NATIONAL ELEVATION DATASET

METADATA FIELD DEFINITIONS

1.6.2010

The field names and descriptions that follow apply to metadata prepared for the NED release of December, 2009.

Field descriptions and definitions generally assume a standard, native format USGS DEM. Most notably, references to *Type A* and *Type C* records apply only to standard USGS source data. As non-standard sources are incorporated into NED, alternate descriptions of some metadata fields may be supplied, in the form of an updated version of this document.

SOURCE IDENTIFICATION

Fields: **DEMNAME**
QUADNAME

DEMNAME (text)

The name of the source DEM file.

Example: DEMNAME = 30.2.1.1181199

QUADNAME (text)

The name of the corresponding USGS quadrangle. This information may also be present in the first 40 characters of the FREETEXT field. This field may be used in other ways in the case of non-standard data.

Example QUADNAME = oak_island_MN

SOURCE PRODUCTION

Fields: **PSITE**
PMETHOD
PDEVICE
FREETEXT
RESOLUTION
S_DATE
I_DATE

PSITE (text)

The site or party who created the source DEM

Currently valid codes are:

UNKNOWN	Unknown
CONT	Contractor
MCMC	Mid-Continent Mapping Center
RMMC	Rocky Mountain Mapping Center
EMC	Eastern Mapping Center
WMC	Western Mapping Center
MAC	Mapping Applications Center
FS	Forest Service
BLM	Bureau of Land Management
NGTO	National Geospatial Technical Operations Center

PMETHOD (integer)

The compilation method used to compile the source DEM

Current valid codes are:

0	Unknown
1	Electronic Image Correlation (specifically GPM II)
2	Manual Profiling
3	DLG2DEM
4	DCASS
5	LT4X
6	Complex polynomial interpolation, such as ANUDEM
7	LIDAR or other active remote sensing
8	Photogrammetric mass points and break lines
9	Digital camera correlation

PDEVICE (text)

The name of the instrument used to compile the source DEM. This field is of significance primarily to DEMs produced by manual profiling (PMETHOD = 2)

The current list of identified instruments is:

Wild A-7	Wild Autograph A7 - Mechanical Stereoplotter
Wild AG-1	Wild AG1 - Analytical Stereoplotter
OMI AS11A	OMI AS11A - Mechanical Stereoplotter
Wild B-8	Wild Aviograph B8 - Mechanical Stereoplotter
Wild BC-1	Wild BC1 - Analytical Stereoplotter
Wild BC-2	Wild BC2 - Analytical Stereoplotter
Zeiss C-8	Zeiss Stereoplanigraph C8 - Stereoplotter
Zeiss C100	Zeiss C100 Planicomp - Analytical Stereoplotter
GPM	Gestalt Photo Mapper II (GPM II)
KELSH	Kelsh - Optical Stereoplotter
Kern PG-2	Kern PG-2 - Mechanical Stereoplotter
Wild PPO-8	Wild PPO-8 Orthophoto Equipment (Used with Wild A8)
Santoni IIC	Santoni IIC - Analytical Stereoplotter
Galileo IIId	Galileo-Santoni Stereosimplex IIId
Jena Topocart B	Zeiss Jena Topocart B
Matra Traster	Matra Optique Traster - Photogrammetric Workstation
Helava US-2	Helava US-2 - Analytical Stereoplotter
CP100	Unknown, but appears to be a stereoplotter
CTOG	Contour to Grid Conversion
DCASS	Digital Cartographic Software System (USGS Software)
DLG	Digital Line Graph
LT4X	Either LT4X or LTPlus software
GDM COTS	DEM made by GeoDigital Mapping, Inc.
GTR COTS	DEM made by GTRSystems, Inc.
LT2000	Windows version of LT4X by Titan Systems, Inc

FREETEXT

The first 136 bytes of the source DEM file, including the quadrangle name, free format text, and process field. This field may contain additional information, though there are no standards for the use of the free text field. PMETHOD and PDEVICE may often be derived from text present in the FREETEXT field.

Example:

NORTH CHINOOK RESERVOIR, MT -VDYA 1-09 9/06/75 WILD A-7 60000 4
-10915 0.0000 4845 0.00002

The contents of the FREETEXT field vary greatly from one DEM to the next, and in some cases are more confusing than helpful. This field is retained in the NED metadata primarily to allow for confirmation of the PMETHOD and PDEVICE fields.

RESOLUTION (integer)

The planimetric (x, y) spacing of elevation postings within the source DEM.

Current valid values are:

1	1 arc-second	(Alaska)
2	2 arc-seconds	(1:100k series)
3	3 arc-seconds	(1:250k series)
5	5 meters	(non-standard data)
10	10 meters	(7.5-minute series)
30	30 meters	(7.5-minute series)
13	1/3 arc-second	(non-standard data)
19	1/9 arc-second	(non-standard data)

Note that all source data are resampled to a common resolution during NED production.

S_DATE (text)

Data Source Date (data element 21 in the source DEM's *Type A* record)

The date of original photography from which the DEM was compiled. For more information consult **Standards for Digital Elevation Models.** This information was not provided with some standard DEMs with a native resolution of 30 meters.

In the case of non-standard data, this field reflects the year that the base elevation data was collected, as in the case of LIDAR derived DEMs.

Format is either YYYY or less often YYMM

I_DATE (text)

Data Inspection Date (data element 22 in the source DEM's *Type A* record)

DEM Edit System (DES) inspection date. This information was not provided with some standard DEMs, and it not used in the case of non-standard data.

Format is either YYYY or YYMM

PLANIMETRIC DESCRIPTORS

Fields: **HDATUM**
UTMZONE
XSHIFT
YSHIFT
LRLAT
LRLON
ULLAT
ULLON

HDATUM (integer)

Horizontal Datum of source DEM

Currently valid values are:

27	North American Datum of 1927 (NAD 27)
83	North American Datum of 1983 (NAD 83)
72	World Geodetic System of 1972 (WGS 72)
84	World Geodetic System of 1984 (WGS 84)

ZONE (integer)

The projection zone of the source DEM. If two digits, a UTM zone. If four digits, a State Plane zone. A value of zero in this field indicates that the source DEM is cast in geographic (lat/lon) coordinates.

XSHIFT, YSHIFT (float)

Units: decimal degrees

The positional shifts in longitude and latitude, respectively, applied to each posting in the source DEM to convert from NAD27 coordinates to NAD83 coordinates. These values will be zero if the source DEM's HDATUM field value is 83, 84 or 72. (WGS84 is nearly identical NAD83, and WGS72 is sufficiently similar that no shift was deemed necessary). The shift values were obtained from NGS's NADCON software, and were calculated at the nominal center of each quadrangle.

LRLAT, LRLON, ULLAT, ULLON (float)

Units: decimal degrees

Coordinates in NAD 83 defining the minimum bounding box of the source DEM, derived from corner coordinates indicated in data element 11 of the DEM's *Type A* record. In most cases this will correspond to the boundaries of the metadata polygon. This information does apply as reliably to non-standard source data, where the nominal boundaries of a given dataset often extend beyond the actual data.

LRLAT	Lower right latitude
LRLON	Lower right longitude
ULLAT	Upper left latitude
ULLON	Upper left longitude

ELEVATION DESCRIPTORS

Fields: **VDATUM**
ZUNIT
ZSTEP
ZSHIFT

VDATUM (integer)

Vertical datum of source DEM

Valid values are:

0	Unknown
1	Local mean sea level
29	National Geodetic Vertical Datum of 1929 (NGVD 29)
88	North American Vertical Datum of 1988 (NAVD 88)

ZUNIT (integer)

Elevation unit of source DEM

Valid values: 0 = Feet, 1 = Meters

ZSTEP (float)

Elevation resolution

With ZUNIT, this field defines vertical resolution of the source DEM.

Typical values are 1 and 0.1, though others are possible. A value of 0 is used when this field does not apply, as in the case of source data with floating point precision.

Example: ZUNIT = 1
ZSTEP = 0.1

This indicates that the source DEM records elevations to the nearest tenth of a meter.

ZSHIFT (float)

The elevation shift, in meters, applied to each posting within the source DEM to convert to NAVD88 values. The shift values were obtained from NGS's VERTCON software, and were calculated at the nominal center of each quadrangle.

SUMMARY STATISTICS

Fields: **ZMIN**
ZMAX
ZMEAN
ZSIGMA

ZMIN, ZMAX (float)

The minimum and maximum elevation values of the source DEM before any filtering or reprojection, but after conversion to meters and to NAVD88. In the case of standard USGS DEMs, subtracting ZSHIFT and converting to the DEM's original units results in the min and max values reported in data element 12 of the DEM's *Type A* record.

ZMEAN (float)

The mean elevation value of the source DEM, before any filtering or reprojection, but after conversion to meters and to NAVD88.

ZSIGMA (float)

The standard deviation of the elevations of the source DEM, before any filtering or reprojection, but after conversion to meters.

Discussion

The summary statistics shown in these fields usually describe the entire source DEM, even when only some portion of the source DEM is used in NED, or when the source DEM is represented by more than one polygon within the metadata.

These data are presented in common units and in a common datum to allow for more meaningful graphical displays and simplified queries.

ACCURACY STATISTICS

Fields:

	RMSE
ABSX	**RMSEX**
ABSY	**RMSEY**
ABSZ	**RMSEZ**
ABSPTS	**RMSEPTS**

These fields echo the source DEM's *Type C* record, and apply only to standard production USGS DEMs. See **Standards for Digital Elevation Models** for more information.

ABSX, ABSY, ABSZ

Absolute accuracy in X, Y, Z - zero if not available (data element 2)

ABSPTS

Sample size (data element 3)

RMSE

Code indicating availability of relative accuracy statistics (data element 4)

Valid values: 1 Available, 0 Not available

RMSEX, RMSEY, RMSEZ

Relative accuracy in X, Y, Z - zero if not available (data element 5)

RMSEPTS

Sample size (data element 6)

NED PRODUCTION TIMESTAMPS

Fields: **QUADDATE**

QUADDATE (integer)

The date on which the source DEM was *first* processed into NED. This field is particularly useful in the identification of recently updated quads.

Format YYYYMMDD

Correspondence between selected NED metadata items and USGS DEM Type A records.

Refer to Data User's Guide 5, Appendix A, for complete descriptions of the A record data elements referenced below.

FREETEXT The FREETEXT field is a literal copy of Data Element 1: The first 140 bytes of the A record. By USGS definition, only bytes 41 through 80 are free format text, but this restriction is not commonly observed.

PSITE This is a literal copy of data element 2, the Mapping Center origin code. If this field is blank, the code "UNKNOWN" is assigned to PSITE.

ZONE This is a literal copy of data element 6.

ZUNIT This field is derived from data element 9, but does not use the same values. Data element 9 is coded as 1 = feet, 2 = meters. ZUNIT, however, is coded as 0 = feet, 1 = meters.

LRLAT, LRLON, ULLAT, ULLON These fields are derived from data element 11.

RESOLUTION This field is derived from data element 15, which indicates the *x*, *y*, and *z* resolutions of the source DEM. In the case of Alaksa data, where x and y resolutions differ, the y resolution is taken to be the resolution of the DEM. Further, RESOLUTION is indicated in the DEM's native units (meters or decimal seconds). Non-standard DEM's may be assigned RESOLUTION values in a different manner.

ZSTEP This is a literal copy of the *z* resolution component of data element 15.

S_DATE This is a literal copy of data element 21, or 0 if data element 21 is absent.

I_DATE This is a literal copy of data element 22, or 0 if data element 22 is absent.

HDATUM This field is derived from data element 27, but uses different values. Data element 27 specifies unique codes for the Old Hawaii Datum and the Puerto Rico Datum, both of which are designated as 27 in HDATUM.

VDATUM This field is derived from data element 26, but uses different values. A value of 0 is assigned to VDATUM if no vertical datum information is present.