

Metadata for Digital Raster Graphics (DRGs)

A Digital Raster Graphic (DRG) is a scanned image of a US Geological Survey (USGS) standard series topographic map, including all map collar information. This is a data-set level implementation of the Federal Geographic Data Committee's Content Standards for Digital Geospatial Metadata.

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Identification Information

Identification_Information:

Citation:

Citation_Information:

Originator:

U.S. Geological Survey

EROS Data Center

Publication_Date: 1996

Title: Digital Raster Graphics (DRGs)

Edition: 1.0

Geospatial_Data_Presentation_Form: map

Series_Information:

Series_Name: USGS Digital Raster Graphics

Issue_Identification:

Digital Raster Graphics (DRGs) are scanned color images of USGS topographic maps.

Publication_Information:

Publication_Place: Sioux Falls

Publisher:

U.S. Geological Survey

EROS Data Center

Other_Citation_Details:

Earth Science Information Centers (ESIC) offer nationwide information

and sales service for USGS map products and earth science publications. For additional information, contact any USGS Earth Science Information Center (ESIC), or call 1-800-USA-MAPS.

Online_Linkage: <http://edcwww.cr.usgs.gov/>

Description:

Abstract:

A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey (USGS) topographic map. The scanned image includes all map collar information. The image inside the map neatline is georeferenced to the surface of the Earth. The DRG can be used to collect, review, and revise other digital data, especially digital line graphs (DLG). When the DRG is combined with other digital products, such as digital orthophoto quadrangles (DOQ) or digital elevation models (DEM), the resulting image provides additional visual information for the extraction and revision of base cartographic information. The USGS is producing DRG's of the 1:24,000-, 1:24,000/1:25,000-, 1:63,360- (Alaska), 1:100,000-, and 1:250,000-scale topographic map series.

Purpose:

The DRG is used for validating digital line graphs (DLG's) and for DLG data collection and revision. The DRG can help assess the completeness of digital data from other mapping agencies. It can also be used to produce "hybrid" products. These include combined DRG's and DOQ's for revising and collecting digital data, DRG's and DEM's for creating shaded-relief DRG's, and combinations of DRG, DOQ, and DLG data. Although a standard DRG is an effective mapping tool, its full potential for digital production is realized in combination with other digital data

Supplemental_Information:

Digital raster graphic (DRG) data on CD-ROM are being produced by the U.S. Geological Survey (USGS) through an Innovative Partnership agreement with The Land Information Technology Company, Ltd., of Aurora, CO. This series includes DRG's of USGS standard series quadrangle maps of the United States, its Trusts, and Territories.

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 1996

Ending_Date: Present

Currentness_Reference: ground condition

Status:

Progress: In work

Maintenance_and_Update_Frequency: As needed

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -124.7333

East_Bounding_Coordinate: -067.9500

North_Bounding_Coordinate: 49.3833

South_Bounding_Coordinate: 24.5333

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: digital elevation model

Theme_Keyword: DEM

Theme_Keyword: digital terrain model

Theme_Keyword: contour line

Theme_Keyword: digital contours

Theme_Keyword: DOQ

Theme_Keyword: digital orthophoto

Theme_Keyword: digital orthophotoquad

Theme_Keyword: digital image map

Theme_Keyword: aerial photograph

Theme_Keyword: paper map

Theme_Keyword: map

Theme_Keyword: digital line graph

Theme_Keyword: U.S. Public Land Survey System

Theme_Keyword: hydrography

Theme_Keyword: transportation

Theme_Keyword: hydrography

Theme_Keyword: topographic

Theme_Keyword: Universal Transverse Mercator (UTM)

Theme_Keyword: scanner

Theme_Keyword: raster

Theme_Keyword: digital image

Place:

Place_Keyword_Thesaurus:

U.S. Department of Commerce, 1977, Countries, dependencies, areas of special sovereignty, and their principal administrative divisions

(Federal Information Processing Standard 10-3):Washington, D.C.,

National Institute of Standards and Technology.

Place_Keyword: US

Place_Keyword: United States

Place_Keyword: FIPS codes for states covered

Place_Keyword: Puerto Rico

Temporal:

Temporal_Keyword_Thesaurus: None

Temporal_Keyword: true ground conditions

Access_Constraints: None

Use_Constraints:

Acknowledgement of the U.S. Geological Survey would be appreciated

n products derived from these data.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

U.S. Geological Survey

EROS Data Center

Contact_Position: Customer Services Representative

Contact_Address:

Address_Type: mailing and physical address

Address:

U.S. Geological Survey

EROS Data Center

City: Sioux Falls

State_or_Province: SD

Postal_Code: 57198-0001

Country: USA

Contact_Voice_Telephone: (605) 594-6151

Contact_TDD/TTY_Telephone: (605) 594-6933

Contact_Facsimile_Telephone: (605) 594-6589

Contact_Electronic_Mail_Address: custserv@edcmail.cr.usgs.gov

Hours_of_Service: 0730 - 1615 CST

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

Browse_Graphic:

Browse_Graphic_File_Name: Digital Raster Graphic

Browse_Graphic_File_Description: Dover, Delaware

Browse_Graphic_File_Type: JPEG

Security_Information:

Security_Classification_System: None

Security_Classification: Unclassified

Security_Handling_Description: None

Native_Data_Set_Environment: Unix

Data Quality Information

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

The DRG uses a standard palette to ensure uniform color throughout a particular map series. The RGB values for a particular color, therefore, will remain consistent throughout that DRG series. Although the color values of the DRG may sometimes match those of the paper source map, a user will usually notice small differences between the colors on the digital image and on the paper map. Also, the quality of the user's monitor affects the DRG color displayed.

Although the DRG generally contains the complete content of the source map, features may occasionally be blurred because of substandard source materials. The DRG also may contain misclassified pixels (color noise).

The DRG is an 8-bit color image that employs a color palette to ensure uniform colors throughout a particular DRG series. All DRG's within a series must have the same RGB value.

Quantitative_Attribute_Accuracy_Assessment:

Attribute_Accuracy_Value: 00

Attribute_Accuracy_Explanation:

DRG's are examined to ensure color consistency within a series. Inspections are performed on selected DRG's to ensure that both the order of digital numbers (see table 2-2) and digital number values are correct. Colors will be checked for color compliance to map series and for major color differences between features on the DRG and similar features on the source map. Color consistency throughout each series is checked by comparing a DRG to its neighboring quadrangles whenever possible.

Logical_Consistency_Report:

The USGS DRG is produced with the intention of replicating as close as possible the original source map. Users of the DRG will note, however, that a certain amount of "noise" can be discerned when small areas are blown up or viewed under zoomed-in conditions. This noise is in the form of random specks or pixels of color and halos due to any number of factors, such as, the quality of the source, the use of screens and patterns on the litho, and the unevenness of ink due to saturation and absorption. Discontinuities or breaks in linear features may also be present and are due to improper calibration or usage of the scanner, the condition of the source, and resampling. Descreening, quantizing, and noise filtering are methods used to reduce noise, which, besides creating a more aesthetically pleasing image, have the added benefit of reducing the size of the image file. Removal of lithographic screen patterns is preferred but not required.

Completeness_Report:

Image completeness is checked by visually inspecting a sampling of DRG's. Each selected DRG will be examined for gaps (missing data) in the main body of the map, the map collar, the overedge areas, and any insets

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

A random sampling of DRG's will be accuracy tested. The accuracy test will be performed by comparing the positions of UTM grid intersections on the source graphic against the corresponding

location on the digital image. A visual inspection will determine whether those coordinates fall within the pixels that define a grid tick. DRG's duplicate the horizontal accuracy of its source.

Quantitative_Horizontal_Positional_Accuracy_Assessment:

Horizontal_Positional_Accuracy_Value: 0

Horizontal_Positional_Accuracy_Explanation:

DRG's will retain the horizontal accuracy of the source maps. Most USGS printed maps contain the National Map Accuracy Standards (NMAS) note in the collar area. The NMAS states that for maps on publication scales of 1:20,000 or smaller, not more than 10 percent of the points tested shall be in error by more than 1/50 inch measured on the publication scale. Test points must be "well-defined", that is, easily visible or recoverable on the ground. For DRG's this accuracy statement applies only to that area of the DRG that falls within the neatline of the source map (excluding inset areas). Overedge areas falling outside the transformation boundary area (the map neatline), can exhibit anomalies or discrepancies. These anomalies also will appear in the map inset areas and in the map collar. For maps without the NMAS note, the horizontal accuracy is unknown. However, the DRG will retain the accuracy of the source map.

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report:

In the DRG the vertical positional accuracy is referenced in the DRG collar.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: U.S. Geological Survey

Publication_Date: 0000

Title: USGS Topographic maps

Geospatial_Data_Presentation_Form: map

Other_Citation_Details:

The source for DRG's are the standard quadrangle format USGS topographic maps as described in the Federal Geographic Data Committee "Manual of Federal Geographic Data Products." They include 1:20,000-, 1:24,000-, 1:25,000-, 1:30,000-, 1:63,360-, 1:100,000- and 1:250,000-scale topographic maps. Included in the 1:24,000- and 1:25,000-scale series are provisional (P) maps and color orthophotomaps.

Type_of_Source_Media: paper

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 0000

Ending_Date: present

Source_Currentness_Reference: ground condition

Source_Citation_Abbreviation: USGS Topo

Source_Contribution:

The standard area of coverage of a DRG is the entire area printed on a USGS standard series topographic map including the map collar, any overedge areas, and insets. These standard series maps include:

7.5-minute map series: Conterminous United States, Hawaii, and limited areas of Alaska at 1:24,000 and 1:25,000 scale.

7.5- by 15-minute map series: Covers limited areas of the conterminous United States at 1:25,000 scale.

30- by 60-minute map series: Conterminous United States

Process_Step:

Process_Description:

Production of a DRG begins with the scanning of a paper 7.5-minute topographic map (map1) on a high-resolution scanner. Scanning resolutions range from 500-1,000 dpi with an output file of 160-300 Mb in size. Removal of screens (descreening) and color quantization to reduce the number of colors also takes place during the scanning phase.

The raw scan file is then transformed and georeferenced using UTM coordinates of the sixteen 2.5-minute grid ticks, which are obtained using the in-house produced program COORDAT and stored in a ground control file. Those sixteen 2.5-minute ticks are interactively visited and assigned their respective UTM coordinates. The USGS program XSHAPES4 then performs a piecewise linear rubber sheet transformation.

An output resolution of 2.4 meters (8.2 feet) is chosen to resample the file to 250 dpi. The image file is converted to a TIFF 6.0 image and further reduced by converting the file to a run length encoded PackBits compression (type 32773).

The color palette of the compressed DRG is then standardized by replacing the original RGB values assigned during the scanning process with standard RGB value combinations using the in-house produced TIFFREMAP program.

Source_Used_Citation_Abbreviation: map1

Process_Date: 0000

Process_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Rolla-ESIC

U.S. Geological Survey

Contact_Position: Customer Services Representative

Contact_Address:

Address_Type: mailing and physical address

Address: 1400 Independence Rd., MS231

City: Rolla

State_or_Province: MO

Postal_Code: 65401-2602

Country: USA

Contact_Voice_Telephone: 573-308-3577

Contact_Facsimile_Telephone: 573-308-3652

Contact_Electronic_Mail_Address: esic@mcmcmail.er.usgs.gov

Contact_Instructions: URL: <http://mcmcweb.er.usgs.gov/drg/>

Spatial Data Organization Information

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Pixel

Entity and Attribute Information

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

Each raster entity or pixel contains a digital number from 0 through 12 referencing a color palette of RGB values from 0 through 255 in which the standard colors used in the DRG are defined.

Entity_and_Attribute_Detail_Citation: Standards for Digital Raster Graphic.

Distribution Information

Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

U.S. Geological Survey

EROS Data Center

Contact_Person: Customer Services
Contact_Position: Customer Services Representative
Contact_Address:

Address_Type: mailing and physical address

Address:

Customer Services
U.S. Geological Survey
EROS Data Center

City: Sioux Falls

State_or_Province: SD

Postal_Code: 57198

Country: USA

Contact_Voice_Telephone: 605-594-6151

Contact_TDD/TTY_Telephone: 605-594-6933

Contact_Facsimile_Telephone: 605-594-6589

Contact_Electronic_Mail_Address: custserv@edcmail.cr.usgs.gov

Hours_of_Service: 7:30 am to 4:00 pm CT

Contact_Instructions:

Automated Ordering. Your order is forwarded to Customer Services at the U.S. Geological Survey's EROS Data Center. A Customer Services Representative contacts you to discuss your order and your mode of payment.

Manual Ordering. Write down the ordering ID(s) for your item(s). Contact Customer Services between the hours of 8:00 a.m. and 4:00 p.m. CST.

Resource_Description: DRG CD-R

Distribution_Liability:

Although these data have been processed successfully on a computer system at the USGS, no warranty expressed or implied is made by the USGS regarding the use of the data on any other system, nor does the act of distribution constitute any such warranty. The USGS will warrant the delivery of this product in computer-readable format and will offer appropriate adjustment of credit when the product is determined unreadable by correctly adjusted computer input peripherals, or when the physical medium is delivered in damaged condition. Requests for adjustment of credit must be made within 90 days from the date of this shipment from the ordering site.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: Tagged Image File Format (TIFF)

Format_Version_Number: version 6.0

Format_Specification:

Download WinCATS USGS DRG and DLG-O & DRG viewing software available from USGS.

Format_Information_Content:

To facilitate file manipulation by the widest possible range of

potential users, data and text files on the CD-ROM conform to the DOS "eight plus three" (8.3) file naming convention.

The associated DRG image (.TIF), world (.TFW), and metadata (.FGD) files incorporate an intelligent data set name (DSN) consisting of descriptive metadata wrapped around a standardized kernel that describes the spatial location of the file. The intent of this file naming protocol is to positively identify the spatial identity of the file and describe its categoric identity.

The DSN is designed to geographically locate DRG's of quadrangles using the 7.5-minute grid, clearly identifying those that fall exactly on the grid. DRG's that are not aligned with the 7.5-minute grid can be named with this convention but additional consideration is required to relate these undersize, oversize, or offset quadrangles to their most logical and unique 7.5-minute grid location.

File_Decompression_Technique: PackBits

Transfer_Size: 5 to 15 megabytes.

Digital_Transfer_Option:

Offline_Option:

Offline_Media: CD-ROM

Recording_Capacity:

Recording_Density: 650

Recording_Density_Units: megabytes

Recording_Format: ISO 9660

Compatibility_Information: None

Fees:

The current costs are available at:

URL: http://edcwww.cr.usgs.gov/glis/hyper/order_info/prices#DRG_CD

DRG File size may necessitate distribution on multiple CD-ROMs

Ordering_Instructions:

Dataset searching and ordering capabilities are available through the Global Land Information System (GLIS) at:

URL: <http://edcwww.cr.usgs.gov/webglis>

Turnaround: ASAP

Technical_Prerequisites: Adobe Acrobat Reader 2., CD-ROM drive

Available_Time_Period:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1997

Metadata Reference Information

Metadata_Reference_Information:

Metadata_Date: 19970904

Metadata_Review_Date: 19970904

Metadata_Future_Review_Date: 19971230

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

U.S. Geological Survey

EROS Data Center

Contact_Position: Customer Services Representative

Contact_Address:

Address_Type: mailing and physical address

Address:

Customer Services

U.S. Geological Survey

EROS Data Center

City: Sioux Falls

State_or_Province: SD

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Country: USA

Contact_Voice_Telephone: (605) 594-6151

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Contact_Facsimile_Telephone: (605) 594-658

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Hours_of_Service: 0700 - 1615 CST

Metadata_Standard_Name: Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: June 8, 1994

Metadata_Time_Convention: local time

Metadata_Access_Constraints: None

Metadata_Use_Constraints: None

Metadata_Security_Information:

Metadata_Security_Classification_System: None

Metadata_Security_Classification: Unclassified

Metadata_Security_Handling_Description: None