

# Fundamental Concepts of Geographic Information Systems (GIS)

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Toolbar Help

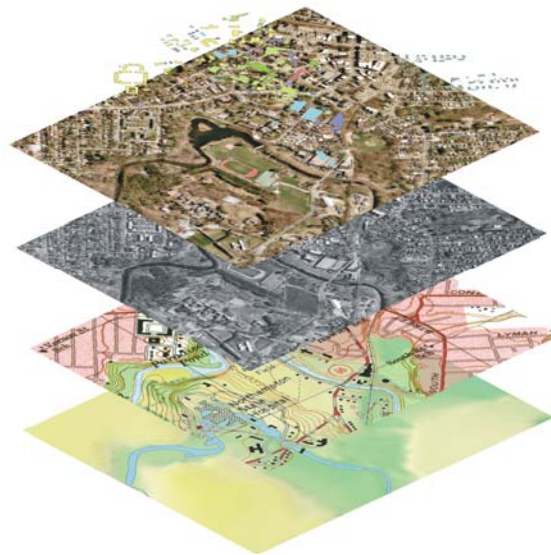
Interactive Mapping System

Mystery Map Series

Spatial Analysis Lab Home Page

# 1. GIS Data are separated and stored as Layers

The graphic below displays Layers from the Smith Campus area: a Digital Elevation Model; a USGS Topographic Map; a Black and White Orthophotograph (aerial image); a True Color Orthophotograph; and Campus Buildings floating above.



Buildings

True color aerial image  
(2001)

Black & white aerial image  
(1997)

USGS topographic map

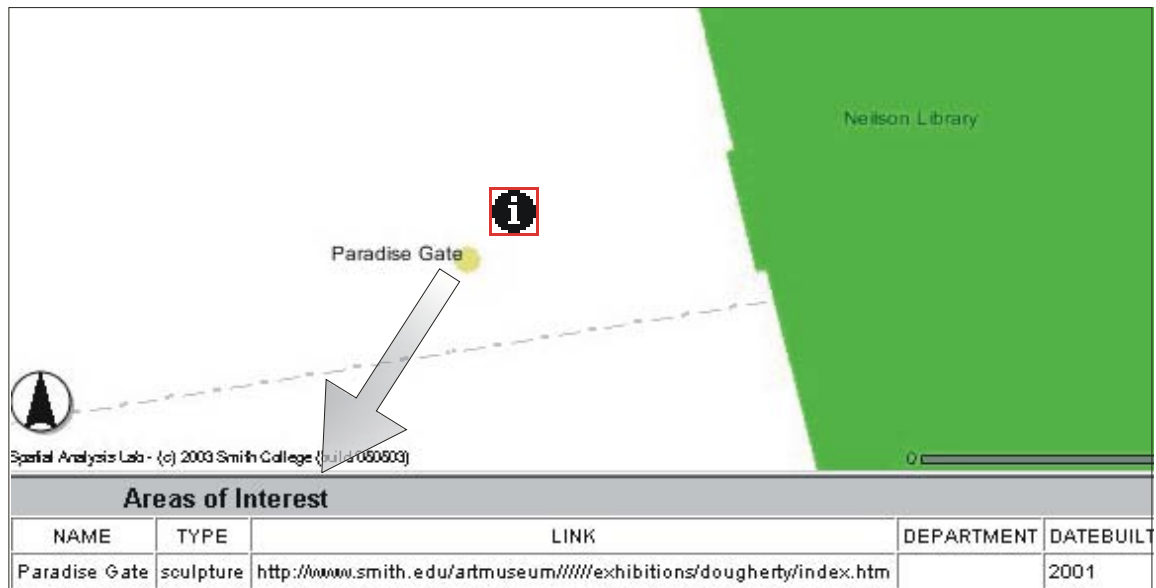
Elevation

# 2. Questions are often asked about an Active Layer



In this case our query or identification would return one or more Emergency Phones since it is the **Active Layer**.

### 3. Map Features have Attributes or Characteristics



The **Identify Tool** was used to access the attributes of Paradise Gate. The user may develop and store any type of attribute as necessary. Here we see Name, Type, a URL link, Department, and Date Built.



### 4. Map Features are typically represented with Points, Lines, and Polygons

In the graphic above, Paradise Gate is represented by a **Point** and Neilson Library is represented as a **Polygon**. You can also see a dashed **Line** feature that represents a land parcel. For the most part, Map Features are logical representations of true geographic features (e.g. fire hydrants become points and lakes are represented as polygons). However, Scale can play an important role in determining how features are represented.

## 5. Scale

Think of Scale as the percent reduction imposed on the real world to fit on a Map. Another explanation is that Scale represents the ratio of map distance to ground distance. By convention, 1 map unit is on the left side of the ratio. The right side of the ratio represents the ground distance equivalent of 1 map unit. For example, a Scale of 1:24,000 implies that 1 unit on the map equals 24,000 units on the ground. In other words, the map is reduced 24,000 times.

Also note that scale is unit free. Using the same example, 24,000 millimeters on the ground is represented by 1 millimeter on the map. You can also say 24,000 feet on the ground represents 1 foot on the map.

Zooming In  increases the scale and reveals more detail over smaller areas. Zooming Out  decreases the scale and shows more area, but less detail.

## 6. Index Maps show the area of detail in a Primary Map



At left is a typical Index Map. The **Red Box** represents the visible area in the Main Map View. You can also move the **Red Box** with your mouse to change the extent of the Main Map View.

You may also toggle the Index Map off if you want more room for the Main Map.