FORMAL ASSESSMENT

The Great Oyster Mystery

Each activity in the Estuaries 101 Middle School Curriculum is designed around specific performance tasks. A generalized set of scoring rubrics is provided to judge student progress against these performance tasks. Use the performance assessment indicators in the table below along with the suggested answers in the Teacher Guide to arrive at a score for each performance task.

In addition, you can use the attached Student Assessment handout to conduct a formal assessment at the conclusion of the activity. Use the suggested answers and performance assessment indicators to rate each student's progress.

Performance Tasks	Performance Assessment Indicators		
	Low - Basic	**Medium - Proficient**	**High- Advanced**
The student can observe oyster abundance graphs from two locations and describe how young oyster abundance in those bays changed over time.	The response is partially correct. There is also evidence of inaccurate, incomplete, or inappropriate skills or knowledge.	The response is correct, and demonstrates accurate understanding of concepts. Minor inaccuracies may appear but there is no evidence of misconceptions.	Evidence of higher-level thinking and the application of the appropriate skills and prior knowledge. The response is correct and complete, and contains elaboration and extension. There is no evidence of misconceptions. Minor inaccuracies should not necessarily lower the score.
The student can access and print real salinity and rainfall data using online tools			
The student can analyze real data to explain variations in water salinity and abundance of oysters and oyster parasites/predators.			

Questions and Answers

1. **What happens to salinity in Copano Bay after period of frequent or heavy rains? Identify three examples on the graph by month and year.**

   Salinity decreases, sometimes dramatically. after periods of frequent or heavy rain. The graph shows several drops in salinity corresponding to high precipitation, including July – August 2007, October 2007, and August 2008.

2. **During what month did salinity fall below the level of oysters' lower limit of salinity tolerance? Approximately how long did salinity remain below the oysters' salinity tolerance limit?**

   Salinity fell below 5 ppt in July 2007, and remained that low for approximately a month.

3. **During this time period, would the Oyster Drill and Stone Crab be able to thrive in Copano Bay? Why or why not?**

   Oyster Drills and Stone Crabs would not thrive in this time period because their lower limit for salinity tolerances are even higher, at 15 ppt.

4. **During this time period, would you predict oysters would be relatively safe from *Perkinsus marinus*? Why or why not?**

   During the period when salinity was below 5 ppt, you would predict oysters would be relatively safe from *P. marinus.* Even though the salinity was below the oysters tolerance limit, it was also below the lowest tolerance limit for *P. marinus*.

Reflection Question

How do salinity and precipitation influence the health of estuary organisms?

Student answers may vary. Students should recognize that changes in abiotic factors such as precipitation and salinity don't just impact organisms like oysters directly. The changes can impact other organisms in the ecosystem as well.

STUDENT ASSESSMENT

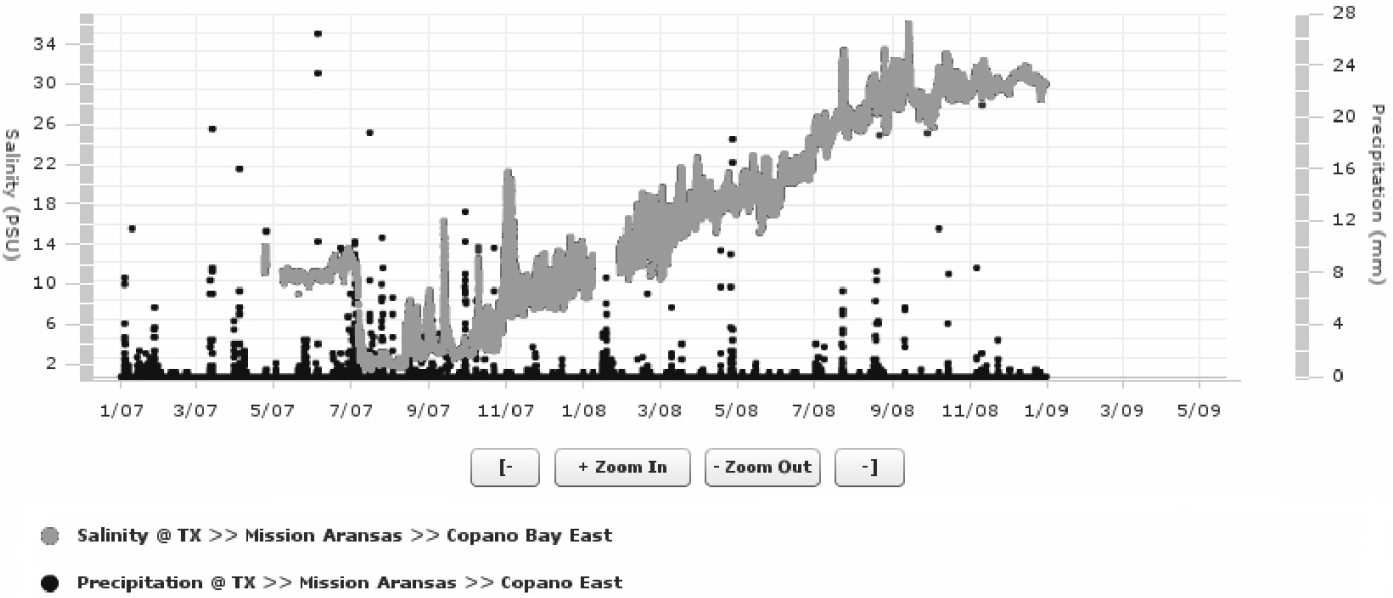
The Great Oyster Mystery

You learned that all living things have a range of environmental conditions in which they can live. Your challenge now is to identify how salinity and precipitation influenced the health of estuary organisms.

Recall the lower limits of salinity tolerances for oysters, oyster drills, stone crabs, and *Perkinsus marinus*.

Organism	Lower Limit of Salinity Tolerance
Oyster	5 ppt.
Oyster Drill	15 ppt.
Stone Crab	15 ppt.
Perkinsus marinus (cause of dermo disease)	8 ppt.

The graph shows recorded precipitation and salinity levels in Copano Bay in 2007 and 2008.



1. What happens to the salinity in Copano Bay after period of frequent or heavy rains? Identify three examples on the graph by month and year.
2. During what month did salinity fall below the level of oysters' lower limit of salinity tolerance? Approximately how long did salinity remain below the oysters' salinity tolerance limit?
3. During this time period, would the Oyster Drill and Stone Crab be able to thrive in Copano Bay? Why or why not?
4. During this time period, would you predict oysters would be relatively safe from *Perkinsus marinus*? Why or why not?

Reflection Question

How do salinity and precipitation influence the health of estuary organisms?