Lesson Four: Best Management Practices

What can Humans do to Help Coastal Wetlands "Adapt" to Changes?

Lesson Overview:

This lesson focuses on the practices to best manage and reduce the impacts caused by climate change. Students will use the climate impact scenarios that they developed in the previous lesson to brainstorm a way to reduce or avoid the negative climate impact.

Focus Questions:

Students will answer these essential questions:

- How can the impacts of climate change be reduced?
- What steps can the state take to protect the Great Lakes and coastal wetlands against climate change?

Next Generation Science Standards:

ESS3.D: Global Climate Change: Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)

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

ESS3.C: Human Impacts on Earth Systems: Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

Materials:

- Tip of the Mitt Watershed Council Publication, *Climate Change Adaptation for Coastal Wetlands: A Toolkit of Best Management Practices for Coastal Wetlands in Michigan*
- Wetlands Habitat Chart – Double sided copy (Lesson 1)
- Climate Impact Chart (Lesson 3)

Time: 1 class period

Objectives:

Students will be able to:

1. Define and identify best management practices for protecting and preserving coastal wetlands.
2. Communicate the importance of protecting coastal wetlands.

Advance Preparation:

1. Have *Climate Change Adaptation 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.
2. Selected pairs/groups for matching activity and completing chart.

Background Information:

There are many ways that we can protect our Great Lakes wetlands from the negative effects of climate change. The Tip of the Mitt Watershed Council publication *Climate Change Adaptation for Coastal Wetlands: A Toolkit of Best Management Practices for Coastal Wetlands in Michigan* names some of these best management practices.

A **Best Management Practice (BMP)** is a practice or combination of practices that is determined to be an effective and practical means of preventing pollution or protecting the environment. BMPs in our case refer to protecting and preserving coastal wetlands.

Coastal wetland BMPs can be split into three main categories: Preservation and Protection, Stormwater Management and Green Infrastructure, and Wetland Management, Creation, and Restoration.

Preservation and Protection BMPs include ordinances, easements, laws, and regulations. These types of protective measures are typically implemented by local and state governments and agencies.

Stormwater Management and Green Infrastructure BMPs include installation of structures that will lessen the impact that developments like residences, businesses, and roadways have on the local watershed. The structures include rain barrels, rain gardens, native landscaping, natural shorelines, riparian buffers, and permeable paving. These BMPs can be implemented by anyone, anywhere!

Wetland Management, Creation, and Restoration BMPs include practices such as removal or treatment of invasive species, restoration of wetlands, creation of stormwater wetlands, or landscape level assessments.

For more information on the wetland BMPs, refer to pages 8-30 of the *Climate Change Adaptation for Coastal Wetlands: A Toolkit of Best Management Practices for Coastal Wetlands in Michigan* publication.

Procedure:

1. Ask students to think about the negative impacts that climate change will have on Great Lakes coastal wetlands. Refer to the scenarios that the students developed in the previous lesson.
2. Explain to students that they will be brainstorming "adaptations" or ways to reduce or avoid impacts caused by climate change.
3. Explain to the students that these adaptations are called best management practices (BMPs) and there are recommended BMPs for coastal wetlands in the *Climate Change Adaptation for Coastal Wetlands: A Toolkit of Best Management Practices for Coastal Wetlands in Michigan* publication.
4. Have students work in groups to develop adaptations. Students may refer to BMPs in the *Climate Change Adaptations for Coastal Wetlands* publication.
5. Students can write their suggestions in the space in the BMP section on the Climate Impact Chart. (Lesson 3)
6. Have groups present their BMP to the rest of the class.
7. Engage students in class discussion on local issues and what could be done to fix them.

Additional Resources:

Sea Grant Michigan: Climate Adaptation
http://www.miseagrant.umich.edu/explore/climate-weather-and-the-great-lakes/climate-adaptation/

North American Lake Management Society: Climate Impacts on Lakes
https://www.nalms.org/home/our-mission/nalms-position-papers/climate-change-impacts-on-lakes/