

# National Elevation Dataset

## October, 2010 Release Notes

The October 2010 release of the National Elevation Dataset (NED) was released on October 5, 2010. It marks the 56<sup>th</sup> update of the 1-arc-second layer since bi-monthly revisions began in June, 2000. This release incorporates new lidar data, in addition to all the USGS 7.5-minute digital elevation models (DEM's) that were revised between the previous NED release and September 15, 2010. Spatially referenced metadata of all three resolutions data layers, in the form of ESRI shapefiles and a corresponding data dictionary in pdf format are available for download at: <http://ned.usgs.gov/Ned/metadata.asp>

The next NED release is scheduled for December 7, 2010.

Areas where new data were incorporated in this and other recent releases are indicated in Figure 1.

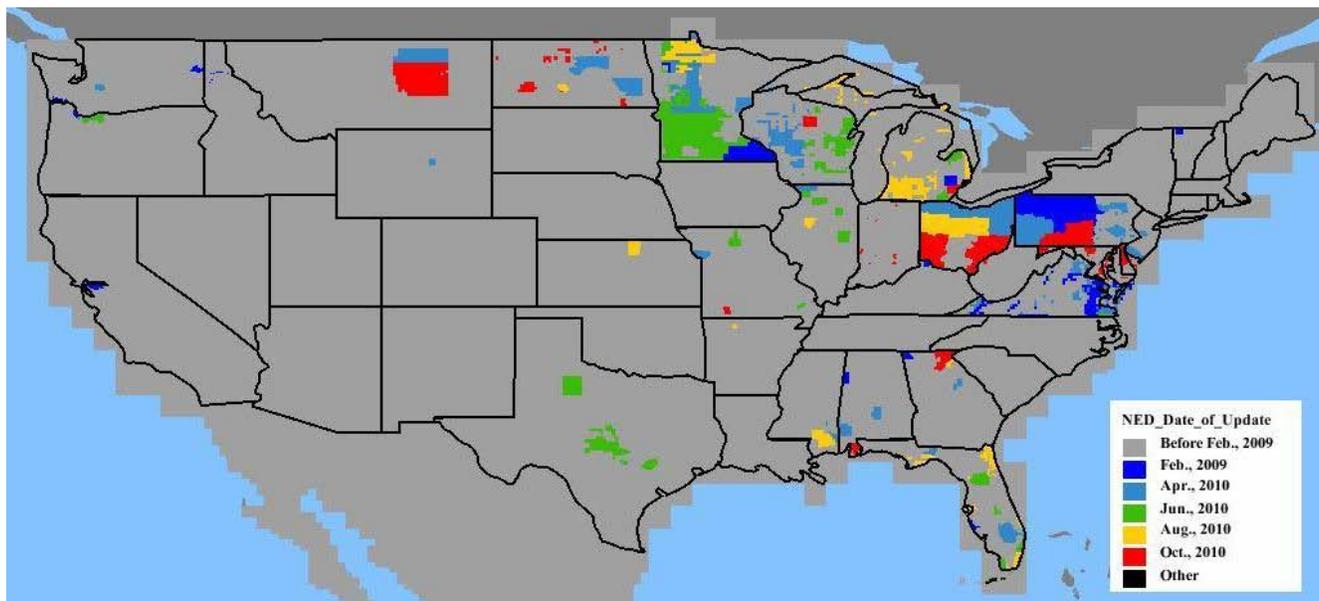


Figure 1. 1-arc-second NED, updated areas by release date—October 2010 release

The following figures show additional information derived from the spatial metadata that accompanies the NED.

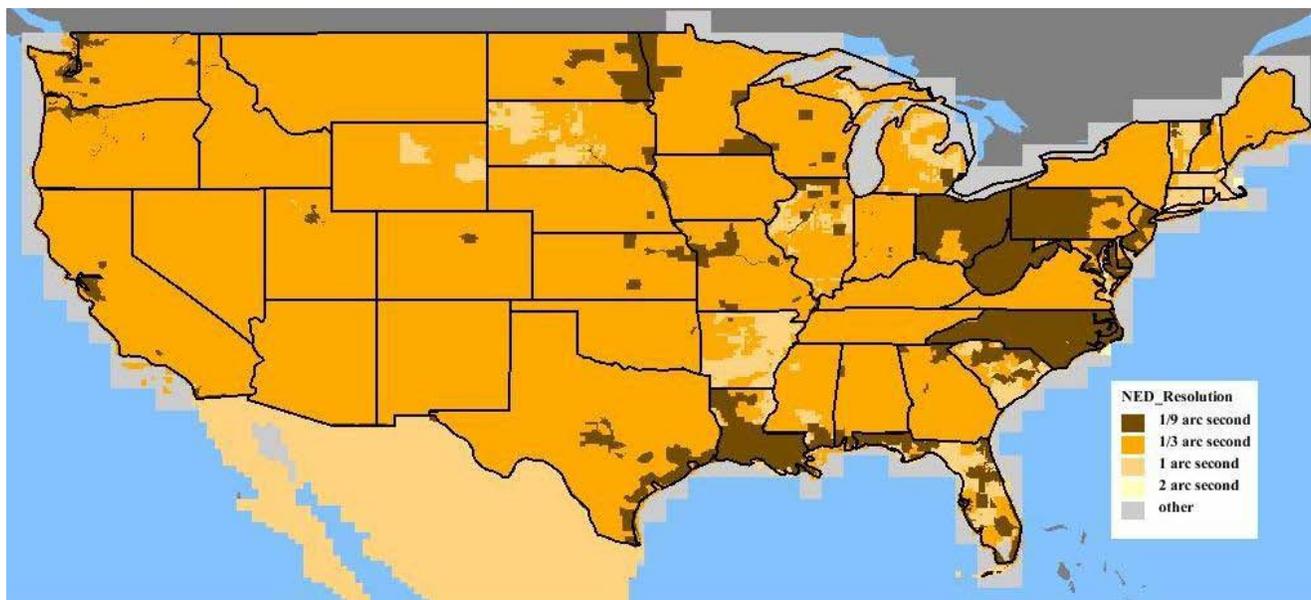


Figure 2. NED source data by resolution – October 2010 release

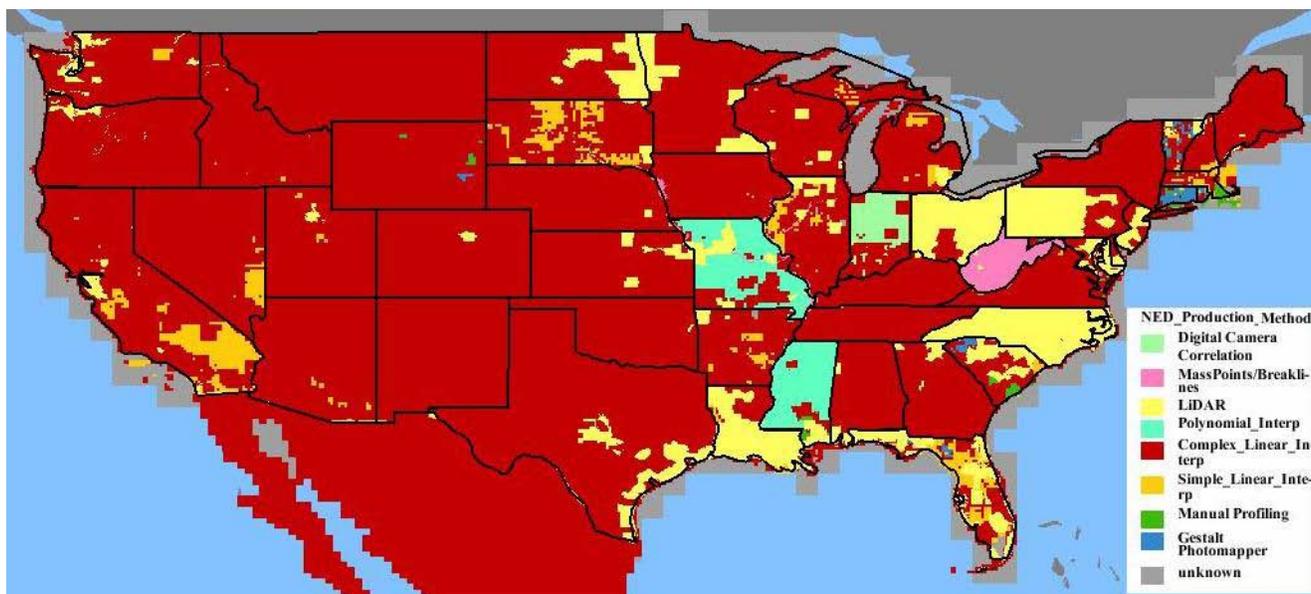


Figure 3. NED source data by production method – October 2010 release

A data dictionary, providing metadata field definitions is included with data downlands, and is also available at: [http://ned.usgs.gov/Ned/NED\\_DataDictionary.pdf](http://ned.usgs.gov/Ned/NED_DataDictionary.pdf)

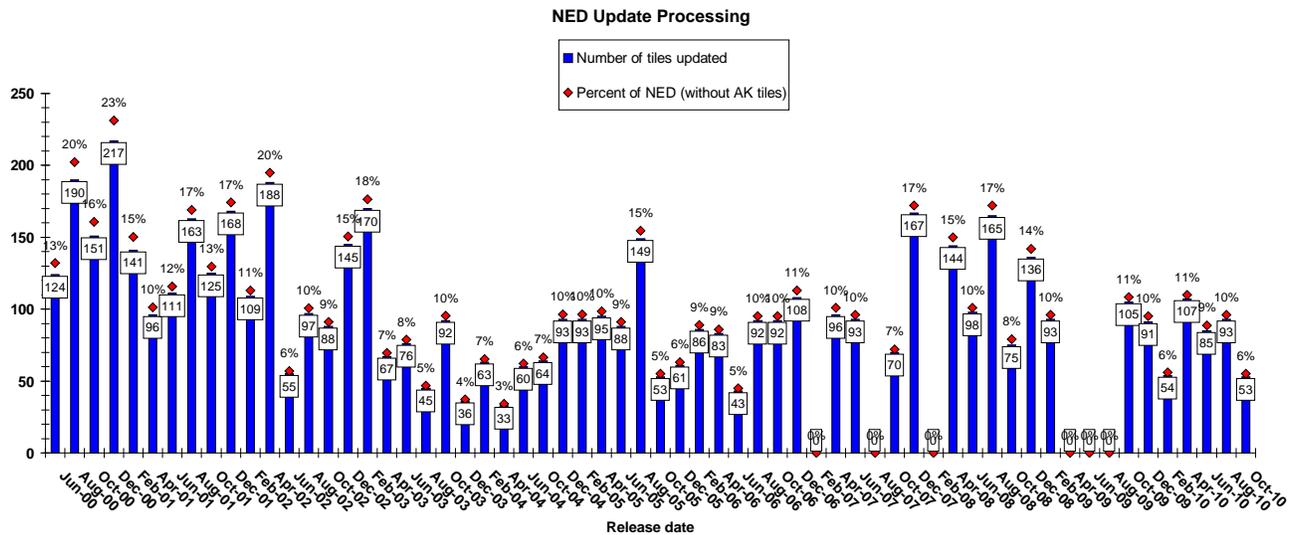
## NED Tile Processing

To address practical concerns of data processing and storage, the NED (at all but the 1/9-arc-second resolution) is processed in tiles of 1° × 1°, coincident with integer degree boundaries of the GRS80 ellipsoid. A small amount of overlap is added to ensure that adjacent tiles are logically seamless. Additional tiles are added as required to accommodate new areas of coverage. (Table 1)

| Release date | Number of tiles | Note  |
|--------------|-----------------|---|
| June 2000    | 1,367           | CONUS: 925 tiles; AK: 428 tiles; HI: 14 tiles |
| April 2001   | 1,375           | 8 tiles added: Puerto Rico and Virgin Islands |
| June 2001    | 1,387           | 12 tiles added: Pacific islands               |
| August 2001  | 1,392           | 5 tiles added: Pacific islands                |
| October 2008 | 1,651           | 259 tiles added: Country of Mexico            |

**Table 1. Number of NED tiles and changes, by release date.**

In the current release, 53 tiles were updated, representing 6% of NED, excluding Alaska and Mexico for which the extent of coverage is resolution-specific.(Figure 4)



**Figure 4. Number and percentage of NED tiles processed, by release date**

## Source Data

NED source data are selected from an ever-growing inventory of DEM's, produced both by USGS standard production and by other methods. With first consideration being given always to data quality, the selections are made according to the following ranking and listed in the order of descending priority:

1. High-resolution data, typically derived from lidar or digital photogrammetry, and often break line enforced. If collected at a ground sample distance no coarser than 5 meters, such data may also be offered within the NED at a resolution of 1/9<sup>th</sup> arc-second.
2. Moderate-resolution data, other than that compiled from cartographic contours. This data may also be derived from lidar or digital photogrammetry, or less often by IFSAR. A typical ground sample distance is 10 meters, commonly called "1/3-arc-second data"
3. 10-meter DEM's derived from cartographic contours and mapped hydrography. Most often, such data are produced by or for the USGS as a standard elevation product, and they currently account for the bulk of the NED.
4. 30-meter cartographically derived DEM's. Similar in most respects to their 10-meter counterparts, though usually of lower overall quality.
5. 30-meter photogrammetrically derived DEM's. These are the oldest DEM's in the 7.5-minute series. These data were derived directly from stereo photography, either by a human operator or by an early form of electronic image correlation. They are typically marred by erroneous production artifacts that are addressed to the greatest practical extent by digital filtering within the NED production process.
6. 2-arc-second DEMs are a standard USGS product. They are derived from cartographic contours at a scale of 1:63,360 over the state of Alaska, and a scale of 1:100,000 elsewhere.
7. 1-arc-second Shuttle Radar Topography Mission (SRTM) data, to date, are only used in preference to 3-arc-second data in the Aleutian Islands.
8. 3-arc-second DEMs are another standard USGS product, and are generally only used within the NED as a source of fill values over large water bodies.

The composition of source data within the October, 2010 NED release continues the trend seen in previous releases, with an increase in coverage from 10-meter or better sources. (Figure. 5)

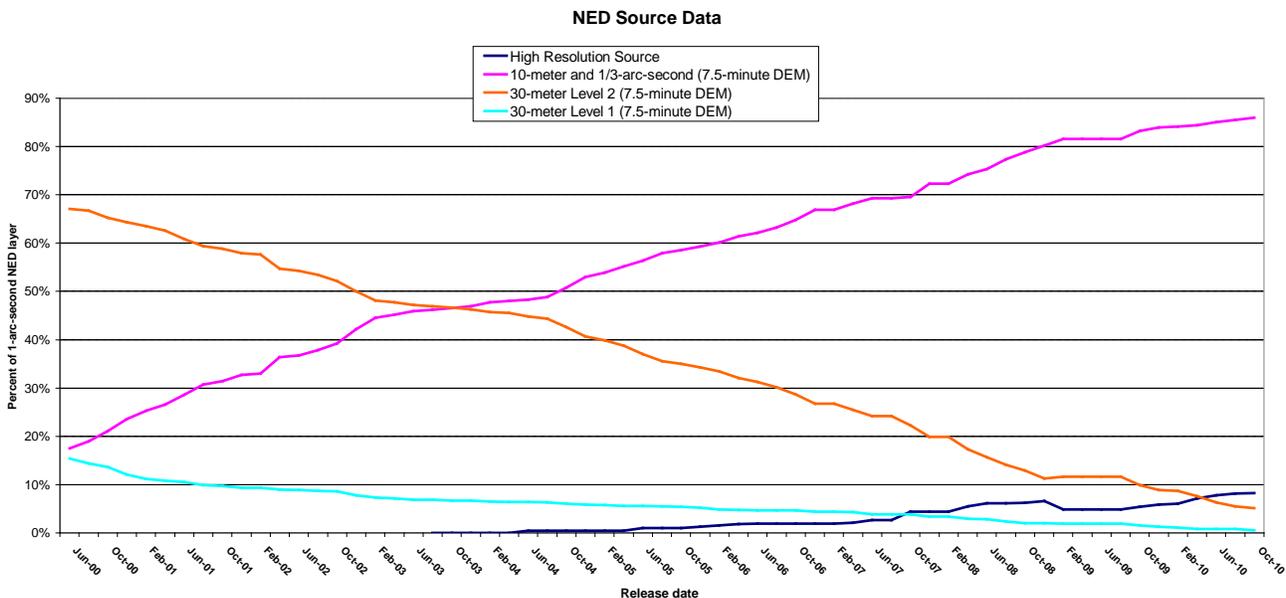


Figure 5. Type of DEM source data, 1-arc-second NED, by release date

### Changes in NED processing over Alaska.

All NED data are currently distributed in the North American Datum of 1983 (NAD83). Prior to April, 2008, NED data over Alaska were cast in the North American Datum of 1927 (NAD27)

Additionally, some portions of Alaska are now available at resolutions of 1 and 1/3 arc seconds. The most current data is radar-derived, either from airborne interferometric synthetic aperture radar (IFSAR) or from the Shuttle Radar Topography Mission (SRTM). The inclusion of SRTM data in the Aleutian chain is particularly significant, as it replaces 3-arc-second DEM's, which are generally of poor quality and are cast in the World Geodetic System of 1972 (WGS72). The first lidar data of the Kenai Peninsula was added to the 1/9-arc-second NED in September, 2009 adding to the small amount of data covering the port city of Valdez added in December, 2008. Additional lidar datasets were released in July and August of 2010, including two more Kenai areas and Yukon Flats. The original Kenai dataset released in September, 2009 was reworked to fill the many data voids. The resolution of existing data, and of the data anticipated in the upcoming year are shown in Figure 6.

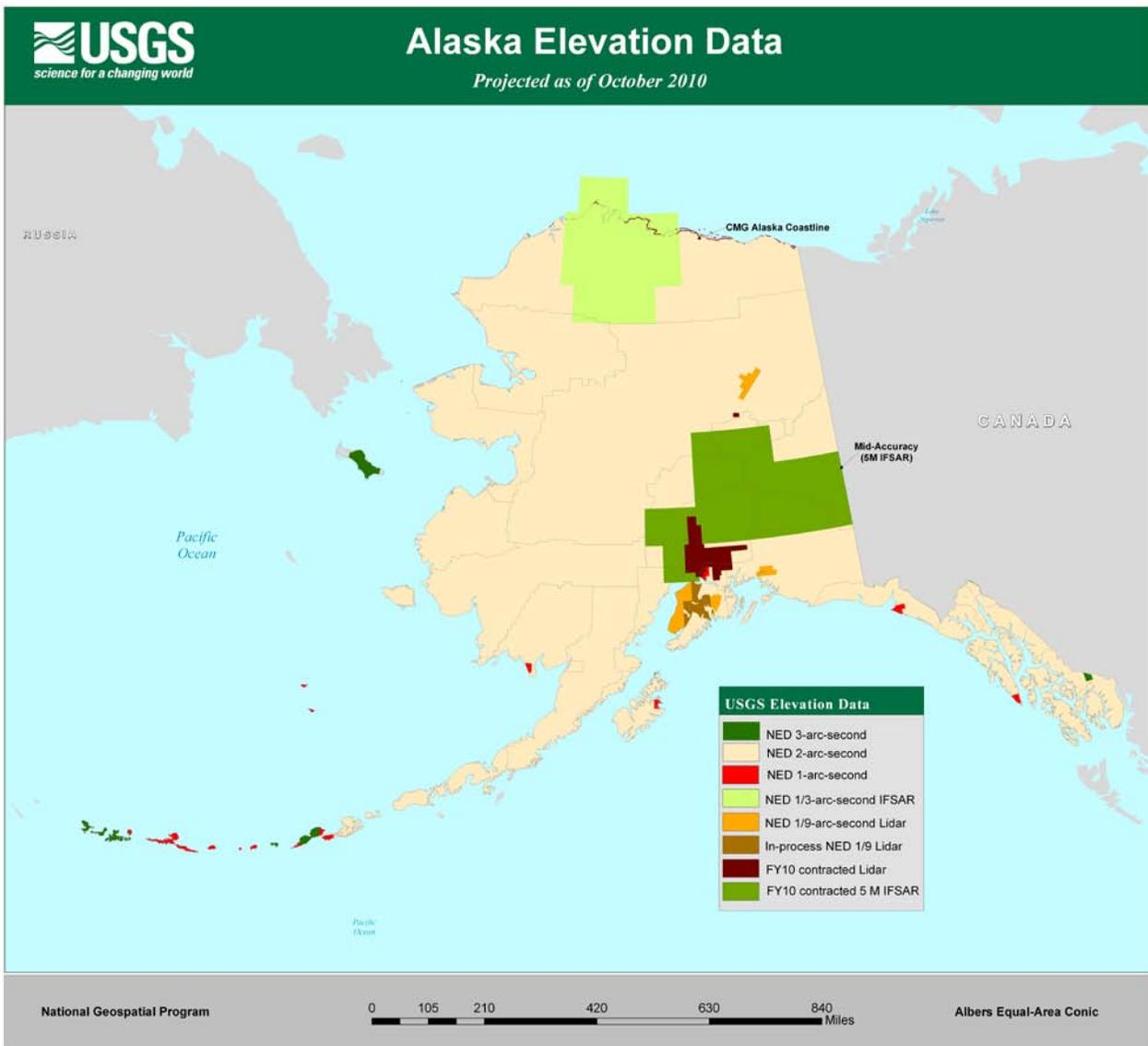


Figure 6. Available and anticipated Alaska elevation data

### Mexico addition to the NED 1-arc-second layer

Elevation data for country of Mexico were added to the 1-arc-second NED in October, 2008. These data are a result of collaboration between the USGS and Mexico's National Institute of Statistics and Geography (INEGI). The data were provided and quality control conducted by INEGI. Topographic staff at USGS EROS processed the data to improve edge matching, making the dataset seamless within itself and along the U.S. / Mexico border.

## Multi-resolution NED

In addition to the standard 1-arc-second resolution, NED data for all of the contiguous United States, Hawaii, and many Pacific Islands are available at a resolution of 1/3-arc-second (approximately 10 meters). The current release of 1/3-arc-second NED (October 5, 2010) includes all USGS 10-meter and 1/3-arc-second DEMs produced as of September 15, 2010. (Figure 7)

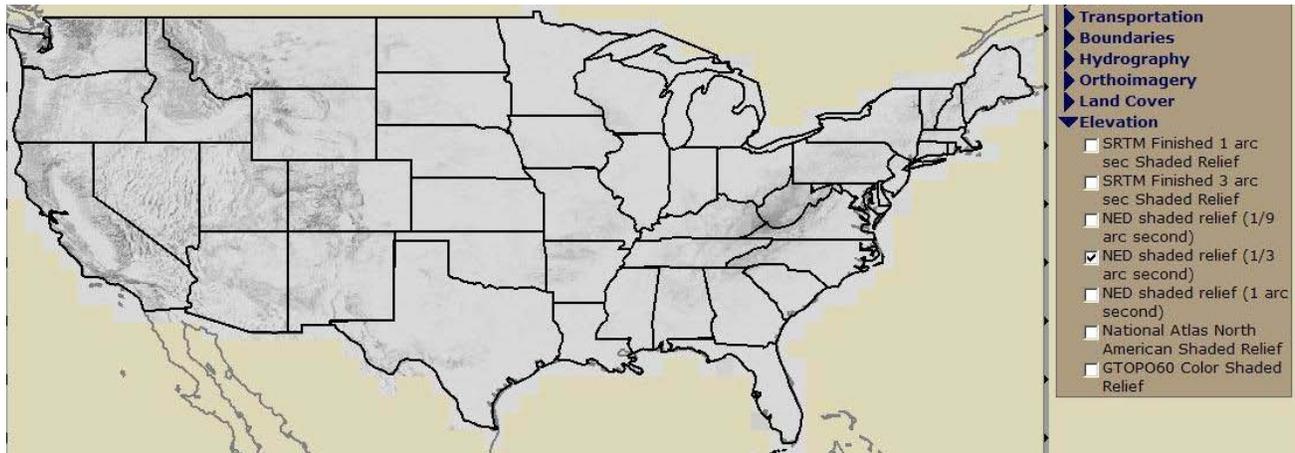


Figure 7. 1/3-arc-second NED available through SDDS

Source data with a resolution of 10 meters or higher currently exists for 92.5% of the United States (excluding Alaska). To complete 1/3<sup>rd</sup> arc-second coverage, the remaining areas are derived by oversampling 30-meter source data. Figure 8 shows the distribution of source data resolutions. The spatial metadata delivered with each order can be queried to determine the resolution of the source data used over any given area. As higher resolution source data become available, the data derived from 30-meter DEMs will be replaced. Oversampled 30-meter data has been assembled into the 1/3-arc-second NED as a convenience to the user community. Users would otherwise have to perform the oversampling themselves to fully cover study areas.

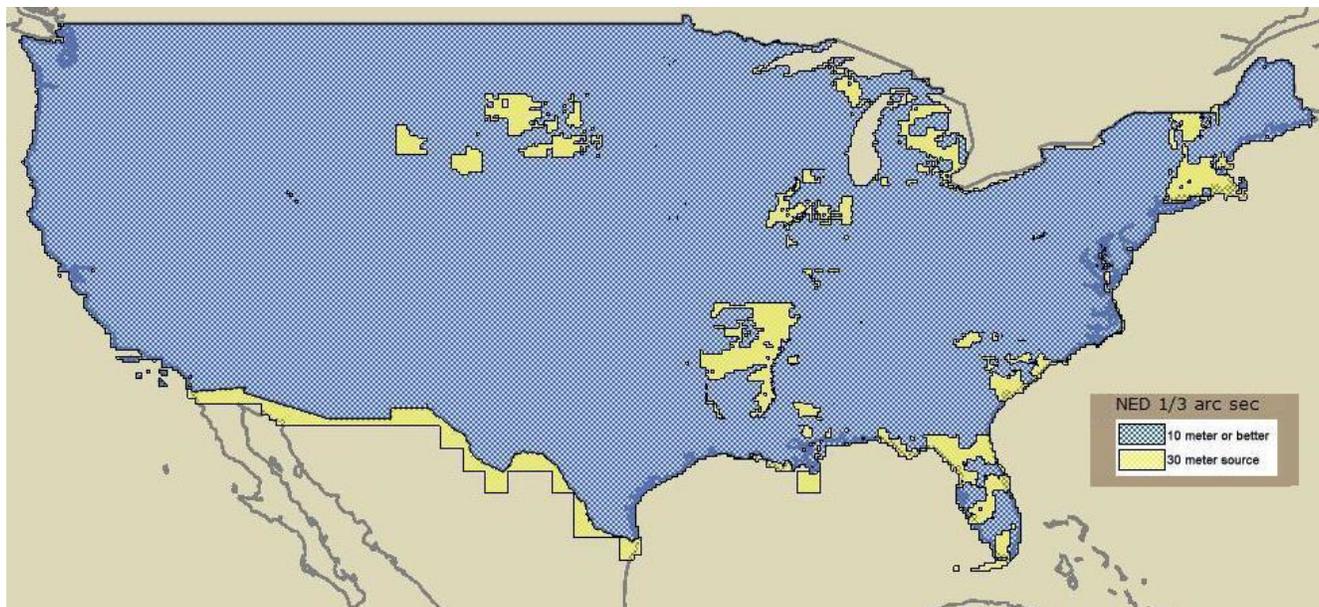


Figure 8. 1/3-arc-second NED, October 2010 release, by source resolution

## NED High Resolution Data

The 1/9-arc-second NED is being developed from high resolution source data (3-meter or better point spacing from lidar, photogrammetry, or other sources). Higher resolution layers are being populated through the integration of data from various sources, using new technologies, and are acquired through partnerships with Federal, State, and local partners, providing access to the best available local information. As data are acquired and made available in the public domain, they are incorporated into the NED at a 1/9-arc-second resolution. Figure 9 shows the areas that reside in the NED 1/9-arc-second layer, as of October, 2010.

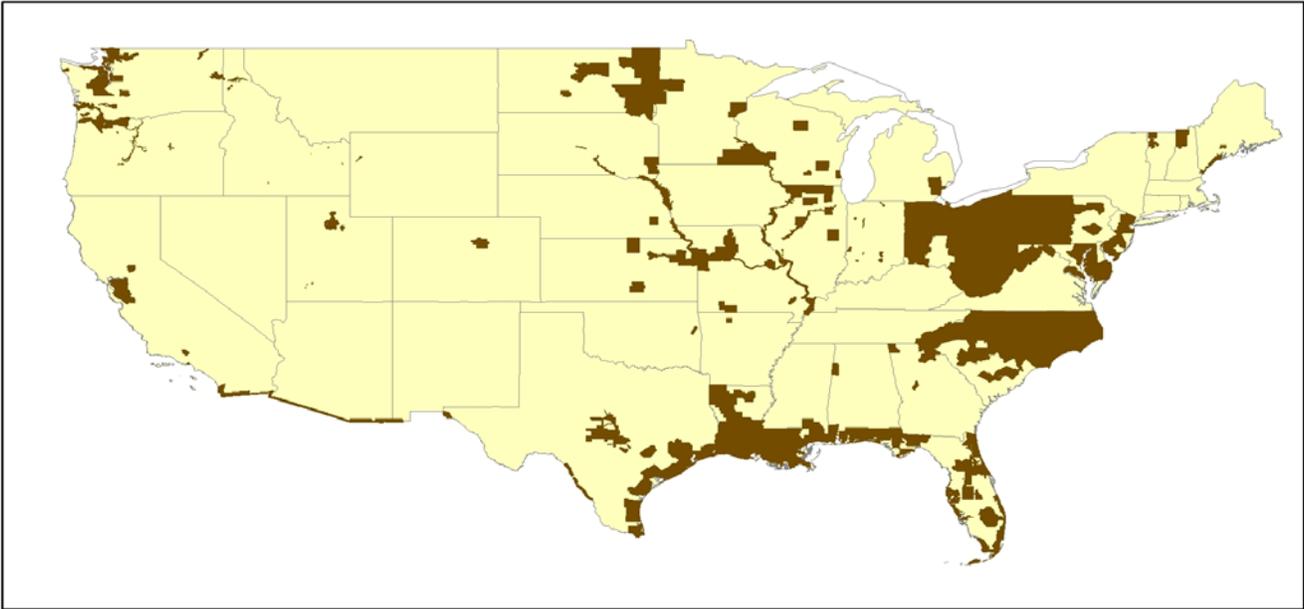


Figure 9. 1/9-arc-second NED available through SDDS—October 2010 release

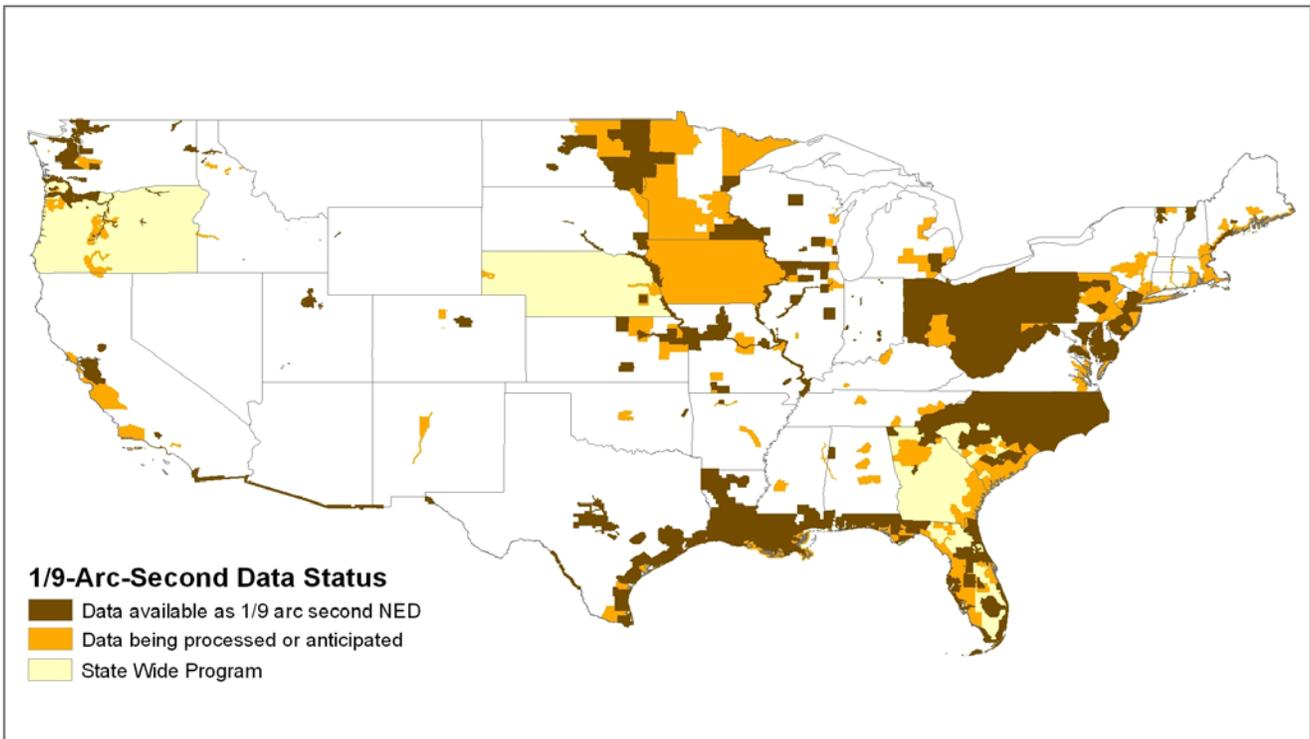
The following are NED 1/9-arc-second datasets released since the last Release Notes were distributed. These datasets are shown by state and project name:

October, 2010

AL\_MOBLBAY10  
IN\_FLOOD210  
MO\_STONE10  
OR\_UMATLRVR00

GA\_LKLANIER10  
IN\_FLOOD210  
OH\_LOT306  
PA\_SOUTH07

IN\_FLOOD110  
MI\_WAYNE09  
OH\_LOT506  
WI\_LINCOLN08



**Figure 10. Status of the NED 1/9-arc-second layer—October 2010 release**

Most of the high resolution data are being generated from lidar bare earth point data. NED distributes the elevation data but does not distribute the bare earth point cloud data. The released data are available for download through the seamless data distribution system (SDDS) (<http://seamless.usgs.gov>) or for NED bulk data delivery via hard drive -- contact USGS EROS Customer Service [custserv@usgs.gov](mailto:custserv@usgs.gov) (605-594-6151) to order.

As the higher resolution data set are released into the 1/9-arc-second NED layer they are also evaluated for possible inclusion into the NED 1- and 1/3-arc-second layers. Several higher resolution datasets were used as source into the other NED layers for this update cycle. The intention was to keep the 1/9-arc-second layer in sync with both the NED 1 and 1/3 layers even though there would be a time delay due to the differences in the processing flows. Unfortunately, the consistency of the 1/9-arc-second data is variable. Some of the 1/9th-arc-second datasets received by the National Elevation Team (NET) are very useful for specific applications and are the best available at the 1/9-arc-second resolution, but may not meet the criteria to which the NED 1- and 1/3-arc-second layers are held, such as flattened water bodies and bare-earth digital elevation models. Therefore, some of the datasets will not be used as source data for the NED 1 and 1/3<sup>rd</sup>.

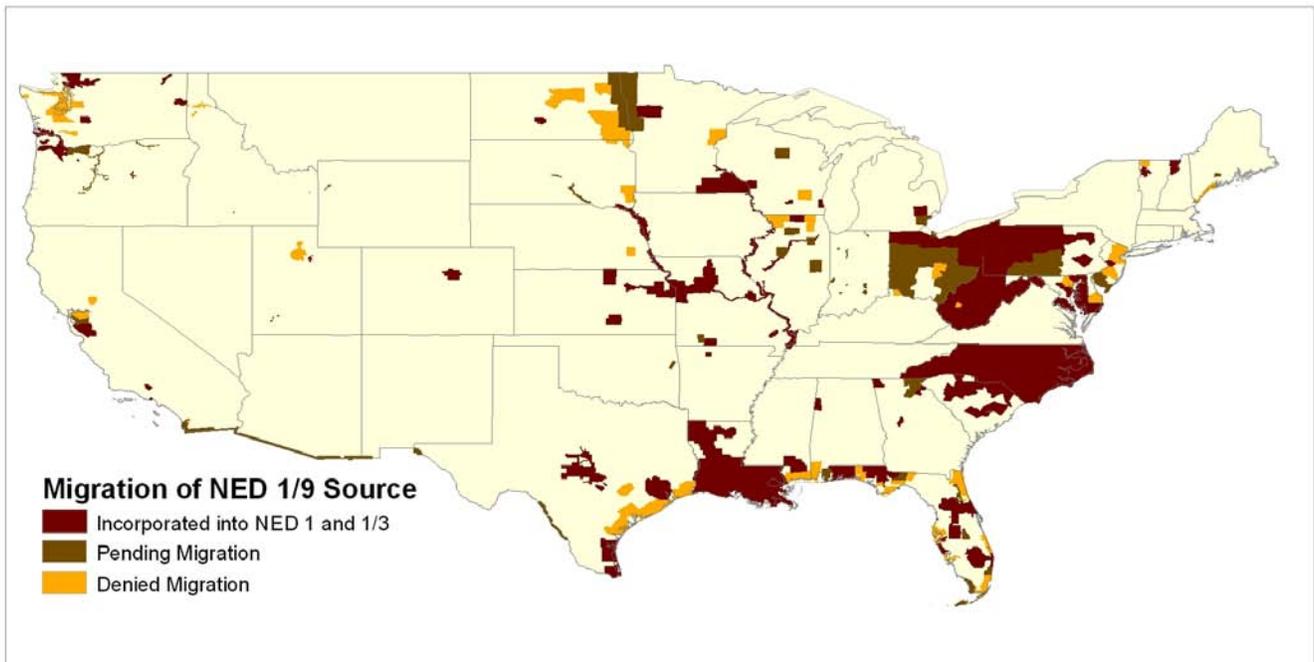
The following is a list of the NED1/9-arc-second source data recently incorporated into the NED 1- and 1/3-arc-second:

**October, 2010**

AK\_YKNFLATS09  
 AK\_KENAI08  
 AR\_BUFLORVR09  
 GA\_STEPHENS09

AK\_KENAI  
 OR\_LWR\_CLMBIA(additions)  
 MS\_CPSHELBY06

AK\_KENAIEST08  
 ND\_BISMNDN09  
 GA\_BANKS09

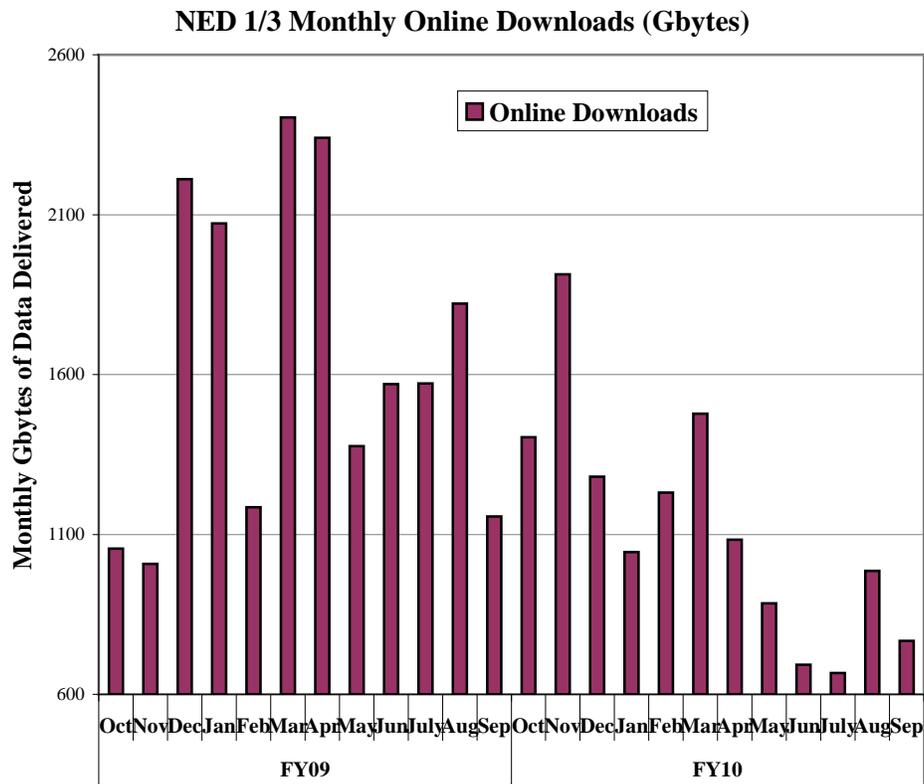
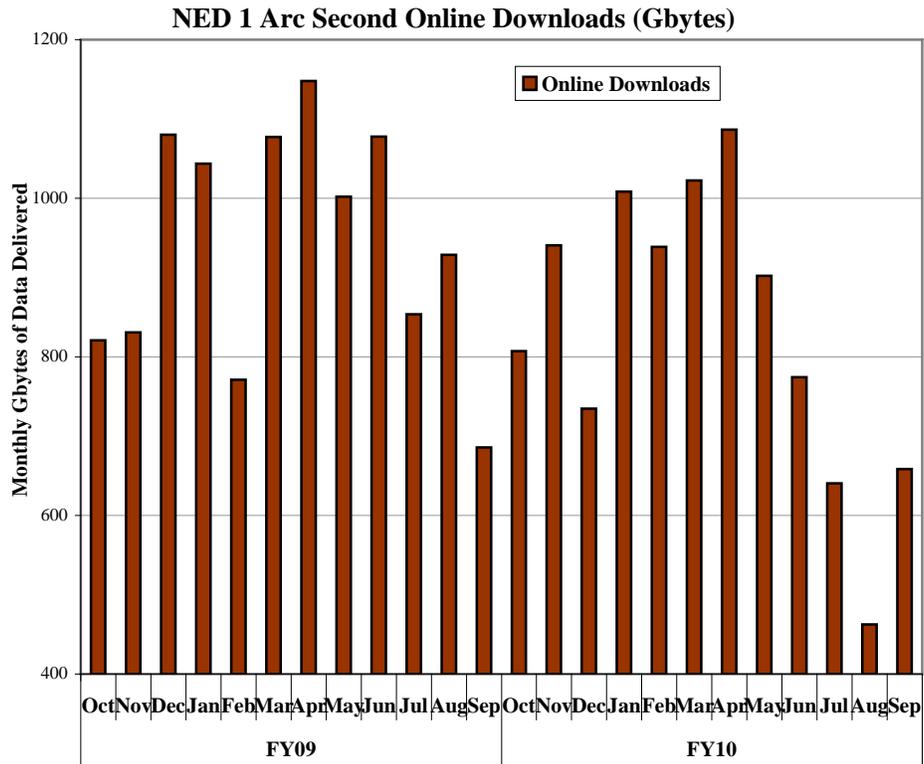


**Figure 11. Migration status of NED 1/9 to other NED layers—October 2010 release**

**Notes**

- The following are available from the NED Web site (<http://ned.usgs.gov/Ned/metadata.asp>): the NED spatial metadata in shapefile (.shp), the NED data dictionary with definitions of the attributes of the spatial metadata coverage; previous issues of the NED Release Notes; and spatial metadata shapefiles of previous releases.
- No new information was added to the FAQ list on the NED home page (<http://ned.usgs.gov>)
- A complementary USGS activity to the NED is the Center for Lidar Information Coordination and Knowledge (CLICK) which provides lidar point cloud data for download (<http://lidar.cr.usgs.gov/>).

## Download Statistics



**SDDS NED 1/9 Arc Second Online Downloads (Gbytes)**

