

Lesson Plan for Teacher At Sea Program
Carol Schnaiter
Amboy Central School
Grade 4

Standards to be addressed:

- A. NGSS 3-LS4.3 construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- B. NGSS 3-LS4.4 make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Goals:

- Groups will be able to develop an argument with evidence, that in the Gulf of Mexico as the level of oxygen changes, some organisms that are able will move and those that are not able to move will die or change in order to survive.
- Students will be able to list organisms that live in the Gulf of Mexico and what they need to survive.
- Students will be able to list possible reasons the level of oxygen changes in the Gulf of Mexico.
- To have discussions about:
 - Water pollution: not-point sources of pollution
 - Hypoxia: what it is and how it affects organisms
 - Farming and the chemicals being used and when the chemicals are being put onto the fields
 - Looking at surveys from the past to see if the levels have increased or decreased over the years

Outline of Lesson:

1. This lesson will begin with the showing of a power point from my time aboard the NOAA ship *Oregon II* in the summer of 2014.
2. Students will read over the data provided by the ship from the Summer Groundfish Survey. Students will make a hypothesis as to what happens in the water when the oxygen is high or low.
3. Using this data the students will create a diagram that shows how they think nutrients enter the Gulf of Mexico.
4. Students will use iPads to watch videos from PBS and from youtube on water monitoring and the importance of having DO (dissolved oxygen) in the water.
5. Students will research the terms “hypoxia” and “dead zone” and discuss what could cause these problems. They will research organisms that live in the Gulf of Mexico to determine which ones could move and which ones would stay there and create a chart to share this information.
6. Students will communicate with scientists aboard the NOAA ship *Oregon II* during the Fall Groundfish Survey and track the ship using a map of the Gulf of Mexico.
7. Videos from PBS, “Agricultural Runoff and the Gulf of Mexico” and “Farm Solutions to Water Pollutions” will be shown.
8. In the spring, students will use water-monitoring kits to check the local river.
9. For the ending project the students will create informational brochures, signs, or a video to explain to local farmers what may be causing the “dead zone” in the Gulf of Mexico. The project will need to include suggestions on ways to improve the water quality.

Internet resources:

- NOAA ship tracker: shiptracker.noaa.gov
- Real data from NOAA Ship Oregon II: <http://www.ncddc.noaa.gov/hypoxia/products>
- World Water Monitoring Challenge Website: www.monitorwater.org
- PBS video: illinois.pbslearningmedia.org
- youtube video: “Water Quality Dissolved Oxygen, Part 2”

Website: TryScience.org

NOAA Office of Education: www.oesd.noaa.gov

The Kids' Science Challenge: www.kidsciencechallenge.com

Science Net Links: sciencenetlinks.com

U.S. Fish and Wildlife Service: www.fws.gov/letsgooutside

Assessments:

- Rubrics of the poster/brochure/video on giving information to the public
- Rubric to evaluate the diagram of how nutrients enter the Gulf of Mexico
- Class participation
- Journal entries

NOAA Teacher at Sea

Aboard the NOAA Ship *Oregon II*

June 6-21, 2014

Carol J. Schnaiter

Gulf of Mexico



NOAA's Teacher at Sea Program: Background Statistics

- Established in 1990
- Nearly 700 teachers have participated
- Approximately 250 applicants per year with 25-30 accepted
- Most participants go to sea during the summer
- Fall and spring opportunities available

NOAA Ship *Oregon II* was built in 1967, it is the oldest in the NOAA fleet.





Stateroom #2	Patricia Vosburg
	Rebeca Rosado
Stateroom #4	Chrissy Stepongzi
	Carol Schnaiter
Stateroom #6	Chuck Godwin
	Chris Nichols
OPS Stateroom	Andre Debose
	Larry Thomas



NOAA's Teacher at Sea Program: Fisheries Cruises

Fisheries cruises perform biological and physical science studies in support of fisheries research and support NOAA's mission to protect, restore and manage the use of living marine, coastal, and ocean resources through ecosystem-based management.

Teachers can anticipate:

- Sorting biological samples
- Recording data including weighing, measuring, and sexing samples
- Dissecting samples
- Assisting in deploying and retrieving equipment
- Fisheries ships include *Henry B. Bigelow*, *Oscar Dyson*, *Nancy Foster*, *Gordon Gunter*, *Hi'ialakai*, *Oregon II*, *Oscar Elton Sette*, *Bell. M. Shimada*, and *Reuben Lasker*.

First day at sea-sun and drills!



Safety is Important!



Day 2-divers check the hull before we start our work



Lab



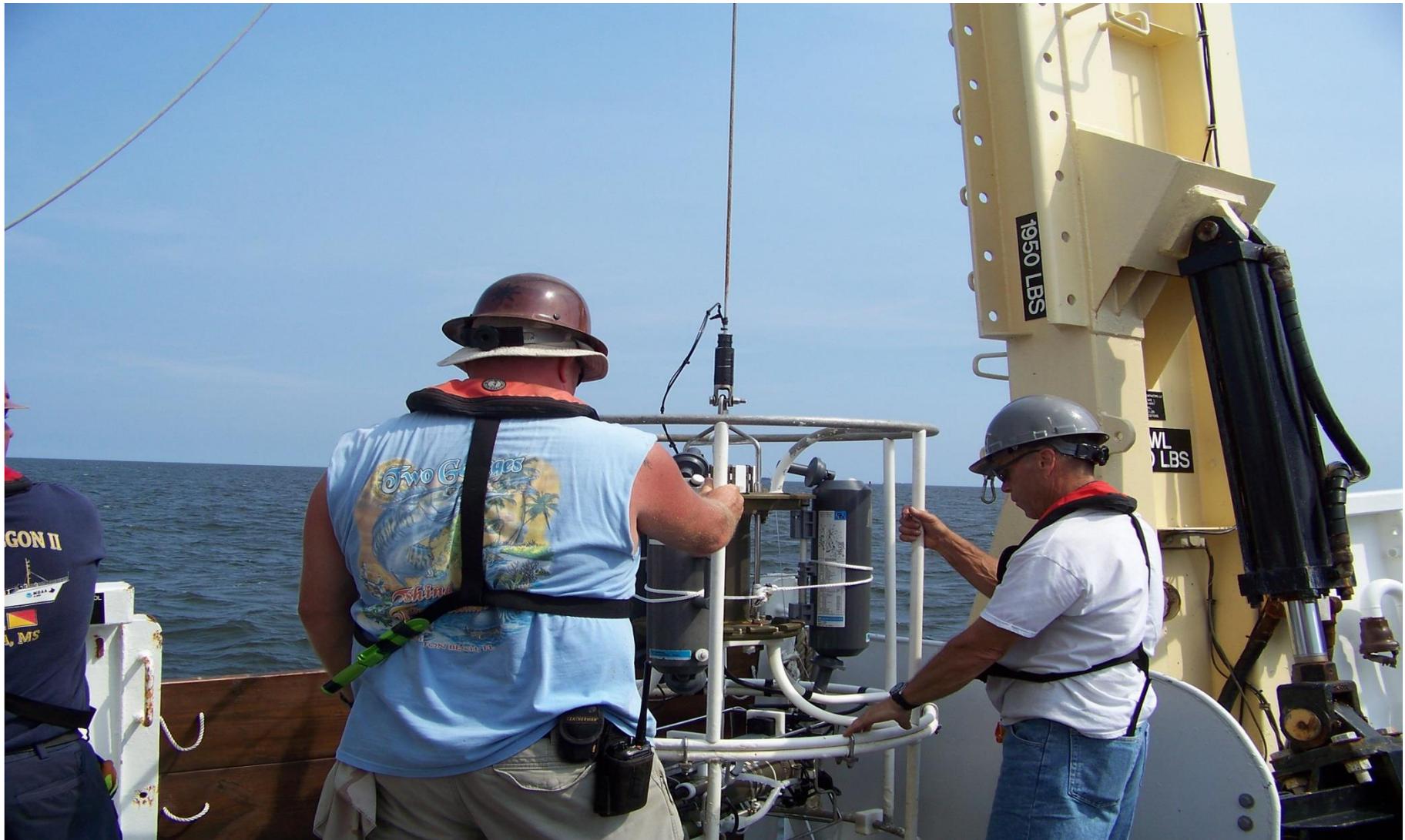
“Wet” Lab



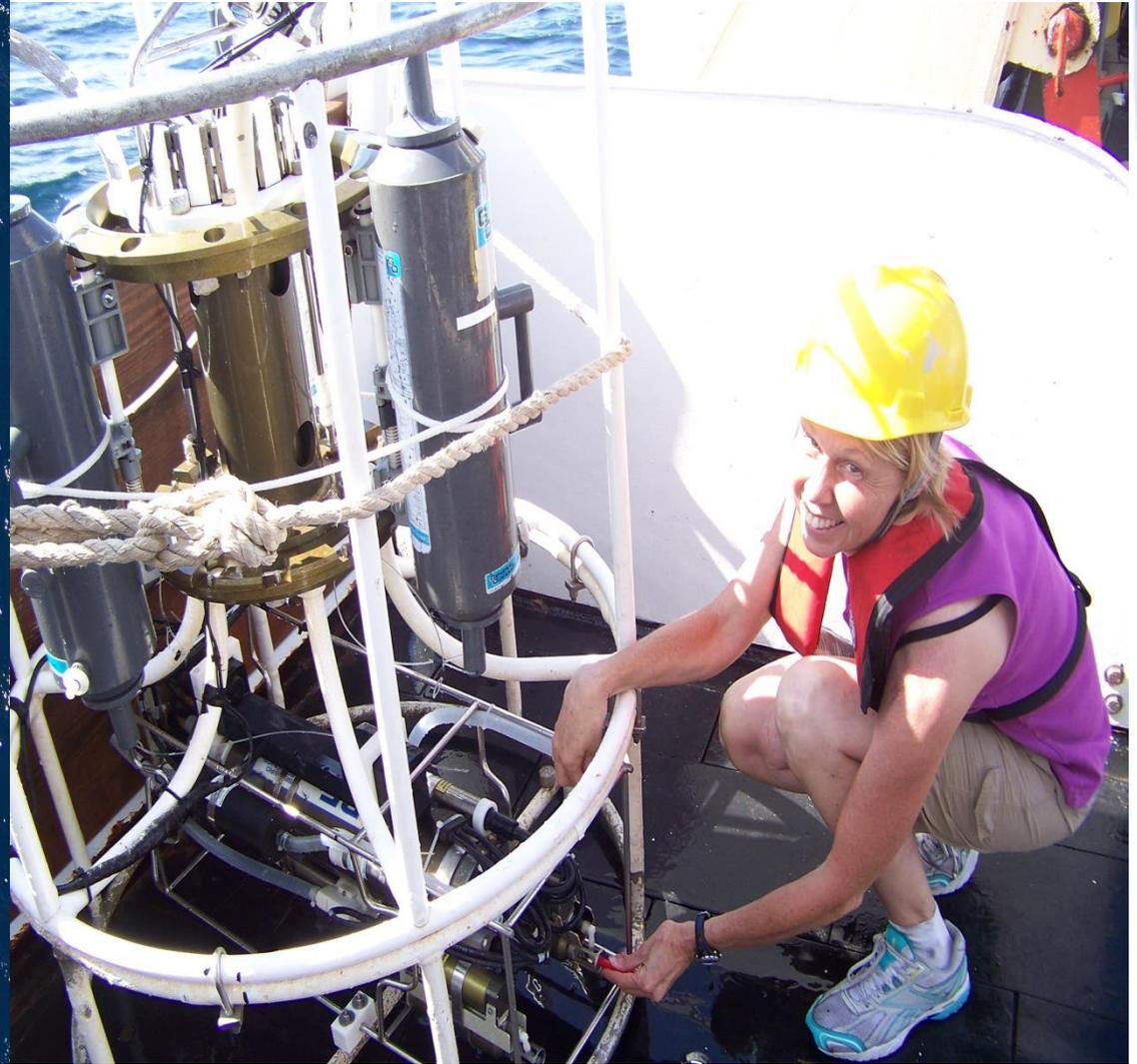
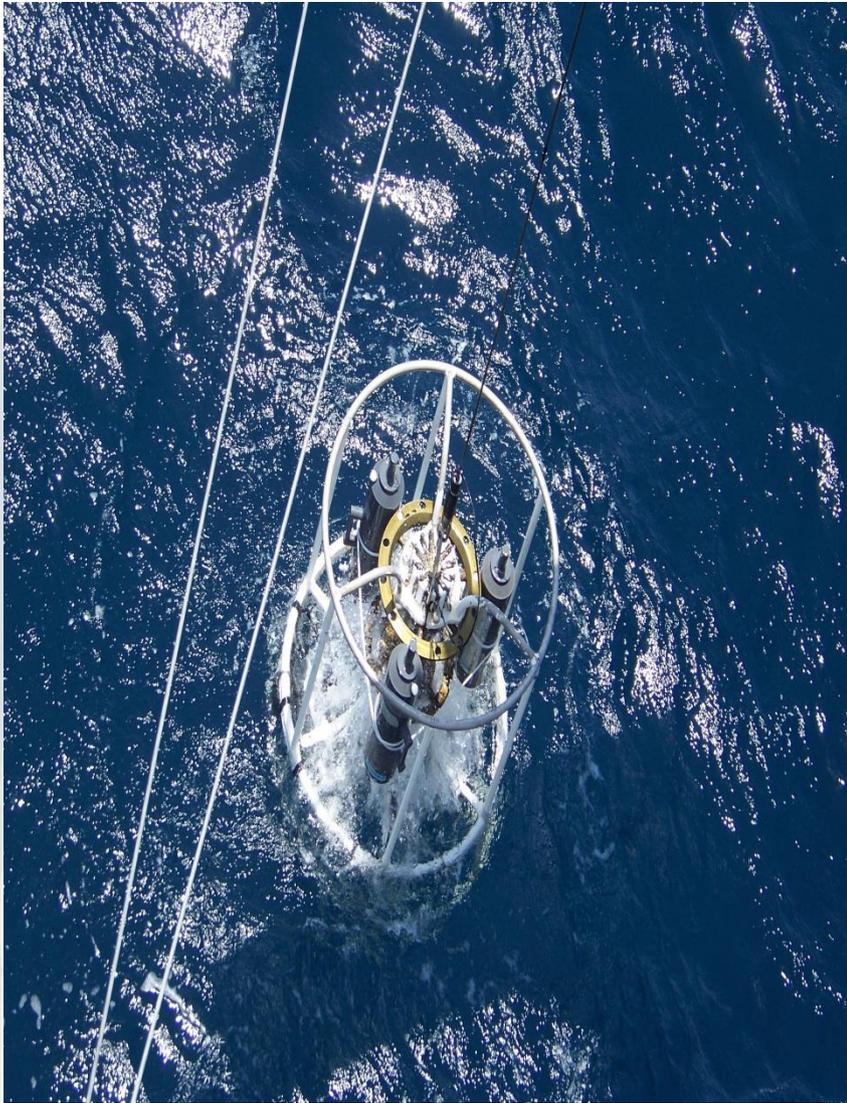
Measuring table and Conveyor belt



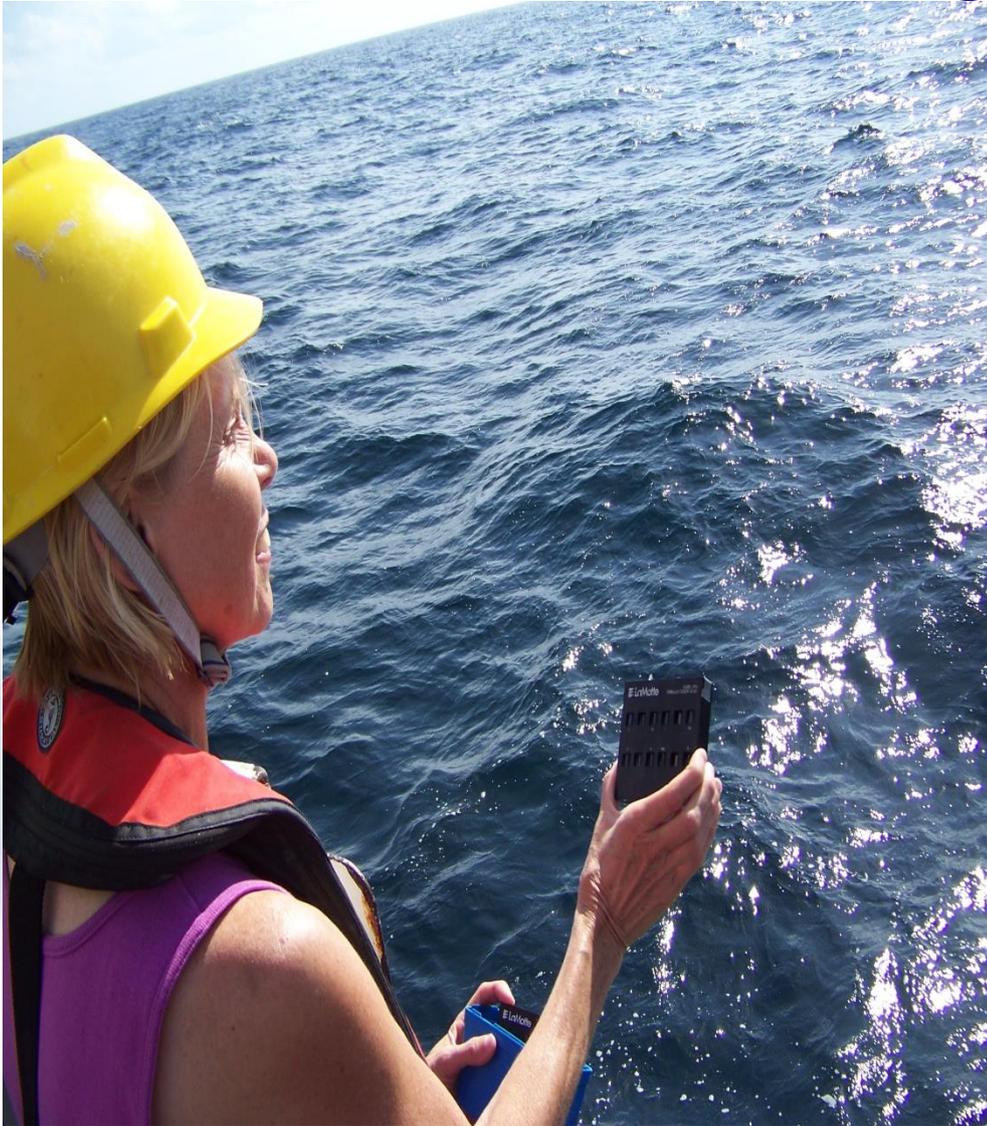
CTD-Conductivity, temperature, and depth is checked at every station.



The CDT coming up and cleaning the tubes.



We needed to check and record the water color, cloud cover, and wave height.



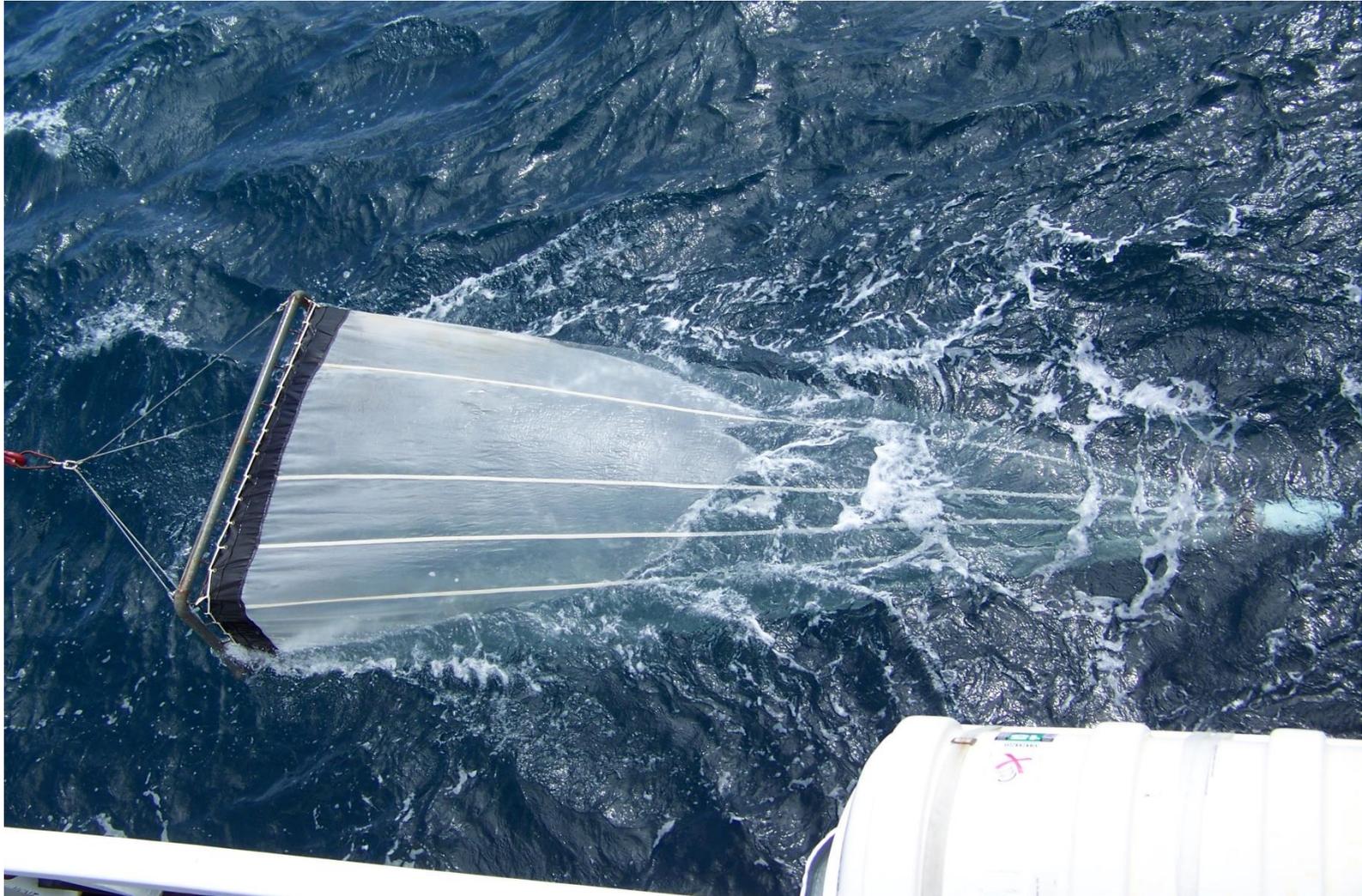
Lead Scientist Kim Johnson showing Robin how to do the Winkler Test



Learning how to check the oxygen level in the water



The Neuston Net is used to collect from the top of the water.



Washing the Neuston net down



Seas of sargassum (seaweed) floating past the ship.



Plankton collected from the Neuston net to send back to the lab on land.



Doing transfers from the Bongo and Neuston nets at the outside lab



Trawling nets coming up



Robin and Mike emptying the net



Next we had to weigh the entire catch



Time to sort everything



Sometimes we had to look up the species.



Some of the cool things we caught- Red Snapper and scallops!



Black edge Moray



Lesser Electric Ray



Atlantic Flying Fish



Invasive species-Lion Fish



Fish ear-used to tell the age of a fish



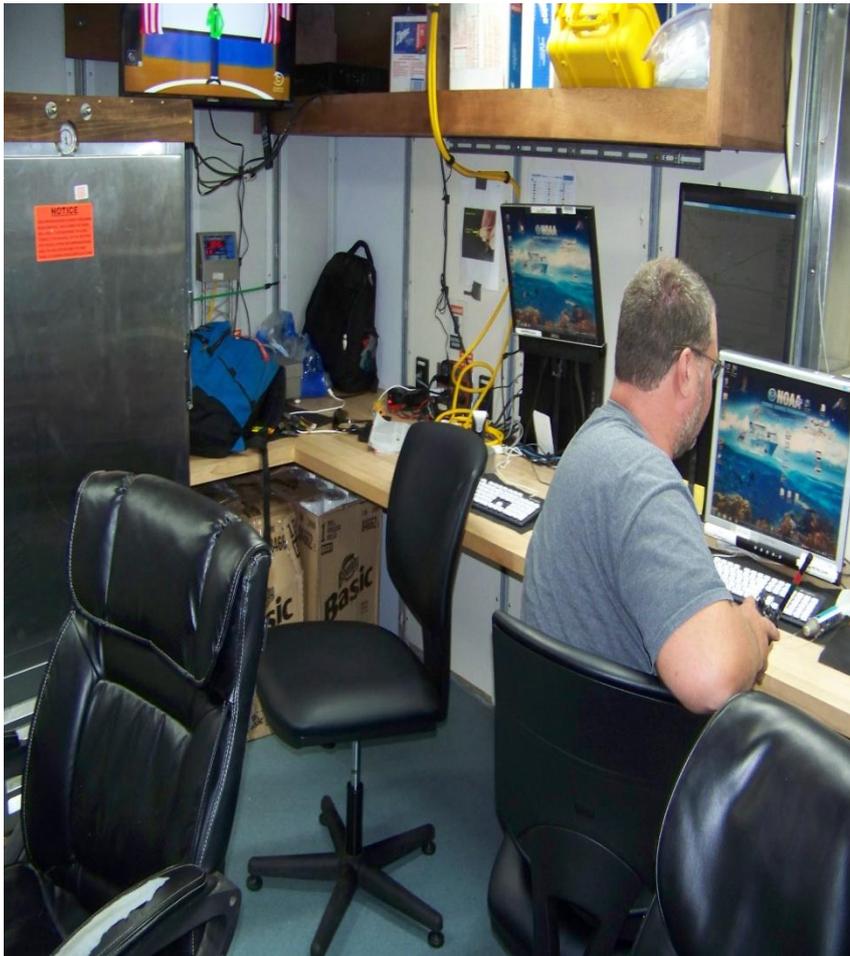
And one of the reasons NOAA is there... to count the shrimp!



We collected data at 120 stations in the Gulf of Mexico



It was important to communicate with the bridge at every station.



Sharks of all sizes and types were in our nets.





Master Dave and XO Eric



The Day Crew-noon to midnight!



The Night Shift-midnight to noon!



The ship's night crew!



Chief Steward Walter and 2nd Cook Steve



The engine room: the electrical board and making our fresh water.





Sunset over the Gulf of Mexico!



Mrs. Schnaiter

Class: _____

Student: _____

Rubric: Hypoxia Test- Essay Rubric

Essay Rubric- Hypoxia			
	Poor 4 pts	Fair 6 pts	Good 10 pts
Points covered	Poor Only one point of the criterion is discussed or explained in 75% or more of the questions.	Fair Only a few points of the criterion are discussed or explained in 50% of the questions.	Good Each point of the criterion are fully discussed or explained in each question.
Length of each answer	Poor The answer is no more than one or two words in length.	Fair The answer is only one sentence in length.	Good The answer must be two sentences or more in length.
Punctuation	Poor The entire assessment has 6 or more errors in punctuation.	Fair The entire assessment has three to five errors in punctuation.	Good The entire assessment must have correct punctuation.
Graphic	Poor Graphic has no labels or explanation.	Fair Graphic has basic labels and explanations.	Good Graphic has expanded explanations and labels.

Comments:

Rubric: 4th Grade Research Skills Rubric

4th grade research skills rubric.

4th Grade Research Skills



	Level 1 1 pts	Level 2 2 pts	Level 3 3 pts	Level 4 4 pts
Extracted key facts from Renzulli.	Level 1 Missed basic facts	Level 2 Listed basic facts	Level 3 Listed most of the important facts of the the subject.	Level 4 Listed all the important facts of the the subject. Used more than one source.
Organized information appropriately	Level 1 Unable to organize facts appropriately.	Level 2 Attempted to organize the facts but had 1-2 facts that were not in the appropriate place.	Level 3 Organized most the facts in an appropriate manner.	Level 4 Organized all the facts in an appropriate manner. Kept notes readable and clear.
Information on subject.	Level 1 Learning to put information on the subject into his/her own words.	Level 2 Put the information into his/her own words but had many mistakes (for example, mistakes in spelling and grammar).	Level 3 Organized information in his/her own words few mistakes.	Level 4 Well organized information in his/her own words without mistakes.
Focus/Use of time.	Level 1 Student became involved in distractions from other students or distracted others. Needs to use class time more productively.	Level 2 Student beginning to stay focused on their research topic and used class time more effectively.	Level 3 Student remained focus on their research topic and were engaged in their topic. Used time effectively.	Level 4 Student remained very focused on their research topic despite and seemed highly engaged in their topic. Used time wisely in class.
Graphics	Level 1 No graphic included.	Level 2 Included a graphic of the topic.	Level 3 Included a graphic and used it in appropriate way.	Level 4 Included 2 or more graphics and wrote small descriptions for each graphic.
Content: Mechanics	Level 1 More than 4 errors in spelling and/or grammar.	Level 2 3-4 combined errors in spelling and/or grammar	Level 3 1-2 errors in spelling and/or grammar	Level 4 No spelling and/or grammar errors.

Comments:

Rubric: Project rubric

The students will work to put together a project for display.

Science Project



	Poor 1 pts	Fair 2 pts	Good 3 pts	Exceeds 4 pts
Content Knowledge	<p>Poor</p> <p>The project is lacking in elements required. There are many gaps in information presented. Confusing.</p>	<p>Fair</p> <p>Does not have all of the relevant information of the project. Information is presented in an unorganized fashion and may be hard to understand.</p>	<p>Good</p> <p>Project includes all relevant information; however, it is not well-organized or easily understood..</p>	<p>Exceeds</p> <p>The project includes all information relevant to the topic. The poster is creative and clear. The student added information above what was taught in class or required for assignment.</p>
Work quality/effort	<p>Poor</p> <p>Work is done with little effort, quality is not what the learner is capable of. It is evident that the work was rushed and little time was spent on the final product. Work is incomplete.</p>	<p>Fair</p> <p>Work is done with fair effort, but the quality is still not what the learner is capable of. It is evident that the work was rushed.</p>	<p>Good</p> <p>The work was done with good effort that shows what the learner is capable of. It is evident that time was put into this project.</p>	<p>Exceeds</p> <p>The work done exceeds all expectations and shows that the learner is proud of his/her work. The effort that was put into this task is the best it can be by the learner.</p>
Expectations/Potential	<p>Poor</p> <p>Does not meet teachers expectations or students potential.</p>	<p>Fair</p> <p>Few areas of project meets teachers expectations or students potential.</p>	<p>Good</p> <p>Numerous areas of project meets teachers expectations and students potential.</p>	<p>Exceeds</p> <p>Meets teachers expectations and students potential.</p>

Comments:
