

# Digital Geodata Series DGS 04-1

## Earthquakes Epicentered in New Jersey

### Explanation

#### MAGNITUDES

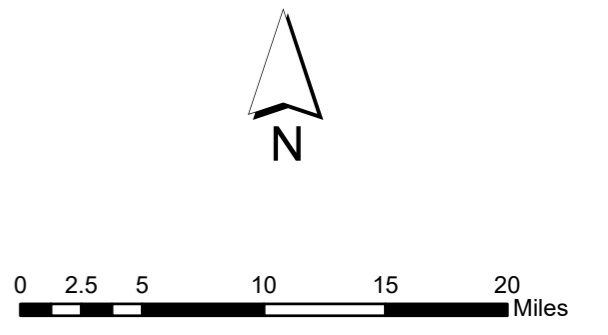
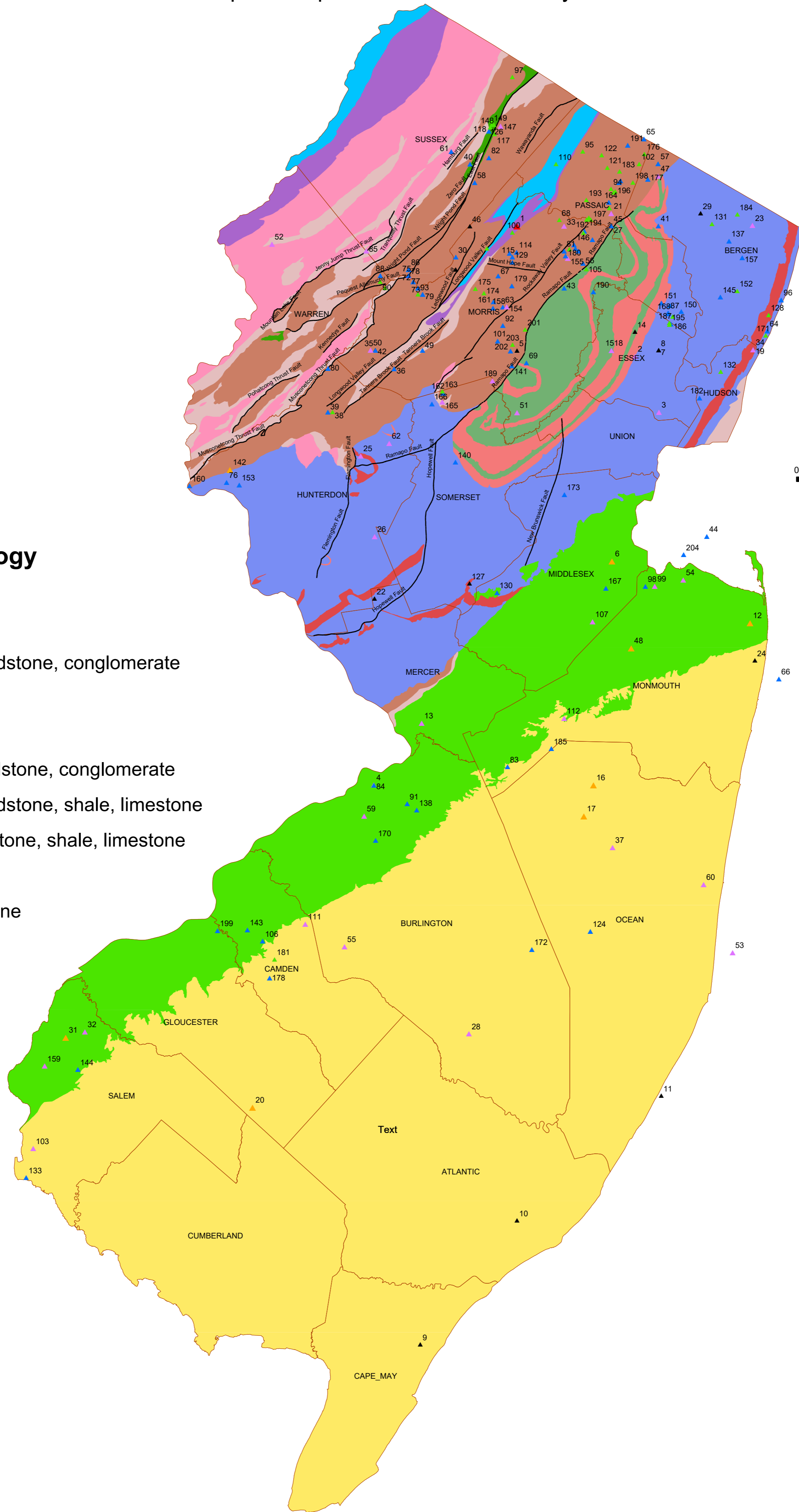
- ▲ 0.0 - 0.3
- ▲ 0.4 - 1.3
- ▲ 1.4 - 2.3
- ▲ 2.4 - 3.3
- ▲ 3.4 - 4.3
- ▲ 4.4 - 5.3

— Named Faults

□ Counties

#### Generalized Bedrock Geology

- Tertiary sand, silt, clay
- Cretaceous sand, silt, clay
- Jurassic siltstone, shale, sandstone, conglomerate
- Jurassic basalt
- Jurassic diabase
- Triassic siltstone, shale, sandstone, conglomerate
- Devonian conglomerate, sandstone, shale, limestone
- Silurian conglomerate, sandstone, shale, limestone
- Ordovician shale, limestone
- Cambrian limestone, sandstone
- Precambrian marble
- Precambrian gneiss, granite





# Earthquakes Epicentered In New Jersey, DGS 04-1, Edition 20171108

## Metadata:

- [Identification Information](#)
  - [Data Quality Information](#)
  - [Spatial Data Organization Information](#)
  - [Spatial Reference Information](#)
  - [Entity and Attribute Information](#)
  - [Distribution Information](#)
  - [Metadata Reference Information](#)
- 

### *Identification Information:*

#### *Citation:*

#### *Citation Information:*

#### *Originator:*

New Jersey Department of Environmental Protection NJDEP, New Jersey Geological Survey NJGS

*Publication Date:* 20041217

#### *Title:*

Earthquakes Epicentered In New Jersey, DGS 04-1, Edition 20171108

*Edition:* 20171108

*Geospatial Data Presentation Form:* Vector Digital Data Set (Point)

#### *Series Information:*

*Series Name:* Digital Geodata Series

*Issue Identification:* DGS04-1

#### *Publication Information:*

*Publication Place:* Trenton, New Jersey

*Publisher:* New Jersey Geological Survey

*Online Linkage:* <http://www.state.nj.us/dep/njgs/geodata/dgs04-1.htm>

### *Description:*

#### *Abstract:*

The New Jersey Geological Survey Digital Geodata Series DGS04-1 dataset shows earthquakes that had epicenters in New Jersey. This data has 204 earthquakes with epicenters in New Jersey. Most are minor with magnitudes ranging from 0.4 to 5.3 and depths up to 25 km below sea level. Earthquakes with magnitude of 0 (zero) implies that the magnitude is unknown.

Following earthquake added since Oct. 2, 2017 version:

1) 3.5 km NW of Keansburg, NJ on 11-08-2017, 08:33:44 (EST), Magnitude 1.38, Depth 4.34 km.

#### *Purpose:*

To provide information on earthquakes which had epicenters in New Jersey.

#### *Supplemental Information:*

Various Data Sources and References:

Coffman, J. L. and von Hake, C. A., ed., 1973, Earthquake history of the United States: U. S. Department of Commerce, National Oceanic and Atmospheric Administration Publication 41-1, Revised edition

(through 1970).

Dombroski, D. R., 1992, Catalog of NJ Earthquakes Through 1990: N.J. Geological Survey, Geological Survey Report 31, 16p.

Eppley, R. A., ed., 1965, Earthquake history of the United States: U.S. Department of Commerce, Coast and Geodetic Survey Publication 41-1 Revised (through 1963).

Richter, C.F., 1935, An instrumental earthquake magnitude scale: Seismological Society of America Bulletin, v. 25 p.1-32.

Smith, W.E.T., 1962, Earthquakes of eastern Canada and adjacent areas, 1534-1927: Publication of the Dominion Observatory, Ottawa, v.24, no. 5.

Smith, W.E.T., 1966, Earthquakes of eastern Canada and adjacent areas, 1928-1959: Publication of the Dominion Observatory, Ottawa, v.32, no. 3.

Sykes, Lynn R., John Ambruster, Won-Young Kim , Leonardo Seeber and Klaus Jacob, Appendices to paper Earthquakes in the Greater NY City-Philadelphia Area: 1677-2004. (<http://www.ldeo.columbia.edu/~sykes/pages/EqCatNYC-Phil.html>)

Stover, C.W., and Coffman, J.L., 1993, Seismicity of the United States, 1568-1989 (Revised) U.S. Geological Survey Professional Paper 1527.

Stover, C.W., Reagor, G., and Algermissen, S.T., 1984, United States earthquake data file: U.S. Geological Survey, Open-file Report 84-225, 123p.

Wood, H. O, and Neumann, Frank, 1931, Modified Mercalli scale of 1931: Seismological Society of America Bulletin, v.21 no. 4, p. 277-283.

LCSN - Lamont Doherty Cooperative Seismographic Network. (<http://www.ldeo.columbia.edu/LCSN/>)

NEIC- National Earthquake Information Center.(<http://earthquake.usgs.gov/regional/neic/index.php>)

NESN - New England Seismic Network. Weston Observatory. (<http://www.bc.edu/research/westonobservatory/>)

PDE (Preliminary Determination of Epicenters) -USGS/NEIC PDE Monthly list. (<ftp://hazards.cr.usgs.gov/pde/manuscript/>)

*Time\_Period\_of\_Content:*

*Time\_Period\_Information:*

*Single\_Date/Time:*

*Calendar\_Date:* 20171108

*Currentness\_Reference:* publication date

*Status:*

*Progress:* In work

*Maintenance\_and\_Update\_Frequency:* As needed

*Spatial\_Domain:*

*Bounding\_Coordinates:*

*West\_Bounding\_Coordinate:* -75.546016802

*East\_Bounding\_Coordinate:* -73.791860951

*North\_Bounding\_Coordinate:* 41.239949622

*South\_Bounding\_Coordinate:* 39.195749044

*Keywords:*

*Theme:*

*Theme\_Keyword\_Thesaurus:* None

*Theme\_Keyword:* Earthquake

*Theme\_Keyword:* Magnitude

*Theme\_Keyword:* Depth

*Theme\_Keyword:* Epicenter

*Theme\_Keyword:* Foreshock

*Theme\_Keyword:* Aftershock

*Theme\_Keyword:* Fault

*Theme\_Keyword:* Seismic

*Theme\_Keyword:* Seismograph

*Theme\_Keyword:* Intensity

*Theme\_Keyword:* Seismological

*Theme\_Keyword:* Seismicity

*Theme:*

*Theme\_Keyword\_Thesaurus:* ISO 19115 Topic Category

*Theme\_Keyword:* geoscientificInformation

*Place:*

*Place\_Keyword\_Thesaurus:* USGS Place Names Gazetteer

*Place\_Keyword:* New Jersey

*Place\_Keyword:* State of New Jersey

*Stratum:*

*Stratum\_Keyword\_Thesaurus:* none

*Stratum\_Keyword:* Underground

*Access\_Constraints:* None

*Use\_Constraints:*

New Jersey Department of Environmental Protection (NJDEP) Data Distribution Agreement

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*Point\_of\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Suhas Ghatge

*Contact\_Organization:*

New Jersey Department of Environmental Protection, New Jersey Geological Survey

*Contact\_Position:* Research Scientist

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* 29 Arctic Parkway P.O. Box 420, Mail Code: 29-01

*City:* Trenton

*State\_or\_Province:* New Jersey

*Postal\_Code:* 08625-420

*Contact\_Voice\_Telephone:* (609) 292-1185

*Contact\_Facsimile\_Telephone:* (609) 633-1004

*Contact\_Electronic\_Mail\_Address:* suhas.ghatge@dep.nj.gov

*Browse\_Graphic:*

*Browse\_Graphic\_File\_Name:* <http://www.state.nj.us/dep/njgs/geodata/dgs04-1.htm#image>

*Browse\_Graphic\_File\_Description:* image

*Browse\_Graphic\_File\_Type:* JPEG

*Security\_Information:*

*Security\_Classification\_System:* none

*Security\_Classification:* Unclassified

*Security\_Handling\_Description:* none

*Native\_Data\_Set\_Environment:*

Environment as of Metadata Creation: Microsoft [Unknown] Version 6.2 (Build 9200) ; Esri ArcGIS 10.4 (Build 5524) Service Pack N/A (Build N/A)

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*Data\_Quality\_Information:*

*Attribute\_Accuracy:*

*Attribute\_Accuracy\_Report:* unknown

*Logical\_Consistency\_Report:* unknown

*Completeness\_Report:*

Some earthquake locations were in Latitude and Longitude degrees and minutes, rounded to the nearest minute and converted to decimal degrees. Others were in decimal degree and they were converted to NJ State Plane coordinate system. Earthquakes with magnitude of 0 (zero) implies that the magnitude is unknown.

*Positional\_Accuracy:*

*Horizontal\_Positional\_Accuracy:*

*Horizontal\_Positional\_Accuracy\_Report:*

Instrumental epicenter accuracy is estimated to be within 0.0 degrees to 0.5 degrees and non-instrumental accuracy ranges from 0 degrees to 2.0 degrees (Stover, 1984 and NEIC).

*Vertical\_Positional\_Accuracy:*

*Vertical\_Positional\_Accuracy\_Report:*

A formal accuracy assessment of the vertical positional information in the data set has either not been conducted, or is not applicable.

*Lineage:*

*Process\_Step:*

*Process\_Description:*

Data on earthquake epicenters were gathered from the regional seismic network at Lamont Doherty Observatory, Bulletins of the Northeast Seismic Network, New England Seismic Network, information from the U.S. Geological Survey and other books and reports. A table was created with this information in Microsoft Excel software. The tabular information was then imported into ESRI ArcMap software and converted into a shapefile.

Most of the earthquakes in this database were recorded with seismic equipment. The older earthquakes, included were not recorded by seismic equipment but were documented by NEIC, and the USGS. Instrumental epicenter accuracy is estimated to be within 0.0 degrees to 0.5 degrees and non-instrumental accuracy ranges from 0 degrees to 2.0 degrees (Stover, 1984 and NEIC). Earthquakes with magnitude of 0 (zero) implies that the magnitude is unknown.

*Process\_Date:* 20040322

*Process\_Step:*

*Process\_Description:*

Following earthquake added since July 13, 2015 version:

- 1) 3.5 km N of Bernardsville, NJ on 08-14-2015, 03:41 (EDT), Magnitude 2.7, Depth 3.5 km.

*Process\_Date:* 20150814

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Aug 14, 2015 version:

- 1) 5 km WNW of Fairfield, NJ on 08-24-2015, 03:17 (EDT), Magnitude 1.4, Depth 8 km.

*Process\_Date:* 20150824

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Jan 4, 2016 version:

- 1) 1.1 km NW of Butler, NJ on 02-18-2016, 20:17 (EST), Magnitude 1.1, Depth 4.11 km.

*Process\_Date:* 20160219

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Feb 19, 2016 version:

- 1) 1 km NW of Butler, NJ on 07-4-2016, 00:06:49 (EDT), Magnitude 1.1, Depth 2 km.

*Process\_Date:* 20160705

*Process\_Step:*

*Process\_Description:*

Following earthquake added since July 5, 2016 version:

- 1) 4.4 km NW of Butler, NJ on 05-27-2016, 12:48:43 (EDT), Magnitude 0.8, Depth 2.9 km.
- 2) 2.2 km SW of Clifton, NJ on 07-30-2016, 20:34:45 (EDT), Magnitude 0.8, Depth 4.7 km.

*Process\_Date:* 20160801

*Process\_Step:*

*Process\_Description:*

The following earthquakes added since Aug. 1, 2016 version:

- 1) 2 km N of Wanaque, NJ on 08-8-2016, 22:01:45 (EDT), Magnitude 1.0, Depth 5.61 km.

2) 1 km N of Butler, NJ on 08-8-2016, 22:33:00 (EDT), Magnitude 0.54, Depth 1.62 km.

*Process\_Date:* 20160809

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Aug. 9, 2016 version:

1) 5 km NE of Wanaque, NJ on 09-19-2016, 23:04:04 (EDT), Magnitude 0.6, Depth 7.91 km.

*Process\_Date:* 20160921

*Process\_Step:*

*Process\_Description:*

Following earthquakes added since Sep. 20, 2016 version:

1) 2.6 km W of Bellmawr, NJ on 11-06-2016, 05:11:15 (EST), Magnitude 1.46, Depth 5 km.

2) 16.3 km E of Highlands, NJ on 11-06-2016, 07:15:02 (EST), Magnitude 1.98, Depth 4.48 km.

*Process\_Date:* 20161107

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Nov. 7, 2016 version:

1) 1.4 km S of Morris Plains, NJ on 3-25-2017, 13:14:50 (EDT), Magnitude 1.31, Depth 6.03 km.

*Process\_Date:* 20170327

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Mar. 27, 2017 version:

1) 3.7 km SW of Morris Plains, NJ on 9-25-2017, 18:35:07 (EDT), Magnitude 1.71, Depth 5 km.

*Process\_Date:* 20170926

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Sept. 26, 2017 version:

1) 2.7 km SW of Morris Plains, NJ on 9-30-2017, 08:05:54 (EDT), Magnitude 0.98, Depth 11.5 km.

*Process\_Date:* 20171002

*Process\_Step:*

*Process\_Description:*

Following earthquake added since Oct. 2, 2017 version:

1) 3.5 km NW of Keansburg, NJ on 11-08-2017, 08:33:44 (EST), Magnitude 1.38, Depth 4.34 km.

*Process\_Date:* 20171108

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*Spatial\_Data\_Organization\_Information:*

*Direct\_Spatial\_Reference\_Method:* Point

*Point\_and\_Vector\_Object\_Information:*

*SDTS\_Terms\_Description:*

*SDTS\_Point\_and\_Vector\_Object\_Type:* Entity point

*Point\_and\_Vector\_Object\_Count:* 204

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*Spatial\_Reference\_Information:*



*Horizontal\_Coordinate\_System\_Definition:*

*Planar:*

*Grid\_Coordinate\_System:*

*Grid\_Coordinate\_System\_Name:* State Plane Coordinate System 1983

*State\_Plane\_Coordinate\_System:*

*SPCS\_Zone\_Identifier:* 2900

*Transverse\_Mercator:*

*False\_Easting:* 492125.0

*False\_Northing:* 0.0

*Longitude\_of\_Projection\_Center:* -74.5

*Latitude\_of\_Projection\_Center:* 38.8333333333

*Planar\_Coordinate\_Information:*

*Planar\_Coordinate\_Encoding\_Method:* coordinate pair

*Coordinate\_Representation:*

*Abscissa\_Resolution:* [Unknown]

*Ordinate\_Resolution:* [Unknown]

*Planar\_Distance\_Units:* Foot\_US

*Geodetic\_Model:*

*Horizontal\_Datum\_Name:* D\_North\_American\_1983

*Ellipsoid\_Name:* GRS\_1980

*Semi-major\_Axis:* 6378137.0

*Denominator\_of\_Flattening\_Ratio:* 298.257222101

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*Entity\_and\_Attribute\_Information:*

*Detailed\_Description:*

*Entity\_Type:*

*Entity\_Type\_Label:* Attribute Table

*Entity\_Type\_Definition:*

Table containing attribute information associated with the data set.

*Entity\_Type\_Definition\_Source:* Producer defined

*Attribute:*

*Attribute\_Label:* FID

*Attribute\_Definition:* Internal feature number.

*Attribute\_Definition\_Source:* Esri

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:*

Sequential unique whole numbers that are automatically generated.

*Attribute:*

*Attribute\_Label:* Shape

*Attribute\_Definition:* Feature geometry.

*Attribute\_Definition\_Source:* Esri

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Coordinates defining the features.

*Attribute:*

*Attribute\_Label:* ID

*Attribute\_Definition:* Unique ID for each earthquake.

*Attribute\_Definition\_Source:* New Jersey Geological Survey

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* NORTHING

*Attribute\_Definition:* In NJ State Plane feet.

*Attribute\_Definition\_Source:* New Jersey Geological Survey

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* EASTING

*Attribute\_Definition:* In NJ State Plane feet.

*Attribute\_Definition\_Source:* New Jersey Geological Survey

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* QUAD

*Attribute\_Definition:*

USGS 7.5 minute quadrangle the earthquake epicenter was located.

*Attribute\_Definition\_Source:* New Jersey Geological Survey

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* unique input

*Attribute:*

*Attribute\_Label:* MUN

*Attribute\_Definition:* Municipality

*Attribute\_Definition\_Source:* New Jersey Geological Survey

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* unique input

*Attribute:*

*Attribute\_Label:* COUNTY

*Attribute\_Definition:* County

*Attribute\_Definition\_Source:* New Jersey Geological Survey

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* DATE

*Attribute\_Definition:* Unknown

*Attribute\_Definition\_Source:* Producer defined

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* TIME

*Attribute\_Definition:*

Time earthquake was recorded in UTC or GMT (-5 hours for EST, -4 for EDT)

*Attribute\_Definition\_Source:* NJDEP/NJGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* unique input

*Attribute:*

*Attribute\_Label:* LAT\_N

*Attribute\_Definition:* Latitude of the earthquake in decimal degrees.

*Attribute\_Definition\_Source:* NJDEP/NJGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* LON\_W

*Attribute\_Definition:* Longitude of the earthquake in decimal degrees.

*Attribute\_Definition\_Source:* NJDEP/NJGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* DEPTH\_KM

*Attribute\_Definition:* Depth of the earthquake in kilometers.

*Attribute\_Definition\_Source:* NJDEP/NJGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* MAGNITUDES

*Attribute\_Definition:*

Magnitude is a logarithmic measure of the size of the earthquake related to the energy released as seismic waves at the focus of an earthquake.

*Attribute\_Definition\_Source:* USGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* LOCATION

*Attribute\_Definition:* Location of the earthquake.

*Attribute\_Definition\_Source:* NJDEP/NJGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* unique input

*Attribute:*

*Attribute\_Label:* COMMENTS

*Attribute\_Definition:* Information about the earthquake if available.

*Attribute\_Definition\_Source:* NJDEP/NJGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:* Unique input

*Attribute:*

*Attribute\_Label:* DATA\_SOURC

*Attribute\_Definition:* Source of the data.

*Attribute\_Definition\_Source:* NJDEP/NJGS

*Attribute\_Domain\_Values:*

*Unrepresentable\_Domain:*

Source of the data. See "Supplemental Information" for definitions

*Overview\_Description:*

*Entity\_and\_Attribute\_Overview:*

The entity and attribute information provided here describes the tabular data associated with the data set. Please review the detailed descriptions that are provided (the individual attribute descriptions) for information on the values that appear as fields/table entries of the data set.

*Entity\_and\_Attribute\_Detail\_Citation:*

The entity and attribute information was generated by the individual and/or agency identified as the originator of the data set. Please review the rest of the metadata record for additional details and information.

---

*Distribution\_Information:*

*Distributor:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Organization:*

New Jersey Department of Environmental Protection, New Jersey Geological Survey

*Contact\_Position:* Webmaster

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* 29 Arctic Parkway, P.O. Box 420, Mail Code: 29-01

*City:* Trenton

*State\_or\_Province:* New Jersey

*Postal\_Code:* 08625-420

*Contact\_Voice\_Telephone:* (609) 292-1185

*Contact\_Facsimile\_Telephone:* (609) 633-1004

*Contact\_Electronic\_Mail\_Address:* njgsweb@dep.nj.gov

*Resource\_Description:* Downloadable Data

*Distribution\_Liability:*

This organization provides the geographic data as is. This organization makes no guarantee or warranty concerning the accuracy of information contained in the geographic data. Also, this organization makes no warranty either expressed or implied, regarding the condition of the product or its fitness for any particular purpose. The burden for determining fitness for use lies entirely with the user. Although these files have been processed successfully on computers at this organization, no warranty is made by this organization regarding the use of these data on any other system, nor does the fact of distribution constitute or imply any such warranty.

*Standard\_Order\_Process:*

*Digital\_Form:*

*Digital\_Transfer\_Information:*

*Format\_Name:* Vector Digital Data Set (Point)

*Format\_Version\_Number:* 9x

*File-Decompression\_Technique:* WinZip

*Transfer\_Size:* 0.004

*Digital\_Transfer\_Option:*

*Online\_Option:*

*Computer\_Contact\_Information:*

*Network\_Address:*

*Network\_Resource\_Name:* <http://www.state.nj.us/dep/njgs/geodata/dgs04-1.htm>

*Offline\_Option:*

*Offline\_Media:* none

*Recording\_Format:* none

*Fees:* None

*Ordering\_Instructions:*

Available by downloading from New Jersey Geological Survey website.

*Technical\_Prerequisites:*

Internet access and web browser for viewing in internet mapping applications and software capable of viewing ESRI shapefiles for the downloadable shapefile.

*Available\_Time\_Period:*

*Time\_Period\_Information:*

*Single\_Date/Time:*

*Calendar\_Date:* 20171108

---

*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20171108

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Suhas Ghatge

*Contact\_Organization:*

New Jersey Department of Environmental Protection (NJDEP), New Jersey Geological Survey (NJGS)

*Contact\_Position:* Research Scientist

*Contact\_Address:*

*Address\_Type:* mailing and physical address

*Address:* 29 Arctic Parkway P.O box 420, Mail Code: 29-01

*City:* Trenton

*State\_or\_Province:* New Jersey

*Postal\_Code:* 08625-420

*Contact\_Voice\_Telephone:* (609) 984-6587

*Contact\_Facsimile\_Telephone:* (609) 633-1004

*Contact\_Electronic\_Mail\_Address:* suhas.ghatge@dep.nj.gov

*Metadata\_Standard\_Name:* FGDC Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001-1998

*Metadata\_Time\_Convention:* local time

*Metadata\_Access\_Constraints:* None

*Metadata\_Use\_Constraints:* None

*Metadata\_Security\_Information:*

*Metadata\_Security\_Classification\_System:* none

*Metadata\_Security\_Classification:* Unclassified

*Metadata\_Security\_Handling\_Description:* none