

# Biomes: The Threat of the Sea

**Grade Level:** 6-8

**Subject:** Ecology

**Duration:** Three class periods

## Objectives

Students will

- discuss the causes and effects of global warming; and
- create posters designed to make people see global warming as an urgent issue.

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## Materials

- Computer with Internet access
- Poster board, markers, colored pencils, and other materials for creating posters
- Paper and pencil

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## Procedures

1. After watching the program *Biomes: The Threat of the Sea*, ask students to define global warming. (Global warming is the overall rise in the world's temperature caused by an increase in heat-trapping gases in the atmosphere.)
2. On a classroom map, find the three locations featured in the program.
  - Shishmaref, Alaska, United States
  - Tuvalu, Micronesia, South Pacific Ocean
  - New York, New York, United States
3. Ask students to describe how global warming is affecting each location. (Rising sea levels are threatening each them, but in different ways: They are eroding coastline in Shishmaref; they may eventually submerge the island of Tuvalu; and they're wearing away the barrier islands protecting New York City.) Explain that in addition to rising sea levels, higher overall temperatures may lead to storms, drought, floods, and heat waves.
4. Discuss the causes of global warming. Ask students about greenhouse gases and how they are related to global warming. (Greenhouse gases, such as carbon dioxide, trap heat in Earth's atmosphere, and their increase in our atmosphere is contributing to global warming.) What is the source of greenhouse gases? (The gases come from burning petroleum, coal, or natural gas for energy and transportation.) What is the main action that can be taken to slow or stop global warming? (Cut down on emissions of greenhouse gases.)
5. Ask students if watching the program made them think differently about global warming. If so, how? (Answers will vary, but students may mention the following: It showed the effects of global warming on people and their environment. It made global warming problems seem more real, serious, or urgent.) What parts of the program made the biggest impressions about the seriousness of global warming? (Students may include the stories about people whose lives are directly affected, interviews with the scientists, the shocking images, or the maps and graphs of global warming scenarios.)
6. The students' assignment is to create a poster to make people consider global warming as a serious, urgent issue. Encourage students to consider the information, images, or techniques from the program that made an impression on them. For some, statistics and graphs might have the biggest impact; for others, it may be the

pictures or personal stories. The posters can highlight any aspect of global warming, including its causes, effects, or possible solutions. Guidelines:

- A poster must focus on a specific theme, such as rising sea levels or energy-efficient cars.
- The message must be stated very clearly.
- Posters should include at least three pieces of information from the program or independent research.

7. Share the following Web sites with students:

World View of Global Warming  
<http://www.worldviewofglobalwarming.org>

Global Environment: Global Warming  
[http://www.ucsusa.org/global\\_environment/global\\_warming/index.cfm](http://www.ucsusa.org/global_environment/global_warming/index.cfm)

Sierra Club: Global Warming  
<http://www.sierraclub.org/globalwarming>

National Resource Defense Council: Global Warming  
<http://www.nrdc.org/globalwarming/gsteps.asp>

Global Warming: Undo It: 20 Simple Steps  
[http://www.undoit.org/undoit\\_steps\\_1.cfm](http://www.undoit.org/undoit_steps_1.cfm)

Global Warming: Early Warning Signs  
<http://www.climatehotmap.org/index.html>

Global Warming: Focus on the Future: What You Can Do  
[http://globalwarming.enviroweb.org/dosomething/dosomething\\_frameset.html](http://globalwarming.enviroweb.org/dosomething/dosomething_frameset.html)

EPA Global Warming Site  
<http://yosemite.epa.gov/oar/globalwarming.nsf/content/index.html>

8. When students present their posters, they should briefly describe the following:

- the primary message;
- techniques or information featured to get across the message; and
- how it highlights the serious nature of global warming.

9. Have the class choose five or six posters to hang in a hallway or elsewhere in the school. Encourage students to choose posters that focus on different themes and use different methods to present the point.

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## Evaluation

Use the following three-point rubric to evaluate students' work during this lesson.

- **Three points:** Students participated actively in class discussion about global warming and effectively used techniques and information in the program; created a thoughtful poster with a specific theme, clear message, and at least three facts from the program or independent research; made a clear presentation to the class.
- **Two points:** Students participated in class discussion about global warming and effectively used techniques and information in the program; created a satisfactory poster with a specific theme, fairly clear message, and three facts from the program or independent research; made an adequate presentation to the class.
- **One point:** Students did not participate in class discussion about global warming and effectively used techniques and information in the program; created an incomplete poster that had no specific theme, including an unclear message and fewer than three facts from the program or independent research; made an incomplete or sloppy presentation to the class.

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## Vocabulary

fossil fuel

**Definition:** a hydrocarbon deposit—petroleum, coal, or natural gas—derived from living matter of a previous geologic time and used for fuel

**Context:** When burned, fossil fuels release carbon dioxide and other heat-trapping gases into the atmosphere.

### **global warming**

**Definition:** gradual increase of the temperature of Earth's lower atmosphere

**Context:** Many scientists believe that global warming is caused by an increase of heat-trapping gases like carbon dioxide in the atmosphere.

### **greenhouse gas**

**Definition:** a gas such as carbon dioxide that traps heat in the Earth's atmosphere by reflecting radiation

**Context:** Increased greenhouse gases are enhancing the natural "greenhouse effect" and causing global climate change.

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## **Academic Standards**

### **Science**

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K–12. To view the standards, visit <http://books.nap.edu>.

This lesson plan addresses the following national standards:

- Science in Personal and Social Perspectives: Populations, resources and environments; Science and technology in society
- Life Science: Populations and ecosystems; Diversity and adaptations of organisms

### **Social Studies**

The National Council for the Social Studies (NCSS) has developed national standards to provide guidelines for teaching social studies. To become a member of the NCSS, or to view the standards online, go to <http://www.socialstudies.org>.

This lesson plan addresses the following thematic standard:

- People, Places, and Environments

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## **Credit**

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