Part 9
1-Degree Digital Elevation Models

Standards for the Preparation of Digital Geospatial Metadata

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Standards for the Preparation of Digital Geospatial Metadata
Part 9: 1-Degree 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

              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   <u>Example</u>

    Identification_Information:
      Citation:
      Citation_Information:
        Originator: *National Imagery and Mapping Agency (NIMA)*
        Publication_Date: the date (year or year and month) the DEM was archived; format YYYY or YYYYMM
        Title: the NIMA alpha-numeric designation for the 1:250,000-scale quadrangle W or E followed in parentheses by the Geographic Cell Names Data Base designation for the 1:250,000-scale quadrangle plus east or west
        Publication_Information:
          Publication_Place: *Bethesda, MD*
          Publisher: *National Imagery and Mapping Agency*

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

1.2.1   <u>Example</u>

Abstract:
  Digital elevation model (DEM) is the terminology adopted by the USGS to describe terrain elevation data sets in a digital raster form. The standard DEM consists of a regular array of elevations cast on a designated coordinate projection system. The DEM data are stored as a series of profiles in which the spacing of the elevations along and between each profile is in regular whole-number intervals. The normal orientation of data is by columns and rows. Each column 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 includes 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).

1-degree DEM (3- by 3-arc-second data spacing). Provides coverage in 1- by 1-degree blocks. Two products (three in some regions of Alaska) provide the same coverage as a standard USGS 1- by 2-degree quadrangle. The basic elevation model is produced by or for the National Imagery and Mapping Agency (NIMA) but is distributed by the USGS in the DEM data record format. Coverage is for the United States.

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.

Supplemental_Information:

1-degree DEM's have rows and columns that are based on the geographic coordinate system. The use of this system results in a rectangular DEM that shares a common edge and therefore duplicate points with other adjacent 1-degree 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.

range of dates/times - the means of encoding a range of dates and times

  beginning date - the year (optionally month and/or day) representing the earliest date of information in the data set

  ending date - the year (optionally month and / or day)

representing the latest date of information in the data set

currentness reference - the basis on which the content currentness
is determined; for example, ground condition

1.3.1 Example

Time_Period_of_Content:
  Time_Period_Information:
   Range_of_Dates/Times:
    Beginning_Date: *19791000*
    Ending_Date: *19900331*
  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 (west half) or
    central longitude (east half) of 1:250,000-scale quadrangle in
    decimal degrees
    East_Bounding_Coordinate: central longitude (west half) or
    eastern longitude (east half) of 1:250,000-scale quadrangle in
    decimal degrees
    North_Bounding_Coordinate: northern longitude of 1:250,000-scale
    quadrangle in decimal degrees
    South_Bounding_Coordinate: southern latitude of the 1:250,000-
    scale quadrangle 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 abbreviation   No reference is used for Canada and Mexico because digital data outside the United States are not archived as part of the data set.

1.6.1   <u>Example</u>

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, 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_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:** the two-letter designation for each State covered (separate Place_Keyword entry for each State)

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.*

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   <u>Example</u>

          Attribute_Accuracy_Report:
          *The accuracy of a DEM 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:
All 1-degree NIMA DEM's have been classified as Level 3 because the hypsographic information, when plotted at 1:250,000 scale, is consistent with the planimetric features normally found on 1:250,000-scale topographic maps. Inconsistencies may exist, but these are regarded as isolated cases to be tempered by the 90-percent confidence level for the overall product.

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 digital elevation model is validated for content completeness and logical consistency during production quality control and before being archived in the NDCDB.

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 coordinate measurements that includes an estimate of the value in (ground) meters 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 coordinate measurements that includes an estimate of the value in (ground) meters and the name of the test that yielded the value

2.4.1   Example

Positional_Accuracy:
  Horizontal_Positional_Accuracy:
  Horizontal_Positional_Accuracy_Report:
      Digital elevation models meet horizontal National Map Accuracy Standards (NMAS) accuracy requirements. NMAS horizontal accuracy requires that at least 90 percent of points tested are within 0.02 inch of the true position. The 1-degree DEM accuracy is source-dependent and is based on the 1:100,000-scale USGS topographic series map.
    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 root-mean-square-error (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 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 and may be encountered. 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.

Quantitative_Vertical_Positional_Accuracy_Assessment:

Vertical_Positional_Accuracy_Value: RMSE value of the DEM

Vertical_Positional_Accuracy_Explanation: *DEM's meet the 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   <u>Example</u>

Lineage:
  Source_Information:
  Source_Citation:
    Citation_Information: (use one entry for each vector contour file used in the production of the 1-degree DEM)
      Originator: *U.S. Geological Survey*
      Publication_Date: the latest date (year or year and month) in the header of the digital contour source data set; 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:
        Calendar_Date: same as used for publication date
    Source_Currentness_Reference: *ground condition*
  Source_Citation_Abbreviation: *CONTOUR1* (increment by 1 for each vector contour file used in the production of the 1-degree DEM)
  Source_Contribution: *Hypsographic vector information that is interpolated to regular grid posts to form DEM grids in 3- by 3-arc-second data spacing within the 1-degree DEM bounds.*
  Source_Information:
  Source_Citation:
    Citation_Information: (use one entry for each 7.5-, 15-, or

30-minute DEM used in the production of the 1-degree DEM)

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: the date (year or year and month) the DEM was archived

Source_Currentness_Reference: *ground condition*

Source_Citation_Abbreviation: *DEM1* (increment by 1 for each DEM used in the production of the 1-degree DEM)

Source_Contribution: *Elevation data in the form of a digital elevation model regridded to 3- by 3-arc-second data spacing within the 1-degree DEM bounds.*

Process_Step:

Process_Description:

Elevation data from cartographic sources were collected from any map series 7.5 minute through 1 degree (1:24,000 through 1:250,000 scale). The hypsographic features (contours, drain lines, ridge lines. lakes, and spot elevations) were first digitized and then processed into the required matrix form and interval spacing. Elevation from photographic sources were collected by using manual and automated correlation techniques. Elevations along a profile were collected at 80 to 100 percent of the eventual point spacing. The raw elevations were weighted with additional information such as drain, ridge, water, and spot heights during the resampling process in which the final elevations were determined for the required interval spacing.

Under a cooperative agreement with NIMA, selected 1-degree DEM's were regridded by the USGS from 7.5- and 30-minute DEM's.

The accuracy and data spacing are intended to support computer applications that analyze hypsographic features to a level of detail similar to manual interpolation of information from printed source maps.

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 being archived in the National Digital Cartographic Data Base (NDCDB). Additional information on this software may be found in U.S. Department of the Interior, U.S. Geological Survey, 1993, Technical Instructions, DVS Users Manual (draft): Reston, Va.

Source_Used_Citation_Abbreviation: *CONTOUR1, DEM1*; use as many references to contour files and DEM's as needed

Process_Date: the date (year or year and month) the DEM was archived in the Sales Data Base (SDB) at EDC; 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 - maximum number of raster objects along the ordinate
                       (y) axis in rectangular data sets; must be greater than 0

                       column count - 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 data set
            Column_Count: use the column count for the data set

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.

                geographic - the quantities of latitude and longitude that define
                the position of a point on the Earth's surface with respect to a
                reference spheroid

                  latitude resolution - the minimum difference between two
                  adjacent latitude values expressed in geographic coordinate
                  units of measure

                  longitude resolution - the minimum difference between two
                  adjacent longitude values expressed in geographic coordinate
                  units of measure

                  geographic coordinate units - units of measure used for the
                  longitude and latitude values

4.1.1   <u>Example</u>
                Horizontal_Coordinate_System_Definition:
                  Geographic:
                    Latitude_Resolution: *3*
                    Longitude_Resolution: *3*
                    Geographic_Coordinate_Units: *Decimal seconds*
                  Geodetic_Model:
                    Horizontal_Datum_Name: *World Geodetic System 1972 (WGS72)* or
                    World Geodetic System of 1984 (WGS84)

Ellipsoid_Name: *WGS72* or *WGS84*

Semi-major_Axis: *6,378,135* (WGS72) or *6,378,137* (WGS84)

Denominator_of_Flattening_Ratio: *298.26* (WGS72) or *298.25722* (WGS84)

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.

  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   <u>Example</u>

Vertical_Coordinate_System_Definition:
  Altitude_System_Definition:
    Altitude_Datum_Name: *National Geodetic Vertical Datum of 1929*
    Altitude_Datum_Name: *local mean sea level* (Puerto Rico and Hawaii)
    Altitude_Resolution: *1*
    Altitude_Distance_Units: *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 is
          using 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*
              Contact_TDD/TDY_Telephone: *703 648 4119*
              Contact_Facsimile_Telephone: *703 648 5548*
              Contact_Electronic_Mail_Address: *esicmail@usgs.gov*
              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

The element gives the name by which the distributor knows the data set.

6.2.1   Example

Resource_Description: *DEM 1-degree unit*
Resource_Description: *NIMA DTED*

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 option, 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 1-degree DEM is an ASCII formatted elevation file preceded by a metadata header file that consists of one 1,024 byte ASCII record.
    Transfer_Size: use the size of the DEM file rounded to the next highest 0.1 megabyte
   Digital_Transfer_Option:
   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. For efficiency, blocking factors of less than 16,000 are discouraged.*
   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: *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)*

Digital_Transfer_Option:

  Online_Option:

   Computer_Contact_Information:

    Network_Address:

     Network_Resource_Name:

      ftp://edcftp.cr.usgs.gov/pub/data/DEM/250

Fees:

  The online copy of the data sets can be accessed without charge. 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   <u>Example</u>

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

7.2   METADATA CONTACT

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

7.2.1   <u>Example</u>

Metadata_Contact:
  Contact_Information:
   Contact_Organization_Primary:
     Contact_Organization: *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*

        Contact_TDD/TDY_Telephone: *703 648 4119*

        Contact_Facsimile_Telephone: *703 648 5548*

        Contact_Electronic_Mail_Address: *esicmail@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 <u>Example</u>
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 <u>Example</u>
Metadata_Standard_Version: *19940608*