Estuary Explorers

NJCCCS: 3.3,5.1,5.4,5.5,5.6,5.8,5.10

Field Trip Overview

What will your students do on their visit to the environment center?

On your field trip, you and your students will explore a salt marsh estuary. Weather dependent, we will take a field walk in which students will participate in conducting water chemistry tests for pH and salinity. In addition, students will use dip nets to collect the aquatic animals (fauna) that inhabit the Kingsland impoundment of DeKorte Park. After collection is complete, students will use their observation skills to identify the organisms collected. Students will record data in a salt marsh journal that will be brought back to school with them.

Background Information

What is an Estuary?

Estuaries are unique environments that serve as a nursery grounds for fish, improve our water quality and help protect shorelines.

An estuary is a partially enclosed body of water where saltwater from the sea mixes with freshwater from rivers, streams and creeks. These areas of transition between the land and the sea are tidally driven, like the sea, but sheltered from the full force of ocean wind and waves, more like a river. Estuaries are generally enclosed in part by the coastline, marshes and wetlands; the seaward border may be barrier islands, reefs and sand or mud flats.

Every estuary is unique; each individual ecosystem has different components that complete the estuarine habitat. Marshes and barrier islands may enclose one estuary, while another estuary's borders are the coastline and reefs. Bodies of water that may be estuaries are: sloughs, bays, harbors, sounds, inlets and bayous. Some familiar examples of estuaries are: Chesapeake Bay, San Francisco Bay, Boston Harbor, Tampa Bay and Puget Sound. There are also wetlands in the Great Lakes with estuarine-like functions. These ecosystems have a strong tidal force and are protected from the open water of the Great Lakes by a natural barrier, such as a mud flat.

What types of animals live in an estuary?

A plethora of organisms can be found in estuaries, organisms specially adapted to the "brackish" estuarine waters. Estuaries are homes to all kind of terrestrial or land-based plants and animals, such as herons, egrets, coniferous and deciduous trees

and butterflies. Estuaries are also homes to unique aquatic plants and animals, such as marsh grass, aquatic turtles and several varieties of fishes.

Why are estuaries important?

Estuaries are important for many reasons. Estuaries are among the most biologically productive ecosystems on the planet. More than two thirds of the fish and shellfish we eat spend some part of their lives in estuaries. These ecosystems also provide many other important ecological functions; they act as filters for terrestrial pollutants and provide protection from flooding. Estuaries also have economic importance. These dynamic bodies of water provide us with an important source of food, but are also a popular tourist destination. Millions of people visit the nation's estuaries each year to boat, swim, bird watch, and fish.

Estuaries are peaceful places with tremendous aesthetic beauty. Enjoy them responsibly. We all deserve to visit a clean, healthy estuary.

Why do we need to protect estuaries?

The fragile balance of these productive estuarine environments may be easily destroyed by human activities. Changes in water quality or altercations, by dredging and construction, to the multiple components of estuaries can result in harmful changes in the ecosystem.

What is water chemistry?

The chemistry of water deals with the fundamental chemical property and information about water. Water is an unusual compound with unique physical properties. As a result, it's the compound of life. Yet, it's the most abundant compound in the biosphere of Earth. Students will explore two properties of water while in the field: pH and salinity.

Vocabulary

Adaptation: Adjustment to environmental conditions; something a plant or animal has that helps it to survive

Brackish: A mixture of salt and fresh water.

Consumers: Organisms that get their energy from other living things.

Decomposers: Organisms that break down once-living things, releasing the energy stored in them.

Detritus: Decaying plant and animal matter that serves as a nutrient-rich food source.

Estuary: The wide opening where the river meets and mixes with the sea.

Fauna: Animals.

Flora: Plants.

Food Chain: The passage of energy (in the form of food) from producers through several levels of consumers and decomposers.

Food Web: Complex network of many interconnected food chains and feeding relationships.

Habitat: The environment in which an organism lives that provides four necessities for survival: food, water, shelter, and space.

Plankton: Free floating plants and animals that range in size from microscopic to large jellyfish. Many microscopic plant-like plankton serve as an important food source for marsh animals.

pH: A measurement of substances that are acidic or basic (alkaline). pH is measured on a scale of 0-14. 0 is extremely acidic, 7 is neutral, and 14 is extremely basic.

Salinity: The concentration of dissolved salts in the water. It is measured as the number of units (parts) of salt per thousand units of water. Average ocean salinity is 35ppt and the average river water salinity is 0.5ppt or less. This means that in every kilogram (1000 grams) of seawater, 35 grams are salt. Because the water in estuaries is a mix of fresh water and ocean water, the salinity in most estuaries is less than the open ocean.

Salt Marsh Estuary: Type of wetland semi-enclosed by land but having partial access to open ocean or river.

Temperature: The degree of hotness or coldness of a body or environment.

Water: Binary compound that occurs at room temperature as a clear colorless odorless tasteless liquid; freezes into ice below 0 degrees centigrade and boils above 100 degrees centigrade; widely used as a solvent.

Water Chemistry: The fundamental chemical property and information about water.

Water Quality: A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose.

Wetland: A landform characterized by the presence of water, hydric soils, and hydrophytic plants.

Marsh Market

Organisms:		
phytoplankton duckweed salt marsh grass cattail coniferous tree deciduous tree	Deer cottontail rabbit Canadian geese butterflies grasshopper mice	Pond turtles mallards opossum raccoon herring
Bacteria Fungi	Heron black sea bass Ibis Egret Cottonmouth snake Fox	Hawk Coyote Turkey vultures blue crab shrimp house fly

Include on card:
1. Name of organism
2. Picture of Organism
3. What it eats
4. Predators
5. Identify it as : Producer, Consumer, or Decomposer (detritivore)
6. If it is a consumer- identify it as: herbivore, omnivore, carnivore, or scavenger