GEOLOGICAL SURVEY CIRCULAR 766–C

Earthquakes in the United States, July-September 1976

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

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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," to the extent of providing detailed felt and intensity data, as well as intensity and isoseismal maps for U.S. earthquakes. The purpose is to provide a complete listing of macroseismic effects of earthquakes, which can be used in risk studies, nuclear power plant site evaluations, seismicity studies, and answering inquiries by the public.

This publication contains two major sections. The first (table 1) is a tabular listing of earthquakes in chronological order by State, consisting of the following basic information: date, origin time, hypocenter, magnitude, maximum intensity, and computational source of the hypocenter. The second section consists of four maps and table 2, which lists detailed intensity information. The list of earthquakes in table 1 was compiled from those located in the United States or off the coasts that were published in the PDE; from hypocenters in California above magnitude 3.0, supplied by 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 any others that were felt or that caused damage, regardless of magnitude or availability of a hypocenter. Known or suspected explosions are also listed.

The intensities and macroseismic data were compiled from information obtained through questionnaires, from newspaper articles, and with the cooperation of other government agencies, State institutions, local organizations, and individuals. (See "Acknowledgments" for a list of collaborators.) The questionnaire (fig. 1A, B) is the latest revision of this form; it was not in use for earthquake-intensity evaluations for the years 1975-76. An interim version of the form and an earlier version that had been in use since the 1930's were the basis for intensity evaluations throughout 1976. Anyone wishing to submit felt or damage information on earthquakes for inclusion in future reports should send it to the National Earthquake Information Service, Stop 967, Box 25046, Denver Federal Center, Denver, Colo. 80225. Copies of the current "Earthquake Report" questionnaire can be obtained at this address.

The primary method used by the NEIS to collect macroseismic information is a questionnaire canvass using the "Earthquake Report" forms, which are mailed to postmasters in the area affected by the earthquake. The postmasters complete the forms and return them to the NEIS, where they are evaluated and an intensity value is assigned. The intensity observations are mapped and contoured by isoseismals. Isoseismal contours present a generalization of intensity data and an extrapolation of these data to regions from which there are no observations; they do not necessarily account for every individual observation.

The data in table 2 will be included in the "Earthquake Description" section of "United States Earthquakes," an annual publication, to which later data from other sources may be added for the purpose of updating and completeness. "United States Earthquakes" is published jointly by the U.S. Geological Survey, Department of the Interior, and the Environmental Data Service, NOAA, Department of Commerce.

DISCUSSION OF TABLES

The parameters for the earthquakes in table 1 and table 2 include the date, origin time, hypocenter (epicenter and focal depth), magnitude, intensity, and hypocenter source. The origin time and date are listed in 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

U.S. DEPARTMENT OF THE INTERIOR
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EARTHQUAKE REPORT

Form Approved
OMB No. 42-R1700

Please answer this questionnaire carefully and return as soon as possible.

1. Was an earthquake felt by anyone in your town or zip code area recently?

☐ Not felt: Please refold and tape for return mail.

☐ Felt: 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

2a. Did you personally feel the earthquake? 1☐ Yes ☐ No

b. Were you awakened by the earthquake? 2☐ Yes ☐ No

c. Were you frightened by the earthquake? 3☐ Yes ☐ No

d. Were you at 4☐ Home 5☐ Work 6☐ Other?

e. Town and zip code of your location at time of earthquake _____

f. 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

g. Were you 14☐ Inside or 15☐ Outside?

h. If inside, on what floor were you? 16☐☐

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

COMMUNITY REPORT

Check one box for each question that is applicable.

3a. The earthquake was felt by	☐ No one	17☐ Few	18☐ Several	19☐ Many	20☐ All?
b. This earthquake awakened	☐ No one	21☐ Few	22☐ Several	23☐ Many	24☐ All?
c. This earthquake frightened	☐ No one	25☐ Few	26☐ Several	27☐ Many	28☐ All?

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

Parapets or cornices fallen	29☐ Yes	☐ No	
Trees and bushes shaken	30☐ Slightly	31☐ Moderately	32☐ Strongly
Standing vehicles rocked	33☐ Slightly	34☐ Moderately	35☐ Strongly
Moving vehicles rocked	36☐ Slightly	37☐ Moderately	38☐ Strongly
Ground cracks	39☐ Wet ground	40☐ Steep slopes	41☐ Dry and level ground
Landslides	42☐ Small	43☐ Large	
Underground pipes	44☐ Broken	45☐ Out of service	
Water splashed onto sides of lakes, ponds, swimming pools	46☐ Yes	☐ No	
Elevated water tanks	47☐ Cracked	48☐ Twisted	49☐ Fallen (thrown down)
Air coolers	50☐ Displaced	51☐ Rotated	52☐ Fallen
Railroad tracks bent	53☐ Slightly	54☐ Greatly	
Stone or brick fences	55☐ Cracked	56☐ Fallen	57☐ Destroyed
Tombstones	58☐ Displaced 61☐ Fallen	59☐ Cracked	60☐ Rotated
Chimneys	62☐ Cracked 65☐ Broken at roof line	63☐ Twisted	64☐ Fallen 66☐ Bricks fallen
Highways or streets	67☐ Cracked slightly	68☐ Large cracks	69☐ Displaced
Sidewalks	70☐ Cracked slightly	71☐ Large cracks	72☐ Displaced

Continued on the reverse side

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

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

Windows, doors, dishes rattled	73 ☐ Yes	☐ No		
Buildings creaked	74 ☐ Yes	☐ No		
Building trembled (shook)	75 ☐ Yes	☐ No		
Hanging pictures	76 ☐ Swung	77 ☐ Out of place	78 ☐ Fallen	
Water in small containers	79 ☐ Spilled	80 ☐ Slightly disturbed		
Windows	81 ☐ Few cracked	82 ☐ Some broken	83 ☐ Many broken	

6a. Did hanging objects, doors swing? ☐ No 84 ☐ Slightly 85 ☐ Moderately 86 ☐ Violently

b. Can you estimate direction? ☐ No 87 ☐ North/South 88 ☐ East/West 89 ☐ Other

7a. Were small objects (dishes, knick-knacks, pictures) ☐ Unmoved 90 ☐ Shifted 91 ☐ Overturned 92 ☐ Fallen, not broken 93 ☐ Broken?

b. Was light furniture ☐ Unmoved 94 ☐ Shifted 95 ☐ Overturned 96 ☐ Fallen, not broken 97 ☐ Broken?

c. Were heavy furniture or appliances ☐ Unmoved 98 ☐ Overturned 99 ☐ Shifted 100 ☐ Broken?

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

Plaster	101 ☐ Cracked	102 ☐ Fell
Dry wall	103 ☐ Cracked	104 ☐ Fell
Ceiling tiles	105 ☐ Cracked	106 ☐ Fell

9a. Check below any damage to buildings or structures.

Foundation	107 ☐ Cracked		108 ☐ Destroyed	
Interior walls	109 ☐ Split	110 ☐ Fallen	111 ☐ Separated from ceiling or floor	
Exterior walls	112 ☐ Hairline cracks		113 ☐ Large cracks	114 ☐ Bulged outward
	115 ☐ Partial collapse		116 ☐ Total collapse	
Building	117 ☐ Moved on foundation		118 ☐ Shifted off foundation	

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

119 ☐ Wood	120 ☐ Stone	121 ☐ Brick veneer	122 ☐ Other
123 ☐ Brick	124 ☐ Cinderblock	125 ☐ Reinforced concrete	

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

126 ☐ Don't know	127 ☐ Sandy soil	128 ☐ Marshy	129 ☐ Fill
130 ☐ Hard rock	131 ☐ Clay soil	132 ☐ Sandstone, limestone, shale	

d. Was the ground: 133 ☐ Level 134 ☐ Sloping 135 ☐ Steep?

e. Check the approximate age of the building:

136 ☐ Built before 1935 137 ☐ Built 1935-65 138 ☐ Built after 1965

10a. What percentage of buildings were damaged?

Within 2 city blocks of your location ☐ None 139 ☐ Few (about 5%) 140 ☐ Many(about 50%) 141 ☐ Most (about 75%)

b. In area covered by your zip code ☐ None 142 ☐ Few (about 5%) 143 ☐ Many (about 50%) 144 ☐ Most (about 75%)

11a. Were springs or well water disturbed? 145 ☐ Level changed 146 ☐ Flow disturbed 147 ☐ Muddied ☐ Don't know

b. Were rivers or lakes changed? 148 ☐ Yes ☐ No ☐ Don't know

12a. Was there earth noise? ☐ No 149 ☐ Faint 150 ☐ Moderate 151 ☐ Loud

b. Direction of noise 152 ☐ North 153 ☐ South 154 ☐ East 155 ☐ West

c. Estimated duration of shaking 156 ☐ Sudden, sharp (less than 10 secs) 157 ☐ Long (30-60 secs) 158 ☐ Short (10-30 secs) 159 ☐ Other

13. What is the approximate population of your city/town?

160 ☐ Less than 1,000 161 ☐ 10,000 to 100,000 162 ☐ 1,000 to 10,000 163 ☐ Over 100,000

Or are you in a 164 ☐ Rural area?

This community report is associated with what town or zip code? _____

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.

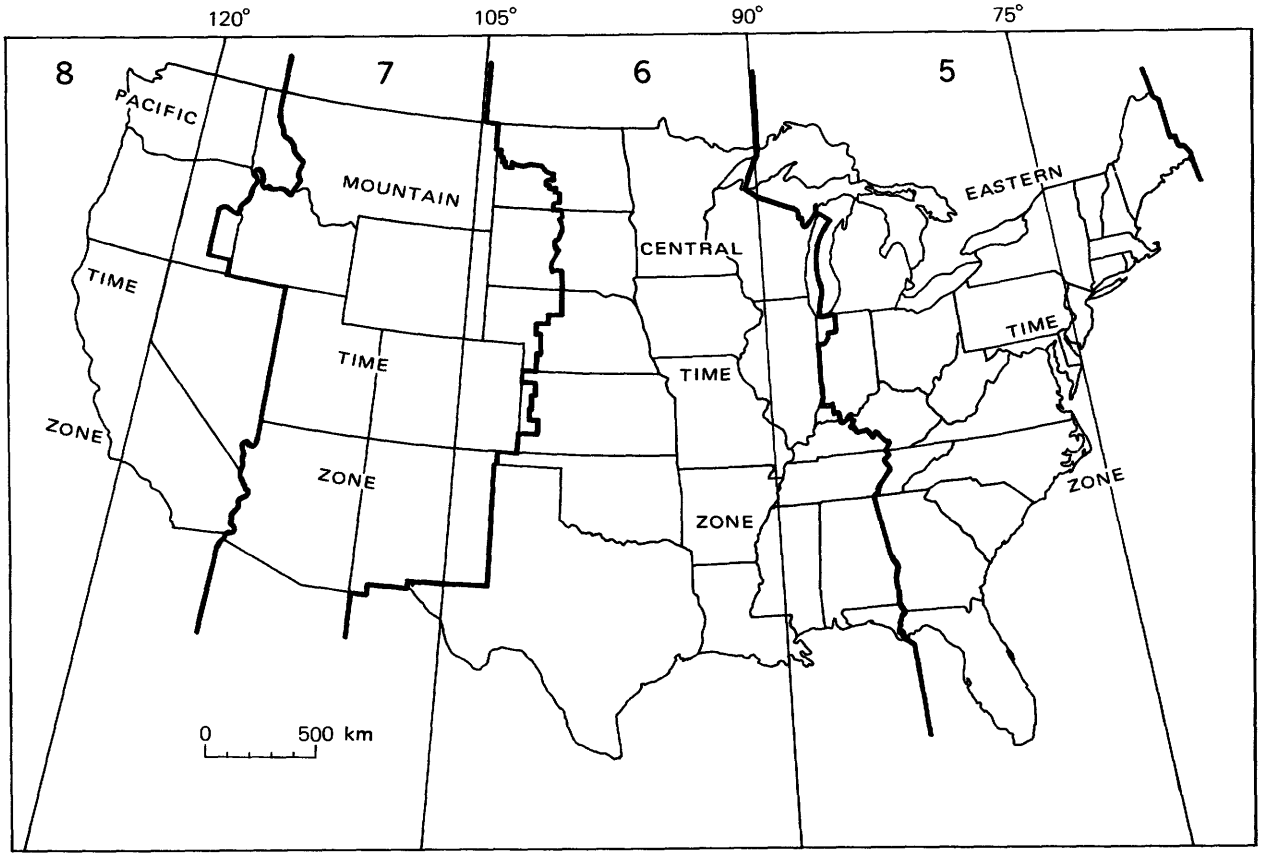

FIGURE 2.--Standard time zones of the conterminous United States. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

epicenters is that claimed by the institution supplying the hypocenter and is not necessarily the accuracy indicated by the number of decimals listed. The epicenters located by the NEIS have a varying degree of accuracy, usually two-tenths of a degree or less, depending on their continental or oceanic location. The oceanic hypocenters are less accurate than those on the continent, even though both are listed to two decimals. 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 1976. The magnitudes plotted in these figures are based on ML or mbLg; 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 the 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 NEIS is the source. In table 2 the magnitude source is the same as the location source unless indicated otherwise, by an alphabetic character to the right of the magnitude value. The magnitude values calculated by the NEIS are based on the following formulas:

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

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 horizontal 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 $D \geq 5°$.

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

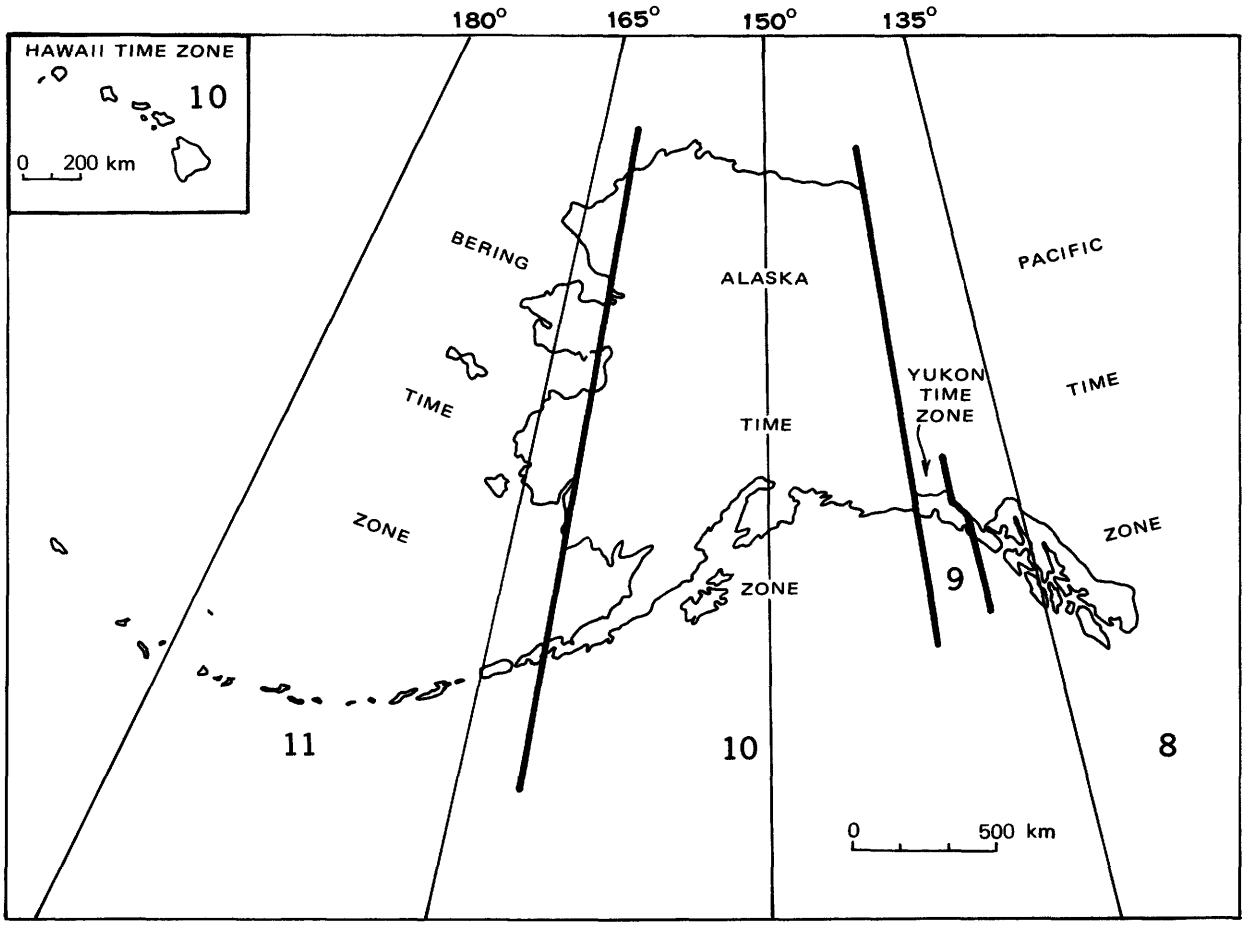

FIGURE 3.--Standard time zones of Alaska and Hawaii. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.

as defined by Richter (1958, p. 340), where A is the maximum trace amplitude in millimeters, written by a Wood-Anderson torsion seismometer, and log A_o 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.

$$mbLg=3.75+0.90(\log D)+\log(A/T) \quad (4)$$
$$0.5^\circ \leq D \leq 4^\circ,$$

$$mbLg=3.30+1.66(\log D)+\log(A/T)$$
$$4^\circ \leq D \leq 30^\circ,$$

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 derived, 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 which contain minimal information are assigned an Intensity II. These reports are filed in the offices of the NEIS or in government archives and are available for detailed study.

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.

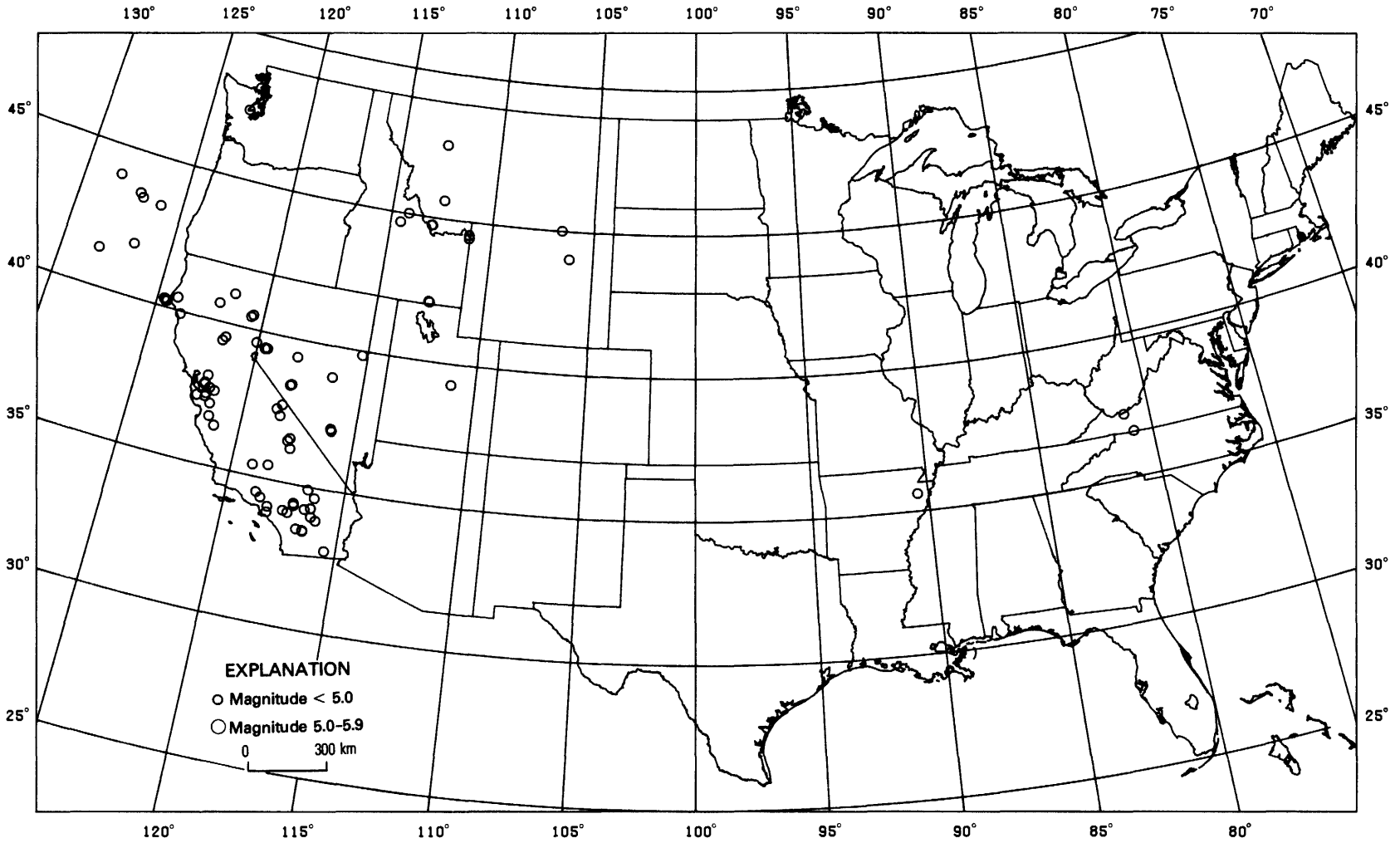

FIGURE 4.--Earthquake epicenters in the conterminous United States for July-September 1976, plotted from table 1.

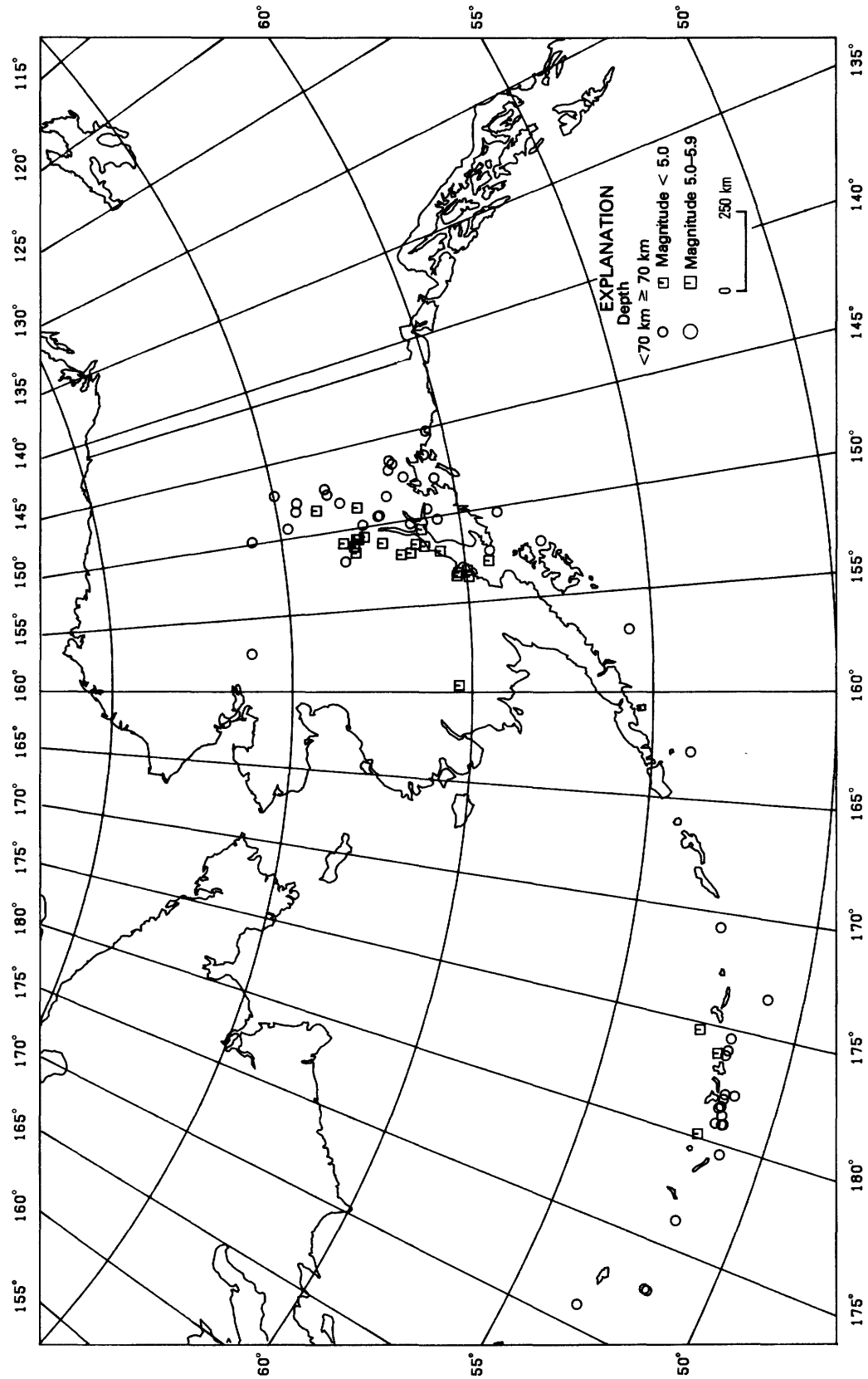

FIGURE 5.--Earthquake epicenters in Alaska for July-September 1976, plotted from table 1.

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.

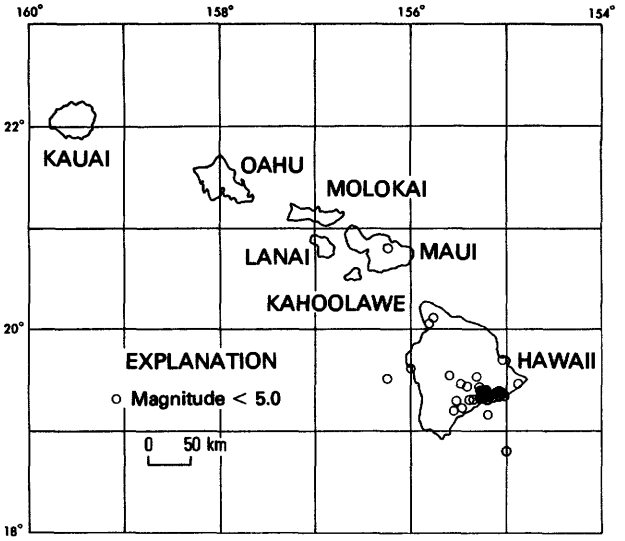

FIGURE 6.--Earthquake epicenters in Hawaii for July-September 1976, plotted from table 1.

Table 1.–*Summary of U.S. earthquakes for July-September 1976*

[Sources of the hypocenter and magnitudes: (A) U.S. Energy Research and Development Administration; (B) University of California, Berkeley; (D) University of Montana, Missoula; (F) U.S. Geological Survey Open-File Report 77-181 (Fuis and others, 1977); (G) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (M) NOAA, 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 City; (V) Virginia Polytechnic Institute and State University, Blacksburg; (W) University of Washington, Seattle. N, Normal depth; UTC, Universal Coordinated Time. For names of local time zones, see figures 2 and 3. Leaders (...) indicate no information available]

Date (1976)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or mbLg	Maximum intensity	Hypocenter source	Local time Date	Hour
ALASKA													
JULY 1	13	19	00.0	63.23 N.	148.28 W.	33N	...	...	...	...	G	JULY 1	03 A.M. AST
JULY 5	16	53	19.7	51.51 N.	179.15 W.	56	4.0	...	...	...	G	JULY 5	05 A.M. BST
JULY 5	18	25	17.7	51.30 N.	179.14 W.	61	4.6	...	...	II	G	JULY 5	07 A.M. BST
JULY 5	18	28	28.0	51.33 N.	179.16 W.	54	5.2	...	...	II	G	JULY 5	07 A.M. BST
JULY 6	01	12	50.0	63.56 N.	147.25 W.	33N	...	...	3.0M	...	G	JULY 5	03 P.M. AST
JULY 7	16	04	30.3	60.49 N.	147.83 W.	34	...	...	3.2M	...	G	JULY 7	06 A.M. AST
JULY 10	09	17	58.6	61.91 N.	148.39 W.	52	...	...	...	...	G	JULY 9	11 P.M. AST
JULY 11	02	00	11.1	63.30 N.	150.80 W.	133	4.5	...	...	...	G	JULY 10	04 P.M. AST
JULY 11	05	10	13.5	59.93 N.	153.58 W.	164	...	...	...	...	G	JULY 10	07 P.M. AST
JULY 12	01	59	15.3	62.86 N.	150.68 W.	128	4.6	...	...	...	G	JULY 11	03 P.M. AST
JULY 14	07	48	26.5	53.95 N.	162.78 W.	33N	4.7	...	...	...	G	JULY 13	08 P.M. BST
JULY 14	17	55	31.5	61.64 N.	146.36 W.	65	...	...	...	...	G	JULY 14	07 A.M. AST
JULY 15	08	09	47.4	62.70 N.	149.83 W.	24	4.2	...	4.6M	IV	G	JULY 14	10 P.M. AST

Table 1.–*Summary of U.S. earthquakes for July–September 1976*–Continued

Date (1976)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or mbLg	Maximum intensity	Hypocenter source	Local time Date	Hour
ALASKA--Continued													
JULY 18	03	06	31.3	51.71 N.	172.90 E.	33N	4.6	...	...	...	G	JULY 17	04 P.M. BST
JULY 18	03	11	22.5	51.64 N.	172.89 E.	33N	4.4	...	...	...	G	JULY 17	04 P.M. BST
JULY 19	09	43	06.0	60.65 N.	146.44 W.	33N	...	...	3.3M	...	G	JULY 18	11 P.M. AST
JULY 20	11	17	09.9	55.62 N.	156.90 W.	33	4.9	...	...	...	G	JULY 20	01 A.M. AST
JULY 22	14	30	17.7	51.49 N.	177.86 W.	58	4.9	...	...	II	G	JULY 22	03 A.M. BST
JULY 22	19	09	57.8	53.21 N.	171.00 E.	13	4.9	...	...	...	G	JULY 22	08 A.M. BST
JULY 26	01	41	54.5	61.06 N.	151.58 W.	120	3.9	...	...	...	G	JULY 25	03 P.M. AST
JULY 27	18	26	43.1	59.28 N.	152.29 W.	68	4.2	...	...	...	G	JULY 27	08 A.M. AST
JULY 30	13	54	32.2	61.33 N.	147.44 W.	40	3.9	...	4.0M	II	G	JULY 30	03 A.M. AST
AUG. 1	01	59	16.8	61.72 N.	146.92 W.	22	...	...	3.4M	...	G	JUL. 31	03 P.M. AST
AUG. 1	05	13	07.0	63.89 N.	148.49 W.	130	...	...	...	...	G	JUL. 31	07 P.M. AST
AUG. 4	05	51	30.7	50.98 N.	173.39 W.	36	4.0	...	...	...	G	AUG. 3	06 P.M. BST
AUG. 9	22	55	39.0	60.84 N.	149.50 W.	50	...	...	...	...	G	AUG. 9	12 P.M. AST
AUG. 11	18	39	49.1	62.76 N.	148.77 W.	89	...	...	...	...	G	AUG. 11	08 A.M. AST
AUG. 11	20	43	45.5	51.70 N.	175.42 W.	33N	4.6	...	...	III	G	AUG. 11	09 A.M. BST
AUG. 13	01	39	17.2	62.69 N.	150.58 W.	115	...	...	...	...	G	AUG. 12	03 P.M. AST
AUG. 15	06	56	51.4	65.81 N.	149.81 W.	68	...	...	...	...	G	AUG. 14	08 P.M. AST
AUG. 16	05	11	38.9	51.50 N.	178.38 W.	65	5.1	...	...	II	G	AUG. 15	06 P.M. BST
AUG. 16	10	11	33.3	51.49 N.	178.05 W.	55	4.8	3.9	...	II	G	AUG. 15	11 P.M. BST
AUG. 20	20	56	18.7	60.26 N.	153.48 W.	178	...	...	...	...	G	AUG. 20	10 A.M. AST
AUG. 21	02	29	58.9	51.56 N.	178.49 W.	57	4.2	...	...	...	G	AUG. 20	03 P.M. BST
AUG. 21	07	28	49.2	61.57 N.	146.58 W.	33N	...	...	3.0M	...	G	AUG. 20	09 P.M. AST
AUG. 21	10	02	32.3	62.97 N.	151.46 W.	162	...	...	...	...	G	AUG. 21	12 A.M. AST
AUG. 22	02	01	47.4	60.22 N.	153.30 W.	144	5.5	...	...	VI	G	AUG. 21	04 P.M. AST
AUG. 25	11	04	18.9	60.61 N.	150.17 W.	47	...	...	...	III	G	AUG. 25	01 A.M. AST
AUG. 26	03	36	32.6	64.40 N.	147.79 W.	33N	...	...	3.0M	...	G	AUG. 25	05 P.M. AST
AUG. 27	00	10	04.7	64.76 N.	149.33 W.	29	...	...	3.1M	...	G	AUG. 26	02 P.M. AST
AUG. 27	17	07	23.6	62.24 N.	149.47 W.	65	4.0	...	...	...	G	AUG. 27	07 A.M. AST
AUG. 28	02	30	09.2	52.60 N.	175.34 W.	145	5.1	...	...	III	G	AUG. 27	03 P.M. BST
AUG. 28	17	29	30.7	51.22 N.	177.78 W.	39	5.0	...	...	...	G	AUG. 28	06 A.M. BST
AUG. 29	08	01	55.2	60.65 N.	151.96 W.	86	...	...	...	...	G	AUG. 28	10 P.M. AST
AUG. 30	08	17	50.6	59.97 N.	153.23 W.	119	...	...	...	...	G	AUG. 29	10 P.M. AST
AUG. 30	10	01	12.9	61.30 N.	151.43 W.	82	4.1	...	...	...	G	AUG. 30	12 A.M. AST
SEPT. 1	02	17	25.1	51.98 N.	176.17 W.	116	4.5	...	...	...	G	AUG. 31	03 P.M. BST
SEPT. 1	09	49	54.7	63.29 N.	151.93 W.	56	...	...	...	...	G	AUG. 31	11 P.M. AST
SEPT. 1	17	29	38.0	58.95 N.	150.26 W.	55	...	...	...	...	G	SEPT. 1	07 A.M. AST
SEPT. 2	04	15	07.3	51.15 N.	179.56 E.	64	4.2	...	...	...	G	SEPT. 1	05 P.M. BST
SEPT. 4	19	03	23.1	51.74 N.	176.17 W.	53	4.1	...	...	...	G	SEPT. 4	08 A.M. BST
SEPT. 4	23	23	46.0	62.93 N.	150.65 W.	123	5.4	...	...	...	G	SEPT. 4	01 P.M. AST
SEPT. 5	10	33	49.0	51.40 N.	178.77 W.	68	4.4	...	...	II	G	SEPT. 4	11 P.M. BST
SEPT. 5	21	27	50.7	64.47 N.	148.34 W.	43	...	...	3.0M	...	G	SEPT. 5	11 A.M. AST
SEPT. 7	00	16	29.1	60.37 N.	159.60 W.	108	...	...	...	...	G	SEPT. 6	02 P.M. AST
SEPT. 9	15	28	14.9	61.38 N.	150.18 W.	32	...	...	3.2M	...	G	SEPT. 9	05 A.M. AST
SEPT. 10	14	56	35.4	52.61 N.	170.65 W.	33N	4.6	...	...	...	G	SEPT. 10	03 A.M. BST
SEPT. 11	02	40	25.8	51.88 N.	179.82 W.	100	4.9	...	...	...	G	SEPT. 10	03 P.M. BST
SEPT. 11	15	33	26.9	63.52 N.	147.66 W.	33N	...	...	3.2M	...	G	SEPT. 11	05 A.M. AST
SEPT. 15	16	44	29.6	61.08 N.	150.62 W.	74	...	...	...	II	G	SEPT. 15	06 A.M. AST
SEPT. 19	09	14	30.3	63.00 N.	151.09 W.	144	...	...	...	...	G	SEPT. 18	11 P.M. AST
SEPT. 19	12	03	37.7	62.19 N.	149.46 W.	43	...	...	3.0M	...	G	SEPT. 19	02 A.M. AST
SEPT. 21	03	01	04.6	57.84 N.	152.12 W.	33N	4.9	...	4.6M	III	G	SEPT. 20	05 P.M. AST
SEPT. 22	01	44	58.4	59.34 N.	152.84 W.	108	...	...	...	...	G	SEPT. 21	03 P.M. AST
SEPT. 22	02	30	25.7	51.72 N.	175.95 W.	43	4.8	5.1	...	IV	G	SEPT. 21	03 P.M. BST
SEPT. 26	08	25	41.8	61.73 N.	151.90 W.	110	4.0	...	...	...	G	SEPT. 25	10 P.M. AST
SEPT. 26	09	28	54.0	61.47 N.	151.92 W.	95	4.0	...	...	...	G	SEPT. 25	11 P.M. AST
SEPT. 27	05	59	45.7	60.46 N.	145.17 W.	41	4.0	...	3.3M	III	G	SEPT. 26	07 P.M. AST
SEPT. 27	07	21	54.8	64.96 N.	147.06 W.	47	...	...	...	...	G	SEPT. 26	09 P.M. AST
SEPT. 27	08	12	29.9	66.12 N.	157.41 W.	33N	...	...	...	...	G	SEPT. 26	10 P.M. AST
SEPT. 29	14	17	44.7	62.22 N.	151.14 W.	73	...	...	...	...	G	SEPT. 29	04 A.M. AST
SEPT. 30	16	56	01.3	51.66 N.	176.20 E.	52	4.5	3.7	...	...	G	SEPT. 30	05 A.M. BST
ARKANSAS													
SEPT. 25	14	06	56.0	35.61 N.	90.45 W.	5	...	...	3.6S	V	S	SEPT. 25	08 A.M. CST
CALIFORNIA													
JULY 3	19	45	20.4	40.39 N.	120.58 W.	5	4.4	...	3.8B	V	B	JULY 3	11 A.M. PST
JULY 6	01	40	21.8	40.48 N.	120.52 W.	5	...	...	3.4B	...	B	JULY 5	05 P.M. PST
JULY 6	03	55	17.4	39.41 N.	121.52 W.	8	4.5	...	4.1B	V	B	JULY 5	07 P.M. PST
JULY 7	07	50	45.4	37.44 N.	121.77 W.	10	...	...	3.5B	III	B	JULY 6	11 P.M. PST
JULY 7	18	27	36.3	37.65 N.	118.36 W.	8	...	...	3.5P	...	P	JULY 7	10 A.M. PST
JULY 7	18	58	19.9	37.47 N.	118.55 W.	5	...	...	3.2P	...	G	JULY 7	10 A.M. PST

Table 1.–*Summary of U.S. earthquakes for July–September 1976*–Continued

Date (1976)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or mbLg	Maximum intensity	Hypocenter source	Local time Date	Hour
CALIFORNIA--Continued													
JULY 8	16	14	10.5	40.10 N.	124.00 W.	2	...	...	2.9B	IV	B	JULY 8	08 A.M. PST
JULY 13	13	34	53.7	38.09 N.	121.87 W.	10	...	...	3.6B	V	B	JULY 13	05 A.M. PST
JULY 14	20	19	59.3	33.48 N.	116.52 W.	17	...	...	3.0P	...	P	JULY 14	12 P.M. PST
JULY 18	03	01	36.8	36.56 N.	117.75 W.	5	...	...	3.3B	...	G	JULY 17	07 P.M. PST
JULY 18	11	49	28.4	37.28 N.	122.17 W.	10	...	...	2.6B	V	B	JULY 18	03 A.M. PST
JULY 19	05	47	30.6	35.41 N.	119.10 W.	4	...	...	3.0P	...	F	JULY 18	09 P.M. PST
JULY 23	20	53	55.9	33.87 N.	118.13 W.	11	...	...	3.1P	IV	P	JULY 23	12 P.M. PST
JULY 26	13	50	05.0	36.37 N.	121.17 W.	6	...	...	2.3B	IV	B	JULY 26	05 A.M. PST
JULY 26	14	00	01.7	36.55 N.	121.17 W.	6	...	...	2.0B	II	B	JULY 26	06 A.M. PST
AUG. 1	06	19	23.1	41.00 N.	121.54 W.	2	...	...	3.0B	...	B	JULY 31	10 P.M. PST
AUG. 1	17	18	48.1	34.90 N.	116.58 W.	12	...	...	4.5P	V	P	AUG. 1	09 A.M. PST
AUG. 8	19	37	51.6	33.87 N.	116.04 W.	17	4.2	...	3.7P	...	P	AUG. 8	11 A.M. PST
AUG. 9	10	54	30.0	34.33 N.	118.52 W.	8	...	...	2.8P	II	P	AUG. 9	02 A.M. PST
AUG. 11	15	24	55.5	33.48 N.	116.51 W.	15	...	...	4.3P	VI	P	AUG. 11	07 A.M. PST
AUG. 12	03	00	39.1	34.21 N.	116.60 W.	8	...	...	3.1P	...	P	AUG. 11	07 P.M. PST
AUG. 12	08	51	11.3	37.17 N.	121.53 W.	7	...	...	3.2B	IV	B	AUG. 12	12 A.M. PST
AUG. 15	12	29	05.6	37.79 N.	121.96 W.	7	...	...	3.3B	V	B	AUG. 15	04 A.M. PST
AUG. 16	16	37	21.4	36.19 N.	117.66 W.	8	...	...	3.7P	V	F	AUG. 16	08 A.M. PST
AUG. 17	07	05	38.8	39.97 N.	123.74 W.	2	...	...	3.3B	...	B	AUG. 16	11 P.M. PST
AUG. 19	08	15	04.7	39.46 N.	121.49 W.	2	...	...	3.0B	...	B	AUG. 19	12 A.M. PST
AUG. 19	20	44	32.7	34.35 N.	117.07 W.	2	...	...	3.1P	...	P	AUG. 19	12 P.M. PST
AUG. 19	20	44	43.7	34.29 N.	117.06 W.	8	...	...	3.2P	...	P	AUG. 19	12 P.M. PST
AUG. 20	05	14	03.0	33.44 N.	116.52 W.	8	...	...	3.2P	...	P	AUG. 19	09 P.M. PST
AUG. 20	22	05	52.9	37.79 N.	121.97 W.	7	...	...	4.0B	IV	B	AUG. 20	02 P.M. PST
AUG. 20	22	08	01.1	37.76 N.	121.91 W.	2	...	...	3.8B	IV	B	AUG. 20	02 P.M. PST
AUG. 22	06	52	10.6	37.25 N.	118.38 W.	5	...	...	3.0B	...	G	AUG. 21	10 P.M. PST
AUG. 22	08	09	59.7	34.05 N.	117.47 W.	3	...	...	3.0P	IV	P	AUG. 22	12 A.M. PST
AUG. 27	06	21	54.2	35.50 N.	118.44 W.	3	...	...	3.1P	...	P	AUG. 26	10 P.M. PST
AUG. 31	00	27	52.9	34.50 N.	118.71 W.	8	...	...	3.1P	...	P	AUG. 30	04 P.M. PST
AUG. 31	12	29	28.3	37.67 N.	121.66 W.	7	...	...	3.4B	...	B	AUG. 31	04 A.M. PST
SEPT. 1	22	42	48.8	40.64 N.	122.21 W.	5	...	...	3.5B	IV	B	SEPT. 1	02 P.M. PST
SEPT. 3	17	43	47.1	39.59 N.	120.06 W.	2	...	...	2.9B	...	B	SEPT. 3	09 A.M. PST
SEPT. 3	19	58	49.9	36.70 N.	121.42 W.	2	3.9	...	3.5B	...	B	SEPT. 3	11 A.M. PST
SEPT. 5	03	15	09.3	37.60 N.	121.43 W.	9	...	...	3.5B	IV	B	SEPT. 4	07 P.M. PST
SEPT. 5	22	30	30.0	34.00 N.	117.27 W.	18	...	...	3.2P	...	P	SEPT. 5	02 P.M. PST
SEPT. 6	18	54	55.8	34.28 N.	116.34 W.	6	...	...	3.1P	...	P	SEPT. 6	10 A.M. PST
SEPT. 12	17	34	33.0	37.90 N.	122.22 W.	6	...	...	2.5B	II	B	SEPT. 12	09 A.M. PST
SEPT. 14	23	00	16.2	33.98 N.	116.26 W.	8	...	...	3.0P	...	P	SEPT. 14	03 P.M. PST
SEPT. 16	12	37	12.0	37.34 N.	121.77 W.	2	...	...	2.5B	II	B	SEPT. 16	04 A.M. PST
SEPT. 16	15	15	59.6	34.65 N.	116.25 W.	8	...	...	3.2P	...	P	SEPT. 16	07 A.M. PST
SEPT. 19	06	45	47.0	32.90 N.	115.47 W.	8	...	...	3.3P	...	P	SEPT. 18	10 P.M. PST
SEPT. 19	11	11	42.2	33.48 N.	116.78 W.	16	...	...	3.3P	...	P	SEPT. 19	03 A.M. PST
SEPT. 23	02	46	55.0	36.45 N.	117.83 W.	15	...	...	3.0P	...	F	SEPT. 22	06 P.M. PST
SEPT. 24	14	02	17.6	34.07 N.	118.15 W.	8	...	...	2.2P	II	P	SEPT. 24	06 A.M. PST
SEPT. 30	16	05	46.9	33.47 N.	116.53 W.	8	...	...	3.1P	...	P	SEPT. 30	08 A.M. PST
CALIFORNIA--OFF THE COAST													
JULY 6	10	33	32.8	41.83 N.	126.73 W.	33N	4.9	4.4	...	...	G	JULY 6	02 A.M. PST
JULY 6	14	07	46.0	41.34 N.	128.25 W.	10	4.1	...	...	...	G	JULY 6	06 A.M. PST
JULY 25	23	02	39.4	40.30 N.	124.64 W.	2	...	...	3.7B	...	B	JULY 25	03 P.M. PST
AUG. 29	22	04	01.8	40.28 N.	124.52 W.	2	...	...	3.5B	...	B	AUG. 29	02 P.M. PST
SEPT. 13	16	08	10.2	40.20 N.	124.39 W.	1	4.8	...	4.0B	IV	B	SEPT. 13	08 A.M. PST
SEPT. 13	19	32	25.5	40.22 N.	124.51 W.	2	...	...	3.2B	...	B	SEPT. 13	11 A.M. PST
SEPT. 20	03	33	12.4	40.37 N.	124.50 W.	2	...	...	3.6B	...	B	SEPT. 19	07 P.M. PST
HAWAII													
JULY 2	15	57	37.8	19.26 N.	155.53 W.	9	...	...	2.6H	II	H	JULY 2	05 A.M. HST
JULY 5	11	40	43.5	19.40 N.	155.06 W	8	...	...	3.1H	...	H	JULY 5	01 A.M. HST
JULY 6	23	45	47.8	19.36 N.	155.25 W.	10	...	...	3.2H	...	H	JULY 6	01 P.M. HST
JULY 8	03	49	06.6	19.40 N.	155.26 W.	5	...	...	2.5H	II	H	JULY 7	05 P.M. HST
JULY 8	07	39	17.0	19.39 N.	155.26 W.	7	...	...	2.7H	III	H	JULY 7	09 P.M. HST
JULY 10	21	50	24.7	19.34 N.	155.23 W.	11	...	...	3.0H	...	H	JULY 10	11 A.M. HST
JULY 12	09	26	10.7	19.35 N.	155.22 W.	10	...	...	3.2H	II	H	JULY 11	11 P.M. HST
JULY 12	22	45	35.2	19.38 N.	155.25 W.	5	...	...	3.0H	II	H	JULY 12	12 P.M. HST
JULY 14	12	05	02.3	19.39 N.	155.24 W.	6	...	...	3.3H	III	H	JULY 14	02 A.M. HST
JULY 15	00	14	38.1	19.37 N.	155.21 W.	6	...	...	3.2H	II	H	JULY 14	02 P.M. HST
JULY 15	18	54	39.8	19.36 N.	155.13 W.	8	...	...	3.3H	II	H	JULY 15	08 A.M. HST
JULY 16	11	11	28.6	19.19 N.	155.55 W.	10	...	...	3.2H	II	H	JULY 16	01 A.M. HST
JULY 19	10	51	15.8	19.33 N.	155.13 W.	10	...	...	3.0H	...	H	JULY 19	12 A.M. HST

Table 1.–*Summary of U.S. earthquakes for July-September 1976*–Continued

Date (1976)	Origin time (UTC) hr min s	Lat	Long	Depth (km)	Magnitude mb	Magnitude MS	Magnitude ML or mbLg	Maximum intensity	Hypocenter source	Local time Date	Local time Hour
HAWAII--Continued											
JULY 22	12 40 53.0	19.38 N.	155.08 W.	9	...	...	3.7H	III	H	JULY 22	02 A.M. HST
JULY 23	07 49 45.4	19.39 N.	155.25 W.	5	...	...	3.3H	III	H	JULY 22	09 P.M. PST
JULY 24	05 38 17.0	19.34 N.	155.14 W.	9	...	...	3.7H	II	H	JULY 23	07 P.M. HST
JULY 24	11 22 14.5	19.22 N.	155.59 W.	10	...	...	3.4H	...	H	JULY 24	01 A.M. HST
JULY 25	06 53 44.1	19.38 N.	155.12 W.	9	...	...	2.9H	II	H	JULY 24	08 P.M. HST
JULY 25	09 46 31.0	19.39 N.	155.25 W.	5	...	...	3.3H	...	H	JULY 24	11 P.M. HST
JULY 27	17 14 26.8	19.37 N.	155.09 W.	9	...	...	4.0H	III	H	JULY 27	07 A.M. HST
JULY 28	06 37 12.7	19.39 N.	155.24 W.	5	...	...	3.6H	III	H	JULY 27	08 P.M. HST
JULY 29	02 03 19.7	19.40 N.	155.40 W.	9	...	...	3.5H	...	H	JULY 28	04 P.M. HST
JULY 30	08 46 35.2	19.37 N.	155.25 W.	6	...	...	3.0H	II	H	JULY 29	10 P.M. HST
JULY 30	15 09 43.6	19.34 N.	155.11 W.	8	...	...	3.8H	III	H	JULY 30	05 A.M. HST
JULY 30	18 02 34.9	19.34 N.	155.12 W.	9	...	...	2.7H	II	H	JULY 30	08 A.M. HST
JULY 31	09 19 13.9	19.34 N.	155.20 W.	9	...	...	3.0H	II	H	JULY 30	11 P.M. HST
JULY 31	19 55 24.0	19.39 N.	155.25 W.	5	...	...	3.1H	...	H	JULY 31	09 A.M. HST
AUG. 1	02 51 36.0	19.41 N.	155.27 W.	5	...	...	3.3H	III	H	JULY 31	04 P.M. HST
AUG. 1	21 51 33.3	19.38 N.	155.24 W.	2	...	...	3.0H	...	H	AUG. 1	11 A.M. HST
AUG. 2	01 01 17.4	19.37 N.	155.09 W.	9	...	...	3.4H	III	H	AUG. 1	03 P.M. HST
AUG. 2	02 39 18.0	19.39 N.	155.25 W.	6	...	...	3.6H	III	H	AUG. 1	04 P.M. HST
AUG. 2	16 37 01.3	19.36 N.	155.25 W.	10	...	...	3.2H	II	H	AUG. 2	06 A.M. HST
AUG. 3	13 30 17.0	19.32 N.	155.21 W.	8	...	...	3.0H	...	H	AUG. 3	03 A.M. HST
AUG. 3	15 23 31.9	19.44 N.	154.90 W.	9	...	...	3.0H	...	H	AUG. 3	05 A.M. HST
AUG. 6	13 38 55.3	19.38 N.	155.10 W.	8	...	...	3.2H	...	H	AUG. 6	03 A.M. HST
AUG. 7	11 31 45.3	19.35 N.	155.04 W.	8	...	...	3.3H	...	H	AUG. 7	01 A.M. HST
AUG. 7	21 42 19.4	19.32 N.	155.20 W.	8	...	...	3.1H	...	H	AUG. 7	11 A.M. HST
AUG. 9	23 09 33.5	19.39 N.	155.24 W.	5	...	...	3.4H	III	H	AUG. 9	01 P.M. HST
AUG. 11	05 03 47.5	19.32 N.	155.22 W.	10	...	...	3.5H	II	H	AUG. 10	07 P.M. HST
AUG. 12	02 30 11.0	19.34 N.	155.19 W.	9	...	...	2.7H	II	H	AUG. 11	04 P.M. HST
AUG. 15	03 01 00.3	19.36 N.	155.14 W.	9	...	...	3.2H	II	H	AUG. 14	05 P.M. HST
AUG. 18	03 25 34.5	19.41 N.	155.26 W.	2	...	...	2.3H	II	H	AUG. 17	05 P.M. HST
AUG. 23	02 26 55.8	19.38 N.	155.24 W.	5	...	...	2.2H	II	H	AUG. 22	04 P.M. HST
AUG. 26	13 19 43.5	19.36 N.	155.25 W.	10	...	...	3.6H	III	H	AUG. 26	03 A.M. HST
AUG. 29	04 59 55.3	19.36 N.	155.22 W.	10	...	...	3.0H	...	H	AUG. 28	06 P.M. HST
AUG. 31	20 41 08.3	19.39 N.	155.49 W.	10	...	...	4.0H	III	H	AUG. 31	10 A.M. HST
SEPT. 1	00 00 38.4	19.33 N.	155.12 W.	9	...	...	3.4H	...	H	AUG. 31	02 P.M. HST
SEPT. 2	20 20 26.7	19.35 N.	155.05 W.	8	...	...	3.5H	III	H	SEPT. 2	10 A.M. HST
SEPT. 3	11 16 55.7	19.33 N.	155.18 W.	9	...	...	3.1H	...	H	SEPT. 3	01 A.M. HST
SEPT. 4	01 23 19.6	19.38 N.	155.42 W.	12	...	...	3.0H	...	H	SEPT. 3	03 P.M. HST
SEPT. 4	08 03 41.4	19.48 N.	154.86 W.	9	...	...	3.5H	III	H	SEPT. 3	10 P.M. HST
SEPT. 4	23 10 54.1	19.33 N.	155.27 W.	10	...	...	3.9H	III	H	SEPT. 4	01 P.M. HST
SEPT. 5	16 04 19.7	19.32 N.	155.28 W.	9	...	...	3.2H	...	H	SEPT. 5	06 A.M. HST
SEPT. 6	15 34 15.2	19.44 N.	154.91 W.	9	...	...	3.5H	III	H	SEPT. 6	05 A.M. HST
SEPT. 7	05 19 00.4	19.35 N.	155.27 W.	5	...	...	3.6H	...	H	SEPT. 6	07 P.M. HST
SEPT. 8	07 24 48.7	19.37 N.	155.08 W.	8	...	...	3.0H	...	H	SEPT. 7	09 P.M. HST
SEPT. 8	08 01 16.2	19.37 N.	155.08 W.	8	...	...	3.5H	III	H	SEPT. 7	10 P.M. HST
SEPT. 8	14 01 55.4	19.31 N.	155.35 W.	9	...	...	3.2H	II	H	SEPT. 8	04 A.M. HST
SEPT. 9	18 03 31.0	19.46 N.	154.78 W.	8	...	...	3.0H	...	H	SEPT. 9	08 A.M. HST
SEPT. 10	06 46 22.2	19.39 N.	155.07 W.	8	...	...	2.5H	II	H	SEPT. 9	08 P.M. HST
SEPT. 10	16 25 19.6	18.89 N.	155.25 W.	10	...	...	3.1H	...	H	SEPT. 10	06 A.M. HST
SEPT. 11	15 04 30.4	19.37 N.	155.07 W.	8	...	...	3.6H	III	H	SEPT. 11	05 A.M. HST
SEPT. 12	23 21 43.3	19.43 N.	154.97 W.	5	...	...	2.8H	II	H	SEPT. 12	01 P.M. HST
SEPT. 15	12 01 25.6	19.37 N.	155.09 W.	9	...	...	3.6H	...	H	SEPT. 15	02 A.M. HST
SEPT. 17	03 56 58.3	19.36 N.	155.80 W.	48	...	...	3.3H	...	H	SEPT. 16	05 P.M. HST
SEPT. 21	19 35 49.7	19.35 N.	155.11 W.	9	...	...	3.2H	II	H	SEPT. 21	09 A.M. HST
SEPT. 26	01 54 55.8	19.45 N.	155.39 W.	10	...	...	3.0H	...	H	SEPT. 25	03 P.M. HST
SEPT. 28	19 14 53.3	19.33 N.	155.22 W.	10	...	...	3.7H	III	H	SEPT. 28	09 A.M. HST
SEPT. 29	22 58 03.9	19.34 N.	155.09 W.	9	...	...	3.3H	III	H	SEPT. 29	12 P.M. HST
IDAHO											
JULY 7	17 34 03.0	44.69 N.	114.51 W.	5	...	...	...	...	G	JULY 7	09 A.M. PST
JULY 12	16 44 38.8	42.06 N.	112.56 W.	5	...	...	2.9A	...	G	JULY 12	09 A.M. MST
JULY 12	20 32 43.5	42.10 N.	112.63 W.	5	...	...	3.0A	...	G	JULY 12	01 P.M. MST
JULY 26	10 45 28.2	45.02 N.	114.18 W.	10	4.3	...	4.4G	V	G	JULY 26	02 A.M. PST

Table 1.–*Summary of U.S. earthquakes for July-September 1976*–Continued

Date (1976)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML or mbLg	Maximum intensity	Hypocenter source	Local time Date	Hour
MONTANA													
JULY 11	16	22	27.4	44.53 N.	111.09 W.	5	...	...	3.2A	...	G	JULY 11	09 A.M. MST
JULY 28	05	06	16.9	47.55 N.	112.73 W.	5	...	...	3.5G	IV	G	JULY 27	10 P.M. MST
AUG. 5	17	36	37.9	45.63 N.	112.50 W.	5	...	...	2.9A	...	G	AUG. 5	10 A.M. MST
AUG. 10	13	54	57.5	45.03 N.	106.57 W.	5	...	...	3.4G	...	G	AUG. 10	06 A.M. MST
AUG. 15	14	28	14.1	44.42 N.	111.07 W.	5	...	...	2.9A	...	G	AUG. 15	07 A.M. MST
SEPT. 4	07	56	11.6	44.74 N.	112.95 W.	5	...	...	2.9A	...	G	SEPT. 4	12 A.M. MST
SEPT. 4	09	24	30.8	44.73 N.	112.98 W.	5	...	...	3.1D	...	G	SEPT. 4	02 A.M. MST
NEVADA													
JULY 27	20	30	00.1	37.07 N.	116.04 W.	0	5.3	...	5.2B	...	A	JULY 27	12 P.M. PST
AUG. 2	08	14	07.4	38.38 N.	118.19 W.	8	4.8	...	4.3B	IV	G	AUG. 2	12 A.M. PST
AUG. 5	19	38	20.8	38.40 N.	118.14 W.	8	...	...	3.5B	...	G	AUG. 5	11 A.M. PST
AUG. 14	07	50	44.9	39.48 N.	119.62 W.	7	...	...	2.2G	II	G	AUG. 13	11 P.M. PST
AUG. 14	07	58	32.4	39.45 N.	119.54 W.	4	...	...	3.1B	II	G	AUG. 13	11 P.M. PST
AUG. 14	08	08	03.1	39.43 N.	119.64 W.	6	...	...	2.2G	II	G	AUG. 14	12 A.M. PST
AUG. 22	10	14	06.5	38.91 N.	116.43 W.	1	4.7	...	4.0B	...	G	AUG. 22	02 A.M. PST
AUG. 26	14	30	00.2	37.13 N.	116.08 W.	0	5.3	4.2	5.1B	...	A	AUG. 26	06 A.M. PST
SEPT. 15	14	09	27.8	39.85 N.	115.25 W.	5	...	...	4.0B	...	G	SEPT. 15	06 A.M. PST
SEPT. 26	22	44	37.2	39.37 N.	118.11 W.	5	...	...	3.0G	...	G	SEPT. 26	02 P.M. PST
OKLAHOMA													
SEPT. 20	09	40		NEAR WILSON		..	...	...	2.2T	II	.	SEPT. 20	03 A.M. CST
OREGON--OFF THE COAST													
JULY 10	02	38	44.7	43.99 N.	128.28 W.	15	4.2	3.9	...	...	G	JULY 9	06 P.M. PST
AUG. 28	22	14	43.5	43.58 N.	127.13 W.	33N	4.7	3.7	...	...	G	AUG. 28	02 P.M. PST
SEPT. 5	07	13	55.8	43.36 N.	126.03 W.	15	3.8	...	...	...	G	SEPT. 4	11 P.M. PST
SEPT. 30	17	36	02.6	43.45 N.	126.97 W.	33N	5.2	...	...	...	G	SEPT. 30	09 A.M. PST
UTAH													
AUG. 19	13	29	53.3	39.27 N.	111.08 W.	2	...	...	3.3U	...	U	AUG. 19	06 A.M. MST
VIRGINIA													
JULY 3	20	53	46.5	37.22 N.	81.10 W.	5	...	...	...	...	G	JULY 3	03 P.M. EST
SEPT. 13	18	54	37.1	36.60 N.	80.81 W.	5	...	...	3.3V	VI	G	SEPT. 13	01 P.M. EST
WASHINGTON													
SEPT. 2	13	36	11.0	48.20 N.	122.76 W.	24	4.3	...	4.0G	V	W	SEPT. 2	05 A.M. PST
SEPT. 8	08	21	01.6	47.38 N.	123.08 W.	48	4.6	3.9	4.8G	VI	W	SEPT. 8	12 A.M. PST
WYOMING													
SEPT. 3	04	18	16.2	44.04 N.	106.15 W.	10	4.8	...	4.2G	V	G	SEPT. 3	09 P.M. MST

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July–September 1976*

[Sources of the hypocenter and magnitudes: (A) U.S. Energy Research and Development Administration; (B) University of California, Berkeley; (D) University of Montana, Missoula; (F) U.S. Geological Survey Open-File Report 77-181 (Fuis and others, 1977); (G) U.S. Geological Survey, National Earthquake Information Service; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (M) NOAA, 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 City; (V) Virginia Polytechnic Institute and State University, Blacksburg; (W) University of Washington, Seattle. Dates and origin times are listed in Universal Coordinated Time (UTC), giving the hour, minute, and second. Epicentars are shown in decimal degrees. Only earthquakes with intensity data and explosions are listed]

Alaska

5 July (G) Andreanof Islands, Aleutian Islands
Origin time: 18 25 17.7
Epicenter: 51.30 N., 179.14 W.
Depth: 61 km
Magnitude: 4.6 mb
Intensity II: Adak.

5 July (G) Andreanof Islands, Aleutian Islands
Origin time: 18 28 28.0
Epicenter: 51.33 N., 179.16 W.
Depth: 54 km
Magnitude: 5.2 mb
Intensity II: Adak.

15 July (G) Central Alaska
Origin time: 08 09 47.4
Epicenter: 62.70 N., 149.83 W.
Depth: 24 km
Magnitude: 4.2 mb, 4.6 ML(M)
Intensity IV: Talkeetna.

22 July (G) Andreanof Islands, Aleutian Islands
Origin time: 14 30 17.7
Epicenter: 51.49 N., 177.86 W.
Depth: 58 km
Magnitude: 4.9 mb
Intensity II: Adak.

30 July (G) Southern Alaska
Origin time: 13 54 32.2
Epicenter: 61.33 N., 147.44 W.
Depth: 40 km
Magnitude: 3.9 mb, 4.0 ML(M)
Intensity II: Valdez.

11 August (G) Andreanof Islands, Aleutian Islands
Origin time: 20 43 45.5
Epicenter: 51.70 N., 175.42 W.
Depth: Normal
Magnitude: 4.6 mb
Intensity III: Adak.

16 August (G) Andreanof Islands, Aleutian Islands
Origin time: 05 11 38.9
Epicenter: 51.50 N., 178.38 W.
Depth: 65 km
Magnitude: 5.1 mb
Intensity II: Adak.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July–September 1976*–Continued

Alaska–Continued

16 August (G) Andreanof Islands, Aleutian Islands
Origin time: 10 11 33.3
Epicenter: 51.49 N., 178.05 W.
Depth: 55 km
Magnitude: 4.8 mb, 3.9 MS
Intensity II: Adak.

22 August (G) Southern Alaska
Origin time: 02 01 47.4
Epicenter: 60.22 N., 153.30 W.
Depth: 144 km
Magnitude: 5.5 mb

An observer near the epicenter noted: Campers at the west end of Kontrashibuna Lake, at about 60.15 N., 153.90 W., heard a loud noise to the southeast, looked immediately in that direction, but saw nothing. Experienced mountaineers in the group agreed later that it sounded like a rock avalanche, and that if it had been a rockfall they would have seen it. Less than a minute later they saw a 5-8 cm swell on the lake reach the shore where they were camped, even though it was a windless day. Five to eight cm waves continued to break on the shore from many directions for several minutes before beginning to subside. The water was murky for at least one-half hour afterward. None of the campers felt any indication of earth movement.

Intensity VI: Kenai (small ground cracks--unconfirmed), Ninilchik (small objects fell, not broken).

Intensity V: Anchorage (small objects moved, many people frightened), Anchor Point, Clam Gulch, Homer, Kasilof (surface of water disturbed, small objects moved), Nondalton (observer drifting in small boat on Snowshoe Bay felt vibration), Port Graham, Port Lions, Seward (small objects moved), Soldotna, Sterling (observer picking berries felt shaking "longer than two minutes"), Wasilla.

Intensity IV: Aniak, Chugiak, Nyac, Old Harbor, Ouzinkie, Seldovia, Talkeetna.

Intensity III: Mill Bay, Kodiak, Palmer (M).

25 August (G) Kenai Peninsula
Origin time: 11 04 18.9
Epicenter: 60.61 N., 150.17 W.
Depth: 47 km
Magnitude: None computed.
Intensity III: Anchorage, Northern Kenai Peninsula.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Alaska--Continued

28 August (G) Andreanof Islands, Aleutian Islands
Origin time: 02 30 09.2
Epicenter: 52.60 N., 175.34 W.
Depth: 145 km
Magnitude: 5.1 mb
Intensity III: Adak.

5 September (G) Andreanof Islands, Aleutian Islands
Origin time: 10 33 49.0
Epicenter: 51.40 N., 178.77 W.
Depth: 68 km
Magnitude: 4.4 mb
Intensity II: Adak.

15 September (G) Southern Alaska
Origin time: 16 44 29.6
Epicenter: 61.08 N., 150.62 W.
Depth: 74 km
Magnitude: None computed.
Intensity II: Anchorage.

21 September (G) Kodiak Island region
Origin time: 03 01 04.6
Epicenter: 57.84 N., 152.12 W.
Depth: Normal
Magnitude: 4.9 mb, 4.6 ML(M)
Intensity III: Kodiak.

22 September (G) Andreanof Islands, Aleutian Islands
Origin time: 02 30 25.7
Epicenter: 51.72 N., 175.95 W.
Depth: 43 km
Magnitude: 4.8 mb, 5.1 MS
Intensity IV: Adak.

27 September (G) Southern Alaska
Origin time: 05 59 45.7
Epicenter: 60.46 N., 145.17 W.
Depth: 41 km
Magnitude: 4.0 mb, 3.3 ML(M)
Intensity III: Cordova.

Arkansas

25 September (S) Northeastern Arkansas
Origin time: 14 06 56.0
Epicenter: 35.61 N., 90.45 W.
Depth: 5 km
Magnitude: 3.6 mbLg
Intensity V:
Arkansas--Lepanto, Payneway, Trumann, Tyronza.
Tennessee--Macon, Memphis.
Intensity IV:
Arkansas--Marked Tree, Riverdale.
Missouri--Deering.
Intensity II:
Arkansas--Hunter, Swifton.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

California

3 July (B) Northern California
Origin time: 19 45 20.4
Epicenter: 40.39 N., 120.58 W.
Depth: 5 km
Magnitude: 4.4 mb(G), 3.8 ML
Intensity V: Litchfield.
Intensity IV: Strawberry Valley.
Intensity II: Janesville, Susanville.

6 July (G) Northern California
Origin time: 03 55 16.2
Epicenter: 39.40 N., 121.60 W.
Depth: 5 km
Magnitude: 4.5 mb, 4.1 ML(B)
Intensity V: Camptonville, Dobbins, Fair Oaks, Forbestown, Oroville, Marysville.
Intensity IV: Bangor, Browns Valley, Chico, Colfax, Grass Valley, Gridley, Loomis, Meadow Vista, Nevada City, Rackerby, Rio Oso, Sheridan, Smartville, Weimar, Wheatland.
Intensity III: Strawberry Valley, Sutter, Trowbridge.
Intensity II: Meridian, Richvale, Sacramento (press report), Twain, Yuba City (press report).

7 July (B) Central California
Origin time: 07 50 45.4
Epicenter: 37.44 N., 121.77 W.
Depth: 10 km
Magnitude: 3.5 ML

A power outage for 20,000 residents of Santa Clara County that lasted 2 hours occurred at the time of the quake (press report).

Intensity IV: Mt. Hamilton, San Jose, Sunnyvale, Willow Glen (press report).
Intensity III: Campbell (press report), Fremont (press report), Santa Clara (press report).

8 July (B) Northern California
Origin time: 16 14 10.5
Epicenter: 40.10 N., 124.00 W.
Depth: 2 km
Magnitude: 2.9 ML
Intensity IV: Petrolia.

13 July (B) Northern California
Origin time: 13 34 53.7
Epicenter: 38.09 N., 121.87 W.
Depth: 10 km
Magnitude: 3.6 ML

Felt throughout sections of Contra Costa, Sacramento, and Solano Counties (press report).

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*—Continued

California--Continued

Intensity V: Pittsburg.
Intensity IV: Birds Landing, Diablo, Rio Vista.
Intensity III: Antioch, Collinsville (press report).
Intensity II: Bethel Island (press report), Byron, Concord, Fairfield (press report), Hood, Martinez, Ryde, Walnut Creek.

18 July (B) Central California
Origin time: 11 49 28.4
Epicenter: 37.28 N., 122.17 W.
Depth: 10 km
Magnitude: 2.6 ML
Intensity V: Los Altos Hills (stained glass windows cracked--press report).

23 July (P) Southern California
Origin time: 20 53 55.9
Epicenter: 33.87 N., 118.13 W.
Depth: 11 km
Magnitude: 3.1 ML
Intensity IV: Lakewood (shook desk lamps--press report).
Intensity III: Bellflower (press report), Compton (press report), North Long Beach (press report).

26 July (B) Northern California
Origin time: 13 50 05.0
Epicenter: 36.37 N., 121.17 W.
Depth: 6 km
Magnitude: 2.3 ML
Intensity IV: Pinnacles National Monument (east side, headquarters area).

26 July (B) Northern California
Origin time: 14 00 01.7
Epicenter: 36.55 N., 121.17 W.
Depth: 6 km
Magnitude: 2.0 ML
Intensity IV: Pinnacles National Monument (east side headquarters area).

1 August (P) Southern California
Origin time: 17 18 48.1
Epicenter: 34.90 N., 116.58 W.
Depth: 12 km
Magnitude: 4.5 ML
Intensity V: Daggett, Newberry Springs.
Intensity IV: Landers, Yermo.
Intensity II: Baker.

2 August (G) California-Nevada border region
Origin time: 08 14 07.4
Epicenter: 38.38 N., 118.19 W.
Depth: 8 km
Magnitude: 4.8 mb, 4.3 ML(B)
Intensity IV: Luning, Mina.
Intensity II: Hawthorne.

9 August (P) Southern California
Origin time: 10 54 30.0

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*—Continued

California--Continued

Epicenter: 34.33 N., 118.52 W.
Depth: 8 km
Magnitude: 2.8 ML
Intensity II: Northridge.

11 August (P) Southern California
Origin time: 15 24 55.5
Epicenter: 33.48 N., 116.51 W.
Depth: 15 km
Magnitude: 4.3 ML

An area around the epicenter having a radius of 200 km was canvassed and 642 questionnaires were mailed. The quake was felt in San Bernardino, San Diego, Orange, and Imperial Counties, over an area of approximately 15,500 sq km, as shown in figure 7.

Intensity VI: Borrego Springs (ground cracked in "fault wash" in east part of Anza-Borrego State Park; also some mudslides reported by acting manager of State Park), Indio (slight damage; one resident became nauseous--press report), Palm Desert (cement curb raised 5 cm, causing buckling).

Intensity V: Angelus Oaks (postmaster sitting in car in parking lot reported, "The trees and surrounding area...made a strange sound as if the wind were blowing. The animals and birds were very still, and the building creaked somewhat. My vehicle bounced...for about 30-40 seconds and then began to slow down as the suspension stopped the vibrations."), Anza, Big Bear City, Cathedral City, Hemet, Idyllwild, Laguna Niguel (report from observer on fifth floor of six-story Federal Building stated that 13 of 18 people felt the shock. Duration was estimated to be 2-3 seconds, with two shocks 8-10 seconds apart. Hanging planters and pictures swung from east to west. Some people frightened; some became dizzy), North Palm Springs, Potrero, Ranchita (small objects displaced), San Diego, San Jacinto, San Luis Rey Downs, Thousand Palms, Warner Springs.

Intensity IV: Alpine (goats reacted before the earthquake), Cabazon, Coachella, Escondido, Julian, La Quinta, Mead Valley, Mecca, Moreno, Morongo Valley, Mountain Center, Muscoy, North Shore, Pala, Palm Springs, Rancho Mirage, Salton City, Temecula, Thermal, White Water, Winchester, Yucca Valley.

Intensity III: Cuyamaca (felt at caretaker's home, on State Highway 79 at south end of Cuyamaca Dam), Murrieta, Riverside, Santa Ysabel.
Intensity II: Bonsall, Homeland, North Park.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

California--Continued

12 August (B) Central California
Origin time: 08 51 11.3
Epicenter: 37.17 N., 121.53 W.
Depth: 7 km
Magnitude: 3.2 ML
Intensity IV: Pinnacles National Monument (windows rattled at headquarters building; light fixtures squeaked but did not swing), Storrie (windows rattled).

15 August (B) Central California
Origin time: 12 29 05.6
Epicenter: 37.79 N., 121.96 W.
Depth: 7 km
Magnitude: 3.3 ML

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

California--Continued

The press reported that seven quakes occurred within 2 1/2 hours after this shock near Danville in Contra Costa County.

Intensity V: Alamo, Castro Valley, Diablo (3 tremors felt from 3 a.m. to 5 a.m.), San Lorenzo. (Many were awakened and frightened in these communities.)

Intensity IV: Danville (press report), Walnut Creek (radio station reported windows shattered in one house--unconfirmed).

Intensity II: Dimond, Oakland Airport.

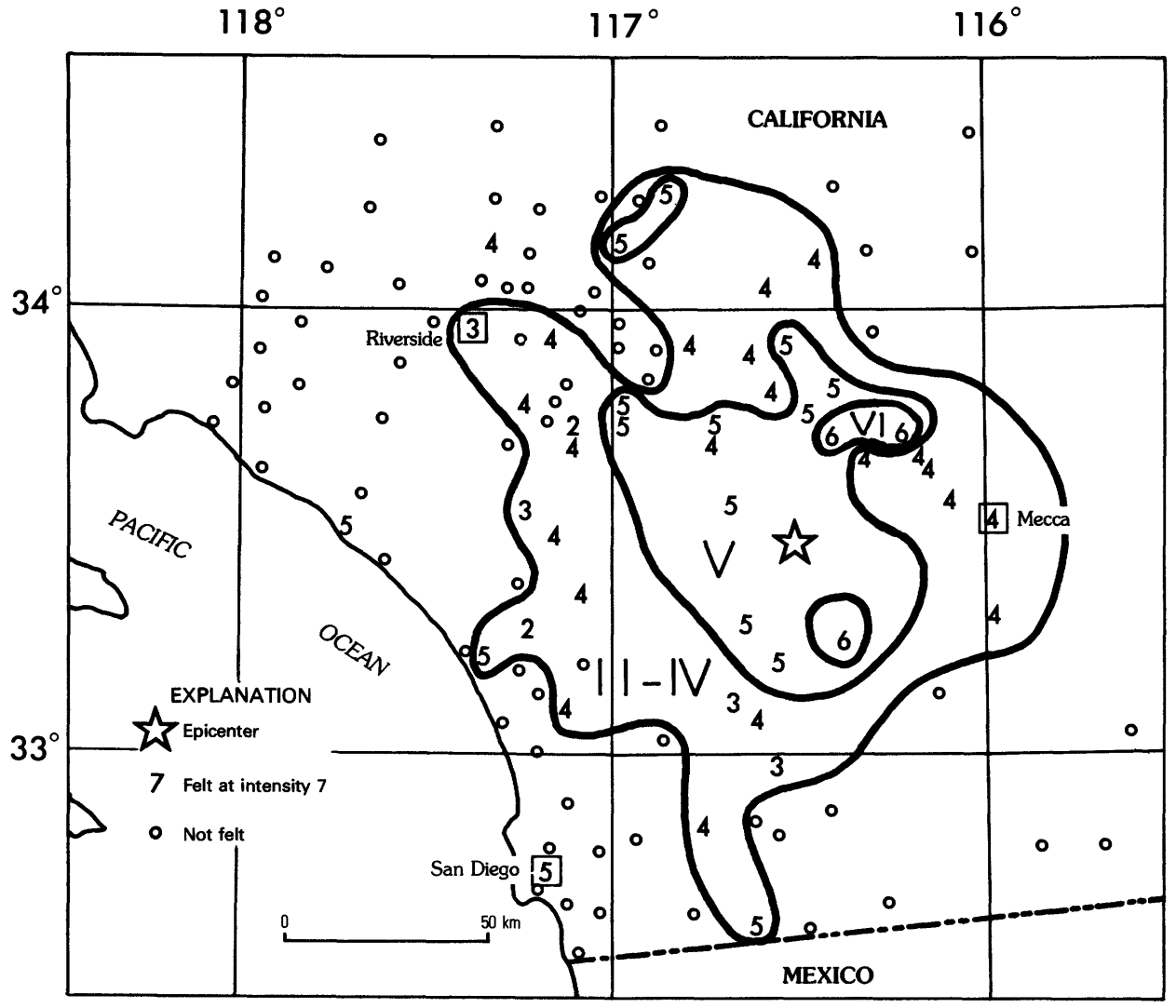

FIGURE 7.--Isoseismal map for the southern California earthquake of 11 August 1976, 15 24 55.5 UTC. Roman numerals represent Modified Mercalli intensities between isoseismals; Arabic numbers are used to represent these intensities at specific sites.

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*—Continued

California--Continued

16 August (F) Califonia-Nevada Border Region
Origin time: 16 37 21.4
Epicenter: 36.19 N., 117.66 W.
Depth: 8 km
Magnitude: 3.7 ML(B), 3.7 ML(P)
Intensity V: Darwin.

20 August (B) Central California
Origin time: 22 05 52.9
Epicenter: 37.79 N., 121.97 W.
Depth: 7 km
Magnitude: 4.0 ML

Felt throughout the San Francisco Bay area.

Intensity IV: Alameda, Danville, Dublin (press report).
Intensity III: Berkeley (press report), El Cerrito, Walnut Creek.
Intensity II: Daly City, Dimond, Hayward, Martinez, Oakland, Pittsburg, Pleasanton, San Francisco, San Ramon, Sunol. (All press reports except Dimond.)

20 August (B) Central California
Origin time: 22 08 01.1
Epicenter: 37.76 N., 121.91 W.
Depth: 2 km
Magnitude: 3.8 ML

Felt throughout the San Francisco Bay area. The preceding earthquake was canvassed. Only one respondent mentioned that the same effects were felt for both shocks.

Intensity IV: Danville, Dublin (press report).

22 August (P) Southern California
Origin time: 08 09 59.7
Epicenter: 34.05 N., 117.47 W.
Depth: 3 km
Magnitude: 3.0 ML
Intensity IV: Etiwanda.
Intensity III: Fontana (press report), San Bernardino (press report).

1 September (B) Northern California
Origin time: 22 42 48.8
Epicenter: 40.64 N., 122.21 W.
Depth: 5 km
Magnitude: 3.5 ML
Intensity IV: Central Valley, French Gulch, Lakehead, Palo Cedro, Project City, Red Bluff (press report), Redding.
Intensity III: Millville.
Intensity II: Anderson.

5 September (B) Central California
Origin time: 03 15 09.3
Epicenter: 37.60 N., 121.43 W.
Depth: 9 km
Magnitude: 3.5 ML
Intensity IV: Tracy (floors and walls shook).

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*—Continued

California--Continued

12 September (B) Northern California
Origin time: 17 34 33.0
Epicenter: 37.90 N., 122.22 W.
Depth: 6 km
Magnitude: 2.5 ML
Intensity II: Martinez.

16 September (B) Central California
Origin time: 12 37 12.0
Epicenter: 37.34 N., 121.77 W.
Depth: 2 km
Magnitude: 2.5 ML
Intensity II: San Jose.

24 September (P) Southern California
Origin time: 14 02 17.6
Epicenter: 34.07 N., 118.15 W.
Depth: 8 km
Magnitude: 2.2 ML
Intensity II: Downtown Los Angeles area.

California--Off the coast

13 September (B) Northern California
Origin time: 16 08 10.2
Epicenter: 40.20 N., 124.39 W.
Depth: 1 km
Magnitude: 4.8 mb(G), 4.0 ML
Intensity IV: Ferndale, Petrolia, Scotia.
Intensity III: Rio Dell.

Hawaii

All the intensities listed below, unless indicated otherwise, were assigned by the Hawaiian Volcano Observatory.

2 July (H) Island of Hawaii
Origin time: 15 57 37.8
Epicenter: 19.26 N., 155.53 W.
Depth: 9 km
Magnitude: 2.6 ML
Intensity II: Pahala.

8 July (H) Island of Hawaii
Origin time: 03 49 06.6
Epicenter: 19.40 N., 155.26 W.
Depth: 5 km
Magnitude; 2.5 ML
Intensity II: Hawaii National Park.

8 July (H) Island of Hawaii
Origin time: 07 39 17.0
Epicenter: 19.39 N., 155.26 W.
Depth: 7 km
Magnitude: 2.7 ML
Intensity III: Hawaii National Park.
Intensity II: Volcano.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Hawaii--Continued

12 July (H) Island of Hawaii
Origin time: 09 26 10.7
Epicenter: 19.35 N., 155.22 W.
Depth: 10 km
Magnitude: 3.2 ML
Intensity II: Volcano.

12 July (H) Island of Hawaii
Origin time: 22 45 35.2
Epicenter: 19.38 N., 155.25 W.
Depth: 5 km
Magnitude: 3.0 ML
Intensity II: Hawaiian Volcano Observatory.

14 July (H) Island of Hawaii
Origin time: 12 05 02.3
Epicenter: 19.39 N., 155.24 W.
Depth: 6 km
Magnitude: 3.3 ML
Intensity III: Hawaii National Park.
Intensity II: Volcano.

15 July (H) Island of Hawaii
Origin time: 00 14 38.1
Epicenter: 19.37 N., 155.21 W.
Depth: 6 km
Magnitude: 3.2 ML
Intensity II: Volcano.

15 July (H) Island of Hawaii
Origin time: 18 54 39.8
Epicenter: 19.36 N., 155.13 W.
Depth: 8 km
Magnitude: 3.3 ML
Intensity II: Hilo.

16 July (H) Island of Hawaii
Origin time: 11 11 28.6
Epicenter: 19.19 N., 155.55 W.
Depth: 10 km
Magnitude: 3.2 ML
Intensity II: Pahala.

22 July (H) Island of Hawaii
Origin time: 12 40 53.0
Epicenter: 19.38 N., 155.08 W.
Depth: 9 km
Magnitude: 3.7 ML
Intensity III: Hilo.
Intensity II: Mountain View, Papaikou.

23 July (H) Island of Hawaii
Origin time: 07 49 45.4
Epicenter: 19.39 N., 155.25 W.
Depth: 5 km
Magnitude: 3.3 ML
Intensity III: Hawaii National Park.
Intensity II: Volcano.

24 July (H) Island of Hawaii
Origin time: 05 38 17.0
Epicenter: 19.34 N., 155.14 W.
Depth: 9 km
Magnitude: 3.7 ML
Intensity II: Kurtistown, Naniwale, Volcano.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Hawaii--Continued

25 July (H) Island of Hawaii
Origin time: 06 53 44.1
Epicenter: 19.38 N., 155.12 W.
Depth: 9 km
Magnitude: 2.9 ML
Intensity II: Glenwood.

27 July (H) Island of Hawaii
Origin time: 17 14 26.8
Epicenter: 19.37 N., 155.09 W.
Depth: 9 km
Magnitude: 4.0 ML
Intensity III: Hilo.
Intensity II: Glenwood, Kurtistown, Mountain View, Papaikou, Volcano.

28 July (H) Island of Hawaii
Origin time: 06 37 12.7
Epicenter: 19.39 N., 155.24 W.
Depth: 5 km
Magnitude: 3.6 ML
Intensity III: Hawaii National Park, Hawaiian Volcano Observatory.
Intensity II: Volcano.

30 July (H) Island of Hawaii
Origin time: 08 46 35.2
Epicenter: 19.37 N., 155.25 W.
Depth: 6 km
Magnitude: 3.0 ML
Intensity II: Hawaii National Park, Volcano.

30 July (H) Island of Hawaii
Origin time: 15 09 43.6
Epicenter: 19.34 N., 155.11 W.
Depth: 8 km
Magnitude: 3.8 ML
Intensity III: Hilo.
Intensity II: Keaau, Mountain View.

30 July (H) Island of Hawaii
Origin time: 18 02 34.9
Epicenter: 19.34 N., 155.12 W.
Depth: 9 km
Magnitude: 2.7 ML
Intensity II: Hilo.

31 July (H) Island of Hawaii
Origin time: 09 19 13.9
Epicenter: 19.34 N., 155.20 W.
Depth: 9 km
Magnitude: 3.0 ML
Intensity II: Volcano.

1 August (H) Island of Hawaii
Origin time: 02 51 36.0
Epicenter: 19.41 N., 155.27 W.
Depth: 5 km
Magnitude: 3.3 ML
Intensity III: Hawaii National Park.
Intensity II: Volcano.

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*—Continued

Hawaii--Continued

2 August (H) Island of Hawaii
Origin time: 01 01 17.4
Epicenter: 19.37 N., 155.09 W.
Depth: 9 km
Magnitude: 3.4 ML
Intensity III: Hilo.

2 August (H) Island of Hawaii
Origin time: 02 39 18.0
Epicenter: 19.39 N., 155.25 W.
Depth: 6 km
Magnitude: 3.6 ML
Intensity III: Hawaii National Park.

2 August (H) Island of Hawaii
Origin time: 16 37 01.3
Epicenter: 19.36 N., 155.25 W.
Depth: 10 km
Magnitude: 3.2 ML
Intensity II: Hilo.

9 August (H) Island of Hawaii
Origin time: 23 09 33.5
Epicenter: 19.39 N., 155.24 W.
Depth: 5 km
Magnitude: 3.4 ML
Intensity III: Hawaii National Park.
Intensity II: Hawaiian Volcano Observatory.

11 August (H) Island of Hawaii
Origin time: 05 03 47.5
Epicenter: 19.32 N., 155.22 W.
Depth: 10 km
Magnitude: 3.5 ML
Intensity II: Hilo, Kurtistown, Volcano.

12 August (H) Island of Hawaii
Origin time: 02 30 11.0
Epicenter: 19.34 N., 155.19 W.
Depth: 9 km
Magnitude: 2.7 ML
Intensity II: Hawaii National Park.

15 August (H) Island of Hawaii
Origin time: 03 01 00.3
Epicenter: 19.36 N., 155.14 W.
Depth: 9 km
Magnitude: 3.2 ML
Intensity II: Volcano.

18 August (H) Island of Hawaii
Origin time: 03 25 34.5
Epicenter: 19.41 N., 155.26 W.
Depth: 2 km
Magnitude: 2.3 ML
Intensity II: Volcano.

23 August (H) Island of Hawaii
Origin time: 02 26 55.8
Epicenter: 19.38 N., 155.24 W.
Depth: 5 km
Magnitude: 2.2 ML
Intensity II: Hawaii National Park.

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*—Continued

Hawaii--Continued

26 August (H) Island of Hawaii
Origin time: 13 19 43.5
Epicenter: 19.36 N., 155.25 W.
Depth: 10 km
Magnitude: 3.6 ML
Intensity III: Volcano.
Intensity II: Hilo, Mountain View, Papaikou.

31 August (H) Island of Hawaii
Origin time: 20 41 08.3
Epicenter: 19.39 N., 155.49 W.
Depth: 10 km
Magnitude: 4.0 ML
Intensity III: Hawaiian Volcano Observatory
Intensity II: Kona.

2 September (H) Island of Hawaii
Origin time: 20 20 26.7
Epicenter: 19.35 N., 155.05 W.
Depth: 8 km
Magnitude: 3.5 ML
Intensity III: Hilo.
Intensity II: Kalapana.

4 September (H) Island of Hawaii
Origin time: 08 03 41.4
Epicenter: 19.48 N., 154.86 W.
Depth: 9 km
Magnitude: 3.5 ML
Intensity III: Pahoa.

4 September (H) Island of Hawaii
Origin time: 23 10 54.1
Epicenter: 19.33 N., 155.27 W.
Depth: 10 km
Magnitude: 3.9 ML
Intensity III: Hawaiian Volcano Observatory, Volcano.
Intensity II: Hilo, Honaunau, Keaau, Pahoa.

6 September (H) Island of Hawaii
Origin time: 15 34 15.2
Epicenter: 19.44 N., 154.91 W.
Depth: 9 km
Magnitude: 3.5 ML
Intensity III: Glenwood.
Intensity II: Hawaii National Park.

8 September (H) Island of Hawaii
Origin time: 08 01 16.2
Epicenter: 19.37 N., 155.08 W.
Depth: 8 km
Magnitude: 3.5 ML
Intensity III: Hilo, Kurtistown.
Intensity II: Hawaii National Park.

8 September (H) Island of Hawaii
Origin time: 14 01 55.4
Epicenter: 19.31 N., 155.35 W.
Depth: 9 km
Magnitude: 3.2 ML
Intensity II: Glenwood, Hilo.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Hawaii--Continued

10 September (H) Island of Hawaii
Origin time: 06 46 22.2
Epicenter: 19.39 N., 155.07 W.
Depth: 8 km
Magnitude: 2.5 ML
Intensity II: Mountain View.

11 September (H) Island of Hawaii
Origin time: 15 04 30.4
Epicenter: 19.37 N., 155.07 W.
Depth: 8 km
Magnitude: 3.6 ML
Intensity III: Hilo.
Intensity II: Keaau.

12 September (H) Island of Hawaii
Origin time: 23 21 43.3
Epicenter: 19.43 N., 154.97 W.
Depth: 5 km
Magnitude: 2.8 ML
Intensity II: Pahoa.

21 September (H) Island of Hawaii
Origin time: 19 35 49.7
Epicenter: 19.35 N., 155.11 W.
Depth: 9 km
Magnitude: 3.2 ML
Intensity II: Hilo.

28 September (H) Island of Hawaii
Origin time: 19 14 53.3
Epicenter: 19.33 N., 155.22 W.
Depth: 10 km
Magnitude: 3.7 ML
Intensity III: Hawaiian Volcano Observatory, Hilo.
Intensity II: Honaunau, Honokaa, Kapapala Ranch, Mountain View, Naniwale, Papaikou, Pepeekeo.

29 September (H) Island of Hawaii
Origin time: 22 58 03.9
Epicenter: 19.34 N., 155.09 W.
Depth: 9 km
Magnitude: 3.3 ML
Intensity III: Hilo.

Idaho

26 July (G) Western Idaho
Origin time: 10 45 28.2
Epicenter: 45.02 N., 114.18 W.
Depth: 10 km
Magnitude: 4.3 mb, 4.4 ML
Intensity V: Cobalt, North Fork, Tendoy.
Intensity IV: Carmen, Ellis, Salmon, Shoup, Williams Lake (press report).

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Montana

28 July (G) Western Montana
Origin time: 05 06 16.9
Epicenter: 47.55 N., 112.73 W.
Depth: 5 km
Magnitude: 3.5 ML(D), 3.5 ML
Intensity IV: Augusta.

Nevada

14 August (G) Western Nevada
Origin time: 07 50 44.9
Epicenter: 39.48 N., 119.62 W.
Depth: 7 km
Magnitude: 2.2 ML
Intensity II: Steamboat (University of Nevada, oral commun., 1976).

14 August (G) Western Nevada
Origin time: 07 58 32.4
Epicenter: 39.45 N., 119.54 W.
Depth: 4 km
Magnitude: 3.1 ML(B)
Intensity II: Steamboat (University of Nevada, oral commun., 1976).

14 August (G) Western Nevada
Origin time: 08 08 03.1
Epicenter: 39.43 N., 119.64 W.
Depth: 6 km
Magnitude: 2.2 ML
Intensity II: Steamboat (University of Nevada, oral commun., 1976).

26 August (A) Southern Nevada
Origin time: 14 30 00.2
Epicenter: 37.13 N., 116.08 W.
Depth: 0 km
Magnitude: 5.3 mb, 4.2 MS, 5.1 ML(B)

Nevada Test Site explosion "Banon" at 37°07′ 30.03" N., 116°04′ 55.19" W., surface elevation 1,302 m.

Oklahoma

20 September Southern Oklahoma
Origin time: 09 40
Epicenter: Not located.
Depth: None computed.
Magnitude: 2.2 ML(T)
Intensity II: Wilson.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Virginia

13 September (G) Virginia-North Carolina border
Origin time: 18 54 37.1
Epicenter: 36.60 N., 80.81 W.
Depth: 5 km
Magnitude: 3.3 mbLg(V)

An area around the epicenter having a radius of 150 km was canvassed by the U.S. Geological Survey and 356 questionnaires were mailed. In addition, data were also provided by G. A. Bollinger, Virginia Polytechnic Institute and State University, at Blacksburg, and by Law Engineering Testing Company, Marietta, Georgia. These data were evaluated by the U.S. Geological Survey and the combined results are listed below. The quake was felt over an area of approximately 17,500 sq km, as shown in figure 8.

Intensity VI:
North Carolina--Toast (cracked masonry, cracked plaster; guards on fluorescent light fixtures and metal sorting cases in post office rattled violently. Loud noises resembling explosions were heard.), Mt. Airy (bricks dislodged from chimney).

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Virginia--Continued

Intensity V:
North Carolina--Advance, Dobson, East Bend, Ennice, Glade Valley, Pilot Mountain, Piney Creek, Rural Hall, Siloam, Sparta, State Road, Thurmond, White Plains.
Virginia--Cana, Fancy Gap, Fries, Galax, Lambsburg.

Intensity IV:
North Carolina--Ararat, Belle Island (two shocks felt several seconds apart at Currituck Sound), Boonville, Borum Springs, Concord (north-south motion reported), Elkin (loud sound like an explosion rattled windows and doors; water in bathtub rippled), Grandy (three shocks felt), Hamptonville, Harmony, Hillsville, Jonesville, Kitty Hawk (6.3 km north on Currituck Sound; two tremors noted, each lasting several seconds and separated by several seconds, described as relatively high frequency vibration that did not vary in intensity from beginning to end, but began and ceased abruptly.), Knotts Island (rattling of windows and doors, lasting about 10 seconds), Landis, Lewisville, Lowgap, Maple (in Currituck County; three shocks felt in approximately 5 minutes, two

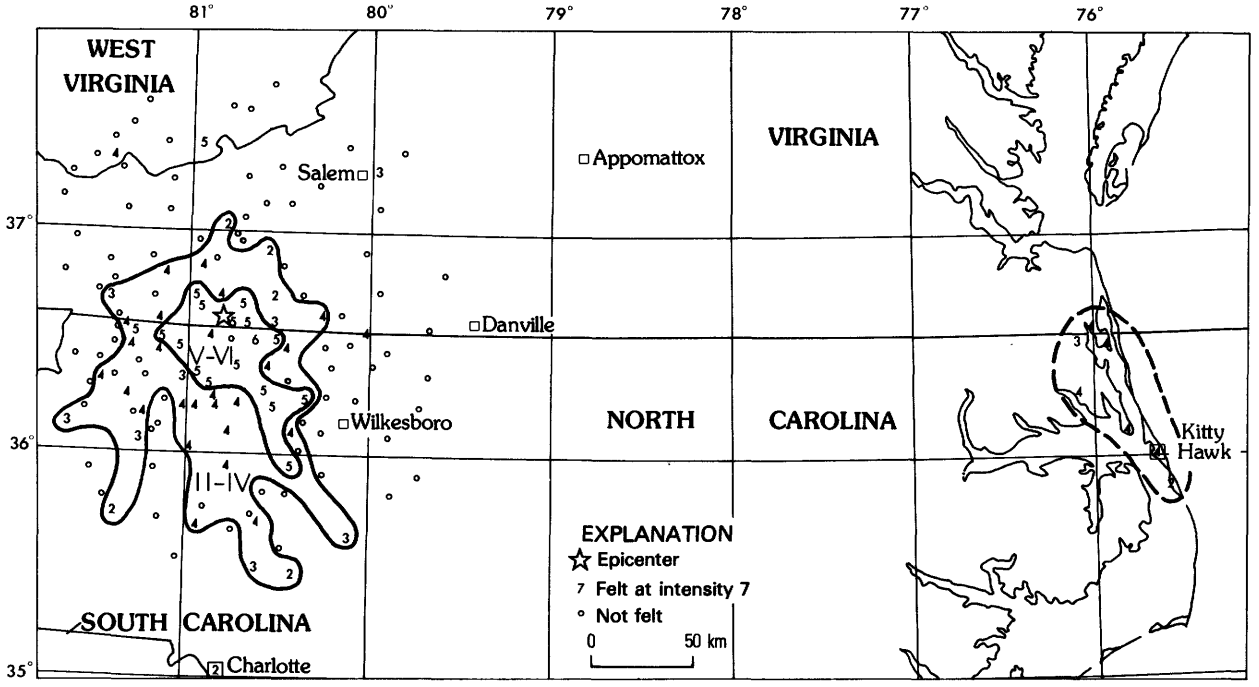

FIGURE 8.--Isoseismal map for the Virginia earthquake of 13 September 1976, 18 54 37.1 UTC. Roman numerals represent Modified Mercalli intensities between isoseismals; Arabic numbers are used to represent these intensities at specific sites.

Table 2.–*Summary of macroseismic data for U.S. earthquakes, July-September 1976*–Continued

Virginia--Continued

close together), Millers Creek, Pilot Mountain, Powells Point (on Albemarle Sound), Roaring River, Ronda, Salisbury (southern Rowan County), Scottville, Sparta, Statesville, Union Grove, Westfield, Whitehead, Wilbar, Woodleaf.
Virginia--Austinville, Claudville, Cripple Creek, Independence, Mouth of Wilson, Stuart, Woodlawn.
West Virginia--Anawalt.

Intensity III:
North Carolina--Blowing Rock, Boomer, Denton, Kannapolis, Moyock (lasted longer than 10 seconds), Needmore, Traphill.
Virginia--Ararat, Fancy Gap, Roanoke, Trout Dale.

Intensity II:
North Carolina--Charlotte, Longview, Manteo (two shocks felt), Mt. Pleasant.
South Carolina--Columbia (felt on upper floors of an eight-story building--telephone report), Greenville (telephone report).

Virginia--Indian Valley, Laurel Fork, Marion.

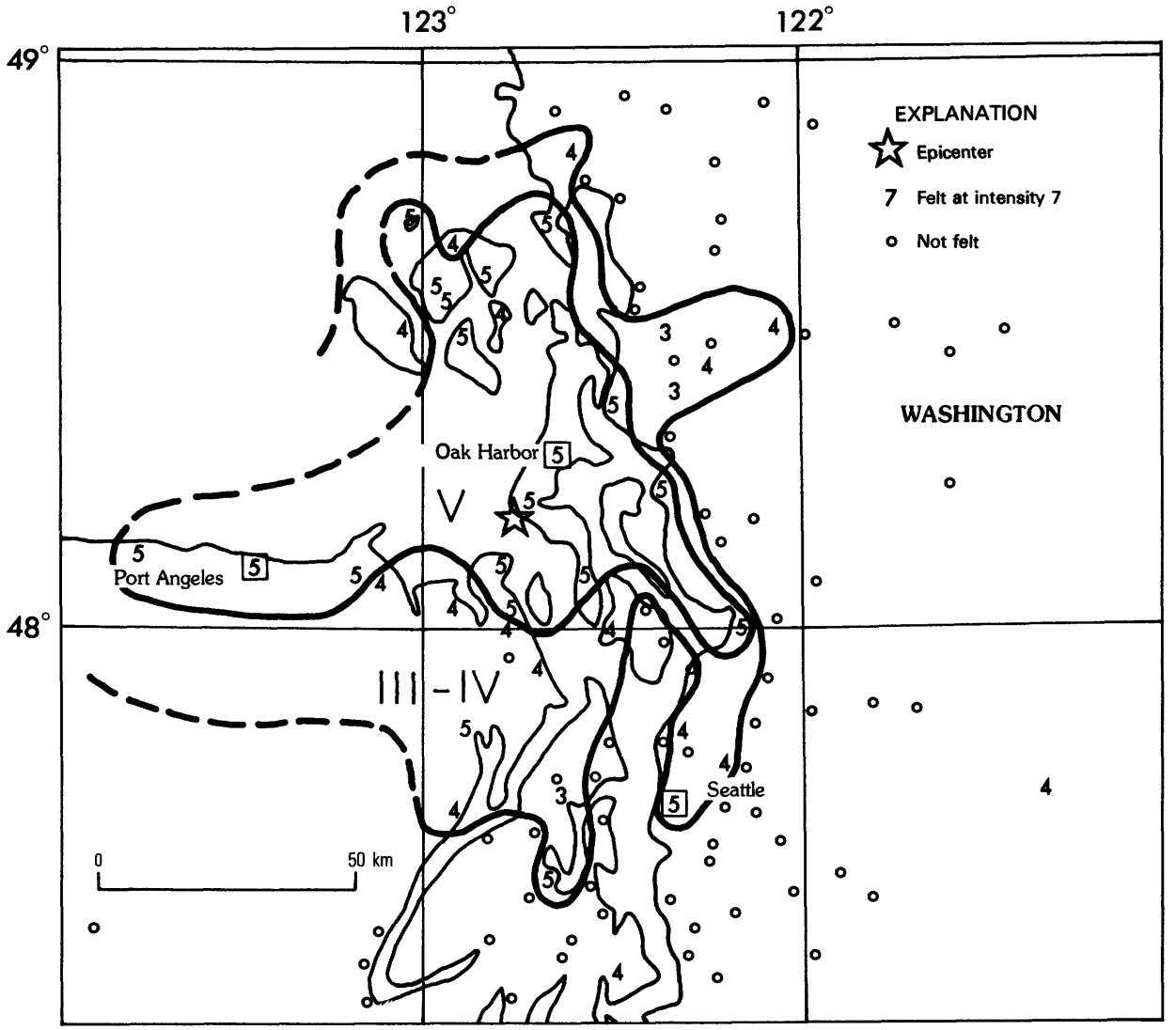

FIGURE 9.--Isoseismal map for the northwestern Washington earthquake of 2 September 1976, 13 36 11.0 UTC. Roman numerals represent Modified Mercalli intensities between isoseismals; Arabic numbers are used to represent these intensities at specific sites.

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*

Washington

2 September (W) Northwestern Washington
Origin time: 13 36 11.0
Epicenter: 48.20 N., 122.76 W.
Depth: 24 km
Magnitude: 4.3 mb(G), 4.0 ML(G)

This earthquake was widely felt in the following Washington counties: Clallam, Island, Jefferson, King, Kitsap, San Juan, Skagit, Snohomish, and Whatcom, as well as in Vancouver and Victoria in British Columbia (press report). An area around the epicenter having a radius of 125 km was canvassed by the USGS and 244 questionnaires were mailed. This quake was felt throughout the Puget Sound area, as shown in figure 9.

Intensity V: Bremerton, Carlsburg, Coupeville, Everett, Greenbank, Hadlock, Joyce, La Connor, Lopezi, Lummi Island, Oak Harbor, Olga, Orcas, Port Angeles, Port Townsend, Quilcene, Seattle, Shaw Island, Stanwood, Waldron, Whidbey Island.
Intensity IV: Blakely Island, Bothell, Brinnon, Chimacum, Clearlake, Eastsound, Ferndale, Freeland, Friday Harbor, Gardiner, Lyman, Lynnwood, Magnolia, Port Ludlow, Sequim, Skykomish.
Intensity III: Bow, Keyport, Mt. Vernon (press report).
Intensity II: Capitol Hill.

8 September (W) Northwestern Washington
Origin time: 08 21 01.6
Epicenter: 47.38 N., 123.08 W.
Depth: 48 km
Magnitude: 4.6 mb(G), 3.9 MS(G), 4.8 ML(G)

An area around the epicenter having a radius of 150 km was canvassed and 336 questionnaires were mailed. The quake was felt throughout the Puget Sound area, as shown in figure 10.

Intensity VI: Tacoma (broken glassware, other slight damage, many awakened and frightened--press report).
Intensity V: Allyn, Aloha, Anderson Island, Auburn, Belfair, Burley, Carnation, Dockton, East Olympia, Fox Island, Grapeview, Lilliwaup, Longbranch, Lopez, Lyman, Manchester, Matlock, McMillin, Mercer Island (press report), Milton, Mineral, Nordland, Oakville, Olga, Olympia, Pacific, Puyallup, Redondo, Renton, Rochester, Rolling Bay, Seattle, Shaw Island, Shelton, South Colby, Startup, Tahuya, Tracyton, Union, Vashon, Victor (press report), West Seattle (press report).

Table 2.—*Summary of macroseismic data for U.S. earthquakes, July-September 1976*

Washington--Continued

Intensity IV: Ashford, Bremerton, Carbonado, Fort Lewis, Hoodsport, Indianola, Joyce, Lakebay, Lynnwood, Malone, McCleary, Normandy Park (press report), Randle, Seattle-Tacoma Airport (control-tower personnel estimated tower swayed 3 m), Sumner.
Intensity III: Duvall, Seabeck.
Intensity II: Auburn, Suquamish.

Wyoming

3 September (G) Northeastern Wyoming
Origin time: 04 18 16.2
Epicenter: 44.04 N., 106.15 W.
Depth: 10 km
Magnitude: 4.8 mb, 4.2 ML
Intensity V: Kaycee (small objects and light furniture moved, building creaked, several frightened).

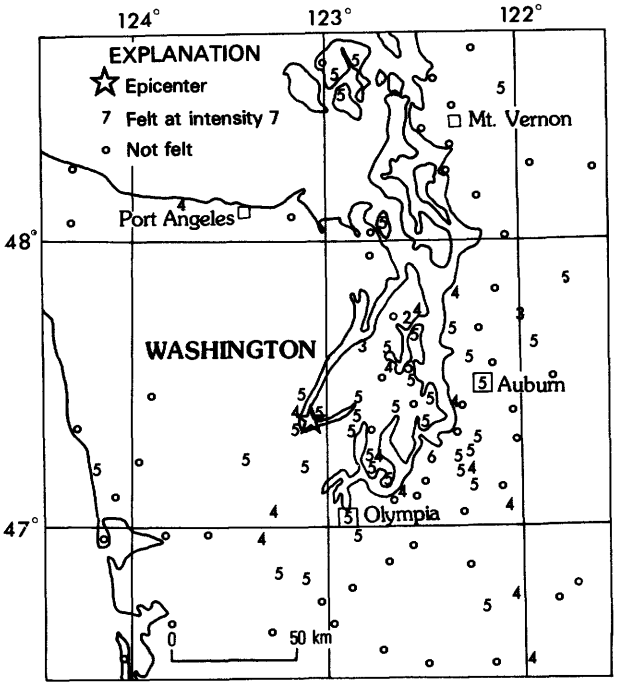

FIGURE 10.--Intensity map for the northwestern Washington earthquake of 8 September 1976, 08 21 01.6 UTC. Arabic numbers are used to represent Modified Mercalli intensities at specific sites.

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