

Full Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**Salt and Ecosystems Case Studies Worksheet**

Use the ecosystem fact sheets to complete the table below

|                    | <b>List at least two organisms that live in this ecosystem.</b> | <b>How will changing salt levels affect the organisms that live in this ecosystem?</b> |
|--------------------|---|--|
| <b>FOREST</b>      |   |  |
| <b>FRESH-WATER</b> |   |  |
| <b>SWAMP</b>       |   |  |
| <b>MARSH</b>       |   |  |
| <b>ESTUARY</b>     |   |  |
| <b>OCEAN</b>       |   |  |

## THE FOREST

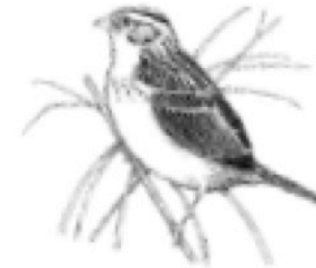


### PLANTS

The Mountain Holly and Tamarack plants cannot grow in salt levels higher than 170 mg/L.



**SALT** is not a normal part of this ecosystem.



### BIRDS

Seed eating birds may eat road salt crystals because they think they are seeds. These birds may then die.

### DID YOU KNOW?

About 8 to 12 million tons of road salt is used per year in the United States.



### ROOTS AND SEEDS

Salt levels of 100 mg/L can affect water absorption, root growth, seed sprouting. The loss of habitat harms animals that depend on the land for food, shelter, and breeding sites.



### MAMMALS

Moose, elk, & deer that drink salty water lose their fear of vehicles and humans and are commonly killed by traffic.

## FRESHWATER



### FISH

like rainbow trout will die if they swim in water of 1,000 mg/L of salt.



**FRESHWATER** means that the water is **NOT SALTY.**



### FROGS

can die in salt levels of 400 mg/L.

### DID YOU KNOW?

Most of the world's water is off limits for drinking! Only 3% of Earth's water is considered fresh, i.e. not salty. Most of it is locked up in ice as glaciers. Only 0.3% of Earth's water is found in rivers or lakes and 0.9% is found underground.



### PEOPLE

can only drink freshwater. The Environmental Protection Agency (EPA) does not allow people to drink water with salt levels greater than 250 mg/L. Also, water begins to taste bad at this level.

**BRACKISH WATER** has 1,000 mg/L or more of salt and is considered to be too salty to drink.

**BRINE WATER** has 10,000 mg/L or more of salt and is considered to be very salty.



### SMALL FRESHWATER PLANTS AND ANIMALS

that are the basis of the food web will begin to die at salt levels of 226 mg/L.

# WETLANDS

## WHAT IS THE DIFFERENCE BETWEEN A SWAMP AND A MARSH?

A **SWAMP** is a wetland with woody plants like **trees** and often grows in freshwater.



**MARSHES** are **SALTY**.

**SWAMPS** are **NOT SALTY**.

A **MARSH** is a wetland with **grasses**, but no trees. It often grows in brackish (1000 mg/L) or even saltier water.



### NEW JERSEY MEADOWLANDS: FROM SWAMP TO MARSH

#### 200 years ago — Cedar Tamarack Swamp

The New Jersey Meadowlands used to be filled with tall cedars and tamarack trees that grew in the wet swampy habitat. People cut them down, and they were also killed by **SALT!**



#### 1922 to Today—Reedy Marsh

In 1922, the Hackensack River was dammed, cutting off the flow of freshwater to the Meadowlands. The water became saltier, killing trees and leading to the growth of the salt tolerant reedy grasses that you can see today.

## ESTUARY

### WHAT IS AN ESTUARY?

An estuary is a semi-enclosed area where fresh water meets and mixes with salty ocean water. It is often called “the cradle of the ocean” because it is filled with life.

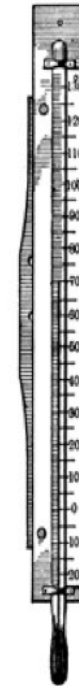


### ATLANTIC STURGEON

can be 15 ft long and weigh over 800 lbs. They are part of an ancient 200 million year old fish lineage – older than dinosaurs!



**SALT** in estuaries can range with the tide from 3,000 to 30,000 mg/L of salt.



### TEMPERATURES

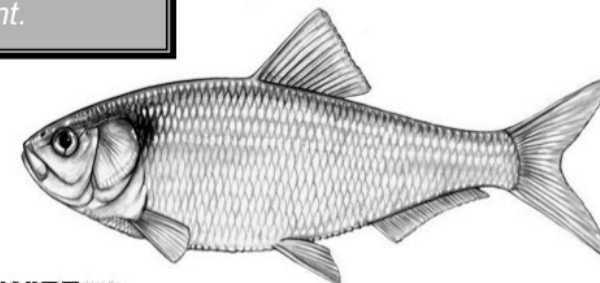
in shallow estuaries can range from freezing to more than 100 °F in the course of a year.

### DID YOU KNOW?

*Organisms that live in estuaries are unique because they are able to live in huge ranges of salt, temperature, tides and sunlight.*

### RIVER OTTERS

can sometimes be seen swimming at the mouth of the Hudson River.



### ALEWIFE

is a species of herring less than 1 foot long. Its name comes from its round body that people thought looked like an overweight wife of a bar owner (ale wife)

## OCEAN

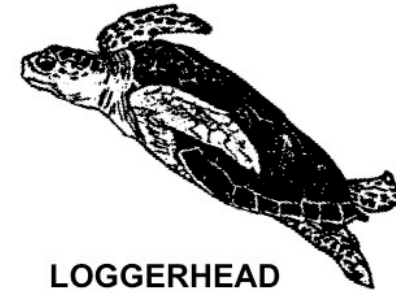


### **GREAT WHITE SHARK**

is found in all oceans, including off the coast of Long Island and NJ. It can be 20 ft long and weigh almost 5,000 lbs. Like other sharks, Great Whites have rows and rows of teeth, one behind the next that move forward to replace broken and worn teeth.



**SALT** levels are as high as 32,000 mg/L in the open ocean.



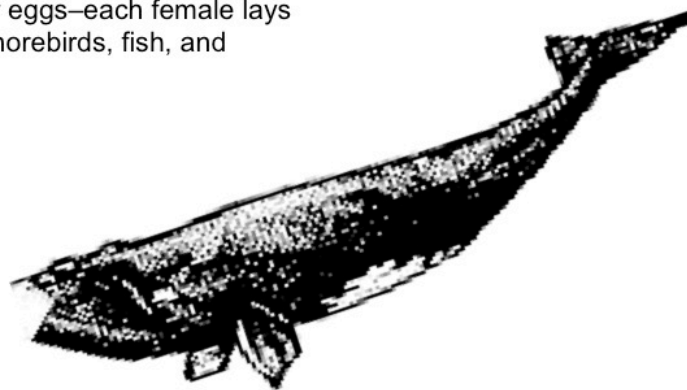
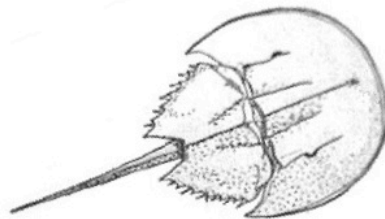
### **LOGGERHEAD SEA TURTLES**

along with Green Turtles, Hawksbill Turtles, Leatherback Turtles, and Atlantic Ridley Turtles still sometimes swim in the Atlantic off the New York / New Jersey coast.

***DID YOU KNOW?***  
*97% of the Earth's water is salty and found in the oceans.*

### **HORSESHOE CRABS**

climb onshore in the spring to lay their eggs—each female lays 80,000! These eggs feed migrating shorebirds, fish, and Atlantic loggerhead turtles.



### **NORTH ATLANTIC RIGHT WHALES**

along with fin, humpback, minke, sperm, blue and sei whales, dolphins, pilot whales and porpoises can all be spotted off the coast of Long Island. Right whales were given the name because they were the “right” whales to kill for their oil. Today less than 300 of the 50 foot, 70 ton animals remain.

**A SALT CONCENTRATION GUIDE in mg/L:**

|        |  |
|--------|--|
| 67.5   | Harms forest pine trees  |
| 100    | Maximum allowed in NYC drinking water  |
| 226    | Kills tiny freshwater plants and animals   |
| 250    | Tastes salty. Maximum allowed in drinking water by the Environmental Protection Agency |
| 400    | Will kill some freshwater frogs  |
| 1,000  | Will kill some freshwater fish like trout.<br>Considered to be brackish or salty water |
| 3,000  | Lowest salt level found in the New York/New Jersey estuary                             |
| 30,000 | Highest level in the New York/New Jersey estuary                                       |
| 32,000 | Average in ocean off of Long Island and New Jersey                                     |