

May 12, 2008

Land use in my neighborhood Part 2

This is the second part of the aerial photo project we started a few weeks ago. Our purpose now is to collect up-to-date data on land use near your home for comparison with the first data set. This will tell us how land use has changed, and will allow us to make an educated guess about land change in the future. Especially, we are interested in the fate of the forest, but change in other land uses interests us too!

You already know something about historical trends in land use in Ohio. A short history of forests in Ohio was included in my lecture segments “Moving westward” and “Industrial uses of forests”, and in pages 361-368 of the book *Americans and Their Forests* (your textbook). You should review your notes and read this section before you write your final report. Integrating your findings with these sources is part of your assignment.

Please note the following general requirements:

1. **Typed.** Essays must be typed. Please number the essays as questions are numbered (below).
2. **Length.** We expect at least 200 words for each essay. Please tell us the number of words in each essay, as before.
3. **Use your data.** Use the data you collected from the aerial photos to answer the questions.
4. **Use your text and lectures.** Refer to material from your textbook and lectures in answering question 5. Pages 361-368 should be especially helpful.

The Assignment

1. *Modern land use.* Go into ImageJ and open your modern (2000s) aerial photo. Get out the data collection sheet you used before. Locate your house again.

2. *Recording data.* Using your house as the center, set up the grid as you did before. **Except** the modern aerials are at a scale of 1:40,000, so you must use 40,000 (not 80,000) when you calculate the scale (Step 5 e in Part I of the assignment). All grid points on the acetate sheet should line up exactly on the same points as in the old photos. Make note of the modern land use at each point, and record it in the appropriate blank on the data sheet.

Note: If you live in a largely urbanized area, please distinguish lawn and street trees, as well as pavement and buildings.

3. *Distance to edge and stand size.* For each point, also measure the modern distance to the forest edge (if your point is inside a forest) and distance to the closest forest patch (if the point falls on another land use). Also, if the sample point falls within a forest, measure area of the forest patch, as you did before. Enter your data on the data sheet.

4. *Calculate.* Calculate the **average** distance to the edge of the forest and average distance to the closest forest, as you did before. Enter these on the Part II assignment sheet (below) next to the comparable numbers from the old photos (Aerials Part I) which you handed in before. If you misinterpreted this figure in the first part (several students tell me they did) you will need to go back and recalculate it.

Calculate the average area of a forest patch. Enter the average values **in meters** in your assignment sheet.

5. *Transitions.* Your data collection sheet lists old and modern land uses side-by-side for each sample point. Count the number of times each land use turns into each of the other land uses, and enter it in the assignment sheet. For example, count the number of times

deciduous forest (small) → deciduous forest (large)
deciduous forest (small) → old field (rough with sparse trees)
deciduous forest (small) → lawn/pasture (smooth, no trees)
deciduous forest (small) → row-crop agriculture
deciduous forest (small) → water
etc.

Note! Be sure to record the number of times that land use **stays the same**, too! For example

deciduous forest (small) → deciduous forest (small)

To hand in

Please! Express all distances in meters in the real landscape. Indicate units of measurement. Express distances in terms of real distance on the ground, not distance on the photo.

These data were collected for the town of _____ ,
_____ (state) which falls in ZIP code _____.

1. Enter the number of sample points observed in each land-use category:

	At your birth 1981-1985	Modern 2000-2008
Young deciduous forest	_____	_____
Old deciduous forest	_____	_____
Old field	_____	_____
Pasture/lawn	_____	_____
Row-crop agriculture	_____	_____
Conifer forest	_____	_____
Water	_____	_____
Urban/pavement	_____	_____
Disturbed soil	_____	_____
Other	_____	_____

If you listed sites as “other”, what land use does “other” refers to? _____

2. Enter the average area of forest patches in units of meters in the landscape.

At your birth 1981-1985	Modern 2000-2002
_____	_____

Note: Apply the common-sense test – do these areas make sense in terms of what you know intuitively about the landscape?

3. Enter the average distance to the nearest forest edge in units of meters in the landscape.

At your birth 1981-1985	Modern 2000-2002
_____	_____

Forested sample points _____

4. Enter the average distance to the closest forest patch in units of meters in the landscape.

Unforested sample points _____

Note: Apply the common-sense test – do these distances make sense in terms of what you know intuitively about the landscape?

5. Transitions. Enter the number of sample points that changed from each land use to each other land use. If a transition never happened (for example, water → cropland), enter a “0” in that blank. Remember also to enter the number of times a land use stayed the same (for example, conifer forest → conifer forest).

To
(recent
photos)

From (in the old photos)

	Young decide.	Old decide.	Old field	Pasture	Crop	Conifer	Water	Paved	Dis- turbed	Other
Young decid.										
Old decide.										
Old field										
Pasture										
Crop										
Conifer										
Water										
Paved										
Dis- turbed										
Other										

Essays

Please write short (at least 200 word) essays answering each of the following questions. Show the number of words.

Number the essays as I have numbered the questions (below).

Be sure to support your conclusions by referring to specific observations your report above. Be sure to answer all parts of each question.

Please type your answers.

6. Based on your textbook (esp. Chapter 11), my lectures, and your knowledge of the history of your community, write a short history of forest and land use **in the area around your house** (not the whole state) between the years 1700-2008. Focus on what probably happened in your immediate neighborhood, not the county or the state. Be specific!
7. What are the 2 dominant **modern** land-use categories (question 1, above)? Based on your observed transitions (question 4, above), which two **non-forest** land uses experienced the **greatest change** during your lifetime? What were those land uses most likely to turn into? What caused these changes?
8. What land-use category has most often changed **to forest** (question 4, above)? What land-use category has forest most often changed into? What do you think are the causes of these changes?
9. In terms of distance to the nearest forest, forest fragment size, fragment age, and edge distance, describe **how forest has changed** since your birth. Please be specific.
10. How do you think the changes described in question 8 would affect a) a plant species and b) an animal species living in a forest fragment? Please be specific.
11. Ohio has a great variety of landscapes, e.g. hilly Appalachian, flat agricultural, urban lakeside, etc. Choose an alternative Ohio landscape different from the one you measured. Answer questions 8. and 9. for your alternative landscape based on what you imagine it to be like. Explain your answer at length.