National Mapping Program

US GeoData

Digital Cartographic and Geographic Data

Department of the Interior
U.S. Geological Survey
National Cartographic
Information Center (NCIC)

Digital terrain data merged with Landsat Multispectral Scanner data for perspective view of Nebesna, Alaska.

Elevation Data
Geographic Names Information
Planimetric Data

The increasing use of computers for storing and analyzing earth science information has sparked a growth in the demand for various types of cartographic data in digital form. The production of map data in computerized form is called digital cartography, and it involves the collection, storage, processing, analysis, and display of map data with the aid of computers.

The U.S. Geological Survey, the nation's largest earth science research agency, has expanded its national mapping program to incorporate operations associated with digital cartography, including the collection of planimetric, elevation, and geographic names information in digital form. This digital information is available for use in meeting the multipurpose needs and applications of the map user community.

US GeoData are excellent for:

- Mineral resource assessments
- Wildlife habitat assessments
- Resource management
- Hydrologic modeling
- Rangeland inventories
- Irrigation potential determinations
- Geologic assessments
- Visual interpretations
- Land cover diversity estimates
- Vegetation inventories
- Soil surveys
- Forest fire behavior predictions
- Earthquake hazards mapping
- Coastal zone management
- Environmental assessments
- Geographic names analysis

You can:

- Combine US GeoData with other data
- Plot your own maps (with appropriate software)
- Perform calculations related to spatial analysis

Elevation Data

Digital Elevation Models (DEM's) are digital records of terrain elevations for ground positions at regularly spaced horizontal intervals. Elevation data are available for some USGS 7.5-minute topographic quadrangles and 1° x 2° (1:250,000-scale) maps.

USGS 7.5-Minute Digital Elevation Data

These data are produced in 7.5- by 7.5-minute blocks which correspond to USGS topographic quadrangle maps. Each DEM, like each topographic quadrangle, covers between 50.39 square miles (at 52.5°N latitude) to 68.37 square miles (at 23°N latitude). The ground distance between each pair of digitized points is 30 meters. These DEM's are prepared from contour plates that have been digitized, or from profiles derived by scanning stereomodels of high-altitude photographs taken at a typical contact scale of 1:80,000. The accuracy of the USGS 7.5-minute elevation data depends on the accuracy of these contours or the technique used for scanning the photographs. The vertical accuracy of DEM's is classified into two categories: between 0 and 7 or 8 and 15 meters.

Defense Mapping Agency 1° x 2° DEM Data

The 1° x 2° (1:250,000-scale) DEM data are available in two forms: in 1° by 1° blocks, with a 3-arc-second ground distance between each pair of digitized points (referred to as arc-second data); or in 1° by 1° blocks with a ground distance between each pair of digitized points equal to approximately 200 feet (referred to as planar/terrain data). DMA arc-second and planar data files cover the same geographical area. The main differences are in the sampling interval and the structure of the data files.

Both forms are produced from contour plates that have been digitized, and their accuracy, therefore, is dependent on the accuracy of the contour plates.

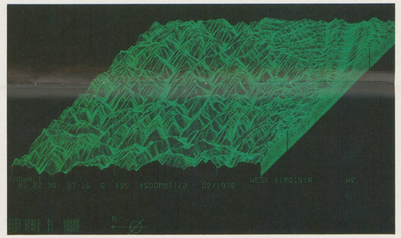
For both forms, each 1° x 2° (1:250,000-scale quadrangle) area scanned is usually split into an east half and a west half to accommodate the large volume of information. Therefore, two 1° by 1° DEM files are needed to cover the complete 1° by 2° map area.

Applications

DEM files may be used to generate graphics displaying slope, aspect (direction of slope), and terrain profiles between selected points. They may also be used in combination with stream locations and weather data to plan forest fire control. Many non-graphic applications have also been developed, such as modeling terrain and gravity data for use in the search for energy resources, determining the volume of proposed reservoirs, calculating the amount of material removed during strip mining, and determining landslide probability.

Ordering Instructions

DEM files may be ordered by identifying the quadrangles needed by latitude and longitude of the southeast corner or by quadrangle name.



Digital isometric plot of an area in West Virginia.

Geographic Names Information

The Geographic Names Information System (GNIS) is an automated data system which provides primary information for all known places, features, and areas in the United States identified by a proper name. The information in the system may be used for basic research, or the information may be reformatted and retrieved for specialized needs.

GNIS consists of four separate data bases, each with unique characteristics and functions: National Geographic Names Data Base; USGS Topographic Maps Data Base; Generic Data Base; and the Board on Geographic Names Data Base.

National Geographic Names Data Base

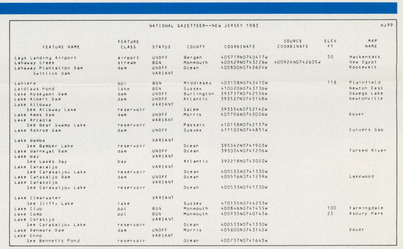
The National Geographic Names Data Base is a computerized file of more than two-million place names and features in the United States—from towns, schools, reservoirs, and parks to streams, valleys, springs, and ridges. The information is useful in locating the names of manmade and natural features. The National Geographic Names Data Base is used by the scientific and academic communities, and the general public. The information is used for local transportation planning, regional planning, product marketing, site selection and analysis, emergency preparedness, genealogical research, and solving problems requiring the use of analysis of geographic names.

USGS Topographic Maps Data Base

The USGS Topographic Maps Data Base contains descriptive information for the official names of each published or planned individual 7.5- by 7.5-minute topographic map area in the USGS 1:24,000-scale topographic map series. The data base includes current and historical map names, locations, geographic coordinates of the reference corners, and scale. If a 1:24,000-scale map is not published, then the name of the next smallest-scale, published map is referenced. The map name, scale, coordinates of the southeast corner, State, and other descriptive information are provided. The data base also contains a file with information for all 1:100,000- and 1:250,000-scale topographic maps.

Generic Data Base

The Generic Data Base provides information on every type of generic feature found in compiling the National Geographic Names Data Base. There are a total of 62 broad categories of feature types to facilitate searching and retrieving information about related features. For example, all rivers, streams, creeks, brooks, branches, runs, etc. are categorized as a "stream." About 1,100 types of features have been cross-referenced to these 62 broad categories. The Generic Data Base defines these feature types and describes them. For example, the word slough is used in different geographical areas to convey different meanings. The Generic Data Base provides the location, application, and reason for unusual application of these generics. This data base is also the GNIS information depository, and it contains complete annotated bibliographies of source materials other than USGS topographic maps utilized in the compilation of the National Geographic Names Data Base and other information regarding the nature of the information in GNIS.



NATIONAL GAZETTEER—NEW JERSEY 1983 NJ99

FEATURE NAME	FEATURE CLASS	STATUS	COUNTY	COORDINATE	SOURCE COORDINATE	ELEV FT	MAP NAME
Legg Landing Airport	airport	UNOFF	Bergen	405759N0742678w		50	Hackensack
Lehigan Creek	stream	BGN	Monmouth	400429N0740328w	400924N0742605w		New Egypt
Lehaway Plantation Dam	dam	UNOFF	Ocean	400820N0742424w			Roosevelt
Sullivan Dam		VARIANT					
Levitre	pol	BGN	Middlesex	401328N0742108w		118	Plainfield
Levitown Pond	lake	BGN	Sussex	410120N0743736w			Newton East
Lew Hickman Dam	dam	UNOFF	Burlington	395737N0751506w			Owaqua Lake
Lew Hickman Lake	dam	UNOFF	Atlantic	395307N0745104w			Weymouth
See Hickman Lake							
Lewis Creek	reservoir	UNOFF	Salem	393354N0753742w			
Lewis Creek	dam	UNOFF	Morris	405706N0743503w			Dover
Lew Arlington		VARIANT					
See Bear Swamp Lake							
Lew Ashton Dam	dam	UNOFF	Sussex	411102N0743531w			Culvers Gap
Lew Bambo		VARIANT					
See Bunker Lake							
Lew Barnegat Dam	dam	UNOFF	Ocean	395134N0741903w			
Lew Bates	dam	UNOFF	Ocean	395225N0742706w			Forked River
See Lake Ivy							
Lew Carabelle		VARIANT					
Lew Carabelle Lake	reservoir	UNOFF	Ocean	400153N0743532w			
Lew Carabelle Dam	dam	UNOFF	Ocean	400153N0743159w			Lakewood
Lew Carabelle		VARIANT					
See Carabelle Lake	reservoir	UNOFF	Ocean	400153N0743530w			
Lew Clearwater		VARIANT					
See Cliffs Lake							
Lew Cliffs Lake	lake		Sussex	410155N0743253w			
Lew Club	pol	BGN	Monmouth	400846N0741433w		100	Farmingdale
Lew Cumo	pol	BGN	Monmouth	400936N0740543w		23	Asbury Park
Lew Dorado		VARIANT					
Lew Dorado Lake	reservoir	UNOFF	Ocean	400153N0743530w			
Lew Fenwick Dam	dam	UNOFF	Morris	405802N0743512w			Dover
Lew Long		VARIANT					
See Bennetts Pond	reservoir	UNOFF	Ocean	400737N0741645w			

A photo reduction of a page from the National Geographic Names Data Base alphabetical finding list for New Jersey.

The Board on Geographic Names Data Base

The Board on Geographic Names Data Base provides information representing the investigations and decisions of the Domestic Names Committee of the U.S. Board on Geographic Names, from its creation in 1890 through the present. Each entry in this data base may also be found in the National Geographic Names Data Base, but the entries in this data base contain the reference and associated detailed information as researched and compiled by the U.S. Board on Geographic Names staff. BGN data is currently available for 1890-1959.

Available Products and Ordering Instructions

GNIS information is available as spiral-bound books, microfiche, and magnetic tape. Special searches are also performed upon request. Products in any format from data bases other than the National Geographic Names Data Base are considered special searches (costs vary).

A more formalized and more inclusive publication titled *The National Gazetteer of the United States of America* is also available. The National Gazetteer is a geographic dictionary of place and feature names, published on a State-by-State basis. In addition to the information contained in the National Geographic Names Data Base, the Gazetteer includes a glossary of terms and abbreviations, a map of counties in that particular State, and an alphabetical listing of USGS topographic quadrangle maps of the State. Also included are names of features from other historical and pertinent sources. Variant names are listed and cross-referenced to their official names. A variant name is any other known name or spelling applied to a feature other than the official name.

Volumes of the Gazetteer are currently available only for a few selected States in the United States.

Contact the National Cartographic Information Center (NCIC) for more information or to order GNIS products. To purchase *The National Gazetteer of the United States* (published as Professional Paper 1200), contact Eastern Distribution Branch, Text Products Section, U.S. Geological Survey, 604 South Pickett Street, Alexandria, Virginia 22304.

Planimetric Data

Digital line graphs (DLG's) are the digital representation of the planimetric information (line map data) usually portrayed on a map. DLG's are now available for some 7.5- and 15-minute topographic quadrangle maps, 1:2,000,000-scale maps, and the 1:250,000- and 1:100,000-scale land use and land cover series.

DLG's from 7.5- and 15-Minute Topographic Quadrangle Series

DLG's from 7.5- and 15-minute topographic quadrangles are prepared and sold in four thematic categories: (1) boundaries—includes State and county boundaries and federally administered lands; (2) transportation—includes roads and trails, railroads, and pipelines and transmission lines; (3) hydrography—includes streams and water bodies; and (4) U.S. Public Land Survey System.

Each of the four categories may be purchased individually, and they may be combined with any of the other categories, or with selected data in those categories.

DLG's from 7.5- and 15-minute topographic quadrangles are topologically structured, which means that spatial relationships inherent in the map have been preserved. This facilitates general spatial applications and calculations.

Because data for these DLG's are stored in the geographic coordinate (latitude/longitude) system, they are readily usable with other data that are identified by geographic coordinates.

Applications

DLG's can be combined with other types of digital information. For example, US GeoData can be combined with census data to produce a map showing population distribution among counties. US GeoData also can be used for mathematical computations, such as calculating the distance between locations or determining the length of the shoreline of a lake.

Ordering Instructions

US GeoData DLG tapes are sold in 7.5- and 15-minute blocks which correspond to USGS 7.5- and 15-minute topographic quadrangle maps. The area can be identified from a USGS index map (free upon request), and the data file(s) will correspond to that area.

DLG's from 1:2,000,000-Scale Maps

Digital line graphs from 1:2,000,000-scale maps are available in three categories: (1) boundaries—includes State and county boundaries, and federally administered lands; (2) transportation—includes roads, railroads, and airports; (3) hydrography—includes streams and water bodies. These three categories may be purchased individually, and they may be combined with any of the other categories, or selected data in those categories.

DLG's from 1:2,000,000-scale maps are available in a topologically structured format and a graphic-applications format. The topologically structured format is suitable for use in geographic information systems for spatial analyses and geographic studies. The graphic-applications format may be used to generate computer-plotted maps. The graphic-applications format is stored in the geographic coordinate system that allows the data to be plotted at various scales and on selected projections.

Applications

With appropriate software, the graphic-applications format may be used to plot maps which show only selected combinations of categories of data such as National Forest lands and railroads or rivers and railroads, or even to plot a simple base map showing only State boundaries. With appropriate software, the topologically structured format may be used in a variety of calculations and applications in addition to map plotting.

Ordering Instructions

DLG's from 1:2,000,000-scale maps are sold by geographic sections. There are 21 sections covering the United States. DLG's may be ordered by specifying the data category, and identifying the desired section on the USGS index map shown on the price list for 1:2,000,000-scale planimetric digital data (free upon request).

Land Use and Land Cover and Associated Maps Digital Data

Land Use and Land Cover (LULC) digital data are derived from thematic overlays registered to 1:250,000- and 1:100,000-scale base maps. LULC maps provide information on urban or built-up land, agricultural land, rangeland, forest land, water, wetland, barren land, tundra, and perennial snow or ice. Associated maps display information in four categories: (1) political units, (2) hydrologic units, (3) Federal land ownership, (4) census county subdivisions.

The LULC and associated maps used to produce US GeoData tapes are polygon, or areal, maps. Areas consisting of uniform structures and similar characteristics are compiled on the map as a series of lines which enclose the areas and form polygons. Each polygon is identified with an attribute code describing the area. Digitized map information is processed through the Geographic Information Retrieval and Analysis System (GIRAS) to produce data in two formats: the vector polygon format, and the composite theme grid cell format.

In the vector polygon format, all topological elements of the polygon map are represented as points, lines, and areas that (with special software) may be joined to form polygons replicating the graphic map product. The LULC data and four categories of the associated map data are available in this format and can be selected and purchased individually.

In the composite theme grid cell format, the map area is divided into 4-hectare (10-acre) cells. Each cell is completely identified with attribute codes for all LULC and associated map data. This format is particularly useful for combining and analyzing various categories of information. It includes all LULC data as well as the four categories of associated map data.

The vector polygon format and the composite theme grid cell format are available in ASCII character or in IBM binary format.

US GeoData for LULC and associated maps are stored in the Universal Transverse Mercator (UTM) coordinate system. The data may be transformed to other map projections, and converted to geographic coordinates.

Applications

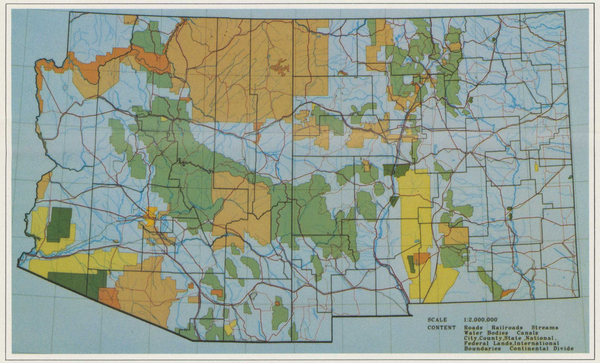
The vector polygon format is useful for readily locating all areas with similar characteristics, for plotting maps, and for area analysis. For example, in order to find the length of the border between two noncomparable types of land use or land cover (such as an area of industrial land bordering a lake under study), the amount of lakeshore occupied by the industrial site can be determined.

The composite theme grid cell format is particularly useful for combining and analyzing various categories of information. For example, it is possible to determine how many acres of deciduous forest are located on Federal land in a particular county, or how many acres of cropland and pasture are in a particular hydrologic unit.

US GeoData for LULC may be plotted with special software. Color plotting may be used to show the distribution of types of land use and land cover over a particular area and for various types of spatial analysis. Other data, such as population information, may be combined and analyzed with the US GeoData files.

Ordering Instructions

LULC data may be ordered by specifying the name of the quadrangle map area desired, or by identifying the latitude and longitude of the southeast corner and scale of the appropriate maps. A special LULC index is available upon request.



Composite from a plot of a digital line graph showing roads; railroads; streams; waterbodies; canals; city, county, State, National, and Federal lands; international boundaries; and the Continental Divide. (Reduced from original scale of 1:2,000,000.) Arizona and New Mexico.

Color plots showing forest land, water, and urban land for Washington, D.C. (Reduced from original scale of 1:250,000.)

1:250,000-scale land use and land cover computer plot of Washington, D.C., area.

For Further Details

For more detailed information on digital line graphs, digital elevation model data, and geographic names, contact the NCIC office nearest you. Fact sheets, user guides, price lists, and order forms are available upon request. NCIC personnel will assist you with ordering any of the digital products you request, and if you need more technical information, they will refer you to someone who can provide assistance.

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