

In Deep Water

Grades 9 – 12

Educational Program Guide

PASS

High School Science Process 1.1-1.3, 2.1, 4.1- 4.4, 4.8, 5.1-5.3, 6.1-6.4, |
Environmental Science: 1.1b, 4.2, 5.1-5.3

OAS

HS-LS2-2 | Science Practices 1, 2, 3, 4, 5, 6, 7, 8 | Core Ideas LS2, ESS3
Crosscutting Concepts, Cause and Effect, Stability and Change

Program Overview

What happens when aquatic ecosystems experience changes in climate patterns? Students will examine what factors influence ocean conditions and marine populations. They will perform experiments, create and analyze graphs and gather information from scenarios in order to find out why our oceans are “in deep water.”

Objectives

After participating in this program, students will be able to:

- understand climate trends past and present to determine “normal climate patterns”
- determine the cause of changes in climate patterns within an ecosystem
- collect, analyze and interpret data using models, and scientific evidence

Background

Aquatic ecosystems are tied to earth’s climate by the water cycle. Small changes in these ecosystems can harm individual species and affect the earth as a whole. Climatologists study water conditions in the earth’s oceans by monitoring temperatures, water chemistry and the health of aquatic species like fish and corals. Changes in levels of pH and carbon dioxide can quickly affect these species and cause a chain reaction that upsets the balance of the ecosystem as a whole.

At the Museum

Hall of Natural Wonders

Be sure to visit the Upland Stream in the Hall of Natural Wonders. Compare and contrast fast flowing areas, such as riffles, to slow moving areas, like deep pools and ponds. Consider the following questions:

- What kinds of animals and plants live in each area?
- What adaptations do they have that allow them to survive in their environments?
- If a chemical spill occurred in the Upland Stream, which populations would have a better chance of survival (populations in the Deep Pool or the Riffle)? Why?

Vocabulary

Climate

A group of organisms within a body of water that depend on each other for survival.

Ecosystem

Oxygen that is dissolved in water through diffusion or plant photosynthesis.

Coral

A marine invertebrate of the phylum Cnidaria that lives in warm, tropical seas. Most corals are colonial and form reefs.

Be familiar with the following in freshwater environments:

pH

pH is the measure of acidity or basicity of a liquid. A pH of 7 is neutral and the ideal pH for water. Water that is too acidic or basic is fatal to plants and animals

Carbon dioxide

Carbon dioxide (CO₂) is the primary greenhouse gas emitted through human activities. Carbon dioxide is naturally present in the atmosphere, but human activities are altering the carbon cycle by adding more CO₂. Carbon dioxide is constantly being exchanged among the atmosphere, ocean, and land surface as it is both produced and absorbed by many microorganisms, plants, and animals.