GIS Terms and Concepts for Non-GIS Librarians

Adapted from the USDA National Resources Conservation Service Cartographic and GIS Technical Note MT-1 (Rev. 1) *Glossary on Common GIS and GPS Terms.*

Arc - 1. An ordered string of vertices (x,y coordinate pairs) that begin at one location and end at another. Connecting the arc's vertices creates a line. The vertices at each endpoint of an arc are called nodes.
2. A coverage feature class used to represent linear features and polygon boundaries. One line feature can contain many arcs. Arcs are topologically linked to nodes (arc-node topology) and to polygons (polygon-arc topology).

ArcCatalog - File and data management module of ArcGIS. Can be used to create and manage metadata.

ArcGIS - A comprehensive desktop GIS software package developed by ESRI.

Attribute - 1. A characteristic of a feature in a Geographic Information System (GIS). Each identifiable feature has attributes. One common attribute of all geographic features is its position. Other attributes depend on the type of feature. Example: a road may have a name or designation number, pavement type, width, number of lanes, etc. Each attribute has a range of possible values called its domain.
2. A column in a database table.

Attribute table - A tabular file containing rows and columns. In a GIS, attribute tables are associated with a class of geographic features, such as wells or roads. Each row represents a geographic feature. Each column represents one attribute of a feature, with the same column representing the same attribute in each row.

Base map (or base layer) - A map containing geographic features that is used for reference. Roads, for example, are commonly found on base maps.

Coordinate - A set of numeric quantities that describe the location of a point in a geographic reference system. A coordinate pair describes the location of a point or node in two dimensions (ususally x-y), and a coordinate triplet describes a point in three dimensions (x-y-z). A series of points (two or more) is used to describe lines and the edges of polygons or areas. Coordinates represent locations on the Earth's surface relative to other locations.

CSSM (Content Standards for Spatial Metadata) - A document produced by the Federal Geographic Data Committee (FGDC) that describes spatial metadata.

Data capture - The collection of GPS attributes and position information for geographic features.

Data set - A named collection of logically related data items arranged in a prescribed manner.

Data type - The characteristic of columns and variables that defines what types of data values they can store. Examples include character, floating point and integer.

Database Management System (DBMS) - A set of computer programs for organizing the information in a database. A DBMS supports the structuring of the database in a standard format and provides tools for data input, verification, storage, retrieval, query, and manipulation. Examples of database management systemes include Access, SQLserver, Oracle, Informix, and DBASE.

DGM (Digital Geospatial Metadata) - DGM was approved in June 1994 by the Federal Geographic Data Committee (FGDC). DGM describes the specifications for the content, quality, condition, and other characteristics of metadata (data about data). The standard provides a common set of terminology and definitions for the documentation of geospatial data. DGM establishes the names of data elements and groups of data elements to be used for these purposes, definitions of these data elements and groups, and information about the values that are to be provided for the data elements.

Digitize - 1. To encode geographic features in digital form as x,y coordinates. 2. The process of using a digitizer to encode the locations of geographic features by converting their map positions to a series of x,y coordinates stored in computer files. Pushing a digitizer button records an x,y coordinate. A digitized line is created by recording a series of x,y coordinates.

Domain - The domain of a GIS attribute determines the set of possible values for that attribute. A domain can be set of numbers, characters, or strings. For example the domain for the attribute 'Pavement type' may be the set of strings ('Gravel','Bitumen', Concrete).

Entity - A collection of objects (persons, places, things) described by the same attributes. Entities are identified during the conceptual design phase of database and application design.

ESRI (Environmental Systems Research Institute) - international supplier of GIS software, including ArcGIS

Feature - In a GIS, a physical object or location of an event. Features can be points (a tree or a traffic accident), lines (a road or river), or areas (a forest or a parking lot).

Feature attribute table - A table used to store attribute information for a specific coverage feature class.

Geocode - The process of identifying the coordinates of a location given its address. For example, an address can be matched against a TIGER street network to determine the location of a home. Also referred to as address geocoding.

Geodatabase - An object-based GIS data model developed by ESRI for ArcGIS that stores each feature as rows in a table. Personal geodatabases store data in a Microsoft Access .mdb file. Corporate geodatabases store data in a DBMS such as SQLserver or Oracle. This data structure supports rules-based topology and allows the user to assign behavior to data.

Geospatial - relating to or denoting data that is associated with a particular location.

Geographic data model - The different formats geographic data is stored in, including vector, raster, TIN, and tables.

GIS (Geographic information system) - An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information. Outputs include cartographic displays, spatial analysis, and tabular reports. A GIS uses geography or space as a common key between data sets. Information is linked only if it relates to the same geographical area. It is an analysis tool that allows analysis and display of spatial relationships between mapped features. Questions GIS can provide information on: location- What is at X location? condition- Where is X located? amount/extent- How much X is present? trends- What has changed since ..? patterns- What spatial patterns exist? modeling- What if ....?

GPS (Global positioning system) - A system of satellites and receiving devices used to compute positions on the Earth.

ISO (The International Organization for Standardization) - A worldwide federation of national standards bodies (e.g., ANSI from the US.) that develops international standards. A Technical Committee (ISORC211) is developing international Geographic InformationlGeomatics standards. Among many other computing standards, IS0 maintains an SQL standard and is developing an extended version, SQL3, which will support queries on geographic data sets.

Neatline - A border line commonly drawn around the extent of a map. Also the name of a "geotemporal exhibit-builder that allows you to create beautiful, complex maps, image annotations, and narrative sequences from Omeka collections of archives and artifacts, and to connect your maps and narratives with timelines that are more-than-usually sensitive to ambiguity and nuance."

Point - A single x,y coordinate that represents a geographic feature too small to be displayed as a line or area; for example, the location of a mountain peak or a building location on a small-scale map.

Vector - Data type comprised of x-y coordinate representations of locations on the earth that take the form of single points, strings of points (lines or arcs) or closed lines (polygons) known as features. Each feature has an associated attribute code for identification. Data can be converted to raster data through a process know as rasterization.

Vertex - One of a set of ordered x,y coordinates that constitutes a line.

Resources for more definitions:

United States Department of Agriculture NATURAL RESOURCES CONSERVATION SERVICE Cartographic and GIS Technical Note MT-1 (Rev. 1) August 2006

ESRI searchable online dictionary

Content Standard for Digital Geospatial Metadata