GEOLOGICAL SURVEY CIRCULAR 853–C

Earthquakes in the United States, July–September 1980

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By J. H. Minsch, C. W. Stover, B. G. Reagor, and P. K. Smith

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1981

United States Department of the Interior

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Geological Survey

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INTRODUCTION

The earthquake information in this publication supplements that published in the NEIS (National Earthquake Information Service) publications, PDE ("Preliminary Determination of Epicenters") and "Preliminary Determination of Epicenters Monthly Listing," by providing detailed felt and intensity data for U.S. earthquakes. The purpose of this circular is to provide a complete listing of macroseismic effects of earthquakes, which can be used in risk studies, nuclear power plant site evaluations, seismicity studies, and to answer inquiries by the public.

This publication contains two major sections. The first part (table 1), which is mainly concerned with data obtained by seismographs, 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 computational source of the hypocenter. The second section, which concerns intensity information, consists of two maps, three photographs, and table 2. This section also contains information on events that were felt but were not listed in the PDE because there was not enough instrumental data to obtain a solution. The list of earthquakes in table 1 was compiled from those located in the United States or nearby offshore areas that were published in the PDE; from aftershock studies carried out by the U.S. Geological Survey and other organizations; from hypocenters in California above magnitude 3.0 supplied by the California Institute of Technology, Pasadena, the University of California, Berkeley, and other offices of the U.S. Geological Survey; from hypocenters in Hawaii supplied by the Hawaiian Volcano Observatory; and from other institutions as listed in the acknowledgments. Known or suspected explosions are also listed in table 1 and table 2.

The intensities and macroseismic data were compiled from information obtained from postal questionnaires, from newspaper articles, and from other Government agencies, State institutions, local organizations, and individuals. (See "Acknowledgments" for a list of collaborators.) Figure 1 is the questionnaire in use by the NEIS. Other types of questionnaires are used by State agencies, engineering firms, and other Government agencies to collect intensity data. 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, CO 80225. Copies of the current "Earthquake Report" questionnaire can be obtained at this address.

The NEIS uses the postal questionnaire as the primary source of macroseismic data to carry out an intensity survey; however, on-site field investigations are made following earthquakes that do significant damage. The "Earthquake Report" forms are mailed to postmasters within the area affected by the earthquake. The completed forms are returned to the NEIS, where they are evaluated and intensity values are assigned to individual locations. In the case of large or significant earthquakes, the intensity observations are plotted and isoseismal maps are prepared. It should be pointed out that the isoseismals represent a general intensity level and that they do not necessarily agree with every individual observation.

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 source of the computed solution. The origin time and date are listed in Universal Coordinated Time (UTC) and local standard time based on the time-zone maps in figures 2 and 3. The epicenters, which were taken from those published in the PDE, or from other sources as noted, are listed here to two decimals. The accuracy of the epicenters is not necessarily indicated by the number of decimals

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EARTHQUAKE REPORT

Form Approved
OMB No. 42-R1700

Please answer this questionnaire and return as soon as possible

1. Was an earthquake felt by anyone in your town near the date and time indicated on the opposite page?
   ☐ No: Please refold and tape for return mail.
   ☐ Yes: Date_____ Time_____ ☐ AM ☐ PM ☐ Standard time ☐ Daylight time

Name of person filling out form _____

Address_____

City_____ County_____

State_____ Zip code_____

If you felt the earthquake, complete the following section. If others felt the earthquake but you did not, skip the personal report and complete the community report.

PERSONAL REPORT

2. Did you personally feel the earthquake? 1☐ Yes ☐ No
   Were you awakened by the earthquake? 2☐ Yes ☐ No
   Were you frightened by the earthquake? 3☐ Yes ☐ No
   Were you at 4☐ Home 5☐ Work 6☐ Other? _____
   Town and zip code of your location at time of earthquake _____
   Check your activity when the earthquake occurred:
   7☐ Walking 8☐ Sleeping 9☐ Lying down 10☐ Standing
   11☐ Driving (car in motion) 12☐ Sitting 13☐ Other_____
   Were you 14☐ Inside or 15☐ Outside?
   If inside, on what floor were you? 16 _____
   Did you have difficulty in standing or walking 17☐ Yes 18☐ No
   Vibration could be described as 19☐ Light 20☐ Moderate 21☐ Strong
   Was there earth noise? ☐ No 22☐ Faint 23☐ Moderate 24☐ Loud
   Direction of noise ☐ North ☐ South ☐ East ☐ West
   Estimated duration of shaking 25☐ Sudden, sharp (less than 10 secs) 26☐ Long (30-60 secs) 27☐ Short (10-30 secs)

Continue on to next section which should include personal as well as reported observations.

COMMUNITY REPORT

Town and zip code_____

DO NOT INCLUDE EFFECTS FROM OTHER COMMUNITIES/TOWNS
Check one box for each question that is applicable.

3a.	The earthquake was felt by	☐ No one	28☐ Few	29☐ Several	30☐ Many	31☐ All?
b.	This earthquake awakened	☐ No one	32☐ Few	33☐ Several	34☐ Many	35☐ All?
c.	This earthquake frightened	☐ No one	36☐ Few	37☐ Several	38☐ Many	39☐ All?

4. What indoor physical effects were noted in your community?

Windows, doors, dishes rattled	40☐ Yes	☐ No	
Walls creaked	41☐ Yes	☐ No	
Building trembled (shook)	42☐ Slightly	43☐ Strongly	
Hanging pictures (more than one)	44☐ Swung	45☐ Out of place	46☐ Fallen
Windows 47☐ Few cracked	48☐ Some broken out	49☐ Many broken out	
Small objects overturned	50☐ Few	51☐ Many	
Small objects fallen	52☐ Few	53☐ Many	
Glassware/dishes broken	54☐ Few	55☐ Many	
Light furniture or small appliances	56☐ Overturned	57☐ Damaged seriously	
Heavy furniture or appliances	58☐ Overturned	59☐ Damaged seriously	
Did hanging objects or doors swing?	60☐ Slightly	61☐ Moderately	62☐ Violently
Can you estimate direction?	☐ North/South	☐ East/West	☐ Other_____
Items thrown from store shelves	63☐ Few	64☐ Many	

Continued on the reverse side

FIGURE 1.--Example of the "Earthquake Report" form used for evaluating the intensities of earthquakes. A, front side.

5. Indicate effects of the following types to interior walls if any:

Plaster/stucco	65☐ Hairline cracks	66☐ Large cracks (many)	67☐ Fell in large amounts
Dry wall	68☐ Hairline cracks	69☐ Large cracks (many)	70☐ Fell in large amounts

6. What outdoor physical effects were noted in your community?

Trees and bushes shaken	71☐ Slightly	72☐ Moderately	73☐ Strongly
Standing vehicles rocked	74☐ Slightly	75☐ Moderately	
Moving vehicles rocked	76☐ Slightly	77☐ Moderately	
Water splashed onto sides of lakes, ponds, swimming pools	78☐ Yes	☐ No	
Elevated water tanks	79☐ Cracked	80☐ Twisted	81☐ Fallen (thrown down)
Tombstones	82☐ Displaced 85☐ Fallen	83☐ Cracked	84☐ Rotated
Chimneys	86☐ Cracked 89☐ Broken at roof line	87☐ Twisted	88☐ Fallen 90☐ Bricks fallen
Railroad tracks bent	91☐ Slightly	92☐ Greatly	
Stone or brick fences /walls	93☐ Open cracks	94☐ Fallen	95☐ Destroyed
Underground pipes	96☐ Broken	97☐ Out of service	
Highways or streets	98☐ Large cracks	99☐ Large displacements	
Sidewalks	100☐ Large cracks	101☐ Large displacements	

7a. Check below any structural damage to buildings.

Foundation	102☐ Cracked		103☐ Destroyed	
Interior walls	104☐ Split	105☐ Fallen	106☐ Separated from ceiling or floor	
Exterior walls	107☐ Large Cracks		108☐ Bulged outward	
	109☐ Partial collapse		110☐ Total collapse	

b. What type of construction was the building that showed this damage?

111☐ Wood	112☐ Stone	113☐ Brick veneer	114☐ Other _____
115☐ Brick	116☐ Cinderblock	117☐ Reinforced concrete	118☐ Mobile home

c. What was the type of ground under the building?

☐ Don't know	119☐ Sandy soil	120☐ Marshy	121☐ Fill	
122☐ Hard rock	123☐ Clay soil	124☐ Sandstone, limestone, shale		

d. Was the ground: 125☐ Level 126☐ Sloping 127☐ Steep?

e. Check the approximate age of the building:
128☐ Built before 1935 129☐ Built 1935-65 130☐ Built after 1965

8. Check below any structural damage to

Bridges/Overpasses	131☐ Concrete	132☐ Wood	133☐ Steel	134☐ Other_____
Damage was	135☐ Slight	136☐ Moderate		137☐ Severe
Dams	138☐ Concrete	139☐ Large earthen		
Damage was	140☐ Slight	141☐ Moderate		142☐ Severe

9. What geologic effects were noted in your community?

Ground cracks	143☐ Wet ground	144☐ Steep slopes	145☐ Dry and level ground
Landslides	146☐ Small	147☐ Large	
Slumping	148☐ River bank	149☐ Road fill	150☐ Land fill
Were springs or well water disturbed?	151 Level changed		152☐ Flow disturbed
	153 Muddied		☐ Don't know
Were rivers or lakes changed?	154 Yes	☐ No	☐ Don't know

10a. What percentage of buildings were damaged?

Within 2 city blocks of your location	☐ None		155☐ Few (about 5%)
	156☐ Many(about 50%)		157☐ Most (about 75%)
b. In area covered by your zip code	☐ None		158☐ Few (about 5%)
	159☐ Many (about 50%)		160☐ Most (about 75%)

Thank you for your time and information. Refold this card and tape for return mail.

FIGURE 1.--Example of the "Earthquake Report" form used for evaluating the intensities of earthquakes. B, reverse side.

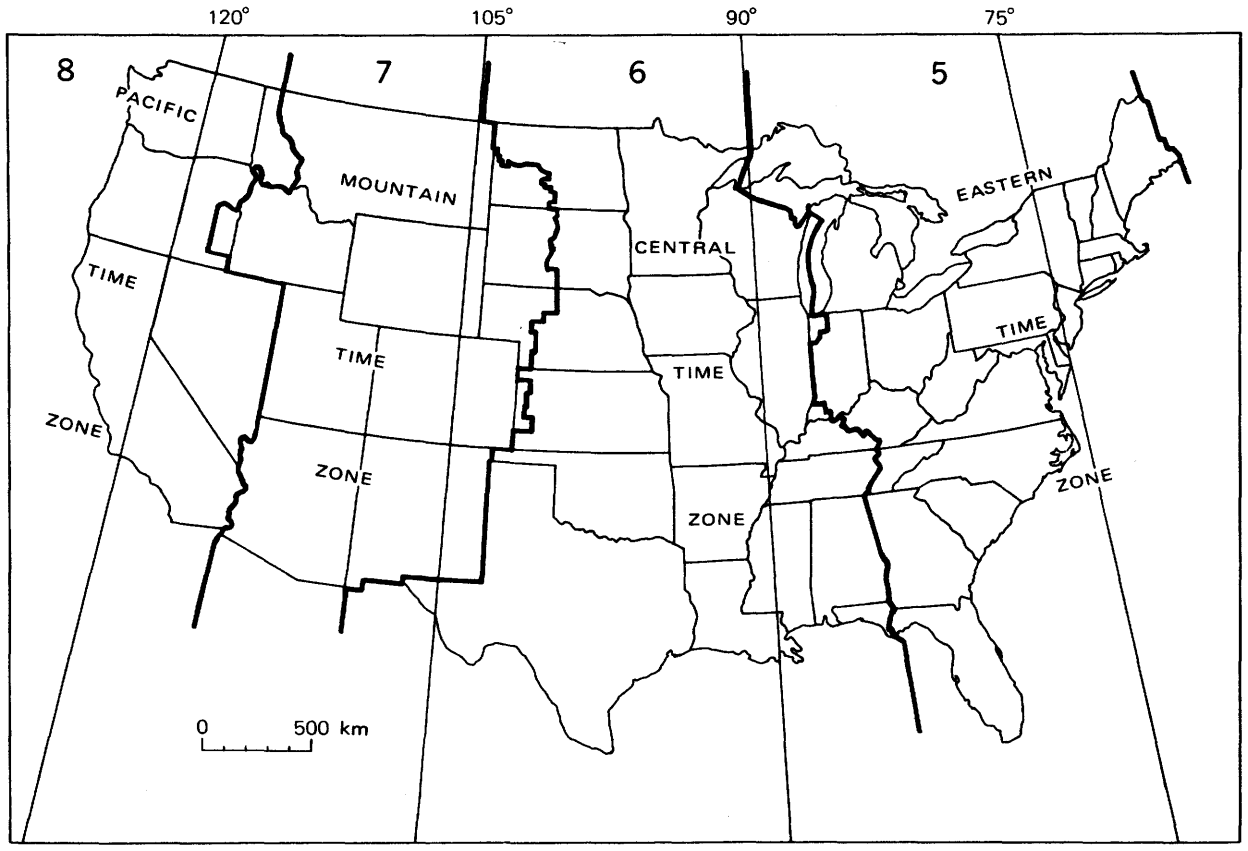

FIGURE 2.—Standard time zones of the conterminous United States. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

listed. The epicenters located by the NEIS usually are accurate to two-tenths of a degree or less. In general, epicenters located offshore are less accurate than those on land, even though they are listed to two decimals. In regions covered by dense networks of seismographs such as California, epicenter accuracy is significantly better than the two-tenths of a degree listed. Depths are listed to the nearest whole kilometer.

Figures 4-6 are maps summarizing the earthquake activity for the conterminous United States, Alaska, and Hawaii for the period July-September 1980. The magnitudes represented in these figures are based on ML or Mn; if neither was computed, then on MS; and finally on mb, when it was the only magnitude computed.

The magnitude values listed in tables 1 and 2 were furnished by cooperating institutions or determined by NEIS. The computational sources are labeled 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 source is NEIS.

The magnitude values calculated by NEIS are based on the following formulas:

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

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 vertical surface-wave ground amplitude, in micrometers; 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 depths less than 50 km.

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

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 micrometers, is not necessarily the maximum of the P-wave group. Q is a function of distance D and depth h, where $D \geq 5°$.

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

as defined by Richter (1958, p. 340), where A is the maximum trace amplitude in millimeters,

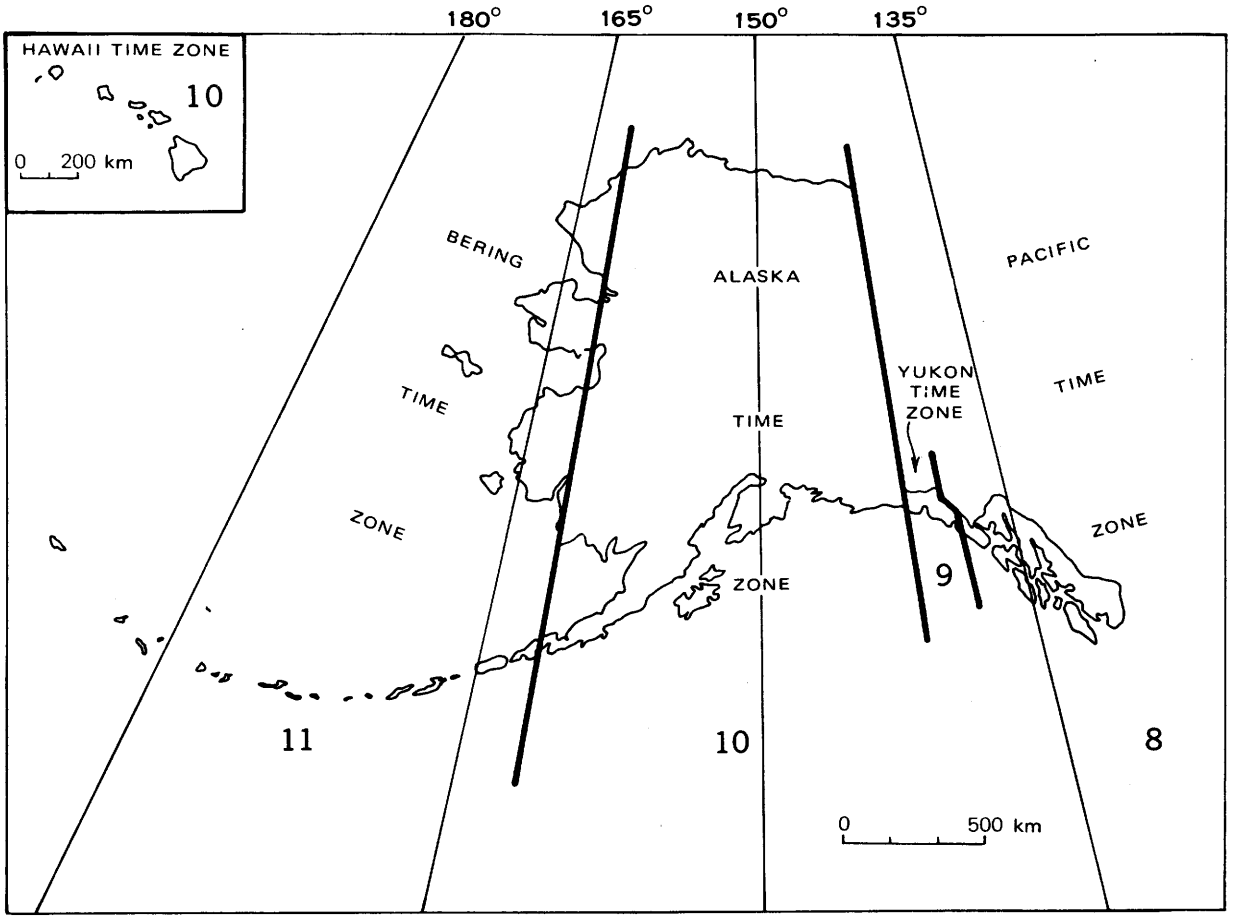

FIGURE 3.--Standard time zones of Alaska and Hawaii. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

written by a Wood-Anderson torsion seismometer, and log A is a standard value as a function of distance, where the distance is $\leq$600 km. ML values are also calculated from other seismometers by conversion of recorded ground motion to the expected response of the torsion seismometer.

$$Mn=3.75+0.90(\log D)+\log(A/T) \quad (4)$$
$$0.5° \leq D \leq 4°,$$

$$Mn=3.30+1.66(\log D)+\log(A/T)$$
$$4° \leq D \leq 30°,$$

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

All of the intensity values (indicated by Roman numerals) listed in this summary were determined, using the Modified Mercalli Intensity Scale of 1931 (Wood and Neumann, 1931) 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 that contain minimal or sketchy information are listed only as "FELT." This does not imply that the earthquake was felt at a low intensity level, but indicates that the available data is not sufficient for assigning a valid intensity value. These reports are filed in the offices of the NEIS or in government archives and are available for detailed study.

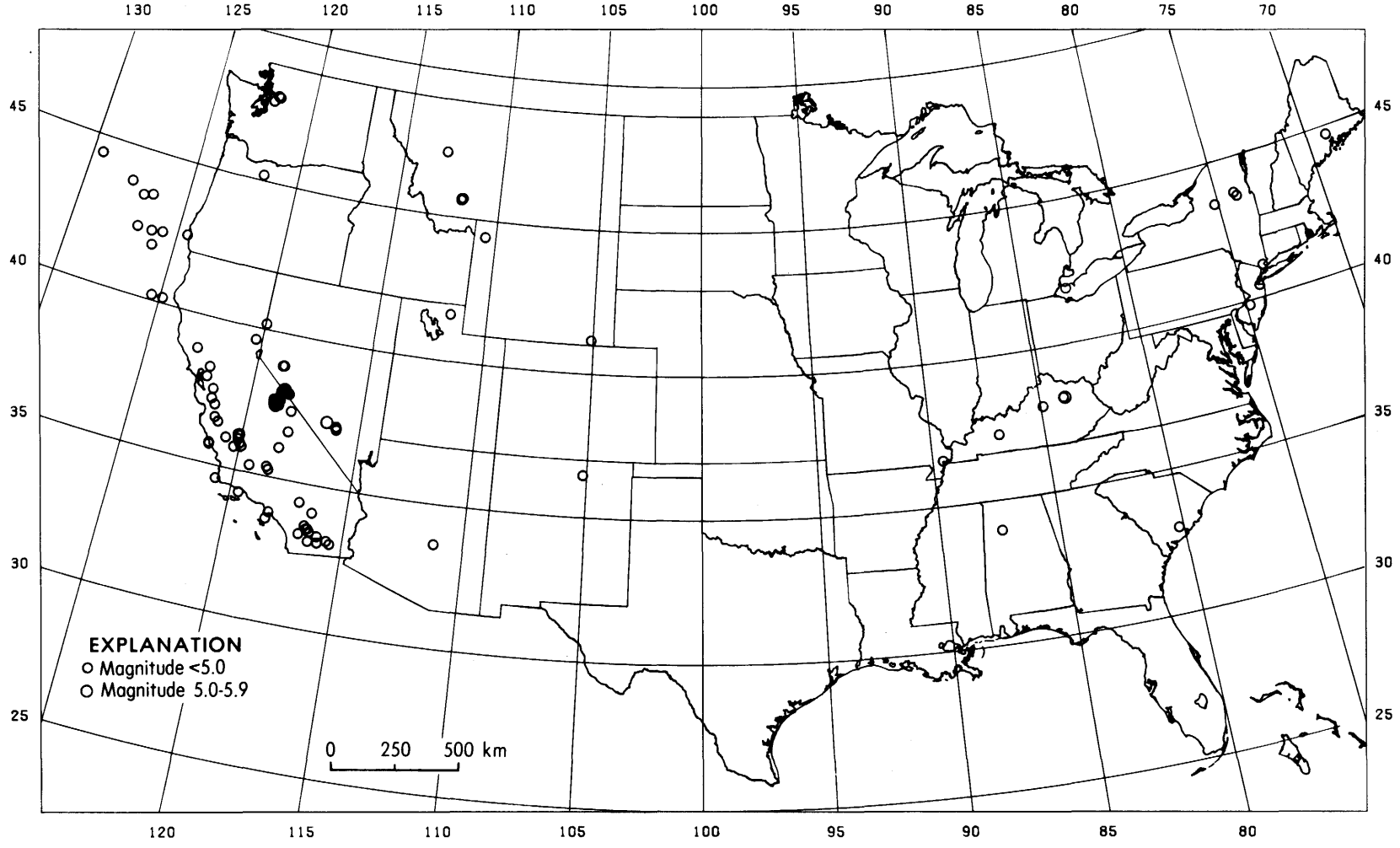

FIGURE 4.--Earthquake epicenters in the conterminous United States for July-September 1980, plotted from table 1.

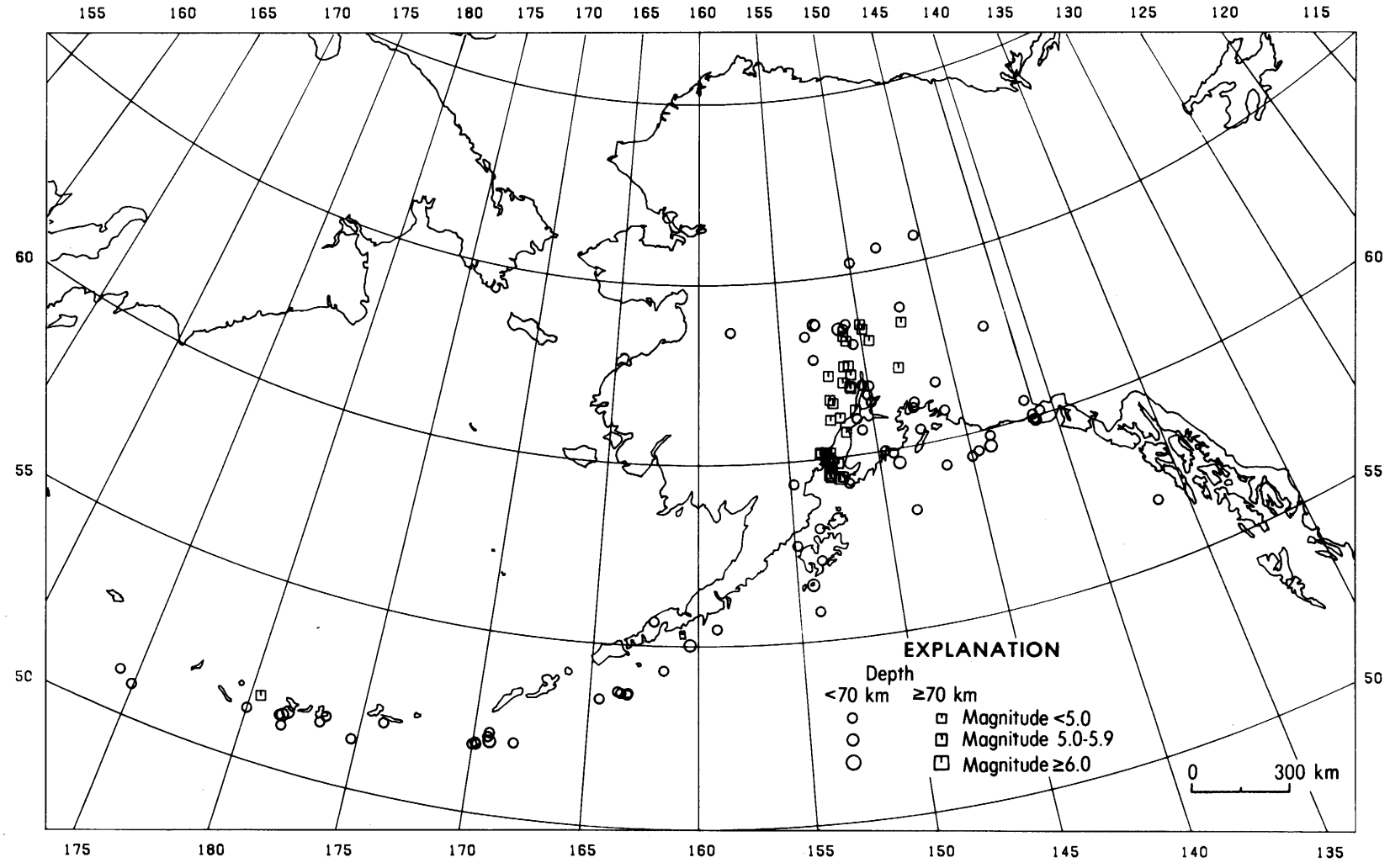

FIGURE 5.--Earthquake epicenters in Alaska for July-September 1980, plotted from table 1.

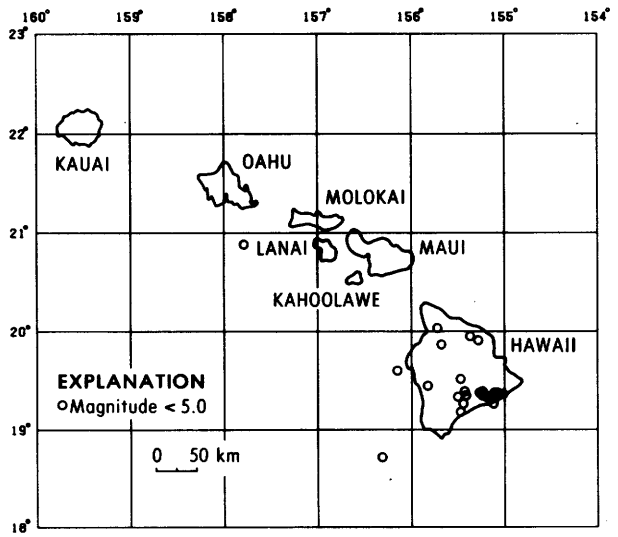

FIGURE 6.--Earthquake epicenters in Hawaii for July-September 1980, plotted from table 1.

MODIFIED MERCALLI INTENSITY SCALE OF 1931

Adapted from Sieberg's Mercalli-Cancani scale, modified and condensed.

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

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

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

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

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

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

VII. Frightened all--general alarm, all ran outdoors. Some, or many, found it difficult to stand. Noticed by persons driving motor cars. Trees and bushes shaken moderately to strongly. Waves on ponds, lakes, and running water. Water turbid from mud stirred up. Incaving to some

extent of sand or gravel stream banks. Rang large church bells, etc. Suspended objects made to quiver. Damage negligible in buildings of good design and construction, slight to moderate in well-built ordinary buildings, considerable in poorly built or badly designed buildings, adobe houses, old walls (especially where laid up without mortar), spires, etc. Cracked chimneys to considerable extent, walls to some extent. Fall of plaster in considerable to large amount, also some stucco. Broke numerous windows, furniture to some extent. shook down loosened brickwork and tiles. Broke weak chimneys at the roof-line (sometimes damaging roofs). Fall of cornices from towers and high buildings. Dislodged bricks and stones. Overturned heavy furniture, with damage from breaking. Damage considerable to concrete irrigation ditches.

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

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

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

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

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

Table 1.--*Summary of U.S. earthquakes for July-September 1980*

Administration, Alaska Tsunami Warning Center, Palmer; (P) California Institute of Technology, Pasadena; (S) St. Louis University, St. Louis, Missouri; (T) University of Oklahoma, Leonard; (U) University of Utah, Salt Lake; (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]

[Sources of the hypocenters and magnitudes: (B) University of California, Berkeley; (E) U.S. Department of Energy, Las Vegas, Nevada; (G) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (K) Tennessee Earthquake Information Center, Memphis; (L) Lamont-Doherty Geological Observatory, Palisades, N.Y.; (M) National Oceanic and Atmospheric

Date (1980)	Origin time (UTC)			Lat	Long	Depth (km)	Magnitude			Maximum intensity	Hypocenter source	Local time		
	hr	min	s				mb	MS	ML or Mn			Date	Hour	
ALABAMA														
JULY 25	15	30	12.5	33.94 N.	87.44 W.	0	...	...	3.1G	...	G	JULY 25	09	A.M. CST
ALASKA														
JULY 1	14	04	45.5	52.03 N.	168.20 W.	25	4.2	...	3.9M	...	G	JULY 1	03	A.M. BST
JULY 2	02	42	15.4	59.87 N.	141.16 W.	15	...	...	3.8M	...	G	JULY 1	04	P.M. AST
JULY 4	05	45	14.5	61.90 N.	151.06 W.	80	4.3	...	...	FELT	G	JULY 3	07	P.M. AST
JULY 4	06	07	40.5	53.69 N.	163.72 W.	33N	4.7	...	4.3M	...	G	JULY 3	07	P.M. BST
JULY 5	15	19	22.8	51.47 N.	178.43 W.	51	5.1	4.9	5.7M	...	G	JULY 5	04	A.M. BST
JULY 5	15	50	24.5	61.61 N.	150.11 W.	49	...	...	3.7M	FELT	G	JULY 5	05	A.M. AST
JULY 5	18	31	54.8	62.48 N.	151.29 W.	107	...	...	...	...	G	JULY 5	08	A.M. AST
JULY 6	18	45	30.8	56.56 N.	154.24 W.	26	5.2	4.9	5.4M	FELT	G	JULY 6	08	A.M. AST
JULY 9	16	59	32.9	59.38 N.	144.97 W.	33N	...	...	4.1M	...	G	JULY 9	06	A.M. AST
JULY 10	09	14	3.3	50.89 N.	174.91 E.	33N	4.5	...	...	...	G	JULY 9	10	P.M. BST
JULY 12	22	20	4.9	63.43 N.	147.36 W.	91	...	...	...	...	G	JULY 12	12	P.M. AST
JULY 13	05	26	19.1	59.95 N.	152.78 W.	123	...	...	...	...	G	JULY 12	07	P.M. AST
JULY 13	15	48	36.1	55.82 N.	153.99 W.	33N	...	...	3.6M	...	G	JULY 13	05	A.M. AST
JULY 13	19	14	37.7	61.90 N.	150.37 W.	5	...	...	3.0M	...	G	JULY 13	09	A.M. AST
JULY 14	03	41	57.4	57.22 N.	153.67 W.	33N	...	...	3.4M	...	G	JULY 13	05	P.M. AST
JULY 15	03	29	35.8	63.63 N.	150.81 W.	33N	...	...	3.6M	...	G	JULY 14	05	P.M. AST
JULY 15	13	27	26.0	61.20 N.	147.53 W.	59	...	...	...	...	G	JULY 15	03	A.M. AST
JULY 15	18	47	49.2	51.57 N.	176.78 W.	55	4.6	...	...	...	G	JULY 15	07	A.M. BST
JULY 17	14	45	52.6	63.17 N.	150.90 W.	149	...	...	...	...	G	JULY 17	04	A.M. AST
JULY 18	20	12	3.6	60.08 N.	141.21 W.	15	4.7	...	4.3M	...	G	JULY 18	10	A.M. AST
JULY 22	00	35	44.0	51.95 N.	174.02 W.	70	4.6	...	...	...	G	JULY 21	01	P.M. BST
JULY 22	22	45	41.7	59.76 N.	152.64 W.	96	...	...	...	...	G	JULY 22	12	P.M. AST
JULY 23	03	10	0.1	63.42 N.	149.83 W.	117	...	...	...	...	G	JULY 22	05	P.M. AST
JULY 23	23	07	20.7	59.45 N.	152.08 W.	87	...	...	...	...	G	JULY 23	01	P.M. AST
JULY 24	02	34	4.3	53.46 N.	164.54 W.	14	4.7	4.4	...	...	G	JULY 23	03	P.M. BST
JULY 24	17	53	27.8	51.75 N.	176.56 W.	62	4.1	...	...	FELT	G	JULY 24	06	A.M. BST
JULY 24	19	01	55.0	61.51 N.	152.15 W.	133	...	...	...	...	G	JULY 24	09	A.M. AST
JULY 25	03	35	53.8	59.93 N.	141.22 W.	15	...	...	3.7M	...	G	JULY 24	05	P.M. AST
JULY 25	19	16	56.9	59.46 N.	152.75 W.	115	...	...	...	...	G	JULY 25	09	A.M. AST
JULY 26	12	02	8.9	63.09 N.	149.51 W.	123	...	...	...	...	G	JULY 26	02	A.M. AST
JULY 26	13	15	53.4	61.03 N.	147.61 W.	33N	...	...	3.4M	...	G	JULY 26	03	A.M. AST
JULY 27	09	05	35.0	63.72 N.	152.79 W.	21	4.7	3.7	5.0M	IV	G	JULY 26	11	P.M. AST
JULY 27	09	24	0.2	63.73 N.	152.72 W.	33N	...	...	3.5M	...	G	JULY 26	11	P.M. AST
JULY 28	01	15	35.0	59.89 N.	141.10 W.	15	...	...	3.0M	...	G	JULY 27	03	P.M. AST
JULY 28	02	29	24.6	60.11 N.	140.77 W.	28	...	...	3.1M	...	G	JULY 27	05	P.M. YST
JULY 29	02	26	22.0	63.42 N.	153.41 W.	33N	...	...	3.6M	...	G	JULY 28	04	P.M. AST
JULY 29	10	50	2.8	51.15 N.	174.22 E.	33N	4.5	...	...	...	G	JULY 28	11	P.M. BST
JULY 30	04	12	32.3	61.25 N.	150.93 W.	73	3.7	...	...	...	G	JULY 29	06	P.M. AST
JULY 31	04	43	55.2	51.19 N.	178.37 W.	33N	4.7	...	4.1M	...	G	JULY 30	05	P.M. BST
JULY 31	11	59	21.3	59.39 N.	152.31 W.	94	3.7	...	...	...	G	JULY 31	01	A.M. AST
AUG. 1	04	05	38.5	59.91 N.	152.72 W.	118	...	...	...	...	G	JULY 31	06	P.M. AST
AUG. 1	14	39	14.0	60.18 N.	153.15 W.	121	...	...	...	...	G	AUG. 1	04	A.M. AST
AUG. 1	23	07	14.7	59.62 N.	148.94 W.	26	5.4	5.1	5.7M	IV	G	AUG. 1	01	P.M. AST
AUG. 2	07	07	17.3	52.11 N.	169.36 W.	33N	5.3	5.2	4.8M	...	G	AUG. 1	08	P.M. BST
AUG. 2	10	46	15.0	52.23 N.	169.34 W.	33N	4.5	...	...	...	G	AUG. 1	11	P.M. BST
AUG. 2	15	40	29.2	59.90 N.	149.18 W.	33N	...	...	3.1M	...	G	AUG. 2	05	A.M. AST
AUG. 3	07	11	43.0	52.00 N.	169.28 W.	33N	4.8	5.5	5.2M	...	G	AUG. 2	08	P.M. BST
AUG. 3	07	59	52.2	62.20 N.	148.07 W.	76	...	...	...	...	G	AUG. 2	09	P.M. AST
AUG. 4	17	31	0.8	61.09 N.	151.87 W.	96	3.8	...	...	III	G	AUG. 4	07	A.M. AST
AUG. 6	09	16	18.9	60.15 N.	152.65 W.	122	...	...	...	...	G	AUG. 5	11	P.M. AST
AUG. 7	19	16	6.5	63.52 N.	151.29 W.	10	5.2	...	5.4M	IV	G	AUG. 7	09	A.M. AST
AUG. 9	23	24	39.6	58.10 N.	153.64 W.	66	4.2	...	...	...	G	AUG. 9	01	P.M. AST
AUG. 10	07	51	52.7	54.32 N.	161.64 W.	33N	4.9	...	4.4M	...	G	AUG. 9	08	P.M. BST
AUG. 10	09	10	51.3	53.62 N.	163.29 W.	33N	4.9	4.6	4.5M	...	G	AUG. 9	10	P.M. BST
AUG. 10	16	18	54.4	59.49 N.	144.59 W.	33N	...	...	3.0M	...	G	AUG. 10	06	A.M. AST

Table 1.--*Summary of U.S. earthquakes for July-September 1980*--Continued

Date (1980)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or Mn	Maximum intensity	Hypocenter source	Local time Date	Hour
ALASKA--Continued													
AUG. 11	20	25	45.0	59.59 N.	152.81 W.	125	...	...	...	...	G	AUG. 11	10 A.M. AST
AUG. 12	14	44	28.5	59.98 N.	152.84 W.	110	5.0	...	...	...	G	AUG. 12	04 A.M. AST
AUG. 12	22	38	44.9	58.25 N.	148.43 W.	33N	...	...	3.3M	...	G	AUG. 12	12 P.M. AST
AUG. 13	02	17	53.3	53.67 N.	163.24 W.	33N	4.8	4.8	...	...	G	AUG. 12	03 P.M. BST
AUG. 13	03	52	55.8	59.25 N.	151.78 W.	53	4.0	...	...	III	G	AUG. 12	05 P.M. AST
AUG. 16	14	06	5.0	51.80 N.	179.57 W.	85	4.7	...	...	...	G	AUG. 16	03 A.M. BST
AUG. 16	21	33	1.5	53.66 N.	163.58 W.	33N	4.8	...	...	...	G	AUG. 16	10 A.M. BST
AUG. 18	22	50	23.7	63.05 N.	150.51 W.	39	4.5	...	4.0M	III	G	AUG. 18	12 P.M. AST
AUG. 20	10	14	48.4	60.66 N.	151.62 W.	87	3.7	...	...	...	G	AUG. 20	00 A.M. AST
AUG. 21	06	14	47.7	63.66 N.	158.03 W.	33N	...	...	3.5M	...	G	AUG. 20	08 P.M. AST
AUG. 22	00	43	48.7	61.60 N.	152.35 W.	128	4.3	...	...	...	G	AUG. 21	02 P.M. AST
AUG. 23	00	45	54.8	55.03 N.	160.40 W.	38	5.3	4.4	5.3M	...	G	AUG. 22	02 P.M. AST
AUG. 23	03	51	0.5	60.00 N.	149.58 W.	33N	...	...	3.0M	...	G	AUG. 22	05 P.M. AST
AUG. 23	11	39	39.9	55.67 N.	162.16 W.	33N	...	...	...	...	G	AUG. 23	00 A.M. BST
AUG. 24	00	40	52.2	55.47 N.	159.08 W.	53	4.4	...	4.3M	...	G	AUG. 23	02 P.M. AST
AUG. 24	06	31	34.6	60.14 N.	153.22 W.	139	...	...	...	...	G	AUG. 23	08 P.M. AST
AUG. 24	11	00	37.1	60.42 N.	147.48 W.	66	...	...	...	...	G	AUG. 24	01 A.M. AST
AUG. 25	13	38	24.4	59.95 N.	152.53 W.	33N	4.8	...	3.1M	...	G	AUG. 25	03 A.M. AST
AUG. 25	15	45	18.4	65.30 N.	149.96 W.	37	...	...	3.6M	...	G	AUG. 25	05 A.M. AST
AUG. 25	18	10	37.8	56.70 N.	136.45 W.	22	...	...	...	...	G	AUG. 25	10 A.M. PST
AUG. 26	01	35	3.4	62.76 N.	153.04 W.	33N	...	...	3.9M	...	G	AUG. 25	03 P.M. AST
AUG. 30	00	18	21.1	59.52 N.	152.84 W.	81	4.5	...	...	IV	G	AUG. 29	02 P.M. AST
AUG. 31	16	48	45.2	62.49 N.	151.00 W.	106	...	...	...	...	G	AUG. 31	06 A.M. AST
SEPT. 1	19	46	41.2	59.37 N.	154.81 W.	33N	4.3	...	3.6M	...	G	SEPT. 1	09 A.M. AST
SEPT. 4	10	53	59.6	59.53 N.	143.89 W.	33N	5.0	5.4	5.0M	...	G	SEPT. 4	00 A.M. AST
SEPT. 5	05	46	13.0	60.16 N.	153.21 W.	153	4.0	...	...	...	G	SEPT. 4	07 P.M. AST
SEPT. 5	08	43	27.1	61.04 N.	152.41 W.	117	...	...	...	...	G	SEPT. 4	10 P.M. AST
SEPT. 6	04	34	47.2	51.44 N.	178.54 W.	55	4.6	...	...	...	G	SEPT. 5	05 P.M. BST
SEPT. 6	19	28	45.9	51.37 N.	179.99 W.	56	4.4	...	...	...	G	SEPT. 6	08 A.M. BST
SEPT. 8	03	07	22.1	63.32 N.	151.05 W.	115	...	...	...	...	G	SEPT. 7	05 P.M. AST
SEPT. 9	08	25	10.4	61.01 N.	150.91 W.	33N	3.6	...	3.7M	III	G	SEPT. 8	10 P.M. AST
SEPT. 9	10	08	27.3	63.57 N.	149.94 W.	140	...	...	...	...	G	SEPT. 9	00 A.M. AST
SEPT. 11	21	25	3.0	60.80 N.	145.93 W.	33N	...	...	3.2M	...	G	SEPT. 11	11 A.M. AST
SEPT. 13	07	24	12.2	59.84 N.	152.25 W.	100	4.3	...	...	FELT	G	SEPT. 12	09 P.M. AST
SEPT. 13	09	14	58.4	62.80 N.	142.52 W.	33N	...	...	3.4M	...	G	SEPT. 12	11 P.M. AST
SEPT. 13	21	19	23.5	59.82 N.	143.79 W.	33N	...	...	3.3M	...	G	SEPT. 13	11 A.M. AST
SEPT. 14	05	04	57.0	63.52 N.	150.99 W.	33N	...	...	3.0M	...	G	SEPT. 13	07 P.M. AST
SEPT. 14	07	24	39.5	60.49 N.	141.45 W.	15	...	...	3.4M	...	G	SEPT. 13	09 P.M. AST
SEPT. 14	10	10	14.0	57.66 N.	154.89 W.	33N	...	...	...	...	G	SEPT. 14	00 A.M. AST
SEPT. 14	20	14	32.6	59.30 N.	146.46 W.	31	...	...	3.3M	...	G	SEPT. 14	10 A.M. AST
SEPT. 15	12	34	29.1	61.86 N.	149.97 W.	69	...	...	...	...	G	SEPT. 15	02 A.M. AST
SEPT. 15	17	07	46.7	60.14 N.	152.86 W.	125	...	...	...	...	G	SEPT. 15	07 A.M. AST
SEPT. 17	05	43	26.3	61.61 N.	146.12 W.	25	...	...	...	...	G	SEPT. 16	07 P.M. AST
SEPT. 19	09	49	13.1	51.58 N.	178.22 W.	54	5.0	...	...	...	G	SEPT. 18	10 P.M. BST
SEPT. 19	22	34	50.2	65.60 N.	148.05 W.	16	...	...	3.8M	FELT	G	SEPT. 19	12 P.M. AST
SEPT. 19	23	12	51.7	63.85 N.	147.31 W.	51	...	...	3.1M	...	G	SEPT. 19	01 P.M. AST
SEPT. 20	06	34	20.8	62.26 N.	152.24 W.	124	...	...	...	...	G	SEPT. 19	08 P.M. AST
SEPT. 21	17	08	55.6	51.91 N.	169.91 W.	12	5.2	4.9	4.7M	...	G	SEPT. 21	06 A.M. BST
SEPT. 21	17	13	32.3	51.86 N.	170.03 W.	14	5.4	4.8	4.9M	...	G	SEPT. 21	06 A.M. BST
SEPT. 21	21	00	17.3	60.09 N.	152.93 W.	130	4.2	...	...	...	G	SEPT. 21	11 A.M. AST
SEPT. 21	23	47	16.0	62.04 N.	151.45 W.	83	4.4	...	...	...	G	SEPT. 21	01 P.M. AST
SEPT. 22	19	44	11.0	62.23 N.	150.91 W.	80	...	...	...	...	G	SEPT. 22	09 A.M. AST
SEPT. 23	06	14	1.9	61.85 N.	151.05 W.	89	...	...	...	...	G	SEPT. 22	08 P.M. AST
SEPT. 23	18	35	21.5	51.34 N.	175.26 W.	69	4.4	...	...	...	G	SEPT. 23	07 A.M. BST
SEPT. 25	06	41	49.9	51.88 N.	169.87 W.	33N	4.4	...	4.0M	...	G	SEPT. 24	07 P.M. BST
SEPT. 25	08	07	44.8	61.41 N.	149.96 W.	52	...	...	2.5M	...	G	SEPT. 24	10 P.M. AST
SEPT. 27	05	36	9.7	65.72 N.	145.45 W.	33N	...	...	3.8M	...	G	SEPT. 26	07 P.M. AST
SEPT. 28	09	10	28.9	60.66 N.	150.69 W.	33N	...	...	3.3M	...	G	SEPT. 27	11 P.M. AST
SEPT. 28	17	54	7.5	63.54 N.	151.32 W.	33N	...	...	3.2M	...	G	SEPT. 28	07 A.M. AST
ARIZONA													
SEPT. 15	22	38	22.2	33.59 N.	111.25 W.	0	...	...	...	V	G	SEPT. 15	03 P.M. MST

Table 1.--*Summary of U.S. earthquakes for July-September 1980*--Continued

Date (1980)		Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or Mn	Maximum intensity	Hypocenter source	Local time Date		Hour	
CALIFORNIA																
JULY	1	06	38	14.0	37.60 N.	118.85 W.	10	...	...	3.5B	FELT	B	JUNE	30	10 P.M.	PST
JULY	1	06	43	52.2	37.58 N.	118.92 W.	9	...	...	3.3P	...	P	JUNE	30	10 P.M.	PST
JULY	1	10	50	51.1	36.05 N.	118.35 W.	5	...	...	3.2P	...	P	JULY	1	02 A.M.	PST
JULY	1	14	25	12.7	37.61 N.	118.93 W.	5	...	...	3.5B	...	B	JULY	1	06 A.M.	PST
JULY	2	04	13	53.0	37.55 N.	118.87 W.	11	...	...	3.6B	...	B	JULY	1	08 P.M.	PST
JULY	2	04	53	31.2	33.82 N.	118.23 W.	6	...	...	2.4P	III	P	JULY	1	08 P.M.	PST
JULY	2	08	01	12.8	37.50 N.	118.85 W.	4	...	...	3.0P	...	P	JULY	2	00 A.M.	PST
JULY	3	02	19	32.0	37.63 N.	118.92 W.	5	...	...	4.0B	...	B	JULY	2	06 P.M.	PST
JULY	3	02	21	51.9	37.62 N.	118.95 W.	5	...	...	3.5B	...	B	JULY	2	06 P.M.	PST
JULY	3	02	39	58.8	37.56 N.	118.91 W.	11	...	...	4.1B	...	B	JULY	2	06 P.M.	PST
JULY	3	03	08	13.2	37.54 N.	118.91 W.	12	...	...	3.5B	...	B	JULY	2	07 P.M.	PST
JULY	3	06	00	22.4	37.63 N.	118.96 W.	5	...	...	3.6B	...	B	JULY	2	10 P.M.	PST
JULY	3	07	05	38.6	37.64 N.	118.97 W.	5	...	...	3.4B	...	B	JULY	2	11 P.M.	PST
JULY	4	17	21	0.2	37.57 N.	118.83 W.	14	...	...	3.5B	...	B	JULY	4	09 A.M.	PST
JULY	5	09	13	37.4	36.05 N.	120.69 W.	5	...	...	3.2B	...	B	JULY	5	01 A.M.	PST
JULY	5	11	58	59.2	37.61 N.	118.83 W.	5	4.2	...	4.3B	IV	B	JULY	5	03 A.M.	PST
JULY	5	12	14	34.9	37.60 N.	118.76 W.	5	...	...	2.9B	...	G	JULY	5	04 A.M.	PST
JULY	5	12	14	51.8	37.58 N.	118.83 W.	5	...	...	3.2P	...	P	JULY	5	04 A.M.	PST
JULY	5	12	17	8.0	37.57 N.	118.87 W.	7	...	...	3.1P	...	P	JULY	5	04 A.M.	PST
JULY	5	12	26	14.3	37.57 N.	118.85 W.	6	...	...	3.1P	...	P	JULY	5	04 A.M.	PST
JULY	5	13	43	8.3	37.48 N.	118.87 W.	5	...	...	3.2P	...	P	JULY	5	05 A.M.	PST
JULY	5	14	19	25.6	37.37 N.	118.15 W.	7	...	...	3.5B	FELT	B	JULY	5	06 A.M.	PST
JULY	5	21	59	31.4	37.57 N.	118.85 W.	8	...	...	3.1P	...	P	JULY	5	01 P.M.	PST
JULY	5	22	46	40.8	37.51 N.	118.90 W.	6	...	...	3.5B	...	B	JULY	5	02 P.M.	PST
JULY	6	05	25	51.3	37.55 N.	118.93 W.	8	...	...	3.1P	...	P	JULY	5	09 P.M.	PST
JULY	6	12	04	45.8	37.98 N.	122.08 W.	10	...	...	3.1B	FELT	B	JULY	6	04 A.M.	PST
JULY	6	16	40	9.9	37.59 N.	118.91 W.	5	...	...	3.3B	...	G	JULY	6	08 A.M.	PST
JULY	6	17	53	13.3	37.59 N.	118.79 W.	7	...	...	3.5B	...	B	JULY	6	09 A.M.	PST
JULY	7	11	32	14.4	38.00 N.	118.68 W.	5	...	...	3.5B	...	B	JULY	7	03 A.M.	PST
JULY	7	15	39	46.4	38.01 N.	118.73 W.	5	...	...	3.7B	FELT	B	JULY	7	07 A.M.	PST
JULY	7	17	32	18.3	37.62 N.	118.91 W.	5	...	...	3.1B	...	G	JULY	7	09 A.M.	PST
JULY	7	20	46	44.4	38.01 N.	118.72 W.	5	...	...	3.9B	FELT	B	JULY	7	12 P.M.	PST
JULY	7	21	34	37.2	37.98 N.	118.68 W.	9	...	...	3.8B	FELT	B	JULY	7	01 P.M.	PST
JULY	8	17	13	1.8	37.07 N.	121.48 W.	1	...	...	3.0B	...	B	JULY	8	09 A.M.	PST
JULY	9	11	17	27.4	37.43 N.	118.83 W.	5	...	...	3.2P	...	P	JULY	9	03 A.M.	PST
JULY	9	21	11	25.3	33.05 N.	116.40 W.	8	...	...	3.1P	...	P	JULY	9	01 P.M.	PST
JULY	10	06	46	59.9	37.59 N.	118.83 W.	5	...	...	3.1B	...	G	JULY	9	10 P.M.	PST
JULY	10	15	45	31.3	34.33 N.	117.02 W.	6	...	...	2.9P	FELT	P	JULY	10	07 A.M.	PST
JULY	11	11	29	34.9	37.59 N.	118.82 W.	14	...	...	3.5B	FELT	B	JULY	11	03 A.M.	PST
JULY	13	10	55	36.3	37.52 N.	118.84 W.	12	...	...	3.5B	...	B	JULY	13	02 A.M.	PST
JULY	15	07	16	12.0	37.53 N.	118.87 W.	13	...	...	3.5B	FELT	B	JULY	14	11 P.M.	PST
JULY	15	18	36	4.6	37.65 N.	118.88 W.	5	...	...	3.1B	...	G	JULY	15	10 A.M.	PST
JULY	16	09	11	11.4	37.57 N.	118.80 W.	8	...	...	3.2P	...	P	JULY	16	01 A.M.	PST
JULY	16	11	25	4.3	37.50 N.	118.90 W.	5	...	...	3.2P	...	P	JULY	16	03 A.M.	PST
JULY	16	16	18	39.5	37.60 N.	118.92 W.	4	...	...	3.1P	...	P	JULY	16	08 A.M.	PST
JULY	17	20	19	20.7	37.58 N.	118.83 W.	6	...	...	3.0P	...	P	JULY	17	12 P.M.	PST
JULY	18	05	14	51.0	34.57 N.	120.70 W.	5	...	...	3.2P	...	P	JULY	17	09 P.M.	PST
JULY	18	20	14	52.7	37.55 N.	118.93 W.	7	...	...	3.5B	FELT	B	JULY	18	12 P.M.	PST
JULY	19	16	55	18.4	36.09 N.	120.10 W.	5	...	...	3.1P	III	G	JULY	19	08 A.M.	PST
JULY	20	11	24	25.1	37.52 N.	118.87 W.	6	...	...	3.2P	...	P	JULY	20	03 A.M.	PST
JULY	20	20	27	2.5	37.63 N.	118.84 W.	5	...	...	3.3B	...	G	JULY	20	12 P.M.	PST
JULY	21	21	50	3.6	37.57 N.	118.90 W.	5	...	...	3.3P	...	P	JULY	21	01 P.M.	PST
JULY	23	07	50	13.4	34.27 N.	119.62 W.	7	...	...	3.4P	III	P	JULY	22	11 P.M.	PST
JULY	23	09	55	51.5	33.07 N.	115.50 W.	3	...	...	2.5P	FELT	P	JULY	23	01 A.M.	PST
JULY	24	19	22	10.1	33.27 N.	116.87 W.	7	...	...	3.0P	...	P	JULY	24	11 A.M.	PST
JULY	25	06	44	19.5	37.58 N.	118.90 W.	5	...	...	3.7B	FELT	B	JULY	24	10 P.M.	PST
JULY	26	03	23	18.9	37.52 N.	118.88 W.	2	...	...	3.4P	...	P	JULY	25	07 P.M.	PST
JULY	26	17	22	47.1	37.56 N.	118.92 W.	5	...	...	3.5B	FELT	B	JULY	26	09 A.M.	PST
JULY	26	18	08	27.9	38.02 N.	118.66 W.	5	...	...	3.4B	...	B	JULY	26	10 A.M.	PST
JULY	26	19	17	52.1	35.72 N.	121.34 W.	5	...	...	3.3B	...	G	JULY	26	11 A.M.	PST
JULY	26	21	43	1.4	37.65 N.	118.88 W.	5	...	...	3.5B	...	G	JULY	26	01 P.M.	PST
JULY	27	16	55	31.3	37.52 N.	118.78 W.	13	...	...	3.4B	...	B	JULY	27	08 A.M.	PST
JULY	29	01	44	58.9	34.03 N.	116.47 W.	6	...	...	3.0P	...	P	JULY	28	05 P.M.	PST
JULY	29	06	48	19.5	33.07 N.	116.02 W.	5	...	...	3.6P	...	P	JULY	28	10 P.M.	PST
JULY	29	06	58	40.7	37.58 N.	118.70 W.	4	...	...	3.0P	...	P	JULY	28	10 P.M.	PST

Table 1.--*Summary of U.S. earthquakes for July-September 1980*--Continued

Date (1980)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or Mn	Maximum intensity	Hypocenter source	Local time Date	Hour
CALIFORNIA--Continued													
JULY 29	19	17	14.7	37.51 N.	118.91 W.	7	...	...	3.7B	...	B	JULY 29	11 A.M. PST
JULY 29	20	56	49.9	37.52 N.	118.90 W.	13	...	...	3.5B	...	B	JULY 29	12 P.M. PST
JULY 29	22	01	1.3	37.53 N.	118.91 W.	5	...	...	3.2B	...	G	JULY 29	02 P.M. PST
JULY 29	23	18	44.2	37.55 N.	118.90 W.	2	...	...	3.1P	...	P	JULY 29	03 P.M. PST
JULY 31	08	20	46.5	37.67 N.	118.72 W.	11	...	...	3.3P	...	P	JULY 31	00 A.M. PST
AUG. 1	16	38	56.3	37.56 N.	118.89 W.	4	4.7	5.0	5.4B	V	B	AUG. 1	08 A.M. PST
AUG. 1	16	42	56.0	37.52 N.	118.90 W.	5	...	...	3.8B	...	B	AUG. 1	08 A.M. PST
AUG. 1	16	47	47.8	37.53 N.	118.82 W.	5	...	...	3.0P	...	P	AUG. 1	08 A.M. PST
AUG. 1	16	48	54.9	37.55 N.	118.90 W.	5	4.2	...	4.7B	...	B	AUG. 1	08 A.M. PST
AUG. 1	16	52	15.0	37.52 N.	118.88 W.	5	...	...	3.2B	...	B	AUG. 1	08 A.M. PST
AUG. 1	16	52	32.4	37.47 N.	118.89 W.	5	...	...	3.6B	...	B	AUG. 1	08 A.M. PST
AUG. 1	16	59	13.5	37.52 N.	118.87 W.	5	...	...	3.3P	...	P	AUG. 1	08 A.M. PST
AUG. 1	17	09	17.5	37.58 N.	118.88 W.	8	...	...	3.8B	...	B	AUG. 1	09 A.M. PST
AUG. 1	17	32	55.0	37.58 N.	118.90 W.	5	...	...	3.4B	...	G	AUG. 1	09 A.M. PST
AUG. 1	17	47	59.0	37.52 N.	118.83 W.	5	...	...	3.2B	...	B	AUG. 1	09 A.M. PST
AUG. 1	17	48	15.7	37.57 N.	118.88 W.	5	...	...	3.7B	...	B	AUG. 1	09 A.M. PST
AUG. 1	18	16	34.9	37.57 N.	118.87 W.	6	...	...	3.4P	...	P	AUG. 1	10 A.M. PST
AUG. 1	18	28	44.3	37.59 N.	118.89 W.	5	...	...	3.3B	...	G	AUG. 1	10 A.M. PST
AUG. 1	18	52	50.8	37.65 N.	118.84 W.	5	...	...	3.5B	...	G	AUG. 1	10 A.M. PST
AUG. 1	19	56	26.5	37.68 N.	118.97 W.	5	...	...	3.4P	...	P	AUG. 1	11 A.M. PST
AUG. 1	22	20	7.5	37.57 N.	118.88 W.	6	...	...	3.6P	...	P	AUG. 1	02 P.M. PST
AUG. 2	01	15	50.1	37.57 N.	118.90 W.	5	...	...	3.6B	...	G	AUG. 1	05 P.M. PST
AUG. 2	17	09	43.5	37.57 N.	118.91 W.	5	...	...	3.9B	...	B	AUG. 2	09 A.M. PST
AUG. 2	17	51	45.2	37.60 N.	118.78 W.	5	...	...	3.1P	...	P	AUG. 2	09 A.M. PST
AUG. 3	00	34	32.7	37.57 N.	118.88 W.	7	...	...	3.0P	...	P	AUG. 2	04 P.M. PST
AUG. 3	02	58	18.7	37.64 N.	118.96 W.	5	...	...	3.0B	...	G	AUG. 2	06 P.M. PST
AUG. 3	02	58	35.1	37.55 N.	118.85 W.	5	...	...	3.0P	...	P	AUG. 2	06 P.M. PST
AUG. 3	03	35	9.4	37.67 N.	118.97 W.	5	...	...	3.4P	...	P	AUG. 2	07 P.M. PST
AUG. 3	04	49	0.1	37.67 N.	118.95 W.	2	...	...	3.7P	...	P	AUG. 2	08 P.M. PST
AUG. 3	07	32	42.2	37.58 N.	118.88 W.	7	...	...	3.6B	...	B	AUG. 2	11 P.M. PST
AUG. 3	10	02	55.7	37.55 N.	118.83 W.	5	...	...	3.1P	...	P	AUG. 3	02 A.M. PST
AUG. 3	17	12	4.5	37.62 N.	118.90 W.	5	...	...	3.3P	...	P	AUG. 3	09 A.M. PST
AUG. 4	12	52	48.3	37.60 N.	118.90 W.	4	...	...	3.4P	...	P	AUG. 4	04 A.M. PST
AUG. 6	10	42	39.4	37.67 N.	118.97 W.	5	...	...	3.4P	...	P	AUG. 6	02 A.M. PST
AUG. 6	10	51	20.3	37.50 N.	118.85 W.	5	...	...	3.4P	...	P	AUG. 6	02 A.M. PST
AUG. 6	10	56	14.1	37.55 N.	118.92 W.	5	...	...	3.0P	...	P	AUG. 6	02 A.M. PST
AUG. 7	16	13	36.7	37.52 N.	118.72 W.	6	...	...	3.0P	...	P	AUG. 7	08 A.M. PST
AUG. 7	23	57	3.7	37.65 N.	118.92 W.	1	...	...	3.1P	...	P	AUG. 7	03 P.M. PST
AUG. 8	02	14	39.0	37.56 N.	118.93 W.	5	...	...	3.7B	...	B	AUG. 7	06 P.M. PST
AUG. 8	08	16	58.8	37.60 N.	118.95 W.	5	...	...	3.3P	...	P	AUG. 8	00 A.M. PST
AUG. 8	08	20	26.2	37.58 N.	118.93 W.	5	...	...	3.0P	...	P	AUG. 8	00 A.M. PST
AUG. 8	08	25	2.1	37.60 N.	118.90 W.	5	...	...	3.2P	...	P	AUG. 8	00 A.M. PST
AUG. 8	08	35	25.7	37.56 N.	118.91 W.	5	...	...	3.0P	...	G	AUG. 8	00 A.M. PST
AUG. 8	14	56	29.8	37.62 N.	118.82 W.	6	...	...	3.4P	...	P	AUG. 8	06 A.M. PST
AUG. 8	22	14	1.4	37.61 N.	118.83 W.	9	...	...	3.4B	...	B	AUG. 8	02 P.M. PST
AUG. 9	23	26	3.8	37.56 N.	118.89 W.	6	...	...	3.5B	...	B	AUG. 9	03 P.M. PST
AUG. 10	04	43	4.4	37.57 N.	118.87 W.	5	...	...	3.4P	...	P	AUG. 9	08 P.M. PST
AUG. 10	06	48	53.8	37.60 N.	118.85 W.	5	...	...	3.0P	...	P	AUG. 9	10 P.M. PST
AUG. 11	00	35	15.2	35.86 N.	119.93 W.	5	...	...	3.3P	...	G	AUG. 10	04 P.M. PST
AUG. 11	05	55	15.1	37.58 N.	118.88 W.	5	...	...	3.3P	...	P	AUG. 10	09 P.M. PST
AUG. 11	09	10	22.1	37.65 N.	118.93 W.	5	...	...	3.0P	...	P	AUG. 11	01 A.M. PST
AUG. 11	13	58	38.4	37.57 N.	118.90 W.	5	...	...	3.4B	...	B	AUG. 11	05 A.M. PST
AUG. 14	14	21	48.6	37.62 N.	118.92 W.	5	...	...	3.6B	...	B	AUG. 14	06 A.M. PST
AUG. 15	04	23	39.8	35.85 N.	119.90 W.	4	...	...	3.1P	...	P	AUG. 14	08 P.M. PST
AUG. 15	04	25	33.1	39.58 N.	120.26 W.	5	...	...	3.3B	...	G	AUG. 14	08 P.M. PST
AUG. 15	05	07	9.8	35.95 N.	120.03 W.	5	...	...	3.0P	...	P	AUG. 14	09 P.M. PST
AUG. 15	13	50	21.6	37.55 N.	118.80 W.	5	...	...	3.2P	...	P	AUG. 15	05 A.M. PST
AUG. 16	21	46	34.0	37.49 N.	118.88 W.	16	...	...	3.4B	...	B	AUG. 16	01 P.M. PST
AUG. 19	06	45	27.2	37.63 N.	118.87 W.	5	...	...	4.1B	FELT	B	AUG. 18	10 P.M. PST
AUG. 20	05	29	1.1	37.56 N.	118.93 W.	5	...	...	3.5B	...	B	AUG. 19	09 P.M. PST
AUG. 21	04	47	59.2	35.32 N.	118.67 W.	5	...	...	3.3P	...	P	AUG. 20	08 P.M. PST
AUG. 21	19	59	46.9	37.25 N.	121.68 W.	6	...	...	3.1B	...	B	AUG. 21	11 A.M. PST
AUG. 23	04	20	22.6	37.57 N.	118.88 W.	6	...	...	3.0P	...	P	AUG. 22	08 P.M. PST
AUG. 23	06	50	42.3	33.27 N.	116.10 W.	5	...	...	3.6P	...	P	AUG. 22	10 P.M. PST
AUG. 23	08	43	36.6	33.48 N.	116.58 W.	12	...	...	3.0P	...	P	AUG. 23	00 A.M. PST

Table 1.--*Summary of U.S. earthquakes for July-September 1980*--Continued

Date (1980)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or Mn	Maximum intensity	Hypocenter source	Local time Date	Hour
CALIFORNIA--Continued													
AUG. 23	15	27	36.1	38.80 N.	122.78 W.	4	...	...	3.2B	...	B	AUG. 23	07 A.M. PST
AUG. 24	12	41	17.6	37.57 N.	121.67 W.	6	...	...	4.1B	IV	B	AUG. 24	04 A.M. PST
AUG. 24	23	38	49.5	37.65 N.	118.85 W.	5	...	...	3.3P	...	P	AUG. 24	03 P.M. PST
AUG. 25	03	26	24.6	33.15 N.	115.67 W.	9	...	...	3.0P	...	P	AUG. 24	07 P.M. PST
AUG. 26	03	11	27.2	33.37 N.	116.40 W.	5	...	...	3.0P	...	P	AUG. 25	07 P.M. PST
AUG. 29	00	23	5.7	37.55 N.	118.87 W.	12	...	...	3.1P	...	P	AUG. 28	04 P.M. PST
AUG. 29	17	16	40.5	38.27 N.	122.07 W.	5	...	...	2.5B	III	G	AUG. 29	09 A.M. PST
AUG. 30	10	53	29.1	37.58 N.	118.77 W.	5	...	...	3.5B	FELT	B	AUG. 30	02 A.M. PST
AUG. 30	17	49	34.6	37.60 N.	118.82 W.	5	...	...	3.0P	...	P	AUG. 30	09 A.M. PST
AUG. 30	23	38	36.0	33.55 N.	116.67 W.	11	...	...	3.5P	...	P	AUG. 30	03 P.M. PST
AUG. 31	10	32	46.6	35.22 N.	118.60 W.	3	...	...	3.5P	FELT	P	AUG. 31	02 A.M. PST
SEPT. 4	10	59	46.5	37.60 N.	118.75 W.	3	...	...	3.2P	...	P	SEPT. 4	02 A.M. PST
SEPT. 7	13	09	17.0	37.55 N.	118.80 W.	1	...	...	3.0P	...	P	SEPT. 7	05 A.M. PST
SEPT. 8	06	28	8.3	35.72 N.	121.31 W.	5	...	...	3.6B	...	B	SEPT. 7	10 P.M. PST
SEPT. 9	16	42	38.6	36.52 N.	121.14 W.	5	...	...	3.0B	...	G	SEPT. 9	08 A.M. PST
SEPT. 9	17	26	20.8	33.58 N.	118.30 W.	5	...	...	3.9P	IV	P	SEPT. 9	09 A.M. PST
SEPT. 9	18	07	20.4	33.82 N.	118.23 W.	5	...	...	2.4P	FELT	P	SEPT. 9	10 A.M. PST
SEPT. 13	10	50	19.3	36.65 N.	121.36 W.	3	...	...	3.3B	...	B	SEPT. 13	02 A.M. PST
SEPT. 14	11	50	2.2	37.63 N.	118.96 W.	5	...	...	3.5B	FELT	B	SEPT. 14	03 A.M. PST
SEPT. 16	05	41	30.1	37.67 N.	118.88 W.	11	...	...	3.2P	...	P	SEPT. 15	09 P.M. PST
SEPT. 17	05	41	5.2	37.63 N.	118.96 W.	5	...	...	3.4B	...	B	SEPT. 16	09 P.M. PST
SEPT. 20	10	42	51.3	36.23 N.	120.13 W.	5	...	...	3.0P	...	P	SEPT. 20	02 A.M. PST
SEPT. 20	20	08	30.0	33.50 N.	116.52 W.	11	...	...	3.0P	...	P	SEPT. 20	12 P.M. PST
SEPT. 20	21	14	44.8	38.85 N.	118.83 W.	27	...	...	4.1B	...	B	SEPT. 20	01 P.M. PST
SEPT. 21	04	49	46.4	38.87 N.	118.80 W.	5	...	...	3.1P	...	G	SEPT. 20	08 P.M. PST
SEPT. 21	17	13	27.7	37.58 N.	118.93 W.	5	...	...	3.4B	...	B	SEPT. 21	09 A.M. PST
SEPT. 23	11	13	5.8	36.23 N.	120.15 W.	7	...	...	3.4P	...	P	SEPT. 23	03 A.M. PST
SEPT. 24	08	08	38.9	36.27 N.	120.17 W.	9	4.8	...	4.3B	V	B	SEPT. 24	00 A.M. PST
SEPT. 24	08	13	27.4	36.22 N.	120.13 W.	5	...	...	3.2P	...	P	SEPT. 24	00 A.M. PST
SEPT. 24	08	14	33.1	36.22 N.	120.13 W.	5	...	...	3.0P	...	P	SEPT. 24	00 A.M. PST
SEPT. 25	03	20	32.7	37.57 N.	118.87 W.	9	...	...	3.1P	...	P	SEPT. 24	07 P.M. PST
SEPT. 25	16	33	29.5	36.67 N.	118.10 W.	6	...	...	2.7P	...	P	SEPT. 25	08 A.M. PST
SEPT. 26	10	15	41.4	35.78 N.	120.27 W.	6	...	...	3.2P	IV	P	SEPT. 26	02 A.M. PST
SEPT. 26	13	18	41.2	35.27 N.	119.40 W.	5	...	...	4.4P	V	P	SEPT. 26	05 A.M. PST
SEPT. 26	14	21	39.6	37.67 N.	118.90 W.	12	...	...	3.0P	...	P	SEPT. 26	06 A.M. PST
SEPT. 26	16	19	11.8	37.56 N.	118.84 W.	5	...	...	3.5B	...	B	SEPT. 26	08 A.M. PST
SEPT. 27	19	16	24.9	37.62 N.	118.90 W.	5	...	...	4.1B	FELT	B	SEPT. 27	11 A.M. PST
SEPT. 27	21	29	0.4	37.67 N.	118.92 W.	10	...	...	3.5P	...	P	SEPT. 27	01 P.M. PST
SEPT. 28	00	42	15.8	37.65 N.	118.92 W.	6	...	...	3.4P	...	P	SEPT. 27	04 P.M. PST
SEPT. 28	10	43	40.8	37.67 N.	118.92 W.	11	...	...	3.0P	...	P	SEPT. 28	02 A.M. PST
SEPT. 28	22	53	21.6	37.67 N.	118.90 W.	11	...	...	3.0P	...	P	SEPT. 28	02 P.M. PST
SEPT. 29	03	21	42.3	37.61 N.	118.93 W.	5	...	...	3.0P	...	G	SEPT. 28	07 P.M. PST
CALIFORNIA--OFF THE COAST													
JULY 10	06	13	55.4	40.22 N.	125.38 W.	5	4.5	3.8	4.3B	...	B	JULY 9	10 P.M. PST
AUG. 2	23	15	41.0	41.84 N.	126.03 W.	15	4.0	...	4.0B	...	G	AUG. 2	03 P.M. PST
AUG. 8	09	20	10.7	40.20 N.	124.90 W.	11	...	...	3.4B	...	B	AUG. 8	01 A.M. PST
HAWAII													
JULY 5	05	36	00.7	20.88 N.	157.79 W.	10	...	...	3.7H	III	H	JULY 4	07 P.M. HST
JULY 9	20	42	13.1	19.38 N.	155.24 W.	3	...	...	3.0H	...	H	JULY 9	10 A.M. HST
JULY 17	05	03	51.0	19.95 N.	155.37 W.	9	...	...	3.0H	II	H	JULY 16	07 P.M. HST
JULY 18	11	26	29.9	19.38 N.	155.08 W.	1	...	...	3.6H	...	H	JULY 18	01 A.M. HST
JULY 18	20	31	10.6	19.52 N.	155.47 W.	4	...	...	3.4H	...	H	JULY 18	10 A.M. HST
JULY 27	21	35	44.0	18.72 N.	156.31 W.	38	...	...	4.2H	...	H	JULY 27	11 A.M. HST
JULY 28	16	18	07.1	19.34 N.	155.50 W.	11	...	...	3.4H	...	H	JULY 28	06 A.M. HST
JULY 30	21	01	20.9	19.18 N.	155.48 W.	34	...	...	3.0H	...	H	JULY 30	11 A.M. HST
AUG. 1	11	42	15.5	19.38 N.	155.24 W.	6	...	...	3.6H	III	H	AUG. 1	01 A.M. HST
AUG. 5	17	45	41.9	20.04 N.	155.73 W.	7	...	...	3.1H	III	H	AUG. 5	07 A.M. HST
AUG. 12	06	42	33.1	19.33 N.	155.11 W.	10	...	...	4.3H	IV	H	AUG. 11	08 P.M. HST
AUG. 12	17	23	44.6	19.34 N.	155.11 W.	9	...	...	3.0H	III	H	AUG. 12	07 A.M. HST
AUG. 12	21	01	55.9	19.33 N.	155.18 W.	10	...	...	3.5H	III	H	AUG. 12	11 A.M. HST
AUG. 13	22	34	58.8	19.38 N.	155.11 W.	2	...	...	3.1H	...	H	AUG. 13	12 P.M. HST
AUG. 14	07	27	16.7	19.35 N.	155.42 W.	11	...	...	4.1H	IV	H	AUG. 13	09 P.M. HST

Table 1.--*Summary of U.S. earthquakes for July-September 1980*--Continued

Date (1980)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or Mn	Maximum intensity	Hypocenter source	Local time Date	Hour
HAWAII--Continued													
AUG. 18	03	32	48.6	19.27 N.	155.45 W.	11	...	...	3.6H	III	H	AUG. 17	05 P.M. HST
AUG. 20	16	06	25.9	19.60 N.	156.15 W.	25	...	...	4.0H	III	H	AUG. 20	06 A.M. HST
AUG. 26	22	38	26.5	19.33 N.	155.19 W.	9	...	...	3.2H	...	H	AUG. 26	12 P.M. HST
AUG. 27	11	58	53.9	19.91 N.	155.28 W.	39	...	...	3.4H	III	H	AUG. 27	01 A.M. HST
AUG. 28	01	25	58.7	19.39 N.	155.24 W.	4	...	...	3.2H	III	H	AUG. 27	03 P.M. HST
AUG. 28	02	26	55.0	19.39 N.	155.24 W.	3	...	...	3.1H	...	H	AUG. 27	04 P.M. HST
AUG. 28	02	34	01.3	19.38 N.	155.24 W.	1	...	...	3.4H	III	H	AUG. 27	04 P.M. HST
AUG. 28	03	03	50.4	19.35 N.	155.23 W.	28	...	...	3.7H	...	H	AUG. 27	05 P.M. HST
AUG. 28	06	48	45.2	19.38 N.	155.26 W.	1	...	...	3.1H	III	H	AUG. 27	08 P.M. HST
AUG. 29	00	06	57.1	19.38 N.	155.26 W.	1	...	...	3.3H	V	H	AUG. 28	02 P.M. HST
SEPT. 1	04	16	53.8	19.34 N.	155.11 W.	9	...	...	3.6H	III	H	AUG. 31	06 P.M. HST
SEPT. 3	20	43	06.3	19.36 N.	155.02 W.	8	...	...	3.3H	III	H	SEPT. 3	10 A.M. HST
SEPT. 7	16	21	36.3	19.45 N.	155.82 W.	9	...	...	3.4H	...	H	SEPT. 7	06 A.M. HST
SEPT. 10	22	21	43.4	19.27 N.	155.12 W.	45	...	...	3.6H	...	H	SEPT. 10	12 P.M. HST
SEPT. 12	17	11	11.6	19.33 N.	155.18 W.	9	...	...	3.3H	...	H	SEPT. 12	07 A.M. HST
SEPT. 13	05	59	56.1	19.39 N.	155.43 W.	10	...	...	3.0H	...	H	SEPT. 12	07 P.M. HST
SEPT. 13	19	04	11.8	19.33 N.	155.19 W.	10	...	...	3.2H	III	H	SEPT. 13	09 A.M. HST
SEPT. 18	10	52	54.0	19.86 N.	155.68 W.	15	...	...	3.0H	...	H	SEPT. 18	00 A.M. HST
SEPT. 20	08	57	11.3	19.35 N.	155.07 W.	9	...	...	3.4H	III	H	SEPT. 19	10 P.M. HST
KENTUCKY													
JULY 12	23	59	54.8	37.26 N.	86.99 W.	0	...	...	3.1G	III	G	JULY 12	05 P.M. CST
JULY 27	18	52	21.8	38.17 N.	83.91 W.	8	5.1	4.7	5.2T	VII	G	JULY 27	01 P.M. EST
JULY 31	09	26	56.3	38.20 N.	83.92 W.	13	...	...	2.5G	IV	G	JULY 31	04 A.M. EST
AUG. 23	03	49	2.5	37.99 N.	84.92 W.	5	...	...	3.1S	III	G	AUG. 22	10 P.M. EST
AUG. 25	11	41	36.9	38.20 N.	83.91 W.	13	...	...	2.5G	IV	K	AUG. 25	06 A.M. EST
MAINE													
SEPT. 8	05	59	54.9	44.68 N.	69.02 W.	0	...	...	3.2L	...	L	SEPT. 8	00 A.M. EST
MISSOURI													
JULY 5	08	54	40.9	36.61 N.	89.58 W.	12	...	...	3.5G	IV	S	JULY 5	02 A.M. CST
MONTANA													
JULY 15	19	37	27.3	45.65 N.	111.80 W.	5	...	...	3.0G	FELT	G	JULY 15	12 P.M. MST
JULY 20	12	57	29.8	45.65 N.	111.85 W.	5	...	...	3.0G	FELT	G	JULY 20	05 A.M. MST
JULY 20	13	03	39.7	45.61 N.	111.85 W.	5	...	...	3.3G	FELT	G	JULY 20	06 A.M. MST
AUG. 24	08	32	22.5	47.19 N.	112.92 W.	5	...	...	3.4G	...	G	AUG. 24	01 A.M. MST
NEVADA													
JULY 25	19	05	0.1	37.26 N.	116.48 W.	0	5.5	4.2	5.7B	...	E	JULY 25	11 A.M. PST
JULY 31	18	19	0.1	37.01 N.	116.02 W.	0	4.3	...	3.9B	...	E	JULY 31	10 A.M. PST
AUG. 25	15	58	36.5	40.18 N.	119.98 W.	5	...	...	3.9B	...	B	AUG. 25	07 A.M. PST
SEPT. 4	13	39	9.5	38.09 N.	118.57 W.	5	4.0	...	4.6B	V	B	SEPT. 4	05 A.M. PST
SEPT. 4	21	03	33.9	38.06 N.	118.52 W.	20	4.9	...	4.9B	FELT	B	SEPT. 4	01 P.M. PST
SEPT. 4	22	31	39.5	38.07 N.	118.50 W.	5	...	...	3.0P	...	P	SEPT. 4	02 P.M. PST
SEPT. 5	15	52	56.0	38.07 N.	118.55 W.	14	...	...	3.7B	...	B	SEPT. 5	07 A.M. PST
SEPT. 6	05	31	3.3	38.07 N.	118.58 W.	5	...	...	4.0B	...	B	SEPT. 5	09 P.M. PST
SEPT. 6	07	27	52.1	38.07 N.	118.57 W.	5	4.1	...	4.6B	...	B	SEPT. 5	11 P.M. PST
SEPT. 6	07	57	38.4	38.05 N.	118.53 W.	5	...	...	3.0P	...	P	SEPT. 5	11 P.M. PST
SEPT. 7	01	30	42.7	38.05 N.	118.56 W.	14	4.4	...	5.1B	FELT	B	SEPT. 6	05 P.M. PST
SEPT. 7	04	36	38.3	38.03 N.	118.58 W.	15	4.9	5.0	5.4B	V	B	SEPT. 6	08 P.M. PST
SEPT. 7	04	40	6.8	38.03 N.	118.58 W.	15	...	...	3.9B	...	B	SEPT. 6	08 P.M. PST
SEPT. 7	06	00	11.2	38.07 N.	118.53 W.	5	...	...	3.0P	...	G	SEPT. 6	10 P.M. PST
SEPT. 7	06	48	10.5	38.08 N.	118.60 W.	5	...	...	3.9B	FELT	B	SEPT. 6	10 P.M. PST
SEPT. 7	06	48	30.2	38.08 N.	118.60 W.	5	4.7	4.4	5.3B	FELT	B	SEPT. 6	10 P.M. PST
SEPT. 7	10	08	55.1	38.07 N.	118.61 W.	5	...	...	3.7B	...	B	SEPT. 7	02 A.M. PST
SEPT. 7	11	02	1.8	38.10 N.	118.53 W.	5	...	...	3.3P	...	G	SEPT. 7	03 A.M. PST
SEPT. 7	11	58	2.2	38.05 N.	118.61 W.	3	...	...	3.8B	...	B	SEPT. 7	03 A.M. PST
SEPT. 7	16	04	4.5	38.06 N.	118.61 W.	5	...	...	3.7B	...	B	SEPT. 7	08 A.M. PST

Table 1.--*Summary of U.S. earthquakes for July-September 1980*--Continued

Date (1980)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or Mn	Maximum intensity	Hypocenter source	Local time Date	Hour
NEVADA--Continued													
SEPT. 7	16	57	34.5	38.09 N.	118.60 W.	5	...	...	3.9B	FELT	B	SEPT. 7	08 A.M. PST
SEPT. 7	18	37	0.9	38.06 N.	118.60 W.	5	...	...	3.6B	...	B	SEPT. 7	10 A.M. PST
SEPT. 7	22	14	29.8	38.08 N.	118.60 W.	5	...	...	3.5B	...	B	SEPT. 7	02 P.M. PST
SEPT. 7	22	23	12.3	38.07 N.	118.53 W.	5	...	...	3.2P	...	P	SEPT. 7	02 P.M. PST
SEPT. 7	23	22	32.4	38.11 N.	118.50 W.	5	...	...	3.0P	...	G	SEPT. 7	03 P.M. PST
SEPT. 8	01	15	48.0	38.12 N.	118.51 W.	5	...	...	3.0P	...	G	SEPT. 7	05 P.M. PST
SEPT. 8	04	26	19.9	38.03 N.	118.58 W.	13	...	...	4.6B	IV	B	SEPT. 7	08 P.M. PST
SEPT. 8	08	19	26.6	38.07 N.	118.59 W.	5	...	...	3.5B	...	B	SEPT. 8	00 A.M. PST
SEPT. 8	11	13	4.3	38.07 N.	118.57 W.	1	...	...	3.0P	...	P	SEPT. 8	03 A.M. PST
SEPT. 8	18	17	12.9	38.08 N.	118.53 W.	3	...	...	3.0P	...	P	SEPT. 8	10 A.M. PST
SEPT. 8	21	58	53.2	38.07 N.	118.52 W.	5	...	...	3.0P	...	P	SEPT. 8	01 P.M. PST
SEPT. 9	12	09	38.6	38.12 N.	118.49 W.	5	...	...	3.0P	...	G	SEPT. 9	04 A.M. PST
SEPT. 10	10	29	8.8	37.93 N.	118.35 W.	3	...	...	3.0P	...	P	SEPT. 10	02 A.M. PST
SEPT. 10	23	49	41.3	38.05 N.	118.60 W.	5	...	...	3.4B	...	B	SEPT. 10	03 P.M. PST
SEPT. 11	04	16	49.6	38.08 N.	118.59 W.	4	...	...	3.7B	...	B	SEPT. 10	08 P.M. PST
SEPT. 11	09	54	26.8	38.06 N.	118.59 W.	5	...	...	3.5B	...	B	SEPT. 11	01 A.M. PST
SEPT. 15	15	08	42.4	38.03 N.	118.57 W.	5	...	...	3.8B	...	B	SEPT. 15	07 A.M. PST
SEPT. 15	16	07	38.5	38.05 N.	118.55 W.	5	...	...	3.0P	...	G	SEPT. 15	08 A.M. PST
SEPT. 16	04	19	44.0	38.05 N.	118.57 W.	2	...	...	3.3P	...	P	SEPT. 15	08 P.M. PST
SEPT. 16	04	24	41.1	38.01 N.	118.56 W.	14	4.2	...	4.6B	IV	B	SEPT. 15	08 P.M. PST
SEPT. 16	06	15	9.3	37.97 N.	118.42 W.	3	...	...	3.0P	...	P	SEPT. 15	10 P.M. PST
SEPT. 17	10	46	42.6	38.06 N.	118.60 W.	5	...	...	3.5B	...	B	SEPT. 17	02 A.M. PST
SEPT. 17	21	37	52.5	38.04 N.	118.60 W.	5	...	...	3.5B	...	B	SEPT. 17	01 P.M. PST
SEPT. 18	06	06	40.4	38.07 N.	118.60 W.	5	...	...	3.6B	...	B	SEPT. 17	10 P.M. PST
SEPT. 18	19	02	28.0	38.05 N.	118.60 W.	5	...	...	3.4B	...	B	SEPT. 18	11 A.M. PST
SEPT. 19	20	05	36.2	38.10 N.	118.58 W.	4	...	...	3.0P	...	P	SEPT. 19	12 P.M. PST
SEPT. 19	20	56	58.6	38.04 N.	118.58 W.	5	...	...	3.6B	...	B	SEPT. 19	12 P.M. PST
SEPT. 20	01	35	42.5	38.04 N.	118.61 W.	5	...	...	3.6B	...	B	SEPT. 19	05 P.M. PST
SEPT. 21	15	15	55.6	38.05 N.	118.60 W.	5	...	...	3.8B	...	B	SEPT. 21	07 A.M. PST
SEPT. 23	10	55	12.6	38.07 N.	118.56 W.	5	...	...	3.0P	...	G	SEPT. 23	02 A.M. PST
SEPT. 25	14	45	0.1	37.06 N.	116.05 W.	0	4.6	...	4.1B	...	E	SEPT. 25	06 A.M. PST
SEPT. 25	15	26	30.1	37.12 N.	116.06 W.	0	...	...	3.7G	...	E	SEPT. 25	07 A.M. PST
NEW JERSEY													
AUG. 2	17	20	59.7	40.43 N.	74.15 W.	8	...	...	3.1L	...	L	AUG. 2	12 P.M. EST
AUG. 30	09	19	09.0	39.84 N.	74.86 W.	2	...	...	3.0L	...	L	AUG. 30	04 A.M. EST
NEW MEXICO													
SEPT. 11	17	34	37.5	36.46 N.	105.19 W.	5	...	...	3.1G	V	G	SEPT. 11	10 A.M. MST
NEW YORK													
AUG. 11	14	54	46.2	43.54 N.	75.16 W.	0	...	...	3.3L	...	L	AUG. 11	09 A.M. EST
SEPT. 4	04	30	55.8	41.11 N.	73.78 W.	13	...	...	3.2L	IV	L	SEPT. 3	11 P.M. EST
SEPT. 21	20	54	45.1	43.63 N.	74.02 W.	1	...	...	3.2L	...	L	SEPT. 21	03 P.M. EST
SEPT. 28	22	19	05.4	43.77 N.	74.12 W.	1	...	...	3.0L	...	L	SEPT. 28	05 P.M. EST
OREGON													
JULY 7	01	17	6.0	45.22 N.	121.69 W.	5	...	...	3.3G	IV	G	JULY 6	05 P.M. PST
AUG. 3	14	43	4.2	42.50 N.	124.56 W.	15	4.5	...	...	...	G	AUG. 3	06 A.M. PST
OREGON--OFF THE COAST													
JULY 15	14	29	19.9	43.48 N.	127.06 W.	15	4.5	...	...	...	G	JULY 15	06 A.M. PST
AUG. 3	08	24	2.0	42.40 N.	125.71 W.	15	4.5	3.2	...	...	G	AUG. 3	00 A.M. PST
AUG. 3	09	04	23.4	42.35 N.	126.20 W.	15	4.5	...	...	...	G	AUG. 3	01 A.M. PST
AUG. 4	09	40	44.7	42.35 N.	126.94 W.	15	4.4	...	...	...	G	AUG. 4	01 A.M. PST
AUG. 9	05	31	53.3	43.80 N.	127.78 W.	15	4.6	...	...	...	G	AUG. 8	09 P.M. PST
AUG. 15	22	34	3.9	44.41 N.	129.52 W.	15	4.7	3.7	...	...	G	AUG. 15	02 P.M. PST
SEPT. 3	13	12	6.8	43.57 N.	126.65 W.	15	...	...	...	...	G	SEPT. 3	05 A.M. PST

Table 1.--*Summary of U.S. earthquakes for July-September 1980*--Continued

Date (1980)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or Mn	Maximum intensity	Hypocenter source	Local time Date	Hour
SOUTH CAROLINA													
SEPT. 1	05	44	42.3	32.97 N.	80.20 W.	6	...	...	2.7G	...	G	SEPT. 1	00 A.M. EST
UTAH													
AUG. 15	06	25	23.2	41.66 N.	111.66 W.	7	...	...	2.9U	...	U	AUG. 14	11 P.M. MST
WASHINGTON													
SEPT. 19	22	53	14.5	47.97 N.	121.89 W.	5	...	...	3.8G	V	G	SEPT. 19	02 P.M. PST
SEPT. 21	17	45	18.7	47.92 N.	121.81 W.	5	...	...	3.4G	FELT	G	SEPT. 21	09 A.M. PST
SEPT. 30	16	32	13.6	47.74 N.	122.06 W.	9	...	...	2.8G	FELT	W	SEPT. 30	08 A.M. PST
WYOMING													
AUG. 9	04	50	38.9	44.44 N.	110.54 W.	2	...	...	...	IV	G	AUG. 8	09 P.M. MST
AUG. 9	04	52	04.4	44.43 N.	110.54 W.	3	...	...	...	IV	G	AUG. 8	09 P.M. MST
AUG. 9	05	18	28.5	44.44 N.	110.54 W.	2	...	...	...	IV	G	AUG. 8	10 P.M. MST
SEPT. 12	22	33	55.4	41.18 N.	105.12 W.	0	...	...	3.2G	FELT	G	SEPT. 12	03 P.M. MST

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*

[Sources of the hypocenters, magnitudes, and macroseismic data: (B) University of California, Berkeley; (E) U.S. Department of Energy, Las Vegas, Nevada; (G) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (K) Tennessee Earthquake Information Center, Memphis; (L) Lamont-Doherty Geological Observatory, Palisades, N.Y.; (M) National Oceanic and Atmospheric Administration, Alaska Tsunami Warning Center, Palmer; (P) California Institute of Technology, Pasadena; (S) St. Louis University, St. Louis, Missouri; (T) University of Oklahoma, Leonard; (W) University of Washington, Seattle; Dates and origin times are listed in Universal Coordinated Time (UTC) giving the hour, minute, and second. Epicenters are shown in decimal degrees. Only earthquakes with intensity data and explosions are listed]

Alabama

25 July (G) Northwestern Alabama
Origin time: 15 30 12.5
Epicenter: 33.94 N., 87.44 W.
Depth: 0 km
Magnitude: 3.1 Mn(G)

Probable explosion.

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Alaska

4 July (G) Southern Alaska
Origin time: 05 45 14.5
Epicenter: 61.90 N., 151.06 W.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Alaska--Continued

Depth: 80 km
Magnitude: 4.3 mb(G), 3.8 ML(M)

Felt from Houston to Anchorage (M).

5 July (G) Kenai Peninsula
Origin time: 15 50 24.5
Epicenter: 61.61 N., 150.11 W.
Depth: 49 km
Magnitude: 3.7 ML(M)

Felt at Palmer (M).

6 July (G) Kodiak Island region
Origin time: 18 45 30.8
Epicenter: 56.56 N., 154.24 W.
Depth: 26 km
Magnitude: 5.2 mb(G), 4.9 MS(G), 5.4 ML(M), 4.8 MS(B)

Felt strongly on Kodiak (M).

24 July (G) Andreanof Islands, Aleutian Islands
Origin time: 17 53 27.8
Epicenter: 51.75 N., 176.56 W.
Depth: 62 km
Magnitude: 4.1 mb(G)

Felt on Adak (M).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Alaska--Continued

27 July (G) Central Alaska
Origin time: 09 05 35.0
Epicenter: 63.72 N., 152.79 W.
Depth: 21 km
Magnitude: 4.7 mb(G), 3.7 MS(G), 5.0 ML(M)
Intensity IV: Lake Minchumina, McGrath, Medfra, Ruby.
Felt: Fairbanks (M).

1 August (G) Kenai Peninsula
Origin time: 23 07 14.7
Epicenter: 59.62 N., 148.94 W.
Depth: 26 km
Magnitude: 5.4 mb(G), 5.1 MS(G), 5.3 MS(B), 5.7 ML(M)
Intensity IV: Anchorage, Cooper Landing, Moose Pass, Seward.
Intensity III: Chugiak, East Chester, Homer, Kenai, Ninilchik, Skwentna, Sutton.
Intensity II: Whittier.

4 August (G) Kenai Peninsula
Origin time: 17 31 00.8
Epicenter: 61.09 N., 151.87 W.
Depth: 96 km
Magnitude: 3.8 mb(G)
Intensity III: Chugiak (M), Eagle River (M).

7 August (G) Central Alaska
Origin time: 19 16 06.5
Epicenter: 63.52 N., 151.29 W.
Depth: 10 km
Magnitude: 5.2 mb(G), 5.4 ML(M)
Intensity IV: Cantwell, Ester, Ferry, McKinley Park, Talkeetna, Usibelli.
Intensity III: Anchorage, Clear AFB, Delta Junction, East Chester, Fairbanks, Healy, Nenana, Paxson, Skwentna, Sutton.
Intensity II: Lake Minchumina.
Felt: McGrath, Palmer, and several points along the Alaska Railroad (all from press reports).

13 August (G) Kenai Peninsula
Origin time: 03 52 55.8
Epicenter: 59.25 N., 151.78 W.
Depth: 53 km
Magnitude: 4.0 mb(G)
Intensity III: Homer (M).

18 August (G) Central Alaska
Origin time: 22 50 23.7
Epicenter: 63.05 N., 150.51 W.
Depth: 39 km
Magnitude: 4.5 mb(G), 4.0 ML(M)
Intensity III: Curry and Gold Creek (M).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Alaska--Continued

30 August (G) Kenai Peninsula
Origin time: 00 18 21.1
Epicenter: 59.52 N., 152.84 W.
Depth: 81 km
Magnitude: 4.5 mb(G)
Intensity IV: Homer.
Intensity III: Seldovia.
Intensity II: Cooper Landing.

9 September (G) Kenai Peninsula
Origin time: 08 25 10.4
Epicenter: 61.01 N., 150.91 W.
Depth: 33 km
Magnitude: 3.6 mb(G), 3.7 ML(M)
Intensity III: Anchorage (M).

13 September (G) Kenai Peninsula
Origin time: 07 24 12.2
Epicenter: 59.84 N., 152.25 W.
Depth: 100 km
Magnitude: 4.3 mb(G),

Felt at Anchor Point and Homer (M).

19 September (G) Central Alaska
Origin time: 22 34 50.2
Epicenter: 65.60 N., 148.05 W.
Depth: 16 km
Magnitude: 3.8 ML(M)

Felt at College and Fairbanks (M).

Arizona

15 September (G) Central Arizona
Origin time: 22 38 22.2
Epicenter: 33.59 N., 111.25 W.
Depth: 0 km
Magnitude: None computed.

Possible explosion.

Intensity V: Roosevelt.

California

1 July (B) Owens Valley area
Origin time: 06 38 14.0
Epicenter: 37.60 N., 118.85 W.
Depth: 10 km
Magnitude: 3.5 ML(B), 3.6 ML(P)

Felt at Mammoth Lakes (B).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

California--Continued

2 July(P) Southern California
Origin time: 04 53 31.2
Epicenter: 33.82 N., 118.23 W.
Depth: 6 km
Magnitude: 2.4 ML(P)
Intensity III: Long Beach (press report).

5 July (B) Owens Valley area
Origin time: 11 58 59.2
Epicenter: 37.61 N., 118.83 W.
Depth: 5 km
Magnitude: 4.2 mb(G), 4.3 ML(B), 4.4 ML(P)
Intensity IV: Mammoth Lakes (press report).

5 July (B) Owens Valley area
Origin time: 14 19 25.6
Epicenter: 37.37 N., 118.15 W.
Depth: 7 km
Magnitude: 3.5 ML(B), 3.3 ML(P)

Felt at Bishop (B).

6 July (B) Central California
Origin time: 12 04 45.8
Epicenter: 37.98 N., 122.08 W.
Depth: 10 km
Magnitude: 3.1 ML(B)

Felt at Concord and Martinez (B).

7 July (B) Central California
Origin time: 15 39 46.4
Epicenter: 38.01 N., 118.73 W.
Depth: 5 km
Magnitude: 3.7 ML(B), 3.6 ML(P)

Felt in the Mono Lake area (B).

7 July (B) Central California
Origin time: 20 46 44.4
Epicenter: 38.01 N., 118.72 W.
Depth: 5 km
Magnitude: 3.9 ML(B), 3.7 ML(P)

Felt in the Mono Lake area (B).

7 July (B) Central California
Origin time: 21 34 37.2
Epicenter: 37.98 N., 118.68 W.
Depth: 9 km
Magnitude: 3.8 ML(B), 3.8 ML(P)

Felt in the Mono Lake area (B).

10 July (P) Southern California
Origin time: 15 45 31.3
Epicenter: 34.33 N., 117.02 W.
Depth: 6 km
Magnitude: 2.9 ML(P)

Felt at Big Bear (P).

11 July (B) Owens Valley area
Origin time: 11 29 34.9
Epicenter: 37.59 N., 118.82 W.
Depth: 14 km
Magnitude: 3.5 ML(B), 3.3 ML(P)

Felt at Mammoth Lakes (B).

11 July Central California
Origin time: 21 14
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.
Intensity III: Mariposa.

15 July (B) Owens Valley area
Origin time: 07 16 12.0
Epicenter: 37.53 N., 118.87 W.
Depth: 13 km
Magnitude: 3.5 ML(B), 3.7 ML(P)

Felt at Mammoth Lakes (B).

18 July (B) Owens Valley area
Origin time: 20 14 52.7
Epicenter: 37.55 N., 118.93 W.
Depth: 7 km
Magnitude: 3.5 ML(B), 3.6 ML(P)

Felt at Mammoth Lakes (B).

19 July (G) Central California
Origin time: 16 55 18.4
Epicenter: 36.09 N., 120.10 W.
Depth: 5 km
Magnitude: 3.0 ML(B), 3.1 ML(P)
Intensity III: Six miles north-northeast of Avenal.

23 July (P) Southern California
Origin time: 07 50 13.4
Epicenter: 34.27 N., 119.62 W.
Depth: 7 km
Magnitude: 3.4 ML(P)
Intensity III: Santa Barbara (press report).

23 July (P) Imperial Valley area
Origin time: 09 55 51.5
Epicenter: 33.07 N., 115.50 W.
Depth: 3 km
Magnitude: 2.5 ML(P)

Felt at Brawley (P).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

California--Continued

25 July (B) Owens Valley area
Origin time: 06 44 19.5
Epicenter: 37.58 N., 118.90 W.
Depth: 5 km
Magnitude: 3.7 ML(B), 3.8 ML(P)

Felt at Mammoth Lakes (B).

26 July (B) Owens Valley area
Origin time: 17 22 47.1
Epicenter: 37.56 N., 118.92 W.
Depth: 5 km
Magnitude: 3.5 ML(B), 3.6 ML(P)

Felt at Mammoth Lakes (B).

1 August (B) Owens Valley area
Origin time: 16 38 56.3
Epicenter: 37.56 N., 118.89 W.
Depth: 4 km
Magnitude: 4.7 mb(G), 5.0 MS(G), 5.4 ML(B), 5.3 ML(P)

This earthquake was felt over an area of approximately 40,000 sq km of California and Nevada (fig. 7).

Intensity V:
California--Mammoth Lakes (Windows, doors, and dishes rattled; buildings creaked; buildings shook strongly; hanging pictures out of place; a few windows cracked; hanging objects swung moderately; trees and bushes shook moderately, standing and moving vehicles rocked slightly. One jar of mayonnaise was knocked off the shelves at the Safeway store--press report).
Intensity IV:
California--Benton, Big Creek, Big Pine, Bishop, Cartago, Caruthers, Clovis, Coarsegold, Corcoran, Curry Village, Dunlap, El Portal, Fish Camp, Friant, Groveland, Huntington Lake, June Lake, Kings Canyon National Park, Lakeshore, Lee Vining, Lemoore Naval Air Station, Lone Pine, Mariposa, Midpines, Mono Hot Springs, Mountain Ranch, Murphys, Pioneer, Raisin, Reedley, Sequoia National Park, Shaver Lake, Sheep Ranch, Sonora, Soulsbyville, Tollhouse, Toms Place, Tuolumne, Tuolumne Meadows, Volcano, Wawona, Woodville, Yosemite National Park (rock slides occurred on slopes and hiking trails--press report).
Nevada--Reno.
Intensity III:
California--Ahwahnee, Bass Lake, Big Oak Flat, Camp Connell, Cantua Creek, Fresno, Grizzly Flats, Hathaway Pines, Hume, Jamestown, Kernville, Lemoore, Long Barn, North Fork, Oakhurst, Piedra, Pine Grove, Pinecrest, Railroad Flat, Riverdale, Selma, Stanford, Strawberry, Tipton, Wilseyville.
Nevada--Dyer, Luning.
Intensity II:
California--Copperopolis, Helm, Hornitos, Lindsay, Madera, Mi-Wuk Village, Pioneer, Visalia.
Nevada--Fish Lake Valley (near Dyer).
Felt:
California--Convict Lake (press report), O'Neals, Sacramento (press report).

19 August (B) Owens Valley area
Origin time: 06 45 27.2
Epicenter: 37.63 N., 118.87 W.
Depth: 5 km
Magnitude: 4.1 ML(B), 4.1 ML(P)

Felt at Mammoth Lakes (B).

24 August (B) Central California
Origin time: 12 41 17.6
Epicenter: 37.57 N., 121.67 W.
Depth: 6 km
Magnitude: 4.1 ML(B)

Felt in the San Francisco Bay area (B).

Intensity IV: Livermore.

29 August (G) Central California
Origin time: 17 16 40.5
Epicenter: 38.27 N., 122.07 W.
Depth: 5 km
Magnitude: 2.5 ML(B)

Intensity III: Green Valley area north of Benecia.

30 August (B) Owens Valley area
Origin time: 10 53 29.1
Epicenter: 37.58 N., 118.77 W.
Depth: 5 km
Magnitude: 3.5 ML(B), 3.7 ML(P)

Felt at Mammoth Lakes (B).

31 August (P) Southern California
Origin time: 10 32 46.6
Epicenter: 35.22 N., 118.60 W.
Depth: 3 km
Magnitude: 3.5 ML(P)

Felt at Bakersfield (P).

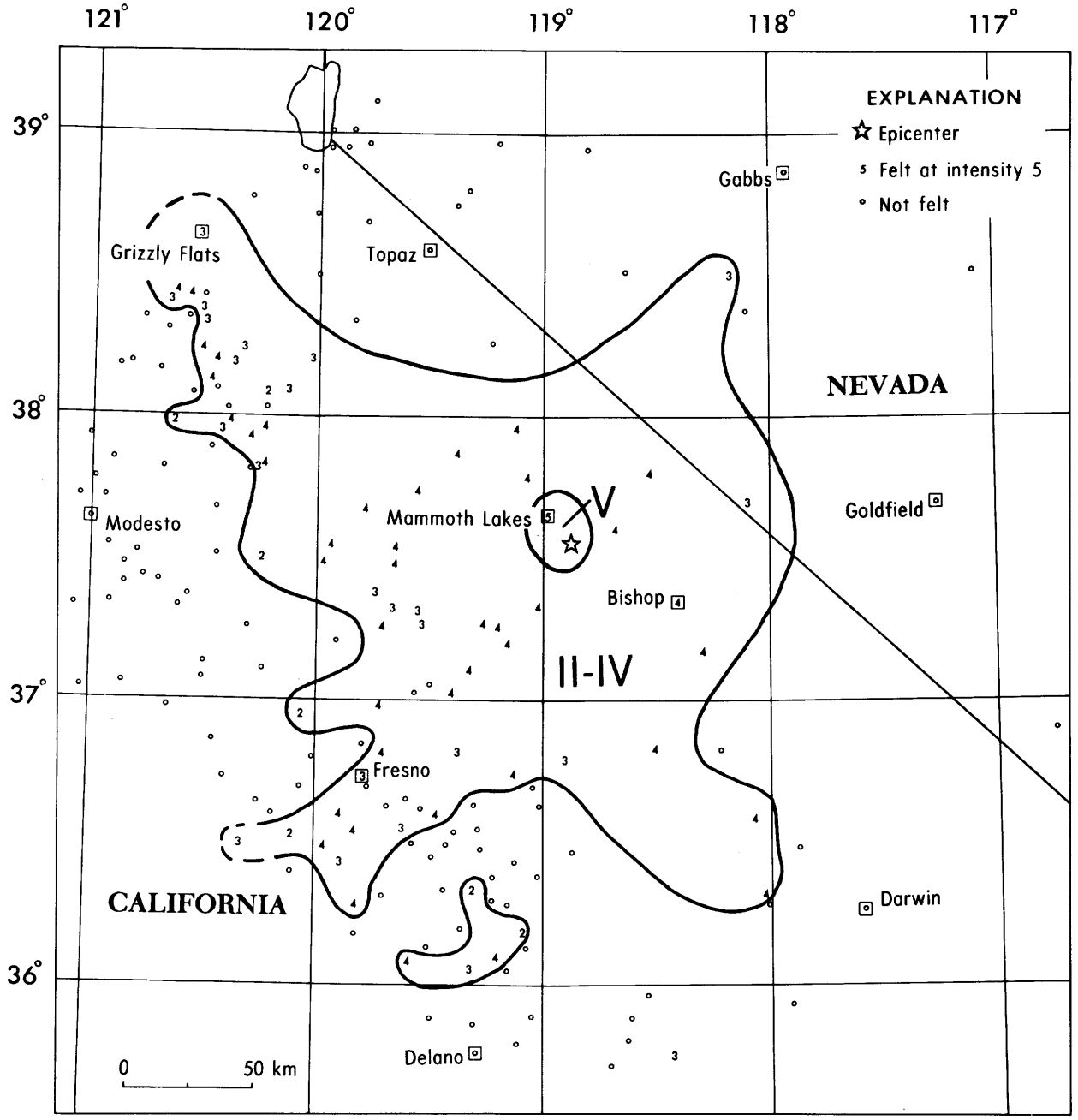

FIGURE 7.--Isoseismal map for the Owens Valley area, California, earthquake of 1 August 1980, 16 38 56.3 UTC. Roman numerals represent Modified Mercalli intensities between isoseismals; Arabic numerals are used to represent these intensities at specific sites.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

California—Continued

4 September (B) Western Nevada
Origin time: 13 39 09.5

See Nevada listing.

4 September (B) Western Nevada
Origin time: 21 03 33.9

See Nevada listing.

7 September (B) Western Nevada
Origin time: 01 30 42.7

See Nevada listing.

7 September (B) Western Nevada
Origin time: 04 36 38.3

See Nevada listing.

7 September (B) Western Nevada
Origin time: 06 48 10.5

See Nevada listing.

7 September (B) Western Nevada
Origin time: 06 48 30.2

See Nevada listing.

7 September (B) Western Nevada
Origin time: 16 57 34.5

See Nevada listing.

8 September (B) Western Nevada
Origin time: 04 26 19.9

See Nevada listing.

9 September (P) Southern California
Origin time: 17 26 20.8
Epicenter: 33.58 N., 118.30 W.
Depth: 5 km
Magnitude: 3.9 ML(P)
Intensity IV: North Long Beach (press report), Palos Verdes Peninsula.
Intensity III: Compton, Signal Hill (press report).
Intensity II: Cypress.
Felt: Long Beach (P), Redondo Beach (P).

9 September (P) Southern California
Origin time: 18 07 20.4
Epicenter: 33.82 N., 118.23 W.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

California--Continued

Depth: 5 km
Magnitude: 2.4 ML(P)

Felt at Long Beach (P).

14 September (B) Owens Valley area
Origin time: 11 50 02.2
Epicenter: 37.63 N., 118.96 W.
Depth: 5 km
Magnitude: 3.5 ML(B), 3.5 ML(P)

Felt at Mammoth Lakes (B).

16 September (B) Western Nevada
Origin time: 04 24 41.1

See Nevada listing.

24 September (B) Central California
Origin time: 08 08 38.9
Epicenter: 36.27 N., 120.17 W.
Depth: 9 km
Magnitude: 4.8 mb(G), 4.3 ML(B), 4.3 ML(P)
Intensity V: Avenal (windows, doors, and dishes rattled; hanging objects swung moderately; hairline cracks in plaster walls).
Intensity IV: Coalinga, Lemoore, Mariposa, Tranquillity.
Intensity III: Burrel, Firebaugh, Fresno.
Intensity II: Kerman.

25 September (P) Central California
Origin time: 16 33 29.5
Epicenter: 36.67 N., 118.10 W.
Depth: 6 km
Magnitude: 2.7 ML(P)

Felt at Lake Isabella (P).

26 September (P) Southern California
Origin time: 10 15 41.4
Epicenter: 35.78 N., 120.27 W.
Depth: 6 km
Magnitude: 3.2 ML(P), 2.9 ML(B)

Intensity IV: Avenal.

26 September (P) Southern California
Origin time: 13 18 41.2
Epicenter: 35.27 N., 119.40 W.
Depth: 5 km
Magnitude: 4.2 ML(B), 4.4 ML(P)
Intensity V:
Arvin (windows, doors, and dishes rattled;

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

California--Continued

small objects overturned and fell; few dishes broke; hanging objects swung slightly).
Intensity IV: Avenal, Buttonwillow, Fellows, Stratford, Taft, Wofford Heights.
Intensity III: Bakersfield.
Felt: Derby Acres, Santa Barbara.

27 September (B) Owens Valley area
Origin time: 19 16 24.9
Epicenter: 37.62 N., 118.90 W.
Depth: 5 km
Magnitude: 4.1 ML(B), 3.9 ML(P)

Felt at Mammoth Lakes (B).

California--Off the coast

18 July Southern California
Origin time: 19 56
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.
Intensity IV: San Clemente Island (telegram).

Georgia

27 July (G) Northern Kentucky
Origin time: 18 52 21.8#

See Kentucky listing.

Hawaii

The locations shown below followed by (H) designate intensity values assigned by the Hawaiian Volcano Observatory.

5 July (H) Off coast of Oahu
Origin time: 05 36 00.7
Epicenter: 20.88 N., 157.79 W.
Depth: 10 km
Magnitude: 3.7 ML(H)

Felt on the island of Oahu.

Intensity III: Kaneohe, Makiki, Pacific Heights, and Waikiki (press reports).

17 July (H) Island of Hawaii
Origin time: 05 03 51.0

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Hawaii--Continued

Epicenter: 19.95 N., 155.37 W.
Depth: 9 km
Magnitude: 3.0 ML(H)
Intensity II: Waimea (H).

1 August (H) Island of Hawaii
Origin time: 11 42 15.5
Epicenter: 19.38 N., 155.24 W.
Depth: 6 km
Magnitude: 3.6 ML(H)
Intensity III: Hawaii Volcanoes National Park (H).

5 August (H) Island of Hawaii
Origin time: 17 45 41.9
Epicenter: 20.04 N., 155.73 W.
Depth: 7 km
Magnitude: 3.1 ML(H)
Intensity III: Kohala (H).

12 August (H) Island of Hawaii
Origin time: 06 42 33.1
Epicenter: 19.33 N., 155.11 W.
Depth: 10 km
Magnitude: 4.3 ML(H)
Intensity IV: Glenwood, Hilo, and Volcano (H).
Intensity III: Honaunau and Papaikou (H).

12 August (H) Island of Hawaii
Origin time: 17 23 44.6
Epicenter: 19.34 N., 155.11 W.
Depth: 9 km
Magnitude: 3.0 ML(H)
Intensity III: Puna area (H).

12 August (H) Island of Hawaii
Origin time: 21 01 55.9
Epicenter: 19.33 N., 155.18 W.
Depth: 10 km
Intensity III: Hilo (H).
Intensity II: Papaikou (H).

14 August (H) Island of Hawaii
Origin time: 07 27 16.7
Epicenter: 19.35 N., 155.42 W.
Depth: 11 km
Magnitude: 4.1 ML(H)
Intensity IV: Glenwood, Hilo, Pahala, and Papaikou (H).
Intensity III: Kealakekua and Volcano (H).

18 August (H) Island of Hawaii
Origin time: 03 32 48.6
Epicenter: 19.27 N., 155.45 W.
Depth: 11 km
Magnitude: 3.6 ML(H)
Intensity III: Hilo and Volcano (H).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Hawaii--Continued

20 August (H) Island of Hawaii
Origin time: 16 06 25.9
Epicenter: 19.60 N., 156.15 W.
Depth: 25 km
Magnitude: 4.0 ML(H)
Intensity III: Kona (H).

27 August (H) Island of Hawaii
Origin time: 11 58 53.9
Epicenter: 19.91 N., 155.28 W.
Depth: 39 km
Magnitude: 3.4 ML(H)
Intensity III: Hilo (H).

28 August (H) Island of Hawaii
Origin time: 01 25 58.7
Epicenter: 19.39 N., 155.24 W.
Depth: 4 km
Magnitude: 3.2 ML(H)

This was one of a swarm of earthquakes that occurred from August 28-29 beneath the Pihimau pit crater on Kilauea.

Intensity III: Hawaii Volcanoes National Park, Hawaiian Volcano Observatory, and Volcano (H).

28 August (H) Island of Hawaii
Origin time: 02 34 01.3
Epicenter: 19.38 N., 155.24 W.
Depth: 1 km
Magnitude: 3.4 ML(H)
Intensity III: Hawaii Volcanoes National Park, Hawaiian Volcano Observatory, and Volcano (H).

28 August (H) Island of Hawaii
Origin time: 06 48 45.2
Epicenter: 19.38 N., 155.26 W.
Depth: 1 km
Magnitude: 3.1 ML(H)
Intensity III: Hawaii Volcanoes Natinal Park and Hawaiian Volcano Observatory (H).

29 August (H) Island of Hawaii
Origin time: 00 06 57.1
Epicenter: 19.38 N., 155.26 W.
Depth: 1 km
Magnitude: 3.3 ML(H)
Intensity V: Puhimau (H).
Intensity III: Hawaii Volcanoes National Park, Hawaiian Volcano Observatory, and Volcano (H).

1 September (H) Island of Hawaii
Origin time: 04 16 53.8
Epicenter: 19.34 N., 155.11 W.
Depth: 9 km
Magnitude: 3.6 ML(H)
Intensity III: Hilo (H).

3 September (H) Island of Hawaii
Origin time: 20 43 06.3
Epicenter: 19.36 N., 155.02 W.
Depth: 8 km
Magnitude: 3.3 ML(H)
Intensity III: Kalapana (H).

13 September (H) Island of Hawaii
Origin time: 19 04 11.8
Epicenter: 19.33 N., 155.19 W.
Depth: 10 km
Magnitude: 3.2 ML(H)
Intensity III: Volcano (H).

20 September (H) Island of Hawaii
Origin time: 08 57 11.3
Epicenter: 19.35 N., 155.07 W.
Depth: 9 km
Magnitude: 3.4 ML(H)
Intensity III: Mountain View and Volcano (H).

Illinois

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Indiana

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Kentucky

12 July (G) Western Kentucky
Origin time: 23 59 54.8
Epicenter: 37.26 N., 86.99 W.
Depth: 0 km
Magnitude: 3.1 Mn(G)

Probable explosion.

Intensity III: Horse Branch, South.

27 July (G) Northern Kentucky
Origin time: 18 52 21.8
Epicenter: 38.17 N., 83.91 W.
Depth: 8 km
Magnitude: 5.1 mb(G), 4.7 MS(G), 5.0 Mn(L), 5.2 Mn(T)

This shock is the strongest earthquake to be centered in Kentucky and the strongest earthquake to be felt in this region since the southern Illinois earthquake of 1968. It was felt over an area of approximately 600,000 sq km of the central United States and Canada (fig. 8). The press reported one woman was injured in Kent, Kentucky. The worst damage was at Maysville, Kentucky (MM VII) approximately 50 km north of the epicenter, where 37 business structures and 269 residences suffered damage of some degree. The preliminary estimate of loss in Maysville was $1,000,000. Most of the significant damage to structures occurred in the older downtown section of the city, which lies adjacent to and extends several blocks back from the Ohio River. This lower section of downtown Maysville extends westward from Limestone Street, through the center of the business district, along West 1st through West 4th Streets (Reagor and others, 1981). The damage was mostly to older brick structures probably built during the middle 1800's. A storm entered the Maysville area after the earthquake and some people associated the thunder with earthquake noise. The storm also contributed to the damage when rain water entered buildings through cracks and holes in roofs, thereby soaking interior finishes.

Ground cracks were reported to have occurred about 12 km from the epicenter at Owingsville and Little Rock, Kentucky (James Zollweg, Tennessee Earthquake Information Center, Memphis, Tenn., oral commun., 1980). At Owingsville, east of the epicenter, the ground cracks were estimated to be 6-10 cm deep and 30 m in length. To the west of the epicenter, on Stoner Road near Little Rock, ground cracks were observed by residents to run toward a cistern. During the earthquake, the ground near the epicenter appeared to have waves, and was described "as if the streets and sidewalks were made out of rubber." Reports of the duration of ground vibration were about 15 sec of strong motions and up to several minutes for sensible vibration. Generally, the noise associated with the shock was described as similar to a low-flying jet, a sonic boom, or an air conditioner or furnace exploding, but the most common description was a blown natural-gas pipeline.

The most common type of damage from this earthquake occurred to chimneys (fig. 9). Except in Maysville, the damage was not a community-wide effect, but was scattered within a community. There were several instances of homes having several chimneys to which the extent of damage varied. The damage to the chimneys also took many forms and exhibited a wide variation in the degree of damage. The chimney damage included cracks of varying lengths and widths, bricks loosened or bricks toppled from the top of chimneys (fig. 10), bricks knocked out between the chimney top and the roofline, and in a few scattered instances, chimneys were toppled down to near the roofline. There were also reports of bricks that were dislodged inside the chimney and fell onto the hearth. The most extensive damage to chimneys was to older chimneys that were constructed without reinforcement and with mud and lime mortar or a mortar mixture called "brickment." These types of mortar weather and erode quite easily. Although many of these types of chimneys were damaged, there were instances when one chimney would be damaged and another of similar construction was not. On the other hand, there were a few instances of damage occurring to chimneys which had been recently rebuilt and strengthened (fig. 11). A community with scattered chimney damage was assigned an intensity VI.

Much of the data listed below were taken from reports by Hopper and Reagor (1980), Giese-Koch and Reinbold (1980), Anderson and others (1980), and Reagor and others (1981).

Intensity VII:
United States--
Kentucky--Maysville (The most common effects reported were concentrated chimney damage, dislodged bricks and bricks fallen from several unbraced parapets, cracks in exterior masonry walls, broken or shattered windows, cracked basement walls, merchandise thrown to the floor, dishes broken,

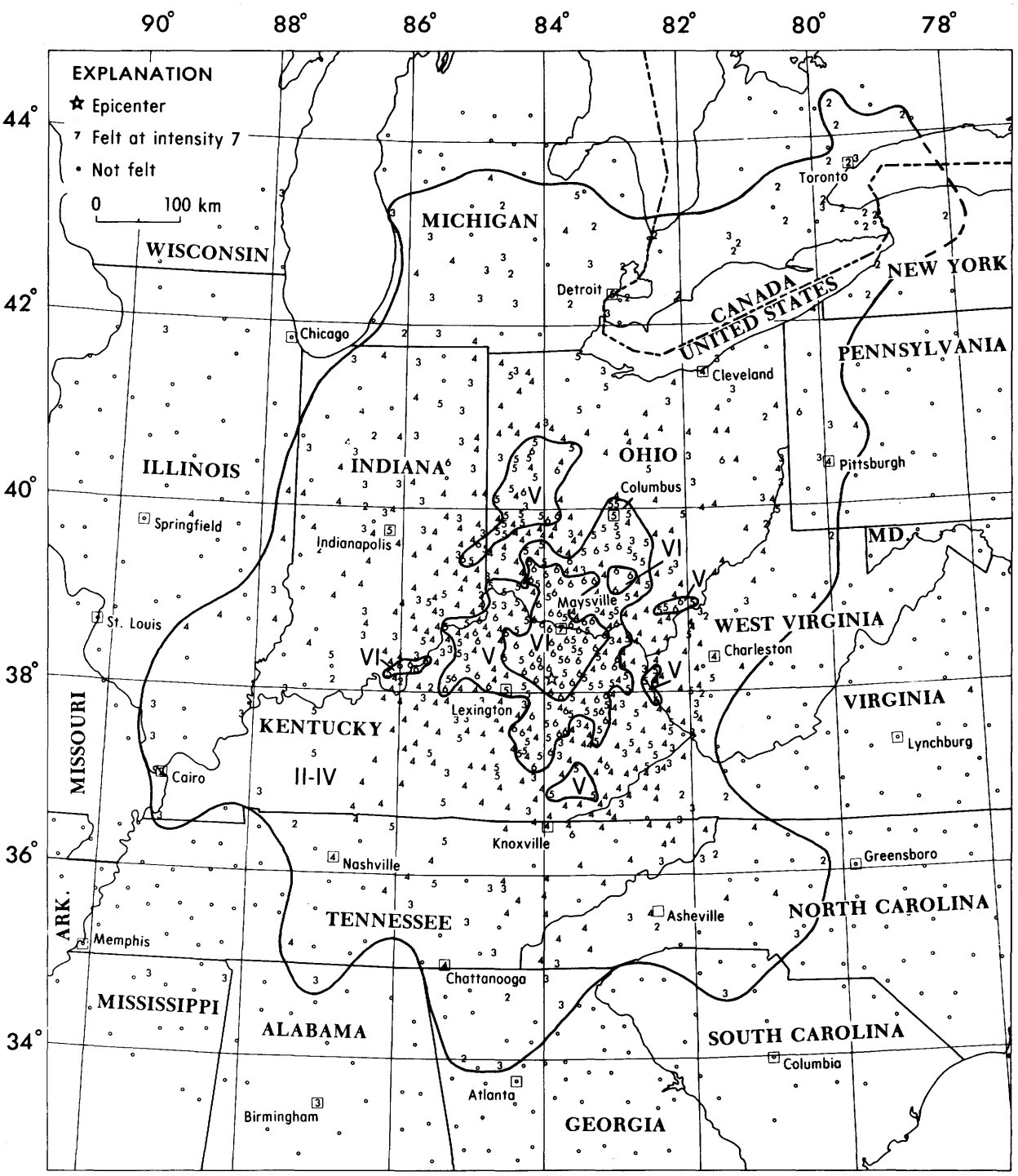

FIGURE 8.--Isoseismal map for the northern Kentucky earthquake of 27 July 1980, 18 52 21.8 UTC. Roman numerals represent Modified Mercalli intensities between isoseismals; Arabic numerals are used to represent these intensities at specific sites.

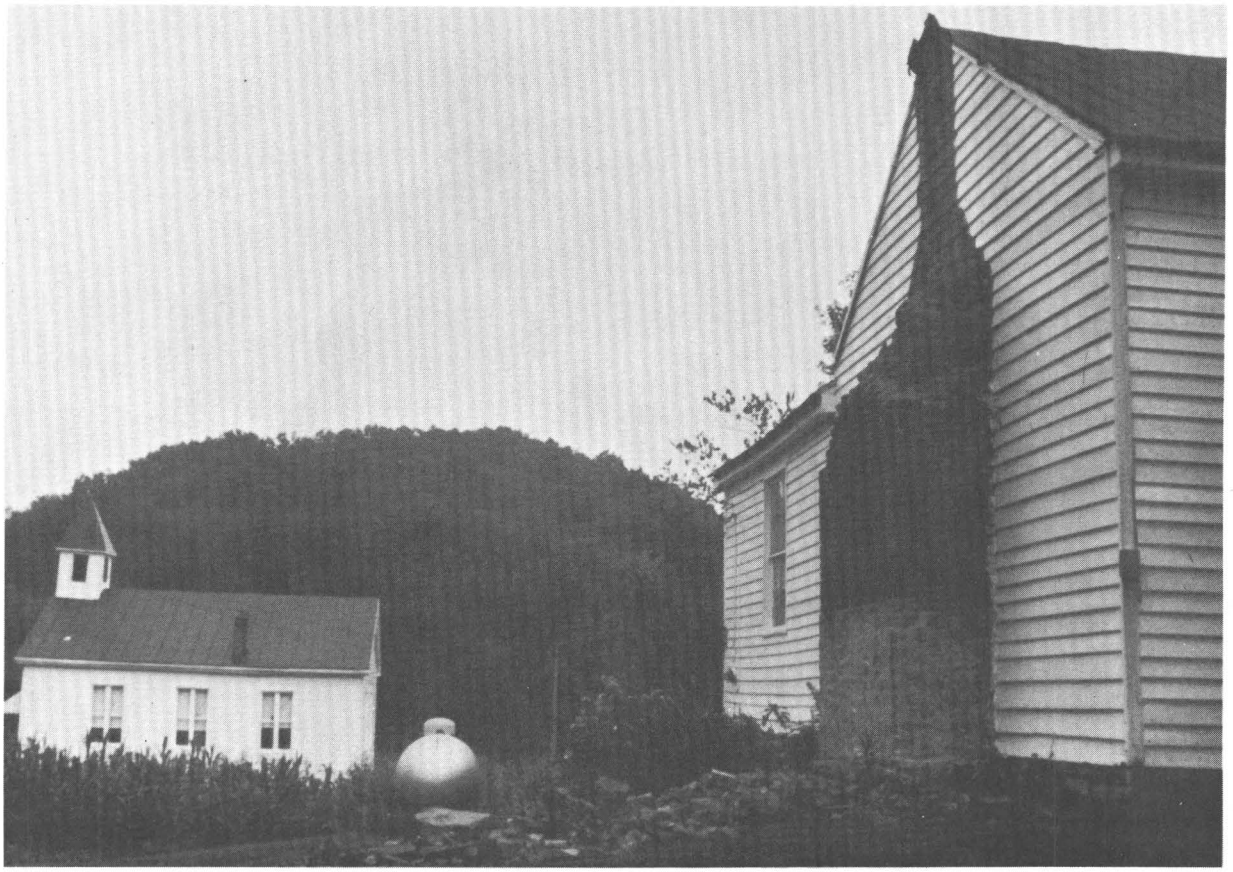

FIGURE 9.--Photograph of partial chimney collapse in Sherburne, Kentucky (photo provided by M. Hopper).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued
furniture shifted, and hanging pictures fell from walls).
The Cox Building, a brick masonry structure built in 1886, had broken windows and a few cracks in the brick walls at window openings.
The only building reported condemned in Maysville was the Calvary Baptist Church. The entire structure was erected from single-wall cement blocks that were braced across the width of the church by stress rods with turnbuckles. The front wall had cracked on a previous occasion at which time the stress rods were installed. The earthquake reopened the old crack in the front wall to such an extent that the Maysville fire chief condemned the building until repairs could be made.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

People were kept out of the First Christian Church because of a wall that had shifted and roof columns that had moved.
The First Presbyterian Church had cracks in interior plaster and a cracked stone beam over the main entrance.
At the Spurlock Station of Eastern Kentucky Power, 3.2 km west of Maysville, a 24.4 m-tall smokestack appeared to sway between 3.6 and 4.5 m during the tremor. The natural built-in sway is 2.4 m (press report).
The Hayswood Hospital on East 4th Street at Market had minor damage to the equipment penthouse at the top of the four-story structure. Cracks developed in the south and west

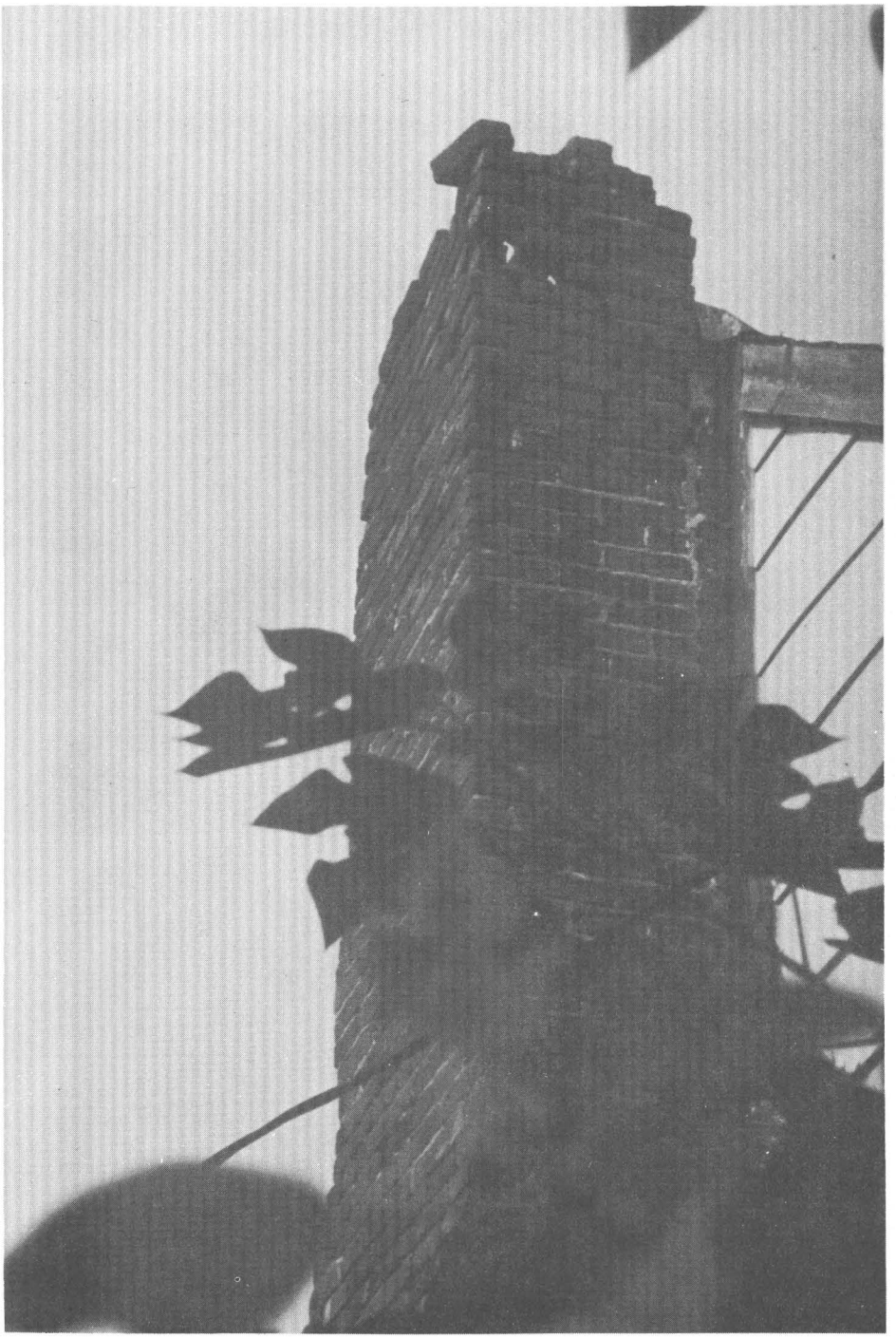

FIGURE 10.--Photograph of chimney damage near Sharpsburg, Kentucky (photo provided by M. Hopper).

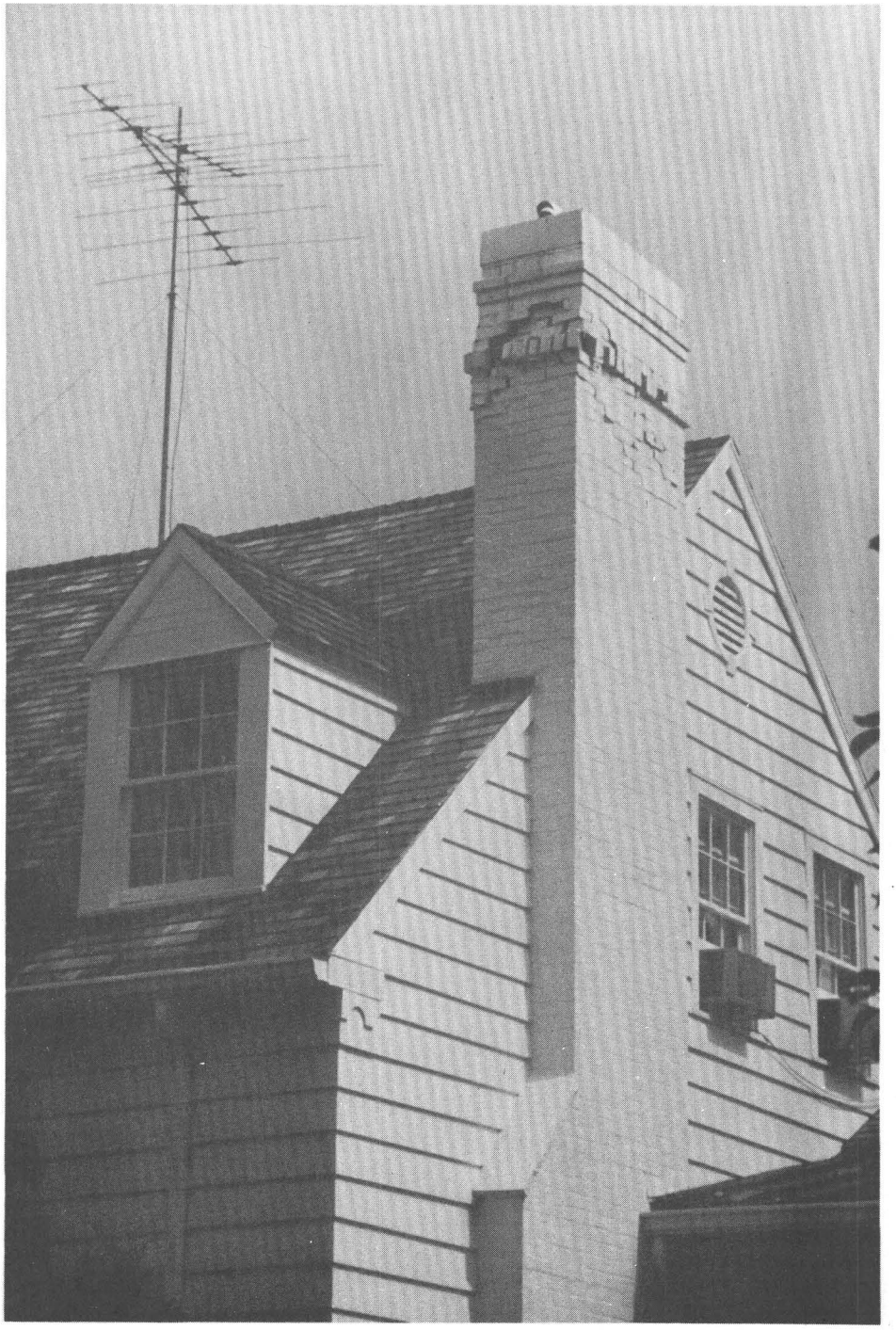

FIGURE 11.--Photograph of damage to a recently rebuilt chimney in Owingsville, Kentucky (photo provided by M. Hopper).

walls. Each of the four 6.1-m columns at the front of the hospital developed horizontal cracks just above the entrance level.
Several windows were broken on the floors above the Kilgus Pharmacy (press report).
A liquor store near the central business district lost its entire stock when bottles fell from shelves.
At the Central Shopping Center on U.S. Highway 62 between Maysville and Washington, Murphys Department Store had slight diagonal cracks along mortar seams on the brick-veneered reinforced concrete-block north-facing wall, and several concrete blocks appeared to be slightly pushed outward.
At the St. Patrick Catholic Church arches cracked and seams of the inside walls were cracked. The ground shook so violently that the church's bell rang. Lead was broken out of stained glass windows at the church, though none of the panes of glass broke. At the St. Patrick Catholic School the framework of the suspended ceiling failed and several ceiling panels fell in the gymnasium. There were also reports of loosened capstones and bricks from outside walls, and cracks in the ceiling plaster.

Intensity VI:

United States--

In addition to the effects listed below, there were instances of chimney damage in most towns (as described above) but not as concentrated as in Maysville. Other commonly reported damage included cracked basement walls and floors and cracked foundations.

Indiana--

Georgetown
Hartford City (cracks in exterior brick walls).
Liberty
Metamora
New Albany

Kentucky--

Augusta
Barterville (glassware broken).
Beattyville
Berry
Bethel (tombstones were rotated mostly counterclockwise and some were displaced to the southwest).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky--Continued

Blue Lick
Buena Vista
Camargo
Camp Dix
Carlisle (a wall was reported cracked in a grocery store at the intersection of Highways 36 and 32;, merchandise in stores was knocked to the floor).
Charters (hairline cracks in concrete block walls of the grocery store).
Concord (one window in a church was cracked diagonally across several panes; a sidewalk was cracked).
Cottageville
Cowan
Crystal (some broken windows).
Dover (items fell off shelves, pictures came off walls).
East Bernstadt
Elizaville
Elkfork
Ewing (cracked plaster in walls of homes and the hospital--press report).
Fairview (few items fell off shelves, cracks in concrete-block cisterns).
Flemingsburg (The exterior block wall of the Nutrition Center had cracks at the window and door openings and additional cracking at the window sill. At the Fleming Court House, built in 1939, a wooden cornice fell from the top of an outside window. The Fleming County Hospital had one broken window, some cracked plaster, and cracks in the inside and outside cement-block brick-veneered wall).
Frankfort (North of Frankfort on U.S. Highway 127 a home was reported to have a broken rear wall where the bricks were loosened and could be removed by hand. Other homes in the subdivision had similar damage.
Fritz (split interior walls and cracked stone fences).
Fultz (large cracks in plaster walls).
Grayson (displaced tombstones).
Harper
Headquarters (a hairline crack in one house through both bricks and mortar, that extended from the bottom corner of one window to the ground).
Heidelberg
Hookstown
Jeff
Jeffersonville (crack in a brick-veneered wall and hairline cracks along mortar seams in one store).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky--Continued

Judy (several concrete-block cisterns were cracked and one century-old brick house had a meter-long diagonal shear crack in a brick wall).
Little Rock (the concrete-block Davis grocery store and garage had several items fall off shelves).
Louisville (plaster fell from a ceiling, a basement floor cracked, furniture moved, and some windows broke--press report).
Mays Lick (groceries fell from shelves at the Welsh grocery store, pictures were out of place and some fell, furniture moved, and exterior brick walls were cracked).
Means
Millersburg
Minerva
Moorefield (some items were thrown off shelves and brick cisterns were damaged--press report).
Morehead (chimneys and walls damaged, sidewalks broken, patios cracked, items fell off shelves in stores--press report).
Morning Glory (a concrete-block cistern was cracked around the top edge and concrete block steps moved away from a house).
Mount Carmel (groceries were knocked off the shelves at the Food Market).
Mount Olivet (several items fell off shelves at the K-Y grocery store, and the storekeeper's home settled and damaged the gas pipeline).
Mount Sterling (There were reports that pictures were out of place, items fell off shelves, windows broke, a clock stopped, a wood-framed house with brick veneer had a crack in the brick mortar and some plaster fell, and a plate-glass window broke. Giese-Koch and Reinbold (1980) reported that the Junior High School Building had hairline cracks at all corners of the building and cracks in exterior brick walls. The Chenault Agricultural Building of the high school complex had long cracks in the "terrazzo" floor and minor cracks in the inner cement block walls. One cement-block structure on the Mount Sterling golf course had cracks through all four outside walls, both through blocks and along mortar joints. One pump for the city water supply system was shut down temporarily by the earthquake. The earthquake set off fire alarms at the hospital.).
Murphysville (items fell off shelves).
Muses Mills (cracks in concrete patio walls).
North Middletown (an 8-year-old brick building was extensively cracked completely through double brick walls).
Olive Hill
Olympia
Orangeburg
Owenton
Owingsville (items fell off shelves, pictures turned facing the wall, the 1887 brick Saint Julie Catholic Church had extensive damage to plaster walls, the 1845 two-story brick United Methodist Church had hairline cracks over the arch of one of the front windows and plaster damage over the windows inside the church, cracks in exterior brick walls, and tombstones were displaced and fell).
Paint Lick
Paris (items fell off shelves, patios were cracked, plaster walls were cracked, and several antique clocks stopped).
Pittsburg (some windows broke).
Pleasant Valley (few items fell off shelves).
Plum (At the grocery and Ashland service station all the groceries came off the west wall, but none came off the east wall; concrete-block cisterns and basements were cracked).
Plumville (a concrete slab porch was cracked and a cave-in at the limestone quarry was reported).
Polksville (at the Village Mart there was a crack in the garage wall from the bottom of a window to the floor straight down through the concrete blocks).
Poplar Plains (cracks in brick walls).
Preston (cracked plaster and dry wall).
Prospect
Quincy
Rectorville (a few items knocked off shelves).
Sadieville
Salt Lick (hairline cracks in concrete-block walls, items fell off shelves).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

Sand Hill (wall cracked in one house).
Sanders
Sandgap
Sardis
Shannon (tombstones shifted counter-clockwise--press report).
Sharpsburg (There were reports of basements cracked, plaster chips fell in the post office, some brick and block masonry walls cracked, and tombstones rotated clockwise with many displaced about 1 cm to the south. One home which was more than 150 years old and in poor condition sustained such serious damage from cracked brick walls that it was declared unsafe.).
Shelbyville
Sherburne (At the General Store and Standard Station the front window on the south side was buckled and broken out and all of the groceries lining the east wall were thrown off the shelf. At one home glassware broke and one picture on a table fell, a plastered wall adjacent to a chimney was cracked near the ceiling).
Slade (some broken windows).
South Shore
Taylorsville
Tollesboro (press report).
Tyner
Vanceberg
Verona
Versailles
Waco
Wallingford (pictures fell off dressers and broke and pictures came off walls and broke).
Warsaw (cracks in exterior brick walls).
Washington (At Riggs Ashland Service Station there were over 1-m long, small cracks running diagonally across the ceiling of the restroom. There were also cracks in the concrete-block walls of the restroom. At the cemetery across from Riggs Service Station tombstones were rotated, most clockwise, and displaced to the northeast up to 4 cm. At Murphy's Department Store several blocks were slightly moved out from the concrete-block side wall. The municipal swimming pool was cracked. Two cases of liquor came off the shelves at the liquor store. At the Kroger Store about $30 worth of things were lost off the shelves; everyone rushed out of the store and one person fainted.).
Wedonia
West Liberty
Whitesulphur (items fell and a stone house was cracked).
Williamstown

Ohio--
Aberdeen (books were knocked off shelves; a picture fell from a wall; a wood door frame pulled away from the rest of the building, and industrial cooling units were displaced).
Addison (broken windows).
Bainbridge
Bellefontaine
Bentonville (pictures were knocked off walls, items fell from shelves, furniture moved, a loose-stacked rock retaining wall partially collapsed at one home).
Bethel
Blanchester
Blue Creek
Buford (damaged swimming pools).
Chillicothe (broken windows).
Chilo (at the grocery store items fell off shelves, several windows were broken, and there was damage to the tin roof).
Circleville (broken windows).
Cridersville
Dover (cracks in a patio and driveway--press report).
Dunkinsville (press report).
Fayetteville
Georgetown
Goshen
Higginsport
Hillsboro (items fell off shelves, one table bounced up and down, and pictures were knocked askew).
Lebanon
Lees Creek
Londonderry
Lynchburg
Lynx
Manchester
Medway (cracked plaster).
Middleport
Morrow
New Albany (collapsed brick and concrete wall in basement of Day's Grocery Store--press report).
New Holland
Piqua
Portsmouth
Rainsboro

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

Ripley (at Taylor's Village Mart there was some damage to the parapet).
Russellville
Springfield (broken windows).
Waverly (broken windows).
Wilmington (at one home a gas line was broken and the base of a shed was cracked--press report).
Winchester (broken windows).
Pennsylvania--
New Castle (cracked plaster and cracked exterior brick walls).
Tennessee--
New Tazewell
West Virginia--
Crum

Intensity V:

The most common effects for the places listed below were a few windows cracked, small objects and light furniture moved, standing and moving vehicles rocked slightly, buildings shook slightly, glassware broke, small objects fell.

United States--
Indiana--Brookville, Columbia City, Corydon, Floyds Knobs, Holton, Indianapolis (tables bounced across the floor, pictures started swinging, portable walls started moving around--press report), Jasper, Otisco, Vernon, Vevay.
Kentucky--Alexandria, Bagdad, Barbourville, Baxter, Bear Branch, Blaine, Bledsoe, Bradfordsville, Bruin, Burdine, Burkesville, Campbellsburg, Caney, Cannel City, Central City, Clay City, Clayhole, Clearfield, Climax, Clintonville (a cement block cistern was cracked--press report), Cottle, Crittenden, Cynthiana, East Union, Falmouth, Farmers, Fernleaf, Finchville, Foster, Foxport, Frenchburg (concrete porch pulled away about 8 cm from a foundation), Garrison, Germantown, Grange City, Greenup, Hager, Hatton, Hazel Green, Head of Grassy, Helechawa, Helena, Hillsboro, Index, Irvine, Isonville, Jacobs, Kentontown, Leeco, Lenox, Lewisburg, Lexington (ceiling cracked in wood-frame brick-veneer home, items knocked from grocery shelves, pictures fell from wall, sounded like a sonic boom--press report), Logville, Lookout, Lytten, Marthas Mills (press report), McAndrews, McCarr, Melbourne, Milton, Moranburg (at one home a previously cracked glass window was pushed out and an upstairs door was left out of plumb and hard to close--press report), Mount Vernon, Myers, New Castle, Newport, Oddville, Orlando, Owensboro, Parrot, Petersville, Pikeville, Pine Ridge, Pleasureville, Plummers Landing, Poplar Grove, Prestonburg, Reynoldsville (press report), Roark, Robinson Creek, Rousseau, Sandy Hook, Science Hill, Somerset (press report), Stanton, Summersville, Tilton, Turners Station, Union, Vanceburg, Wayland, Webbville, West Van Lear, Westbend, Winchester, Wind Cave, Wyoming.
Michigan--Detroit (shook desks and heavy computer terminals in the Detroit News Newsroom, Tiger Stadium swayed 4-6 in--press report), Saginaw.
Ohio--Ashville, Beaver, Bidwell, Bradysville, Bryan, Cheshire, Cincinnati (a sandstone finial fell from the roof-level of the four-story city hall and broke the granite steps below. The press reported a chimney at St. Pauls Church was damaged and some bricks fell to the street), Clarksburg (press report), Clarksville, Cleves, College Corner, Columbus (2-foot piece of plaster crashed to the floor at the RKO Palace Theatre--press report), Decatur, Eaton, Englewood, Enon, Findlay, Fizzleville (north of Aberdeen), Fremont, Gahanna, Gordon, Greenville, Grove City, Hamden, Hamersville (press report), Kenton, Kingston, Lewisburg, Lima (press report), Lockbourne, Lucasville, Martinsville, McDermott, Mount Orab, Mount Sterling, Mount Vernon, New Bremen, New Carlisle, New Marshfield, New Philadelphia, Newtonsville, North Bend, Orient, Point Pleasant, Racine, Rarden, Reynoldsburg, Rio Grande, Saint Marys, Seven Mile, Sidney (press report), South Bloomingville, South Lebanon, Spring Valley, Springboro, Stout, Sugar Grove, Syracuse, Tarlton, Terrace Park, Toledo (press report), Versailles, Wallingford, Wapakoneta, Washington Court House, Waterford (press report), Wellston (press report), West Alexandria, West Milton, Williamsburg, Williamsport, Worthington (press report), Zanesville.
Tennessee--Grainger County (press report), Lafayette, Olivingston, Sparta.
West Virginia--Buffalo, Fort Gay, Man, Moundsville, Switzer, Wayne, Williamson.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky--Continued

Intensity IV:
United States--
Alabama--Huntsville (press report), New Market (press report).
Illinois--Danville, Decatur, Lawrenceville, Louisville, Paris, Salem.
Indiana--Angola, Batesville, Bath, Berne, Bloomfield, Bloomington, Borden, Brownstown, Brownsville, Butlerville, Cambridge City, Carmel (press report), Cedar Grove, Clarksburg, Commiskey, Connersville, Cortland, Covington, Crandall, Crawfordsville, Cross Plains, Crothersville, Decatur, Dillsboro, Dupont, East Enterprise, Elizabethtown, Elwood, Fairland (press report), Franklin, Fredericksburg, Gas City, Glenwood, Greensburg, Greenville, Guilford, Hanover, Hartsville, Huntington, Ireland, Jonesville, Knightstown, Kokomo, Laconia, Lafayette, Lawrenceburg, Lexington, Madison, Marion, Martinsville, Marysville, Memphis, Milan, Milroy, Mitchell, Monticello, Mooreland, Moores Hill, Morris, Muncie, Nabb, Napoleon, New Castle, New Middletown, New Point, New Salisbury, New Washington, North Vernon, Oldenburg, Osgood, Paris Crossing, Patriot, Pekin, Peru, Petersburg, Plainfield, Ramsey, Richmond, Rising Sun, Rockville, Rushville, Scipio, Scottsburg, Seymour, Shelbyville, South Bend, Spencer, Sunman, Terre Haute (telegram), Union City, Versailles, Warsaw, Westport, Winamac, Winchester.

Kentucky—Annville, Athol, Auxier, Barnetts Creek, Bays, Beauty, Beaver, Bedford, Beechburg, Belfry, Berea, Bethany, Bighill, Blacks Crossroads, Blairs Mills, Bloomfield, Bonnieville, Booneville, Bowen, Bowling Green, Brandenburg, Brodhead, Bronston, Brooks, Bryantsville, Buckner, Buffalo, Bulan, Burlington, Burnside, Buskirk, Bypro, California, Campton, Canada, Canoe, Carrollton, Carter, Cawood, Cecilia, Chaplin, Cobhill, Colville (press report), Combs, Conway, Corbin, Corinth, Cornettsville, Coxs Creek, Crestwood, Crockett, Cromona, Cumberland, Danville, De Mossville, Denniston, Dreyfus, Drift, Dry Ridge, Dunnville, Eastview, Edna, Egypt, Ekron, Elizabethtown, Elna, Emerson, Eminence, Erlanger, Ermine, Eubank, Evarts, Ezel, Fearisville, Ferguson, Firebrick, Flat Fork, Flatwoods, Florence, Foraker, Ford, Fort Knox, Fort Thomas (press report), Frakes, Franklin (press report), Freeburn, Garrard, Garrett, Ghent, Gifford, Gillmore, Glasgow, Glencoe, Glendale, Glenview, Goshen, Grahn, Gratz, Gravel Switch, Gray, Gray Hawk, Green Hall, Greensburg, Guerrant, Haddix, Haldeman, Hardy, Hardyville, Harlan, Harold, Harrods Creek, Hazard, Hebron, Hi Hat, Hindman, Hitchins, Hodgenville, Hulen, Hustonville, Insko, Ivel, Jackstown, Jamestown, Jeremiah, Johns Run, Jonesville, Junction City, Keene, Kenton, Kenvir, Kerby Knob, Kings Mountain, Lair, Lancaster, Langley, Lawrenceburg, Lebanon Junction, Lerose, Letcher, Lily, Livingston, Lone, Loretto, Lynn, Maceo, Maggard, Magnolia, Malone, Manchester, Mariba, Martha, Martin, Mason, Mayking (press report), Mazie, McDowell, McKee, McRoberts, Midway, Millstone, Mintonville, Monticello, Moon, Morrill, Mount Eden, Mousie, Nancy, Nazareth, Neon, Nerinx, New Haven, New Hope, New Liberty, Newfoundland, Nicholasville, Oil Springs, Old Landing, Oldtown, Oneida, Ophir, Paintsville, Pathfork, Perryville, Pewee Valley, Phyllis, Pilgrim, Pine Grove (press report), Pine Knot, Pineville, Pinsonfork, Pomeroyton, Poplar Flat, Port Royal, Primrose, Pryse, Quicksand, Raywick, Redbush, Regina, Revelo, Ricetown, Richmond, Rockholds, Rockhouse, Rogers, Rosslyn, Royalton, Rush, Saint Catharine, Saint Francis, Saint Helens, Saldee, Salyersville, Sassafras, Scottsville, Sebastians Branch, Shady Nook, Shawhan, Shelbiana, Shepherdsville, Sidney (press report), Silver Grove, Silverhill, Smithfield, Smiths Creek, Soldier, Sonora, South Portsmouth, Sparta, Stacy Fork, Stamping Ground, Stanford, Stanville, Stephens, Strunk, Sweeden, Talbert, Tateville, Tomahawk, Topmost, Trappist, Trinity, Upper Tygart, Upton, Van Lear, Vancleve, Vicco, Vine Grove, Viper, Virgie, Waddy, Wallins Creek, Walton, Warfield, Washington, Weeksbury, Wellington, Wendover, West Point, Westport, Wheelwright, White Oak, Whitesburg, Whitley City, Wildie, Willard, Willisburg, Wilmore, Winston, Woodbine, Wooton, Worthington, Worthville, Wrigley, Yocum, Zachariah.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

Michigan--Allegan, Coldwater (press report), Flint, Hastings, Mount Clemens (telegram), Mount Pleasant, New Buffalo (press report), Union City.
North Carolina--Asheville, Bryson City, Franklin, Morganton, Murphy, Robbinsville, Sparta, Statesville.
Ohio--Ada, Addyston, Adelphi, Akron, Albany, Alpha, Amelia, Ashland, Batavia, Bellbrook, Belle Center (press report), Belpre, Bethel (press report), Bluffton, Botkins, Bexley (press report), Bourneville, Bowersville, Bremen, Bridgeport, Brookville, Bucyrus, Cambridge (press report), Camden, Camp Dennison, Canal Winchester, Canton, Carey (press report), Cedarville, Cherry Fork, Clayton, Cleveland, Clifton, Coalton, Coldwater, Columbus Grove (press report), Commercial Point, Coolville, Covington, Crestline (press report), Crown City, Dayton (press report), Defiance, Delphos (press report), Derby, Eldorado, Ellsberry, Elyria, Fairborn, Felicity, Frankfort, Franklin, Franklin Furnace, Friendship, Galion, Gallipolis, Glouster, Gratis, Greenwich (press report), Groesbeck (press report), Harrisburg, Harrison (press report), Haverhill, Highland, Hooven, Jackson, Jamestown, Jeffersonville, Kings Mills, Kitts Hill, Langsville, Latham, Laura, Leesburg, Loveland, Ludlow Falls, Mansfield, Marietta, Marion, Mason, Massillon, McArthur, Miamisburg, Miamiville, Middletown, Minford, Minster, Monroe, Montpelier (press report), Moscow, Mount Gilead, Mount Saint Joseph, Napoleon, Nelsonville, Neville, New Concord, New Lebanon, New Lexington, New Paris, New Richmond, New Vienna, Newark, North Hampton, Oak Hill, Oregonia, Ottawa, Otway, Overpeck, Owensville, Oxford (press report), Patriot, Paulding, Pedro, Peebles, Phillipsburg, Piketon, Pleasant Plain, Port William, Ray, Rockbridge, Ross, Rutland, Sabina, Sandusky, Sardinia, Scioto Furnace, Scottown, Seaman, Sedalia, Sherrodsville, Somerville, South Charleston, South Point, South Vienna, South Webster, Steubenville, Summit Station, Tipp City, Trenton, Upper Sandusky, Urbana, Utopia, Van Wert (press report), Vandalia, Verona, Wakefield, Waterloo, Wauseon, Waynesville, West Chester, West Elkton, West Manchester,

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

West Union, Westerville, Wheelersburg, Wilberforce, Willow Wood, Woodsfield (press report), Wooster, Wright-Patterson AFB, Xenia, Yellow Springs, Youngstown, Zaleski.
Pennsylvania--Bellevue (press report), Erie, Kittanning, Pittsburgh.
Tennessee--Alcoa, Arthur, Blountville, Carthage, Chattanooga, Clairfield, Cookeville, Cumberland Gap, Duff, Elizabethton (press report), Greeneville, Harriman, Jefferson City, Jellico, Johnson City, Jonesboro, Kingsport, Knoxville, La Follette, Lawrenceburg, Lenoir City, Loudon, Maryville, Mountain City, Nashville, Newport, Oneida, Oak Ridge (press report), Portland, Smithville, Sneedville, Sweetwater, Tazewell, Woodbury.
Virginia--Big Rock, Big Stone Gap, Blackwater, Clinchco, Coeburn, Dungannon, East Stone Gap, Ewing, Grundy, Hurley, Jonesville, Kents Stone, Norton, Pennington Gap, Pound, Rose Hill, Saint Charles, Wytheville (press report).
West Virginia--Ashton, Bancroft, Branchland, Bruno, Buckhannon, Charleston, Charlton Heights, Chattaroy, Costa, Dingess, East Lynn, Eleanor (press report), Genoa, Glenwood, Harrisville, Harts, Henderson, Henlawson, Hewett, Huntington, Hurricane, Institute, Lavalette, Lenore, Leon, Lesage, Letart, Logan, Mason, Middlebourne, Naugatuck, Parkersburg, Peach Creek, Point Pleasant, Racine, Ranger, Scott Depot, Sod, Sophia, Southside, Tornado, Varney, Washington, West Hamlin.

Intensity III:
Canada--
Ontario--Allanburg, Amherstburg (press report), Don Mills (press report), East York (press report), Hamilton (press report), London (press report), North York (press report), Scarborough (press report).
United States--
Alabama--Athens, Birmingham.
Georgia--Blairsville, Cleveland, Marietta.
Illinois--Dixon, Jonesboro, Murphysboro, Robinson, Shawneetown.
Indiana--Anderson, Auburn, Bedford, Bluffton, Boston, Canaan, Danville, Delphi, Deputy, Evansville, Fort Wayne, Fowler, Frankfort, Goshen, Greenfield, Hagerstown, La Porte, Laurel, Mount Saint Francis, Paoli,

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

Pendleton, Portland, Salem, Sellersburg, Tell City, Tipton, Wabash, Williamsburg, Zionsville.
Kentucky--Benham, Bethlehem, Betsy Layne, Boston, Burke, Cadiz, Clermont, Columbia, Cutuno, Dorton, Elsie, Fuget, Hellier, Hickman, Hueysville, Independence, Jackhorn, Jackstown, Johnetta, Keaton, La Grange, Lackey, Lawton, London, Mackville, Mary, Middlesboro, Mize, Mouthcard, Owensboro (press report), Pendleton, Petersburg, Pikeville (press report), Pippa Passes, Raceland, Rineyville, Russell, Salvisa, Sextons Creek, Springfield, Sulphur, Vada, Vincent, Waneta, Wheelersburg, Williamsburg, York (press report).
Michigan—Centreville, Charlotte, Grand Rapids, Jackson, Kalamazoo, Lansing, Marshall, Muskegon, Pontiac, Royal Oak (press report).
Mississippi--Ashland, Iuka.
North Carolina--Banner Elk, Canton, Harrisburg, Hayesville.
Ohio--Amanda, Archbold (press report), Athens, Barnesville, Blacklick, Branch Hill, Brighton (press report), Cardington (press report), Celina, Chesapeake, Cheviot (press report), Coshocton, Donnelsville, Greenfield, Huntington (press report), Ironton, Kent (press report), Maineville, Mantua (press report), Milford (press report), Millersburg, Oak Harbour (press report), Okeana, Pandora (press report), Penfield (press report), Port Clinton (press report), Proctorville, Ravenna (press report), Rochester (press report), Saint Clairsville, South Solon, Stoutsville, Stow (press report), Stryker (press report), Troy, Twin Lakes (press report), Wellington (press report), Wharton (press report), Willowick.
Pennsylvania--Avalon, Bellevue (press report), Butler, Crafton (press report), East Liberty (press report), McKees Rocks (press report), Whitehall (press report).
South Carolina--Union.
Tennessee-Benton, Dayton, Erwin, Kingston, McMinnville, Pikeville, Rockwood, Speedwell.
Virginia--Abingdon, Andover, Bristol (press report), Clintwood, Dryden, Haysi, McClure, Wise (press report).
West Virginia--Accoville, Barboursville,

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

Cottageville, Delbarton, Ethel, Foster, Fraziers Bottom, Kermit, Kimberly, Mallory, Morgantown, New Cumberland, New Haven, Peytona, Pound (press report), Prichard, Ravenswood, Red Jacket, Saint Albans, Sumerco, Wellsburg, West Columbia, Wharncliffe.
Wisconsin--Port Washington.

Intensity II:

Canada--
Ontario—Barrie (press report), Belle River, Belmont, Bethany, Blenheim, Bradford, Brampton (press report), Burford, Burlington (press report), Camlachie, East Catharines (press report), Emeryville, Grimsby (press report), Kitchener (press report), Kleinburg, Niagara Falls (press report), Peel (press report), Saint Catharines (press report), Saint Thomas (press report), Sarnia (press report), Toronto, Waterboro (press report), Waterloo (press report), Welland (press report), Windsor (press report).
United States--
Georgia--Ellijay, Rome.
Illinois--Cairo.
Indiana—Brazil, Crown Point, Edinburg, Elizabeth, Lebanon, Logansport, Michigan City (press report), Santa Claus.
Kentucky—Denton, Greenback (press report), Jenkins, Mount Washington, Pleasure Ridge Park (press report), Shively (press report).
Michigan--Cassopolis, Farmington Hills (press report), Ithaca, Lapeer, Mason, Monroe, Romeo (press report), Royal Oak (press report), Selfridge Air National Guard Base (Detroit), Ypsilanti.
New York--Bemus Point (press report), Chataqua City (press report), Jamestown (press eport), Lakewood (press report), Mayville (press report).
North Carolina--Boone, Fletcher, Winston-Salem.
Ohio--Lisbon, Tallmadge (press report).
Pennsylvania--Oakland (press report).
Tennessee--Clarksville.
Virginia--Bristol, Christiansburg (press report), Lebanon, Marion, Salem (press report).
West Virginia--Chapmanville, Griffithsville, Holden, Jeffrey, Lundale, Matewan, New Martinsville, Ripley, Stollings, Wheeling (press report), Winfield.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Kentucky—Continued

31 July (G) Northern Kentucky
Origin time: 09 26 56.3
Epicenter: 38.20 N., 83.92 W.
Depth: 13 km
Magnitude: 2.5 Mn(G)

This is the largest of approximately 30 aftershocks that followed the earthquake on July 27.

Intensity IV: Plum.
Intensity III: Bethel, Carlisle, Moorefield, Sharpsburg.

23 August (G) Northern Kentucky
Origin time: 03 49 02.5
Epicenter: 37.99 N., 84.92 W.
Depth: 5 km
Magnitude: 3.1 Mn(S)
Intensity III: Bethlehem, Cropper, Orville.
Felt: Frankfort (K).

25 August (K) Northern Kentucky
Origin time: 11 41 36.9
Epicenter: 38.20 N., 83.91 W.
Depth: 13 km
Magnitude: 2.5 Mn(G)
Intensity IV: Sharpsburg, Sherburne (K).
Felt: Bethel (press report), Owingsville (press report).

Michigan

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

20 August (G) Lake Erie, Canada
Origin time: 09 34 52.3
Epicenter: 41.94 N., 83.01 W.
Depth: 5 km
Magnitude: 3.2 Mn(G), 3.2 Mn(S)

This earthquake was felt in parts of Michigan and Ohio, United States and Ontario, Canada.

Intensity V:
Canada--
Ontario--Harrow (dishes were broken and children were awakened).
Intensity IV:
Canada--
Ontario--Colchester and Windsor (press report).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Michigan--Continued

United States--
Michigan--Milan, New Boston (press report), Pearl Beach, Rockwood.
Ohio--Huron.
Intensity III:
United States--
Michigan--Gross Ile, Salem, Samaria, South Rockwood, Trenton.
Intensity II:
United States--
Michigan--Flat Rock.
Felt:
United States--
Michigan--Detroit (press report).
Ohio--Toledo (press report).

Mississippi

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Missouri

5 July (S) New Madrid area
Origin time: 08 54 40.9
Epicenter: 36.61 N., 89.58 W.
Depth: 12 km
Magnitude: 3.5 Mn(G), 3.2 Mn(T)
Intensity IV: Kewanee, Marston, New Madrid.
Felt: Lilbourn (telephone report).

Montana

15 July (G) Southern Montana
Origin time: 19 37 27.3
Epicenter: 45.65 N., 111.80 W.
Depth: 5 km
Magnitude: 3.0 ML(G)

Felt in the Harrison-Pony area (telephone report).

20 July (G) Southern Montana
Origin time: 12 57 29.8
Epicenter: 45.65 N., 111.85 W.
Depth: 5 km
Magnitude: 3.0 ML(G)

Felt in the Harrison-Pony area (telephone report).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Montana--Continued

20 July (G) Southern Montana
Origin time: 12 57 29.8
Epicenter: 45.65 N., 111.85 W.
Depth: 5 km
Magnitude: 3.0 ML(G)

Felt in the Harrison-Pony area (telephone report).

20 July (G) Southern Montana
Origin time: 13 03 39.7
Epicenter: 45.61 N., 111.85 W.
Depth: 5 km
Magnitude: 3.3 ML(G)

Felt in the Harrison-Pony area (telephone report).

Nevada

25 July (E) Southern Nevada
Origin time: 19 05 00.082
Epicenter: 37.26 N., 116.48 W.
Depth: 0 km
Magnitude: 5.5 mb(G), 4.2 MS(G), 5.7 ML(B)

Nevada Test Site explosion "TAFI" at 37°15'22.77" N., 116°28'38.65" W., surface elevation 1886 m, depth of burial 680 m.

31 July (E) Southern Nevada
Origin time: 18 19 00.092
Epicenter: 37.01 N., 116.02 W.
Depth: 0 km
Magnitude: 4.3 mb(G), 3.9 ML(B)

Nevada Test Site explosion "VERDELLO" at 37°00'46.96" N., 116°01'21.89" W., surface elevation 1210 m, depth of burial 366 m.

1 August (B) Central California
Origin time: 16 38 56.3

See California listing.

4 September (B) Western Nevada
Origin time: 13 39 09.5
Epicenter: 38.09 N., 118.57 W.
Depth: 5 km
Magnitude: 4.0 mb(G), 4.6 ML(B), 4.6 ML(P)

This is the first in a swarm of earthquakes that occurred in this area from September 4 to 8.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Nevada--Continued

Intensity V:
California--Benton (hanging pictures swung, small objects overturned and fell, hanging objects swung slightly, many people awakened).
Intensity IV:
California--Atwater, June Lake, Lee Vining, Toms Place.
Intensity III:
California--Bass Lake, Bishop, Bridgeport, North Fork.
Nevada--Hawthorne.

4 September (B) Western Nevada
Origin time: 21 03 33.9
Epicenter: 38.06 N., 118.52 W.
Depth: 20 km
Magnitude: 4.9 mb(G), 4.9 ML(B), 4.6 ML(P)

Felt in Mono County, California (B).

Intensity III:
California--Castle AFB.
Felt:
California--Mammoth Lakes (P).

7 September (B) Western Nevada
Origin time: 01 30 42.7
Epicenter: 38.05 N., 118.56 W.
Depth: 14 km
Magnitude: 4.4 mb(G), 5.1 ML(B), 4.9 ML(P)

Felt in California at Bodie, Mammoth Lakes, and Yosemite National Park (B).

7 September (B) Western Nevada
Origin time: 04 36 38.3
Epicenter: 38.03 N., 118.58 W.
Depth: 15 km
Magnitude: 4.9 mb(G), 5.0 MS(G), 5.4 ML(B), 5.6 ML(P)

Intensity V:
California--
Bishop (windows, doors, and dishes rattled; hanging pictures swung; small objects overturned; hairline cracks in plaster).
June Lake (poker chips fell off a table and some chairs bounced around--press report).
Intensity IV:
California--Benton, Bridgeport, Fish Camp, Groveland, Hume, Lee Vining, Lone Pine, Raymond, Strawberry, Toms Place, Tuolumne, Wawona, Yosemite National Park.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Nevada--Continued

Nevada--Babbitt, Dyer, Fallon, Hawthorne, Luning, Mina, Schurz, Yerington.
Intensity III:
California--Arnold, Crowley Lake, El Portal, La Grange, Twain Harte, Wilseyville.
Nevada--Gabbs, Silver Springs, Smith.
Intensity II:
California--Camp Connell.
Felt:
California--Bodie (B), Mammoth Lakes (B).

7 September (B) Western Nevada
Origin time: 06 48 10.5
Epicenter: 38.08 N., 118.60 W.
Depth: 5 km
Magnitude: 3.9 ML(B), 4.5 ML(P)

Felt in California at Bodie, Mammoth Lakes, and Yosemite National Park (B).

7 September (B) Western Nevada
Origin time: 06 48 30.2
Epicenter: 38.08 N., 118.60 W.
Depth: 5 km
Magnitude: 4.7 mb(G), 4.4 MS(G), 5.3 ML(B), 5.2 ML(P)

Felt in California at Bodie, Mammoth Lakes, and Yosemite National Park (B).

7 September (B) Western Nevada
Origin time: 16 57 34.5
Epicenter: 38.09 N., 118.60 W.
Depth: 5 km
Magnitude: 3.9 ML(B), 3.7 ML(P)

Felt in Mono County, California (B).

8 September (B) Western Nevada
Origin time: 04 26 19.9
Epicenter: 38.03 N., 118.58 W.
Depth: 13 km
Magnitude: 4.6 ML(B), 4.3 ML(P)

Intensity IV:
California--Bodie (press report).
Felt:
California--Mammoth Lakes and Yosemite National Park (B).

16 September (B) Western Nevada
Origin time: 04 24 41.1
Epicenter: 38.01 N., 118.56 W.
Depth: 14 km
Magnitude: 4.2 mb(G), 4.6 ML(B), 4.4 ML(P)
Intensity IV:
California--Bishop, Lee Vining.

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Nevada--Continued

Nevada--Luning, Schurz.
Intensity III:
Nevada--Mina.
Felt:
California--Mammoth Lakes (B).

25 September (E) Southern Nevada
Origin time: 14 45 00.094
Epicenter: 37.06 N., 116.05 W.
Depth: 0 km
Magnitude: 4.6 mb(G), 4.1 ML(B)

Nevada Test Site explosion "BONARDA" at 37°03'22.19" N., 116°02'53.11" W., surface elevation 1237 m, depth of burial 381 m.

25 September (E) Southern Nevada
Origin time: 15 26 30.084
Epicenter: 37.12 N., 116.06 W.
Depth: 0 km
Magnitude: 3.7 ML(G)

Nevada Test Site explosion "RIOLA" at 37°06'57.11" N., 116°03'52.44" W., surface elevation 1281 m, depth of burial 424 m.

New Mexico

11 September (G) Northeastern New Mexico
Origin time: 17 34 37.5
Epicenter: 36.46 N., 105.19 W.
Depth: 5 km
Magnitude: 3.1 ML(G)
Intensity V: Ute Park (foundation was reported cracked, some glasses were broken, and small objects were overturned).
Intensity IV: Cimarron, Red River.
Intensity III: Eagle Nest.
Intensity II: Ocate.

New York

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

4 September (L) Southeastern New York
Origin time: 04 30 55.8
Epicenter: 41.11 N., 73.78 W.
Depth: 13 km
Magnitude: 3.2 Mn(L)
Intensity IV:
Mount Pleasant and Pleasantville (several people awakened, buildings shook--press report).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

New York—Continued

Thornwood (windows rattled and furniture disturbed--press report).

North Carolina

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Ohio

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

20 August (G) Lake Erie, Canada
Origin time: 09 34 52.3

See Michigan listing.

Oregon

7 July (G) Northwestern Oregon
Origin time: 01 17 06.0
Epicenter: 45.22 N., 121.69 W.
Depth: 5 km
Magnitude: 3.3 ML(G)

This was the first in a swarm of earthquakes that occurred near Mount Hood. In the following 24 hours a total of 55 events were recorded, but by July 13 the activity had declined to only one recorded event.

Intensity IV: Government Camp.
Felt: Timberline Lodge (press report).

28 September Northwestern Oregon
Origin time: 20 26
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.

Several people in the eastern part of Lincoln County reported that the earthquake sounded like a sonic boom (press report).

Intensity IV: Eddyville, Logsden, and Toledo (press reports).
Intensity III: Siletz (press report).

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Pennsylvania

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

South Carolina

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Tennessee

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Virginia

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Washington

15 July Southeastern Washington
Origin time: 19 00
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.

Two earthquakes were felt in the Elk Lake area near Mt. St. Helens shortly after noon on July 15 (press report).

19 September (G) Puget Sound area
Origin time: 22 53 14.5
Epicenter: 47.97 N., 121.89 W.
Depth: 5 km
Magnitude: 3.8 ML(G)

Intensity V:
Gold Bar (small objects overturned and fell, trees and bushes shook moderately, standing and moving vehicles rocked slightly, many people frightened, felt by all).
Sultan (few small objects overturned and

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Washington--Continued

fell, few windows cracked; few dishes broke; trees and bushes shook moderately; several people frightened; felt by all).
Intensity IV: Granite Falls, Monroe, Startup.
Intensity III: Index, Snohomish.
Intensity II: Clearview.
Felt: Bothell and Everett (press report).

21 September (G) Puget Sound area
Origin time: 17 45 18.7
Epicenter: 47.92 N., 121.81 W.
Depth: 5 km
Magnitude: 3.4 ML(G)

Felt in the Sultan area (press report).

30 September (W) Puget Sound area
Origin time: 16 32 13.6
Epicenter: 47.74 N., 122.06 W.
Depth: 9 km
Magnitude: 2.8 ML(G)

Felt at Duvall (press report).

West Virginia

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Wisconsin

27 July (G) Northern Kentucky
Origin time: 18 52 21.8

See Kentucky listing.

Wyoming

9 August Yellowstone National Park
Origin time: 04 50 38.9
Epicenter: 44.44 N., 110.54 W.
Depth: 2 km
Magnitude: None computed.
Intensity IV: Grant Village-West Thumb Geyser Basin area.

9 August Yellowstone National Park
Origin time: 04 52 04.4

Table 2.--*Summary of macroseismic data for U.S. earthquakes, July-September 1980*--Continued

Wyoming--Continued

Epicenter: 44.43 N., 110.54 W.
Depth: 3 km
Magnitude: None computed.
Intensity IV: Grant Village-West Thumb Geyser Basin area.

9 August Yellowstone National Park
Origin time: 05 18 28.5
Epicenter: 44.44 N., 110.54 W.
Depth: 2 km
Magnitude: None computed.
Intensity IV: Grant Village-West Thumb Geyser Basin area.

12 September (G) Southeastern Wyoming
Origin time: 22 33 55.4
Epicenter: 41.18 N., 105.12 W.
Depth: 0 km
Magnitude: 3.2 ML(G)

This event was an explosion of 150 tons of dynamite, which was felt 20 miles west-northwest of Cheyenne (telephone report).

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