All About GIS Maps

Accuracy and Precision

Mapping today has so many critical components that all add up to the final product. Each of the elements that make up todays maps, can all have varying levels of error. When the data is gathered from different sources, with different techniques, over a large time period, combining the data can be tricky.

> *Accuracy* can be defined as the degree or closeness to which the information on a map matches the values in the real world. Therefore, when we refer to accuracy, we are talking about quality of data and about number of errors contained in a certain dataset. In GIS data, accuracy can come from the geographic position, attribute, conceptual, etc.

> *Precision* refers to how exact the description of the data is. Precise data may be inaccurate. It may be exactly described, but inaccurately gathered. For example, the surveyor made a mistake, or the data was recorded incorrectly into the database.

Some sources of error in GIS data are very obvious, whereas others are more difficult to point out. GIS software has the ability to display the data to a viewer that **appears** accurate and precise to a degree but that is **not quite real**. The maps displayed are the "*probable*" location within a certain area and are not to be used for survey purposes or any legal boundary disputes.

Imagine peeling an orange, it cannot be completely flattened unless compressed, stretched or torn into pieces. Now apply this image of the orange peel to the earth's surface and trying to fit it on a 2D map on your computer screen.

To learn more about accuracy and precision errors in GIS:
http://www.colorado.edu/geography/gcraft/notes/error/error_f.html

If you feel that your property has been mapped inaccurately please contact our office with details of your discrepancy Lake County makes every effort to ensure the accuracy of our data. If the survey is out dated or we are unable to process it, you have the right to get a new survey to dispute the boundary at any time.

What is GIS?

A Geographic Information System (GIS) integrates hardware, software, and data to capture, manage, analyze, and display geographic information. Many organizations use GIS to examine data, answer questions, solve problems and most importantly, make informed decisions in thousands of different situations. For example, government organizations use GIS to track a host of different data from earthquakes to the incidence of heart attacks and strokes, then position this information on maps. One very large benefit of computerized maps is that they can quickly combine information from different sources or layers and display them on the same map.

Layers, Features, and Attributes

Information in web-based maps is separated into layers. Each layer can have a different set of information. For example, if you were wanting to keep track of parcel data, you would have one layer that showed parcels, and another layer for roads, and yet another for boundaries.

Each layer of the map has features on it, for example the parcels on the parcel layer and road types on the roads layer. Each single feature (parcel) has information about it in the form of attributes, for example, the owner of the parcel, owner's mailing address, legal description, etc. So, although any one parcel may be only a polygon on the map, that polygon contains information about all the attributes of that parcel. If you think about all the parcels on any map, plus the roads, boundaries, lakes and all their attributes, that is a lot of information.

The information is stored in a database but because this is a computerized map, it can access all the information in not just one, but multiple databases if it needs to.

For example looking at the single parcel and its attributes. If we had to track all the information about the parcel, we would enter it in a spreadsheet or database as a single record. Each category of information, for example owner name, is called a Field.

Single Record in a Database

ID:	Name:	Address:	Street:
11	Alli	128	Harrison Avenue

Multiple Records in a Database

ID:	Name:	Address:	Street:
12	Alli	128	Harrison Avenue
13	Miguel	129	Harrison Avenue
14	Cathy	130	Harrison Avenue
15	Tony	131	Harrison Avenue
16	Jackie	132	Harrison Avenue
17	Anne	133	Harrison Avenue

For a neighborhood, we would not only want to track the attributes of each parcel; but also where each parcel is positioned in relation to all the others in the neighborhood. If we plotted their position on a map, it would look something like the Tax Parcel Viewer Map.

Mapping Locations

This ability to add spatial data and information (attributes) is the foundation of GIS. A GIS tells us not just where something is but also *what* it is. Computers make GIS possible as computers link the maps to databases of information. By using a computer, we can have hundreds of fields (different attributes) for an endless amount of records.

Web-Based Maps vs. Paper Maps

Paper maps tell you a few things about something on the map, but web-based maps are far more powerful, they allow you to interact with them. In the future Lake County will provide multiple interactive maps for various purposes, stay tuned.

About Map Features

Features are the collection of items found on one map layer. Each feature has a number of information attributes. For example, if you were looking at a Parcel layer that shows people's properties, each parcel is a feature. Each parcel feature has attributes, which may include: The ID number of the parcel, area and shape of the parcel, parcel owners, buildings on the parcel, the address, the zip code, the mailing address, the value of the land, total acres, etc.

About Layers

Web maps separate information into layers. This means that you can show or hide information on the map by turning on or off layers. It also means that you can have multiple layers of information on a single web map.

A map layer is really a category of information like streets, bridges, buildings, properties, etc. Any information can be represented on a layer, but to make it easier to read, the information is represented in simplified abstract ways. For example an address would be represented as a point, a river as a line, a parcel/property area as a polygon. The features on a layer can be represented in two ways on a computerized image - Vector or Raster.

Vector Layers

In vector layers, features are usually represented as points, lines, and polygons.

Points: Points are used to show where a feature is when its physical shape is not important (for example, customers, below).

Lines: Lines are used to represent features that are continuous (for example, the streets, below).

Polygon: A polygon is a solid, multi-sided shape. Polygons are used to represent features that occupy an area. Everything inside the boundary of the polygon is one record and has the attributes of that record (for example, parcels, below).
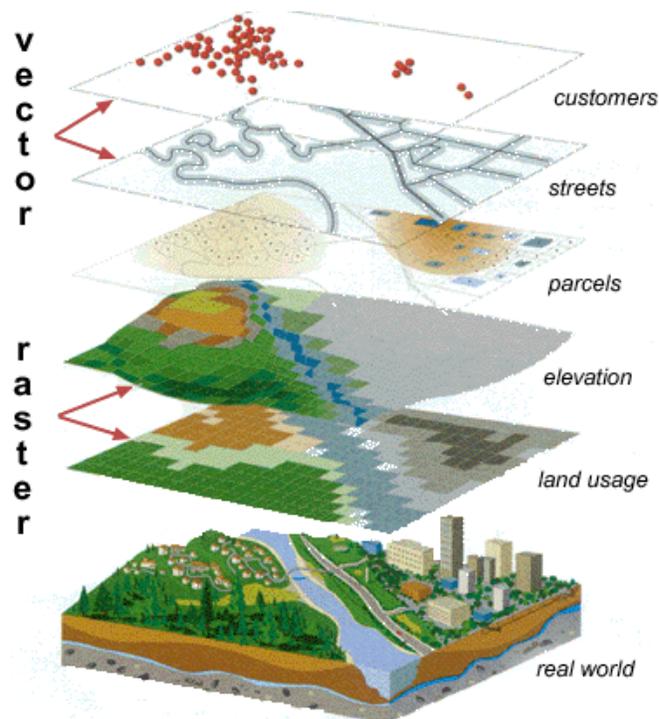
Raster layers

Raster layers are made up of pixels in a grid. Web maps that are images, often have a raster layer, this is how digital photos are stored. Raster images do not have attributes attached to their features like vector images.

About Base Maps

A base map is a layer with geographic information that serves as a background. A base map provides context for additional layers that are overlaid on top of the base map. Base maps usually provide location references for features that do not change often like boundaries, rivers, lakes, roads, and highways. Even on base maps, these different categories of information are in layers. Usually a base map contains basic data, and then extra layers with a particular theme or from a particular discipline are overlaid on the base map layers for the sake of analysis. Some base maps look like Vector Layers but are actually tiled Raster layers. Tiled images are used because they display faster and deliver a good combination of layers for providing context and orientation. If your base map has raster layers, you cannot turn the layers off and on.