SOURCE IDENTIFICATION

Fields: DEMNAME
                    FULLPATH
                    QUADNAME

FULLPATH (text)

The fully expressed path to the source DEM file, as used during processing. This information is retained to provide an unambiguous link to the data source.

Example: FULLPATH = /sgs9/DEM/7.5min/O/oak_island_MN/30.2.1.1181199

DEMNAME (text)

The name of the source DEM file without any path information. This field is derived from the FULLPATH field.

Example: DEMNAME = 30.2.1.1181199

QUADNAME (text)

The name of the quadrangle, usually derived from the FULLPATH field. This information is also present in the first 40 bytes of the FREETEXT field.

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
GPM2	Gestalt Photomapper II at MAC

PMETHOD (integer)

The compilation method used to compile the source DEM.

Current valid codes are:

0	Unknown
1	Electronic linage Correlation (specifically GPM 11)
2	Manual Profiling
3	DLG2DEM
4	DCASS
5	LT4X

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 = 1).

The current list of identified instruments is:

Wild A-7	Wild Autograph A7 - Mechanical Stereoplotter
Wild A-8	Wild Autograph A8 - 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
Wild BC-3	Wild BC3 - Analytical Stereoplotter
Zeiss C-8	Zeiss Stereoplanigraph C8 - Stereoplotter
Zeiss C100	Zeiss C100 Planicomp - Analytical Stereoplotter
Zeiss C120	Zeiss C120 Planicomp - Analytical Stereoplotter
Kern DSR-1	Kern DSR-1 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
Galileo 6	Galileo Stereosimplex 6
Jena Topocart B	Zeiss Jena Topocart B

Matra Traster	Matra Optique Traster - Photogrammetric Workstation
Helava US-2	Helava US-2 - Analytical Stereoplotter
Zeiss P-3	Zeiss P3 - Analytical Stereoplotter
Zeiss C-12	Zeiss C12 - Analytical Stereoplotter
Scitex Scanner	Scitex Scanner
CP100	Unknown, but appears to be a stereoplotter
AMU	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

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:

2	2-arc seconds (1: 100k series)
3	3-arc seconds (1:250k series)
10	10 meters (7.5-minute series)
30	30 meters (7.5-minute series)

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)

Format is either YYMM or YYYY

The date of original photography from which the DEM was compiled. For more information consult **Standards for Digital Elevation Models**

I_DATE (text)

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

Format is either YYMM or YYYY

DEM Edit System (DES) inspection date.

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)

UTMZONE (integer)

UTM zone of source DEM, or 0 if source DEM is not cast in UTM coordinates. A value of 0 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 or 72. (WGS 72 is sufficiently similar to NAD83 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.

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

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)

Vertical units

Valid values:

0   Feet
1   Meters

ZSTEP (float)

Vertical resolution

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

Typical values are 1 and 0.1, though others are possible.

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: MIN
               MAX
               MEAN
               SIGMA

MIN, MAX (float)

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

MEAN (float)

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

SIGMA (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 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: ABS   RMSE
                        ABSX   RMSEX
                        ABSY   RMSEY
                        ABSZ   RMSEZ
                        ABSPTS   RMSEPTS

These fields echo the source DEM's *Type C* record.
See **Standards for Digital Elevation Models** for more information

ABS

Code indicating availability of absolute accuracy statistics (data element 1).

Valid values:

1   Available
0   Not available

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).

FILTERING PARAMETERS and STATISTICS

Fields: KERNEL
      LPCUTOFF
      VFILTSIZE
      VFILTLIMIT
      HFILTSIZE
      HFILTLIMIT
      R_MIN
      R_MAX
      R_MEAN
      R_SIGMA

In addition to the metadata which is derived from the DEM itself, additional items are recorded for each source DEM, describing the filtering which was performed.

Example:

KERNEL	0
LPCUTOFF	0.030000
VFILTSIZE	11
VFILTLIMIT	4.000000
HFILTSIZE	0
HFILTLIMIT	0.000000
R_MIN	-4.000000
R MAX	4.000000
R_MEAN	-0.008025
R_SIGMA	0.587705

KERNEL (integer)

Indicates whether Gaussian or Sinc weighting was used in the low-pass operation.

Valid values:

0 Gaussian kernel
1 Sinc kernel

LPCUTOFF (float)

A parameter which effects the bandwidth of the low-pass filter. When Sinc weighting is employed, this parameter has a direct physical significance, as it is equal to the cutoff wavelength. When Gaussian weighting is selected (as it was in this example), there is no well-defined cutoff. In this case LPCUTOFF relates to the width of the Gauss curve.

VFILTSIZE, HFILTSIZE (integer)

The cutoff wavelength of the high-pass filter, which may varied independently for each axis. A value of zero, as shown here for HFILTSIZE, indicates that no filtering was performed on this axis.

VFILTLIMIT, HFILTLIMIT (float)

The largest absolute change in elevation which the filter was allowed to make. Where two filtering steps are used, as with the GPM II, VFILTLIMIT and HFILTLIMIT are additive. That is, after two filtering steps, the largest absolute change in elevation is the sum of these two numbers.

R_MIN, R_MAX, R_MEAN, R_SIGMA (float)

The min, max, mean, and standard deviation of the residuals, obtained by subtracting the pre-filtered DEM from the filtered DEM. R_MEAN is usually very close to zero, in which case R_SIGMA may be interpreted as an RMS value. Note that the min and max changes introduced by the filtering are constrained to the value of VFILTLIMIT + HFILTLIMIT.

NED PRODUCTION TIMESTAMPS

Fields: TIMESTAMP
                 TILEDATE
                 QUADDATE

TIMESTAMP (text)

The time and date on which the source DEM was most recently processed into NED.

TILEDATE (integer)

The date on which the source DEM was most recently processed into NED. Derived from TIMESTAMP.

Format YYYYMMDD

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

REFERENCES

Standards for Digital Elevation Models
Available at http://rockyweb.cr.usgs.gov/nmpstds/demstds.html

Data Users Guide 5 - Digital Elevation Models
Available at ftp://mapping.usgs.gov/pub/ti/DEM/demguide