GEOLOGICAL SURVEY CIRCULAR 723–B

Earthquakes in the United States, April–June 1974

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

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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 U.S. 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 in chronological order by State, 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 seven 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, Colo. 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, to which later data from other sources may be added for the purposes 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.

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Form Approved
OMB No. 41-R0013

EARTHQUAKE REPORT

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.

DISCUSSION OF TABLES

The parameters for the earthquakes in table 1 and table 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 Universal Coordinated Time (UTC), and the secondary one is local standard time based on the time-zone maps in figures 2 and 3. The times are adjusted one 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 M_S, and

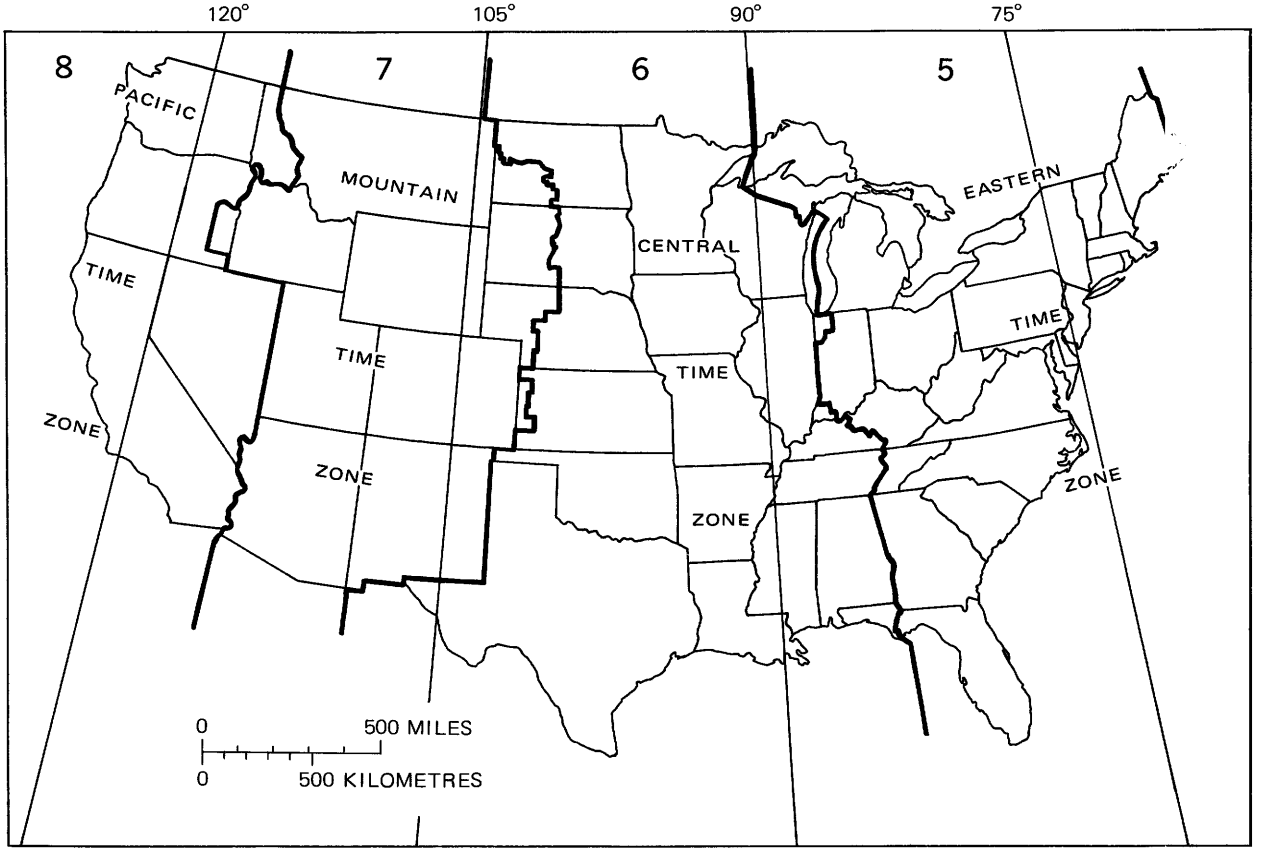

FIGURE 2.—Standard time zones of the conterminous United States. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

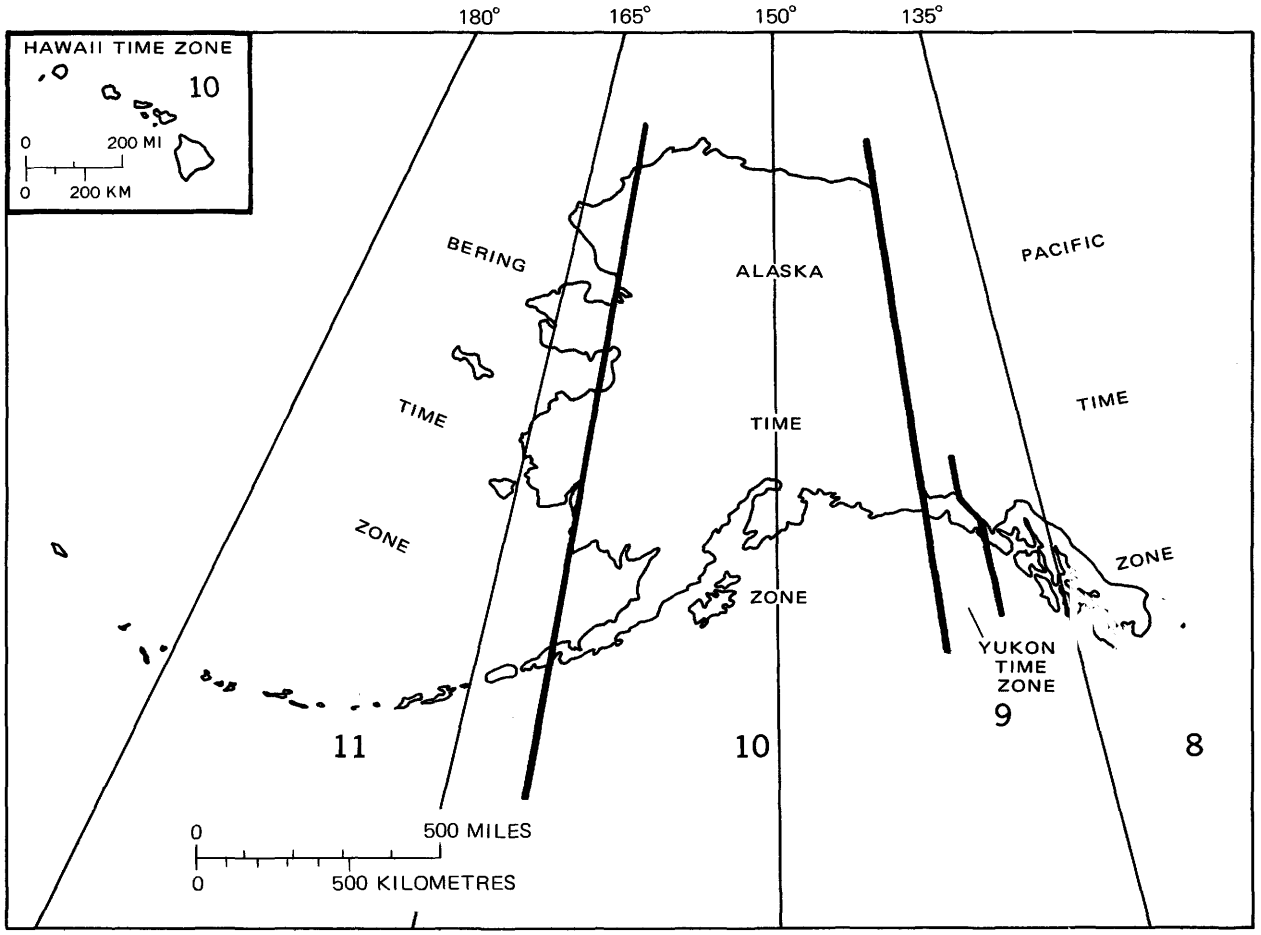

FIGURE 3.—Standard time zones of Alaska and Hawaii. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

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 labelled according to the assigned letter codes shown in 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 indicated otherwise, 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 $0.1 < T < 3.0$, 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 $D \geq 5°$.

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

TABLE 1.—*Summary of United States earthquakes for April-June 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; (L) Lamont Doherty Geological Observatory, Palisades, New York; (M) NOAA, Palmer Observatory, Alaska; (P) California Institute of Technology, Pasadena; (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. Leaders (. . .) indicate no information available]

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						
Apr. 1	23 16 57.4	63.12 N.	150.77 W.	115	. . .	. . .	. . .	. . .	G	Apr. 1	02 p.m. ADT
Apr. 2	11 19 30.6	62.98 N.	150.53 W.	108	. . .	. . .	. . .	. . .	G	Apr. 2	02 a.m. ADT
Apr. 2	19 08 04.1	59.67 N.	146.85 W.	48	3.3	. . .	. . .	. . .	G	Apr. 2	10 a.m. ADT
Apr. 3	16 10 17.9	62.18 N.	148.58 W.	87	. . .	. . .	. . .	. . .	G	Apr. 3	05 a.m. ADT
Apr. 3	16 34 13.5	61.78 N.	149.51 W.	48	. . .	. . .	. . .	. . .	G	Apr. 3	05 a.m. ADT
Apr. 5	08 53 44.6	51.38 N.	177.69 E.	80	4.1	. . .	. . .	. . .	G	Apr. 4	10 p.m. BDT
Apr. 5	14 24 43.3	61.47 N.	146.41 W.	23	. . .	. . .	3.0M	. . .	G	Apr. 5	05 a.m. ADT
Apr. 5	19 49 46.0	62.07 N.	149.66 W.	52	. . .	. . .	. . .	. . .	G	Apr. 5	10 a.m. ADT
Apr. 6	01 53 47.3	55.10 N.	160.44 W.	27	5.7	5.1	. . .	VI	G	Apr. 5	04 p.m. ADT
Apr. 6	02 27 21.8	55.33 N.	160.60 W.	N	4.3	. . .	. . .	II	G	Apr. 5	05 p.m. ADT
Apr. 6	03 56 01.8	55.12 N.	160.44 W.	40	6.0	5.3	. . .	II	G	Apr. 5	06 p.m. ADT
Apr. 6	05 12 26.4	57.80 N.	153.49 W.	53	4.6	. . .	. . .	. . .	G	Apr. 5	08 p.m. ADT
Apr. 7	16 35 15.1	60.03 N.	152.63 W.	124	. . .	. . .	. . .	. . .	G	Apr. 7	07 a.m. ADT
Apr. 8	11 14 19.8	58.31 N.	154.89 W.	85	4.0	. . .	. . .	. . .	G	Apr. 8	02 a.m. ADT
Apr. 9	16 52 35.7	62.93 N.	149.59 W.	129	. . .	. . .	. . .	. . .	G	Apr. 9	07 a.m. ADT
Apr. 9	20 51 11.0	51.35 N.	177.82 E.	37	4.7	4.7	. . .	. . .	G	Apr. 9	10 a.m. BDT
Apr. 10	01 28 15.9	52.51 N.	168.74 W.	15	4.6	. . .	. . .	. . .	G	Apr. 9	03 p.m. BDT
Apr. 10	03 55 59.5	58.32 N.	148.33 W.	60	3.6	. . .	. . .	. . .	G	Apr. 9	06 p.m. ADT
Apr. 10	04 40 42.1	60.20 N.	152.74 W.	129	. . .	. . .	. . .	. . .	G	Apr. 9	07 p.m. ADT
Apr. 11	06 53 04.7	52.01 N.	170.52 W.	N	4.5	. . .	. . .	. . .	G	Apr. 10	08 p.m. BDT
Apr. 13	13 35 24.8	58.80 N.	153.69 W.	19	4.3	. . .	4.4M	. . .	G	Apr. 13	04 a.m. ADT
Apr. 14	04 07 19.6	54.76 N.	170.85 E.	40	4.2	. . .	. . .	. . .	G	Apr. 13	06 p.m. BDT
Apr. 14	15 43 10.6	64.20 N.	173.99 W.	N	4.5	. . .	. . .	. . .	G	Apr. 14	05 a.m. BDT
Apr. 15	02 29 35.0	64.14 N.	173.94 W.	N	4.3	. . .	. . .	. . .	G	Apr. 14	04 p.m. BDT
Apr. 15	16 27 35.5	59.19 N.	136.42 W.	7	4.2	. . .	. . .	IV	G	Apr. 15	09 a.m. PDT
Apr. 16	18 06 29.7	51.72 N.	175.51 E.	40	4.2	. . .	. . .	. . .	G	Apr. 16	08 a.m. BDT
Apr. 17	00 39 40.6	51.73 N.	173.48 W.	46	4.9	4.7	. . .	. . .	G	Apr. 16	02 p.m. BDT
Apr. 18	21 54 26.4	59.16 N.	139.97 W.	28	3.9	. . .	4.4M	II	G	Apr. 18	01 p.m. YDT
Apr. 19	14 19 01.5	61.84 N.	154.72 W.	N	. . .	. . .	3.1M	. . .	G	Apr. 19	05 a.m. ADT
Apr. 20	08 22 21.3	52.97 N.	167.37 W.	42	4.3	. . .	. . .	. . .	G	Apr. 19	10 p.m. BDT
Apr. 20	17 38 29.3	51.87 N.	173.86 W.	40	4.0	. . .	. . .	. . .	G	Apr. 20	07 a.m. BDT
Apr. 22	02 29 40.1	51.98 N.	176.05 W.	70	4.9	. . .	. . .	V	G	Apr. 21	04 p.m. BDT
Apr. 22	04 22 29.6	52.40 N.	169.53 W.	43	4.2	. . .	. . .	. . .	G	Apr. 21	06 p.m. BDT
Apr. 22	04 31 00.5	52.55 N.	169.55 W.	32	4.5	. . .	. . .	. . .	G	Apr. 21	06 p.m. BDT
Apr. 23	01 39 58.0	56.20 N.	154.02 W.	59	4.0	. . .	. . .	. . .	G	Apr. 22	04 p.m. ADT
Apr. 24	13 18 59.2	63.86 N.	148.85 W.	121	. . .	. . .	. . .	. . .	G	Apr. 24	04 a.m. ADT
Apr. 25	08 33 59.4	66.45 N.	157.59 W.	101	. . .	. . .	. . .	. . .	G	Apr. 24	11 p.m. ADT
Apr. 26	01 07 08.7	51.75 N.	176.74 W.	64	4.7	. . .	. . .	III	G	Apr. 25	03 p.m. BDT
Apr. 26	14 23 14.6	61.84 N.	150.66 W.	78	3.3	. . .	. . .	. . .	G	Apr. 26	05 a.m. ADT
Apr. 28	00 48 12.9	63.20 N.	150.52 W.	130	3.6	. . .	. . .	. . .	G	Apr. 27	03 p.m. ADT
Apr. 28	16 27 39.8	61.67 N.	149.02 W.	32	. . .	. . .	2.6M	II	G	Apr. 28	07 a.m. ADT
Apr. 30	02 54 34.9	51.13 N.	179.30 E.	58	4.2	. . .	. . .	. . .	G	Apr. 29	04 p.m. BDT
Apr. 30	19 47 39.8	51.09 N.	172.72 W.	12	4.8	. . .	. . .	. . .	G	Apr. 30	09 a.m. BDT
May 1	10 21 52.9	58.65 N.	137.63 W.	17	3.6	. . .	3.5M	. . .	G	May 1	03 a.m. PDT
May 2	10 40 23.8	53.15 N.	170.52 W.	131	4.3	. . .	. . .	. . .	G	May 2	12 a.m. BDT
May 2	11 28 49.7	55.73 N.	158.80 W.	47	4.0	. . .	. . .	. . .	G	May 2	02 a.m. ADT
May 2	14 07 22.5	51.29 N.	179.49 E.	54	4.4	. . .	. . .	. . .	G	May 2	04 a.m. BDT
May 2	21 45 39.1	52.23 N.	171.97 W.	47	4.0	. . .	. . .	. . .	G	May 2	11 a.m. BDT
May 4	08 02 00.2	56.29 N.	153.26 W.	10	4.6	. . .	. . .	. . .	G	May 3	11 p.m. ADT
May 4	08 47 04.6	56.29 N.	153.29 W.	2	4.4	. . .	. . .	. . .	G	May 3	11 p.m. ADT

TABLE 1.—*Summary of United States earthquakes for April-June 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											
May 4	09 22.6	57.22 N.	152.93 W.	74	4.2	...	...	...	G	May 4	12 a.m. ADT
May 4	16 23 06.6	62.29 N.	148.66 W.	64	...	...	...	...	G	May 4	07 a.m. ADT
May 4	20 08 49.6	62.61 N.	149.56 W.	19	...	...	3.0M	...	G	May 4	11 a.m. ADT
May 4	22 28 51.2	58.17 N.	151.63 W.	47	...	...	...	...	G	May 4	01 p.m. ADT
May 8	04 27 13.1	63.66 N.	150.72 W.	11	4.6	...	4.7M	III	G	May 7	07 p.m. ADT
May 11	04 17 34.7	61.66 N.	150.58 W.	67	3.8	...	...	II	G	May 10	07 p.m. ADT
May 11	19 10 47.8	56.49 N.	153.07 W.	27	4.9	...	4.1M	...	G	May 11	10 a.m. ADT
May 13	05 10 49.8	55.86 N.	158.51 W.	41	4.9	...	5.0M	...	G	May 12	08 p.m. ADT
May 13	16 50 ...	Not located		...	...	...	...	III	...	May 13	07 a.m. ADT
May 14	14 07 35.7	54.30 N.	164.10 W.	27	4.8	4.5	...	...	G	May 14	04 a.m. BDT
May 15	05 39 49.0	62.49 N.	151.31 W.	88	...	...	...	...	G	May 14	08 p.m. ADT
May 15	10 58 03.3	62.46 N.	150.97 W.	116	...	...	...	...	G	May 15	01 a.m. ADT
May 15	13 04 04.1	52.40 N.	168.81 W.	44	5.0	4.5	...	...	G	May 15	03 a.m. BDT
May 15	16 17 21.5	66.38 N.	142.41 W.	82	...	...	...	...	G	May 15	07 a.m. ADT
May 16	05 12 38.6	52.25 N.	170.57 W.	N	4.4	...	...	...	G	May 15	07 p.m. BDT
May 16	08 55 46.4	51.05 N.	179.03 W.	42	4.3	...	...	...	G	May 15	10 p.m. BDT
May 16	10 56 02.4	62.20 N.	151.06 W.	88	3.2	...	...	...	G	May 16	01 a.m. ADT
May 16	20 48 44.3	64.67 N.	149.48 W.	46	...	...	3.2M	...	G	May 16	11 a.m. ADT
May 16	22 55 06.7	62.97 N.	150.80 W.	129	3.6	...	...	...	G	May 16	01 p.m. ADT
May 18	14 53 40.1	59.85 N.	153.51 W.	136	3.8	...	...	...	G	May 18	05 a.m. ADT
May 19	16 34 16.8	63.64 N.	149.64 W.	127	...	...	...	...	G	May 19	07 a.m. ADT
May 19	18 51 56.5	55.23 N.	160.45 W.	N	4.3	...	...	...	G	May 19	09 a.m. ADT
May 20	18 43 32.3	52.62 N.	172.02 E.	38	4.6	...	...	...	G	May 20	08 a.m. BDT
May 21	23 31 41.2	63.31 N.	151.24 W.	12	4.2	...	4.6M	II	G	May 21	02 p.m. ADT
May 23	05 16 54.2	50.20 N.	179.53 W.	35	4.8	...	...	...	G	May 22	07 p.m. BDT
May 24	22 30 02.0	58.11 N.	156.83 W.	126	4.5	...	...	...	G	May 24	01 p.m. ADT
May 26	15 52 50.6	62.93 N.	148.23 W.	88	...	...	...	II	G	May 26	06 a.m. ADT
May 26	18 13 58.6	61.57 N.	150.24 W.	3	...	...	...	II	G	May 26	09 a.m. ADT
May 27	14 01 43.5	60.32 N.	146.01 W.	21	5.5	5.7	5.4M	III		May 27	05 a.m. ADT
May 28	08 21 59.4	60.61 N.	149.77 W.	27	3.4	...	3.8M	...	G	May 27	11 p.m. ADT
May 31	03 13 10.7	53.60 N.	163.81 W.	N	4.8	4.6	...	...	G	May 30	05 p.m. BDT
May 31	06 25 54.7	60.54 N.	151.36 W.	65	3.4	...	...	...	G	May 30	09 p.m. ADT
June 1	11 42 13.3	65.80 N.	155.08 W.	N	...	...	3.0M	...	G	June 1	02 a.m. ADT
June 1	12 46 39.6	65.78 N.	155.12 W.	35	...	...	3.1M	...	G	June 1	03 a.m. ADT
June 1	14 40 36.6	63.06 N.	151.03 W.	131	3.4	...	...	...	G	June 1	05 a.m. ADT
June 2	18 05 02.0	53.74 N.	165.72 W.	72	4.2	...	...	...	G	June 2	08 a.m. BDT
June 6	10 53 08.2	52.01 N.	175.40 W.	62	4.1	...	...	II	G	June 6	12 a.m. BDT
June 7	17 50 08.8	50.92 N.	170.62 W.	N	5.0	...	...			June 7	07 a.m. BDT
June 9	03 19 25.8	58.40 N.	152.65 W.	18	...	...	3.3M	...	G	June 8	06 p.m. ADT
June 9	04 00 07.8	52.42 N.	170.18 W.	48	4.3	...	...	...	G	June 8	06 p.m. BDT
June 9	06 02 48.9	52.48 N.	170.17 W.	N	4.1	...	...	...	G	June 9	08 p.m. BDT
June 10	14 34 22.3	54.76 N.	161.64 W.	11	4.8	...	...	...	G	June 10	05 a.m. ADT
June 11	10 19 34.7	61.47 N.	152.45 W.	122	3.2	...	...	...	G	June 11	01 a.m. ADT
June 11	13 37 46.6	57.67 N.	151.67 W.	6	3.7	...	3.7M	...	G	June 11	04 a.m. ADT
June 11	20 20 44.9	51.91 N.	173.53 W.	58	4.8	...	...	II	G	June 11	10 a.m. BDT
June 12	14 18 21.0	62.96 N.	150.80 W.	121	3.6	...	...	...	G	June 12	05 a.m. ADT
June 12	16 46 34.3	52.44 N.	170.20 W.	46	5.2	...	5.2M	...	G	June 12	06 a.m. BDT
June 13	00 42 38.3	60.38 N.	143.55 W.	N	3.5	...	3.3M	...	G	June 12	03 p.m. ADT
June 15	02 37 13.8	52.26 N.	178.79 E.	157	5.7	...	...	...	G	June 14	05 a.m. BDT
June 17	21 53 25.8	51.96 N.	179.47 E.	190	4.2	...	...	...	G	June 17	11 a.m. BDT
June 19	11 35 11.7	53.82 N.	163.43 W.	N	4.7	...	...	...	G	June 19	01 a.m. BDT
June 19	23 27 44.8	61.68 N.	149.49 W.	13	...	...	2.9M	...	G	June 19	02 p.m. ADT
June 21	23 57 01.9	63.19 N.	149.70 W.	100	...	...	...	...	G	June 21	02 p.m. ADT
June 22	20 35 37.0	51.24 N.	178.23 W.	49	4.5	...	...	II	G	June 22	10 a.m. BDT
June 22	22 49 05.2	51.94 N.	173.94 E.	19	4.6	...	...	...	G	June 22	12 p.m. BDT

TABLE 1.—*Summary of United States earthquakes for April-June 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											
June 23	05 14 53.8	52.53 N.	169.02 W.	42	5.0	...	...	...	G	June 22	07 p.m. BDT
June 24	21 20 22.1	63.16 N.	149.88 W.	75	5.5	...	...	...	G	June 24	12 p.m. ADT
June 25	06 23 30.2	63.19 N.	149.22 W.	108	...	...	...	...	G	June 24	09 p.m. ADT
June 29	06 59 24.6	61.41 N.	149.88 W.	67	...	...	...	...	G	June 28	09 p.m. ADT
June 29	18 46 37.5	60.28 N.	153.54 W.	179	...	...	...	...	G	June 29	09 a.m. ADT
California											
Apr. 1	14 07 22.1	33.48 N.	116.43 W.	8	...	...	3.2P	...	P	Apr. 1	07 a.m. PDT
Apr. 5	10 42 50.7	34.53 N.	116.45 W.	8	...	...	4.0P	...	P	Apr. 5	03 a.m. PDT
Apr. 9	09 13 ...	Not located	... ...	...	...	...	2.2B	IV	...	Apr. 9	02 a.m. PDT
Apr. 17	19 30 20.4	36.56 N.	122.00 W.	7	...	...	3.2B	IV	B	Apr. 17	12 p.m. PDT
Apr. 20	01 35 03.6	34.73 N.	118.45 W.	8	3.5	...	3.3P	...	P	Apr. 19	06 p.m. PDT
Apr. 26	12 26 13.6	40.50 N.	124.00 W.	...	...	...	3.3B	IV		Apr. 26	05 a.m. PDT
Apr. 29	14 59 ...	Not located	... ...	...	...	...	...	II	...	Apr. 29	07 a.m. PDT
May 6	20 31 48.4	37.04 N.	116.52 W.	8	3.6	...	3.1P	...	P	May 6	01 p.m. PDT
May 16	06 48 01.4	35.08 N.	118.97 W.	8	...	...	3.5P	...	P	May 15	11 p.m. PDT
May 22	00 28 36.7	34.53 N.	116.53 W.	8	...	...	3.5P	...	P	May 21	05 p.m. PDT
May 25	14 51 43.4	34.90 N.	116.95 W.	8	...	...	3.2P	...	P	May 25	07 a.m. PDT
May 26	14 13 59.0	34.20 N.	117.52 W.	8	...	...	3.0P	...	P	May 26	07 a.m. PDT
May 27	09 19 19.7	39.852 N.	120.910W.	2	4.6	...	3.9B	V		May 27	02 a.m. PDT
May 27	11 42 47.1	34.70 N.	116.37 W.	8	...	...	3.6P	...	P	May 27	04 a.m. PDT
May 27	11 56 27.5	34.65 N.	116.35 W.	8	...	...	3.1P	...	P	May 27	04 a.m. PDT
May 27	14 09 37.6	34.67 N.	116.37 W.	8	...	...	3.8P	...	P	May 27	07 a.m. PDT
May 28	17 03 51.9	35.50 N.	118.63 W.	8	...	...	3.2P	...	P	May 28	10 a.m. PDT
May 30	00 45 43.7	34.82 N.	117.55 W.	8	...	...	3.2P	...	P	May 29	05 p.m. PDT
May 31	03 43 24.2	35.83 N.	117.40 W.	8	...	...	3.2P	...	P	May 30	08 p.m. PDT
June 2	06 54 21.9	33.10 N.	115.60 W.	8	...	...	3.1P	...	P	June 1	11 p.m. PDT
June 3	21 24 02.6	35.05 N.	118.88 W.	8	...	...	3.3P	...	P	June 3	02 p.m. PDT
June 6	12 13 49.8	38.45 N.	122.64 W.	2	3.5	...	3.1B	IV		June 6	05 a.m. PDT
June 7	07 09 58.2	33.65 N.	118.33 W.	8	...	...	3.0P	...	P	June 7	12 a.m. PDT
June 9	22 27 33.7	35.53 N.	117.45 W.	8	...	...	4.0P	II		June 9	03 p.m. PDT
June 10	06 44 09.9	35.53 N.	117.45 W.	8	4.1	...	4.2P	V	P	June 9	11 p.m. PDT
June 10	15 02 ...	Not located	.....	...	...	...	2.5B	II	...	June 10	08 a.m. PDT
June 11	04 55 07.0	35.60 N.	115.65 W.	19	...	...	3.9P	...	G	June 10	09 p.m. PDT
June 12	19 21 51.2	36.718 N.	121.425W.	5	3.7	...	3.7B	V	B	June 12	12 p.m. PDT
June 13	11 10 ...	Near Ferndale	....	...	...	...	...	II	...	June 13	04 a.m. PDT
June 14	14 03 ...	Near Hollister	....	...	...	...	...	IV	...	June 14	07 a.m. PDT
June 14	23 47 53.9	34.20 N.	117.12 W.	8	...	...	3.0P	...	...	June 14	04 p.m. PDT
June 15	00 24 ...	Near Oakland	.....	...	...	...	2.3B	II	...	June 14	05 p.m. PDT
June 15	17 49 25.4	36.72 N.	121.41 W.	7	3.1	...	3.0B	...	B	June 15	10 a.m. PDT
June 20	19 26 35.8	34.85 N.	120.99 W.	N	...	...	...	...	G	June 20	12 p.m. PDT
June 21	07 15 01.5	34.38 N.	117.03 W.	8	...	...	3.0P	...	P	June 21	12 a.m. PDT
June 22	17 01 18.4	34.28 N.	116.60 W.	8	4.2	...	3.2P	...	P	June 22	10 a.m. PDT
June 23	16 13 00.7	34.28 N.	116.67 W.	8	...	...	3.1P	...	P	June 23	09 a.m. PDT
June 24	00 39 52.0	40.95 N.	124.06 W.	N	4.7	...	4.0B	IV	G	June 23	05 p.m. PDT
June 26	01 40 23.6	36.16 N.	120.34 W.	8	...	...	3.5P	...	P	June 25	06 p.m. PDT
California—Off the coast											
Apr. 7	11 09 30.5	40.37 N.	125.31 W.	N	4.5	...	3.8B	...	B	Apr. 7	04 a.m. PDT
June 10	07 35 00.5	40.45 N.	125.08 W.	22	4.8	4.4	4.2B	IV	B	June 10	12 a.m. PDT
June 19	19 21 48.9	41.93 N.	126.78 W.	N	4.9	4.2	...	...	G	June 19	12 p.m. PDT
June 20	00 27 51.0	41.76 N.	126.78 W.	N	4.4	...	...	...	G	June 19	05 p.m. PDT

TABLE 1.—*Summary of United States earthquakes for April-June 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)
Hawaii											
May 5...	11 37 24.0	19.35 N.	155.27 W.	15	4.4	...	3.75H	II	H	May 5...	02 a.m. HDT
June 19...	15 05 42.0	19.35 N.	155.40 W.	10	5.1	...	...	VI	H	June 19...	06 a.m. HDT
June 21...	06 50 27.0	19.35 N.	155.22 W.	5	4.3	..	3.5-4.0H	II	H	June 20...	09 p.m. HDT
Illinois											
Apr. 3...	23 05 02.5	38.59 N.	88.09 W.	11	4.5	...	4.7S	VI	G	Apr. 3...	06 p.m. CDT
June 5...	08 06 11.3	38.62 N.	89.94 W.	11	4.0	...	3.6S	V	S	June 5...	03 a.m. CDT
Kentucky											
June 5...	00 16 40.4	38.60 N.	84.77 W.	15	...	...	3.2S	...	S	June 4...	08 p.m. EDT
Missouri											
Apr. 5...	19 41 11.2	38.590N.	90.910 W.	1	...	...	2.6S	II	S	Apr. 5...	12 p.m. CDT
May 13...	06 52 18.8	36.71 N.	89.39 W.	1	4.3	...	4.1S	VI	S	May 13...	01 a.m. CDT
Montana											
June 9...	00 50 42.0	44.80 N.	111.05 W.	5	...	...	4.9	II	G	June 8...	06 p.m. MDT
June 9...	01 44 23.5	44.93 N.	111.34 W.	5	...	...	...	...	G	June 8...	07 p.m. MDT
Nevada											
May 29...	18 10 39.9	36.82 N.	115.87 W.	5	...	...	4.0P	...	G	May 29...	11 a.m. PDT
May 29...	19 23 32.8	36.82 N.	115.88 W.	11	...	...	4.0P	...	G	May 29...	12 p.m. PDT
June 11...	12 40 40.9	37.66 N.	115.29 W.	18	4.4	...	...	...	G	June 11...	05 a.m. PDT
June 11...	12 53 07.6	37.60 N.	115.29 W.	11	3.9	...	...	...	G	June 11...	05 a.m. PDT
June 13...	12 18 35.7	39.58 N.	115.91 W.	10	...	...	...	...	G	June 13...	05 a.m. PDT
New York											
June 7...	19 45 37.0	41.63 N.	73.94 W.	...	...	...	2.9L	VI	L	June 7...	03 p.m. EDT
Oregon—off the coast											
Apr. 29...	16 15 00.2	43.38 N.	126.67 W.	N	4.5	...	...	...	G	Apr. 29...	09 a.m. PDT
June 8...	14 13 27.5	42.78 N.	126.15 W.	N	4.1	...	...	...	G	June 8...	07 a.m. PDT
Pennsylvania											
Apr. 27...	14 45 39.1	41.00 N.	75.96 W.	3	3.0	...	3.0	...	G	Apr. 27...	10 a.m. EDT
Utah											
Apr. 29...	05 44 35.7	37.71 N.	113.03 W.	5	4.1	...	3.0	II	G	Apr. 29...	11 p.m. MDT
Apr. 29...	07 35 51.8	37.81 N.	112.98 W.	5	4.4	...	3.2	II	G	Apr. 29...	01 a.m. MDT
Virginia											
May 30...	21 28 37.2	37.382 N.	80.419 W.	8	...	...	3.6V	V	V	May 30...	05 p.m. EDT
Washington											
Apr. 20...	03 00 09.3	46.759 N.	121.523W.	5	4.8	...	4.9	V	W	Apr. 19...	08 p.m. PDT
Apr. 20...	14 08 53.0	46.7 N.	127.5 W.	...	...	...	3.5W	...	W	Apr. 20...	07 a.m. PDT
May 16...	13 04 36.1	48.14 N.	122.92 W.	54	3.8	...	...	V	G	May 16...	06 a.m. PDT
May 22...	11 58 17.7	48.6 N.	123.0 W.	...	3.0	...	...		W	May 22...	04 a.m. PDT
May 25...	06 59 20.7	47.9 N.	121.8 W.	...	3.5	...	...	...	W	May 24...	11 p.m. PDT
Wyoming											
Apr. 14...	13 32 15.6	44.85 N.	111.00 W.	3	...	...	...	...	G	Apr. 14...	07 a.m. MDT

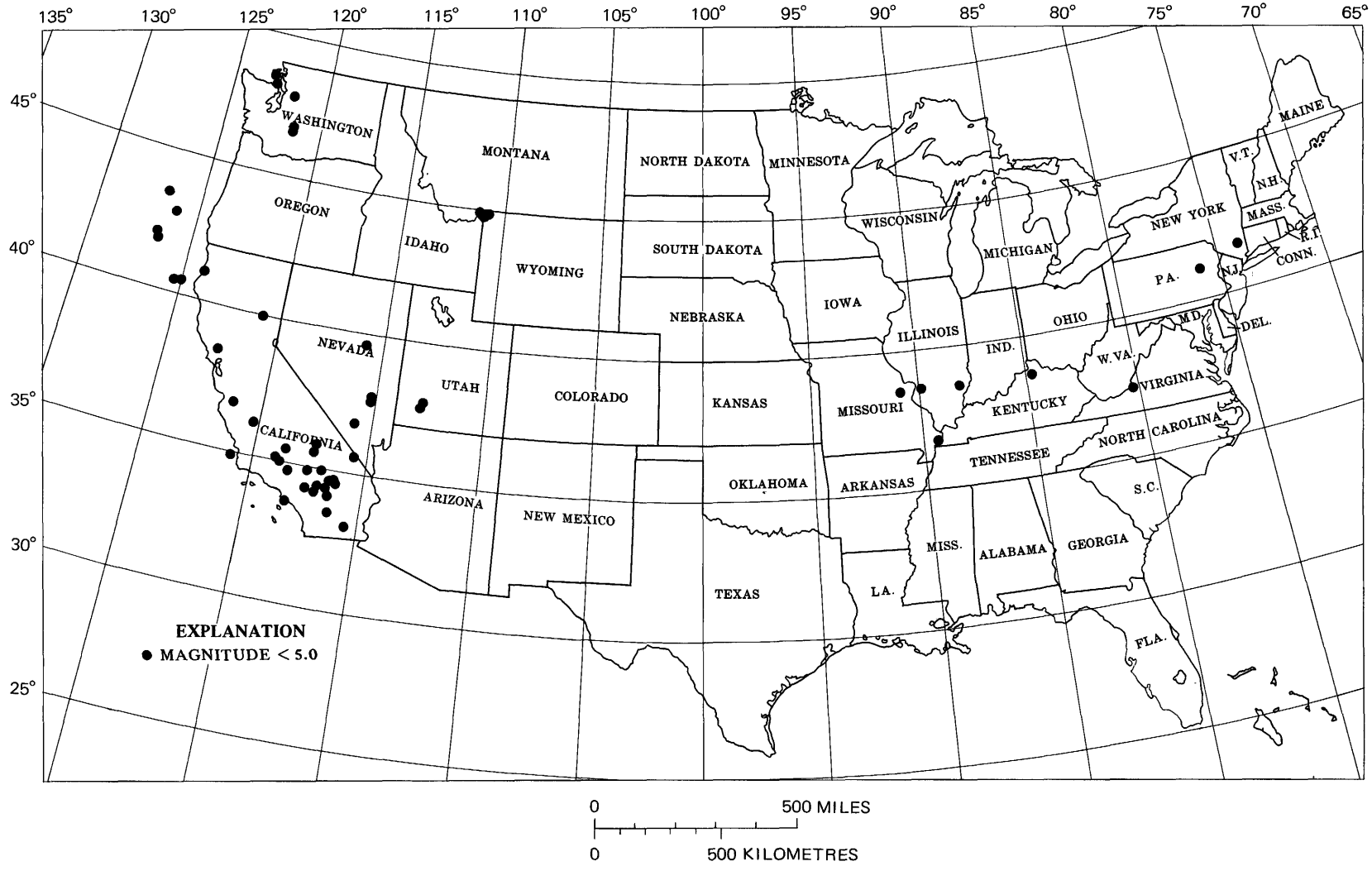

FIGURE 4.—Earthquake epicenters in the conterminous United States for April—June 1974, plotted from table 1.

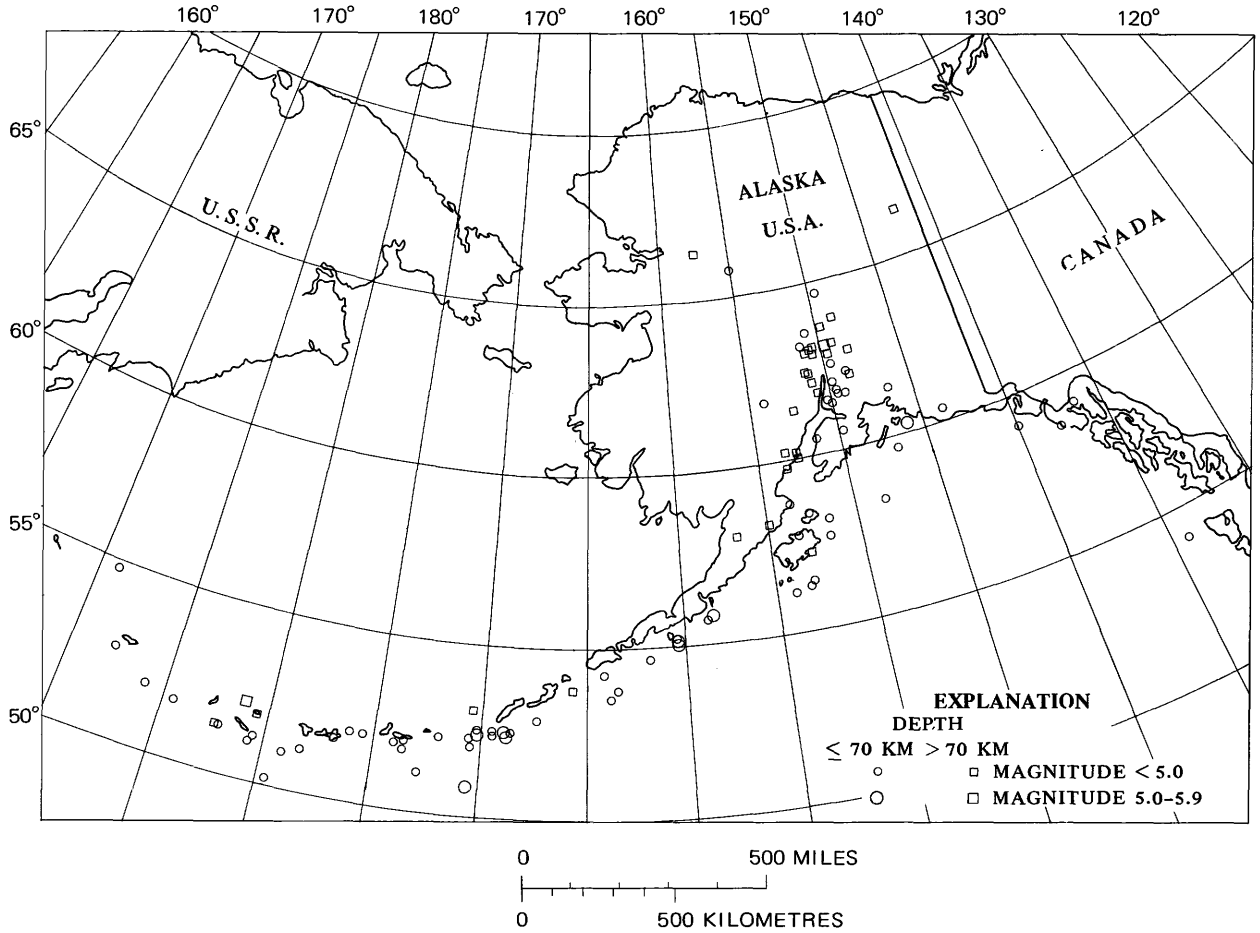

FIGURE 5.—Earthquake epicenters in Alaska for April-June 1974, plotted from table 1.

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.

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

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

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 earthquake reports received which contain minimal information are assigned in 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.

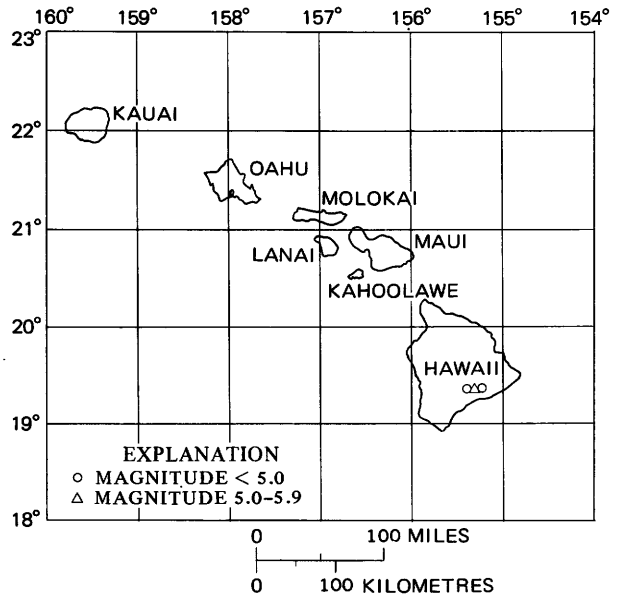

FIGURE 6.—Earthquake epicenters in Hawaii for April-June 1974, plotted from table 1.

II. Felt only by 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 substantial 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.

TABLE 2.—*Summary of macroseismic data for United States earthquakes, April-June 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; (L) Lamont-Doherty Geological Observatory, Palisades, New York; (M) NOAA, Palmer Observatory, Alaska; (P) California Institute of Technology, Pasadena; (S) St. 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 and explosions are listed]

Alaska

6 April (G)	Alaska Peninsula
Origin Time:	01 53 47.3
Epicenter:	55.10° N., 160.44° W.
Depth:	27 km
Magnitude:	5.7 m_b, 5.1 M_S
Intensity VI:	Minor damage at Sand Point.
Intensity II:	Port Moller and Cold Bay.
6 April (G)	Alaska Peninsula
Origin time:	02 27 21.8
Epicenter:	55.33° N., 160.60° W.
Depth:	Normal
Magnitude:	4.3 m_b
Intensity II:	Sand Point.
6 April (G)	Alaska Pensinula
Origin Time:	03 56 01.8
Epicenter:	55.12° N., 160.44° W.
Depth:	40 km
Magnitude:	6.0 m_b, 5.3 M_S
Intensity II:	Cold Bay, Port Moller, Sand Point.
15 April (G)	Southeastern Alaska
Origin time:	16 27 35.5
Epicenter:	59.19° N., 136.42° W.
Depth:	7 km
Magnitude:	4.2 m_b, 4.0 M_L (M)
Intensity IV:	Haines.
18 April (G)	Southeastern Alaska
Origin time:	21 54 26.4
Epicenter:	59.16° N., 139.97° W.
Depth:	28 km
Magnitude:	3.9 m_b, 4.4 M_L (M)
Intensity II:	Yakutat.
22 April (G)	Andreanof Islands, Aleutians
Origin time:	02 29 40.1
Epicenter:	51.98° N., 176.05° W.
Depth:	70 km
Magnitude:	4.9 m_b
Intensity V:	Adak.
26 April (G)	Andreanof Islands, Aleutians
Origin time:	01 07 08.7
Epicenter:	51.75° N., 176.74° W.
Depth:	64 km
Magnitude:	4.7 m_b
Intensity III:	Adak.

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

28 April (G)	Southern Alaska
Origin time:	16 27 39.8
Epicenter:	61.67° N., 149.02° W.
Depth:	32 km
Magnitude:	2.6 M_L (M)
Intensity II:	Palmer and Wasilla.
8 May (G)	Central Alaska
Origin time:	04 27 13.1
Epicenter:	63.66° N., 150. 72° W.
Depth:	11 km
Magnitude:	4.6 m_b, 4.7 M_L (M)
Intensity III:	Fairbanks area.
11 May (G)	Southern Alaska
Origin time:	04 17 34.7
Epicenter:	61.66° N., 150.58° W.
Depth:	67 km
Magnitude:	3.8 m_b
Intensity II:	Felt from Gold Creek to Anchorage and at points along the Alaska railroad.
13 May	Central Alaska
Origin time:	16 50
Epicenter:	Not located.
Depth:	None computed.
Magnitude:	None computed.
Intensity III:	College.
21 May (G)	Central Alaska
Origin time:	23 31 41.2
Epicenter:	63.31° N., 151.24° W.
Depth:	12 km
Magnitude:	4.2 m_b, 4.6 M_L (M)
Intensity II:	Palmer.
26 May (G)	Central Alaska
Origin time:	15 52 50.6
Epicenter:	62.93° N., 148.23° W.
Depth:	88 km
Magnitude:	None
Intensity II:	Willow.
26 May (G)	Central Alaska
Origin time:	18 13 58.6
Epicenter:	61.57° N., 150.24° W.
Depth:	3 km
Magnitude:	3.1 M_L (M)
Intensity II:	Willow.
27 May (G)	Southern Alaska
Origin time:	14 01 43.5
Epicenter:	60.32° N., 146.01° W.
Depth:	21 km
Magnitude:	5.5 m_b, 5.7 M_S, 5.4 M_L (M)
Intensity III:	Boswell Bay, Cordova.
Intensity II:	Anchorage area.

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

6 June (G) Andreanof Islands, Aleutians
Origin time: 10 53 08.2
Epicenter: 52.01° N., 175.40° W.
Depth: 62 km
Magnitude: 4.1 m_b
Intensity II: Adak.

11 June (G) Andreanof Islands, Aleutians
Origin time: 20 20 44.9
Epicenter: 51.91° N., 173.53° W.
Depth: 58 km
Magnitude: 4.8 m_b
Intensity II: Adak.

22 June (G) Andreanof Islands, Aleutians
Origin time: 20 35 37.0
Epicenter: 51.24° N., 178.23° W.
Depth: 49 km
Magnitude: 4.5 m_b
Intensity II: Adak.

California

9 April Northern California
Origin time: 09 13
Epicenter: Not located.
Depth: None computed.
Magnitude: 2.2M_L (B)
Intensity IV-V: Cloverdale.
Intensity III: Geysers Powerplant (relay switch was tripped by the earthquake).

17 April (B) Northern California
Origin time: 19 30 20.4
Epicenter: 36.94° N., 122.00° W.
Depth: 7 km
Magnitude: 3.2 M_L
Felt about 29 km southeast of San Jose.
Intensity IV: Pacific Gas & Electric Co., San Francisco.

26 April (B) Northern California
Origin time: 12 26 13.6
Epicenter: 40.50° N., 124.00° W.
Depth: None reported.
Magnitude: 3.3 M_L
Intensity IV: Eureka, Fortuna.
Intensity III: Humboldt Bay Powerplant.
Intensity II: Arcata, Scotia.

29 April Northern California
Origin time: 14 58
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.
Intensity II: Redwood Valley, reported by Mendocino telephone operator.

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

27 May (B) Northern California
Origin time: 09 19 19.7
Epicenter: 39.852° N., 120.910° W.
Depth: 2 km
Magnitude: 3.9 M_L, 4.6 m_b (G)
Intensity V: Berry Creek, Blairsden, Calpine, Dobbins, Feather Falls, Johnsville, La Porte, Nevada City, Quincy, Sierra City, Strawberry Valley.
Intensity IV: Alleghany, Beckwourth, Downieville, Grass Valley, Janesville, Paradise, Portola, Sattley, Sierraville, Sloat, Spring Garden, Starrie, Vinton, Washington.

6 June (B) Northern California
Origin time: 12 13 49.8
Epicenter: 38.45° N., 122.64° W.
Depth: 2 km
Magnitude: 3.1 M_L, 3.5 m_b (G)
Intensity IV: Santa Rosa (awakened many).
Intensity III: Rohnert Park.
Intensity II: Angwin.

9 June (P) Central California
Origin time: 22 27 33.7
Epicenter: 35.53° N., 117.45° W.
Depth: 8 km
Magnitude: 4.0 M_L, 4.0 M_L (B)
Intensity II: China Lake area.

10 June (P) Central California
Origin time: 06 44 09.9
Epicenter: 35.53° N., 117.45° W.
Depth: 8 km
Magnitude: 4.2 M_L, 4.2 M_L (B), 4.1 m_b (G)
Intensity V: Argus, China Lake, Randsburg, Red Mountain, Trona.
Intensity IV: Johannesburg.
Intensity III: 3.5 km north of Inyokern.

10 June Northern California
Origin time: 15 02
Epicenter: Not located.
Depth: None computed.
Magnitude: 2.5 M_L (B)
Intensity II: Santa Rosa.

12 June (B) Central California
Origin time: 19 21 51.2
Epicenter: 36.718° N., 121.425° W.
Depth: 5 km
Magnitude: 3.7 M_L, 3.7 m_b (G)
Foreshock felt at the Harris Ranch at 18 56.
Intensity V: 14 km south of Hollister, Tres Pinos.
Intensity IV: San Jaun Bautista.
Intensity III: 19 km south of Hollister.

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

13 June — Northern California
- Origin time: 11 10
- Epicenter: Not located.
- Depth: Not computed.
- Magnitude: None computed.
- *Intensity II:* Ferndale.

14 June — Central California
- Origin time: 14 03
- Epicenter: Not located.
- Depth: None computed.
- Magnitude: None computed.
- *Intensity IV:* Hollister.

15 June — Northern California
- Origin time: 00 24
- Epicenter: Not located.
- Depth: None computed.
- Magnitude: 2.3 M_L (B)
- Epicenter in or very near Oakland.
- *Intensity III:* Oakland.

24 June (G) — Near coast of northern California
- Origin time: 00 39 52.0
- Epicenter: 40.95° N., 124.06° W.
- Depth: Normal.
- Magnitude: 4.7 m_b, 4.0 M_L (B)
- *Intensity IV:* Bayside, Eureka, Rio Dell.
- *Intensity III:* Fortuna.
- *Intensity II:* Ferndale.

California—Off the coast

10 June (G) — Off coast of northern California
- Origin time: 07 35 00.5
- Epicenter: 40.45° N., 125.08° W.
- Depth: 22 km
- Magnitude: 4.8 m_b, 4.4 M_S, 4.3 M_L (B), 4.5 m_b (B)
- *Intensity IV:* Pepperwood, Rio Dell, Scotia.

Hawaii

5 May (H) — Island of Hawaii
- Origin time: 11 37 24.0
- Epicenter: 19.35° N., 155.27° W.
- Depth: 15 km
- Magnitude: 3.75 M_L, 4.4 m_b (G)
- *Intensity II:* Island of Hawaii.

19 June (H) — Island of Hawaii
- Origin time: 15 05 42.0
- Epicenter: 19.35° N., 155.40° W.
- Depth: 10 km
- Magnitude: 5.1 m_b (G)
- *Intensity VI:* Minor damage in Kan district.
- *Intensity II:* Throughout most of the other areas of the island.

21 June (H) — Island of Hawaii
- Origin time: 06 50 27.0
- Epicenter: 19.35° N., 155.22° W.
- Depth: 5 km

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

21 June (H) Island of Hawaii—Continued
- Magnitude: 3.5-4.0 M_L, 4.3 m_b (G)
- *Intensity II:* Southern half of the island.

Illinois

3 April (G) — Southern Illinois
- Origin time: 23 05 02.5
- Epicenter: 38.59° N., 87.09° W.
- Depth: 11 km
- Magnitude: 4.7 m_{bLg}, 4.5 m_b (G)

Minor damage at West Salem. Felt from Chicago to Nashville, Tenn., and from St. Louis, Mo., to Columbus, Ohio. Maximum Intensity VI. Total felt area about 980,000 km², in all or portions of 12 states.

The intensity values shown in figure 7 resulted from the evaluation of "Earthquake Report" questionnaires completed by postmasters. Stormy conditions were reported in all the states surrounding the epicenter, both before and after the occurrence of the earthquake. Figure 8 shows the paths and initial time (UTC) tornadoes touched down in Illinois, Indiana, Kentucky, and Ohio, according to the "Storm Data," National Oceanic and Atmospheric Administration, Environmental Data Service (1974a, b). Because of the extreme weather conditions, which may have resulted in imprecisely felt data, no attempt was made to draw isoseismals in figure 7.

This is the largest earthquake in Illinois since 1968. The following information is excerpted from Coffman and von Hake (1973).

> "1968. November 9, (38.0° N., 88.5° W.). South-central Illinois. This was the strongest earthquake in this region since 1895. It was felt over all or portions of 23 states, from eastern Minnesota to northwestern Florida, and from western North Carolina to central Kansas. There were isolated felt reports from people in tall buildings at more distant localities—Boston, Mass., and southern Ontario, Canada. Earthquake damage in south-central Illinois consisted primarily of bricks thrown from chimneys, broken windows, toppled television aerials, and cracked or fallen plaster. In the epicentral area, intensity VII was characterized by downed chimneys, cracks in foundations, overturned tombstones, and scattered instances of collapsed parapets. Most buildings sustaining chimney damage were 30 to more than 50 years old. Considerable masonry damage occurred at the City Building at Henderson, Ky., 50 miles east-southeast of the epicenter. Several thousand dollars' damage was sustained to a large two-story brick house near Dale, Ill. A few miles west of Dale near Tuckers Corners, a concrete and brick cistern collapsed. Moderate damage to chimneys and/or walls occurred in several towns in south-central Illinois, south-western Indiana, northwestern Kentucky, and at Hermann, St. Charles, Sikeston, and St. Louis, Mo. Magnitude 5.3."

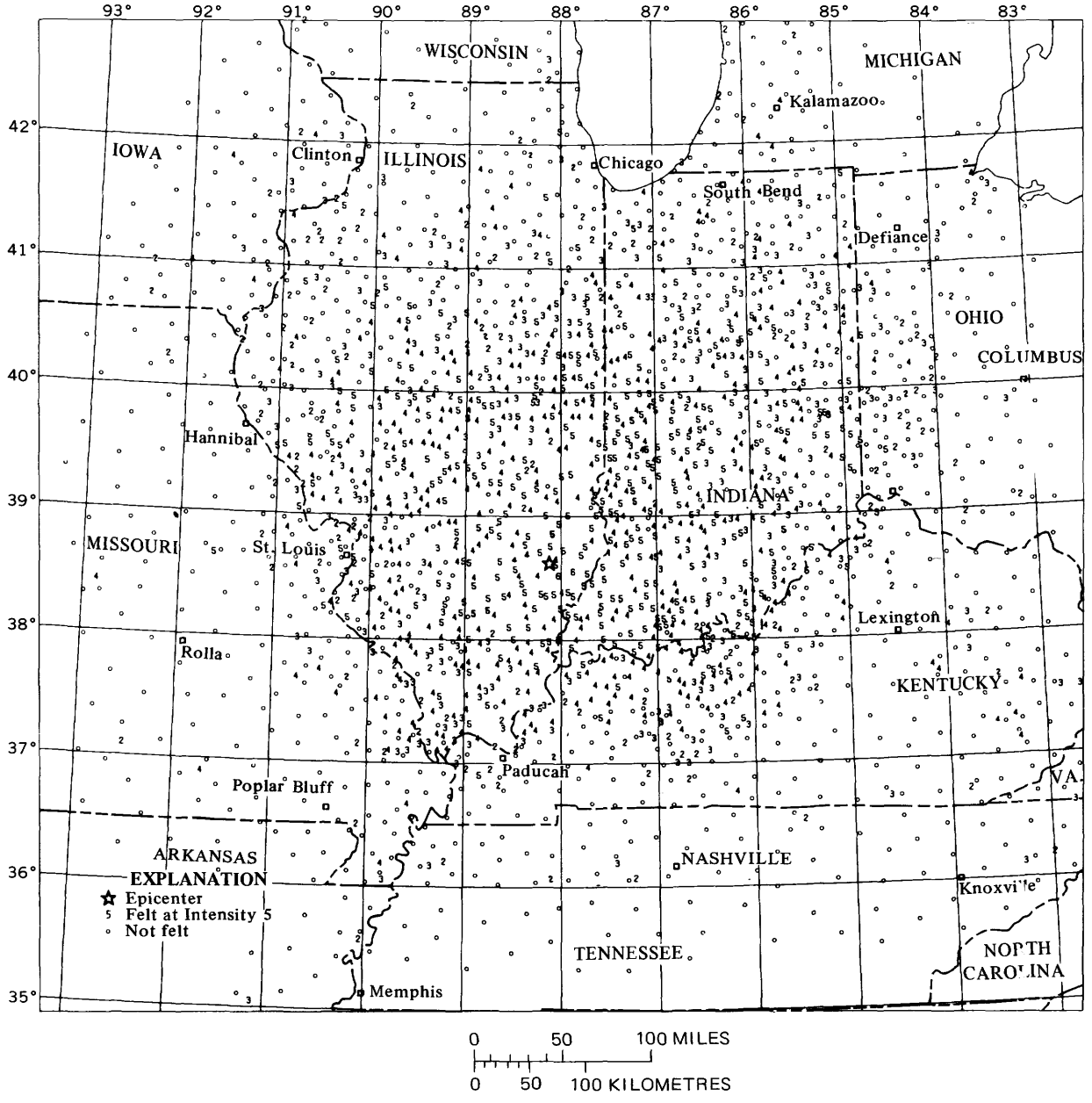

FIGURE 7.—Intensity map for the southern Illinois earthquake of 3 April 1974, 23 05 02.5 UTC.

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

3 April (G) Southern Illinois—Continued

Intensity VI:

Illinois—Lancaster (chimneys cracked), West Salem (Bricks fell from one chimney, tombstones fell. Three observers reported "loud earth noise." One of these wrote, "There was a loud boom before things began to rattle.")

Intensity V:

Illinois—Albion (6 observations), Allendale, Alsey, Alvin, Armstrong, Astoria, Athens, Atwood, Belnap, Belle Rive, Belleville, Bellmont, Bingham, Bluff Springs, Bluford, Bone Gap, Bonnie, Bridgeport, Brimfield, Broadlands, ("Following the tornadoes that swept through this area that afternoon, an earthquake seemed a minor occurrence."), Brocton, Brownstown, Burnt Prairie, Casey Clark, Cerro Gordo, Claremont, Cobden, Collinson, Co-

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

3 April (G) Southern Illinois—Continued

Intensity V—Continued

Illinois—Continued

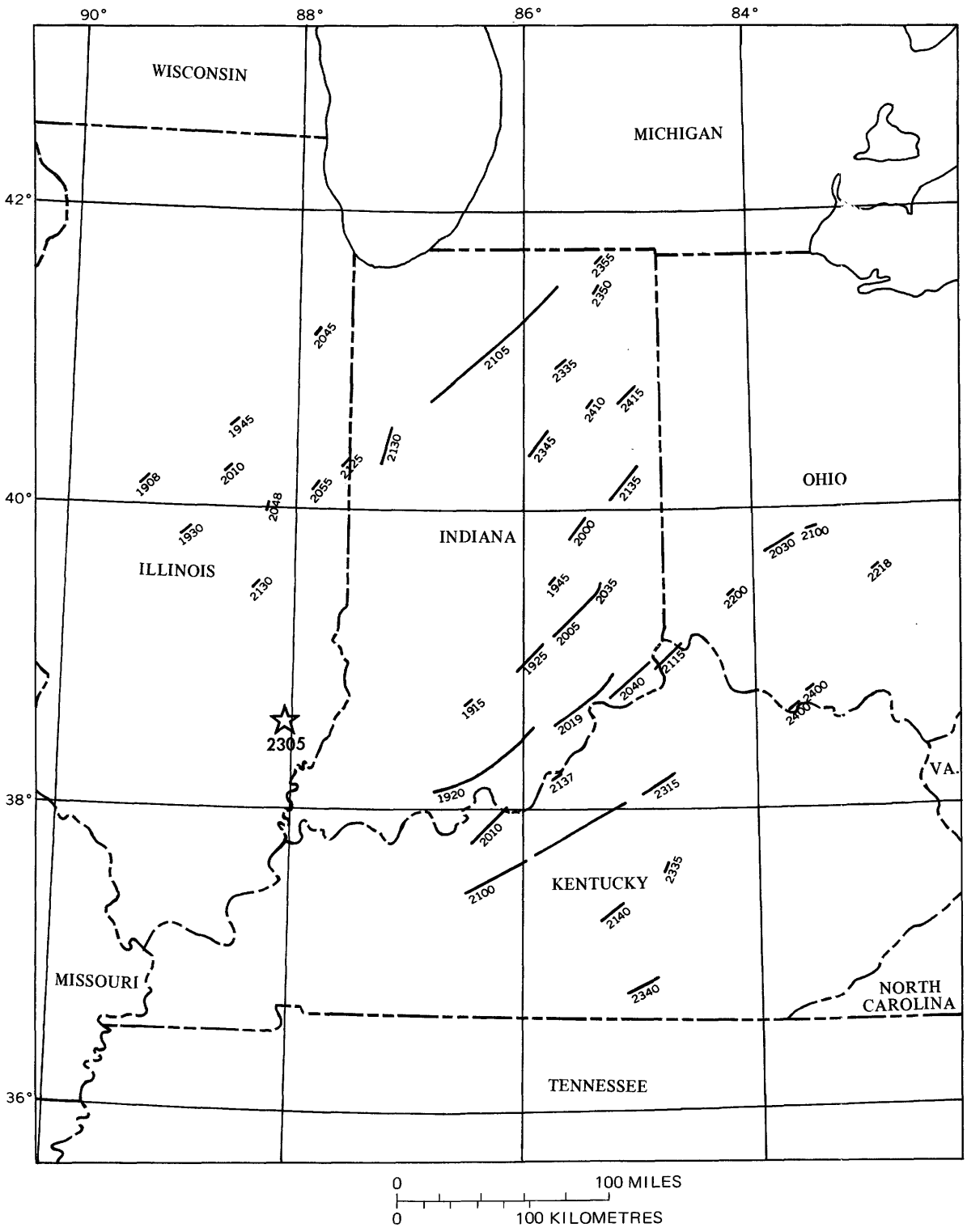

FIGURE 8.—Tornado map of the Midwestern United States for 3 April 1974. All the paths were from southwest to northeast, and the times shown are in Universal Coordinated Time. Star indicates epicenter of the 3 April 1974 earthquake in southern Illinois.

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

3 April (G) Southern Illinois—Continued

Intensity V—Continued

Illinois—Continued

Iona, Cornland, Dale, Dennison, DeWitt, Divernon, Dowell, Dundas, Edgewood, Ellery, Elwin, Emma, Enfield, Fairfield, Fairmount, Farmington, Fithian, Flat Rock, Fults, Galatia, Geff, Gibson City, Gifford, Goldengate, Goodfield, Goodwine, Grayville, Harristown, Hazel Dell, Hecker, Herald, Herscher, Hillsboro, Homer, Hoopston, Hoyleton, Hutsonville, Ingraham, Iola, Jewett, Keensburg, Kenny, Kilbourne, Kincaid, Kirkwood, La Clede, Lake City, Lakewood, Lawrenceville, Literberry, Loogootee, Lovejoy, Mackinaw, Manchester, Marion, Martinsville, Mason, Mason City, Mattoon, McLeansboro, Mechanicsburg, Melvin, Michael, Middletown, Milton, Minier, Mode, Monroe Center, Montrose, Mount Carmel, Mt. Pulaski, Murdock, Neoga, New Holland, Nilwood, Noble, Nokomis, Oakdale, Oakley, Oakwood, Odin, Ogden, Ohlman, Olivet, Olney, Onarga, Opdyke, Orchardville, Oreana, Owaneco, Palestine, Palos Heights, Palmer, Pana, Parkersburg, Pekin, Peoria, Pesotum, Petersburg, Philo, Plainview, Potomac, Radom, Redmon, Ridgway, Robinson, Rockport, Sailor Springs, Sainte Marie, St. Francisville, St. Peter, Salem, Savoy, Shelbyville, Shobonier, Sidell, Sigel, Simpson, Stewardson, Summer Hill, Tamaroa, Texico, Tolona, Tower Hill, Vermilion, Virden, Virginia, Waggoner, Waltonville, Warrensburg, Watseka, Watson, Wayne, Wayne City, West Liberty, Westville, West York, Williamsville, Willow Hill, Winchester, Witt, Xenia.

Indiana—Advance, Alamo, Amboy, Arlington, Attica, Bainbridge, Bethlehem, Bicknell, Blanford, Boggstown, Boonville, Bowling Green, Bridgeton, Brook, Brooklyn, Brookville, Brownsburg, Brownsville, Buffalo, Buffaloville, Cambridge City, Camby, Campbellsburg, Cedar Grove, Centerpoint, Centerton, Centerville, Clay City, Clayton, Clinton, Cloverdale, Coalmont, Commiskey, Connersville, Corydon, Craigville, Crandall, Crawford, Crawfordsville ("The City of Crawfordsville, Ind., on 04-03-74 at 6:06 p.m. was under a TORNADO alert and at the time of the earthquake we were experiencing very heavy rains, strong winds, large hail stones (1 to 2 inches). It is most difficult to determine the exact related sounds and effects connected with a quake since we were already under the conditions as described. I'm sure that had these conditions not existed, all in the community would have felt and noticed the quake more than we did. As a matter of fact, when you're under tornado conditions, as described, who ever thinks of an earthquake? Also, for the record, I've heard of NO DAMAGE that was done that evening locally being attributed to the earthquake"), Cutler, Dale, Danville, Decker, Delphi, Dublin, Eckerty, Edwardsport,

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

3 April (G) Southern Illinois—Continued

Intensity V—Continued

Indiana—Continued

Elizabeth, Elwood, Eminence, Emison, Evansville, Fillmore, Forest, Fort Branch, Francisco, Freedom, Fremont, French Lick, Gas City, Grand View, Graysville, Green Castle, Greentown, Griffin, Gwynneville, Hatfield, Haubstadt, Hazleton, Hebron, Heltonville, Hemlock, Henryville, Hillsdale, Holland, Indianapolis, Indian Springs, Inglefield, Jonesville, Judson, Kingman, Knightsville, Kokomo, Koleen, Kyana, Lapel, Lewis, Liberty, Lincoln City, Linton, Lynn, Mariah Hill, Mauckport, Medaryville, Medora, Mellott, Merom, Mexico, Monroe City, Monrovia, Montezuma, Morgantown, Mount Saint Francis, Mount Vernon, Muncie, Newburgh, New Goshen, New Lebanon, New Market, New Middletown, New Palestine, Newport, New Ross, Newtown, Oakland City, Odon, Otwell, Owensville, Oxford, Paragon, Patoka, Patricksburg, Paxton, Pimento, Pittsboro, Plainville, Poland, Prairie Creek, Princeton, Reelsville, Richland, Roachdale, Rockville, Rosedale, Rossville, Russellville, Saint Bernice.

Saint Meinrad, Salem, Sanborn, Sanford, Santa Claus, Scircleville, Scottsburg, Seymour, Sharpsville, Shelbyville, Shepardsville, Sheridan, Siberia, Solsberry, Spencer, Springport, Spurgeon, Star City, Staunton, Stendal, Stewartsville, Stilesville, Sullivan, Sweetser, Switz City, Tennyson, Terre Haute, Universal, Urbana, Vallonia, Veedersburg, Velpen, Wallace, Washington, West Phalia, Westport, West Terre Haute, Whitestown, Wilkinson.

Kentucky—Beech Grove, Claremont, Custer, Florence, Harned, Lovelaceville, Manitou, McQuady, Milton, Mooleyville, Perry Park, Radcliffe, Smith Mills, Sweeden, Waverly, Wax, West Point, Whitesville.

Missouri—Foley, Mapaville, Morrison, Normandy.

Intensity IV:

Illinois—Allerton, Alma, Alto Pass, Annapolis, Arenzville, Arthur, Ashmore, Atlanta, Ava, Barnhill, Beason, Beaverville, Bellflower, Bement, Benld, Benton, Bible Grove, Birds, Blue Mound, Boles, Bonnie, Braidwood, Broughton, Browning, Browns, Bulpitt, Bunker Hill, Cache, Calhoun, Camargo, Campbell Hill, Canton, Carlinville, Carlyle, Carmi, Carriers Mills, Carrollton, Catlin, Champaign, Chatham, Chesterfield, Chrisman, Cisne, Clay City, Claytonville, Clinton, Coffeen, Colp, Columbia, Cowden, Creal Springs, Cropsey, Crossville, Curran, Cutler, Dahlgren, Danville, Dawson, Decatur, DeLand, Dewey, Dix, Donnellson, Donovan, Du Quoin, Eagarville, East Lynn, Eddyville, Edinburg, Edwardsville, Effingham, Eldorado, Elkhart, Emden, Energy, Equality, Evansville, Ewing, Farina, Farmersville, Fieldon, Fillmore, Findlay, Flova, Forrest, Forsyth, Fred-

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

3 April (G) Southern Illinois—Continued

Intensity IV—Continued

Illinois—Continued

erick, Garrett, Gays, Georgetown, Gillespie, Girard, Glenarm, Golconda, Goreville, Grand Chain, Greenfield, Green Valley, Greenview, Greenville, Hagarstown, Hammond, Harco, Hardin, Hartford, Henning, Herrick, Herrin, Heyworth, Hidalgo, Highland, Hillsboro, Hindsboro, Hume, Illinois City, Illiopolis, Indianola, Irving, Jacksonville, Janesville, Jerseyville, Johnson City, Jonesboro, Joppa, Junction, Kampsville, Kansas, Karbers Ridge, Kell, Kewanee, Kinmundy, Lake Fork, Langleyville, La Place, La Prairie, Lewistown, Logan, Long Point, Longview, Lostant, Louisville, Ludlow, Mahomet, Mansfield, Mapleton, Marine, Marissa, Marseilles, Marshall, Maryville, Mascoutah, Maunie, McLean, Metcalf, Mill Shoals, Modesto, Monticello, Morrisonville, Mounds, Mt. Auburn, Mt. Claire, Mt. Erie, Mt. Zion, Mulberry Grove, Muncie, Murrayville, New Athens, New Berlin, New Haven, Newman, Newton, Niantic, Norris City, Oconee, Omaha, Orient, Palmyra, Panama, paris, Patoka, Pawnee, Paxton, Pearl, Penfield, Percy, Pinckneyville, Pinkstaff, Pittsburg, Plano, Pleasant Hill, Pulaski, Raleigh, Raymond, Red Bud, Ridge Farm, Riverton, Rockwood, Roodhouse, Rosamond, Rosiclare, Rossville, Royalton, St. Elmo, St. Jacob, St. Joseph, St. Libory, Sandoval, San Jose, Sawyerville, Scheller, Serena, Sesser, Shumway, Sidney, Sims, Smithton, Sorento, South Pekin, Springerton, Springfield, Staunton, Steeleville, Stonington, Stoy, Strasburg, Sullivan, Tallula, Tamms, Taylorville, Tennessee, Teutopolis, Thawville, Thayer, Tilden, Toledo, Towanda, Trenton, Troy, Troy Grove, Tuscola, Valier, Vandalia, Venedy, Walshville, Waynesville, Welge, Westfield, West Union, Wheeler, Willisville, Willow Springs, Wyoming, Yale.

Indiana—Albany, Ambia, Amo, Anderson, Andrews, Bargersville, Bedford, Bellmore, Bennington, Berne, Beverly Shores, Bippus, Birdseye, Bloomfield, Bloomington, Bradford, Brazil, Bristow, Bruceville, Buck Creek, Buckskin, Burlington, Butlerville, Cannelton, Carbon, Carlisle, Cartersburg, Cates, Cayuga, Celestine, Charlestown, Chesterton, Chrisney, Clarksville, Clifford, Coal City, Coatesville, Columbus, Converse, Cortland, Cory, Covington, Cynthiana, Daleville, Darlington, Derby, Dubois, Dugger, Edinburg, Elberfeld, Evanston, Fairbanks, Farmersburg, Ferdinand, Flora, Floyds Knobs, Francesville, Freelandville, Freetown, Fulda, Geneva, Gentryville, Goodland, Goshen, Gosport, Greensboro, Greensburg, Greenville, Greenwood, Grovertown, Harmony, Hillsboro, Hillsburg, Huntingburg, Hymera, Ireland, Jasper, Kempton, Kentland, Kirklin, Knightstown, Ladoga, Lafayette, La Fountaine, Lebanon, Little York, Lizton, Loogootee, Lynnville, Mackey,

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

3 April (G) Southern Illinois—Continued

Intensity IV—Continued

Indiana—Continued

Magnet, Manilla, Marshall, Marshfield, Mays, McCordsville, Mecca, Metamora, Miami, Midland, Mitchell, Monroeville, Montgomery, Montmorenci, Morristown, Mulberry, Needham, Newberry, New Harmony, New Haven, New Salisbury, New Whiteland, Nineveh, Norman, Oaktown, Oolitic, Orestes, Orleans, Owensburg, Pence, Pendleton, Pennville, Petersburg, Portland, Poseyville, Prairietown, Qunicy, Ragsdale, Remington, Richmond, Rockport, Rushville, Russiaville, Saint Anthony, St. Croix, St. Paul, Salamonia, San Pierre, Scotland, Sedalia, Seelyville, Shelburn, Shoals, Silver Lake, Sims, Smithville, Somerville, Spiceland, Springville, Stanford, State Line, Stinesville, Sulphur Springs, Summitville, Swayzee, Talbot, Tell City, Tipton, Versailles, Vincennes, Wabash, Wadesville, Waldron, Walkerton, Warren, Warsaw, Waveland, Waynetown, West Baden Springs, Westfield, West Lebanon, West Point, Wheatland, Williams, Williamsport, Willow Branch, Winslow, Wolf Lake, Woodburn, Yorktown, Zionsville.

Iowa—Danville, Ely, Fairfield, Maquoketa.

Kentucky—Bagdad, Baskett, Beaver Dam, Big Clifty, Bonnieville, Boston, Brooks, Burna, Calhoun, Caneyville, Carrollton, Carrsville, Cerulean, Clay, Cloverport, Constantine, Corydon, Dixon, Dundee, Eastview, Fordsville, Garfield, Glen Dean, Hampton, Hawesville, Henderson, Hudson, Leitchfield, Lewisport, Logansport, Lola, Louisville, Maceo, Madisonville, Magnolia, Maple Mount, Marion, Mason, Moorman, Mount Sterling, Napfor, Olaton, Onton, Owensboro, Philpot, Poole, Prospect, Reynolds Station, Rineyville, Rosseau, Salem, Saul, Scottsville, Sebree, Slaughters, Stanley, Stephensport, Symsonia, Uniontown, Valley Station, Vine Grove, Waco, Waddy, Warsaw, Wendover, West Louisville, Westview, Winston, Yeaman.

Michigan—Kalamazoo, Marcellus, Three Rivers.

Missouri—Belleview, Braggadocio, Brazeau, Burfordville, Cape Girardeau, Doe Run, Dutchtown, Farrar, Flinthill, Fredericktown, Kelso, Kewanee, Mountain View, Perkins, Pevely, Saint Albans, Scott City, Sedgewickville, Versailles, West Alton.

Ohio—Ansonia, Harbor View, Piqua, Van Wert.

Intensity III:

Arkansas—Hunter.

Illinois—Akin, Anna, Arcola, Armington, Ashton, Barry, Beardstown, Beckemeyer, Bethany, Blackstone, Buckley, Buckner, Butler, Carbon Cliff, Carlock, Carterville, Cave-in-Rock, Christopher, Cisco, Cissna Park, Coal City, Coello, Crescent City, Cypress, Danforth, Delavan, De Soto, DuBois, Dunfermline, Dupo, East Carondelet, East Peoria, Elizabethtown, Elwin, Fancy Prairie, Farmer City, Fidelity, Fisher, Flanagans, Foosland, Gilman,

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

3 April (G) Southern Illinois—Continued

Intensity III—Continued

Illinois—Continued

Glen Carbon, Grafton, Havanna, Hazel Crest, Hopkins Park, Humboldt, Ipava, Irvington, Ivesdale, Keyesport, Kinsman, Liberty, Litchfield, Lovington, Lyndon, Maquon, McNabb, Milford, Milmine, Modoc, Monmouth, Moweaqua, Muddy, Nashville, New Burnside, Olive Branch, Olmstead, Oraville, Perks, Piasa, Pierron, Pierson Station, Pleasant Plains, Pontoosue, Putnam, Rankin, Roberts, Rosebud, Royal, Rushville, Saybrook, Scottville, Seymour, Sherman, Shipman, Sibley, Sparta, Stonefort, Temple Hill, Thomasboro, Timewell, Toulon, Tunnel Hill, Ullin, Vergennes, Villagrove, Villa Park, Washington, Weldon, Westervelt, Woodland, Woodlawn, Worden, Wrights.

Indiana—Akron, Alfordsville, Arcadia, Atlanta, Austin, Battleground, Bentonville, Boone Grove, Branchville, Brownstown, Carmel, Chesterfield, Churubusco, Clarksburg, Claypool, Camelburg, Dayton, Dunkirk, Dyer, Flat Rock, Fontanet, Fort Ritner, Frankfort, Franktown, Galveston, Goldsmith, Grantsburg, Greenfield, Hardinsburg, Harrodsburg, Hartford City, Hartsville, Helmsburg, Hoagland, Hobbs, Huron, Ingalls, Jamestown, Kurtz, Laketon, Lanesville, Leipsic, Leroy, Linngrove, Marion, Martinsville, Matthews, Maxwell, Milton, Nebraska, New Lisbon, Noblesville, North Vernon, Oakville, Onward, Ora, Palmyra, Paoli, Paris, Parker, Pekin, Peru, Poneto, Raub, Reynolds, Rockfield, Rome, Rome City, Sellersburg, Somerset, South Whitley, Thorntown, Trafalgar, Troy, Underwood, Uniondale, Unionville, Van Buren, Vernon, Webster, West Lafayette, Williamsburg, Winamac, Wolcott, Yeoman, Zanesville.

Iowa—Preston, Sunbury, Winfield.

Kentucky—Bandana, Belton, Bowen, Browder, Centertown, Co-operative, Crayne, Cub Run, Echols, Fairfield, Falls of Rough, Fort Knox, Harold, Hartford, Hueysville, McDaniels, Morganfield, Owingsville, Payneville, Powderly, Reed, Richardsville, Richelieu, Sadler, Sparta, Trappist, Union Star, Vanzant, Woodbury, Worthville.

Michigan—Lakeside.

Missouri—Altenburg, Benton, Commerce, Cooter, Elsberry, Frohna, High Ridge, Holden, Leadwood, Oran, St. Louis, St. Marys, Winfield, Wittenberg.

Ohio—Deshler, El Dorado, Farmersville, Montezuma, Ohio City, Port Jefferson, Vernon, West Alexandria, Williston, Wren, Wright Patterson AFB.

Tennessee—Erin, Obion, White Pine.

Virginia—Clinchport, Nora.

Wisconsin—Kansasville.

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

3 April (G) Southern Illinois—Continued

Intensity II:

Arkansas—Wilson.

Illinois—Addieville, Aledo, Alpha, Alton, Arrowsmith, Baldwin, Belleview, Berwick, Bluffs, Brookfield, Brookport, Brownfield, Buncombe, Bureau, Cabery, Cambridge, Chambersburg, Chebanse, Collinsville, Colmar, Dalton City, Danvers, Dieterich, Dongola, Dorsey, Dow, East Moline, East St. Louis, Elmwood, Fairbury, Freeport, Gale, Galesburg, Geneseo, Good Hope, Grand Tower, Grant Park, Hamburg, Harvel, Herod, Holder, Huntsville, Kane, Lane, Latham, Lebanon, Lerna, Leroy, Liverpool, Lowder, Lowpoint, Macedonia, Matherville, Merna, Monee, Murphysboro, Nebo, New Liberty, New Memphis, Paloma, Plainville, Plato Center, Plymouth, Rantoul, Rardin, Reddick, Saint Charles, Sheldon, Stronghurst, Summum, Trilla, Utica, Valmeyer, Vernon, Viola, Waterloo, Wellington, White Hall, Whittington, Wolf Lake.

Indiana—Beech Grove, Burrows, Central, Columbia City, Dana, Demotte, Dillsboro, Fairmount, Fowler Fowlerton, Hall, Hanna, Helmer, Homer, Hope, Idaville, Jasonville, Kouts, Laurel, Leopold, Montpelier, New Washington, North Salem, Oakford ("The funnel cloud of the tornado was right above Oakford at the time of the earthquake. The windows were rattling, but I do not know if it was the wind or the quake. Some people said that they felt the floor to be in a wavy motion. No damage in Oakford that I know of except a crack in a cement walk."), Pershing, Ridgeville, Roann, Schneider, Scipio, Selma, Spencerville, Stockwell, Tippecanoe, Tobinsport, Tyner, Winona Lake, Wolcottville, Worthington.

Iowa—Atalissa, Baldwin, Bloomfield, Davenport, Keokuk, Mediapolis, Vining.

Kentucky—Auburn, Beechmont, Berry's Lick, Bethany, Blandville, Burlington, Clarkson, Eddyville, Elliston, Fairdale, Farmers, Guston, Hadley, Hickory, Ingram, Livermore, Melber, New Haven, Olympia, Providence, Rhodelia, Rochester, Rockport, Sadieville, Saint Mary, Sharon Grove, Sullivan.

Michigan—Alto, Decatur, Harbert, South Haven, West Olive.

Missouri—Baring, Campbell, El Dorado Springs, Eolia, Florissant, Lockwood, Macomb, Manchester, Menfro, Mesler, Painton, Portage, Des Sioux, Truesdail, Washington, Womack, Zalma.

Ohio—Anna, Centerville, Christiansburg, Luckey, Macon, McGuffey, Miamisburg, Middletown, New Knoxville, New Lebanon, New Madison, Piketon, Rosewood, Ross, Tipp City, West Milton, Wilmington.

Tennessee—Celina, Eva, Midway, Trimble, White Bluff.

Wisconsin—Mount Hope, Trevor.

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

5 June (S) Southern Illinois
Origin time: 08 06 11.3
Epicenter: 38.62° N., 89.94° W.
Depth: 11 km
Magnitude: 3.6 m_{bLg}, 4.0 m_b (G)
See figure 9.

Intensity V:
Illinois—Caseyville, Cottage Hills, Plainview.

Intensity IV:
Illinois—Alhambra, Belleville, Edwardsville, Evansville, Hartford, Highland, Marine, Mitchell, O'Fallon, Renault, Roxana, St. Clair, St. Jacob, Summerfield, Trenton, Troy.
Missouri—Arnold, Flinthill, Mapaville, Normandy, St. Ann, St. Charles, St. Louis.

Intensity III:
Illinois—Glen Carbon, Maryville.
Missouri—Barnhart, Westalton.

Intensity II:
Illinois—Granite City, Mascoutah, New Baden, New Minden, Oakdale, Piasa, Shipman, Texico.
Missouri—Bonneterre, Dittmer, Hillsboro, Maplewood.

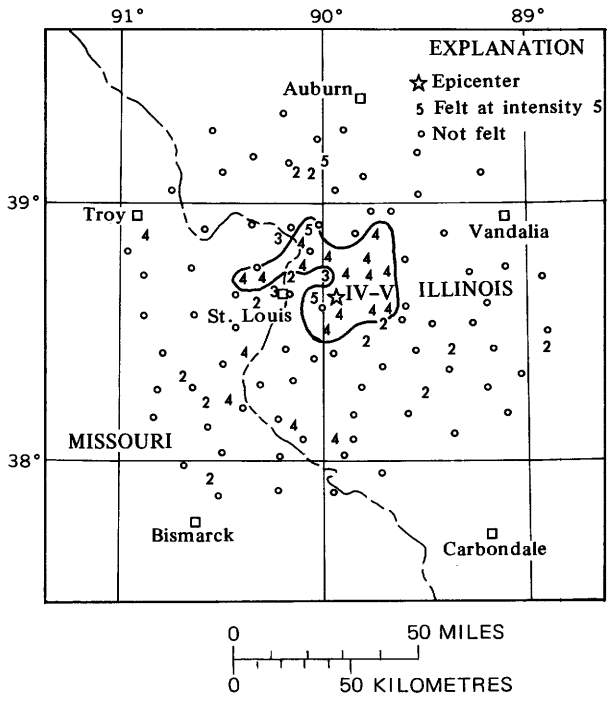

FIGURE 9.—Isoseismal map for the southern Illinois earthquake of 5 June 1974, 08 06 11.3 UTC.

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

Missouri

5 April (S) Eastern Missouri
Origin time: 19 41 11.2
Epicenter: 38.590° N., 90.910° W.
Depth: 1 km
Magnitude: 2.6 m_{bLg}
Intensity II: Augusta.

13 May (S) New Madrid, Missouri
Origin time: 06 52 18.8
Epicenter: 36.71°N., 89.39°W.
Depth: 1 km
Magnitude: 4.1m_{bLg}, 4.3m_b (G)
See figure 10.

Intensity VI:
Missouri—East Prairie (Damage to swimming pool, fire hall, and funeral home).

Intensity V:
Missouri—Union City, Wolf Island.

Intensity IV:
Arkansas—McDougal.
Illinois—Cairo, Olmstead.
Kentucky—Columbus, Kevil, Wickliffe, Wingo.
Missouri—Anniston, Wyatt.

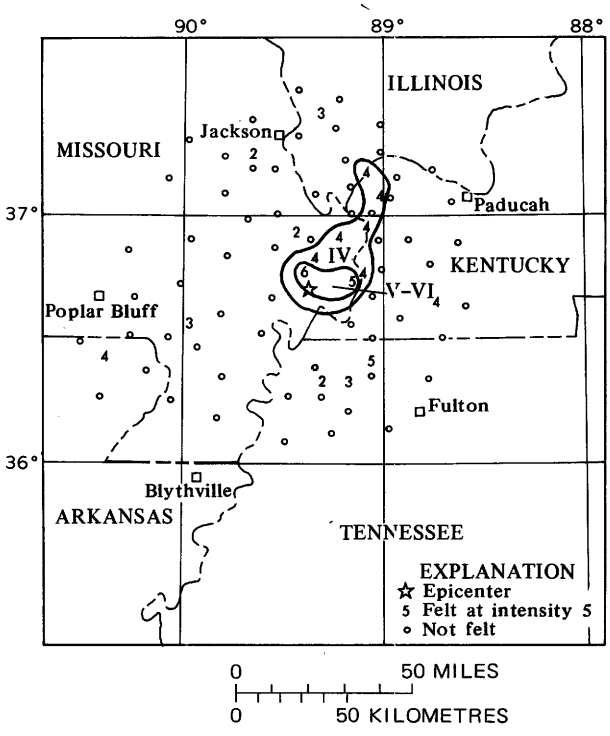

FIGURE 10.—Isoseismal map for the New Madrid, Mo., earthquake of 13 May 1974, 06 52 18.8 UTC.

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

3 May (S) New Madrid, Missouri—Continued

Intensity III:
Illinois—Jonesboro.
Missouri—Malden.
Tennessee—Troy.

Intensity II:
Missouri—Charleston, Dutchtown.
Tennessee—Hornbeak.

Montana

9 June (G)	Hebgen Lake region
Origin time:	00 50 42.0
Epicenter:	44.80° N., 111.05° W.
Depth:	5 km
Magnitude:	4.9 M_L
Intensity II:	Felt in Gallatin County-Yellowstone National Park Area.

Nevada

29 May (G)	Southern Nevada
Origin time:	19 23 32.8
Epicenter:	36.82° N., 115.88° W.
Depth:	11 km
Magnitude:	3.9 M_L, 4.0 M_L (P)
Intensity II:	Yucca Flat area.

New York

7 June (L)	Southern New York
Origin time:	19 45 37.0
Epicenter:	41.63° N., 73.94° W.
Depth:	Shallow.
Magnitude:	2.9 M_L, 3.3 m_{bLg}

Figure 11 is the isoseismal map by Pomeroy, Simpson, and Sbar (1975).

The Maximum Intensity of VI is based on one report of broken windows in Wappingers Falls. Over 100 aftershocks were recorded in the 6-day period following this earthquake.

Intensity VI: Minor damage in Wappingers Falls area.

Pennsylvania

7 April (G)	South Central Pennsylvania
Origin time:	14 45 39.1
Epicenter:	41.00° N., 75.96° W.
Depth:	3 km
Magnitude:	3.0 m_b, 3.0m_{bLg}

It is noteworthy that this event occurred in a major zone of anthracite production. This event may possibly be nontectonic or artificial. Both a macroseismic questionnaire canvass of the area and queries to the Pennsylvania Division of Mines, Quarries, and Explosions yielded negative results.

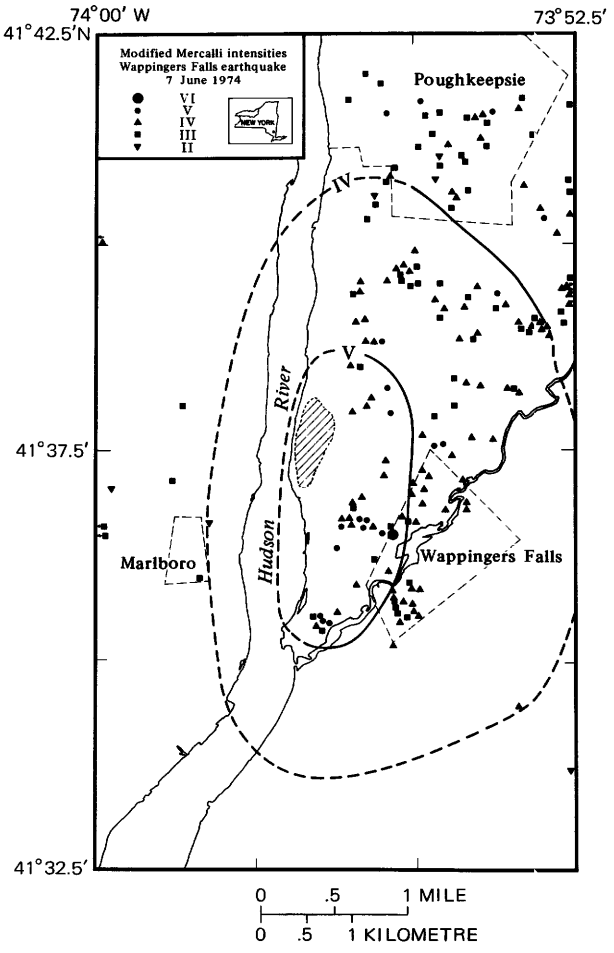

FIGURE 11.—Isoseismal map for the southern New York earthquake of 7 June 1974, 19 45 36.8 UTC. From Pomeroy, Simpson, and Sbar (1975).

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

Utah

29 April (G)	Southern Utah
Origin time:	05 44 35.7
Epicenter:	37.71° N., 113.03° W.
Depth:	5 km
Magnitude:	4.1 m_b, 3.0 M_L
Intensity II:	Summit area.

29 April (G)	Southern Utah
Origin time:	07 35 51.8
Epicenter:	37.81° N., 112.98° W.
Depth:	5 km
Magnitude:	4.4 m_b, 3.2 M_L
Intensity II:	Summit area.

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

Virginia

30 May (V) Southern Virginia
Origin time: 21 28 37.2
Epicenter: 37.382° N., 80.419° W.
Depth: 8 km
Magnitude: 3.6 m_{bLg}
See figure 12.
Intensity V:
Virginia—Bel Spring, Lafayette, Pembroke.
Intensity IV:
Virginia—Catawba, Fincastle, Kimballton, Newcastle, Newport, Ripplemead.
West Virginia—Alderson, Gap Mills, Lindside, Pickaway, Sarton, Union, Waiteville, Willowbend.
Intensity III:
Virginia—Paint Bank, Roanoke.
West Virginia—Peterstown, Sweet Springs.
Intensity II:
Virginia—Blairs, Eggleston, Emory, Glen Lyn, Vansant.
West Virginia—Cucumber, Dingess, Drennon, Forest Hill, Gary, Greenville, Meadow Bridge.

Washington

20 April (G) Western Washington
Origin time: 03 00 09.3
Epicenter: 46.759° N., 121.523° W.
Depth: 5 km
Magnitude: 4.8 m_b, 4.9 M_L

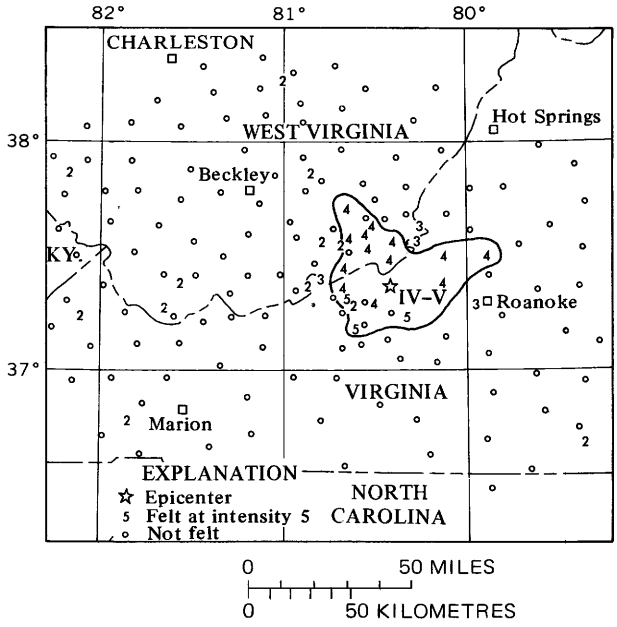

FIGURE 12.—Isoseismal map for the southern Virginia earthquake of 30 May 1974, 21 28 37.2 UTC.

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

20 April (G) Western Washington—Continued

Intensity V: Packwood ("No damage except knocked a few things off of shelves." Two other small shocks felt afterward.), Ohanopecosh campground, Mt. Rainier National Park.
Intensity IV: Elbe, Longmire.
Intensity III: Ronald, Selleck, Union.
Intensity II: Carbonado, Carnation, Eatonville, Freeland, Indianola, Issaquah, Kapowsin, Kittitas, Mattawa, Roslyn, Seabeck, Winlock.

16 May (G) Northwestern Washington
Origin time: 13 04 36.1
Epicenter: 48.14° N., 122.92° W.
Depth: 54 km
Magnitude: 3.8 m_b
See figure 13.
This shock was felt over 9,400 km² of northwestern Washington.
Intensity V: Coupeville, La Conner, Nordland.
Intensity IV: Bellingham, Brinnon, Darrington, Eastsound, Gardiner, Granite Falls, Green Bank, Index, Joyce, Oak Harbor, Olga, Port Gamble, Port Ludlow, Preston, Stanwood.
Intensity III: Arlington, Clinton, Friday Harbor, Langley, Quilcene.
Intensity II: Anacortes, Duvall, Freeland, Lopez, Silvana.

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

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Bruce A. Bolt, Seismograph Station, University of California at Berkeley.

HAWAII: Robert Y. Koyanagi, U.S. Geological Survey, Hawaiian Volcano Observatory, Hawaii National Park.

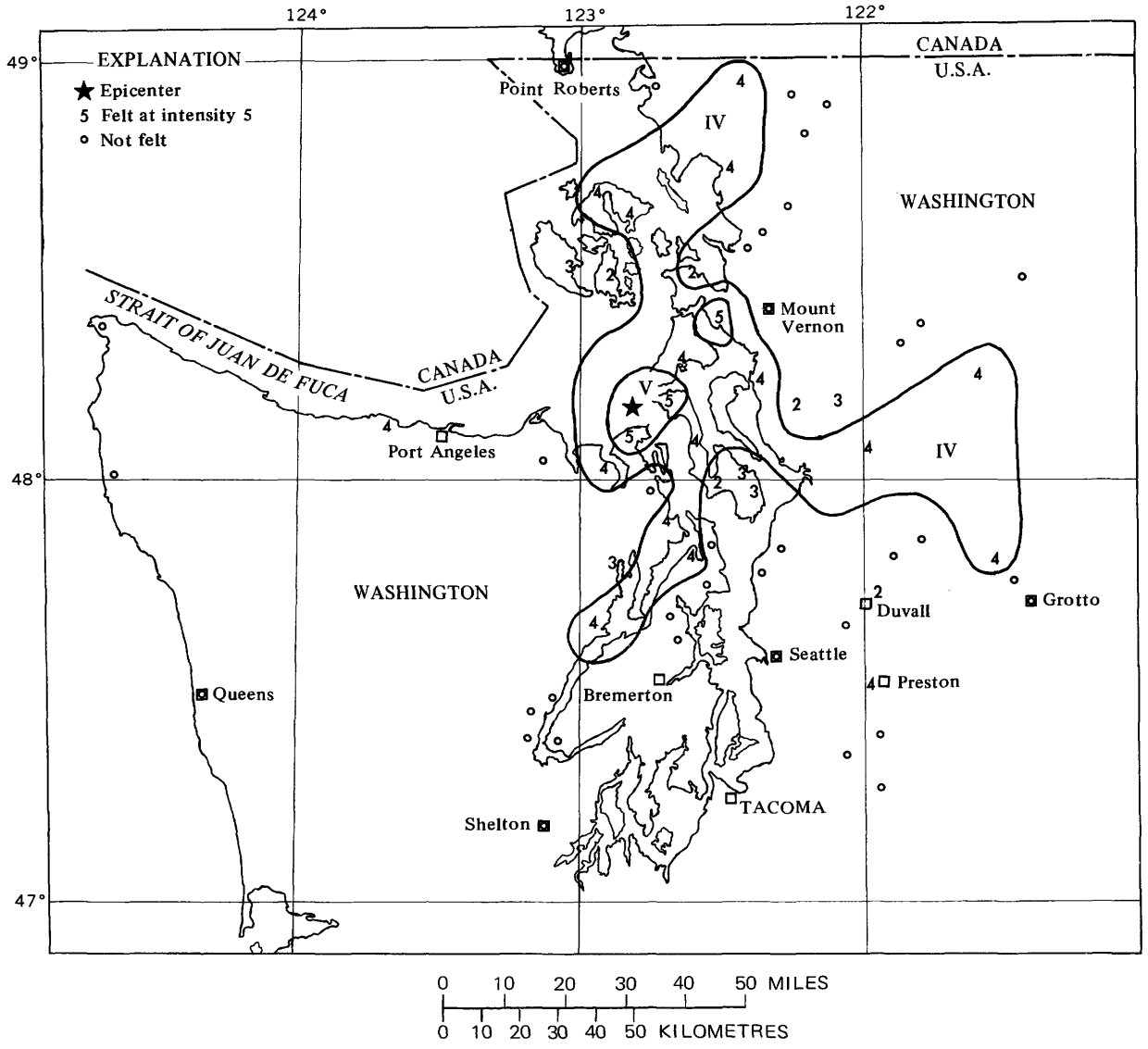

FIGURE 13.—Isoseismal map for the northwestern Washington earthquake of 16 May 1974, 13 04 36.1 UTC.

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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.

Coffman, J.L., and von Hake, C.A., eds., 1973, Earthquake history of the United States, revised edition (through 1970): U.S. Natl. Oceanic and Atmospheric Adm. Pub. 41-1, p. 56-57.

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.

Pomeroy, P.W., Simpson, D.W., and Sbar, M.L., 1975, The Wappingers Fall earthquake of June 7, 1974, and its aftershocks: Seismol. Soc. America Bull. (in press).

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

U.S. National Oceanic and Atmospheric Administration, Environmental Data Service, 1974a, Storm data: Storm Data, v. 16, no. 4, 23 p. 1974b, Storm data: Storm Data, v. 16, no. 12, 33 p.

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