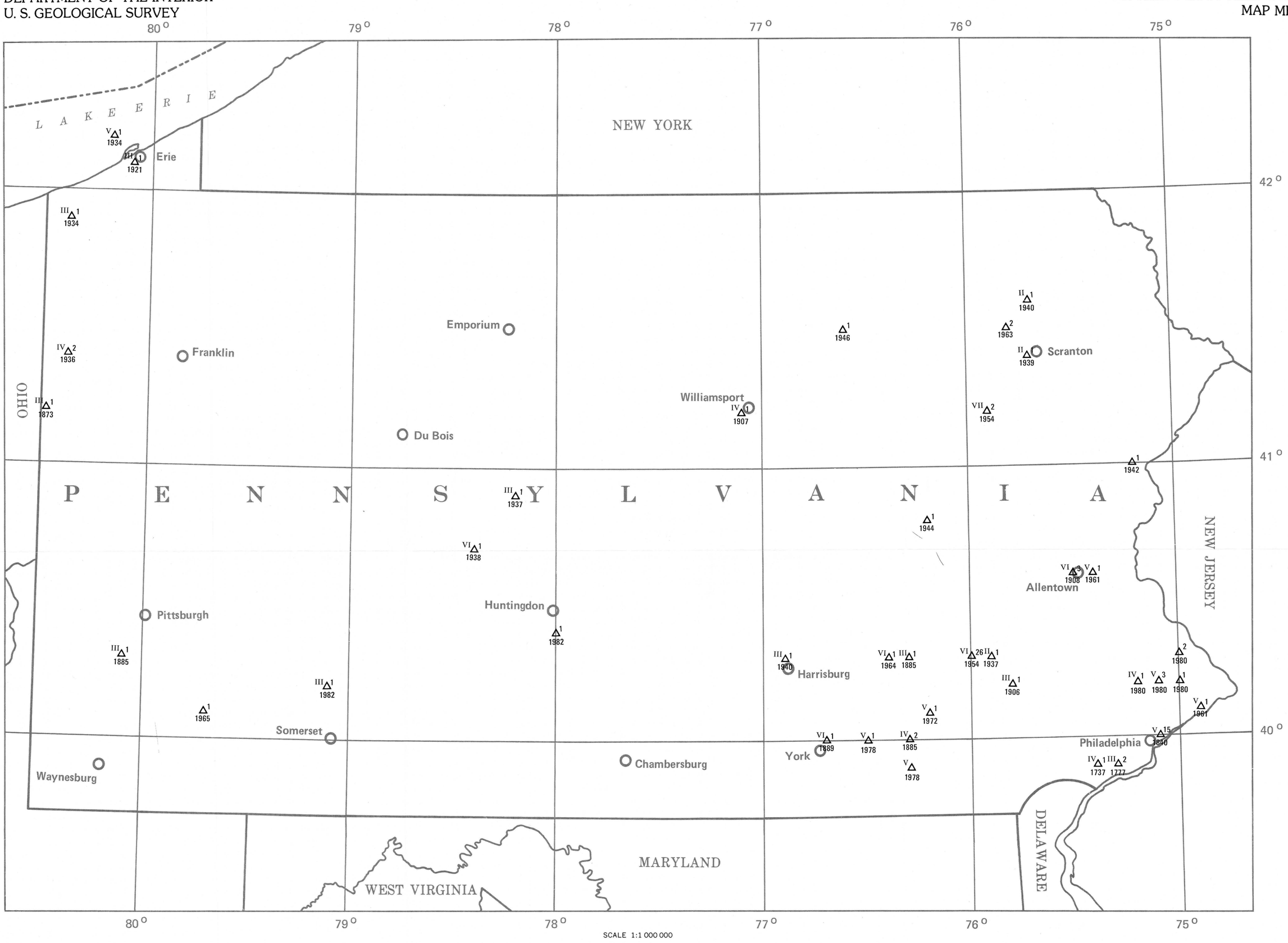

INTRODUCTION

This map is one of a series of seismicity maps produced by the U. S. Geological Survey that show earthquake data of individual states or groups of states at the scale of 1:1,000,000. This map shows only those earthquakes with epicenters located within the boundaries of Pennsylvania, even though earthquakes in nearby states or countries may have been felt or may have caused damage in Pennsylvania.

The data in table 1 were used to compile the seismicity map; these data are a corrected, expanded, and updated (through 1983) version of the data used by Algermissen (1969) for a study of seismic risk in the United States. The locations and intensities of some earthquakes were revised and intensities were assigned where none had been before. Many earthquakes were added to the original list from new data sources as well as from some old data sources that had not been previously used. The data in table 1 represent best estimates of the location of the epicenter, magnitude, and intensity of each earthquake on the basis of historical and current information. Some of the aftershocks from large earthquakes are listed, but not all, especially for earthquakes that occurred before seismic instruments were universally used.

The latitude and longitude coordinates of each epicenter were rounded to the nearest tenth of a degree and sorted so that all identical locations were grouped and counted. These locations are represented on the map by a triangle. The number of earthquakes at each location is shown on the map by the arabic number to the right of the triangle. A Roman numeral to the left of a triangle is the maximum Modified Mercalli intensity (Wood and Neumann, 1931) of all earthquakes at that geographic location. The absence of an intensity value indicates that no intensities have been assigned to earthquakes at that location. The year shown below each triangle is the latest year for which the maximum intensity was recorded.

EXPLANATION OF THE TABLES

The data in table 1 are listed chronologically in the following categories: date, origin time in Coordinated Universal Time (UTC), N. latitude, W. longitude, depth, hypocenter quality and reference, magnitude, intensity (Modified Mercalli), and intensity reference. The letter F is recorded in the intensity column if an earthquake was felt but not enough information was available to assign an intensity. Table 1 has some basic limitations in terms of the size (magnitude or intensity) of the earthquakes listed. All felt earthquakes or those with computed magnitudes greater than 2.5 are listed. If no magnitude was computed and the earthquake was felt or an epicenter published, it was included in the earthquake list. The low-magnitude events located in recent years with data from dense seismograph networks have not been included.

Listed below is an explanation of the symbols and codes used in table 1:

1. Leaders (..) indicate information not available.
2. Latitude and longitude are listed to a hundredth of a degree if they have been published with that degree of accuracy or greater; however, most historical events have assigned locations based on felt or damage information and are listed in table 1 only to the nearest degree or tenth of a degree. An asterisk (*) to the right of the longitude indicates that the latitude and longitude were not given in the source reference but were assigned by the compilers of the data file. An x to the right of the longitude indicates that the event is an explosion, a suspected explosion, a rockburst, or some other nontectonic event; these have not been plotted on the map. A question mark (?) to the right of the longitude indicates that published descriptions of the event are inconclusive and it may or may not be an earthquake.
3. The letter code in the HYPOCENTER, QUAL column is defined below:
   a. Determinations of instrumental hypocenters are estimated to be accurate within the ranges of latitude and longitude listed below; each range is letter coded as indicated:
      - A 0.0°-0.1°
      - B 0.1°-0.2°
      - C 0.2°-0.5°
      - D 0.5°-1.0°
      - E 1.0° or larger
   b. Determinations of noninstrumental epicenters from felt data are estimated to be accurate within the ranges of latitude and longitude listed below; each range is letter coded as indicated:
      - F 0.0°-0.5°
      - G 0.5°-1.0°
      - H 1.0°-2.0°
      - I 2.0° or larger
4. The reference identification numbers in the HYPOCENTER, REF and INTENSITY, REF columns indicate the sources of the hypocenter and intensity data. They are listed in numerical order in the list of data sources.
5. The magnitudes listed under USGS are mb (modified from Gutenberg and Richter, 1956) or Ms (Bath, 1966) values published in the Preliminary Determination of Epicenters (PDE) by the National Earthquake Information Center, U. S. Geological Survey and predecessor organizations. Associated with the magnitude values listed under OTHER are the source code and type. Type is defined by mb (Gutenberg and Richter, 1956), MD (duration or coda length), Mfa (magnitude based on felt areas or attenuation), ML (Richter, 1958), Mn (Nuttli, 1973), and Ms (Bath, 1966 or Gutenberg, 1945). Magnitudes computed solely from epicentral intensity have not been included. Moment magnitudes (Mw) are listed by value and source. The value was computed using the formula by Hanks and Kanamori (1979). The source codes are listed below:
   - DG - Dewey, J. W., and Gordon, D. W., 1984, U. S. Geological Survey, Miscellaneous Field Studies Map MF-1699 Phamphlet, 39 p.
   - OTT - Earth Physics Branch, Seismological Service of Canada, Ottawa.
   - PAL - Lamont-Doherty Geological Observatory, Palisades, N.Y.
   - SCP - Pennsylvania State University, University Park, Pa.
   - WES - Weston Observatory, Weston, Mass.
   - XXX - Published magnitudes of unknown source.
6. An asterisk (*) in the INTENSITY, MM column indicates that the intensity was assigned by the compiler on the basis of the available data at the time the catalog was compiled.

REFERENCES

Algermissen, S. T., 1969, Seismic risk studies in the United States: Fourth World Conference on Earthquake Engineering, Santiago, Chile, January 13-18, 1969, Proceedings, v. 1, p. 14-27.

Bath, Markus, 1966, Earthquake energy and magnitude, in Physics and chemistry of the Earth, v. 7: New York, Pergamon Press, p. 115-165.

Gutenberg, Beno, 1945, Amplitudes of surface waves and magnitudes of shallow earthquakes: Seismological Society of America Bulletin, v. 35, no. 1, p. 3-12.

Gutenberg, Beno, and Richter, C. F., 1956, Magnitude and energy of earthquakes: Annali di Geofisica, v. 9, no. 1, p. 1-15.

Hanks, T. C., and Kanamori, Hiroo, 1979, A moment magnitude scale: Journal of Geophysical Research, v. 84, no. B5, p. 2348-2350.

Nuttli, O. W., 1973, Seismic wave attenuation and magnitude relations for eastern North America: Journal of Geophysical Research, v. 78, no. 5, p. 876-885.

Richter, C. F., 1958, Elementary seismology: San Francisco, W. H. Freeman and Co., 768 p.

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

MODIFIED MERCALLI INTENSITY SCALE OF 1931

Adapted from Sieberg's Mercalli-Cancani scale, modified and condensed (Wood and Neumann, 1931)

I. Not felt - or, except rarely under especially favorable circumstances. Under certain conditions, at and outside the boundary of the area in which a great shock is felt: sometimes birds, animals, reported uneasy or disturbed; sometimes dizziness or nausea experienced; sometimes trees, structures, liquids, bodies of water, may sway--doors may swing, very slowly.

II. Felt indoors by few, especially on upper floors, or by sensitive or nervous persons. Also, as in grade I, but often more noticeably: sometimes hanging objects may swing, especially when delicately suspended; sometimes trees, structures, liquids, bodies of water, may sway, doors may swing, very slowly; sometimes birds, animals, reported uneasy or disturbed; sometimes dizziness or nausea experienced.

III. Felt indoors by several, motion usually rapid vibration. Sometimes not recognized to be an earthquake at first. Duration estimated in some cases. Vibration like that due to passing of light, or lightly loaded trucks, or heavy trucks some distance away. Hanging objects may swing slightly. Movements may be appreciable on upper levels of tall structures. Rocked standing motor cars slightly.

IV. Felt indoors by many, outdoors by few. Awakened few, especially light sleepers. Frightened no one, unless apprehensive from previous experiences. Vibration like that due to passing of heavy or heavily loaded trucks. Sensation like heavy body striking building or falling of heavy objects inside. Rattling of dishes, windows, doors; glassware and crockery clink and clash. Creaking of walls, frame, expecially in the upper range of this grade. Hanging objects swung, in numerous instances. Disturbed liquids in open vessels slightly. Rocked standing motor cars noticeably.

V. Felt indoors by practically all, outdoors by many or most: outdoors direction estimated. Awakened many, or most. Frightened few--slight excitement, a few ran outdoors. Buildings trembled throughout. Broke dishes, glassware to some extent. Cracked windows--in some cases, but not generally. Overturned vases, small or unstable objects, in many instances, with occasional fall. Hanging objects, doors, swing generally or considerably. Knocked pictures against walls, or swung them out of place. Opened, or closed, doors, shutters, abruptly. Pendulum clocks stopped, started, or ran fast or slow. Moved small objects, furnishings, the latter to slight extent. Spilled liquids in small amounts from well-filled open containers. Trees, bushes shaken slightly.

VI. Felt by all, indoors and outdoors. Frightened many, excitement general, some alarm, many ran outdoors. Awakened all. Persons made to move unsteadily. Trees, bushes, shaken slightly to moderately. Liquid set in strong motion. Small bells rang--church, chapel, school, etc. Damage slight in poorly built buildings. Fall of plaster in small amount. Cracked plaster somewhat, especially fine cracks, chimneys is some instances. Broke dishes, glassware, in considerable quantity, also some windows. Fall of knick-knacks, books, pictures. Overturned furniture in many instances. Moved furnishings of moderately heavy kind.

VII. Frightened all--general alarm, all ran outdoors. Some, or many, found it difficult to stand. Noticed by persons driving motor cars. Trees and bushes shaken moderately to strongly. Waves on ponds, lakes, and running water. Water turbid from mud stirred up. Incaving to some extent of sand or gravel stream banks. Rang large church bells, etc. Suspended objects made to quiver. Damage negligible in buildings of good design and construction, slight to moderate in well-built ordinary buildings, considerable in poorly built or badly designed buildings, adobe houses, old walls (especially where laid up without mortar), spires, etc. Cracked chimneys to considerable extent, walls to some extent. Fall of plaster in considerable to large amount, also some stucco. Broke numerous windows, furniture to some extent. Shook down loosened brickwork and tiles. Broke weak chimneys at the roof-line (sometimes damaging roofs). Fall of cornices from towers and high buildings. Dislodged bricks and stones. Overturned heavy furniture, with damage from breaking. Damage considerable to concrete irrigation ditches.

VIII. Fright general--alarm approaches panic. Distrubed persons driving motor cars. Trees shaken strongly--branches, trunks, broken off, especially palm trees. Ejected sand and mud in small amounts. Changes, temporary or permanent: in flow of springs and wells; dry wells renewed flow; in temperature of spring and well waters. Damage slight in structures (brick) built especially to withstand earthquakes. Considerable in ordinary substantial buildings, partial collapse: racked, tumbled down, wooden houses in some cases; threw out panel walls in frame structures, broke off decayed piling. Fall of walls. Cracked, broke, solid stone walls seriously. Wet ground to some extent, also ground on steep slopes. Twisting, fall, of chimneys, columns, monuments, also factory stacks, towers. Moved conspicuously, overturned, very heavy furniture.

IX. Panic general. Cracked ground conspicuously. Damage considerable in (masonry) structures built especially to withstand earthquakes: Threw out of plumb some wood-frame houses built especially to withstand earthquakes; great in substantial (masonry) buildings, some collapse in large part; or wholly shifted frame buildings off foundations, racked frames, serious to reservoirs; underground pipes sometime broken.

X. Cracked ground, especially when loose and wet, up to widths of several inches; fissures up to a yard in width ran parallel to canal and stream banks. Landslides considerable from river banks and steep coasts. Shifted sand and mud horizontally on beaches and flat land. Changed level of water in wells. Threw water on banks of canals, lakes, rivers, etc. Damage serious to dams, dikes, embankments. Severe to well-built wooden structures and bridges, some destroyed. Developed dangerous cracks in excellent brick walls. Destroyed most masonry and frame structures, also their foundations. Bent railroad rails slightly. Tore apart, or crushed endwise, pipe lines buried in earth. Open cracks and broad wavy folds in cement pavements and asphalt road surfaces.

XI. Disturbances in ground many and widespread, varying with ground material. Broad fissures, earth slumps, and land slips in soft, wet ground. Ejected water in large amounts charged with sand and mud. Caused sea-waves ("tidal" waves) of significant magnitude. Damage severe to wood-frame structures, especially near shock centers. Great to dams, dikes, embankments often for long distances. Few, if any (masonry) structures remained standing. Destroyed large well-built bridges by the wrecking of supporting piers, or pillars. Affected yielding wooden bridges less. Bent railroad rails greatly, and thrust them endwise. Put pipe lines buried in earth completely out of service.

XII. Damage total--practically all works of construction damaged greatly or destroyed. Disturbances in ground great and varied, numerous shearing cracks. Landslides, falls of rock of significant character, slumping of river banks, etc., numerous and extensive. Wrenched loose, tore off, large rock masses. Fault slips in firm rock, with notable horizontal and vertical offset displacements. Water channels, surface and underground, disturbed and modified greatly. Dammed lakes, produced waterfalls, deflected rivers, etc. Waves seen on ground surfaces (actually seen, probably, in some cases). Distorted lines of sight and level. Threw objects upward into the air.

Table 1.--Chronological listing of earthquakes for the State of Pennsylvania

DATE YEAR	MONTH	DAY	ORIGIN TIME H (UTC)	M	S	LAT.		LONG.		DEPTH (KM)	HYPOCENTER QUAL	REF	MAGNITUDE USGS (mb)	(Ms)	OTHER		MOMENT (Mw)	INTENSITY MM	REF
1724	AUG	16	09	30	..	40.0	N.	75.1	W. *	..	I	282	..	..	.. ..	.. ...		IV*	282
1737	DEC	08	03	58	..	39.9	N.	75.4	W. *	..	H	158	..	..	.. ..	.. ...		IV*	158
1755	NOV	27	01	00	..	40.0	N.	75.1	W. *	..	I	50	..	..	.. ..	.. ...		III*	50
1758	MAR	23	03	30	..	40.0	N.	75.1	W. *	..	H	158	..	..	.. ..	.. ...		III*	158
1763	MAR	22	..	..	..	39.9	N.	75.3	W. *	..	H	50	..	..	.. ..	.. ...		III*	50
1763	OCT	30	21	15	..	40.0	N.	75.1	W. *	..	H	59	..	..	.. ..	.. ...		IV*	59
1772	APR	25	13	00	..	40.0	N.	75.1	W. *	..	H	158	..	..	.. ..	.. ...		II*	158
1777	NOV	22	..	..	..	40.0	N.	75.1	W. *	..	H	50	..	..	.. ..	.. ...		III*	50
1777	NOV	23	..	..	..	39.9	N.	75.3	W. *	..	H	50	..	..	.. ..	.. ...		III*	50
1780	NOV	29	..	..	..	40.0	N.	75.1	W. *	..	H	157	..	..	.. ..	.. ...		III*	157
1780	NOV	29	..	..	..	40.0	N.	75.1	W. *	..	H	157	..	..	.. ..	.. ...		III*	157
1800	MAR	17	..	..	..	40.0	N.	75.1	W. *	..	H	59	..	..	.. ..	.. ...		II	126
1800	NOV	29	..	..	..	40.0	N.	75.1	W. *	..	H	59	..	..	.. ..	.. ...		F	59
1801	NOV	12	..	..	..	40.0	N.	75.1	W. *	..	H	50	..	..	.. ..	.. ...		III*	50
1811	DEC	09	01	00	..	40.0	N.	75.1	W. *	..	H	158	..	..	.. ..	.. ...		III*	158
1811	DEC	16	08	00	..	40.0	N.	75.1	W. *	..	H	158	..	..	.. ..	.. ...		III*	158
1840	NOV	11	..	..	..	40.0	N.	75.1	W. *	..	H	59	..	..	.. ..	.. ...		V	141
1840	NOV	14	..	..	..	40.0	N.	75.1	W. *	..	H	59	..	..	.. ..	.. ...		F	59
1873	AUG	17	14	00	..	41.2	N.	80.5	W. *	..	G	133	..	..	.. ..	.. ...		III*	133
1884	MAY	31	..	..	..	40.6	N.	75.5	W.	..	H	38	..	..	.. ..	.. ...		V	38
1885	JAN	15	09	10	..	40.3	N.	76.3	W.	..	G	76	..	..	.. ..	.. ...		III	84
1885	MAR	09	01	..	..	40.0	N.	76.3	W. *	..	G	139	..	..	.. ..	.. ...		IV	84
1885	SEP	26	20	30	..	40.3	N.	80.1	W. *	..	H	181	..	..	.. ..	.. ...		III*	181
1889	MAR	08	23	40	..	40.0	N.	76.7	W.	..	G	141	..	..	.. ..	.. ...		VI	142
	Southeastern Pennsylvania, near York, Pa. The shock was felt throught northeastern Maryland, northern Delaware, and southeastern Pennsylvania-an area estimated at 4,000 sq mi. The greatest damage occurred at York where chimneys were knocked over, a man was thrown from a sofa, and articles were thrown from shelves. It is interesting to note that there were reports of a "ball of fire" passing over the area at the same time as the shock.																		
1906	MAY	28	22	30	..	40.2	N.	75.8	W. *	..	G	84	..	..	.. ..	.. ...		III	84
1907	JAN	10	09	45	..	41.2	N.	77.1	W.	..	G	76	..	..	.. ..	.. ...		IV	76
1907	JUN	10	10	45	..	40.5	N.	78.5	W. x	..	G	84	..	..	.. ..	.. ...		...	..
1908	MAY	31	17	42	..	40.6	N.	75.5	W.	..	G	38	..	..	.. ..	.. ...		VI	38
	Allentown, Pennsylvania. A few chimneys toppled and people were thrown down. There was a sound like an explosion or the fall of a heavy body. Not felt over more than 50 sq mi. It may have been due to a fall of a rockmass in a subterranean cavern, this being limestone country.																		
1909	JAN	18	..	..	..	40.9	N.	76.7	W. x	..	G	84	..	..	.. ..	.. ...		...	..
1921	SEP	27	04	32	..	42.1	N.	80.1	W.	..	G	105	..	..	.. ..	.. ...		III	105
1928	JUN	22	04	07	..	40.6	N.	75.5	W. x	..	F	1	..	..	.. ..	.. ...		IV*	1
1934	OCT	29	20	07	..	42.2	N.	80.2	W.	..	G	77	..	..	.. ..	.. ...		V	7
1934	NOV	05	20	00	..	41.9	N.	80.4	W. *	..	G	7	..	..	.. ..	.. ...		III	7
1936	AUG	26	09	00	..	41.4	N.	80.4	W.	..	G	77	..	..	.. ..	.. ...		III	77
1936	AUG	26	09	55	..	41.4	N.	80.4	W. *	..	G	105	..	..	.. ..	.. ...		IV*	105
1937	MAR	25	14	54	..	40.9	N.	78.2	W.	..	G	105	..	..	.. ..	.. ...		III	105
1937	JUN	09	00	04	..	40.3	N.	75.9	W.	..	G	77	..	..	.. ..	.. ...		II	77
1938	JUL	15	22	46	12.0	40.680	N.	78.430	W.	001	D	349	..	..	3.3Mfa DG	.. ...		VI	38
	Southern Elair County, Pennsylvania. Broken dishes and fall of plaster were reported at Henrietta and Clover Creek, Pa. Wells were affected in Clover Creek Valley. Felt are estimated at 100 sq mi.																		
1939	FEB	09	23	50	..	41.4	N.	75.7	W. *	..	G	12	..	..	.. ..	.. ...		II*	12
1939	APR	02	03	00	..	40.0	N.	76.3	W. *	..	G	12	..	..	.. ..	.. ...		II*	12
1940	MAY	28	20	06	..	40.3	N.	76.9	W. *	..	G	13	..	..	.. ..	.. ...		III*	13
1940	SEP	27	..	..	..	41.6	N.	75.7	W. *	..	H	126	..	..	.. ..	.. ...		II	126
1942	OCT	24	17	27	04	41.0	N.	75.2	W.	..	C	77	..	..	3.4ML OTT	.. ...		...	..
1944	FEB	05	16	22	01	40.8	N.	76.2	W.	..	C	77	..	..	3.7ML OTT	.. ...		...	..
1946	OCT	28	20	36	06	41.5	N.	76.6	W.	..	E	77	..	..	3.6ML OTT	.. ...		...	..
1950	MAR	20	22	55	12	41.5	N.	75.8	W.	..	D	77	..	..	3.3ML OTT	.. ...		...	..
1951	NOV	23	06	45	36	40.6	N.	75.5	W.	..	G	77	..	..	.. ..	.. ...		IV	77
1954	JAN	07	07	25	..	40.3	N.	76.0	W.	..	G	38	..	..	.. ..	.. ...		VI	38
	Sinking Spring, Pennsylvania. Felt in western Berks County an in the eastern section of Lancaster County. Minor damage occurred in the City's west section. Plaster fell, dishes and bottles tumbled from shelves, and furniture was upset. Many small shocks were felt during the month in the vicinity of Sinking Spring.																		
1954	JAN	07	08	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	07	08	30	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	07	10	45	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	08	01	25	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	08	01	30	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	08	18	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	08	21	45	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	09	07	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	09	08	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	09	14	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	09	16	30	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	09	18	25	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	09	20	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	09	21	30	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	10	04	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	10	22	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	13	21	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	14	03	30	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	15	19	40	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	17	02	54	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	17	03	32	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		II*	27
1954	JAN	24	03	30	..	40.3	N.	76.0	W.	..	G	77	..	..	.. ..	.. ...		III	77
1954	FEB	21	20	00	..	41.2	N.	75.9	W. ?	..	F	38	..	..	.. ..	.. ...		VII	38
	Wilkes-Barre, Pennsylvania. A local shock caused extensive damage in a five-block area. Hundreds of homes were damaged; streets and sidewalks cracked; gas and water mains snapped.																		
1954	FEB	24	03	55	..	41.2	N.	75.9	W.	..	F	38	..	..	.. ..	.. ...		VI	38
	Wilkes-Barre, Pennsylvania. Another local shock with effects similar to the February 21, 1964 event.																		
1954	AUG	11	03	40	..	40.3	N.	76.0	W.	..	G	77	..	..	.. ..	.. ...		IV	77
1954	SEP	24	11	00	..	40.3	N.	76.0	W.	..	F	116	..	..	.. ..	.. ...		IV	116
1955	JAN	20	03	00	..	40.3	N.	76.0	W.	..	F	77	..	..	.. ..	.. ...		IV	28
1960	JAN	22	20	53	22.0	41.5	N.	75.5	W. x	..	F	220	..	..	3.4ML OTT	.. ...		...	..
1961	SEP	15	02	16	56	40.6	N.	75.4	W.	..	F	141	..	..	.. ..	.. ...		V	34
1961	DEC	27	17	06	..	40.1	N.	74.9	W. *	..	G	34	..	..	.. ..	.. ...		V	34
1963	MAR	02	20	24	32.0	41.5	N.	75.8	W.	..	F	141	..	..	3.4ML OTT	.. ...		F	141
1964	FEB	13	19	46	40.8	40.377	N.	77.957	W. x	001	A	349	..	..	3.3Mn DG	.. ...		VI	141
	No comments can be found to support the listed intensity.																		
1964	MAY	12	06	45	10.7	40.298	N.	76.411	W.	001	A	349	4.5	..	3.2Mn DG	.. ...		VI	37
	Cornwall, Pennsylvania. This local shock cracked a wall and felled plaster. Small landslides were reported.																		
1965	OCT	08	02	17	27.0	40.1	N.	79.7	W.	..	C	144	..	..	3.3ML OTT	.. ...		...	..
1971	MAR	05	17	19	12.0	40.693	N.	77.989	W. x	000	C	349	..	..	.. ..	.. ...		...	..
1972	DEC	08	03	00	33.3	40.144	N.	76.241	W.	002	A	349	..	..	3.5Mn DG	.. ...		V	45
1974	APR	27	14	45	39.9	40.974	N.	75.907	W. x	000	A	349	3.0	..	3.2Mn DG	.. ...		...	..
1978	JUL	16	06	39	39.3	39.913	N.	76.307	W.	001	A	349	..	..	3.1Mn WES	.. ...		V	240
1978	OCT	06	19	25	41.6	39.97	N.	76.51	W.	005	B	240	..	..	3.0Mn PAL	.. ...		V	240
1980	MAR	02	11	54	47.9	40.21	N.	75.08	W.	000	B	300	..	..	2.8Mn PAL	.. ...		...	..
1980	MAR	05	17	06	54.5	40.19	N.	75.16	W.	005	B	300	..	..	3.5Mn PAL	.. ...		IV	300
1980	MAR	05	17	20	32.4	40.18	N.	75.07	W.	005	B	300	..	..	3.1Mn PAL	.. ...		...	..
1980	MAR	11	06	00	26.0	40.16	N.	75.10	W.	005	B	300	..	..	3.7Mn PAL	.. ...		V	300
1980	MAR	11	16	16	05.5	40.25	N.	74.99	W.	002	B	300	..	..	2.8Mn PAL	.. ...		...	..
1980	MAY	02	15	23	23.5	40.16	N.	74.99	W.	005	B	300	..	..	2.8Mn PAL	.. ...		...	..
1980	MAY	02	19	02	24.4	40.26	N.	75.03	W.	000	B	300	..	..	3.0Mn PAL	.. ...		...	..
1982	FEB	03	04	28	20.6	40.21	N.	79.05	W.	002	B	350	..	..	2.6Mn SCP	.. ...		III	350
1982	MAY	12	18	29	33.0	40.41	N.	77.96	W.	000	B	350	..	..	3.0MD SCP	.. ...		...	..

List of data sources

1. Heck, N. H., and Bodle, R. R., 1930, United States earthquakes 1928: U. S. Coast and Geodetic Survey , Serial 483, 28 p.
7. Neumann, Frank, 1936, United States earthquakes 1934: U. S. Coast and Geodetic Survey, Serial 593, 99 p.
12. Bodle, R. R., 1941, United States earthquakes 1939: U. S. Coast and Geodetic Survey, Serial 637, 69 p.
13. Neumann, Frank, 1942, United States earthquakes 1940: U. S. Coast and Geodetic Survey, Serial 647, 74 p.
27. Murphy, L. M., and Cloud, W. K., 1956, United States earthquakes 1954: U. S. Coast and Geodetic Survey, Serial 793, 110 p.
28. Murphy, L. M., and Cloud, W. K., 1957, United States earthquakes 1955: U. S. Coast and Geodetic Survey, 83 p.
34. Lander, J. F., and Cloud, W. K., 1963, United States earthquakes 1961: U. S. Coast and Geodetic Survey, 106 p.
37. von Hake, C. A., and Cloud, W. K., 1966, United States earthquakes 1964: U. S. Coast and Geodetic Survey, 91 p.
38. Coffman, J. L., von Hake, C. A., and Stover, C. W., 1982, Earthquake history of the United States: U. S. National Oceanic and Atmospheric Administration and U. S. Geological Survey, Publication No. 41-1(through 1980), 258 p.
45. Coffman, J. L., and von Hake, C. A., 1974, United States earthquakes 1972: U. S. National Oceanic and Atmospheric Administration, 119 p.
50. Winkler, Louis, 1978, Early American earthquake history for nuclear reactor site selection, prepared for Nuclear Regulatory Commission, Contract NRC-04-78-208, 61 p.
59. Brigham, W. T., 1871, Historical notes on the earthquakes of New England, 1638-1869: Mem. Boston Society of Natural History, v. 2. p. 1-28.
76. Smith, W. E. T., 1962, Earthquakes of eastern Canada and adjacent areas, 1534-1927: Publications of the Dominion Observatory Ottawa, v. 26, no.5, p. 271-301.
77. Smith, W. E. T., 1966, Earthquakes of eastern Canada and adjacent areas, 1928-1959: Publications of the Dominion Observatory Ottawa, v. 32, no. 3, p. 87-121.
84. Woollard, G. P., 1968, A catalogue of earthquakes in the United States prior to 1925 based on unpublished data compiled by Harry Fielding Reid and unpublished sources prior to 1930: Hawaii Institute of Geophysics, University of Hawaii, Data Report No. 10, 163 p.
105. Docekal, Jerry, 1970, Earthquakes of the stable interior, with emphasis on the midcontinent, v. 2: Lincoln, Neb., University of Nebraska, Ph.D. dissertation; available from Ann Arbor, Mich., University Microfilms Ltd., 332 p.
116. Varma, M. M., 1975, Seismicity of the eastern half of the United States (exclusive of New England): Bloomington, Ind., University of Indiana Ph.D. dissertation, 176 p.
126. Chiburis, E. F., 1979, Seismicity, recurrence rates, and the regionalization of the northeast United States and adjacent Southeastern Canada: Weston, Mass., Weston Observatory, for the U. S. Nuclear Regulatory Commission, NUREG/CR-2309, 76p.
133. Rockwood, C. G., 1874, Notices of recent earthquakes: American Journal of Science and Arts, v. 7, no. 40, p. 384-387.
139. Rockwood, C. G., 1886, Notes on American earthquakes: American Journal of Science, v. 32, no. 187, p. 7-19.
141.