GEOLOGICAL SURVEY CIRCULAR 871–D

Earthquakes in the United States, October–December 1981

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

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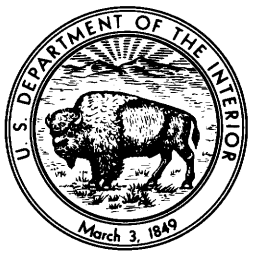
1982

United States Department of the Interior

JAMES G. WATT, *Secretary*



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Earthquakes in the United States, October-December 1981

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INTRODUCTION

The earthquake information in this publication supplements that published by the U. S. Geological Survey (USGS) in the National Earthquake Information Service (NEIS) 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 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 USGS. 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 U. S. Geological Survey, United States Earthquakes Project, Stop 967, Box 25046, Denver Federal Center, Denver, CO 80225. Copies of the current "Earthquake Report" questionnaire can be obtained at this address.

The USGS 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 USGS, 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

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	83☐ Cracked	84☐ Rotated
	85☐ Fallen		
Chimneys	86☐ Cracked	87☐ Twisted	88☐ Fallen
	89☐ Broken at roof line	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.

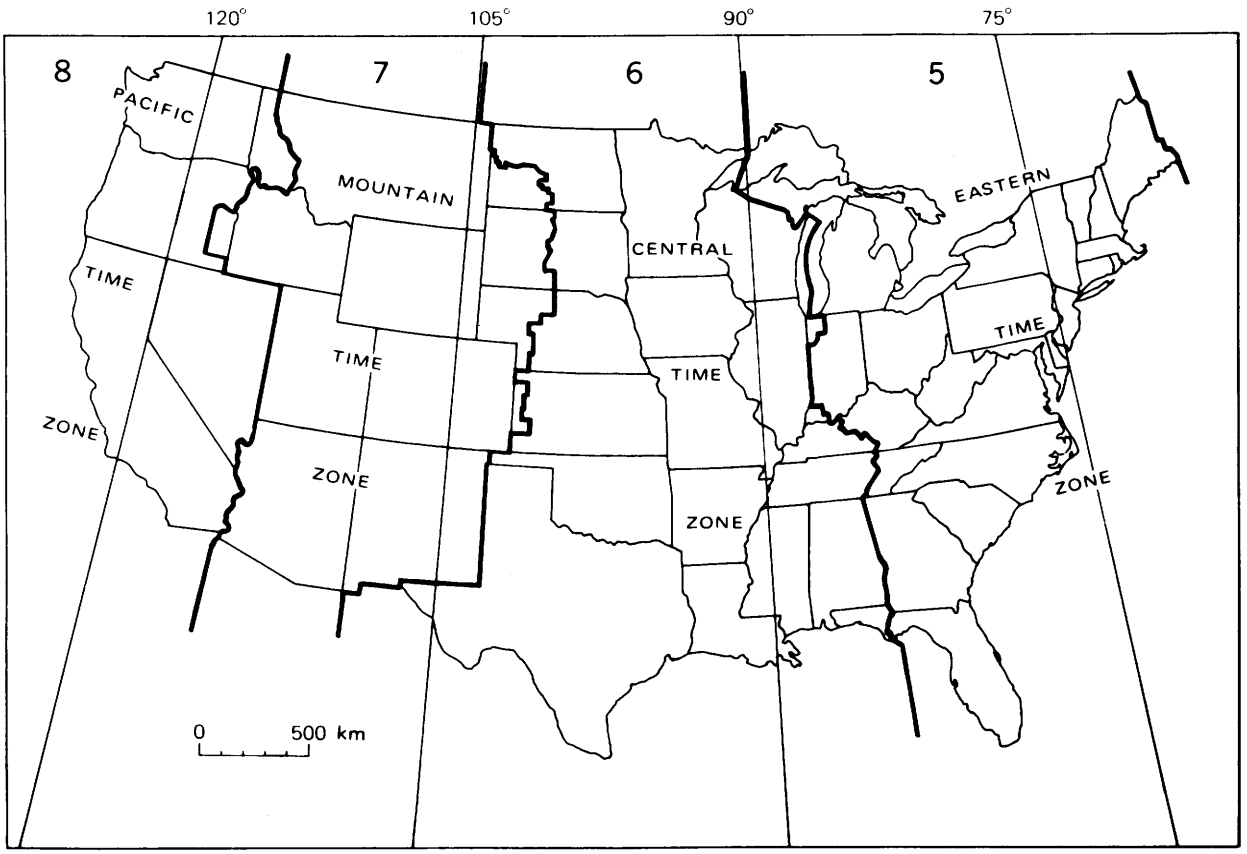

FIGURE 2.--Standard time zones of the conterminous United States. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

decimals. The accuracy of the epicenters is not necessarily indicated by the number of decimals 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 October-December 1981. The magnitudes represented in these figures are based on ML, Mn, or MD; 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 USGS. 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 USGS. The magnitude values calculated by USGS 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 $D \geq 5°$.

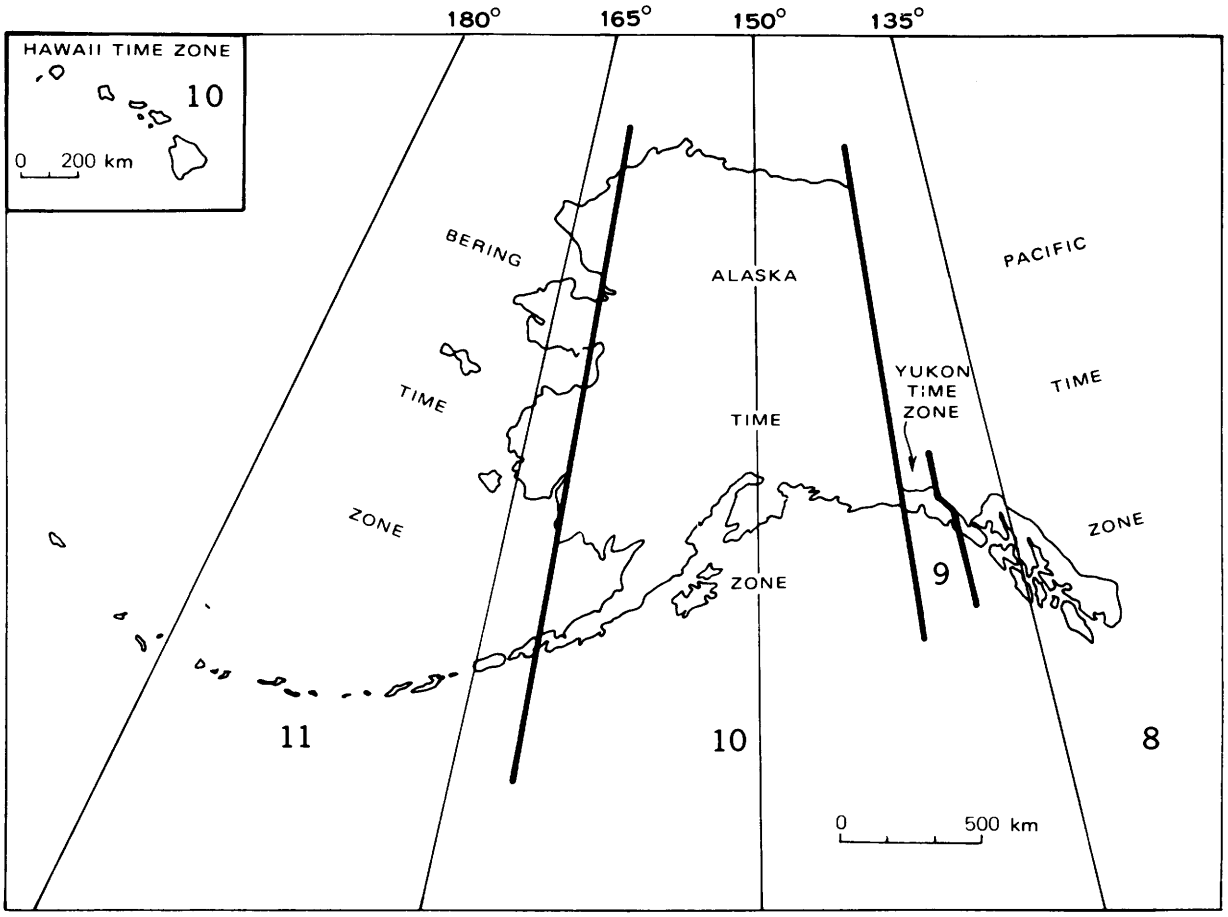

FIGURE 3.--Standard time zones of Alaska and Hawaii. The number in each zone shows the number of hours to be subtracted from Universal Coordinated Time to convert to local standard time. (Subtract 1 hour less for local daylight-saving time.)

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

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_0 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.

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

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

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.

MD is used in this publication for the duration or coda length magnitude. MD is usually computed from the difference, in seconds, between Pn or Pg-wave arrival time and the time the final coda amplitude decreases to the background-noise amplitude. These magnitudes are normally correlated with ML or mbLg so that resulting magnitudes are compatible. Thus the formulas vary for different geographic regions and seismograph systems.

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 USGS by people in the area affected by the earthquake. All earthquake reports received that contain minimal or sketchy

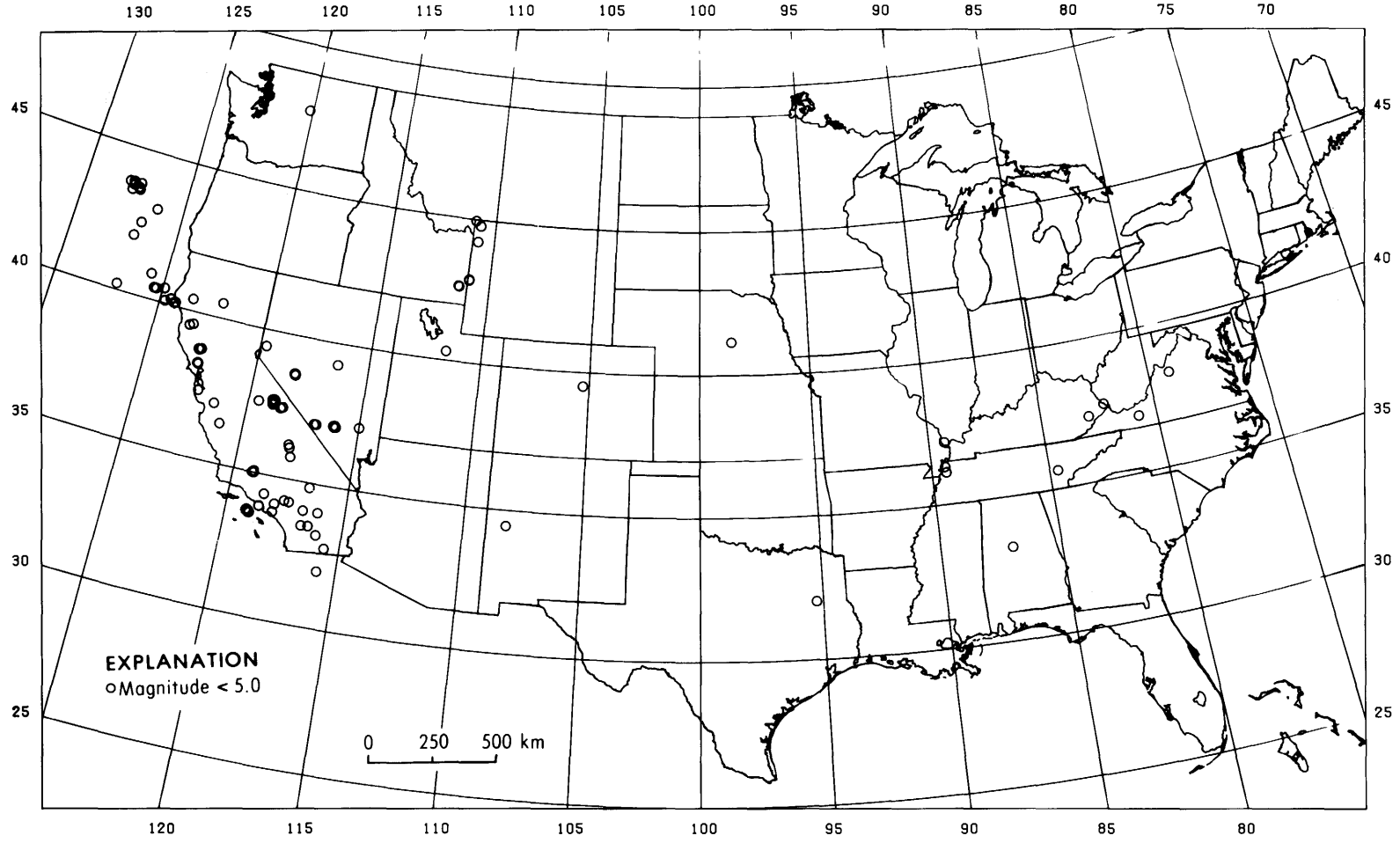

FIGURE 4.--Earthquake epicenters in the conterminous United States for October-December 1981, plotted from table 1.

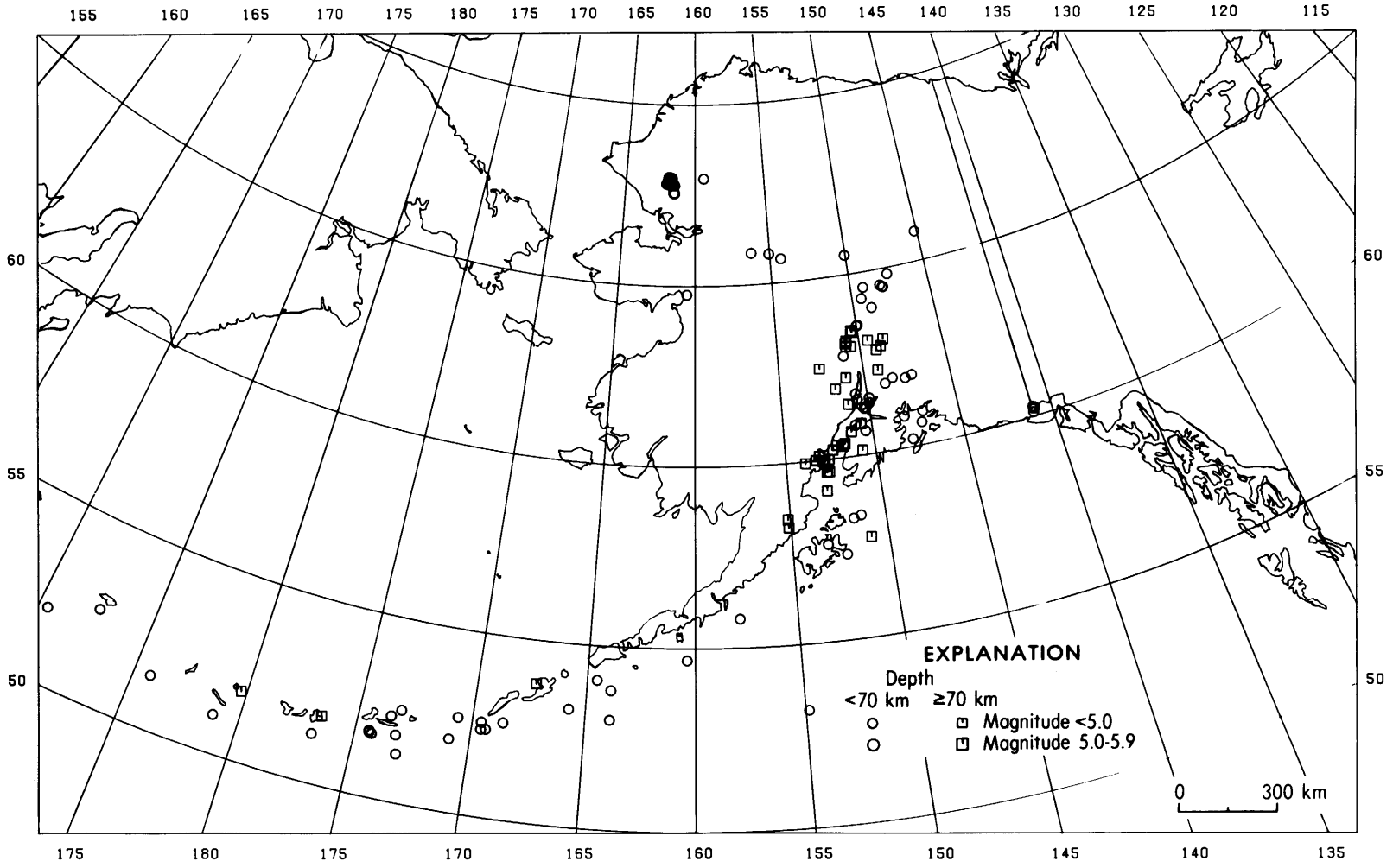

FIGURE 5.--Earthquake epicenters in Alaska for October-December 1981, plotted from table 1.

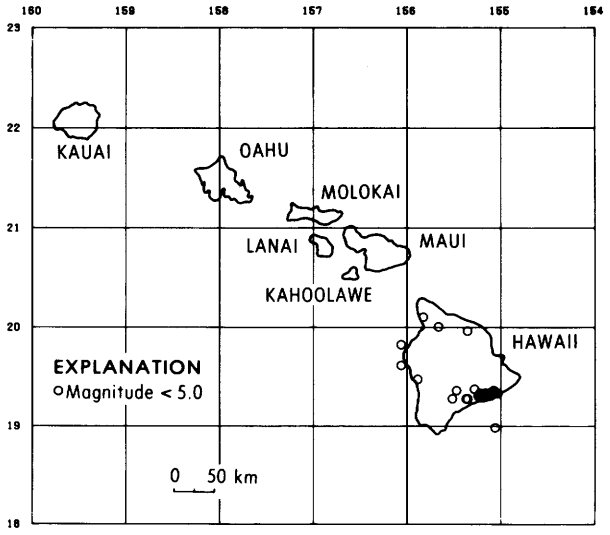

FIGURE 6.--Earthquake epicenters in Hawaii for October-December 1981, plotted from table 1.

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.

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 October-December 1981*

[Sources of the hypocenters and magnitudes: (B) University of California, Berkeley; (E) U.S. Department of Energy, Las Vegas, Nev.; (G) U.S. Geological Survey, National Earthquake Information Service, Golden, Colo., or Network Operations Branch, Menlo Park, Calif.; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (J) Weston Observatory, Mass.; (K) Tennessee Earthquake Information Center, Memphis; (M) National Oceanic and Atmospheric Administration, Alaska Tsunami Warning Center, Palmer; (P) California Institute of Technology, Pasadena; (R) University of Nevada, Reno; (S) St. Louis University, St. Louis, Mo.; (T) Oklahoma Geological Survey, 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 (1981)	Origin time (UTC)			Lat	Long	Depth (km)	Magnitude			Maximum intensity	Hypocenter source	Local time		
	hr	min	s				mb	MS	ML, Mn or MD			Date	Hour	
ALABAMA														
DEC. 9	03	29	34.5	33.24 N.	87.02 W.	3	...	...	2.6K	...	K	DEC. 8	09	P.M. CST
ALASKA														
OCT. 1	15	12	19.6	67.90 N.	161.88 W.	33	...	...	3.4M	...	G	OCT. 1	04	A.M. BST
OCT. 2	08	13	23.0	61.54 N.	149.91 W.	52	...	...	3.3M	...	G	OCT. 1	10	P.M. AST
OCT. 3	04	16	04.4	52.60 N.	170.67 W.	46	4.6	...	...	...	G	OCT. 2	05	P.M. BST
OCT. 3	12	03	03.5	59.15 N.	152.90 W.	113	...	...	...	...	G	OCT. 3	02	A.M. AST
OCT. 4	11	17	30.5	51.87 N.	176.57 W.	88	4.5	...	...	...	G	OCT. 4	00	A.M. BST
OCT. 5	13	05	24.2	62.17 N.	151.08 W.	105	4.2	...	...	...	G	OCT. 5	03	A.M. AST
OCT. 6	07	40	13.1	51.45 N.	175.72 E.	23	5.2	4.3	5.1M	...	G	OCT. 5	08	P.M. BST
OCT. 6	19	44	59.4	63.58 N.	149.96 W.	28	4.7	...	4.4M	...	G	OCT. 6	09	A.M. AST
OCT. 7	02	08	35.5	60.11 N.	141.06 W.	15	4.1	...	3.9M	...	G	OCT. 6	04	P.M. AST
OCT. 8	01	16	12.3	61.84 N.	148.86 W.	26	...	...	3.1M	...	G	OCT. 7	03	P.M. AST
OCT. 8	07	58	08.9	58.38 N.	151.29 W.	33	...	...	...	...	G	OCT. 7	09	P.M. AST
OCT. 9	09	19	48.6	52.30 N.	173.59 W.	68	4.6	...	...	...	G	OCT. 8	10	P.M. BST
OCT. 9	19	23	59.4	61.96 N.	147.25 W.	65	3.7	...	...	...	G	OCT. 9	09	A.M. AST
OCT. 11	03	33	19.7	60.84 N.	150.94 W.	33	...	...	3.4M	...	G	OCT. 10	05	P.M. AST
OCT. 13	00	37	58.1	53.82 N.	167.34 W.	111	4.5	...	...	...	G	OCT. 12	01	P.M. BST
OCT. 13	09	27	23.9	58.46 N.	155.12 W.	121	...	...	...	...	G	OCT. 12	11	P.M. AST
OCT. 14	11	03	19.6	60.36 N.	152.08 W.	120	...	...	...	...	G	OCT. 14	01	A.M. AST
OCT. 14	13	59	36.3	67.84 N.	162.06 W.	15	...	...	...	...	G	OCT. 14	02	A.M. BST
OCT. 15	21	36	28.1	57.75 N.	150.92 W.	150	...	...	...	...	G	OCT. 15	11	A.M. AST
OCT. 16	07	52	50.4	60.91 N.	147.01 W.	33	4.2	...	4.2M	FELT	G	OCT. 15	09	P.M. AST
OCT. 16	11	22	49.2	60.23 N.	140.92 W.	15	...	...	4.5M	...	G	OCT. 16	02	A.M. YST
OCT. 16	14	36	34.4	60.21 N.	140.98 W.	15	...	...	3.7M	...	G	OCT. 16	05	A.M. YST
OCT. 16	14	43	21.3	60.26 N.	140.98 W.	15	4.4	...	4.5M	...	G	OCT. 16	05	A.M. YST
OCT. 16	17	39	00.1	60.21 N.	140.94 W.	15	...	...	3.8M	...	G	OCT. 16	08	A.M. YST
OCT. 18	10	41	31.2	67.93 N.	161.93 W.	15	...	...	3.9M	...	G	OCT. 17	11	P.M. BST
OCT. 18	12	36	47.5	60.37 N.	151.64 W.	90	...	...	...	...	G	OCT. 18	02	A.M. AST
OCT. 18	14	57	31.7	67.83 N.	161.76 W.	15	...	...	3.7M	...	G	OCT. 18	03	A.M. BST
OCT. 18	15	44	50.4	67.93 N.	161.91 W.	15	...	...	3.9M	...	G	OCT. 18	04	A.M. BST
OCT. 18	19	31	40.0	67.81 N.	161.88 W.	15	...	...	3.3M	...	G	OCT. 18	08	A.M. BST
OCT. 19	01	46	16.0	60.24 N.	152.34 W.	127	...	...	...	...	G	OCT. 18	03	P.M. AST
OCT. 19	03	53	27.8	67.88 N.	161.65 W.	15	4.2	...	4.1M	...	G	OCT. 18	04	P.M. BST
OCT. 19	04	35	45.3	67.80 N.	161.68 W.	15	...	...	2.9M	...	G	OCT. 18	05	P.M. BST
OCT. 19	07	06	58.3	67.58 N.	161.45 W.	15	...	...	3.0M	...	G	OCT. 18	08	P.M. BST
OCT. 19	08	02	19.6	67.89 N.	161.75 W.	15	...	...	3.3M	...	G	OCT. 18	09	P.M. BST
OCT. 19	09	32	58.6	67.84 N.	161.89 W.	15	...	...	3.4M	...	G	OCT. 18	10	P.M. BST
OCT. 19	14	28	37.0	67.79 N.	161.50 W.	15	4.8	4.6	4.3M	...	G	OCT. 19	03	A.M. BST
OCT. 19	15	00	18.0	68.00 N.	161.93 W.	15	...	...	3.6M	...	G	OCT. 19	04	A.M. BST
OCT. 19	15	09	57.6	67.98 N.	161.69 W.	15	...	...	3.9M	...	G	OCT. 19	04	A.M. BST
OCT. 19	15	49	44.4	65.87 N.	156.21 W.	33	...	...	4.2M	...	G	OCT. 19	05	A.M. AST
OCT. 22	20	22	17.4	51.33 N.	176.82 W.	41	3.9	...	...	...	G	OCT. 22	09	A.M. BST
OCT. 24	04	50	14.0	61.53 N.	150.61 W.	33	...	...	3.2M	...	G	OCT. 23	06	P.M. AST
OCT. 24	07	01	31.6	51.31 N.	173.06 W.	33	...	...	3.9M	...	G	OCT. 23	08	P.M. BST
OCT. 24	08	11	17.9	51.82 N.	173.23 W.	41	4.7	...	4.4M	...	G	OCT. 23	09	P.M. BST
OCT. 24	20	00	32.2	60.65 N.	150.40 W.	53	...	...	4.5M	...	G	OCT. 24	10	A.M. AST
OCT. 25	00	56	45.2	57.66 N.	153.16 W.	64	4.6	...	...	...	G	OCT. 24	02	P.M. AST
OCT. 25	12	19	14.1	52.59 N.	169.59 W.	51	4.5	...	...	...	G	OCT. 25	01	A.M. BST
OCT. 26	02	37	02.1	59.67 N.	152.66 W.	108	...	...	...	...	G	OCT. 25	04	P.M. AST
OCT. 26	09	26	00.2	63.55 N.	149.99 W.	33	...	...	3.7M	...	G	OCT. 25	11	P.M. AST
OCT. 28	03	56	08.2	63.10 N.	149.45 W.	104	...	...	...	...	G	OCT. 27	05	P.M. AST
OCT. 30	04	42	13.7	64.76 N.	160.55 W.	33	...	...	3.2M	...	G	OCT. 29	06	P.M. AST
OCT. 31	06	44	13.8	53.00 N.	163.87 W.	33	4.5	...	4.5M	...	G	OCT. 30	07	P.M. BST
NOV. 1	06	37	39.7	52.02 N.	170.42 E.	33	4.4	...	...	...	G	OCT. 31	07	P.M. BST
NOV. 2	12	18	58.0	61.70 N.	150.68 W.	57	...	...	3.2M	...	G	NOV. 2	02	A.M. AST

Table 1.--*Summary of U. S. earthquakes for October-December 1981*--Continued

Date (1981)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML, Mn or MD	Maximum intensity	Hypocenter source	Local time Date	Hour
ALASKA--Continued													
NOV. 3	04	03	12.7	60.00 N.	152.64 W.	117	4.2	...	...	...	G	NOV. 2	06 P.M. AST
NOV. 3	20	02	34.6	61.44 N.	151.15 W.	79	...	...	...	...	G	NOV. 3	10 A.M. AST
NOV. 4	02	42	02.9	67.98 N.	159.38 W.	33	...	...	3.1M	...	G	NOV. 3	04 P.M. AST
NOV. 4	05	25	01.9	51.99 N.	170.92 W.	41	4.9	3.9	...	...	G	NOV. 3	06 P.M. BST
NOV. 4	23	17	47.1	63.01 N.	150.54 W.	110	...	...	...	...	G	NOV. 4	01 P.M. AST
NOV. 5	19	46	56.2	67.56 N.	161.55 W.	15	...	...	3.2M	...	G	NOV. 5	08 A.M. BST
NOV. 8	11	13	02.2	51.73 N.	174.28 W.	33	4.7	4.3	4.0M	...	G	NOV. 8	00 A.M. BST
NOV. 8	22	36	24.0	51.79 N.	174.41 W.	33	4.5	...	3.8M	...	G	NOV. 8	11 A.M. BST
NOV. 9	00	07	52.8	58.23 N.	155.10 W.	129	4.7	...	...	...	G	NOV. 8	02 P.M. AST
NOV. 9	04	59	34.7	64.27 N.	149.43 W.	33	...	...	3.9M	...	G	NOV. 8	06 P.M. AST
NOV. 9	16	45	06.0	53.22 N.	165.75 W.	33	5.5	5.3	...	IV	G	NOV. 9	05 A.M. BST
NOV. 10	03	07	16.1	52.39 N.	169.38 W.	41	4.6	...	...	...	G	NOV. 9	04 P.M. BST
NOV. 13	10	03	01.1	60.61 N.	147.21 W.	33	...	...	2.6M	...	G	NOV. 13	00 A.M. AST
NOV. 13	12	12	59.7	52.64 N.	168.63 W.	33	4.4	...	...	...	G	NOV. 13	01 A.M. BST
NOV. 13	18	10	29.3	60.13 N.	150.73 W.	79	...	...	...	...	G	NOV. 13	08 A.M. AST
NOV. 14	00	43	03.3	54.07 N.	164.54 W.	66	5.1	...	...	III	G	NOV. 13	01 P.M. BST
NOV. 15	18	49	08.0	67.93 N.	161.77 W.	15	...	...	3.2M	...	G	NOV. 15	07 A.M. BST
NOV. 15	21	05	55.7	68.00 N.	161.85 W.	15	...	...	3.4M	...	G	NOV. 15	10 A.M. BST
NOV. 16	06	47	57.0	51.75 N.	174.38 W.	33	4.3	...	...	...	G	NOV. 15	07 P.M. BST
NOV. 16	23	49	48.0	60.11 N.	153.12 W.	126	4.5	...	...	II	G	NOV. 16	01 P.M. AST
NOV. 17	11	28	40.8	60.31 N.	151.74 W.	74	4.8	...	...	IV	G	NOV. 17	01 A.M. AST
NOV. 18	06	16	08.5	64.58 N.	149.21 W.	10	...	...	3.4M	IV	G	NOV. 17	08 P.M. AST
NOV. 18	11	19	14.1	62.25 N.	149.16 W.	73	...	...	...	...	G	NOV. 18	01 A.M. AST
NOV. 18	19	34	46.7	53.81 N.	163.90 W.	60	4.7	...	...	...	G	NOV. 18	08 A.M. BST
NOV. 19	01	45	33.7	61.40 N.	149.96 W.	45	...	...	2.8M	III	G	NOV. 18	03 P.M. AST
NOV. 19	04	20	07.6	52.57 N.	172.56 E.	39	4.9	4.5	4.7M	...	G	NOV. 18	05 P.M. BST
NOV. 22	12	51	17.3	63.04 N.	150.84 W.	143	...	...	...	...	G	NOV. 22	02 A.M. AST
NOV. 22	17	55	06.6	60.86 N.	150.61 W.	85	...	...	...	...	G	NOV. 22	07 A.M. AST
NOV. 23	07	27	34.6	60.69 N.	151.19 W.	86	...	...	...	III	G	NOV. 22	09 P.M. AST
NOV. 25	02	43	41.2	52.52 N.	173.17 W.	33	4.7	...	4.7M	...	G	NOV. 24	03 P.M. BST
NOV. 29	05	18	18.9	65.81 N.	145.16 W.	33	...	...	3.2M	...	G	NOV. 28	07 P.M. AST
NOV. 29	22	27	54.5	63.08 N.	148.54 W.	107	...	...	...	...	G	NOV. 29	12 P.M. AST
NOV. 30	01	14	45.8	58.32 N.	151.68 W.	33	...	...	4.0M	...	G	NOV. 29	03 P.M. AST
NOV. 30	04	29	30.8	63.41 N.	150.36 W.	150	...	...	...	...	G	NOV. 29	06 P.M. AST
NOV. 30	14	48	35.9	60.20 N.	147.84 W.	33	...	...	3.8M	...	G	NOV. 30	04 A.M. AST
DEC. 1	20	05	09.3	51.04 N.	178.87 E.	42	4.6	...	5.2M	...	G	DEC. 1	09 A.M. BST
DEC. 4	13	51	02.9	62.91 N.	148.75 W.	93	...	...	...	...	G	DEC. 4	03 A.M. AST
DEC. 5	05	45	00.4	63.44 N.	150.39 W.	126	...	...	...	...	G	DEC. 4	07 P.M. AST
DEC. 6	04	41	48.0	60.02 N.	153.35 W.	137	4.3	...	...	...	G	DEC. 5	06 P.M. AST
DEC. 6	17	27	41.6	61.97 N.	148.40 W.	63	4.6	...	...	IV	G	DEC. 6	07 A.M. AST
DEC. 7	14	42	58.1	57.35 N.	152.26 W.	33	4.8	3.9	4.1M	...	G	DEC. 7	04 A.M. AST
DEC. 7	17	45	40.1	61.90 N.	147.65 W.	33	...	...	2.9M	FELT	G	DEC. 7	07 A.M. AST
DEC. 8	14	06	59.0	64.83 N.	147.49 W.	15	...	...	3.0M	III	G	DEC. 8	04 A.M. AST
DEC. 8	18	04	40.9	62.77 N.	151.06 W.	33	...	...	3.1M	...	G	DEC. 8	08 A.M. AST
DEC. 9	12	22	17.6	53.19 N.	154.83 W.	33	4.9	...	4.9M	...	G	DEC. 9	02 A.M. AST
DEC. 10	02	26	23.6	51.88 N.	179.72 E.	109	4.6	...	...	...	G	DEC. 9	03 P.M. BST
DEC. 10	05	45	16.1	63.17 N.	150.75 W.	161	...	...	...	...	G	DEC. 9	07 P.M. AST
DEC. 11	06	43	41.4	60.86 N.	148.09 W.	33	...	...	3.1M	...	G	DEC. 10	08 P.M. AST
DEC. 13	03	46	53.1	62.80 N.	149.03 W.	88	...	...	...	...	G	DEC. 12	05 P.M. AST
DEC. 14	09	17	35.0	62.51 N.	152.56 W.	158	...	...	...	...	G	DEC. 13	11 P.M. AST
DEC. 14	21	13	10.8	59.95 N.	153.93 W.	198	...	...	...	...	G	DEC. 14	11 A.M. AST
DEC. 15	21	34	52.4	65.65 N.	154.25 W.	33	...	...	3.5M	...	G	DEC. 15	11 A.M. AST
DEC. 16	08	06	33.3	65.54 N.	150.05 W.	33	...	...	3.4M	...	G	DEC. 15	10 P.M. AST
DEC. 17	00	34	42.9	65.82 N.	155.06 W.	33	...	...	2.6M	...	G	DEC. 16	02 P.M. AST
DEC. 18	14	20	45.5	61.29 N.	150.20 W.	33	...	...	2.1M	III	G	DEC. 18	04 A.M. AST
DEC. 20	10	52	06.4	61.27 N.	150.30 W.	65	...	...	...	III	G	DEC. 20	00 A.M. AST
DEC. 20	14	13	47.3	59.97 N.	152.93 W.	122	...	...	...	...	G	DEC. 20	04 A.M. AST
DEC. 22	04	31	34.6	59.96 N.	152.84 W.	125	...	...	...	...	G	DEC. 21	06 P.M. AST
DEC. 24	01	08	24.4	63.99 N.	148.88 W.	33	...	...	2.7M	...	G	DEC. 23	03 P.M. AST
DEC. 25	22	26	38.6	59.65 N.	152.81 W.	107	4.3	...	...	...	G	DEC. 25	12 P.M. AST
DEC. 28	10	28	16.1	54.67 N.	160.41 W.	33	...	...	3.8M	...	G	DEC. 28	00 A.M. AST
DEC. 28	22	01	50.1	63.11 N.	150.82 W.	151	...	...	...	...	G	DEC. 28	12 P.M. AST
DEC. 30	08	09	44.1	52.39 N.	169.59 W.	45	4.8	...	...	...	G	DEC. 29	09 P.M. BST
DEC. 30	13	31	50.7	64.50 N.	147.96 W.	15	...	...	...	...	G	DEC. 30	03 A.M. AST

Table 1.—*Summary of U. S. earthquakes for October-December 1981*—Continued

Date (1981)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML, Mn or MD	Maximum intensity	Hypocenter source	Local time Date	Hour
ALASKA—Continued													
DEC. 30	13	38	41.5	55.80 N.	157.84 W.	33	...	...	4.0M	...	G	DEC. 30	03 A.M. AST
DEC. 30	13	46	18.1	64.50 N.	147.96 W.	15	...	...	...	...	G	DEC. 30	03 A.M. AST
DEC. 30	13	47	26.7	64.51 N.	147.99 W.	15	3.9	...	4.2M	IV	G	DEC. 30	03 A.M. AST
DEC. 30	13	59	52.8	64.50 N.	147.93 W.	15	...	...	...	...	G	DEC. 30	03 A.M. AST
DEC. 30	14	00	33.5	64.56 N.	148.09 W.	24	4.9	4.6	5.2M	V	G	DEC. 30	04 A.M. AST
DEC. 30	14	07	58.0	64.50 N.	147.91 W.	15	...	...	...	...	G	DEC. 30	04 A.M. AST
DEC. 30	14	11	28.1	64.50 N.	147.93 W.	15	...	...	...	...	G	DEC. 30	04 A.M. AST
DEC. 31	12	15	54.5	61.91 N.	151.76 W.	128	4.1	...	...	FELT	G	DEC. 31	02 A.M. AST
CALIFORNIA													
OCT. 1	01	04	15.5	37.63 N.	118.87 W.	1	...	...	3.5B	FELT	B	SEPT. 30	05 P.M. PST
OCT. 1	07	02	05.1	37.53 N.	118.89 W.	7	3.9	...	4.6B	FELT	B	SEPT. 30	11 P.M. PST
OCT. 1	09	13	57.4	37.51 N.	118.90 W.	1	...	...	3.5B	...	B	OCT. 1	01 A.M. PST
OCT. 1	13	22	36.0	37.62 N.	118.88 W.	2	...	...	3.7B	FELT	B	OCT. 1	05 A.M. PST
OCT. 1	15	00	17.9	37.57 N.	118.91 W.	8	...	...	3.4B	...	B	OCT. 1	07 A.M. PST
OCT. 1	18	16	47.2	37.58 N.	118.83 W.	6	...	...	3.2B	...	B	OCT. 1	10 A.M. PST
OCT. 1	22	05	07.9	37.51 N.	118.91 W.	5	...	...	3.4B	...	B	OCT. 1	02 P.M. PST
OCT. 2	07	37	22.3	37.63 N.	118.88 W.	4	...	...	4.2B	FELT	B	OCT. 1	11 P.M. PST
OCT. 2	07	45	03.0	37.64 N.	118.88 W.	5	...	...	3.1B	...	B	OCT. 1	11 P.M. PST
OCT. 2	16	14	23.5	37.63 N.	118.87 W.	1	...	...	3.5B	FELT	B	OCT. 2	08 A.M. PST
OCT. 2	18	18	13.3	37.65 N.	118.89 W.	5	...	...	3.4B	...	B	OCT. 2	10 A.M. PST
OCT. 3	01	20	37.3	37.60 N.	118.84 W.	1	...	...	4.0B	FELT	B	OCT. 2	05 P.M. PST
OCT. 3	07	23	32.6	37.57 N.	118.83 W.	5	...	...	3.1B	...	B	OCT. 2	11 P.M. PST
OCT. 3	14	40	55.3	37.59 N.	118.89 W.	9	...	...	3.7B	FELT	B	OCT. 3	06 A.M. PST
OCT. 4	00	30	41.2	37.48 N.	118.92 W.	5	...	...	3.1B	...	B	OCT. 3	04 P.M. PST
OCT. 4	04	27	36.9	37.61 N.	118.87 W.	9	...	...	3.0B	...	B	OCT. 3	08 P.M. PST
OCT. 4	06	32	51.3	37.63 N.	118.89 W.	4	...	...	3.3B	...	B	OCT. 3	10 P.M. PST
OCT. 5	17	43	22.4	34.23 N.	117.43 W.	12	...	...	3.0P	...	P	OCT. 5	09 A.M. PST
OCT. 6	05	46	12.2	37.51 N.	118.92 W.	7	...	...	3.1B	...	B	OCT. 5	09 P.M. PST
OCT. 6	07	16	11.2	40.42 N.	123.52 W.	5	...	...	2.7B	IV	B	OCT. 5	11 P.M. PST
OCT. 6	23	36	39.0	37.58 N.	118.87 W.	2	...	...	3.0B	...	B	OCT. 6	03 P.M. PST
OCT. 9	11	01	00.2	37.64 N.	118.89 W.	11	...	...	3.6B	FELT	B	OCT. 9	03 A.M. PST
OCT. 9	11	17	26.0	37.58 N.	118.83 W.	6	...	...	3.6B	FELT	B	OCT. 9	03 A.M. PST
OCT. 9	17	50	22.1	37.57 N.	118.83 W.	5	...	...	3.2B	...	B	OCT. 9	09 A.M. PST
OCT. 9	18	55	28.9	38.77 N.	122.68 W.	5	...	...	3.2B	FELT	B	OCT. 9	10 A.M. PST
OCT. 10	12	13	17.8	40.52 N.	122.12 W.	5	...	...	3.2B	FELT	B	OCT. 10	04 A.M. PST
OCT. 11	18	10	12.6	33.65 N.	119.05 W.	7	...	...	3.6P	...	P	OCT. 11	10 A.M. PST
OCT. 13	04	44	48.7	37.57 N.	118.93 W.	7	...	...	3.0B	...	B	OCT. 12	08 P.M. PST
OCT. 13	20	14	03.0	34.03 N.	116.15 W.	8	...	...	3.3P	...	P	OCT. 13	12 P.M. PST
OCT. 16	04	07	33.4	33.60 N.	119.02 W.	15	...	...	3.2P	...	P	OCT. 15	08 P.M. PST
OCT. 16	22	03	16.1	37.54 N.	118.89 W.	27	...	...	3.2B	...	B	OCT. 16	02 P.M. PST
OCT. 17	19	47	21.8	33.23 N.	116.07 W.	5	...	...	3.8P	...	P	OCT. 17	11 A.M. PST
OCT. 17	19	54	35.0	33.23 N.	116.07 W.	8	...	...	3.1P	...	P	OCT. 17	11 A.M. PST
OCT. 20	02	25	20.0	37.63 N.	118.86 W.	28	...	...	3.3B	...	B	OCT. 19	06 P.M. PST
OCT. 20	12	40	55.6	33.52 N.	116.45 W.	5	...	...	3.0P	IV	P	OCT. 20	04 A.M. PST
OCT. 21	05	37	44.7	33.50 N.	116.77 W.	5	...	...	3.6P	FELT	P	OCT. 20	09 P.M. PST
OCT. 23	17	28	16.9	33.63 N.	119.02 W.	12	4.7	...	4.6P	V	P	OCT. 23	09 A.M. PST
OCT. 23	19	15	52.5	33.63 N.	119.05 W.	6	4.6	...	4.6P	V	P	OCT. 23	11 A.M. PST
OCT. 25	17	18	03.3	40.14 N.	124.27 W.	5	3.6	...	3.8B	...	B	OCT. 25	09 A.M. PST
OCT. 26	14	58	01.8	37.39 N.	118.53 W.	18	...	...	3.1B	III	B	OCT. 26	06 A.M. PST
OCT. 28	14	17	08.9	34.33 N.	118.52 W.	5	...	...	3.1P	III	P	OCT. 28	06 A.M. PST
OCT. 29	12	30	58.8	40.12 N.	124.33 W.	5	...	...	3.3B	...	B	OCT. 29	04 A.M. PST
OCT. 30	17	07	25.8	33.62 N.	119.00 W.	6	...	...	3.6P	...	P	OCT. 30	09 A.M. PST
OCT. 31	08	59	07.9	38.77 N.	122.71 W.	3	...	...	3.0B	...	B	OCT. 31	00 A.M. PST
OCT. 31	23	14	32.7	33.63 N.	119.05 W.	12	...	...	3.1P	...	P	OCT. 31	03 P.M. PST
NOV. 2	05	08	05.9	33.62 N.	119.00 W.	6	...	...	3.0P	...	P	NOV. 1	09 P.M. PST
NOV. 2	21	33	37.9	40.10 N.	124.75 W.	5	...	...	3.1B	...	B	NOV. 2	01 P.M. PST
NOV. 4	11	54	56.1	33.90 N.	118.63 W.	6	...	...	2.7P	FELT	P	NOV. 4	03 A.M. PST
NOV. 5	03	30	17.3	37.54 N.	118.88 W.	22	...	...	3.5B	...	B	NOV. 4	07 P.M. PST
NOV. 9	15	54	40.5	32.83 N.	115.63 W.	6	...	...	2.7P	IV	P	NOV. 9	07 A.M. PST
NOV. 10	07	33	07.3	37.61 N.	118.94 W.	5	...	...	3.1B	...	B	NOV. 9	11 P.M. PST
NOV. 10	19	17	48.6	37.62 N.	118.90 W.	12	...	...	3.4B	...	B	NOV. 10	11 A.M. PST
NOV. 10	22	34	35.5	35.02 N.	119.13 W.	3	4.7	...	4.6P	V	P	NOV. 10	02 P.M. PST
NOV. 10	22	37	05.0	35.02 N.	119.18 W.	9	...	...	4.2P	FELT	P	NOV. 10	02 P.M. PST
NOV. 11	00	29	44.4	35.02 N.	119.17 W.	2	...	...	3.4P	...	P	NOV. 10	04 P.M. PST

Table 1.--*Summary of U. S. earthquakes for October-December 1981*--Continued

Date (1981)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML, Mn or MD	Maximum intensity	Hypocenter source	Local time Date	Hour
CALIFORNIA--Continued													
NOV. 11	00	30	56.6	35.02 N.	119.17 W.	2	...	...	3.2P	...	P	NOV. 10	04 P.M. PST
NOV. 11	20	25	10.2	35.77 N.	117.72 W.	7	...	...	3.2P	...	P	NOV. 11	12 P.M. PST
NOV. 13	03	00	00.2	37.62 N.	118.97 W.	5	...	...	3.8B	FELT	B	NOV. 12	07 P.M. PST
NOV. 13	03	07	47.6	37.63 N.	118.97 W.	5	...	...	3.7B	FELT	B	NOV. 12	07 P.M. PST
NOV. 13	03	50	21.9	37.64 N.	118.96 W.	5	...	...	3.2B	...	B	NOV. 12	07 P.M. PST
NOV. 14	17	57	44.5	34.07 N.	118.02 W.	11	...	...	4.9P	FELT	P	NOV. 14	09 A.M. PST
NOV. 16	07	29	53.5	36.43 N.	121.04 W.	5	...	...	3.1B	...	B	NOV. 15	11 P.M. PST
NOV. 16	12	01	45.5	35.05 N.	119.15 W.	5	...	...	3.1P	...	P	NOV. 16	04 A.M. PST
NOV. 16	19	47	05.6	37.06 N.	121.45 W.	1	...	...	2.9B	...	B	NOV. 16	11 A.M. PST
NOV. 17	02	53	40.4	33.70 N.	119.13 W.	16	...	...	3.0P	...	P	NOV. 16	06 P.M. PST
NOV. 18	16	15	49.2	37.49 N.	119.54 W.	3	...	...	3.8B	FELT	B	NOV. 18	08 A.M. PST
NOV. 24	09	20	17.7	34.85 N.	116.65 W.	6	...	...	3.5P	...	P	NOV. 24	01 A.M. PST
NOV. 27	01	25	12.0	32.03 N.	115.80 W.	6	...	...	3.0P	...	P	NOV. 26	05 P.M. PST
DEC. 2	02	57	30.0	37.59 N.	118.89 W.	9	...	...	3.0B	...	B	DEC. 1	06 P.M. PST
DEC. 7	21	32	37.4	39.58 N.	123.22 W.	5	...	...	2.6B	IV	B	DEC. 7	01 P.M. PST
DEC. 9	22	58	23.0	33.68 N.	119.13 W.	16	...	...	3.3P	...	P	DEC. 9	02 P.M. PST
DEC. 10	09	33	20.2	37.43 N.	118.46 W.	19	...	...	3.5B	FELT	B	DEC. 10	01 A.M. PST
DEC. 10	11	57	37.8	38.80 N.	122.56 W.	6	...	...	3.3B	FELT	B	DEC. 10	03 A.M. PST
DEC. 12	15	11	09.1	37.38 N.	122.28 W.	9	...	...	3.8B	V	B	DEC. 12	07 A.M. PST
DEC. 13	01	20	01.0	38.67 N.	118.24 W.	5	...	...	3.7B	...	B	DEC. 12	05 P.M. PST
DEC. 14	11	32	59.2	33.67 N.	119.15 W.	25	...	...	3.8P	FELT	P	DEC. 14	03 A.M. PST
DEC. 15	08	05	33.9	36.10 N.	117.83 W.	4	...	...	3.8P	IV	P	DEC. 15	00 A.M. PST
DEC. 16	01	34	52.3	36.20 N.	117.90 W.	3	...	...	3.5P	...	P	DEC. 15	05 P.M. PST
DEC. 16	14	33	46.2	33.77 N.	118.05 W.	6	...	...	2.1P	FELT	P	DEC. 16	06 A.M. PST
DEC. 18	14	41	44.9	38.28 N.	122.63 W.	5	...	...	3.1B	IV	B	DEC. 18	06 A.M. PST
DEC. 19	20	56	52.9	38.63 N.	118.21 W.	17	...	...	4.4B	...	B	DEC. 19	12 P.M. PST
DEC. 20	07	41	49.7	38.29 N.	122.62 W.	5	...	...	3.2B	FELT	B	DEC. 19	11 P.M. PST
DEC. 20	10	25	29.5	38.29 N.	122.58 W.	5	...	...	2.6B	FELT	G	DEC. 20	02 A.M. PST
DEC. 20	15	29	55.4	38.29 N.	122.57 W.	5	...	...	2.8B	FELT	G	DEC. 20	07 A.M. PST
DEC. 24	02	22	07.7	34.02 N.	116.77 W.	20	...	...	3.0P	...	P	DEC. 23	06 P.M. PST
DEC. 27	20	24	15.5	34.25 N.	117.62 W.	9	...	...	3.1P	...	P	DEC. 27	12 P.M. PST
DEC. 30	02	12	26.3	39.51 N.	123.39 W.	1	...	...	2.6B	IV	B	DEC. 29	06 P.M. PST
CALIFORNIA--OFF THE COAST													
OCT. 12	00	45	41.0	40.90 N.	125.70 W.	5	...	...	4.0B	...	B	OCT. 11	04 P.M. PST
OCT. 17	03	26	36.4	40.45 N.	125.31 W.	5	...	...	3.0B	...	B	OCT. 16	07 P.M. PST
OCT. 21	07	06	18.7	40.45 N.	125.40 W.	5	...	...	3.4B	...	B	OCT. 20	11 P.M. PST
OCT. 29	03	17	17.7	40.23 N.	127.11 W.	5	4.3	3.6	4.3B	...	B	OCT. 28	07 P.M. PST
NOV. 11	17	46	07.5	40.22 N.	124.53 W.	5	3.7	...	4.0B	IV	B	NOV. 11	09 A.M. PST
NOV. 20	23	58	59.7	40.52 N.	124.91 W.	5	...	...	3.8B	...	B	NOV. 20	03 P.M. PST
COLORADO													
NOV. 2	03	03	00.2	39.52 N.	105.30 W.	1	...	...	2.8G	V	G	NOV. 1	08 P.M. MST
HAWAII													
OCT. 2	07	39	18.9	19.34 N.	155.03 W.	7	...	...	3.1H	...	H	OCT. 1	09 P.M. HST
OCT. 2	15	44	34.3	19.34 N.	155.12 W.	9	...	...	3.1H	III	H	OCT. 2	05 A.M. HST
OCT. 2	21	43	40.5	19.34 N.	155.12 W.	9	...	...	3.1H	...	H	OCT. 2	11 A.M. HST
OCT. 5	01	42	28.0	19.28 N.	155.52 W.	28	...	...	3.7H	III	H	OCT. 4	03 P.M. HST
OCT. 7	09	35	43.4	19.31 N.	155.23 W.	10	...	...	3.0H	...	H	OCT. 6	11 P.M. HST
OCT. 11	17	21	19.0	19.62 N.	156.07 W.	38	...	...	3.0H	...	H	OCT. 11	07 A.M. HST
OCT. 14	05	11	22.8	19.28 N.	155.36 W.	9	...	...	3.1H	II	H	OCT. 13	07 P.M. HST
OCT. 15	00	38	20.5	20.00 N.	155.67 W.	14	...	...	3.1H	III	H	OCT. 14	02 P.M. HST
OCT. 15	11	00	00.2	18.98 N.	155.06 W.	35	...	...	3.3H	...	H	OCT. 15	01 A.M. HST
OCT. 19	20	08	35.6	19.33 N.	155.18 W.	9	...	...	3.0H	...	H	OCT. 19	10 A.M. HST
OCT. 23	07	56	08.9	19.32 N.	155.15 W.	10	...	...	3.3H	...	H	OCT. 22	09 P.M. HST
OCT. 28	09	33	32.3	19.38 N.	155.28 W.	33	4.2	...	4.0H	V	H	OCT. 27	11 P.M. HST
NOV. 2	02	05	50.6	19.48 N.	155.88 W.	11	...	...	3.1H	...	H	NOV. 1	04 P.M. HST
NOV. 7	17	23	46.8	19.33 N.	155.22 W.	10	...	...	3.1H	III	H	NOV. 7	07 A.M. HST
NOV. 10	13	02	56.6	19.34 N.	155.22 W.	10	5.3	...	4.4H	V	H	NOV. 10	03 A.M. HST

Table 1.–*Summary of U. S. earthquakes for October-December 1981*--Continued

Date (1981)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML, Mn or MD	Maximum intensity	Hypocenter source	Local time Date	Hour
HAWAII--Continued													
NOV. 10	13	31	02.6	19.34 N.	155.21 W.	9	...	...	3.4H	III	H	NOV. 10	03 A.M. HST
NOV. 16	06	23	59.4	19.97 N.	155.35 W.	10	...	...	3.0H	III	H	NOV. 15	08 P.M. HST
NOV. 16	12	26	40.2	19.96 N.	155.36 W.	12	...	...	3.4H	III	H	NOV. 16	02 A.M. HST
NOV. 17	05	10	09.5	19.28 N.	155.37 W.	8	...	...	3.0H	...	H	NOV. 16	07 P.M. HST
NOV. 19	08	29	54.8	19.37 N.	155.48 W.	11	...	...	3.6H	IV	H	NOV. 18	10 P.M. HST
NOV. 20	05	32	58.1	19.96 N.	155.35 W.	12	...	...	3.8H	VI	H	NOV. 19	07 P.M. HST
NOV. 20	17	42	52.4	19.37 N.	155.08 W.	9	...	...	3.4H	IV	H	NOV. 20	07 A.M. HST
NOV. 28	19	17	18.4	19.97 N.	155.35 W.	10	...	...	3.4H	III	H	NOV. 28	09 A.M. HST
DEC. 1	06	07	09.7	19.36 N.	155.08 W.	9	...	...	3.4H	III	H	NOV. 30	08 P.M. HST
DEC. 5	22	26	30.9	19.33 N.	155.13 W.	8	...	...	3.3H	...	H	DEC. 5	12 P.M. HST
DEC. 7	19	07	29.1	19.32 N.	155.22 W.	9	...	...	3.2H	III	H	DEC. 7	09 A.M. HST
DEC. 8	03	39	27.2	19.82 N.	156.07 W.	41	...	...	4.0H	IV	H	DEC. 7	05 P.M. HST
DEC. 13	04	23	13.3	19.33 N.	155.09 W.	10	...	...	3.7H	III	H	DEC. 12	06 P.M. HST
DEC. 13	13	22	28.8	19.35 N.	155.07 W.	8	...	...	3.0H	...	H	DEC. 13	03 A.M. HST
DEC. 14	00	20	21.3	19.33 N.	155.14 W.	9	...	...	3.3H	III	H	DEC. 13	02 P.M. HST
DEC. 17	06	21	51.5	19.33 N.	155.12 W.	9	...	...	3.4H	III	H	DEC. 16	08 P.M. HST
DEC. 20	15	08	02.6	19.34 N.	155.17 W.	9	...	...	3.1H	...	H	DEC. 20	05 A.M. HST
DEC. 22	05	15	15.6	19.33 N.	155.12 W.	9	...	...	3.2H	...	H	DEC. 21	07 P.M. HST
DEC. 23	17	11	14.6	20.10 N.	155.82 W.	28	...	...	3.0H	II	H	DEC. 23	07 A.M. HST
DEC. 28	02	09	30.4	19.28 N.	155.37 W.	8	...	...	3.2H	...	H	DEC. 27	04 P.M. HST
IDAHO													
DEC. 9	08	15	05.2	42.63 N.	111.43 W.	7	4.3	...	4.1U	V	U	DEC. 9	01 A.M. MST
DEC. 9	08	43	33.0	42.64 N.	111.46 W.	7	...	...	3.2U	...	U	DEC. 9	01 A.M. MST
ILLINOIS													
DEC. 27	21	10	42.7	37.17 N.	89.32 W.	2	...	...	2.6K	...	K	DEC. 27	03 P.M. CST
KENTUCKY													
NOV. 30	17	33	11.0	37.63 N.	82.20 W.	7	...	...	2.5K	...	K	NOV. 30	12 P.M. EST
DEC. 7	20	01	10.5	37.29 N.	82.92 W.	0	...	...	...	...	V	DEC. 7	03 P.M. EST
NEBRASKA													
OCT. 9	21	54	27.9	41.17 N.	98.54 W.	5	...	...	3.3T	...	G	OCT. 9	03 P.M. CST
NEVADA													
OCT. 1	19	00	00.1	37.08 N.	116.01 W.	0	4.9	...	5.0B	...	E	OCT. 1	11 A.M. PST
OCT. 13	14	47	53.9	37.07 N.	116.93 W.	6	...	...	3.4P	...	P	OCT. 13	06 A.M. PST
OCT. 13	19	51	12.9	37.05 N.	116.97 W.	5	...	...	3.1P	...	P	OCT. 13	11 A.M. PST
OCT. 15	04	21	10.6	37.07 N.	116.95 W.	1	...	...	3.5P	...	P	OCT. 14	08 P.M. PST
NOV. 4	11	47	18.9	39.42 N.	119.72 W.	2	...	...	3.3B	V	R	NOV. 4	03 A.M. PST
NOV. 11	20	00	00.0	37.08 N.	116.07 W.	0	4.8	...	4.8B	...	E	NOV. 11	12 P.M. PST
NOV. 12	15	00	00.1	37.11 N.	116.05 W.	0	5.3	4.4	5.5B	...	E	NOV. 12	07 A.M. PST
NOV. 19	18	01	55.8	39.26 N.	116.39 W.	5	...	...	3.5G	...	G	NOV. 19	10 A.M. PST
NOV. 19	21	40	53.4	37.07 N.	116.88 W.	6	...	...	3.1P	...	G	NOV. 19	01 P.M. PST
DEC. 1	16	18	50.0	38.62 N.	118.19 W.	11	...	...	4.5B	V	B	DEC. 1	08 A.M. PST
DEC. 3	15	00	00.1	37.15 N.	116.07 W.	0	4.6	...	4.9B	...	E	DEC. 3	07 A.M. PST
DEC. 7	07	47	51.6	38.67 N.	118.22 W.	6	...	...	4.1B	IV	B	DEC. 6	11 P.M. PST
DEC. 16	21	05	00.1	37.12 N.	116.12 W.	0	4.4	...	4.4B	...	E	DEC. 16	01 P.M. PST
DEC. 28	22	45	42.2	37.21 N.	114.98 W.	5	...	...	3.6G	IV	G	DEC. 28	02 P.M. PST
NEW MEXICO													
DEC. 4	08	51	24.2	34.46 N.	108.23 W.	5	...	...	2.8G	FELT	G	DEC. 4	01 A.M. MST
NEW YORK													
OCT. 21	16	49	06.7	41.15 N.	72.58 W.	6	...	...	3.8J	V	J	OCT. 21	11 A.M. EST

Table 1.--*Summary of U. S. earthquakes for October-December 1981*--Continued

Date (1981)	Origin time (UTC) hr	min	s	Lat	Long	Depth (km)	Magnitude mb	MS	ML, Mn or MD	Maximum intensity	Hypocenter source	Local time Date	Hour
OREGON--OFF THE COAST													
OCT. 20	18	35	46.7	43.10 N.	126.26 W.	10	4.1	...	...	...	G	OCT. 20	10 A.M. PST
NOV. 3	13	47	34.1	43.54 N.	127.71 W.	10	6.0	6.2	5.8B	...	G	NOV. 3	05 A.M. PST
NOV. 8	08	31	24.0	43.71 N.	127.66 W.	10	...	...	...	...	G	NOV. 8	00 A.M. PST
NOV. 11	02	49	00.8	43.82 N.	127.35 W.	10	...	...	...	...	G	NOV. 10	06 P.M. PST
NOV. 16	13	03	55.3	43.80 N.	127.90 W.	10	4.0	...	...	...	G	NOV. 16	05 A.M. PST
NOV. 22	11	37	56.6	43.60 N.	127.34 W.	10	5.0	5.3	...	...	G	NOV. 22	03 A.M. PST
DEC. 8	20	05	26.0	42.50 N.	126.83 W.	10	...	...	...	...	G	DEC. 8	12 P.M. PST
DEC. 14	16	14	11.7	42.03 N.	127.01 W.	10	4.5	...	...	...	G	DEC. 14	08 A.M. PST
DEC. 20	20	30	06.8	43.82 N.	127.68 W.	10	4.5	...	...	...	G	DEC. 20	12 P.M. PST
DEC. 21	10	57	49.9	43.66 N.	127.40 W.	10	4.6	...	...	...	G	DEC. 21	02 A.M. PST
TENNESSEE													
OCT. 22	10	33	29.3	36.30 N.	89.44 W.	3	...	...	2.5K	FELT	K	OCT. 22	04 A.M. CST
NOV. 8	17	11	19.0	36.10 N.	89.39 W.	12	...	...	3.0G	IV	S	NOV. 8	11 A.M. CST
NOV. 25	11	54	26.0	35.64 N.	84.63 W.	9	...	...	2.6G	...	K	NOV. 25	06 A.M. EST
TEXAS													
NOV. 6	12	36	40.5	32.02 N.	95.26 W.	5	...	...	3.2T	IV	G	NOV. 6	06 A.M. CST
UTAH													
DEC. 17	10	47	43.5	40.33 N.	111.64 W.	2	...	...	2.2U	IV	U	DEC. 17	03 A.M. MST
VIRGINIA													
NOV. 23	13	14	51.0	38.24 N.	79.09 W.	10	...	...	2.1V	IV	V	NOV. 23	08 A.M. EST
DEC. 4	02	35	56.2	36.98 N.	80.78 W.	8	...	...	2.1V	FELT	V	DEC. 3	09 P.M. EST
WASHINGTON													
OCT. 25	03	21	03.6	47.76 N.	120.17 W.	0	...	...	2.4G	FELT	W	OCT. 24	07 P.M. PST
NOV. 12	18	10	24.9	47.95 N.	122.42 W.	28	...	...	3.9G	IV	W	NOV. 12	10 A.M. PST
NOV. 26	12	30	00.7	47.66 N.	122.63 W.	25	...	...	3.1G	IV	W	NOV. 26	04 A.M. PST
WYOMING													
OCT. 8	16	49	32.2	44.23 N.	110.79 W.	1	...	...	3.0G	III	G	OCT. 8	09 A.M. MST
OCT. 18	10	10	40.2	44.78 N.	110.71 W.	1	...	...	2.1G	IV	G	OCT. 18	03 A.M. MST
NOV. 15	02	36	21.6	44.97 N.	110.99 W.	0	...	...	3.0G	III	G	NOV. 14	07 P.M. MST
DEC. 15	14	17	58.1	42.89 N.	110.99 W.	5	...	...	2.9G	...	G	DEC. 15	07 A.M. MST
DEC. 15	15	36	10.5	42.92 N.	110.98 W.	5	...	...	2.9G	...	G	DEC. 15	08 A.M. MST

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*

[Sources of the hypocenters, magnitudes, and macroseismic data: (B) University of California, Berkeley; (E) U.S. Department of Energy, Las Vegas, Nev.; (G) U.S. Geological Survey, National Earthquake Information Service, Golden, Colo., or Network Operations Branch, Menlo Park, Calif.; (H) U.S. Geological Survey, Hawaiian Volcano Observatory; (J) Weston Observatory, Mass.; (K) Tennessee Earthquake Information Center, Memphis; (M) National Oceanic and Atmospheric Administration, Alaska Tsunami Warning Center, Palmer; (P) California Institute of Technology, Pasadena; (S) St. Louis University, St. Louis, Mo.; (T) Oklahoma Geological Survey, 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. Epicenters are shown in decimal degrees. Only earthquakes with intensity data and explosions are listed]

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

ALASKA

6 October (G) Central Alaska
Origin time: 18 35
Epicenter: Not located.
Depth: None computed.
Magnitude: 2.3 ML(A)
Intensity IV: Fairbanks.

16 October (G) Southern Alaska
Origin time: 07 52 50.4
Epicenter: 60.91 N., 147.01 W.

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

ALASKA--Continued

Depth: Normal
Magnitude: 4.2 mb(G), 4.2 ML(M)

Felt at Anchorage, Cordova, and Valdez (M).

9 November (G) Fox Islands, Aleutian Islands
Origin time: 16 45 06.0
Epicenter: 53.22 N., 165.75 W.
Depth: Normal
Magnitude: 5.5 mb(G), 5.3 MS(G), 5.4 MS(B)
Intensity IV: Unalaska (M).

14 November (G) Unimak Island region
Origin time: 00 43 03.3
Epicenter: 54.07 N., 164.54 W.
Depth: 66 km
Magnitude: 5.1 mb(G)
Intensity III: Cold Bay.

16 November (G) Southern Alaska
Origin time: 23 49 48.0
Epicenter: 60.11 N., 153.12 W.
Depth: 126 km
Magnitude: 4.5 mb(G)
Intensity II: Homer (M).

17 November (G) Kenai Peninsula
Origin time: 11 28 40.8
Epicenter: 60.31 N., 151.74 W.
Depth: 74 km
Magnitude: 4.8 mb(G)
Intensity IV: Clam Gulch, Cooper Landing, Girdwood, Homer, Kasilof, Kenai, Ninilchik, Soldotna, Sterling, Tyonek.
Intensity III: Anchor Point, Anchorage, Nikishka, Whittier.
Intensity II: Palmer (M).

18 November (G) Central Alaska
Origin time: 06 16 08.5
Epicenter: 64.58 N., 149.21 W.
Depth: 10 km
Magnitude: 3.4 ML(M)
Intensity IV: Nenana (M).
Intensity II: Fairbanks (M).
Felt: Chena Ridge (press report).

19 November (G) Southern Alaska
Origin time: 01 45 33.7
Epicenter: 61.40 N., 149.96 W.
Depth: 45 km
Magnitude: 2.8 ML(M)
Intensity III: Anchorage (M).

23 November (G) Kenai Peninsula
Origin time: 07 27 34.6
Epicenter: 60.69 N., 151.19 W.
Depth: 86 km
Magnitude: None computed
Intensity III: Anchorage and Kenai (M).

6 December (G) Southern Alaska
Origin time: 17 27 41.6
Epicenter: 61.97 N., 148.40 W.
Depth: 63 km
Magnitude: 4.6 mb(G)
Intensity IV: Sheep Mountain Lodge and Big Lake (M).

7 December (G) Southern Alaska
Origin time: 17 45 40.1
Epicenter: 61.90 N., 147.65 W.
Depth: Normal
Magnitude: 2.9 ML(M)
Intensity III: Chickaloon and Sheep Mountain (M).

8 December (G) Central Alaska
Origin time: 14 06 59.0
Epicenter: 64.83 N., 147.49 W.
Depth: 15 km
Magnitude: 3.0 ML(M)
Intensity III: Fairbanks.

18 December (G) Southern Alaska
Origin time: 14 20 45.5
Epicenter: 61.29 N., 150.20 W.
Depth: Normal
Magnitude: 2.1 ML(M)
Intensity III: Alaska Railroad Dispatch, Anchorage (M).

20 December (G) Southern Alaska
Origin time: 10 52 06.4
Epicenter: 61.27 N., 150.30 W.
Depth: 65 km
Magnitude: None computed.

Intensity III: Anchorage (M).

30 December (G) Central Alaska
Origin time: 13 47 26.7
Epicenter: 64.51 N., 147.99 W.
Depth: 15 km
Magnitude: 3.9 mb(G), 4.2 ML(M)
Intensity IV: Ester, Fairbanks, Fort Wainwright.

30 December (G) Central Alaska
Origin time: 14 00 33.5
Epicenter: 64.56 N., 148.09 W.
Depth: 24 km
Magnitude: 4.9 mb(G), 4.6 MS(G), 5.2 ML(M)

Felt from Delta Junction to the Ester-Fairbanks area (M).

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December1981*--Continued

ALASKA--Continued

Intensity V: Ester (few small objects overturned; windows, doors, and dishes rattled; felt by many).
Intensity IV: Fairbanks, Fort Wainright, North Pole, Usibelli.
Intensity III: Minto.
Felt: Eilson Air Force Base.

31 December (G) Southern Alaska
Origin time: 12 15 54.5
Epicenter: 61.91 N., 151.76 W.
Depth: 128 km
Magnitude: 4.1 mb(G)

Felt at Houston and Wasilla (M).

ARIZONA

28 December (G) Southern Nevada
Origin time: 22 45 42.1

See Nevada listing.

CALIFORNIA

1 October (B) Owens Valley area
Origin time: 01 04 15.5
Epicenter: 37.63 N., 118.87 W.
Depth: 1 km
Magnitude: 3.5 ML(B)

Felt in the Mammoth Lakes area (B).

1 October (B) Owens Valley area
Origin time: 07 02 05.1
Epicenter: 37.53 N., 118.89 W.
Depth: 7 km
Magnitude: 3.9 mb(G), 4.6 ML(B)

Felt in the Mammoth Lakes area (B).

1 October (B) Owens Valley area
Origin time: 13 22 36.0
Epicenter: 37.62 N., 118.88 W.
Depth: 2 km
Magnitude: 3.7 ML(B)

Felt in the Mammoth Lakes area (B).

2 October (B) Owens Valley area
Origin time: 07 37 22.3
Epicenter: 37.63 N., 118.88 W.
Depth: 4 km

Table 2.-*Summary of macroseismic data for U. S. earthquakes, October-December*--Continued

CALIFORNIA--Continued

Magnitude: 4.2 ML(B)

Felt in the Mammoth Lakes area (B).

2 October (B) Owens Valley area
Origin time: 16 14 23.5
Epicenter: 37.63 N., 118.87 W.
Depth: 1 km
Magnitude: 3.5 ML(B)

Felt in the Mammoth Lakes area (B).

3 October (B) Owens Valley area
Origin time: 01 20 37.3
Epicenter: 37.60 N., 118.84 W.
Depth: 1 km
Magnitude: 4.0 ML(B)

Felt in the Mammoth Lakes area (B).

3 October (B) Owens Valley area
Origin time: 14 40 55.3
Epicenter: 37.59 N., 118.89 W.
Depth: 9 km
Magnitude: 3.7 ML(B)

Felt in the Mammoth Lakes area (B).

6 October Northern California
Origin time: 07 16 11.2
Epicenter: 40.42 N., 123.52 W.
Depth: 5 km
Magnitude: 2.7 ML(B)
Intensity IV: Miranda.

9 October (B) Owens Valley area
Origin time: 11 01 00.2
Epicenter: 37.64 N., 118.89 W.
Depth: 11 km
Magnitude: 3.6 ML(B)

Felt in the Mammoth Lakes area (B).

9 October (B) Owens Valley area
Origin time: 11 17 26.0
Epicenter: 37.58 N., 118.83 W.
Depth: 6 km
Magnitude: 3.6 ML(B)

Felt in the Mammoth Lakes area (B).

9 October (B) Central California
Origin time: 18 55 28.9
Epicenter: 38.77 N., 122.68 W.
Depth: 5 km
Magnitude: 3.2 ML(B)

Felt at Cobb Mountain (B).

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

CALIFORNIA--Continued

10 October (B) Northern California
Origin time: 12 13 17.8
Epicenter: 40.52 N., 122.12 W.
Depth: 5 km
Magnitude: 3.2 ML(B)

Felt at Redding (B).

20 October (P) Southern California
Origin time: 12 40 55.6
Epicenter: 33.52 N., 116.45 W.
Depth: 5 km
Magnitude: 3.0 ML(P)
Intensity IV: Palm Desert (press report).
Felt: Palm Springs and Coachella Valley (P).

21 October (P) Southern California
Origin time: 05 37 44.7
Epicenter: 33.50 N., 116.77 W.
Depth: 5 km
Magnitude: 3.6 ML(P)

Felt at Hemet (P).

26 October (B) Owens Valley area
Origin time: 14 58 01.8
Epicenter: 37.39 N., 118.53 W.
Depth: 18 km
Magnitude: 3.1 ML(B), 2.9 ML(P)
Intensity III: Bishop (press report).

28 October (P) Southern California
Origin time: 14 17 08.9
Epicenter: 34.33 N., 118.52 W.
Depth: 5 km
Magnitude: 3.1 ML(P)
Intensity III: Granada Hills, Van Nuys.
Felt: San Fernando.

9 November (P) Imperial Valley
Origin time: 15 54 40.5
Epicenter: 32.83 N., 115.63 W.
Depth: 6 km
Magnitude: 2.7 ML(P)
Intensity IV El Centro (press report).

10 November (P) Southern California
Origin time: 22 34 35.5
Epicenter: 35.02 N., 119.13 W.
Depth: 3 km
Magnitude: 4.7 mb(G), 4.6 ML(P), 4.9 ML(B)
Intensity V: The most common effects at the places listed below were few items thrown from store shelves; few small objects overturned and fell; windows, doors, and dishes rattled.
Mettler, Pumpkin Center, Ventura.

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

CALIFORNIA--Continued

Intensity IV: Caliente, Cuyama, Delkern, Fellows, Frazier Park, Leona Valley, Oxnard, Taft, Tehachapi.
Intensity III: Arvin, Bakersfield, DiGiorgio, Huntington Beach, Inyokern, Lamont, Lebec, Lost Hills, McKittrick, Northridge, Pasadena, Simi Valley, Upland.
Intensity II: Edison, Fillmore.
Felt: Covina (P), Lake Hughes, Los Angeles (press report), Northwest Los Angeles County (P), Santa Barbara (press report), Thousand Oaks (P), Wheeler Ridge (press report).

10 November (P) Southern California
Origin time: 22 37 05.0
Epicenter: 35.02 N., 119.18 W.
Depth: 9 km
Magnitude: 4.2 ML(P)

Felt at Mettler and Wheeler Ridge (press report).

11 November Southern California
Origin time: 01 19
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.

Felt at Silverado (press report).

13 November (B) Owens Valley area
Origin time: 03 00 00.2
Epicenter: 37.62 N., 118.97 W.
Depth: 5 km
Magnitude: 3.8 ML(B)

Felt in the Mammoth Lakes area (B).

13 November (B) Owens Valley area
Origin time: 03 07 47.6
Epicenter: 37.63 N., 118.97 W.
Depth: 5 km
Magnitude: 3.7 ML(B)

Felt in the Mammoth Lakes area (B).

14 November (P) Southern California
Origin time: 17 57 44.5
Epicenter: 34.07 N., 118.02 W.
Depth: 11 km
Magnitude: 1.9 ML(P)

Felt at El Monte (P).

18 November (B) Central California
Origin time: 16 15 49.2
Epicenter: 37.49 N., 119.54 W.
Depth: 3 km

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December*--Continued

CALIFORNIA--Continued

Magnitude: 3.8 ML(B)

Felt in Yosemite National Park (B).

7 December (B) Northern California
Origin time: 21 32 37.4
Epicenter: 39.58 N., 123.22 W.
Depth: 5 km
Magnitude: 2.6 ML(B)
Intensity IV: Willits (water splashed onto sides of swimming pools and lakes, small objects moved, buildings trembled strongly, felt by many).

10 December (B) Owens Valley area
Origin time: 09 33 20.2
Epicenter: 37.43 N., 118.46 W.
Depth: 19 km
Magnitude: 3.5 ML(B), 3.0 ML(P)

Felt at Bishop (P), and in Inyo and Mono Counties (press report).

10 December (B) Central California
Origin time: 11 57 37.8
Epicenter: 38.80 N., 122.56 W.
Depth: 6 km
Magnitude: 3.3 ML(B)

Felt in the Cobb Mountain area (press report).

12 December (B) Central California
Origin time: 15 11 09.1
Epicenter: 37.38 N., 122.28 W.
Depth: 9 km
Magnitude: 3.8 ML(B)

Felt in San Mateo and Santa Cruz Counties.

Intensity V: San Carlos (few small objects overturned and fell, buildings trembled strongly, felt by many and awakened several).
Intensity IV: Belmont, El Granada, Half Moon Bay, La Honda, Menlo Park, Palo Alto, Pescadero, Redwood City, San Mateo, South San Francisco (press report).
Felt: San Francisco (press report).

15 December (P) Owens Valley area
Origin time: 08 05 33.9
Epicenter: 36.10 N., 117.83 W.
Depth: 4 km
Magnitude: 3.8 ML(P), 4.0 ML(B)
Intensity IV: Darwin, Kernville.

16 December (P) Southern California
Origin time: 14 33 46.2
Epicenter: 33.77 N., 118.05 W.

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December1981*--Continued

CALIFORNIA--Continued

Depth: 6 km
Magnitude: 2.1 ML(P)

Felt at Los Alamitos and Long Beach (P).

18 December (B) Central California
Origin time: 14 41 44.9
Epicenter: 38.28 N., 122.63 W.
Depth: 5 km
Magnitude: 3.1 ML(B)
Intensity IV: Glen Ellen, Petaluma.
Intensity III: Eldridge, Sonoma.
Felt: Santa Rosa (B).

20 December (B) Central California
Origin time: 07 41 49.7
Epicenter: 38.29 N., 122.62 W.
Depth: 5 km
Magnitude: 3.2 ML(B)

Felt at Petaluma and Santa Rosa (B).

20 December (G) Northern California
Origin time: 10 25 29.5
Epicenter: 38.29 N., 122.58 W.
Depth: 5 km
Magnitude: 2.6 ML(B)

Felt in the Santa Rosa area (B).

20 December (G) Northern California
Origin time: 15 29 55.4
Epicenter: 38.29 N., 122.57 W.
Depth: 5 km
Magnitude: 2.8 ML(B)

Felt in the Santa Rosa area (B).

30 December (B) Northern California
Origin time: 02 12 26.3
Epicenter: 39.51 N., 123.39 W.
Depth: 1 km
Magnitude: 2.6 ML(B)
Intensity IV: Willits.

CALIFORNIA--OFF THE COAST

23 October (P) Southern California
Origin time: 17 28 16.9
Epicenter: 33.63 N., 119.02 W.
Depth: 12 km
Magnitude: 4.7 mb(G), 4.6 ML(P), 4.3 ML(B)

This earthquake was felt over approximately 6000 sq km of the land area of Los Angeles, Orange, and Ventura Counties (fig. 7).

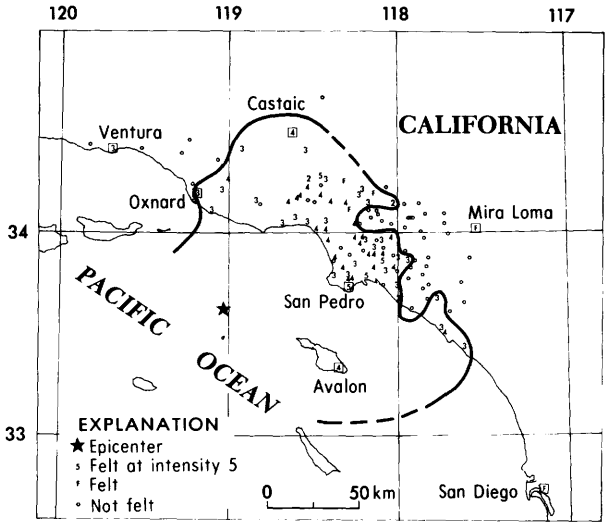

FIGURE 7.--Intensity map for the southern California, earthquake of 23 October 1981, 17 28 16.9 UTC. Roman numerals represent Modified Mercalli intensities between isoseismals; Arabic numerals are used to represent these intensities at specific sites.

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

CALIFORNIA--OFF THE COAST--Continued

Intensity V: The most common effects at the places listed below were few small objects overturned and fell, water splashed onto sides of lakes and swimming pools, and felt by many.
Artesia (hairline cracks in plaster and drywall), Long Beach, Mission Hills, San Pedro.

Intensity IV: Avalon, Bellflower, Calabasas, Canoga Park, Castaic, Cole, Culver City, Cypress, Glendale, Huntington Park, Laguna Niguel, Lakewood, Lawndale, Lomita, Los Angeles, Manhattan Beach, Marina del Rey, Maywood, North Hollywood, Northridge, Norwalk, Paramount, Reseda, San Fernando, Santa Monica, Somis, Southgate, Torrance, Universal City, Van Nuys, Venice, Whittier, Wilmington.

Intensity III: Arleta, Bell, Beverly Hills, Buena Park, Calabasas Park, Camarillo, Compton, Downey, El Camino College, East Irvine, Fillmore, Florence, Fullerton, Harbor City, Huntington Beach, La Canada, Laguna Niguel, Los Alamitos, Malibu, Montrose, Oxnard, Pacific Palisades, Palos Verdes Peninsula, Pasadena, Point Mugu, Redondo Beach, San Clemente, Saugus, Sepulveda, South Laguna, South Whittier, Thousand Oaks, Topanga, Ventura, Westminster.

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

CALIFORNIA--OFF THE COAST--Continued

Intensity II: Arcadia, Granada Hills, Santa Barbara (press report), Sun Valley, Sunland.
Felt: Altadena (press report), Mira Loma (press report), San Diego (P).

23 October (P) Southern California
Origin time: 19 15 52.5
Epicenter: 33.63 N., 119.05 W.
Depth: 6 km
Magnitude: 4.6 mb(G), 4.6 ML(P), 4.3 ML(B)

This event occurred in the same region as the one at 17 28 16.9, listed above, with about the same magnitude and felt over a similar area. Most reports tend to describe the effects as a repeat of the earlier shaking which had a maximum intensity of V.

Intensity IV: San Juan Capistrano.
Intensity III: Costa Mesa, Glendale, Laguna Niguel, Ventura.
Felt: Burbank (P) La Brea (P), Mira Loma (press report), Oxnard (press report), Pasadena (P), San Diego (press report), Santa Barbara (press report), Santa Monica (press report), Studio City (P), Valencia (press report).

4 November (P) Southern California
Origin time: 11 54 56.1
Epicenter: 33.90 N., 118.63 W.
Depth: 6 km
Magnitude: 2.7 ML(P)

Felt at Los Angeles (P).

11 November (B) Northern California
Origin time: 17 46 07.5
Epicenter: 40.22 N., 124.53 W.
Depth: 5 km
Magnitude: 3.7 mb(G), 4.0 ML(B)
Intensity IV: Whitehorn.
Intensity III: Alderpoint, Fields Landing, Honeydew.

11 December Southern California
Origin time: 18 42
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.

Felt in the beach area of Santa Monica (press report).

14 December (P) Southern California
Origin time: 11 32 59.2

Table 2.–*Summary of macroseismic data for U. S. earthquakes, October-December 1981*

CALIFORNIA--OFF THE COAST--Continued

Epicenter: 33.67 N., 119.15 W.
Depth: 25 km
Magnitude: 3.8 ML(P)

Felt in the beach area of Santa Monica (press report).

COLORADO

2 November (G) Central Colorado
Origin time: 03 03 00.2
Epicenter: 39.52 N., 105.30 W.
Depth: 1 km
Magnitude: 2.8 ML(G), 3.1 Mn(T)
Intensity V: Morrison--South Turkey Creek Canyon about 3 miles east of Aspen Park (few cracked windows and broken glassware, few small objects overturned and fallen, felt by many).
Pine Junction--about 4 miles southwest of Conifer (few small objects overturned and fallen, hanging pictures out of place, felt by many).
Intensity IV: Aspen Park, Bailey, Conifer, Double Header Mountain Estates (3 miles east of Aspen Park), Elk Creek Fire Station (near Conifer), Evergreen (2 reports of small objects overturned and fallen), 5 miles southwest of Evergreen, Littleton (Critchell and McKinney Ranch subdivision), Morrison (town), Morrison (8 miles southwest on Highway 285), Morrison (the Homestead Mountain area), Phillipsburg (and 3 miles south), Pine, Shaffer's Crossing (4 miles southwest of Conifer), Tiny Town.
Intensity III: Bailey (1 mile south of Highway 285 and 3 miles northeast of Bailey), Elk Creek Meadows (near Bailey), Evergreen (1 mile southeast of Evergreen, 3.2 miles southwest of Evergreen Dam, and 4 miles southwest of Evergreen), Foxton, Idledale, Indian Hills, Kittredge, Morrison (Hilldale Pines), Phillipsburg (5 miles south) Shawnee.
Intensity II: Golden, Golden (Lookout Mountain).
Felt: Idaho Springs, (press report).

9 December Central Colorado
Origin time: 02 45 36.2
Epicenter: Not located.
Depth: None computed.
Magnitude: None computed.

This earthquake is an aftershock of the event on November 2. It was felt at Evergreen.

Table 2.–*Summary of macroseismic data for U. S. earthquakes, October-December 1981*–Continued

CONNECTICUT

21 October (J) Long Island Sound
Origin time: 16 49 06.7

See New York listing.

HAWAII

2 October (H) Island of Hawaii
Origin time: 15 44 34.3
Epicenter: 19.34 N., 155.12 W.
Depth: 9 km
Magnitude: 3.1 ML(H)
Intensity III: Hilo.

5 October (H) Island of Hawaii
Origin time: 01 42 28.0
Epicenter: 19.28 N., 155.52 W.
Depth: 28 km
Magnitude: 3.7 ML(H)
Intensity III: Pahala.

14 October (H) Island of Hawaii
Origin time: 05 11 22.8
Epicenter: 19.28 N., 155.36 W.
Depth: 9 km
Magnitude: 3.1 ML(H)
Intensity II: Pahala.

15 October (H) Island of Hawaii
Origin time: 00 38 20.5
Epicenter: 20.00 N., 155.67 W.
Depth: 14 km
Magnitude: 3.1 ML(H)
Intensity III: Waimea.

28 October (H) Island of Hawaii
Origin time: 09 33 32.3
Epicenter: 19.38 N., 155.28 W.
Depth: 33 km
Magnitude: 4.0 ML(H)
Intensity V: Volcano.
Intensity IV: Glenwood, Hilo.
Intensity III: Kona, Pahala.

7 November (H) Island of Hawaii
Origin time: 17 23 46.8
Epicenter: 19.33 N., 155.22 W.
Depth: 10 km
Magnitude: 3.1 ML(H)
Intensity III: Volcano.

10 November (H) Island of Hawaii
Origin time: 13 02 56.6
Epicenter: 19.34 N., 155.22 W.
Depth: 10 km
Magnitude: 4.4 ML(H)
Intensity V: Hilo, Opihikao (few items thrown from store shelves--press report).

Table 2.-*Summary of macroseismic data for U. S. earthquakes, October-December*--Continued

HAWAII--Continued

Intensity IV: Glenwood, Volcano.
Intensity III: Pahala.
Intensity II: Captain Cook.

10 November (H) Island of Hawaii
Origin time: 13 31 02.6
Epicenter: 19.34 N., 155.21 W.
Depth: 9 km
Magnitude: 3.4 ML(H)
Intensity III: Hilo.

16 November (H) Island of Hawaii
Origin time: 06 23 59.4
Epicenter: 19.97 N., 155.35 W.
Depth: 10 km
Magnitude: 3.0 ML(H)
Intensity III: Kukaiau, Paauilo.
Intensity II: Ahualoa, Honokaa.

16 November (H) Island of Hawaii
Origin time: 12 26 40.2
Epicenter: 19.96 N., 155.36 W.
Depth: 12 km
Magnitude: 3.4 ML(H)
Intensity III: Kukaiau, Paauilo.
Intensity II: Ahualoa, Honokaa.

19 November (H) Island of Hawaii
Origin time: 08 29 54.8
Epicenter: 19.37 N., 155.48 W.
Depth: 11 km
Magnitude: 3.6 ML(H)
Intensity IV: Pahala.
Intensity III: Hilo, Volcano.

20 November (H) Island of Hawaii
Origin time: 05 32 58.1
Epicenter: 19.96 N., 155.35 W.
Depth: 12 km
Magnitude: 3.8 ML(H)
Intensity VI: Waimea.
Intensity V: Kukuihaele.
Intensity IV: Ahualoa, Honokaa.
Intensity III: Hilo.

20 November (H) Island of Hawaii
Origin time: 17 42 52.4
Epicenter: 19.37 N., 155.08 W.
Depth: 9 km
Magnitude: 3.4 ML(H)
Intensity IV: Kalapana.
Intensity III: Hilo, Volcano.

28 November (H) Island of Hawaii
Origin time: 19 17 18.4
Epicenter: 19.97 N., 155.35 W.
Depth: 10 km
Magnitude: 3.4 ML(H)
Intensity III: Waimea.
Intensity II: Ahualoa.

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December1981*--Continued

HAWAII--Continued

1 December (H) Island of Hawaii
Origin time: 06 07 09.7
Epicenter: 19.36 N., 155.08 W.
Depth: 9 km
Magnitude: 3.4 ML(H)
Intensity III: Hilo.

7 December (H) Island of Hawaii
Origin time: 19 07 29.1
Epicenter: 19.32 N., 155.22 W.
Depth: 9 km
Magnitude: 3.2 ML(H)
Intensity III: Volcano.

8 December (H) Island of Hawaii
Origin time: 03 39 27.2
Epicenter: 19.82 N., 156.07 W.
Depth: 41 km
Magnitude: 4.0 ML(H)
Intensity IV: Kona.
Intensity III: Ahualoa, Honokaa.

13 December (H) Island of Hawaii
Origin time: 04 23 13.3
Epicenter: 19.33 N., 155.09 W.
Depth: 10 km
Magnitude: 3.7 ML(H)
Intensity III: Hilo.

14 December (H) Island of Hawaii
Origin time: 00 20 21.3
Epicenter: 19.33 N., 155.14 W.
Depth: 9 km
Magnitude: 3.3 ML(H)
Intensity III: Kurtistown.

17 December (H) Island of Hawaii
Origin time: 06 21 51.5
Epicenter: 19.33 N., 155.12 W.
Depth: 9 km
Magnitude: 3.4 ML(H)
Intensity III: Hilo.

23 December (H) Island of Hawaii
Origin time: 17 11 14.6
Epicenter: 20.10 N., 155.82 W.
Depth: 28 km
Magnitude: 3.0 ML(H)
Intensity II: Ahualoa.

IDAHO

9 December (U) Southeastern Idaho
Origin time: 08 15 05.2
Epicenter: 42.63 N., 111.43 W.
Depth: 7 km
Magnitude: 4.3 mb(G), 4.1 ML(U)

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

IDAHO--Continued

Intensity V: Conda (few items thrown from store shelves, small objects fell, and windows, doors and dishes rattled), Soda Springs (hairline cracks in plaster and drywall, small objects fell and windows, doors and dishes rattled).
Intensity IV: Paris.
Intensity III: Lava Hot Springs.
Intensity II: Pocatello.

KENTUCKY

7 December (V) Eastern Kentucky
Origin time: 20 01 10.5
Epicenter: 37.29 N., 82.92 W.
Depth: 0 km
Magnitude: None Computed.

An explosion in a coal mine about 3 miles south of Topmost. Five miners were killed and three were missing.

NEVADA

1 October (E) Southern Nevada
Origin time: 19 00 00.103
Epicenter: 37.08 N., 116.01 W.
Depth: 0 km
Magnitude: 4.9 mb(G), 5.0 ML(B), 5.2 ML(P)

Nevada Test Site explosion "PALIZA" at 37°04'53.82" N., 116°00'31.51" W., surface elevation 1287 m, depth of burial 472 m.

4 November (R) Western Nevada
Origin time: 11 47 18.9
Epicenter: 39.42 N., 119.72 W.
Depth: 2 km
Magnitude: 3.3 ML(B)
Intensity V: Reno (few small objects overturned and fell; hanging pictures swung; windows, doors, and dishes rattled).
Intensity III: Silver City.
Intensity II: Carson City.

11 November (E) Southern Nevada
Origin time: 20 00 00.036
Epicenter: 37.08 N., 116.07 W.
Depth: 0 km
Magnitude: 4.8 mb(G), 4.8 ML(B), 5.0 ML(P)

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

NEVADA--Continued

Nevada Test Site explosion "TILCI" at 37°04'34.76" N., 116°04'06.57" W., surface elevation 1259 m, depth of burial 445 m.

12 November (E) Southern Nevada
Origin time: 15 00 00.100
Epicenter: 37.11 N., 116.05 W.
Depth: 0 km
Magnitude: 5.3 mb(G), 4.4 MS(G), 5.5 ML(B), 5.3 ML(P)

Nevada Test Site explosion "ROUSANNE" at 37°06'29.35" N., 116°02'56.31" W., surface elevation 1270 m, depth of burial 518 m.

1 December (B) Western Nevada
Origin time: 16 18 50.0
Epicenter: 38.62 N., 118.19 W.
Depth: 11 km
Magnitude: 4.5 ML(B)
Intensity V: Luning (few items thrown from store shelves, few small objects overturned and fell, buildings trembled strongly, felt by all and awakened many).
Intensity IV: Mina.
Intensity II: Cabbs.

3 December (E) Southern Nevada
Origin time: 15 00 00.098
Epicenter: 37.15 N., 116.07 W.
Depth: 0 km
Magnitude: 4.6 mb(G), 4.9 ML(B)

Nevada Test Site explosion "AKAVI" at 37°08'54.35" N., 116°04'15.01" W., surface elevation 1320 m, depth of burial 494 m.

7 December (B) Western Nevada
Origin time: 07 47 51.6
Epicenter: 38.67 N., 118.22 W.
Depth: 6 km
Magnitude: 4.1 ML(B)
Intensity IV: Luning, Mina.
Intensity III: Hawthorne.

16 December (E) Southern Nevada
Origin time: 21 05 00.093
Epicenter: 37.12 N., 116.12 W.
Depth: 0 km
Magnitude: 4.4 mb(G), 4.4 ML(B)

Nevada Test Site explosion "CABOC" at 37°06'52.29" N., 116°07'22.36" W., surface elevation 1375 m, depth of burial 335 m.

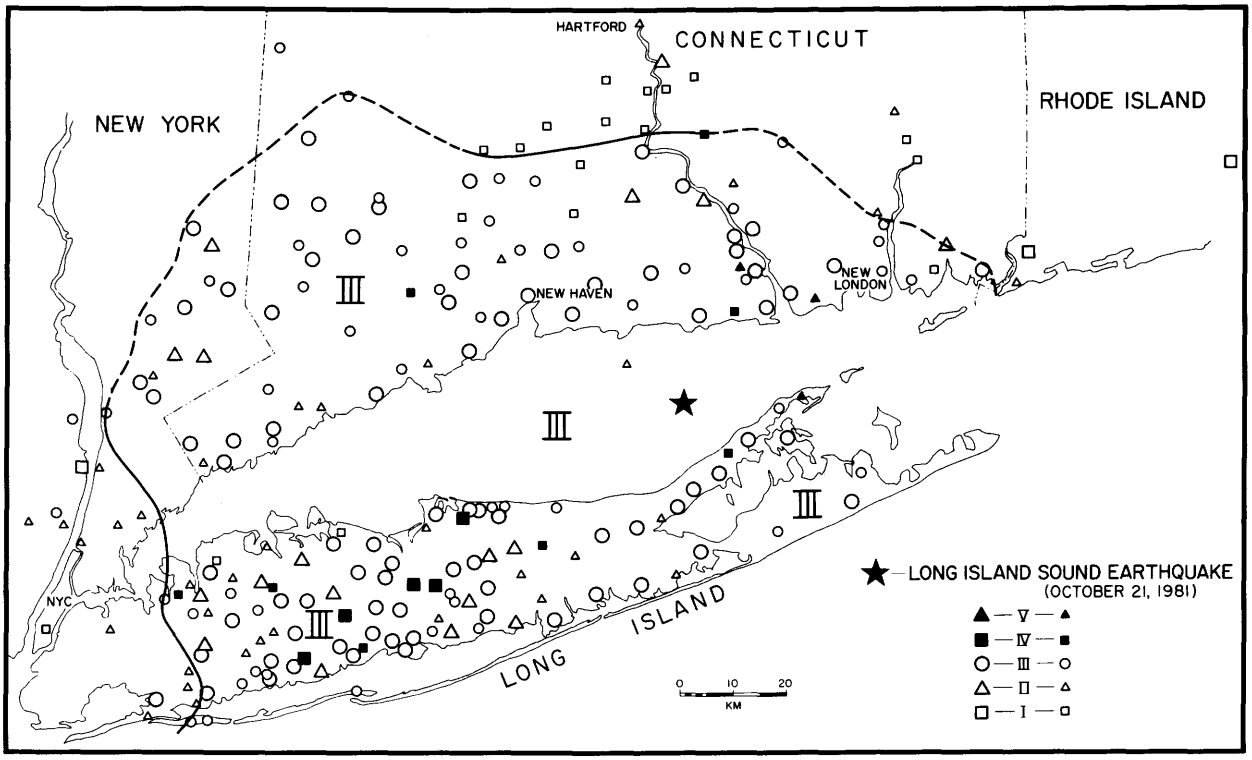

FIGURE 8.--Intensity survey of the October 21, 1981 earthquake in Long Island Sound, New York. Larger symbols represent the modal values of reported intensities for a given locality, and smaller symbols represent either single reports or reports from localities for which there was no well defined mode (provided by Schlesinger-Miller, Lamont-Doherty Geological Observatory).

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

NEVADA--Continued

28 December (G) Southern Nevada
Origin time: 22 45 42.1
Epicenter: 37.21 N., 114.98 W.
Depth: 5 km
Magnitude: 3.6 ML(G)
Intensity IV:
Arizona--Temple Bar.
Nevada--Blue Diamond, Henderson, Las Vegas, North Las Vegas, Pioche.
Utah--Toquerville.
Felt:
Nevada--Alamo and Boulder City (press report).

NEW MEXICO

4 December (G) Western New Mexico
Origin time: 08 51 24.2
Epicenter: 34.46 N., 108.23 W.
Depth: 5 km
Magnitude: 2.8 ML(G)

Felt south of Grants (telephone report).

Table 2.-*Summary of macroseismic data for U. S. earthquakes, October-December*--Continued

NEW YORK

21 October (J) Long Island Sound
Origin time: 16 49 06.7
Epicenter: 41.15 N., 72.58 W.
Depth: 6 km
Magnitude: 3.8 Mn(J), 3.4ML(J)

Felt in southern Connecticut, Long Island and vicinity, New York, and western Rhode Island. This is the first event to be located instrumentally within the Sound (Pulli and Godkin, 1981). The extent of the felt area mapped by Schlesinger-Miller, Lamont-Doherty Geological Observatory is shown on the intensity map in figure 8; however, it does not reflect all the intensity values listed below.

Intensity V: The most common effects at the places listed below were hairline cracks in plaster and drywall, few items thrown from store shelves, few small objects overturned and fell, few glassware and dishes broke, few windows cracked, felt by many.
Connecticut--Centerbrook, Chester, East Lymes (foundation cracked), Essex, Gales

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

NEW YORK--Continued

Ferry, Middle Haddam, Moodus, Mystic, Old Saybrook, Seymour, South Lyme, Stratford.
New York--Mastic Beach (a chandelier fell and dishes fell from shelves--press report), south shore of Suffolk County (dishes fell from shelves--press report).

Intensity IV:
Connecticut--Clinton, Deep River, Derby, East Hampton, Groton, Guilford, Haddam, Hadlyme, Madison, Monroe, Saybrook (press report), Westbrook (press report).
New York--Great Kills (press report), Hauppauge (press report), Todt Hill (press report).

Intensity III:
Connecticut--Colchester, East Haddam, Haddam, Higganum, Ivoryton, Portland, New Haven (press report), New London, Niantic, Northford, Quaker Hill, Stevenson.
New York--Commack, East Chester, Greenburg, Orient Point, Port Chester, Riverhead, Rye, Sea Cliff, Yorktown (all from press reports).

Intensity II:
Connecticut--Old Mystic.
New York--Shelter Island, Waterbury, and West Hempstead (press reports).

Felt:
Connecticut--Danbury (press report), Middletown (press report), Norwich (press report), Uncasville, Waterbury (press report).
Rhode Island--Western tip.

RHODE ISLAND

21 October (J) Long Island Sound
Origin time: 16 49 06.7

See New York listing.

TENNESSEE

22 October (K) Northwestern Tennessee
Origin time: 10 33 29.3
Epicenter: 36.30 N., 89.44 W.
Depth: 3 km
Magnitude: 2.5 MD(K)

Felt at Ridgely (K).

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*

TENNESSEE--Continued

8 November (S) Northwestern Tennessee
Origin time: 17 11 19.0
Epicenter: 36.10 N., 89.39 W.
Depth: 12 km
Magnitude: 3.0 Mn(G), 2.5 Mn(T), 2.9 MD(K)
Intensity IV: Dyersburg, Newbern.
Intensity III: Gates, Maury City, Wynnburg.

TEXAS

6 November (G) Eastern Texas
Origin time: 12 36 40.5
Epicenter: 32.02 N., 95.26 W.
Depth: 5 km
Magnitude: 3.2 Mn(T), 2.9 MD(K)
Intensity IV: Jacksonville (press report), Mount Enterprise (press report), New Summerfield.

UTAH

17 December (U) Central Utah
Origin time: 10 47 43.5
Epicenter: 40.33 N., 111.64 W.
Depth: 2 km
Magnitude: 2.2 ML(U)
Intensity IV: Edgemont and Orem (press report).
Felt: Provo and Utah Counties (press report).

28 December (G) Southern Nevada
Origin time: 22 45 42.1

See Nevada listing.

VIRGINIA

23 November (V) Northern Virginia
Origin time: 13 14 51.0
Epicenter: 38.24 N., 79.09 W.
Depth: 10 km
Magnitude: 2.1 MD(V)
Intensity IV: Staunton.
Felt: Churchville, Frank's Mill (telephone report).

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December1981*--Continued

VIRGINIA--Continued

4 December (V) Southwestern Virginia
Origin time: 02 35 56.2
Epicenter: 36.98 N., 80.78 W.
Depth: 8 km
Magnitude: 2.1 Mn(V)
Felt: Pulaski (V).

WASHINGTON

25 October (W) Central Washington
Origin time: 03 21 03.6
Epicenter: 47.76 N., 120.17 W.
Depth: 0 km
Magnitude: 2.4 ML(G), 2.7 MD(W)

Felt in the Chelan area (press report).

12 November (W) Northwestern Washington
Origin time: 18 10 24.9
Epicenter: 47.95 N., 122.42 W.
Depth: 28 km
Magnitude: 3.9 ML(G)
Intensity IV: Everett (press report), Freeland, Gold Bar, Langley, Lynnwood (Seattle--press report), Marysville, Monroe, Mulkilteo, Nordland, Port Ludlow, Poulsbo, Seattle, Silvana, Woodinville.
Intensity III: Clinton, Conway, Granite Falls, Hansville, Keyport, Kingston, Lake Stevens, Northgate, Oak Harbor, Port Gamble, Snohomish.
Intensity II: Quilcene, Rollingbay.
Felt: Bainbridge Island, Indianola, Lakewood.

26 November (W) Western Washington
Origin time: 12 30 00.7
Epicenter: 47.66 N., 122.63 W.
Depth: 25 km
Magnitude: 3.1 ML(G)
Intensity IV: Fox Island, Indianola, Port Orchard, Seabeck.
Intensity III: Bremerton, Milton, Tahuya.
Felt: East Union, Shelton.

WYOMING

8 October (G) Yellowstone National Park
Origin time: 16 49 32.2
Epicenter: 44.23 N., 110.79 W.
Depth: 1 km
Magnitude: 3.0 ML(G)
Intensity III: Old Failthful.

Table 2.--*Summary of macroseismic data for U. S. earthquakes, October-December 1981*--Continued

WYOMING--Continued

18 October (G) Yellowstone National Park
Origin time: 10 10 40.2
Epicenter: 44.78 N., 110.71 W.
Depth: 1 km
Magnitude: 2.1 MD(G)
Intensity IV: Norris Geyser Basin.

15 November (G) Yellowstone National Park
Origin time: 02 36 21.6
Epicenter: 44.97 N., 110.99 W.
Depth: None computed.
Magnitude: 3.0 MD(G).
Intensity III: Madison Junction.
Intensity II: Old Faithful.

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