

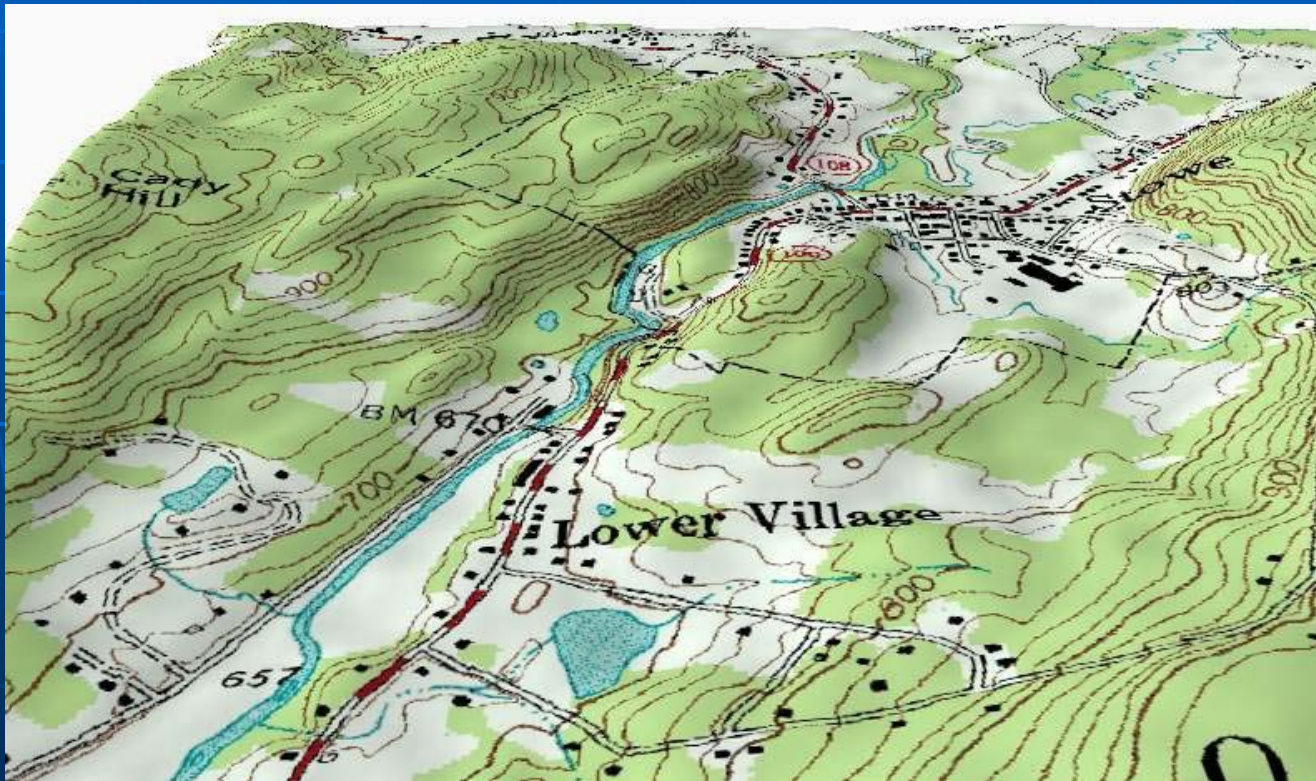
Visualization

Once the information is gathered, by surveying, aircraft, satellites how are these maps translated and visualized.

- Contour Lines or Topo's
- Shaded Relief
- Hypsometric Tints
- Digital elevation model (DEM) or Digital terrain model (DTM)
- Cartographic Relief Depiction

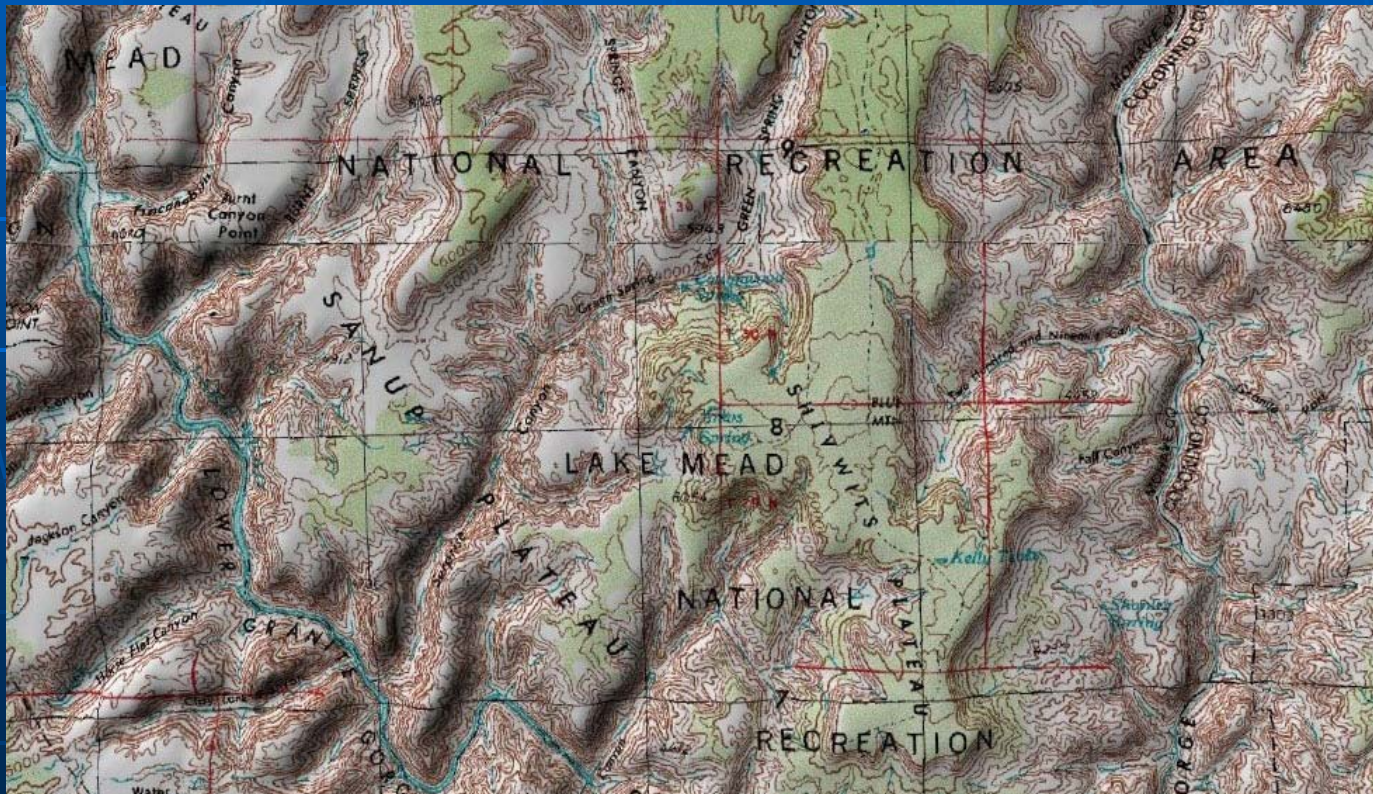
Contour Lines or Topo's Map

- Uses line to show elevation.



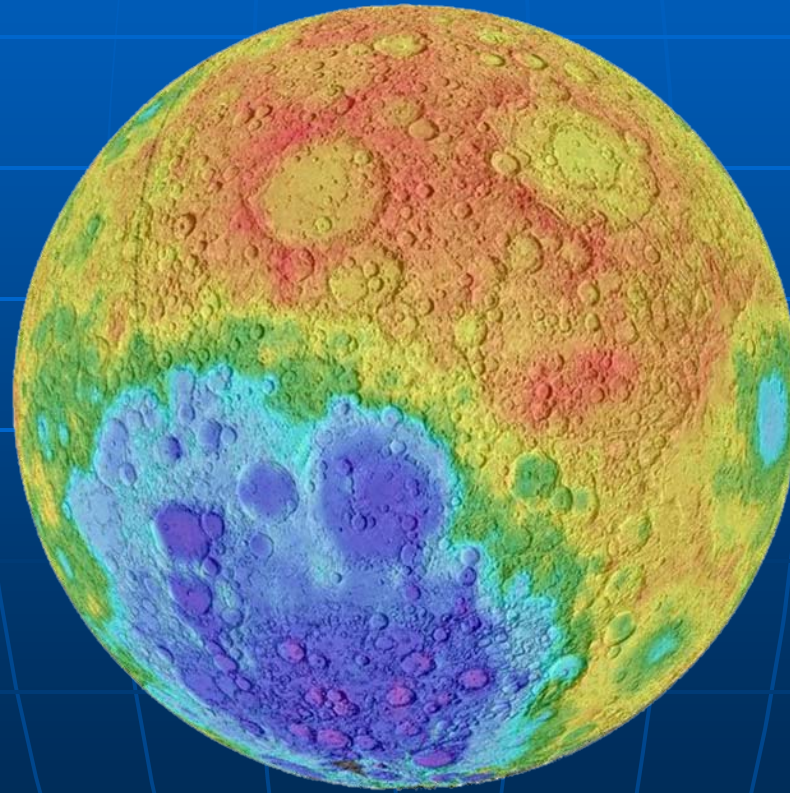
Shaded Relief Map

- uses light and shadows show elevation



Hypsometric Tints Map

- uses color to show elevation



Cartographic Relief Depiction Map

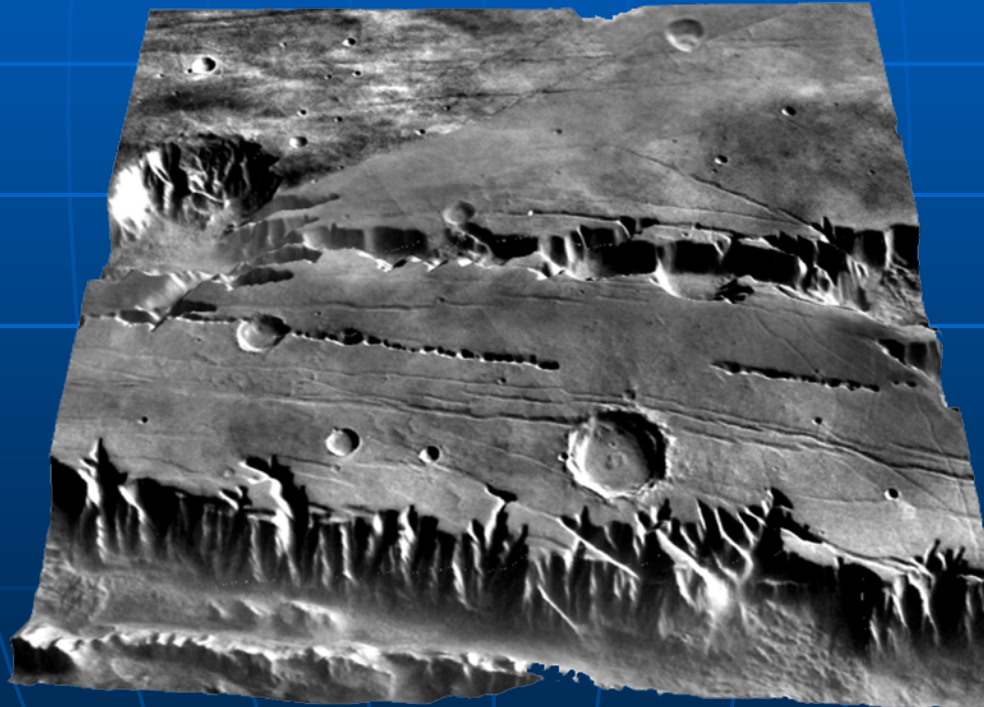
- uses this information to produce a 3D physical usually plastic structure



Digital Elevation Model (DEM)

Also known as Digital Terrain Model (DTM) map

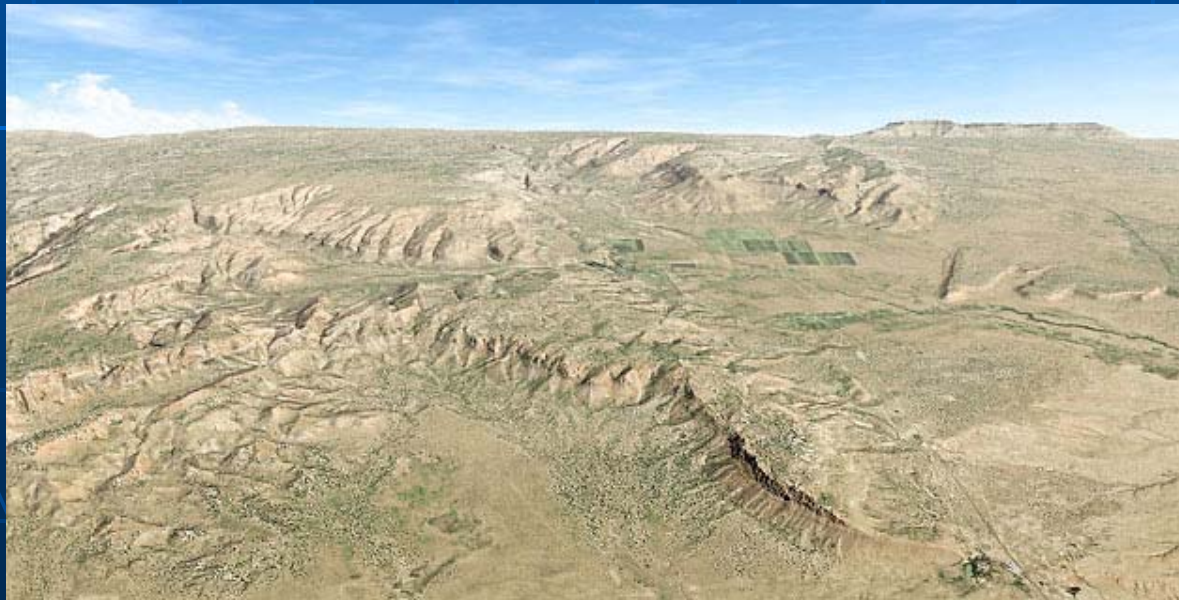
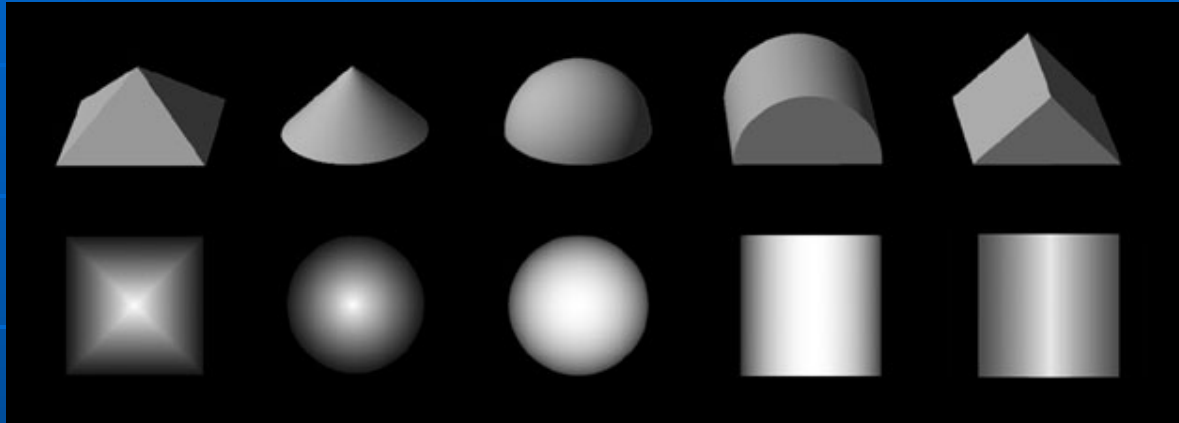
- uses satellite imagery to gather elevation information



Digital Elevation Models (DEMs):

- A height map is commonly used to create DEMs. A height map is a raster 2d greyscale image that's brightness represents elevation data for the grid coordinates, similar to the contour lines of a contour line map, but in a grid. DEMs take this color value and represent the elevation on a 3d representation. At the same time, DEMs can use contour map/vector information, just as topographic maps. There are very many programs out there that can visualize DEM and height map data in a 3d form.

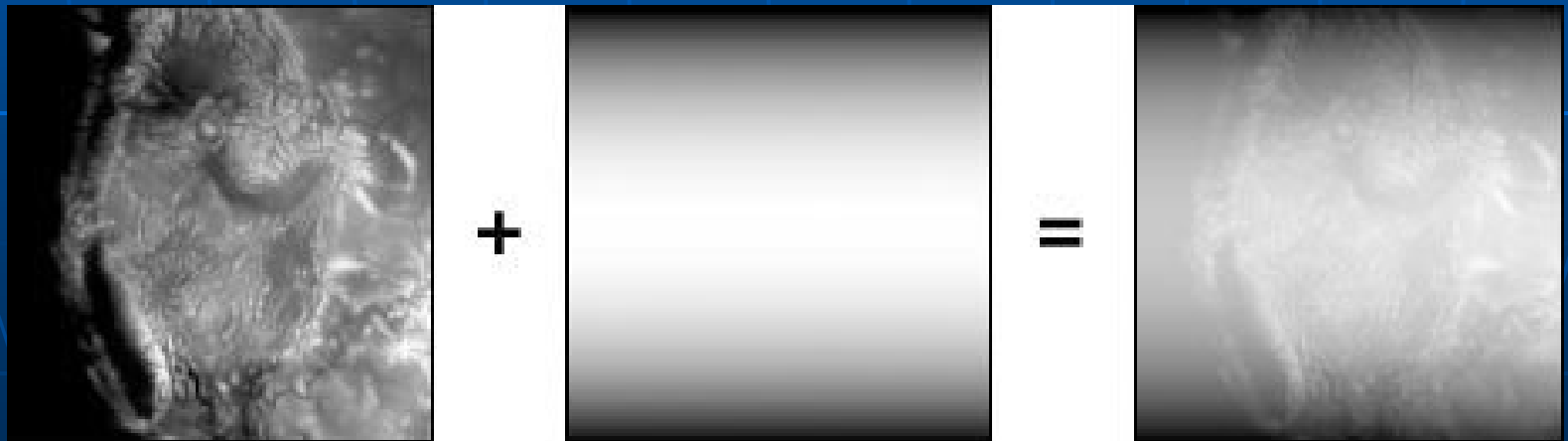
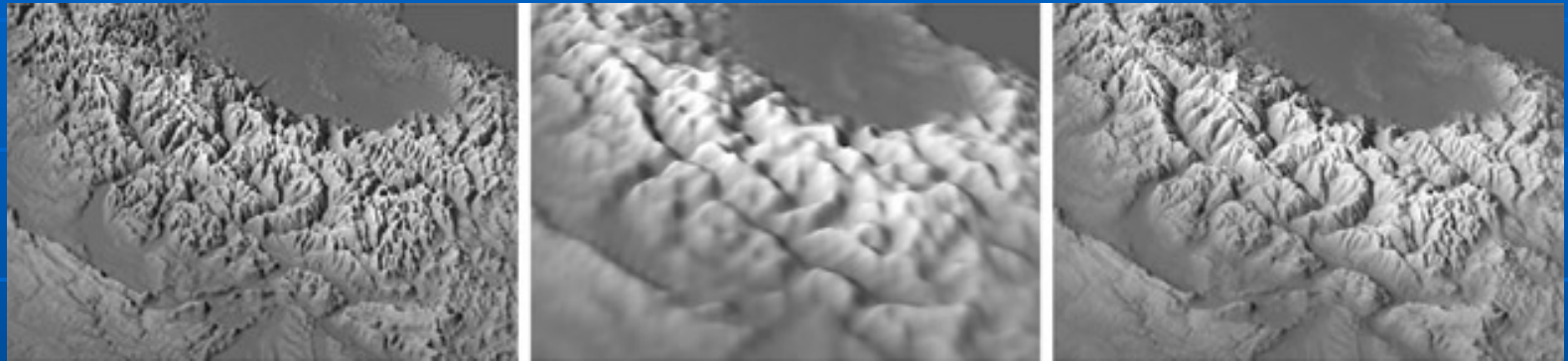
DEM's (cont)



DEMs (cont)

- DEMs are used very commonly by the National Park Service to create and display maps, images, and models that represent different landforms. After a DEM is created, there are many different methods used to make the information represented in the DEM even easier to understand. These range from stretching the map to fit specifications, changing resolution to simplify an image, or make it more detailed, combining high resolution with a low resolution, bending the plane of the DEM to create a 'realistic' airplane like view, to other things. Ex:
<http://www.shadedrelief.com/dem/dem.html>

DEM's (cont)



Common uses of DEMs

- extracting terrain parameters
- modeling water flow or mass movement
- creation of relief maps
- rendering of 3D visualizations.
- creation of physical models (including raised relief maps)
- rectification of aerial photography or satellite imagery.
- reduction (terrain correction) of gravity measurements
- terrain analyses in geomorphology and physical geography

Topological Maps

- A Topological Map is a map that has been simplified to only show vital information. Ex. Subway map, Bus route map, etc.



Sources

- <http://www.terrainmap.com/>
- <http://www.shadedrelief.com/dem/dem.html>
- http://en.wikipedia.org/wiki/Digital_elevation_model
- <http://en.wikipedia.org/wiki/Heightmap>
- [http://en.wikipedia.org/wiki/Geographic information system](http://en.wikipedia.org/wiki/Geographic_information_system)
- [http://en.wikipedia.org/wiki/Topographic map](http://en.wikipedia.org/wiki/Topographic_map)

Thematic Mapping



Use of Thematic Maps

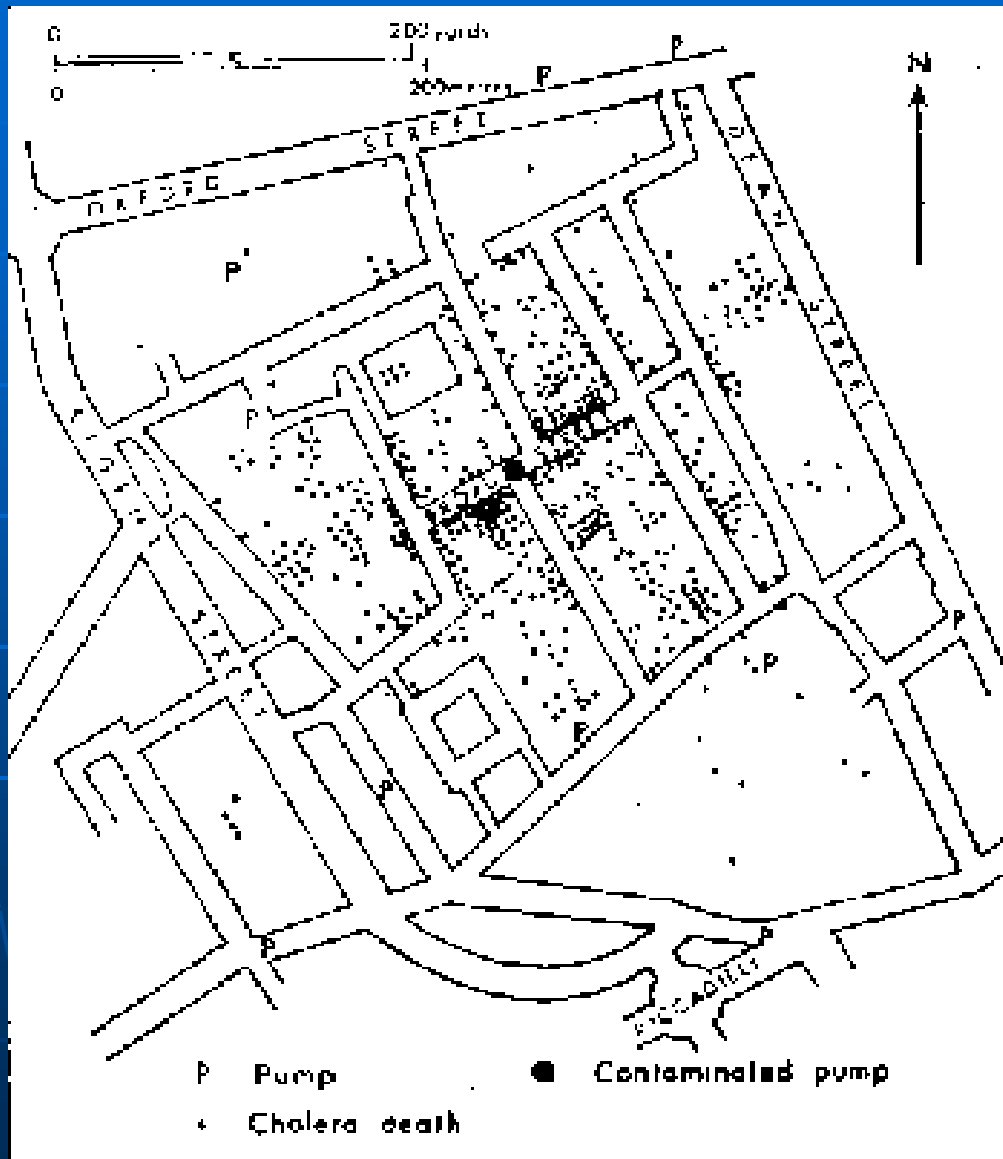
3 primary purposes:

- They provide specific information about particular locations
- They provide general information about spatial patterns
- They can be used to compare patterns on two or more maps

Common examples are maps of demographic data such as population density

Early Thematic Map

- Comes from London physician John Snow
- Though disease had been mapped thematically, Snow's cholera map in 1855 is the best known example of using thematic maps for analysis

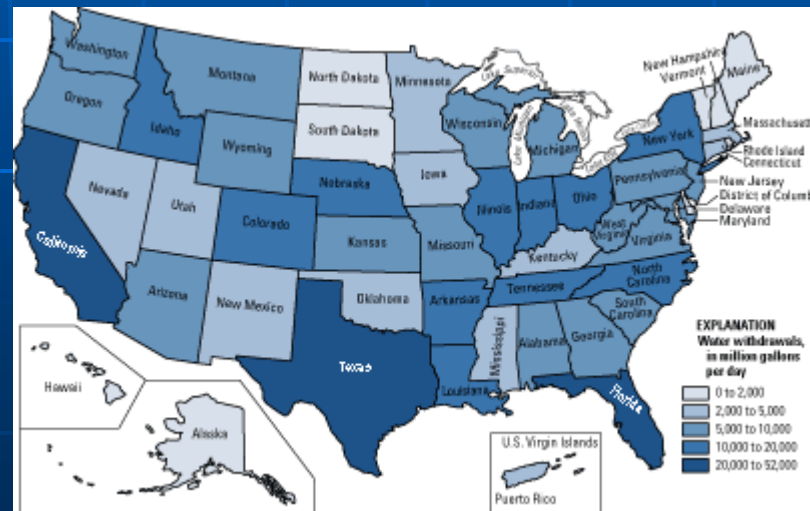


Constructing Thematic Maps

- select the physical area to examine
- next step is collecting data sets.
- Data Types:
 - **Univariate** Data dealing with one subject, which examines occurrences of a single type of event
 - Bivariate mapping shows the distribution of two sets of data to explore possibilities of correlations
 - **multivariate** mapping is Taking three or more data sets and displaying the result on a map helps determine possible correlations between different phenomena

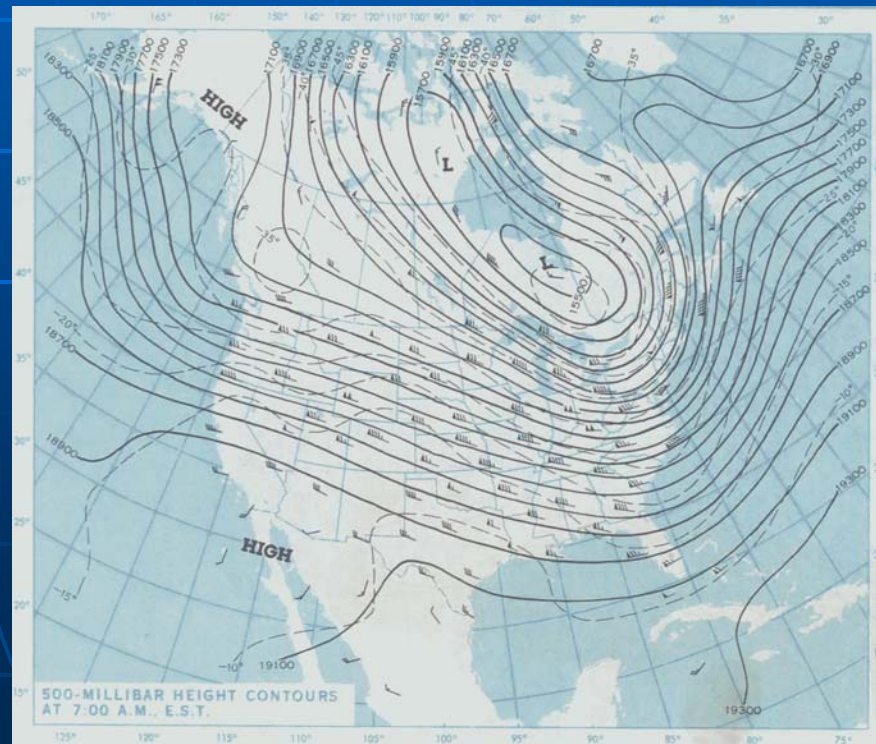
Types of Thematic Maps

- The most commonly used method of thematic mapping. Choropleth maps are particularly suited for charting phenomena that are evenly distributed within each enumeration unit (set area).



Types of Thematic Maps

- *Proportional symbol* maps represent data associated with point locations (i.e., cities or counties)
- *Isarithmic* also known as contour maps, depict smooth continuous phenomena such as precipitation.



Types of Thematic Maps

- *Dot* A map using dots to show the presence of a feature or occurrence and display a spatial pattern
- *Dasymetric* These maps utilize areal symbols However, although boundaries are displayed on dasymetric maps, these geographic units may span multiple theme

