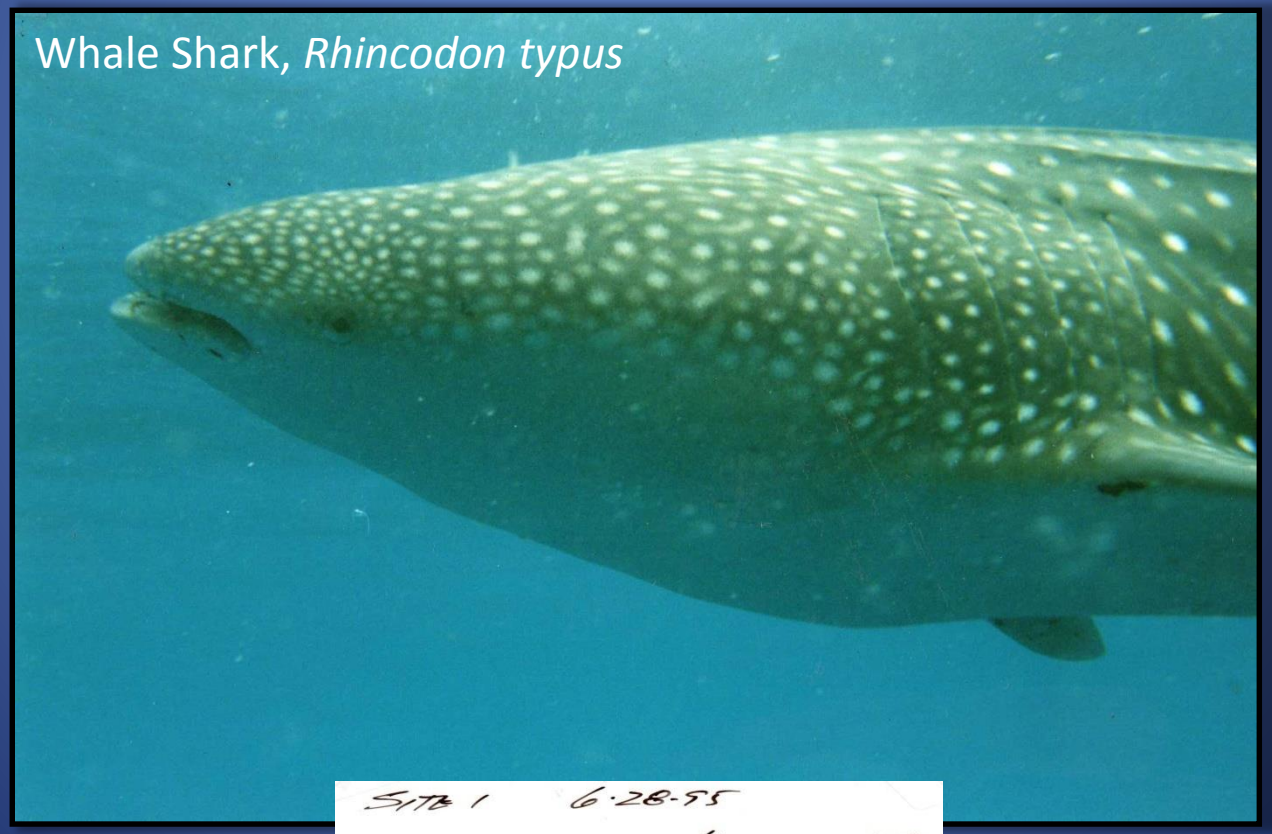
# Diving Volusia County's Artificial Reefs

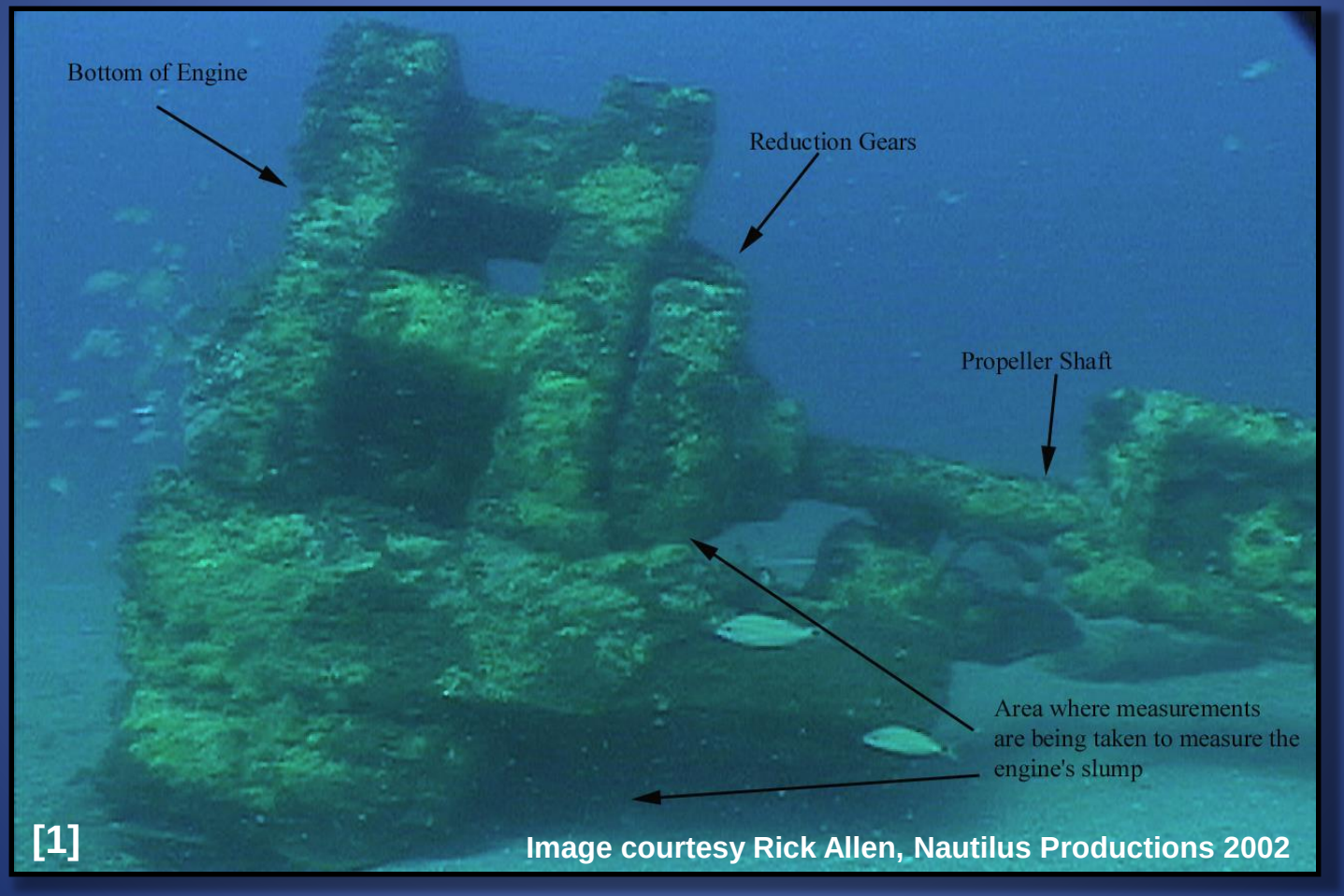


# History of Artificial Reefs of Volusia County

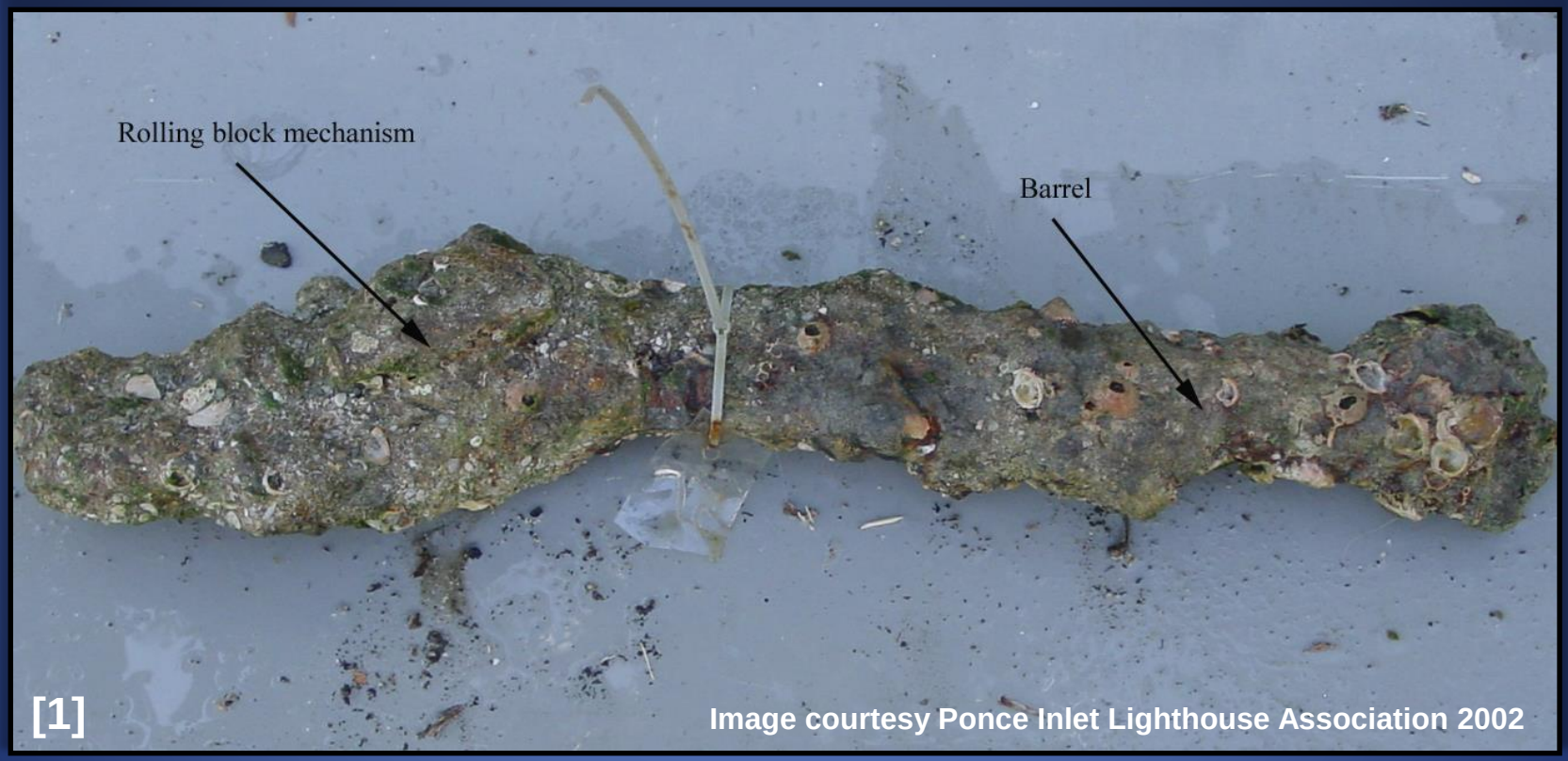

Retrieved from http://www.staugustinelighthouse.org/LAMP/Research/SS_Commodore

# SS Commodore

Volusia County's oldest known artificial reef (shipwreck) was created in 1897 with the sinking of the SS Commodore.



# Ormond Anchor Chasers and the Discovery of the SS Commodore

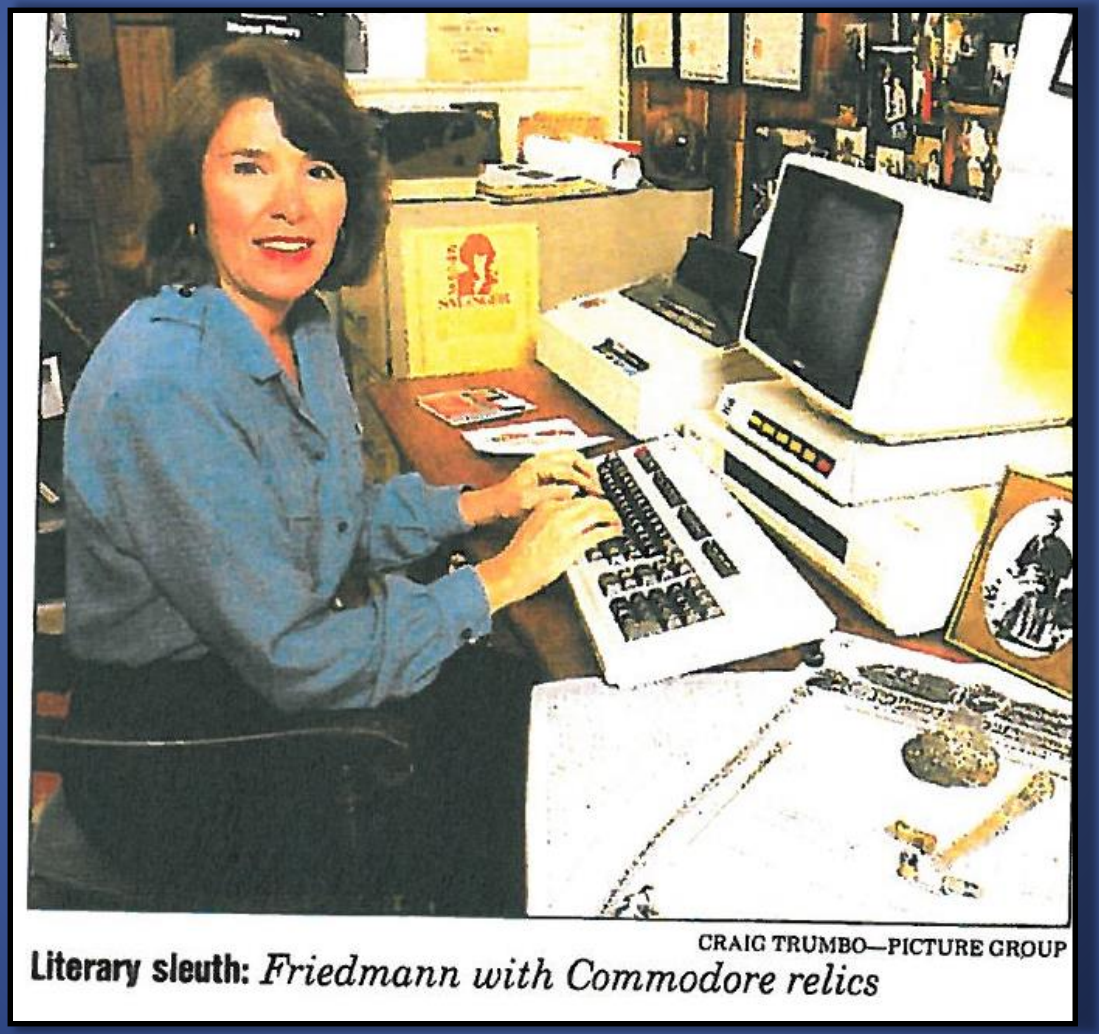



Concreted .43-caliber Remington rolling-block rifle matching the manifest of the SS Commodore [1]

• November 1, 1887 - Present Ponce Inlet Lighthouse completed.
• January 1897 – The SS Commodore sinks ,with Stephen Crane on board, while running guns, ammunition, and Cuban freedom fighters to Cuba.
•1941 – Ponce de Leon Inlet Coast Guard Station opened.
•1941 – Ponce Inlet Port District was formed. [2]
•1940's – Ormond Anchor Chasers formed as a Dive Club. "The local non-profit organization was formed to encourage the sport of SCUBA diving through proper safe and sane diver training and practices."[3]

Retrieved from http://ponceinlet.org/history.cfm

•1985 – Peggy Friedmann, an English professor at Jacksonville University, meets Don Serbousek for the first time while researching the SS Commodore through Stephen Crane's book, "The Open Boat". [4]



CRAIG TRUMBO—PICTURE GROUP

**Literary sleuth:** *Friedmann with Commodore relics*

Photo Credit : Craig Trumbo

•1986 – May. Peggy and Don dive the wreck of the Commodore together for the first time. Later Kimberly Eslinger, 2002-2004, would investigate the site and write her Master's Degree thesis on the discovery of the Commodore. [5]

Photo of Don Serbousek

Don was a master diver and founding member of the Ormond Anchor Chasers. He was instrumental in helping create Volusia County's Artificial Reef Program.

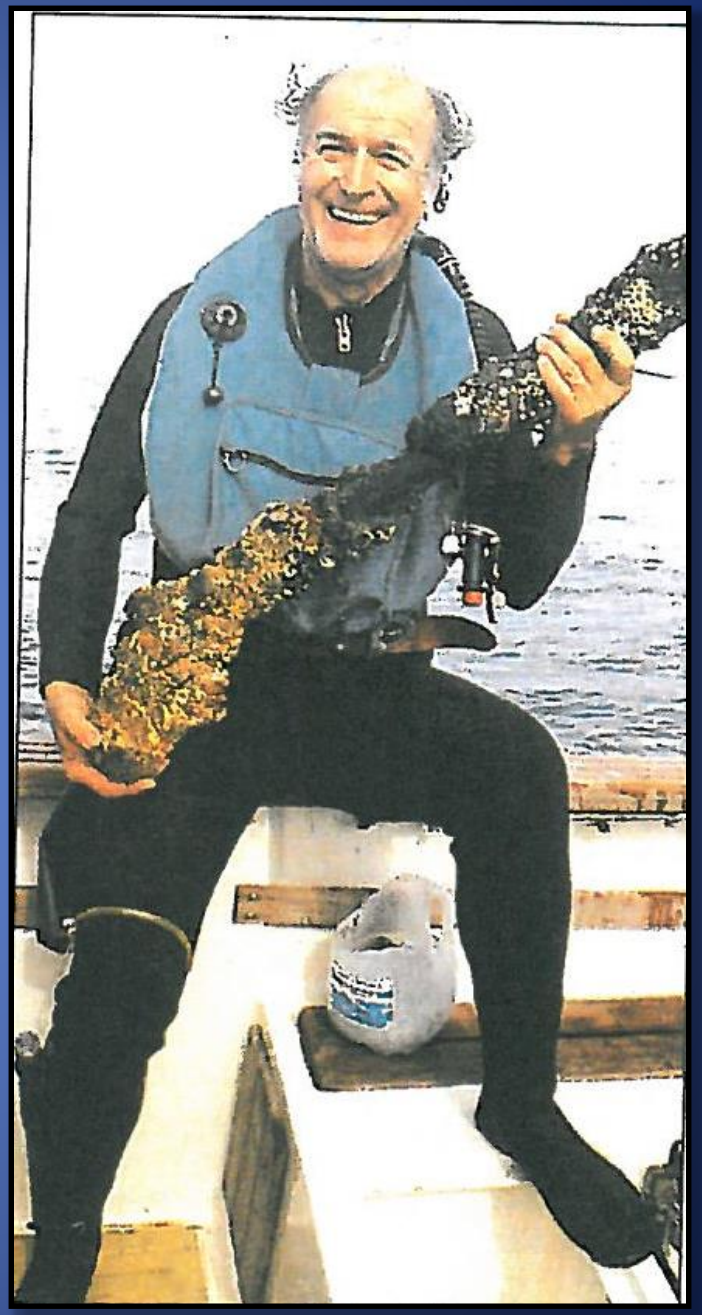


Photo Credit : Bill Belleville

Don Serbousek was also an amateur paleontologist and is credited with finding the world's most complete Giant Ground Sloth in South Daytona.

Originally discovered in 1966, he kept it a secret until approached by Roger Alexon in 1975 who also found bones on the site. [6]

The Giant Ground Sloth on display at Daytona Beach's Museum of Arts and Sciences was discovered in 1975 at what is now Reed Canal Park.

Photo retrieved from http://www.fossil-treasures-of-florida.com/eremotherium.html

# Verifying The Wreck As The Commodore

Ammunition and Remington rifles match a cargo list published in newspapers following the sinking of the Commodore.

“The match of the rifle caliber with the ammunition supports the identification of the site as Commodore.” [1]

Photo courtesy Joe Knott (2013)

Photograph of a .43 caliber bullet recovered from the site of the Commodore.

# Timeline of Volusia County's Artificial Reef Program

1940's – Redwood Wharton opens a fish camp in Ponce Inlet and purchases the Gay Wind that begins the area's charter boat fleet.

Late 60's – Redwood begins constructing a tire reef, "Wharton's Tire Reef" about four miles off the coast to create a fishing area closer to shore.


1932 photo of Redwood Wharton (right) holding redfish in front of a Main St. Bait and Tackle Store


Redwood's charter boat "Gay Wind"

Photos Courtesy Halifax Sport Fishing Club Archives

1967 – The Halifax Sportfishing Club is created to promote fishing in Volusia County. The first discussions are about creating an offshore fishing chart and creating artificial reefs closer to shore. Founder Johnny Hazouri and First President Tom Humphries have meetings at restaurants and clubhouses until a permanent home is built in 1995. (Carl Zimmerman, personal communication March 12, 2013.)

Early fundraisers were in the form of fish frys on the Dunlawton Causeway. Police would install reduced speed zones so that passers-by could stop and purchase fried fish plates.

# Johnny Hazouri

A founding member of the Halifax Sport Fishing Club, he went on to co-found, with Royce Riehlman, the Greater Daytona Beach Striker Fishing Tournament in 1977.

Pictured here with his wife Ginny.

Photo Courtesy Carl Zimmerman

# Greater Daytona Beach Striker Fishing Tournament

Johnny and Royce each took out loans against their homes to put together the $25,000 purse for the first Striker Fishing Tournament. The first tournament featured over 100 boats and was at the time considered the richest prize of any offshore tournament in the world.

The tournament had its doubters, and in a June 12, 1977 News Journal article Hazouri says, “Those people who think we don’t have good fishing around here, if they show up at the weigh station this afternoon, we’re going to show them something.” [7]

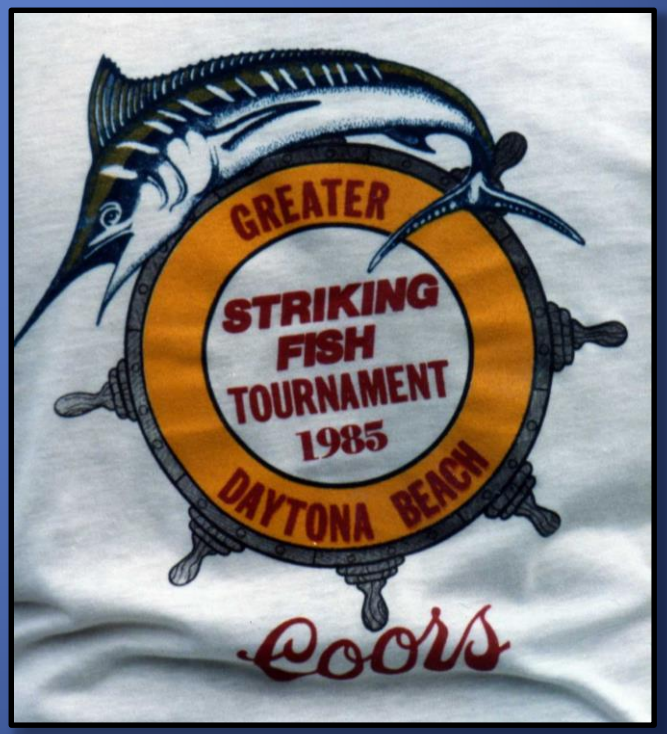



Photo Courtesy Halifax Sport Fishing Club Archives

Over 4,500 people came out to see the tournament's first weigh in. The tournament helped put Ponce Inlet on the map for marlin, sailfish and other offshore game fish.[7]

Photos Courtesy Halifax Sport Fishing Club Archives

•Late 1970's – Volusia County fishermen and divers approach the County Council about creating artificial reefs.

Peter Heebner of the Halifax Sportfishing Club and Halifax Reef Inc. along with Dan O'Brien, Port Authority Director, were instrumental in persuading the Army Corp of Engineers to issue the County a permit for the first artificial reefs. [2]

Volusia County works closely with and depends on the volunteer work of the Reef Team and Halifax Sport Fishing Club

2012 photo of Volusia County Council showing its appreciation of the Reef Team and HSFC's hard work throughout the years.

•1977 – Possible artificial reef sites are surveyed by Dr. Hayward Mathews, Ormond Anchor Chasers and Joe Halusky. Sites 1,2,3 and 4 were recommended.

•1979 - The Army Corps of Engineers issues permits for the first four artificial reef sites in Volusia County.

•1980 – The USS Mindanao becomes Volusia County's first permitted artificial reef. (Site 3) [2]

# USS Mindanao

Launched in 1943, the USS Mindanao served as a engine repair ship in the South Pacific during WWII.

**Shown heavily damaged after the ammunition ship USS Mt Hood exploded 350 yards from the USS Mindanao**

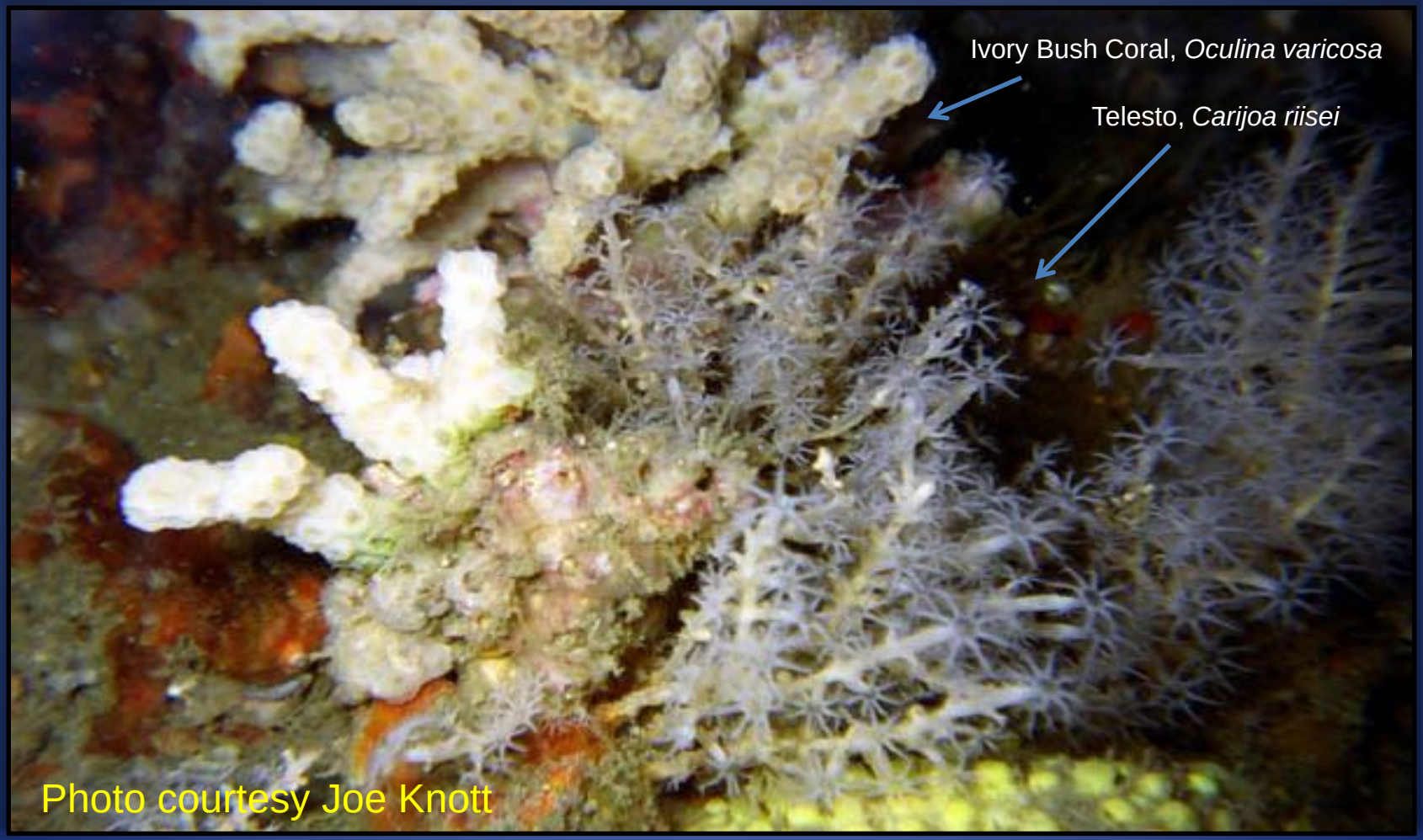
1980 – Ormond Anchor Chasers are trained at Florida Sea Grant's first artificial reef diver training program. The Sea Grant extension agent was Joe Halusky. [2]

Joe Knott Surveying Site 11 with FWC

Photo Credit: Keith Mille

1981 – The first culverts are deposited to become artificial reefs on Site 2, Cracker Ridge. [2]

## Hard and soft coral growth Site 2 (2005)



1988 – An additional 5 artificial reef sites are permitted, sites 5, 6, 7 ,8, and 9. [2]

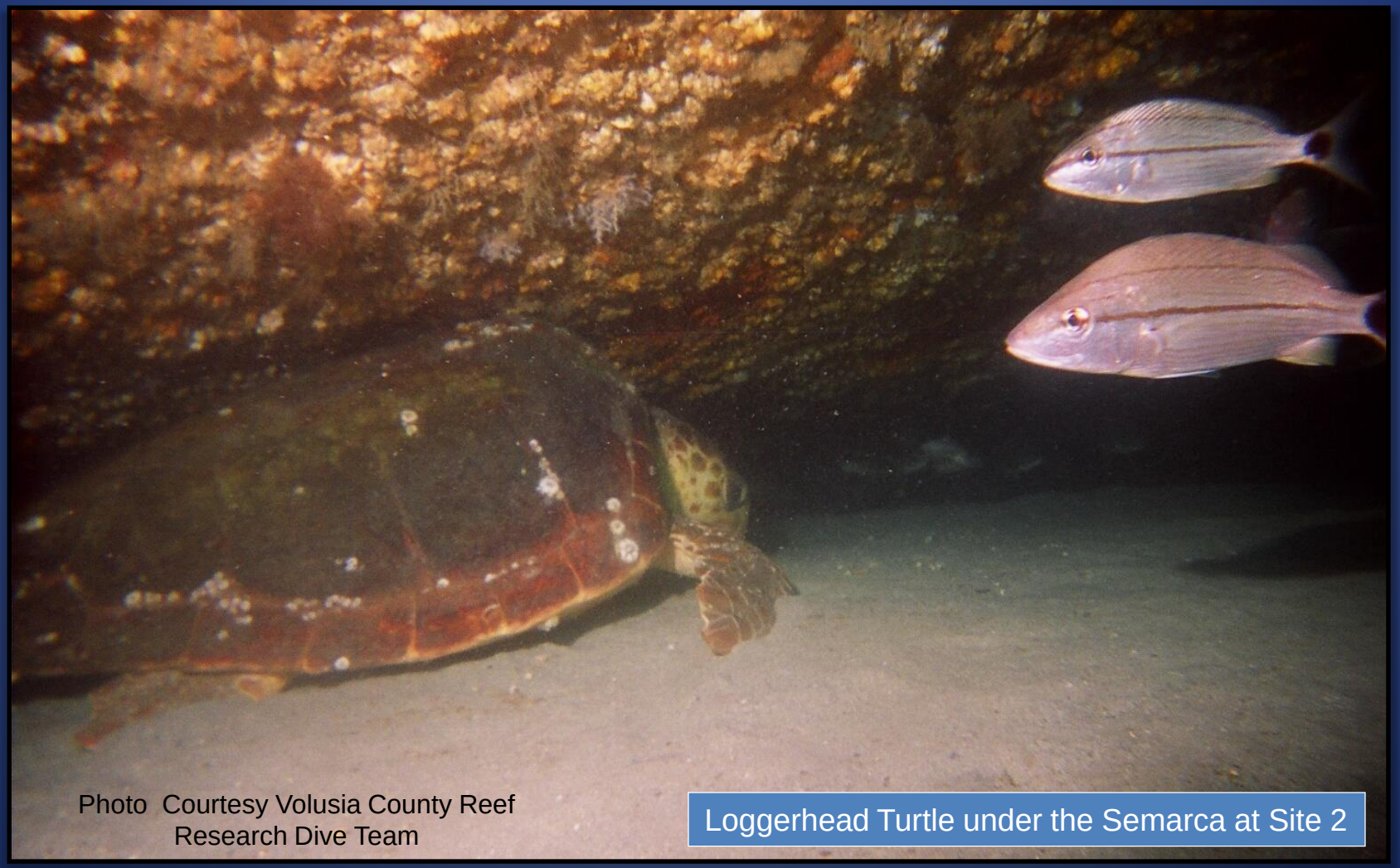
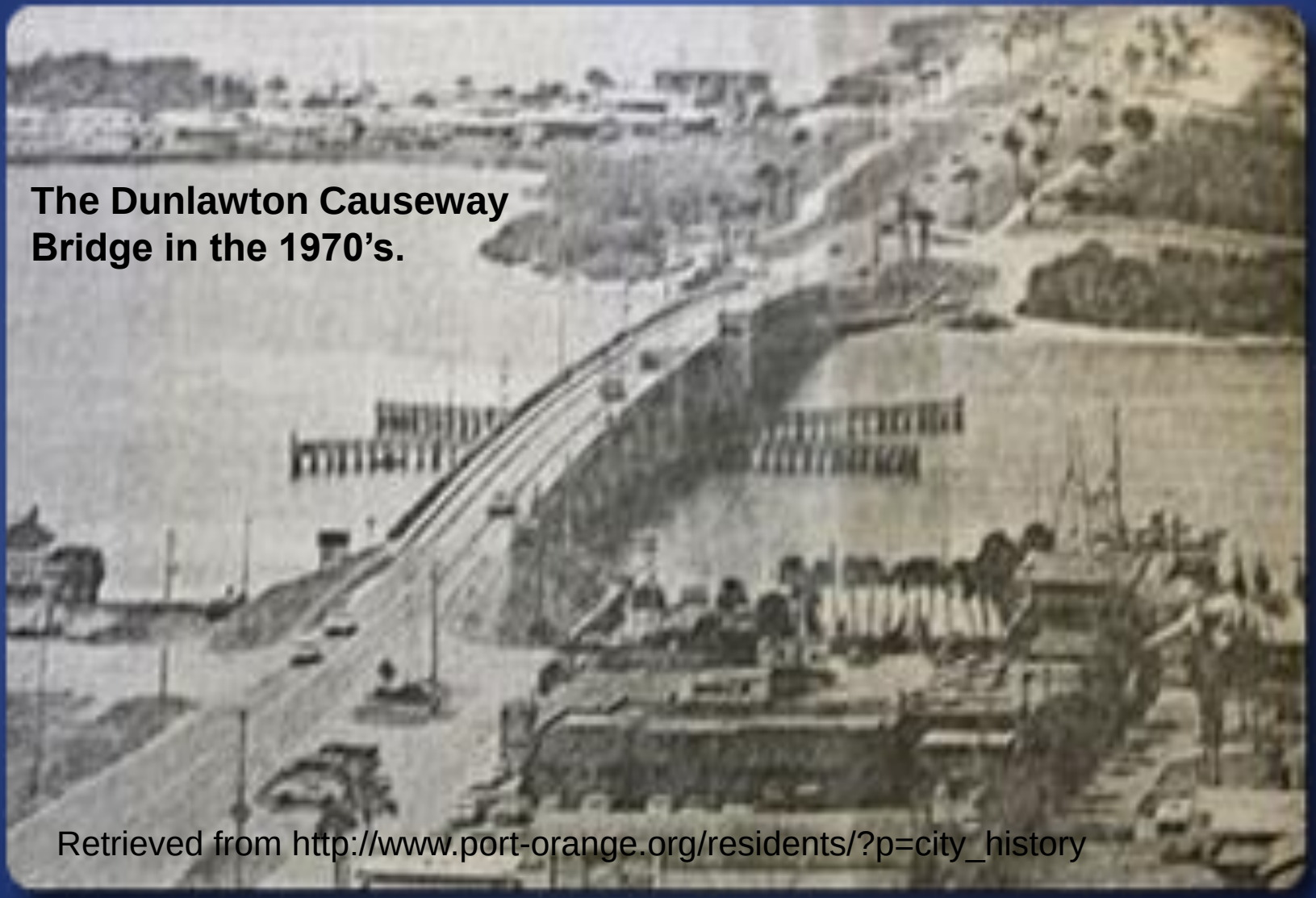


Photo Courtesy Volusia County Reef Research Dive Team

Loggerhead Turtle under the Semarca at Site 2

The old Port Orange Bridge became an artificial reef at site 5.




Retrieved from http://www.port-orange.org/residents/?p=city_history

The Dunlawton Causeway Bridge rests as an artificial reef.

# Beginnings of Volusia County Reef Research Dive Team

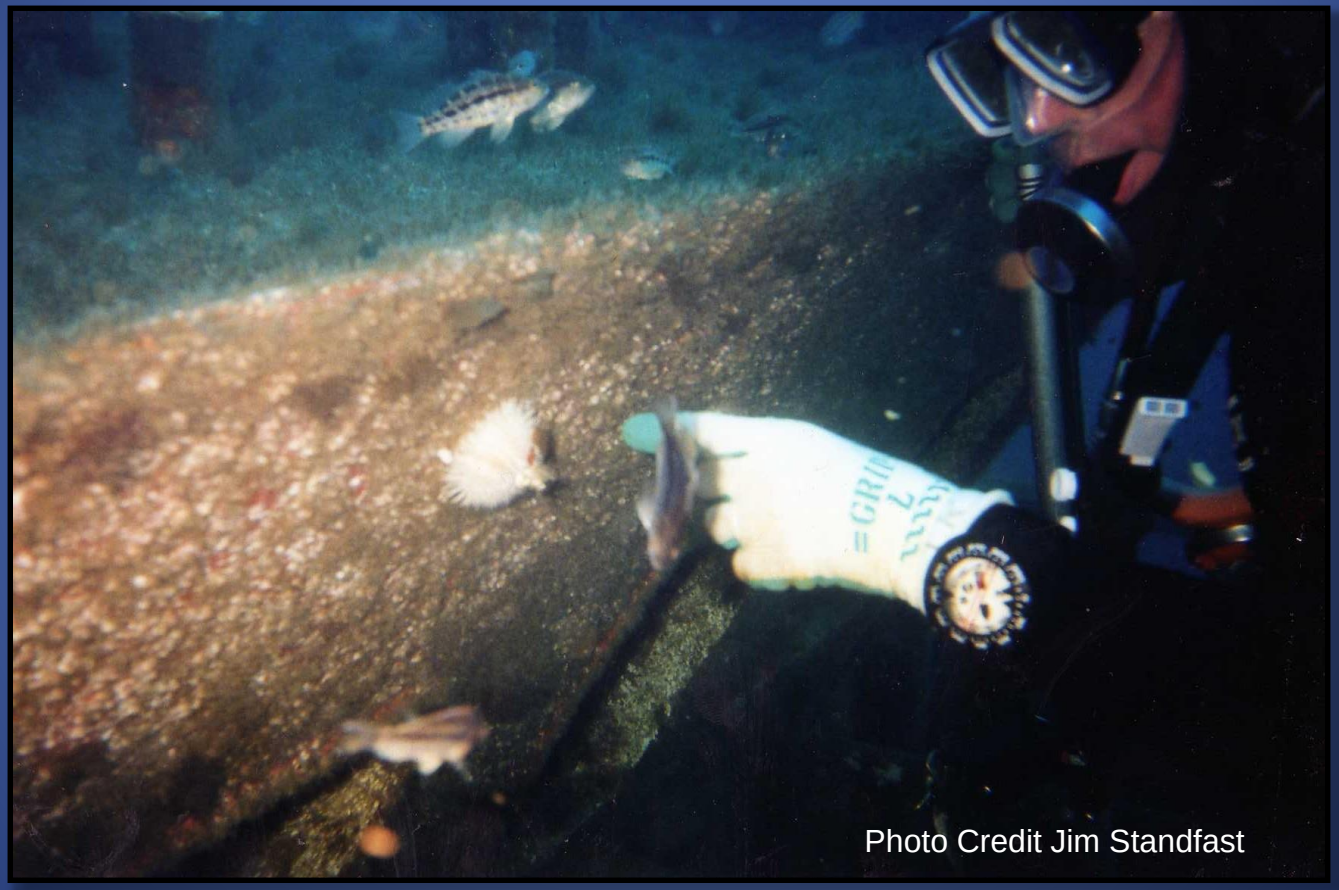
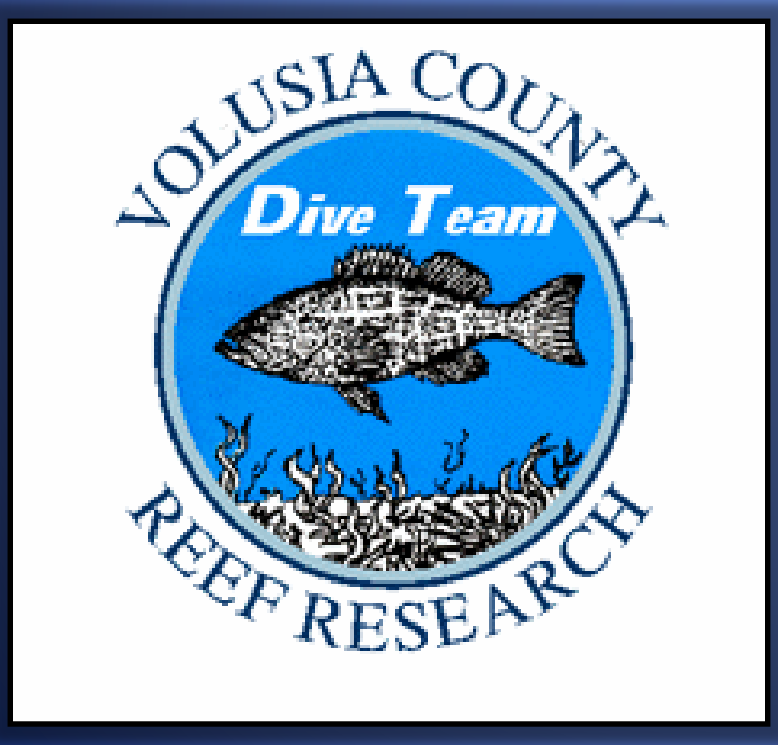



Photo of Joe Knott surveying the Antilles Star just four months after deployment.

1991- Under the recommendation of the Port Authority Coordinator, Dan O'Brien, the Ormond Anchor Chasers becomes the Volusia County Reef Research Dive Team (The Reef Team)

"The Ormond Anchor Chasers, a local dive club, originally began this endeavor. As the work load increased and training became a prerequisite, it became apparent that a larger, more formalized group was needed. Thus, the Volusia County Reef Research Dive Team came into existence."[8]




As described in the May 1994 publication of the "Port Authority Water Line," "The Volusia County Reef Research Dive Team, Inc. is a not-for-profit corporation whose sole **purpose is to assist the Port Authority to create and maintain artificial reefs."** [8]

# Documentation and Mapping of Artificial Reef Locations.

1993 – John Lane begins to map the locations of all the artificial reef deposits and surveys. He uses Loran – C to establish coordinates of each deposit within a site that further aids in the placement of additional deposits. [2]

Photo Courtesy John Lane and Volusia County Reef Research Dive Team.

John Lane was a member of the Ormond Anchor Chasers and founding member of the Volusia County Reef Research Dive Team.

John Lane ascending after a survey of Site 11.

This work, along with efforts from other Reef Team Members and the Halifax Sport Fishing Club, allowed for updated fishing charts of Volusia County's natural and artificial reefs.

In 1968, the HSFC produced its first Offshore Fishing Chart. Members used Loran –C to locate natural reefs and shipwrecks and placed large buoys to mark the site. [6]

Updated 2012 Offshore Fishing Chart produced by the HSFC

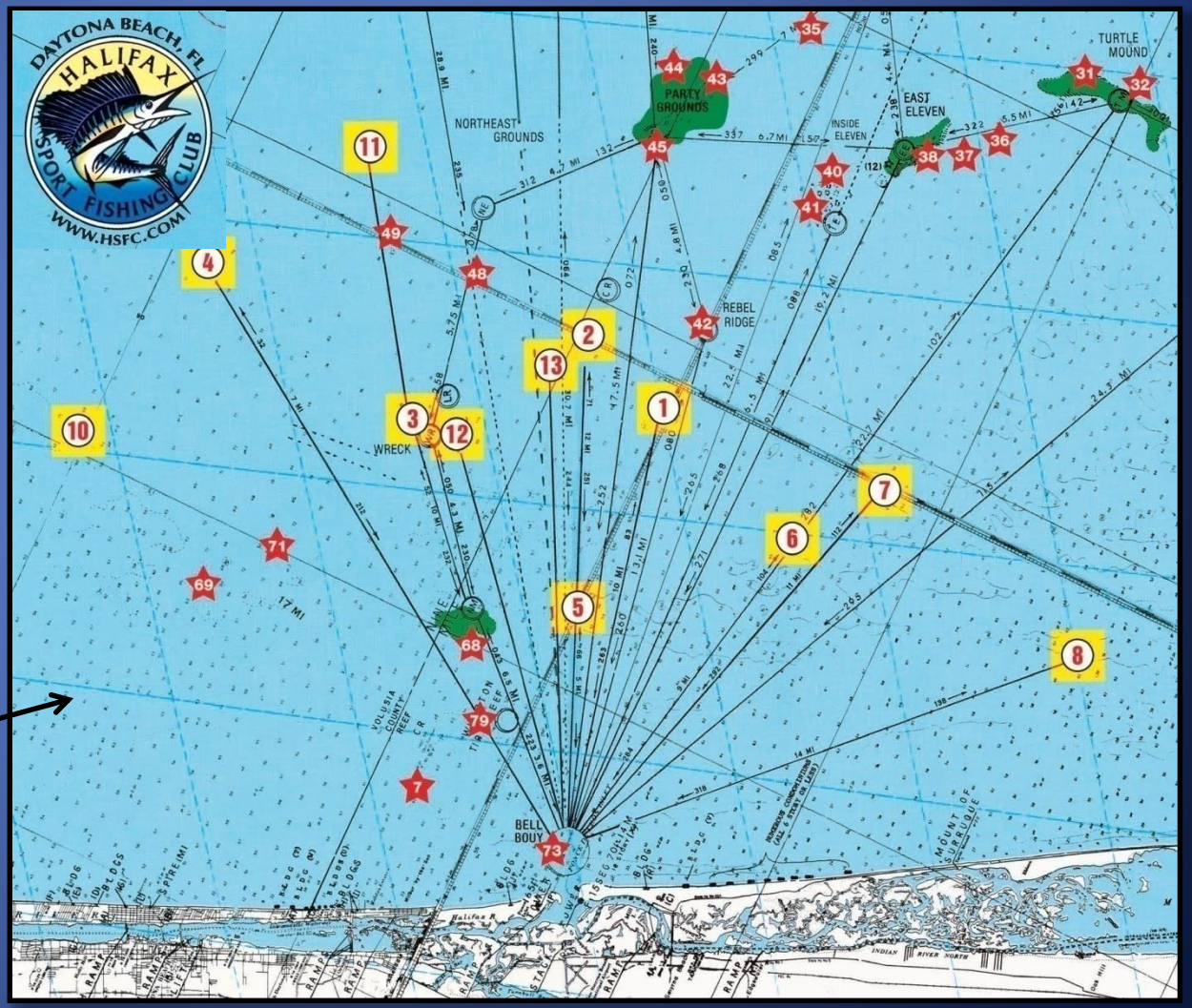



Image Courtesy Halifax Sport Fishing Club

This early photo shows members of the Halifax Sport Fishing Club going offshore to mark reef locations with homemade buoys (1970's).


Photo Courtesy Halifax Sportfishing Club Archives

1995 – Sites 10, 11, 12 and 13 were permitted by the Army Corp of Engineers

Regal Sea Fan, *Leptogorgia hebes*, Site 13, 2005. The first deposits at this site were old car carriers and concrete culverts.

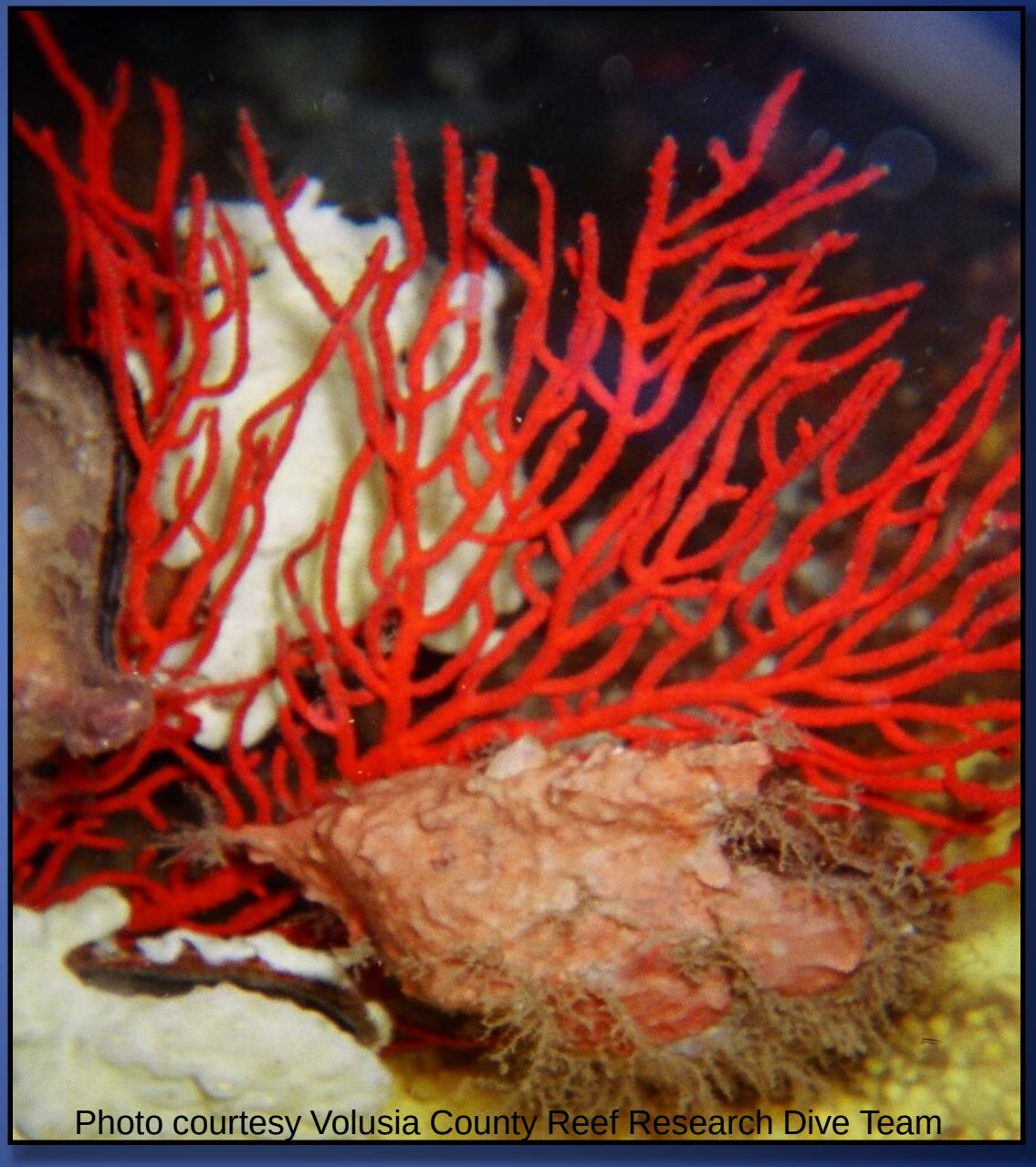


Photo courtesy Volusia County Reef Research Dive Team

1998 – In order to make artificial reef locations more accessible to the public, Joe Nolin (Port Authority Manager) and the Reef Team begin publishing all of the artificial reef sites on the www.volusiareefs.org website. [2]

Example of site coordinates and description from http://www.volusiareefs.org/reefsiteinfo.htm

**SITE 9**

**1996-Ship**
Lat/Long: (GPS)
29°21.23'N, 80°21.44'W

**1996-The USN Intruder Planes** are very scattered. Look a short distance to the southeast and to the east of the ship for the first few planes.

**Site 9** is 33 nm from the inlet. It is a popular deep water, (135ft.) fishing site. In 1996, about two dozen USN Intruders and a 100 ft. ship were placed in the area. The ship is upright, intact and easy to find. However, the planes are very scattered and are not easy to find. This site is no longer an active permitted site.

**Because of the depth, and sometimes strong currents, this site is not recommended for sport diving.**

2000 - The US Government makes GPS signals more available, which greatly improves its accuracy. Old Loran – C data is converted to GPS latitude and longitude. This allows for an even more accurate mapping and description of the sites and makes it easier for fishermen and divers to locate artificial reef deposits. [2]

Photo Courtesy Volusia County Reef Research Dive Team

# Reef Team Today

The Reef Team is currently composed of 12 members with many different interests diving artificial reefs. These interests include science, photography, videography, spear fishing, diver training, and general recreational diving.

The Reef Team meets the last Thursday of the month, excluding November and December. Meeting are held at the South Daytona Police Department Training Room at 7:30 p.m. The President is Joe Knott.

Macrophotography of Arrow Crab and Anemones.

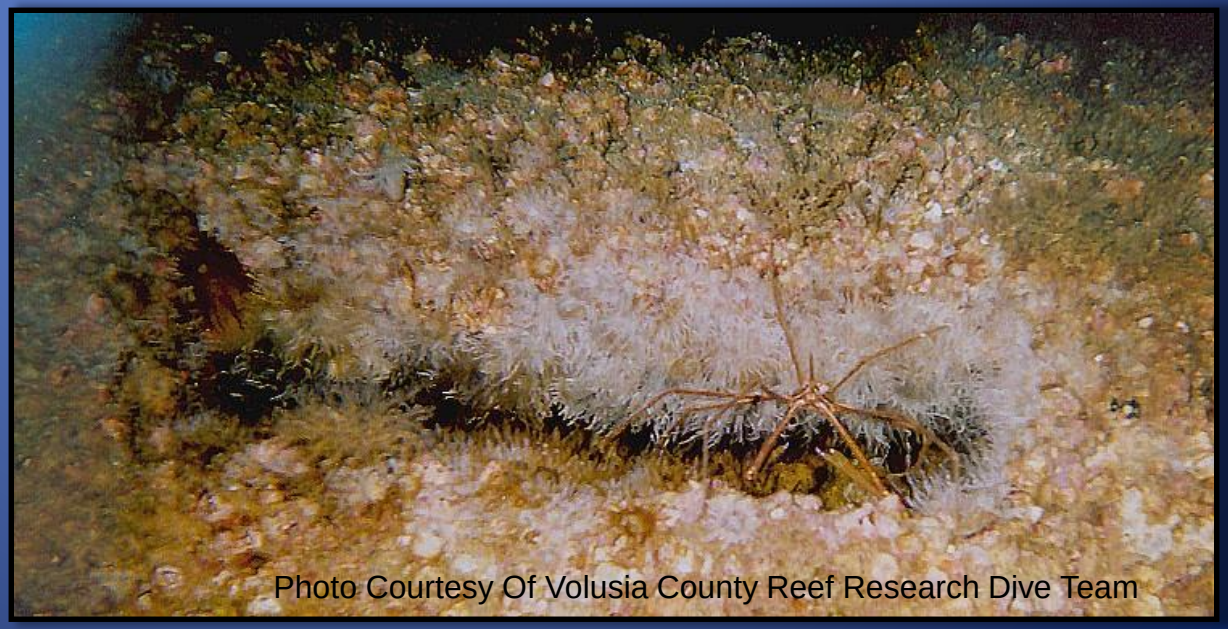


Photo Courtesy Of Volusia County Reef Research Dive Team

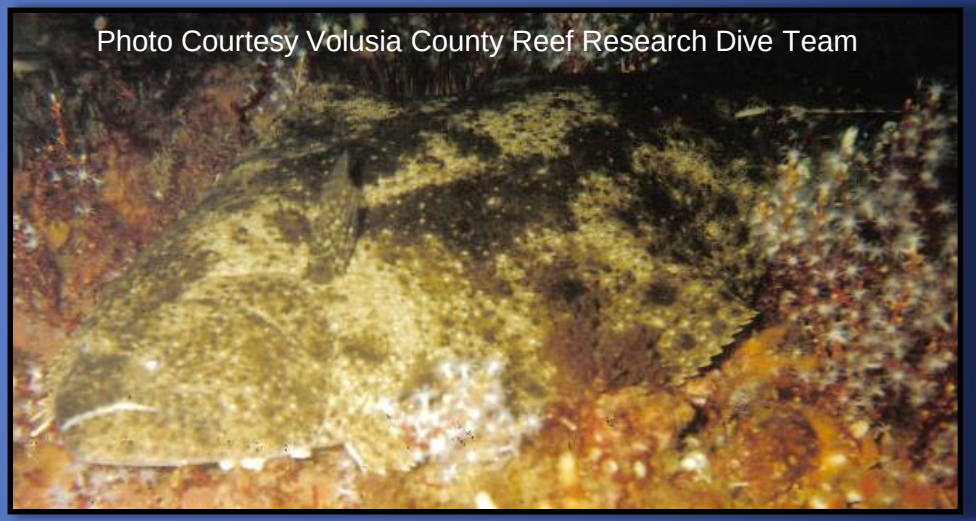
Visit:
http://www.volusiareefs.org/
for more information.

# Reef Team Meetings

Meetings are open to the public and you do not have to be a team member or diver to attend.

**Topics Of Discussion:**

- Diver Survey Reports
- Offshore Diving Conditions
- Unusual Occurrences/Sightings
- Member Activities
- Upcoming Events
- Current Events and Topics
- Guest Speakers




Don’t just lay around like a flounder…join the team!

# Purpose of the Volusia County Reef Research Dive Team

The current purpose of the Reef Team is to assist the Port Authority with monitoring and surveying Volusia County's artificial and natural reefs. The Reef Team also assists with pre-drop surveys to investigate the proposed artificial reef site area.

Photo Courtesy Volusia County Reef Research Dive Team

# Pre-Drop Surveys

Potential new sites must be evaluated before a permit can be issued. After a potential new site is determined, the Reef Team surveys the area to determine:

- **Absence of live bottom.**
  - To make sure the area does not already hold a “live bottom” or natural reef.
- **Ability of substrate to hold an artificial reef.**
  - Evaluate the ocean floor to make sure it is firm enough to support an artificial reef without sinking into the substrate and possibly becoming “sanded over.”
- **Depth to limestone layer.**
  - Optimal conditions would be a 6-8” layer of sand over a layer of limestone. This would allow current to scour away the layer of sand once the artificial reef is in place, making the edges of the reef suitable for benthic growth and increasing the overall area of the reef.

(H. Mathews, personal communication, March 11,2013.)

# Artificial Reef Surveys

**The purpose of monitoring artificial reefs is to:**

- Document and verify reef deposit locations and any changes over time.
- Record biological activity including attached benthic growth, mobile invertebrate species, and juvenile/adult fish populations.
- Monitor the succession of new reefs.
- Detail any seasonal differences in fish and invertebrate populations.
- Detail any differences in fish and invertebrate populations between reef locales.

Blue Angelfish,
*Holacanthus bermudensis*

Photo Courtesy Volusia County Reef Research Dive Team

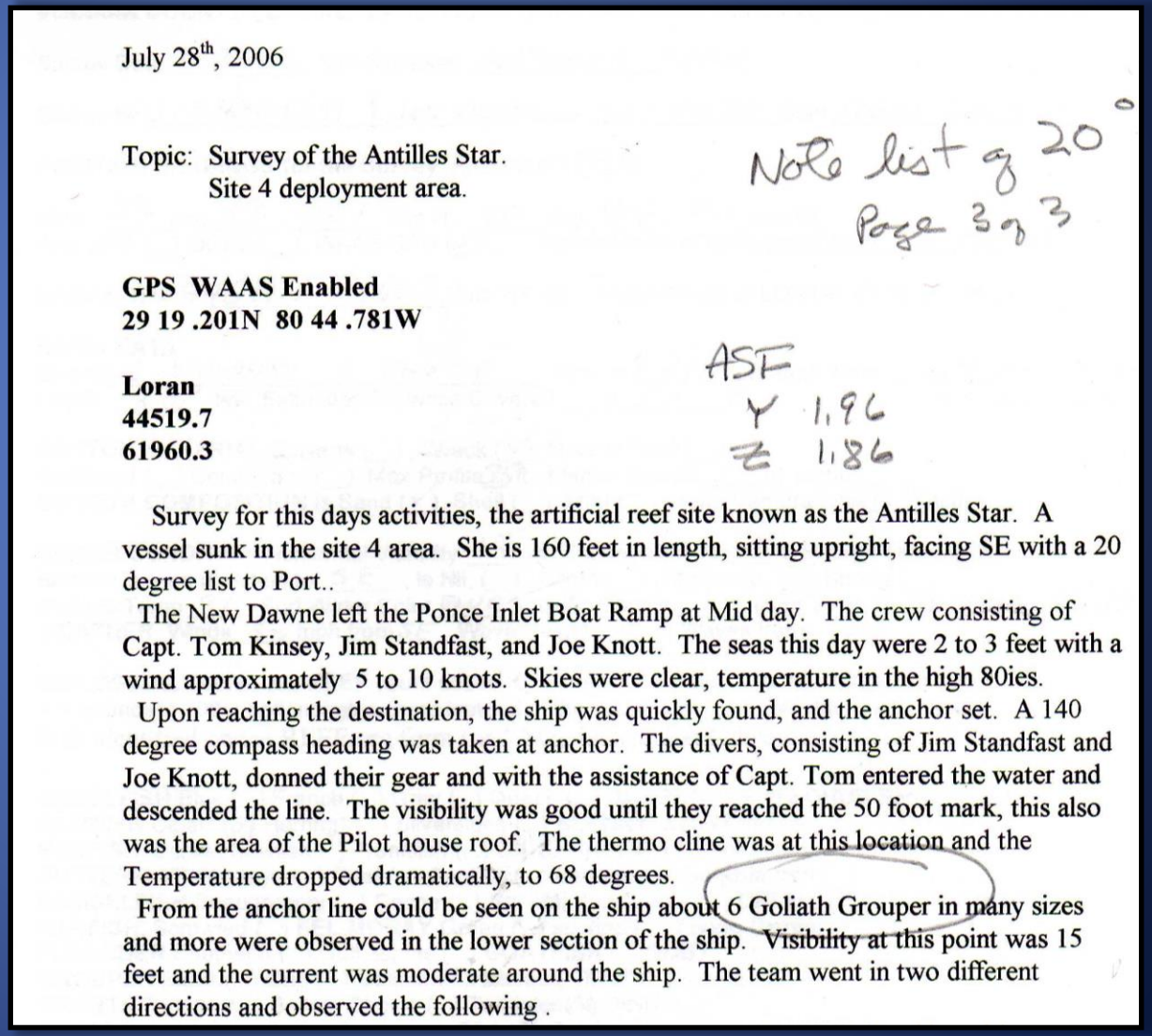
# The purpose of monitoring artificial reefs

- Differences between natural and artificial reefs
- Monitor organism range extensions or invasions

The Reef Team has monitored the increase in Lionfish abundance over the years.

# Survey forms are completed in three parts

The **summary** details the dive including, conditions, crew members, and anything that describes the survey for that day.



July 28th, 2006

Topic: Survey of the Antilles Star.
Site 4 deployment area.

Note list @ 20°
Page 3 of 3

**GPS WAAS Enabled**
**29 19 .201N 80 44 .781W**

**Loran**
**44519.7**
**61960.3**

ASF
Y 1.96
Z 1.86

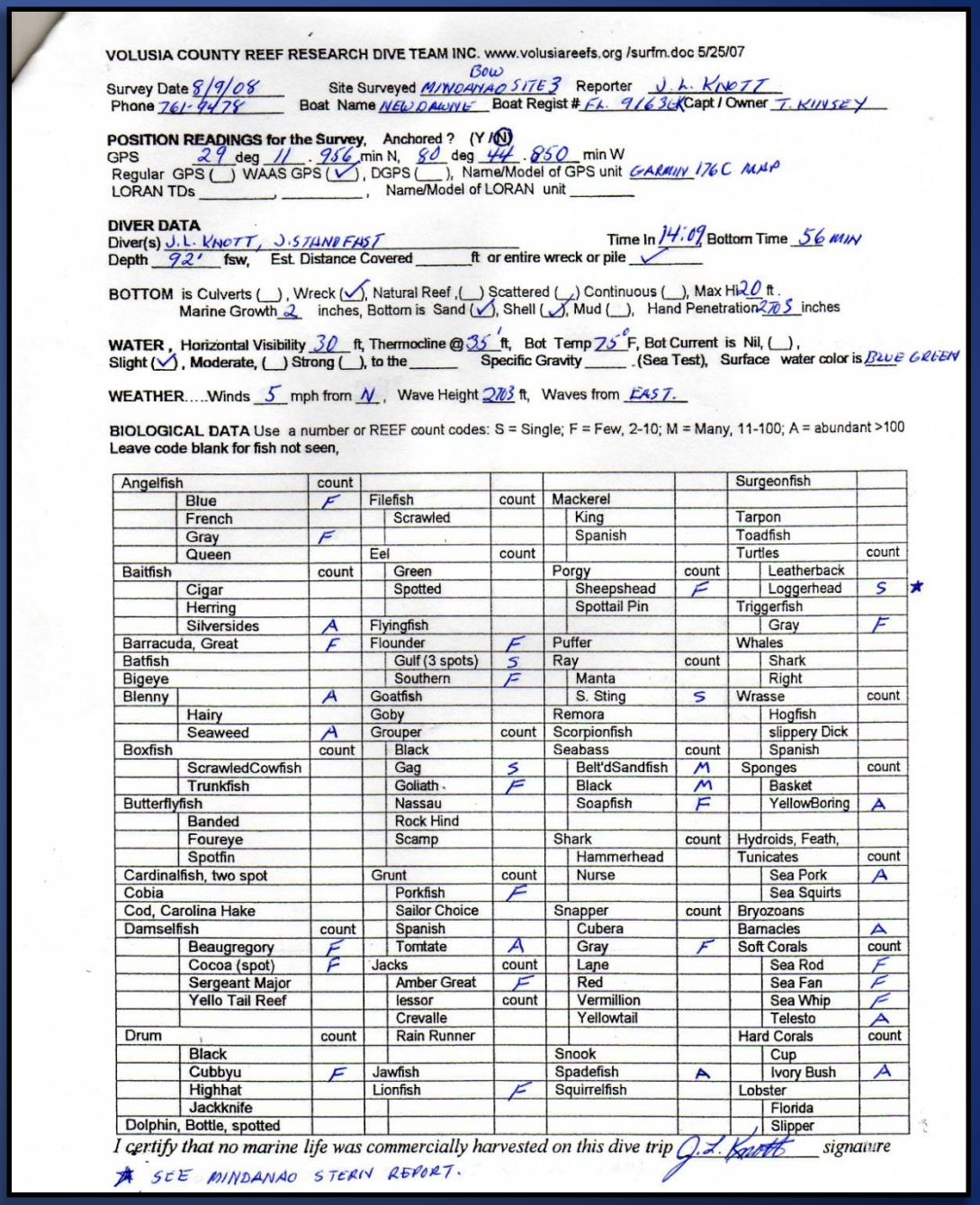
Survey for this days activities, the artificial reef site known as the Antilles Star. A vessel sunk in the site 4 area. She is 160 feet in length, sitting upright, facing SE with a 20 degree list to Port..

The New Dawne left the Ponce Inlet Boat Ramp at Mid day. The crew consisting of Capt. Tom Kinsey, Jim Standfast, and Joe Knott. The seas this day were 2 to 3 feet with a wind approximately 5 to 10 knots. Skies were clear, temperature in the high 80ies.

Upon reaching the destination, the ship was quickly found, and the anchor set. A 140 degree compass heading was taken at anchor. The divers, consisting of Jim Standfast and Joe Knott, donned their gear and with the assistance of Capt. Tom entered the water and descended the line. The visibility was good until they reached the 50 foot mark, this also was the area of the Pilot house roof. The thermo cline was at this location and the Temperature dropped dramatically, to 68 degrees.

From the anchor line could be seen on the ship about 6 Goliath Grouper in many sizes and more were observed in the lower section of the ship. Visibility at this point was 15 feet and the current was moderate around the ship. The team went in two different directions and observed the following .

# Biological Data Survey Form



VOLUSIA COUNTY REEF RESEARCH DIVE TEAM INC. www.volusiareefs.org /surfm.doc 5/25/07

Survey Date 8/9/08 Site Surveyed BOW MINDANAO SITE 3 Reporter J.L. KNOTT
Phone 761-9478 Boat Name NEW DAWNE Boat Regist # FL 9163CK Capt / Owner T. KINSEY

**POSITION READINGS for the Survey,** Anchored ? (Y /(N))
GPS 29 deg 11 . 956 min N, 80 deg 44 . 850 min W
Regular GPS (__) WAAS GPS (✓), DGPS (___), Name/Model of GPS unit GARMIN 176C MAP
LORAN TDs _____, _____, Name/Model of LORAN unit _____

**DIVER DATA**
Diver(s) J.L. KNOTT, J. STANDFAST Time In 14:09 Bottom Time 56 MIN
Depth 92' fsw, Est. Distance Covered _____ ft or entire wreck or pile ✓

**BOTTOM** is Culverts (__), Wreck (✓), Natural Reef (__) Scattered (__) Continuous (__), Max Ht 20 ft.
Marine Growth 2 inches, Bottom is Sand (✓), Shell (✓), Mud (__), Hand Penetration 2TO5 inches

**WATER**, Horizontal Visibility 30 ft, Thermocline @ 35' ft, Bot Temp 75° F, Bot Current is Nil, (__),
Slight (✓), Moderate, (__) Strong (__), to the _____ Specific Gravity _____ .(Sea Test), Surface water color is BLUE GREEN

**WEATHER**.....Winds 5 mph from N, Wave Height 2TO3 ft, Waves from EAST.

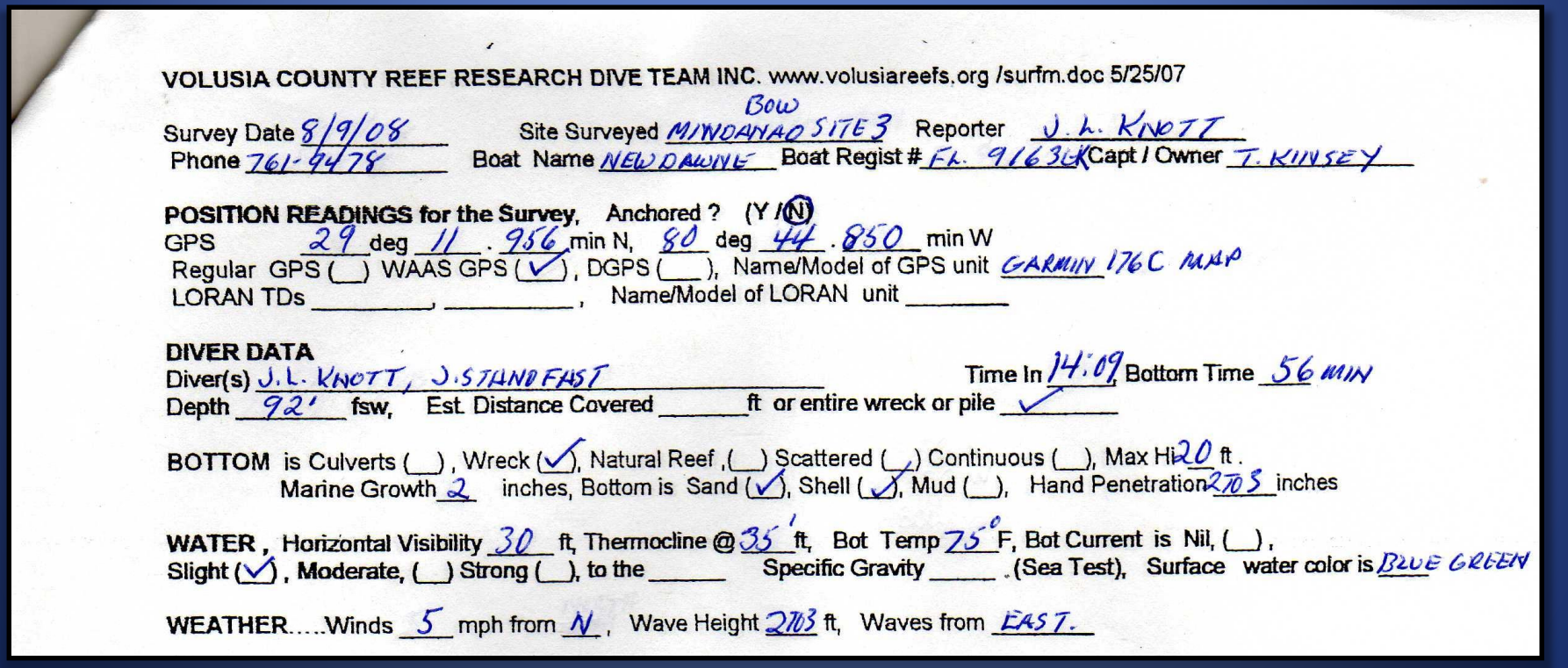
**BIOLOGICAL DATA** Use a number or REEF count codes: S = Single; F = Few, 2-10; M = Many, 11-100; A = abundant >100
**Leave code blank for fish not seen,**

| Angelfish | count | | | | | | Surgeonfish | |
|---|---|---|---|---|---|---|---|---|
| Blue | F | Filefish | count | Mackerel | | | | |
| French | | Scrawled | | King | | Tarpon | | |
| Gray | F | | | Spanish | | Toadfish | | |
| Queen | | Eel | count | | | Turtles | count | |
| Baitfish | count | Green | | Porgy | count | Leatherback | | |
| Cigar | | Spotted | | Sheepshead | F | Loggerhead | S | ★ |
| Herring | | | | Spottail Pin | | Triggerfish | | |
| Silversides | A | Flyingfish | | | | Gray | F | |
| Barracuda, Great | F | Flounder | F | Puffer | | Whales | | |
| Batfish | | Gulf (3 spots) | S | Ray | count | Shark | | |
| Bigeye | | Southern | F | Manta | | Right | | |
| Blenny | A | Goatfish | | S. Sting | S | Wrasse | count | |
| Hairy | | Goby | | Remora | | Hogfish | | |
| Seaweed | A | Grouper | count | Scorpionfish | | slippery Dick | | |
| Boxfish | count | Black | | Seabass | count | Spanish | | |
| ScrawledCowfish | | Gag | S | Belt'dSandfish | M | Sponges | count | |
| Trunkfish | | Goliath | F | Black | M | Basket | | |
| Butterflyfish | | Nassau | | Soapfish | F | YellowBoring | A | |
| Banded | | Rock Hind | | | | | | |
| Foureye | | Scamp | | Shark | count | Hydroids, Feath, | | |
| Spotfin | | | | Hammerhead | | Tunicates | count | |
| Cardinalfish, two spot | | Grunt | count | Nurse | | Sea Pork | A | |
| Cobia | | Porkfish | F | | | Sea Squirts | | |
| Cod, Carolina Hake | | Sailor Choice | | Snapper | count | Bryozoans | | |
| Damselfish | count | Spanish | | Cubera | | Barnacles | A | |
| Beaugregory | F | Tomtate | A | Gray | F | Soft Corals | count | |
| Cocoa (spot) | F | Jacks | count | Lane | | Sea Rod | F | |
| Sergeant Major | | Amber Great | F | Red | | Sea Fan | F | |
| Yello Tail Reef | | lessor | count | Vermillion | | Sea Whip | F | |
| | | Crevalle | | Yellowtail | | Telesto | A | |
| Drum | count | Rain Runner | | | | Hard Corals | count | |
| Black | | | | Snook | | Cup | | |
| Cubbyu | F | Jawfish | | Spadefish | A | Ivory Bush | A | |
| Highhat | | Lionfish | F | Squirrelfish | | Lobster | | |
| Jackknife | | | | | | Florida | | |
| Dolphin, Bottle, spotted | | | | | | Slipper | | |

*I certify that no marine life was commercially harvested on this dive trip* J.L. Knott *signature*

★ SEE MINDANAO STERN REPORT.

# Close Up Of Biological Data Survey Form



VOLUSIA COUNTY REEF RESEARCH DIVE TEAM INC. www.volusiareefs.org /surfm.doc 5/25/07

Survey Date 8/9/08 Site Surveyed BOW MINDANAO SITE 3 Reporter J. L. KNOTT
Phone 761-9478 Boat Name NEW DAWNE Boat Regist # FL. 9163LK Capt / Owner T. KINSEY

**POSITION READINGS for the Survey,** Anchored ? (Y / (N))
GPS 29 deg 11 . 956 min N, 80 deg 44 . 850 min W
Regular GPS (__) WAAS GPS (✓), DGPS (__), Name/Model of GPS unit GARMIN 176C MAP
LORAN TDs _____, _____, Name/Model of LORAN unit _____

**DIVER DATA**
Diver(s) J.L. KNOTT, J. STANDFAST Time In 14:09, Bottom Time 56 MIN
Depth 92' fsw, Est. Distance Covered _____ ft or entire wreck or pile ✓

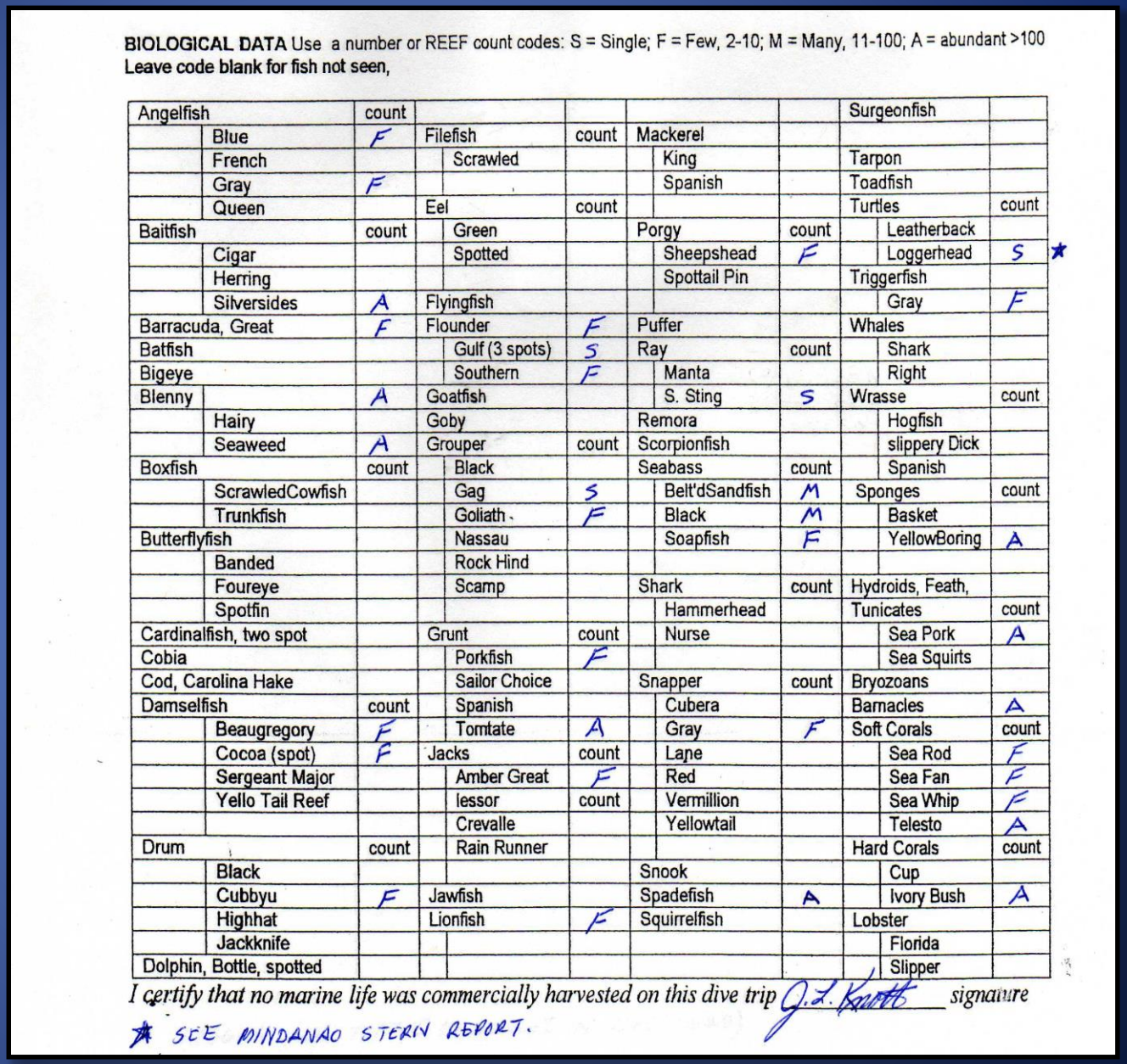
**BOTTOM** is Culverts (__), Wreck (✓), Natural Reef (__) Scattered (__) Continuous (__), Max Ht 20 ft.
Marine Growth 2 inches, Bottom is Sand (✓), Shell (✓), Mud (__), Hand Penetration 2 TO 5 inches

**WATER,** Horizontal Visibility 30 ft, Thermocline @ 35' ft, Bot Temp 75° F, Bot Current is Nil, (__),
Slight (✓), Moderate, (__) Strong (__), to the _____ Specific Gravity _____ (Sea Test), Surface water color is BLUE GREEN

**WEATHER**.....Winds 5 mph from N, Wave Height 2 TO 3 ft, Waves from EAST.

Biological Surveys are conducted using the Roving Diver Underwater Visual Assessment Method

This method uses visual surveys to assess fish and invertebrate populations[10]



**BIOLOGICAL DATA** Use a number or REEF count codes: S = Single; F = Few, 2-10; M = Many, 11-100; A = abundant >100
**Leave code blank for fish not seen,**

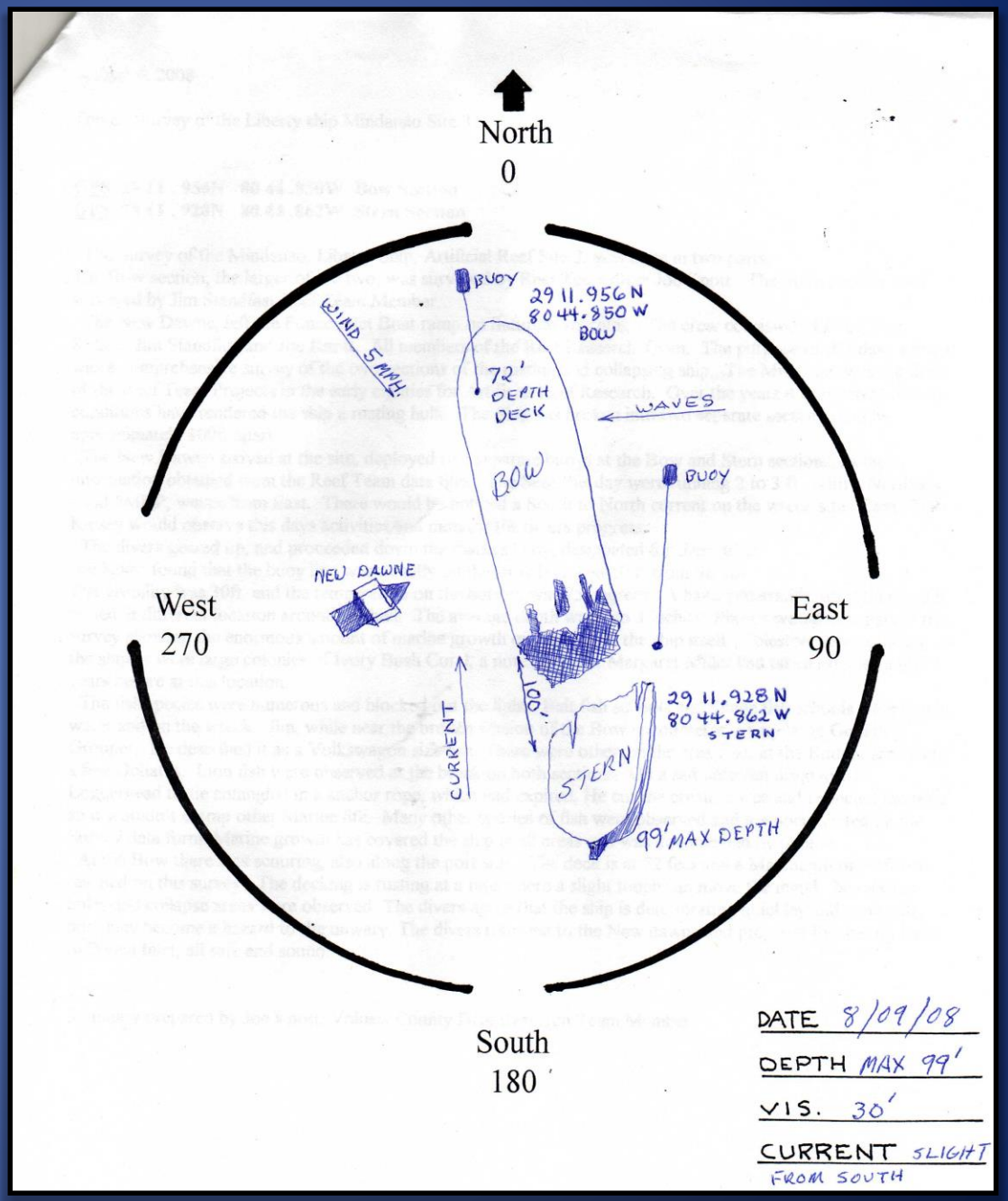
| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Angelfish | | count | | | | | | Surgeonfish | | | |
| | Blue | F | Filefish | | count | Mackerel | | | | | |
| | French | | | Scrawled | | | King | | Tarpon | | |
| | Gray | F | | | | | Spanish | | Toadfish | | |
| | Queen | | Eel | | count | | | | Turtles | | count |
| Baitfish | | count | | Green | | Porgy | | count | | Leatherback | |
| | Cigar | | | Spotted | | | Sheepshead | F | | Loggerhead | S ★ |
| | Herring | | | | | | Spottail Pin | | Triggerfish | | |
| | Silversides | A | Flyingfish | | | | | | | Gray | F |
| Barracuda, Great | | F | Flounder | | F | Puffer | | | Whales | | |
| Batfish | | | | Gulf (3 spots) | S | Ray | | count | | Shark | |
| Bigeye | | | | Southern | F | | Manta | | | Right | |
| Blenny | | A | Goatfish | | | | S. Sting | S | Wrasse | | count |
| | Hairy | | Goby | | | Remora | | | | Hogfish | |
| | Seaweed | A | Grouper | | count | Scorpionfish | | | | slippery Dick | |
| Boxfish | | count | | Black | | Seabass | | count | | Spanish | |
| | ScrawledCowfish | | | Gag | S | | Belt'dSandfish | M | Sponges | | count |
| | Trunkfish | | | Goliath | F | | Black | M | | Basket | |
| Butterflyfish | | | | Nassau | | | Soapfish | F | | YellowBoring | A |
| | Banded | | | Rock Hind | | | | | | | |
| | Foureye | | | Scamp | | Shark | | count | Hydroids, Feath, | | |
| | Spotfin | | | | | | Hammerhead | | Tunicates | | count |
| Cardinalfish, two spot | | | Grunt | | count | | Nurse | | | Sea Pork | A |
| Cobia | | | | Porkfish | F | | | | | Sea Squirts | |
| Cod, Carolina Hake | | | | Sailor Choice | | Snapper | | count | Bryozoans | | |
| Damselfish | | count | | Spanish | | | Cubera | | Barnacles | | A |
| | Beaugregory | F | | Tomtate | A | | Gray | F | Soft Corals | | count |
| | Cocoa (spot) | F | Jacks | | count | | Lane | | | Sea Rod | F |
| | Sergeant Major | | | Amber Great | F | | Red | | | Sea Fan | F |
| | Yello Tail Reef | | | lessor | count | | Vermillion | | | Sea Whip | F |
| | | | | Crevalle | | | Yellowtail | | | Telesto | A |
| Drum | | count | | Rain Runner | | | | | Hard Corals | | count |
| | Black | | | | | Snook | | | | Cup | |
| | Cubbyu | F | Jawfish | | | Spadefish | | A | | Ivory Bush | A |
| | Highhat | | Lionfish | | F | Squirrelfish | | | Lobster | | |
| | Jackknife | | | | | | | | | Florida | |
| Dolphin, Bottle, spotted | | | | | | | | | | Slipper | |

*I certify that no marine life was commercially harvested on this dive trip* J. L. Knott *signature*

★ SEE MINDANAO STERN REPORT.

# Survey Site Sketch

Survey site sketches help document any changes in the locations of deposits, and a description of conditions that affect the dive.




Sketch of Mindanao site by Joe Knott, August 9, 2008

# Becoming A  Team Member

Team members must be experienced open-water divers and complete a fishes and invertebrates identification exam using Florida Sea Grant and Reef Environmental Education Foundation (REEF) monitoring techniques.

*Epinephelus striatus*

*Epinephelus morio*

Differentiating similar species of fishes is very important to ensure the validity of the scientific data collected.  Underwater these two species of groupers will look even more similar.

After supplying your credentials and species identification training you will be required to dive with a team member and complete two underwater surveys. After fulfilling these requirements, you are officially part of the **Volusia County Reef Research Dive Team!**

A member dives the wreck of the Antilles Star, August 24, 2004

# John Lane Artificial Reef

In August of 2012, the Volusia County Council voted unanimously to name Site 4 after John Lane, long time Ormond Anchor Chaser and the Volusia County Reef Research Dive Team's site verification manager and coordinator. "He has worked tirelessly and directly with us in making sure our federal permits are accurate. He's just an incredible resource", says Joe Nolin, the County's Artificial Reef Manager.[9]

# Tips Diving Volusia County's Artificial Reefs

- Common sense is the key to any successful dive.
- Conditions in Volusia County can be more challenging than diving in South Florida**…Dive Your Training**.
- Plan Your Dive And Dive Your Plan.
- Attend Reef Team Meetings to better understand diving conditions and specifics about Volusia's offshore reefs.
- Call your local dive shop to find about underwater conditions before you leave.
- Only dive with local, experienced divers.  Come to the meetings!

Photo Courtesy Volusia County Reef Research Dive Team

# Identification Of Artificial Reef Invertebrates

## Echinoderms

### Sea Urchins

Variegated Sea Urchin

Photo Courtesy Volusia County Reef Research Dive Team

# Echinoderms

## Sea Stars

Small Spined Sea Star
*Echinaster spinulosus*

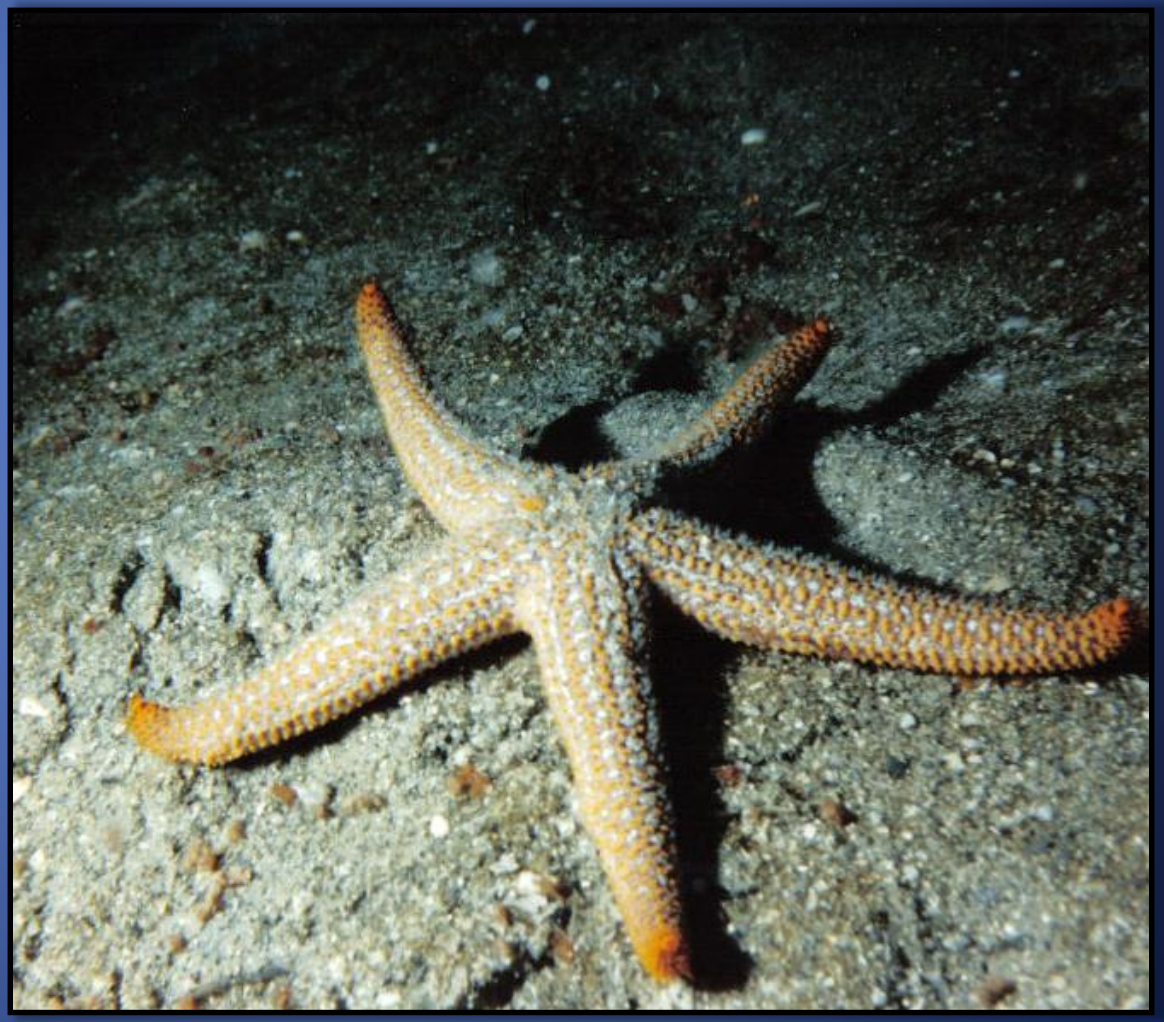


Photo Courtesy Volusia County Reef Research Dive Team

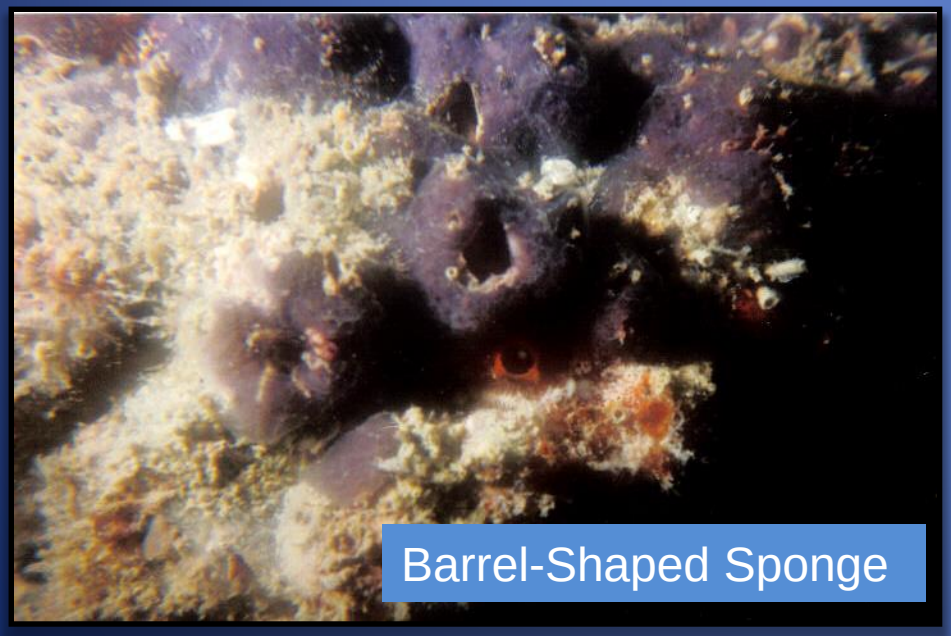
# Echinoderms

## Sea Cucumbers

Three-Rowed Sea Cucumber *Isostichopus badionotus*

# Sponges

Sponges are one of the simplest multicellular animals and can be very difficult to identify to species. They are mostly identified in the field by their shape.

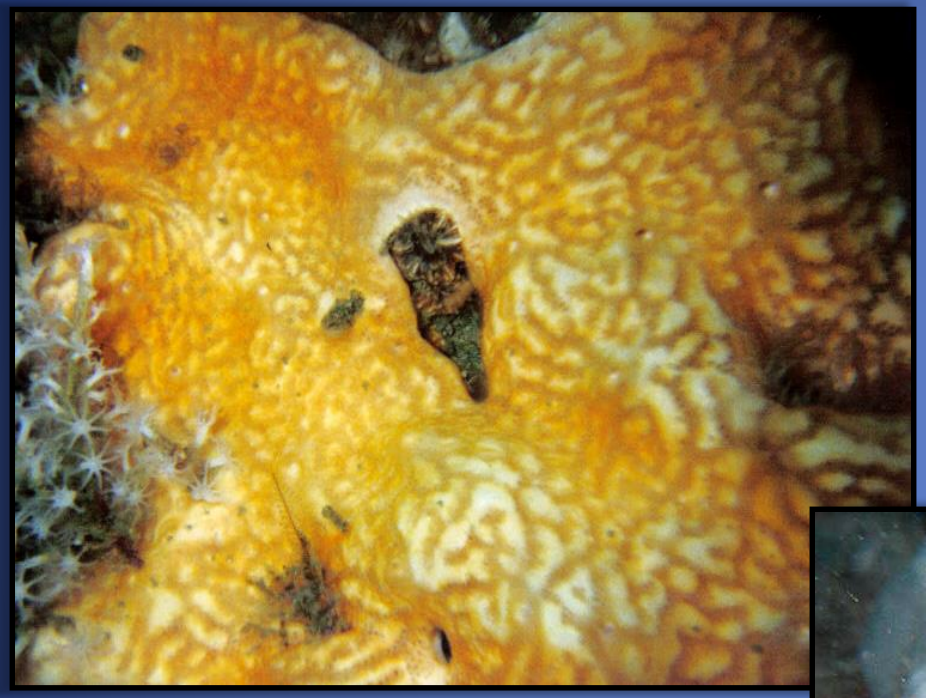


Barrel-Shaped Sponge

Boring Sponge

Photos Courtesy Volusia County Reef Research Dive Team

# Tunicates



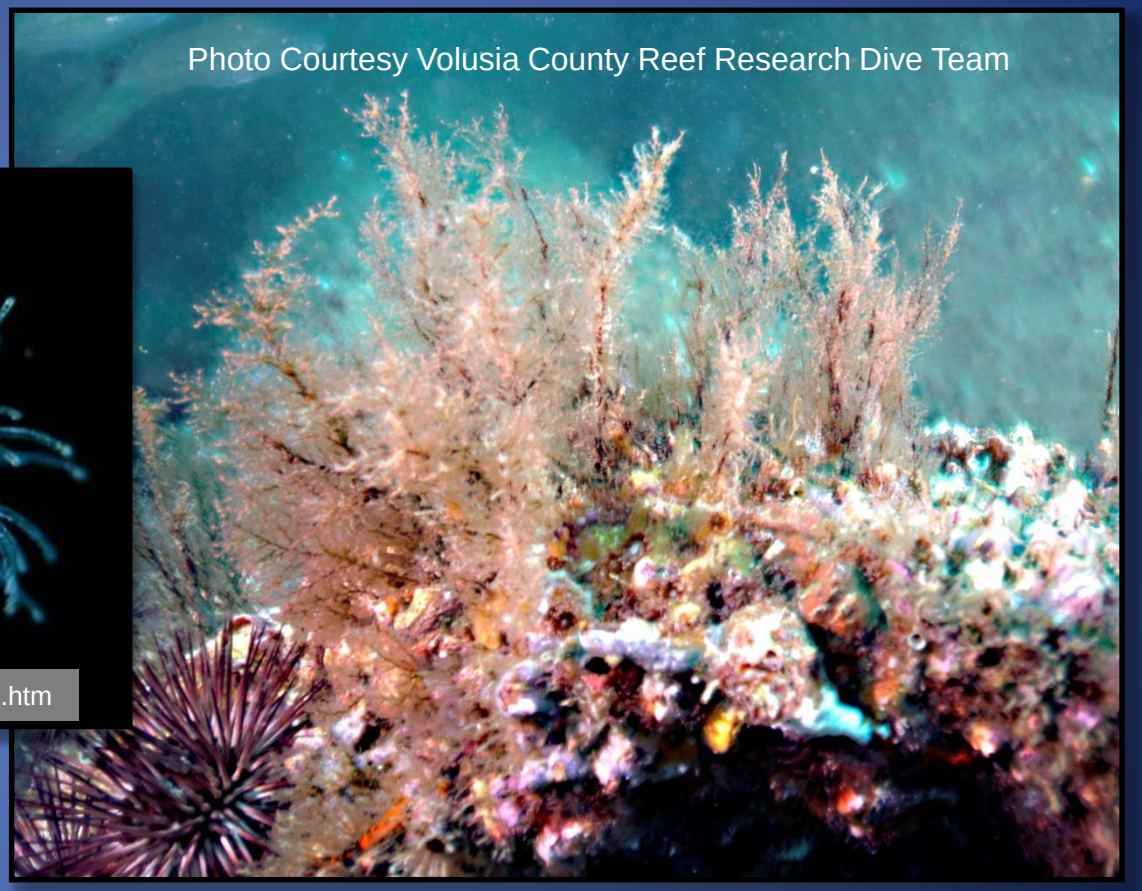
Encrusting Tunicate

Sea Pork

Sometimes mistaken for sponges, tunicates are complex animals with nervous, circulatory, and digestive systems.

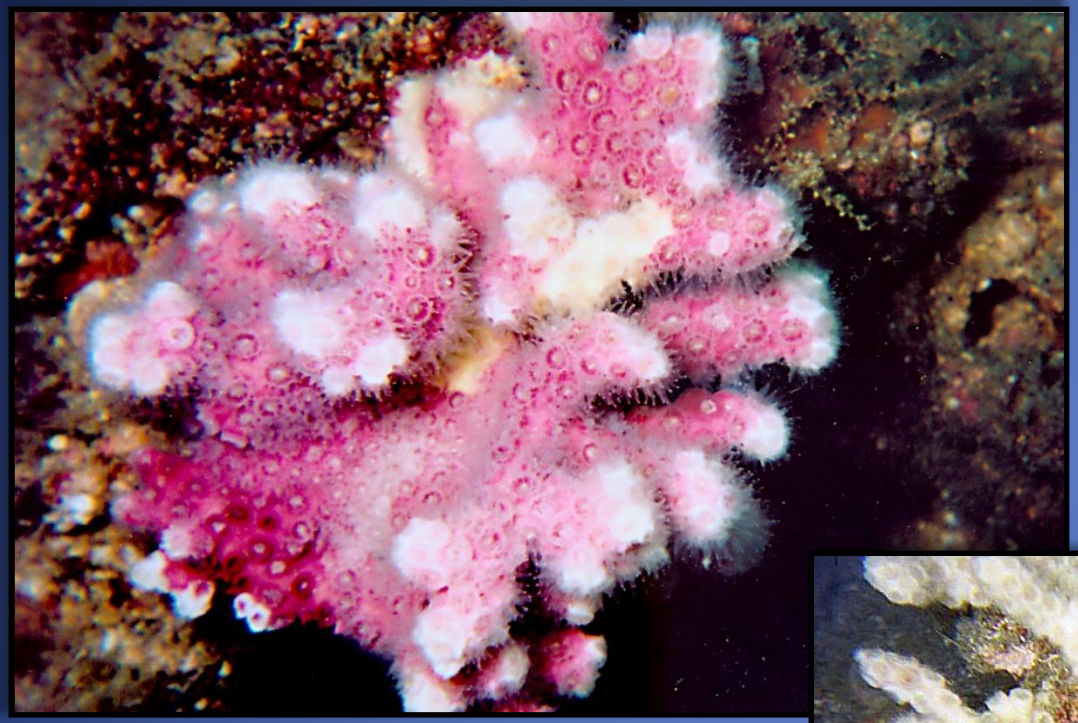
# Bryozoans

Zooid Close Up

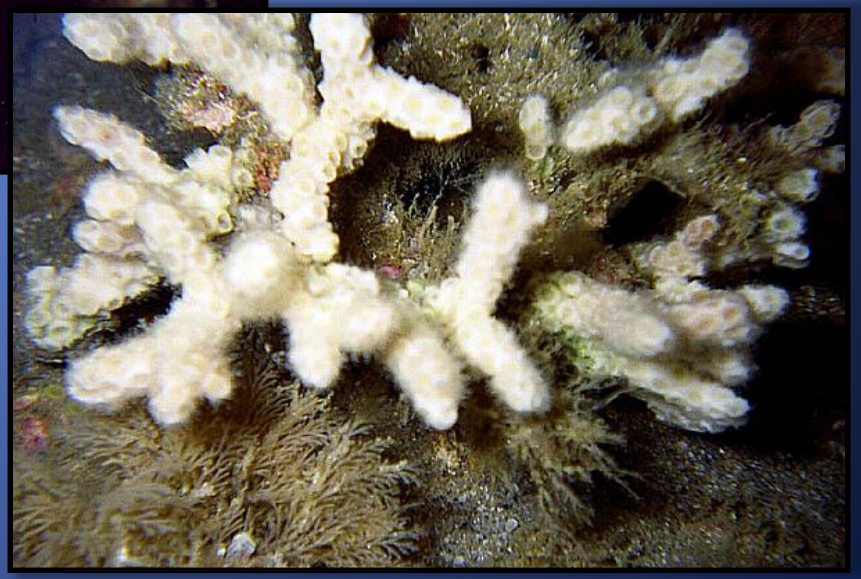




Tiny, colonial animals that form a colonial skeleton, but differ from corals in that each polyp-like animal, called a zooid, has its own mouth and anus.

# Stony Corals



Ivory Bush Coral
*Oculina varicosa*

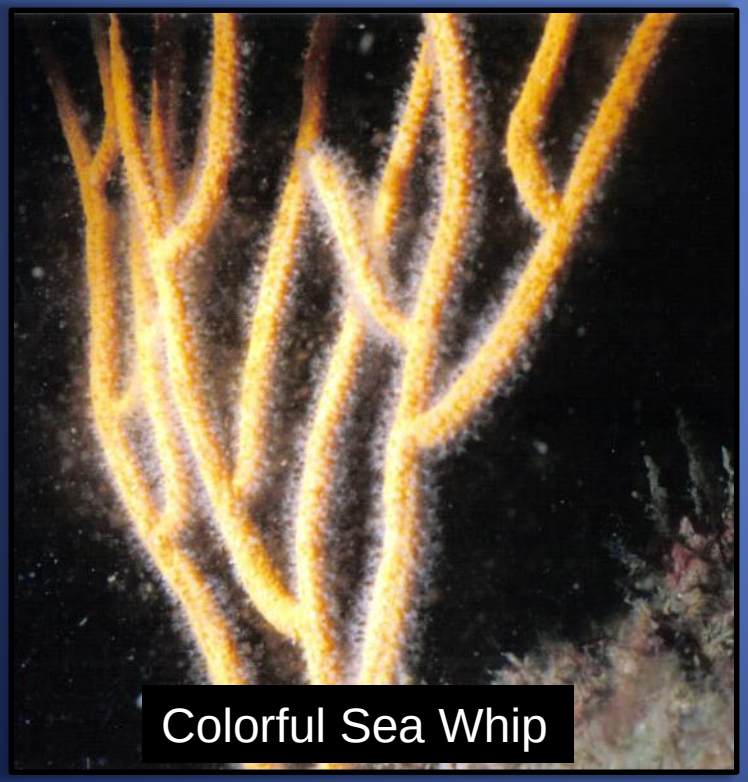


Oculina is a very important coral to the health and ecology of Volusia County's Reefs

# Gorgonians

These corals lack a hard skeleton, like stony corals, but have a tough central core that gives these corals the ability to grow in upright, branching colonies.


White-Eyed Sea Spray


Colorful Sea Whip


Telesto

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