GEOSPATIAL TECHNOLOGY

Data, data, data… data is everywhere. It's collected every time you go to the grocery store and use their card to reduce the costs when you click on a link on Facebook, or when you do any kind of search on a search engine like Google, Bing, or Yahoo!. It is used by the state department of transportation when you are driving on a freeway, or when you use an app on a smartphone. Futurists believe that in the near future, face recognition technology will allow a sales representative to know what types of clothes you like to buy based on a database of your recent purchases at their store and others.

Now there are two basic types of data you need to know: spatial and non-spatial data. Spatial data, also called geospatial data, is data that can be linked to a specific location on Earth. Geospatial data is becoming "big business" because it isn't just data, but data that can be located, tracked, patterned, and modeled based on other geospatial data. Census information that is collected every 10 years is an example of spatial data. Non-spatial data is data that cannot be specifically traced to a specific location. This might include the number of people living in a household, enrollment within a specific course, or gender information. But non-spatial data can easily become spatial data if it can be linked in some way to a location. Geospatial technology specialists have a method called geocoding that can be used to give non-spatial data a geographic location. Once data has a spatial component associated with it, the type of questions that can be asked dramatically changes.

Remote Sensing

Remote sensing can be defined as the ability to study objects without being in direct physical contact with them. For example, your eyes are a form of *passive remote sensing* because they are "passively" absorbing electromagnetic energy within the visible spectrum from distant objects and your brain is processing that energy into information. There are a variety of remote sensing platforms or devices, but they can be categorized into the following that we will look at throughout the course. Satellite imagery is a type of remotely sensed imagery taken of the Earth's surface, which is produced from orbiting satellites that gather data via electromagnetic energy. Next is aerial photography, which is film-based or digital photographs of the Earth, usually from an airplane or non-piloted drone. Images are either taken from a vertical or oblique position. The third is radar, which is an interesting form of remote sensing technology that uses microwave pulses to create imagery of features on Earth. This can be from a satellite image or ground-based Doppler radar for weather forecasting. Finally, a fast-growing realm of remote sensing is called Light Detection and Ranging or Lidar, which is a form of remote sensing that measures the distance of objects using laser pulses of light.