



KEY TO GEOPHYSICAL RECORDS Documentation No. 3

CATALOG OF EARTHQUAKE PHOTOGRAPHS

PHOTOGRAPH CREDITS

Dames & Moore, Los Angeles, CA: 245

Fairbanks Daily News: 184, 186

Hawaii Civil Defense: 246, 248, 249, 252-254

Hawaii Tribune-Herald: 247, 250, 251, 255, 256, 257-261

National Aeronautics and Space Administration: 273

U.S. Geological Survey: 1-37, 42-67, 91, 96, 98-116, 137, 151, 158, 159, 162, 220,

221, 262-268, 270, 271, 274

University of Chile (E. Kausel): 201-203

National Oceanic and Atmospheric Administration: All remaining photos in the file.

Cover and title page, designed by Jon Howe, are montages of photographs listed in this catalog.

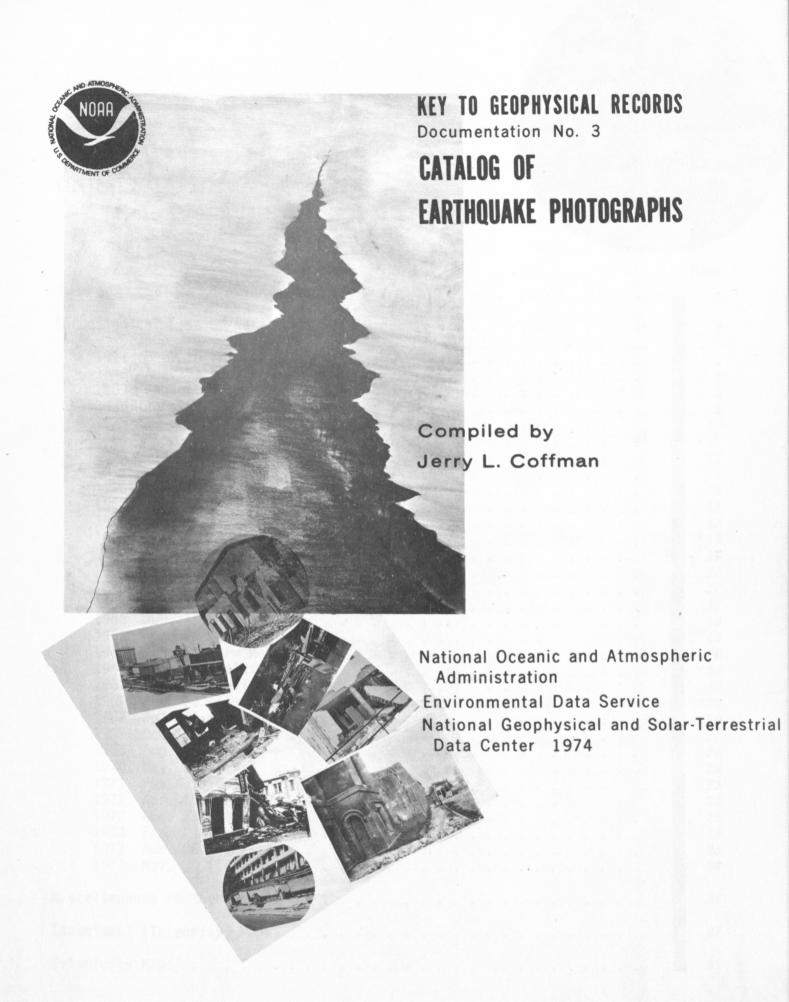






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INTRODUCTION

Photographs of earthquake damage and other effects are a unique data form capturing the transient consequences of the violent shaking. They preserve a record of the effects which otherwise may be quickly lost in cleanup and repair operations. For engineers, they provide details of construction and effects which cannot easily be reduced to a written report. For others, photographs provide graphic evidence of the effects of earthquakes.

This catalog represents a beginning effort to systematically collect photographs and maps from many sources and to make them generally available. Photographs of such California earthquakes as Santa Barbara, 1925, Long Beach, 1933, and El Centro, 1940, are noticeably missing from this first effort. However, private photograph collections already have been offered to fill these and other gaps and to supplement many earthquake photos now in the data file. These will be published in the first revision of the catalog. This catalog lists approximately 300 photographs and 200 maps on the subject of earthquakes and contains descriptions and examples of the collection. Many of the photographs show views of earthquake-damaged buildings, bridges, dams, and other man-made structures; several show spectacular landslides, rifts, and ground cracks resulting from destructive shocks. The maps depict intensity distribution of important earthquakes and the seismicity of areas throughout the world. All of these are available as black and white prints or 35-mm transparencies, but some may be obtained in color. Prints, copy negatives, and 35-mm transparencies may be ordered as indicated on page 3.

The "Chronological List of Earthquake Photographs" beginning on page 5 is a listing of 32 damaging earthquakes that date from December 1811. Date, location, and photographs on file for each earthquake are given. To obtain all available photos for a particular earthquake, refer to the Table of Contents, page iii, which gives the dates of all earthquakes listed in the file. If photos are needed on a certain aspect of earthquake damage (for example, damage to bridges), refer to the Index to Photographs and Maps, page 35, which provides cross-reference to the subjects covered in this catalog.

The index contains six main categories: I. Earthquake damage; II. Aerial views; III. Human interest photographs; IV. Isoseismal (intensity) maps; V. Seismicity maps; and VI. Damage (all types) by location. The numbers following each entry refer to the numbered descriptions in "Chronological List of Earthquake Photographs."

Category I (earthquake damage) is subdivided into nine sections to guide the user to most subjects concerning damage. They are as follows: Buildings; damage to specific engineering structural elements; damage to bridges and wharfs; damage to tunnels and culverts; ground effects and damage to earthwork; damage to dams and related structures; damage to harbor and coastal works; miscellaneous earthquake damage; and damage from fires following earthquakes. In some instances these subjects are further divided into more detailed aspects.

The aerial views of category II are listed by city and state or country.

Some of these are cross-indexed under other categories. Category III contains photos emphasizing the impact of earthquakes in human, rather than engineering, aspects. The intensity maps of category IV are presented alphabetically by state. Category V contains seismicity maps listed by subject. The last section, category VI, is especially helpful to those seeking earthquake photographs from a particular city of the world. An alphabetical listing by state or country and city, it is a cross-index of categories I through III.

Directions for Ordering

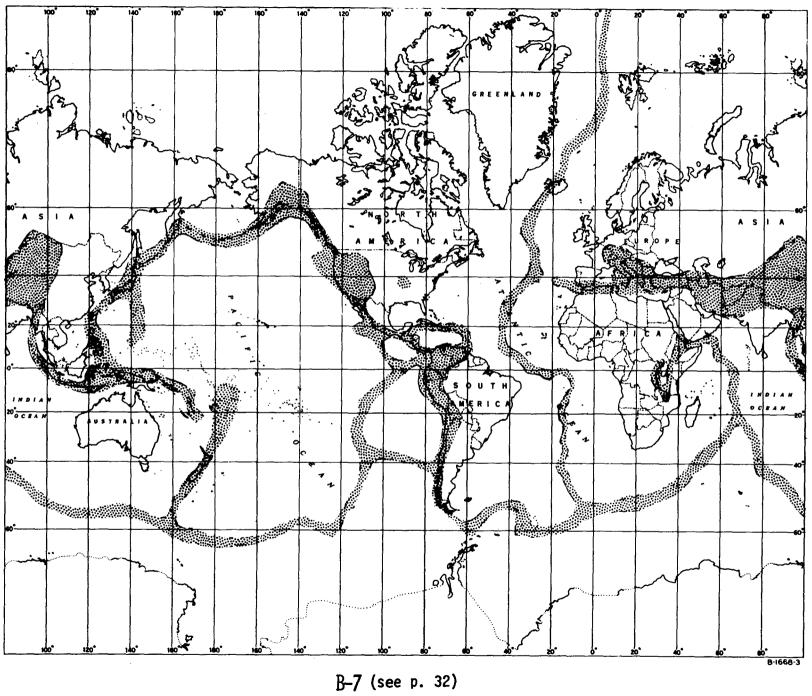
A request for prints, copy negatives, and duplicates of color transparencies should specify the date of the earthquake, the photograph number in the catalog, and the type and size of print or negative required. A check made payable to "NOAA, EDS, NGSDC" must be sent with each order (see price table below).

When the order is filled, NGSDC will furnish a caption and credit line for each item. Although permission for use of prints or negatives is not required, photos or maps may not be used to indicate that the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, or Environmental Data Service endorses any product or service.

PRICE SCHEDULE

	Size	${\it Cost}$
Photographic prints and maps (black and white)	8 X 10	\$2.45
Photographic prints (color)	(Prices will for specific	be furnished requests)
Copy negatives (black and white)	4 X 5	3.00
35-mm transparencies (if made from 8 X 10 print).		4.00
35-mm transparencies (duplicatecopied from archive transparency)		1.00

NOTE: Prices are subject to revision without notice. The minimum charge per order is \$10.00. Unless otherwise specified, glossy prints will be furnished. For 35-mm transparencies, the duplicate price is applicable if the caption is followed by (Color) or (S). Address all requests to the National Geophysical and Solar-Terrestrial Data Center, NOAA/EDS, Boulder, CO. 80302. Please make check or money order payable to "NOAA, EDS, NGSDC" at the time the order is placed.

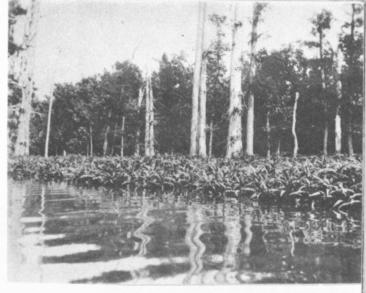


CHRONOLOGICAL LIST OF EARTHQUAKE PHOTOGRAPHS

Dec. 16, 1811 New Madrid, MO.

Note: Photographs were taken by USGS in 1904.

- 1 Growth of nelumbium, allied to lotus. River-swamp type of sunk lands, Varney River, Kennett, MO.
- 2 Water weeds of shallower lakes of sunk lands in New Madrid earthquake area, Varney River, Kennett, MO.
- 3 Swamp in New Madrid earthquake area; submerged land. Some dead trees and new growth, Varney River, Kennett, MO.
- 4 Enlarged butt of gum tree in New Madrid area. Young growth along edges of sunk lands, Varney River, Kennett, MO.
- 5 Channel of Varney River, MO. Swamp in New Madrid earthquake area is on left. Trees were killed by subsidence; area on right is new growth.
- 6 Gum and cypress in swamp in New Madrid earthquake area; growth since earthquake, Varney River, Kennett, MO.
- 7 Water standing in earthquake crack, Marked Tree, AR.
- 8 Log across earthquake crack, Marked Tree, AR.
- 9 Young gum and cypress growth in sunk lands, St. Francis River, Lake City, AR.
- 10 Cypress trunks killed by submergence, Lake St. Francis, AR.
- Water pocket in earthquake craterlet of New Madrid earthquake, Blytheville, AR.
- 12 Coalescent or linear blows obstructing drainage in Arkansas district. Sand blows of New Madrid earthquake, Blytheville, AR.







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New Madrid, MO.--Cont.

- 13 Sand blow of craterlet type in area of disturbance, Caruthersville, MO.
- 14 Two views of lower end of Reelfoot Lake, TN, showing trunks killed by submergence in distance.
- 15 Elevated cypress near south end of Reelfoot Lake, TN.
- 16 Trees prostrated by New Madrid earthquake, Reelfoot Lake, TN.
- 17 Landslide trench and ridge in Chickasaw Bluffs, TN, east of Reelfoot Lake.
- 18 Landslide fissures in Chickasaw Bluffs, TN, east of Reelfoot Lake.
- 19 Trees tilted by New Madrid earthquake, Chickasaw Bluffs, east side of Reelfoot Lake, TN. Note twist of trees into upright position.
- 20 View of one side of fault trench of fissure near banks of St. Francis River, New Madrid County, MO.

Aug. 31, 1886 Charleston, SC.

- 21 Displaced coping; portico of old Guard House, southwest corner of Meeting and Broad St., Charleston.
- 22 Damaged house at Lincolnville.
- 23 Lateral displacement of railroad tracks near Rantowles. (S)*
- 24 Railroad tracks warped in area.
- 25 East Bay St. damage, Charleston.
- 26 Typical damage to buildings in Charleston.



^{*}Designation (S) is explained on p. 3.

Charleston, SC. -- Cont.



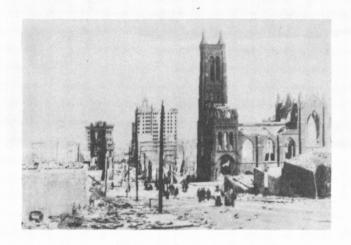
- 27 Hiberian Hall crashed to ground on Meeting St., Charleston. (S)
- 28 Building damage on Hayne St., Charleston. (S)
- 29 Wrecked brick house at 157 Tradd St., Charleston.
- 30 Destroyed gable of brick house, corner of Queen and Mazyck St., Charleston.
- 31 Thrown gable and twisted chimney, Broad St. opposite Orange, looking northeast, Charleston.
- 32 Derailed locomotive on Ten Mile Hill, Berkeley County.
- 33 Craterlet, Ten Mile Hill, Berkeley County.
- 34 Damaged tower and coping of city hospital, Charleston.
- 35 Brick wall of city jail fissured, Magazine St. near Luzon, Charleston.
- 36 People encamped in city park public square, Charleston, after earthquake.

Sept. 10, 1899 Yakutat Bay, AK.

37 Aerial view of Bancas Point and Disenchantment Bay; locality of 47-foot (14.3 m) uplift during earthquake.

Apr. 18, 1906 San Francisco, CA.

- 38 A panoramic view of San Francisco in flames five hours after earthquake; photo taken from Mason St. at 10:00 a.m., April 18, 1906.
- 39 Row of two-story buildings collapsed backward away from street when ground slumped beneath foundations. Photo was taken before fire destroyed entire block.

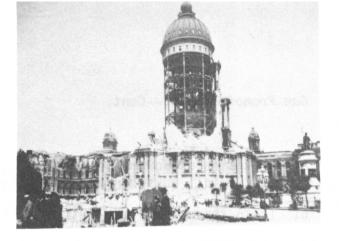


- 40 California St. after earthquake and fire.
- 41 Earthquake effects on terrain and street.
- 42 Collapsed pilarcitos 30-inch (11.8 cm) wrought-iron pipeline, near trestle crossing fault. The slip produced a compression on pipeline which buckled it, thereby throwing down trestle support.
- 43 House on line of fault, torn asunder by earthquake. Near Wrights Station, on Southern Pacific Railroad, Santa Cruz County.
- 44 Courthouse and Hall of Records wrecked, Santa Rosa.
- 45 Refugees gather in Jefferson Square, San Francisco.



San Francisco, CA. -- Cont.

- 46 Severely damaged City Hall, San Francisco.
- 47 Earthquake and fire-wrecked buildings--Palace Hotel and Call Building, San Francisco.
- 48 Damaged store on University Ave., Palo Alto.
- 49 Wrecked concrete block house, University Ave., Palo Alto.
- 50 Damaged building one block north of University Ave., Palo Alto.
- 51 Entrance to Stanford University grounds, Palo Alto.
- 52 Property damage at Stanford Library, Palo Alto.
- 53 Great arch and overturned urns, Stanford campus, Palo Alto.
- 54 University Chapel, collapsed corridor viewed from rear, Stanford, Palo Alto.
- 55 Wrecked east wing of museum, Stanford, Palo Alto.
- 56 Gymnasium and library, Stanford, Palo Alto.
- 57 Chapel from inner quad, Stanford, Palo Alto.
- 58 Fence offset $8\frac{1}{2}$ feet (2.6 m) by main fault $\frac{1}{2}$ mile (0.8 km) northwest of Woodville, looking northeast. (S)
- Main fault at Skinner place, 1 mile (1.6 km) west of Olema, looking northwest. Fault passes under barn to right of center. Main part of barn remained on its foundation; shed at right was dragged 15 feet (4.6 m).



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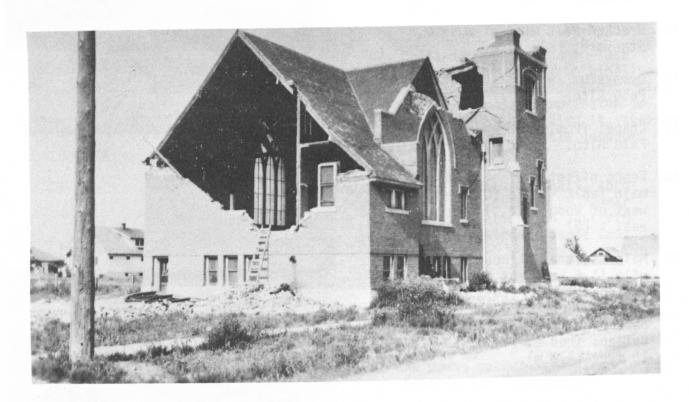


San Francisco, CA.--Cont.

- 60 East side of Howard near 17th St., San Francisco. All houses shifted toward left. Tall house dropped from its south foundation wall and leaned.
- 61 Train thrown down at Point Reyes Station.

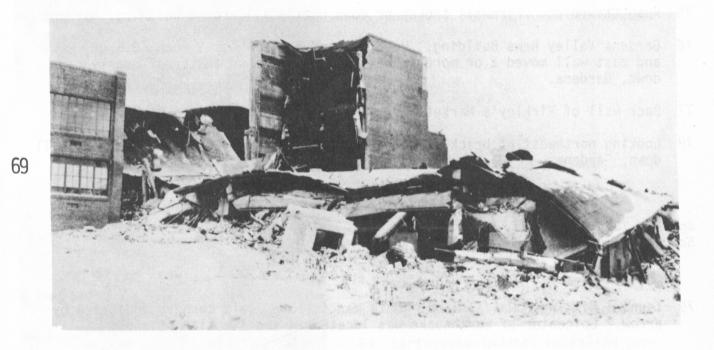
June 27, 1925 Montana

- 62 Wrecked Methodist Church at Three Forks. Fallen bricks are separated from one another because poor mortar was used.
- 63 High school at Three Forks was damaged by earthquake.
- 64 Joints opened in limestone cliff, near Lombard.
- 65 Damaged school house at Manhattan.
- 66 Broken railroad track near Lombard. Note rebound of broken rail.
- 67 Rocks on railroad track near Lombard.



Mar. 12, 1934 Kosmo, UT.

68 Fault scarp created north of Kosmo.



Oct. 31, 1935 Helena, MT.

69 Collapse of west wing of new Helena High School.

Nov. 14, 1941 Los Angeles County, CA.

- 70 Herald Building. Stucco over bricks; bricks were not tied in properly. Cracks over and around openings, Torrance.
- 71 Firewall down. Small attached building was knocked down. All buildings had broken glass windows, Torrance.
- 72 Herald Building. Firewall down, Torrance.
- 73 Brick building at 1316 Cabrillo Ave. Firewall down and corner cracked, Torrance.

Los Angeles County, CA. -- Cont.

- 74 Farmers and Merchants Bank. Partition broke away from outside wall and moved east, Gardena.
- 75 Rush Chevrolet. Firewall broken or down nearly all around building, Gardena.
- 76 Gardena Valley News Building. West wall moved in about 1 inch (2.6 cm) east and east wall moved 2 or more inches (5.2 cm) east so that roof nearly came down, Gardena.
- 77 Back wall of Kirkley's Market, next to Farmers and Merchants Bank, Gardena.
- 78 Looking northwest at brick structure at Ainsworth and Gardena. East firewall down, Gardena.

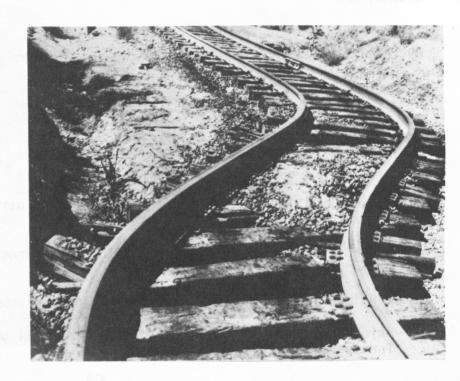
Apr. 1, 1946 Hawaii Island, Hawaii

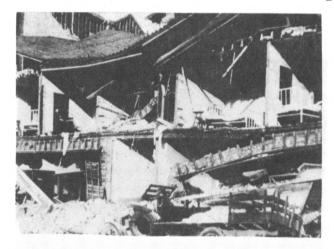
79 Tsunami hitting Hawaii Island. Note man in lower left corner, indicated by arrow. Epicenter of earthquake was located in the Aleutian Islands.

July 21, 1952

Kern County, CA.

- 80 Railroad tracks, near Bealville, bent and twisted.
- 81 Lodge Hall, Tehachapi. Partition at right shows original roof height of 2-story structure. Roof collapsed after supporting walls crumbled.
- 82 Collapsed Cummings Valley School. School was constructed of concrete walls and wood roof. (Color)
- 83 Collapsed school building. (Color)

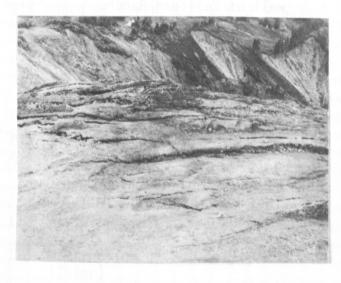




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87



Kern County, CA. -- Cont.

- 84 Damage to building front.
- 85 Railroad water tank collapsed.
- 86 Southern Pacific Railroad tunnel.

Dec. 16, 1954 Fairview Peak, NV.

87 Vertical ground displacement. (S)

July 9, 1958 Lituya Bay, AK.

- 88 Aerial view of area. (Color)
- 89 Earthquake-induced rockslide generated a wave that surged 1,740 feet (503 m) up mountainside.
- 90 Yakutat Bay, Alaska. Foreground portion of Island sank; 3 people on Island were lost and were never recovered. (S)
- 91 Aerial view of ground breakage at time of earthquake; Fairweather fault east of Crillon Lake.

Aug. 18, 1959 Hebgen Lake, MT.

- 92 Slumping highway. (Color)
- 93 Highway damage. (Color)
- 94 State Highway 287 disappeared into Montana's Hebgen Lake.

Hebgen Lake, MT. -- Cont.

- Damage to north shore of Hebgen Lake, State Highway 287.
- 96 Easternmost slide cutting Highway 287.
- 97 Landslide effects. (Color)
- 98 Damage to elementary school at West Yellowstone. Decorative stone entryway shaken down.
- 99 Brick veneer along east wall of elementary school spalled off and collapsed, West Yellowstone.
- 100 Collapse of chimney at Union Pacific Dining Lodge at West Yellowstone.
- 101 Disruption of Highway 191 near Cougar Creek.

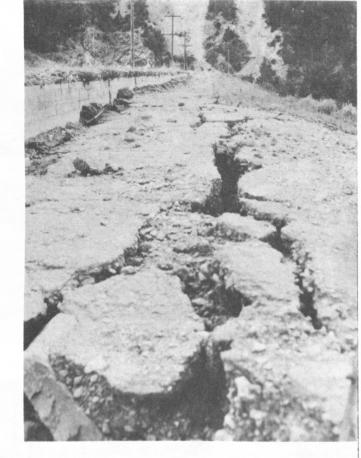




- 102 Elevated margin of Kirkwood earthflow about midway on northeast side raised 15 feet (4.6 m). Man is standing on a trail whose continuation on the flow is displaced 100 feet (30.5 m) to left.
- Marginal pressure ridge at southwest side of Kirkwood earthflow 1,500 feet (458 m) from the head. View is southeast along the boundary shear scarp at the northwest end of ridge.
- 104 Closeup view of collapsed storage shed on foot (north) wall of Culligan Ranch.
- 105 Fence broken by underthrust fault.
- 106 Fence compressed by a component of the downhill motion.
- 107 Slumped earthfill of Hebgen Dam. This view looks into disrupted spillway. Tilted concrete core of dam shows in center right of photograph.

Hebgen Lake, MT.--Cont.

- 108 Crest of Hebgen Dam shows slumped earthfill, cracks in the concrete core, the tilted concrete core, and the earthfill remnant on the core.
- 109 Damaged bridge at Grayling Creek.
- 110 Man stands in hole formed due to compaction of sediments underlying Montana State Highway gravel pile.
- 111 Fractures about 1/2 mile (0.8 km) west of Morris Ranch. These are in a large mudflow that has moved south, distorting Highway 187.
- 112 This photograph, taken on morning of Aug. 18, shows an overturned Cadillac along the Red Canyon fault scarp where it crosses U.S. Highway 191 near the Duck Creek Motel.



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- 113 Slump disrupting road along west side of Horse Butte. Photograph shows slump of debris along Lake shore.
- 114 Hebgen Dam spillway. Shows damage by massive land slump, increased by flood water during quake.
- 115 Middle part of earthflow area east of Hebgen Lake. Fault scarp (top) and pressure ridge at east side of flow (bottom).
- 116 Head of earthflow east of Hebgen
 Lake. Trees tilted backward.
 Fault at east side of flow (lower right) and west side (left center).

Feb. 28, 1960 Agadir, Morocco

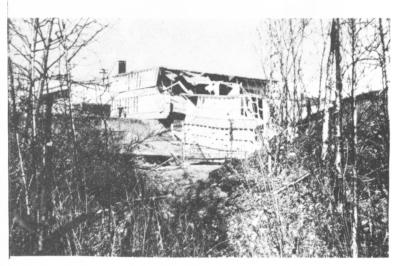
- 117 Aerial photo of damage. (Color)
- 118 Destruction of buildings. (Color)



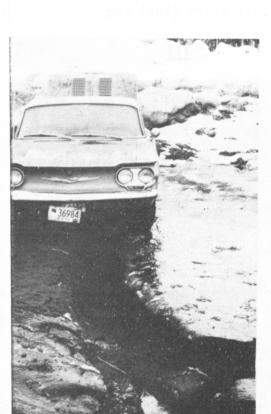




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129

May 21, 1960 Chile

Public square in Puerto Montt, Chile. Liquefied soil caused statue to sink.

Mar. 27, 1964 Anchorage, AK.

- 120 Damage inside Anchorage International Terminal. (Color)
- 121 Damage at Anchorage camera shop. (Color)
- 122 Collapse of Government Hill School. (Color)
- 123 Closeup of Government Hill School. (Color)
- 124 Cordova Building 6th Ave. and Cordova St. Fractured outside walls of 6-story structure. (Color)
- 125 4th Ave. slide. Graben dropped 11 feet (3.4 m) in response to 14 feet (4.3 m) of horizontal movement.
- 126 Two views of downtown damage to 4th Ave. and buildings. (Color)
- 127 General view of 4th Ave. slide.
- 128 4th Ave. slide and damaged buildings. (Color)
- 129 Car straddles ground crack. (Color)
- 130 Damage to private homes.
- 131 House and section of office building dropped when ground moved.

Anchorage, AK. -- Cont.

- 132 Building damage (two views).
- 133 Damage to small shops and stores on 4th Ave.
- 134 Commercial building damage.
- 135 Closeup of 5-story J.C. Penney Building, 5th Ave. and D St. (Color)
- 136 Two views of Denali Theatre marquee which rests at street level after ground dropped. (Color)
- 137 Wreckage of 6-story Four Seasons Apartment House. The building was in the last stages of construction.
- 138 Turnagain Heights area. Aerial view. (Color)
- 139 Turnagain Heights area. Destruction of lawn. (Color)
- 140 Turnagain Heights area. Landslides and effects. (Color)
- 141 Turnagain Heights area. Landslides and effects.
- 142 Turnagain Heights area.
 Destroyed houses. (Color)
- 143 Turnagain Heights area. McCadam Road damage.
- 144 Turnagain Heights area. Destroyed house.
- 145 Turnagain Heights area. Destroyed house. Partial view of landslide.
- 146 Turnagain Heights area. Breakup of roadway.
- 147 Turnagain Heights area. Roadway and house destruction.



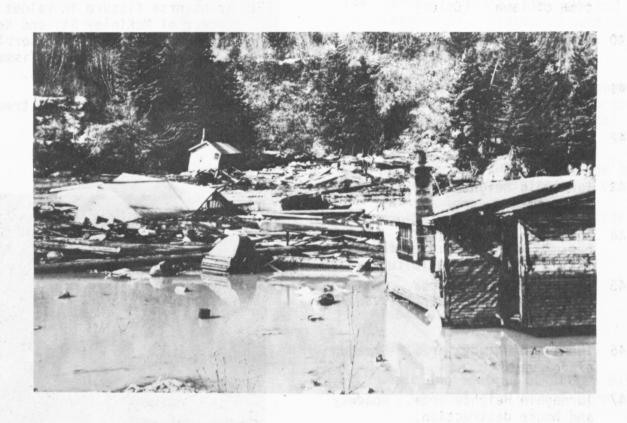
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- 148 Turnagain Heights area. Beginning of Turnagain Parkway. Slumping effects.
- 149 Slides, Portage to Seward. (Color)
- 150 Downtown Valdez. Damage to Alaskan Hotel.
- 151 Transverse fissure in Valdez at corner of McKinley St. and Keystone Ave. Note damage to cinderblock building where the main fissure, foreground, intersects it.
- 152 Montague Island. Downed trees. (Color)



Anchorage, AK. -- Cont.

- 153 Seward. Aerial view of Seward Highway. (Color)
- 154 Seward. Tsunami damage. (Color)
- 155 Seward. Destruction of house due to tsunami.
- 156 Seward. Tsunami damage at Seward port facilities. (Color)
- 157 Seward. View of railroad tracks damaged by tsunami.
- The waterfront at Seward, looking south, before earthquake-generated underwater landslides, surgewaves, and tsunami waves devastated the waterfront.
- 159 Waterfront at Seward a few months after earthquake, looking north.
- 160 Montague Island. College Fiord fault, Prince William Sound. (Color)
- 161 Uplift at Macleod Harbor. (Color)
- Living spruce trees 2 feet (0.6 m) in diameter were snapped off by a local wave at elevations between 88 (27 m) and 101 feet (31 m) above lower low water at the locality near Shoup Bay.



June 16, 1964 Niigata, Japan

163 Building was turned on its side.

164 Street scene. (Color)

165 View of leaning apartment houses. (Color)



165

166 Collapsed bridge. (Color)

Apr. 29, 1965 Seattle, WA.

167 Bridge damage. (Color)

168 House damage (fallen bricks). (Color)

169 Damage to house roof. (Color)

170 Debris left by earthquake. (Color)

171 Wall failure. (Color)

172 Damage at Tacoma, WA. (Color)



169

173 Settled road. (Color)

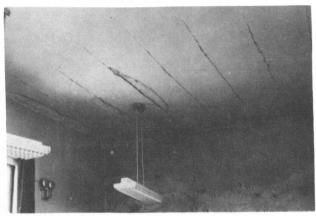
Jan. 22, 1966 Dulce, NM.

174 Ceiling damage at Bureau of Indian Affairs (BIA) School.

175 Cracked outside wall at BIA School.

176 Shear fractures in wall of steamheating plant.

177 Spalling of stucco on house.



174



179



181

June 27, 1966 Parkfield, CA.

178 Crack in Highway 466. (Color)

179 Highway 6 offset. (Color)

180 Crack in bridge abutment on Highway 466; also crack in pier of same bridge. Dec. 28, 1966 Taltal, Chile

- 181 Damage to houses at Catalina, Chile.
- 182 Damage to houses at Taltal, Chile.

July 21, 1967 Fairbanks, AK.

- 183 Mode-O-Day shop in Fairbanks sustained broken plate glass window.
- 184 Books knocked from shelves at Fairbanks library.
- 185 Merchandise damage at College Inn Market, College.
- 186 Tall stack buckled near Fairbanks.

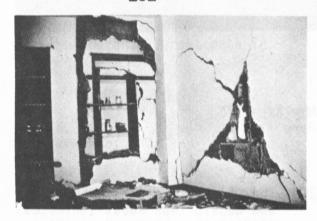
July 29, 1967 Caracas, Venezuela

- 187 Elevator shaft at Marcuto Sheraton at Caraballeda, near Caracas. (Color)
- 188 Interior court of 17-story Union Building in Caracas. (Color)
- 189 San Jose Building in Caracas before earthquake (10-story structure). (Color)
- 190 Column damage to Marcuto Sheraton Hotel, Caraballeda. (Color)

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- 191 Life hazard from failure of suspended ceiling, Marcuto Sheraton Hotel, Caraballeda. (S)
- 192 14-story San Bosco Building, Caracas. Tile walls failed.
- 193 San Bosco Building, Caracas. Column damage.
- 194 Closeup of Mansion Charaima Apartment Building, Caracas. Top four floors collapsed. (Color)
- 195 Cypress Garden, Caracas.
 Failure of columns of 14-story structure.

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- 196 Detail of failed columns at Cypress Garden, Caracas.
- 197 18-story Mene Grande Building, Caracas. Damage to southeastern corner of south unit, first floor.
- 198 View similar to No. 197, above.
- 199 Bahia del Mar Building, Caraballeda. Details of outside damage.

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200 Bahia del Mar Building, Caraballeda. Extensive damage to outside west wall.

Dec. 20, 1967 Tocopilla, Chile

- 201 Damaged house. Outside wall collapsed.
- 202 Total destruction of front; unfastening of ceiling.
- 203 Collapse of block walls into bedroom.



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Aug. 31, 1968 Dasht-i-Biaz, Iran

- 204 Typical domed house in eastern Iran, split by fissures crossing Salaiani. (Color)
- 205 Damage at small village east of Khezizi. (Color)
- 206 Damage to village of Miami. (Color)
- 207 Building walls collapsed. (Color)
- 208 Aerial view of damaged area. (Color)

May 31, 1970 Peru

- 209 The slide of ice, mud, boulders, and debris took about 5 minutes to bury Ranrahirca, destroying town for second time in its history. (S)
- 210 Damage to paved Rio Culebras bridge near coastal Huarmey. (S)
- 211 Hotel Monterrey, about 4 miles (6.4 km) north of Huaras on thinner alluvium, sustained only minor structural damage. (S)
- 212 Aerial view of Yungay area before earthquake and avalanche. (S)
- 213 Chimate. Aerial view of damage.

Peru--Cont.

- 214 Damage to dwellings in Callejon de Huaylas. (S)
- 215 Cemetery at Caras; tombs shaken to rubble and coffins thrown from niches. (S)
- 216 Aerial view of Yungay area after avalanche. (S)
- 217 Huge crack in highway. (S)
- 218 Structural damage to building. (S)
- 219 Landslide. (S)
- Overturned bus on top of debris avalanche at side of former Plaza de Armas, Yungay. Depth of debris avalanche here is about 15 feet (4.6 m).
- 221 Aerial view showing mountain range including Nevado Huascaran, highest peak in Peru.

Feb. 9, 1971 San Fernando, CA.

- 222 Olive View Hospital, Sylmar.
 Damaged reinforced concrete
 ambulance port.
- Damage to new Olive View Hospital,
 Medical Treatment and Care Unit,
 Sylmar. Notice collapsed basement substructure and damaged
 first-floor column. (S)
- 224 Olive View Hospital, Sylmar.
 Damaged parking shelter.

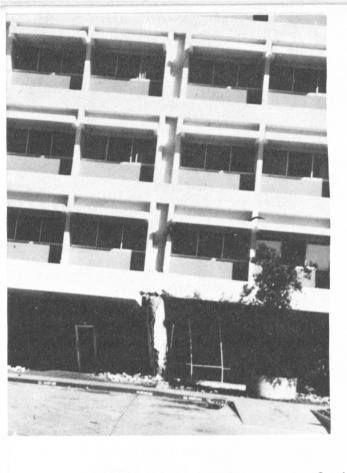


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- 225 Slumping at edge of steep-walled canyon near Sylmar at north edge of VA Hospital complex. (Color)
- 226 Damage to Olive View Hospital, Sylmar. Collapsed stair towers of Medical Treatment and Care Unit.
- 227 Damaged unreinforced concrete wall on VA grounds near Sylmar. Unit 3, east elevation.
- 228 Carl Stepp surveys highway damage. (S)
- 229 Southern Pacific Railroad tracks near Juvenile Home, Sylmar. (Color)



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- 234 Olive View Hospital, Medical Treatment and Care Unit, main entrance of Wing A, west side.
- 235 Olive View Hospital, Medical Treatment and Care Unit, west end of Wing B. (S)
- 236 Closeup of Olive View Hospital, Medical Treatment and Care Unit, main entrance of Wing A, west side.
- 237 Ground crack at base of tank.
- 238 Olive View Hospital, Medical Treatment and Care Unit, collapse on first floor.
- 239 Olive View Hospital, Medical Treatment and Care Unit, Wing D, where stair tower overturned.
- 240 Column failures on Golden State-Foothill freeway interchange.
- 241 Damage at the Sylmar Converter Station.
- 242 Collapse of Lower San Fernando Dam.

- 230 Collapse of concrete facing and earthen crest of the Lower San Fernando Dam.
- 231 Lower San Fernando Dam near collapse.
- 232 Distortion in supporting column of freeway overpass. Closeup of exterior spiral column.
- 233 Olive View Hospital, Medical Treatment and Care Unit, Wing D; stair tower overturned.



Apr. 10, 1972 Ghir, Iran

243 Destroyed buildings.

Dec. 23, 1972 Managua, Nicaragua

244 Collapsed building.

Feb. 21, 1973 Point Mugu, CA.

245 Sea floor craters at Pt. Mugu quake site.

Apr. 26, 1973 Hilo, HI.

- 246 House foundation collapse at Amauulo.
- 247 Highway embankment earthslide, Malia Gulch.
- 248 Damage to concrete block wall at Puueo.
- 249 Cesspool collapse, Hilo.
- 250 Federal Building, downtown Hilo. Interior damage.
- 251 Cleaning up after earthquake, downtown Hilo.
- 252 Highway shoulder failure at Wainaku, north of Hilo. U.S. Senator Dan K. Inouye (in business suit).

- 253 Commercial building roof and wall collapse, downtown Hilo.
- 254 Pier 2, structural damage to wharf, Hilo.
- 255 Clearing debris at commercial building, downtown Hilo.
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- 257 Typical damage to store fronts, downtown Hilo.
- 258 Typewriter Center, downtown Hilo. Interior damage.
- 259 Rock wall tumbled over on small trees in Hilo area.



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Hilo, Hi.--Cont.

260 Cracks in Hilo street.

261 Street slumped in Hilo.

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262 Leaning chimney, Maryville.

263 Installing aftershock equipment south of Maryville.

264 Ceiling cracks at Barley residence, Alcoa.

265 Bricks fell inside chimney, Carpenter Camp Ground.

266 Slightly damaged chimney, Maryville.

267 Damaged chimney, Alcoa.

268 Cracked pavement from earthquake vibrations, Maryville.

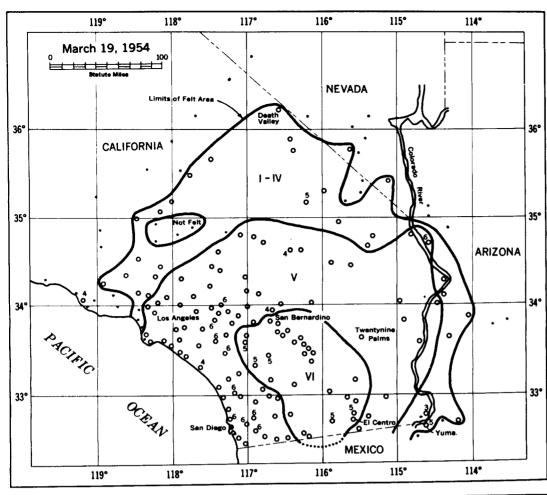
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- 269 San Andreas fault, southern California.
- 270 Southwest rift of Kilauea, HI (reference on p. 42).
- 271 Destruction of road at Kalonokuaiko Palo, HI (volcanic origin, 1965).
- 272 Aerial view of San Andreas rift zone from Hughes Lake to Lake Palmdale, CA.
- 273 Satellite view of North and South America (reference on p. iii).
- 274 Transamerica Building, San Francisco, CA (example of earthquake-engineered structure).
- 275 Fault creep is revealed by sidewalk displacement, California.

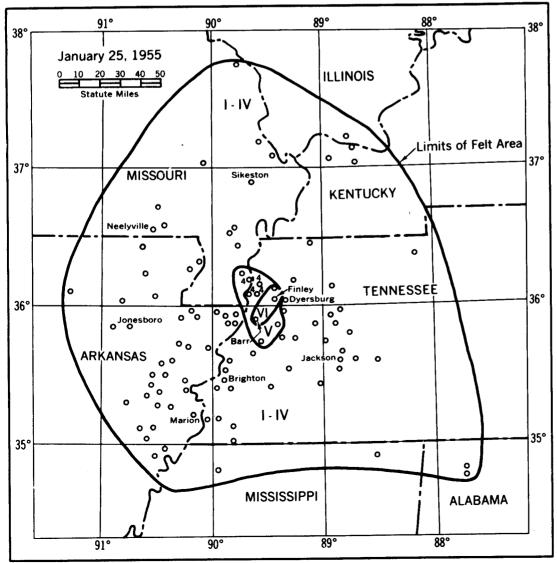
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Note: Maps are approximately 8 by 10 inches.

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                                  California
A-4
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        June 19, 1936
July 15, 1936
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A-6
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A-7
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                                  California
          Mar. 8, Mar. 25,
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          1937
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A-8
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          and June 18, 1937
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                                  West-central California
                                  West-central California
A-38
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        Dec. 16, 1955
                                  Southern California
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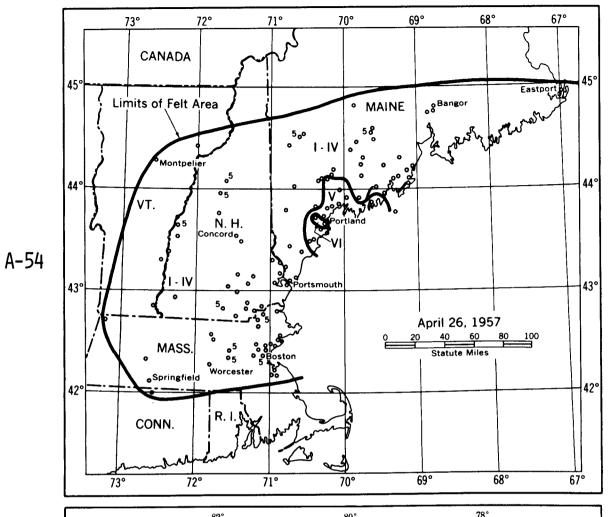


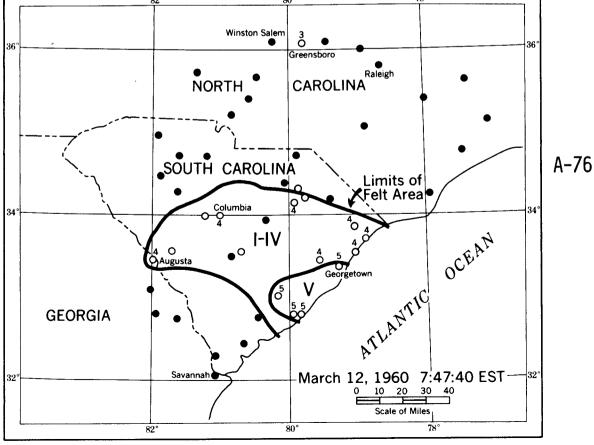


A-32

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A-42	Feb. 9, 1956	Baja California
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A-44	May 11, 1956	Southern_California
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A-54	Apr. 26, 1957	Southeastern Maine
		Western North Carolina
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A-57	Nov. 24, 1957	North Carolina-Tennessee border
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A-59	Apr. 12, 1958	North-central Washington
A-60	May 28, 1958	Western Montana
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A-63	Nov. 30, 1958	Baja California
A-64	Dec. 11, 1958	West-central California
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		California-Western Nevada
A-67	Apr. 1, 1959	
A-68	June 17, 1959	Southwestern Oklahoma
A-69	June 23, 1959	California-Western Nevada
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A-93	Mar. 25, 1963	Near Boulder City, NV
		West-central California
A-94	Sept. 14, 1963	אכט <i>ג-ע</i> כוונו מו יעוווטווומ





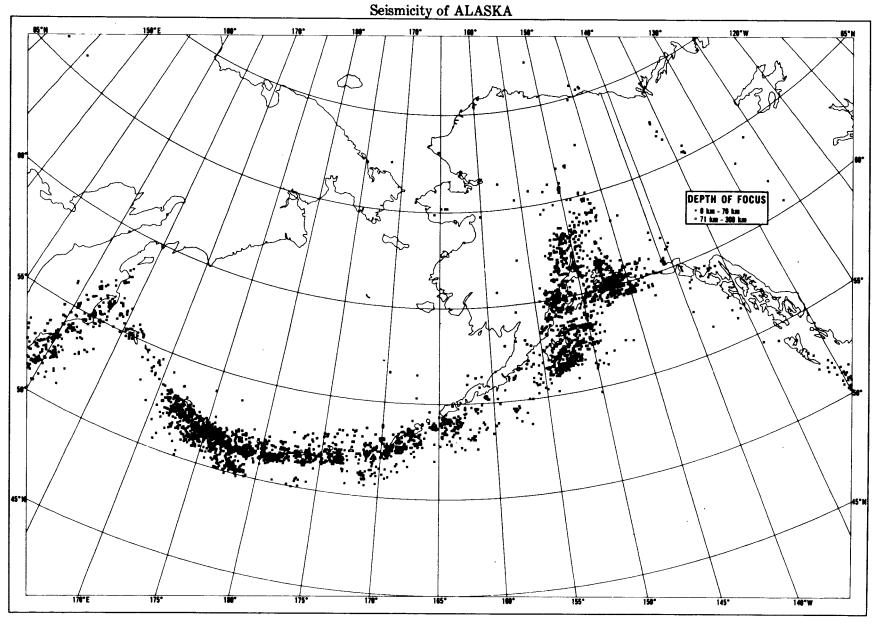
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A-97
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                                     Eastern California
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                                     Northern California
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         Feb. 15, 1974
A-141
                                     Arkansas
A-142
                                     Southeastern Illinois
         Apr. 3, 1974
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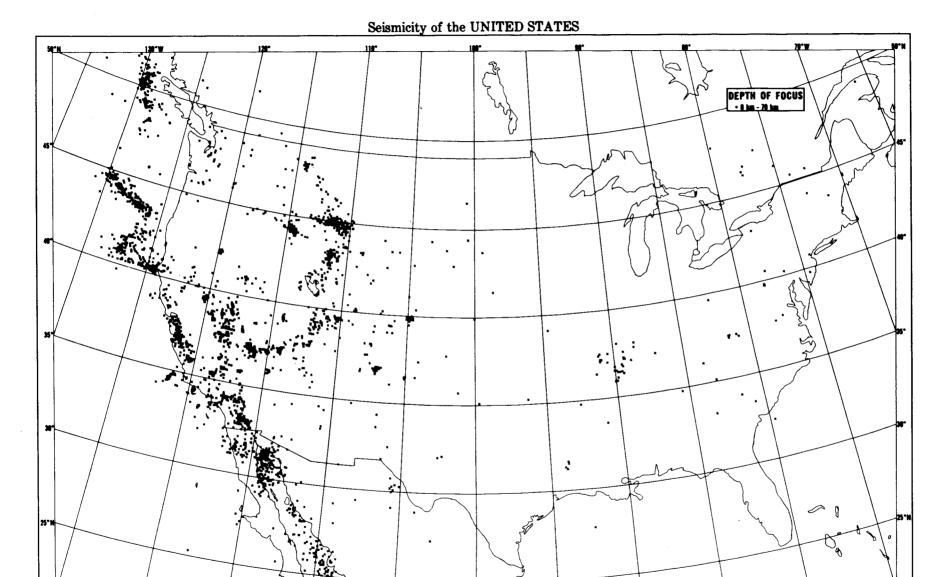
SEISMICITY MAPS

Note: Maps are approximately 8 by 10 inches.

- B-1 Felt or damaging earthquakes in United States. Map for each year, 1955 to 1973.
- B-2 Cumulative United States map of damaging earthquake locations from earliest history. Map for each year, 1964 to 1973.
- B-3 World seismicity. Map for each year, 1963 to 1972.
- B-4 World Seismicity, 1961-1969. Also available as five-color map, 49 by 32 inches.
- B-5 Regional Seismicity Maps, 1962-1969, as follows. Also available in 20by 30-inch size with buff-colored land areas:
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- B-8 Generalized fault map of coastal and southern California.
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DATA PUBLICATIONS

Listed below are previous catalogs in Key to Geophysical Records Documentation series and selected NOAA publications available from the National Geophysical and Solar-Terrestrial Data Center (NGSDC) or National Technical Information Service (NTIS). Listings without an asterisk may be obtained fron NGSDC, NOAA/EDS, Boulder, Co. 80302. Those preceded by an asterisk should be requested from NTIS, U.S. Department of Commerce, Springfield, Va. 22151. NTIS also will furnish microfiche on these reports for \$1.45 each. When ordering, please make check or money order payable to the proper agency.

- Key to Geophysical Records Documentation No. 1, Marine Geophysical Data Catalog.
- Key to Geophysical Records Documentation No. 2, Catalog of Strong-Motion Seismograph Stations and Records.
- Seismological Publications and Services.
- Publication 41-1 (Revised Edition Through 1970), Earthquake History of the United States (\$2.80).
- *Publication 41-2, Earthquake Investigations in the Western United States, 1931-1964 (COM-74-10325, \$16.75).
- *United States Earthquakes, 1928-1935--reprint (COM-73-11456, \$24.75).
- *United States Earthquakes, 1936-1940--reprint (COM-73-11457, \$18.50).
- *United States Earthquakes, 1941-1945--reprint (COM-73-11447, \$16.00).
 - United States Earthquakes, individual copies for 1946 through 1972 (price list available upon request to NGSDC).