

NED Release Notes

June 2003

The June 2003 release of the National Elevation Dataset (NED) represents the 19th update since the NED bi-monthly maintenance schedule began in June 2000. This release includes existing source data and all new 7.5-minute digital elevation models (DEMs) available in the USGS Sales Database (SDB) as of May 1, 2003. Areas where the new source data were incorporated for this release (and previous releases) are indicated in Figure 1. Figure 2 indicates the combined areas updated in the December 2002, February 2003, April 2003, and June 2003 releases.

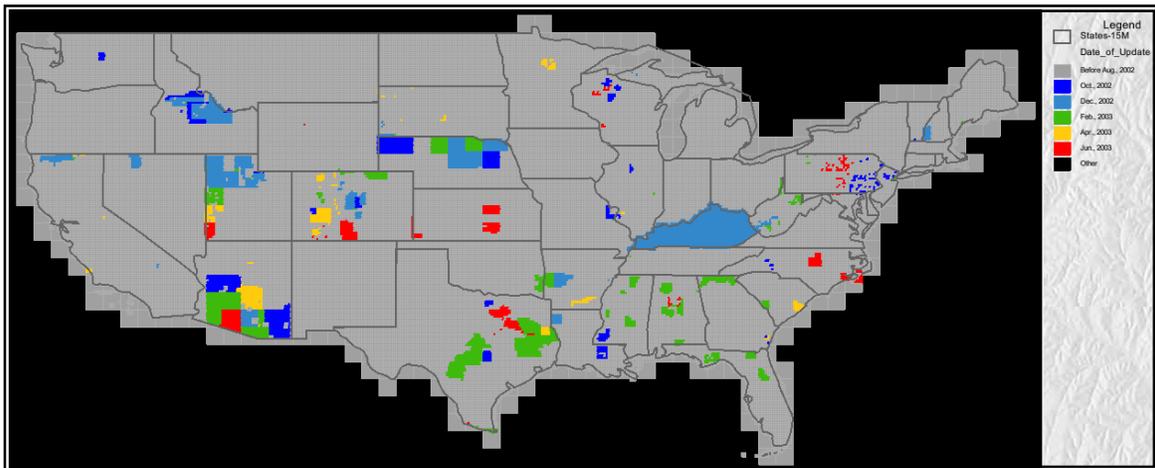


Figure 1. NED update areas, by release date.

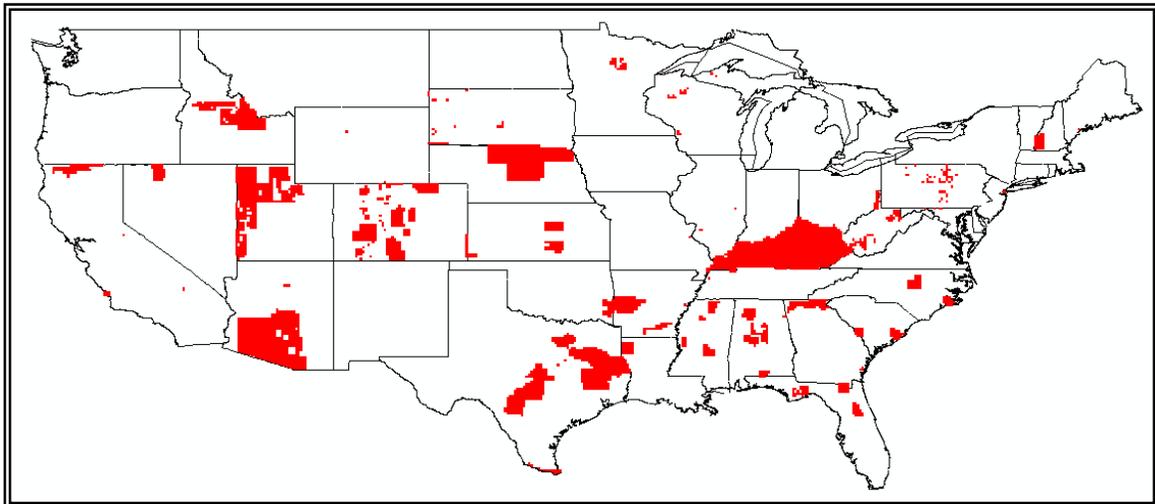


Figure 2. NED areas updated in December 2002, February 2003, April 2003, and June 2003 releases.

NED Tile Processing

NED is processed and stored internally as 1°x1° tiles. The number of tiles, and changes by release date, are listed in 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
June 2003	1,392	

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

For the current release, 76 tiles were updated, which represents 8% of NED (not including Alaska tiles). The number of NED tiles processed for each of the last 19 releases is shown in Figure 3.

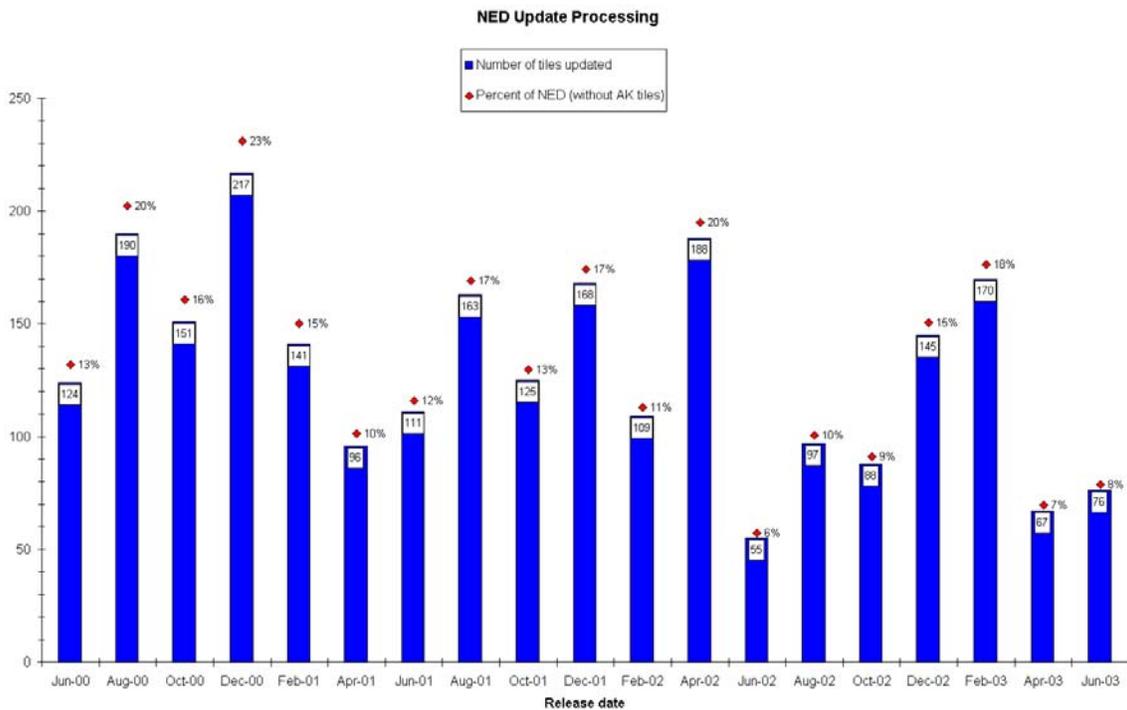


Figure 3. Number (and percentage) of NED tiles processed, by release date.

NED Source Data

NED source data are selected from the available USGS DEMs according to the following ranking (highest priority listed first): 10-meter, 30-meter Level 2, 30-meter Level 1, 2-arc-second, 3-arc-second. The composition of the source data used in NED continued the trend seen in previous releases with 10-meter increasing and the corresponding decrease in 30-meter. Thus, the ongoing production of USGS 10-meter DEMs is reflected in each NED release. The number of source DEMs (by type) and the percentage of NED derived from each type for each of the last 19 releases are shown in Figure 4 and Figure 5, respectively. Note that only 7.5-minute DEMs were included for Figures 4 and 5, so the totals and percentages do not include Alaska, which is derived mostly from 2-arc-second source data.

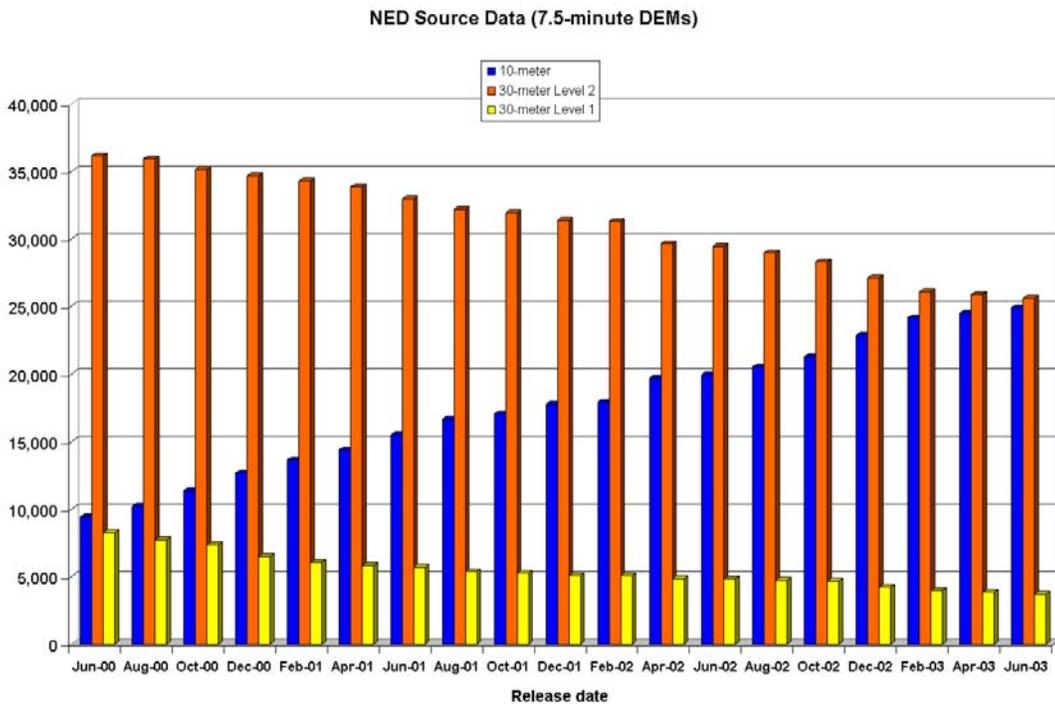


Figure 4. NED source data (by DEM type) for recent releases.

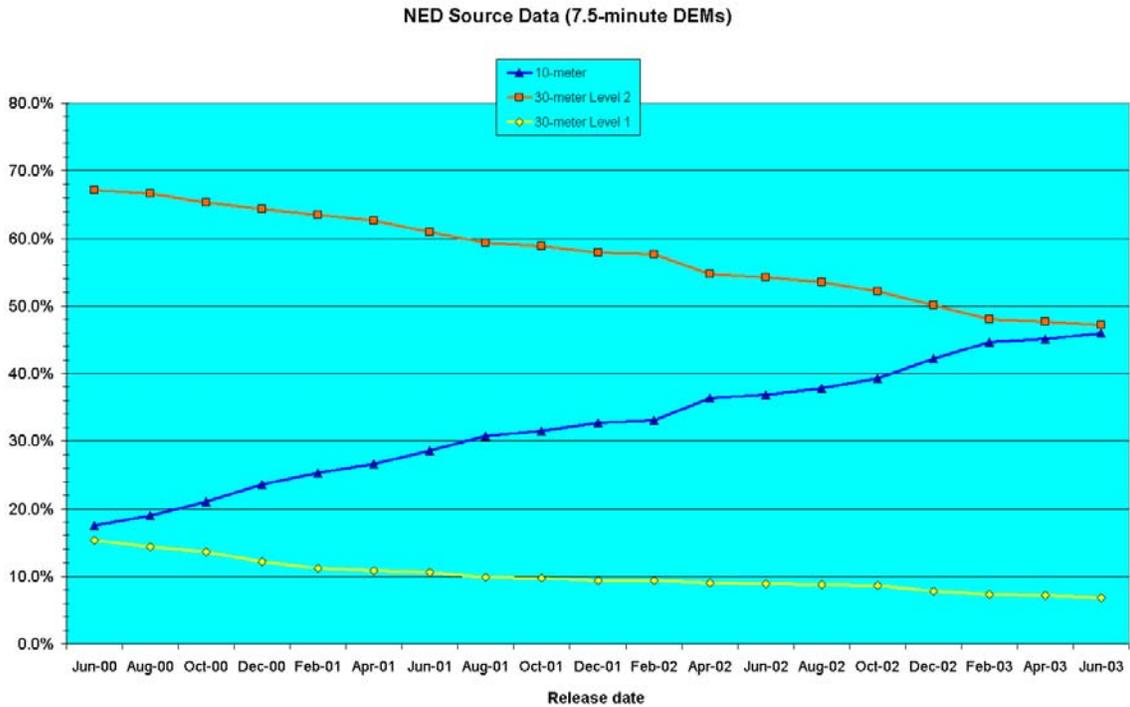


Figure 5. Percent of NED source data (by DEM type) for recent releases.

The changes in NED source data since the previous releases are described in Table 2.

Release date	10-meter added	10-meter removed	30-meter Level 2 added	30-meter Level 2 removed	30-meter Level 1 added	30-meter Level 1 removed	Total added	Total removed	Net added
June 2001	1,288	176	31	919	0	134	1,319	1,229	90
August 2001	1,181	6	96	871	49	375	1,326	1,252	74
October 2001	488	95	205	479	76	196	769	770	-1
December 2001	715	22	182	689	12	189	909	900	9
February 2002	151	0	3	121	15	40	169	161	8
April 2002	1,801	2	28	1,649	1	187	1,830	1,838	-8
June 2002	258	16	1	222	3	21	262	259	3
August 2002	711	138	211	669	1	117	923	924	-1
October 2002	788	36	6	683	0	48	794	767	27
December 2002	1,835	254	5	1164	4	451	1,844	1,869	-25
February 2003	1,332	14	7	1076	1	253	1,340	1,343	-3
April 2003	325	10	24	223	1	118	350	351	-1
June 2003	457	40	5	283	2	141	464	464	0

Table 2. Changes in NED source data (7.5-minute DEMs).

As recorded in the NED spatially referenced metadata, the composition of the NED source data may be described in terms of specific characteristics of the source DEMs. Table 3 and Table 4 show the number of DEMs by production method and production site, respectively, for the current and previous releases. Note that in the current release 6.5% of NED is derived from DEMs produced with photogrammetric methods (GPM and MP), while over 86% of NED is derived from DEMs produced from hypsography processed with LT4X.

Release date	GPM	MP	CTOG	DCASS	LT4X	Unknown
August 2001	2,332	3,061	6,759	230	44,845	476
October 2001	2,281	2,988	6,091	235	45,627	469
December 2001	2,168	2,919	5,515	238	46,360	440
February 2002	2,146	2,911	5,250	238	46,560	427
April 2002	2,084	2,786	4,921	233	47,078	424
June 2002	2,084	2,768	4,917	232	47,099	424
August 2002	2,033	2,705	4,889	232	47,239	407
October 2002	2,018	2,672	3,767	229	48,439	406
December 2002	1,791	2,435	3,683	220	48,954	404
February 2003	1,727	2,263	3,591	216	49,277	390
April 2003	1,704	2,169	3,584	216	49,400	390
June 2003	1,672	2,061	3,575	215	49,564	377

Table 3. NED source DEMs, by production method.

Release date	MAC	MCMC	RMMC	WMC	Contractor	FS	BLM	EMC	Unknown
August 2001	1,748	9,476	8,109	2,706	22,046	9,450	379	258	3,531
October 2001	1,721	9,480	8,090	2,726	22,193	9,406	366	258	3,450
December 2001	1,672	9,426	7,957	2,727	22,506	9,375	364	261	3,348
February 2002	1,620	9,392	7,916	2,721	22,597	9,349	352	260	3,312
April 2002	1,581	9,388	7,744	2,931	23,063	8,985	322	259	3,201
June 2002	1,582	9,377	7,755	2,955	23,118	8,920	313	259	3,119
August 2002	1,561	9,520	7,758	2,971	23,217	8,798	311	256	3,113
October 2002	1,516	9,547	7,792	2,963	23,446	8,674	262	255	3,076
December 2002	1,407	9,278	7,645	3,051	23,706	8,328	253	250	3,587
February 2003	1,412	9,214	7,505	3,021	24,061	8,361	214	236	3,440
April 2003	1,407	9,244	7,555	3,008	24,185	8,245	213	229	3,377
June 2003	1,400	9,336	7,568	2,973	24,249	8,217	205	224	3,292

Table 4. NED source DEMs, by production site.

NED Processing Notes

The following items from the December 2002 NED maintenance are noted:

- Included in the 145 updated tiles are all of Hawaii and all island territories. This was not a response to new data, but rather an improvement in a NED processing routine that effectively eliminates "ocean smear" from the edge matching operation.
- Metadata items MEAN and SIGMA have been renamed ZMEAN and ZSIGMA. Metadata item UTMZONE has been renamed ZONE, as it may also indicate State Plane zones, beginning with the new Kentucky data. As before, the ZONE field will have a value of zero if the source data are cast in geographic coordinates.
- The net reduction of 25 7.5-minute quads is due to sliver removal.

The following items from the February 2003 NED maintenance are noted:

- The most notable feature of this release is the complete reprocessing of Alaska, but this is not as significant as it may seem. Only a few truly new DEMs are incorporated, as will be indicated by the metadata QUADDATE field. The primary motivation for this update is the new ability of NED processing code to read Alaska 3-arc-second DEMs with variable point spacing. Previously, these DEMs were processed in ArcInfo prior to inclusion in NED, with an accompanying loss of metadata. To avoid user confusion, the QUADDATE field of these DEMs will not show them to be new data. A few previously unrepairable 2-arc-second DEMs have been fixed, however, and these will properly appear as new data.
- Some tiles in the contiguous U.S., mostly along the Canadian border, were reprocessed to exclude slivers of 2- and 3-arc-second data. This results in a net reduction of 41 source DEMs when all resolutions are taken into account.
- A review of the PDEVICE field in the spatially referenced metadata revealed no remaining DEMs produced with the Galileo IIIId stereoplotter.

The following items from the April 2003 NED maintenance are noted:

- The "new" 30-meter Level 1 DEM is merely a fixed version of an older DEM. The net loss of one DEM is due to sliver removal.
- Some tiles along the Canadian border were updated solely to correct data errors (large negative values) inadvertently introduced during previous processing.

Miscellaneous Notes

- The following are available via anonymous FTP: the NED spatial metadata in Shapefile and Arc Export format, the NED data dictionary with definitions of the attributes of the spatial metadata coverage, previous issues of the NED Release Notes, and Shapefiles that outline the areas updated in the June 2003 and previous releases. The FTP site for these items is: <ftp://edcftp.cr.usgs.gov/pub/data/ned/>

NED Data Distribution

In addition to free FTP download through the online data distribution system (<http://seamless.usgs.gov>) and pre-defined areas on CD, NED data are also now available on DVD. The price is \$60 per DVD, plus a base charge of \$60 and \$5 handling fee per order.

NED Accuracy Assessment

The overall absolute vertical accuracy of NED has been assessed by comparison to an independent reference dataset, the high accuracy geodetic control points maintained and distributed by the National Geodetic Survey (NGS). The initial assessment was done in September 1999 using 5,811 High Accuracy Reference Network (HARN) points located throughout the conterminous United States. At that time, some small areas of NED in the conterminous United States were still based on 2-arc-second or 3-arc-second data. Also, less than 15% of NED was derived from 10-meter DEMs. The accuracy assessment was conducted again in October 2001 using the same 5,811 HARN points for reference. At that time, the conterminous U.S. NED was derived entirely from 7.5-minute source DEMs, with nearly one-third being 10-meter DEMs. The accuracy assessment was conducted a third time in November 2002, with the reference dataset being the NGS GPS on benchmarks dataset (5,874 points; Figure 6). The vertical accuracy (expressed in meters) calculated in each assessment is presented in Table 5. The numbers are presented as the root mean square error (RMSE) and also as the equivalent metrics in the National Map Accuracy Standards (NMAS; 90% confidence) and the National Standard for Spatial Data Accuracy (NSSDA; 95% confidence).

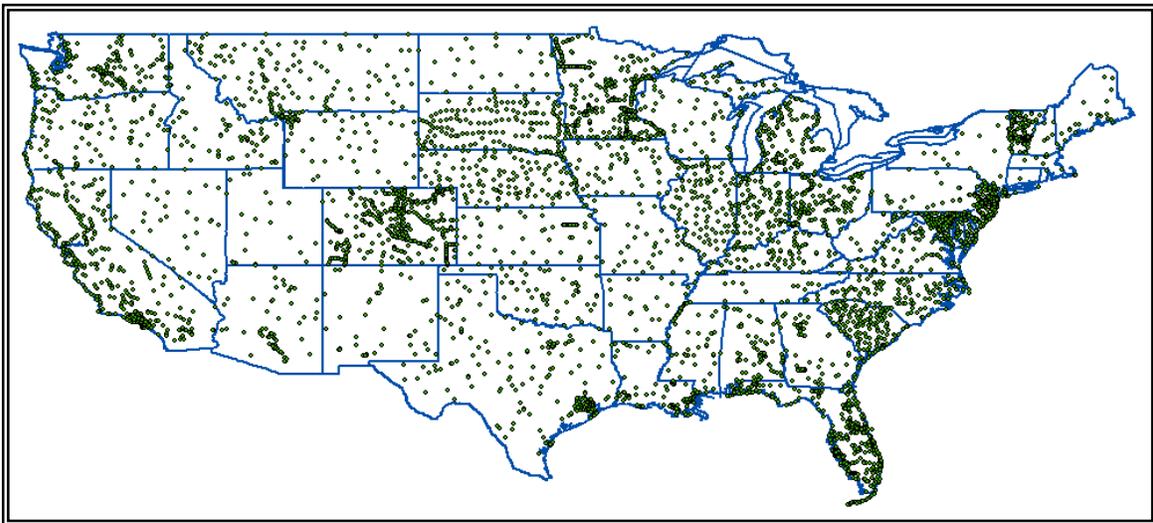


Figure 6. NGS control points used for NED accuracy assessment.

Date of assessment	RMSE	NMAS (90%)	NSSDA (95%)
September 1999	3.74 meters	6.15 meters	7.34 meters
October 2001	3.13 meters	5.15 meters	6.14 meters
November 2002	2.70 meters	4.44 meters	5.29 meters

Table 5. NED vertical accuracy based on a comparison with NGS control points.

Multi-resolution NED

In addition to the standard 1-arc-second resolution, NED data for a portion of the United States are now available in 1/3-arc-second resolution (approximately 10 meters). These higher resolution data have been produced where 10-meter DEMs are available as NED source data. Production of 1/3-arc-second NED is continuing, and additional areas will be made available as they are completed. Figure 7 shows the current coverage of 1/3-arc-second NED. The data are available for download and on media copies through the seamless data distribution system (SDDS).

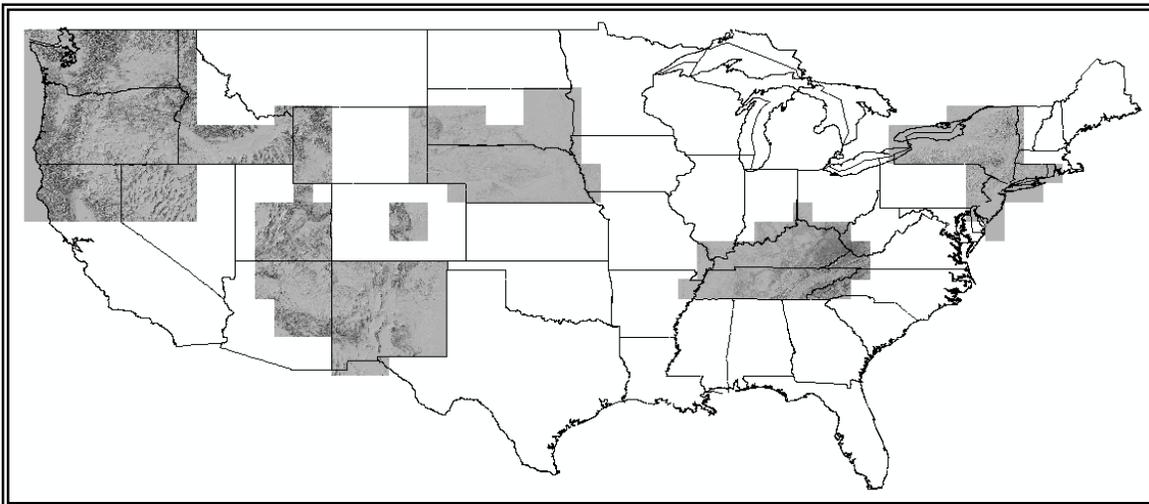
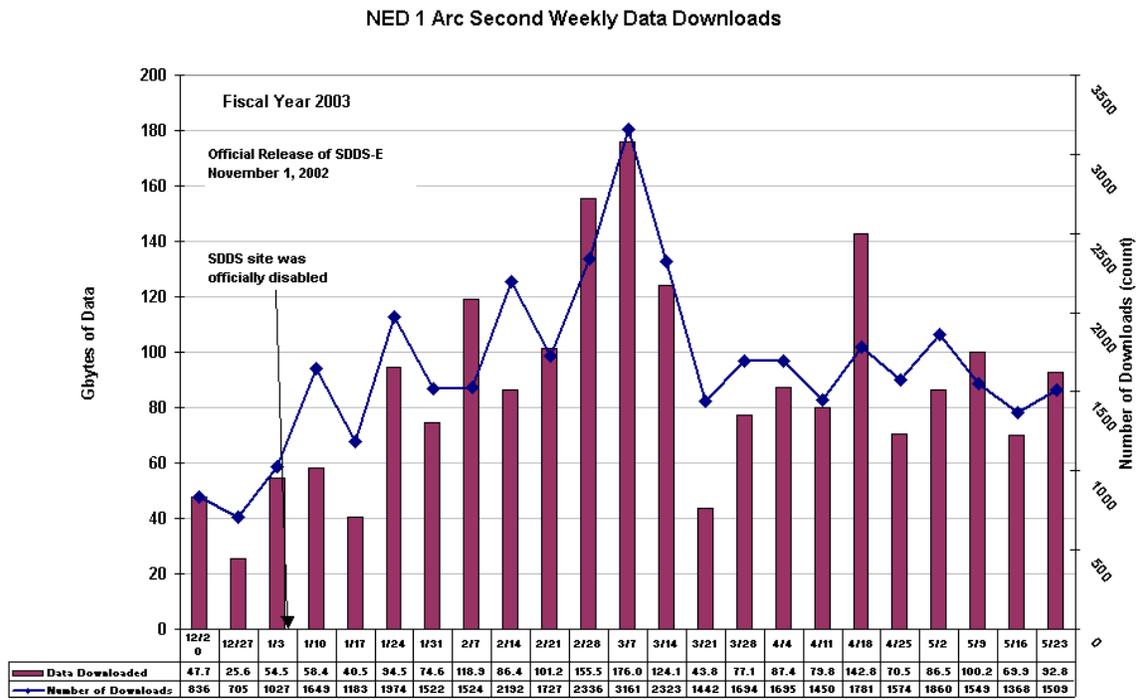


Figure 7. 1/3-arc-second available for download through the SDDS.

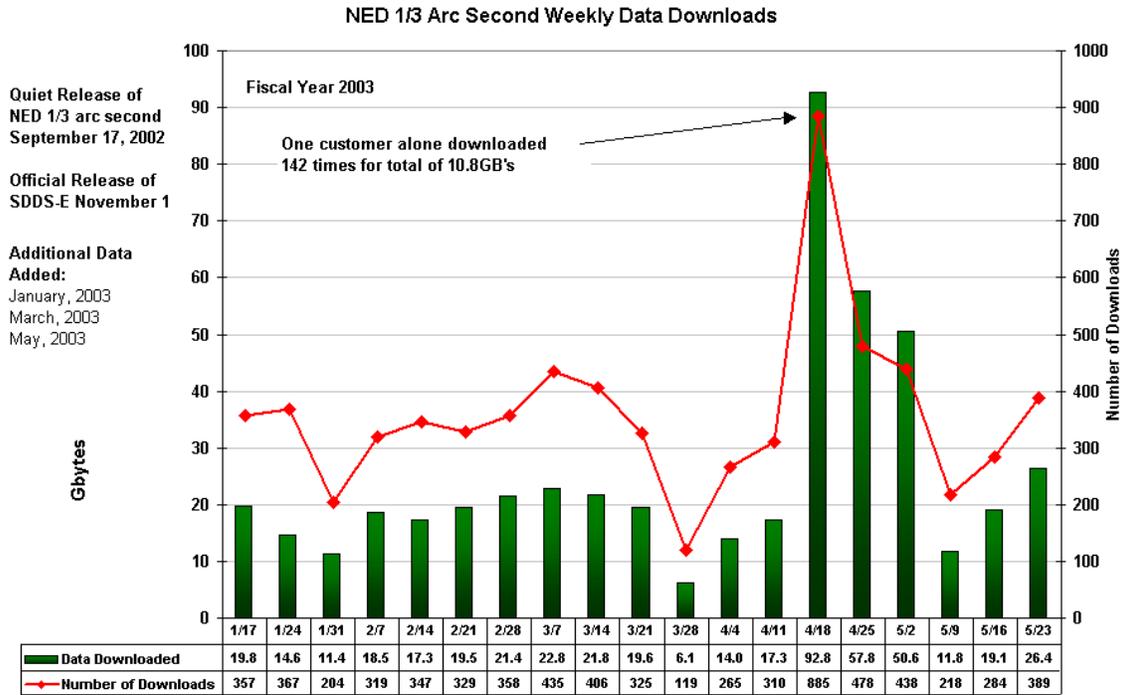
NED Download Statistics

Download activity for 1-arc-second NED and 1/3-arc-second NED are shown in Figure 8 and Figure 9, respectively.



Includes data downloaded for free from SDDS-E only.

Figure 8. Download activity for 1-arc-second NED.



Includes free data downloads only.

Figure 9. Download activity for 1/3-arc-second NED.