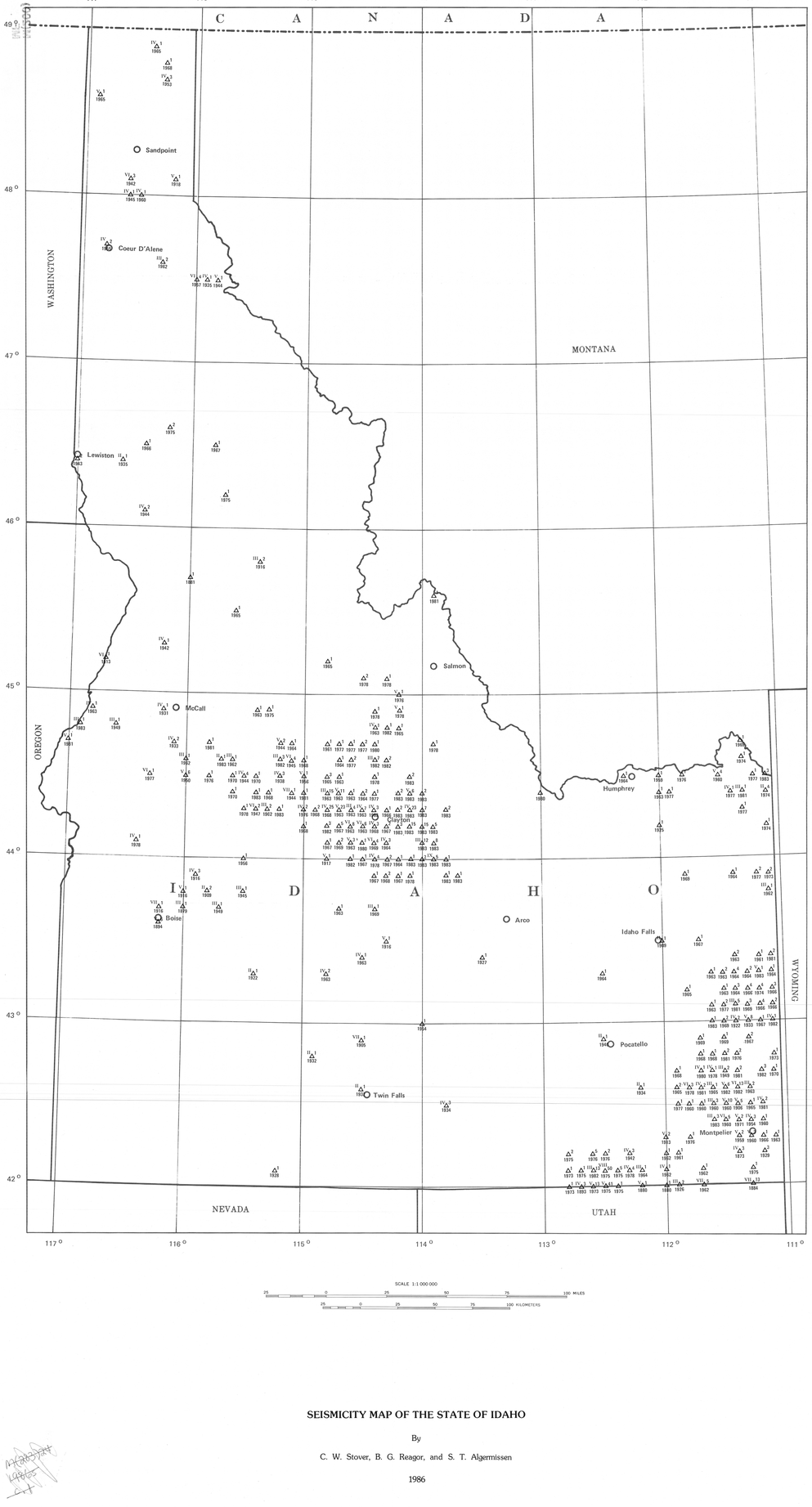

SEISMICITY MAP OF THE STATE OF IDAHO

By

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MF-1857

INTRODUCTION

This map is one of a series of seismicity maps produced by the U. S. Geological Survey (USGS) that show earthquake data of individual states or groups of states at the scales of 1:1,000,000 or smaller. Earthquakes originating outside a state are plotted within the boundaries of Idaho, even though earthquakes in nearby states or Canada may have been felt or may have caused damage in Idaho. The USGS and the Idaho Geological Survey are continuing to research historical data with the objective of improving the pre-instrumental data listed below.

The data in table 1 were used to compile the seismicity map; these data are a corrected, expanded, and updated (through 1982) version of the data used by Algermissen (1969) for a study of seismic risk in the United States. The locations and intensities of earthquakes before 1961 were largely revised and supplemented with new data where available. 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 widely 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 and the year shown below each triangle is the latest year for which that maximum intensity was recorded. The absence of an intensity value indicates that no intensities have been assigned to earthquakes at that location, in which case the year shown below the triangle is the most recent year an earthquake occurred at that location.

EXPLANATION OF THE TABLES

The data in table 1 are listed chronologically in the following categories: date, origin time in Coordinated Universal Time (UTC), lat. latitude, N. 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 are assigned values given in the publication. A question mark (?) to the right of the data field, or an * 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 refer to bibliographic sources for 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 (Rath, 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), ML (Richter, 1958), Mle (modified ML), Ms (Nuttli, 1973), Mx (Rath, 1966 or Gutenberg, 1945), and UKN (unknown). Magnitudes computed by the author are listed under AUTHOR. Magnitudes published in publications cited by and listed by value and source. The value was computed using the formula by Banks and Kanamori (1979). The source codes are listed below:

   BRK – Seismograph Station, University of California, Berkeley, Calif.
   DM – Dewey, J. W., 1985, U. S. Geological Survey Open-File Report 85-290, p. 264-284.
   ERD – Earthquake Research Division (formerly U.S. Energy Research and Development Administration and U. S. Atomic Energy Commission).
   GR – Gutenberg, Beno, and Richter, C. F., 1954, Seismicity of the Earth and associated phenomena, New York, Hafner Publishing Company 310 p.
   GS – National Earthquake Information Center (and predecessor organizations), U. S. Geological Survey, Golden, Colo.
   ISC – International Seismological Centre Bulletin.
   MMT – Montana College of Mineral Sciences and Technology, Butte, Mt.
   MSO – University of Montana, Missoula, Mt.
   PAS – Seismological Service of Canada, Ottawa.
   PAS – Seismological Laboratory, California Institute of Technology, Pasadena, Calif.
   RER – University of Nevada, Reno, Nev.
   UU – University of Utah, Salt Lake City, Utah.
   USC – U. S. Geological Survey, Menlo Park, Calif.

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.

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Table 1.—Chronological listing of earthquakes for the State of Idaho

YEAR	MONTH	DAY	ORIGIN TIME (UTC)	LAT.	LONG.	DEPTH (KM)	HYPOCENTER QUAL	REF	MAGNITUDE AUTH	MAG	TYPE	SOURCE	INTENSITY MM	REF
1872	DEC	18	14 00 ..	42.2	N. 111.4 W.	..	G	298	..	..	..	..	IV	32
1878	APR	05	.. .. ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	V	298
1880	JUN	12	.. .. ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	V	298
1880	JUL	12	05 00 ..	42.0	N. 112.2 W.	..	G	298	..	..	..	..	F	32
1880	JUL	22	05 03 ..	42.0	N. 112.0 W.	..	G	298	..	..	..	..	F	32
1881	AUG	09	.. .. ..	42.0	N. 111.5 W.	..	G	298	..	..	..	..	F	361
			Mount Idaho, Idaho. "This event was reported in the Helena (Montana) Daily Herald, August 23, 1881, as a 'volcanic eruption sending a column of fire and smoke several hundred feet in height'. Field investigations of the site by the Idaho Geological Survey deemed it 'a chemical explosion'." (Dewey, 1985)										
1884	NOV	08	07	43.0	N. 111.3 W.	..	G	298	..	..	..	..	VII	52
			Centered near Paris, Idaho. Considerable damage to houses in Paris. Chimneys fell in Richmond, Logan, and Wellsville, Utah. Felt in Montpelier, Idaho. (Townley and Allen, 1939)											
1884	NOV	..	09	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	10	09 19 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	11	09 48 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	11	10 45 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	11	11 45 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	11	14 00 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	12	08 50 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	12	09 25 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	13	02 05 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	13	04 55 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1884	NOV	14	08	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
1892	NOV	30	23 30 ..	42.0	N. 112.7 W.	..	G	298	..	..	..	..	II	32
1896	DEC	25	12	43.6	N. 116.2 W.	..	G	56	..	..	..	..	IIIX	56
1896	DEC	26	11 16 ..	43.6	N. 116.2 W.	..	G	56	..	..	..	..	IIIX	56
1896	DEC	26	17 16 ..	43.6	N. 116.2 W.	..	G	56	..	..	..	..	IIIX	56
1901	JAN	01	01 16 ..	43.6	N. 116.2 W.	..	G	298	..	..	..	..	IIIX	56
1903	NOV	03	21 30 ..	42.0	N. 111.3 W.	..	G	298	..	..	..	..	II	32
			Centered near Rockford, Idaho. Plaster fell in courthouse and schools cracked; plaster fell from ceiling in nearly all buildings. Felt from Salt Lake City, Utah to Baker, Oregon. Registered on seismograph stations in Europe.											
1906	OCT	22	07 06 ..	43.3	N. 111.6 W.	..	G	38	..	..	..	..	V	38
1909	FEB	09	08	43.3	N. 111.6 W.	..	G	56	..	..	..	..	IIIX	56
1909	FEB	10	02	43.3	N. 111.6 W.	..	G	56	..	..	..	..	IIIX	56
1911	APR	12	08 40 ..	43.3	N. 111.6 W.	..	G	56	..	..	..	..	III	56
1913	OCT	12	03 00 ..	43.7	N. 116.7 W.	..	G	56	..	..	..	..	IIIX	56
			Idaho and Adams Counties, Idaho. Broke windows and clocks.											
1914	APR	13	13	43.3	N. 115.6 W.	..	G	56	..	..	..	..	V	56
1914	APR	14	10	43.3	N. 115.6 W.	..	G	56	..	..	..	..	V	56
1914	APR	15	10 30 ..	43.3	N. 115.6 W.	..	G	272	..	..	..	..	IV	272
1914	APR	16	10	43.3	N. 115.6 W.	..	G	272	..	..	..	..	IV	272
1914	APR	30	01 30 ..	43.3	N. 115.6 W.	..	G	272	..	..	..	..	IV	272
1915	NOV	19	02	43.3	N. 115.6 W.	..	G	56	..	..	..	..	IIIX	56
1917	JUL	26	17	43.3	N. 115.6 W.	..	G	56	..	..	..	..	IIIX	56
			Ketchum, Idaho. Some chimneys fell. Felt in eastern Oregon and western Montana.											
1918	JUN	12	03 30 ..	43.3	N. 115.6 W.	..	G	56	..	..	..	..	III	272
1918	NOV	26	08 36 ..	43.8	N. 116.0 W.	..	G	56	..	..	..	..	V	56
1919	SEP	10	02 17 ..	43.5	N. 114.3 W.	..	G	38	..	..	..	..	V	272
1921	JUL	29	07	43.3	N. 115.6 W.	..	G	56	4.5RL GRA	..	..	..	V	56
1921	AUG	02	11	43.3	N. 115.6 W.	..	G	56	5.0RL GRA	..	..	..	V	56
1921	DEC	31	08	43.3	N. 115.6 W.	..	G	56	5.0RL GRA	..	..	..	V	272
1922	JAN	26	17	43.3	N. 115.6 W.	..	G	56	..	..	..	..	II	56
1922	FEB	01	07	43.3	N. 115.6 W.	..	G	56	..	..	..	..	II	56
1922	FEB	02	08	43.3	N. 115.6 W.	..	G	56	..	..	..	..	II	56
1922	DEC	16	21	43.3	N. 115.6 W.	..	G	248	..	..	..	..	III	248
1923	MAR	28	02	43.3	N. 115.6 W.	..	G	56	..	..	..	..	III	56
1926	JUL	29	18 30 ..	42.0	N. 111.9 W.	..	G	298	..	..	..	..	III	298
1927	JUL	01	17 15 ..	42.0	N. 111.9 W.	..	G	298	..	..	..	..	III	298
1928	SEP	12	11	42.2	N. 111.3 W.	..	G	38	5.0RL BER	..	..	..	V	38
1929	SEP	03	12 14 ..	42.2	N. 111.3 W.	..	G	7	5.0RL BER	..	..	..	IV	7
1929	SEP	03	12	42.2	N. 111.3 W.	..	G	7	..	..	..	..	IV	7
1931	OCT	03	08 00 ..	42.6	N. 116.1 W.	..	G	38	..	..	..	..	V	38
1931	DEC	22	08 55 ..	42.6	N. 116.1 W.	..	G	38	..	..	..	..	V	38
1932	JAN	01	07	42.6	N. 116.1 W.	..	G	38	..	..	..	..	V	38
1932	JAN	02	07	42.6	N. 116.1 W.	..	G	38	..	..	..	..	V	38
1932	JAN	03	07	42.6	N. 116.1 W.	..	G	38	..	..	..	..	V	38
1932	JAN	04	07	42.6	N. 116.1 W.	..	G	38	..	..	..	..	V	38
1932	JAN	26	17	43.3	N. 115.6 W.	..	G	56	..	..	..	..	II	56
1932	FEB	01	07	43.3	N. 115.6 W.	..	G	56	..	..	..	..	II	56
1932	FEB	02	08	43.3	N. 115.6 W.	..	G	56	..	..	..	..	II	56
1932	DEC	16	21	43.3	N. 115.6 W.	..	G	248	..	..	..	..	III	248
1933	MAR	28	02	43.3	N. 115.6 W.	..	G	56	..	..	..	..	III	56
1934	NOV	02	16 26 ..	42.0	N. 111.9 W.	..	G	298	..	..	..	..	III	298
1935	JUL	27	07 13 ..	42.2	N. 111.3 W.	..	G	38	..	..	..	..	V	38
1935	SEP	13	14	42.2	N. 111.3 W.	..	G	7	..	..	..	..	IV	7
1935	APR	19	09 50 ..	42.2	N. 111.3 W.	..	G	7	..	..	..	..	IV	7
1935	APR	20	08	42.2	N. 111.3 W.	..	G	7	..	..	..	..	IV	7
1935	APR	20	10