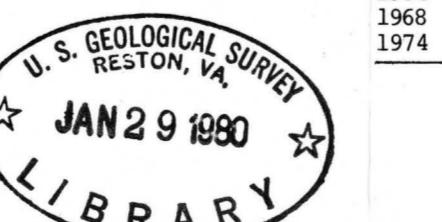


SEISMICITY MAP OF THE STATE OF INDIANA

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INTRODUCTION

The earthquake data shown on this map and listed in table 1 are a list of earthquakes that were originally used in preparing the Seismic Risk Studies in the United States (Algermissen, 1969) which have been recompiled and updated through 1977. The data have been reexamined and intensities assigned where none had been assigned before, on the basis of available data. Other intensity values were updated from new and additional data sources that were not available at the time of original compilation. Some epicenters were relocated on the basis of new information. The data shown in table 1 are estimates of the most accurate 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 are incomplete in many instances, especially for ones that occurred before seismic instruments were in universal usage.

The data in table 1 were used to compile the seismicity map. The latitude and longitude were rounded to the nearest tenth of a degree and sorted so that all identical locations were grouped together and counted. A triangle represents the epicenter plotted to a tenth of a degree. The number of earthquakes at each location is shown on the map by the number to the left of the triangle. A Roman numeral to the left of the triangle is the maximum Modified Mercalli intensity (Wood and Neumann, 1931) of all earthquakes located at that geographic position. The absence of an intensity value indicates that no intensities have been assigned to earthquakes at that location. A year shown below a triangle is the latest year for which the maximum intensity was recorded.

EXPLANATION OF THE TABLES

The data are listed chronologically in table 1 in the following categories: date, origin time, N. latitude, W. longitude, depth, hypocenter quality and referenced data sources, magnitude, and intensity (Modified Mercalli) and intensity source references. Table 1 has some basic limitations in terms of the size (magnitude or intensity) of the earthquakes listed. Prior to 1965 all recorded felt earthquakes are listed, after 1965 only felt earthquakes of those with magnitudes above the 2.5-3.0 range are listed; the lower magnitude levels apply mostly to the eastern United States. The low magnitude events located in recent years with dense seismograph networks have not been included.

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

- Leaders (...) indicate information not available.
- Latitude and longitude are listed to a hundredth of a degree if they have been published with that degree of accuracy, or tenth; however, most historical events have been published only to the nearest degree or tenth of a degree and are therefore listed at this accuracy in table 1. 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, rockburst, or a nontectonic event; these have not been plotted on the map.
- The letter code in the HYPOCENTER, QUAL column is defined below:
 - a. Determination 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°-0.5°
 - B 0.1°-0.2°
 - C 0.2°-0.5°
 - D 0.5°-1.0°
 - E 1.0° or larger
 - b. Determination 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 0.1°-1.0°
 - H 1.0° or larger
 - I 2.0° or larger
- The reference identification numbers in the HYPOCENTER, REF and INTENSITY, REF columns indicate the sources of the hypocenter and intensity. They are listed in numerical order in table 2. The magnitudes listed under "USGS" are mb values (Gutenberg and Richter, 1956) published in the Preliminary Determination of Epicenters (PDE) by the National Earthquake Information Service, 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 1 = ML (Richter, 1958), 2 = mbg (Nuttli, 1973), 3 = MS (Bath, 1966), and 4 = mb (Gutenberg and Richter, 1956). The source codes are listed below:
 - SL St. Louis University, St. Louis, Mo.
- 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.

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

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Table 1.—Chronological listing of Earthquakes for the State of Indiana

DATE	ORIGIN TIME(UTC)	LAT.	LONG.	DEPTH	HYPOCENTER	MAGNITUDE	INTENSITY			
YEAR	MONTH	DAY	H	M	S	QUAL	USGS	OTHER	MM	REF
1827	JUL	05	11	30	..	38.3	85.8	..	G	105
1827	AUG	07	04	30	..	38.3	85.8	..	G	38
1827	AUG	07	07	..	..	38.3	85.8	..	G	38
1827	MAR	26	21	..	..	38.2	87.9	..	G	105
1831	MAR	17	11	..	..	41.6	85.8	..	G	105
1836	MAR	01	16	..	..	39.8	85.5	..	G	105
1886	AUG	13	22	..	..	39.8	86.1	..	G	105
1887	FEB	06	22	15	..	38.7	87.5	..	G	38
1891	JUL	27	02	28	..	37.9	87.5	..	G	38
1894	APR	30	02	05	..	38.5	87.0	..	G	38
1902	MAR	10	06	..	..	39.9	85.2	..	G	105
1902	MAR	10	11	30	..	39.9	85.2	..	G	105
1903	JAN	01	18	30	..	39.9	85.2	..	G	105
1903	JAN	01	23	45	..	39.9	85.2	..	G	105
1903	SEP	20	..	..	..	39.4	86.3	..	G	105
1903	NOV	20	..	..	..	39.4	86.3	..	G	105
1906	MAY	08	05	..	..	39.5	85.8	..	G	105
1906	MAY	09	06	38	..	39.2	85.9	..	G	105
1906	MAY	15	06	15	..	38.5	87.4	..	G	38
1906	AUG	13	13	19	..	38.2	87.6	..	G	105
1907	SEP	07	16	33	..	39.5	86.6	..	G	105
1907	JAN	29	..	..	..	39.5	86.6	..	G	105
1909	SEP	22	..	..	..	38.7	86.5	..	G	38
1909	SEP	27	09	45	..	39.5	87.4	..	G	105
1909	SEP	27	12	00	..	39.5	87.4	*	G	109
1910	JAN	07	19	45	..	39.1	87.0	..	G	58
1919	MAY	25	09	45	..	38.5	87.5	..	G	38
1921	MAR	14	12	15	..	39.5	87.5	..	F	113
1922	MAR	31	20	03	..	37.9	87.8	..	G	105
1922	JAN	11	03	42	..	37.9	87.4	..	G	84
1925	APR	27	04	05	..	38.3	87.6	..	G	105
1925	APR	27	07	14	..	38.1	87.4	*	G	125
1926	OCT	04	24	30	..	36.3	87.6	*	G	105
1929	FEB	14	20	20	..	38.3	87.6	..	H	2
1931	JAN	06	21	..	..	38.5	87.0	..	H	38
1931	DEC	31	..	..	..	38.5	87.2	x	H	105
1938	FEB	16	07	27	..	41.6	87.0	..	G	105
1940	JAN	08	20	05	..	38.3	85.8	..	G	105
1940	DEC	29	02	30	..	37.9	87.3	..	G	105
1954	AUG	09	..	..	..	38.5	87.3	x	H	105
1966	DEC	11	16	00	..	38.3	85.8	..	F	116
1974	NOV	25	23	34	05.1	40.3	87.4	005	B	47
									2.4SLM 2	II 47

Table 2—List of data sources

- Heck, N. H. and Bodie, R. R., 1931, United States Earthquakes 1929, U. S. Department of Commerce, Coast and Geodetic Survey, Serial No. 511, p. 1-55.
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MODIFIED MERCALLI INTENSITY SCALE OF 1931

- 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.
- 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, very slowly; sometimes birds, animals, reported uneasy or disturbed; sometimes dizziness or nausea experienced.
- 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.
- Felt indoors by many, outdoors by few. Awakened few, especially light sleepers. Frightened no one, unless apprehensive from previous experience. Vibration like that due to passing of heavy or heavily loaded trucks. Sensation like heavy body striking buildings or falling of heavy objects inside. Rattling of dishes, windows, doors, glassware and crockery clink and clash. Creaking of walls, frame, especially in the upper range of this grade. Hanging objects swung, in numerous instances. Disturbed liquids in open vessels slightly. Rocked standing motor cars noticeably.
- Felt indoors by practically all, outdoors by few. Awakened 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,