

ESA 21: Environmental Science Activities

Name:

Professor:

Individual Impacts

In the first exercise in this module you used allometric equations to determine the amount of carbon dioxide that can be sequestered in the biomass of a typical forest in our area. Let's now look at how many trees it would take to sequester your annual carbon dioxide emissions.

First, enter your annual carbon emissions from the personal _____ lbs.
impact calculator (total emissions before making any changes).

(a.) It is estimated that one acre of forest can remove and store _____ acres
about 19,000 lbs of carbon dioxide from the atmosphere each
year¹. How many acres of forest would be needed to absorb
your annual emissions of CO₂?

(b.) If you were to drive a hybrid vehicle instead of your current _____ acres
vehicle, how many acres of forest would be needed to absorb
your CO₂ emissions? Use the CO₂ emissions value you obtained
after making the change to a hybrid vehicle in exercise 3.

If Everyone Lived As You Do:

While an individual's environmental impacts might seem reasonable, this often changes once you multiply these effects by a large number of people. Let's expand our analysis to address the number of people impacting the environment from KSU and Cobb County.

(a.) Kennesaw State University currently enrolls about 16,000 _____ acres
students. If all KSU students had the same annual CO₂
emissions as you, how many acres of forest would be needed to
sequester these outputs?

(b.) The Kennesaw State University Main Campus is 183 acres in _____ forests
area². How many forests the size of the KSU campus would be
needed to store the CO₂ emissions from KSU's students?

(c.) Cobb County had a population of 607,751 people according _____ acres
to the 2000 U.S. Census³. Census figures also show that 73.9%
of the population was 18 years old or older, making the adult
population of the County 449,128. If all the adults in Cobb
County had emissions like you, how many acres of forest would
be needed to sequester these outputs?

(d.) Cobb County contains 217,728 acres of land area. How _____ forests
many forests the size of Cobb County would it take to sequester
the County's annual emissions if everyone lived like you do?

(e.) How many County-sized forests would be needed if everyone _____ forests
switched to hybrid vehicles?

Analysis:

Did you find the amount of forest required to store your annual CO₂ emissions surprising? Explain your answer.

After performing these analyses, do you feel that reforestation efforts alone are an effective method for combating global warming, or will reductions in CO₂ emissions also be necessary? Explain your answer, citing the land areas of forests needed to sequester the outputs of the KSU student population and Cobb County you determined in this activity.

References:

- ¹<http://www.forestry.uga.edu/warnell/service/library/for96-039/>
- ²http://www.kennesaw.edu/inst_res/factbook/2001factbook/index.shtml
- ³<http://quickfacts.census.gov/qfd/states/13/13067.html>