

GeoMap App

SWAC Module 7: GeoViewers



1. Opening the Program

Click on the GeoMapApp Icon. The first window to appear is entitled “Choose a Base Map Projection” and offers us three different choices. A map’s **“projection”** defines how we convert the three dimensional Earth into a two dimensional map. Because it is impossible to accurately render three dimensions on a two-dimensional plane, all projections have a certain degree of distortion associated with them. Understanding this distortion (whether it be positive or negative) is an essential part of creating and interpreting maps.

The first choice is the “Mercator” projection, which maps the entire world. The Mercator a common choice for maps of the entire United States, and distortion remains relatively low over the continental states. It is important to note that **distortion increases as distance from the equator increases**, so **landmasses in higher and lower latitudes appear larger than they actually are.**

The second choice is the “South Polar” projection, which maps the southern latitudes of the Earth. Because this projection is specifically designed for use in the South Polar Region, distortion there area is very low; making it a better choice than the Mercator if the study area is near the South Pole.

The third choice is the “North Polar” projection, which serves exactly the same purpose as the South Polar projection.

Select the “Mercator” projection and click “OK.”

2. Exploring the Interface

After selecting the projection, the program launches the geographic interface. GeoMap App is a light-weight web-based application that relies on an internet connection to load data (meaning that no data is stored on your personal computer) This can be a mixed bag although it is convenient not to have to waste valuable hard drive space on large datasets, if your internet connection is disrupted, so is GeoMap App. Lamont-Doherty also occasionally updates their information, which temporarily halts access to the program.

We can see a window that contains a graphical map with the projection that we defined in step one, a toolbar with several icons, and the program bar with several drop down menus. The Application also launches a separate window the is entitled “Layer Manager.” We will see why this window is important in just a few minutes.

Take a second to explore the drop down menus-

The **Basemaps** menu offers 12 sub options of various types. Each of these Sub-Options has yet another series of choices. These different choices represent some of the potential data that GeoMap App allows us to access.

The **Portals** menu allows users to view geophysical data that is in the process of being collected. It allows users to interact with the information, giving the user the power not only view, but to manipulate the data.

The **Datasets** menu contains tabular data (excel tables) for a variety of scientific fields.

The **Focus Sites** menu provides links to data for a NSF project exploring continental margins.

The **Overlays** menu allows users to superimpose basic geographic information such as country boundaries, coastlines, and other map features.

The **Bookmarks** menu allows users to save areas of interests as bookmarks, similar to how we save our favorite web addresses. Unfortunately, since GeoMapp App is a web-based program, the bookmarks are lost when the program is closed.

The **Education** menu lists a series of educational resources for those interested in using GeoMap App as a teaching resource.

The **Help** menu contains support resources for the program.

3. Accessing the Data

Let's take a look at some of the data available to us through the GeoMap App.

Select: **Basemaps/Precipitation/Radar Image of Current Rainfall Over US**

We now have realtime radar data showing rainfall over the US. Notice that on the Layer Manager, a new layer called "Radar Image of Current Rainfall Over US" has been added. Think of Layers as being panes of glass with information painted on them. If we have one pane that is completely covered with paint (the map that we selected), and we lay a piece of glass that only has part of the surface painted, we will see what is beneath through the glass. However, if we rearrange the glass so that the completely painted piece is on top, we will not be able to see the pane below. This is how layers work. **We can adjust the position of layers by clicking on the up and down arrows in the Layer Manager window.**

Let's say that we want to look specifically at Vermont, and want to see our Radar Data at a better scale. To do this, we need to zoom to the relative area of Vermont. This is accomplished using the **zoom button**. We have two options: **we can either repeatedly click the button until we are satisfied, or we can define the area by holding down the left mouse button and drawing a square.**

Since we are interested in Vermont, it might make sense to display the State Boundary line so that we can differentiate between Vermont and the states that surround it. **Click Overlays/Local Administrative Boundaries/United States/US State Boundaries.**

Again, this layer is added to the Layer Manager.

Now we can see Vermont a lot better, and can once again refine our zoom area by drawing a square with the zoom tool. Should we want to zoom out, we can use the exact same procedure with the **zoom-out** tool, OR we can click **Bookmarks/Zoom out to Global Scale** if we want to zoom way out.

Should we need to pan around a given area, we have two options: we can either **adjust the sliding bars at the bottom and side of the window, OR we can use the Hand tool, which allows us to move the map similar to how we would move a globe in real life.**

4. Interpreting the Data

Let's take a look at how we can use the GeoMap App to look at some longer scales trends.

Deactivate the Radar layer by un-checking its box in the Layer Manager window.

Click on Basemaps/Land Surface Temperatures/Recent Day.

We want to make sure that we can still clearly see the state boundaries, so we should move this layer to the top of the Layer Manager.

Move the State Boundaries layer to the top of the Layer Manager using the “up” and “down” arrows.

The name MODIS stands for “Moderate-Resolution Imaging Spectroradiometer” and is a passive NASA satellite that records outgoing radiation signatures. From these data, a variety of measurements ranging from Cloud Altitudes to Surface Temperatures are calculated.

The data that we just loaded represent average daily temperatures for one month. The resolution of the data is approximately 10km.

*Note the window entitled “**Symbology**” that appears. A map’s symbology simply describes the color scales or other symbols that the cartographer uses to represent various datasets.*

*It is difficult for us to see what lies beneath this temperature layer because it’s **opacity** is set to 100%. In order for us to be able to interpret this data, we need to be able to see the landscape below the temperature layer. To accomplish this, we will reduce the opacity of the Recent Day layer.*

Drag the sliding button on the Recent Day layer to the left to change the opacity.

Zoom out so that all of New England and Metro-NY is visible.

Take a look at the map. What do you notice? Why might there be differences in temperature from one region to another?

1.

2.

3.

We should see if these same interpretations also hold true during the nighttime.

Deactivate the Recent Day layer by un-checking its box in the Layer Manager window.

Click on Basemaps/Land Surface Temperatures/Recent Night.

Drag the sliding button on the Recent Night layer to the left to change the opacity.

Move the State Boundaries layer to the top of the Layer Manager.

What do you notice about this data layer? Do your hypothesis from the Day Temperatures hold true for the Night Temperatures?

5. Sharing and Exporting

*Now that we have created a map complete with data, we can export it to use in class or in another application. To do this, we must first select the proper “**extent**”. A map’s extent simply refers to the area that the map covers. *Note that **ONLY** the data that is **CURRENTLY BEING DISPLAYED** will be exported during this process (this means that if there is data that is in the Layer Manager, but is **NOT** being displayed in the map window, it will be **OMITTED**.)*

*We would like to save a map of the entire New England Region. **Use the zoom tools to center the map view on New England.***

Then click File/Save Map Window as Image/Grid Window.

*The save option will depend on the types of data in the window. In this case, we have the option to save in 4 different formats. The .jpeg format is usually sufficient if the image is going to be used in printed material, but the .png format will retain more information. *Note*

that GeoMap App allows the user to select the Google Earth .kmz format. This will be especially useful for bridging the two programs later on.

Select the .jpg option and press ok. A dialog box comes up asking whether to Remove Insects or not. Our only inset is the small box that shows our Map Window's extent in the entire worldview. **This option is up to you personally, but for simplicity's sake, click yes. Select your save location, a meaningful name, and then press save.**

We now have a .jpg image file with the map that we created.

6. Conclusions

In summary, GeoMap App is a powerful web-based tool that allows users to access, view, and export a variety of data. Although the program gives the user access to a lot of information, it has eccentricities that make it difficult to produce finished maps, and can be frustrating when used with a slow Internet connection. What it is extremely useful for however, is functioning as a library from which to draw data to add to programs like Google Earth. Its lightweight design and compact features make it an ideal platform for introducing students to different types of data, all packed in one relatively simple to understand (and **FREE!**) program.

GeoMap App Links

<i>GeoMapApp Homepage</i>	http://www.geomapapp.org/
<i>Macintosh Install</i>	http://www.geomapapp.org/MacInstall.html
<i>Microsoft Install</i>	http://www.geomapapp.org/MSInstall.html
<i>User's Guide</i>	http://www.geomapapp.org/GMA/newHelp/GMAHelp_2.html
<i>Sample Teaching Application</i>	http://serc.carleton.edu/margins/webinar_s09/