United States Earthquakes, 1984

By CARL W. STOVER

This publication summarizes data for earthquakes that occurred in the 50 states and Puerto Rico during 1984. Descriptions of individual earthquakes include hypocenters, magnitudes, intensities, and damages. The report also contains results from regional networks and data recorded by strong-motion seismographs

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United States Earthquakes, 1984

By Carl W. Stover, *Editor*

Introduction

This publication describes all earthquakes that were reported felt in the United States and nearby territories in 1984. Its purpose is to provide a continuous history of U.S. earthquakes to be used in estimating areal seismic risk, designing earthquake-resistant structures, and answering inquiries from scientists, engineers, and the public.

The U.S. Geological Survey/National Earthquake Information Center (USGS/NEIC) collects intensity information primarily by mailing questionnaires, "Earthquake Report" forms, to postmasters and other public institutions (police departments and/or fire departments) in the earthquake area. Completed questionnaires are returned to the USGS, where they are evaluated and intensities are assigned. For damaging earthquakes, the questionnaires are supplemented by USGS field investigations. The USGS/NEIC publishes preliminary maximum intensity data for United States earthquakes in the *Preliminary Determination of Epicenters, Monthly Listing (PDE)* (for example, Irby and others, 1982). The latest and most complete information is published with maps, diagrams, and photographs in *United States Earthquakes* (now published as a USGS Bulletin), issued annually since 1928. Copies of issues prior to 1982 can be obtained from the Open-File Services Section (OFSS), Distribution Branch, U.S. Geological Survey, Box 25425, Federal Center, Denver, Colo. 80225.

This publication is composed of four major sections: "Earthquake Descriptions," which includes a summary of macroseismic data reported for each earthquake and a chronological list of earthquakes by State (table 1); "Network Operations," which summarizes the results from local seismic networks; "Miscellaneous Activities," which contains information on principal earthquakes of the world (table 11); and "Strong-Motion Seismograph Data" (table 12). The intensity and macroseismic data in "Earthquake Descriptions" are compiled from questionnaire canvasses (see previous paragraph), newspaper articles, and reports prepared by other government organizations, State institutions, local organizations, and individuals. Each description includes date, hypocenter, the source of the hypocenter computation, magnitude, maximum intensity (Modified Mercalli), and/or macroseismic effects reported by localities that felt the earthquake.

DISCUSSION OF TABLES

The earthquake parameters in tables 1 and 11 include date, origin time, hypocenter (epicenter and focal depth), and magnitude. Table 1 also contains the maximum observed Modified Mercalli (MM) intensity. The origin time and date are listed in Universal Coordinated Time (UTC). The epicenters were taken principally from those published in the USGS *Preliminary Determination of Epicenters, Monthly Listings*. These data have been updated and new data added from subsequent publications of universities or State agencies who operate seismic networks. The accuracy of the 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 USGS/NEIC have a varying degree of accuracy, usually two-tenths of a degree or less. See *Preliminary Determination of Epicenters, Monthly Listing*, for an explanation of the accuracy of USGS hypocenters. Depths are listed to the nearest kilometer.

Magnitudes listed in the tables were furnished by cooperating institutions or determined by the USGS. The computational sources are indicated by letter codes identified in headnotes to the tables.

EPICENTER AND ISOSEISMAL MAPS

Figures 1-3 are computer plots of all earthquake epicenters in the conterminous United States, Alaska, and Hawaii listed in table 1. Figures 4-6 show only these earthquakes that had computed magnitudes of 5.0 or larger. Each earthquake epicenter is indicated by a small circle or square.

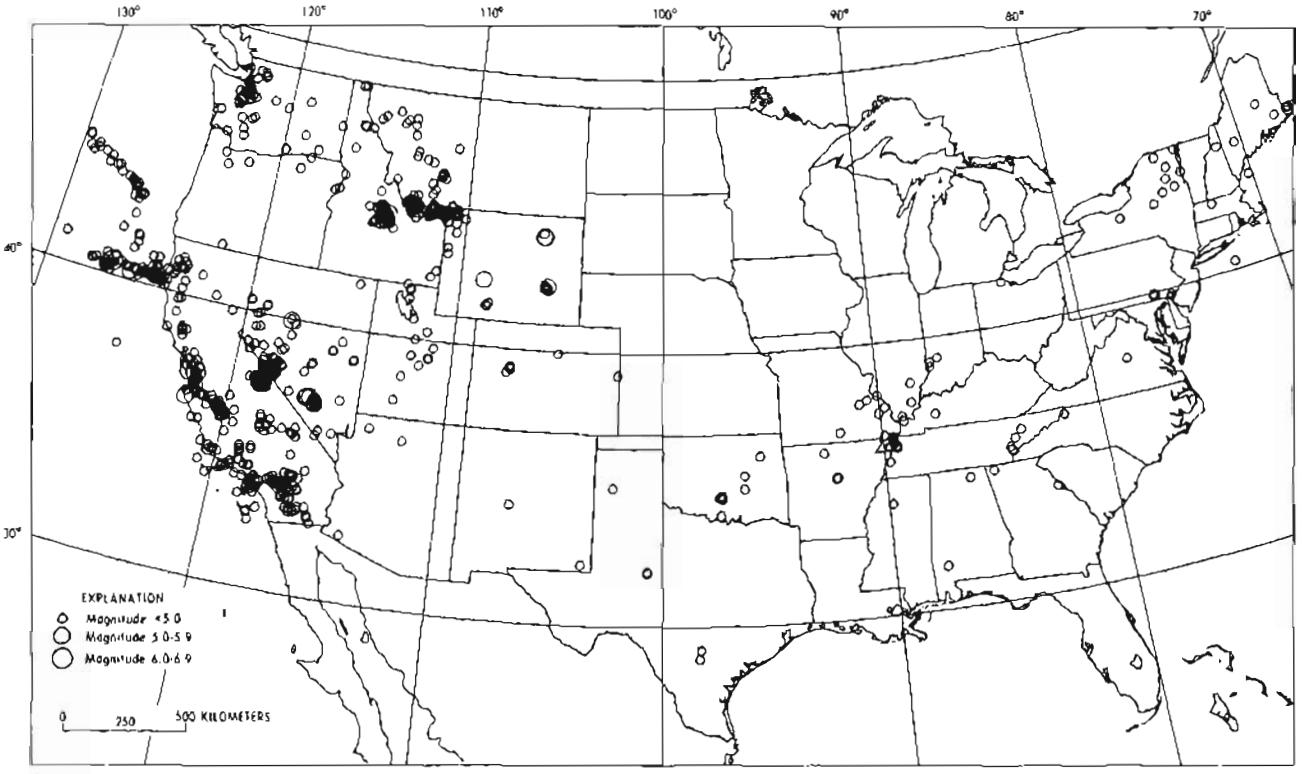

Figure 1. Earthquake epicenters in the conterminous United States for 1984 (from table 1).

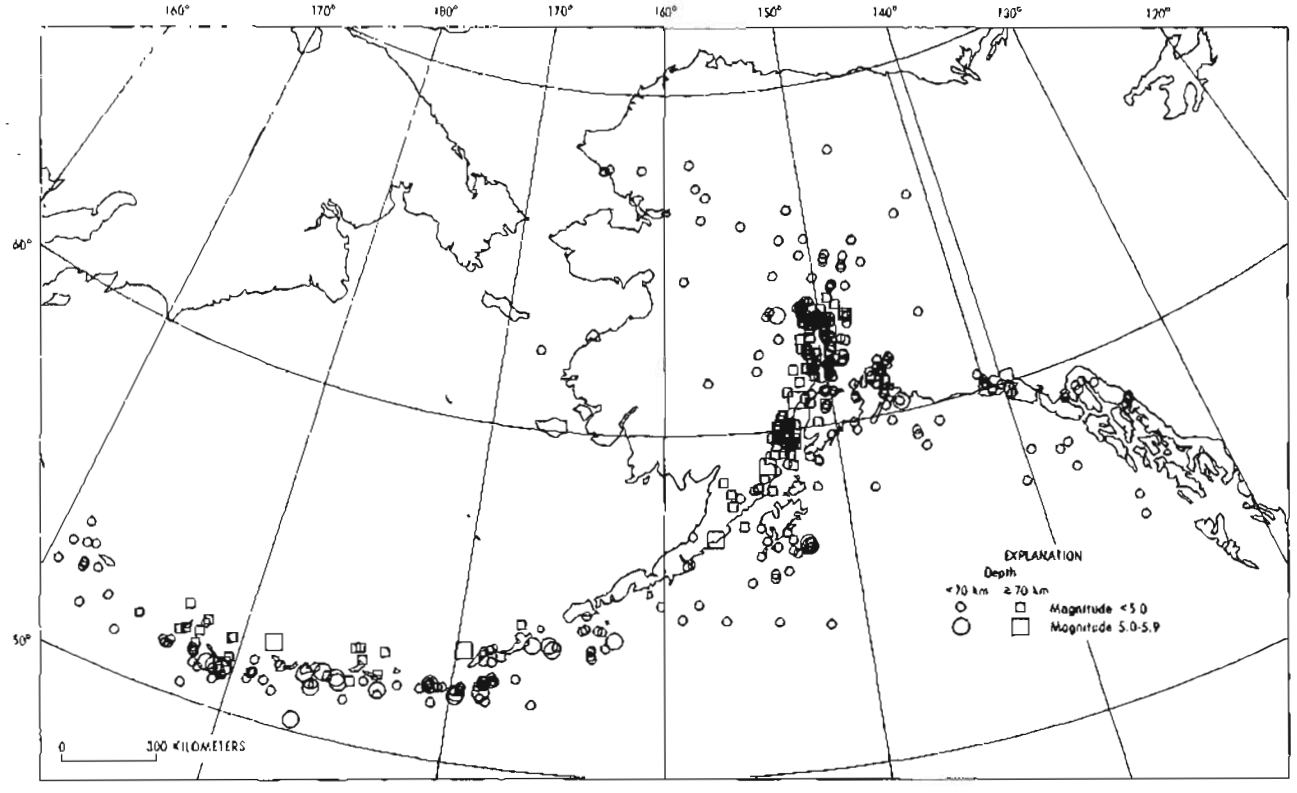

Figure 2. Earthquake epicenters in Alaska for 1984 (from table 1).

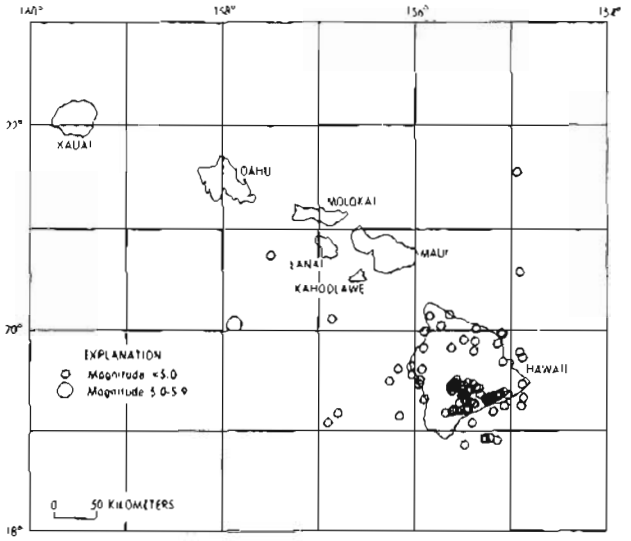

Figure 3. Earthquake epicenters in Hawaii for 1984 (from table 1).

Figures 7-9 are maps showing the maximum intensity of earthquakes in the conterminous United States, Alaska, and Hawaii. Maximum intensities are represented by Arabic numerals at the epicentral locations. Earthquakes of intensity I-IV are represented by solid circles.

The USGS/NEIC coordinates the collection of all types of earthquake information, with the special objective of correlating instrumentally determined earthquake locations with noninstrumental locations indicated by intensity data. This correlation is achieved through regional investigations of earthquakes by local organizations and the USGS. Primary data are gathered by a mail canvass of the epicentral area using questionnaire cards. A field survey is usually carried out for damaging events. When returned and analyzed, this information is used to prepare isoseismal maps which show the areal pattern of intensity associated with individual earthquakes.

The selection of earthquakes for isoseismal maps (shown in the Earthquake Descriptions) is governed largely by the size of the area affected. This means that sharp, localized shocks of intensity VI (which often occur in California) may not be represented by these maps, whereas more widely felt earthquakes of intensity V and VI (which are characteristic of the Eastern and Central States) often will be illustrated because of the larger felt areas. Arabic numerals on these computer-plotted maps represent the maximum MM intensities at sampled localities. Isoseismal contours are a generalization of intensity data and are extrapolated in regions that have few observations. The isoseismals do not account for each intensity observation since they are drawn to show the general patterns at a level of intensity or range of intensities.

MAGNITUDE AND INTENSITY RATINGS

Magnitude, a measure of the "size" of an earthquake, is related to the energy release at the focus of an earthquake. Although the magnitude scale has neither "top" nor "bottom" values, the highest ever calculated was greater than 9.0 and the lowest was about -3.0. On this logarithmic scale, a magnitude 6.0 shallow-focus earthquake represents elastic-wave energy about 30 times greater than that generated by a magnitude 5.0 earthquake, 900 times greater than that of a magnitude 4.0 shock, and so forth. Many factors enter into the determination of earthquake magnitude, including earthquake focal depth, frequency content of the sampled energy, and the earthquake radiation pattern. Magnitude values calculated by the USGS are based on the following five formulas:

Surface Wave Magnitude

$$\mathbf{M}_S = \log(\mathbf{A}/\mathbf{T}) + 1.66 \log \mathbf{D} + 3.3, \qquad (1)$$

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 $18 \leq \mathbf{T} \leq 22$; and **D** is the distance in geocentric degrees (station to epicenter), and $20^\circ \leq \mathbf{D} \leq 160^\circ$. No depth correction is made for depth less than 50 km, and no $\mathbf{M}_S$ magnitudes are computed for depths greater than 50 km.

Body Wave Magnitude

$$\mathbf{m}_b = \log(\mathbf{A}/\mathbf{T}) + \mathbf{Q}(\mathbf{D},\mathbf{h}), \qquad (2)$$

as defined by Gutenberg and Richter (1956), except that **T**, the period in seconds, is restricted to $0.1 \leq \mathbf{T} \leq 3.0$, 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 $\mathbf{D} \geq 5^\circ$.

Local Magnitude

$$\mathbf{M}_L = \log \mathbf{A} - \log \mathbf{A}_0, \qquad (3)$$

as defined by Richter (1958, p. 340), where **A** is the maximum trace amplitude in millimeters, written by a Wood-Anderson torsion seismometer, and $\log \mathbf{A}_0$ is a standard value as a function of distance, where the distance is $\leq$ 600 km. Values of $\mathbf{M}_L$ are also calculated from other seismometers by conversion of recorded ground motion to the expected response of the torsion seismometer. $\mathbf{M}_L$ magnitudes are listed for events with depths less than 70 kilometers.

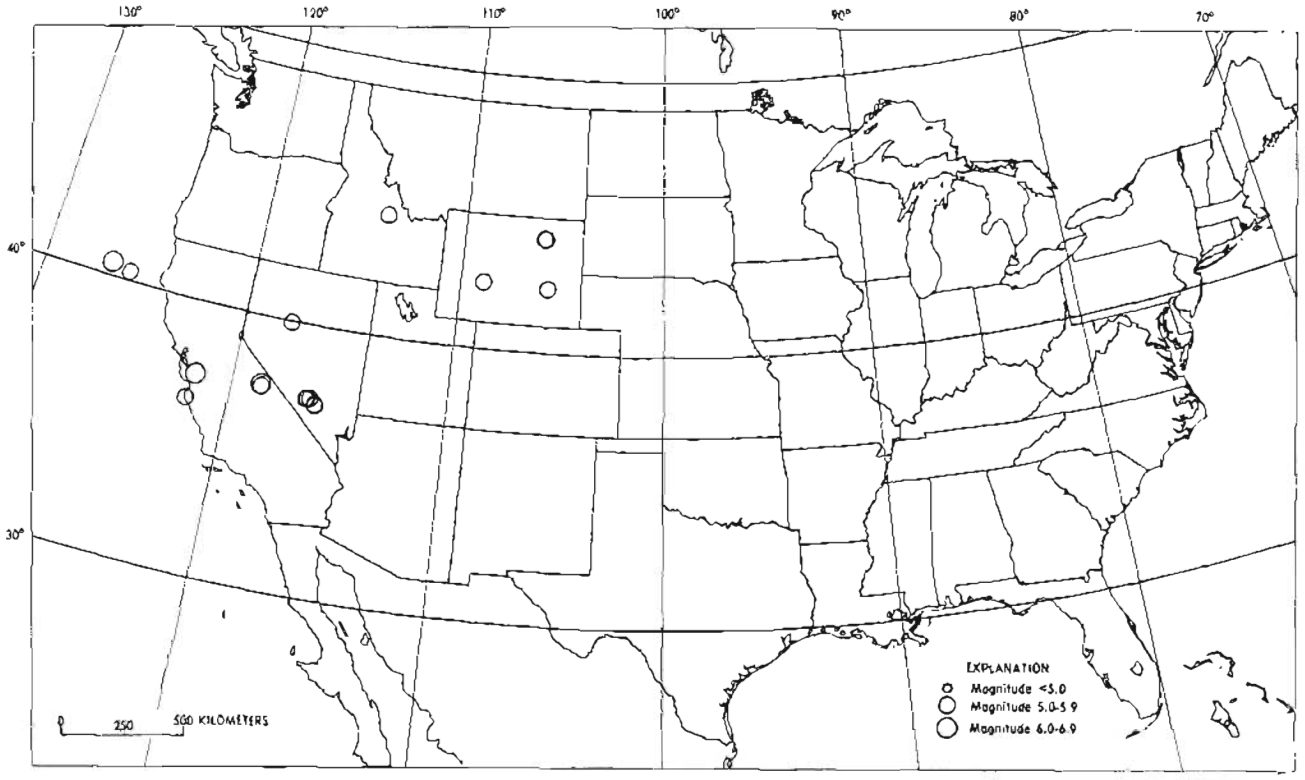

Figure 4. Epicenters in the conterminous United States for earthquakes with magnitudes $\geq$ 5.0 in 1984.

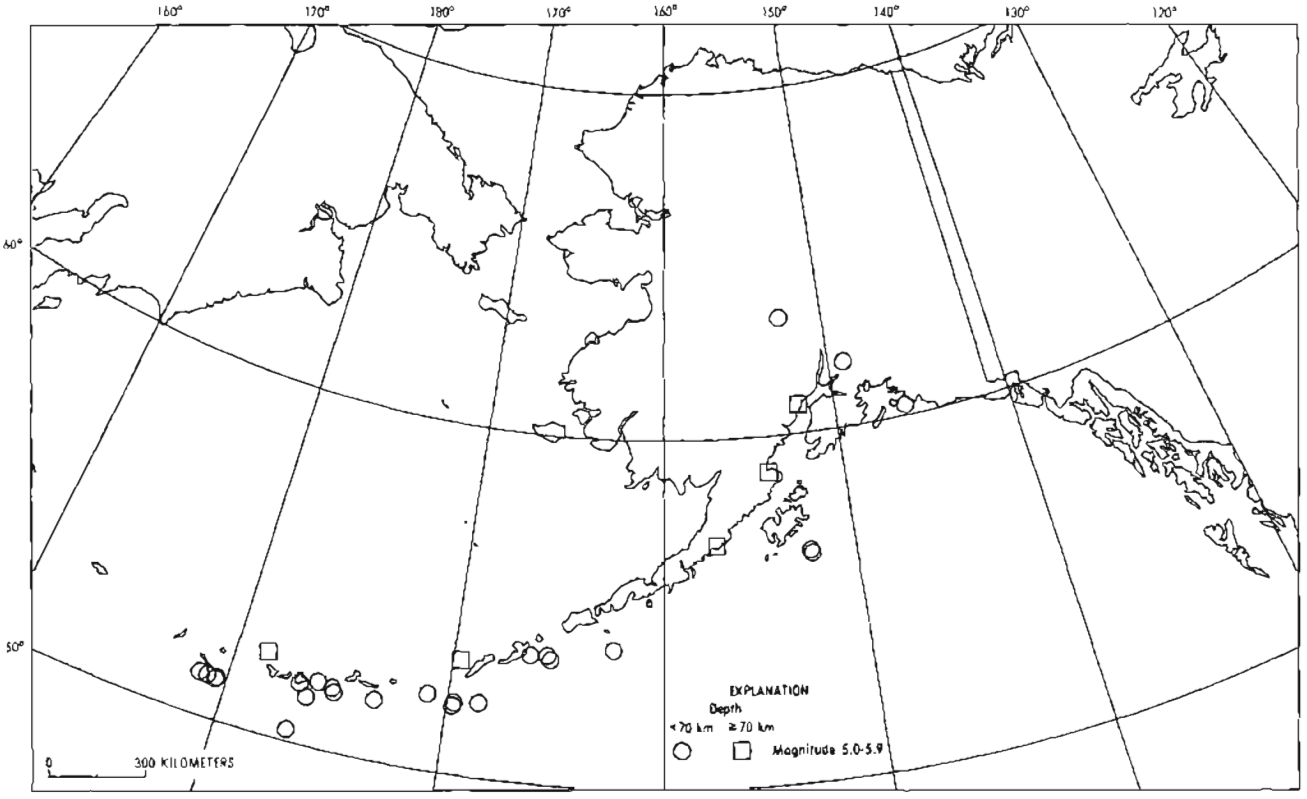

Figure 5. Epicenters in Alaska for earthquakes with magnitudes $\geq$ 5.0 in 1984.

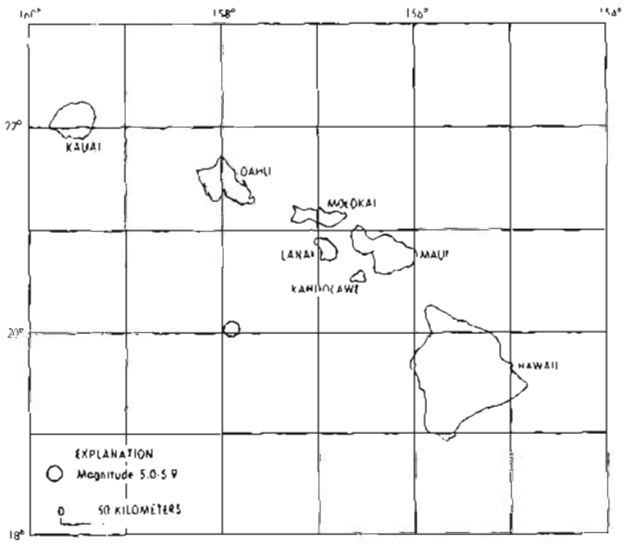

Figure 6. Epicenters in Hawaii for earthquakes with magnitudes $\geq$ 5.0 in 1984.

Local Magnitude

$$\mathbf{M}_n = 3.75 + 0.90(\log \mathbf{D}) + \log (\mathbf{A}/\mathbf{T})$$
$$0.5^\circ \leq \mathbf{D} \leq 4^\circ, \qquad (4)$$

$$\mathbf{M}_n = 3.30 + 1.66(\log \mathbf{D}) + \log(\mathbf{A}/\mathbf{T})$$
$$4^\circ \leq \mathbf{D} \leq 30^\circ$$

as proposed by Nuttli (1973) for North America east of the Rocky Mountains, where $\mathbf{A}/\mathbf{T}$ is expressed in micrometers per second, calculated from the vertical-component 1-second *Lg* waves, and $\mathbf{D}$ is the distance in geocentric degrees.

Moment Magnitude

$$\mathbf{M}_w = 2/3 \log \mathbf{M}_o - 10.7 \qquad (5)$$

as defined by Hanks and Kanamori (1979), where $\mathbf{M}_o$ is the seismic moment in dyne-cm.

Other types of magnitudes computed by other organizations or universities are also listed in this publication. These are defined in the following two paragraphs.

$\mathbf{M}_D$ designates duration or coda length magnitude. $\mathbf{M}_D$ 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. Duration magnitude scales are normally adjusted to agree with $\mathbf{M}_L$ or $\mathbf{M}_n$ estimates so that resulting magnitudes are compatible. Thus, the $\mathbf{M}_D$ formulas vary for different geographic regions and seismograph systems.

Some seismograph network operators determine a magnitude formula for their specific network based on a comparison of their computed magnitude values with magnitudes published from other sources; such as the USGS. These values are usually compared with $\mathbf{m}_b$, $\mathbf{M}_L$, or $\mathbf{M}_n$ magnitudes. In this bulletin these types of magnitudes will be designated as $\mathbf{m}$, for body wave magnitudes ($\mathbf{m}_b$) and $\mathbf{M}_X$ for local magnitudes ($\mathbf{M}_L$ or $\mathbf{M}_n$).

Intensity, as applied to earthquakes, represents a quantity determined from the effects on people, man-made structures, and the Earth's surface (landslides, ground fissures, etc.). Intensities are assigned according to the descriptions listed in the Modified Mercalli Intensity Scale of 1931 (Wood and Neumann, 1931). There are 12 discrete steps in the MM scale (see next section). An earthquake in a populated area will have different intensities at different localities, owing to the distance from the focus of the earthquake, type of focal mechanism, local geological conditions, structural design of buildings, and the earthquake magnitude.

The text of this publication gives the intensity at locations where an earthquake was reported felt and summaries of the strongest effects. Each earthquake is further characterized by its maximum intensity, which is given in the text and in table 1. The word "FELT" in the maximum intensity columns of table 1 indicates that only minimal or sketchy information was available. This does not imply that the earthquake was felt at a low intensity level, but indicates that the available data were not sufficient for assigning an intensity value.

Although the Modified Mercalli Intensity Scale is in many instances inadequate for present-day requirements, the scale has been the guide used by the USGS and will continue to be so until a new scale has been devised and has acceptance in the engineering and seismological communities.

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.

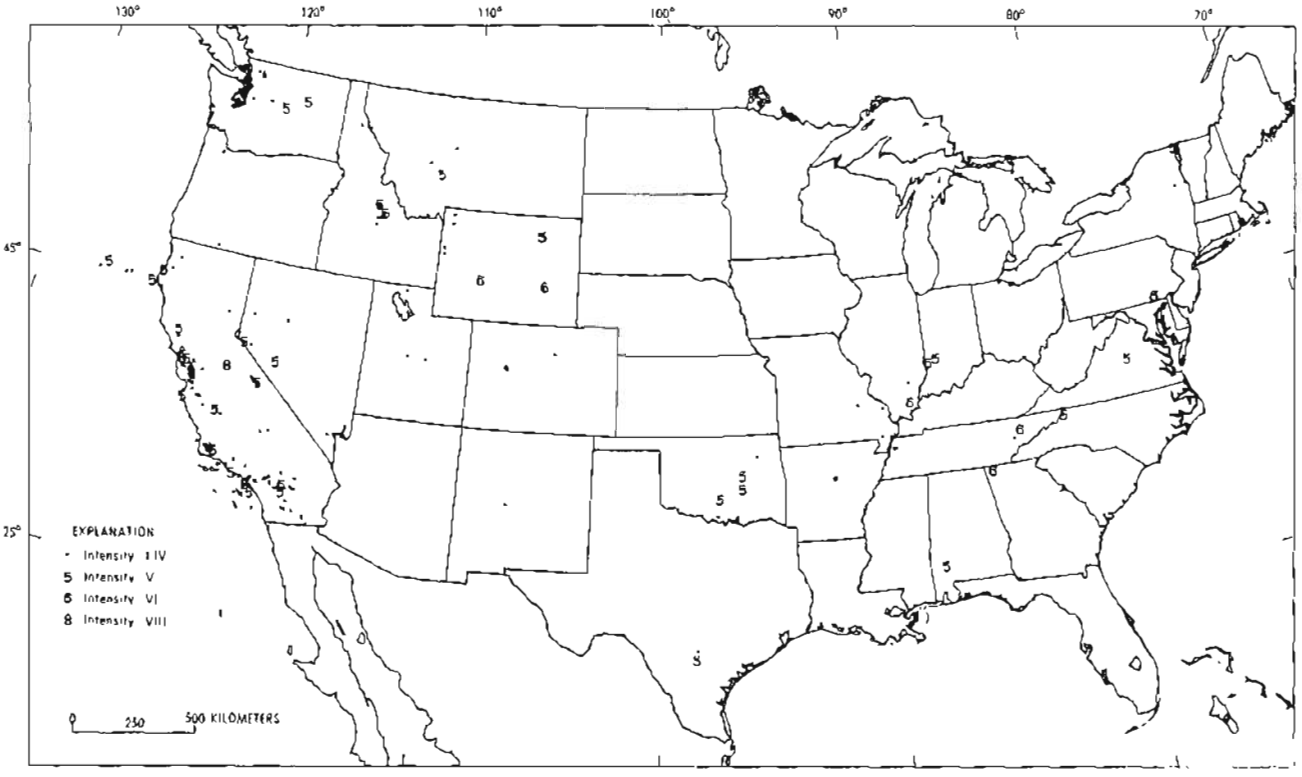

Figure 7. Earthquakes in the conterminous United States that were felt or caused damage in 1984. The intensities denote maximum observed intensity plotted at the epicenter.

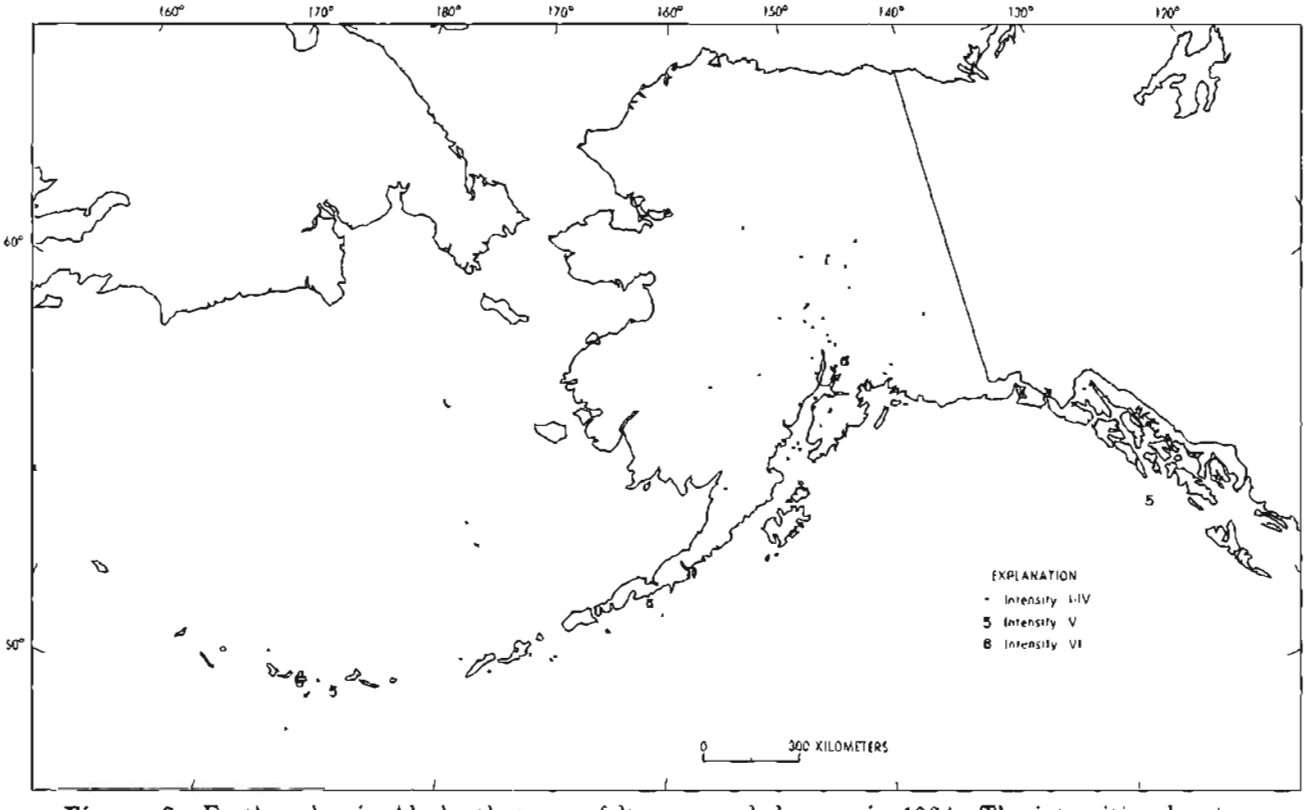

Figure 8. Earthquakes in Alaska that were felt or caused damage in 1984. The intensities denote maximum observed intensity plotted at the epicenter.

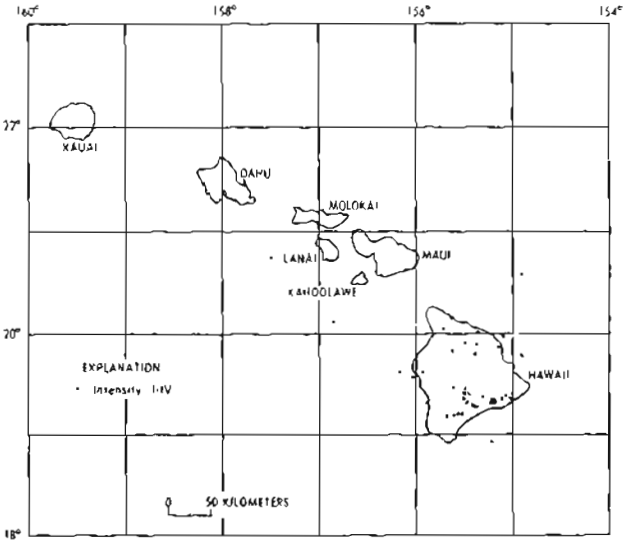

Figure 9. Earthquakes in Hawaii that were felt or caused damage in 1984. The intensities denote maximum observed intensity plotted at the epicenter.

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 in 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.

COLLABORATORS

Active cooperation in earthquake investigations in the United States is provided by several seismological collaborators. The following served as collaborators to the USGS during 1984:

Alaska.–Staff of NOAA-Alaska Tsunami Warning Center, Palmer.

California (northern).–Bruce A. Bolt and Robert A. Uhrhammer, University of California, Berkeley.

California (southern).–Clarence R. Allen and L. K. Hutton, California Institute of Technology, Pasadena.

Canada–Staff of Seismological Service, Geological Survey of Canada, Ottawa and Staff of Pacific Geoscience Centre, Sidney, British Columbia.

Connecticut.–Robert Miller, University of Connecticut, Groton.

Delaware.–Kenneth D. Woodruff, University of Delaware, Newark.

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Montana.–Anthony Qamar, University of Montana, Missoula.

Nevada.–Ute R. Vetter, University of Nevada, Reno.

New England.–James P. McCaffrey, S. J., Boston College, Weston, Mass.

New York.–Lynn R. Sykes, Lamont-Doherty Geological Observatory, Palisades, N.Y.

Ohio.–William R. Ott, S. J., John Carroll University, Cleveland.

Earthquake Descriptions

This section lists alphabetically by State (and Puerto Rico) all 1984 earthquakes that were reported felt. The origin time of each earthquake is given in Universal Coordinated Time (UTC). Time is expressed continuously from midnight to midnight, or 0 to 24 hours.

Sources of noninstrumental information (macroseismic data) in this publication include questionnaire canvasses conducted by the USGS, newspaper articles, bulletins of the Seismological Society of America, and special earthquake reports of other organizations. Instrumental data are provided by the USGS/National Earthquake Information Center, other government agencies, and universities that operate seismic networks.

Roman numerals in the earthquake descriptions refer to the Modified Mercalli Intensity Scale of 1931 (see above), which gives about equal weight to the disturbance of inanimate objects and to reactions of people. Where more than one degree of intensity is reported from a town, the town is assigned the highest intensity reported. All earthquake questionnaires or press reports that contain only minimal information, without enough detail from which to assign an intensity, are listed as "FELT."

[The following codes are used to indicate sources for hypocenters, magnitudes, intensities and/or felt data: **(BK)** University of California, Berkeley; **(BU)** Montana Bureau of Mines and Geology, Butte; **(DE)** Delaware Geological Survey, Newark; **(EN)** Department of Energy, Washington, D.C.; **(EP)** Geophysics Division, Geological Survey of Canada, Ottawa, Ontario; **(GM)** U.S. Geological Survey, Menlo Park, Calif.; **(GS)** U.S. Geological Survey, Golden, Colo.; **(HV)** Hawaiian Volcano Observatory, U.S. Geological Survey, Hawaii National Park; **(IU)** Indiana University, Bloomington; **(LA)** Los Alamos National Laboratory, New Mexico; **(LD)** Lamont-Doherty Geological Observatory, Palisades, N.Y.; **(MI)** University of Michigan, Ann Arbor; **(NM)** New Mexico Institute of Mining and Technology, Socorro: **(OS)** Oregon State University, Corvallis; **(PG)** Pacific Geoscience Centre, Sydney, B.C., Canada; **(PM)** Alaska Palmer Observatory, NOAA, Palmer, Alaska; **(PS)** California Institute of Technology, Pasadena; **(RN)** University of Nevada, Reno; **(SL)** St. Louis University, St. Louis, Mo.; **(TC)** Tennessee Earthquake Information Center, Memphis; **(TU)** Oklahoma Geological Survey, Leonard; **(UU)** University of Utah, Salt Lake City; **(VP)** Virginia Polytechnic Institute and State University, Blacksburg; **(WA)** University of Washington, Seattle; **(WO)** Weston Observatory, Weston, Mass. Normal depth = 33 km.

ALASKA

3 January (GS) Southern Alaska
Origin time: 11 40 09.1
Epicenter: 61.738N., 149.943W.
Depth: 62 km
Magnitude: $3.8m_b$(GS), $3.6M_L$(PM)
Intensity III: Anchorage (press report), Palmer (PM).

8 January (GS) Southeastern Alaska
Origin time: 03 36 43.4
Epicenter: 59.254N., 136.057W.
Depth: 15 km
Magnitude: $3.8m_b$(GS), $4.3M_L$(PM)
Felt: Haines (PM).

Oklahoma.–James E. Lawson, Jr., Oklahoma Geological Survey, Leonard.

Oregon.–Randy Jacobson, Oregon State University, Corvallis.

Pennsylvania.–Benjamin F. Howell, Jr. and Shelton Alexander, Pennsylvania State University, University Park.

South Carolina.–Pradeep Talwani, University of South Carolina, Columbia, and Joyce Bagwell, Baptist College at Charleston, Charleston.

Tennessee.–Arch C. Johnston, Tennessee Earthquake Information Center, Memphis.

Texas.–W. D. Pennington, University of Texas, Austin.

Utah.–W. J. Arabasz, University of Utah, Salt Lake City.

Virginia.–G. A. Bollinger, Virginia Polytechnic Institute and State University, Blacksburg.

Washington.–Robert S. Crosson, University of Washington, Seattle.

Wyoming.–R. A. Hutchinson, National Park Service, Yellowstone National Park.

12 January (GS) Southern Alaska
Origin time: 01 18 50.2
Epicenter: 61.764N., 154.265W.
Depth: Normal
Magnitude: $3.3M_L$(PM)
Intensity III: Palmer (PM).

14 January (GS) Southern Alaska
Origin time: 11 44 24.8
Epicenter: 59.883N., 153.293W.
Depth: 142 km
Magnitude: $4.8m_b$(GS)
Intensity III: Homer.

23 January (GS) Fox Islands, Aleutian Islands
Origin time: 22 06 06.5
Epicenter: 53.287N., 169.639W.
Depth: 103 km
Magnitude: $5.3m_b$(GS)
Intensity III: Nikolski (PM).

27 January (GS) Alaska Peninsula
Origin time: 10 00 08.6
Epicenter: 56.169N., 158.807W.
Depth: Normal
Magnitude: $4.1m_b$(GS), $4.1M_L$(PM)
Intensity IV: Chignik (PM).

3 February (GS) Southern Alaska
Origin time: 23 17 15.2
Epicenter: 62.109N., 150.942W.
Depth: 72 km
Magnitude: $4.1m_b$(GS)
Felt: Anchorage, Big Lake, and Wasilla (press report).

6 February (GS) Southern Alaska
Origin time: 07 16 31.2
Epicenter: 61.983N., 148.877W.
Depth: 18 km
Magnitude: $3.3M_L$(PM)
Felt: Anchorage and Palmer areas (PM).

6 February (GS) Southern Alaska
Origin time: 07 48 17.3
Epicenter: 62.988N., 150.739W.
Depth: 129 km
Magnitude: $4.4m_b$(GS)
Intensity II-III: Anchorage to Talkeetna (PM).

6 February (GS) Central Alaska
Origin time: 12 15 35.3
Epicenter: 64.944N., 149.011W.
Depth: Normal

ALASKA—Continued

Magnitude: None computed.
Felt: Fairbanks (PM).

10 February (GS) Southern Alaska
Origin time: 22 17 44.4
Epicenter: 61.515N., 146.329W.
Depth: Normal
Magnitude: $3.0M_L$(PM)
Felt: Palmer (PM).

14 February (GS) Kenai Peninsula
Origin time: 18 17 24.4
Epicenter: 59.721N., 150.319W.
Depth: Normal
Magnitude: $3.3M_L$(PM)
Intensity III: Homer.

22 February (GS) Central Alaska
Origin time: 16 04 40.8
Epicenter: 65.032N., 150.744W.
Depth: Normal
Magnitude: $4.3M_L$(PM)
Felt: Manley Hot Springs (PM).

24 February (GS) Southern Alaska
Origin time: 06 47 04.3
Epicenter: 60.393N., 153.106W.
Depth: 140 km
Magnitude: $4.3m_b$(GS)
Intensity III: Homer.

26 February (GS) Southern Alaska
Origin time: 11 23 26.6
Epicenter: 61.376N., 149.751W.
Depth: 43 km
Magnitude: $3.9m_b$(GS), $3.6M_L$(PM)
Intensity IV: Skwentna.
Intensity III: Anchorage, Eagle River (press report).

27 February (GS) Southern Alaska
Origin time: 03 12 21.6
Epicenter: 59.747N., 152.450W.
Depth: 104 km
Magnitude: None computed.
Felt: Homer (PM).

7 March (GS) Southern Alaska
Origin time: 02 35 56.2
Epicenter: 61.059N., 148.556W.
Depth: Normal
Magnitude: $3.5M_L$(PM)
Intensity II: Anchorage and Palmer (PM).

14 March (GS) Southern Alaska
Origin time: 20 32 52.4
Epicenter: 61.703N., 149.859W.
Depth: 67 km
Magnitude: $4.8m_b$(GS), $4.5M_L$(PM)
Intensity IV: Eagle River, Fort Richardson, Palmer (PM), Skwentna, Sutton (PM), Wasilla (PM), Willow.
Intensity III: Anchorage, Anchorage International Airport, Chugiak, Cooper Landing, Moose Pass, and Spenard.
Felt: Talkeetna.

23 March (GS) Southern Alaska
Origin time: 08 38 05.8
Epicenter: 58.978N., 154.153W.
Depth: 119 km
Magnitude: $5.3m_b$(GS)
Intensity IV: Homer, Larsen Bay, Naknek, Portlock (PM).
Intensity III: Akhiok, Anchorage, Moose Pass, Port Lions, and Seldovia.
Intensity II: Anchorage International Airport, Kodiak (PM).
Felt: Anchor Point.

15 April (GS) Southern Alaska
Origin time: 16 59 34.1
Epicenter: 60.681N., 148.542W.
Depth: 63 km
Magnitude: $3.8m_b$(GS), $3.9M_L$(PM)
Felt: Anchorage (PM).

15 April (GS) Southern Alaska
Origin time: 20 05 00.1
Epicenter: 59.610N., 152.775W.
Depth: 97 km
Magnitude: $4.0m_b$(GS)
Felt: Homer.

18 April (GS) Southern Alaska
Origin time: 19 31 28.7
Epicenter: 60.833N., 152.067W.
Depth: 95 km
Magnitude: $5.1m_b$(GS)
Intensity IV: Kasilof, Moose Pass, Ninilchik, Skwentna, Sutton, and Tyonek.
Intensity III: Anchor Point, Homer, Seward, Wasilla, and Whittier.
Intensity II: Willow.
Felt: Anchorage, Kenai, Palmer, and Valdez (PM).

19 April (GS) Southern Alaska
Origin time: 20 14 36.3
Epicenter: 61.516N., 149.893W.

Depth: 74 km
Magnitude: None computed.
Intensity II: Anchorage and Palmer (PM).

23 April (GS) Central Alaska
Origin time: 01 42 36.3
Epicenter: 65.182N., 146.945W.
Depth: 15 km
Magnitude: $4.2M_L$(PM)
Felt: Ester and Fairbanks (PM).

23 April (GS) Central Alaska
Origin time: 02 32 16.9
Epicenter: 65.243N., 146.889W.
Depth: 22 km
Magnitude: $3.3M_L$(PM)
Felt: Fairbanks (PM).

26 April (GS) Southeastern Alaska
Origin time: 18 10 58.4
Epicenter: 61.295N., 146.827W.
Depth: Normal
Magnitude: $3.4M_L$(PM)
Intensity III: Valdez (PM).

2 May (GS) Southeastern Alaska
Origin time: 18 59 05.7
Epicenter: 55.590N., 135.047W.
Depth: 10 km
Magnitude: $4.9m_b$(GS), $4.0M_s$(GS), $4.9M_L$(PM), $5.1M_L$ (EP)
Intensity V: Port Alexander— A few windows cracked; a few small objects overturned and fell; moving vehicles rocked slightly; windows rattled.
Intensity III: Craig, Sitka (PM).

4 May (GS) Southern Alaska
Origin time: 23 03 18.9
Epicenter: 59.316N., 153.187W.
Depth: 88 km
Magnitude: $4.8m_b$(GS)
Intensity IV: Homer, Seldovia.
Felt: Anchorage and Seward (PM).

6 May (GS) Andreanof Islands, Aleutian Islands
Origin time: 19 54 49.1
Epicenter: 51.688N., 176.774W.
Depth: 58 km
Magnitude: $5.6m_b$(GS), $5.6M_L$(PM)
Intensity V: Adak— Small objects overturned or fell; a few items shook off of store shelves; standing and moving vehicles rocked slightly; trees and bushes shook

slightly; water splashed onto sides of ponds; felt by many.

5 June (GS) Alaska Peninsula
Origin time: 01 44 21.4
Epicenter: 56.901N., 157.262W.
Depth: 94 km
Magnitude: $5.3m_b$(GS)
Intensity IV: Chignik (PM).

11 June (GS) Southern Alaska
Origin time: 01 28 17.0
Epicenter: 62.492N., 149.829W.
Depth: 15 km
Magnitude: $4.0M_L$(PM)
Intensity II: Palmer (PM).

12 June (GS) Fox Islands, Aleutian Islands
Origin time: 11 09 15.4
Epicenter: 53.648N., 165.218W.
Depth: 43 km
Magnitude: $5.3m_b$(GS), $4.8M_s$(GS), $5.2M_s$(BK)
Intensity III: Cold Bay, Unalaska.

13 June (GS) Southern Alaska
Origin time: 02 16 46.0
Epicenter: 60.960N., 150.340W.
Depth: 50 km
Magnitude: $3.3m_b$(GS), $3.8M_L$(PM)
Intensity III: Anchorage.

14 June (GS) Southern Alaska
Origin time: 06 26 27.8
Epicenter: 62.377N., 149.464W.
Depth: 88 km
Magnitude: $3.6m_b$(GS)
Intensity II: Anchorage (PM).

15 June (GS) Andreanof Islands, Aleutian Islands
Origin time: 04 27 14.9
Epicenter: 52.335N., 178.550W.
Depth: 170 km
Magnitude: $5.1m_b$(GS)
Intensity II: Adak (PM).

17 June (EP) Southeastern Alaska
Origin time: 15 18 18.0
Epicenter: 59.270N., 135.630W.
Depth: 18 km
Magnitude: $3.1M_L$ (PM)
Intensity III: Haines (PM).

ALASKA—Continued

23 June (EP) Southeastern Alaska
Origin time: 10 22 04.0
Epicenter: 59.640N., 139.630W.
Depth: 18 km
Magnitude: $3.2M_L$(EP)
Intensity IV: Yakutat.

28 June (GS) Central Alaska
Origin time: 22 23 06.9
Epicenter: 64.751N., 149.130W.
Depth: Normal
Magnitude: $3.6M_L$(PM)
Intensity III: Fairbanks (PM).

16 July (GS) Central Alaska
Origin time: 11 09 42.1
Epicenter: 63.576N., 150.999W.
Depth: 15 km
Magnitude: $3.7m_b$(GS), $4.1M_L$(PM)
Intensity IV: Denali National Park Headquarters, Kantishna Lodge, and Wonder Lake (PM).

25 July (GS) Southern Alaska
Origin time: 04 59 50.1
Epicenter: 62.688N., 149.811W.
Depth: 71 km
Magnitude: $4.4m_b$(GS)
Intensity IV: Talkeetna and Willow (PM).
Intensity II: Anchorage (PM).
Felt: Palmer and Wasilla (PM).

25 July (GS) Southern Alaska
Origin time: 12 36 45.9
Epicenter: 61.504N., 157.329W.
Depth: Normal
Magnitude: $4.1m_b$(GS), $4.8M_L$(PM)
Intensity IV: Aniak and Akiak (PM).
Intensity II: Bethel (PM).

25 July (GS) Alaska Peninsula area
Origin time: 23 28 53.3
Epicenter: 54.955N., 160.113W.
Depth: 53 km
Magnitude: $5.3m_b$(GS), $4.7M_L$(PM)
Intensity IV: Sand Point (PM).

27 July (GS) Andreanof Islands, Aleutian Islands
Origin time: 15 57 51.3
Epicenter: 50.317N., 176.868W.
Depth: Normal
Magnitude: $5.8m_b$(GS), $5.0M_s$(GS), $5.7M_L$(PM), $5.2M_s$(BK)
Intensity IV: Adak (PM).

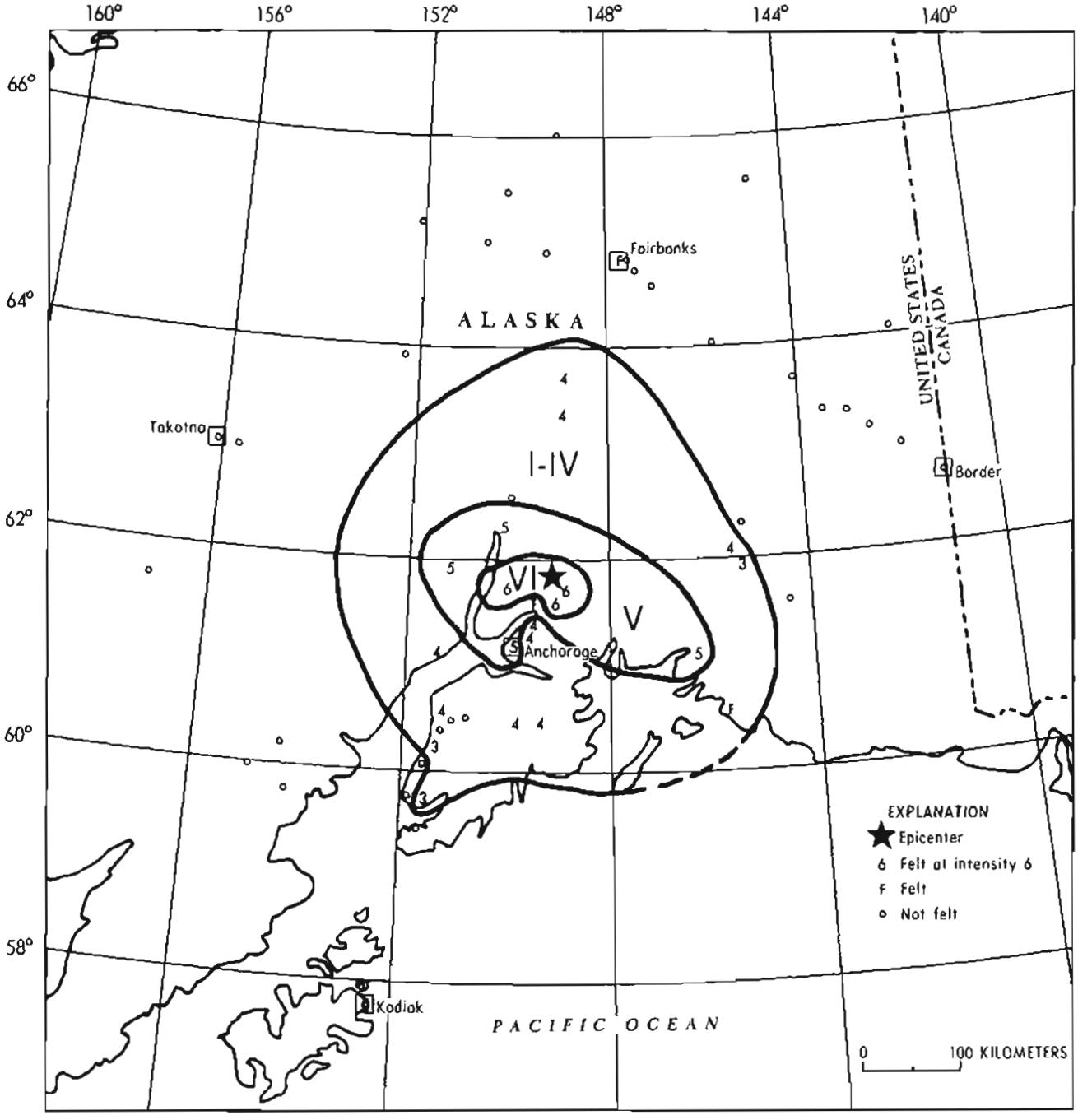

Figure 10. Isoseismal map for the southern Alaska earthquake of 14 August 1984, 01 02 08.4 UTC. Roman numerals represent Modified Mercalli intensities between isoseismals; Arabic numerals represent intensities at specific sites.

5 August (GS) Southern Alaska
Origin time: 14 11 02.7
Epicenter: 61.636N., 149.823W.
Depth: 58 km
Magnitude: $3.0M_L$(PM)
Felt: Anchorage, Eagle River, and Palmer (PM).

7 August (GS) Southern Alaska
Origin time: 08 35 22.7
Epicenter: 61.769N., 149.674W.
Depth: 44 km
Magnitude: $3.4M_L$(PM)
Intensity III: Anchorage, Eagle River, and Palmer (PM).

11 August (GS) Southeastern Alaska
Origin time: 07 30 10.0
Epicenter: 59.131N., 136.771W.
Depth: 15 km
Magnitude: $4.1m_b$(GS), $4.2M_L$(PM)
Felt: At several places in Glacier Bay National Park and on a tour boat in Glacier Bay.

14 August (GS) Southern Alaska
Origin time: 01 02 08.4
Epicenter: 61.857N., 149.104W.
Depth: 20 km
Magnitude: $5.7m_b$(GS), $5.2M_S$(GS), $5.7M_L$(PM), $5.4M_S$(BK)

This earthquake was felt over an area of approximately 74,500 kilometers^2 of southern Alaska (fig. 10).

Intensity VI:
Palmer— Plate glass windows shattered at Pioneer Meat Market and D and G Super; a few dishes broke; light furniture overturned; a few items shook off of store shelves; a few small objects overturned and fell; buildings shook strongly; people had difficulty standing; trees and bushes shook moderately; standing vehicles rocked slightly; small landslides occurred; felt by many.
Sutton— Some windows broke; light furniture overturned; a few dishes broke; many small items overturned and fell; many items shook off of store shelves; trees and bushes shook slightly; standing and moving vehicles shook; water splashed onto sides of lakes; buildings shook strongly; felt by all. The press reported a small dirt and rock landslide on Glenn Highway at Mile 69 near Sutton.
Willow— Hanging pictures fell; many dishes broke; many small objects overturned and fell; many items shook off of store shelves; trees and bushes shook moderately; standing vehicles rocked moderately; buildings shook strongly; people had difficulty standing; felt by many.

ALASKA—Continued

Intensity V:
Anchorage— A few dishes broke; a few small objects overturned and fell; a few items shook off of store shelves; buildings shook strongly; trees and bushes shook moderately; standing vehicles rocked slightly; felt by many.
Skwentna— A few small objects overturned and fell; a few items shook off of store shelves; trees and bushes shook strongly; buildings shook strongly; felt by many.
Talkeetna— A few items shook off of store shelves; standing vehicles rocked moderately; buildings shook strongly; felt by all.
Valdez— A few dishes broke; a few small objects overturned and fell; trees and bushes shook slightly; buildings shook slightly; people had difficulty standing; felt by many.
Intensity IV: Cantwell, Chugiak, Cooper Landing, Eagle River, Elmendorf Air Force Base, Glennallen, Kenai, McKinley Park, Moose Pass, and Tyonek.
Intensity III: Clam Gulch, Copper Center, and Homer.
Felt: Cordova, Fairbanks, and Wasilla (press report).

14 August (GS) Southern Alaska
Origin time: 01 54 37.3
Epicenter: 61.774N., 148.973W.
Depth: 24 km
Magnitude: $4.2M_L$(PM)
Intensity IV: Palmer and Wasilla (PM).
Felt: Anchorage to Homer (PM).

14 August (GS) Southern Alaska
Origin time: 07 41 07.7
Epicenter: 61.784N., 148.935W.
Depth: 15 km
Magnitude: $3.7M_L$(PM)
Intensity III: Palmer and Wasilla (PM).

19 August (GS) Southern Alaska
Origin time: 04 31 29.6
Epicenter: 60.493N., 150.478W.
Depth: 58 km
Magnitude: $3.6m_b$(GS), $4.0M_L$(PM)
Felt: Anchorage, Kenai, Palmer, and Wasilla (PM).

23 August (GS) Central Alaska
Origin time: 20 41 50.8
Epicenter: 64.554N., 147.980W.
Depth: 16 km
Magnitude: $4.1M_L$(PM)

Intensity III: Fairbanks, Fort Wainwright.
Felt: Eielson Air Force Base (PM).

26 August (GS) Southern Alaska
Origin time: 03 32 45.7
Epicenter: 60.703N., 151.339W.
Depth: 100 km
Magnitude: None computed.
Felt: Kenai Peninsula (PM).

30 August (GS) Queen Charlotte Islands, Canada
Origin time: 12 28 39.7
Epicenter: 54.113N., 133.639W.
Depth: 10 km
Magnitude: $5.5m_b$(GS), $5.5M_S$(GS), $5.4M_L$(PM)
Intensity IV:
Alaska— Craig, Ketchikan.
Intensity III:
Alaska— Hydaburg, Metlakatla, Petersburg.
Felt:
British Columbia— Masset, Prince Rupert, Queen Charlotte City, and Skidegate (EP).

1 September (GS) Fox Islands, Aleutian Islands
Origin time: 14 58 16.4
Epicenter: 53.012N., 168.260W.
Depth: 61 km
Magnitude: $4.6m_b$(GS), $4.6M_L$(PM)
Felt: Nikolski (PM).

4 September (GS) Central Alaska
Origin time: 08 47 35.9
Epicenter: 64.847N., 149.107W.
Depth: 28 km
Magnitude: $3.8M_L$(PM)
Intensity III: Fairbanks, Healy, and Nenana (PM).

10 September (GS) Southern Alaska
Origin time: 19 22 31.1
Epicenter: 60.933N., 151.115W.
Depth: 5 km
Magnitude: None computed.
Intensity III: Anchorage (PM).

20 September (GS) Southern Alaska
Origin time: 04 17 24.4
Epicenter: 60.322N., 146.001W.
Depth: 18 km
Magnitude: $5.5m_b$(GS), $5.2M_S$(GS), $5.2M_L$(PM), $5.1M_S$(BK)
Intensity IV: Anchorage, Cordova, Sutton.
Intensity III: Chitina (PM), Chugiak, Palmer (PM), Seward (PM), Valdez (PM).
Intensity II: Eagle River.

20 September (GS) Southern Alaska
Origin time: 04 28 04.0
Epicenter: 60.306N., 146.098W.
Depth: 26 km
Magnitude: $5.1m_b$(GS), $4.7M_S$(GS), $4.7M_L$(PM)
Intensity IV: Cordova (PM).
Intensity III: Anchorage, Chitina, Palmer, Seward, and Valdez (PM).

23 September (GS) Fox Islands, Aleutian Islands
Origin time: 17 06 36.3
Epicenter: 53.577N., 165.424W.
Depth: Normal
Magnitude: $5.7m_b$(GS), $5.5M_S$(GS), $5.9M_L$(PM), $5.6M_S$(BK)
Intensity IV: Unalaska.
Felt: Nikolski (PM).

24 September (GS) Southern Alaska
Origin time: 13 48 38.9
Epicenter: 61.432N., 150.005W.
Depth: 46 km
Magnitude: $3.3M_L$(PM)
Intensity II: Anchorage (PM).

25 September (GS) Fox Islands, Aleutian Islands
Origin time: 19 06 50.3
Epicenter: 53.663N., 166.404W.
Depth: 65 km
Magnitude: $4.7m_b$(GS), $5.1M_L$(PM)
Intensity II: Unalaska (PM).

26 September (GS) Southern Alaska
Origin time: 14 58 25.1
Epicenter: 63.168N., 149.926W.
Depth: 114 km
Magnitude: $4.3m_b$(GS)
Intensity III: Cantwell (PM), Trappers Creek (PM).
Intensity II: Anchorage (PM).

29 September (GS) Southern Alaska
Origin time: 14 19 15.0
Epicenter: 61.000N., 149.836W.
Depth: 62 km
Magnitude: $4.6m_b$(GS), $4.2M_L$(PM)
Intensity III: Anchorage (PM).
Intensity II: Palmer, Wasilla, and Willow (PM).

3 October (GS) Eastern Alaska
Origin time: 19 17 23.0

Epicenter: 62.742N., 143.714W.
Depth: 5 km
Magnitude: 3.0M_L(PM)
Intensity II: Nabesna and Slana (PM).

4 October (GS) Kenai Peninsula
Origin time: 22 41 03.3
Epicenter: 59.145N., 151.706W.
Depth: 63 km
Magnitude: 4.6m_b(GS), 4.3M_L(PM)
Intensity III: Homer (PM).

5 October (GS) Andreanof Islands, Aleutian Islands
Origin time: 15 46 27.2
Epicenter: 51.871N., 176.016W.
Depth: 68 km
Magnitude: 5.3m_b(GS), 5.2M_L(PM)
Intensity IV: Adak (PM).

18 October (GS) Southern Alaska
Origin time: 05 19 56.6
Epicenter: 63.176N., 151.131W.
Depth: 135 km
Magnitude: 4.7m_b(GS)
Intensity III: Talkeetna.
Intensity II: Palmer and Wasilla (PM).

19 October (GS) Southern Alaska
Origin time: 04 44 44.7
Epicenter: 61.649N., 150.973W.
Depth: 77 km
Magnitude: 4.5m_b(GS)
Intensity II: Anchorage–Palmer area (PM).

19 October (GS) Southern Alaska
Origin time: 20 43 06.2
Epicenter: 60.139N., 150.987W.
Depth: 97 km
Magnitude: 3.7m_b(GS)
Intensity II: Anchorage (PM).

25 October (GS) Andreanof Islands, Aleutian Islands
Origin time: 12 37 15.4
Epicenter: 51.675N., 175.210W.
Depth: 56 km
Magnitude: 5.3m_b(GS), 5.1M_L(PM)
Intensity V: Adak— A few items shook off of store shelves; a few small objects overturned and fell; hanging pictures swung out of place; buildings shook slightly; walls creaked; windows rattled; felt by many.

ALASKA—Continued

9 November (GS) Central Alaska
Origin time: 06 58 06.9
Epicenter: 63.905N., 147.915W.
Depth: 23 km
Magnitude: 3.7m_b(GS), 4.2M_L(PM)
Intensity IV: Ester and Fairbanks (PM).

17 November (GS) Central Alaska
Origin time: 09 03 19.3
Epicenter: 63.330N., 152.694W.
Depth: 3 km
Magnitude: 5.0m_b(GS), 5.3M_L(PM)
Intensity III: Lake Minchumina (PM), McGrath, Takotna.
Intensity II: Talkeetna (PM).

19 November (GS) Alaska Peninsula
Origin time: 00 44 27.2
Epicenter: 58.567N., 156.702W.
Depth: 206 km
Magnitude: 4.6m_b(GS)
Intensity II: Egegik (PM).

19 November (GS) Rat Islands, Aleutian Islands
Origin time: 04 10 42.4
Epicenter: 51.170N., 179.096E.
Depth: 39 km
Magnitude: 5.6m_b(GS), 5.5M_S(GS), 5.7M_L(PM)
Intensity II: Adak (PM).

19 November (GS) Andreanof Islands, Aleutian Islands
Origin time: 12 06 37.3
Epicenter: 51.777N., 175.272W.
Depth: 58 km
Magnitude: 5.6m_b(GS), 5.5M_L(PM)
Intensity IV: Adak and Atka (PM).

23 November (GS) Fox Islands, Aleutian Islands
Origin time: 10 37 38.3
Epicenter: 54.654N., 163.849W.
Depth: Normal
Magnitude: 4.8m_b(GS)
Intensity III: Cold Bay.

29 November (GS) Andreanof Islands, Aleutian Islands
Origin time: 07 45 12.6
Epicenter: 51.466N., 176.268W.
Depth: Normal
Magnitude: 4.3m_b(GS), 4.6M_L(PM)
Felt: Adak Island (PM).

1 December (GS) Kenai Peninsula
Origin time: 18 25 51.3
Epicenter: 60.575N., 150.301W.
Depth: 51 km
Magnitude: $3.8m_b$(GS), $4.1M_L$(PM)
Intensity II: Anchorage and Soldotna (PM).

1 December (GS) Andreanof Islands, Aleutian Islands
Origin time: 18 45 24.8
Epicenter: 51.355N., 176.342W.
Depth: Normal
Magnitude: $5.0m_b$(GS), $5.0M_L$(PM)
Intensity III: Adak Island (PM).

8 December (GS) Central Alaska
Origin time: 21 07 47.3
Epicenter: 63.653N., 150.770W.
Depth: 24 km
Magnitude: $4.6m_b$(GS), $5.2M_S$(GS), $4.6M_L$(PM)
Felt: Fairbanks (PM).

17 December (GS) Central Alaska
Origin time: 00 51 52.2
Epicenter: 66.067N., 154.489W.
Depth: 27 km
Magnitude: $3.8M_L$(PM)
Intensity II: Hughes (PM).

17 December (GS) Southern Alaska
Origin time: 18 36 23.5
Epicenter: 59.553N., 152.389W.
Depth: 85 km
Magnitude: None computed.
Intensity III: Homer.

Table 1. *Summary of U.S. earthquakes for 1984*

[The following codes are used to indicate the source of hypocenters and/or magnitudes: (**BK**) University of California, Berkeley; (**BU**) Montana Bureau of Mines and Geology, Butte; (**EN**) Department of Energy, Washington, D.C.; (**EP**) Geophysics Division, Geologic Survey of Canada, Ottawa; (**GM**) U.S. Geological Survey, Menlo Park, Calif.; (**GS**) U.S. Geological Survey, Golden, Colo.; (**GT**) Georgia Institute of Technology, Atlanta; (**HV**) Hawaiian Volcano Observatory, U.S. Geological Survey, Hawaii National Park; (**LD**) Lamont-Doherty Geological Observatory, Palisades, N.Y.; (**MI**) University of Michigan, Ann Arbor; (**PM**) Palmer Observatory, NOAA, Palmer Alaska; (**PS**) California Institute of Technology, Pasadena; (**RN**) University of Nevada, Reno; (**SL**) St. Louis University, St. Louis, Mo.; (**TC**) Tennessee Earthquake Information Center, Memphis; (**TU**) Oklahoma Geological Survey, Leonard; (**UU**) University of Utah, Salt Lake City; (**VP**) Virginia Polytechnic Institute and State University, Blacksburg; (**WA**) University of Washington, Seattle; (**WO**) Weston Observatory, Weston, Mass. Normal depth (km) = 33N. AST = Alaska Standard Time, CST = Central Standard Time, EST = Eastern Standard Time, HST = Hawaii Standard Time, MST = Mountain Standard Time, PST = Pacific Standard Time, YST = Yukon Standard Time. Leaders (...) indicate information is not available.]

Date		Origin time (UTC) hr min sec	Latitude (°)	Longitude (°)	Depth (km)	Hypocenter source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date		Hour	Time zone
						ALASKA								
JAN.	2	16 10 18.1	56.354N.	152.981W.	33N	GS	5.0	...	4.5ML(PM)	...	JAN.	2	07:10	YST
JAN.	3	11 40 09.1	61.738N.	149.943W.	62	GS	3.8	...	3.6ML(PM)	III	JAN.	3	02:40	YST
JAN.	3	18 52 46.8	63.015N.	149.775W.	115	GS	...	...	....	...	JAN.	3	09:52	YST
JAN.	4	17 03 28.4	51.138N.	174.287E.	33N	GS	4.9	4.9	....	...	JAN.	4	07:03	AST
JAN.	4	20 04 35.0	65.473N.	150.310W.	33N	GS	...	...	4.8ML(PM)	...	JAN.	4	11:04	YST
JAN.	5	21 41 48.0	51.296N.	179.194W.	53	GS	5.2	4.8	4.9ML(PM)	...	JAN.	5	11:41	AST
JAN.	6	21 36 26.7	63.985N.	148.943W.	33N	GS	...	...	2.9ML(PM)	...	JAN.	6	12:36	YST
JAN.	7	11 59 35.7	51.907N.	176.398W.	57	GS	4.4	...	3.7ML(PM)	...	JAN.	7	01:59	AST
JAN.	8	03 36 43.4	59.254N.	136.057W.	15	GS	3.8	...	4.3ML(PM)	FELT	JAN.	7	18:36	YST
JAN.	10	22 04 33.4	51.469N.	172.304E.	33N	GS	4.6	...	....	...	JAN.	10	12:04	AST
JAN.	11	20 49 30.9	61.843N.	149.696W.	47	GS	...	...	3.2ML(PM)	...	JAN.	11	11:49	YST
JAN.	12	01 18 50.2	61.764N.	154.265W.	33N	GS	...	...	3.3ML(PM)	III	JAN.	11	16:18	YST
JAN.	13	09 22 12.0	59.950N.	140.690W.	18	EP	...	...	3.3ML(EP)	...	JAN.	13	00:22	YST
JAN.	13	19 33 50.9	60.198N.	152.658W.	116	GS	3.9	...	....	...	JAN.	13	10:33	YST
JAN.	14	06 53 05.4	51.859N.	168.331W.	33N	GS	4.8	...	4.6ML(PM)	...	JAN.	13	21:53	AST
JAN.	14	11 04 21.4	52.635N.	177.124E.	85	GS	4.3	...	....	...	JAN.	14	01:04	AST
JAN.	14	11 44 24.8	59.883N.	153.293W.	142	GS	4.8	...	....	III	JAN.	14	02:44	YST
JAN.	14	22 04 47.0	56.484N.	152.272W.	33N	GS	4.5	...	4.0ML(PM)	...	JAN.	14	13:04	YST
JAN.	15	07 10 52.7	56.621N.	152.406W.	33N	GS	5.1	5.1	5.3ML(PM)	...	JAN.	14	22:10	YST
JAN.	15	07 30 05.1	56.487N.	152.393W.	33N	GS	4.8	4.9	4.2ML(PM)	...	JAN.	14	22:30	YST
JAN.	15	12 02 44.3	56.491N.	152.345W.	33N	GS	4.4	...	3.7ML(PM)	...	JAN.	15	03:02	YST
JAN.	15	12 28 39.5	56.503N.	152.319W.	33N	GS	5.3	4.7	5.0ML(PM)	...	JAN.	15	03:28	YST
JAN.	15	19 14 47.1	63.167N.	148.369W.	111	GS	...	...	....	...	JAN.	15	10:14	YST
JAN.	17	05 49 14.0	59.753N.	153.472W.	135	GS	...	...	....	...	JAN.	16	20:49	YST
JAN.	17	10 25 38.0	52.199N.	169.530W.	33N	GS	4.7	...	....	...	JAN.	17	00:25	AST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date		Origin time (UTC) hr	min	sec	Latitude (°)	Longitude (°)	Depth (km)	Hypo-center source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date		Hour	Time zone
ALASKA-Continued																
JAN.	18	01	18	12.2	60.930N.	147.186W.	33N	GS	...	...	3.5ML(PM)	...	JAN.	17	16:18	YST
JAN.	20	18	23	28.2	60.027N.	153.352W.	139	GS	4.1	...	....	...	JAN.	20	09:23	YST
JAN.	23	22	06	06.5	53.287N.	169.639W.	103	GS	5.3	...	....	III	JAN.	23	12:06	AST
JAN.	25	21	19	55.1	61.383N.	146.977W.	33N	GS	...	...	3.2ML(PM)	...	JAN.	25	12:19	YST
JAN.	27	10	00	08.6	56.169N.	158.807W.	33N	GS	4.1	...	4.1ML(PM)	IV	JAN.	27	01:00	YST
JAN.	27	10	51	22.2	67.986N.	147.370W.	10	GS	4.6	...	....	...	JAN.	27	01:51	YST
JAN.	28	12	47	41.2	55.783N.	154.297W.	33N	GS	4.7	...	4.0ML(PM)	...	JAN.	28	03:47	YST
JAN.	28	19	48	52.4	67.727N.	164.614W.	33N	GS	...	...	3.4ML(PM)	...	JAN.	28	10:48	YST
JAN.	30	04	04	41.3	67.737N.	164.589W.	33N	GS	...	...	3.2ML(PM)	...	JAN.	29	19:04	YST
JAN.	30	05	03	56.5	67.789N.	164.215W.	33N	GS	...	...	3.2ML(PM)	...	JAN.	29	20:03	YST
JAN.	30	05	24	06.4	62.813N.	148.322W.	33N	GS	...	...	3.3ML(PM)	...	JAN.	29	20:24	YST
JAN.	30	18	01	03.9	55.784N.	154.321W.	33N	GS	4.8	...	4.0ML(PM)	...	JAN.	30	09:01	YST
JAN.	30	18	39	08.3	63.072N.	149.289W.	33N	GS	...	...	3.0ML(PM)	...	JAN.	30	09:39	YST
FEB.	3	07	13	57.0	59.030N.	136.900W.	18	EP	...	...	3.3ML(EP)	...	FEB.	2	22:13	YST
FEB.	3	23	17	15.2	62.109N.	150.942W.	72	GS	4.1	...	....	FELT	FEB.	3	14:17	YST
FEB.	6	07	16	31.2	61.983N.	148.877W.	18	GS	...	...	3.3ML(PM)	FELT	FEB.	5	22:16	YST
FEB.	6	07	48	17.3	62.988N.	150.739W.	129	GS	4.4	...	....	III	FEB.	5	22:48	YST
FEB.	6	12	15	35.3	64.944N.	149.011W.	33N	GS	...	...	....	FELT	FEB.	6	03:15	YST
FEB.	8	01	19	17.3	62.092N.	150.942W.	81	GS	...	...	....	...	FEB.	7	16:19	YST
FEB.	10	22	17	44.4	61.515N.	146.329W.	33N	GS	...	...	3.0ML(PM)	FELT	FEB.	10	13:17	YST
FEB.	12	03	28	57.7	66.324N.	157.322W.	33N	GS	...	...	....	...	FEB.	11	18:28	YST
FEB.	12	04	48	00.9	60.269N.	140.990W.	15	GS	3.7	...	4.0ML(PM)	...	FEB.	11	19:48	YST
FEB.	12	09	01	46.8	59.232N.	145.441W.	33N	GS	...	...	3.0ML(PM)	...	FEB.	12	00:01	YST
FEB.	13	18	05	52.1	55.686N.	154.332W.	33N	GS	4.9	4.8	....	...	FEB.	13	09:05	YST
FEB.	14	05	43	39.8	64.488N.	158.690W.	33N	GS	...	...	....	...	FEB.	13	20:43	YST
FEB.	14	18	17	24.4	59.721N.	150.319W.	33N	GS	...	...	3.3ML(PM)	III	FEB.	14	09:17	YST
FEB.	15	13	52	55.8	52.263N.	178.139E.	33N	GS	3.8	...	4.1ML(PM)	...	FEB.	15	03:52	AST
FEB.	15	14	01	35.0	62.285N.	167.725W.	33N	GS	4.1	...	....	...	FEB.	15	05:01	YST
FEB.	16	02	02	27.2	52.367N.	170.522E.	33N	GS	4.8	...	....	...	FEB.	15	16:02	AST
FEB.	16	14	17	37.6	56.432N.	153.244W.	33N	GS	4.6	...	....	...	FEB.	16	05:17	YST
FEB.	17	16	47	53.9	63.154N.	150.534W.	137	GS	...	...	....	...	FEB.	17	07:47	YST
FEB.	21	16	31	49.0	62.944N.	149.620W.	111	GS	...	...	....	...	FEB.	21	07:31	YST
FEB.	22	01	08	24.0	59.120N.	135.060W.	18	EP	...	...	3.1ML(EP)	...	FEB.	21	16:08	4ST
FEB.	22	16	04	40.8	65.032N.	150.744W.	33N	GS	...	...	4.3ML(PM)	FELT	FEB.	22	07:04	YST
FEB.	23	10	06	47.9	62.608N.	149.881W.	33N	GS	...	...	....	...	FEB.	23	01:06	YST
FEB.	24	06	47	04.3	60.393N.	153.106W.	140	GS	4.3	...	....	III	FEB.	23	21:47	YST
FEB.	24	11	12	06.8	51.481N.	177.930E.	48	GS	4.8	...	4.7ML(PM)	...	FEB.	24	01:12	AST
FEB.	25	07	55	20.6	58.232N.	151.491W.	33N	GS	3.9	...	3.6ML(PM)	...	FEB.	24	22:55	YST
FEB.	26	11	23	26.6	61.376N.	149.751W.	43	GS	3.9	...	3.6ML(PM)	IV	FEB.	26	02:23	YST
FEB.	26	15	39	06.9	54.165N.	163.027W.	56	GS	4.4	...	....	...	FEB.	26	06:39	YST
FEB.	26	21	54	45.4	60.908N.	149.800W.	33N	GS	...	...	3.5ML(PM)	...	FEB.	26	12:54	YST
FEB.	27	03	12	21.6	59.747N.	152.450W.	104	GS	...	...	....	FELT	FEB.	26	18:12	YST
FEB.	27	10	27	10.2	56.972N.	153.461W.	33N	GS	4.6	...	4.5ML(PM)	...	FEB.	27	01:27	YST
MAR.	1	02	09	49.6	57.201N.	154.786W.	33N	GS	4.1	...	4.0ML(PM)	...	FEB.	29	17:09	YST
MAR.	2	13	01	51.9	62.552N.	150.773W.	95	GS	...	...	....	...	MAR.	2	04:01	YST
MAR.	2	13	20	18.6	61.426N.	146.281W.	33N	GS	...	...	3.9ML(PM)	...	MAR.	2	04:20	YST
MAR.	2	14	57	30.4	62.357N.	148.636W.	82	GS	...	...	....	...	MAR.	2	05:57	YST
MAR.	3	01	28	10.3	64.024N.	148.984W.	33N	GS	...	...	3.3ML(PM)	...	MAR.	2	16:28	YST
MAR.	4	08	04	52.5	55.009N.	158.210W.	33N	GS	4.8	...	4.1ML(PM)	...	MAR.	3	23:04	YST
MAR.	7	02	35	56.2	61.059N.	148.556W.	33N	GS	...	...	3.5ML(PM)	II	MAR.	6	17:35	YST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date		Origin time (UTC) hr min sec	Latitude (°)	Longitude (°)	Depth (km)	Hypo-center source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date	Hour	Time zone
						ALASKA-Continued							
MAR.	7	07 16 13.6	52.007N.	177.959E.	137	GS	4.4	...	....	...	MAR. 6	21:16	AST
MAR.	8	00 00 50.3	51.986N.	171.430W.	33N	GS	4.6	...	....	...	MAR. 7	14:00	AST
MAR.	8	13 04 05.4	54.205N.	167.015W.	138	GS	4.7	...	....	...	MAR. 8	04:04	AST
MAR.	9	17 00 54.4	52.804N.	173.332W.	250	GS	4.4	...	....	...	MAR. 9	07:00	AST
MAR.	10	00 56 25.2	61.870N.	149.470W.	54	GS	...	...	3.0ML(PM)	...	MAR. 9	15:56	YST
MAR.	11	02 53 13.4	60.130N.	140.936W.	15	GS	...	...	3.4ML(PM)	...	MAR. 10	17:53	YST
MAR.	11	23 10 31.4	59.601N.	152.925W.	109	GS	...	...	....	...	MAR. 11	14:10	YST
MAR.	12	21 16 14.0	54.202N.	164.071W.	59	GS	4.1	...	4.9ML(PM)	...	MAR. 12	12:16	YST
MAR.	13	09 33 09.0	54.563N.	159.114W.	33N	GS	4.8	...	4.1ML(PM)	...	MAR. 13	00:33	YST
MAR.	14	20 32 52.4	61.703N.	149.859W.	67	GS	4.8	...	4.5ML(PM)	IV	MAR. 14	11:32	YST
MAR.	20	01 01 17.2	64.012N.	148.882W.	33N	GS	...	...	3.3ML(PM)	...	MAR. 19	16:01	YST
MAR.	20	05 14 35.6	60.286N.	153.170W.	143	GS	...	...	....	...	MAR. 19	20:14	YST
MAR.	21	23 34 00.2	51.522N.	179.659E.	75	GS	4.8	...	....	...	MAR. 21	13:34	AST
MAR.	22	19 18 41.4	63.047N.	151.043W.	162	GS	...	...	....	...	MAR. 22	10:18	YST
MAR.	23	08 38 05.8	58.978N.	154.153W.	119	GS	5.3	...	....	IV	MAR. 22	23:38	YST
MAR.	23	13 54 00.5	62.975N.	149.373W.	33N	GS	...	...	3.4ML(PM)	...	MAR. 23	04:54	YST
MAR.	24	06 08 34.0	59.283N.	152.836W.	79	GS	...	...	....	...	MAR. 23	21:08	YST
MAR.	24	16 43 34.1	61.805N.	150.562W.	66	GS	4.7	...	4.0ML(PM)	...	MAR. 24	07:43	YST
MAR.	24	21 04 41.1	52.332N.	168.541W.	29	GS	5.4	5.0	4.9ML(PM)	...	MAR. 24	11:04	AST
MAR.	24	22 43 37.6	52.371N.	168.456W.	33N	GS	5.1	...	4.3ML(PM)	...	MAR. 24	13:43	AST
MAR.	24	22 49 58.2	52.320N.	168.523W.	33N	GS	4.9	...	....	...	MAR. 24	12:49	AST
MAR.	27	18 02 04.5	52.011N.	169.708W.	35	GS	5.0	5.3	....	...	MAR. 27	08:02	AST
MAR.	28	07 46 08.8	50.964N.	178.379E.	33N	GS	4.3	...	....	...	MAR. 27	21:46	AST
MAR.	29	12 05 14.2	61.689N.	151.281W.	99	GS	...	...	....	...	MAR. 29	03:05	YST
MAR.	29	18 52 01.0	59.728N.	146.792W.	33N	GS	...	...	3.4ML(PM)	...	MAR. 29	09:52	YST
MAR.	29	23 03 27.1	51.049N.	178.164E.	33N	GS	4.9	...	....	...	MAR. 29	13:03	AST
MAR.	30	22 05 39.6	51.374N.	177.949E.	53	GS	4.9	4.3	....	...	MAR. 30	12:05	AST
MAR.	31	04 58 04.7	51.334N.	178.026E.	54	GS	4.8	...	4.3ML(PM)	...	MAR. 30	18:58	AST
MAR.	31	12 35 17.9	51.478N.	176.896E.	33N	GS	4.5	...	4.3ML(PM)	...	MAR. 31	02:35	AST
APR.	4	12 02 32.9	51.429N.	176.486W.	64	GS	4.6	...	....	...	APR. 4	02:02	AST
APR.	4	12 13 45.3	61.574N.	146.190W.	66	GS	...	...	3.9ML(PM)	...	APR. 4	03:13	YST
APR.	6	18 05 39.2	62.282N.	151.172W.	87	GS	...	...	....	...	APR. 6	09:05	YST
APR.	7	00 53 44.4	59.784N.	152.762W.	100	GS	...	...	....	...	APR. 6	15:53	YST
APR.	8	00 41 24.6	51.358N.	179.596E.	92	GS	4.3	...	....	...	APR. 7	14:41	AST
APR.	8	20 24 31.8	59.618N.	152.653W.	115	GS	...	...	....	...	APR. 8	11:24	YST
APR.	10	03 20 49.3	62.789N.	150.793W.	99	GS	...	...	....	...	APR. 9	18:20	YST
APR.	10	14 36 03.6	62.280N.	151.375W.	100	GS	...	...	....	...	APR. 10	05:36	YST
APR.	12	14 23 58.7	60.471N.	141.229W.	15	GS	5.0	...	4.2ML(PM)	...	APR. 12	05:23	YST
APR.	14	11 14 26.7	58.994N.	151.232W.	56	GS	3.9	...	3.9ML(PM)	...	APR. 14	02:14	YST
APR.	15	16 59 34.1	60.681N.	148.542W.	63	GS	3.8	...	3.9ML(PM)	FELT	APR. 15	07:59	YST
APR.	15	20 05 00.1	59.610N.	152.775W.	97	GS	4.0	...	....	FELT	APR. 15	11:05	YST
APR.	17	00 28 28.0	50.976N.	178.035W.	33N	GS	4.7	...	....	...	APR. 16	14:28	AST
APR.	18	06 55 46.5	52.046N.	169.753W.	33N	GS	5.0	...	4.8ML(PM)	...	APR. 17	20:55	AST
APR.	18	10 57 11.6	59.781N.	146.750W.	33N	GS	3.9	...	3.6ML(PM)	...	APR. 18	01:57	YST
APR.	18	13 33 12.5	62.243N.	154.131W.	33N	GS	...	...	3.5ML(PM)	...	APR. 18	04:33	YST
APR.	18	18 46 29.1	56.398N.	152.509W.	33N	GS	4.2	...	....	...	APR. 18	09:46	YST
APR.	18	19 31 28.7	60.833N.	152.067W.	95	GS	5.1	...	....	IV	APR. 18	10:31	YST
APR.	18	20 20 22.4	63.045N.	151.023W.	131	GS	4.4	...	....	...	APR. 18	11:20	YST
APR.	18	20 44 34.0	57.030N.	137.580W.	18	EP	...	...	3.1ML(EP)	...	APR. 18	11:44	YST
APR.	19	01 18 17.3	61.193N.	147.409W.	10	GS	...	...	3.0ML(PM)	...	APR. 18	16:18	YST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date		Origin time (UTC) hr min sec	Latitude (°)	Longitude (°)	Depth (km)	Hypocenter source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date		Hour	Time zone
ALASKA-Continued														
APR.	19	18 39 46.7	66.410N.	151.120W.	33N	GS	...	...	4.7ML(PM)	...	APR.	19	09:39	YST
APR.	19	20 14 36.3	61.516N.	149.893W.	74	GS	...	...	....	II	APR.	19	11:14	YST
APR.	20	04 24 47.8	61.723N.	152.089W.	119	GS	4.5	...	....	...	APR.	19	19:24	YST
APR.	23	01 42 36.3	65.182N.	146.945W.	15	GS	...	...	4.2ML(PM)	FELT	APR.	22	16:42	YST
APR.	23	02 32 16.9	65.243N.	146.889W.	22	GS	...	...	3.3ML(PM)	FELT	APR.	22	17:32	YST
APR.	23	18 21 01.0	57.770N.	137.610W.	18	EP	...	...	3.4ML(EP)	...	APR.	23	09:21	YST
APR.	24	14 56 21.9	64.522N.	146.681W.	4	GS	...	...	3.0ML(PM)	...	APR.	24	05:56	YST
APR.	25	07 08 38.3	58.329N.	154.775W.	106	GS	3.8	...	....	...	APR.	24	22:08	YST
APR.	26	18 10 58.4	61.295N.	146.827W.	33N	GS	...	...	3.4ML(PM)	III	APR.	26	09:10	YST
APR.	27	12 29 13.6	52.633N.	167.014W.	33N	GS	4.9	...	4.6ML(PM)	...	APR.	27	03:29	AST
APR.	28	10 05 51.8	51.943N.	169.792W.	33N	GS	5.4	4.7	5.1ML(PM)	...	APR.	28	00:05	AST
APR.	29	10 57 55.6	63.173N.	150.855W.	137	GS	...	...	....	...	APR.	29	01:57	YST
APR.	30	16 14 14.2	59.578N.	152.581W.	88	GS	..	...	...	...	APR.	30	07:14	YST
MAY	2	00 22 52.1	61.252N.	146.905W.	33N	GS	...		3.5ML(PM)	...	MAY	1	15:22	YST
MAY	2	09 11 45.5	57.262N.	155.678W.	114	GS	4.3	..	.	...	MAY	2	00:11	YST
MAY	2	18 59 05.7	55.590N.	135.047W.	10	GS	4.9	4.0	4.9ML(PM)	V	MAY	2	09:59	YST
MAY	4	23 02 39.9	60.718N.	146.809W.	33N	GS	.	...	....	...	MAY	4	14:02	YST
MAY	4	23 03 18.9	59.316N.	153.187W.	88	GS	4.8	..	....	IV	MAY	4	14:03	YST
MAY	5	00 30 42.8	52.591N.	168.156W.	33N	GS	4.4	.	....	...	MAY	4	15:30	AST
MAY	6	03 52 25.9	61.656N.	146.186W.	33N	GS	..	...	3.0ML(PM)	..	MAY	5	18:52	YST
MAY	6	19 54 49.1	51.688N.	176.774W.	58	GS	5.6	...	5.6ML(PM)	V	MAY	6	09:54	AST
MAY	15	23 37 44.0	59.910N.	140.690W.	18	EP	...	...	3.8ML(EP)	...	MAY	15	14:37	YST
MAY	17	20 02 58.8	51.374N.	176.540E.	33N	GS	4.8	..	....	...	MAY	17	10:02	AST
MAY	17	20 07 51.2	51.324N.	176.645E.	33N	GS	4.9	...	...	..	MAY	17	10:07	AST
MAY	19	03 44 53.5	60.134N.	141.078W.	15	GS	4.2	..	4.2ML(PM)	...	MAY	18	18:44	YST
MAY	21	18 47 03.1	58.220N.	156.298W.	161	GS	4.6	...	....	...	MAY	21	09:47	YST
MAY	21	19 23 39.8	62.583N.	151.416W.	100	GS	.	...	...	...	MAY	21	10:23	YST
MAY	22	08 14 53.5	63.100N.	150.361W.	143	GS	3.6	..	....	...	MAY	21	23:14	YST
MAY	23	18 36 00.5	55.587N.	155.465W.	33N	GS	4.5	...	4.4ML(PM)	...	MAY	23	09:36	YST
MAY	25	09 30 09.8	63.343N.	151.109W.	33N	GS	...	...	3.0ML(PM)	...	MAY	25	00:30	YST
MAY	25	14 52 15.2	59.508N.	153.014W.	89	GS	3.4	...	....	...	MAY	25	05:52	YST
MAY	26	04 14 25.9	53.752N.	171.186E.	33N	GS	4.0	...	....	...	MAY	25	18:14	AST
MAY	28	00 05 41.0	58.340N.	133.550W.	18	EP	...	...	3.4ML(EP)	...	MAY	27	15:05	YST
MAY	28	05 17 54.7	59.297N.	153.685W.	101	GS	4.8	...	....	...	MAY	27	20:17	YST
MAY	28	10 56 33.2	67.957N.	158.085W.	33N	GS	4.1	...	3.9ML(PM)	...	MAY	28	01:56	YST
MAY	28	14 38 34.2	63.127N.	150.696W.	138	GS	3.4	...	....	...	MAY	28	05:38	YST
MAY	29	04 14 06.1	60.572N.	146.848W.	33N	GS	...	...	3.0ML(PM)	...	MAY	28	19:14	YST
MAY	29	08 12 37.7	58.380N.	154.760W.	33N	GS	4.3	...	4.3ML(PM)	...	MAY	28	23:12	YST
MAY	29	15 19 26.5	51.950N.	166.213W.	33N	GS	4.5	...	4.3ML(PM)	...	MAY	29	06:19	AST
MAY	30	12 41 21.3	51.176N.	178.720E.	48	GS	4.9	...	4.8ML(PM)	...	MAY	30	02:41	AST
MAY	30	12 58 02.7	51.174N.	178.709E.	40	GS	5.0	...	5.1ML(PM)	...	MAY	30	02:58	AST
MAY	31	06 07 07.0	58.320N.	133.610W.	18	EP	...	...	3.3ML(EP)	...	MAY	30	21:07	YST
MAY	31	21 43 59.3	53.034N.	170.852E.	33N	GS	5.0	4.4	....	...	MAY	31	11:43	AST
JUNE	2	08 49 15.9	60.249N.	146.956W.	33N	GS	...	...	3.2ML(PM)	...	JUNE	1	23:49	YST
JUNE	3	13 56 06.3	61.468N.	150.839W.	89	GS	3.2	...	....	...	JUNE	3	04:56	YST
JUNE	4	05 43 42.0	63.047N.	150.522W.	119	GS	...	...	....	...	JUNE	3	20:43	YST
JUNE	4	05 53 57.2	61.057N.	152.613W.	150	GS	...	...	....	...	JUNE	3	20:53	YST
JUNE	4	09 38 41.8	64.530N.	152.661W.	33N	GS	...	...	3.7ML(PM)	...	JUNE	4	00:38	YST
JUNE	4	17 19 59.2	52.112N.	170.999W.	33N	GS	5.2	4.9	....	...	JUNE	4	07:19	AST
JUNE	5	01 44 21.4	56.901N.	157.262W.	94	GS	5.3	...	....	IV	JUNE	4	16:44	YST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date		Origin time (UTC) hr	min	sec	Latitude (°)	Longitude (°)	Depth (km)	Hypocenter source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date		Hour	Time zone
ALASKA-Continued																
JUNE	7	19	57	04.2	64.821N.	147.717W.	24	GS	...	...	2.8ML(PM)	...	JUNE	7	10:57	YST
JUNE	9	03	16	45.4	67.252N.	157.674W.	33N	GS	3.7	...	3.7ML(PM)	...	JUNE	8	18:16	YST
JUNE	10	04	14	16.0	62.228N.	149.527W.	33N	GS	...	...	3.0ML(PM)	...	JUNE	9	19:14	YST
JUNE	10	16	08	54.6	59.790N.	153.718W.	143	GS	...	...	....	...	JUNE	10	07:08	YST
JUNE	11	01	28	17.0	62.492N.	149.829W.	15	GS	...	...	4.0ML(PM)	II	JUNE	10	16:28	YST
JUNE	11	11	16	36.0	52.758N.	174.715W.	177	GS	4.4	...	....	...	JUNE	11	01:16	AST
JUNE	12	11	09	15.4	53.648N.	165.218W.	43	GS	5.3	4.8	....	III	JUNE	12	02:09	AST
JUNE	13	02	16	46.0	60.960N.	150.340W.	50	GS	3.3	...	3.8ML(PM)	III	JUNE	12	17:16	YST
JUNE	14	00	08	28.1	52.097N.	169.593W.	33N	GS	4.7	...	....	...	JUNE	13	14:08	AST
JUNE	14	06	26	27.8	62.377N.	149.464W.	88	GS	3.6	...	....	II	JUNE	13	21:26	YST
JUNE	15	02	11	18.2	65.536N.	151.947W.	33N	GS	...	...	3.7ML(PM)	...	JUNE	14	17:11	YST
JUNE	15	04	27	14.9	52.335N.	178.550W.	170	GS	5.1	...	....	II	JUNE	14	18:27	AST
JUNE	15	07	19	10.9	61.627N.	146.899W.	33N	GS	...	...	....	...	JUNE	14	22:19	YST
JUNE	16	22	10	47.1	60.189N.	152.627W.	114	GS	3.7	...	....	...	JUNE	16	13:10	YST
JUNE	17	15	18	18.0	59.270N.	135.630W.	18	EP	...	...	3.1ML(PM)	III	JUNE	17	06:18	YST
JUNE	17	16	26	50.4	51.684N.	173.354W.	33N	GS	5.4	5.2	....	...	JUNE	17	06:26	AST
JUNE	17	19	26	27.4	57.041N.	158.475W.	33N	GS	...	...	3.8ML(PM)	...	JUNE	17	10:26	YST
JUNE	17	20	35	10.3	52.437N.	168.491W.	33N	GS	4.6	...	....	...	JUNE	17	11:35	AST
JUNE	18	00	17	48.5	51.570N.	173.293W.	33N	GS	5.4	4.9	....	...	JUNE	17	14:17	AST
JUNE	22	05	37	23.0	59.090N.	136.040W.	18	EP	...	...	3.1ML(EP)	...	JUNE	21	20:37	YST
JUNE	22	22	56	18.4	53.697N.	162.855W.	33N	GS	4.9	4.7	....	...	JUNE	22	13:56	YST
JUNE	23	10	22	04.0	59.640N.	139.630W.	18	EP	...	...	3.2ML(EP)	IV	JUNE	23	01:22	YST
JUNE	26	12	38	18.2	63.114N.	149.561W.	117	GS	4.0	...	....	...	JUNE	26	03:38	YST
JUNE	27	09	39	17.6	61.023N.	150.372W.	33N	GS	...	...	3.9ML(PM)	...	JUNE	27	00:39	YST
JUNE	27	14	20	15.6	60.164N.	152.829W.	113	GS	...	...	....	...	JUNE	27	05:20	YST
JUNE	28	22	23	06.9	64.751N.	149.130W.	33N	GS	...	...	3.6ML(PM)	III	JUNE	28	13:23	YST
JUNE	29	06	45	38.8	51.834N.	177.118E.	74	GS	4.9	...	....	...	JUNE	28	20:45	AST
JULY	2	21	29	19.1	56.355N.	154.879W.	33N	GS	4.9	...	....	...	JULY	2	12:29	YST
JULY	4	06	04	39.7	61.305N.	146.744W.	33N	GS	...	...	3.7ML(PM)	...	JULY	3	21:04	YST
JULY	4	15	08	43.0	58.300N.	133.610W.	18	EP	...	...	3.0ML(EP)	...	JULY	4	06:08	YST
JULY	8	01	06	58.0	58.340N.	133.610W.	18	EP	...	...	3.3ML(EP)	...	JULY	7	16:06	YST
JULY	8	02	37	17.7	59.004N.	153.059W.	51	GS	3.5	...	3.7ML(PM)	...	JULY	7	17:37	YST
JULY	8	14	33	48.0	58.360N.	133.550W.	18	EP	...	...	3.4ML(EP)	...	JULY	8	05:33	YST
JULY	10	10	12	19.1	62.954N.	150.276W.	91	GS	...	...	....	...	JULY	10	01:12	YST
JULY	11	02	44	47.0	58.300N.	133.660W.	18	EP	...	...	3.4ML(EP)	...	JULY	10	17:44	YST
JULY	11	03	41	29.0	58.330N.	133.610W.	18	EP	...	...	3.4ML(EP)	...	JULY	10	18:41	YST
JULY	11	11	29	34.0	58.190N.	133.830W.	18	EP	...	...	3.0ML(EP)	...	JULY	11	02:29	YST
JULY	11	15	47	03.0	57.660N.	138.090W.	18	EP	...	...	3.7ML(EP)	...	JULY	11	06:47	YST
JULY	12	03	42	06.7	52.518N.	171.770E.	33N	GS	4.5	...	....	...	JULY	11	17:42	AST
JULY	12	05	11	18.7	52.572N.	171.756E.	33N	GS	4.7	...	....	...	JULY	11	19:11	AST
JULY	14	11	40	05.7	59.745N.	153.087W.	123	GS	4.0	...	....	...	JULY	14	02:40	YST
JULY	15	06	04	48.5	52.450N.	171.767E.	33N	GS	5.1	4.3	....	...	JULY	14	20:04	AST
JULY	16	00	10	20.8	52.438N.	168.151W.	33N	GS	5.1	4.0	4.4ML(PM)	...	JULY	15	15:10	AST
JULY	16	11	09	42.1	63.576N.	150.999W.	15	GS	3.7	...	4.1ML(PM)	IV	JULY	16	02:09	YST
JULY	18	09	42	07.2	51.998N.	173.454E.	40	GS	5.0	4.4	4.7ML(PM)	...	JULY	17	23:42	AST
JULY	19	03	37	44.4	59.944N.	148.878W.	29	GS	4.3	...	4.0ML(PM)	...	JULY	18	18:37	YST
JULY	19	08	31	05.0	58.320N.	133.600W.	18	EP	...	...	3.4ML(EP)	...	JULY	18	23:31	YST
JULY	19	17	19	46.0	58.320N.	133.630W.	18	EP	...	...	3.4ML(EP)	...	JULY	19	08:19	YST
JULY	20	11	09	35.0	58.290N.	133.590W.	18	EP	...	...	3.0ML(EP)	...	JULY	20	02:09	YST
JULY	21	02	12	55.0	58.340N.	133.590W.	18	EP	...	...	3.3ML(EP)	...	JULY	20	17:12	YST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date		Origin time (UTC) hr min sec	Latitude (°)	Longitude (°)	Depth (km)	Hypo-center source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date	Hour	Time zone
						ALASKA-Continued							
JULY	21	07 11 39.0	58.340N.	133.560W.	18	EP	...	...	3.5ML(EP)	...	JULY 20	22:11	YST
JULY	24	00 48 40.3	62.790N.	149.681W.	101	GS	...	...	....	...	JULY 23	15:48	YST
JULY	24	15 50 01.7	56.761N.	153.156W.	33N	GS	4.3	...	4.5ML(PM)	...	JULY 24	06:50	YST
JULY	25	04 59 50.1	62.688N.	149.811W.	71	GS	4.4	...	....	IV	JULY 24	19:59	YST
JULY	25	12 36 45.9	61.504N.	157.329W.	33N	GS	4.1	...	4.8ML(PM)	IV	JULY 25	03:36	YST
JULY	25	23 28 53.3	54.955N.	160.113W.	53	GS	5.3	...	4.7ML(PM)	IV	JULY 25	14:28	YST
JULY	27	07 39 50.3	60.058N.	152.950W.	106	GS	...	...	....	...	JULY 26	22:39	YST
JULY	27	15 57 51.3	50.317N.	176.868W.	33N	GS	5.8	5.0	5.7ML(PM)	IV	JULY 27	05:57	AST
JULY	27	23 22 50.2	51.764N.	175.713W.	190	GS	...	...	....	...	JULY 27	13:22	AST
JULY	29	10 37 11.6	60.993N.	146.712W.	33N	GS	...	...	3.0ML(PM)	...	JULY 29	01:37	YST
JULY	29	22 04 57.7	52.521N.	168.065W.	33N	GS	4.7	...	....	...	JULY 29	13:04	AST
JULY	30	09 07 47.8	59.872N.	152.343W.	93	GS	4.2	...	....	...	JULY 30	00:07	YST
JULY	30	13 38 29.7	60.846N.	151.533W.	94	GS	...	...	....	...	JULY 30	04:38	YST
JULY	30	16 32 15.4	57.852N.	156.309W.	152	GS	...	...	....	...	JULY 30	07:32	YST
JULY	30	21 14 28.2	52.082N.	179.496E.	143	GS	4.8	...	....	...	JULY 30	11:14	AST
JULY	30	22 03 24.5	53.681N.	165.581W.	33N	GS	4.9	5.0	....	...	JULY 30	13:03	AST
AUG.	1	17 30 54.7	51.931N.	172.474W.	33N	GS	4.7	...	....	...	AUG. 1	07:30	AST
AUG.	2	04 50 32.6	60.632N.	146.935W.	33N	GS	...	...	3.7ML(PM)	...	AUG. 1	19:50	YST
AUG.	3	15 38 15.5	58.891N.	145.063W.	33N	GS	...	...	3.7ML(PM)	...	AUG. 3	06:38	YST
AUG.	5	14 11 02.7	61.636N.	149.823W.	58	GS	...	...	3.0ML(PM)	FELT	AUG. 5	05:11	YST
AUG.	5	17 34 30.0	62.721N.	149.346W.	93	GS	...	...	....	...	AUG. 5	08:34	YST
AUG.	6	07 09 26.7	63.529N.	150.911W.	33N	GS	...	...	....	...	AUG. 5	22:09	YST
AUG.	6	20 24 52.8	51.269N.	179.124W.	57	GS	4.6	...	....	...	AUG. 6	10:24	AST
AUG.	7	06 37 22.3	51.306N.	179.091W.	56	GS	5.0	...	4.9ML(PM)	...	AUG. 6	20:37	AST
AUG.	7	08 35 22.7	61.769N.	149.674W.	44	GS	...	...	3.4ML(PM)	III	AUG. 6	23:35	YST
AUG.	7	14 15 28.8	58.248N.	154.012W.	110	GS	...	...	...	...	AUG. 7	05:15	YST
AUG.	8	13 37 16.7	61.354N.	151.736W.	100	GS	...	...	...	...	AUG. 8	04:37	YST
AUG.	9	14 43 42.4	62.027N.	149.726W.	59	GS	...	...	3.2ML(PM)	...	AUG. 9	05:43	YST
AUG.	11	07 30 10.0	59.131N.	136.771W.	15	GS	4.1	...	4.2ML(PM)	FELT	AUG. 10	22:30	YST
AUG.	11	23 31 42.5	63.079N.	150.368W.	130	GS	...	...	....	...	AUG. 11	14:31	YST
AUG.	12	21 18 50.1	62.415N.	148.880W.	33N	GS	...	...	....	...	AUG. 12	12:18	YST
AUG.	13	07 10 58.0	63.670N.	149.311W.	124	GS	...	...	....	...	AUG. 12	22:10	YST
AUG.	14	01 02 08.4	61.857N.	149.104W.	20	GS	5.7	5.2	5.7ML(PM)	VI	AUG. 13	16:02	YST
AUG.	14	01 54 37.3	61.774N.	148.973W.	24	GS	...	...	4.2ML(PM)	IV	AUG. 13	16:54	YST
AUG.	14	07 41 07.7	61.784N.	148.935W.	15	GS	...	...	3.7ML(PM)	III	AUG. 13	22:41	YST
AUG.	14	12 34 36.3	66.158N.	142.445W.	33N	GS	...	...	3.9ML(PM)	...	AUG. 14	03:34	YST
AUG.	16	18 26 51.3	54.164N.	151.752W.	33N	GS	...	...	4.5ML(PM)	...	AUG. 16	09:26	YST
AUG.	17	10 01 13.6	54.486N.	156.929W.	33N	GS	4.6	4.1	4.5ML(PM)	...	AUG. 17	01:01	YST
AUG.	17	20 26 59.6	53.121N.	171.492E.	33N	GS	4.6	...	....	...	AUG. 17	10:26	AST
AUG.	19	00 41 42.7	51.714N.	177.988W.	116	GS	4.4	...	....	...	AUG. 18	14:41	AST
AUG.	19	04 31 29.6	60.493N.	150.478W.	58	GS	3.6	...	4.0ML(PM)	FELT	AUG. 18	19:31	YST
AUG.	20	14 19 59.7	64.297N.	150.099W.	18	GS	...	...	3.2ML(PM)	...	AUG. 20	05:19	YST
AUG.	21	18 18 03.2	55.845N.	153.571W.	33N	GS	...	...	4.3ML(PM)	...	AUG. 21	09:18	YST
AUG.	22	14 35 27.2	56.798N.	154.506W.	33N	GS	...	...	4.2ML(PM)	...	AUG. 22	05:35	YST
AUG.	23	09 44 28.7	60.188N.	140.999W.	15	GS	...	...	3.2ML(PM)	...	AUG. 23	00:44	YST
AUG.	23	20 41 50.8	64.554N.	147.980W.	16	GS	...	...	4.1ML(PM)	III	AUG. 23	11:41	YST
AUG.	24	18 28 32.4	59.492N.	144.104W.	33N	GS	3.9	...	4.0ML(PM)	...	AUG. 24	09:28	YST
AUG.	26	03 32 45.7	60.703N.	151.339W.	100	GS	...	...	....	FELT	AUG. 25	18:32	YST
AUG.	27	06 38 13.9	59.008N.	151.201W.	33N	GS	...	...	4.0ML(PM)	...	AUG. 26	21:38	YST
AUG.	27	20 41 13.5	59.832N.	153.413W.	127	GS	4.5	...	....	...	AUG. 27	11:41	YST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date	Origin time (UTC) hr min sec	Latitude (°)	Longitude (°)	Depth (km)	Hypocenter source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date	Hour	Time zone
ALASKA-Continued												
AUG. 29	07 20 45.6	60.430N.	153.009W.	150	GS	...	...	....	...	AUG. 28	22:20	YST
AUG. 31	22 03 31.0	58.320N.	133.610W.	18	EP	...	...	3.4ML(EP)	...	AUG. 31	13:03	YST
SEPT. 1	14 58 16.4	53.012N.	168.260W.	61	GS	4.6	...	4.6ML(PM)	FELT	SEPT. 1	05:58	AST
SEPT. 1	15 30 18.1	52.127N.	170.570W.	33N	GS	4.8	...	....	...	SEPT. 1	05:30	AST
SEPT. 1	22 55 51.7	53.488N.	163.574W.	33N	GS	4.9	...	4.5ML(PM)	...	SEPT. 1	13:55	YST
SEPT. 1	23 33 13.0	58.320N.	133.620W.	18	EP	...	...	3.4ML(EP)	...	SEPT. 1	14:33	YST
SEPT. 2	06 56 12.0	58.310N.	133.590W.	18	EP	...	...	3.5ML(EP)	...	SEPT. 1	21:56	YST
SEPT. 3	10 04 03.2	58.003N.	148.383W.	33N	GS	...	...	3.4ML(PM)	...	SEPT. 3	01:04	YST
SEPT. 4	08 47 35.9	64.847N.	149.107W.	28	GS	...	...	3.8ML(PM)	III	SEPT. 3	23:47	YST
SEPT. 5	18 24 02.8	59.393N.	145.461W.	33N	GS	4.6	...	4.2ML(PM)	...	SEPT. 5	09:24	YST
SEPT. 7	07 19 19.8	63.060N.	148.396W.	111	GS	...	...	....	...	SEPT. 6	22:19	YST
SEPT. 10	09 57 47.9	52.577N.	172.482E.	33N	GS	4.9	...	....	...	SEPT. 9	23:57	AST
SEPT. 10	19 22 31.1	60.933N.	151.115W.	5	GS	...	...	....	III	SEPT. 10	10:22	YST
SEPT. 15	08 50 44.6	67.783N.	161.771W.	33N	GS	...	...	....	...	SEPT. 14	23:50	YST
SEPT. 15	12 51 58.3	61.722N.	151.182W.	85	GS	...	...	....	...	SEPT. 15	03:51	YST
SEPT. 20	04 17 24.4	60.322N.	146.001W.	18	GS	5.5	5.2	5.2ML(PM)	IV	SEPT. 19	19:17	YST
SEPT. 20	04 28 04.0	60.306N.	146.098W.	26	GS	5.1	4.7	4.7ML(PM)	IV	SEPT. 19	19:28	YST
SEPT. 22	18 02 23.4	60.143N.	152.342W.	112	GS	...	...	....	...	SEPT. 22	09:02	YST
SEPT. 23	17 06 36.3	53.577N.	165.424W.	33N	GS	5.7	5.5	5.9ML(PM)	IV	SEPT. 23	08:06	AST
SEPT. 24	13 48 38.9	61.432N.	150.005W.	46	GS	...	...	3.3ML(PM)	II	SEPT. 24	04:48	YST
SEPT. 25	19 06 50.3	53.663N.	166.404W.	65	GS	4.7	...	5.1ML(PM)	II	SEPT. 25	10:06	AST
SEPT. 26	09 53 39.5	53.380N.	163.526W.	33N	GS	4.7	...	....	...	SEPT. 26	00:53	YST
SEPT. 26	14 58 25.1	63.168N.	149.926W.	114	GS	4.3	...	....	III	SEPT. 26	05:58	YST
SEPT. 26	20 30 46.4	51.180N.	178.510W.	33N	GS	4.9	...	....	...	SEPT. 26	10:30	AST
SEPT. 27	09 02 52.8	59.836N.	153.048W.	128	GS	...	...	....	...	SEPT. 27	00:02	YST
SEPT. 27	11 20 07.1	63.456N.	153.191W.	33N	GS	...	...	3.4ML(PM)	...	SEPT. 27	02:20	YST
SEPT. 28	10 24 04.7	62.182N.	151.176W.	123	GS	...	...	....	...	SEPT. 28	01:24	YST
SEPT. 29	08 02 22.3	61.802N.	150.930W.	94	GS	...	...	....	...	SEPT. 28	23:02	YST
SEPT. 29	13 14 58.1	63.513N.	151.110W.	33N	GS	...	...	2.7ML(PM)	...	SEPT. 29	04:14	YST
SEPT. 29	14 19 15.0	61.000N.	149.836W.	62	GS	4.6	...	4.2ML(PM)	III	SEPT. 29	05:19	YST
OCT. 1	08 40 25.1	51.609N.	177.951E.	149	GS	4.4	...	....	...	SEPT. 30	22:40	AST
OCT. 2	12 05 09.4	52.142N.	173.469W.	91	GS	4.5	...	....	...	OCT. 2	02:05	AST
OCT. 2	17 43 10.9	52.095N.	179.590E.	175	GS	4.6	...	....	...	OCT. 2	07:43	AST
OCT. 3	04 15 02.5	54.212N.	163.321W.	33N	GS	4.6	...	....	...	OCT. 2	19:15	YST
OCT. 3	19 17 23.0	62.742N.	143.714W.	5	GS	...	...	3.0ML(PM)	II	OCT. 3	10:17	YST
OCT. 3	23 42 30.5	63.344N.	153.382W.	33N	GS	...	...	3.2ML(PM)	...	OCT. 3	14:42	YST
OCT. 4	06 41 57.0	57.910N.	139.570W.	18	EP	...	...	3.5ML(EP)	...	OCT. 3	21:41	YST
OCT. 4	22 41 03.3	59.145N.	151.706W.	63	GS	4.6	...	4.3ML(PM)	III	OCT. 4	13:41	YST
OCT. 5	15 46 27.2	51.871N.	176.016W.	68	GS	5.3	...	5.2ML(PM)	IV	OCT. 5	05:46	AST
OCT. 6	02 09 58.4	63.947N.	148.967W.	5	GS	...	...	3.1ML(PM)	...	OCT. 5	17:09	YST
OCT. 7	16 35 23.9	63.432N.	150.398W.	5	GS	...	...	3.3ML(PM)	...	OCT. 7	07:35	YST
OCT. 7	17 24 54.8	63.507N.	151.321W.	5	GS	...	...	3.7ML(PM)	...	OCT. 7	08:24	YST
OCT. 7	23 42 46.0	59.990N.	140.120W.	18	EP	...	...	3.1ML(EP)	...	OCT. 7	14:42	YST
OCT. 8	00 49 37.9	63.232N.	151.128W.	33N	GS	...	...	3.2ML(PM)	...	OCT. 7	15:49	YST
OCT. 8	21 10 09.8	61.716N.	150.834W.	56	GS	...	...	3.5ML(PM)	...	OCT. 8	12:10	YST
OCT. 10	21 38 09.7	51.086N.	179.275W.	33N	GS	4.8	...	....	...	OCT. 10	11:38	AST
OCT. 11	19 30 32.4	53.292N.	168.721W.	33N	GS	4.2	...	....	...	OCT. 11	09:30	AST
OCT. 13	18 42 58.8	53.588N.	163.596W.	33N	GS	5.0	...	4.5ML(PM)	...	OCT. 13	09:42	YST
OCT. 13	19 01 28.3	53.638N.	163.518W.	33N	GS	4.8	...	....	...	OCT. 13	10:01	YST
OCT. 14	04 49 38.3	62.249N.	149.577W.	76	GS	3.8	...	....	...	OCT. 13	19:49	YST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date		Origin time (UTC) hr min sec	Latitude (°)	Longitude (°)	Depth (km)	Hypo-center source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date	Hour	Time zone
ALASKA-Continued													
OCT.	14	10 19 48.9	60.928N.	147.298W.	40	GS	3.2	...	3.4ML(PM)	...	OCT. 14	01:19	YST
OCT.	14	14 33 47.6	53.389N.	168.435W.	33N	GS	4.6	...	....	...	OCT. 14	05:33	AST
OCT.	15	03 25 52.2	52.455N.	168.595W.	33N	GS	4.6	...	....	...	OCT. 14	17:25	AST
OCT.	15	04 32 56.2	51.953N.	168.643W.	33N	GS	4.7	4.4	....	...	OCT. 14	18:32	AST
OCT.	15	05 44 34.4	52.279N.	168.732W.	33N	GS	5.0	4.4	....	...	OCT. 14	19:44	AST
OCT.	16	06 58 38.2	52.105N.	169.883W.	33N	GS	4.4	...	....	...	OCT. 15	20:58	AST
OCT.	17	13 53 47.2	52.483N.	168.027W.	33N	GS	4.9	...	4.6ML(PM)	...	OCT. 17	04:53	AST
OCT.	17	17 57 27.0	51.653N.	179.195W.	33N	GS	4.7	...	4.1ML(PM)	...	OCT. 17	07:57	AST
OCT.	18	05 19 56.6	63.176N.	151.131W.	135	GS	4.7	...	....	III	OCT. 17	20:19	YST
OCT.	18	23 47 26.5	62.981N.	148.216W.	82	GS	3.6	...	....	...	OCT. 18	14:47	YST
OCT.	19	04 44 44.7	61.649N.	150.973W.	77	GS	4.5	...	....	II	OCT. 18	19:44	YST
OCT.	19	20 43 06.2	60.139N.	150.987W.	97	GS	3.7	...	....	II	OCT. 19	11:43	YST
OCT.	20	15 41 45.1	52.140N.	168.566W.	33N	GS	5.0	...	....	...	OCT. 20	05:41	AST
OCT.	21	14 12 19.1	64.453N.	147.990W.	15	GS	...	...	3.9ML(PM)	...	OCT. 21	05:12	YST
OCT.	23	16 39 53.9	54.984N.	135.167W.	10	GS	3.9	...	....	...	OCT. 23	07:39	YST
OCT.	25	12 37 15.4	51.675N.	175.210W.	56	GS	5.3	...	5.1ML(PM)	V	OCT. 25	02:37	AST
OCT.	29	01 39 11.4	65.711N.	143.617W.	33N	GS	...	...	3.7ML(PM)	...	OCT. 28	16:39	YST
OCT.	29	23 04 43.6	51.125N.	179.484E.	39	GS	5.2	5.2	5.3ML(PM)	...	OCT. 29	13:04	AST
OCT.	31	01 17 37.5	52.796N.	174.507W.	189	GS	4.5	...	....	...	OCT. 30	15:17	AST
OCT.	31	04 40 05.0	51.173N.	179.559E.	57	GS	5.1	...	5.4ML(PM)	...	OCT. 30	18:40	AST
NOV.	1	08 18 00.7	60.634N.	150.445W.	73	GS	...	...	....	...	OCT. 31	23:18	YST
NOV.	2	17 45 43.9	58.945N.	152.712W.	86	GS	4.0	...	....	...	NOV. 2	08:45	YST
NOV.	3	13 18 52.3	54.406N.	154.296W.	33N	GS	4.6	...	4.3ML(PM)	...	NOV. 3	04:18	YST
NOV.	8	09 37 31.9	52.151N.	171.036W.	33N	GS	4.8	4.5	4.8ML(PM)	...	NOV. 7	23:37	AST
NOV.	8	13 02 00.1	52.181N.	170.999W.	33N	GS	5.4	5.3	5.5ML(PM)	...	NOV. 8	03:02	AST
NOV.	8	14 53 55.3	52.187N.	170.958W.	33N	GS	4.6	...	....	...	NOV. 8	04:53	AST
NOV.	8	17 48 03.6	52.024N.	170.947W.	33N	GS	4.7	...	4.4ML(PM)	...	NOV. 8	07:48	AST
NOV.	9	06 58 06.9	63.905N.	147.915W.	23	GS	3.7	...	4.2ML(PM)	IV	NOV. 8	21:58	YST
NOV.	9	19 51 39.2	62.973N.	149.968W.	105	GS	...	...	....	...	NOV. 9	10:51	YST
NOV.	11	05 45 42.3	61.291N.	147.472W.	33N	GS	...	...	4.2ML(PM)	...	NOV. 10	20:45	YST
NOV.	12	08 16 32.0	57.090N.	140.350W.	18	EP	...	..	3.0ML(EP)	...	NOV. 11	23:16	YST
NOV.	13	00 37 49.9	62.092N.	150.641W.	32	GS	...	..	3.0ML(PM)	...	NOV. 12	15:37	YST
NOV.	13	13 08 24.8	51.884N.	174.028W.	33N	GS	4.6	...	4.9ML(PM)	...	NOV. 13	03:08	AST
NOV.	13	23 29 44.4	61.801N.	149.717W.	30	GS	...	...	3.8ML(PM)	...	NOV. 13	14:29	YST
NOV.	14	19 40 09.4	53.059N.	168.653W.	82	GS	4.2	..	....	...	NOV. 14	09:40	AST
NOV.	17	09 03 19.3	63.330N.	152.694W.	3	GS	5.0	..	5.3ML(PM)	III	NOV. 17	00:03	YST
NOV.	18	04 36 30.6	63.119N.	148.204W.	94	GS	..	..	....	...	NOV. 17	19:36	YST
NOV.	18	08 29 20.0	56.601N.	152.319W.	33N	GS	4.8	...	4.2ML(PM)	...	NOV. 17	23:29	YST
NOV.	19	00 44 27.2	58.567N.	156.702W.	206	GS	4.6	..	....	II	NOV. 18	15:44	YST
NOV.	19	04 10 42.4	51.170N.	179.096E.	39	GS	5.6	5.5	5.7ML(PM)	II	NOV. 18	18:10	AST
NOV.	19	12 06 37.3	51.777N.	175.272W.	58	GS	5.6	...	5.5ML(PM)	IV	NOV. 19	02:06	AST
NOV.	22	04 15 14.5	51.128N.	179.416E.	33N	GS	4.8	...	4.8ML(PM)	...	NOV. 21	18:15	AST
NOV.	22	04 21 16.5	51.066N.	179.093E.	33N	GS	4.5	...	....	...	NOV. 21	18:21	AST
NOV.	22	04 38 21.6	50.777N.	179.240E.	33N	GS	4.6	...	....	...	NOV. 21	18:38	AST
NOV.	22	05 58 01.0	50.954N.	179.596E.	33N	GS	4.5	...	....	...	NOV. 21	19:58	AST
NOV.	22	13 10 58.1	62.965N.	149.602W.	107	GS	...	..	....	...	NOV. 22	04:10	YST
NOV.	23	10 37 38.3	54.654N.	163.849W.	33N	GS	4.8	..	....	III	NOV. 23	01:37	YST
NOV.	23	16 16 24.5	52.149N.	170.384W.	33N	GS	4.6	...	....	...	NOV. 23	06:16	AST
NOV.	24	10 42 24.1	60.011N.	153.359W.	161	GS	4.1	...	....	...	NOV. 24	01:42	YST
NOV.	25	08 49 55.1	58.291N.	155.072W.	33N	GS	4.2	...	4.5ML(PM)	...	NOV. 24	23:49	YST

Table 1. *Summary of U.S. earthquakes for 1984*—Continued

Date		Origin time (UTC) hr min sec	Latitude (°)	Longitude (°)	Depth (km)	Hypo-center source	Magnitude mb	MS	ML, Mn MD, Mw	Maximum intensity	Local time Date		Hour	Time zone
ALASKA-Continued														
NOV.	25	09 58 57.1	53.190N.	171.869E.	33N	GS	4.1	...	....	...	NOV.	24	23:58	AST
NOV.	26	01 42 13.4	62.902N.	150.536W.	126	GS	...	...	....	...	NOV.	25	16:42	YST
NOV.	26	02 31 39.9	62.910N.	150.574W.	100	GS	...	...	....	...	NOV.	25	17:31	YST
NOV.	26	06 13 08.9	59.614N.	152.888W.	119	GS	4.0	...	....	...	NOV.	25	21:13	YST
NOV.	27	02 08 00.1	54.241N.	163.857W.	33N	GS	4.8	...	4.2ML(PM)	...	NOV.	26	17:08	YST
NOV.	29	06 09 08.5	51.233N.	174.832W.	33N	GS	4.6	...	4.0ML(PM)	...	NOV.	28	20:09	AST
NOV.	29	07 45 12.6	51.466N.	176.268W.	33N	GS	4.3	...	4.6ML(PM)	FELT	NOV.	28	21:45	AST
NOV.	29	15 32 03.5	51.884N.	175.114E.	47	GS	4.8	4.2	....	...	NOV.	29	05:32	AST
NOV.	29	22 35 36.6	51.850N.	175.076E.	47	GS	4.5	...	....	...	NOV.	29	12:35	AST
NOV.	30	01 19 38.5	64.022N.	148.802W.	33N	GS	...	...	3.6ML(PM)	...	NOV.	29	16:19	YST
DEC.	1	17 17 30.8	52.352N.	178.195E.	160	GS	4.5	...	....	...	DEC.	1	07:17	AST
DEC.	1	18 25 51.3	60.575N.	150.301W.	51	GS	3.8	...	4.1ML(PM)	II	DEC.	1	09:25	YST
DEC.	1	18 45 24.8	51.355N.	176.342W.	33N	GS	5.0	...	5.0ML(PM)	III	DEC.	1	08:45	AST
DEC.	2	09 43 02.7	59.782N.	153.364W.	149	GS	...	...	....	...	DEC.	2	00:43	YST
DEC.	3	05 53 54.3	52.175N.	169.531W.	33N	GS	4.8	...	....	...	DEC.	2	19:53	AST
DEC.	3	12 22 45.1	51.943N.	177.330E.	90	GS	4.9	...	....	...	DEC.	3	02:22	AST
DEC.	3	22 51 29.5	63.474N.	148.889W.	114	GS	...	...	....	...	DEC.	3	13:51	YST
DEC.	4	19 42 26.5	60.104N.	152.752W.	133	GS	...	...	....	...	DEC.	4	10:42	YST
DEC.	5	07 52 39.5	62.645N.	152.760W.	5	GS	...	...	2.9ML(PM)	...	DEC.	4	22:52	YST
DEC.	5	13 58 55.6	61.839N.	149.711W.	39	GS	...	...	3.0ML(PM)	...	DEC.	5	04:58	YST
DEC.	7	16 27 55.3	51.668N.	170.817W.	33N	GS	4.9	4.3	4.2ML(PM)	...	DEC.	7	06:27	AST
DEC.	8	21 07 47.3	63.653N.	150.770W.	24	GS	4.6	5.2	4.6ML(PM)	FELT	DEC.	8	12:07	YST
DEC.	9	04 23 18.2	63.638N.	150.771W.	28	GS	3.7	...	4.3ML(PM)	...	DEC.	8	19:23	YST
DEC.	10	18 50 21.3	62.573N.	149.505W.	24	GS	...	...	2.9ML(PM)	...	DEC.	10	09:50	YST
DEC.	12	04 50 54.4	61.659N.	150.965W.	76	GS	3.8	...	....	...	DEC.	11	19:50	YST
DEC.	12	15 50 32.7	66.973N.	156.956W.	33N	GS	...	...	3.3ML(PM)	...	DEC.	12	06:50	YST
DEC.	16	09 15 44.7	51.327N.	176.837E.	33N	GS	4.3	...	4.7ML(PM)	...	DEC.	15	23:15	AST
DEC.	17	18 36 23.5	59.553N.	152.389W.	85	GS	...	...	....	III	DEC.	17	09:36	YST
DEC.	19	00 51 52.2	66.067N.	154.489W.	27	GS	...	...	3.8ML(PM)	II	DEC.	18	15:51	YST
DEC.	19	05 19 45.9	58.123N.	155.821W.	33N	GS	...	...	....	...	DEC.	18	20:19	YST
DEC.	20	03 48 40.8	56.564N.	154.041W.	36	GS	4.7	...	4.5ML(PM)	...	DEC.	19	18:48	YST
DEC.	20	22 26 12.1	63.348N.	149.842W.	122	GS	...	...	....	...	DEC.	20	13:26	YST
DEC.	21	07 51 19.2	63.605N.	150.495W.	33N	GS	...	...	3.3ML(PM)	...	DEC.	20	22:51	YST
DEC.	21	09 46 51.3	52.474N.	174.353W.	133	GS	4.3	...	....	...	DEC.	20	23:46	AST
DEC.	22	10 27 38.8	60.980N.	146.614W.	9	GS	...	...	3.0ML(PM)	...	DEC.	22	01:27	YST
DEC.	23	22 01 58.6	62.205N.	151.012W.	98	GS	...	...	....	...	DEC.	23	13:01	YST
DEC.	24	13 29 56.4	58.627N.	154.393W.	33N	GS	...	...	3.4ML(PM)	...	DEC.	24	04:29	YST
DEC.	27	09 55 30.2	53.925N.	162.417W.	33N	GS	5.0	...	....	...	DEC.	27	00:55	YST
DEC.	27	20 50 56.6	53.218N.	167.897W.	175	GS	4.2	...	....	...	DEC.	27	11:50	AST
DEC.	27	23 11 32.4	51.787N.	174.639W.	97	GS	4.3	...	....	...	DEC.	27	13:11	AST
DEC.	28	04 16 17.0	50.392N.	177.926E.	33N	GS	4.8	...	....	...	DEC.	27	18:16	AST
DEC.	29	03 02 12.6	60.117N.	153.388W.	166	GS	4.0	...	....	...	DEC.	28	18:02	YST

NETWORK OPERATIONS

Eastern Aleutian Seismicity

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There were 655 events located by the Shumagin seismic network in 1984, with 73 events greater than or equal to magnitude 3.0. This seismicity is shown in map view in figure 29 and in cross section in figure 30. The coverage within the network is uniform at about the magnitude 2.0 level but events as small as 0.4 can be located in some areas. The overall pattern over this time period is similar to previous years, though the double-planed Benioff zone between 50 and 150 kilometers depth is only weakly determined. The highest concentration of events occurs along the base of the shallow thrust zone on a line roughly from station NGI to station SNK (fig. 31). The thrust zone itself, which is assumed to be the contact between the Pacific and North American plates, is poorly defined. West of the network the seismicity is more diffuse and extends further offshore, i.e., closer to the trench.

The only unusual activity consisted of a shallow (less than 10 kilometers) earthquake swarm that began in August under Mt. Dutton, an extinct volcano of uncertain age near 55.25°N., 162.25°W. This was the largest swarm we have recorded on the peninsula since the network was installed in 1973. There were 35 events located between 8-20-84 and 12-30-84 with at least 20 additional smaller events near the beginning of the swarm. Occasional events continued into March 1985. The biggest event in the swarm was M_L=2.9 with most magnitudes measuring below 1.5.

The Shumagin seismic network consists of short-period, high-gain seismic stations, a few low-gain stations, and strong motion accelerographs. The data from the different sets of instrumentation are being applied to ground motion, seismic source, earthquake prediction, tectonic and volcanological studies. The network includes 13 remote stations plus four stations in the Pavlof Volcano subarray and the local station at Sand Point (SAN) (fig. 31). There are 12 stations with a single vertical seismometer and 6 three-component stations. There is one digital strong-motion recorder and 11 analog strong-motion accelerographs (SMA-1) with the network. Nine of these SMA's are co-located with high-gain stations and are connected to the telemetry system, allowing us to know the exact time at which the SMA began recording a given earthquake.

A bulletin listing solutions for all located events and individual pickfiles for all events greater than magnitude 3.0 (including some regional events not shown on the map) can be obtained from the authors.

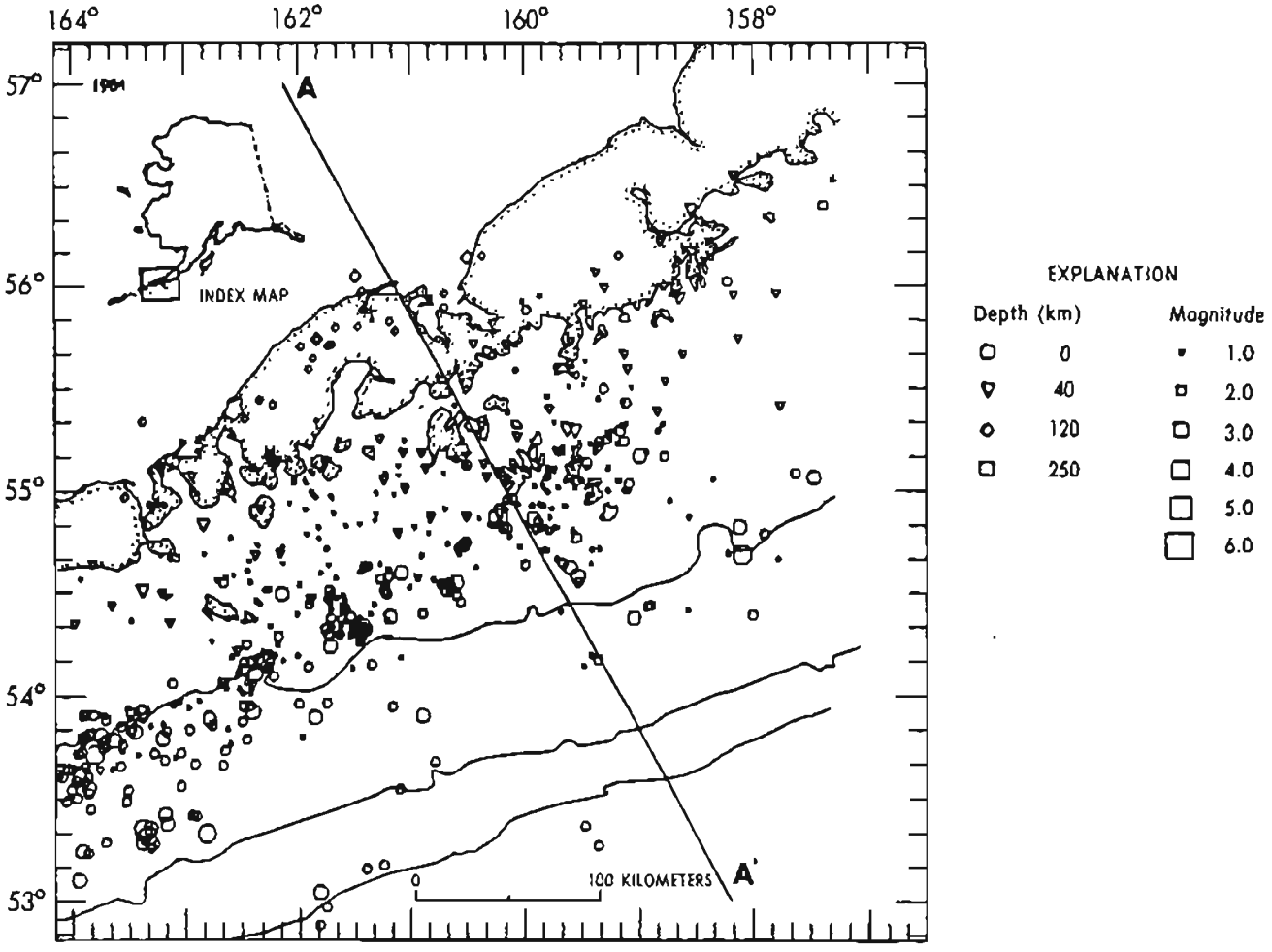

Figure 29. Seismicity recorded by the Shumagin Island seismic network from January 1 to December 30, 1984. Depth is shown by symbol type and magnitude by symbol size.

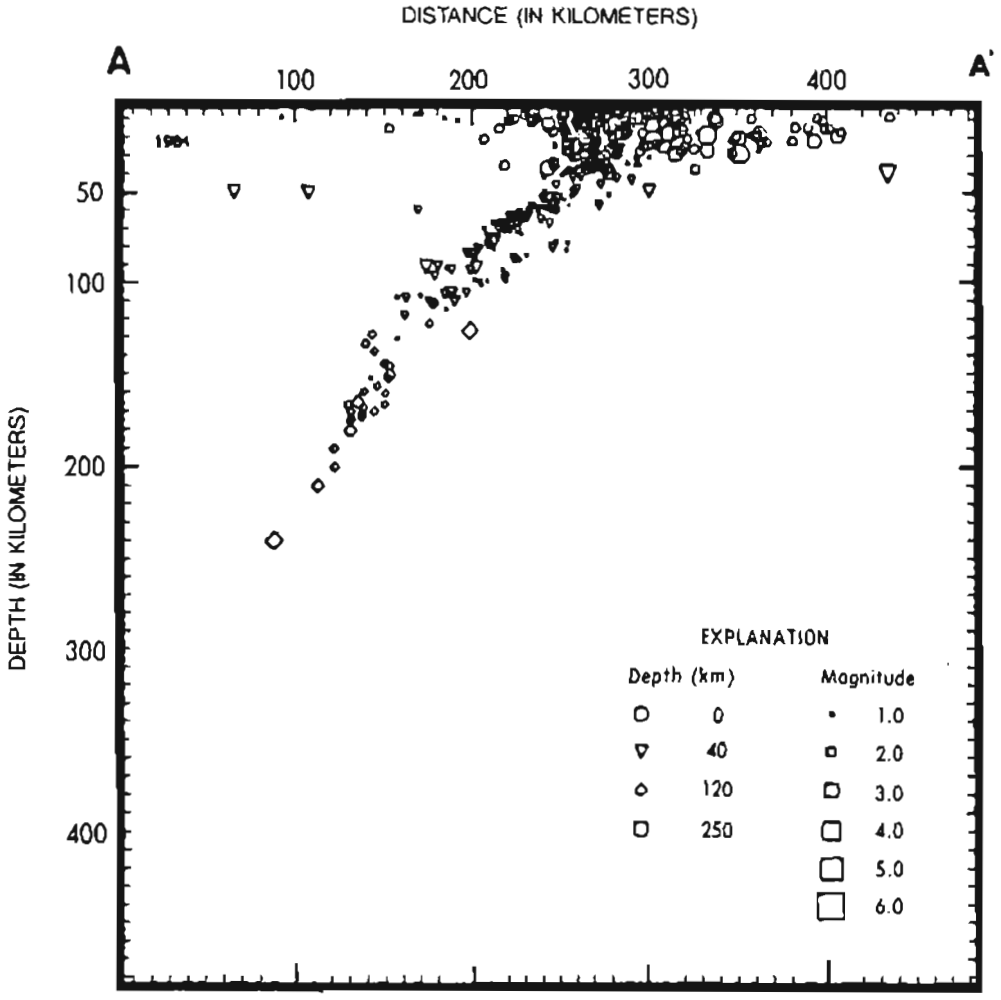

Figure 30. Cross section of seismicity projected along the line A-A' in figure 29.

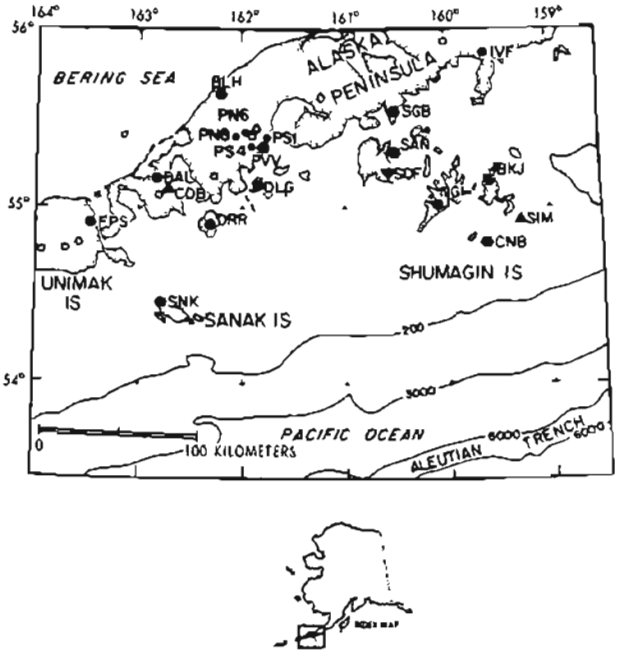

Figure 31. The Shumagin seismic network, Alaska, during 1984. Solid circles are short-period vertical seismic stations. Hexagons are short-period, three-component seismic stations. The inverted triangle (SQF) indicates a low-gain site with a three-component force balance accelerometer. Strong-motion accelerographs (SMA-1) are located at the seismic stations SNK, DRR, DLG, SGB, SAN, NGI, BKJ, IVF, and CNB, and at upward pointing triangles. Instrumentation at SAN also includes a digitally recording PDR-1 strong-motion recorder with FBA sensors.

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United States Earthquakes, 1984
"Earthquake Descriptions"

The following event description was omitted:

19 December (GS) Central Alaska
Origin time: 00 51 52.2
Epicenter: 66.067N., 154.489W.
Depth: 27 km
Magnitude: 3.8 M_L (PM)
Intensity II: Hughes (PM).

"Table 1"

The following hypocenter on page 113 should be listed in CALIFORNIA OFF THE COAST:

Nov. 25 05 08 50.1

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