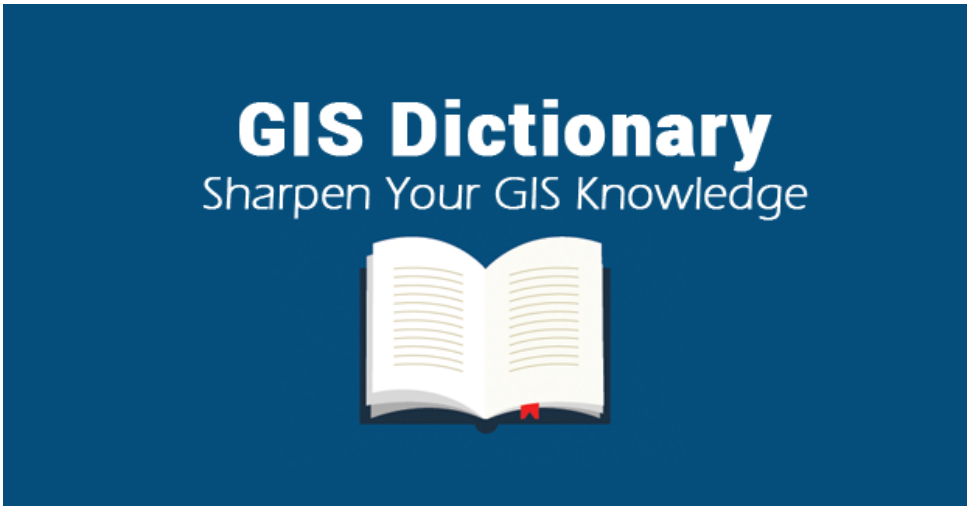
GIS Dictionary – Geospatial Definition Glossary

BASIC GIS TERMINOLOGY AND CONCEPTS



GIS Dictionary

Last Updated: May 13, 2018

The Ultimate GIS Dictionary: Your Complete Guide to GIS

Despite what you may have heard, there's A LOT more to GIS than ***"maps and data"***:

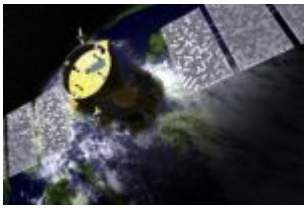
That's why we've put together this comprehensive **list of GIS definitions**:

We give you stunning visualizations so you can have a vision of each definition or term.

From A to Z, GIS professionals, students and everyone with an interest can sharpen their GIS knowledge with these GIS **dictionary definitions** and **meanings**.

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | R | S | T | U | V | W | X | Y | Z

A

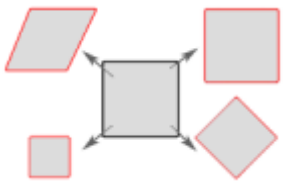


Active Sensors: *[Remote sensing]* Active sensors illuminates its target and measures the reflected backscatter that returns back to the sensor.

Adjacency: *[geometry]* Adjacency occurs when two objects share the same boundary and are next to or adjoining with a common side or vertex.

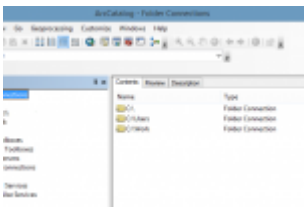
Image courtesy of NASA/JPL

Advanced Very High Resolution Radiometer (AVHRR): *[Remote sensing]*AVHRR collects infrared, visible and thermal images with an approximate 1 kilometer spatial resolution cell size.

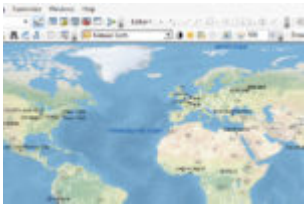


Affine transformation: *[geometry]* An affine transformation changes points, polylines, polygons in a plane by scaling, rotating, skewing, or translating coordinates in two or three-dimensional spaces preserving points, straight lines and planes.

Arc: *[data structure]* Arcs are lines or polygon boundaries, represented as a series of vertices or coordinate points.

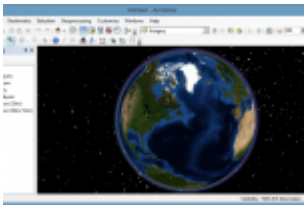


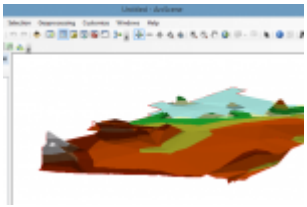
ArcCatalog: *[software]* ArcCatalog is an application in the ArcGIS suite used to manage geographic data – similar to windows file explorer.



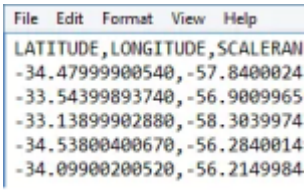
ArcGIS: *[software]* ArcGIS is a GIS software package produced by the Environmental Systems Research Institute (Esri) which allows you to collect, store, manage, visualize, export, analyze and map geographic data. ArcGIS is a suite of spatial analysis tools and cartographic features on a customizable user interface that allows you to be understand and make decisions with spatial data.

ArcGlobe: *[software]* ArcGlobe is a global three-dimensional visualization and analysis environment as part of the Esri ArcGIS suite (3D analyst), specializing in global datasets and larger study areas.

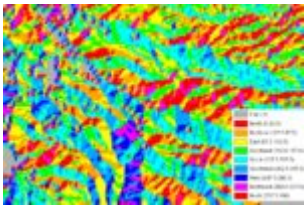




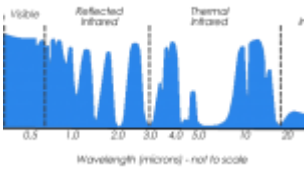
ArcScene: *[software]* ArcScene is a 3D feature and raster viewer part of the Esri ArcGIS suite of applications (3D analyst) specializing in small study area scenes.



American Standard Code for Information Interchange (ASCII): *[file format]* ASCII uses a set of numbers between 0 and 255 for information storage and processing.



Aspect: *[GIS processing]* Aspect is the slope direction on a terrain surface. Aspect is measured clockwise starting North as 0° to 360° North again with flat areas given a value of -1 (or 0 degrees).

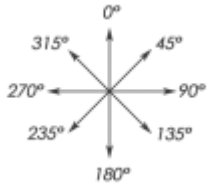


Atmospheric window: *[remote sensing]* An atmospheric window are wavelengths at which electromagnetic radiation (sunlight) from the sun will penetrate the Earth's atmosphere overall constricting these spectrum bands from reaching the Earth.

name	latitude
Seattle	47.570002
New York	40.749979
Miami	25.787611
Los Angeles	33.989978
Dallas	32.820024

Attribute table: *[data structure]* An attribute table stores non-spatial information in columns and rows about geographic data – similar to spreadsheets.

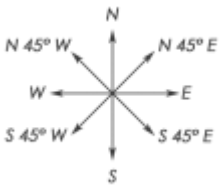
Azimuth: *[surveying]* An azimuth is an angle between 0° and 360° measured clockwise from North. True azimuths are based on true north.
Magnetic azimuths are based on magnetic north.



B

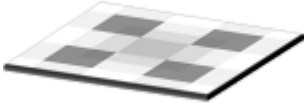
Base station: *[surveying]* A base station is a precisely surveyed location used as a fixed Global Navigation Satellite System (GNSS) recording station. Base stations are typically used in differential correction.

Basemap: *[cartography]* A basemap is a background georeferenced image that gives a point of reference on a map. Basemaps are non-editable and provides aesthetic appeal such as aerial imagery, topography, terrain and street layers.



Bearing: *[surveying]* A bearing is a direction expressed as a geographic angle measured from a base line used in surveying and navigation.

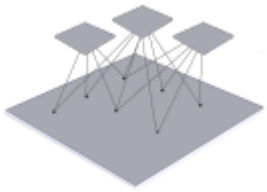
Benchmark: *[surveying]* Benchmarks are precisely surveyed points usually marked with a brass or metal disk in the ground. Benchmarks is a generic term sometimes referred as survey marks, geodetic marks and control stations.



Bilinear interpolation: *[mathematics]*Bilinear interpolation is a technique for calculating values of a grid location based on four nearby grid cells. It assigns the output cell value by taking the weighted average of the four neighboring cells in an image to generate new values.

Boolean Algebra: *[mathematics]* Boolean algebra are conditions used to select features with a set of algebraic conditions. Conditions include AND, OR or NOT. Venn diagrams are often used to represent Boolean operations.

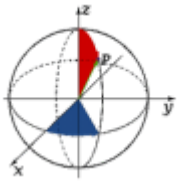
Buffer: *[GIS processing]* The buffer tool is a proximity function that creates a polygon at a set distance surrounding a selected feature or features.



Bundle adjustment: *[geometry]* Bundle adjustment consists of simultaneously removing geometric distortions given a set of images of three dimensional points at different viewpoints. This process ultimately minimizes error between observed and predicted image points during reprojection.

C

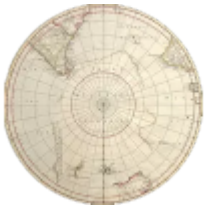
Carrier-phase GPS: *[surveying]* Carrier-phase GPS signals are relatively slow but are very accurate to determine position on the ground. The accuracy of carrier-phase GPS signals can be within a few centimeters or better.



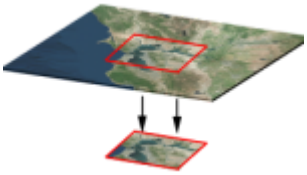
Cartesian coordinate: *[surveying]* A Cartesian coordinate system specifies each point uniquely with a pair of numerical coordinates. Three-dimensional coordinate space have three axes. Each axes has a single unit of length and orientation.

Cartography: *[GIS dictionary]* Cartography is the study and science of representing real-world entities on maps. Cartography combines aesthetics and science to communicate spatial information in two or three dimensions.

Cartometry: *[GIS dictionary]* Cartometry is a division of cartography concerned with depicting objects with a high level of spatial accuracy. Cartometric maps can be used to measure the perimeter of coasts, areas of countries, volumes, slopes and densities.

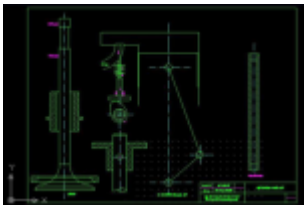


Centroid: *[geometry]* A centroid (or geometric center) is a central point of an area feature. Centroids are defined as the average position of all the points in the shape.

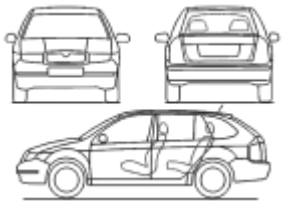


Clip: *[geometry]* A clip is an overlay tool that involves clipping an input layer with the extent of a defined feature boundary. The result of this tool is a new clipped output layer.

Code-Phase GPS: *[GPS]* The coarse acquisitions (C/A) code or Code-Phase GPS, which is available to the general public, is a GPS signal that delivers rapid, low accuracy position estimates. The accuracy of this signal is tens of meters.



Coordinate Geometry (COGO): *[editing]*COGO is the entry of spatial coordinate data points, usually obtained from field survey equipment.

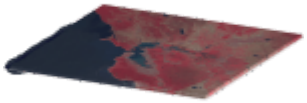


Computer Aided Design/Drafting (CAD): *[GIS dictionary]* CAD is primarily used by engineers and architects for the purpose of producing two and three dimensional drawings.

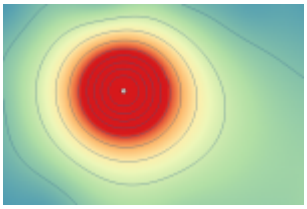
Conformal Projection: *[map projection]* A conformal map projection preserves the correct shapes of small areas. At any given point on a conformal projected map, graticule lines intersect at 90° and the scale is the same in all directions. Areas can be greatly distorted with conformal projections.

Conic Projection: *[map projection]* A conic projection uses a cone to develop its surface on a plane. Meridians converge at a single point, which may or may not be the South or North pole.

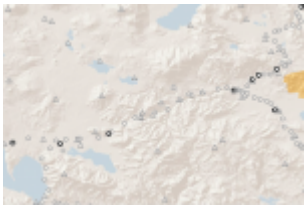
Connectivity: *[geometry]* Connectivity is the representation of the connectedness of linear features when arcs share a common node. Two linear features or networks are connected if they traverse one another spatially.



Continuous raster: *[data structure]*Continuous rasters are grid cells with gradually changing data. This type of surface generally has no distinct boundaries defining different features such as Digital Elevation Models (DEM), temperature data or distance from features.

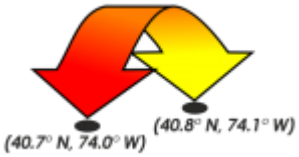


Contour Line: *[data structure]* A contour line is a constant value for mapping any variable such as elevation and temperature maps. Contour lines are used to map equal values and illustrate topography or relief on a map. They are also known as isopleth or isoline maps.

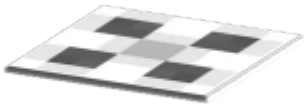


Control point: *[coordinate system]* Control points are XY locations known to have a high degree of accuracy. They are used to convert digitized coordinates from paper maps and georeferencing to standard map projection coordinates.

Coordinate Transformation: *[coordinate system]* A coordinate transformation is the conversion from a non-projected coordinate system to a coordinate system using a series of mathematical equations.



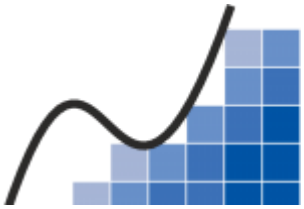
Coordinates: *[coordinate system]*Coordinates are pairs (X, Y) or triplets (X, Y, Z) of values that are used to represent points and features on a two and three-dimensional space. The X-value represents the horizontal position and Y-value represents the vertical position. The Z-value generally refers to the elevation at that point location.



Cubic Convolution Interpolation: *[mathematics]* Cubic convolution interpolation is similar to bilinear interpolation because it averages surrounding cells. Instead of using the four nearest cells, the output value is based on averaging the 16 nearest cells. This method is generally used for continuous surfaces where much noise exists.

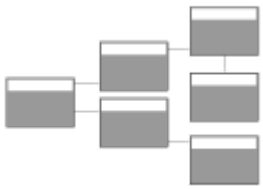
Cylindrical Projection: *[map projection]* A cylindrical projection uses a cylinder to develop a plane surface on a map and can be equidistant, conformal and equal-area. Cylindrical Projection examples are equal area cylindrical projections, Mercator protections and Plate carree projections.

D

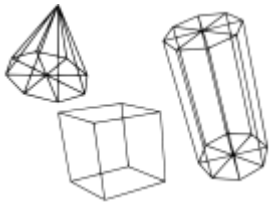


Data Model: *[data structure]* The two main GIS data models are rasters (grids) and vectors. Rasters are sets of pixels with a specific cell size. Vectors represent points, lines and polygons.

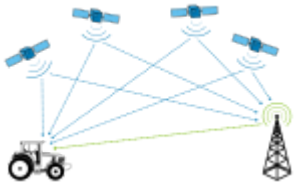
Database Management System (DBMS): *[data structure]* A DBMS is a collection of tools that permits the entry, storage, input, output and organization of data. It serves as an interface between users and their database.



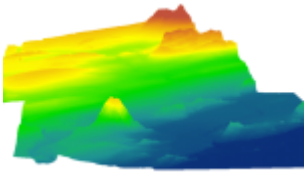
Database Schema: *[data structure]* A database schema is supported in relational database management systems (RDBMS) and acts as blueprints for how database entry will be constructed.



Developable Surface: *[map projection]* A developable surface (cylinders, cones, planes, etc) is the geometric shape that a map projection can be built on. Each surface is mathematically flattened based on those geometric shapes.

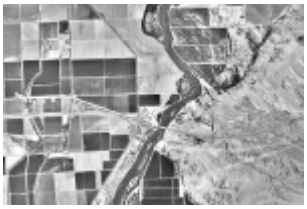


Differential Global Navigation Satellite System (GNSS): *[surveying]* Differential GNSS is a highly accurate (within centimeters) conventional surveying technique which uses a known location from a receiver to determine an unknown position.



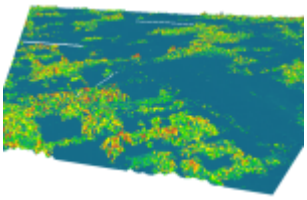
Digital Elevation Model (DEM): *[GIS processing]* A DEM is a bare earth elevation model representing the surface of the Earth. DEMs filter out non-ground points such as bridges and trees.

Digital Line Graph (DLG): *[file format]* DLG is vector data format developed and distributed by the United States Geological Survey (USGS). DLGs depict information about geographic features about terrain, administrative, hydrography, transportation, man-made features and more.

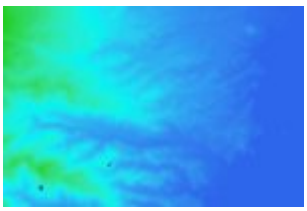


Digital Orthophotos Quadrangle (DOQ): *[file format]* DOQ is a geometrically-corrected photograph produced by the USGS. Orthoimages are geometrically corrected and have an area of interest with a scale of 1:40,000. The spatial resolution is about 1 meter pixels.

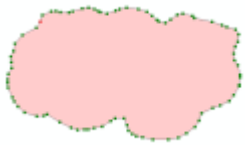
Digital Raster Graphics (DRG): *[file format]*DRG is a digital version map of USGS topographic maps. They include imagery (NAIP), roads, place names, hydrography, elevation contours and boundaries.



Digital Surface Model (DSM): *[file format]* A digital surface model is an elevation that includes the top of buildings, tree canopy, powerlines and other features above the bare earth. For example, the first return of LiDAR consists of a DSM.



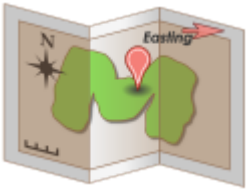
Digital Terrain Model (DTM): *[file format]*DTM is a bare earth representation of the Earth's surface that is augmented natural features such as ridges and breaklines.



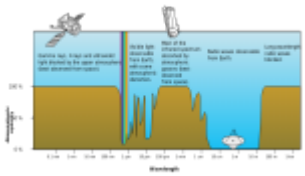
Digitize: *[editing]* When you digitize in a GIS, you are creating geographic computer-compatible stored data with lines, points and polygons in a spatial database.

Dissolve tool: *[GIS processing]* The dissolve tool is a common GIS processing task where boundaries are merged with neighboring boundaries based on common attribute values.

E



Easting: *[coordinate system]* Eastings refer to the x-axis (eastward) approximately parallel to lines of equal latitude commonly used in the Universal Transverse Mercator map projection. A pair of coordinates eastings and northings refers to a Geographic coordinate point on Earth.



Electromagnetic (EM) Spectrum: *[remote sensing]* The EM spectrum refers to the range of energy wavelengths or frequencies from x-rays, ultraviolet, visible, infrared, microwave to radio waves.

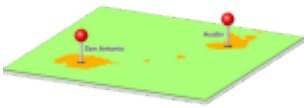
Ellipsoid: *[surveying]* Reference ellipsoids are mathematical models of the shape of the Earth with the major axis along the equatorial radius. They are primarily used as a surface to specify point coordinates such as latitudes (north/south), longitudes (east/west) and elevations (height).

Ellipsoid Height: *[surveying]* The ellipsoid height is the height measured from an ellipsoidal surface to a point on the surface of the Earth. Reference ellipsoids are mathematical models of the shape of the Earth with the shape of flattened sphere.

Endlap: *[remote sensing]* Endlap is the overlap in aerial photographs from end-to-end between flight lines. Flight lines are the paths that aircrafts take for complete coverage of an area. These flight lines are positioned to give endlap between succession photos.

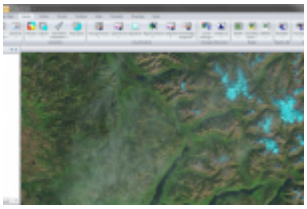
Image courtesy of NASA/JPL

Enhanced Thematic Mapper (ETM+): *[remote sensing]* ETM+ is a sensor equipped on Landsat-7 which generates images of the Earth in 8 spectral bands. The blue, green, red, NIR and mid-infrared (MIR) have 30m resolution (bands 1-5, 7). The panchromatic (band 8) has 15 m resolution. The thermal band is 60 m resolution.



Entity: *[cartography]* Entities represent real-world point, line or polygon features with a geographic location. Features may refer to fire hydrants, hospitals, state boundaries, roads, rivers, lakes, etc. Entities are stored in databases, where they can be retrieved and displayed using GIS software.

Equal Interval Classification: *[cartography]*The equal interval classification method divides attribute values into equal size ranges. For example, if you create 5 classes with attribute values from 0-100, the 5 classes will be 0-20, 21-40, 41-60, 61-80 and 81-100.

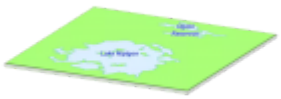


Earth Resources Data Analysis System (ERDAS) Imagine: *[software]* ERDAS Imagine is a GIS and remote sensing processing software owned by Hexagon Geospatial. ERDAS Imagine is a leading remote sensing software package with a range of classification, NDVI and image processing tools for satellite, hyperspectral, radar, LiDAR and other remote sensing data.

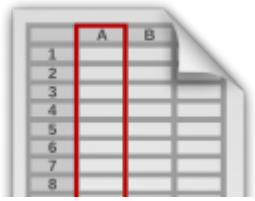
F

Facet: *[data structure]* A facet is a triangular face in a Triangular Irregular Network (TIN). TINs are three-dimensional coordinates depicting elevation surfaces.

False northing: *[coordinate system]* A false northing is a number added in a map projection in the y direction to avoid negative coordinate locations within the specified area of that map projection.

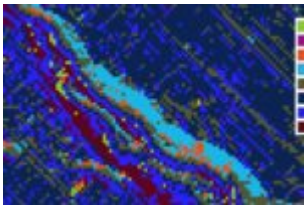


Feature: *[data structure]* A feature is a cartographic point, line or polygon object with a spatial location in the real-world landscape that can be used in a GIS for storage, visualization and analysis.

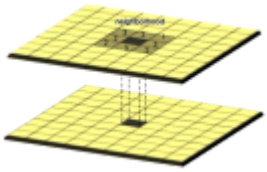


Field (Attribute Table): *[data structure]* An attribute field (or item) are characteristics used to describe each feature in a geographic data set usually viewed as columns in a table.

Federal Information Processing Standard (FIPS): *[organization]* FIPS is a federal code used to define political or physical features in the United States. It was created because it could be used as unique identifier in data processing.



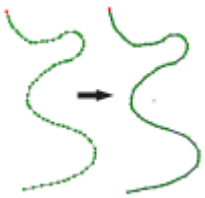
Flow direction: *[GIS processing]* Flow direction calculates the direction water will flow using slope from neighboring cells. This is usually determined by the direction of the steepest descent in each cell. The z-value difference and slope are calculated between neighboring cells to understand the steepest drop.



Focal Operation: *[mathematics]* The focal operation is a spatial function that computes an output value of each cell using neighborhood values. Convolution, kernel and moving windows are examples of image processing techniques that use focal operations.

G

GDAL: *[GIS software]* Geospatial Data Abstraction Library (GDAL) is a C++ library for reading and writing raster geospatial data formats, implementing common GIS operations (unions, intersections, joins, clipping, etc.) with command line utilities. It supports old hardware and operating systems and requires very low amounts of memory.

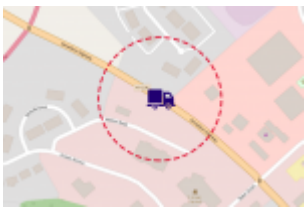


Generalization Tool: *[GIS processing]* The Generalization Tool is an editing process that simplifies the shapes and edges of linear or polygon features in a map. Using an offset tolerance, the output will reduce the number of vertices used in the line or polygon.

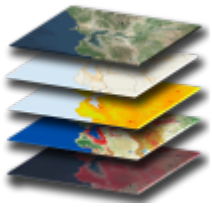
Geocentric: *[geodesy]* Geocentric is a measuring system that uses the center of the Earth as its origin. The WGS 1984 datum is a true geocentric datum while the NAD83 datum is offset by about two meters from the center of the Earth.

Geocoding: *[GIS processing]* Geocoding is the process of assigning geographic coordinates to places based on street address, town/city, province/state and country.

Geodesy: *[GIS dictionary]* Geodesy (or Geodetics) is a branch of applied mathematics and earth science of locating and assigning three-dimensional points on Earth by measuring the shape of the Earth.



Geofencing: *[GIS dictionary]* A virtual geographic boundary designed to give real-time alerts and increases awareness.



Geographic Information Systems (GIS): *[GIS dictionary]* GIS is a computer-based tool that analyzes, stores, manipulates and visualizes geographic information on a map. GIS links geographic locations on Earth with attribute information enabling users to visualize patterns, understand relationships and trends.

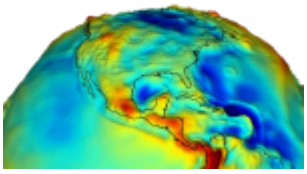
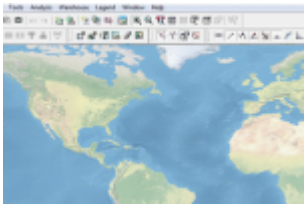


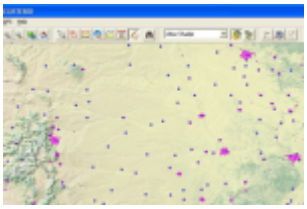
Image Courtesy of NASA/JPL

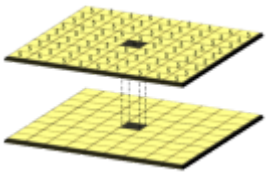
Geoid: *[geodesy]* A geoid is a measurement-based model of the shape of the Earth primarily used as a basis of assigning terrain height. A geoid works by calculating what height the oceans would settle to when pulled by gravity onto the surface of that ellipsoid (equipotential surface).



Geomedia: *[software]* GeoMedia is a GIS software package produced by Hexagon Geospatial (previously Intergraph) used to analyze, store and visualize geographic data.

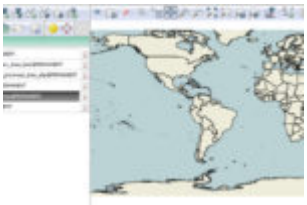
Global Mapper: *[software]* Global Mapper was originally developed by USGS for the purpose of displaying elevation DEM data. It is a commercial GIS software product that allows users to view, edit, merge and export hundreds of supported file formats with flexibility.





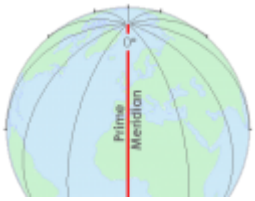
Global Operation: *[mathematics]* A global operation is a process or function that is performed on each output cell using all of the cells of the input raster.

Gnomonic Projection: *[map projection]* A Gnomonic projection uses the center of the spheroid as the projection center. Gnomonic projections are said to be the oldest map projection. They are used in seismic maps because seismic waves tend to travel along great circles.



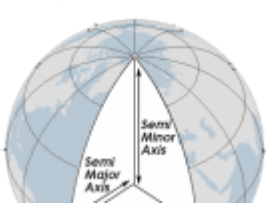
GRASS GIS: *[software]* GRASS GIS (Geographic Resource Analysis Support System) was developed by the US Army Corps of Engineers and is a free and open source GIS software. GRASS GIS is highly used in academic institutions with over 400 modules for GIS analysis.

Graticule: *[coordinate system]* Graticules are lines of latitude or longitude on a digital or hard copy map and assist in showing the geographic locations of map features.

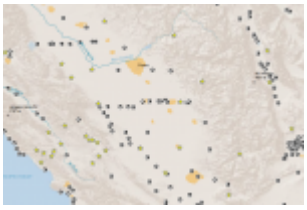


Greenwich Meridian (Prime Meridian): *[coordinate system]* The Greenwich meridian is a line of longitude that passes through the Royal Observatory in Greenwich, England. In a geographical coordinate system, it is a line of longitude defined to be 0°.

Geodetic Reference System 1980 (GRS 80): *[geodesy]* GRS80 is a geodetic reference system consisting of a global reference ellipsoid and a gravity field model (geoid). For practical applications, the reference ellipsoids GRS80 and WGS84 are identical.



H

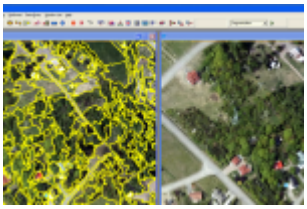


Horizontal Datum: *[geodesy]* A horizontal datum provides a frame of reference as a basis for placing specific locations at specific points on the spheroid. A datum is the model that is used to translate a spheroid into locations on Earth with latitude and longitude lines. Example: North American Datum of 1983 (NAD83)

Hydrography: *[GIS dictionary]* Hydrography is a term describing the geographic representation of water features such as streams, rivers and lakes in a GIS.

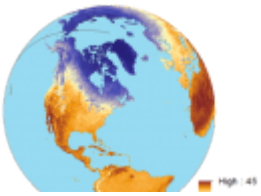
Hypsography: *[GIS dictionary]*Hypsography is the geographic representation of features on a map related to elevation, altitude and height above sea-level from a reference surface. (Hypso is Greek for height)

I

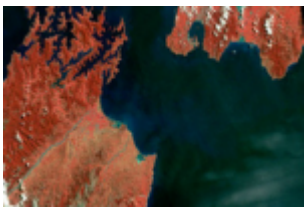


Idrisi: *[software]* Idrisi is a GIS/remote sensing software package developed by Clark Laboratories in 1987. It is widely used in education systems with a range of tools including – image classification tools, restoration, enhancement, temporal analysis and object-based image analysis.

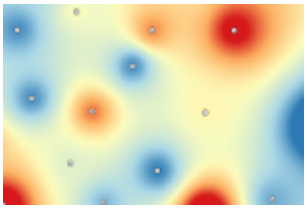
Inverse Distance Weighted (IDW) Interpolation: *[mathematics]* IDW interpolation is a technique used to estimate values of unsampled locations based on the value and distance of known, sampled locations.



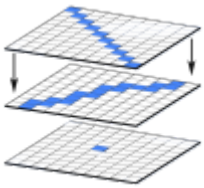
IKONOS: *[remote sensing]* IKONOS is a high resolution commercial imaging satellite that provides 1-meter panchromatic and 3-meter multispectral (blue, green, red, near-infrared) imagery.



Infrared: *[remote sensing]* An infrared image represents reflectance grid cells that are recorded in the near-infrared wavelengths, typically 0.7 to 1.1 micrometers.

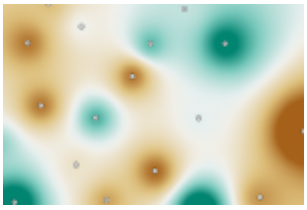


Interpolation: *[mathematics]* Interpolation is the estimation of unsampled locations based on known location sampled values. Interpolation is often used in deriving elevation, temperature and other predicted variables in a grid.



Intersect Tool (Overlay): *[GIS proessing]*The intersect tool is a GIS processing operation that uses two inputs to generate an output layer. It restricts the output similar to clip and preserves the attributes in both input layers.

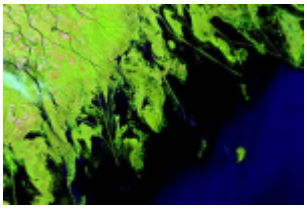
K



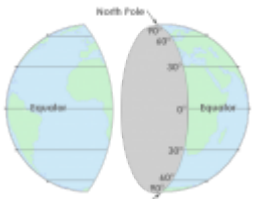
Kriging: *[GIS proessing]* Kriging is a statistical technique based on geostatistics that uses known locations values to interpolate values at unknown locations.

L

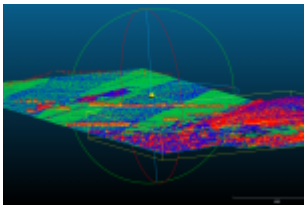
Land Information System (LIS): *[GIS dictionary definition]* LIS was a name originally applied for GIS systems specifically developed for property ownership and boundary records management.



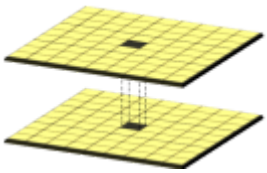
Landsat: *[remote sensing]* Landsat is NASA/USGS mission spanning more than three decades and eight satellites with space-borne remote sensing capabilities of scanning land resources.



Latitude: *[coordinate system]* Latitudes are spherical coordinates of Earth locations that vary in North-South directions. Lines of latitude are angles on the Earth's surface which ranges from 0° at the Equator to 90° (North or South) at the poles.

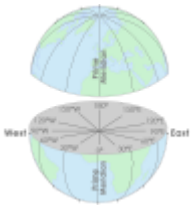


Light Detection and Ranging (LiDAR): *[remote sensing]* LiDAR uses laser pulse measurements to identify heights, depths and other properties of features on the Earth's surface. Example outputs for LiDAR are digital elevation models, light intensity and digital surface models.



Local Operator: *[GIS processing]* A local operation is a spatial operation where the output extent is limited to the same location as the input. Examples of local operations are arithmetic, statistical, relational, trigonometric, exponential and logarithmic operations.

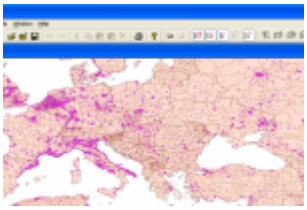
Locator Map: *[cartography]* Locator maps show the extent of the primary map in relation to a larger extent area. It provides context to the map reader to gain a better understand of the overall area.



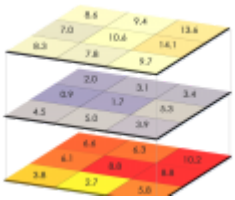
Longitude: *[coordinate system]* Longitudes are coordinate on Earth that vary in east-west directions. They are usually expressed in degrees ranging from 0° to +180° east and −180° west. The prime meridian marks the 0° longitude and passes through the Royal Observatory in Greenwich, England.

M

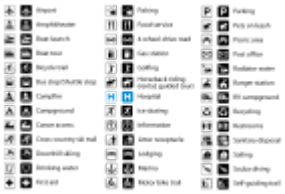
Magnetic North Pole: *[geodesy]* The magnetic north is a point in Northern Canada where the northern lines of attraction enter the Earth. Compass needles point in this direction which differs from true geographic north.



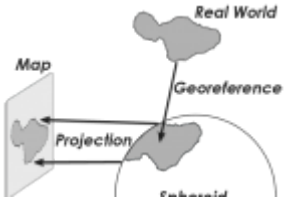
Manifold GIS: *[software]* Manifold is a GIS software package used for mapping, CAD, DBMS and image processing. It was first released in 1998 by CDA International in Carson City, Nevada.



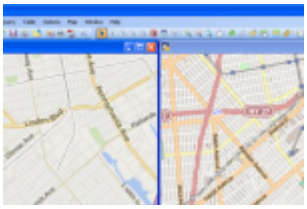
Map Algebra: *[mathematics]* Map algebra is the combination of spatial data using spatial and mathematical, statistical and trigonometric operations to generate new raster outputs.



Map Legend: *[cartography]* A map legend is a visual graphic of the symbology used in a map that tells the map reader what the polygons, lines, points or grid cells represents.



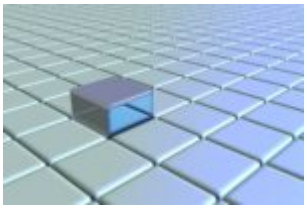
Map Projection: *[cartography]* A map projection is a systematic rendering of features that renders a 3D ellipsoid or spheroid of Earth to a 2D map surface. Because 3D surfaces cannot be displayed perfectly in a two-dimensional space, some distortions of conformality, distance, direction, scale, and area always results from map projections.



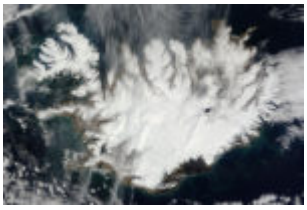
MapInfo: *[software]* MapInfo by Pitney Bowes (founded in 1986) is a GIS location intelligence suite that allows users to manage and create geospatial data create for visualization and export to PDF and various file formats.

Meridian: *[coordinate system]* Meridians (or lines of longitudes) are coordinate on Earth that vary in east-west directions. They are usually expressed in degrees ranging from 0° to +180° east and −180° west. The prime meridian marks the 0° longitude and passes through the Royal Observatory in Greenwich, England.

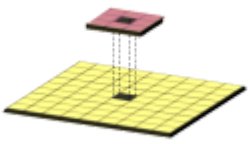
Metadata: *[data structure]* Metadata is data about data. Metadata describes the characteristics of a dataset which includes abstract, coordinate system, attribute information, origin and accuracy.



Minimum Mapping Unit: *[remote sensing]* A minimum mapping unit is the smallest resolution area when interpreting remotely-seemed satellite or aerial imagery.

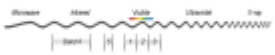


Moderate Resolution Imaging Sensor (MODIS): *[remote sensing]* MODIS is a high spectral resolution and moderate spatial resolution (250-1000 meters) imaging scanner that is part of NASA's Mission to Planet Earth.

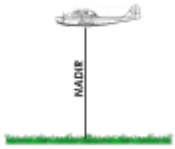


Moving Window: *[mathematics]* A moving window is a rectangular arrangement of cells that applies an operation to each cell in a raster dataset while shifting in position entirely.

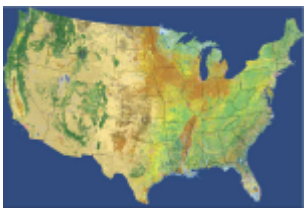
Multispectral Imagery: *[remote sensing]* A multispectral image is a multi-channel raster consisting of several spectral bands of wavelengths. Example: Red, green, blue and NIR.



N



Nadir: *[remote sensing]* Nadir is the point directly below the aircraft which is usually near the center of the aerial image.



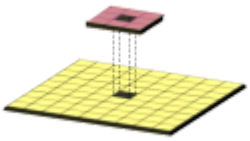
National Land Cover Dataset (NLCD): *[organization]* The NLCD is a Landsat Thematic Mapper (TM) based classification of land cover in the United States.

National Oceanic and Atmospheric Administration (NOAA): *[organization]*NOAA is the US government agency that oversees the development of national datums and several weather and ocean satellites.

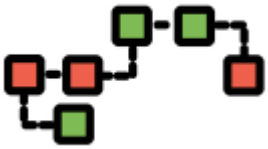
National Wetlands Inventory (NWI): *[organization]* The NWI is a dataset compiled by the US Fish and Wildlife Services that describes the type and extent of wetlands in North America.

Nearest Neighbor Interpolation: *[mathematics]* Nearest neighbor interpolation involves taking the output value from the nearest input layer cell center. This type of interpolation works well for discrete data like land cover and is fastest to process.

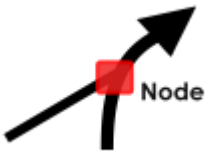
Neat Line: *[cartography]* A neat line is a cartographic element that surrounds all the data, legend, scale and other features in a map. A neat line can be solid or multiple line border that helps map readers focus on details in the map.



Neighborhood Operation: *[mathematics]* A neighborhood operation is a spatial function where the output location, area and extent comes from areas larger than and adjacent to the input cells.



Network: *[data structure]* A network in GIS is a connected set of line features used to model for and demand through real-world networks such as rivers and roads.

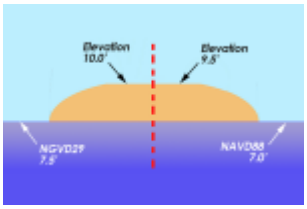


Node: *[data structure]* A node is an important point along a line feature where two lines intersect.

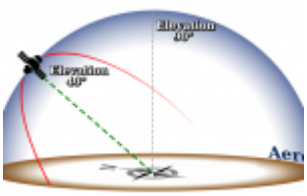
Nominal Scale: *[cartography]* A nominal scale is a types of measurement that indicates the difference between classes or categories of data.

North American Datum 1927 (NAD27): *[geodesy]* NAD27 is the adjustment of long-baseline surveys to establish a network of standardized horizontal positions on North America. This datum uses the Clarke Ellipsoid of 1866 with a fixed latitude and longitude at Meade's Ranch, Kansas.

North American Datum of 1983 (NAD83): *[geodesy]* NAD83 is the successor of NAD27 and is the current network of standard horizontal positions for North America. NAD83 is based off the reference ellipsoid GRS80. It is not geocentric with an offset of about two meters



North American Vertical Datum of 1929 (NAVD29): *[geodesy]* NAVD29 or National Geodetic Vertical Datum of 1929 (NGVD29) gives a vertical measurement network reference frame for which vertical elevations and depressions can be based in North America.

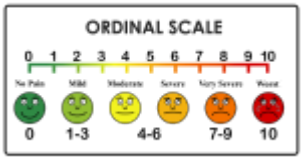


North American Vertical Datum of 1988 (NAVD88): *[geodesy]* NAVD88 is a vertical datum that provides a reference surface which vertical heights (altitude) and depth (depression) above and below mean sea level are measured.

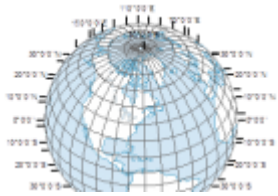
North Arrow: *[cartography]* A north arrow gives orientation to the map reader by showing the north direction in a graphic.

Northing: *[coordinate system]* A northing is the axis in the approximate north-south direction (or y-value) in UTM and other standard coordinate systems.

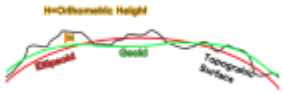
O



Ordinal Scale: *[coordinate system]* An ordinal scale represents the relative order of values but does not record the magnitude of differences between values.



Orthographic Projection: *[map projection]*An orthographic projection is a map projection that represents 3D data in 2D where all the projection lines are orthogonal to the projection plane.

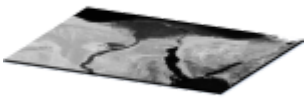


Orthometric Height: *[map projection]*Orthometric height is a height measured from the Geoid surface to a point on the surface of the Earth.

Orthophotograph: *[remote sensing]* An orthophotograph is a vertical photograph with an orthographic view using geometry and measurements to reduce tilt, terrain and perspective distortions.

Overshoot: *[editing]* An overshoot is a digitized line that extend past the intended line of connection.

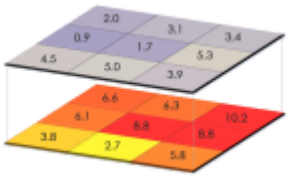
P



Panchromatic Image: *[editing]* A panchromatic image records wavelengths in only one band resulting in grayscale images.

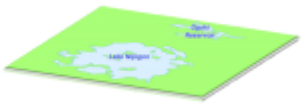
Parallax : *[remote sensing]* Parallax is term used in photogrammetry that describes the apparent shift in relative positions of Earth features when it viewed in different locations.

Passive Sensors: *[remote sensing]* Passive remote sensing measure natural energy from the sun as reflected sunlight or thermal radiation. Passive sensor examples are Landsat, SPOT and GeoEye.

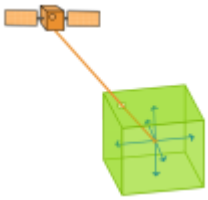


Pixels (GIS): *[data structure]* Pixels are the grid cells that make up raster images. Each cell is identical in size and records a brightness and color in an image.

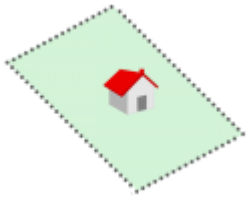
Planar Topology: *[editing]* Planar topology requires that intersections for lines and polygons in a digital data layer is enforced and that no two lines or polygons cross.



Polygon: *[data structure]* A polygon is a closed, connected set of lines that defines a geographic boundary with an area and perimeter. Examples are lakes, forests and country boundaries.

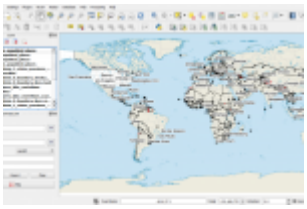


Positional Dilution of Precision (PDOP): *[data structure]* PDOP is a quantitative measurement used to represent the quality of the satellite geometry when taking GPS readings. Low PDOP signifies a higher probability of horizontal accuracy.

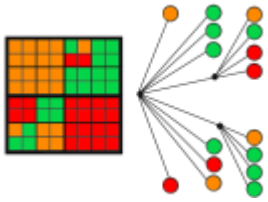


Public Land Survey System (PLSS): *[organization]* The PLSS is a land measurement system used in the western United States to define parcel boundaries and locations.

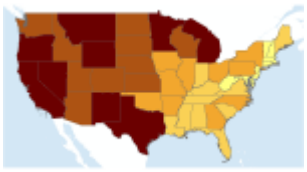
Q



QGIS: *[software]* QGIS (formerly Quantum GIS) is a free and open source software package that allows you to create, edit, visualize, analyze and publish geospatial information.



Quad-Trees: *[remote sensing]* Quad-Trees are raster data structures based on successive reduction of homogeneous cells for the purpose of reducing storage requirements.

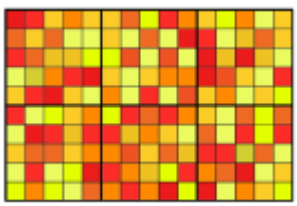


Quantile Classification: *[cartography]*Quantile classification is a classification method that divides classes so that the total number of features in each class is approximately the same.

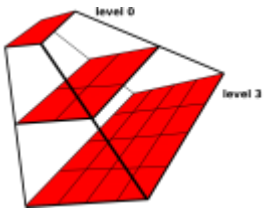
Query: *[programming]* A query is a request or search of spatial or tabular data based on user-define criteria. For example, the results of a query is a subset or selected records. SQL, Python and Java are programming languages how queries are made.

R

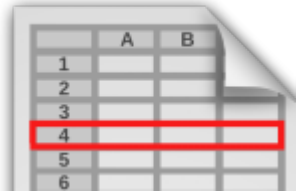
Random Location Sampling: *[statistics]*Random location sampling is a statistical technique where sample locations are selected by a random process with minimal biases.



Raster Data: *[data structure]* A raster is a data model used in GIS which are usually regularly-size rectangular or square shaped grid cells arranged in rows in columns.



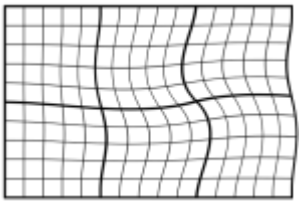
Raster Resampling: *[mathematics]* Raster resampling is a technique used to recalculate and assign new cell values when adjusting cell size or orientation of a raster grid.



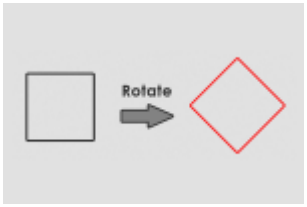
Record: *[data structure]* A record in an attribute table row that specifies an instance of an entity. It represents a spatial feature in the dataset in a one-to-one relationship.

Registration : *[GIS processing]* Registration is the alignment or assignment of coordinates from a non-projected coordinate system to a coordinate system.

Remote Sensing: *[GIS dictionary definition]*Remote sensing is the science of obtaining information about the Earth without physically being there. Examples remote sensing techniques are by satellite, unmanned aerial vehicle and aircraft.



Rubbersheeting : *[mathematics]*Rubbersheeting is a transformation technique using polynomial or other non-linear functions to match feature geometry.



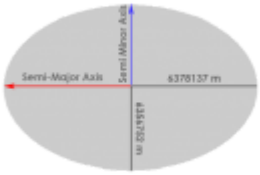
Rotate: *[mathematics]* An affine transformation changes points, polylines, polygons in a plane by scaling, rotating, skewing, or translating coordinates in two or three-dimensional spaces.

S

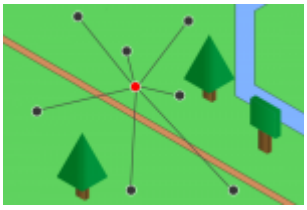
Scale Bar: *[mathematics]* A scale bar graphically shows the distance on the map with units such as kilometers or meters. Scale bars are proportional to the scale of the map.

Scale: *[mathematics]* An affine transformation changes points, polylines, polygons in a plane by scaling, rotating, skewing, or translating coordinates in two or three-dimensional spaces.

Selection Tool: *[GIS processing]* The selection tool identifies an object or set of objects based on user-selected criteria and properties, typically with Structured Query Language (SQL).



Semi-Major/Minor Axis: *[geodesy]* The semi-major axis is one-half of the major axis that is the larger of the two radial axes that define an ellipsoid. The semi-minor axis is one-half of the minor axis that is the shorter of the two radial axes that define an ellipsoid.



Semivariance: *[statistics]* Semivariance is the variance between valued samples given an inter-sample distances known as lag. Points close together expect to have small semivariances and vice versa.

Server: *[hardware]* A server is a computer program component that offers data storage and organization providing subsets of GIS data in response to user requests.

Set Algebra: *[mathematics]* Set algebra is a method to select items in a database based on operators such as ‘greater than’, ‘less than’, ‘equal to’ or ‘not equal to’ using command lines such as SQL.