

## Using NewsHour Extra Feature Stories

### STORY

#### **Beetle Infestation May Impact Climate Change**, 04/28/08

[http://www.pbs.org/newshour/extra/features/health/jan-june08/beetle\\_4-28.html](http://www.pbs.org/newshour/extra/features/health/jan-june08/beetle_4-28.html)

Estimated Time: One 45-minute class period with possible extension

[Student Worksheet](#) (reading comprehension and discussion questions without answers)

### PROCEDURE

#### **1. WARM UP**

Use initiating questions to introduce the topic and find out how much your students know.

#### **2. MAIN ACTIVITY**

Have students read NewsHour Extra's feature story and answer the reading comprehension and discussion questions on the student handout.

#### **3. DISCUSSION**

Use discussion questions to encourage students to think about how the issues outlined in the story affect their lives and express and debate different opinions.

### INITIATING QUESTIONS

- 1. What is the connection between carbon dioxide and global warming?**
- 2. How do forests work to regulate the temperature of the earth?**
- 3. What are some consequences of a rising global temperature?**

### READING COMPREHENSION QUESTIONS – [Student Worksheet](#)

- 1. How are pine beetles destroying forests in Western Canada? How large is their impact?**

#### ANSWER

The source of the destruction is a pine beetle, the *Dendroctonus ponderosae*, which lays eggs under the bark of mature lodge pole pines and jack pine trees, destroying them.

Once an infestation starts, the tree cannot be saved and the rotting dead trees release, rather than absorb, carbon dioxide.

So far, pine beetles have destroyed more than 50,000 square miles of forest in Western Canada and damaged hundreds of thousands of U.S. forests, turning green forests a reddish brown color.

- 2. What is a carbon sink?**

#### ANSWER

Usually, a healthy forest acts as an absorber of carbon dioxide. Scientists refer to this phenomenon as a carbon sink – a place like a forest, ocean or other system that absorbs climate warming CO<sub>2</sub>.

"Historically about 50 percent of the carbon that is released from the burning of fossil fuels has been taken up by terrestrial systems and oceans, allowing only about half of what we burn for fossil fuels to accumulate in the atmosphere," Werner Kurz, co-author of a study of the beetle's impact in the journal *Nature*, told The Canadian Press.

- 3. What role has climate change had in creating the beetle problem?**

#### ANSWER

In fact, it is global climate change that is causing the problem in the first place, according to the researchers.

Milder winters have allowed the pine beetle to spread northward and to higher elevations. It takes five days of extremely cold temperatures of about minus 30 degrees Fahrenheit to kill the beetles. Recent winters have been mild.

**4. What estimated impact will the pine beetles have on carbon emissions? How does this compare to human activity?**

**ANSWER**

The scientists created a computer model to estimate the damage that the beetles could do, as well as measure their future negative impact on Canadian energy-saving efforts to reduce carbon emissions. Reducing emissions is a requirement of participants in the United Nations Kyoto climate protocol, which Canada signed.

"Here we estimate that the cumulative impact of the beetle outbreak in the affected region during 2000 to 2020 will be 270 megatonnes of carbon," the scientists wrote in their study.

Human activity in Canada released the equivalent of 747 megatons of carbon dioxide into the atmosphere in 2005.

**5. What solution to the beetle problem is attractive to the logging industry? Why? What do critics say about this idea?**

**ANSWER**

The Canadian government is considering possible solutions, including removing the impacted trees before they rot and release more carbon dioxide. This solution is supported by the logging industry, although the wood is tainted blue by a fungus carried by the beetles and must be sold at a cheaper price than untainted lumber.

But other scientists, such as Art Fredeen of the University of Northern British Columbia, believe that salvage logging disturbs plant life on the forest floor, further increasing carbon emissions.

"You have all of the shrubs, the moss, lichen; you have a lot of photosynthetic surface that's unperturbed by the mountain pine beetle," Fredeen told Nature News. "When you clear cut, of course, all of that is removed."

**6. Why might the pine beetle population collapse?**

**ANSWER**

Although Canada will have to deal with the impact of a smaller carbon sink for decades to come, the worst may be over. The pine beetle can only reproduce in the largest trees, and soon 90 percent of those will be gone.

"The beetle will eat itself out of house and home and the population will eventually collapse," Kurz said.

DISCUSSION QUESTIONS (more research might be needed)

**1. What solution(s) do you think are best for dealing with the pine beetle problem? Why?**

**2. Much of the evidence for human impact on climate temperatures relies on complex computer models. How much do you understand about these models? Is it important to understand them? Do you trust or distrust the information coming from scientists about global warming? Who do you trust? Why?**

**3. The beetle story demonstrates the impact of a bug on global climate change. What impact do you think you and the way you live have on global climate change? Are there things you could be doing differently? Explain.**

**Extension Activity**

Have students write a 300-500 word essay on this topic providing clear examples. Send your completed editorial to NewsHour Extra (extra@newshour.org). Exceptional essays might be published on our Web site.