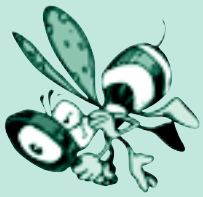
into forests. Forests absorb a lot more carbon dioxide than crop or pasture land. We could minimize the amount of forests that we are cutting down for other uses, such as for agriculture or for building homes and businesses. We can continually improve the way we take care of the forests that we have. We can recycle more paper and wood products, and we can plant more trees in urban and suburban areas.

Reflection Section

- It is hard to predict the future. The predictions made by the computer model may not be correct. How would you recommend that people use the computer model's predictions?
- The scientists identified things that can be done now to reduce the amount of carbon dioxide going into the atmosphere. Of those things, which can you and your classmates do?

From: Joyce, Linda A.; Birdsey, Richard, technical editors. 2000. *The impact of climate change on America's forests: A technical document supporting the 2000 USDA Forest Service RPA Assessment.* Gen. Tech. Rep. RMRS-GTR-59. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 133 pp.



FACTivity

In this article, you have learned that different climates have different kinds of vegetation. The question you will answer in this FACTivity is: Does it take much of a change in climate to cause a change in the type of vegetation growing in an area? In this FACTivity, the only measure of climate you will be considering is temperature. In reality, climate is composed of many other factors in addition to temperature.

The method you will use to answer this question is: Think about what scientists have said about possible future temperatures. In the Methods section, you read that "in one formula, the average temperature for the United States was increased by 4 °C by the year 2100." According to scientists at the Intergovernmental (**in** tür guh vürn **men** tul) Panel on Climate Change, the global average temperature of Earth's surface may increase by between 0.2 °C and 0.5 °C by the year 2020. (The panel is a part of the United Nations Environment Program.) Thus, the average temperature may increase slowly for the next 20 years or so, then the increase may become more rapid through the rest of the 21st century.

On the following page is a table of yearly average temperatures for some U.S. cities. Each of these cities lies in one of the vegetation types from the study. You can see that the last five columns of the table are empty. Your job will be to calculate possible future temperatures for each of these cities and complete this table.

To do this, you will first need to convert the possible increase in temperature from Fahrenheit to Celsius (Column 3 to Column 4). To convert Fahrenheit to Celsius, subtract 32 from the Fahrenheit number, then multiply by 5/9 and write that number in Column 4 for each city. Now that you have the temperature in Celsius, you can add the estimated numbers to the Celsius temperature. To complete Column 5, add 0.2 to the number in Column 4 for the lower end of the range, and add 0.5 to get the higher end of the range. To complete Column 6, add 4 to the number in Column 4. What do the numbers 0.2 and 0.5 represent? What does the number 4 represent?

To compare the temperature in Column 3 with the estimated increases in temperature, you need to convert the Celsius temperatures in

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
City and State	Vegetation Type	Average Yearly Temperature in °F	Average Yearly Temperature in °C	Possible Average Yearly Temperature Range in °C (Year 2020)	Possible Average Yearly Temperature in °C (Year 2100)	Possible Average Yearly Temperature Range in °F (Year 2020)	Possible Average Yearly Temperature in °F (Year 2100)
Fairbanks, Alaska	Taiga-Tundra	26.9	-2.83	-2.63 – -2.33	1.17	27.27 - 27.81	34.11
Los Angeles, California	Shrub woodland	63					
Wichita, Kansas	Grasslands	56.2					
Honolulu, Hawaii	Tropical broadleaf forest	77.2					
Des Moines, Iowa	Savannah woodland	49.9					
Charlotte, North Carolina	Temperate mixed forest	60.1					
Glenwood Springs, Colorado	Boreal coniferous forest	45.7					
Albuquerque, New Mexico	Arid lands	56.2					
Salem, Oregon	Temperate evergreen forest	52.1					
Barrow, Alaska	Tundra	9.42					

Columns 5 and 6 to Fahrenheit and complete Columns 7 and 8. To do this, multiply the Celsius number by 9/5, then add 32. Fairbanks, Alaska, is completed as an example.

Now compare the current average temperature with the possible future average temperatures for all of the cities. Does the difference seem very big? Read the Findings section again, and look again at figure 3. Are you surprised at the possible changes in vegetation, given the amount of temperature change? What does this information tell you about the relationship between average yearly air temperature and the type of vegetation growing in an area?