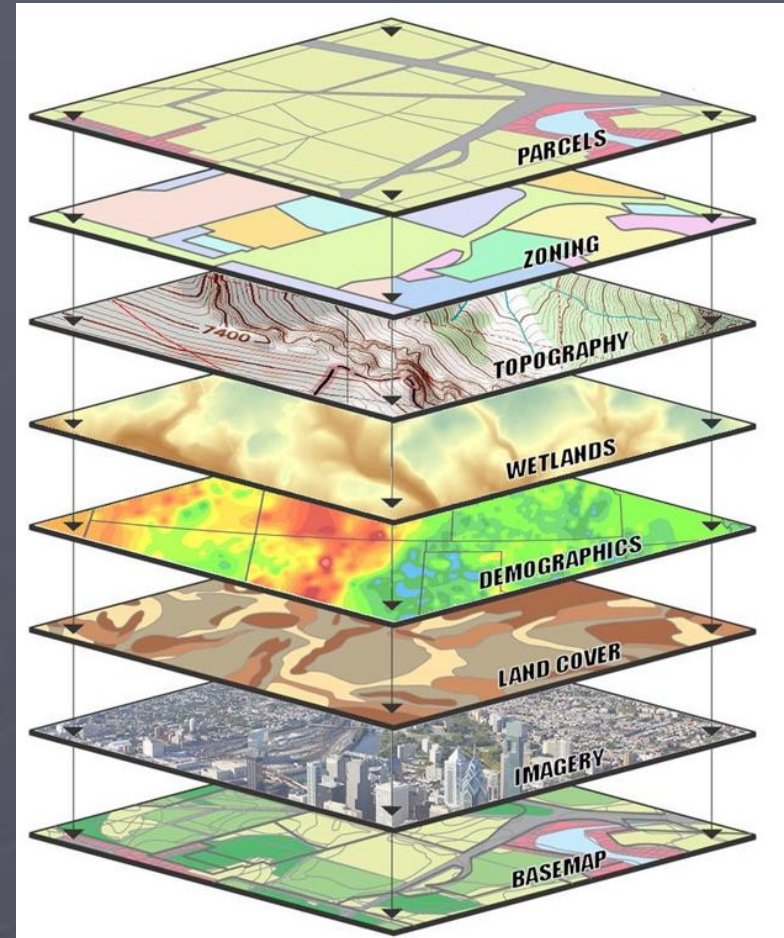


Understanding GIS Data



Geospatial Data

- Data is the different location or attribute based characteristics that can be entered in and displayed in GIS
 - Different data sets can be laid on top of each other as layers to be analyzed to find patterns and relationships



Two Main Forms of Data

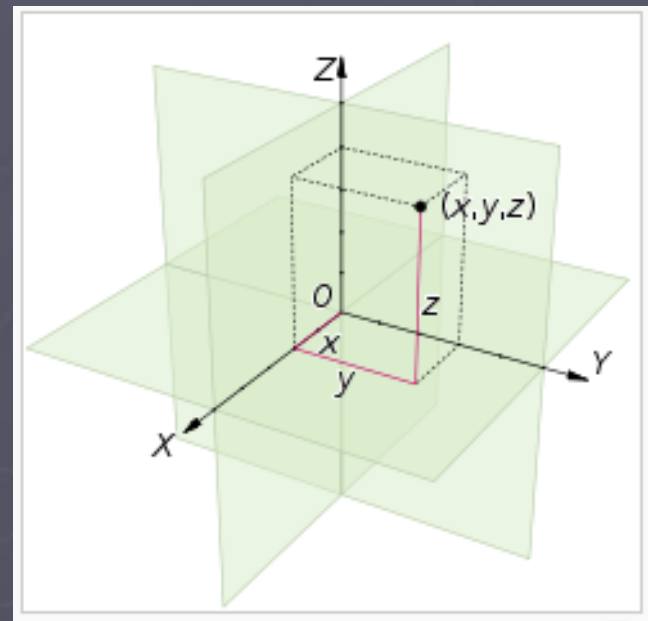
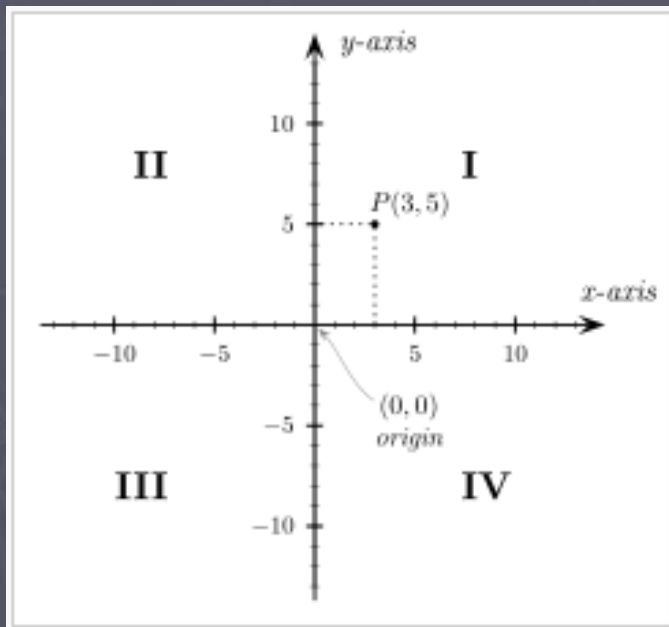
- Coordinate Data – Ways of measuring and plotting the physical locations of things
- Attribute Data – Adding non-location based characteristics to a map (size, color, depth, elevation etc...)



Name	FIPS	Pop90	Area	PopDn
Whatcom	53073	128	2170	59
Skagit	53057	80	1765	45
Clallam	53009	56	1779	32
Snohomish	53061	466	2102	222
Island	53029	60	231	261
Jefferson	53031	20	1773	11
Kitsap	53035	190	391	485
King	53033	1507	2164	696
Mason	53045	38	904	42
Gray Harbor	53027	64	1917	33
Pierce	53053	586	1651	355
Thurston	53067	161	698	231
Pacific	53049	19	945	20
Lewis	53041	59	2479	24

Coordinate Data: Cartesian

- Cartesian Coordinate System
 - Designed by Rene Descartes as a way of identifying locations by plotting them using a system of x and y axis



Coordinate Data: Spherical

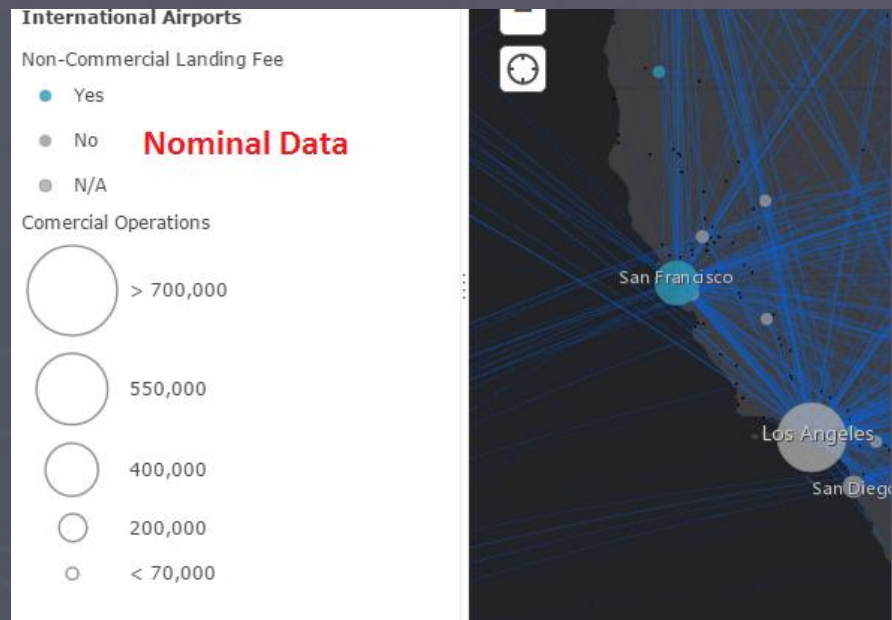
- Spherical Data

- Ways of writing latitude and longitude

- Signed Coordinates – Uses a system of positive (North and East) and negative (West and South) coordinates
 - Ex. St Paul is $+44.9442^\circ$, -93.0936°
 - Spherical Coordinates – Uses DMS system (Degrees, Minutes, Seconds)
 - Ex. St Paul is $44^\circ 54' 42''$ N, $93^\circ 09' 36''$ W

Attribute Data: Nominal

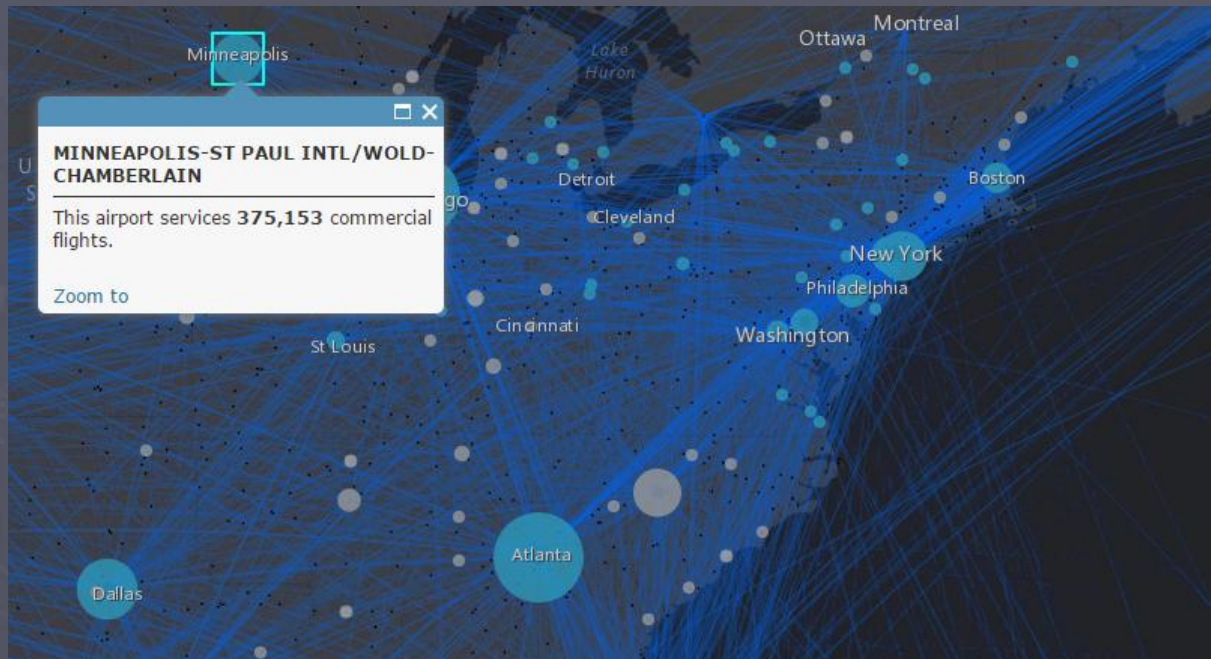
- Descriptive information about a feature that is not necessarily a location or have a number value attached to it
 - Ex. Color, Demographics, Name etc...



[International Airports in the US](#)

Attribute Data: Ordinal

- Data set that is organized by a ranking or order.
 - Higher rankings will appear larger or have attached color sets (or brighter)



Attribute Data: Interval

- Data with attached numeric items that do not need to be ranked or sorted based off their values
 - Ex. Area, length, weight, height, depth, date

The Age of Megacities

second-class citizens and forced into the city's periphery. During World War II, Johannesburg experienced another surge in population due increasing levels of rural poverty.

CLICK TO VIEW:

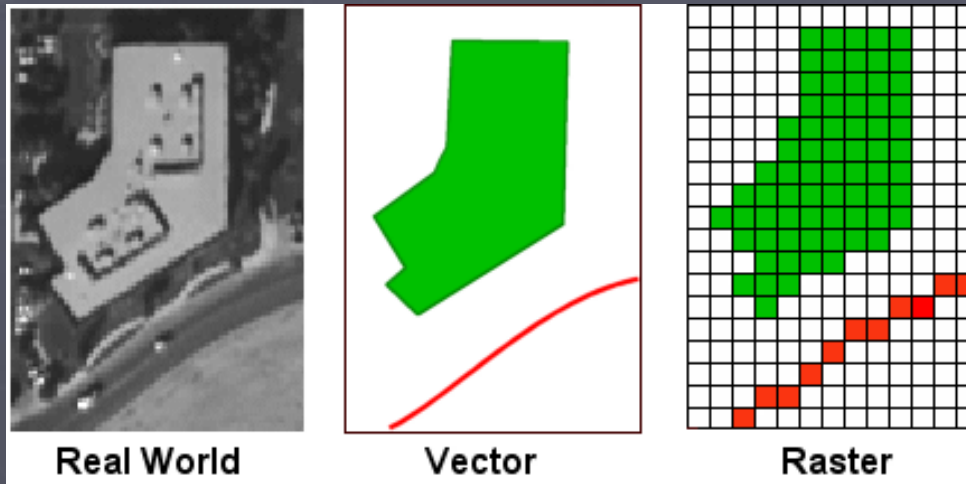
- [Johannesburg's urban extent in 1917](#)
- [Johannesburg's urban extent in 1938](#)
- [Johannesburg's urban extent in 1957](#)
- [Johannesburg's urban extent in 1984](#)
- [Johannesburg's urban footprint today](#)

Interval Data



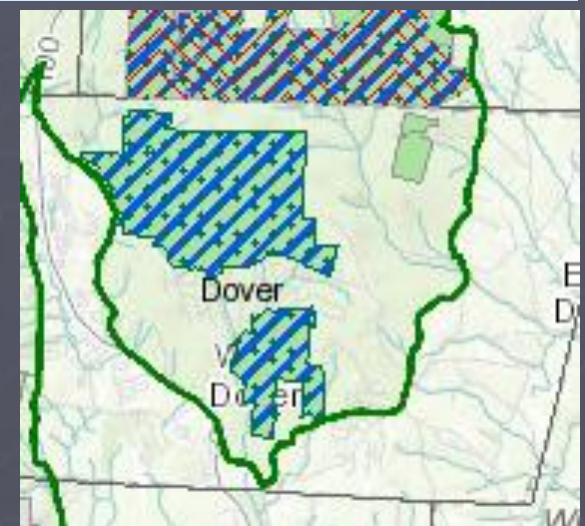
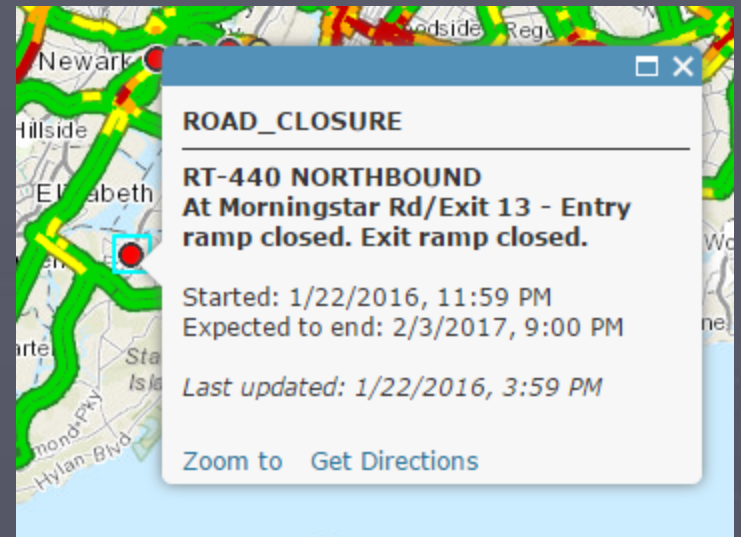
Spatial Data Models

- Different Data Models are different ways of portraying the real world in a geographic model
 - Displayed as either Vector Model or Raster Model
 - Which one to use depends on goals of map



Vector Data

- Uses Lines, Points, and Polygons to represent Data
- Good for showing abrupt changes
 - Dots – May have actual physical dimensions but not important to purpose of map
 - Ex. Using dots to represent road construction
 - Lines – Represent linear features as line segments or arcs
 - Polygons – Uses to represent area features
 - Ex. land cover



Raster Data

- Organizes an area as a x,y grid
- Used to represent continuous spatial features with gradual changes
 - Elevation, precipitation, slope, pollution
 - Shows gradual change on large scale maps, shows more drastic change on small scale maps
 - Larger cells mean more generalized data
 - Can have large variance but still only shows average

