Lesson One: Wetlands in the Great Lakes Region

What are Wetlands and How are Freshwater Coastal Wetlands Unique?

Lesson Overview:

This lesson focuses on describing features of wetlands; identifying different types of wetlands, and, specifically, how coastal wetlands are unique. Students will review basic terms and information associated with wetlands to complete a chart that focuses on five types of wetlands.

Focus Questions:

Students answer these essential questions:

- What are wetlands and where are they found in Michigan?
- What are the different types of wetlands?
- Why are wetlands important and what is unique about Great Lakes coastal wetlands?

Next Generation Science Standards:

Obtaining, Evaluating, and Communicating Information: Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (2-ESS2-3)

ESS2.E: Biogeology: Living things affect the physical characteristics of their regions. (4-ESS2-1)

ESS3.A: Natural Resources: Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)

ESS2.C: The Roles of Water in Earth's Surface Processes: Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)

ESS2.C: The Roles of Water in Earth's Surface Processes:
Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4) Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4)

ESS2.A: Earth Materials and Systems: Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. (4-ESS2-1)

Materials:

- Tip of the Mitt Watershed Council, *Climate Change Adaptations for Coastal Wetlands: A Toolkit of Best Management Practices for Coastal Wetlands in Michigan*
- Wetland Background – Student Information Sheet
- Wetlands Habitat Chart – Double sided copy
- Internet access – Additional research

Time: 1-2 class periods

Objectives:

Students will be able to:

1. Define basic terms and processes associated with wetlands.
2. Identify different types of wetlands (marsh, bog, fen, swamp and swale.)
3. Describe the importance of wetlands in the environment.

Advance Preparation:

1. Make copies of Wetland Background – Student Information Sheet and Wetlands Habitat Chart. One set for each pair of students.
2. Have *Climate Change Adaptations for Coastal Wetlands: A Toolkit of Best Management Practices for Coastal Wetlands in Michigan* available digitally or printed copies for pairs of students. This document is critical for the mini-unit and it is recommended that copies be produced for use with all lessons.
3. Selected pairs/groups for completing chart.
4. Listed websites for students for extended research.

Common Misconceptions:

Students will learn the basics of what makes a wetland unique, but a common misconception occurs when students research *coastal wetlands* in general because there is a difference between ocean coastal wetlands and Great Lakes (i.e. freshwater) coastal wetland habitats. Make sure to make that distinction clear! Comparing ocean versus freshwater coastal wetlands may be an alternative method of introducing this unit.

Background Information:

The websites listed below are general background about wetlands. Coastal wetlands are a smaller subset that will be the focus of this mini-unit. All wetlands function similarly, but coastal wetlands have specific factors, lake levels and wave action for example, that create unique habitats for students to understand.

Websites for Background Information:

U.S. Environmental Protection Agency (EPA): Wetlands Education –General information, great activities and lessons
https://www.epa.gov/wetlands/wetlands-education

Michigan Department of Environmental Quality (MDEQ) Great Lakes Coastal Wetlands - Good background information for teachers on Great Lakes coastal wetlands specifically
http://www.michigan.gov/deq/0,4561,7-135-3313_3687-11177--,00.html

Fabulous Wetlands with Bill Nye The Science Guy – Wetlands video (6:50 min) – Good basic introduction
https://www.youtube.com/watch?v=BeUPbGWg2KU

MDEQ Wetlands Map Viewer – Move around the state to locate different wetlands!
http://www.mcgi.state.mi.us/wetlands/mcgiMap.html

Procedure:

1. Ask students what a wetland is and if they have ever visited a wetland. Students brainstorm features of wetland together or in pairs and then share with class via white board or poster.
2. Identify specific wetlands that will be the focus of the lesson/unit (Examples: Swamp, Bog, Fen, Marsh, Interdunal Swale)
3. Working in pairs, have students use wetlands informational document provided and websites to complete chart.
4. Project chart on white board or create large chart for class to fill in.
5. Invite teams to share information with class - Make sure that all pairs have accurate information!
6. Teams create a visual representation of one type of wetland on chart (poster, picture book, video, etc.). Share with class.
7. Discuss the following questions as a class:
    - What characteristics are shared by these habitats?
    - What species are found in more than one of these ecosystems?
    - What problems might humans cause for plants and animals within these ecosystems? (Global climate change and its effects, erosion, invasive species, habitat destruction, pollution)
    - What problems might nature cause for plants and animals within these ecosystems? (Global climate change and its effects, erosion, weathering)
    - Why is it important to conserve or protect these ecosystems?

Extensions:

1. Students share wetlands projects with another class or the community.
2. As a class, take a field trip to local wetland area and take pictures of wetland features.
3. Make models of wetlands in general, or specifically a Great Lakes coastal wetland. Lesson plans are listed below.

Additional Resources:

Teaching Great Lakes Science: Lessons and Data Sheets
http://www.miseagrant.umich.edu/lessons/

Teaching Great Lakes Science: Wetlands Lesson
http://www.miseagrant.umich.edu/lessons/lessons/by-broad-concept/earth-science/wetlands/

Teaching Great Lakes Science: Activity: Wetland in a Pan
http://www.miseagrant.umich.edu/lessons/lessons/by-broad-concept/earth-science/wetlands/activity-wetland-in-a-pan/

Adapted From:
Alliance for the Great Lakes: Great Lakes in My World Lesson 6
https://greatlakes.org/get-involved/great-lakes-in-your-classroom/k-12-curriculum/