

Biomes, Ecoregions

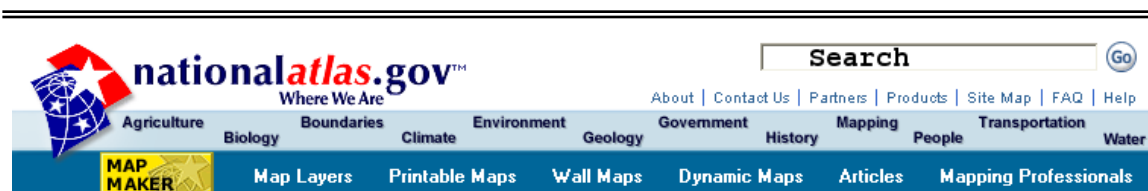
Introduction: This workshop is a computer exercise. You will be using the National Atlas Map Maker (<http://www.nationalatlas.gov/>), an on-line GIS (Geographical Information System) program. Answer the following questions using the various maps that you create.

Key concepts:

- The environment, particularly climate, influences the distributions of plants & animals
- Human impact on the environment varies locally, regionally and globally.
- The distributions of plants & animals have changed in the last two decades

What's due?

After filling in the answers, log onto D2L Workshop 6 and answer the questions. **10 pts**



1. What is a biome? Go to NATS104 lecture 16. Compare the definition of “biome” in lecture 16 with that of “ecoregion” in the [National Atlas site](#).

Ecoregions and biomes are both classifications of ecosystems.

A. Write down a definition for “Biome” from lecture 16

B. Write down the definitions for “Ecoregion” (both Bailey's and Omernik's) from the [National Atlas site](#) (enter “ecoregion” in the search bar at the top of the page and click “Go.”). For each system (Bailey's and Omernik's) how is one ecoregion distinguished from another. What distinguishes their boundaries.

The difference between “ecoregion” and “biome” is one of scale. One is larger than and includes several of the other. Find the two words in [Wikipedia](#) and fill in the blanks

"_____ are classified by _____ type"

2. Ecoregion characteristics. Based on the two definitions you copied (1.A.) what are the environmental parameters that define the ecoregions in a biome (mark their boundaries)? How do Bailey's and Omernik's ecoregion classifications differ? What environmental characteristics do *both* use? Which uses the largest number of characteristics?

3. Ecoregion subdivisions. “Ecoregions” are the **highest** level of **Bailey's ecosystem classification**. What are the lower (smaller area) units of Bailey's classification? These units are used in land management for building roads and construction permits. Upon what environmental parameters is each level based? Are they based on different environmental factors?

4. Return to the [National Atlas site](#). If you cannot see any of the tabs mentioned below, click on the yellow "[MapMaker]" tab near the top left of the page. Check the boxes for "Cities and Towns" and "States" under the "Basic Maps" tab. Click on "Biology," and select "Provinces," under "Ecoregions-Bailey" then under "Invasive Species" (farther down) check "Land Cover 200 Meter Resolution." Then, above the map, select "Arizona" from the "Zoom to State(s)" menu.

For Phoenix, AZ, (check the "Cities & Towns box if it isn't showing), use the "[Identify]" tab above the map to identify the type of ecoregion province. Phoenix is in the ___ province.

What is the ecoregion province for Tucson? (You can use the "Find" tab near the top of the page to move to Tucson (zoom to feature) or your Tucson zip code.

The ecoregion sections are smaller-scale and more homogeneous in terms of vegetation, climate and relief. What are the ecoregion sections for Tucson and Phoenix? The section is named on the pop-window for provinces. You may need to click on "MAP LAYERS" to access the "Ecoregions – Bailey" Menu.

5. In urban areas like Phoenix and Tucson, there is little natural vegetation left, so classifications like "Land Cover" are used instead of natural classification like Bailey's and Omernik's. On the [National Atlas site](#), under "Biology," click "None Selected" under "Ecoregions - Bailey" (but Land Cover 200 Meter Resolution must be checked) then click "**Redraw Map**" tab near the top of the page. Scroll through the map to Tucson, (or use the "Find" tab near the top of the page).

Zoom in to "Tucson" until you "Cannot zoom in any more." The square beneath the word "Tucson" is **red**, what kind of "Land Cover Class" is it?" (Find it on the "Map Key" near the top of the page. The "Identify" tab doesn't work for "land cover.")

At this scale ("Cannot zoom in any more") is the Tucson Basin (3 mile radius around the "Tucson" label) mostly **natural** or mostly **residential**?

The **Land Cover Class** for most of the Tucson Basin is **pink**. That is the "Low intensity residential" Land Cover Class. Only two kinds of **natural** land cover are shown near Tucson at this scale -- one is light brown and the other is a less-common blue-gray color. What is the Land Cover Class of the more common light brown cover type?

Use the "Find" tab near the top of the page to zoom in on "**Mount Lemmon Ski Valley**." What land cover class is most common next to the Mount Lemmon Ski Valley? Is it natural or human made?

6. The distributions of animals and plants may be widespread at the continental scale, but locally, they may be restricted to specific vegetation types or land cover types. The importance of local environments may become more pronounced at the edges of organisms' ranges.

Un-check "Land Cover 200 Meter Resolution," click on the "Map Layers" tab, then select the distributions of the various kinds of bats from the menu beneath the "**Bat Range**." Of the following bats, which one(s) occur in Tucson, Idaho, New York, West Virginia? (Click on **Redraw Map** each time.) California leaf-nosed bat, Mexican long-nosed bat, Mexican long-tongued bat, Townsend's big eared bat, Western yellow bat

Click "**None Selected**" under "**Bat Range**" and Click on "**Individual Butterfly Species Distribution**" under "**Butterflies**," Which of the following butterflies occur in Tucson? Acadian Hairstreak, Crescent Metalmark, Desert cloudywing, Desert elfin, Dusky Azure

7. The [National Atlas site](#) also includes information on changing animal distributions. These are recent introductions of species harmful to humans, whose ranges are rapidly expanding.

Under "Butterflies" click "**None Selected**," check "**Land Cover 200 Meter Resolution**" and then open the "**Invasive Species**" Menu. Under "Invasive Species" explore the menu for "**Africanized Honey Bees**." Click on the various dates. Were these "killer bees" present in Tucson in

1990

1991

1992

1993

1994

Click "**Redraw Map**" and under "**Invasive Species**" select "**Purple Loosestrife**" and under "**Basic Maps**" select "**Counties**" and "**County Names**." Does purple loosestrife occur in Arizona? If so, list the Arizona counties in which purple loosestrife occurs.