

National Elevation Dataset



Figure 1: A shaded-relief representation of the conterminous United States portion of the National Elevation Dataset (NED). Elevation is portrayed as a range of colors, from dark green for low elevations to white for high elevations.

The National Elevation Dataset (NED) is a new raster product assembled by the U.S. Geological Survey (USGS). The NED is designed to provide national elevation data in a seamless form with a consistent datum, elevation unit, and projection. Data corrections were made in the NED assembly process to minimize artifacts, permit edge matching, and fill sliver areas of missing data.

Data Characteristics

The NED has a resolution of 1 arc-second (approximately 30 meters) for the conterminous United States, Hawaii, and Puerto Rico and a resolution of 2 arc-seconds for Alaska. National Elevation Dataset data sources have a variety of elevation units, horizontal datums, and map projections. In the NED assembly process, the elevation values are converted to decimal meters as a consistent unit of measure, North American Datum 1983 is consistently used as horizontal datum, and all the data are recast in a geographic projection. Older digital elevation models (DEM) produced by methods that are now obsolete have been filtered during the

NED assembly process to minimize artifacts that are commonly found in data produced by these methods. Artifact removal greatly improves the quality of the slope, shaded-relief, and synthetic drainage information that can be derived from the elevation data. Figure 2

illustrates the results of this artifact removal filtering. NED processing also includes steps to adjust values where adjacent DEM's do not match well and to fill areas of missing data between DEM's. These processing steps ensure that the NED has no void areas and artificial discontinuities have been minimized.

As higher resolution or higher quality data become available, the NED is updated to incorporate the best available coverage. As the USGS's 7.5-minute and 15-minute digital elevation products near completion for the conterminous United States and Alaska respectively, NED data will soon incorporate these sources. For the small areas that are not yet covered, the lower resolution 30-minute and 1-degree USGS DEM products were interpolated to obtain values used in NED. These original elevation files are currently available at <http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/ndcdb.html>. In cases where 7.5-

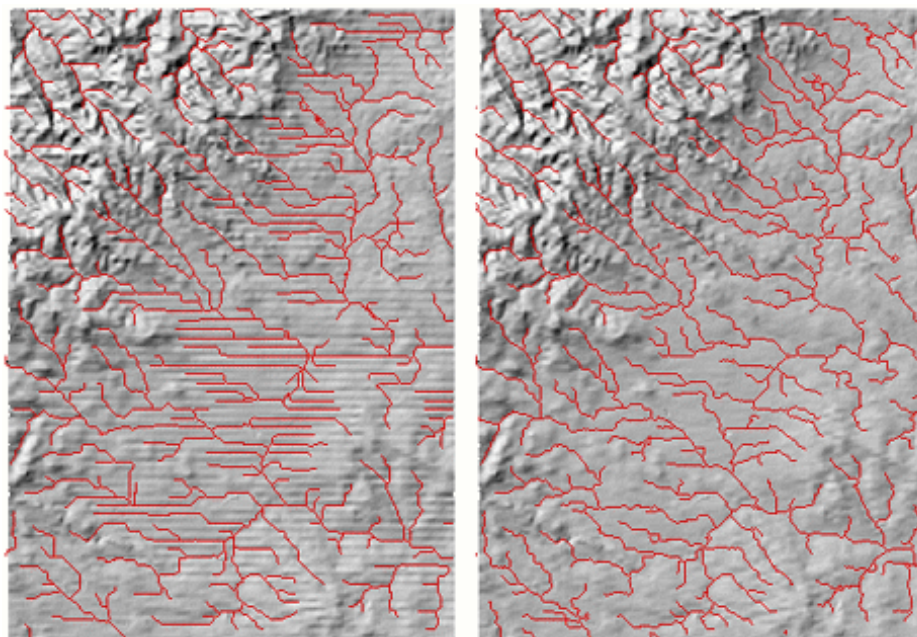


Figure 2: A shaded-relief representation of the Rockypoint, Wyoming, 7.5-minute digital elevation model is shown above on the left. The same area is shown on the right after NED artifact filtering has been performed. The superimposed red lines are synthetic drainage networks derived from each elevation dataset.

minute DEM's have 10-meter resolution, the original source data will be at a higher resolution than the NED. As more data become available at a finer resolution than that of the NED, the feasibility of developing a finer resolution NED will be investigated.

Metadata

The Federal Geographic Data Committee's content standard for digital geospatial metadata (<http://www.fgdc.gov/metadata/constan.html>) will be used to document NED data. Metadata about the individual source datasets used to assemble NED are presented in a spatially referenced form. The polygonal footprint of each part used from a source dataset is retained during NED assembly to provide the spatial context. The attributes of each source dataset, such as original resolution, production method, and date entered into NED, are linked to this polygonal footprint. All of these source polygons together form a national coverage. Through this spatially referenced metadata, the information is made available to the user regarding the source data for any area of NED. For example, a NED user might use the spatially referenced metadata to identify the parts of a study area that were produced by obsolete production methods.

Applications

Elevation data are an essential part of many earth science applications. They are used for such diverse purposes as providing shaded-relief backgrounds, establishing stratification in land cover classification, doing geometric and radiometric correction of remotely sensed data, indicating landform characteristics such as slope and aspect, and analyzing synthetic drainage networks and watershed delineations through the use of geographic information systems.

Obtaining Data

Plans are to have NED publicly available by late 2000. The NED will be delivered in the Spatial Data Transfer Standard (SDTS) raster profile. The spatially referenced metadata will be delivered in SDTS topological vector profile. Other formats may also be supported. An

Internet browse of NED shaded-relief imagery with vector reference information will be provided as an aid to ordering. A customer can identify the requested area graphically through the Internet browser. That area of interest will be extracted from the NED and from the spatially referenced metadata and formatted for delivery. The data will be available to download from the Internet using file transfer protocol or on standard distribution media. As more information on the NED becomes available, it will be accessible through the Internet at <http://gisdata.usgs.gov/ned>.

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Information

For information on these and other USGS products and services, call 1-888-ASK-USGS, use the Ask.USGS fax service, which is available 24 hours a day at 703-648-4888, or visit the general interest publications Web site on mapping, geography, and related topics at <http://mapping.usgs.gov/www/products/mappubs.html>.

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