

Glossary

USGS-NPS Vegetation Characterization Program

June 2012

This is not an exhaustive glossary of all vegetation classification or vegetation mapping terms, but is a useful list of definitions for many of the important and/or ambiguous terms used in the USGS-NPS Vegetation Characterization Program.

For detailed glossaries of different aspects of the program see

- 1) http://www1.usgs.gov/vip/standards/NPSVI_Accuracy_Assessment_Guidelines_ver2.pdf for definitions of terms related to accuracy assessment.
- 2) The FGDC Vegetation Subcommittee glossary at <http://www.fs.fed.us/research/fgdc/fgdcindex2.htm> for definitions of terms related to vegetation classification and the NVCS.
- 3) "[Datums And Projections: A Brief Guide](#)" at for an introduction to datums and projections, and
- 4) <http://www.esa.org/vegweb/home> developed by the Ecological Society of America in its "An Initiative For A Standardized Classification Of Vegetation In The United States" (Draft).

7.5-minute Quadrangle – A USGS paper map product at 1:24,000 scale covering 7.5 minutes of latitude and 7.5 minutes of longitude. Features shown include elevation contours, roads, railroads, water bodies, building, urban developments, and wetlands. This is a basic layer of information for many ecological and natural resource applications. An automated version of the 7.5-minute quadrangle is called the digital raster graphic or DRG. Informally known as 7.5-minute quad.

Accuracy – The closeness of results of observations, computations, or estimates to the true values or to values that are accepted as being true (ASP, 1984). In the USGS-NPS Vegetation Characterization Program there are two aspects of accuracy: thematic and positional accuracy.

Accuracy Assessment – The process of determining the positional and thematic accuracy of the spatial vegetation community data. This is an independent process performed after the vegetation mapping and classification is complete. See "Producing rigorous and consistent accuracy assessment procedures", Anonymous, 1996 at http://www1.usgs.gov/vip/standards/NPSVI_Accuracy_Assessment_Guidelines_ver2.pdf for more information.

Accuracy Assessment Point – A location where accuracy assessment data are collected. See "Producing rigorous and consistent accuracy assessment procedures", Anonymous, 1996 at http://www1.usgs.gov/vip/standards/NPSVI_Accuracy_Assessment_Guidelines_ver2.pdf for more information.

Aerial Photography – Analog imagery taken from an airplane. In this program the optical axis is oriented perpendicular to the earth's surface so that the film is parallel to the surface

being photographed. (also Vertical Aerial Photography). A sequence of aerial photographs will overlap so the photos can be used in stereoscopic analysis (stereo pairs). The overlap is referred to as ‘endlap’ (top-to-bottom area in common, same flightline) and ‘sidelap’ (side-to-side area in common, different flightlines) (Portions from ASP, 1984). Aerial photography used in the program is 9 inch by 9 inch vertical, stereoscopic, color or color infrared photography.

Alliance – A physiognomically uniform group of associations sharing one or more diagnostic (dominant, differential, indicator, or character) species that, as a rule, are found in the uppermost stratum of the vegetation (FGDC). This is the second finest level in the National Vegetation Classification Standard hierarchy. See the table under USNVC.

Anderson Classification System – A land cover/land use classification system developed for use with remote sensing systems in the 1970’s adopted for the USGS-NPS Vegetation Characterization Program to map cultural land cover (Anderson et al. 1976).

Level I	Level II
1. Urban or Built-up Land	Residential
	Commercial and Services
	Industrial
	Transportation, Communications, and Utilities
	Industrial and Commercial Complexes
	Mixed Urban or Built-up Land
	Other Urban or Built-up Land
	2. Agricultural Land
	Orchard, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas
	Confined Feeding Operations
	Other Agricultural Lands
3. Rangeland	Herbaceous Rangeland
	Shrub and Brush Rangeland
	Mixed Rangeland
4. Forest Land	Deciduous Forest Land
	Evergreen Forest Land
	Mixed Forest Land
5. Water (nonvegetated portion)	Streams and Canals
	Lakes
	Reservoirs
	Bays and Estuaries

6. Wetland	Forested Wetland
	Nonforested Wetland
7. Barren Land	Dry Salt Flats
	Beaches
	Sandy Areas other than Beaches
	Strip Mines, Quarries, and Gravel Pits
	Transitional Areas
	Mixed Barren Lands
8. Tundra	Shrub and Brush Tundra
	Herbaceous Tundra
	Bare Ground Tundra
	Wet Tundra
	Mixed Tundra
9. Perennial Snow or Ice	Perennial Snowfields
	Glaciers

Note: This is not the complete Anderson Level II Classification. Areas of natural vegetation are classified under the NVCS.

Association – The finest level of the National Vegetation Classification Standard. The association is a physiognomically uniform group of vegetation stands that share one or more diagnostic (dominant, differential, indicator, or character) overstory and understory species. These elements occur as repeatable patterns of assemblages across the landscape, and are generally found under similar habitat conditions (FGDC). See table under USNVC an example. Within the program association is the preferred term, but it is also synonymous with community, community type, plant community, type, vegetation community, and vegetation type.

Association for Biodiversity Information (ABI) – A non-profit organization dedicated to developing and providing knowledge about the world's natural diversity. In cooperation with the Natural Heritage Network, ABI collects and develops authoritative information about the plants, animals, and ecological communities of the Western Hemisphere. ABI maintains databases to support the United States National Vegetation Classification System (USNVCS) and the plot data that it is based on. ABI cooperates closely with the program to develop vegetation community classifications.

Attribute – (digital data) A numeric, text, or image data field in a relational database table (such as a GIS) that describes a spatial feature (point, line, polygon, cell) (ESRI, 1994).

Automate – The process of entering data into a computer. Synonymous with digitize.

Base Map – The source or control from which all spatial data are developed and geo-referenced to. Photo interpreted data are transferred to a base to rectify and register the data. For this program base maps consist of USGS DOQ's or specially made orthophotos.

Bureau of Reclamation (BOR, USBR) – A U.S. Department of Interior agency, created in 1902, charged with developing irrigation and hydropower projects in 17 Western States in an environmentally and economically sound manner in the interest of the American public. The Remote Sensing and GIS Group of the BOR is managing several park projects for the USGS-NPS Vegetation Characterization Program.

Class – The level in the National Vegetation Classification Standard hierarchy based on the structure of the vegetation and determined by the relative percentage of cover and the height of the dominant, uppermost life forms (Grossman et al. 1998). See the table under USNVC.

Classification Accuracy – How closely the map classes match the vegetation communities found on the landscape. This is determined by accuracy assessment protocols. See “Producing rigorous and consistent accuracy assessment procedures” at http://www1.usgs.gov/vip/standards/NPSVI_Accuracy_Assessment_Guidelines_ver2.pdf for more information. Also see producer's and user's accuracy.

Community – An assemblage of species that co-occur in defined areas at certain times and have the potential to interact with one another (Grossman et al., 1998). May also refer to an association in the USNVC, but this is not preferred

Community Element Global (CEGL) – ABI's unique identifier code to a vegetation association (community) in their central biodiversity database; also known as Elcode.

Community Type – See type.

Complex – A group of associations that are not distinguishable from one another on aerial photography and so are grouped into a map unit. Compare with mosaic.

Confusion Matrix – See Contingency Table

Contingency Table – A table that compares mapped data with ground data to determine accuracy. The “known” classes derived from accuracy assessment plots are compared to the classes derived from photo interpretation. The results are then tabulated in the form of a contingency table to determine the degree of misclassification that has occurred between classes. Also referred to as error matrix, confusion matrix, or misclassification matrix. For an example of a contingency table see http://www1.usgs.gov/vip/scbl/scbl_aamatrix.xls.

Coordinate System – A reference system to represent horizontal and/or vertical locations and distances on a map. The geographic coordinate system is the latitude and longitude with respect to a reference spheroid. A local coordinate system is one that is not aligned with the Earth's surface. Most coordinate systems are based on projections of the earth's surface to a plane. All spatial data in the program are represented in the Universal Transverse Mercator (UTM) coordinate system.

Core Science Analytics and Synthesis (CSAS) – CSAS coordinates and develops data integration services, capacity, and framework for Bureau science programs. Incorporating the Community for Data Integration and the Powell Center, CSI supports identification and development of best practices and standards to ensure efficiencies and innovation. Through a network of data consultants, CSI works with USGS science programs, partners, and industry to create new paradigms for accessing, integrating, visualizing, and delivering USGS data and information.

Core Science Systems (CSS) – A USGS division where the Core Science Analytics and Synthesis is located. The CSS mission is to work with others to provide data about earth and its resources are only useful if available in a format that is understandable and accessible. The U.S. Geological Survey (USGS) provides the Nation with ready access to natural science information that supports smart decisions about how to respond to natural risks and manage natural resources..

Cover – The area of ground covered by the vertical projection of the aerial parts of plants of one or more species. (FGDC, 1997).

Cover Type – A designation based upon the plant species forming a plurality of composition within a given area (e.g., Oak-Hickory) (FGDC, 1977). Also refers to an alliance or group of alliances in the USNVC.

Coverage – A file format used by Arc/Info software for vector spatial data.

Cowardin Classification – Wetland classification system commonly referred to as the Cowardin classification, after the first author. This is the FGDC standard for wetland classification. (Cowardin, 1979).

Cultural Vegetation – Vegetation planted or actively maintained by humans such as annual croplands, orchards, and vineyards. Contrast with natural vegetation. (Grossman et al., 1998).

Crosswalk – Relationship between the elements of two classification systems. For example, there is a crosswalk between map classes and units of the NVCS. This relationship is often shown in a look up table (LUT).

Datum – A mathematical model that describes the size and shape of the ellipsoid (the Earth is not a sphere but an ellipsoid distorted by rotation about its axis, with the globe bulging at the equator and flattened at the poles). The flattening is not uniform around the Earth due to the influence of the continents location (Snyder, 1982). Using the wrong datum in relation to geographic coordinates can result in errors of hundreds of meters in position. This Program uses the North American Datum (NAD) of 1983 or NAD83.

Density – Density is the relationship between the area covered by the overstory of a vegetation community and the total area of a polygon in which the community is found. One of the physiognomic modifiers classified in the USGS-NPS Vegetation Characterization Program. Density in map units is classified as Closed/Continuous > 60 %, Discontinuous 40% - 60%, Dispersed 25% - 40%, Sparse 10% - 25%, Rare 2% - 10%. Compare with pattern and height.

Diagnostic Species – Used to evaluate [i.e., diagnose] an area, or site, for some characteristic. For example, the presence and relative density of a *Vaccinium stamineum* var. *stamineum* (gooseberry) understory existing beneath a canopy of chestnut oak, black oak, and Virginia pine indicates that the site is xeric (or dry). The oaks and pines can inhabit a wide range of sites, wet to dry. But the gooseberry understory is the indicator of a drier habitat (which is probably due to a combination of factors including: soil type, slope, aspect, elevation, and site history). Also known as indicator species. (FGDC, 1997).

Dichotomous Field Key – A document that identifies vegetation communities on the basis of exclusive characteristics. An example of exclusive characteristics is forested versus non-forested. Also known as vegetation field key and vegetation key. This key is an important product of each vegetation-mapping project. For an example of a dichotomous field key visit <http://www1.usgs.gov/vip/agfo/agforpt.pdf>.

Digital Orthophoto Quadrangle (DOQ) – USGS digital product derived from high altitude aerial photography. These digital images are rectified and registered to locations on the earth and cover approximately one quarter of a 7.5-minute quadrangle. Also call digital orthophoto quarter quadrangle, DOQQ, and 3.75-minute DOQ. DOQ's are often used as base maps to register the photo interpreted data in this program.

Digital Raster Graphic (DRG) – A scanned image of a paper USGS topographic map. The geographic information is georeferenced in the UTM projection with the accuracy and datum of the original map. The minimum scanning resolution is 250 dots per inch. DRG's are useful layers in a geographic information system

Digitize – The process of entering data into a computer. There are several methods of entering spatial data into a computer including manual digitizing, scan digitizing, and soft copy photogrammetric methods. Synonymous with automate.

Division – The highest level in the NVCS separating Earth cover into either vegetated or non-vegetated categories (FGDC, 1997).. See table under USNVC

Dominance – The extent to which a given species or life form predominates in a community because of its size, abundance or cover, and affects the fitness of associated species (FGDC, 1997).

Dominant Life Form – An organism, group of organisms, or taxon that by its size, abundance, or coverage exerts considerable influence upon an association's biotic (such as structure and function) and abiotic (such as shade and relative humidity) conditions (FGDC, 1997).

Ecological Groups – Classification of vegetation communities based on plant assemblages, physical environments, and dynamic processes useful for conservation planning. These groups are classified on total floristic composition, physiognomy (vertical structure), spatial pattern (horizontal structure), physical environment (landscape position/soil), chemical variables (e.g. soil pH), and disturbance regimes. Some factors are difficult to measure directly, and must be inferred from knowledge of species ecology, spatial patterns, and ecological processes. These groups often occur between the floristic and physiognomic levels of the NVCS.

Ecological Society of America (ESA) – A non-partisan, nonprofit organization of scientists founded in 1915 to promote ecological science and ensure the appropriate use of ecological science in environmental decision making. The ESA Panel on Vegetation Classification was constituted to support and facilitate the creation of standardized, scientifically credible North American vegetation classification.

Error – The distance of results of observations, computations, or estimates from the true values or to values that are accepted as being true. Also refers to the misclassification of thematic data. Contrast with accuracy.

Error Matrix – See contingency table

Existing Vegetation - The plant species existing at a location at the present time. The USGS-NPS Vegetation Characterization Program classifies and maps existing vegetation. Contrast with potential vegetation (ESA, 1999).

Federal Geographic Data Committee (FGDC) – Coordinates the development of the National Spatial Data Infrastructure (NSDI). The NSDI encompasses policies, standards, and procedures for organizations to cooperatively produce and share geographic data. The 17 federal agencies that make up the FGDC are developing the NSDI in cooperation with organizations from state, local and tribal governments, the academic community, and the private sector. The program complies with FGDC standards for vegetation classification, metadata, spatial data transfer, and positional accuracy.

Field Reconnaissance – Preliminary field visits by photo interpreters and vegetation classification experts to gain an overview of the vegetation of the project area and how it relates to the NVCS. Communication between photo interpreters and vegetation classification experts during this fieldwork is key to developing an accurate classification system. Observation point data are collected during this reconnaissance.

Field Verification – Field visits by photo interpreters after photo interpretation is complete to check for correctness of photo interpretation. At this point changes may be made to the photo interpretation. This occurs prior to accuracy assessment.

Flight line. – Refers to a line or strip of aerial photography. Usually designated on the film as ‘flightline number – photo number’. Technical: A line connecting the principal points of sequential vertical aerial photographs (Portions from ASP, 1984)

Floristics – The kinds and number of plant species in particular areas and their distribution (ESA, 1999).

Formation – A level in the National Vegetation Classification Standard hierarchy below subgroup which represents vegetation types that share a definite physiognomy or structure within broadly defined environmental factors, relative landscape positions, or hydrologic regimes (Grossman et al. 1998). See table under USNVC.

Geographic Information System (GIS). – An organized collection of geographically (spatially)-referenced information. (Portions from ESRI, 1994)

Georeference. – The process of converting a map or image into real-world coordinates. A non-georeferenced map or image is said to be in ‘digitizer-inches’ or ‘scanner-inches’, i.e., it has no real world coordinates.

Global Positioning System (GPS) – A system of satellites, ground receiving stations and handheld receivers that allow accurate measurement of feature coordinates on the face of the earth. GPS receivers are used to measure the location of field plots, reconnaissance points, and accuracy assessment points.

Gradsect – Gradient directed transect sampling. This approach is based on the distribution of patterns along environmental gradients. The gradsect sampling design is intended to provide a description of the full range of biotic variability (e.g., vegetation) in a region by sampling along the full range of environmental variability. Transects that contain the strongest environmental gradients in a region are selected in order to optimize the amount of information gained in proportion to the time and effort spent during the vegetation survey (Grossman, Goodin, et al., 1999).

Ground photograph. – An image recorded with the photographer standing on the ground (as opposed to an aerial photograph).

Ground truth. – The process of taking aerial photographs into the field to verify the ground condition compared to how that condition appears in the photograph.

Group – The level in the National Vegetation Classification Standard hierarchy below subclass based on leaf characteristics and identified and named in conjunction with broadly defined

macroclimatic types to provide a structural-geographic orientation (Grossman et al., 1998). See table under USNVC.

Habitat – The combination of environmental or site conditions and ecological processes influencing a plant community. (ESA, 1999).

Habitat Type – (1) a collective term for all parts of the land surface supporting, or capable of supporting, the same kind of climax plant association (Daubenmire 1978); (2) an aggregation of land areas having a narrow range of environmental variation and capable of supporting a given plant association (Gabriel and Talbot 1984).

Hectare. – A metric unit of measure equal to 10,000 m² or approximately 2.471 acres.

Height – Height of the overstory of a vegetation community.. One of the physiognomic modifiers classified in the USGS-NPS Vegetation Characterization Program. Height in map units is classified as < 0.5 meters, 0.5 - 2 meters, 2 - 5 meters, 5 - 15 meters, 15 - 35 meters, 35 - 50 meters, >50 meters. Compare with density and pattern.

Inventory and Monitoring (I&M) Program – A NPS program developed 1) to collect baseline inventories of basic biological and geophysical natural resources for all natural resource parks, 2) to set up long-term monitoring programs will be developed to efficiently and effectively monitor ecosystem status and trends over time at various spatial scales. The USGS-NPS Vegetation Characterization Program collaborates closely with the I&M Program.

Integrated Taxonomic Information System (ITIS) – A comprehensive, standardized reference for the scientific names, and synonyms and common names, for all the plants and animals and other biological organisms of North America and the surrounding oceans developed and maintained by an international partnership among agencies, organizations, and taxonomic specialists. This database is accessible over the Internet and is used by scientists, resource managers, educators and students, museum curators, conservationists, and the interested public. The PLANTS database is an important ITIS partner providing plant taxonomic information to ITIS. See <http://www.itis.gov/>.

Land Cover Classification (LC) – A classification of the cultural, physical, and vegetation features that cover the earth, commonly used with remote sensing technology. Vegetation classification is a subset of land cover classification.

Land Use Classification (LUC) – A classification of the earth’s surface that defines the use that people are making of the land, commonly used with remote sensing technology, and commonly combined with land cover classification. Natural vegetation areas may be classified as “vacant” or “forest”, or “grazing”.

Land Use/Land Cover Classification (LUC/LC) – A combination of a land use classification and land cover classification where the land use classification is used to classify areas that are under a definite land use, such as agriculture, residential, or mining. The land cover classification is used to classify lands that do not have definite land use, such as areas of bare rock, snow and ice, or open water. The Anderson Classification System is a land cover and land use classification.

Look Up Table (LUT) – A computer file that relates the elements of one classification to another in a crosswalk. The values of a map classification are related to the associations of the NVCS in a park project.

Map Accuracy – A measure of the maximum errors permitted in horizontal positions and elevations shown on maps. The National Map Accuracy Standard of the USGS at 1:24,000 scale is the map accuracy standard for the program. This standard is that 90% of well-defined objects should appear within 40 feet (12.2 meters) of their true location. See United States National Map Accuracy Standards.

Map Attribute – Collectively the map class (or map unit) code, the physiognomic modifier codes, and special modifiers if they are used: map unit code is that portion of the map attribute code defining the map unit (e.g. AB) the physiognomic modifier code – portion of map attribute code defining the vegetation community's structure (e.g. -1A3). The map attribute code is thus AB-1A3.

Map Class – The vegetation units that can be discerned on an aerial photograph. Often associations in an alliance cannot be distinguished on an aerial photograph because the differences are found in the understory, so map classes must be developed. For example, at Devils Tower National Monument there were five associations in the Ponderosa Pine Woodland Alliance, but it was necessary to create two ponderosa pine map classes because the associations could not be distinguished on the photography. Map classes may be complexes or mosaics of associations or map classes may also be the same as an association if that can be discerned on the photograph. Also known as map unit.

Map Scale – The relationship between a distance portrayed on a map and the same distance on the Earth (Dana, 1999). A map scale can be defined by a representative fraction (e.g., 1 unit on map / 12,000 units on ground) or by a graphic scalebar.

Map Unit – See map class.

Map Validation – The process of field checking and updating photo interpretation. This step is completed prior to accuracy assessment.

Metadata – Data about data. Metadata describes the content, quality, condition, and other characteristics of data. Its purpose is to help organize and maintain an organization's internal investment in spatial data, provide information about an organization's data holdings to data catalogues, clearinghouses, and brokerages, and provide information to process and interpret data received through a transfer from an external source (FGDC 1997). The FGDC sets standards for metadata content and structure.

Minimum Mapping Unit (MMU) – The smallest area that will be consistently delineated during photo interpretation. The MMU for the USGS-NPS Vegetation Characterization Program is 0.5 hectares.

Mosaic – An intermixing of associations in an area that can be distinguished on the aerial photography, but is too intricate to delineate each association polygon. Compare with complex.

National Biological Information Infrastructure (NBII) – A broad, collaborative program to provide increased access to data and information on the nation's biological resources. The NBII links diverse, high-quality biological databases, information products, and analytical tools maintained by NBII partners and other contributors in government agencies, academic institutions, non-government organizations, and private industry. Resource managers, scientists, educators, and the general public use the NBII to answer a wide range of questions related to the management, use, or conservation of this nation's biological resources. Has been terminated as of January 15, 2012.

National Biological Service (NBS) – The agency that originated the USGS-NPS Vegetation Characterization Program. Organized as the National Biological Survey in 1993, its name was changed to National Biological Service in 1995. It became the USGS Biological Resources Division in 1996. Now is USGS/CSS/Core Science Analytics and Synthesis in 2011.

National Park Service (NPS) – A U.S. Department of Interior agency, created in 1916, charged with preserving unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. NPS manages the National Parks and the Inventory and Monitoring Program and works closely with USGS to coordinate the USGS-NPS Vegetation Characterization Program.

National Vegetation Classification Standard (NVCS) – The Federal Geographic Data Committee's vegetation classification standard. It has been adopted to the formation level (as of June 2001); adoption of the floristic levels is pending. It is based on the Association for Biodiversity Information's United States National Vegetation Classification (USNVC) system. See table under USNVC for comparison and crosswalk.

Natural Heritage Programs – Natural Heritage Programs gather, manage, and distribute information about the biological diversity found within their jurisdiction. Most programs are part of government agencies—such as natural resources or fish and wildlife departments—although some are located within universities or non-governmental organizations. The Association with Biodiversity Information works closely in partnership with Natural Heritage Programs to organize, store, and disseminate data collected by the Programs. Natural Heritage Programs often collaborate on vegetation mapping projects in their states.

Natural Resources Conservation Service (NRCS) – (Formerly the Soil Conservation Service, formerly the Bureau of Soils) The NRCS, U.S. Department of Agriculture, producer to the Nation’s Soil Surveys, is the lead Federal agency for conservation on private land and is a partner in conservation with many state, local and tribal organization.

Natural Vegetation – Plant life of an area that appears to be unmodified by human activities. Most existing vegetation has been subjected to some alteration by human activities, so a clear distinction between natural and cultural vegetation may be difficult (Grossman et al., 1998).

NatureServe – a non-profit organization that provides the scientific information and tools needed to guide effective conservation action. NatureServe and its network of natural heritage program are a leading source of information about the species and ecosystems of the United States, Canada, and Latin America.

NatureServe Explorer – A website from ABI that provides authoritative conservation information in a searchable database for more than 50,000 plants, animals, and ecological communities in the U.S. and Canada. Vegetation community data developed by the USGS-NPS Vegetation Characterization Program is available on NatureServe (URL is <http://www.natureserve.org/explorer/>).

North American Datum (NAD) – The datum for map projections and coordinates throughout North America (see also datum). Usually associated with a version, such as 1927 or 1983. This Program uses the 1983 datum (NAD83), which is consistent with satellite location systems. The 1983 datum uses the GRS 80 spheroid whereas the 1927 datum uses the Clarke 1866 spheroid. (Portions from ESRI, 1994)

Observation Point – A field location point used to support map unit and vegetation classification development. These points are collected during reconnaissance and the mappers’ subsequent fieldwork.

Order – The 2nd highest level in the NVCS hierarchy under Division. The Orders within the Vegetated Division are generally defined by dominant life form (tree, shrub, dwarf shrub, herbaceous, or non-vascular). (FGDC, 1997). See table under USNVC.

Ortho Image – An aerial photograph that has had the distortions due to camera lens, topographic relief, tilt of the aircraft, and other factors common to aerial photography removed and has

been registered to locations on the earth. A digital ortho image can be placed in a GIS and have other layers, such as vegetation, overlain on it. Aerial photo interpretation can also be registered to an ortho image in the process of registering and automating the data into a GIS. A DOQ is a digital ortho image covering 3.75 minutes by 3.75 minutes of the earth's surface.

Pattern – Configuration of vegetation features or across a landscape. One of the physiognomic modifiers classified in the USGS-NPS Vegetation Characterization Program. Pattern in map units is classified as Evenly Dispersed, Clumped/Bunched, Gradational/Transitional, Alternating. Compare with density and height.

Photo Interpretation – The art and science of identifying and delineating objects on an aerial photograph. Photo interpreters in the USGS-NPS Vegetation Characterization Program are knowledgeable about the vegetation in their project area and highly skilled in identifying vegetation map units accurately and consistently.

Photo Interpretation Key – A description of the distinguishing features that make up the signature of each map class. This description may include written clues, as well as graphic examples of the signatures.

Photo-signature – Characteristics of an item on a photograph by which the item may be identified.

Physiognomic Modifiers – Modifiers used for mapping to describe the physiognomic structure of the vegetation found within a mapped polygon (coverage density, coverage pattern, and height).

Physiognomy – The structure and life form of a plant community (FGDC, 1997).

Plant Community – See community.

PLANTS Database – A database maintained by the Natural Resource Conservation Service that is a single source of standardized information about plants. This database focuses on vascular plants, mosses, liverworts, hornworts, and lichens of the U.S. and its territories. The PLANTS Database includes names, checklists, automated tools, identification information, species abstracts, distributional data, crop information, plant symbols, plant growth data, plant materials information, plant links, references, and other plant information. This is the database that maintains current scientific names. The PLANTS database provides the Integrated Taxonomic Information System (ITIS) data for plants. The PLANTS database is the taxonomic authority for the USGS-NPS Vegetation Characterization Program. For more information go to <http://plants.usda.gov/>.

Plot – A formal field location of a certain size where the data necessary to classify the vegetation communities is collected. The data generated from the plot data collection is subsequently entered into a database known as the PLOTS database. Plot size will vary depending on the vegetation physiognomy being sampled. Synonymous with vegetation plot. For more

information see Grossman, et al., 1994 at
<http://www1.usgs.gov/vip/standards/fieldmethodsrap.pdf>.

PLOTS database – A database in Microsoft Access format that contains the information collected from field plots with tables and fields for all the necessary data. The PLOTS database table structure and user' guide can be downloaded from
http://www.usgs.gov/core_science_systems/csas/vip/tools_and_resources.html.

Positional Accuracy – The nearness of a point in a spatial database to its actual location on the earth's surface. The program standard for horizontal positional accuracy meets National Map Accuracy Standards at the 1:24,000 scale. This means that each well-defined object in the spatial database will be within 1/50 of an inch of its actual location or 40 feet (12.2 meters).

Potential Vegetation – the vegetation structure that would become established if all successional sequences were completed without interference under the present climatic and edaphic conditions (ESA, 1999). Contrast with existing vegetation.

Precision Lightweight GPS Receiver (PLGR) – A small, handheld, Global Positioning System (GPS) receiver featuring selective availability/anti-spoofing (SA/A-S) and anti-jam capability.

Producers' accuracy – The probability that a reference sample (the ground data) has been classified correctly, also known as error of omission. This quantity is computed by dividing the number of samples that have been classified correctly by the total number of reference samples in that class (Story and Congalton 1986). Compare with user's accuracy.

Projection – A map or a geospatial database is a flat representation of data located on a curved surface. A projection is a device for producing all or part of a round body on a flat sheet. This projection cannot be done without distortion, so the cartographer must choose which characteristic (distance, direction, scale, area, or shape) that is to be emphasized at the expense of the other characteristics (Snyder, 1982). All spatial data in the program are represented in the Universal Transverse Mercator (UTM) coordinate system that is based on the transverse mercator projection applied between 84 degrees north and 80 degrees south latitude.

Quadrangle – A USGS paper map. Typically, a 7.5-minute USGS map. Informally known as quad.

Quarter quadrangle – A map or image that includes ¼ the area of a 7.5-minute quadrangle and is organized in quadrants of the original quadrangle as follows: Northeast, Northwest, Southeast, and Southwest. USGS DOQ's cover ¼ of a 7.5-minute quadrangle. . Informally known as quarter quad.

Rectify – Remove distortions common to aerial photographs in the process of automating the photo-interpreted information into a digital database. Distortions on aerial photographs are due to topographic relief on the ground, radial distortion in the geometry of the aerial photography, tip and tilt of the plane, and differences in elevation of the airplane from its nominal scale. This process may be separate or included in the registration process depending on the technology used. See transfer.

Register – The process of correlating objects on an aerial photograph with locations on the surface of the Earth using a defined coordinate system. This is necessary to be able to place the vegetation community data in a GIS with other appropriate data such as transportation, topography, soils, etc. This process may be separate or included in the rectification process depending on the technology used. See transfer.

Scale – The relationship between a distance portrayed on a map and the same distance on the Earth (Dana, 1999). A map scale can be defined by a representative fraction (e.g., 1 unit on map / 12,000 units on ground) or by a graphic scale bar.

Spatial Data Transfer Standard (SDTS) – A comprehensive transfer standard for Earth-referenced data endorsed by the Federal Geographic Data Committee. Spatial data in SDTS format consists of a group of files each with specific content and format.

Special Modifiers – Modifiers used as part of a map attribute to describe special features that are not part of the USNVC. For example, a park may be interested in eagle nests, beaver dams, prairie dog towns, and forest blow-down. See map attributes, map codes, and physiognomic modifiers.

Signature – The unique combination of color, texture, pattern, height, physiognomy, and position in the landscape used by an photo interpreters to identify map classes on an aerial photograph.

Stratum – A horizontal layer of vegetation. A stratum may be defined by the life form of the vegetation (tree, shrub, herbaceous), or its actual height.

Structure (Vegetation) – The spatial distribution pattern of life forms in a plant community, especially with regard to their height, abundance, or coverage within the individual layers (ESA, 1999). Synonymous with physiognomy.

Subclass – The level in the National Vegetation Classification Standard hierarchy under class based on growth form characteristics (Grossman et al. 1998). See hierarchy under USNVS.

Subgroup – The level in the National Vegetation Classification Standard hierarchy below group which divides each group into either a "natural/semi-natural" or "cultural" (planted/cultivated) subgroup (Grossman et al. 1998). See hierarchy under USNVS.

Thematic Accuracy – The correctness of the map classes in relation to the vegetation on the ground. This is determined through the accuracy assessment procedures and the program standard is 80% accurate for each map class at the 90% confidence interval. See accuracy assessment, producer’s accuracy and user’s accuracy.

The Nature Conservancy (TNC) – A nonprofit conservation organization founded in 1951. Working with communities, businesses and people TNC protects millions of acres of valuable lands and waters worldwide. TNC was the original caretaker of the USNVC, but those responsibilities have been spun off to the Association for Biodiversity Information. TNC no longer has an active role with the USGS-NPS Vegetation Characterization Program.

Topographic Quadrangles – USGS paper maps showing the topography of an area along with roads, railroads, water bodies, building, urban developments, and wetlands. These come in a variety of scales, but commonly refer to 1:24,000 scale 7.5-minute quads. Informally referred to as top quads.

Transfer – The process of moving photo interpreted data from an aerial photo overlay to an ortho image to register and rectify the data. This process varies depending on the type of technology used.

Transform (ation). – The process of converting coordinates (map or image) from one coordinate system to another. This involves scaling, rotation, translation, and warping (images) (ESRI, 1994).

Transition Zone – An area where the vegetation composition and structure is intermediate between two associations. The transition zone may be small as the associations abruptly change due to a large shift in the landscape, such as a cliff, or it may be large as the physical environment changes gradually. Transition zones often are challenges to properly classify and/or map vegetation.

Type – A generic term that can reference any vegetation level in the USNVC, whether it is association, alliance, formation, etc, and even a combination of levels, or no reference to a known “type” within the classification. It a vague but useful term. It is correctly used when the focus is not on the vegetation “type,” but rather when used loosely to explain some other point that one is trying to get across (e.g., “We do not have a good grasp of how vegetation types at Acadia link to the map units used for mapping.”). “Types” refers to all levels of the classification, not specific association level. Plus the focus is on “not have a good grasp,” not the vegetation type or map unit. Also known as vegetation type.

Upper Midwest Environmental Sciences Center (UMESC) – A USGS Science Center concerned with large river issues and medicinal drugs for public aquaculture. UMESC has established a significant geospatial technologies capability and is managing several park projects for the USGS-NPS Vegetation Characterization Program.

United States Geological Survey (USGS) – Established in 1879, the USGS is the natural science agency for the Department of the Interior. The USGS is the one of the host agencies, along with the National Park Service, for the USGS-NPS Vegetation Characterization Program.

United States National Map Accuracy Standards (NMAS) – USGS accuracy standards for published maps, including horizontal and vertical accuracy, accuracy testing method, accuracy labeling on published maps, labeling when a map is an enlargement of another map, and basic information for map construction as to latitude and longitude boundaries. The table below shows the standard for some common map scales. To meet NMAS maps must have less than 10 percent of the points tested (well-defined points) exceed the standard. Note that the conversion of paper maps into digital data usually creates additional error.

Horizontal Accuracy Examples

Scale	Engineering Scale	National Map Accuracy Standard
1:1,200	1"=100'	+/- 3.33 feet
1:2,400	1"=200'	+/- 6.67 feet
1:4,800	1"=400'	+/- 13.33 feet
1:9,600	1"=800'	+/- 26.67 feet
1:10,000		+/- 27.78 feet
1:12,000	1"=1000'	+/- 33.33 feet
1:24,000	1"=2000'	+/- 40.00 feet
1:63,360	1"=one mile	+/- 105.60 feet
1:100,000		+/- 166.67 feet

United States National Vegetation Classification (USNVC) – The Association for Biodiversity’s vegetation classification system. It is the basis for the FGDC National Vegetation Classification Standard. See table below for comparison

2008 NVCS Version

	FGDC NVCS	Example
Physiognomic Levels	Formation Class	Mesomorphic Shrub and Herb Vegetation
	Formation SubClass	Temperate and Boreal Shrub and Herb Vegetation
	Formation	Temperate Shrub and Herb Vegetation
	Division	Andropogon - Stipa - Bouteloua Grassland & Shrubland Division
	Macrogroup	Andropogon gerardii - Schizachyrium scoparium - Sorghastrum nutans Grassland & Shrubland

**USGS-NPS Vegetation Characterization Program
Glossary**

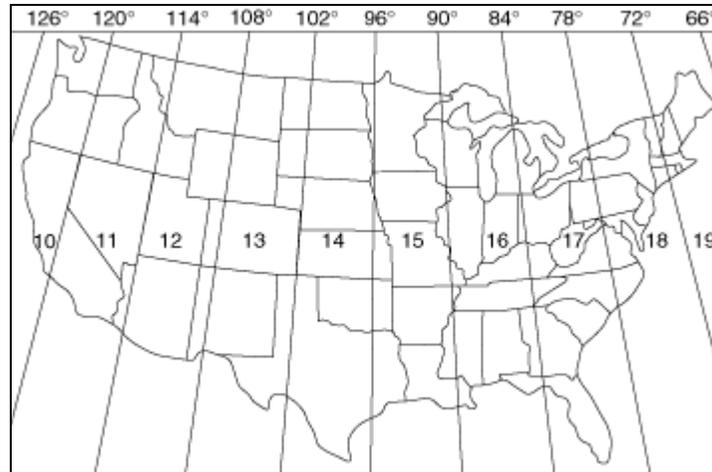
		Macrogrouop
	Group	Andropogon gerardii - Sporobolus heterolepis Grassland Group
Floristic Levels	Alliance	Andropogon gerardii - (Calamagrostis canadensis - Panicum virgatum) Herbaceous Alliance
	Association	Andropogon gerardii - Panicum virgatum - Helianthus grosseserratus Herbaceous Vegetation

1997 NVCS Version

	ABI USNVC	FGDC NVCS	Example
Physiognomic Levels	System		Terrestrial
		Division	Vegetated
		Order	Tree
	Class	Class	Woodland
	Subclass	Subclass	Evergreen Woodland
	Group	Group	Temperate or subpolar needle-leaved evergreen woodland
	Subgroup	Subgroup	Natural or semi-natural vegetation
	Formation	Formation	Rounded-crowned temperate or subpolar needle-leaved evergreen woodland
Floristic Levels	Alliance	Alliance (not finally adopted)	Juniperus scopularum Woodland Alliance
	Association	Association (not finally adopted)	Juniperus scopularum/ <i>Oryzopsis micrantha</i> Woodland

User's accuracy – The probability that a sample from the mapped data actually represents that category on the ground, also known as error of commission. This quantity is computed by dividing the number of correctly classified samples by the total number of samples that were classified as belonging to that category (Story and Congalton 1986). Compare with producer's accuracy.

Universal Transfer Mercator (UTM) –A map coordinate system (not a map projection) that is defined by the Transverse Mercator projection which has a set of zones defined by a central meridian as shown in the figure below for the United States (Portions from ESRI, 1994). All spatial data products developed by the program (vegetation spatial data, plot and accuracy assessment plot data locations are in this coordinate system.



Vector Data. – Spatial (usually digital) data that consists of using coordinate pairs (x, y) to represent locations on the earth. Features can take the form of single points, lines, arcs or closed lines (polygons).

Vegetation – The collective plant cover over an area (FGDC, 1997).

Vegetation Characterization – The detailed portrayal of a vegetation association using diagnostic and dominant species, structure, and ecological processes. The program has a formal structure for association description based on the ABI model. Also known as vegetation description.

Vegetation Classification – The process of categorizing vegetation into repeatable and consistent elements. Also a document the lists and organizes the vegetation communities in an area. An example of a vegetation classification can be found at <http://www1.usgs.gov/vip/agfo/agforpt.pdf>.

Vegetation Community – See community.

Vegetation Description – See vegetation characterization.

Vegetation Field Key – See dichotomous field key

Vegetation Key – See dichotomous field key

Vegetation Mapping – The process of identifying, labeling, and placing in real world coordinates vegetation communities.

Vegetation Plot – See plot.

Vegetation Structure – See structure (vegetation).

Vegetation Type – See type.

Vertical Aerial Photography – See Aerial Photography.

Wetland – A location on the landscape that is characterized by either hydric soils or hydrophytic plants or both. A wetland may be vegetated or non-vegetated. The vegetation description for each association includes its wetland status.

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