

## **Bringing Wetlands to Market Part 3 Introduction**

### **Economics of Carbon Trading**



#### **Estuary Principles**

**Principle 5** Humans, even those living far from the coast, rely on goods and services supplied by estuaries.

**Principle 6** Human activities can impact estuaries by degrading water quality or altering habitats; therefore, we are responsible for making decisions to protect and maintain the health of estuaries.

#### **Research Question**

How can the economic value of ecological services, including carbon sequestration, and human uses of wetlands be assessed or measured?

#### **Introduction**

What is nature worth? What is the value of clean water, fish populations, and a slower rate of climate change? These questions are difficult but important to answer. The “Bringing Wetlands to Market” project includes the development of a set of tools for coastal managers to use to determine the economic value of wetlands in their communities, including their value in taking up and storing carbon, to inform decisions on protecting and restoring coastal wetlands.

An important part of the “Bringing Wetlands to Market” project is educating community members and stakeholders about the economic value of wetlands for carbon sequestration as well as the economic value their ecological services provide to people. In this section, students will consider how economic value can represent a strong rationale for preserving and restoring coastal wetlands. They will also learn how difficult it is to establish the economic value of wetland services in the ecosystem and for people.

A 5-minute “Tools” video developed at the beginning of the project describing the background and the economic component of “Bringing Wetlands to Market” project is available at the bottom of the page <http://waquoitbayreserve.org/research-monitoring/salt-marsh-carbon-project/>

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## **Teacher guide**

### **Trading on the Stalk Market**

#### **Research Question**

How can the economic value of ecological goods and services be determined?

#### **Content objectives**

Students will be able to describe how ecological services of wetlands have economic value to communities.

Students will be able to explain how the carbon trading market works.

Students will be able to use measurements and general guidelines to estimate the amount of carbon in a plant and in a defined wetland area.

#### **Exercises**

Through activities, readings, and discussion, students will learn about the economic value of coastal wetlands as carbon sinks. They will learn why it's important to determine the economic value of a natural system, and why it's so difficult to determine. They will learn about carbon trading and play a game simulating a carbon market.

**Exercise 1** Students will attempt to estimate the economic value of their adopted wetland or another selected wetland.

**Exercise 2** Students will learn about carbon markets and play a carbon trading game

#### **Assessment questions**

Questions are included in the exercises

**Grade level:** 9 - 12 Biology, Earth Science, or Social Studies

#### **Next Generation Science Frameworks**

LS2: Ecosystems: Interactions, Energy, and Dynamics

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

LS4: Biological Evolution: Unity and Diversity

LS4.D: Biodiversity and Humans

ESS2: Earth's Systems

ESS2.A: Earth Materials and Systems

ESS2.C: The Roles of Water in Earth's Surface Processes

ESS3: Earth and Human Activity

ESS3.A: Natural Resources

ESS3.B: Natural Hazards

ESS3.C: Human Impacts on Earth Systems

ESS3.D: Global Climate Change



ETS2: Links Among Engineering, Technology, Science, and Society

ETS2.A: Interdependence of Science, Engineering, and Technology

## **Glossary**

**Banking** The possibility of carrying over emissions allowances from one compliance period to the following period is known as banking.

**Cap** The upper emissions limit or emissions goal for emissions trading at the national level and targets for all macro-sectors (energy production; industry; trade, commerce and services; transport and households).

**Cap and Trade:** A system in which an upper limit is put on the amount of pollution that may be emitted by members of the system. Each member is allotted a certain number of credits, and members may buy credits from one another in order to comply with the limit.

**Carbon Credit:** A permit to release a certain amount of carbon dioxide into the atmosphere.

**Carbon Trading:** A cap and trade system dealing specifically with carbon dioxide.

**Certified Emission Reductions (CER)** CERs are emissions certificates issued by bodies of the UN Framework Convention on Climate Change and the Kyoto Protocol for the successful completion of Clean Development Mechanism (CDM) climate protection projects.

**Compliance** System for checking adherence to reduction obligations, including measures and sanctions to be implemented if a country does not fulfill its obligations to reduce emissions as laid down in the Kyoto Protocol.

**Emissions allowance** Permission to emit one ton of carbon dioxide or carbon dioxide equivalent in a specified period of time.

**Kyoto Protocol** The 1997 Kyoto Protocol commits the 39 participating industrial nations as a whole to a five-percent reduction from 1990 levels in their emissions of gases damaging to the climate, such as carbon dioxide, by 2012.

**Mitigation:** Actions that reduce the amount of greenhouse gases entering the atmosphere in order to reduce the effects of climate change.

**Removal Units (RMU)** Credits arising from emissions reductions created by the respective countries by means of projects that reduce emissions (land-use change and forestry).

**Transactions** Transfer of emissions allowances from one Register account to another.