National Mapping Program
Technical Instructions

Part 7
7.5-Minute Digital Elevation Models

Standards for the Preparation of Digital Geospatial Metadata

U.S. Department of the Interior
U.S. Geological Survey
National Mapping Division

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Standards for the Preparation of Digital Geospatial Metadata
Part 7: 7.5-Minute Digital Elevation Models

1. IDENTIFICATION INFORMATION

Identification information provides basic information about the data set, including the title, geographic area covered, currentness, and rules for acquiring or using the data. Required elements of metadata are those necessary for identification of the data set and include citation, description, time period of content, status, spatial domain, keywords, access constraints, and use constraints. The identification information is a mandatory element of the data set metadata.

1.1 CITATION

The citation is the recommended reference to be used for the data set. The citation information is composed of the following:

originator - name of an organization or individual that developed the data set

publication date - the date when the data set is published or otherwise made available for release

title - the name by which the data set is known

geospatial data presentation form - mode in which the geospatial data are represented. This element usually identifies types of cartographic data in hardcopy form; no reference is made to digital files or media in this element.

publication information - publication detail for published data sets. For NMD data, the publisher is always the U.S. Geological Survey and the publication place always appears as Reston, VA

publication place - name of the city (and State) where the data set was published or released

publisher - name of the individual or organization that

published the data set

1.1.1 Example

Identification_Information:
Citation:
Citation_Information:
Originator: *U.S. Geological Survey*
Publication_Date: the date (year or year and month) the DEM was archived; format YYYY or YYYYMM
Title: the Geographic Cell Names Data Base designation for the 1:24,000-scale (7.5-minute) quadrangle
Publication_Information:
Publication_Place: *Reston VA*
Publisher: *U.S. Geological Survey*

1.2 DESCRIPTION

This element consists of an abstract, the purpose of the data set, and any optional supplemental information.

abstract - a brief narrative summary of the data set

purpose - a summary of the reasons why the data set was developed

supplemental information - other descriptive information about the data set

1.2.1 Example

Abstract:
A digital elevation model (DEM) contains a series of elevations ordered from south to north with the order of the columns from west to east. The DEM is formatted as one ASCII header record (A-record), followed by a series of profile records (B- records) each of which include a short B-record header followed by a series of

ASCII integer elevations per each profile. The last physical record of the DEM is an accuracy record (C-record).

The 7.5-minute DEM is cast on the Universal Transverse Mercator (UTM) projection. It provides coverage in 7.5- by 7.5-minute blocks. Each product provides the same coverage as a standard USGS 7.5-minute quadrangle. Coverage is available for the contiguous United States, Hawaii, and Puerto Rico but is not complete.

Purpose:

DEM's can be used as source data for digital orthophotos and as layers in geographic information systems for earth science analysis. DEM's can also serve as tools for volumetric analysis, for site location of towers, or for drainage basin delineation. These data were collected as part of the National Mapping Program.

Supplemental_Information:

7.5-minute DEM's have rows and columns that vary in length and are staggered. The UTM bounding coordinates form a quadrilateral (no two sides are parallel to each other) rather than a rectangle. The user will need to pad out the uneven rows and columns with blanks or flagged data values if an application requires a rectangle. Some software vendors have incorporated this function into their software for input of standard formatted USGS DEM's.

1.3 TIME PERIOD OF CONTENT

This element may be a single date/time, multiple dates/times, or a range of dates/times and a currentness reference.

single date/time - the means of encoding a single date and time
calendar date - the year representing the latest date of information in the data set

currentness reference - the basis on which the time period of information currentness is determined; for example, ground condition

1.3.1 Example

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: the date (year, year and month, or year, month, and day) of the source, hypsographic compilation, or the aerial photographs; format YYYY, YYYYMM, or YYYYMMDD
Currentness_Reference: *ground condition*

1.4 STATUS

This element includes the progress, maintenance, and update frequency information.

progress - the state of the data set

maintenance and update frequency - the frequency with which changes and additions are made to the data set after the initial data set is completed

1.4.1 Example

Progress: *complete*
Maintenance_and_Update_Frequency: *irregular*

1.5 SPATIAL DOMAIN

This element shows the areal coverage of the data set. The limits are given in latitude-longitude values in decimal degrees. For data sets that include a complete band of latitude around the Earth, the west bounding coordinate is assigned the value of -180.0 and the east bounding coordinate is assigned the value 180.0. Data sets with overedge coverage are referenced to the nominal tile coordinates in the NDCDB.

bounding coordinates - the latitude and longitude values for the

data set in the following order:

west bounding coordinate: the westernmost longitude of the data set
east bounding coordinate: the easternmost longitude of the data set
north bounding coordinate: the northernmost latitude of the data set
south bounding coordinate: the southernmost latitude of the data set

1.5.1 Example

Spatial_Domain:
Bounding _Coordinates:
West_Bounding_Coordinate: western longitude in decimal degrees
East_Bounding_Coordinate: eastern longitude in decimal degrees
North_Bounding_Coordinate: northern latitude in decimal degrees
South_Bounding_Coordinate: southern latitude in decimal degrees

1.6 KEYWORDS

Words or phrases summarizing an aspect of the data set. This element is composed of theme, place, stratum, and temporal keywords. The NMD uses only the theme and place subelements.

theme - subjects covered by the data set

theme keyword thesaurus - reference to a formally registered thesaurus or similar authoritative source of theme keywords

theme keyword - common-use word or phrase used to describe the subject of the data set

place - geographic locations covered by the data set

place keyword thesaurus - reference to a formally registered

thesaurus or a similar authoritative source of place keywords

place keyword - the geographic name of a location covered by a data set; usually US and the two-letter State abbreviation. No reference is used for Canada and Mexico because the digital data outside the United States are not archived as part of the data set.

1.6.1 Example

Theme:
Theme_Keyword_Thesaurus: *none*
Theme_Keyword: *DEM*
Theme_Keyword: *digital elevation model*
Theme_Keyword: *digital terrain model*
Theme_Keyword: *hypsography*
Theme_Keyword: *altitude*
Theme_Keyword: *height*
Place:
Place_Keyword_Thesaurus:
U.S. Department of Commerce, 1987, Codes for the identification of the States, the District of Columbia and the outlying areas of the United States, and associated areas (Federal Information Processing Standard 5-2): Washington, D.C., National Institute of Standards and Technology
Place_Keyword: *US*
Place_Keyword: the two-letter designation for the State(s) (each State has a separate Place_Keyword entry)

1.7 ACCESS CONSTRAINTS

Access constraints are the restrictions and legal prerequisites for accessing the data set, including constraints to protect privacy or intellectual property or limitations on obtaining the data set.

1.7.1 Example

Access_Constraints: *none*

1.8 USE CONSTRAINTS

This element sets out the restrictions and legal prerequisites for using the data set after access is granted.

1.8.1 Example

Use_Constraints:
None. Acknowledgment of the U.S. Geological Survey would be appreciated for products derived from these data.

1.9 DATA SET CREDIT

This element provides recognition of those who contributed to the data set.

1.9.1 Example

Data_Set_Credit: include Federal or State agencies, cooperators, or partnerships that contribute to the production of the data set

1.10 NATIVE DATA SET ENVIRONMENT

This element provides a description of the data set in the producer's processing environment, including items such as the name and version of the software, the computer operating system, file name including host-, path- and filenames, and the data set size.

1.10.1 Example

Native_Data_Set_Environment: include the software version and date, the hardware version and date, and the file size in bytes

2. DATA QUALITY INFORMATION

Data quality information provides a general assessment of the quality of the data set. Recommendations on information to be reported and tests to be performed are found in "Spatial Data Quality," chapter 1, part 3, *in* U.S. Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, D.C., National Institute of Standards and Technology.

2.1 ATTRIBUTE ACCURACY

Attribute accuracy is an assessment of the accuracy of the identification of entities and assignment of attribute values in the data set.

attribute accuracy report - the explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the test used

2.1.1 Example

Attribute_Accuracy_Report:

The accuracy of a DEM is depends on the level of detail in the source and the grid spacing used to sample that source. The primary limiting factor for the level of detail in the source is the scale of the source materials. The proper selection of grid spacing determines the level of content that can be extracted from a given source during digitization.

2.2 LOGICAL CONSISTENCY REPORT

This element provides an explanation of the fidelity of the relationships in the data set and the tests used.

2.2.1 Example

Logical_Consistency_Report:

The fidelity of the relationships encoded in the data structure of the DEM is automatically verified using a USGS software program upon completion of the data production cycle. The test verifies full compliance to the DEM specification.

2.3 COMPLETENESS REPORT

This element provides information about omissions, selection criteria, generalization, definitions, and other rules used to derive the data set. Use the appropriate description depending on the revision status of the data set.

2.3.1 Example

Completeness_Report:

The DEM is visually inspected for completeness on a DEM view-and-edit system for a final check of quality control and, if necessary, edit of the DEM. The physical format of each DEM is validated for content completeness and logical consistency during production quality control before being archived in the National Digital Cartographic Data Base.

Because the quadrilateral has a variable orientation in relation to the Universal Transverse Mercator (UTM) projection grid, profiles that pass within the bounds of the DEM quadrilateral may be void of elevation grid points and so not be represented in the DEM. This condition occurs infrequently and is always the first or last profile of the data set.

Level 2 DEM: Level 2 DEM's may contain void areas caused by interruptions to contours in the source graphic or DLG. Void area elevation grid posts are assigned the value of -32,767. In addition, suspect elevation areas may exist in the DEM but not be

specifically identified. Suspect areas can be located on the source graphic as a "disturbed surface" symbolized by contours overprinted with photorevised or other surface patterns.

2.4 POSITIONAL ACCURACY

The element provides an assessment of the accuracy of the positions of spatial objects in both horizontal and vertical positions.

horizontal positional accuracy - an estimate of accuracy of the horizontal positions of the spatial objects

horizontal positional accuracy report - an explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used.

quantitative horizontal positional accuracy assessment - a summary of the accuracy of the horizontal coordinates that includes a numeric value in meters of the accuracy and the name of the test that yielded the value

vertical positional accuracy - the estimate of accuracy of the vertical position in the data set

vertical positional accuracy report - an explanation of the accuracy of the vertical coordinate measurements and a description of the tests used.

quantitative vertical positional accuracy assessment - a summary of the accuracy of the vertical coordinates that includes a numeric value in meters of the accuracy and the name of the test that yielded the value

2.4.1 Example

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:

The horizontal accuracy of the DEM is expressed as an estimated root mean square error (RMSE). The estimate of the RMSE is based upon horizontal accuracy tests of the DEM source materials, which are selected as equal to or less than the intended horizontal RMSE error of the DEM. The testing of horizontal accuracy of the source materials is accomplished by comparing the planimetric (X and Y) coordinates of well-defined ground points with the coordinates of the same points as determined from a source of higher accuracy.

Quantitative_Horizontal_Positional_Accuracy_Assessment:

Horizontal_Positional_Accuracy_Value: use RMSE of the DEM.

Horizontal_Positional_Accuracy_Explanation: *Digital elevation models meet horizontal National Map Accuracy Standards (NMAS) accuracy requirements.*

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report:

The vertical RMSE statistic is used to describe the vertical accuracy of a DEM, encompassing both random and systematic errors introduced during production of the data. The RMSE is encoded in element number 5 of record C of the DEM. Accuracy is computed by a comparison of linear interpolated elevations in the DEM with corresponding known elevations. Test points are well distributed, representative of the terrain, and have true elevations with accuracies well within the DEM accuracy criteria. Acceptable test points include, in order of preference, field control, aerotriangulated test points, spot elevations, or points on contours from existing source maps with appropriate contour intervals. A minimum of 28 test points per DEM is required to compute the RMSE, which is composed of a single test using 20 interior points and 8 edge points. Edge points are those located along, at, or near the quadrangle neatlines and are deemed by the editor to be useful for evaluating the accuracy of the edge of the DEM. The quality control units within the USGS collect test point data and compare the DEM with the quadrangle hypsography.

There are three types of DEM vertical errors: blunder, systematic, and random. These errors are reduced in magnitude by editing but cannot be completely eliminated. Blunder errors are errors of major proportions and are easily identified and removed during interactive editing. Systematic errors follow some fixed pattern and are introduced by data collection procedures and systems. These error artifacts include vertical elevation shifts, misinterpretation of terrain surface because of trees, buildings and shadows, and fictitious ridges, tops, benches, or striations. Random errors result from unknown or accidental causes.

DEM's are edited to correctly depict elevation surfaces that correspond to water bodies of specified size.

Level 1 DEM: An RMSE of 7 meters or less is the desired accuracy standard. An RMSE of 15 meters is the maximum permitted. A 7.5-minute DEM at this level has an absolute elevation error tolerance of 50 meters (approximately three times the 15-meter RMSE) for blunder errors for any grid node when compared to the true elevation. Any array of points in the DEM cannot encompass more than 49 contiguous elevations in error by more than 21 meters (three times the 7-meter RMSE). Systematic errors that are within stated accuracy standards are tolerated.

Level 2 DEM: A vertical RMSE of one-half of the contour interval, determined by the source map, is the maximum permitted. Systematic errors may not exceed one contour interval specified by the source graphic. Level 2 DEM's have been processed or smoothed for consistency and edited to remove identifiable systematic errors.

Quantitative_Vertical_Positional_Accuracy_Assessment:

Vertical_Positional_Accuracy_Value: use RMSE of the DEM

Vertical_Positional_Accuracy_Explanation: *DEM's meet vertical National Map Accuracy Standards (NMAS) accuracy requirements.*

2.5 LINEAGE

This element contains information about how the data set was constructed, including the events, parameters, and source data.

- source information - list of sources and a short discussion of the information contributed by each
  - source citation - reference for a source data set(includes the source citation abbreviation, originator, publication date, title, geospatial data presentation form, and publication information)
  - source scale denominator - the denominator of the representative fraction for the map scale
  - type of source media - medium of the source data set
  - source time period of content - time period(s) for which the source data set corresponds to ground condition (includes single or multiple date(s)/time(s) and calendar date)
  - source citation abbreviation - short-form alias for the source citation
  - source contribution - brief statement identifying the information contributed by the source to the data set
- process step - information about a single event
  - process description - an explanation of the event and related parameters.
  - source used citation abbreviation - the source citation abbreviation (alias) of each data set used in the processing step

process date - the date the event was completed

2.5.1 Example

Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: *U.S. Geological Survey*
Publication_Date: the date (year or year and month) the DEM was archived; format YYYY or YYYYMM
Title: the Geographic Cell Names Data Base designation for the source quadrangle
Publication_Information:
Publication_Place: *Reston VA*
Publisher: *U.S. Geological Survey*
Type_of_Source_Media: *magnetic tape*
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time: (use appropriate data to reflect currentness of elevation source)
Calendar_Date: the date (year, year and month, or year, month, and day) of the source graphic, the hypsographic compilation, or the date of the photographs used to create the DEM; format YYYY, YYYYMM, or YYYYMMDD
Source_Currentness_Reference: *ground condition*
Source_Citation_Abbreviation: *CONTOUR1*
Source_Contribution: *hypsographic information that is interpolated to regular grid posts to form DEM grids in 30- by 30-meter UTM data spacing within the 7.5-minute DEM bounds*
Source_Information:
Source_Citation: (repeat as needed to reference all photographs used to make the DEM)
Citation_Information:
Originator: *U.S. Geological Survey*
Publication_Date: the date (year or year and month) the

photographs are available to the public for purchase; format YYYY or YYYYMM

Title: photo ID number

Geospatial_Data_Presentation_Form: *remote-sensing image*

Publication_Information:

Publication_Place: *Reston, VA*

Publisher: *U.S. Geological Survey*

Type_of_Source_Media: *transparency*

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time: the date (year and month or year, month, and day) of the aerial photograph; format YYYYMM or YYYYMMDD

Source_Currentness_Reference: *ground condition*

Source_Citation_Abbreviation: *PHOTO1*; reference each photograph used in creating the DEM (PHOTO2, PHOTO3, and so on)

Source_Contribution: *elevation values*

Source_Information:

Source_Citation:

Citation_Information:

Originator: *National Geodetic Survey (NGS)*

Publication_Date: the date (year or year and month) of the source of the survey control or the physical ground survey; format YYYY or YYYYMM

Title: *project control*

Publication_Information:

Publication_Place: *Silver Spring, MD*

Publisher: *National Geodetic Survey (NGS)*

Type_of_Source_Media: *magnetic tape*

Source_Time_Period_of_Content:

Time_Period_Information

Single_Date/Time: unknown, the date (year or year and month) of the source of the survey control, or of the physical ground survey; format YYYY or YYYYMM

Source_Currentness_Reference: *ground condition*

Source_Citation_Abbreviation: *CONTROL1*

Source_Contribution: *ground control points*

Process_Step:

Process_Description:

The production procedures, instrumentation, and hardware and software used in the collection of standard U.S. Geological Survey (USGS) digital elevation models (DEM's) vary depending on systems used at the contractor, cooperator, or National Mapping Division (NMD) production sites. This process step describes, in general, the process used in the production of standard USGS DEM data sets.

Level 1 DEM: Level 1 DEM's are acquired photogrammetrically by manual profiling or image correlation techniques from National Aerial Photography Program (NAPP) or equivalent source photographs.

Level 2 DEM: Level 2 DEM's are produced by converting 1:24,000-scale hypsography digital line graph (DLG) data to DEM format, or the DEM's are generated from vector data derived from scanned raster files of USGS 1:24.000-scale map series contour separates.

Level 3 DEM: Level 3 DEM's are created from DLG data that have been vertically integrated with all categories of hypsography, hydrography, ridge line, break line, drain files, and all vertical and horizontal control networks. The production of level 3 DEM's requires a system of logic incorporated into the software interpolation algorithms that clearly differentiates and correctly interpolates between the various types of terrain, data densities, and data distribution.

Water body editing: DEM surface areas corresponding to water bodies are flattened and assigned map-specified or estimated surface elevations. Water body areas are defined as ponds, lakes, and reservoirs that exceed 0.5 inch at map scale and double line drainage that exceeds 0.25 inch at map scale.

Water body shorelines are derived either from a hypsographic DLG or by interactive delineation from 1:24,000-scale USGS map series.

Edge matching and edge joining: DEM data sets within a project area (consisting of a number of adjacent files) are edge-match and edge-join edited to ensure terrain surface continuity between files. Edge matching is the process of averaging adjacent elevation values along common edges within a zone of approximately 5 row or column grid posts on both edges. When edge values exceed 3 elevation units difference, edge joining is performed. Edge joining involves an extensive level of editing and requires editing elevation values that are internal to the DEM. This is done to create more accurate terrain representations by correcting the alignment of ridges and drains and to achieve overall topographic shaping within an approximately 25-30 row or column grid post zone on both edges.

Quality control: DEM's are viewed on interactive editing systems to identify and correct blunder and systematic errors. DEM's are verified for physical format and logical consistency at the production centers using the Digital Elevation Model Verification System (DVS) software before they are archived in the National Digital Cartographic Data Base (NDCDB).

Source_Used_Citation_Abbreviation: *CONTOUR1, CONTROL1, PHOTO1* (reference as many photos as needed)

Process_Date: the date (year or year and month) the DEM was archived; format YYYY or YYYYMM

3. SPATIAL DATA ORGANIZATION INFORMATION

Spatial data organization information identifies the mechanism used to represent spatial information in a data set. This category of metadata describes point, vector, and raster objects. The elements dealing with direct spatial references are required. Elements dealing with indirect spatial references are applicable only to certain DLG-3 categories. Point, vector, and raster object information is considered optional in the "Content Standards for Digital Geospatial Metadata" but is used by the USGS to provide further information to data users.

3.1 DIRECT SPATIAL REFERENCE METHOD

This element defines the type of data in the data set. Data types are point, vector, and raster.

3.1.1 Raster object information - the types and numbers of raster spatial objects in the data set.

raster object type - raster spatial objects used to reference locations in the data set. The NMD uses the grid cell for elevation data.

row count - the maximum number of raster objects along the ordinate (y) axis in rectangular data sets; must be greater than 0

column count - the maximum number of raster objects along the abscissa (x) axis in rectangular data sets; must be greater than 0

3.1.1.1 Example

Direct_Spatial_Reference:
Direct_Spatial_Reference_Method: *raster*

Raster_Object_Information:
Raster_Object_Type: *grid cell*
Row_Count: use the row count for the DEM
Column_Count: use the column count for the DEM

4. SPATIAL REFERENCE INFORMATION

Spatial reference information describes the reference frame for and the means of encoding coordinates in the data set.

4.1 HORIZONTAL COORDINATE SYSTEM DEFINITION

The horizontal coordinate system definition provides the reference frame or system from which linear or angular distances are measured to locate the position a point occupies in the data set. The element provides information about the latitude/longitude resolution, map projection, and horizontal datum.

planar - the quantities of distances, or distances and angles, that define the position of a point on a reference plane to which the surface of the Earth has been projected

grid coordinate system - a plane-rectangular coordinate system usually based on and mathematically adjusted to a map projection so that geographic positions can be readily transformed to and from plane coordinates. Systems used by the NMD include Universal Transverse Mercator (UTM) and State Plane Coordinate System (SPCS) with zone identification.

planar coordinate information - information about the coordinate system developed on the planar surface

planar coordinate encoding method - the means used to represent horizontal positions; the NMD uses coordinate pairs for point and vector data and uses rows and columns for grid coordinate system data sets

coordinate representation - the method of recording the position of a point by measuring its distance from perpendicular reference axes for coordinate pairs or row and column methods; values for the abscissa and ordinate resolution are given in planar distance units of measure

(meters for data sets in coordinate pairs and grid coordinate systems and arc-seconds for data sets in geographic coordinate systems)

planar distance units - units of measure used for distances

geodetic model - parameters for the shape of the Earth; parameters include horizontal datum name (North American Datum of 1927 or North American Datum of 1983), ellipsoid name, semi-major axis, and the denominator of the flattening ratio

4.1.1 Example

Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: *Universal Transverse Mercator*
Universal_Transverse_Mercator:
UTM_Zone_Number: use the UTM zone for the data set
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: *0.9996*
Longitude_of_Central_Meridian: use the central meridian for the zone the data set falls in
Latitude_of_Projection_Origin: *0.0*
False_Easting: *500000*
False_Northing: *0.0*
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: *row and column*
Coordinate_Representation:
Abscissa_Resolution: *30*
Ordinate_Resolution: *30*
Planar_Distance_Units: *meters*
Geodetic_Model:
Horizontal_Datum_Name: *North American Datum of 1927*
Ellipsoid_Name: *Clark 1866*
Semi-major_Axis: *6378206.4*

Denominator_of_Flattening_Ratio: *294.98*

4.2 VERTICAL COORDINATE SYSTEM DEFINITION

This element provides information on the reference frame or system from which vertical distances (altitudes or depths) are measured.

altitude system definition - the reference frame or system from which altitudes (elevations) are measured. This element is used only for hypsography, hydrography, and survey and control marker DLG-3 categories. Add this to the metadata only for these categories.

altitude datum name - the name of the reference surface from which altitudes are measured

altitude resolution - minimum distance between two adjacent altitude values in altitude distance units; primary, secondary, and supplemental contour intervals for DLG's

altitude distance units - units in which altitudes are measured

altitude encoding method - the means used to encode the altitudes

4.2.1 Example

Vertical_Coordinate_System_Definition:
Altitude_System_Definition:
Altitude_Datum_Name: *National Geodetic Vertical Datum of 1929*
Altitude_Resolution: *1*
Altitude_Distance_Units: *feet* or *meters*
Altitude_Encoding_Method: *explicit elevation coordinate included with horizontal coordinates*

5. ENTITY AND ATTRIBUTE INFORMATION

This element provides information about the information content of the data set, including entities types, their attributes, and the domains from which attribute values can be assigned.

5.1 OVERVIEW DESCRIPTION

This element contains a summary of and a citation to the detailed description of the information content of the data set. The NMD uses the summary overview description for digital products.

5.1.1 Entity and Attribute Overview

This element provides a detailed summary of the information contained in a data set. For gridded data sets, this element specifies the size of the integer value and the range of acceptable values.

5.1.1.1 Example

Overview_Description:

Entity_and_Attribute_Overview:

The digital elevation model is composed of an elevation value linked to a grid cell location representing a gridded form of a topographic map hypsography overlay. Each grid cell entity contains a six-character integer value between -32,767 and 32,768.

5.1.2 Entity and Attribute Detail Citation

This element provides the name of the actual reference standard for the attribute codes and includes an FTP anonymous site Internet address if the standards are available in soft copy.

5.1.2.1 Example

Entity_and_Attribute_Detail_Citation:
U.S. Department of the Interior, U.S. Geological Survey, 1992, Standards for digital elevation models: Reston, Va

6. DISTRIBUTION INFORMATION

This element provides information about the distributor and means of obtaining the data set. The NMD Data and Information Delivery activity is responsible for maintaining and updating the information in this section.

6.1 DISTRIBUTOR

This element provides information about the distributor from whom the data set can be obtained.

6.1.1 Example

Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: *Earth Science Information Center, U.S. Geological Survey*
Contact_Address:
Address_Type: *mailing address*
Address: *507 National Center*
City: *Reston*
State_or_Province: *VA*
Postal_Code: *20192*
Contact_Voice_Telephone: *1 800 USA MAPS*
Contact_Voice_Telephone: *1 800 872 6277*
Hours_of_Service: *0800-1600 Monday -Friday*
Contact_Instructions:
In addition to the ESIC at the address above, there are other ESIC offices throughout the country. A full list of these offices is at
http://mapping.er.usgs.gov/esic/esic_index.html

6.2 RESOURCE DESCRIPTION

This element gives the name(s) by which the distributor knows the data set.

6.2.1 Example

Resource_Description: *DEM 7.5-minute units*

6.3 DISTRIBUTION LIABILITY

This element contains the statement of liability assumed by the distributor for the data set.

6.3.1 Example

Distribution_Liability:

Although these data have been processed successfully on a computer system at the U.S. Geological Survey (USGS), no warranty expressed or implied is made by the USGS regarding the utility of the data on any other system, nor shall 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.

6.4 STANDARD ORDER PROCESS

This element details the common ways in which the data set can be obtained or received, and related instructions and fee information. It addresses data in digital form and provides digital transfer information, digital transfer options, offline and online ordering options, fees, and ordering instructions.

6.4.1 Example

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: *DEM*
Format_Information_Content:
USGS standard DEM: The standard USGS DEM can be described as an ASCII formatted elevation file preceded by a metadata header file that consists of one 1,024 byte ASCII record.
Transfer_Size: *1*
Digital_Transfer_Option:
Offline_Option:
Offline_Media: *3480 cartridge tape*
Recording_Capacity:
Recording_Density: *250*
Recording_Density_Units: *megabytes*
Recording_Format: *ASCII; available unlabeled or with ANSI-standard labels; available block sizes are multiples of 1,024 ranging from 1,024 to 31,744 bytes. For efficiency, blocking factors of less than 16,000 are discouraged.*
Offline_Option:
Offline_Media: *8mm cassette tape*
Recording_Capacity:
Recording_Density: *4.5 (high)*
Recording_Density: *2.3 (low)*
Recording_Density_Units: *gigabytes*
Recording_Format: *ASCII; available unlabeled or with ANSI-standard labels; available block sizes are multiples of 1,024 ranging from 1,024 to 31,744 bytes.*
Offline_Option:
Offline_Media: *CD-Recordable*
Recording_Capacity:
Recording_Density: *650*
Recording_Density_Units: *megabytes*

Recording_Format: *ISO 9660; the files are placed in a flat directory on the CD with naming conventions that are ISO 9660 Level 1 compliant (DOS 8.3).*

Fees:

The online copy of the data set (when available electronically) can be accessed at cost. Fees are subject to change. Call 1-800-USA-MAPS for current prices.

7. METADATA REFERENCE INFORMATION

This element provides information on the currentness of the metadata information and the responsible party. The information includes metadata creation date, contact, and metadata standard and version. Metadata reference information is a mandatory element of the data set metadata.

7.1 METADATA DATE

This element gives the date that the metadata were created or last updated.

7.1.1 Example

Metadata_Date: the date (year or year and month) the data set was entered in the Sales Data Base (SDB) at EROS Data Center

7.2 METADATA CONTACT

This element provides the name of the party responsible for the metadata information.

7.2.1 Example

Metadata_Contact:
  Contact_Information:
    Contact_Organization_Primary:
      Contact_Organization: *U.S. Geological Survey*
        Contact_Address:
          Address_Type: *mailing address*
          Address: *Box 25046, Building 810*
          Address: *Denver Federal Center, MS 504*
          City: *Denver*
          State_or_Province: *CO*
          Postal_Code: *80225-0046*

Contact_Voice_Telephone: *303 202 4200*
Contact_Facsimile_Telephone: *303 202 4188*
Contact_Electronic_Mail_Address: *esic@rmmc1.cr.usgs.gov*

7.3 METADATA STANDARD NAME

This element always refers to the FGDC metadata standard in use at the time the data set metadata were created.

7.3.1 Example

Metadata_Standard_Name: *Content Standards for Digital Geospatial Metadata*

7.4 METADATA STANDARD VERSION

This element is the version of the FGDC standard in use at the time the metadata were created.

7.4.1 Example

Metadata_Standard_Version: *19940608*