Part I: Using the National Atlas to Create Maps

In this section, you will use the US Department of the Interior's National Atlas to create a multi-layer thematic map of geographic phenomena that interests you. **Choose a minimum of three layers**.

Remember that thematic mapping involves mapping the geographic distribution of some ***attribute*** (not simply labeling and showing the locations of features like cities, roads, and census tracts, like reference maps). Like FactFinder, the National Atlas is an ever-changing, Internet-based data distribution tool. The interface changes frequently, and you are encouraged to explore beyond the instructions here.

Go to http://nationalatlas.gov

The National Atlas interface is pretty easy and straightforward to use:

"MAP MAKER" allows you to make maps; "Map Layers" discusses the different layers available in detail; etc. The various categories (e.g., "agriculture, Biology, Boundaries, etc.") give an overview of the types of data associated with those specific layers.

Creating thematic maps with the National Atlas is simple: decide the location you want to map, the layers you want to include in your analysis, and which attributes of each layer you want to include. Here are details on each step:

1. Click on "MAP MAKER" and you get a screen like this:
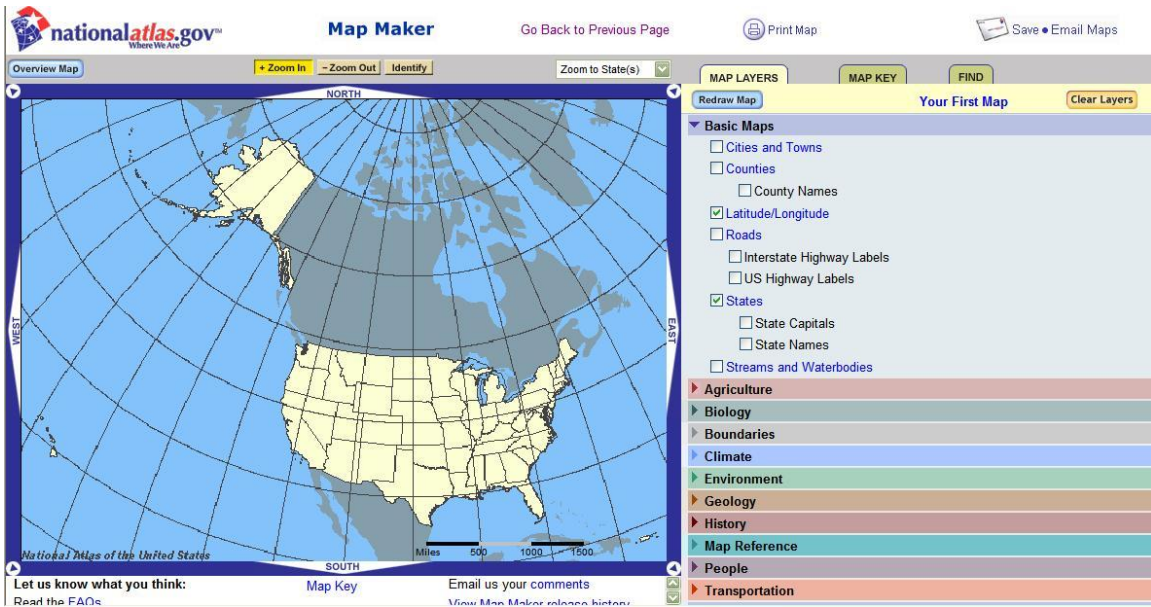
2. Click on the yellow "Zoom In" button above "North"; then click-drag a "box" around the location you want to map. Keep zooming in until arriving at your desired resolution: Choose a location of county-level or smaller (city, town, etc.)

3. When you reach your desired resolution, it may be helpful to "turn on" a reference layer (such as "State Capitals" or "Cities and Towns") to keep track of your location; to do this, simply "click" in the appropriate boxes and click "Redraw Map", giving you something like this image:
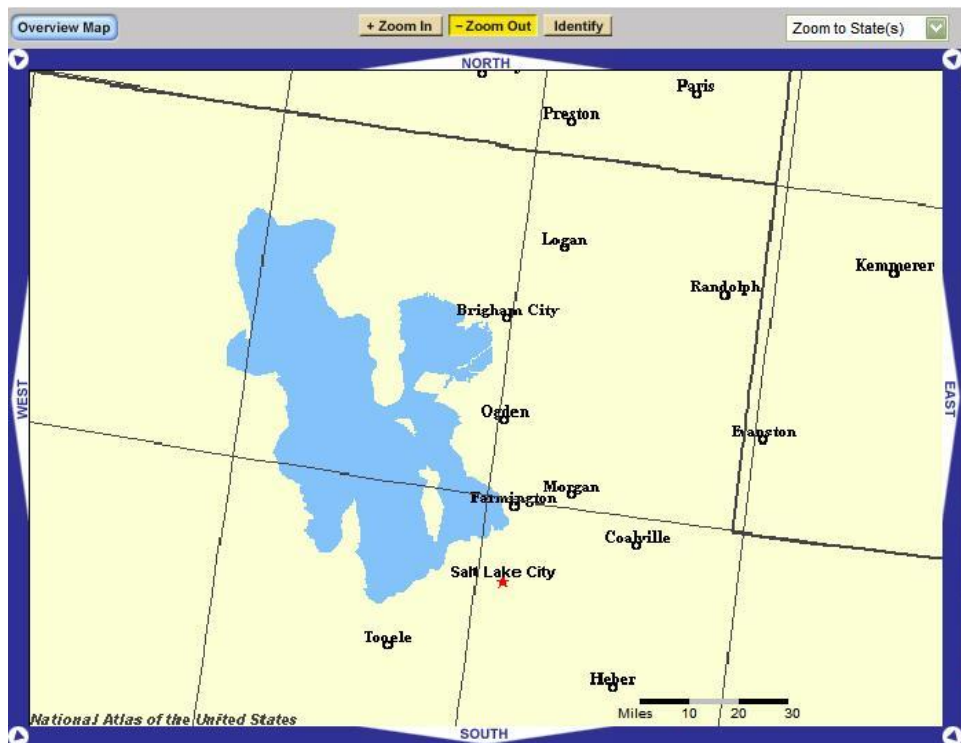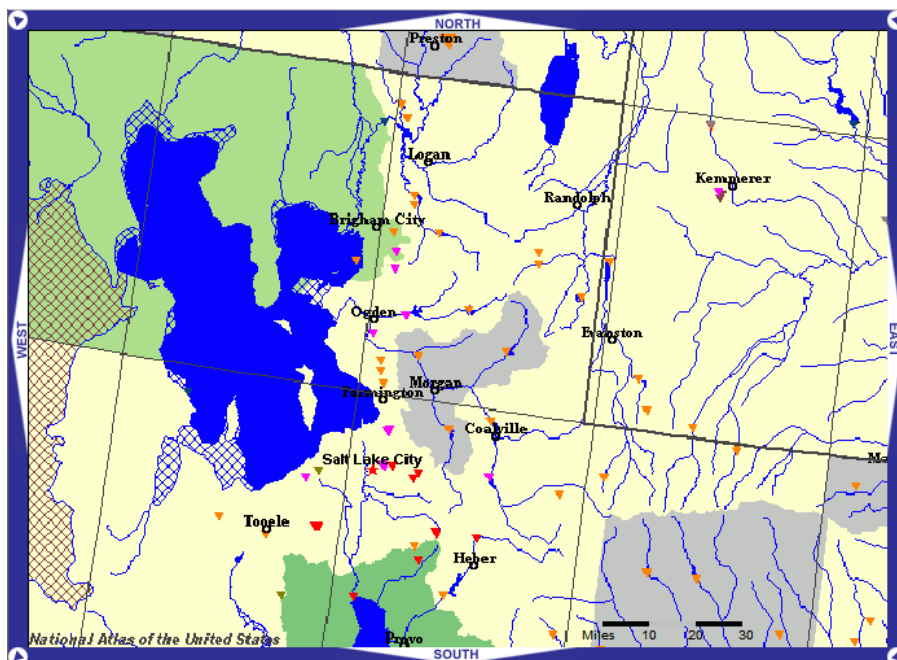

Image showing part of northern Utah and the very southwest extent of Wyoming.
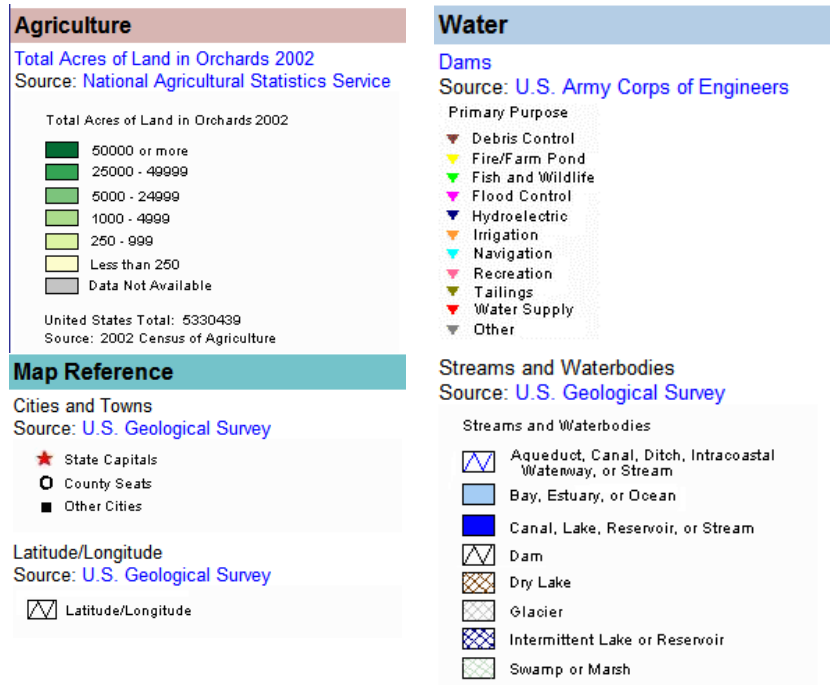
4. Choose the attributes you want to assess for each layer. In this example, the map will show "Total acres of Land in Orchards", "Dams," and "Streams and Waterbodies":

5. Click "Redraw Map" and the chosen layers are displayed:

6. Remember that important components of maps are their legends (or "keys"), so **be sure to include the accompanying legend OF YOUR PHENOMENA**, or create one of your own:

Agriculture

Total Acres of Land in Orchards 2002
Source: National Agricultural Statistics Service

Total Acres of Land in Orchards 2002

- 50000 or more
- 25000 - 49999
- 5000 - 24999
- 1000 - 4999
- 250 - 999
- Less than 250
- Data Not Available

United States Total: 5330439
Source: 2002 Census of Agriculture

Map Reference

Cities and Towns
Source: U.S. Geological Survey

- ★ State Capitals
- O County Seats
- ■ Other Cities

Latitude/Longitude
Source: U.S. Geological Survey

- Latitude/Longitude

Water

Dams
Source: U.S. Army Corps of Engineers
Primary Purpose

- ▼ Debris Control
- ▼ Fire/Farm Pond
- ▼ Fish and Wildlife
- ▼ Flood Control
- ▼ Hydroelectric
- ▼ Irrigation
- ▼ Navigation
- ▼ Recreation
- ▼ Tailings
- ▼ Water Supply
- ▼ Other

Streams and Waterbodies
Source: U.S. Geological Survey

Streams and Waterbodies

- Aqueduct, Canal, Ditch, Intracoastal Waterway, or Stream
- Bay, Estuary, or Ocean
- Canal, Lake, Reservoir, or Stream
- Dam
- Dry Lake
- Glacier
- Intermittent Lake or Reservoir
- Swamp or Marsh

- Save the map to your computer, as described for the reference map (Module 2, step 4)
- Also save the map's **legend** onto your computer. The National Atlas calls this "Map Key"
  - The legend is a separate graphic file. You will need to export the legend as well in order to allow readers of your web page to interpret the map. To do this, right-click on the legend, just as you did with the map itself, and choose "Save As…"

- Remember: all maps should have titles. Be sure to give your map a title—on the map itself (you can do this in *Paint*, see instructions below) and/or add another row to the table, and list an explanatory title. The example below shows both options.

7. Insert the maps and legend side-by-side into your module 4 webpage. *(In Microsoft Word, a good way to place the legend alongside the map is to create **a table** with **1 row** and **2 cells**. Place the map in one cell and the legend in the other cell.)*

NOTE: although your map will most likely look larger, an example of the finished product might look something like this:
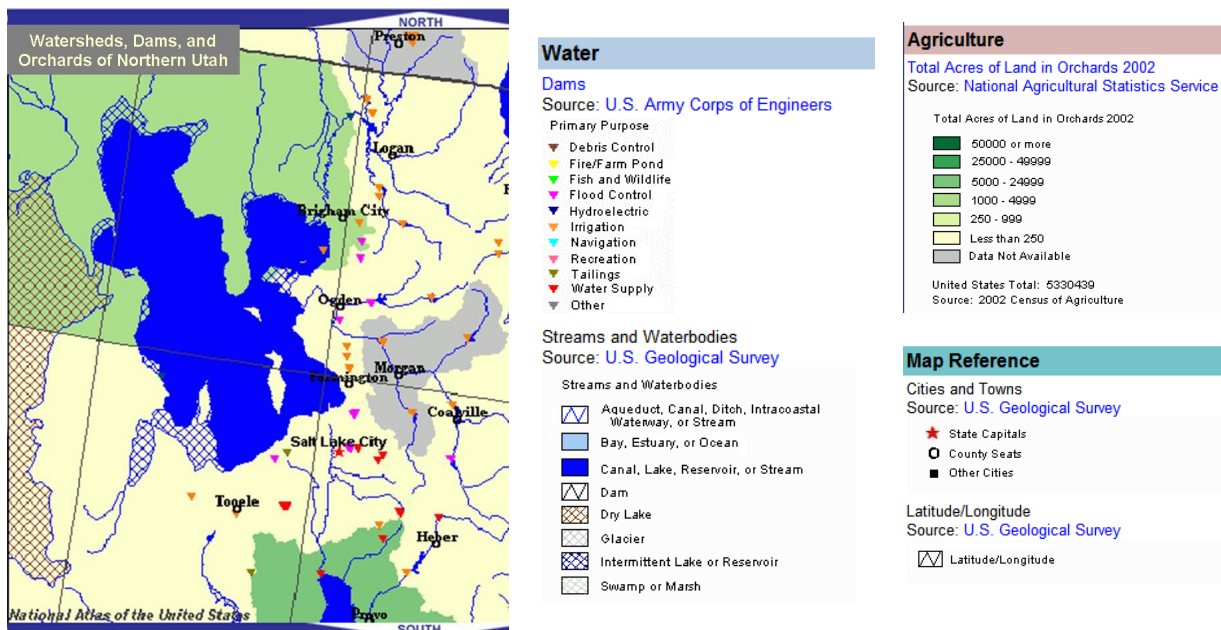
Map correlating northern Utah watersheds and dams with acreage used by orchards.

NOTE: If your map key (legend) is spread out over many data layers, you can simply cut, paste, and Save As…a series of screen shots. For a PC, here's how:

- Get the image you want to save in full view on your computer screen
- Hold down the "Crtl" and "Print Screen" keys at the same time (this puts the screen shot in the computer's buffer)
- Open *Paint* (**Start → All Programs → Accessories → Paint**) and hold down the "Ctrl" and "V" keys at the same time (a shortcut for "paste"), and your screen image appears!
- In *Paint* then, select the specific area you want as your image and hold down the "Ctrl" and "C" keys at the same time (a shortcut for "copy"…the part of the image you selected is now "on" the clipboard)
- Select **File → New**; if asked to save the image, say **NO**
- Again, hold down the "Ctrl" and "V" keys at the same time (a shortcut for "paste"), and the image you just previously selected should appear!
- Select **File → Save As…** and choose the location to save your image ("gcu674images" perhaps) AND the file type. Saving your image as a jpeg (.JPG) is advised.

**This also works with any screen image you may want to "capture"!

Adding a title ON the image in *Paint* is tricky, but here's how you do it:

- When the image is in *Paint*, click on the "A" in the tool bar (this is *Paint's* text tool)
- Draw a box JUST LARGE enough to hold your title (this is the most difficult part)
- Type in your title
- Save the image (**File → Save**)

Part II: Using Google Earth
and Capturing a Google Earth Image

Google Earth is an easy-to-use and fun-to-play-with geotechnology. It allows you to virtually "zoom in" on any location in the world. In areas of high elevation gain the z-axis, or height of an object, is also displayed. Very cool. You can download basic Google Earth for free. Here's how:

- Go to http://earth.google.com
- Click on "Downloads"
- Select your operating system (OS) and click the "Download Google Earth" button
  **NOTE: If you are using Windows, hold down the "CTRL" key when you click the button to by-pass Windows' security block
- When given the option of how to download the .exe file, choose "Save"
- Navigate to the location where you want to save the program—I suggest your desktop
- Once the program is downloaded, double-click the Google Earth set-up icon and follow the instructions

Once you have Google Earth installed on your computer, double-click on the Google Earth icon (NOT the set-up icon) and wait for it load. Spend some time getting familiar with Google Earth's interface. For example, when you move your mouse pointer anywhere on the image, a small compass appears in the upper right-hand corner. You can use this to "spin around". Next to the compass are two white bars. Click and drag across these to zoom-in and zoom-out and also tilt the image. ***NOTE: you can also zoom-in and out using your "scroll" function on your mouse and the arrow keys on your keyboard.* In the "Fly to" box in the upper left-hand corner, you can type any city and state or address or even latitude and longitude coordinates, and Google Earth will "fly" you there.

After becoming familiar with Google Earth, find the location you mapped for Part I of this module. Zoom-in and pan until you capture nearly the same area, like so:
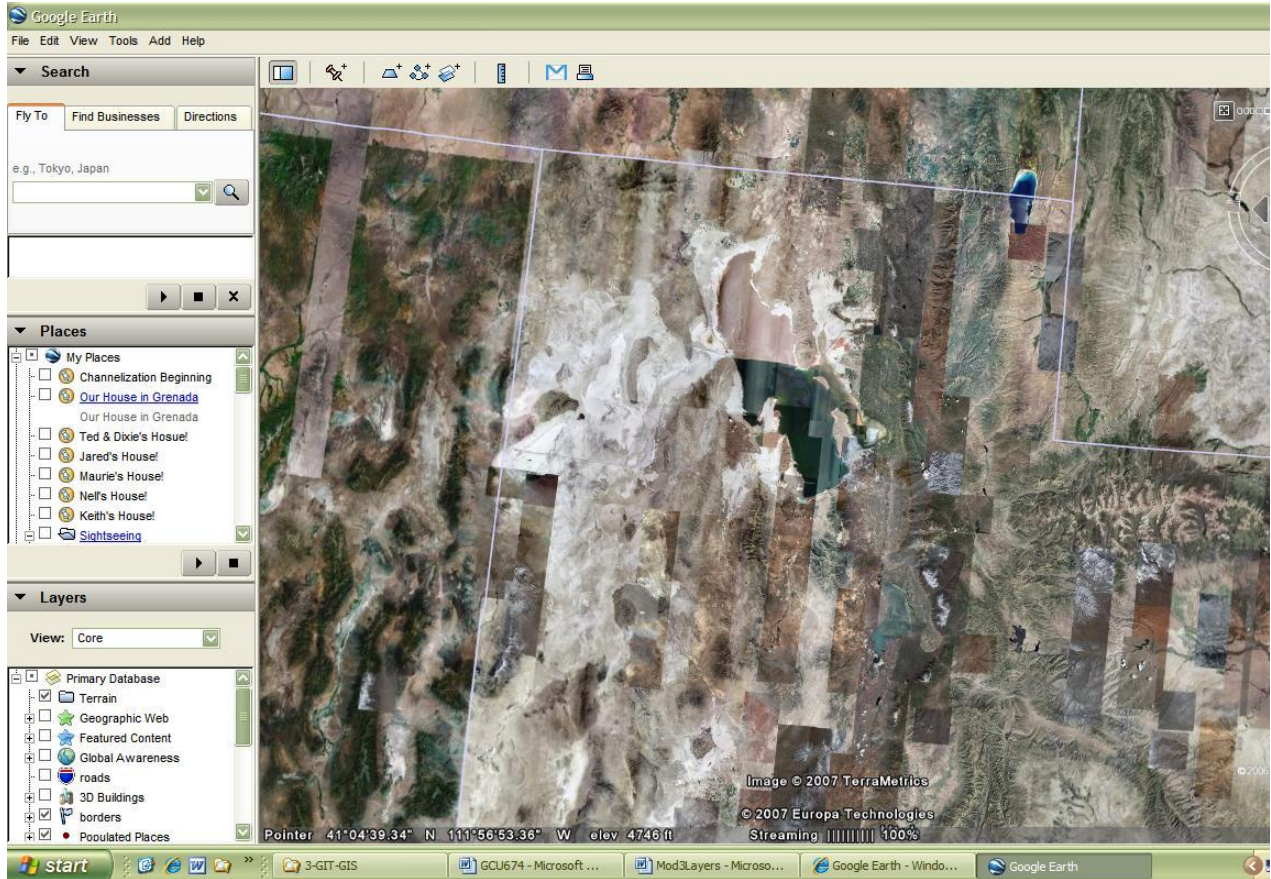
Capture the image, as outlined above, and "crop" it to a comparable size with your layered map. Something like this:

When placed side-by-side, the thematic map and the Google Earth image can be compared and contrasted to reveal even more spatial comparisons. As an example, compare these two samples, the thematic map and the Google Earth image:

Google Earth image.

Watersheds, Dams, and Orchards of Northern Utah
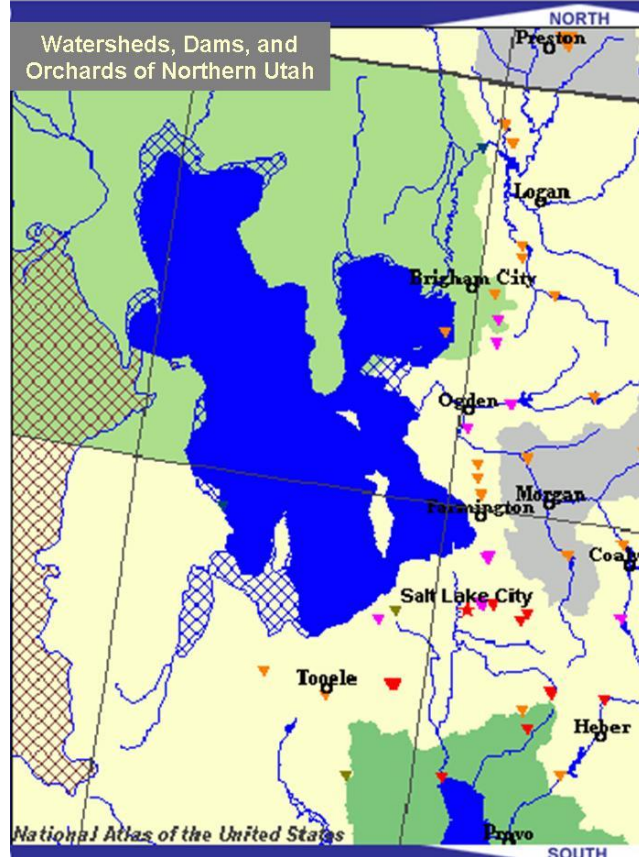
National Atlas image.

What spatial phenomena really stick-out when you analyze each of the images? For example, how does the terrain on the Google Earth image affect your analysis of the watersheds, dams, and orchards? Do you notice similarities? Differences? Why or why not?

SEE BELOW FOR PICTURES OF STUDENTS WORKING ON THIS AND COMPLETED ASSIGNMENTS.

Freshmen in the picture above. Took 2 hours or so.

Sophomores in the picture above. Permission was given to post these pictures.

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