

Coral Restoration of *Oculina arbuscula*: A Comparison of Two Sites at Radio Island, NC

Olivia Gorman, Mary Diez, Nadia Cohen, and Vanessa Wignall

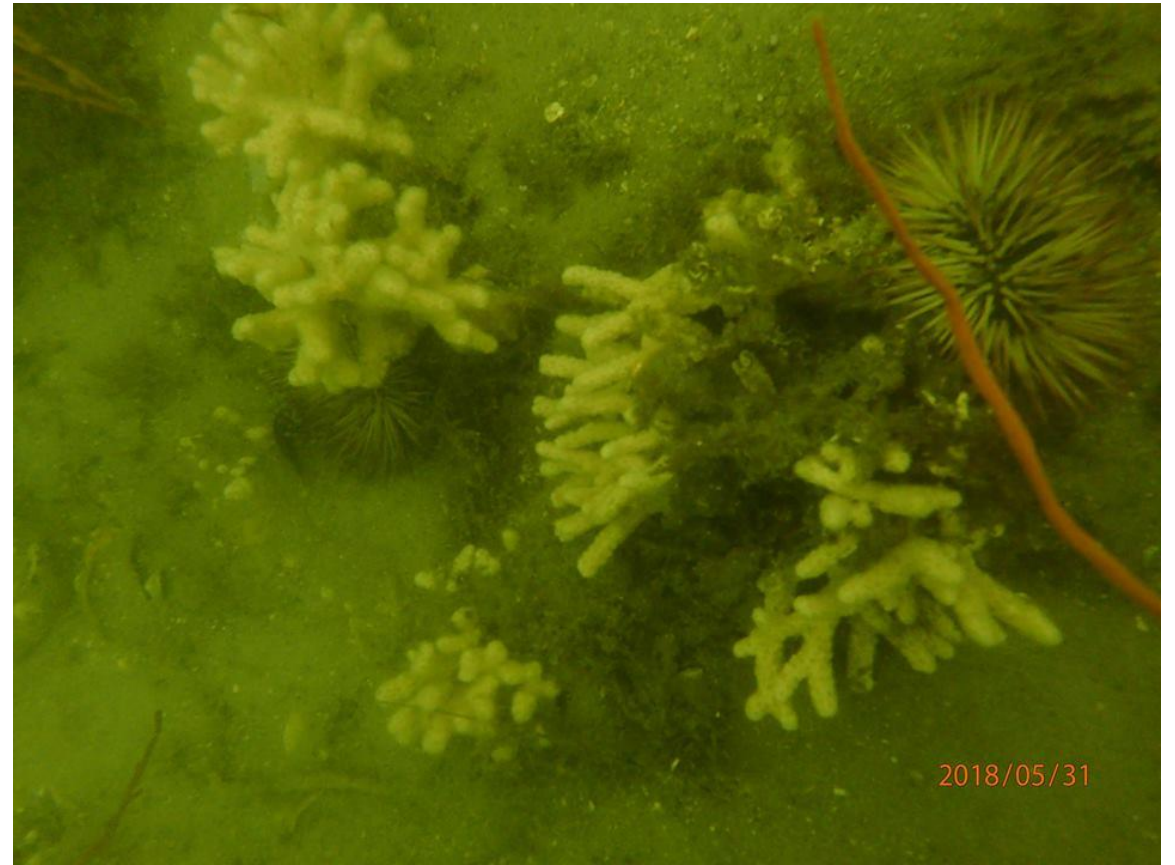
Introduction



Humans have had profound impacts of marine life, notably corals.

Decline of coral populations has prompted the development of new restoration methods such as coral nurseries.

Oculina Is Abundant Along the Rock Jetty



Oculina arbuscula is a facultatively symbiotic coral



Oculina without Zooxanthellae



Oculina with Zooxanthellae

Methods

- 1 Survey and Determine Coral Nursery Locations

1. Survey and Determine Coral Nursery Locations

Considerations

Weak Vs. Strong Current

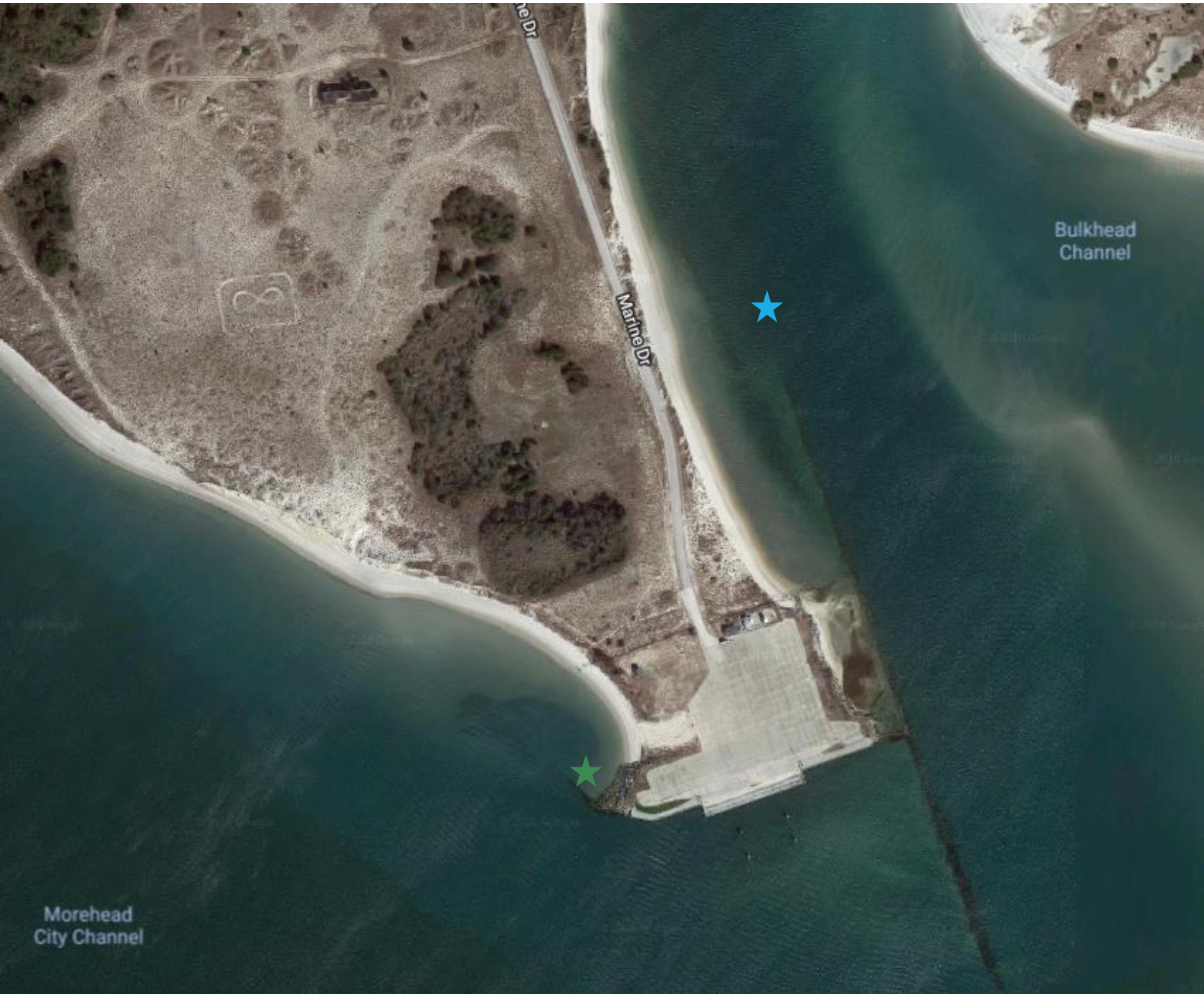
Heavy Vs. Light Boat Traffic

Depth/Light Availability

Temperature

Sediment





Location A: Green Day Marker 3A



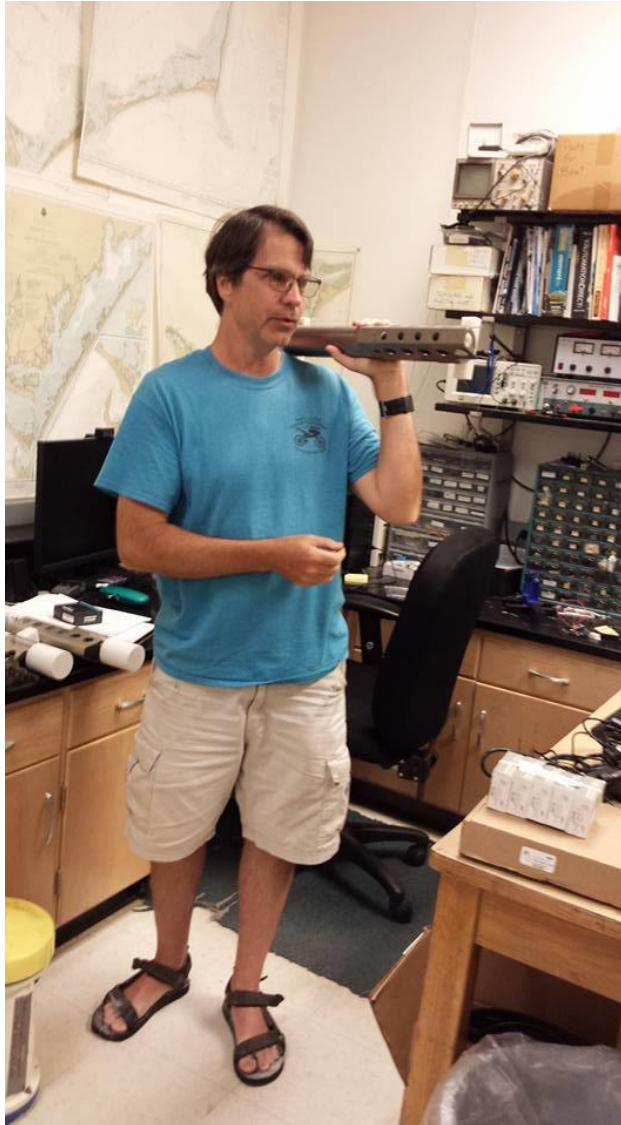
Location B: Western Side of Radio Island

Methods

1 Survey and Determine Coral Nursery Locations

2 Deploy Measurement Instrumentation (CTDs)

2. Deploy Measurement Instrumentation

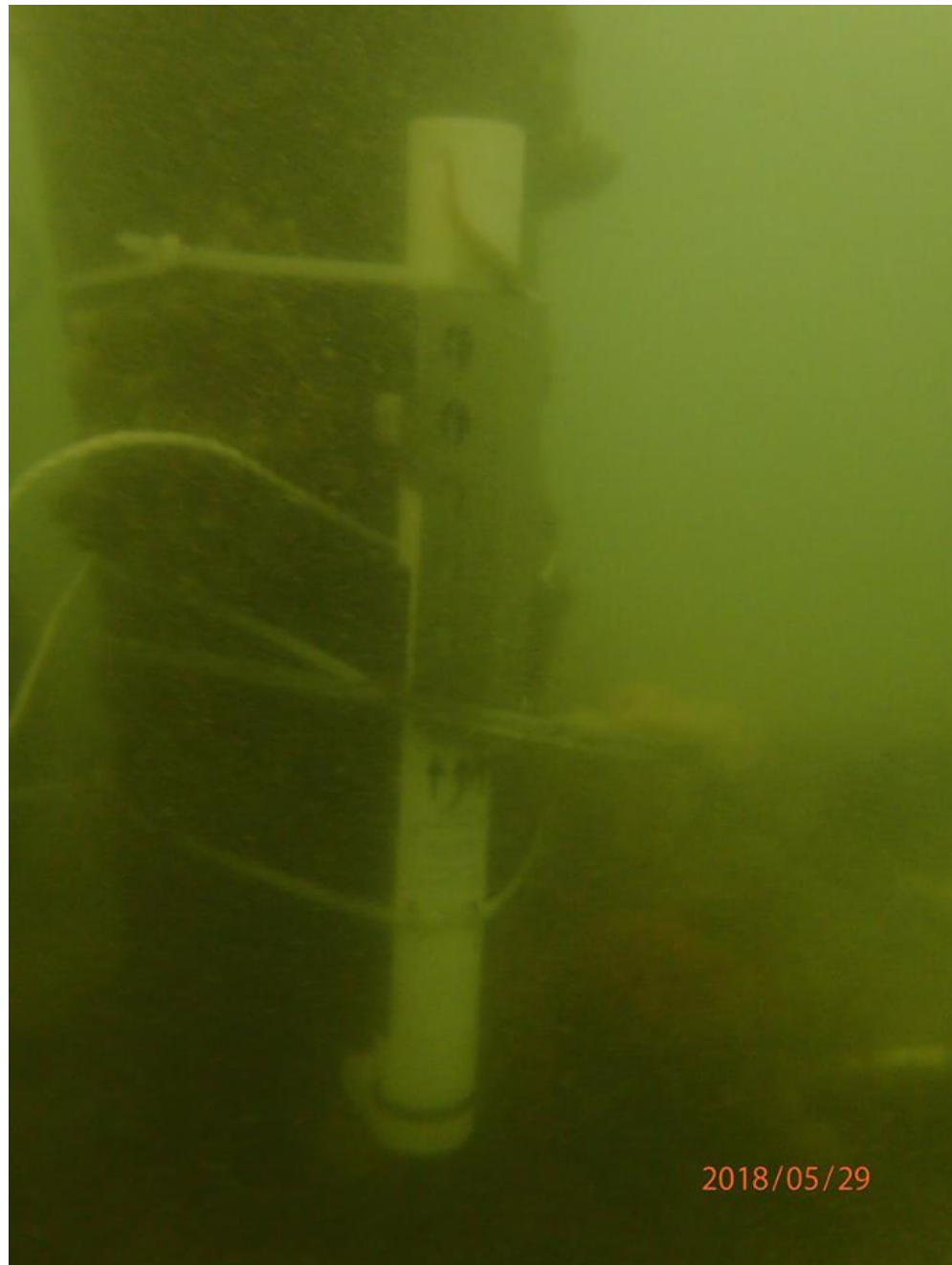


CTDs



What does a
CTD Measure?

1. Conductivity
2. Temperature
3. Depth/Pressure



2018/05/29

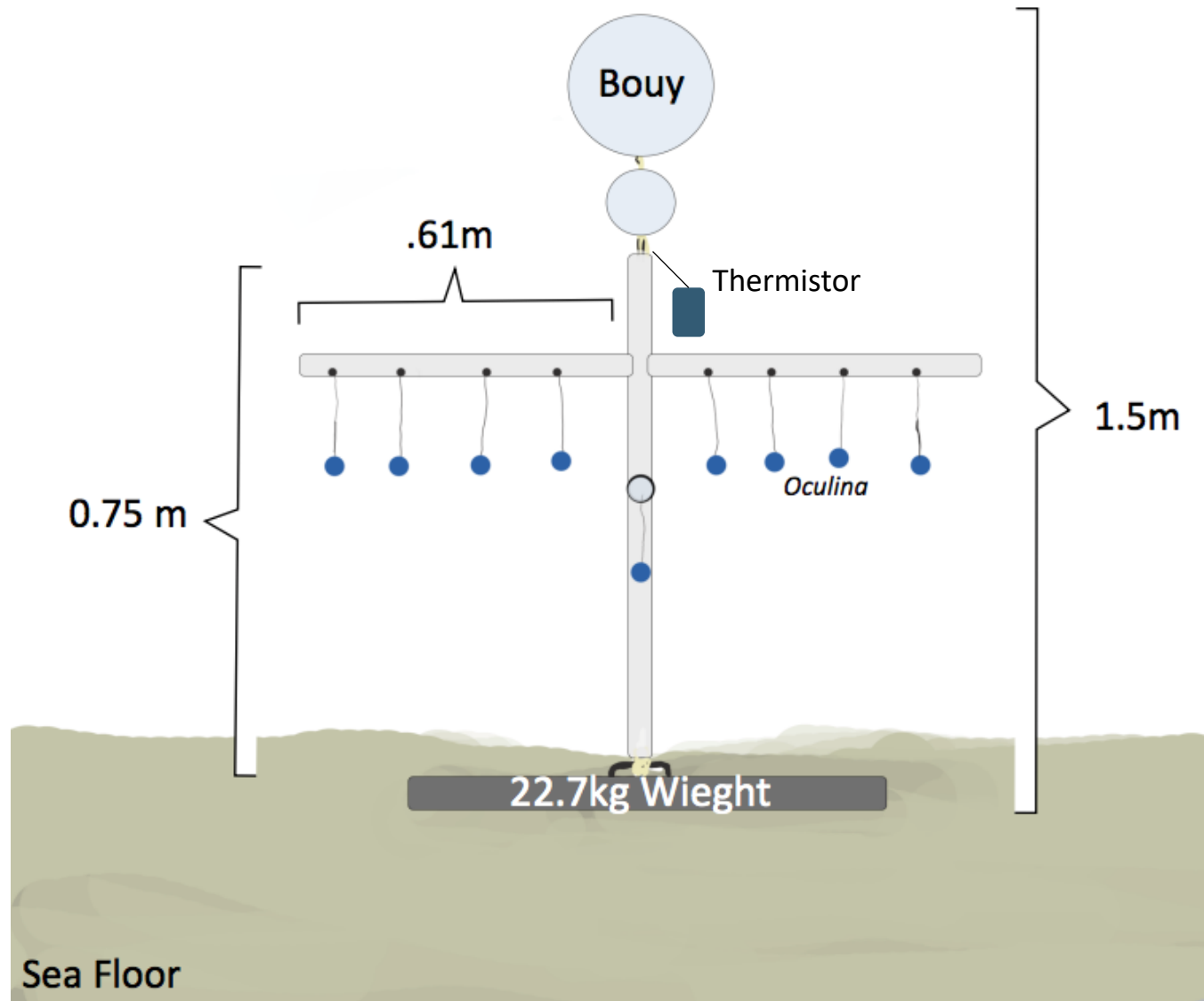


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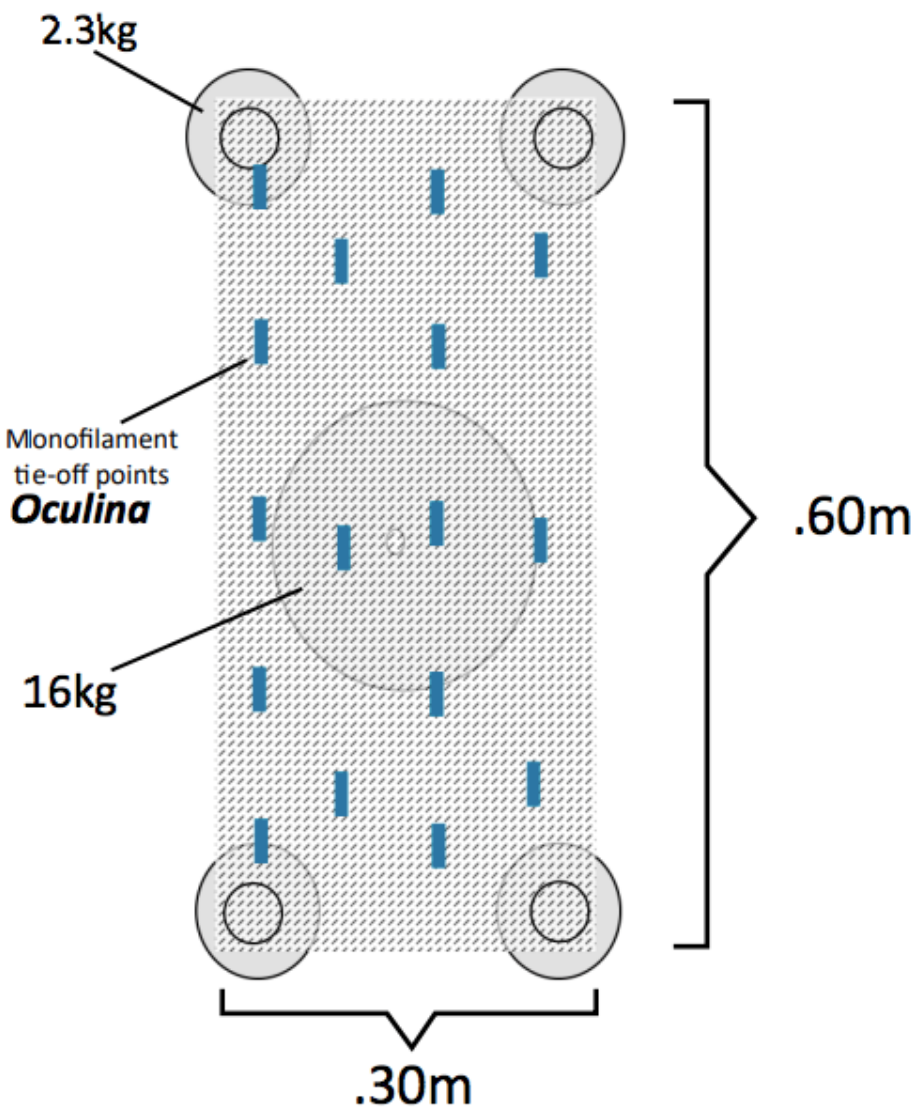
Methods

- 1 Survey and Determine Coral Nursery Locations
- 2 Deploy Measurement Instrumentation (CTDs)
- 3 Construct Coral Trees and Coral Tables

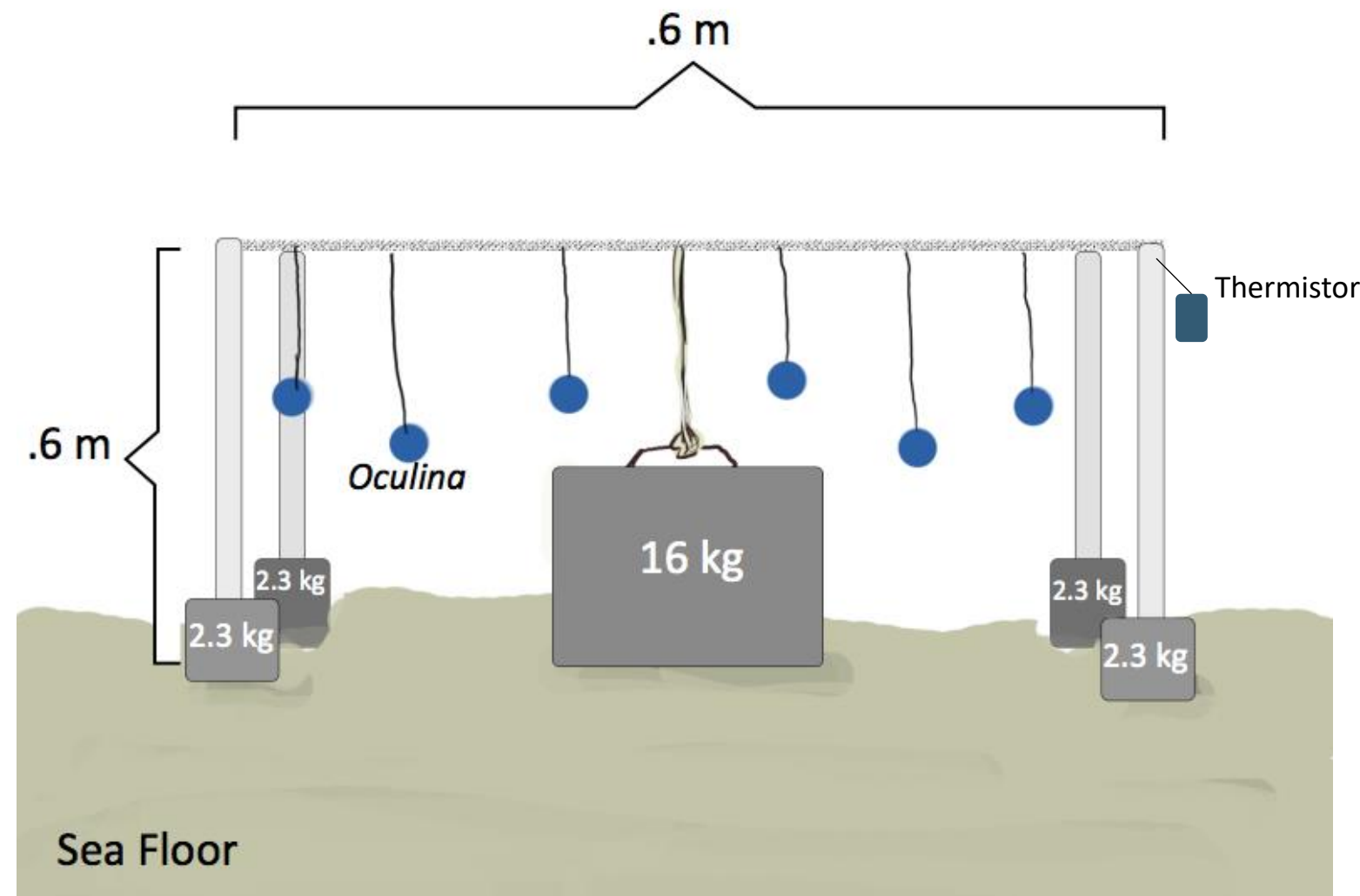
3. Construct Coral Trees and Coral Tables



Side View of Tree



Top View of Table



Side View of Table



PEJE BLANCO
PROYECTO DE CULEBRA



NORTH
CAROLINA



Final Product



Attaching a Thermistor



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Methods

- 1 Survey and Determine Coral Nursery Locations
- 2 Deploy Measurement Instrumentation (CTDs)
- 3 Construct Coral Trees and Coral Tables
- 4 Collect *Oculina* and Deploy Coral Nurseries

4. Collect *Oculina* and Deploy Coral Nurseries

Corals of Opportunity

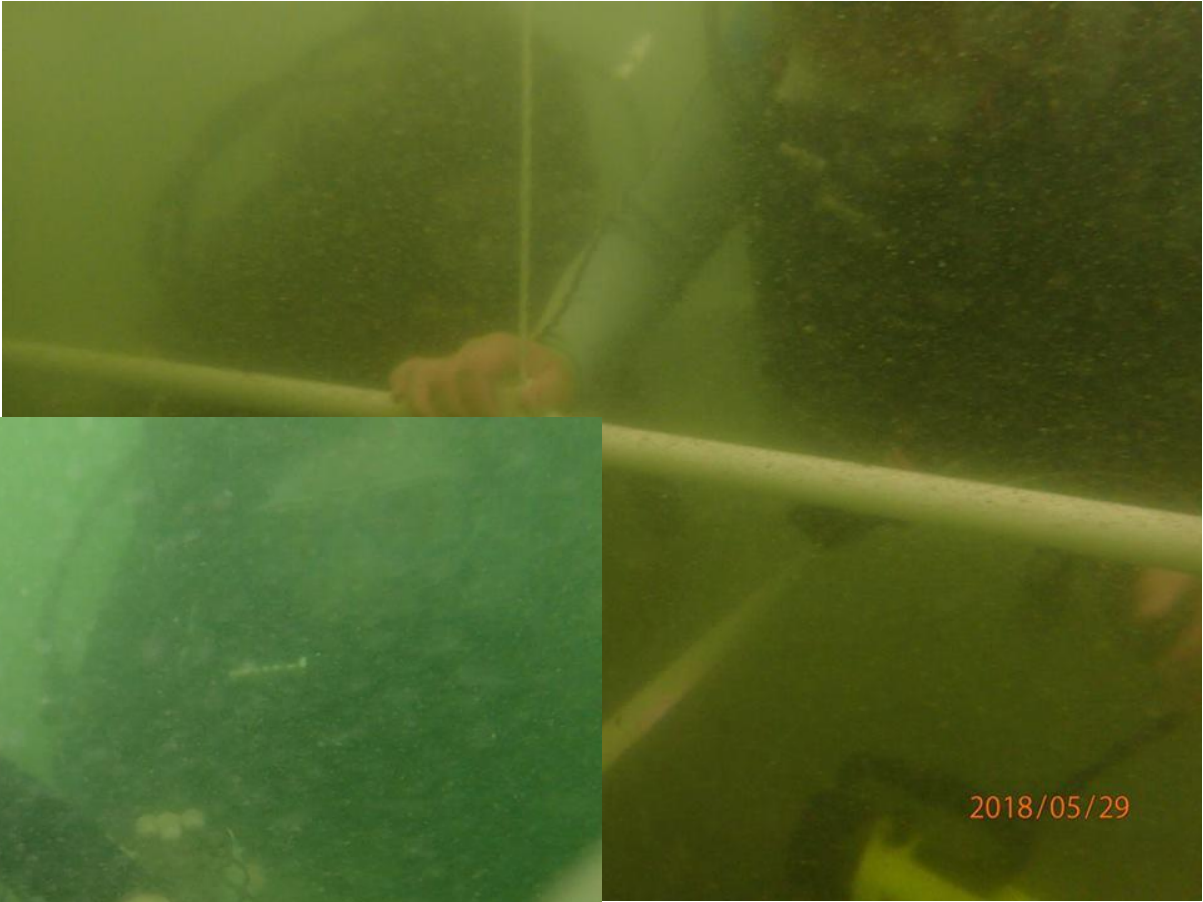


Propagation



Fragments Attached via Monofilament Line





And the fish love it!



Methods

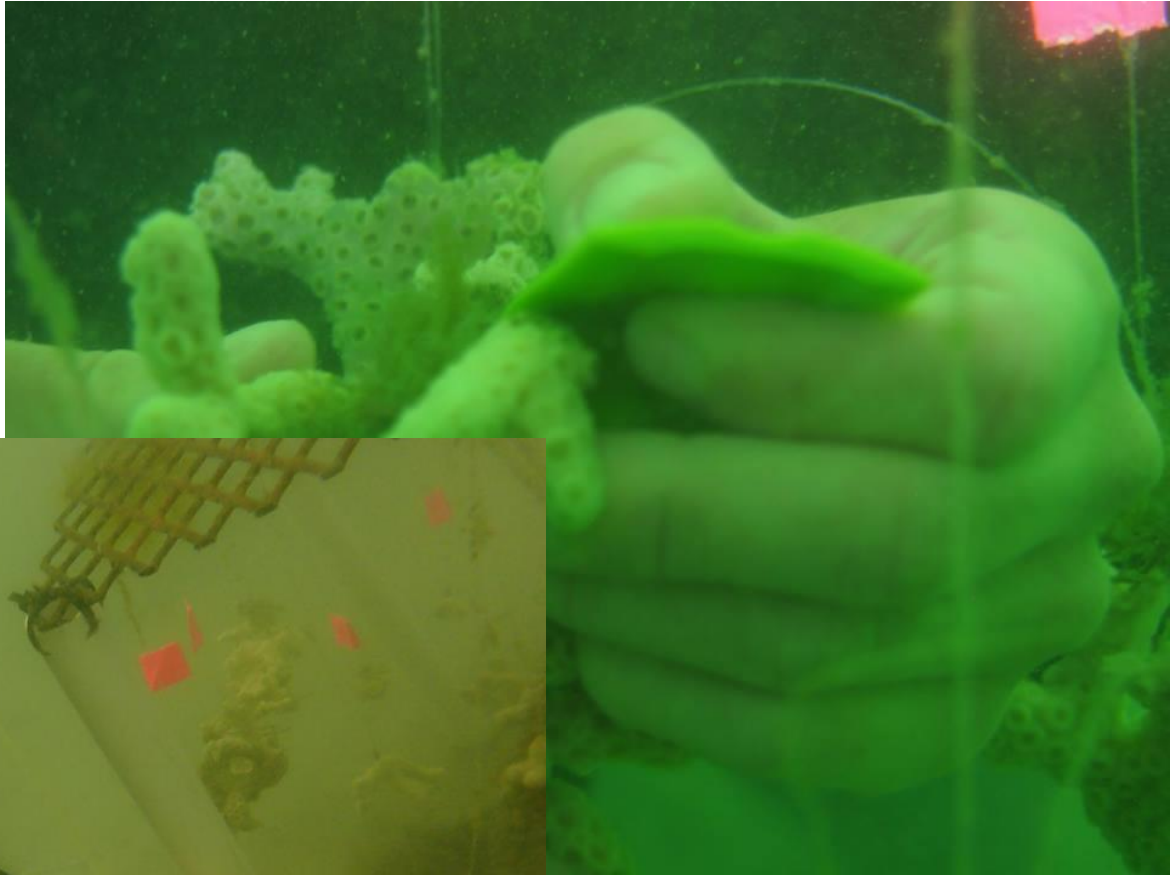
- 1 Survey and Determine Coral Nursery Locations
- 2 Deploy Measurement Instrumentation (CTDs)
- 3 Construct Coral Trees and Coral Tables
- 4 Collect *Oculina* Deploy Coral Nurseries
- 5 Take Initial Measurements of the Corals

5. Take Initial Measurements of the Corals

Measurements

Base Diameter
&
Length From
Base to
Longest Branch





Methods

- 1 Survey and Determine Coral Nursery Locations
- 2 Deploy Measurement Instrumentation (CTDs)
- 3 Construct Coral Trees and Coral Tables
- 4 Collect *Oculina* Deploy Coral Nurseries
- 5 Take Initial Measurements of the Corals
- 6 Remeasure the Corals to Determine Growth

6. Remeasure Corals and Determine Growth

UNC-CH IMS OPERATIONAL DIVE PLAN

To: Diving Control Board

From: MASC 490 e-mail addresses- Below Phone: (828)275-9939

If for any reason the dive plan is altered in the mission, location, depth, personal, or equipment, the Dive Officer, Steve Broadhurst, will be contacted by email, unc.dso@unc.edu, or phone (252) 622-5562 in order that revisions may be reviewed prior to actual operation.

Signature of Dive Supervisor _____ Date _____

Witness _____

Changes are considered accepted when the Dive Supervisor receives confirmation from the DSO, not upon submission. A copy of this plan will be at the diving location whenever diving is conducted.

Dive Team Members

Name	Position	E-mail
Janelle Fleming	Instructor	Janelle.flrming@seahorsecoastal.com
Nadia Cohen	Student	nadiafc@live.unc.edu
Mary Diez	Student	kafka10@liv.unc.edu
Olivia Gorman	Student	oliviag@live.unc.edu
Vanessa Wignall	Student	vanessaw@live.unc.edu

Proposed Dive Operation

Location: Radio Island Rock Jetty

Dates: August 18th -19th 2018

Purpose: Measuring the growth of *Oculina* coral in the nurseries by the green 3A piling and the west side of Radio Island.

Modes for diving: SCUBA w/air

Dive Platform: Shore dive

Site Conditions

Visibility: 2'- 6'

Currents: Dive at slack tide, after high tide, reduced/no current

Water Temp: 78 °F

Depth: 35'

Sea conditions: Very close to shore, calm

Emergency Management Plan

For any cases of DCI 100% will be available for treatment along with a first aid kit to treat any other injuries until EMS arrives. Activate EMS first. Below are all the contact numbers local emergency services.

Emergency Medical Telephone Numbers

To open road access to Radio Island.....(252) _____

Divers Alert Network Hotline (DAN)..... +(919)684-9111(Call collect)

For diving questions that are of a Non-emergency nature..... +(919)684-2948

Emergency Medical Services

Rescue Squad..... 911

Hospitals

Carteret General Emergency Room..... (252)808-6133

Emergency Evacuation

U.S. Coast Guard for North Carolina Non-emergency..... (252)247-4598

U.S. Coast Guard for North Carolina Emergency..... (252)247-5483

U.S Marine Corps Search & Rescue (SAR)..... (252)466-5745

Radio..... (2182)

Radio VHF.....Channel 16

Diving Physicians

Dr. Booth..... (252)808-3696

UNC-CH IMS Dive Personnel

Diving Safety Officer (Steve Broadhurst)..... IMS (252)726-6841..... Cell (252) 622-5562

Recompression Chamber

Wound Healing and Hyperbaric Center..... (252) 808-6450
3722 Bridges Street Morehead City NC 28557

Future Directions

- 1 Monitor the Corals on a Monthly Basis
- 2 Take Additional Measurements to Monitor Growth
- 3 Outplant Corals Into the Jetty Community
- 4 Evaluate Efficacy of Tree Vs. Table and Location
- 5 Consider Deploying Additional Instrumentation
- 6 Implement New Coral Nurseries



We've Learned So Much Along the Way!



Dive Against Debris



PADI Digital Underwater Photographer



PADI Nitrox Diver



AGGRA/NOAA Fish and Benthic Survey Techniques



PADI Advanced Open Water



REEF Level Two Surveyor for the South Atlantic States



DAN Oxygen Provider for the Professional Rescuer



AMERICAN ACADEMY OF
UNDERWATER SCIENCES

AAUS Scientific Divers rated to 60 feet

PADI Rescue Diver



First Aid and CPR For Professional Divers

Underwater Communication



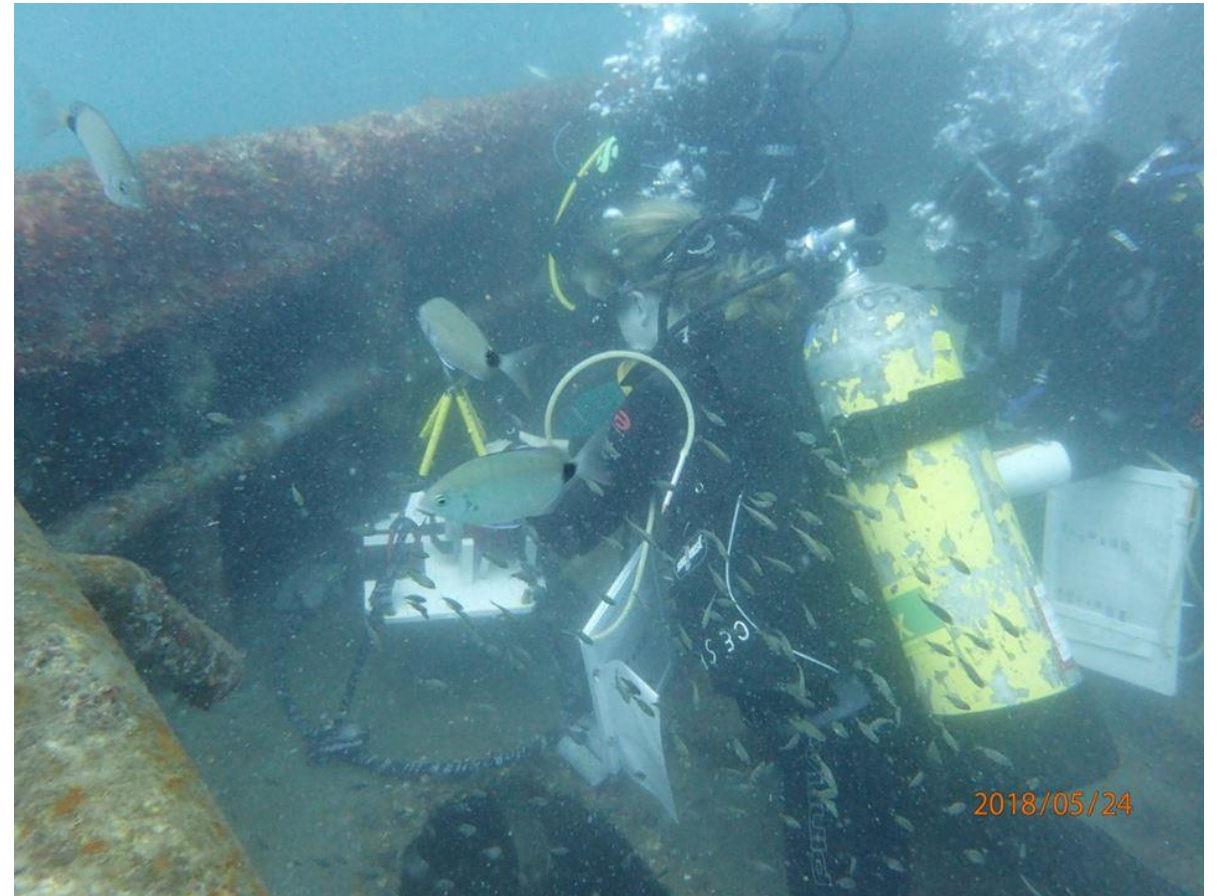
Using a Lift Bag



Using Power Tools



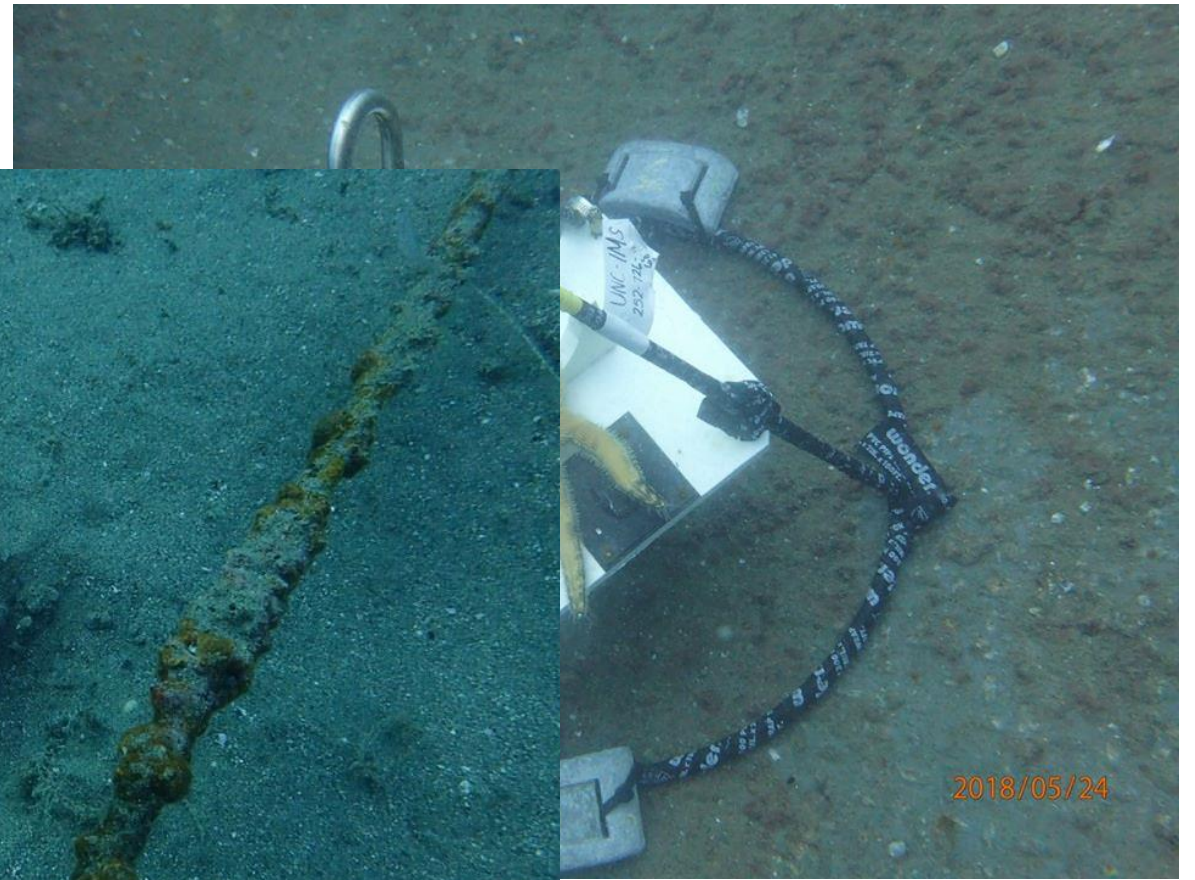
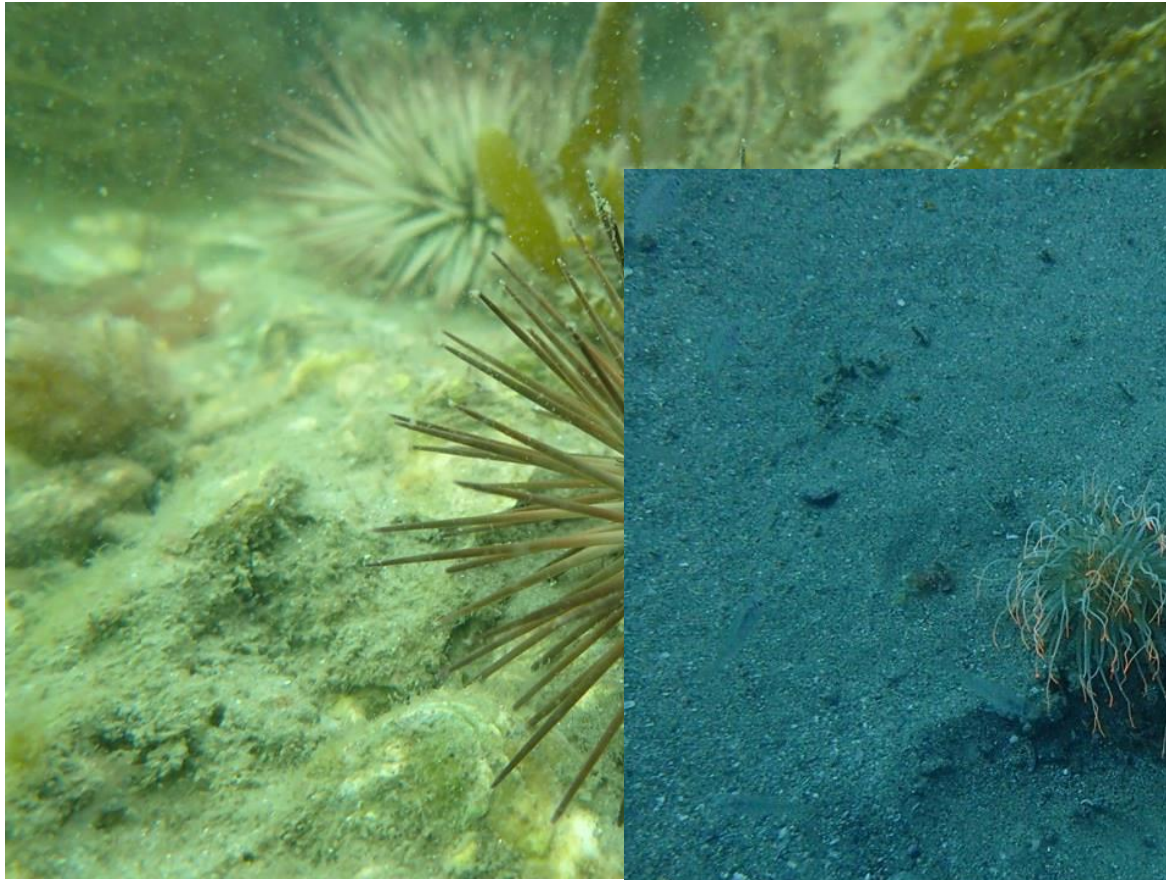
Deploying Instruments



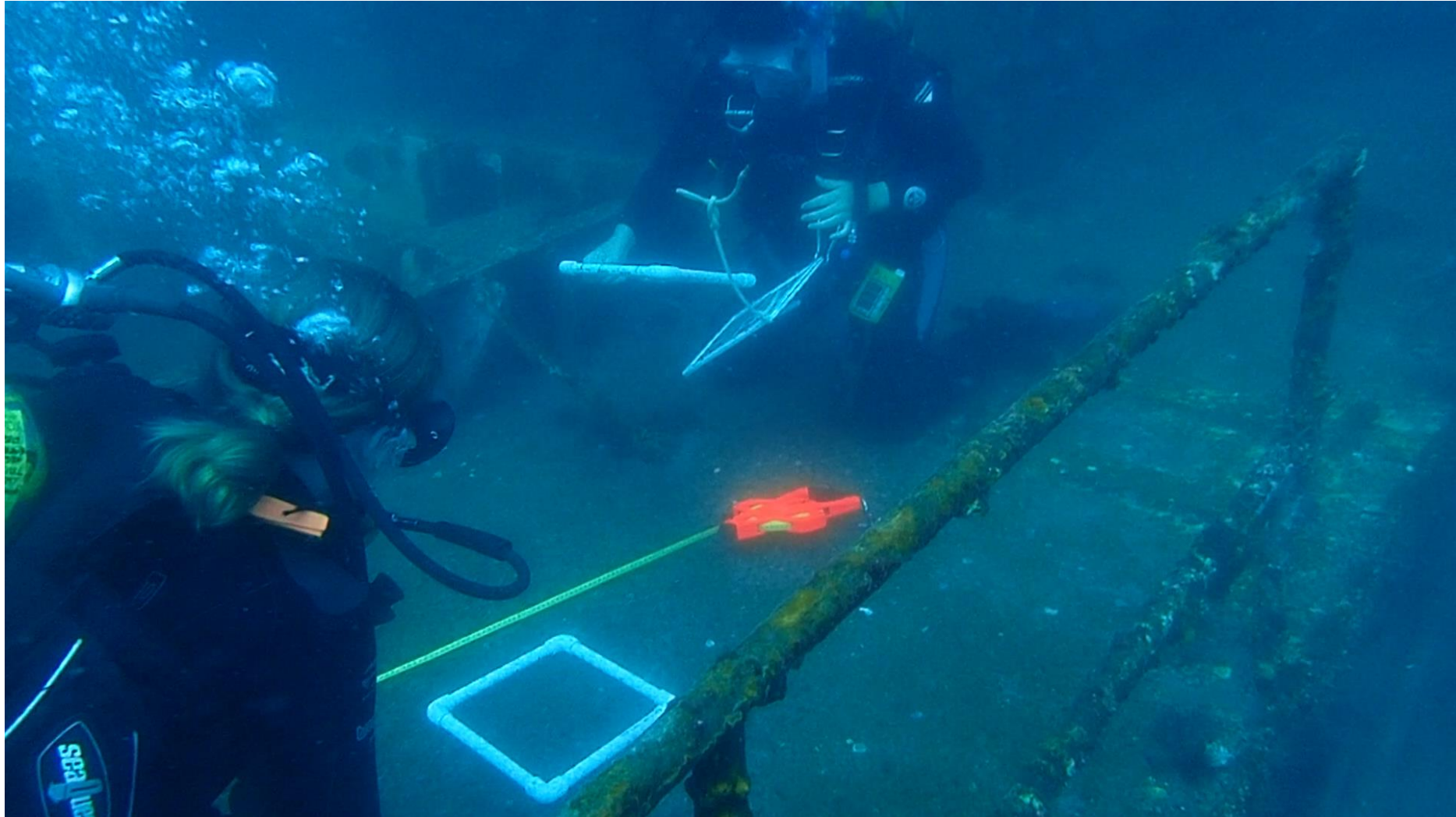
Fish ID



Invertebrate ID



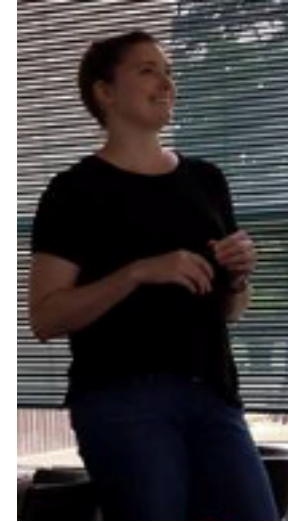
Quadrats and Transects!



Making Connections and Opening New Doors

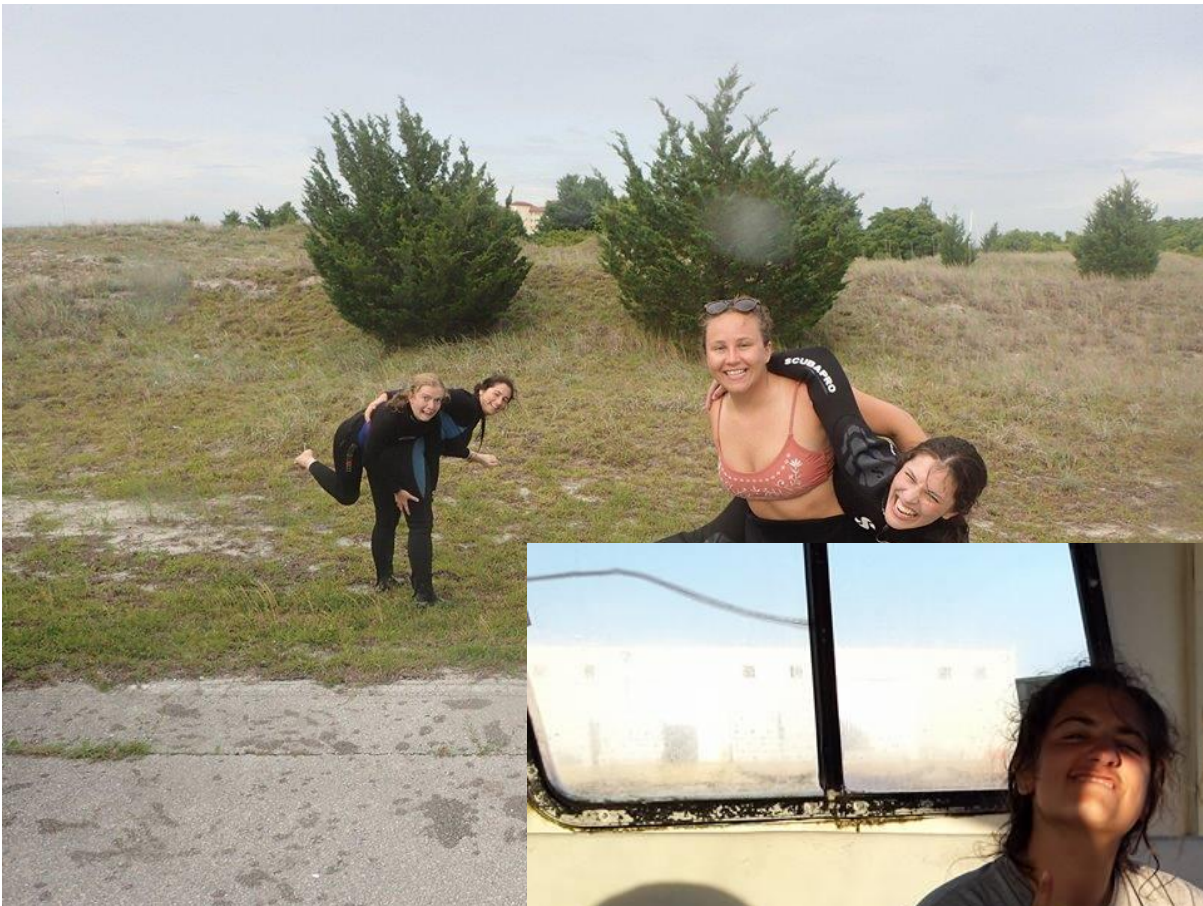


Seeing Tons of Women in Science!



BUT We've Gotten So Much More Out of This Class









Thank You Janelle! Its Been Rad!!



References