ACTIVITY 6

An Ode to the Oyster

Estuary Principle

Estuaries support an abundance of life, and a diversity of habitat types.

Research Question

What is the biological importance of the oyster reef, how are oyster reef populations threatened, and what can be done to prevent declines in oyster populations?

Introduction

Oysters are a valuable part of estuary ecosystems. They help purify the water and control erosion. Oyster reefs provide habitat for numerous other species. However, oysters can also be an "indicator species." Like a canary in a coal mine, oyster health and oyster abundance can tell us about changing conditions in an estuary. In this activity, students will identify the many types of organisms that live on an oyster, dissect an oyster and explore its anatomy, and role-play as biologists whose assignment it is to uncover what is causing the decline in an oyster population.

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This curriculum was developed and produced for:

The National Oceanic and Atmospheric Administration (NOAA) and The National Estuarine Research Reserve System (NERRS)

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Financial support for the Estuaries 101 Middle School Curriculum was provided by the National Oceanic and Atmospheric Administration via grant NA06NOS4690196, administered through the Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section and Weeks Bay National Estuarine Research Reserve. Support was also provided by the Baldwin County Board of Education.

TEACHER GUIDE

An Ode to the Oyster

Research Question

What is the biological importance of the oyster reef, how are oyster reef populations threatened, and what can be done to prevent declines in oyster populations?

Content Objectives

Students will understand that:

- Oysters live with other organisms near the shore and can form oyster reefs.
- Reef oysters are adapted to live within the dynamic, stressful intertidal environment.
- Oysters are economically important in coastal regions. Oysters are also environmentally important in that they remove pollutants from the water and oyster reefs help protect marsh shorelines from erosion.
- Populations of oysters that form oyster reefs have been reduced by pollution, excess sediment in the water, over-fishing, and by loss of areas of hard substrate on which to grow.
- Oyster reef restoration and controls on over-harvesting of oysters can slow or stop the decline in the reef oyster population.

Exercises

Exercise 1: Oyster Reef Community

Students sort oyster reef organisms to identify the many types of organisms that live in an oyster reef and form the reef community. Students then create a mural showing the oyster reef and organisms commonly found there.

Exercise 2: Oyster Dissection

In this exercise, students dissect an oyster and explore its anatomy.

Exercise 3: Save the Oyster Reef

As part of a role-playing exercise, students become biologists whose assignment is to uncover what is causing the decline in an oyster population and then to propose a solution to the problem.

Assessment Questions

Assessment questions based on content covered in *An Ode to the Oyster* can be downloaded on the web page for this activity in the Middle School Curriculum section of the Estuary Education website at estuaries.noaa.gov.

Vocabulary

Bivalve – a mollusk that has two shells hinged together.

Community – an association of interacting populations.

Classification – to group living things.

Habitat – the place where an organism lives.

Intertidal – estuary habitat flooded by high tide waters only.

Invertebrate – an animal that does not have a backbone; such as snails, worms, and insects.

Organism – a living thing, such as animal, plant or micro-organism, that is capable of reproduction, growth and maintenance.

Oyster Reef – Oysters that live in the intertidal zone are found in groups known as oyster reefs.

Population – all individuals of a particular species within a defined area.

Spawn – to deposit sperm or eggs into the water.

Substrate – the surface on which an organism grows.

Subtidal – area usually flooded near edge of tidal waters.

Taking It Further

If you live near the coast, you and your students can visit an oyster farm. Or you could take a field trip to the ocean and visit an actual oyster reef. Have students conduct a survey of animals that live in the oyster reef.

Students can design an in-class oyster aquarium. Have the students grow algae to feed the oysters. Be sure they think about, "How do I feed an oyster?"

Students can bring in oyster recipes or students can prepare oyster dishes at home and bring them in for a taste test. Some students may be allergic to shellfish (or milk products), so be sure to check with all of your classes before proceeding with this activity.

Students can participate in an oyster reef restoration project. In addition to helping build or rebuild the reef, students living near the site can monitor the site on a routine basis to chart spatfall accumulation and oyster recruitment.

If you represent a Reserve that has oyster reefs not mentioned in this activity include or swap-out information from this exercise to highlight oyster reefs found in your Reserve.

Cross-curricular Connections

History: Have your students research the history of shellfishing in an area to determine how the oyster collection practices have changed over time and the impact that declining shellfish populations have had on the shellfishing industry.

Math: Have students calculate the rate of decline in the oyster population in an area. If there aren't oysters occurring naturally in your area, students can calculate rates for the Chesapeake Bay area or for coastal South Carolina. How have annual harvesting rates changed?

English: Students can write and illustrate a short story about the life of an oyster in an oyster reef. Have older students read these stories to a class of younger students.

EXERCISE 1

Oyster Reef Community

Estuary Concept

Estuaries provide a virtual nursery and spawning ground for numerous fish and invertebrates to live in.

Focus Question

What is an oyster reef and what organisms live there?

Performance Tasks

Students will:

- Sort oyster reef organisms by major taxa.
- Identify the most abundant taxon in an oyster reef sample.
- Make a mural of the oyster reef and its inhabitants.

Teacher Background

Oysters that live in the intertidal zone are found in groups known as oyster reefs. Oyster reefs are formed by oysters growing on a firm foundation of dead shells. Clusters of oysters join together to form a continuous group. The intricate, three-dimensional nature of oyster reefs provides extensive habitat for numerous other marine species. Mud crabs, shrimps, juvenile fishes, and other organisms have been observed to seek shelter in reefs from predators as the tide rises. Loose oyster shell on creek bottoms serves as hard clam habitat as well as substrate for sponges, sea fans, and whip corals which, in turn, supply habitat for small crustaceans and fishes. Stone crabs typically reside near or in oyster reefs and feed largely upon oysters. Many larger fish forage for prey that hides among the oysters.

Oyster reefs are important in stabilizing exposed marsh edges. The presence of an oyster reef helps prevent bank erosion and the loss of marsh grasses. The energy of natural and man-made waves (e.g., the wake from boats) is dissipated as the waves are refracted off of the complex structure of the oyster reef.

Overview

Students will examine samples from an oyster reef. They will come to understand that many organisms live on an oyster reef and form a community. Students then work together to create a mural of an oyster reef that shows the organisms commonly found there.

Time Required

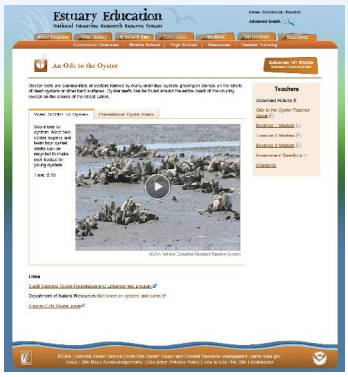
One and a half 45-minute class sessions

Teacher Preparation

1. You may want to find additional pictures of organisms students are likely to find in an oyster reef for students to refer to during the exercise. For older students, these pictures can include more information on the organism, including the scientific name, common name, diet, life history, etc.
2. You should view the slideshow, *Oyster Reefs: A Key to the Health of Our Estuaries*, in its entirety. However, for this exercise, you will only be showing your students Slides 1 through 8 as an introduction.
3. Make copies of the Student Master: *Data Sheet*.
4. You will need to secure oyster bed samples. Each student team can work with a single cluster of oysters. This can be a cluster of oysters from a natural oyster bed or can be a portion of a bag from a SCORE reef. One bag of oyster clusters should provide enough samples for 6 or more sample trays. Ideally, the oyster cluster samples are as unwashed as possible, as students will find organisms living in the surrounding tidal flat mud.

   Safety: In this activity, students will be handling oysters and oyster shells. It is important to know if anyone in your class has a shellfish allergy. For some students, this allergy can be life threatening. Even touching the shell could pose problems.
5. Students should wear gloves to avoid being cut on sharp shell edges.
6. While the hands-on part of this exercise can be completed in one 45-minute class session, the concepts may need to be introduced at a prior class.
7. Be certain to have enough supplies for each group of 3 to 5 students. Time will be saved if workstations are set up prior to students arriving. You might also be able to involve the students in setting up the workstations.
8. Consider covering all work surfaces with plastic sheeting and/or newspaper. This activity tends to be muddy.

You'll find multimedia and other resources on the web page for this activity in the Middle School Curriculum section of the Estuary Education website: http://estuaries.noaa.gov.



Procedure

1. As an introduction, show your students Slides 1 through 8 from the slideshow, *Oyster Reefs: A Key to the Health of Our Estuaries*. You will find the slideshow on the web page for this activity on estuaries.noaa.gov.
2. Divide your class into group of 3 to 5 students per group. Provide each student group with a tray of oysters and associated mud. Do not clean the oyster clusters in advance.
3. Instruct your students to carefully take apart the oyster cluster and separate the organisms into sorting dishes.
4. When 15 minutes remain in the class period, ask students to record information about their observations on the Student Master: Data Sheet. Allow 5 minutes for students to complete this step.
5. Allow each group of students a few minutes to tell the entire class what they found. Prompt the discussion by asking student groups questions such as:
   - How many organisms did you find?
   - How many types of organisms did you find?
   - Which type of organism was most abundant in your sample?
   - Did you find any organisms that were not invertebrates? (It is possible to sometimes find fish in a sample.)
   - What was your most exciting find?
6. Have students collaborate on a large oyster reef mural for the classroom. Have some students create the background for the mural on a large sheet of white butcher paper. Have other students draw oyster reef animals to scale, cut them out, and then place them on the mural.
7. Here are alternative projects to pursue instead of (or in addition to) the mural project described above:
   - Use a metric ruler to measure the length, width, and thickness of oysters in the oyster reef sample. Find the mean, median, and mode of the oyster samples. Graph the results.
   - Identify the organisms found in the oyster reef sample using a dichotomous key or develop a dichotomous key for this purpose.
   - Take digital photos of the individual organisms found in the samples and use them to make a guide to oyster reef communities.

Materials

Per class

- One or more copies of the poster "Oyster Reef Invertebrates"
- Paper towels
- Hand sanitizer
- First aid kit
- Dissecting scope

Per group of 3 to 5 students

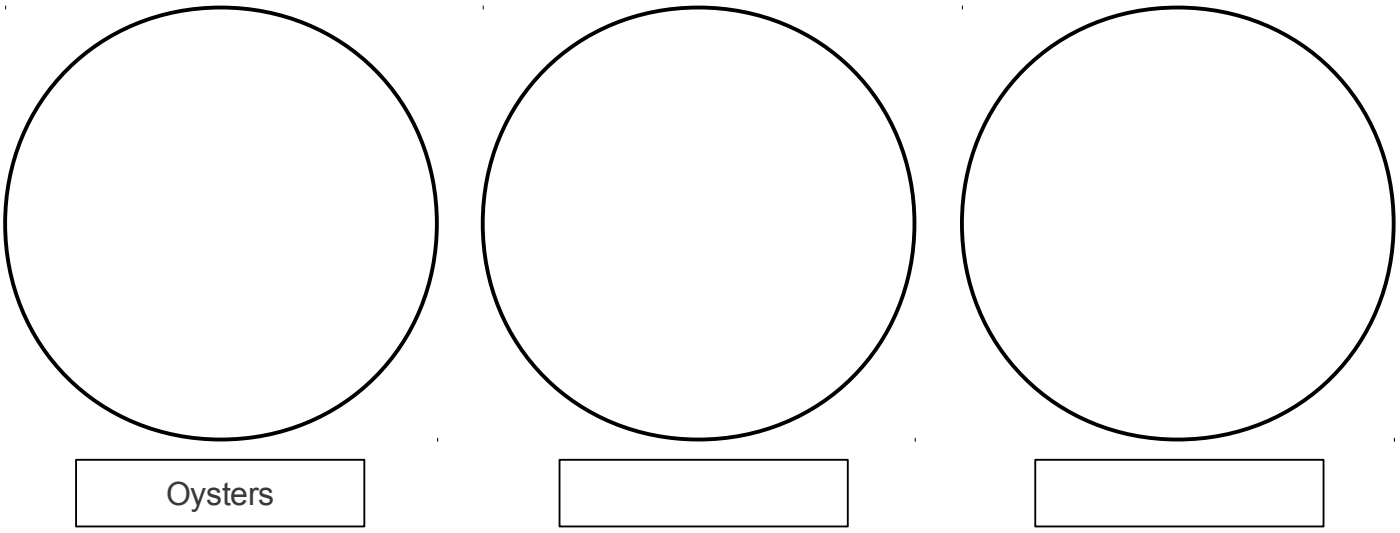
- Student Master: *Data Sheet*
- A tray in which to place the oyster reef sample. This can be a rectangular baking pan (~8x10), a dishpan, or any tray of suitable dimensions.
- Gloves (one pair cotton gloves for each student)
- Oyster knife (blunt type)
- Tweezers (2-3 pairs)
- Hand lens
- Small dishes for sorting organisms (e.g., Petri dishes, finger bowls, aluminum pie plates, etc.)
- Squirt bottle with water
- Pencil
- Oyster reef sample
- Assorted materials to make a mural of an oyster reef and the organisms that live there

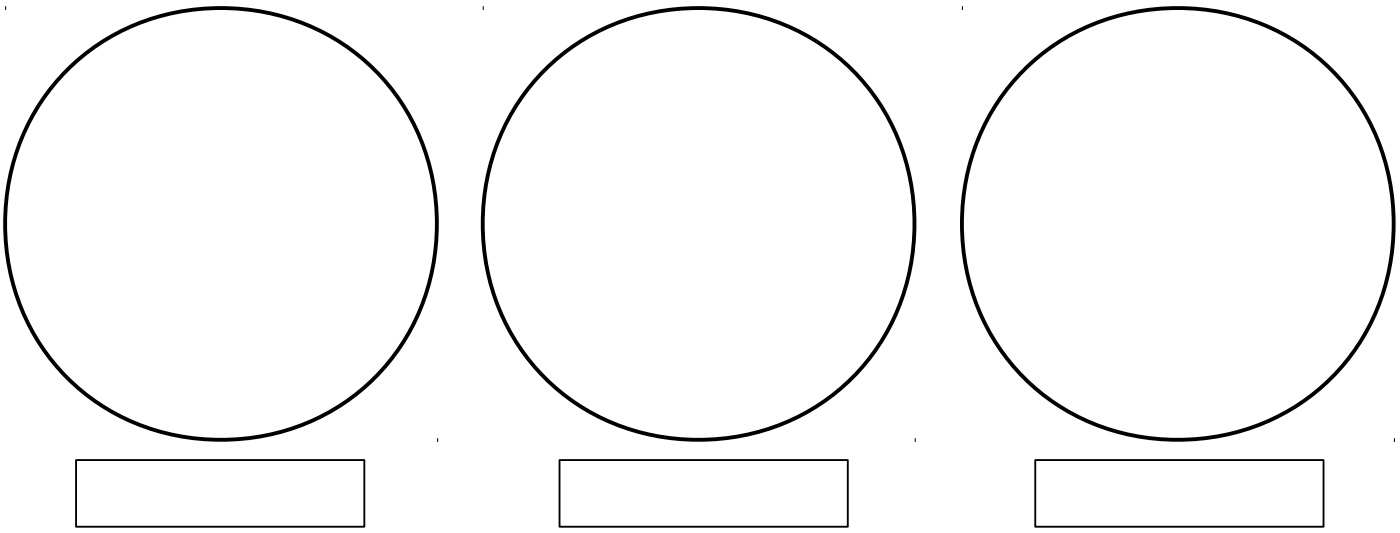
STUDENT MASTER

Data Sheet

Procedure

You will have broken apart and examined your oyster reef sample. One of your sorting trays will contain the whole oysters from your sample. Your other sorting trays should have other organisms that you found and sorted. When your teacher says that it's time, use the data sheet below to record the types of organisms you found and the number of each kind in the corresponding circles (representing your trays).





EXERCISE 2

Oyster Dissection

Estuary Concept

Estuarine animals have specialized physical, biological and behavioral adaptations which allows them to survive in an ever-changing estuarine environment.

Focus Question

What do the anatomical features of the oyster tell us about how the oyster lives in the intertidal environment?

Overview

Students examine the anatomy of the oyster and take notes on the shape, color, and texture of the oyster's shell and the oyster's interior organs.

Time Required

Two 45-minute class sessions

Performance Tasks

Students will:

Dissect an oyster and explore its anatomy.

Teacher Background

Oysters, like other bivalves, have two shells, or valves, that are hinged at one end. The shape of the shell and its thickness vary according to the oyster's habitat. For instance, oysters that live in subtidal areas tend to have regular, heavy shells. They do not form groups called clusters. Oysters that live in intertidal areas have shells that are typically thin, elongated, and irregularly shaped. Those oysters do form clusters. These oysters are attached to the substrate or to one another by their left valve. The left valve tends to be thicker and more deeply curved than the right valve. Inside an oyster's shell, the internal organs are covered by a thick fold of tissue called the mantle. The mantle's primary function is to secrete the oyster's shell. Unattached parts of the mantle enclose a space known as the mantle cavity which, in a living oyster, is always full of seawater. This water keeps the oyster's internal organs constantly wet even when the oyster is exposed to air at low tide.

Teacher Preparation

For this activity, you will need to purchase either preserved oysters from a biological supply house, such as Wards, or fresh oysters from a supermarket fish department. If you live near an estuary or marine site, perhaps you can collect the oysters yourself.

If you buy preserved oyster specimens, you should review and follow safety rules for class dissection of prepared specimens. Preservatives can be dangerous chemicals. For example, formaldehyde is a proven carcinogen. Special safety procedures are always taken when using preserved specimens in class. You will need to clean up properly afterward as all materials exposed to preservatives must be considered contaminated.

In addition, students will be handling oysters, oyster shells, and oyster knives in this activity. It is important for you to know if anyone in your class (or classes) has a shellfish allergy. For some students, this allergy can be life threatening.

Even touching the shell could pose problems. Also, be aware of latex allergies if students are using latex gloves.

Opening oysters may be hazardous for your students. You may want to open the oysters yourself ahead of time. This can help decrease the need for your students to use a scalpel or knife. You may choose to open one oyster as a demonstration so that students see how the adductor holds the oyster's two valves together.

Read background article Ode to the Oyster found in Exercise 3 that contains the biology of the oyster.

Procedure

1. Distribute copies of Student Master: *Oyster Dissection*.
2. Discuss the importance of lab safety, particularly having to do with using the scalpel or knife and with the possible exposure to chemical preservatives.
3. Students assemble in small groups and put on their gloves, goggles, and lab aprons. Each student group will be given an oyster to dissect.
4. Have students use the scalpel or knife to gently slice along the adductor (hinge) of the oyster. Again, you may prefer to do this yourself ahead of time so that students do not need to open the oysters themselves. At minimum, demonstrate the proper way of separating the valves.
5. Students have a simple diagram of oyster anatomy on their Student Master. You will find another diagram of oyster anatomy on Slide 9 of the slideshow, *Oyster Reefs: A Key to the Health of Our Estuaries*, found on the web page for this activity on estuaries.noaa.gov. You may want to have that diagram on a computer screen as an additional student reference.
6. Students examine the anatomy of the oyster and take notes on the shape, color, and texture of the shell and the oyster's interior organs. Students are asked to identify and describe the oyster body parts shown and listed on the Student Master.
7. If necessary, students should place their oyster in a plastic bag and then in a refrigerator for further dissection the following day. Properly dispose of all specimens and contaminated materials when the exercise is finished.
8. Discuss with the students why the anatomy of an oyster makes the oyster well-suited to live in an oyster reef. Oyster anatomy is typical of any bivalve. Discuss the function of the different oyster body parts and how the oyster is able to feed by filtering water over its gills.

Materials

Per class

- Paper towels
- Hand sanitizer
- First aid kit
- Dissecting scope

Per group of two or more students

- Student Master: *Oyster Dissection*
- Scalpel or knife to open the oyster
- 1 oyster for every 2 students
- Gloves (latex or nitrile)
- Safety goggles
- Lab aprons
- Wax paper or dissection trays
- Plastic garbage bags or zip lock bags
- Paper
- Pencil or pen

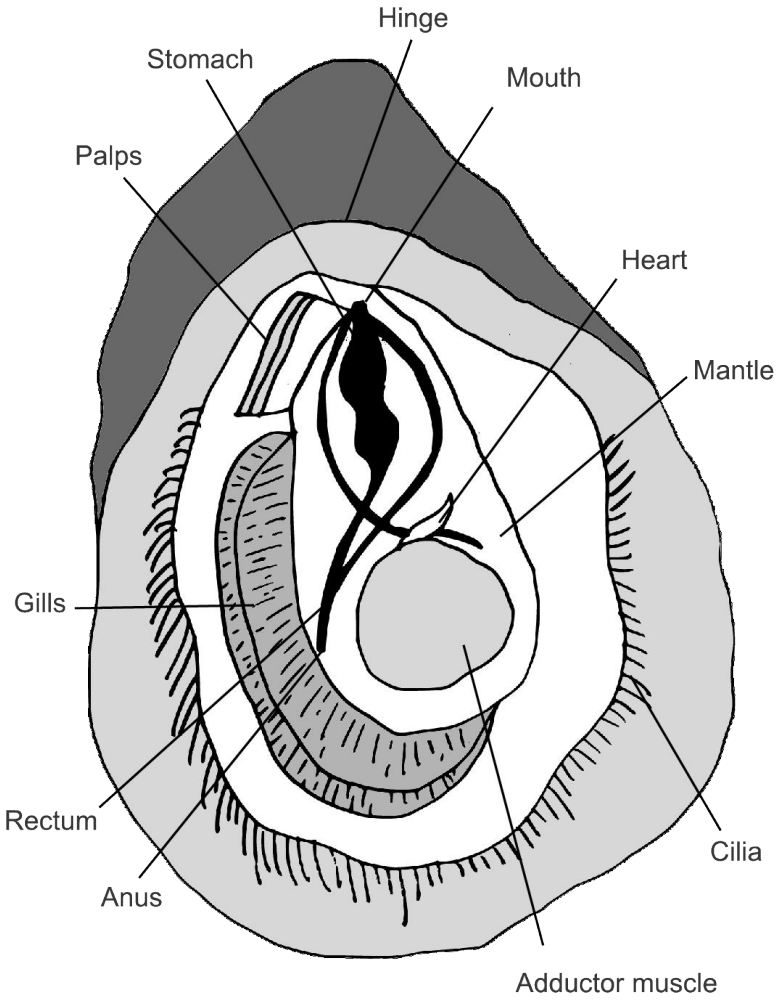
STUDENT MASTER

Oyster Dissection

Maybe it's a bit late to think about this, but just how does the oyster survive in the intertidal zone? If it's a marine animal, how does it survive out of the water when the tide goes out? And the oyster doesn't move around. It's attached to the rocks or other shells beneath it. So how does the oyster get its food? How does it reproduce?

Procedure

Locate the following parts of the oyster anatomy on the diagram and on your specimen. Write a brief description of each part to help you identify the anatomical features of an oyster. When you are done, try to determine the function of each body part.



Adductor muscle

Mantle

Palps

Mouth

Gills

Cilia

Heart

Stomach

Rectum

Anus

EXERCISE 3

Save the Oyster Reef

Estuary Concept

Estuaries have economic value.

Focus Question

How are oyster reef populations threatened, and what can be done to prevent declines in oyster populations?

Performance Tasks

Students will:

- Understand how oyster reefs develop.
- Describe the economic importance of the oyster reef.
- List factors that threaten the oyster reef organisms.
- Identify methods being used to prevent the decline in oyster populations.

Teacher Background

The American oyster, also called the eastern oyster, is the only commercially important oyster species on the East Coast of the United States. In South Carolina, the oyster is among the most popular local seafoods. Harvesting is done by handpicking clusters of oysters at low tide in authorized areas. In addition to providing commercial and recreational benefits, oysters also fulfill several important ecological functions. For instance, their filtering action serves to remove suspended sediments from the water as well as certain pollutants. Oyster reefs provide valuable shelter and habitat for many other species, such as stone crabs, and prevent erosion by stabilizing marsh edges.

In many areas along the east coast of the United States, oyster habitats have declined dramatically in recent years. Overharvesting, habitat destruction, and oyster diseases are only some of the causes. Non-point source pollutants and suspended sediment negatively affect oysters. Oyster reefs also suffer over time if oysters are taken away but no shells returned to the reef areas on which new oysters can set and grow.

Teacher Preparation

1. Computers with Internet access are required for this exercise. Students are directed to the web page for this activity on estuaries.noaa.gov to gather materials for their research.
2. Make copies of the Student Master: *Save the Oyster Reef* and the article, *Ode to the Oyster*.
3. You may choose to divide your students into pairs to complete the exercise. These scientific teams can present their Plan of Action and recommended regulations to the class.

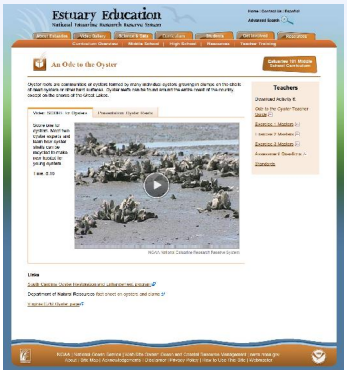
Overview

As part of a role-playing exercise, students are biologists who have been asked to propose at least two new regulations that residents can put into effect that would slow or end the decline in oyster populations in their local oyster reefs. Students will learn about several factors that threaten the oyster reefs and about different preventative measures being employed to protect the oyster population.

Time Required

Two 45-minute class sessions

You'll find multimedia and other resources on the web page for this activity in the Middle School Curriculum section of the Estuary Education website: http://estuaries.noaa.gov.



Procedure

1. Distribute the Student Master: *Save the Oyster Reef* to each student investigator or team of student investigators.
2. Have students read the Student Master. Make sure that students know the Problem to be solved, the Task to be undertaken, and the Process they need to follow.
3. Finish showing the slideshow, *Oyster Reefs: A Key to the Health of Our Estuaries*, to your class. (The first part of the slideshow was shown in Exercise 1: *Oyster Reef Community*.) The slideshow is found on the web page for this activity on estuaries.noaa.gov. Have students answer some of the questions found on the Student Master based on what they see in the slideshow. This will give them a "head start" on their research project.
4. Distribute copies of the article, *Ode to the Oyster*, as an additional reference. Students may find it useful for finding answers to questions not already covered in class or this activity.
5. Students should follow the directions on the Student Master and use all available resources to answer the remaining questions.
6. Tell your students that now it is their turn to make a Plan of Action to save the oyster reef. Have students propose at least two new regulations that the officials or public service groups can institute to slow or stop the decline in the oyster reef population. You may choose to have individual students or investigator teams present their action plans to the class.

Materials

Per student or student pair

- Student Master: *Save the Oyster Reef*
- Copies of the article, *Ode to the Oyster*

Questions and Possible Answers

Q1. In what environment do oyster reefs develop?

In protected shallow water in intertidal zones

Q2. Name three conditions that support oyster reef establishment.

The oysters need a hard surface on which to set. They also need water with high salinity, sufficient food, and only moderate amount of suspended sediment.

Q3. Why is the oyster called a filter feeder?

Oysters consume nutrients and release wastes by filtering water over their gills.

Q4. What is the main diet of the oyster?

Phytoplankton, single to multicellular algae

Q5. Name two factors that influence spawning activities of oysters.

Temperature and salinity

Q6. Why are oysters considered "broadcast" spawners?

Oysters eject sperm and eggs into the water for external fertilization. Females release eggs when sperm is present.

Q7. Describe the development of oyster larvae.

The fertilized eggs of oysters develop into larvae that are planktonic (free-

floating). The last larval stage of the oyster (pediveliger) finds a suitable site on which to settle and attach, such as another oyster shell, a rock, etc. At this point, the larvae change from free-floating to sessile (immobile) and are called "spat."

Q8. Explain how oyster reefs are formed.

Larvae may settle on existing oyster shell as a substrate, thus forming oyster reefs or beds. These areas may be selected due to proper resources necessary for the oysters' survival.

Q9. Describe the commercial and recreational importance of the American oyster.

The American or Eastern oyster is the only oyster species on the East Coast and is an important food source.

Q10. Describe the ecological importance of the oyster.

The oyster improves water quality by filtering pollutants and sediments from the water. The oyster reefs provide a habitat for a wide range of other animals. The oyster reefs also help stabilize the marsh edges and prevent erosion. Oysters also provide food for birds.

STUDENT MASTER

Save the Oyster Reef

The Problem

Something is wrong on the island of Wando Fooka. The normally successful local oyster harvesters have seen a reduction in their annual oyster harvest. Now the number of tourists who come to the island to eat the wonderful oysters has started falling off. What's even worse is that this year, for the first time ever, local residents had to order oysters from hundreds of miles away to use in their traditional oyster roasts. Can you help the good folks of Wando Fooka discover what is causing the decline in their local oyster reef population?

The Task

You are a noted marine biologist. Your assignment on Wando Fooka is to uncover what is causing the decline in the oyster population and propose a solution to the problem. To do this, it will be necessary for you to better understand oysters, how oyster reefs develop, what the economic and biological importance is of an oyster reef, and how oyster reef populations are threatened.

The Process

Read the article, *Ode to the Oyster*, to find out more about the life of the eastern oyster. Then you'll want to read about some of the things that threaten the oyster and lead to shrinking oyster reefs and decreased oyster populations. Read about the problems facing oysters along the South Carolina coast. Finally, read about the oyster reef restoration efforts of the SCORE (South Carolina Oyster Restoration and Enhancement) project.

Your Research

As you do your research, record your answers to the following questions. The information may come in handy as you develop your Plan of Action later.

Q1. In what environment do oyster reefs develop?

Q2. Name three conditions that support oyster reef establishment.

Q3. Why is the oyster called a filter feeder?

Q4. What is the main diet of the oyster?

Q5. Name two factors that influence spawning activities of oysters.

Q6. Why are oysters considered “broadcast” spawners?

Q7. Describe the development of oyster larvae.

Q8. Explain how oyster reefs are formed.

Q9. Describe the commercial and recreational importance of the American oyster.

Q10. Describe the ecological importance of the oyster.

A Plan of Action

You’ve done the research. Now it is time for you to tell the residents of Wando Fooka your recommendation to restore Wando Fooka’s oyster harvest and save the island’s economy. Write down a Plan of Action to save the local oyster reefs. Propose at least two new regulations that the island officials or public service groups can institute to slow or stop the decline in reef oyster populations.

STUDENT MASTER

Ode to the Oyster

Description

Oysters, like other bivalves, have two shells that are hinged at one end. The shape of the shell and its weight vary according to where the oyster lives. For instance, oysters that live in subtidal areas do not form clustersand tend to have regular, heavy shells. Cluster-forming, intertidal oysters have shells that are typically thin, elongated, and irregularly shaped. All oysters are attached to a base material or to one another by their left valve. This valve tends to be thicker and more deeply curved than the right one.

Inside an oyster's shell, the internal organs are covered by a thick fold of tissue called the mantle, whose primary job is to produce a hard, protective shell. Unattached parts of the mantle enclose a space known as the mantle cavity which, in a living oyster, is always full of seawater. This keeps the oyster's organs constantly bathed in water even when it is exposed to air at low tide.

Eastern oyster *(Crassostrea virginica)*

How do oysters eat?

The oyster feeds by filtering food particles from the surrounding water. Opening and closing of the valves are controlled by an adductor muscle attached to each shell. Food and other particles, suspended in the water, are drawn into the oyster by the motion of small, hair-like whips called cilia located on the gills. A large, healthy oyster may pump almost four gallons of water per hour. Food particles captured by the gills are moved by the cilia to the mouth and then to the stomach of the oyster. Matter brought into the shell, but not passed through the mouth, is trapped by sticky mucus on the gills and then discarded. This ability to separate food from other material apparently allows oysters to survive in waters of high turbidity which occurs in many estuaries. The filtering action of oysters can play an important role in removing not only suspended sediments from the water column, but can cleanse the water of various pollutants.

When do oysters reproduce?

Spawning begins in the spring when water temperature exceeds 70 degrees F. In South Carolina for example, most spawning occurs from April to October and is intensive during the summer months. The sperm and eggs are released directly into the water column where fertilization and the early stages of development occur. Tiny young oyster larvae develop in approximately 24 hours and can swim freely in the water. Oysters' have a limited ability to move around by the controlled motion of the cilia. However, tides and currents produce the greater movement. After three to four weeks these larvae settle on the bottom where they must locate a hard, clean surface for permanent attachment. If a place for attachment cannot be found, the larvae sink to the bottom and die.

Do oysters move around after they attach to the substrate?

If a suitable surface for attachment is found, the larva secretes a fluid that cements the left shell permanently to the object. Unless removed by some external force, the oyster will never move again. Almost any hard, clean surface is acceptable for attachment. However, other oyster shells appear to be the most-favored surface.

After attachment occurs, these small oysters are called spat. In southern waters there is a nearly continuous setting of spat during warm weather.

Where do oysters live and are they safe from attack?

Intertidal oysters occur in all of South Carolina's estuaries. Typically in South Carolina, sounds, bays and river mouths are connected by a system of creeks and rivers separated by extensive saltwater marshes. Oysters are found along most of these creeks and riverbanks and on exposed mud flats.

Oyster predators suffer more from exposure to the elements than do oysters. Therefore, intertidal oysters safer from predators than oysters which grow subtidally. The blue crab, as well as other crab species, oyster drills, starfish and boring sponges can all kill oysters, especially when the oysters are young.

The numbers of oysters in South Carolina has remained relatively stable in recent years, although populations are lower now than they were in 1900. Declines, in part, have been related to increased sediment resulting from alterations in stream flow, overharvesting, and physical disturbances to the shell bed. Diseases have also periodically killed oysters.

What are oyster reefs?

Intertidal oysters are also found in groups known as oyster reefs. Oyster reefs are formed by oysters growing on a firm foundation of dead shells. The intricate structure of oyster reefs provides extensive habitat for numerous marine species. Mud crabs, shrimps, juvenile fishes and other organisms have been observed to seek shelter in reefs from predators as the tide rises. Loose oyster shell on creek bottoms serves as hard clam habitat as well as substrate for sponges, sea fans, and whip corals which, in turn, supply habitat for small crustaceans and fishes.

Stone crabs typically reside near or in oyster reefs and feed on oysters. Many larger fish hunt for prey hiding among the oysters. Oyster reefs are important in stabilizing exposed marsh edges, which prevents erosion and loss of marsh grasses. The energy of natural and man-made waves is dissipated as the waves reach the complex structure of the reef.

Why are oysters important?

The American oyster, also called the eastern oyster, is the only commercially important oyster species on the East Coast of the United States. In South Carolina, it is among the most popular local seafoods. Harvesting is done by handpicking clusters of oysters at low tide in authorized areas. In addition to providing commercial and recreational benefits, oysters also fulfill several important ecological functions. For instance, their filtering action serves to remove suspended sediments from the water as well as certain pollutants. Oyster reefs provide valuable shelter and habitat for many other species, such as stone crabs, and prevent erosion by stabilizing marsh edges. Several marine species--some of commercial importance--seek habitats where the bottom is covered with loose oyster shell.

Oysters in the food web

Oysters and other bivalves are filter feeders, and as result, they play a very important role in filtering (thereby cleaning) the waters of the estuary. While filtering, the oysters take in water and ingested the small particles of algae, detritus and other foods out of the water. Who else eats oysters? The spat or larvae are very vulnerable and are eaten by a wide variety of fish and invertebrates. Larger oysters may be eaten by crabs, fish (oyster toadfish, rays, skates, drum), starfish, worms, or birds (oystercatchers). Humans also like to eat oysters.