A

AML ARC Macro Language. A high-level algorithmic language for generating end-user applications. Features include the ability to create on-screen menus, use and assign variables, control statement execution, and get and use map or page unit coordinates. AML includes an extensive set of commands that can be used interactively or in AML programs (macros) as well as commands that report on the status of ARC/INFO environment settings.

Analysis Analysis is the process of identifying a question or issue to be addressed, modeling the issue, investigating model results, interpreting the results, and possibly making a recommendation. See model and spatial analysis.

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). The descriptive attributes of arcs are stored in the arc attribute table (AAT).

Area A homogeneous extent of the Earth bounded by one or more arc features (polygon) or represented as a set of polygons (region). Examples: states, counties, lakes, land-use areas, and census tracts.

Aspect The compass direction toward which a slope faces, measured in degrees from North in a clockwise direction.

Attribute 1. A characteristic of a geographic feature described by numbers, characters, images and CAD drawings, typically stored in tabular format and linked to the feature by a user-assigned identifier (e.g., the attributes of a well might include depth and gallons per minute).

2. A column in a database table. See also item.

B

Base Map A map containing geographic features used for locational reference. Roads, for example, are commonly found on base maps.

Boolean Expression A type of expression that reduces to a true or false (logical) condition. A Boolean expression contains logical expressions (e.g., DEPTH > 100) and Boolean operators. A Boolean operator is a keyword that specifies how to combine simple logical expressions into complex expressions. Boolean operators negate a predicate (NOT), specify a combination of predicates (AND), or specify a list of alternative predicates (OR). For example, DEPTH > 100 AND DIAMETER > 20. See also logical selection.

Buffer A zone of a specified distance around coverage features. Both constant- and variable-width buffers can be generated for a set of coverage features based on each feature's attribute values. The resulting buffer zones form polygons-areas that are either inside or outside the specified buffer distance from each feature. Buffers are useful for proximity analysis (e.g., find all stream segments within 300 feet of a proposed logging area).

C

CAD Drawing The digital equivalent of a drawing, figure or schematic created using a CAD system. For example, a drawing file or DWG file in AutoCAD.

Cell See grid cell.

Clip The spatial extraction of those features from one coverage that reside entirely within a boundary defined by features in another coverage (called the clip coverage)-clipping works much like a cookie cutter.

Contour A line connecting points of equal surface value.

Contour Interval The difference in surface values between contours.

Coordinate A set of numbers that designate location in a given reference system, such as x,y in a planar coordinate system or an x,y,z in a three-dimensional coordinate system. Coordinates represent locations on the Earth's surface relative to other locations. See also vector and Cartesian coordinate system.

Coordinate System A reference system used to measure horizontal and vertical distances on a planimetric map. A coordinate system is usually defined by a map projection, a spheroid of reference, a datum, one or more standard parallels, a central meridian, and possible shifts in the x- and y-directions to locate x,y positions of point, line, and area features.

Coverage 1. A digital version of a map forming the basic unit of vector data storage in ARC/INFO. A coverage stores geographic features as primary features (such as arcs, nodes, polygons, and label points) and secondary features (such as tics, map extent, links, and annotation). Associated feature attribute tables describe and store attributes of the geographic features.

2. A set of thematically associated data considered as a unit. A coverage usually represents a single theme such as soils, streams, roads, or land use.

D

Database A logical collection of interrelated information, managed and stored as a unit, usually on some form of mass-storage system such as magnetic tape or disk. A GIS database includes data about the spatial location and shape of geographic features recorded as points, lines, areas, pixels, grid cells, or tins, as well as their attributes.

Data Dictionary A catalog of all data held in a database, or a list of items giving data names and structures. Also referred to as DD/D for data dictionary/directory.

Datum A set of parameters and control points used to accurately define the three-dimensional shape of the Earth (e.g., as a spheroid). The datum is the basis for a planar coordinate system. For example, the North American Datum for 1983 (NAD83) is the datum for map projections and coordinates within the United States and throughout North America.

DEM - Digital Elevation Model A digital representation of a continuous variable over a two-dimensional surface by a regular array of z values referenced to a common datum. Digital elevation models are typically used to represent terrain relief. Also referred to as `digital terrain model' (DTM).

Digital Terrain Model See digital elevation model.

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.

DLG Digital Line Graph files from the U.S. Geological Survey (USGS), including data from the base map categories such as transportation, hydrography, contours, and public land survey boundaries.

DOQ Digital orthophoto quads are computer-readable air photos that have been processed to minimize distortions found on traditional photos. When these products are formatted to correspond with quadrangle maps, they are called digital orthophoto quadrangles.

DRG A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey (USGS) standard series topographic map, including all map collar information. The image inside the map neatline is georeferenced to the surface of the earth and fit to the Universal Transverse Mercator projection.

DTM Digital terrain model. See digital elevation model.

E

Edit To correct errors within, or modify, a computer file, a geographic data set, or a tabular file containing attribute data.

External File INFO stores data in files within a database. However, database information can be stored in files outside of the database. These files are referred to as external files. For example, feature attribute tables are stored as external INFO data files maintained in the coverage directory.

F

Feature Attribute Table A table used to store attribute information for a specific coverage feature class. ARC/INFO maintains the first several items of these tables. Feature attribute tables supported for coverages include:

.PAT for polygons or points .AAT for arcs .NAT for nodes .RAT for routes .SEC for sections .PAT for regions .TAT for annotation (text) where is the coverage name.

Field In a database, another term for column.

Field Data Collector An electronic device that collects and stores observation information from survey instruments. Two types of devices are available: one records x,y,z coordinates using a satellite-based global positioning system (GPS), and the other device records distance and bearing.

G

Geographic Data The locations and descriptions of geographic features. The composite of spatial data and descriptive data.

Geographic Feature A user-defined geographic phenomenon that can be modeled or represented using geographic data sets in ARC/INFO. Examples of geographic features include streets, sewer lines, manhole covers, accidents, lot lines, and parcels.

Georeference To establish the relationship between page coordinates on a planar map and known real-world coordinates.

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.

GPS - Global Positioning System A system of satellites and receiving devices used to compute positions on the Earth. GPS is used in navigation, and its precision supports cadastral surveying.

Grid A geographic data model representing information as an array of equally sized square cells arranged in rows and columns. Each grid cell is referenced by its geographic x,y location. See also raster and grid cell.

Grid Cell A discretely uniform unit that represents a portion of the Earth, such as a square meter or square mile. Each grid cell has a value that corresponds to the feature or characteristic at that site, such as a soil type, census tract, or vegetation class.

H

I

Image A graphic representation or description of a scene, typically produced by an optical or electronic device. Common examples include remotely sensed data (e.g., satellite data), scanned data (DRG), and photographs (DOQ). An image is stored as a raster data set of binary or integer values that represent the intensity of reflected light, heat, or other range of values on the electromagnetic spectrum.

Index Special data structure used in a database to speed searching for records in tables or spatial features in geographic data sets.

INFO A tabular DBMS used by ARC/INFO to store and manipulate feature attribute tables and other related tables.

INFO Database The contents of a set of INFO data files, feature attribute tables, and related files stored in each ARC/INFO workspace under a subdirectory named INFO. This subdirectory contains all feature attribute tables for the set of coverages contained in the workspace.

J

Join See relational join.

K

L

Landsat A series of satellites that produce images of the earth. The Landsat remote sensing satellite program was developed by NASA (National Aeronautics and Space Administration). Landsat data are provided in .BIL (band interleaved by line) or .BIP (band interleaved by pixel) formats. BIL and BIP are supported by ARC/INFO and ArcView.

Latitude-Longitude A spherical reference system used to measure locations on the Earth's surface. Latitude and longitude are angles measured from the Earth's center to locations on the Earth's surface. Latitude measures angles in a north-south direction. Longitude measures angles in the east-west direction.

Layer A thematic set of spatial data described and stored in an ArcStorm database or a LIBRARIAN map library. Layers organize a database or map library by subject matter (e.g., soils, roads, and wells). Conceptually, layers in a database or map library environment are exactly like coverages.

Legend 1. The reference area on a map that lists and explains the colors, symbols, line patterns, shadings, and annotation used on the map. The legend often includes the scale, origin, orientation, and other map information.

2. The symbol key used to interpret a map.

LIBRARIAN A set of software tools to manage and access large geographic data sets in a map library. LIBRARIAN commands create and define a map library, move data in and out of a library, query the data in a map library, and display the results of a query.

Line 1. A set of ordered coordinates that represents the shape of geographic features too narrow to be displayed as an area at the given scale (e.g., contours, street centerlines, or streams), or linear features with no area (e.g., state and county boundary lines).

2. A single arc in a coverage.

3. A line on a map (e.g., a neatline).

Linear Feature A geographic feature that can be represented by a line or set of lines. For example, rivers, roads within a pizza delivery area, and electric and telecommunication networks are all linear features.

Link A coverage feature class; links are two-point segments that represent from- and to-locations for the rubber sheeting adjustment process.

M

Many-to-one Relate A relate in which many records in one table are related to a single record in another table.

Map An abstract representation of the physical features of a portion of the Earth's surface graphically displayed on a planar surface. Maps display signs, symbols, and spatial relationships among the features. They typically emphasize, generalize, and omit certain features from the display to meet design objectives (e.g., railroad features might be included in a transportation map but omitted from a highway map).

Map Projection A mathematical model that transforms the locations of features on the Earth's surface to locations on a two-dimensional surface. Because the Earth is three-dimensional, some method must be used to depict a map in two dimensions. Some projections preserve shape; others preserve accuracy of area, distance, or direction. See also coordinate system.

Map Query The process of selecting information from a GIS by asking spatial or logical questions of the geographic data. Spatial query is the process of selecting features based on location or spatial relationship (e.g., select all features within 300 feet of another; point at a set of features to select them). Logical query is the process of selecting features whose attributes meet specific logical criteria (e.g., select all polygons whose value for AREA is greater than 10,000 or select all streets whose name is `Main St.'). Once selected, additional operations can be performed, such as drawing them, listing their attributes or summarizing attribute values.

Map Scale The reduction needed to display a representation of the Earth's surface on a map. A statement of a measure on the map and the equivalent measure on the Earth's surface, often expressed as a representative fraction of distance, such as 1:24,000 (one unit of distance on the map represents 24,000 of the same units of distance on the Earth). Map scale can also be expressed as a statement of

equivalence using different units; for example, 1 inch = 1 mile or 1 inch = 2,000 feet.

Map Units The coordinate units in which a geographic data set (e.g., a coverage) is stored in ARC/INFO. Map units can be inches, centimeters, feet, meters, or decimal degrees.

Meridian A line running vertically from the north pole to the south pole along which all locations have the same longitude. The Prime Meridian (0) runs through Greenwich, England. From the Prime Meridian, measures of longitude are negative to the west and positive to the east up to 180, halfway around the globe.

Model A representation of reality used to simulate a process, understand a situation, predict an outcome, or analyze a problem. A model is structured as a set of rules and procedures, including spatial modeling tools available in a geographic information system (GIS). See also spatial modeling, data model, analysis and spatial analysis.

N

Neatline A border line commonly drawn around the extent of a map.

Node The beginning and ending locations of an arc. A node is topologically linked to all arcs that meet at the node.

O

One-to-many A relate in which one record in a table is related to many records in another table.

P

Pan To move the viewing window up, down, or sideways to display areas in a geographic data set which, at the current viewing scale, lie outside the viewing window. See also zoom.

Pixel The smallest unit of information in an image or raster map. Referred to as a cell in an image or grid.

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.

Polygon A coverage feature class used to represent areas. A polygon is defined by the arcs that make up its boundary and a point inside its boundary for identification. Polygons have attributes (PAT) that describe the geographic feature they represent.

Precision Refers to the number of significant digits used to store numbers, and in particular, coordinate values. Precision is important for accurate feature representation, analysis and mapping. ARC/INFO supports single precision and double precision.

Projection See map projection.

Q

Quadrangle (quad) See topographic map.

Query See map query.

R

Raster A cellular data structure composed of rows and columns for storing images. Groups of cells with the same value represent features. See also grid.

Record In an attribute table, a single `row' of thematic descriptors.

Rectification The process by which an image or grid is converted from image coordinates to real-world coordinates. Rectification typically involves rotation and scaling of grid cells, and thus requires resampling of values.

Relational Database A method of structuring data as collections of tables that are logically associated to each other by shared attributes. Any data element can be found in a relation by knowing the name of the table, the attribute (column) name, and the value of the primary key. See also relate, relate key, and relational join.

Relational Join The operation of relating and physically merging two attribute tables using their common item.

Remote Sensing Acquiring information about an object without contacting it physically. Methods include aerial photography, radar, and satellite imaging.

Resampling The process of reducing image data set size by representing a group of pixels with a single pixel. Thus, pixel count is lowered, individual pixel size is increased, and overall image geographic extent is retained. Resampled images are "coarse" and have less information than the images from which they are taken. Conversely, this process can also be executed in the reverse.

Resolution Resolution is the accuracy at which a given map scale can depict the location and shape of geographic features. The larger the map scale, the higher the possible resolution. As map scale decreases, resolution diminishes and feature boundaries must be smoothed, simplified, or not shown at all. For example, small areas may have to be represented as points.

Row 1. A record in an attribute table. The horizontal dimension of a table composed of a set of columns containing one data item each.

2. A horizontal group of cells in a grid, or pixels in an image.

S

Satellite Image A picture of the earth taken from an earth-orbital satellite. Satellite images may be produced photographically or by on-board scanners (e.g., MSS).

Scale See map scale.

Scale Bar A map element that shows the map scale graphically.

Scanning The process of capturing data in raster format with a device called a scanner. Some scanners also use software to convert raster data to vector data.

Slope A measure of change in surface value over distance, expressed in degrees or as a percentage. For example, a rise of 2 meters over a distance of 100 meters describes a 2% slope with an angle of 1.15. Mathematically, slope is referred to as the first derivative of the surface.

Snapping The process of moving a feature to coincide exactly with coordinates of another feature within a specified snapping distance, or tolerance.

Spatial Analysis The process of modeling, examining, and interpreting model results. Spatial analysis is useful for evaluating suitability and capability, for estimating and predicting, and for interpreting and understanding. There are four traditional types of spatial analysis: topological overlay and contiguity analysis, surface analysis, linear analysis, and raster analysis.

Spatial Data Information about the location and shape of, and relationships among, geographic features, usually stored as coordinates and topology.

String A series of alphanumeric characters of any length enclosed by quotes.

Symbol A graphic pattern used to represent a feature. For example, line symbols represent arc features; marker symbols, points; shades symbols, polygons; and text symbols, annotation. Many characteristics define symbols, including color, size, angle, and pattern.

T

Table A set of data elements that has a horizontal dimension (rows) and a vertical dimension (columns) in a relational database system. A table has a specified number of columns but can have any number of rows.

Template A map template containing neatlines, North arrow, logos, and other cartographic map elements for a common map series.

Text Symbol A text style defined by font, size, character spacing, color, and so on, used to label maps and coverage features.

Theme A user-defined perspective on a coverage, grid, tin or image geographic data set specified, if applicable, by a coverage name and feature class or data set name, attributes of interest, a data classification scheme, and theme-specific symbology for drawing.

Tic Registration or geographic control points for a coverage representing known locations on the Earth's surface. Tics allow all coverage features to be recorded in a common coordinate system (e.g., Universal Transverse Mercator [UTM] meters or State Plane feet). Tics are used to register map sheets when they are mounted on a digitizer and to transform the coordinates of a coverage (e.g., from digitizer units [inches] to UTM meters).

TIFF Tagged interchange (image) file format. An industry-standard raster data format. TIFF supports black-and-white, gray-scale, pseudocolor, and true-color images, all of which can be stored in a compressed or uncompressed format.

TIGER The Topologically Integrated Geographic Encoding and Referencing data format used by the U.S. Census Bureau to support census programs and surveys. It was used for the 1990 census. TIGER files contain street address ranges along lines and census tract/block boundaries. This descriptive data can be used to associate address information and census/demographic data with coverage features.

Tile The spatial unit by which geographic data is organized, subdivided, and stored in a map library. Tiles subdivide the area covered by a map library and organize the library data by location (e.g., counties might be the tiles in a statewide database).

Topographic Map 1. A map containing contours indicating lines of equal surface elevation (relief), often referred to as topo maps.

2. Often used to refer to a map sheet published by the U.S. Geological Survey in the 7.5-minute quadrangle series or the 15-minute quadrangle series.

U

Union A topological overlay of two polygonal spatial data sets which preserves features that fall within the spatial extent of either input data set; that is, all features from both coverages are retained. See also intersect and identity.

USGS DEM A digital elevation model produced by the Survey Branch of the United States Department of the Interior, consisting of a regular array of elevations referenced in the Universal Transverse Mercator (UTM) coordinate system. These data correspond to the standard 1:24,000-scale 7.5 x 7.5-minute quadrangles or 1:250,000 one-degree map sheets. Elevations are in meters or feet referenced to mean sea level.

V

Vector A coordinate-based data structure commonly used to represent linear geographic features. Each linear feature is represented as an ordered list of vertices. Traditional vector data structures include double-digitized polygons and arc-node models.

View A logical table whose data are not physically stored. You define a view to access a subset of the columns stored in a row, access a set of columns stored in different rows, or avoid creating a redundant copy of data that is already stored.

W

X

Y

Z

Zoom To enlarge and display greater detail of a portion of a geographic data set.