

Digital Line Graph Data

Digital line graph (DLG) data are digital representations of cartographic information. DLG's of map features are digital vectors converted from maps and related sources. The U.S. Geological Survey (USGS) DLG data are classified as large, intermediate, and small scale.

Data Sources, File Content, and File Extent

Large-Scale DLG's

Large-scale DLG's are derived from the USGS 1:20,000-, 1:24,000-, and 1:25,000-scale 7.5-minute topographic quadrangle maps. When large-scale DLG's are revised, a recent digital orthophoto quadrangle is usually used to update those categories of DLG data that can be detected from an aerial photograph.

Large-scale DLG's are produced in 7.5-minute units that correspond to USGS 1:20,000-, 1:24,000-, and 1:25,000-scale topographic quadrangle maps. However, some older units in the Western United States cover 15-minute areas and correspond to maps at 1:62,500 scale. The unit sizes in Alaska vary depending on latitude. Units south of 59° N., cover 15- by 20-minute areas; between 59° and 62° N., 15- by 22.5-minute areas; between 62° and 68° N., 15- by 35-minute areas (all values are latitude and longitude, respectively).

Large-scale DLG's are available in nine categories or units: (1) Public Land Survey System, including township, range, and section line information; (2) boundaries, including State, county, city, and other national and State lands such as forests and parks; (3) transportation, including roads and trails, railroads, pipelines, and transmission lines; (4) hydrography, including flowing water, standing water, and wetlands;

(5) hypsography, including contours and supplementary spot elevations; (6) non-vegetative features, including lava, sand, and gravel; (7) survey control and markers, including horizontal and vertical positions (third order or better); (8) manmade features, including cultural features not collected in other data categories such as buildings; and (9) vegetative surface cover, including woods, scrub, orchards, vineyards, and vegetative features associated with wetlands.

All nonstandard quadrangles with neat-lines that extend beyond the standard unit size to accommodate overedge boundaries are collected as multiples of the standard unit size. Data covering a 7.5- by 8.5-minute area would, therefore, be sold as two 7.5-minute units.

Intermediate-Scale DLG's

Intermediate-scale DLG's are derived from USGS 1:100,000-scale 30- by 60-minute quadrangle maps. If these maps are not available, Bureau of Land Management planimetric maps at 1:100,000 scale are used, followed by archival compilation materials.

Intermediate-scale DLG's are sold in 30- by 30-minute units that correspond to the east or west half of USGS 30- by 60-minute 1:100,000-scale topographic quadrangle maps. Each 30-minute unit is produced and distributed as four 15- by 15-minute cells, except in high-density areas, where the 15-minute cells may be divided into four 7.5-minute cells.

Intermediate-scale hydrography and transportation DLG's are sold on compact disc-read only memory (CD-ROM). Each disc contains all the 15- by 15-minute cells within the 1:100,000-scale quadrangles that cover a State or States. Fourteen sectional regions in the United States covering the conterminous 48 States and Hawaii are available.

Presently, intermediate-scale DLG's are sold in five categories or units: (1) Public Land Survey System; (2) boundaries; (3) transportation; (4) hydrography; and (5) hypsography.

Small-Scale DLG's

Small-scale DLG's are derived from the USGS 1:2,000,000-scale sectional maps of the National Atlas of the United States of America. Small-scale DLG's were revised from 1990-95 sources.

Small-scale DLG's are sold in State units. At present, the 48 conterminous States and Hawaii have been revised. The District of Columbia is contained within the Maryland unit. Puerto Rico, the U.S. Virgin Islands, and Alaska will be revised by the end of 1996.

Small-scale DLG's are available on two types of CD-ROM discs. One disc type contains data in DLG Optional (DLG-O) format. The other disc type contains DLG-O data in the Spatial Data Transfer Standard (SDTS) format. Each CD-ROM disc contains small-scale DLG's for 49 States and the District of Columbia.

Small-scale DLG's are sold in five categories or units: (1) boundaries; (2) transportation, including roads and trails, railroads, pipelines, and airports; (3) hydrography; (4) manmade features, including built-up areas, capitals, county seats, populated places, and population range; and (5) Public Land Survey System, including land grants, township, range, and subdivisions of the public lands.

In addition to the small-scale DLG's, this disc contains two associated data files in ASCII format for each State; these numbers contain airport names, populated place names, and population density. There are also two national files. One contains land grant names and identifiers for the entire United States.

The other file contains the Federal Information Processing Standards' five-digit codes for all States, State equivalents, counties, and county equivalents. Records in these data files can be associated with cartographic features contained in the small-scale DLG files.

Attribute Codes

Attribute codes are used with vector data to describe the physical and cultural characteristics of node, line, and area elements. Each attribute code identifies the major category or unit to which a data element belongs, as well as the specific nature of the element. Codes also may provide additional descriptive information, numerical values, or identifiers. Many elements are uniquely described by a single attribute code, but some may require two or more codes for a complete description. Allowing for a variable number of attribute codes creates an open-ended structure to which information can be added at any time. It is not necessary for each element to have associated attributes; in general, attribute codes are not assigned to an element if the attributes can be derived on the basis of relationships to adjacent elements.

Data Distribution Formats

Large-scale DLG's are available in optional format. The optional format is easy to use with an 80-byte logical record length, a ground planimetric coordinate system (Universal Transverse Mercator), and topological linkages contained in node, line, and area elements. Large-scale DLG's will also be available in the Spatial Data Transfer Standard (SDTS) format as each State's data are converted.

Intermediate-scale DLG's are available in optional format. The hydrography and transportation categories of intermediate-scale DLG's are also available in the SDTS format. All categories of intermediate-scale DLG's are available in SDTS format.

Small-scale DLG's are available in optional and SDTS formats. Small-scale DLG's in optional format use the ground planimetric coordinate system of the Albers Equal-Area Conic projection. Small-scale DLG's in SDTS format use the geographic coordinate system of latitude and longitude.

Spatial Data Transfer Standard

The SDTS is a mechanism for transferring of spatial data between dissimilar computer systems. The SDTS specifies exchange constructs, addressing formats, structure, and content for spatially referenced vector and raster data. Advantages of the SDTS include data and cost sharing, flexibility, and improved quality, all with no loss of information.

At present, only ARC/INFO Version 7 from Environmental Systems Research Institute, Inc., of Redlands, Calif., includes an SDTS vector translator. Other vendors of geographic information systems (GIS) software are developing SDTS translators.

Data Records

The optional format classifies data into eleven record types. For descriptions of these record types, refer to Data Users Guide 1, "Digital Line Graphs from 1:24,000-Scale Maps;" Data Users Guide 2, "Digital Line Graph Data from 1:100,000-Scale Maps;" and Data Users Guide 3, "Digital Line Graphs from 1:2,000,000-Scale Maps."

SDTS transfers adhere to the Topological Vector Profile (TVP). A profile is a clearly defined and limited subset of the SDTS, designed for use with a specific type of data. The most effective way to use the SDTS is to first define a profile; encoding and decoding software can then be designed to handle only the options in that profile. Each small-scale transfer contains 16 modules defined by the TVP, which contain information about the original DLG-O data, including lineage, completeness, logical consistency, and spatial domain. Each TVP transfer includes a varying number of attribute primary modules, which contain the attributes of spatial objects. The structure, number, and name of attribute primary modules will vary with the DLG-3 theme being transferred.

A master data dictionary is included with each order of small-scale DLG's in the SDTS format. The master data dictionary contains three modules that identify the features and attributes of all small-scale DLG's.

Data Accuracy and Verification

DLG's do not carry quantified accuracy statements. However, the data files are checked and validated for file fidelity, completeness, attribute accuracy, topological fidelity, and matching edges before they are released for distribution.

Ordering Information

DLG's are written as ANSI-standard ASCII characters in fixed-block format on unlabeled or ANSI-labeled tape media. All DLG's are available for a cost on 8-millimeter tape, 3,480 cartridge tape, and compact disc-readable (CD-R). The data are priced per category or unit purchased.

To assist you in ordering, the Earth Science Information Center (ESIC) can furnish indexes and price list order forms. Data user guides are included with all orders except those for the small-scale CD-ROM's. The data user guide is included on these CD-ROM's in ASCII, Acrobat, PostScript, and WordPerfect 5.1 formats. US GeoData users guides can be accessed via:

<URL: <http://www-nmd.usgs.gov/www/html/2nmpgds.html>>

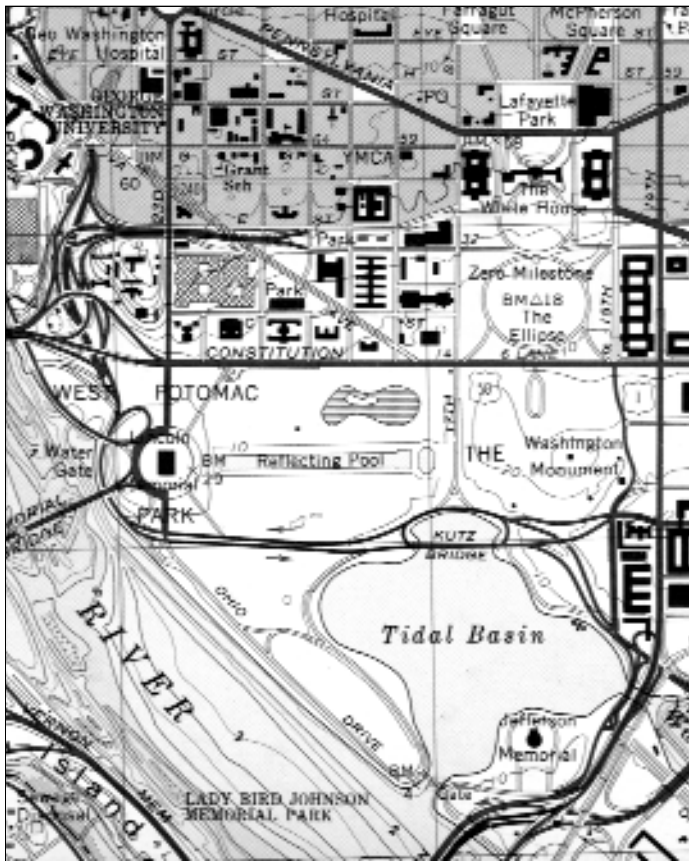
The files can be downloaded from the USGS National Mapping Division Information Server anonymous FTP site:

<URL: <ftp://www-nmd.usgs.gov/pub/ti/>>

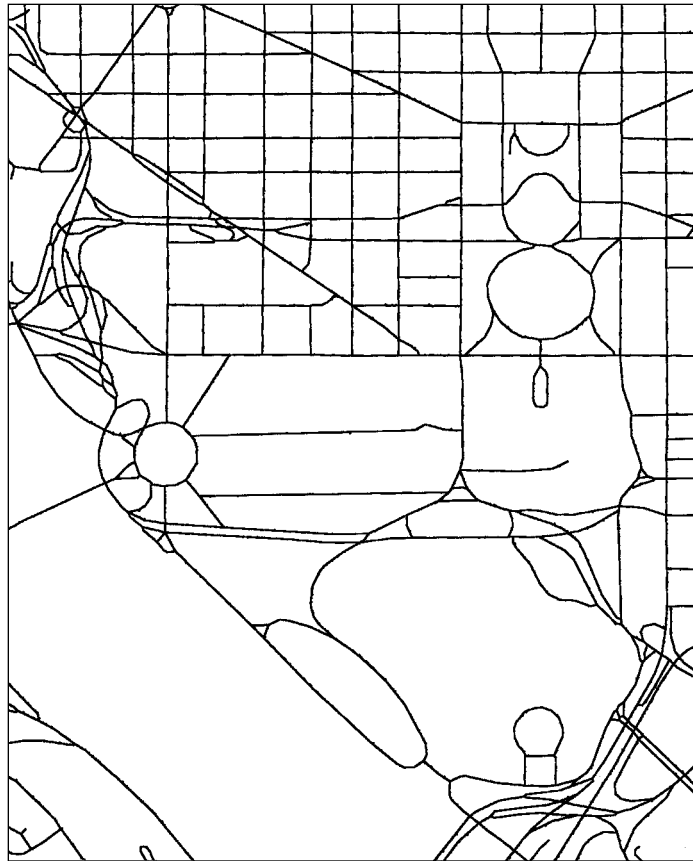
The USGS offers certain US GeoData data products through the Internet. They can be retrieved at no cost using anonymous FTP or World Wide Web (WWW).

The DLG data bases and their directory paths are listed below:

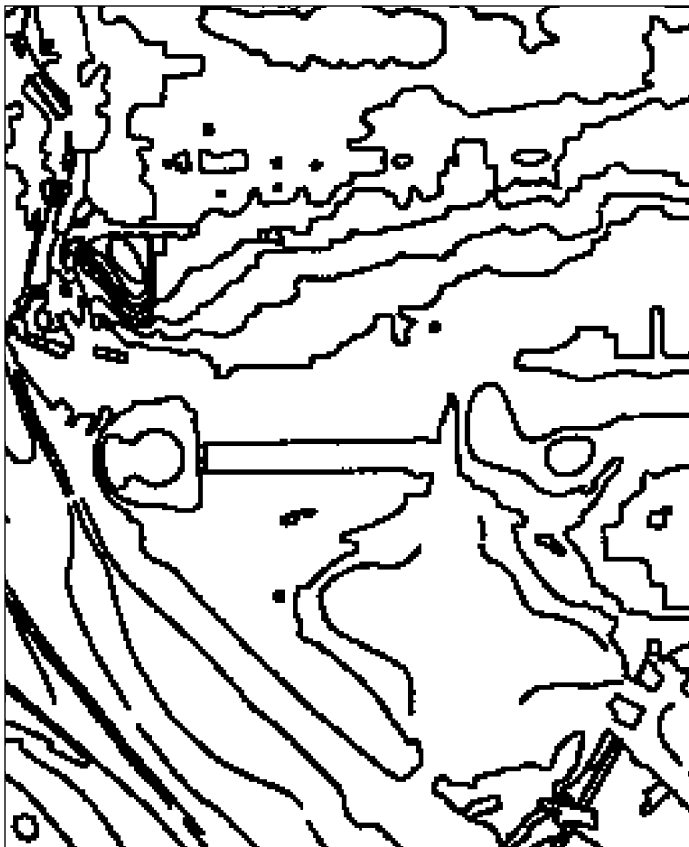
- 1:2,000,000-scale DLG's (/pub/data/DLG/2M)
- 1:100,000-scale DLG's (/pub/data/DLG/100K)



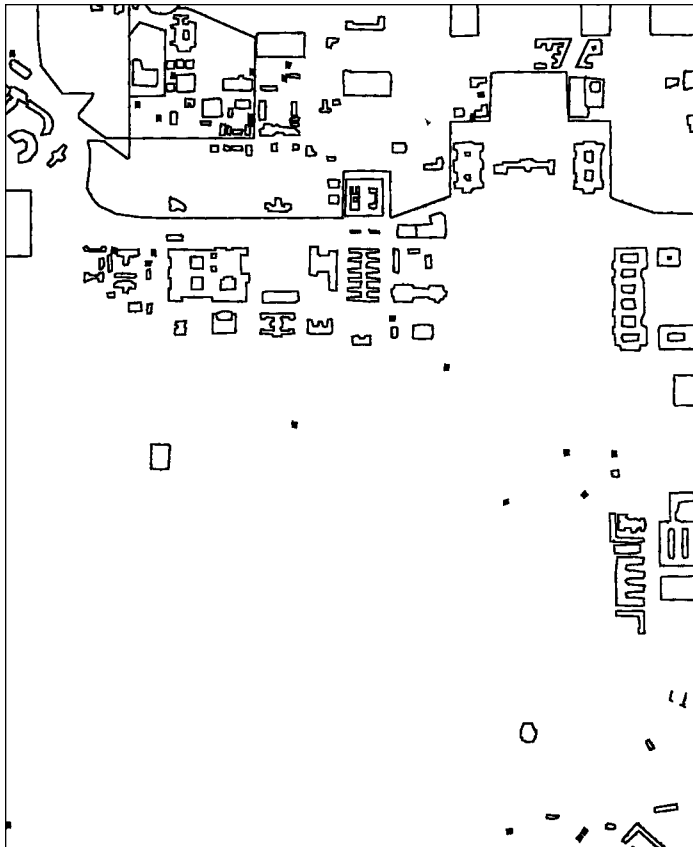
A part of the Washington West, D.C., 1:24,000-scale quadrangle.



A part of the Washington West, D.C., 1:24,000-scale DLG showing transportation.



A part of the Washington West, D.C., 1:24,000-scale DLG showing hypsography (terrain relief).



A part of the Washington West, D.C., 1:24,000-scale DLG showing cultural features.

To download files using FTP, follow these steps:

At the prompt, enter ftp and the following Internet address:

edcftp.cr.usgs.gov
(example: ftp edcftp.cr.usgs.gov)

For "Name" enter "anonymous."

For "Password" enter your e-mail address.

Change to the directory containing the desired files by entering "cd" and the directory path specified above for that particular DLG data base (for example, to get to the small-scale DLG's, enter cd pub/data/DLG/2M).

Enter "ls" to list the files. Locate the desired quadrangle file. The files are listed by area name, generally in an alphabetical list where, for example, the Austin, Texas, quadrangle would be found under the directory "A." SDTS transfers of 1:2,000,000-scale DLG's for Wisconsin would be found under the directory "W."

You would enter "cd A" and then "ls" to see all quadrangle files that begin with the letter A.

When the desired DLG file has been

located, set the file transfer mode to binary by entering "binary" at the prompt. Then enter "get" and the DLG file name. US GeoData files can also be retrieved through a USGS WWW server using browse tools, such as Mosaic. To use such graphical interfaces, follow these steps:

Under the file option, open the following address for the USGS EROS Data Center home page:

<URL: <http://edcwww.cr.usgs.gov/eros-home.html>>

Click on "US GeoData available via FTP." Each of the data bases can be navigated in one or more of the following ways: alphabetically, by State, and through a graphical index. Choose a method of navigation by clicking on that option. Then locate the desired DLG file.

Under the options menu, turn on the "Load to local disc" option.

Click on the file to be downloaded.

Ordering

For further information, contact:

USGS
Earth Science Information Center
507 National Center
Reston, Virginia 20192
1-800-USA-MAPS

For information on other USGS products and services, call 1-800-USA-MAPS, e-mail esicmail@usgs.gov, or fax 703-648-5548.

Receive information from the EARTHFAX fax-on-demand system, which is available 24 hours a day at 703-648-4888.

The address for the USGS home page is
<URL: <http://www.usgs.gov/>>

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.