Canadian Digital Elevation Data (CDED) Reader/Writer

FORMAT NOTES:

- This format is not supported by FME Base Edition.
- The CDED format has a fixed coordinate system: LL-83. Any features given to the CDED writer will be reprojected to this coordinate system.

The Canadian Digital Elevation Data (CDED) Reader/Writer module provides the Feature Manipulation Engine (FME) with the ability to read and write CDED files.

Overview

CDED is a raster format with no provision for storing user-defined attributes for the data.

All CDED information is contained within one file, beginning with a metadata header. The data is stored in profiles, each of which has its own metadata header. A profile is one column in the raster. CDED files typically have a `.dem` extension.

Two versions of CDED are recognized by FME:

- the original CDED specifications distributed by CTI, and
- the CDED-1 specifications distributed by GeoBase.

CDED Quick Facts

Format Type Identifier	CDED
Reader/Writer	Both
Licensing Level	Professional
Dependencies	None
Dataset Type	Reader: File Writer: Directory
Feature Type	CDED or <source_dataset_filename>
Typical File Extensions	.dem
Automated Translation Support	Yes
User-Defined Attributes	Through TAB files
Coordinate System Support	Yes
Generic Color Support	Yes
Spatial Index	Not applicable
Schema Required	No
Transaction Support	No
Geometry Type	cded_type

Geometry Support				
Geometry	**Supported?**		**Geometry**	**Supported?**
aggregate	no		point	no
circles	no		polygon	no
circular arc	no		raster	yes
donut polygon	no		solid	no
elliptical arc	no		surface	no
ellipses	no		text	no
line	no		z values	no
none	no			

Band Interpretations	Int32, Real64
Palette Key Interpretations	not applicable
Palette Value Interpretations	not applicable
Interleave Type	not applicable
Nodata Value	-32767
Cell Origin	0
Multi-Band	No
Multi-Palette	No
World File Support	No
TAB File Support	Yes

Reader Overview

The CDED reader creates FME feature data from a CDED file specified by the `DATASET` keyword. The FME considers a single CDED file to be a dataset. The CDED reader will read both CDED and CDED-1 files.

Reader Directives

The suffixes shown are prefixed by the current `<ReaderKeyword>` in a mapping file. By default, the `<ReaderKeyword>` for the CDED Reader is `CDED`.

DATASET

Required/Optional: *Required*

The CDED reader processes the `DATASET` keyword as described in *Reader Overview.* The CDED reader then opens and reads data from this file.

GROUP_BY_DATASET

Required/Optional: *Required*

The value for this directive is either Yes or No. When the value is set to No, the only feature type this reader will use is the reader type name, which in this case is CDED. When the value is set to Yes, the feature type of each dataset is the filename (without the path or the extension) of the dataset. The default value for this directive is No.

An example of the GROUP_BY_DATASET keyword in use is:

```
GROUP_BY_DATASET "Yes"
```

Workbench Parameter: *<WorkbenchParameter>*

Writer Overview

The CDED writer creates and writes feature data to a CDED directory specified by the DATASET keyword. The writer searches the mapping file for the <WriterKeyword>_DATASET keyword, which is required to be in the mapping file. The writer writes either CDED or CDED-1 files, as specified with the <WriterKeyword>_VERSION keyword in the mapping file. If the <WriterKeyword>_VERSION keyword does not exist, the writer will default to writing CDED files. The names of the CDED output files written to the output dataset directory are determined from the FME Feature Type. The directory need not exist before the translation occurs. Any old CDED files in the directory with the same name are overwritten with the new feature data. The CDED writer distinguishes duplicate output files by appending numbers to the filenames. Please see *About Feature Attributes* on page 7 for details.

Writer Directives

The suffixes shown are prefixed by the current <WriterKeyword> in a mapping file. By default, the <WriterKeyword> for the CDED writer is CDED.

DATASET

Required/Optional: *Required*

The CDED writer processes the DATASET keyword as described in *Writer Overview.* The CDED writer then outputs the data to this directory.

Workbench Parameter: *<WorkbenchParameter>*

VERSION

Required/Optional: *Optional*

The product version to use. The following versions are supported:

- CDED: Canadian Digital Elevation Data (CTI)
- CDED-1: Canadian Digital Elevation Data, Level 1 (GeoBase)

Range: *CDED* | *CDED-1*

Default: *CDED*

Example:

CDED_VERSION CDED

Workbench Parameter: *<WorkbenchParameter>*

FME Raster Features

FME raster features represent raster data and use several concepts that are unlike those used in the handling of vector data. See *About FME Rasters* on page 13.

Feature Representation

In addition to the generic FME feature attributes that FME Workbench adds to all features (see *About Feature Attributes* on page 7), this format adds the format-specific attributes described in this section.

CDED raster features are specified by a matrix of `x`, `y`, and `z` coordinates. If known, the coordinate system will be specified.

All CDED features contain a `cded_type` attribute, which identifies the geometric type.

Attribute Name	Contents
`cded_type`	The CDED geometric type of this entity. This is always `cded_raster`.
`cded_file_name`	This is a string that specifies the basename of the raster file.
`cded_producer`	This is a string that specifies the producer of the data.
`cded_process_code`	This is a one-byte integer that specifies how to the data is processed. **Range:** 1...8 **Default:** 8
`cded_origin_code`	This is a 4-character string that specifies the mapping origin.
`cded_level_code`	This is an integer defining the DEM level. This field is always set to 1 for 1:50,000 and 1:250,000 CDED. **Range:** 1-3 **Default:** 1
`cded_code_defining_elevation_pattern`	This is an integer specifying the regularity of the elevation pattern. **Range:** regular|random **Default:** regular
`cded_spatial_resolution_z`	A positive real number used to specify a scale to apply to the elevation values in the z dimension. In USGS DEM data, this is stored as spatial_resolution_z. When specified for the writer, elevation values will be scaled appropriately. This value is tied to the value of `cded_units`; resolutions of 1 decimal place for feet and 2 decimal places for meters are permitted. **Default:** 1
`cded_accuracy_code_for_elevations`	A number that specifies the existence of accuracy information for this dataset. 0 indicates unknown accuracy information. **Range:** 0|1 **Default:** 0

Attribute Name	Contents
cded_units	The unit of measure for the z coordinate (the altitude). **Range:** meters|feet **Default:** No default
cded_suspect_and_void_area_flag	This is a one-digit integer that indicates if the data contains void areas. Only valid for CDED-1. **Range:** 0|2 **Default:** Calculated based on percent void
cded_data_edition	This is a four-digit integer specifying the data edition or version used. The first two digits indicate the data edition while the last two digits indicate the specifications version. Only valid for CDED-1. **Range:** 0...9999 **Default:** 1021
cded_percent_void	This is an integer equal to the percentage of nodes in the file set to void (-32767). This is only populated if the cded_data_edition field indicates a void. Only valid for CDED-1. **Range:** 0...100 **Default:** Calculated based on number of void nodes