

Name \_\_\_\_\_ Date \_\_\_\_\_

**Modeling the interaction of salinity and diatom populations  
in the Hudson Estuary: Day 1 Worksheet**

1. What organisms live in the Hudson River? List as many as you can below.

For each organism, list whether it is a producer, a consumer, or a decomposer.

*Answers will vary. Some possible answers are listed below.*

<b>Organism</b>	<b>Role in food web</b>
<i>sturgeon</i>	<i>consumer</i>
<i>Water chestnut</i>	<i>producer</i>
<i>diatoms</i>	<i>producer</i>
<i>bacteria</i>	<i>decomposers</i>
<i>phytoplankton</i>	<i>producers</i>
<i>herring</i>	<i>consumer</i>
<i>perch</i>	<i>consumer</i>
<i>bass</i>	<i>consumer</i>
<i>Zebra mussels</i>	<i>consumer</i>

2. What are the abiotic factors in the Hudson River ecosystem? List as many as you can think of, along with one way that changing this abiotic factor could affect the ecosystem.

*Answers will vary. Some possible answers are listed below.*

<b>Abiotic Factor</b>	<b>Predicted effect</b>
<i>Salinity</i>	<i>Too much salt could cause dehydration and death of plants and animals</i>
<i>Water depth</i>	<i>Some kinds of vegetation can only grow in shallow water that allows their leaves reach the surface</i>
<i>Dissolved oxygen</i>	<i>Fish cannot survive in water with too little oxygen</i>
<i>Turbidity</i>	<i>Increased turbidity could block sunlight and decrease photosynthesis</i>

3. Graph the salinity data for your assigned station and answer the following questions.

Assigned station name: *One of the following: Pier 26, Pier 84, Center for the Urban River at Beczak, Piermont Pier, West Point, Marist College, Norrie Point*

What is the independent variable? *Time*

What is the dependent variable? *Salinity*

Does the salinity at your station change over time? *All except Marist and Norrie show significant changes over time.*

If so, is there a pattern? *All except Marist and Norrie show a cyclical pattern throughout the day.*

What do you think might cause this pattern?

*Rising tide forces saltwater up the Hudson, increasing salinity during high tides. During low tide, saltwater from the sea recedes, lowering salinity at low tides.*

4. Walk along the Hudson River map from the mouth of the river going north.

How does the average salinity change as you travel from north to south on the Hudson River?  
*Average salinity increases as you travel from north to south (nearer to the mouth) on the Hudson.*

What causes this change in salinity between stations?

*As you approach the ocean, a large body of saltwater, there is more saltwater entering into the Hudson.*

5. Between which two stations is the salt front located?

*Between West Point and Marist.*

How did you determine the location of the salt front?

*Average salinity at West Point is 1.05 psu, which according to the diagram "Graphic breakdown of water salinity, defining freshwater, brackish water, saltwater, and brine water" falls in the range of brackish (0.5-30 psu). The average salinity at Marist is 0.11, which is freshwater.*

6. Think about the ecosystems on either side of the salt front. How might these ecosystems differ?

*Answers will vary. Possible answers are that we would expect to find organisms in the lower Hudson that can tolerate changes in salt content (euryhaline) or have adaptations to rid themselves of excess salt; we would expect to find more marine species closer to the mouth of the Hudson; we might find organisms that move up and down the Hudson depending on the salinity, or that live only in a particular section of the Hudson.*