

# CHAPTER MYSTERY

TEKS 2H, 3B, 12C

## CHANGES IN THE BAY

Rhode Island's Narragansett Bay is not the only ecosystem that suffers from changes in abiotic factors such as temperature. This is happening within many biomes and ecosystems around the world.

College and Career Readiness

## Rising Temperatures in a Lake

The northwest coniferous forest is a small biome along the coast of the northwestern United States. It experiences seasonal variations in temperature and precipitation. Close to Seattle, Washington, is Lake Washington, which is a freshwater ecosystem in peril from decades of sewage dumping and rising water temperatures. The following is a brief summary of an environmental report on Lake Washington.

### Environmental Report: Lake Washington Status

Prepared By: Environmental Sub-Committee

**SUMMARY:** While it has been more than 40 years since sewage has been dumped into Lake Washington, problems still exist in this freshwater ecosystem. The lake's overall temperature has increased by  $0.5^{\circ}\text{C}$  in the past 40 years. Its upper layer, which is 9 meters deep, has experienced a temperature increase of  $1.25^{\circ}\text{C}$ . These rising temperatures are negatively affecting the ecosystem's food chains. Zooplankton numbers are declining. These microscopic organisms eat algae, which are at the base of many of these food chains. Zooplankton are also prey for salmon. Higher temperatures are generating more frequent algal blooms, which are starting to create eutrophic conditions in the lake. Eutrophication is a condition in which a body of water is very high in nutrients, but low in oxygen. Salmon populations are also declining due to these conditions. Spring turnover in the lake, a process by which warmer surface water sinks and mixes with deep, cold water, is occurring a month later than in the past. The result is that some fish that prefer colder water are migrating into deeper waters, where they encounter more predatory species than they would in shallow water. Studies indicate that global warming is the major contributor to the rising temperatures.

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## Research Skills/Information Literacy

1. What abiotic factor is changing the ecosystem of Lake Washington, and how has this factor changed over time?

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2. Explain how this change has affected the mixing of warm and cold water in the lake. How does this in turn affect fish?

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3. This report suggests that global warming is a primary contributor to the increased temperature in the lake. What does this suggest about other lake ecosystems in the northwest coniferous forest?

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4. Briefly describe a food chain in Lake Washington.

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5. If the zooplankton population is decreasing in Lake Washington, what do you think is happening to the salmon population? Explain your answer.

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## Lake Presentation

Working with a small group, research information about Lake Washington's past issues with sewage disposal and current trends in increasing water temperature. Or, conduct research about a body of water in Texas. You may find it helpful to start your research at the Web sites of federal and state environmental agencies. Visiting your local public library and inquiring at government offices can offer valuable information, too. Find evidence about the relationship between global warming and these rising temperatures. Prepare a presentation describing the information that you find. In your presentation, provide at least one example and show the effects of changing conditions on this ecosystem. Present your findings to the class in an oral report, using figures, tables, and illustrations.