GEOLOGICAL SURVEY CIRCULAR 723-A

Earthquakes in the United States, January–March 1974

Earthquakes in the United States, January–March 1974

By C. W. Stover, R. B. Simon, and W. J. Person

GEOLOGICAL SURVEY CIRCULAR 723-A

1976

United States Department of the Interior

THOMAS S. KLEPPE, *Secretary*

Geological Survey

V. E. McKelvey, *Director*

Free on application to Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202

PREFACE

This is the first issue of a new series that will cover the investigations of earthquakes in the United States; this series is beyond the scope of the publications "Preliminary Determination of Epicenters" and "Preliminary Determination of Epicenters, Monthly Listing." The purpose is to make detailed earthquake information available to the public, scientists, engineers, actuaries, and other government agencies that have a need for it on a timely basis.

The quarterly lists will contain hypocenter lists, magnitudes, intensities, felt information, isoseismal maps, and seismicity maps. The section listing the intensities and felt information replaces "Abstracts of Earthquake Reports for the United States." The last issue, dated December 1973, was numbered MSA-160. This publication was terminated when the responsibility for collecting and evaluating intensity data in the United States was transferred to the National Earthquake Information Service.

CONTENTS

ILLUSTRATIONS

TABLES

Earthquakes in the United States, January–March 1974

By C. W. Stover, R. B. Simon, *and* W. J. Person

INTRODUCTION

The earthquake information in this publication supplements that contained in the NEIS (National Earthquake Information Service) publications, PDE ("Preliminary Determination of Epicenters") and "Preliminary Determination of Epicenters, Monthly Listing," to the extent of providing detailed felt and intensity data, as well as isoseismal maps for United States earthquakes. The purpose is to provide a complete listing of macroseismic effects of earthquakes, which can be used in risk studies, nuclear powerplant sitings, seismicity studies, and answering inquiries by the public.

This publication contains two major sections. The first (table 1) is a tabular listing of earthquakes by State, in chronological order, consisting of the following basic information: Date, origin time, hypocenter, magnitude, maximum intensity, and the computational source of the hypocenter. The second section consists of six isoseismal maps and table 2, which lists detailed intensity information. The list of earthquakes in table 1 was compiled from those located in the United States or off the coasts that were published in the PDE; from hypocenters in California above magnitude 3.5, supplied by California Institute of Technology, Pasadena, and the University of California at Berkeley; and from any others that were felt or that caused damage, regardless of magnitude or availability of a hypocenter. Known or suspected explosions are also listed.

The intensities and macroseismic data were compiled from information obtained through questionnaires sent to post offices in the epicentral area, from newspaper articles, and with the cooperation of other government agencies, State institutions, local organizations, and individuals. (See "Acknowledgments" for a list of collaborators.) Anyone wishing to submit felt or damage information on earthquakes for inclusion in future reports should send it to the National Earthquake Information Service, Stop 967, Box 25046, Denver Federal Center, Denver, Colorado 80225. Copies of the "Earthquake Report" questionnaire can be obtained at this address.

The isoseismal maps were compiled from the data reported on the "Earthquake Report" forms (fig. 1) supplemented by additional data from other sources, such as newspaper articles or information supplied by residents of the area. The primary method used by the NEIS to collect macroseismic information was a questionnaire canvass using the "Earthquake Report" forms, which were mailed to postmasters in the area affected by the earthquake. The postmasters completed the forms and returned them to the NEIS, where they were evaluated, an intensity value was assigned, and an isoseismal map was compiled. The isoseismals are based on a subjective grouping of intensity values, which may be a single value or a range of values. Any isoseismal may include a lower or higher intensity if it falls among a set of the values being contoured and cannot be differentiated by another isoseismal. The lowest contour line may not enclose all the points shown on the map, because the contouring encompasses only the contiguous intensity values.

These data will be made available for inclusion in the "Earthquake Description" section of "United States Earthquakes," an annual publication, where later data from other sources may be added for the purpose of updating and completeness. "United States Earthquakes" is published jointly by the U.S. Geological Survey, Department of the Interior and the Environmental Data Service, NOAA, Department of Commerce.

DISCUSSION OF TABLES

The parameters for the earthquakes in tables 1 and 2 include the date, origin time, hypocenter (epicenter and focal depth), magnitude, intensity, and hypocenter source. The origin time and date are listed in two time zones. The primary zone is Univer-

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
EARTHQUAKE REPORT

Form Approved
OMB No. 41-R0013

1. An earthquake was felt ☐ ; not felt ☐

Time _____ A.M.

Date of shock _____

_____ P.M.

If felt, please supply information below *(Underline appropriate words or fill spaces.)*
If not felt, please sign and return card, which requires no postage.

2. YOUR LOCATION DURING EARTHQUAKE

a. City, County, State _____

Township, Range, Section, Quarter Section, or Geographic Coordinates _____

b. **Ground:**
Rocky, gravelly, loose, compact, marshy, filled in, or _____
Level, sloping, steep, or _____

c. **If inside, type of construction:**
Wood, brick, stone, or _____

d. **Quality of construction:**
New, old, well built, poorly built, or _____

e. No. of floors in building:	f. Observer's floor:	g. Activity when earthquake occurred: Walking, sitting, lying down, sleeping	h. If outside, you, others were: Quiet, active

3. EFFECTS ON POPULATION

a. **Felt by:**
No one, very few, several, many, all (in your home) (in community)
b. **Awakened:**
No one, few, many, all (in your home) (in community)
c. **Frightened:**
No one, few, many, all (in your home) (in community); general panic

4. RELATED SOUNDS

a. **Rattling of windows, doors, dishes, etc.** _____
b. **Creaking of building** (Describe) _____
c. **Earth noises:** Faint, moderate, loud _____

5. PHYSICAL EFFECTS AND DAMAGE

a. **Outside:**
(1) Trees and bushes shaken, vehicles rocked, etc. _____
(2) Ground cracked; landslides; water disturbed, etc. _____
(3) Chimneys, tombstones, elevated water tanks, etc., cracked, twisted, overturned _____
(4) Other effects _____
b. **Buildings:**
(1) Hanging objects swung moderately, violently. Direction _____
(2) Small objects shifted, overturned, fell _____
(3) Furniture shifted, overturned, broken _____
(4) Plaster cracked, broken, fell _____
(5) Windows cracked _____
(6) Structural elements of brick, wood, or _____
Damage: None, slight, moderate, great _____

Signature and address of observer

Additional information would be appreciated. Use space on reverse side.

FIGURE 1.—Example of the "Earthquake Report" form used for evaluating the intensities of earthquakes.

TABLE 1.—*Summary of United States earthquakes for January–March 1974*

[Sources of the hypocenter and magnitudes: (B) University of California at Berkeley; (G) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (M) NOAA, Palmer Observatory, Alaska; (P) California Institute of Technology, Pasadena; (R) University of Nevada, Reno; (S) St. Louis University, St. Louis, Missouri; (V) Virginia Polytechnic Institute and State University, Blacksburg; (W) University of Washington, Seattle. N, normal depth; UTC, Universal Coordinated Time. For names of local time zones see figures 2 and 3]

Date (1974)	Origin Time (UTC) hr min s	Lat	Long	Depth (km)	Magnitude m_b	Magnitude M_S	Magnitude M_L or m_{bLg}	Maximum intensity	Hypocenter source	Date	Hour (local time)
				Alaska							
Jan. 2	09 50 06.3	60.48 N.	149.17 W.	N	....	....	3.0M	....	G	Jan. 1	11 p.m. AST
Jan. 5	14 00 56.8	52.16 N.	171.41 W.	41	5.4	4.7	....	....	G	Jan. 5	03 a.m. BST
Jan. 6	11 29 38.0	59.01 N.	140.17 W.	15	3.7	....	4.2M	....	G	Jan. 6	01 a.m. AST
Jan. 6	11 49 22.6	59.03 N.	139.99 W.	N	3.3	....	4.1M	....	G	Jan. 6	01 a.m. YST
Jan. 7	02 42 56.1	58.93 N.	152.70 W.	61	3.8	....	....	....	G	Jan. 6	05 p.m. ADT
Jan. 7	08 27 03.5	59.80 N.	153.72 W.	128	4.9	....	....	....	G	Jan. 6	11 p.m. ADT
Jan. 7	17 47 03.0	64.88 N.	147.55 W.	10	....	....	....	III	G	Jan. 7	08 a.m. ADT
Jan. 8	22 13 01.6	63.12 N.	149.82 W.	92	....	....	....	....	G	Jan. 8	01 p.m. ADT
Jan. 10	00 02 29.9	53.05 N.	174.44 W.	207	4.5	....	....	....	G	Jan. 9	02 a.m. BDT
Jan. 14	04 46 37.9	62.24 N.	151.80 W.	112	....	....	....	....	G	Jan. 13	07 p.m. ADT
Jan. 19	08 53 39.1	52.93 N.	167.97 W.	59	5.0	....	....	....	G	Jan. 18	10 p.m. BDT
Jan. 20	04 17 37.2	62.56 N.	150.69 W.	89	3.6	....	....	....	G	Jan. 19	07 p.m. ADT
Jan. 21	14 10 10.4	53.90 N.	163.66 W.	N	4.2	....	....	....	G	Jan. 21	04 a.m. BDT
Jan. 22	01 30 40.9	63.85 N.	148.97 W.	122	....	....	....	....	G	Jan. 21	04 p.m. ADT
Jan. 22	04 09 45.2	60.85 N.	150.01 W.	50	3.4	....	....	....	G	Jan. 21	07 p.m. ADT
Jan. 22	10 43 04.2	60.12 N.	153.33 W.	152	4.6	....	....	....	G	Jan. 22	01 a.m. ADT
Jan. 22	11 13 46.0	61.94 N.	152.14 W.	115	3.8	....	....	....	G	Jan. 22	02 a.m. ADT
Jan. 23	20 19 30.2	57.82 N.	153.71 W.	53	3.9	....	....	....	G	Jan. 23	11 a.m. ADT
Jan. 23	22 39 28.3	58.66 N.	153.28 W.	62	4.0	....	....	....	G	Jan. 23	01 p.m. ADT
Jan. 24	14 33 08.6	52.65 N.	168.06 W.	N	4.2	....	....	....	G	Jan. 24	04 a.m. BDT
Jan. 24	15 52 08.6	60.17 N.	152.89 W.	113	....	....	....	....	G	Jan. 24	06 a.m. ADT
Jan. 24	18 43 26.8	61.58 N.	147.62 W.	40	4.8	....	5.1M	V	G	Jan. 24	09 a.m. ADT
Jan. 24	20 17 24.6	61.46 N.	147.42 W.	20	....	....	3.0M	....	G	Jan. 24	11 a.m. ADT
Jan. 24	20 44 13.2	61.48 N.	147.48 W.	30	....	....	3.6M	....	G	Jan. 24	11 a.m. ADT
Jan. 24	21 54 23.9	61.50 N.	147.44 W.	32	....	....	3.2M	....	G	Jan. 24	12 p.m. ADT
Jan. 24	22 47 41.7	61.45 N.	147.44 W.	29	....	....	3.8M	....	G	Jan. 24	01 p.m. ADT
Jan. 25	01 00 21.3	61.53 N.	147.60 W.	28	....	....	3.6M	II	G	Jan. 24	04 p.m. ADT
Jan. 26	03 11 20.9	52.29 N.	171.39 W.	54	5.3	....	....	....	G	Jan. 25	05 p.m. BDT
Jan. 26	16 15 46.0	62.45 N.	151.21 W.	106	....	....	....	....	G	Jan. 26	07 a.m. ADT
Jan. 27	04 39 37.7	59.34 N.	136.37 W.	29	4.0	....	3.8M	....	G	Jan. 26	09 p.m. PDT
Jan. 28	04 58 49.7	61.56 N.	147.62 W.	26	....	....	3.5M	....	G	Jan. 27	08 p.m. ADT
Jan. 31	01 20 41.3	63.80 N.	149.09 W.	126	....	....	....	....	G	Jan. 30	04 p.m. ADT
Jan. 31	14 35 11.9	63.02 N.	150.99 W.	128	3.7	....	....	....	G	Jan. 31	05 a.m. ADT
Jan. 31	15 09 27.7	61.92 N.	148.66 W.	66	....	....	....	II	G	Jan. 31	06 a.m. ADT
Jan. 31	19 40 38.5	61.63 N.	151.92 W.	103	....	....	....	....	G	Jan. 31	10 a.m. ADT
Jan. 31	19 55 26.2	52.35 N.	168.74 W.	36	5.6	5.0	....	....	G	Jan. 31	09 a.m. BDT
Jan. 31	20 15 54.6	52.24 N.	168.77 W.	44	4.8	....	....	....	G	Jan. 31	10 a.m. BDT
Feb. 1	09 02 17.7	62.13 N.	147.83 W.	63	3.5	....	....	....	G	Feb. 1	12 a.m. ADT
Feb. 2	14 36 02.1	61.46 N.	147.46 W.	69	3.8	....	....	II	G	Feb. 2	05 a.m. ADT
Feb. 2	15 55 28.3	61.60 N.	147.60 W.	48	5.1	4.7	...	II	G	Feb. 2	06 a.m. ADT
Feb. 4	14 06 50.6	60.02 N.	152.91 W.	111	3.7	....	....	....	G	Feb. 4	05 a.m. ADT
Feb. 5	02 25 22.0	62.70 N.	148.85 W.	75	5.0	....	....	V	G	Feb. 4	05 p.m. ADT
Feb. 5	12 59 29.4	60.12 N.	147.69 W.	35	3.6	....	3.5M	....	G	Feb. 5	03 a.m. ADT
Feb. 6	04 04 07.2	53.79 N.	164.67 W.	2	5.9	{6.5 6.3P}	....	V	G	Feb. 5	06 p.m. BDT
Feb. 6	22 22 32.3	61.44 N.	147.45 W.	59	....	....	....	....	G	Feb. 6	01 p.m. ADT
Feb. 10	16 58 29.3	61.36 N.	150.23 W.	N	....	....	2.8M	....	G	Feb. 10	07 a.m. ADT
Feb. 10	21 25 11.7	50.81 N.	172.68 W.	N	4.5	....	....	....	G	Feb. 10	11 a.m. BDT
Feb. 10	22 05 46.2	59.13 N.	152.50 W.	61	4.6	....	....	....	G	Feb. 10	01 p.m. ADT
Feb. 11	03 45 16.5	53.81 N.	167.11 W.	79	4.2	....	....	....	G	Feb. 10	05 p.m. BDT
Feb. 11	05 30 19.7	67.97 N.	145.79 W.	N	3.7	....	....	....	G	Feb. 10	08 p.m. ADT

TABLE 1.—*Summary of United States earthquakes for January-March 1974*—Continued

Date (1974)	Origin Time (UTC) hr min s	Lat	Long	Depth (km)	Magnitude m_b	Magnitude M_S	Magnitude M_L or m_{bLg}	Maximum intensity	Hypocenter source	Date	Hour (local time)
Alaska—Continued											
Feb. 11	15 57 15.1	67.92 N.	145.43 W.	80	....	....	....	....	G	Feb. 11	06 a.m. ADT
Feb. 12	04 17 03.3	59.80 N.	141.55 W.	59	....	....	....	....	G	Feb. 12	07 p.m. ADT
Feb. 14	06 43 59.1	60.39 N.	152.72 W.	129	....	....	....	....	G	Feb. 13	09 p.m. ADT
Feb. 15	06 06 28.5	63.14 N.	150.76 W.	126	4.5	....	....	....	G	Feb. 14	09 p.m. ADT
Feb. 15	06 52 48.5	61.57 N.	151.50 W.	91	....	....	....	....	G	Feb. 14	09 p.m. ADT
Feb. 16	16 09 51.9	64.75 N.	146.82 W.	22	....	....	2.9M	....	G	Feb. 16	07 a.m. ADT
Feb. 16	17 52 52.0	51.25 N.	179.28 W.	N	4.2	....	....	II	G	Feb. 16	07 a.m. BDT
Feb. 17	21 19 53.1	53.64 N.	163.54 W.	N	4.7	....	....	....	G	Feb. 17	11 a.m. BDT
Feb. 18	13 34 05.0	51.77 N.	179.77 E.	139	4.7	....	....	....	G	Feb. 18	03 a.m. BDT
Feb. 19	21 02 31.7	65.92 N.	156.37 W.	N	3.7	....	4.1M	....	G	Feb. 19	12 p.m. ADT
Feb. 20	14 07 27.9	64.78 N.	149.26 W.	N	....	....	3.4M	....	G	Feb. 20	05 a.m. ADT
Feb. 21	16 28 04.2	60.33 N.	140.58 W.	N	4.1	....	3.9M	....	G	Feb. 21	08 a.m. YDT
Feb. 23	03 40 38.2	59.43 N.	152.46 W.	109	....	....	....	....	G	Feb. 22	06 p.m. ADT
Feb. 23	08 09 45.8	60.65 N.	142.86 W.	130	3.9	....	....	....	G	Feb. 22	11 p.m. ADT
Feb. 23	19 07 54.2	61.36 N.	146.58 W.	20	....	....	3.0M	....	G	Feb. 23	10 a.m. ADT
Feb. 24	08 44 57.0	63.47 N.	151.34 W.	76	....	....	....	....	G	Feb. 23	11 p.m. ADT
Feb. 24	14 56 54.0	53.41 N.	169.10 W.	98	4.5	....	....	....	G	Feb. 24	04 a.m. ADT
Feb. 24	20 55 51.5	63.82 N.	148.37 W.	15	....	....	3.2M	....	G	Feb. 24	11 a.m. ADT
Feb. 28	14 59 47.3	51.41 N.	179.33 W.	56	4.8	....	....	....	G	Feb. 28	04 a.m. BDT
Feb. 28	19 19 21.9	53.01 N.	166.66 W.	N	5.0	....	....	....	G	Feb. 28	09 a.m. BDT
Mar. 1	06 25 37.0	52.62 N.	168.06 W.	18	4.3	....	....	....	G	Feb. 28	08 p.m. BDT
Mar. 1	08 00 34.8	61.18 N.	148.51 W.	51	3.3	....	....	....	G	Feb. 28	11 p.m. ADT
Mar. 1	14 11 13.7	58.32 N.	150.99 W.	N	3.9	....	3.5M	....	G	Mar. 1	05 a.m. ADT
Mar. 1	16 04 02.0	54.38 N.	169.56 E.	28	4.5	5.4	....	....	G	Mar. 1	06 a.m. BDT
Mar. 2	06 34 24.8	66.21 N.	157.48 W.	46	....	....	....	....	G	Mar. 1	09 p.m. ADT
Mar. 2	20 10 04.6	61.07 N.	148.18 W.	54	3.3	....	....	....	G	Mar. 2	11 a.m. ADT
Mar. 3	17 58 55.8	62.03 N.	149.44 W.	67	3.8	....	....	....	G	Mar. 3	08 a.m. ADT
Mar. 4	03 33 47.5	62.17 N.	153.23 W.	N	....	....	3.2M	....	G	Mar. 3	06 p.m. ADT
Mar. 4	06 54 33.7	60.11 N.	140.67 W.	37	3.9	....	3.6M	....	G	Mar. 3	10 p.m. YDT
Mar. 4	09 53 17.5	65.81 N.	155.20 W.	21	....	....	3.8M	....	G	Mar. 4	12 a.m. ADT
Mar. 4	18 56 23.0	59.51 N.	152.77 W.	122	4.0	....	....	....	G	Mar. 4	09 a.m. ADT
Mar. 5	10 25 57.4	62.48 N.	149.27 W.	91	....	....	....	....	G	Mar. 5	01 a.m. ADT
Mar. 5	12 11 28.3	62.78 N.	150.66 W.	97	3.6	....	....	....	G	Mar. 5	03 a.m. ADT
Mar. 5	23 58 31.7	62.12 N.	149.80 W.	63	3.8	....	....	....	G	Mar. 6	02 a.m. ADT
Mar. 6	15 15 45.6	59.92 N.	153.89 W.	172	....	....	....	....	G	Mar. 6	06 a.m. ADT
Mar. 9	14 18 52.3	61.40 N.	149.62 W.	42	....	....	....	II	G	Mar. 9	05 a.m. ADT
Mar. 10	00 12 40.4	50.53 N.	175.11 W.	28	4.7	....	....	II	G	Mar. 9	02 p.m. BDT
Mar. 10	10 00 14.1	63.16 N.	150.50 N.	117	4.5	....	....	II	G	Mar. 10	01 a.m. ADT
Mar. 12	10 15 41.2	54.30 N.	162.40 W.	56	4.0	....	....	....	G	Mar. 12	12 a.m. BDT
Mar. 14	08 29 35.1	51.71 N.	167.06 W.	N	4.5	....	....	....	G	Mar. 13	10 p.m. BDT
Mar. 14	18 46 09.5	60.77 N.	151.16 W.	39	4.1	....	4.0M	....	G	Mar. 14	09 a.m. ADT
Mar. 15	20 27 30.8	65.56 N.	151.71 W.	26	....	....	3.2M	....	G	Mar. 15	11 a.m. ADT
Mar. 16	13 11 14.8	52.20 N.	179.50 E.	168	4.7	....	....	....	G	Mar. 16	03 a.m. BDT
Mar. 17	14 55 16.4	57.35 N.	152.96 W.	64	3.8	....	....	....	G	Mar. 17	05 a.m. ADT
Mar. 17	15 30 36.4	58.02 N.	145.76 W.	N	....	....	3.6M	....	G	Mar. 17	06 a.m. ADT
Mar. 19	11 53 04.6	60.61 N.	152.74 W.	120	3.7	....	....	....	G	Mar. 19	02 p.m. ADT
Mar. 20	15 35 58.6	52.36 N.	171.99 W.	88	4.3	....	....	....	G	Mar. 20	05 a.m. BDT
Mar. 21	11 41 36.6	66.18 N.	144.79 W.	47	3.4	....	....	....	G	Mar. 21	02 a.m. ADT
Mar. 21	23 01 30.9	61.69 N.	150.92 W.	71	3.7	....	....	....	G	Mar. 21	02 p.m. ADT
Mar. 22	01 23 56.3	51.91 N.	168.36 W.	N	4.0	....	....	....	G	Mar. 21	03 p.m. BDT
Mar. 22	05 45 19.0	53.69 N.	163.43 W.	N	4.9	....	....	....	G	Mar. 21	07 p.m. BDT
Mar. 22	07 04 06.2	53.62 N.	163.37 W.	N	5.1	4.6	....	....	G	Mar. 21	09 p.m. BDT
Mar. 22	07 49 55.1	61.04 N.	147.36 W.	41	3.4	....	3.3M	....	G	Mar. 21	10 p.m. ADT
Mar. 23	18 29 29.6	61.64 N.	149.61 W.	53	....	....	....	....	G	Mar. 23	09 a.m. ADT
Mar. 24	02 40 33.9	58.76 N.	151.24 W.	16	3.7	....	....	....	G	Mar. 23	05 p.m. ADT
Mar. 26	06 56 30.4	62.47 N.	151.00 W.	34	....	....	3.2M	....	G	Mar. 25	09 p.m. ADT
Mar. 26	08 11 36.9	52.46 N.	170.60 W.	40	4.2	....	....	....	G	Mar. 25	10 p.m. BDT
Mar. 26	16 56 34.0	64.89 N.	150.98 W.	N	....	....	3.2M	III	G	Mar. 26	07 a.m. ADT
Mar. 27	16 01 31.1	52.14 N.	174.16 E.	45	4.4	....	....	....	G	Mar. 27	06 a.m. BDT
Mar. 27	16 28 47.3	50.10 N.	179.65 W.	37	5.6	4.8	....	....	G	Mar. 27	06 a.m. BDT

TABLE 1.—*Summary of United States earthquakes for January–March 1974*—Continued

Date (1974)	Origin Time (UTC) hr min s	Lat	Long	Depth (km)	Magnitude m_b	Magnitude M_S	Magnitude M_L or m_{bLg}	Maximum intensity	Hypo-center source	Date	Hour (local time)
Alaska—Continued											
Mar. 28.....	04 19 00.5	60.63	N. 151.62 W.	53	....	....	....	....	G	Mar. 27	07 p.m. ADT
Mar. 28.....	17 52 26.8	52.50	N. 174.30 W.	201	4.3	....	....	....	G	Mar. 28	07 a.m. BDT
Mar. 29.....	21 50 35.3	57.58	N. 153.92 W.	44	5.7	5.2	5.5M	IV	G	Mar. 29	12 p.m. ADT
Mar. 30.....	02 08 40.3	57.77	N. 153.43 W.	60	....	....	....	....	G	Mar. 29	05 p.m. ADT
Mar. 30.....	06 46 39.2	61.69	N. 150.99 W.	83	3.5	....	....	....	G	Mar. 29	09 p.m. ADT
Mar. 31.....	15 34 24.7	51.71	N. 177.28 W.	61	4.4	....	....	IV	G	Mar. 31	05 a.m. BDT
Mar. 31.....	16 56 22.2	52.89	N. 173.23 E.	73	4.1	....	....	....	G	Mar. 31	06 a.m. BDT
Arizona											
Mar. 14.....	20 59 57.2	34.26	N. 112.60 W.	1.3	....	....	4.1G	....	G	Mar. 14	08 a.m. MDT
Arkansas											
Feb. 15.....	22 35 44.7	34.050	N. 93.130 W.	1	4.2	....	3.6S	....	S	Feb. 15	05 p.m. CDT
Feb. 15.....	22 49 01.8	33.960	N. 93.030 W.	1	3.8	....	4.0S	V	S	Feb. 15	05 p.m. CDT
Feb. 15.....	22 53 02.2	33.920	N. 93.020 W.	1	....	....	2.8S	....	S	Feb. 15	05 p.m. CDT
Feb. 16.....	03 38 55.5	33.95	N. 93.09 W.	1	....	....	1.6S	....	S	Feb. 15	10 p.m. CDT
Feb. 16.....	09 43 13.7	33.95	N. 93.09 W.	1	....	....	1.8S	....	S	Feb. 16	04 a.m. CDT
Feb. 16.....	09 44 35.2	34.001	N. 93.130 W.	1	....	....	2.3S	....	S	Feb. 16	04 a.m. CDT
Feb. 24.....	07 53 45.2	35.82	N. 90.38 W.	6	....	....	3.2S	....	S	Feb. 24	02 a.m. CDT
Mar. 4.....	14 24 27.8	35.68	N. 90.35 W.	5	....	....	3.0S	....	S	Mar. 4	09 a.m. CDT
California											
Jan. 2.....	13 49 56.8	35.53	N. 117.23 W.	8	4.2	....	4.2P	....	P	Jan. 2	07 a.m. PST
Jan. 6.....	13 55 23.2	41.122	N. 121.493 W.	5	4.5	....	4.1B	VI	B	Jan. 6	06 a.m. PDT
Jan. 8.....	04 49	Near Santa Rosa		....	....	....	2.2B	II	....	Jan. 7	09 p.m. PDT
Jan. 9.....	05 51	Near Ferndale		....	....	....	2.7B	II	....	Jan. 8	10 p.m. PDT
Jan. 10.....	11 22 24.9	36.955	N. 121.605 W.	10	4.4	....	4.4B	V	B	Jan. 10	04 a.m. PDT
Jan. 19.....	13 13 37.2	34.38	N. 117.05 W.	0	3.1	....	3.9P	II	P	Jan. 19	06 a.m. PDT
Jan. 23.....	01 37 58.0	36.40	N. 120.42 W.	10	....	....	3.1B	V	G	Jan. 22	06 p.m. PDT
Jan. 24.....	05 02 00.8	35.07	N. 119.03 W.	8	4.1	....	{3.4P 4.0B}	....	P	Jan. 23	10 p.m. PDT
Jan. 26.....	12 36 26.4	35.02	N. 117.07 W.	8	....	....	3.0P	....	P	Jan. 26	05 a.m. PDT
Jan. 30.....	00 38 41.1	32.65	N. 115.82 W.	8	....	....	3.1P	....	P	Jan. 29	05 p.m. PDT
Jan. 30.....	07 06 31.3	33.50	N. 116.52 W.	8	....	....	3.1P	....	P	Jan. 29	12 p.m. PDT
Jan. 31.....	06 05 28.8	34.05	N. 117.03 W.	8	3.8	....	4.0P	V	P	Jan. 30	11 p.m. PDT
Feb. 1.....	03 27 51.0	36.78	N. 121.57 W.	4	....	....	3.5B	IV	B	Jan. 31	08 p.m. PDT
Feb. 8.....	22 05 44.7	37.38	N. 121.76 W.	7	....	....	3.3B	II	B	Feb. 8	03 p.m. PDT
Feb. 11.....	12 10 26.3	33.43	N. 116.53 W.	12	4.3	....	3.4P	....	P	Feb. 11	05 a.m. PDT
Feb. 11.....	12 11 15.2	33.50	N. 116.62 W.	12	....	....	3.4P	....	P	Feb. 11	05 a.m. PDT
Feb. 11.....	12 20 56.9	34.10	N. 118.27 W.	12	....	....	3.4P	IV	P	Feb. 11	05 a.m. PDT
Feb. 14.....	05 20	Near Hollister.....		....	....	....	....	IV	....	Feb. 13	10 p.m. PDT
Feb. 14.....	09 56 58.4	34.28	N. 116.83 W.	8	....	....	3.0P	....	P	Feb. 14	02 a.m. PDT
Feb. 15.....	14 44 29.3	34.417	N. 118.383 W.	8	....	....	3.7P	II	P	Feb. 15	07 a.m. PDT
Feb. 19.....	06 07 55.1	33.78	N. 116.07 W.	8	....	....	3.1P	....	P	Feb. 18	11 p.m. PDT
Feb. 19.....	06 42 05.3	33.03	N. 117.83 W.	8	....	....	3.0P	....	P	Feb. 18	11 p.m. PDT
Feb. 21.....	04 38 24.9	33.00	N. 115.93 W.	8	....	....	3.1P	....	P	Feb. 20	09 p.m. PDT
Mar. 2.....	00 23	Near Alpine.....		....	....	....	....	IV	....	Mar. 1	05 p.m. PDT
Mar. 2.....	08 28 25.4	37.27	N. 121.65 W.	7	....	....	3.4B	....	B	Mar. 2	01 a.m. PDT
Mar. 3.....	16 29 02.5	34.35	N. 118.53 W.	8	....	....	3.0P	....	P	Mar. 3	09 a.m. PDT
Mar. 9.....	00 54 13.6	34.38	N. 118.42 W.	8	....	....	3.4P	....	P	Mar. 8	05 p.m. PDT
Mar. 9.....	00 54 31.6	34.38	N. 118.43 W.	8	4.7	....	{4.5P 4.7B}	V	P	Mar. 8	05 p.m. PDT
Mar. 9.....	01 22 52.6	34.37	N. 118.45 W.	8	....	....	3.0P	....	P	Mar. 8	06 p.m. PDT
Mar. 9.....	04 19 09.4	34.38	N. 118.43 W.	8	....	....	3.2P	....	P	Mar. 8	09 p.m. PDT
Mar. 12.....	07 35 46.0	34.10	N. 118.20 W.	8	....	....	3.0P	IV	P	Mar. 12	12 a.m. PDT
Mar. 12.....	12 45 28.1	37.292	N. 122.317 W.	11	3.3	....	3.8B	V	B	Mar. 12	05 a.m. PDT
Mar. 12.....	15 37 29.5	34.82	N. 117.58 W.	8	....	....	3.4P	IV	P	Mar. 12	08 a.m. PDT
Mar. 16.....	16 24 21.1	37.003	N. 121.738 W.	9	....	....	3.5B	....	B	Mar. 16	09 a.m. PDT
Mar. 21.....	21 16 03.6	38.75	N. 122.45 W.	2	3.8	....	3.3B	V	B	Mar. 21	02 p.m. PDT

TABLE 1.—*Summary of United States earthquakes for January–March 1974*—Continued

Date (1974)	Origin Time (UTC) hr min s	Lat	Long	Depth (km)	Magnitude m_b	Magnitude M_S	Magnitude M_L or m_{bLg}	Maximum intensity	Hypo-center source	Date	Hour (local time)
California—Continued											
Mar. 21	22 50 05.7	34.15	N. 117.47 W.	8	....	....	3.0P	IV	P	Mar. 21	03 p.m. PDT
Mar. 24	16 57 09.0	37.533	N. 121.847 W.	8	....	....	3.4B	V	B	Mar. 24	09 a.m. PDT
Mar. 27	06 47 57.3	34.48	N. 116.48 W.	0	3.7	....	4.0P	....	P	Mar. 26	11 p.m. PDT
Mar. 27	07 04 27.6	34.48	N. 116.50 W.	0	4.0	....	4.5P	....	P	Mar. 26	12 a.m. PDT
Mar. 27	17 22 53.7	33.93	N. 115.85 W.	2	....	....	3.4P	....	P	Mar. 27	10 a.m. PDT
Mar. 31	11 20 48.8	34.02	N. 118.70 W.	8	....	....	3.1P	....	P	Mar. 31	04 a.m. PDT
Mar. 31	23 06 18.1	36.937	N. 121.603 W.	8	3.5	....	3.6B	V	B	Mar. 31	04 p.m. PDT
California—Off the coast											
Jan. 1	18 28 19.0	41.97	N. 126.74 W.	N	4.7	....	....	....	G	Jan. 1	12 p.m. PST
Jan. 6	23 17 35.3	40.36	N. 126.80 W.	N	4.5	....	4.3B	....	G	Jan. 6	04 p.m. PDT
Feb. 6	02 32 03.4	40.37	N. 125.24 W.	18	4.9	....	4.0B	....	G	Feb. 5	07 p.m. PDT
Mar. 3	11 37 36.8	41.88	N. 125.44 W.	N	5.1	....	4.4B	....	G	Mar. 3	04 a.m. PDT
Mar. 7	03 25 38.6	40.81	N. 127.57 W.	N	4.5	....	3.8B	....	G	Mar. 6	08 p.m PDT
Mar. 16	15 57 41.8	40.34	N. 124.72 W.	N	4.7	....	....	....	G	Mar. 16	08 a.m. PDT
Colorado											
Mar. 31	11 58 47.1	40.70	N. 107.05 W.	5	....	....	3.5G	II	G	Mar. 31	05 a.m. MDT
Hawaii											
Jan. 12	16 04 33.8	19.343	N. 155.138 W.	7	4.8	....	4.7H	....	H	Jan. 12	07 a.m. HDT
Feb. 5	04 16 54.0	19.50	N. 156.00 W.	15	4.1	....	4.5H	II	H	Feb. 4	07 p.m. HDT
Feb. 6	14 39 25.0	19.67	N. 156.00 W.	30	....	....	3.5H	II	H	Feb. 6	05 a.m. HDT
Illinois											
Mar. 27	16 10 56.3	38.55	N. 90.13 W.	10	....	....	2.4S	II	S	Mar. 27	11 a.m. CDT
Iowa											
Jan. 7	16 47	Des Moines area.....		....	....	....	....	IV	....	Jan. 7	11 a.m. CDT
Montana											
Mar. 24	22 57 07.7	44.50	N. 111.08 W.	N	....	....	....	....	G	Mar. 24	04 p.m. MDT
Nevada											
Mar. 18	12 14 25.5	40.00	N. 116.77 W.	5	....	....	4.3R	....	G	Mar. 18	05 a.m. PDT
Mar. 18	12 54 57.3	40.00	N. 116.78 W.	5	....	....	4.1R	....	G	Mar. 18	05 a.m. PDT
Oklahoma–Texas Border											
Feb. 15	13 33 49.2	36.50	N. 100.69 W.	24	4.5	....	4.6S	V	G	Feb. 15	08 a.m. CDT
Oregon—Off the coast											
Jan. 5	15 16 14.1	42.30	N. 126.61 W.	N	4.0	....	....	....	G	Jan. 5	09 a.m. PST
Jan. 5	15 24 05.0	42.32	N. 126.87 W.	N	4.3	....	....	....	G	Jan. 5	09 a.m. PST
Jan. 5	15 30 24.2	42.56	N. 126.45 W.	N	4.0	....	....	....	G	Jan. 5	09 a.m. PST
Jan. 5	15 37 33.7	42.63	N. 126.42 W.	N	4.6	4.7	....	....	G	Jan. 5	09 a.m. PST
Jan. 5	15 54 03.3	42.48	N. 126.60 W.	N	4.9	5.1	....	....	G	Jan. 5	09 a.m. PST
Jan. 5	16 25 56.1	42.37	N. 126.60 W.	N	4.2	....	....	....	G	Jan. 5	10 a.m. PST
Jan. 5	17 43 02.1	42.58	N. 126.33 W.	N	4.3	3.9	....	....	G	Jan. 5	11 a.m. PST
Jan. 5	23 23 56.7	42.52	N. 126.60 W.	N	4.4	4.0	....	....	G	Jan. 5	05 p.m. PST
Jan. 5	23 29 18.6	42.59	N. 126.58 W.	N	5.0	4.6	....	....	G	Jan. 5	05 p.m. PST
Feb. 26	23 16 21.9	43.85	N. 128.41 W.	N	4.6	....	....	....	G	Feb. 26	04 p.m. PDT
Feb. 26	23 20 24.2	43.97	N. 128.32 W.	N	4.4	....	....	....	G	Feb. 26	04 p.m. PDT
Feb. 27	03 42 01.4	43.88	N. 128.44 W.	15	5.0	4.9	....	....	G	Feb. 26	08 p.m. PDT
Feb. 27	03 43 19.2	43.85	N. 128.55 W.	N	5.0	....	....	....	G	Feb. 26	08 p.m. PDT
Feb. 27	03 45 26.1	43.90	N. 128.08 W.	N	4.9	....	....	....	G	Feb. 26	08 p.m. PDT

TABLE 1.—*Summary of United States earthquakes for January-March 1974*—Continued

Date (1974)	Origin Time (UTC) hr min s	Lat	Long	Depth (km)	Magnitude m_b	Magnitude M_S	Magnitude M_L or m_{bLg}	Maximum intensity	Hypocenter source	Date	Hour (local time)
Oregon—Off the coast—Continued											
Mar. 4	18 17 34.1	43.54	N. 126.89 W.	N	5.0	....	....	....	G	Mar. 4	11 a.m. PDT
Mar. 12	05 17 15.6	44.06	N. 128.11 W.	26	4.5	3.9	....	....	G	Mar. 11	10 p.m. PDT
Mar. 23	19 09 40.9	42.68	N. 126.09 W.	N	4.5	....	....	....	G	Mar. 23	12 p.m. PDT
Mar. 28	01 56 26.9	42.60	N. 126.39 W.	N	4.6	....	....	....	G	Mar. 27	06 p.m. PDT
Tennessee											
Jan. 8	01 12 37.4	36.20	N. 89.39 W.	1	4.1	....	4.3S	V	S	Jan. 7	08 p.m. CDT
Mar. 10	04 34 19.7	36.21	N. 89.53 W.	5	....	....	2.5S	....	S	Mar. 9	10 p.m. CDT
Mar. 12	12 30 28.6	35.66	N. 89.79 W.	5	....	....	3.2S	....	S	Mar. 12	07 a.m. CDT
Utah											
Mar. 10	01 50 21.3	37.57	N. 113.68 W.	2	....	....	....	II	G	Mar. 9	07 p.m. MDT
Virginia											
Mar. 23	09 46 33.8	38.92	N. 77.78 W.	2	....	....	2.6V	....	V	Mar. 23	05 a.m. EDT
Wyoming											
Feb. 6	07 26 13.0	45.11	N. 111.01 W.	N	....	....	....	....	G	Feb. 6	01 a.m. MDT
Mar. 24	15 04 45.6	44.63	N. 110.79 W.	N	3.8	....	....	....	G	Mar. 24	09 a.m. MDT
Mar. 24	15 07 49.0	44.64	N. 110.80 W.	N	....	....	....	....	G	Mar. 24	09 a.m. MDT

sal Coordinated Time (UTC), and the secondary one is local standard time based on the time-zone maps shown in figures 2 and 3. The times are adjusted 1 hour less for daylight-saving time. The epicenters listed in tables 1 and 2, which were taken from those published in the PDE, are listed here to two or three decimals. The accuracy of the epicenters is that claimed by the institution supplying the hypocenter, which is, in general, accurate to the number of decimals listed; however, the epicenters located by the NEIS have a varying degree of accuracy, depending on their continental or oceanic location. The oceanic hypocenters are less accurate than those on the continent, even though both are listed to two decimals. The hypocenter source in table 1 is shown by an assigned letter code (headnotes to tables 1 and 2); in table 2 the letter enclosed in parentheses after the date indicates the source of hypocenter and magnitude parameters. Figures 4, 5, and 6 are maps showing the earthquake epicenters listed in table 1. The magnitudes plotted in these figures are based on M_L or m_{bLg}, if neither was computed, then on M_S, and finally on m_b, when it was the only magnitude computed.

The magnitude values listed in tables 1 and 2 were compiled from data furnished to the PDE by cooperating institutions and from calculations by the NEIS. The computational sources are labeled according to the assigned letter codes shown in the headnotes to tables 1 and 2; the letter follows the value listed under the column heading "Magnitude." In table 1, the absence of a letter code indicates that the NEIS is the source. In table 2 the magnitude source is the same as the location source unless otherwise indicated by an alphabetic character to the right of the magnitude value. The magnitude values calculated by the NEIS are based on the following formulas:

$$M_S = \log (A/T) + 1.66 \log D + 3.3, \quad (1)$$

as adopted by the International Association of Seismology and Physics of the Earth's Interior (IASPEI; Bath, 1966, p. 153), where A is the maximum horizontal surface-wave ground amplitude, in micrometres; T is the period, in seconds, and $18 \leq T \leq 22$, and D is the distance in geocentric degrees (station to epicenter) and $20° \leq D \leq 160°$. No depth correction is made for depth less than 50 km.

$$m_b = \log (A/T) + Q(D,h), \quad (2)$$

as defined by Gutenberg and Richter (1956), except that T, the period, in seconds, is restricted to $0.1 \leq T \leq 3.0$, and A, the ground amplitude, in micrometres, is not necessarily the maximum of the P-wave group. Q is a function of distance D and depth h, where $D \geq 5°$.

$$M_L = \log A - \log A_0, \quad (3)$$

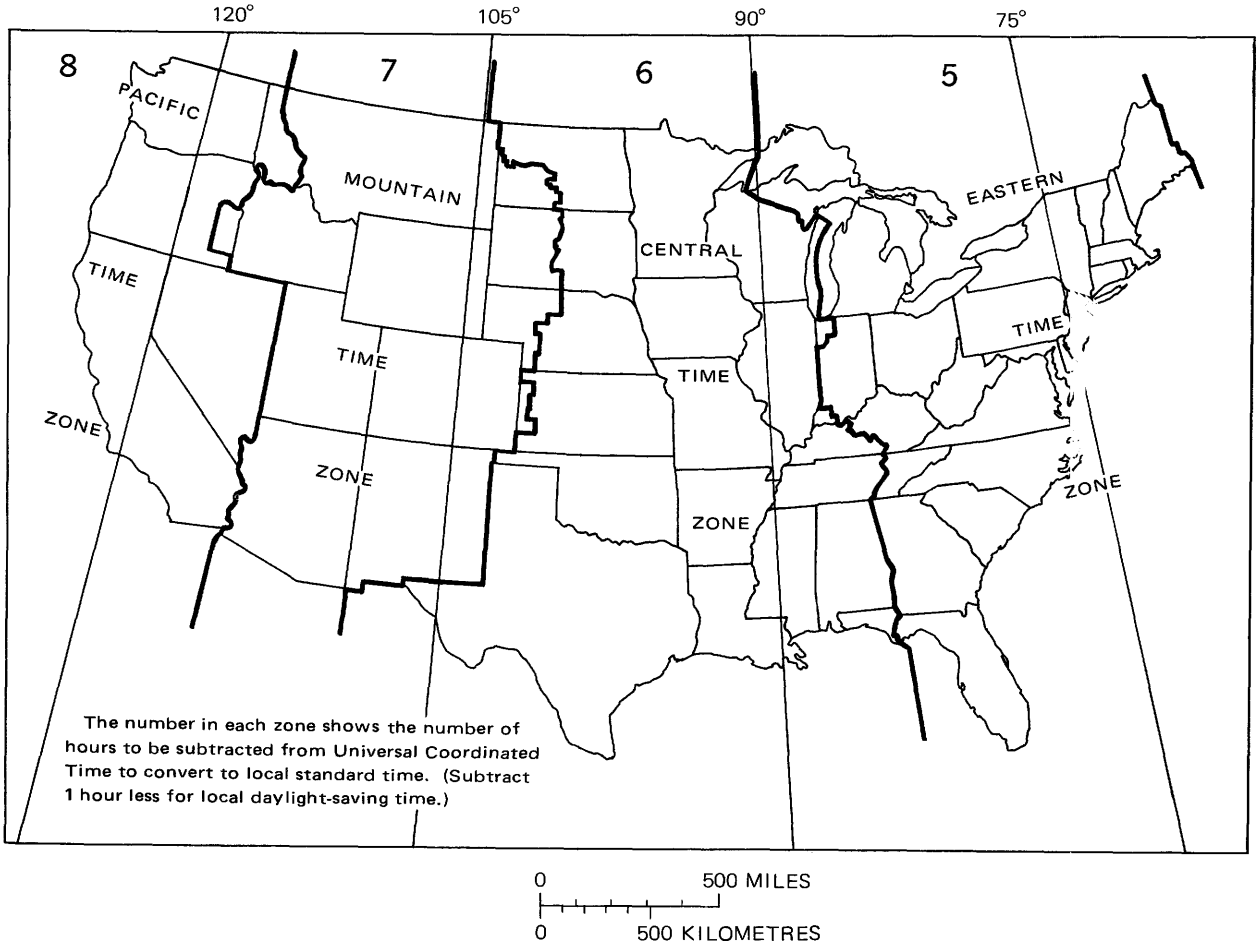

FIGURE 2.—Standard time zones of the conterminous United States. The numbers in each zone show the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

as defined by Richter (1958, p. 340), where A is the maximum trace amplitude, in micrometres, written by a Wood-Anderson torsion seismometer, and log A_0 is a standard value as a function of distance. M_L values are also calculated from other seismometers by conversion of recorded ground motion to the expected response of the torsion seismometer.

$$m_{bLg}=3.75+0.90\ (\log D)+\log\ (A/T) \qquad (4)$$
$$0.5°\leq D\leq 4°,$$

$$m_{bLg}=3.30+1.66\ (\log D)+\log\ (A/T)$$
$$4°\leq D\leq 30°,$$

as proposed by Nuttli (1973), where A/T is expressed in micrometres per second, calculated from the vertical-component 1-second Lg waves, and D is the distance, in geocentric degrees.

All the intensity values (indicated by Roman numerals) listed in this summary were derived, using the Modified Mercalli Intensity Scale of 1931, as shown below, from the evaluation of "Earthquake Report" forms, from field reports by U.S. Geological Survey personnel, engineering firms, or universities, and from detailed macroseismic data communicated to the NEIS by people in the area affected by the earthquake. All the earthquake reports received which contain minimal information are assigned an Intensity II. These reports are filed in the offices of the NEIS and are available for detailed study.

MODIFIED MERCALLI INTENSITY (DAMAGE) SCALE OF 1931

[abridged]

I. Not felt except by a very few under especially favorable circumstances.

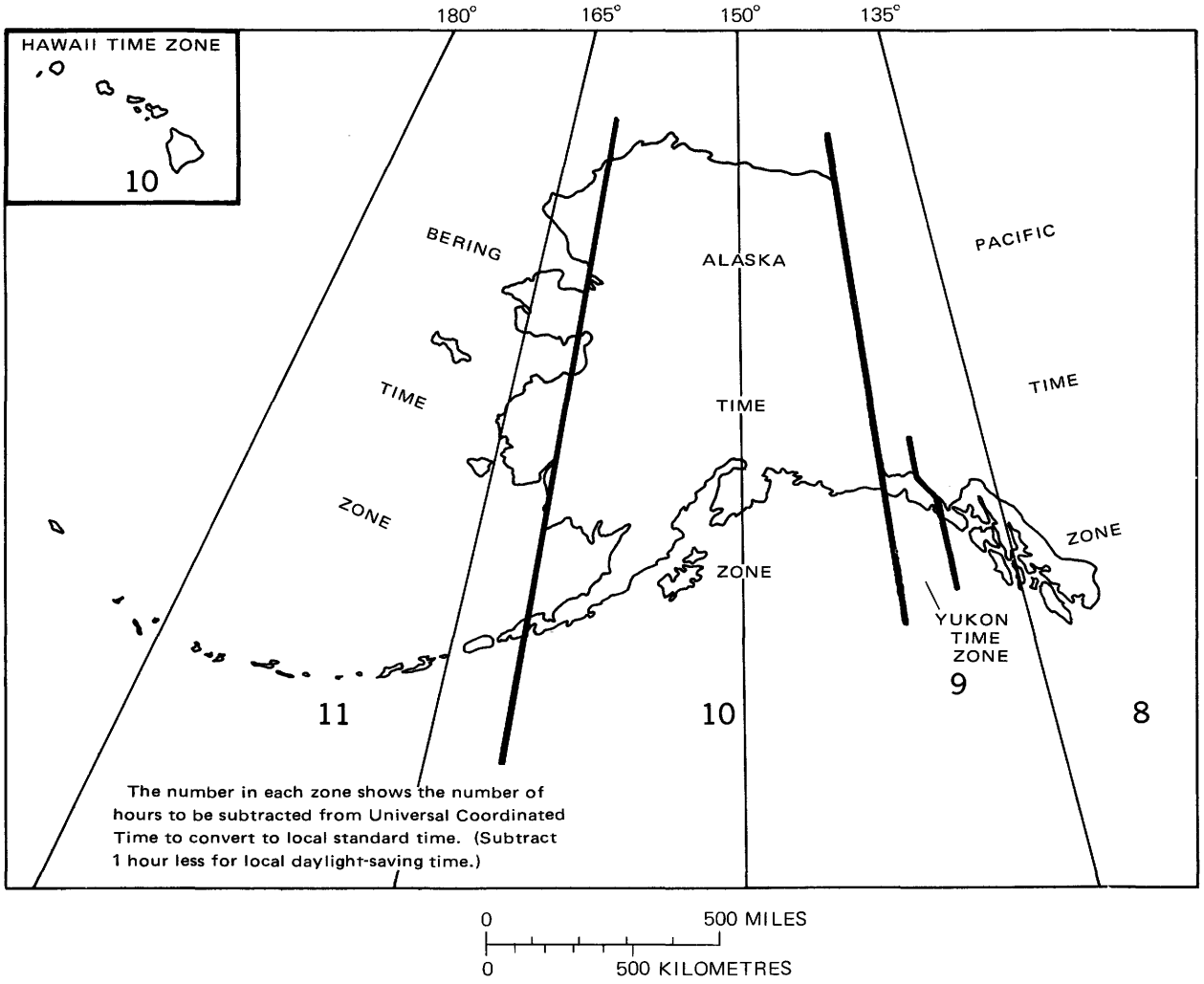

FIGURE 3—Standard time zones of Alaska and Hawaii. The numbers in each zone show the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

II. Felt only be a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.

III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibration like passing truck. Duration estimated.

IV. During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, and doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.

V. Felt by nearly everyone; many awakened. Some dishes, windows, and so forth, broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.

VI. Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.

VII. Everybody runs outdoors. Damage negligible in buildings of good design and construction, slight to moderate in well-built ordinary structures, considerable in poorly built or badly designed structures. Some chimneys broken. Noticed by persons driving motorcars.

VIII. Damage slight in specially designed structures; considerable in ordinary substan-

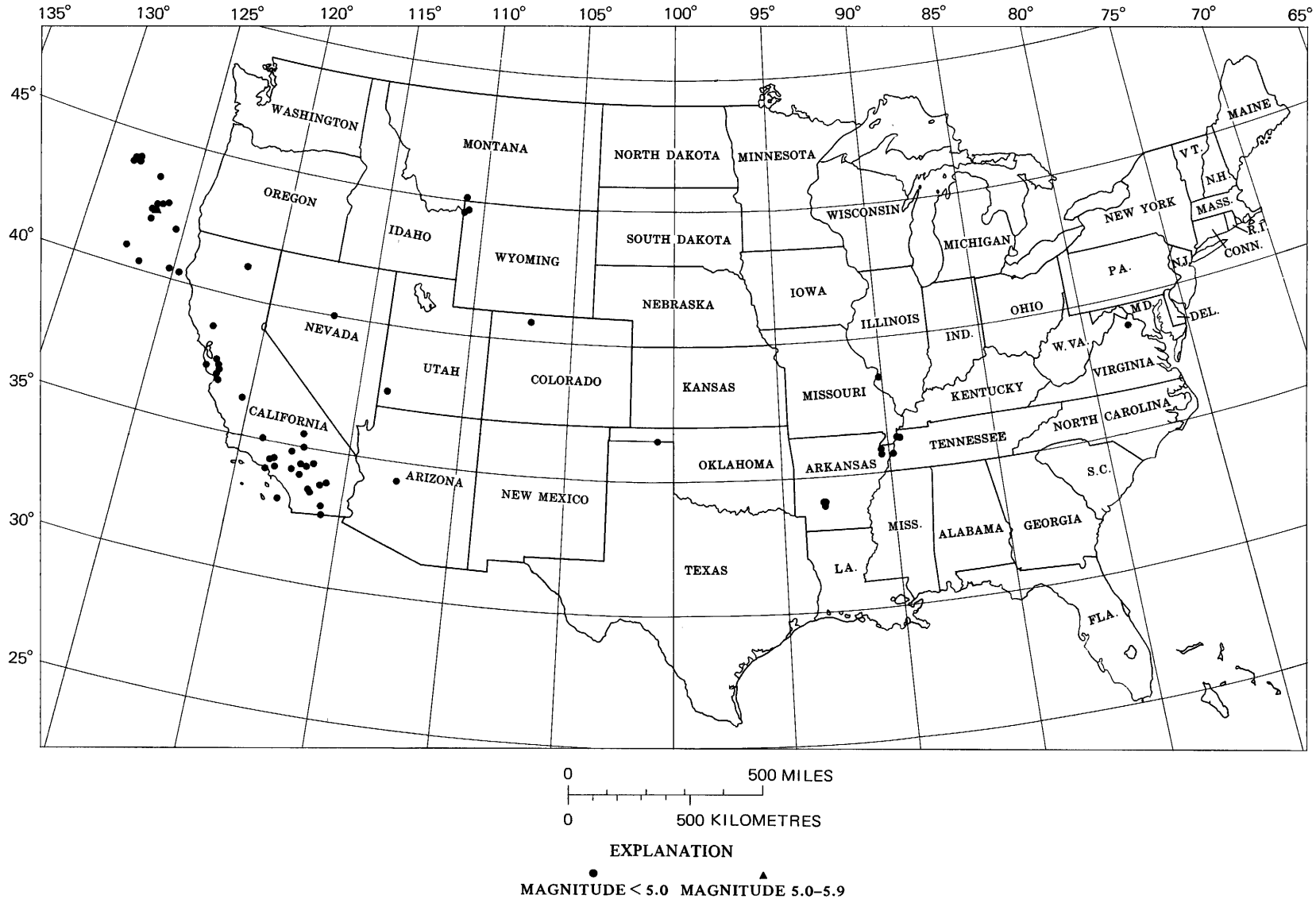

FIGURE 4—Earthquake epicenters in the conterminous United States for January–March 1974, plotted from table 1.

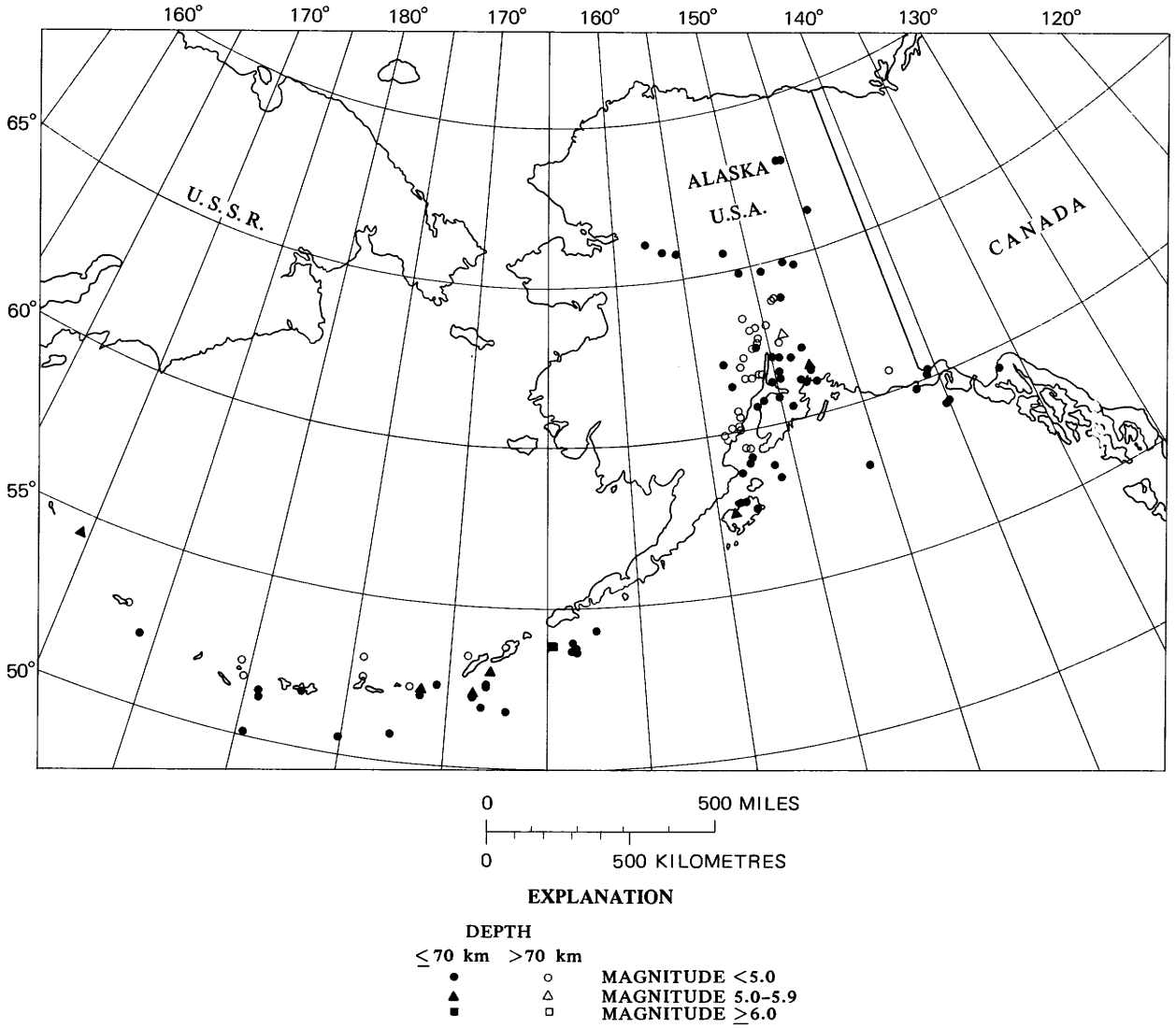

FIGURE 5.—Earthquake epicenters in Alaska for January–March 1974, plotted from table 1.

tial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motorcars disturbed.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides extensive from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.

XI. Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.

XII. Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.

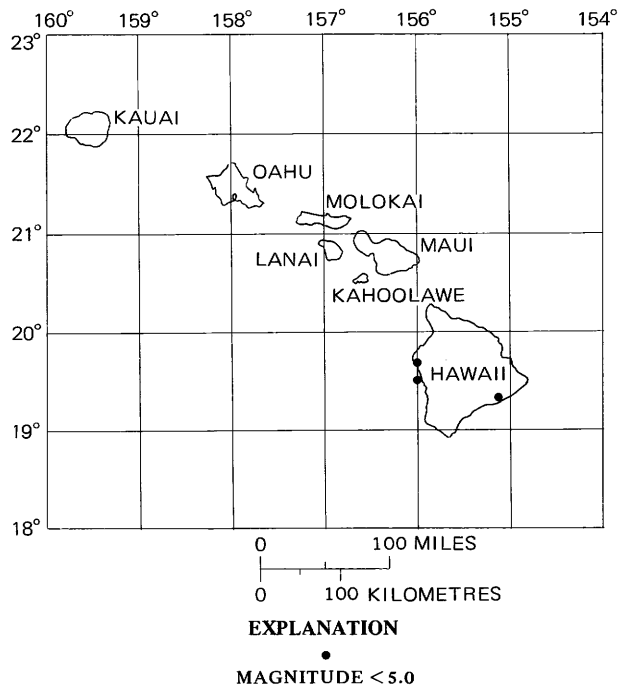

FIGURE 6.—Earthquake epicenters in Hawaii for January-March 1974, plotted from table 1.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March 1974*

[*Sources of the hypocenter and magnitudes: (B) University of California at Berkeley; (G) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (M) NOAA, Palmer Observatory, Alaska; (P) California Institute of Technology, Pasadena; (R) University of Nevada, Reno; (S) Saint Louis University, St. Louis, Missouri; (V) Virginia Polytechnic Institute and State University, Blacksburg; (W) University of Washington, Seattle. Dates and origin times are listed in Universal Coordinated Time (UTC), giving the hour, minute, and second. Only earthquakes with intensity data or explosions are listed.*]

Alaska

7 January (G) Central Alaska
Origin time: 17 47 03.0
Epicenter: 64.88° N., 147.55° W.
Depth: 10 km
Magnitude: None computed.
Intensity III: Fairbanks.

24 January (G) Southern Alaska
Origin time: 18 43 26.8
Epicenter: 61.58° N., 147.62° W.
Depth: 40 km
Magnitude: 4.8 m_b, 5.1 M_L (M)

Felt generally throughout south-central Alaska.
Intensity V: Sheep Mountain Lodge.
Intensity IV: Anchorage, Glenallen, and Palmer.
Intensity III: Valdez.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March, 1974*—Continued

25 January (G) Southern Alaska
Origin time: 01 00 21.3
Epicenter: 61.53° N., 147.60° W.
Depth: 28 km
Magnitude: 3.6 M_L (M)
Intensity II: Sutton.

31 January (G) Southern Alaska
Origin time: 15 09 27.7
Epicenter: 61.92° N., 148.66° W.
Depth: 66 km
Magnitude: None computed.
Intensity II: Palmer.

2 February (G) Southern Alaska
Origin time: 14 36 02.1
Epicenter: 61.46° N., 147.46° W.
Depth: 63 km
Magnitude: 3.8 m_b
Intensity II: Palmer.

2 February (G) Southern Alaska
Origin time: 15 55 28.3
Epicenter: 61.60° N., 147.60° W.
Depth: 48 km
Magnitude: 5.1 m_b, 4.7 M_S
Intensity II: Southern Alaska.

5 February (G) Central Alaska
Origin time: 02 25 22.0
Epicenter: 62.70° N., 148.85° W.
Depth: 75 km
Magnitude: 5.0 m_b
Intensity V: Gold Creek area.

6 February (G) Unimak Island region, Alaska
Origin time: 04 04 07.2
Epicenter: 53.79° N., 164.67° W.
Depth: 2 km
Magnitude: 5.9 m_b, 6.5 M_S, 6.3 M_S (P)
Intensity V: Cold Bay-Cape Sherichef area.
Intensity II: Unalaska.

16 February (G) Andreanof Islands, Aleutian Islands
Origin time: 17 52 52.0
Epicenter: 51.25° N., 179.28° W.
Depth: Normal.
Magnitude: 4.2 m_b
Intensity II: Adak.

9 March (G) Southern Alaska
Origin time: 14 18 52.3
Epicenter: 61.40° N., 149.62° W.
Depth: 42 km
Magnitude: None computed.
Intensity II: Wasilla.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January–March, 1974*—Continued

10 March (G) Andreanof Islands, Aleutian Islands
Origin time: 00 12 40.4
Epicenter: 50.53° N., 175.11° W.
Depth: 28 km
Magnitude: 4.7 m_b
Intensity: Adak.

10 March (G) Central Alaska
Origin time: 10 00 14.1
Epicenter: 63.16° N., 150.50° W.
Depth: 117 km
Magnitude: 4.5 m_b
Intensity II: Gold Creek area.

26 March (G) Central Alaska
Origin time: 06 56 34.0
Epicenter: 64.89° N., 157.98° W.
Depth: 34 km
Magnitude: 3.2 M_L (M)
Intensity III: Manley Hot Springs.

29 March (G) Kodiak Island region
Origin time: 21 50 35.3
Epicenter: 57.58° N., 153.92° W.
Depth: 44 km
Magnitude: 5.7 m_b, 5.2 M_S, 5.5 M_L (M)
Intensity IV: Kodiak.
Intensity II: Anchorage.

31 March (G) Andreanof Islands, Aleutian Islands
Origin time: 15 34 24.7
Epicenter: 51.71° N., 177.28° W.
Depth: 61 km
Magnitude: 4.4 m_b
Intensity IV: Adak.

Arizona

14 March (G) Western Arizona
Origin time: 20 59 57.2
Epicenter: 34°18′19.0″ N., 112°37′46.0″ W.
Elevation: 1.349 km
Magnitude: 4.1 m_b
Chemical explosion, 387.340 kg at Zonia mine.
Origin time is approximate.

Arkansas

15 February (S) Central Arkansas
Origin time: 22 35 44.7
Epicenter: 34.050° N., 93.130° W.
Depth: 1 km
Magnitude: 3.6 m_{bLg}, 4.2 m_b (G)
Felt information included in earthquake of February 15, 22 49 01.8 UTC (below).

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January–March, 1974*—Continued

15 February (S) Central Arkansas
Origin time: 22 49 01.8
Epicenter: 33.960° N., 93.030° W.
Depth: 1 km
Magnitude: 4.0 m_{bLg}, 3.8 m_b (G)
Felt over an area of 5,200 km² of central Arkansas (fig. 7).

Intensity V:
Arkadelphia—Loud roar preceded each of three shocks.
Beirne—Rumbling like distant thunder, walls shook, third shock "louder, sharper noise."
Bluff City—Furniture shifted. "Sounded like thunder."
Donaldson—Small objects shifted.
Gurdon—Light fixtures swinging.
Whelen Springs—Slight damage in this community. Three minor quakes felt, third more serious, causing dishes to rattle.

Intensity IV: Emmet, Friendship, Leola (rumbling like thunder), Malvern, Manning, Okolona, Ozan, Prescott, Sparkman, Tinsman, Vaden.

Intensity III: Cale, Camden, Harrell, Hope, Hot Springs, Little Rock, Sheridan, Texarkana.

Intensity II: Bonnerdale, El Dorado, McCaskill, Mabelvale, Magnolia.

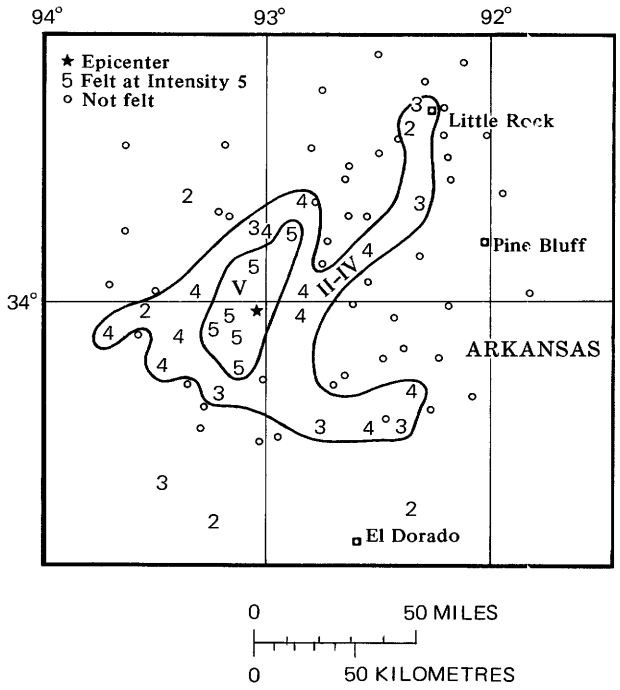

FIGURE 7.—Isoseismal map for the central Arkansas earthquake of 15 February 1974, 22 49 01.8 UTC.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March, 1974*—Continued

15 February (S) Central Arkansas
Origin time: 22 53 02.2
Epicenter: 33.920° N., 93.020° W.
Depth: 1 km
Magnitude: 2.8 m_{bLg}
Felt information included in earthquake of February 15, 22 49 01.8 UTC.

California

6 January (B) Northern California
Origin time: 13 55 23.2
Epicenter: 41.122° N., 121.493° W.
Depth: 5 km
Magnitude: 4.1 M_L, 4.5 m_b (G)
Felt over an area of approximately 3,200 km² (fig. 8).

Intensity VI:
Nubieber—awakened all in community. Ruptured main gas pipe leading to gas pumps at Chevron station.

Intensity V: Adin (two separate shocks felt), Bieber, Day, Fall River Mills, Glenburn (earthquake stopped an 8-day clock), Lookout, McArthur, McCloud, Pondosa.

Intensity II: Hat Creek.

8 January (B) Northern California
Origin time: 04 49

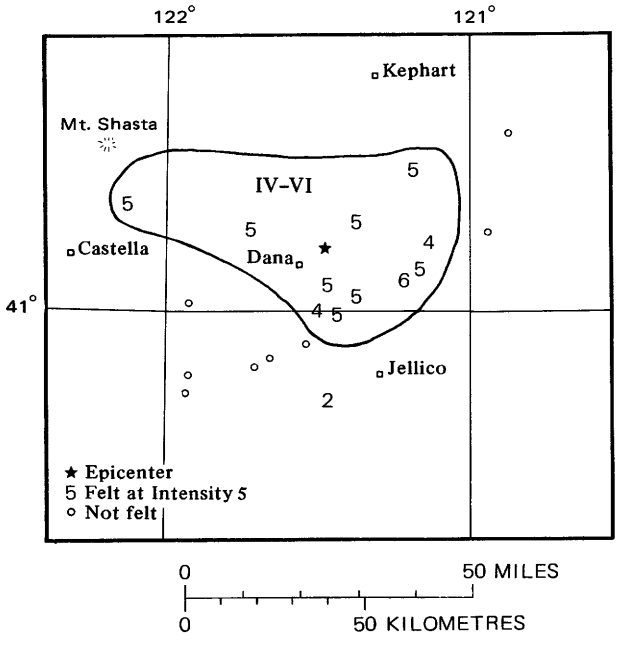

FIGURE 8.—Isoseismal map for the northern California earthquake of 6 January 1974, 13 55 23.2 UTC.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March, 1974*—Continued

8 January (B) Northern California—Continued
Epicenter: Not located.
Depth: None computed.
Magnitude: 2.2 M_L
Intensity II: Southeast Santa Rosa area—Short-duration (1 second) shock.

10 January (B) Central California
Origin time: 11 22 24.9
Epicenter: 36.955° N., 121.605° W.
Depth: 10 km
Magnitude: 4.4 m_b (G)
Felt over an area of 5,000 km² (fig. 9).

Intensity V:
Cupertino—All working night shift (post office) felt the earthquake.
Gilroy—There were 31 phone calls to the police station. Two sharp, rolling motions were felt.
Monterey County—Several residents heard "loud rumble."
Watsonville—One sharp shake, swaying effect, and sharp building noise reported.

Intensity IV:
Hollister—Residents of the Cienega district, near the Almaden winery heard "rolling noise." Felt 11 km south of Hollister.
Los Gatos.
Mount Hamilton—At the Lick Observatory, hanging objects swung moderately, and small objects and furniture shifted, but there was no damage to old buildings. Also felt 13 km east of Mount Hamilton.
Salinas—Reporter wrote that "pictures needed straightening."

Intensity III: San Francisco, South San Francisco, San Juan Bautista (soft, rocking motion and rumbling noises reported).

19 January (B) Southern California
Origin time: 13 13 37.2
Epicenter: 34.38° N., 117.05° W.
Depth: 0 km
Magnitude: 3.9 M_L, 3.1 m_b (G)
Intensity II: Apple and Lucerne Valleys and at Hesperia and Victorville.

24 January (P) Central California
Origin time: 05 02 00.8
Epicenter: 35.07° N., 119.03° W.
Depth: 8 km
Magnitude: 3.4 M_L, 4.0 M_L (B), 4.1 m_b (G)

Intensity V: Felt 32 km south of Bakersfield in the Tehachapi Mountains.
Intensity IV: California City.
Intensity II–III: Most of Kern County.

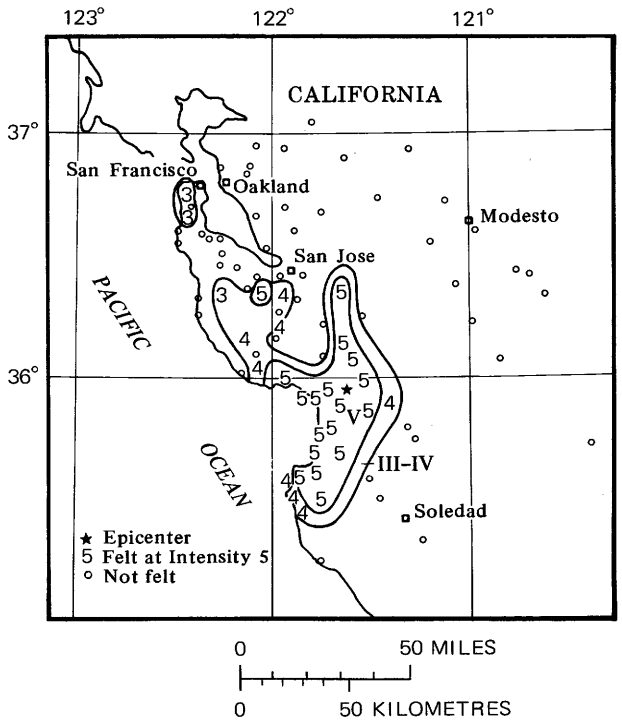

FIGURE 9.—Isoseismal map for the central California earthquake of 10 January 1974, 11 22 14.9 UTC.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January–March, 1974*—Continued

31 January (P) Southern California
Origin time: 06 05 28.8
Epicenter: 34.05° N., 117.03° W.
Depth: 8 km
Magnitude: 4.0 M_L, 3.8 m_b (G)
Felt over approximately 3,000 km² of the Riverside area (fig. 10).

Intensity V: Big Bear Lake, Del Rosa, Riverside, Sunnymead (distinct movement of water in waterbed, followed by rolling motion for approximately 1½ min).

Intensity IV: Calimesa, Corona, Crestline, East Highlands, Green Valley Lake, Hemet, Highland, Lakeview, Loma Linda, Moreno, Redlands ("More noise than movement in building"; another observer "heard two distinct booms," and "dogs started barking." A geologist reported feeling "a series of moderate and continuous sideways (east-west) jarring movements, estimated to last 5 seconds"), Running Springs, San Bernardino, Skyforest.

Intensity III: Norco, Nuevo, Yucaipa.
Intensity II: Cabazon, Sun City.

1 February (B) Central California
Origin time: 03 27 51.0
Epicenter: 36.78° N., 121.57° W.
Depth: 4 km

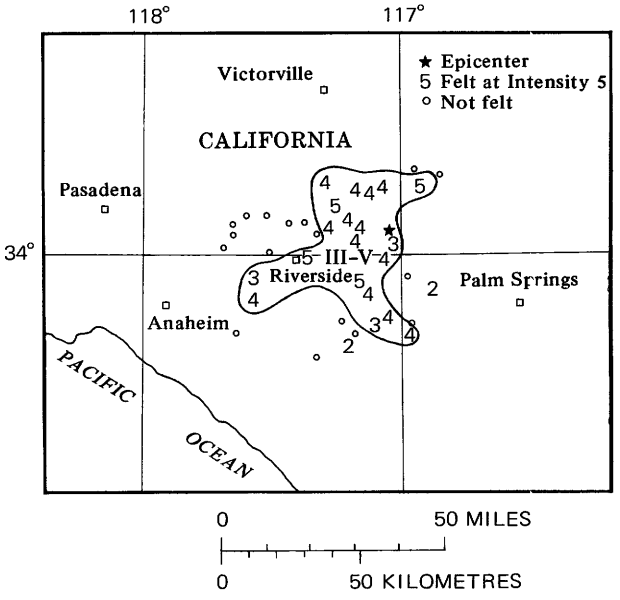

FIGURE 10.—Isoseismal map for the southern California earthquake of 31 January 1974, 06 05 28.8 UTC.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January–March, 1974*—Continued

1 February (B) Central California—Continued
Magnitude: 3.5 M_L
Intensity IV: 7800 Cienega Road, 11 km south of Hollister, the Salinas Substation of the Postal Service.

8 February (B) Central California
Origin time: 22 05 44.7
Epicenter: 37.38° N., 121.76° W.
Depth: 7 km
Magnitude: 3.3 M_L
Intensity II: Milpitas ("rumble in building").

11 February (P) Southern California
Origin time: 12 20 56.9
Epicenter: 34.10° N., 118.27° W.
Depth: 12 km
Magnitude: 3.4 M_L
Felt in the Silver Lake area of Los Angeles and in the San Fernando Valley area.

Intensity IV:
Glendale—Felt in two waves about 4 seconds apart.
Hollywood—Two thumps, 10 seconds apart.
West Los Angeles—One short quake, slight rattle of windows.

14 February Central California
Origin time: 05 20
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.
Intensity IV: Hollister (windows and doors rattled, building creaked).

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March, 1974*—Continued

15 February (P) Southern California
Origin time: 14 44 29.3
Epicenter: 34.417° N., 118.383° W.
Depth: 8 km
Magnitude: 3.7 M_L
Intensity II: Saugus area.

9 March (P) Southern California foreshock
Origin time: 00 54 13.6
Epicenter: 34.38° N., 118.42° W.
Depth: 8 km
Magnitude: 3.4 M_L
Felt information contained in earthquake of March 9, UTC 00 54 31.6.

9 March (P) Southern California
Origin time: 00 54 31.6
Epicenter: 34.38° N., 118.43° W.
Depth: 8 km
Magnitude: 4.5 M_L, 4.7 M_L (B),

Intensity V: Altadena (five observers said all their communities felt the shock), Flintridge, Glendale (swimming pool sloshed), Granada Hills, Hollywood, La Canada, La Crescenta, Newhall, Pacoima, Pasadena, San Fernando, Saugus, Sylmar, Van Nuys.
Intensity IV: Arcadia, Canoga Park, Compton, Fillmore, Inglewood, Manhattan Beach, Monrovia, Moorpark, Piru, Redondo Beach, Sierra Madre, Temple City, Simi Valley, Torrance, West Los Angeles, Woodland Hills.
Intensity III; Maywood.
Intensity II: El Segundo, Gardena, Palos Verdes, San Pedro, Thousand Oaks.

12 March (P) Southern California
Origin time: 07 35 46.0
Epicenter: 34.10° N., 118.20° W.
Depth: 8 km
Magnitude: 3.0 M_L
Felt in Los Angeles and San Fernando Valley areas.
Intensity IV: Hollywood (felt as "one sharp lurch").

12 March (B) Central California
Origin time: 12 45 28.1
Epicenter: 37.292° N., 122.317° W.
Depth: 11 km
Magnitude: 3.8 M_L
Intensity V: Big Basin State Park (ground cracked), La Honda, Pescadero, San Gregorio.

21 March (B) Northern California
Origin time: 21 16 03.6
Epicenter: 38.75° N., 122.45° W.
Depth: 2 km
Magnitude: 3.3 M_L, 3.8 m_b (G)
Felt in Cloverdale, Geyserville, and Healdsburg areas.
Intensity V: Cloverdale, Healdsburg (at Geysers powerplant clock fell off the wall, light fixtures broken, rockslides on rocky, loose soil).
Intensity IV: Cobb, Loch Lomond.
Intensity II: Calistoga.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March, 1974*—Continued

21 March (P) Southern California
Origin time: 22 50 05.7
Epicenter: 34.15° N., 117.47° W.
Depth: 8 km
Magnitude: 3.0 M_L
Intensity IV: Etiwanda.
Intensity II: Fontana.

24 March (B) Central California
Origin time: 16 57 09.0
Epicenter: 37.533° N., 121.847° W.
Depth: 8 km
Magnitude: 3.4 M_L
Intensity V: Sunol, Mission San Jose.
Intensity IV: Fremont.
Intensity II: Berkeley.

31 March (B) Central California
Origin time: 23 00 18.1
Epicenter: 36.937° N., 121.603° W.
Depth: 8 km
Magnitude: 3.6 M_L, 3.5 m_b (G)
Intensity IV–V: Watsonville (clock fell off the chimney).
Intensity III: Moss Landing.

California—Off the coast

16 March (G) Northern California
Origin time: 15 57 41.8
Epicenter: 40.34° N., 124.72° W.
Depth: Normal.
Magnitude: 4.7 m_b
Intensity IV:
Fortuna—Small objects shook slightly.
Humboldt Hill—North to south like a snap.
Rio Dell—Venetian blinds swung.
Intensity III: Eureka (at Humboldt Bay powerplant).

Colorado

31 March (G) Northern Colorado
Origin time: 11 58 47.1
Epicenter: 40.70° N., 107.05° W.
Depth: 5 km
Magnitude: 3.5 M_L
Intensity II: Clark and Steamboat Springs.

Hawaii

5 February (H) Island of Hawaii
Origin time: 04 16 54.0
Epicenter: 19.50° N., 156.00° W.
Depth: 15 km
Magnitude: 4.1 m_b (G), 4.5 M_L
Intensity II: Western side of Island.

6 February (H) Island of Hawaii
Origin time: 14 39 25.0
Epicenter: 19.67° N., 156.00° W.
Depth: 30 km

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March, 1974*—Continued

6 February (H) Island of Hawaii—Continued

Magnitude: 3.5 M_L
Intensity II: Kona.

Illinois

27 March (S) Western Illinois
Origin time: 16 10 56.3
Epicenter: 38.55° N., 90.13° W.
Depth: 10 km
Magnitude: 2.4 m_{bLg}
Intensity II:
Illinois—South and East St. Louis.
Missouri—St. Louis.

Iowa

7 January Central Iowa
Origin time: 16 47 ...
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.
May not have been of seismic origin. Possible explosion for highway construction..
Intensity IV: Cline, Elkhart, West Des Moines, Granger.
Intensity II: Cambridge, Carlisle, Indianola, Sheldahl.

Oklahoma

15 February (G) Oklahoma-Texas Panhandle
Origin time: 13 33 49.2
Epicenter: 36.50° N., 100.69° W.
Depth: 24 km
Magnitude: 4.5 m_b, 4.6 m_{bLg} (S)
Felt over an area of approximately 37,000 km² of Oklahoma, Texas, and Kansas (fig. 11). Maximum intensity V.
Intensity V:
Oklahoma—Balko, Knowles, May, Texhoma, Woodward (wall decoration fell in one home).
Texas—Booker (slight damage, few cracks opened in walls), Darrouzett (some plaster cracked), Perryton (a few glasses broken).
Intensity IV:
Kansas—Richfield, Rolla, Ulysses.
Oklahoma—Baker, Beaver, Elmwood, Eric (like sonic boom), Forgan, Goodwell, Hardesty, Reydon, Rosston, Sweetwater, Turpin, Tyrone, Vinson.
Texas—Briscoe, Farnsworth, Glazier, Gruver, Lipscomps, Morse, Sanford, Spearman, Stinnett, Sunray, Waka.
Intensity III:
Kansas—Ashland, Kismet.
Oklahoma—Adams, Buffalo, Camargo, Fort Supply, Gate, Guymon, Hooker, Mayfield, Optima, Sharon.
Texas—Amarillo, Borger, Canadian, Fritch.

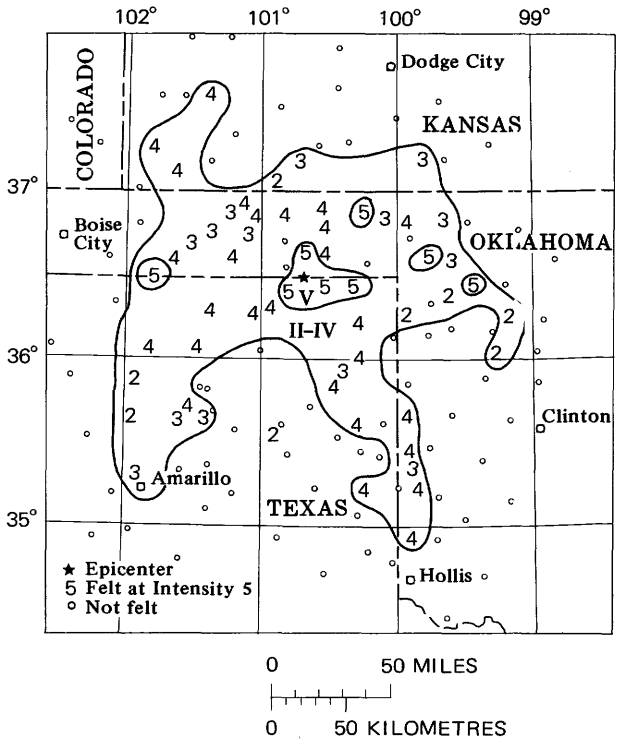

FIGURE 11.—Isoseismal map for the Oklahoma-Texas Panhandle earthquake of 15 February 1974, 13 33 49.2 UTC.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January-March, 1974*—Continued

15 February (G) Oklahoma-Texas Panhandle—Continued
Intensity II:
Kansas—Liberal.
Oklahoma—Fargo, Shattuck.
Texas—Dumas, Masterson, Pampa.

Tennessee

8 January (S) Tennessee-Missouri border region
Origin time: 01 12 37.4
Epicenter: 36.20° N., 89.39° W.
Depth: 1 km
Magnitude: 4.1 m_b (G), 4.3 m_{bLg}
Felt in Missouri, Tennessee, Kentucky, and Arkansas. Maximum intensity V (fig. 12).
Intensity V:
Missouri—Burfordville.
Tennessee—Bogota (loud noises frightened many), Dyersburg (light objects and furniture shifted), Elbridge (described as "very heavy shakes"), Hornbeak, Miston (loud noises like logs rolling under house), Ridgely.
Intensity IV:
Missouri—Deering, Gobler, Hayti.
Tennessee—Bradford, Darden, Lane, Friendship, Obion, Samburg, Wynnburg.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, January–March, 1974*—Continued

8 January (S) Tennessee-Missouri border region—Continued
Intensity III:
Illinois—Perks.
Missouri—Matthews.
Tennessee—Morris Chapel, Trimble, Troy, Scotts Hill.
Intensity II:
Arkansas—Keiser, McCougal.
Illinois—Royalton.
Missouri—Campbell, Caruthersville, Oxly, Steele.
Tennessee—Camden, Tiptonville, Woodland Mills.

Texas

15 February (G) Oklahoma-Texas Panhandle
(See Oklahoma listing.)

Utah

10 March (G) Southwestern Utah
Origin time: 01 50 21.3
Epicenter: 37.57° N., 113.68° W.
Depth: 2 km
Magnitude: None computed.
Intensity II: Enterprise.

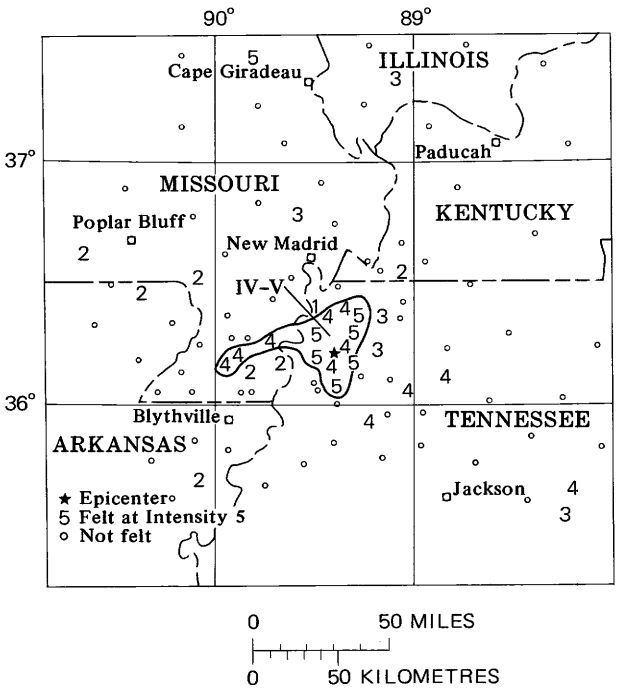

FIGURE 12.—Isoseismal map for the western Tennessee earthquake of 8 January 1974, 01 12 37.4 UTC.

ACKNOWLEDGMENTS

Some of the intensity values listed in this summary were evaluated by Nina Scott, before her retirement on July 1, 1974. Also, some preliminary evaluations were made by David L. Carver of the NEIS, and some additional intensity information was supplied by Jerry L. Coffman, NOAA, Environmental Data Services.

Listed below are the collaborators who furnished data to the National Earthquake Information Service for use in this publication:

ALASKA: Staff of NOAA, Palmer Observatory, Palmer.
ARKANSAS: Ronald Konig, Seismograph Station, University of Arkansas, Fayetteville.
CALIFORNIA: Clarence R. Allen, Seismological Laboratory, California Institute of Technology, Pasadena.
Bruce A. Bolt, Seismograph Station, University of California at Berkeley.
HAWAII: Robert Y. Koyanagi, U.S. Geological Survey, Hawaiian Volcano Observatory, Hawaii National Park.
MISSOURI: Otto Nuttli, Department of Geology and Physics, St. Louis University, St. Louis.
NEVADA: Alan Ryall, Mackay School of Mines, University of Nevada, Reno.
VIRGINIA: G. A. Bollinger, Department of Geological Sciences, Virginia Polytechnic Institute and State University, Blacksburg.

REFERENCES CITED

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

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

Nuttli, O. W., 1973, Seismic wave attenuation and magnitude relations for eastern North America: Jour. Geophys. Research, v. 78, no. 5, p. 876–885.

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

☆U.S. GOVERNMENT PRINTING OFFICE: 1975—677-340/43