

Layers:

In ArcGIS, a reference to a data source, such as a shapefile, coverage, geodatabase feature class, or raster, that defines how the data should be symbolized on a map. Layers can also define additional properties, such as which features from the data source are included. Layers can be stored in map documents (.mxd) or saved individually as layer files (.lyr). Layers are conceptually similar to themes in ArcView 3.

What are projections

Projections are a mathematical transformation that take spherical coordinates (latitude and longitude) and transform them to an XY (planar) coordinate system. This enables you to create a map that accurately shows distances, areas, or directions. With this information, you can accurately work with the data to calculate areas and distances and measure directions. As implemented in Geographic Information Systems, projections are transformations from spherical coordinates to XY coordinates systems and transformations from one XY coordinate system to another.

How can they help you?

Projections are chosen based on the needs of the map or data analysis and on the area of the world. Projections are useful for a limited set of purposes or scales. Finally, projections are based on local needs and standards.

Topic no 7: Map Design: symbols to portray Points, Lines and Volumes:

Maps

A map is a picture or representation of the Earth's surface, showing how things are related to each other by distance, direction, and size. Maps are a way of showing many things about a portion of the earth's surface on a flat piece of paper that can be carried and transported easily.

A map is not a photograph of the Earth's surface. It can show many things that a picture cannot show, and as a result, a map looks different in many ways from a photograph of the Earth's surface.

Reference maps:

Maps that give general information about the location of features are reference maps. Maps in a road atlas are an example of reference maps, as are topographic maps.

Thematic or statistical maps:

Those that show the distribution of a specific topic are thematic or statistical maps. A map showing population distribution by county is a thematic map.

Components of maps:

- **Title It**

The most basic component of a map is its title. The title should refer to everything the map covers.

- **Add a Legend**

The legend should explain every feature or symbol contained on the map.

- **Provide Perspective With a Scale**

A scale is important to put into perspective for the reader the distances on the map and to provide accurate navigational information for the user.

- **Determine Compass Orientation**

- All maps must have a compass orientation. Because the primary purpose of a map is to provide and insight into directions, a map has to be able to show which way is which on a compass.

- **Date It**

To give context to a map, the date of publication should be present.

Map Types: Point Data:



Reference



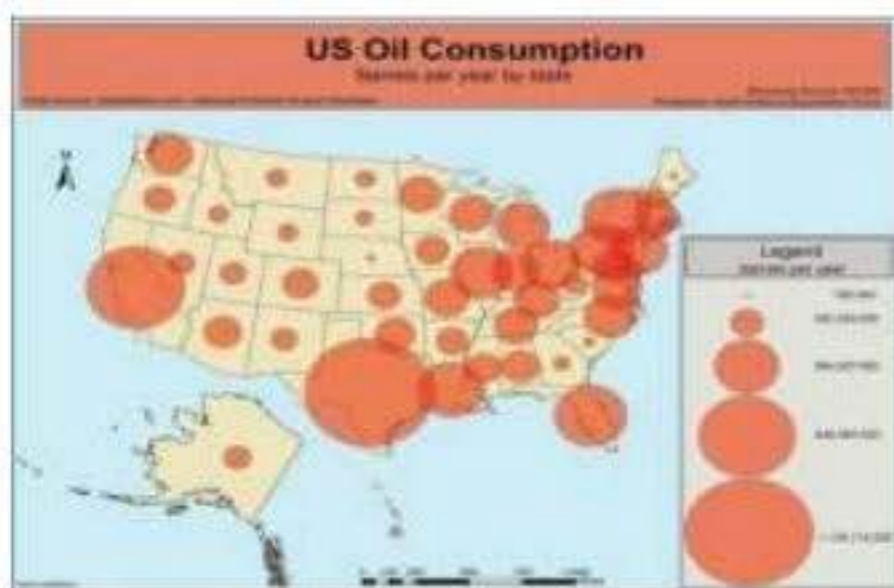
Topographic



Dot



Picture Symbol



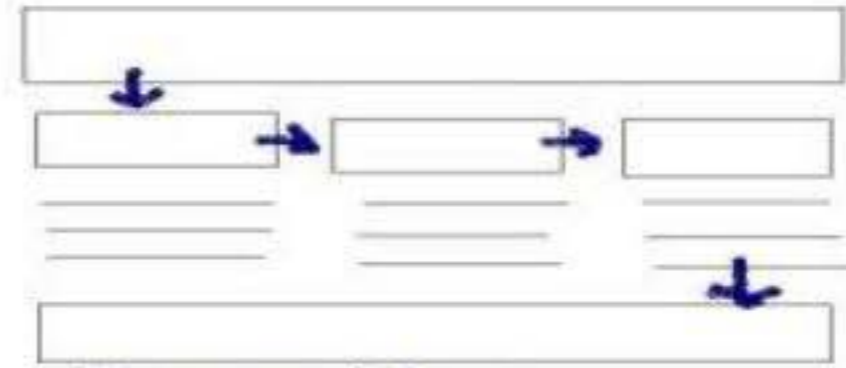
Graduated Symbol

Fig No: these figures shows the points data

Map Types: Line Data



Network



Flow Map

Flow



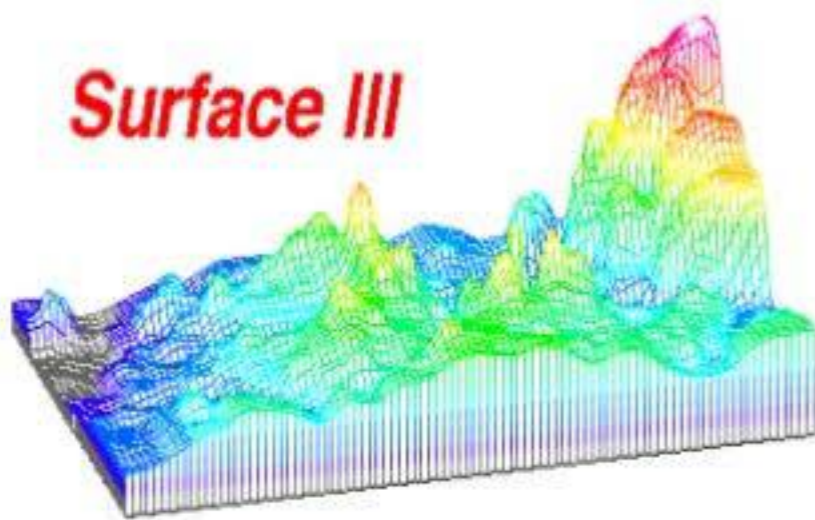
Isoline

Fig No: 15 figures shows the line data



Reference

Map Types: Volume Data



Gridded fishnet map



Hill-shaded



Image map

Fig No: 16 these figures shows the Volume data

Topic no 8: Graphic Variables, Visual hierarchy:

Graphic Variables

Graphic representation of spatial data or maps, thematic data, tables and network with geographic reference and topology is very important to communicate geospatial data and the results of spatial analysis to all users.

Graphic representation in GIS will be implemented in the form of graphs, maps and images with XY plotters, dot printers, color monitors, color plotters etc. based on the knowledges of cartography, computer graphics, color theory, semiology and psychology.

Following graphic variables are used to display quantity, order, difference or similarity.

Location: geographic location and spatial relation of points, lines and areas are displayed in 2D space or map.

Size: Size of symbols and thickness of line represent quantitative difference. Physical difference does not coincide with psychological impression.

Density: density, intensity or gray scale is used to represent order and difference. Density or spacing of dot pattern or screen mesh should be carefully selected for the optimum gray scaling.

Texture: cyclic or repeated pattern of data, lines or symbols will represent difference as well as similarity.

Color: hue (H), intensity (I) and saturation (S) are aesthetically selected.

Orientation: directional pattern with hatching will represent difference as well as similarity.

Symbol: form of symbols will represent similarity of class or group.

Visual hierarchy

Visual survey is the order in which the human eye perceives what it sees. It is used in cartography to help the map designer create a product where the viewer processes the information presented in order from the most important to the least important. This can be achieved by manipulating different pieces of a map such as its color contrast, symbology, texture, shape, position, scale, orientation and size. Jacques Bertin's graphic variables, or visual variables, also work together to make the visual hierarchy of a map.

By focusing on visual hierarchy while designing a map, a cartographer can ensure the main purpose for creating the map is understood by those viewing it. The viewers will also be more persuaded to accept the message the map is trying to convey.

When an object is disconnected from the 'whole' the human eye notices the disassociated object before it notices the 'whole'

An example in cartography is represented in the following map:



Fig No: 17 shows the cartography is represented in the map