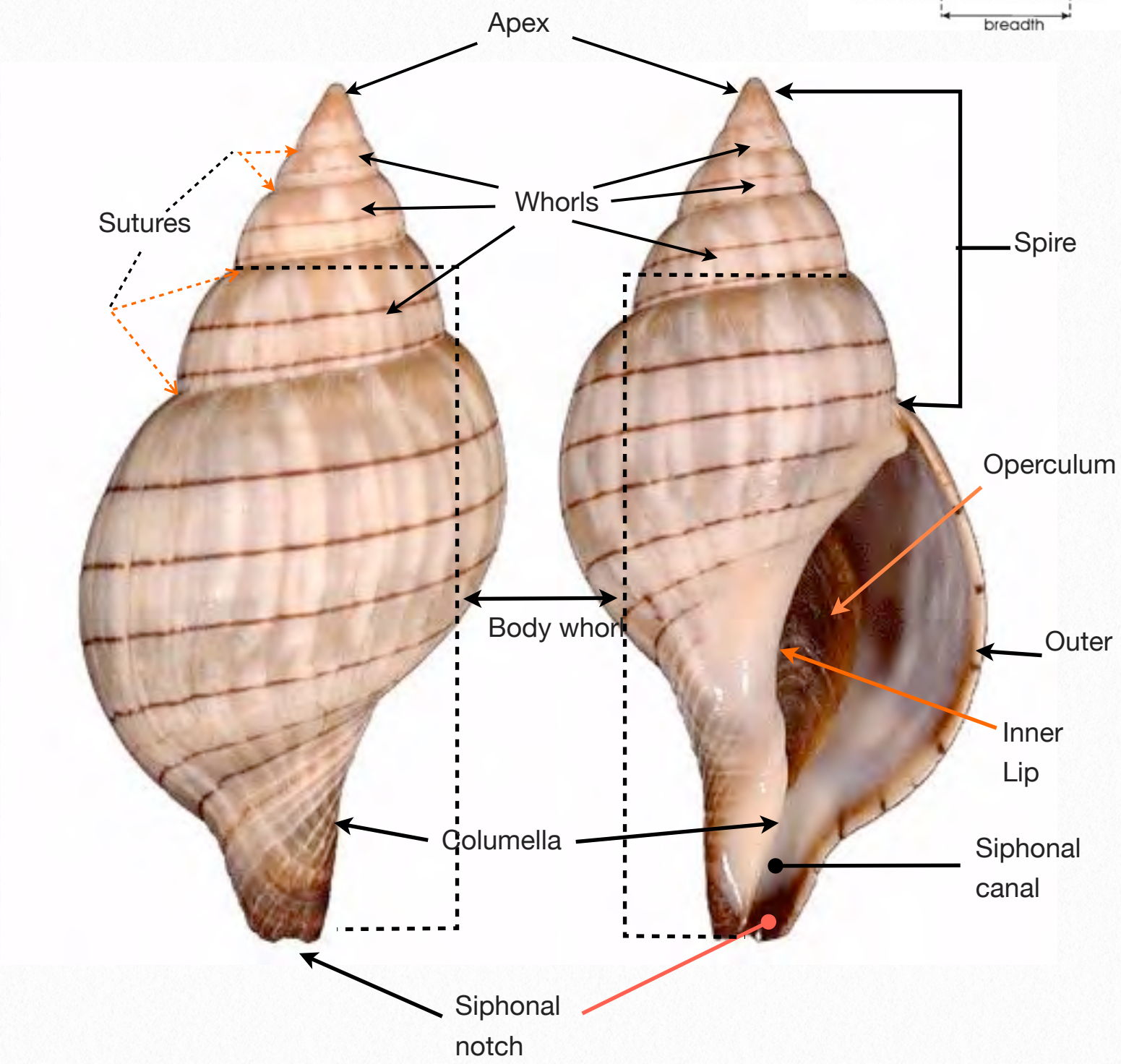
CAUDOFOEVATA
(spicules-covered, worm-like animals)

POLYPLACOPHORA
(chitons)

GASTROPODA

Anatomy of a gastropod shell





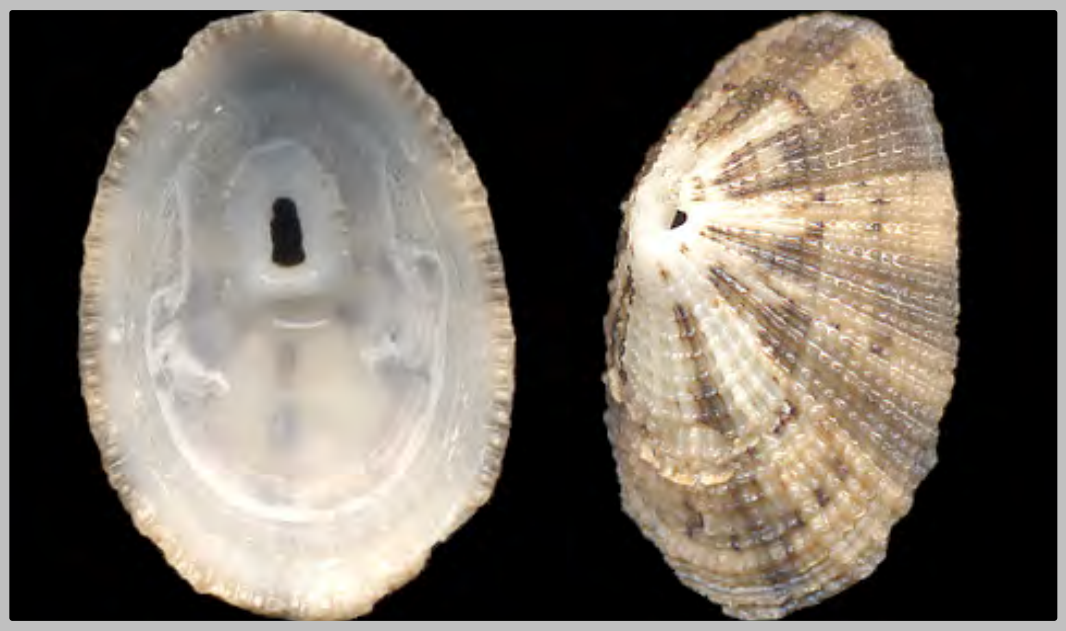
Common Gastropoda

Find details on your found specimen
by different habitats

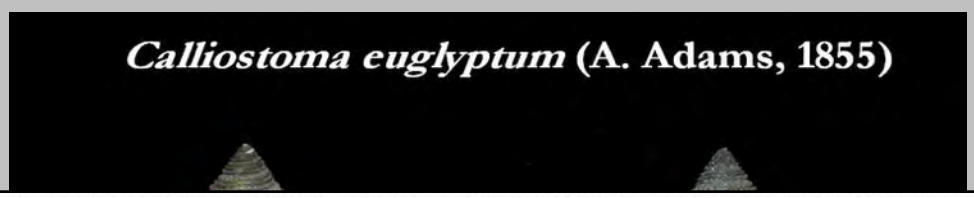
Please scroll in ***galleries*** to locate species image and touch the **binomial name** for linking to species page.

Also,
descriptive pages can be also accessed from the ***species list*** by touching the **binomial name**

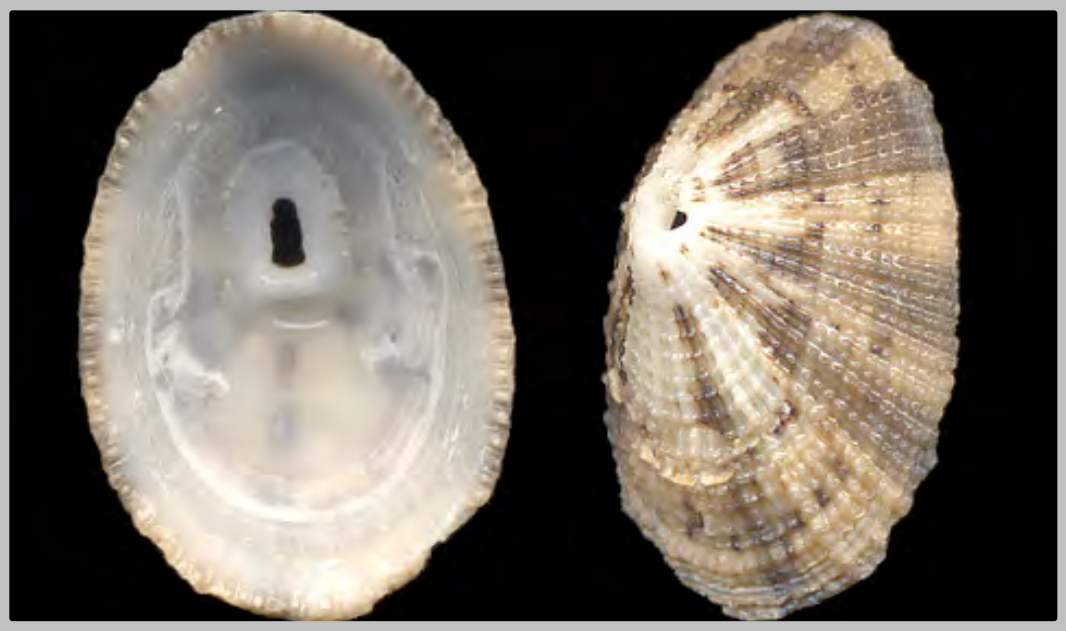
Pilings, jetties, seawalls.



Diodora cayenensis Lamark 1822



Dredged in Core and Bogue Sounds



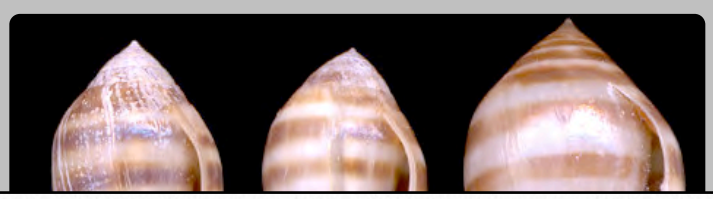
Diodora cayenensis Lamark 1822

Eel Grass Beds

Bittiolum varium (L. Pfeiffer, 1840)

Salt Marshes

Littoraria irrorata (Say,1822)



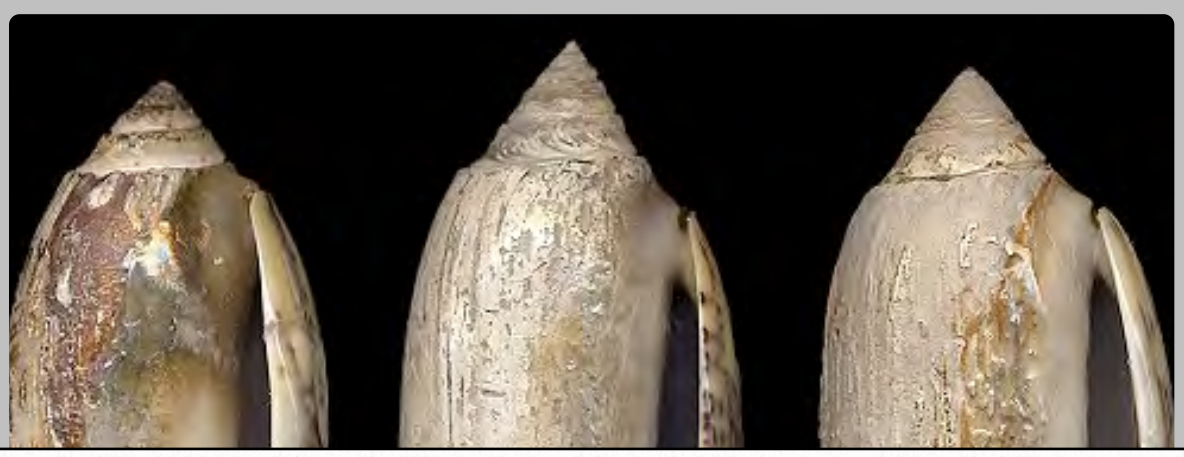
Trawled in Onslow Bay

Neverita duplicata (Say, 1822)

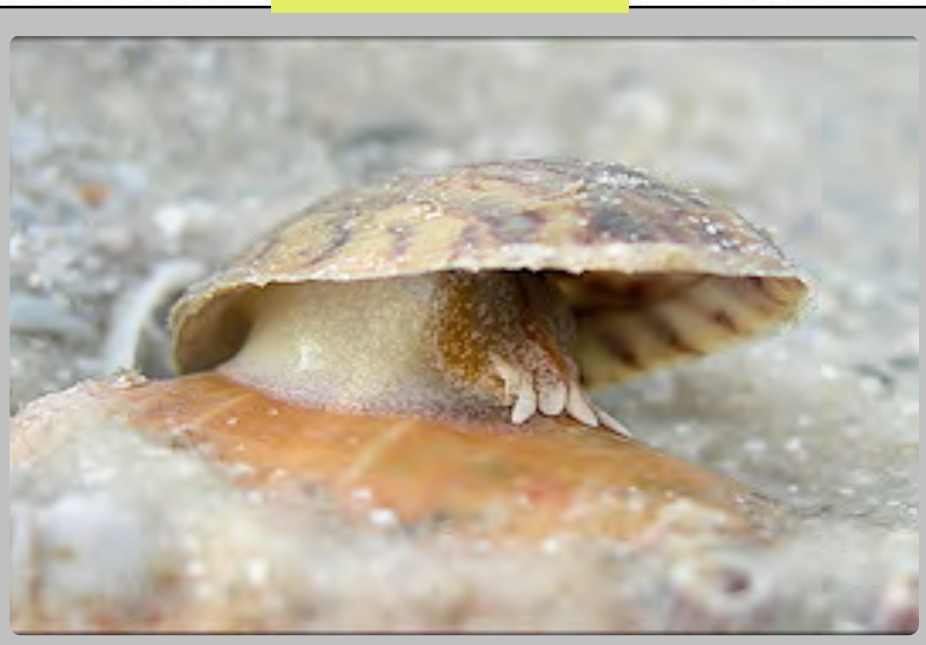
Newport River

Cyphoma uniplicata (G. B. Sowerby II, 1849)

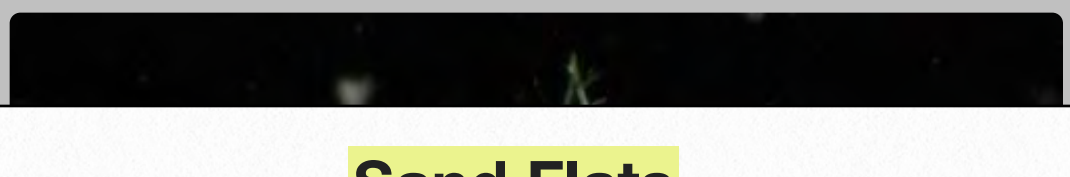
Outer Beaches



Mud Flats



Crepidula fornicata (Linnaeus, 1758)



Sand Flats

Crepidula convexa, Say 1822

List of common gastropod species in Beaufort area

Descriptive pages can be accessed by touching the ***binomial name*** in the following scrolling list.

Acteocina canaliculata (Say, 1826)

Acteocina candei (d'Orbigny, 1841)

Aplysia fasciata Poiret, 1789

Astyris lunata (Say, 1826)

Bittiolum varium (L. Pfeiffer, 1840)

Boonea seminuda (C. B. Adams, 1839)

Busycon carica (Gmelin, 1791)

Busycon sinistrum Hollister, 1958

Busycotypus canaliculatus (Linnaeus, 1758)

Calliostoma depictum Dall, 1927

Calliostoma euglyptum (A. Adams, 1855)

Cinctura hunteria (Perry, 1811)

Costoanachis avara (Say, 1822)

Crepidula convexa Say 1822

Crepidula fornicata (Linnaeus, 1758)

Crepidula plana Say, 1822

Image 2.1

Diodora cayenensis Lamark 1822

The Keyhole Limpet

Source of image:http://www.jaxshells.org/dio11.htm
Digital image by Marlo F. Krisberg www.letstalkseashells.com

***Diodora cayenensis* Lamark 1822**
The Keyhole Limpet

Class: Gastropoda
Subclass: Vetigastropoda
Family: Calliostomatidae
Genus: *Fissurellidae*

Distribution:
In USA: From New Jersey to Florida, Gulf of Mexico; West Indies, lesser Antilles and South to Santa Catarina, Brazil. East Atlantic: Canary Islands.

Image 2.2

Calliostoma euglyptum (A. Adams, 1855)
Sculptured Top Shell

Image source: http://z14.invisionfree.com/Conchologist_Forum/index.php?showtopic=740
Image by Krisberg, Marlo F. www.letstalkseashells.com

Calliostoma euglyptum (A. Adams, 1855)
Sculptured Top Shell

Class: Gastropoda
Subclass: Vetigastropoda
Family: Calliostomatidae

Image 2.3

Calliostoma depictum Dall, 1927

Source of image: http://www.marinespecies.org/aphia.php?p=image&id=52234
Image author: Natural History Museum Rotterdam,

Calliostoma depictum Dall, 1927

Class: Gastropoda
Subclass: Vetigastropoda
Family: Calliostomatidae
Genus: *Calliostoma*

Localities:

Image 2.4

Littoraria irrorata (Say,1822)
Marsh Periwinkle

Image source: http://www.marinespecies.org/aphia.php?p=image&id=69465
Image author: Natural History Museum Rotterdam, Creative Commons License

Littoraria irrorata (Say,1822)
Marsh Periwinkle

Class: Gastropoda
Order: Littorinimorpha
Family: Littorinidae
Genus: *Littoraria*

Image 2.5

Bittiolum varium (L. Pfeiffer, 1840)

Grass cerith

Image source: http://www.jaxshells.org/bit04aa.htm
Image by Bill Frank, http://www.jaxshells.org

Bittiolum varium (L. Pfeiffer, 1840)
Grass cerith

Class: Gastropoda
Order: Caenogastropoda
Family: Cerithiidae
Genus: *Bittiolum*

Distribution:

From South side of Cape Cod to Florida coasts, Gulf of mexico coasts, Carribbean coasts and down to Rio Grande do Sul (Brazil)

***Epitonium angulatum* (Say, 1831)**
Angulate Wentle-trap

Image source: http://www.jaxshells.org/p84m.htm
Image by Bill Frank, http://www.jaxshells.org

***Epitonium angulatum* (Say, 1831)**
Angulate Wentle-trap

Class: Gastropoda
Order: Caenogastropoda
Family: Epitoniidae
Genus: *Epitonium*

Image 2.7

Epitonium humphreysii (Kiener, 1838)

Image source: http://www.jaxshells.org/508oo.html
Image by Bill Frank, http://www.jaxshells.org
Female and egg strand

Epitonium humphreysii (Kiener, 1838)

Class: Gastropoda
Order: Caenogastropoda
Family: Epitoniidae
Genus: *Epitonium*

Distribution:

Image 2.8

Epitonium rupicola (Kurtz, 1860)

Brown-band Wentletrap

Source: http://www.jaxshells.org/erupi.html
Image by Bill Frank, http://www.jaxshells.org

***Epitonium rupicola* (Kurtz, 1860)**

Brown-band Wentletrap

Class: Gastropoda
Order: Caenogastropoda
Family: Epitoniidae
Genus: *Epitonium*

Distribution

Image 2.9

Crepidula fornicata (Linnaeus, 1758)
Atlantic Slipper-shell

Source: http://www.jaxshells.org/40626.htm
Digital image by Amy Tripp

***Crepidula fornicata* (Linnaeus, 1758)**
Atlantic Slipper-shell

Class: Gastropoda

Order: Littorinimorpha

Family: Calyptraeidae

Image 2.10

Crepidula convexa, Say 1822

Convex Slipper-shell

Image source: http://www.jaxshells.org/con11.htm
Digital Image by Krisberg, Marlo F. www.letstalkseashells.com

Crepidula convexa, Say 1822

Convex Slipper-shell

Class: Gastropoda
Order: Littorinimorpha
Family: Calyptraeidae
Genus: *Crepidula*

Image 2.11

Crepidula plana Say, 1822

White Slipper-shell

Image source: hhttp://eol.org/data_objects/15593640 Accessed 06 April 2014
Photo by: Chris Meyer

Source: CalPhotos

Crepidula plana Say, 1822

White Slipper-shell

Class: Gastropoda

Order: Littorinimorpha

Family: Calyptraeidae

Genus: *Crepidula*

Image 2.12

Cyphoma uniplicata (G. B. Sowerby II, 1849)

Single-toothed *Simnia*

Image source: http://www.jaxshells.org/0531xx.htm
Image by Amy Tripp

Cyphoma uniplicata (G. B. Sowerby II, 1849)
Single-toothed *Simnia*

Class: Gastropoda
Order: Littorinimorpha
Family: Ovulidae
Genus: *Simnialena*

Distribution:

Image 2.13

Neverita duplicata (Say, 1822)

Shark Eye or Moon Snail

Source: http://www.jaxshells.org/0408ii.htm
Image by Bill Frank, http://www.jaxshells.org

Neverita duplicata (Say, 1822)
Shark Eye or Moon Snail

Class: Gastropoda
Order: Littorinimorpha
Family: Polinicinae
Genus: *Neverita*

Image 2.14

Sinum perspectivum (Say, 1831)

Baby's Ear

Source: http://www.jaxshells.org/sinumb4.htm
Image by Bill Frank, http://www.jaxshells.org

Sinum perspectivum (Say, 1831)

Baby's Ear

Class: Gastropoda
Order: Littorinimorpha
Family: Naticidae
Genus: *Sinum*

Image 2.15

Tectonatica pusilla (Say, 1822)

Southern Miniature *Natica*

Source: http://www.jaxshells.org/moon.htm
Image by Bill Frank, http://www.jaxshells.org

Tectonatica pusilla (Say, 1822)

Southern Miniature *Natica*

Class: Gastropoda

Order: Littorinimorpha

Family: Naticidae

Genus: *Tectonatica*

Image 2.16

Semicassis granulata (Born, 1778)

Scotch Bonnet

Source: http://www.jaxshells.org/6mil.htm
Image by Bill Frank, http://www.jaxshells.org

Semicassis granulata (Born, 1778)
Scotch Bonnet

Class: Gastropoda
Order: Littorinimorpha
Family: Cassidae
Genus: *Semicassis*

Image 2.17

Hexaplex fulvescens (G. B. Sowerby II, 1834)

Giant Eastern Murex

Source: http://www.jaxshells.org/hfulvescens.htm
This is the largest muricid found in the Western Atlantic. Possessing a massive spinose shell, this species can attain a length of 213 mm
Image by Bill Frank, http://www.jaxshells.org

Hexaplex fulvescens (G. B. Sowerby II, 1834)

Giant Eastern Murex

Class: Gastropoda
Order: Neogastropoda
Family: Muricidae
Genus: Hexaplex

Image 2.18

Urosalpinx cinerea (Say, 1822)
Atlantic Oyster Drill

Source: http://www.jaxshells.org/509j.htm
Image by Bill Frank, http://www.jaxshells.org

Urosalpinx cinerea (Say, 1822)
Atlantic Oyster Drill

Class: Gastropoda
Order: Neogastropoda
Family: Muricidae
Genus: *Urosalpix*

Image 2.19

Stramonita floridana (Conrad, 1837)
Florida Rock Shell

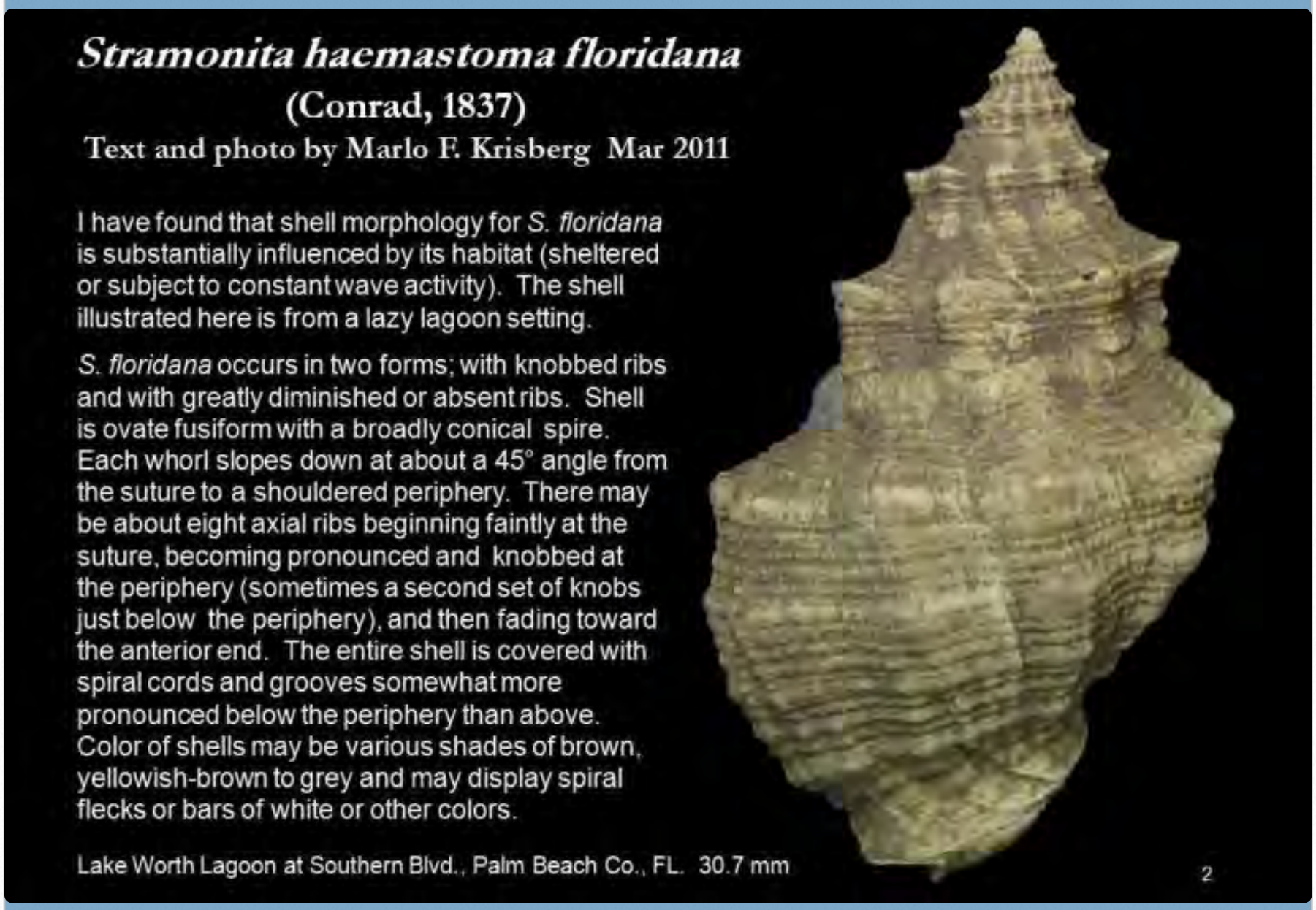


Image source: http://z14.invisionfree.com/Conchologist_Forum/index.php?showtopic=735
Text and image by Krisberg, Marlo F. www.letstalkseashells.com

***Stramonita floridana* (Conrad, 1837)**
Florida Rock Shell

Class: Gastropoda
Order: Neogastropoda
Family: Muricidae
Genus: *Stramonita*

Distribution:

Image 2.20

Eupleura caudata (Say, 1822)

Thick-lip Drill

The largest specimen measures 28 mm.
Image source: http://www.jaxshells.org/423a.htm
Image by Bill Frank, http://www.jaxshells.org

Eupleura caudata (Say, 1822)

Thick-lip Drill

Class: Gastropoda

General comments about the biology of muricids

The oyster drills are among the most serious pests of oyster beds, and as such, their biology and control have been extensively studied. All drills prey upon oysters, especially young oysters or "spat", by boring small, straight-edged holes in the upper valves by mechanical (radular rasping)and chemical (acidic enzymes secreted by the accessory boring gland)means and inserting the proboscis into the soft tissues. *Urosalpinx* is the most abundant and important of the 3 drill species. This species will also feed on barnacles and mussels. Food preference is dependent upon previous food history; that is, given a choice between oysters and barnacles, a drill which had been feeding on barnacles, would most likely continue to feed on barnacles, while a drill feeding on oysters would choose oysters.
The egg capsules of the 3 drills are distinctive: *Urosalpinx* egg cases are simple vase-shaped; *Eupleura* capsules are elongate vase-shaped with 2 distal projections; *Stramonita* egg capsules are elongate rectangular, U-shaped in cross-section. Veliger larvae are released from the *Stramonita* capsules; the young of *Urosalpinx* and *Eupleura* emerge crawling.

Image 2.21

Costoanachis avara (Say, 1822)

Greedy Dove Shell

Source:http://www.jaxshells.org/1129.htm
Image by Bill Frank, http://www.jaxshells.org

Costoanachis avara (Say, 1822)

Greedy Dove Shell

Class:Gastropoda

Order: Neogastropoda

Family: Columbellidae

Image 2.22

Astyris lunata (Say, 1826)

Lunar Dovesnail

Image source: http://www.jaxshells.org/asty.htm
Image by David Kirsh

Astyris lunata (Say, 1826)

Lunar Dovesnail

Class: Gastropoda
Order: Neogastropoda
Family: Columbellidae
Genus: Astyris

Image 2.23

Gemophos tinctus (Conrad, 1846)
Tinted Cantharus

Image source: http://www.jaxshells.org/0702a.htm
Image by Bill Frank, http://www.jaxshells.org

Gemophos tinctus (Conrad, 1846)
Tinted Cantharus

Class: Gastropoda
Order: Neogastropoda
Family: Buccinidae
Genus: *Gemophos*

Distribution:

Image 2.24

Busycon carica (Gmelin, 1791)

Knobbed Whelk

Image source: http://www.jaxshells.org/40903.htm
Image by Bill Frank, http://www.jaxshells.org

Busycon carica (Gmelin, 1791)

Knobbed Whelk

Class: Gastropoda

Order: Neogastropoda

Family: Buccinidae

Genus: *Busycon*

Image 2.25

***Busycon sinistrum* Hollister, 1958**
Lightning Whelk

Image source: http://z14.invisionfree.com/Conchologist_Forum/ar/t2015.htm
Text and image by Krisberg, Marlo F. www.letstalkseashells.com

Busycon sinistrum Hollister, 1958
Lightning Whelk

Class: Gastropoda
Order: Neogastropoda
Family: Buccinidae
Genus: *Busycon*

Distribution: From New Jersey to Western Florida.

Image 2.26

Busycotypus canaliculatus (Linnaeus, 1758)

Channeled Whelk

Large specimen.
Image source: http://www.jaxshells.org/30576.htm
Image by Bill Frank, http://www.jaxshells.org

Busycotypus canaliculatus (Linnaeus, 1758)
Channeled Whelk

Class: Gastropoda
Order: Neogastropoda
Family: Buccinidae
Genus: Busycotypus

Distribution:
From Massachusetts to East Florida coasts

About the biology of the Family Buccinidae

The three common Buccinidae species coexist on intertidal and subtidal sand and muddy sand bottoms. They are predacious and are attracted to, and dig up, bivalve prey. *Busycon sinistrum*, which is active diurnally, and *B. carica* (the most abundant Whelk 1n the Beaufort area), which may be active at all hours, are thick-shelled species. They feed on hard-shelled bivalves which close completely (e.g. *Mercenaria*, *Crassostrea*, *Macrocallista*) by breaking the shells with repeated heavy blows by its body whorl. They may also wait until the bivalve opens and then pry apart the valves with their outer lip. The thin shelled *Busycotypus canaliculatus* is nocturnal, and feeds primarily on bivalves which have a permanent gape (e.g., *Tagelus, Ensis, Mya*). The female whelk produces a distinctive rubbery egg strand made up of dis-like capsules attached to a cord, the early end of which is attached to the substrate. The capsules are filled with an albuminous fluid in which the eggs float. The young emerge with a fully developed shell and immediately begin a predatory behavior (at this stage they may be dependent primarily upon carrion or juveniles for food). Left-handed forms are occasionally collected of *B. canaliculatus* and *B. carica*, the latter case resulting in confusion with *B. sinistrum*.

Image 2.27

Nassarius vibex (Say, 1822)
Common Eastern Nassa

Image source: http://www.jaxshells.org/0930.htm
Image by Bill Frank, http://www.jaxshells.org

Nassarius vibex (Say, 1822)
Common Eastern Nassa

Class: Gastropoda
Order: Neogastropoda
Family: Nassariidae
Genus: *Nassarius*

Image 2.28

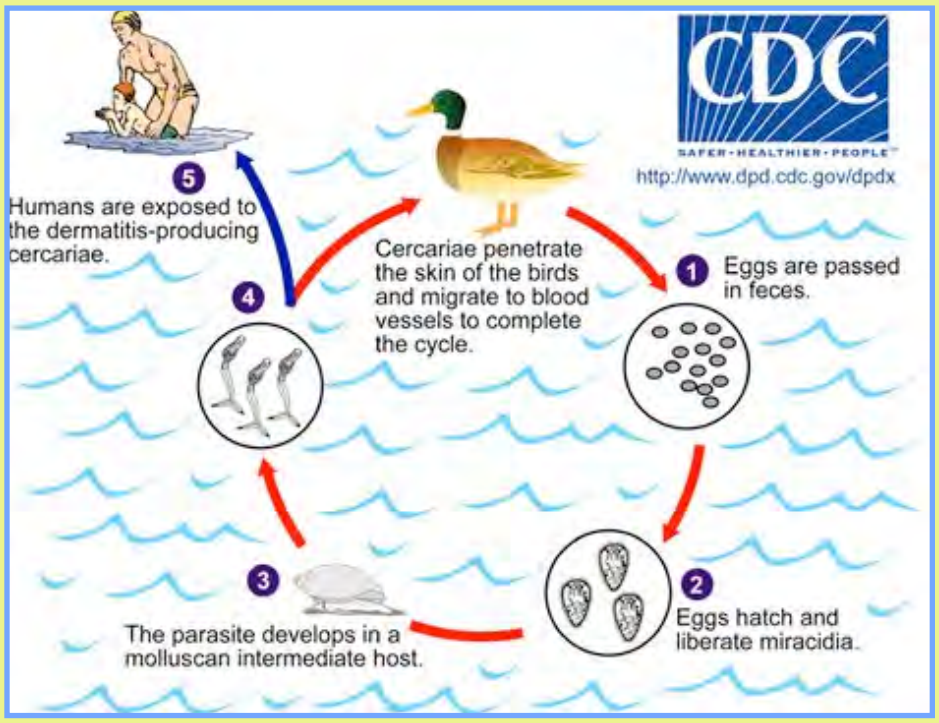
Ilyanassa obsoleta (Say, 1822)
Eastern mud Nassa

Image source: http://www.jaxshells.org/829aa.htm
Image by Bill Frank, http://www.jaxshells.org

Ilyanassa obsoleta (Say, 1822)
Eastern mud Nassa

Class: Gastropoda
Order: Neogastropoda
Family: Nassariidae
Genus: *Ilyanassa*

A WORD OF CAUTION



The snail *Illyanassa obsoleta* has some medical significance to humans as the intermediate host of the schistosomatid trematode flatworm *Austrobilharzia variglandis,* the normal hosts of which are ducks, but which is often implicated in cases of cercarial dermatitis in humans. This snail can be found at marine beaches in temperate climates. Cercarial dermatitis is caused by the cercariae of certain species of schistosomes whose normal hosts are birds and mammals other than humans. These cercariae seem to have a chemotrophic reaction to secretions from the skin and are not as host-specific as other types of schistosomes. They attempt to, and, sometimes may actually, enter human skin. The penetration causes a dermatitis which is usually accompanied with intense itching, but the cercariae do not mature into adults in the human body. Cases of cercarial dermatitis can occur in both fresh and brackish water environments. Cercarial dermatitis should not be confused with seabather's eruption, which is caused by the larval stage of cnidarians (e.g., jellyfish). The areas of skin affected by seabather's eruption is generally under the garments worn by bathers and swimmers where the organisms are trapped after the person leaves the water. In contrast, cercarial dermatitis occurs on the exposed skin outside of close-fitting garments.

Hosts of avian schistosomes can be either year-round resident or migratory birds, including seagulls, shorebirds, ducks, and geese. Adult worms are found in the blood vessels and produce eggs that are passed in the feces . On exposure to water, the eggs hatch and liberate a ciliated miracidium that infects a suitable snail (gastropod) intermediate host, such as *Illyanassa obsoleta*. The parasite develops in the intermediate host to produce free-swimming cercariae that are released under appropriate conditions, penetrate the skin of the avain hosts, and migrate to the blood vessels to complete the cycle. Humans are inadvertent and inappropriate hosts: cercariae may penetrate the skin but do not develop further. A number of species of trematode flatworms with dermatitis-producing cercariae have been described from both freshwater and saltwater environments and exposure to either type of cercaria will sensitize persons to both. Cercarial dermatitis occurs worldwide, with cases reported from every continent except Antarctica. In the United States, cases are commonly reported from the Great Lakes region.

Source:http://www.dpd.cdc.gov/dpdx/HTML/CercarialDermatitis.htm

Image 2.29

Cinctura hunteria (Perry, 1811)
Banded Tulip

Image by Humberto Diaz

Cinctura hunteria **(Perry, 1811)**
Banded Tulip

Class: Gastropoda

Order: Neogastropoda

Family: Fasciolariidae

Image 2.30

Oliva sayana Ravenel, 1834
Lettered Olive

Image source: http://www.jaxshells.org/0901u.htm
Image by Bill Frank, http://www.jaxshells.org

• ◦ ◦ ◦ ◦

***Oliva sayana Ravenel,* 1834**
Lettered Olive

Class: Gastropoda
Order: Neogastropoda
Family: Olividae

Image 2.31

Olivella mutica (Say, 1822)

Variable Dwarf Olive

Image source: http://www.jaxshells.org/16bb.htm
Image by Bill Frank, http://www.jaxshells.org

Olivella mutica (Say, 1822)

Variable Dwarf Olive

Class: Gastropoda

Order: Neogastropoda

Family: Olivellidae

Genus: *Olivella*

Distribution: .

From New Jersey to West Florida; Southern coasts of Caribbean Sea and South to

Image 2.32

Terebra dislocata (Say, 1822)

Atlantic (Eastern) Auger

Image source: http://www.jaxshells.org/012207.htm
Image by Bill Frank, http://www.jaxshells.org

Terebra dislocata (Say, 1822)
Atlantic (Eastern) Auger

Class: Gastropoda
Order: Neogastropoda
Family: Terebridae
Genus: *Terebra*

Distribution:

From USA East coasts from Cobscook Bay, Maine, Caribbean Sea down to Rio Grande

Image 2.33

Boonea seminuda (C. B. Adams, 1839)

Half-smooth Odostome

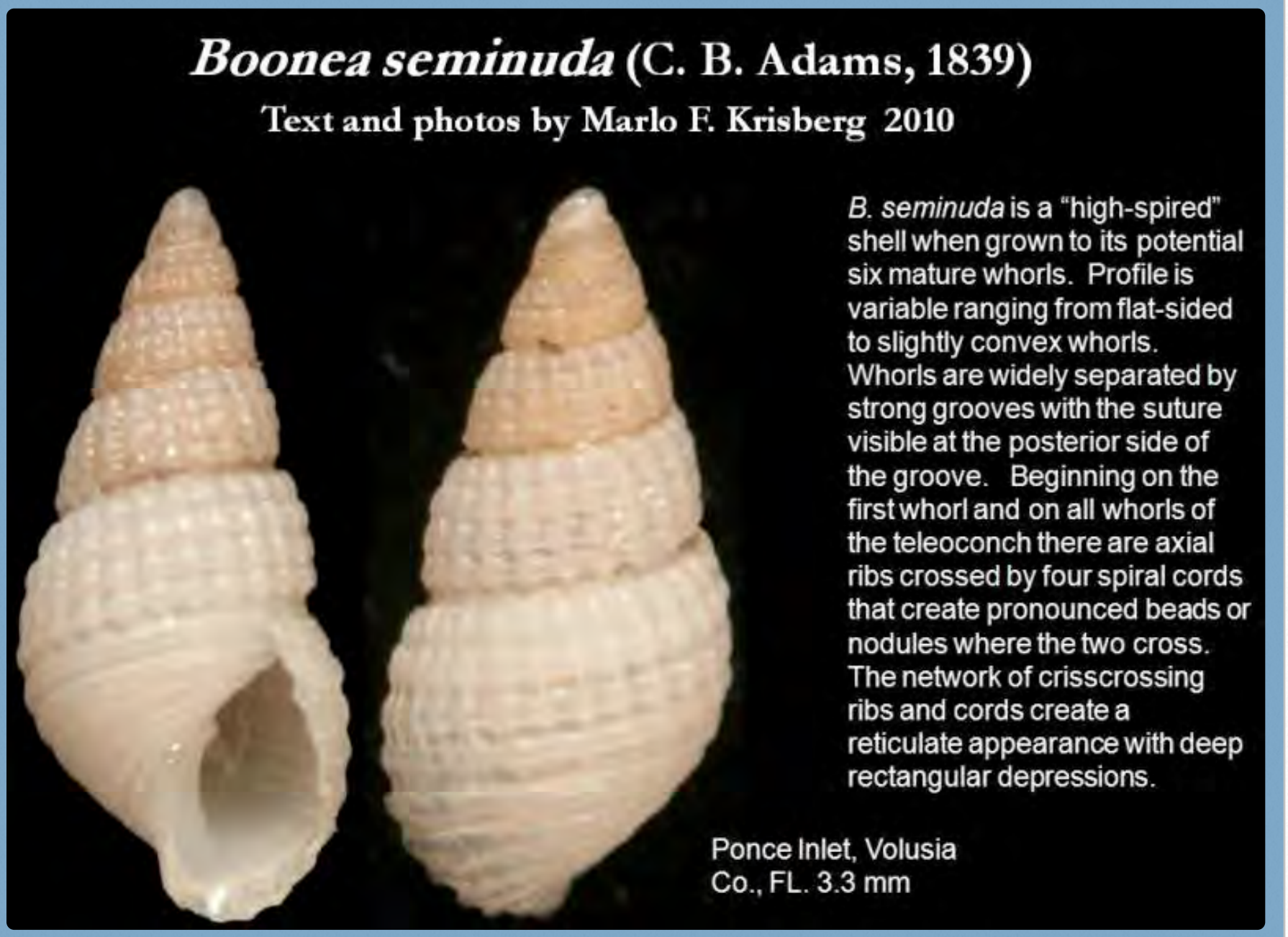


Image source: http://z14.invisionfree.com/Conchologist_Forum/ar/t1884.htm
Text and image by Krisberg, Marlo F. www.letstalkseashells.com

Boonea seminuda (C. B. Adams, 1839)
Half-smooth Odostome

Class: Gastropoda
Order: Neogastropoda
Family: Odostomia
Genus: *Boonea*

Distribution:

From Magdalen Islands, Canada, USA East coasts to West Florida, Gulf of Mexico,

Image 2.34

Acteocina canaliculata (Say, 1826)

Channeled Barrel-bubble

Image source: http://www.jaxshells.org/0316.htm
Image by Bill Frank, http://www.jaxshells.org

Acteocina canaliculata (Say, 1826)
Channeled Barrel-bubble

Class: Gastropoda
Order: Cephalaspidea
Family: Cylichnidae

***Acteocina candei* (d'Orbigny, 1841)**

Candé's Barrel-bubble

Class: Gastropoda
Order: Cephalaspidea
Family: Cylichnidae
Genus: *Acteocina*

Distribution:
From Shackleford, North Carolina to Gulf of Mexico, Central America, Antilles and Lesser Antilles and South to Venezuela.

Range: 35°N to 36°S; 97°W to 32.5°W

Description:
Shell small and cylindrical, widest on shoulder; smooth and shining surface showing faint growth lines. Color milk white. Outer lip advanced in center, moderate fold on columella.
Size: up to 4.5 mm.

Synonymy:

Image 2.35

***Acteocina candei* (d'Orbigny, 1841)**

Candé's Barrel-bubble

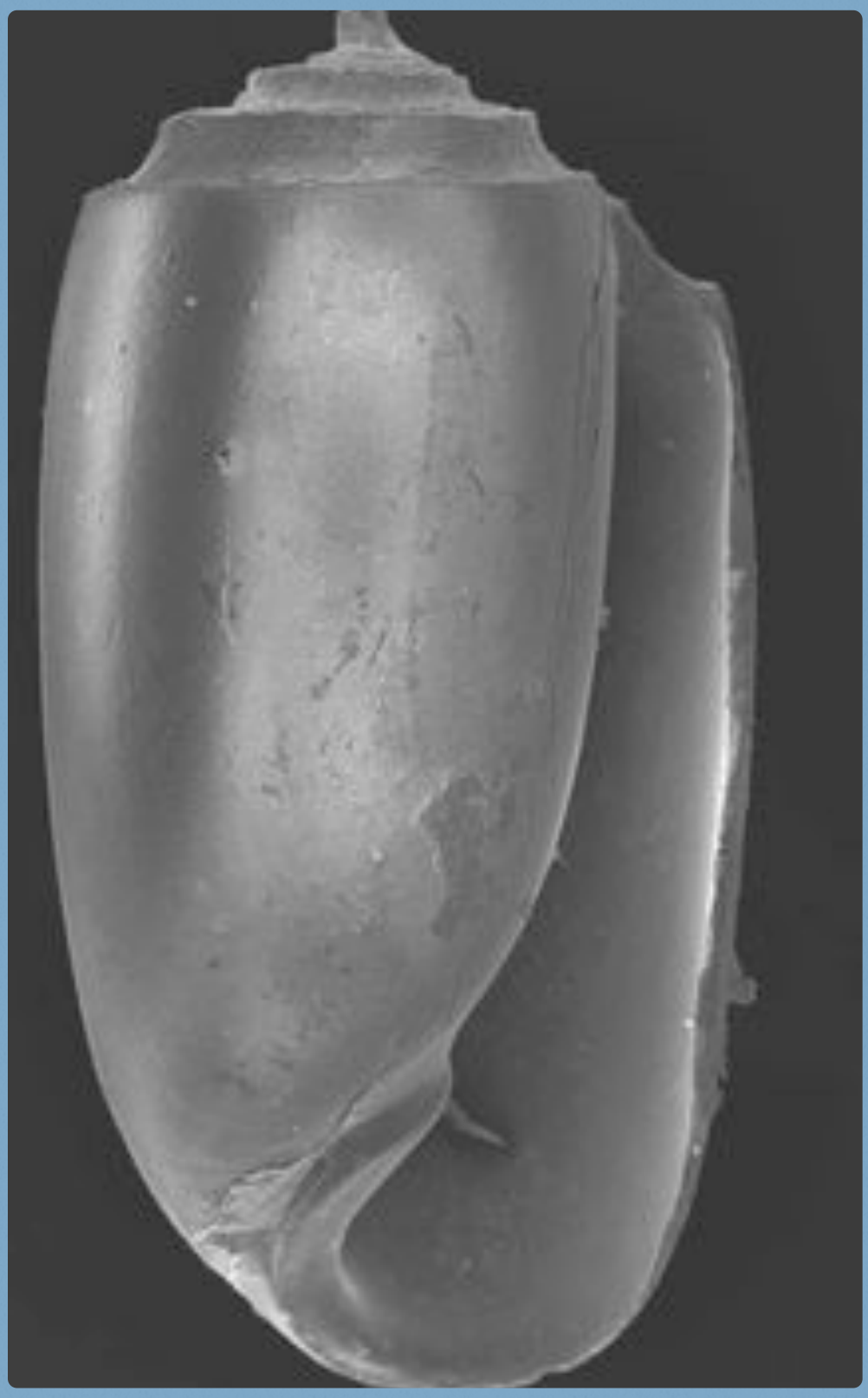


Photo by Nestor Ardila, © (cc) BY-NC
Source: eOpisthobranchia
Image source: http://eol.org/data_objects/16197109
Accessed 06 April 2014

Image 2.36

Haminoea solitaria (Say, 1822)

Solitary Paper-bubble

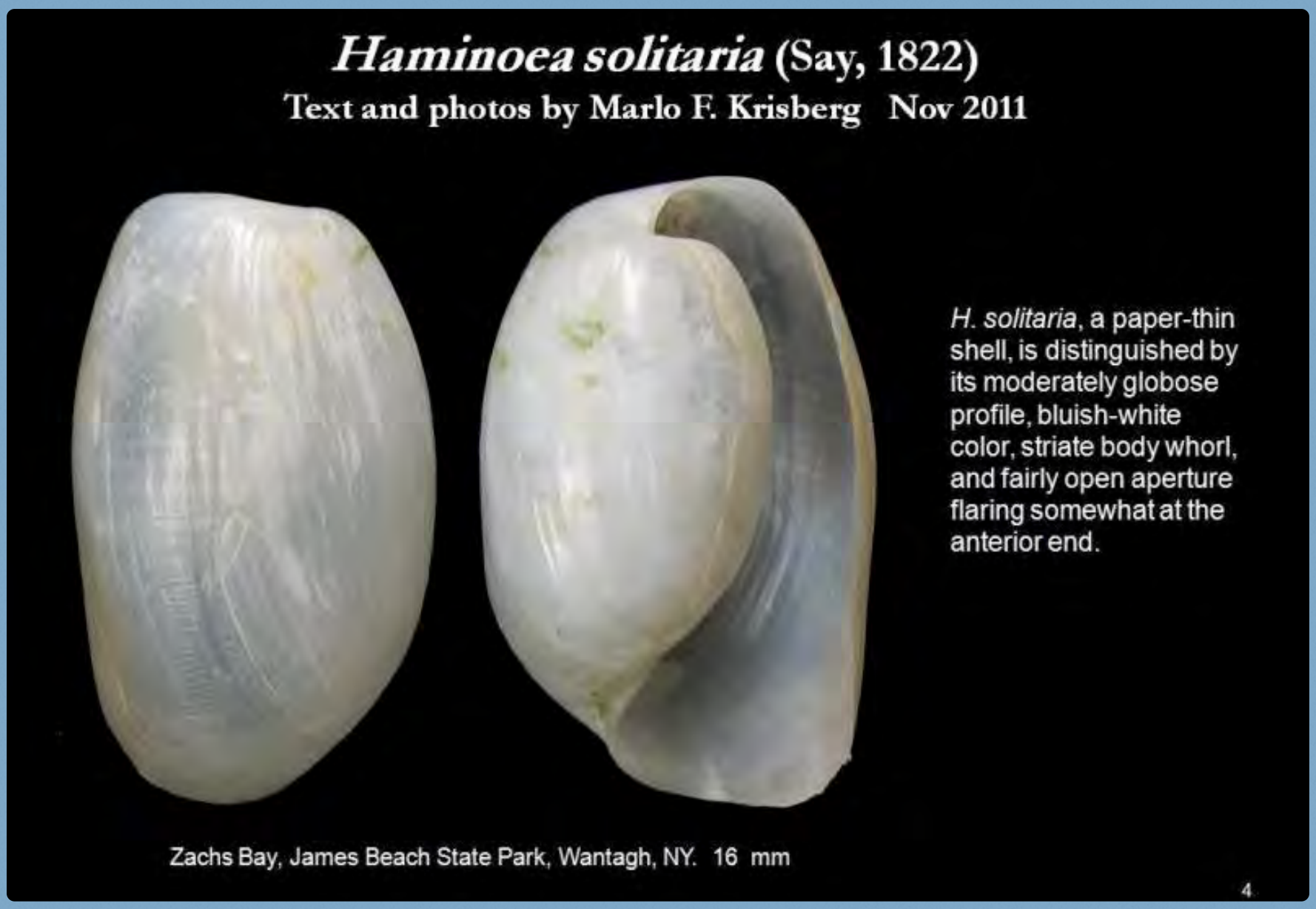


Image source: http://z14.invisionfree.com/Conchologist_Forum/ar/t2266.htm
Text and image by Krisberg, Marlo F. www.letstalkseashells.com

***Haminoea solitaria* (Say, 1822)**

Solitary Paper-bubble

Class: Gastropoda

Order: Cephalaspidea

Family: Haminoeidae

Genus: *Haminoea*

Distribution:

Canada: Gulf of St. Lawrence; USA: Massachusetts to East Florida.

Image 2.37

Aplysia fasciata Poiret, 1789
Mottled Seahare

Image source: http://commons.wikimedia.org
Author: Dimitris Siskopoulos © BY-NC-SA

Aplysia fasciata Poiret, 1789
Mottled Seahare

Class: Gastropoda
Order: Anaspidea
Family: Aplysiidae
Genus: *Aplysia*

Image 2.38

Melampus bidentatus Say, 1822

Eastern Melampus

***Melampus bidentatus* Say, 1822**
Eastern Melampus

Class: Gastropoda

Order: Pulmonata

Family: Ellobiidae

Genus: *Melampus*