

Freshwater Marsh / Wetlands Program

Grades 7-12

Outline

Biome

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Types of Biomes

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Wetlands

|

Marsh

|

Freshwater Marsh

INFO:

What is a Biome?

A biome is defined as a vast geographical area of distinctive plant and animal species that are indigenous to that particular environment. Every plant and animal adapts to the specific climate and geography of the region. Each biome consists of many eco-systems in which their communities have adjusted to small differences to climate and environment inside the biome. All continents contain two or more biomes.

Types of Biomes:

Major biomes include Tundra, Deserts, Forests, Grasslands, and water biomes. Aquatic biomes are broken down into three categories; saltwater, freshwater, and mixed or brackish water.

Freshwater Biomes:

Fresh water biomes are designated into three groups; lakes and ponds, streams and rivers, and wetlands. Even ditches and puddles are considered aquatic biomes because they sustain life forms, even if it is only for short periods of time.

Stats:

- A fresh water biome contains water that has less than 1% salt.
- Freshwater biomes cover roughly 20% spread over Earth's surface.
- Only 3% of the water on Earth comes from freshwater biomes.
- 99% of all freshwater is either in the form of ice or located in an aquifer.
- Freshwater biomes supply 50+% of water to humans.
- Freshwater biomes contain plenty of grass and plants, but trees are scarce.
- No two freshwater biomes are ever exactly the same.
- The largest freshwater biome is the Florida Everglades.
- The longest river in the world, the Nile, is part of a freshwater biome.

What are Wetlands?

Wetlands are defined as any body of water that stands still and lies low. Water level varies throughout the year, and they always serve as a barrier between land and water.

Stats:

- Wetlands are normally located near a river, lake or stream.
- The water is either fresh, salt or a combination known as brackish.
- Wetlands appear on every continent except Antarctica.
- Wetlands are commonly situated inside another biome and can be overlooked.
- Typically remain humid and moist at all times.
- There is more animal diversity in the wetland biome than any other biome type.

Types of wetlands:

Swamps and Bogs: Wetlands that contain trees like a forest

Marshes: Non-tidal biomes that have little or none of the plant species known as PEAT (like peat-moss). Also characterized by the lack or absence of trees.

Benefits:

1. Wetlands serve as a filter that purifies or cleans surface water. They improve water quality by trapping sediment, neutralize chemicals, and absorb excess nutrients.
2. Wetlands also serve as a reservoir for excessive rainfall and prevent flooding. They act as natural sponges by capturing, storing, and slowly releasing water over a period of time. 1 acre of wetlands can store approximately 1.5 million gallons of water.
3. Extremely high productivity for food derived from plants. Wetlands cover 6% of the Earth's surface, but account for 24% of global food output for humans, out-producing all other ecosystems.

4. Along with high plant productivity, wetlands also provide very important habitats for many animal species. Wetlands make excellent nurseries for species of fish, amphibians, and reptiles.
5. All over the world, people spend time in wetlands for recreational activities. Wetlands are excellent area for hiking, fishing, canoeing, bird watching, painting & photography.

Threats:

The lower 48 states in the U.S. have lost over half of their wetland areas and the loss continues to increase at a rate of over 60,000 acres per year!

Often, people mistake wetlands as harmful or non-essential and destroy them.

Wetlands are being eliminated by draining or dredging, thus, eliminating them, converting them into dry land for crops or pastures, even subdivisions for housing. Once dried, wetlands are also mined for underlying resources.

Wetlands can also be dammed and channeled. Filling them for lakes and water retention areas, and using them for dumping grounds for waste and sewage.

Which brings us to what we are here to study hands on today!!

Marshes / Freshwater Marshes:

Marshes: Non-tidal biomes that have little or none of the plant species known as PEAT (like peat-moss). Also characterized by the lack or absence of trees. A freshwater marsh contains water that has less than 1% salt with low drainage. They support an independent pH-neutral ecosystem which encourages biodiversity.

Types of Freshwater Marshes

- a) **Mineralized:** derive their water from groundwater, streams or surface runoff. They form in areas where mineral rich soil drains very slowly.
- b) **Low Mineral Marsh:** Water is derived from consistent, direct precipitation.
- c) **Seasonal Marsh:** Water levels are present in the fall and winter, but are totally dry during the summer months.

Common Plants Present:

Low growing plants like grasses and sedges. Bulrushes and cattails are usually found around the edge. Water lilies and arrowheads cultivate in the water.

Common Animals Present:

Insects are the most abundant inhabitants of the marsh. Pest insects, such as mosquitoes and flies, provide an essential food source to the larger inhabitants.

Mammals such as raccoons, opossums, and beavers are the largest residents.

Reptiles and amphibians such as turtles, snakes, and frogs are also present.

Birds utilize the marsh as well. Some are permanent residents, while others migrate from marsh to marsh depending on climate.

Marshes provide tremendous biodiversity, therefore, create a tremendous amount of predator/prey relationships.

Every freshwater marsh is unique because they all contain a range of plant & animal species, different climates, and varying amounts of water.

Create:

Food chain diagram

Vocabulary list

Task list (as per grade level)

Mercy's Marsh

Long Island's Geology:

Beneath the surface of L.I. lie trillions of gallons of water which fill the pore spaces between the sand and gravel that make our island. The upper surface is known as the Water Table. Our marsh sits on the low lying surface of the land where the water table becomes exposed forming a wetland.

60 million years ago, L.I. was a delta, or outlet area, where draining North American rivers and streams deposited sediment. 21,000 years ago continental glaciers began melting and depositing sediment at different levels forming hilly terrain and outwash plains (North shore/South shore). Ice blocks were buried and then melted forming pockets of water known to us as an aquifer.

Mercy's Marsh is unique as all marshes are. All of the plants and animals have adapted to this area because of the vegetation present, to the chemistry of the water, and the nature of the bottom sediment.

Our marsh is considered a **Palustrine** wetland because the sediment is highly organic and consists of varying amount of clay, silt, and sand.

Marshes can also be broken down further into 2 groups called **Fens**: **Rich fens** have an abundant of nutrients in the water. **Poor fens** have very little nutrient content.

How does our marsh look?

During a drought period: Extremely low water levels expose the edge of the marsh allowing rare species of plants to flourish. Trees and woody plants will also thrive, shading and crowding out the rare specimens.

During a normal period: The shore of the marsh becomes submerged again drowning out the woody plants and rare species. However, the rare plants are inactive until the next drought period.

L.I.'s Pine Barren region contains the highest concentration of rare, threatened, and endangered species of plants and animals in New York State. All of L.I.'s wetlands are protected by the NYS Freshwater Wetlands Act to ensure their continued existence.

DATA SHEET

Date: _____

Weather conditions: _____

Marsh Status: _____

Group #: _____

Marsh Section: _____

Water Quality

Temperature: _____

Visibility: _____

Scale 1 - 5: 1 = No visibility 5 = Clear view to bottom

Plankton Present? _____

Depth: _____

Bottom Sample(Y/N) _____

Results:

Test Results (levels):

Turbidity: None Low Med High

pH: _____ Acidic Neutral Basic

Dissolved O₂: _____ mg/L

Soil Quality:

Temperature: _____

Visible layers: _____

pH: _____

Seine Results:

Plants: _____

Animals: _____

Questions & Answers

1. What type of Marsh is the Mercy Marsh?
 - A) Mineralized
 - B) Low Mineral
 - C) Seasonal

2. Rich Fen or Poor Fen? (Circle the answer)

Based on observations and recorded data, Please create a food chain diagram for the Mercy Marsh: