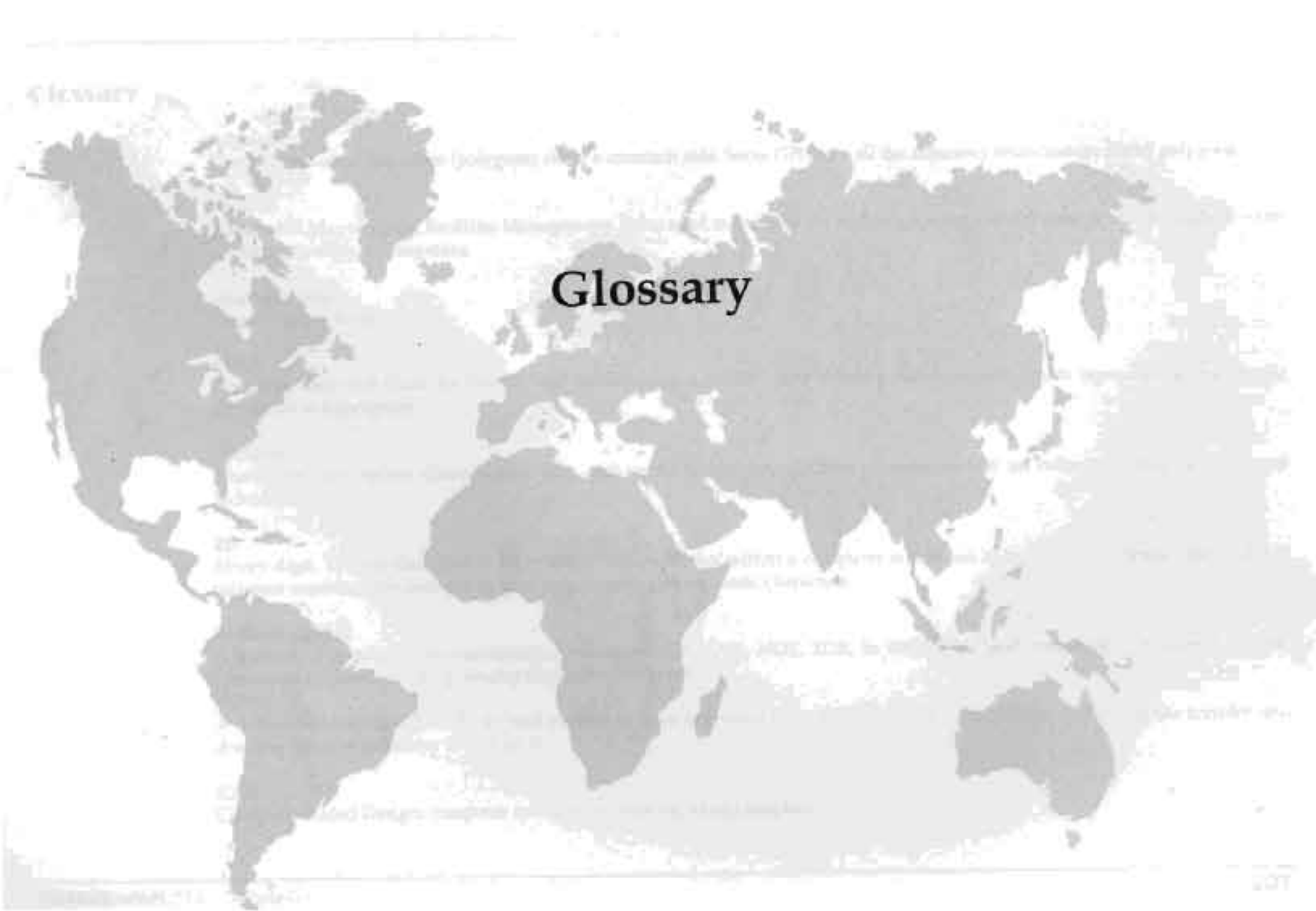

Glossary

Adjacency
Describes whether two areas (polygons) share a common side. Some GIS store all the adjacency relationships for all polygons.

AM/FM
Automated Mapping and Facilities Management. Term used to describe the digital mapping systems used in utilities such as water or electricity supply companies.

Analogue maps
Maps in paper form.

ASCII
American Standard Code for Information Interchange: a widely used industry-standard code which represents alphanumeric characters in a computer.

Attribute
Non-spatial descriptive characteristic of a real-world phenomenon. Often a measurement or value associated with spatial locations.

Bit
Binary digit. The smallest unit of information representation within a computer which can be set to 0 or 1. Seven bits have 128 different combinations and can be used to represent alphanumeric characters.

Boolean algebra
A method of specifying set combination operations: OR, AND, NOT, XOR. In GIS the sets are composed of geometry and the operations specify how the geometry should be combined.

Buffer
A corridor of a specified width defined parallel to lines or around polygons. Buffering is the process of defining the corridor and drawing the new geometry to delimit it.

CAD
Computer Aided Design: computer systems for drawing design graphics.

CCD
Charge Coupled Device: a device used in scanners to sense light/dark or colour contrast on a scanned map.

Choropleth
Map shaded by a density according to value.

Connectivity
Describes whether sets of points (nodes) or lines are connected to each other.

Coordinate pair (X, Y)
A pair of coordinates describing the location of a point feature on x and y axes. Sets of coordinate pairs are used to define lines and polygons.

Coordinate system
A particular type of reference frame, often grid-based, that uses linear or angular quantities to designate the position of points within the frame of reference.

Coverage
A collection of data describing spatial features stored in the same map file (primarily used by ESRI in ARC/INFO systems).

CPU
Central Processing Unit: the part of the computer that controls the flow of data and performs the computations.

CRT
Cathode Ray Tube: similar to a television picture tube, on which an image is displayed.

Cursor
The hand-held, movable part of a digitiser with cross hairs in a small window used for the accurate designation of points on an image or map.

Database
An organised, integrated collection of data related by a common fact or purpose.

Database Management System (DBMS)
A collection of computer software for organising and accessing the information in a database.

Data capture
The encoding of data or the conversion of map data to digital data, both spatial and non-spatial aspects.

Data dictionary
This contains information about definition, structure and usage of data in a database. No data is actually held here.

Data model
An abstraction of the real world which incorporates only those properties thought to be relevant to the application in hand. Also, a set of guidelines for the representation and logical organisation of data in a database, consisting of named logical units of data and the relationships between them. In GIS, this term usually refers to a set of spatial features with associated characteristics.

Data quality
The quality of the data measured in relation to the actual phenomenon measured at source.

Dataset
A named collection of logically related features arranged in a prescribed format.

Data structure
Detailed and low-level descriptions of spatial storage structures and the operations possible upon them.

DEM
Digital Elevation Model: a digital representation of a surface as a regular grid of elevation values.

Digital map data
A collection of digital information about real-world spatial phenomena.

DTM
Digital Terrain Model: a digital representation of ground surface relief enhanced by the addition of topographic information.

Digitiser
A device (usually electronic) for coding point locations on a graphic image or map to plane (x, y) coordinates.

DOS
Disk Operating System: the software which controls the transfer of data between main memory and disk. MS-DOS™ is the most common form of operating system for personal computers.

Edge matching
The comparison and adjustment of features to obtain agreement along the edges of adjoining maps.

Editing
Inserting, deleting and changing geometry and attributes to correct and/or update a model or database.

Electro-magnetic spectrum
The spectrum of wavelengths of electromagnetic radiation (including infrared, visible, and ultraviolet light).

Electrostatic printer/plotter
A device for printing graphic images by placing a grid of small electrical charges on the paper so that a dark or coloured powder, or toner, will adhere to these places.

Entity
A real-world phenomenon perceived or perceivable by human agency.

Error
Various forms of discrepancy between real-world phenomena and a database. Error can be introduced into a spatial database during capture and processing.

Feature
A real-world phenomenon, named and classified. Often used in cartography to name classes of elements shown on a map.

Feature code
An attribute specifying the type of feature recorded in a GIS. Cartographic agencies define feature codes to standardise the description.

Field
A subdivision of a record which contains a unit of information. A characteristic measure for all records.

File
A collection of records, each of which can be referenced according to its position in the file.

Filtering
A method of changing the level of detail or extraction of information from a spatial (normally raster) dataset.

Generalise
Reduce in detail, simplify or resample to change the level of information in a dataset. The most common generalisation operation is line-thinning by discarding coordinates.

Geographic information
Information which can be related to a location (defined in terms of point, line, and area), particularly, information on natural phenomena, cultural or human resources.

Geographical Information System (GIS)
- a set of tools for collecting, storing, retrieving at will, transforming and displaying spatial data from the real world for a particular set of circumstances (Burrough 1986)

Geometry
A system for the manipulation of points and lines defined by a set of axioms.

Global Positioning System (GPS)
A GPS is a position-fixing system which uses the time taken for signals to travel from at least three GPS satellites in a known orbit to a receiver on the ground.

Hardware
The physical device used to process a computer programme and display the results.

Heads-up digitising
Heads-up digitising systems automatically convert strips of raster pixels to vector data by tracing them on screen

Image processing
Encompasses all the various operations that can be applied to image or raster format data. These include image compression, restoration, enhancement, rectification, preprocessing, quantisation, spatial filtering and other image pattern recognition techniques.

Ink-jet printer/plotter
A display device that prints out characters and grey tones as patterns of small dots formed by tiny drops of ink sprayed onto the plotting medium.

Interactive
Describes a process of two-way communication between the user and the computer.

Interface
An electronic translator of the signals of two devices, such as a computer and a plotter, so that otherwise incompatible information can be transferred between them; or a screen format for the display and communication of commands to the computer.

Interpolation
The procedure for estimating the values of unknown points on a surface from the values of a number of points of known value.

Isoline
A line joining points of equal value.

Isometric models
A model of a scene or object scaled to reality.

KBS
Knowledge Based System: a system based upon rules, defined and structured for use in making inferences in restricted knowledge domains.

LAN
Local Area Network: a network linking computers together in a small area (usually a single building).

Layer
Usually represents a theme or feature type within a database. Layers which are registered to the same coordinates as other layers can be integrated in different ways to create a new layer.

Line
The shortest distance between two points (sometimes called a line segment). In some GIS, many connected line segments are also referred to as a line. A one-dimensional object.

LIS
Land Information System: a system for handling land ownership (cadastral) data.

Map algebra
A set of operations for manipulating, filtering, and combining raster maps devised by Tomlin and used in many GIS.

Map projection
A transformation from a spheroid to a flat plane representing the parallels of latitude and the meridians of longitude of the earth.

Menu
A list of available options displayed on a terminal or a set of preprogrammed areas on a digitiser.

Mouse
A device used to move a screen cursor and to input commands; commonly used in graphical operations.

Network analysis
Analytical techniques concerned with the relationships between locations on a network, capacities of network systems and the best location for facilities on a network.

Object-oriented programming
Object-oriented programming is a language design which has been used to develop database management systems and application programmes such as GIS. Object-oriented software has data 'encapsulated' with operations, and commands are executed using message passing.

Overlay
The process of integrating digital representations of various spatial data registered to a common coordinate system.

Pixel
Short for Picture Element, i.e., the smallest discrete element that makes up an image. It may represent either a small square or portion of the earth's surface, scanned by satellite or aircraft, a portion of a graphics image sensed by an optical scanner or an individual dot on a screen.

Point
The position or location of an object in a spatial reference system. A zero-dimensional object.

Polygon
An area with three or more sides intersecting at the same number of points. A two-dimensional object.

Projection
The procedure for transferring features from the spherical earth to a flat plane using mathematical transformations.

Quadtree
A structure to compress and spatially index raster data. Constructed by dividing an (square) area of data recursively until a quadrant is completely full or empty.

Query
A structured enquiry made on a map or database using formal language.

Raster data
Data expressed as an array of pixels with the spatial position implicit in the ordering of the pixels.

Rasterisation
The process of converting vector data into raster form.

Record
A set of observations on real-world phenomena as described by attributes.

Relational database
A database of tables which can be linked together through common attributes.

Remote sensing
The technique of obtaining data about the environment and surface of the earth from a distance, e.g., from an aircraft or satellite.

Resolution
Level of discrimination in the representation of objects, generally spatial.

Scale
The ratio or fraction between the distance on a map, chart or photograph and the corresponding distance on the surface of the earth.

Scanner
The electronic device used to convert analogue information from maps or images into a digital format usable by a computer.

Scanning
A method of data capture whereby an image or map is automatically registered and converted into digital raster form.

Sliver polygon
Formed when two polygons which have been overlaid do not abut exactly but overlap along one edge and leave a small space between the two.

Software
A system of programmes used to execute tasks written for the computer.

Spatial analysis
Analytical techniques associated with the study of locations of geographical phenomena together with their spatial dimensions.

Spatial data
Data relating to the location of geographical phenomena together with their spatial dimensions.

SQL
Structured Query Language: a language for the manipulation, update and querying of the data in relational database tables. ISO standard 9075 (1987).

Standards
A fixed quantity or quality, applied to data. Standards serve as a reference or rule and establish practices or procedures to evaluate results.

Terrain modelling
The creation of a realistic terrain representation for computer display.

Tessellation
The subdivision of geographic space using either regular or non-regular methods.

Thiessen polygon
A polygon bounding the region closer to a point than to any other adjacent point.

Tile
A regular- or irregular-shaped spatial unit within a geographical database.

TIN
Triangular Irregular Network: the most equilateral set of triangles possible joining a set of points.

Topographic map
A map showing the features which describe the surface of a particular place or region.

Topological structuring
The process of organising data so that the relationships of connectivity, adjacency and containment are encoded and stored.

Topology
The location of geographic phenomena relative to each other but independent of distance or direction. Includes relationships of connectivity, adjacency, and containment.

Transformation
Mathematical conversion of coordinates between alternative referencing systems. Affine transformations keep straight lines straight, and curvilinear ones may make straight lines curved (e.g. as in map projection).

Triangulation
The interconnection of all points within an area to form a set of reproducible triangles.

UNIX
An operating system of software used commonly for workstations.

Variable
A discrete measurement on a parameter.

VDU
Visual Display Unit: a screen display for a computer.

Vector data
A description of spatial phenomena based upon geometry.

Vectorisation
The process of converting raster data into vector form.

Window
A frame with a specified size and location on the screen of an interactive graphics system and within which a rectangular portion of the 'map' is displayed.

Work station
A powerful computer with integral processing and data storage and a high resolution screen.