

The following exercise requires access to a computer with Google Earth installed and an internet connection.

Geographic Exploration Systems. This is a term that was coined by David Maguire, VP of ESRI back in the summer of 2006. It is a term that refers to the technologies and tools that have come out of the Web 2.0 revolution and include everything from Yahoo! Maps to Google Earth and sites like Platial or GeoCommons that take advantage of these tools. GES, also known as virtual globes, are limited in functionality in comparison to a full Geographic Information System, but they offer free and accessible means to any with a computer and internet connection, enabling a whole new audience to begin to think spatially and explore the world around them.

For this exercise we will use Google Earth. If you have a computer you can download the software for free from earth.google.com, if not, the software is installed on many of the computers in the teaching labs on the 4th floor on Brooks Hall.

Geocoding/Address matching

One of the most recognizable features of a GES is the ability to match an address to a given location. This location is based on a relative method, so it is rare that the point ends up in the exact location, however it is usually close enough for most purposes. As an example, type in your parents' home address. How close to the house is the marker? Generally the location will be better approximated in urban areas than in rural. Next, search for 99 Beechurst Ave, Morgantown, WV, which is the address for Brooks Hall. As you can see, the location is in the parking lot across from Hodges Hall.

Creating data

While it is great to be able to find locations, what do you do when you find them? If it is a one-off search then it isn't a big deal, you simply erase the point and move on with your day. However, if you want to reuse the point, without having to retype the address every time, you will need to create a marker for the location. We are going to create a point for Brooks Hall so that we can reuse it later in the exercise. Using the pushpin tool at the top of Google Earth, place a marker over Brooks Hall, the building directly north of the PRT station. Creating the point like this is referred to as on-screen digitizing. Next search for your parents house again. In the Table of Contents list on the left, right-click on the address and choose Add Placemark. As you can imagine this would be the way to add data to a project if you had a long list of addresses or even a series of Lat/Long coordinates. There are many tools that allow you to convert a list to Google Earth's KML format. Make sure to name and attribute the marker for your parents' house using the dialog box that pops up before moving on.

In addition to being able to create point markers you can also create paths (lines) and polygons, and even overlay your own map imagery onto Google Earth. You can create collections of data and share them using the KML format or you can create screen captures to share. Keep in mind that while you can use Google Earth for free, there are some restrictions on how you can reuse their data (imagery, roads, etc).

Routing

Once you have two locations (or more) you may want to find the best route between them. Right-click again on your marker for your parents' house in My Places on the left and choose Directions From Here. Then right-click on Brooks Hall and choose Directions To Here. By running this route process you can get not only detailed directions, but if you scroll to the bottom of the directions you will find the distance and the estimated travel time.

Each of the steps above offer simple ways to obtain information that could be used for any number of purposes in the real world from planning your next vacation to creating a bid for a new project. While Geographic Information Systems like ESRI's ArcGIS are far more powerful analytically, for most projects, simply thinking spatially and using free tools will support your needs. You should become familiar with each of the GES (e.g. Microsoft's Virtual Earth, NASA's WorldWind, ESRI's ArcGIS Explorer to name just a few) and what tools they can offer. Beyond that you may also want to take a look at some of the free and OpenSource GIS packages such as Quantum GIS (qgis.org) and uDig (<http://udig.refractions.net/confluence/display/UDIG/Home>), both of which are cross-platform and can run on Windows, MacOS X, and Linux, and offer a great price and relatively good functionality, especially if you are just getting started.