

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Bibliography of United States landslide maps and reports

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and

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

¹Menlo Park, California

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6. Geologists and engineers in state Geological Surveys who provided information.
7. Engineers and geologists in Federal Agencies who provided information or reviewed our bibliography.

INTRODUCTION

U.S. Geological Survey Circular 880 outlines the goals and tasks of the landslide part of a ground-failure hazards reduction program for the United States. One need in such a program is to determine the status of knowledge about landslide processes in various parts of the country so that the magnitude of the task to complete the work can be properly assessed. Although several bibliographies on landslide processes in the United States have been prepared, such as those by Chadburn (1978), Degraff (1977), Fisher, Leith and Deal (1965), Keefer and Tannaci (1981), Lawe and others (1964) and Thompkin and Britt (1951), none is a comprehensive and systematic review of all easily available literature on a state-by-state basis. Thus, the extent to which landslides have been recognized and mapped throughout the country is largely unknown.

The task of assembling a complete bibliography of maps and reports about landslides in the United States is so overwhelming that it will probably never be done, especially if newspaper articles about landslides are included as literature. For example, more than 100 articles about landslides were published in the first half of 1983 alone by just two of the dozens of newspapers in the San Francisco Bay region. Moreover, landslides may be mentioned or mapped only incidentally in a report about the geology of an area, so that a complete reading of all reports and maps about the geology of the United States would be necessary to insure completeness. That number for just the 22-year period from 1961 to 1983 is 127,784 references, according to the GEOREF file of the American Geological Institute (queried 6/2/83).

Another way of looking at the enormity of the task to prepare a complete bibliography is to examine the number of landslides in the United States. No estimates have been made, to our knowledge, for the country as a whole, but Peter Lessing (West Virginia Geological and Economic Survey, verbal communication, 5/11/83) has determined that there are about 437,000 landslides in West Virginia alone.

Fortunately, many short-cuts are available that allowed us to prepare a reasonably complete bibliography for some kinds of literature, and a sampling of others, as explained below. This bibliography of about 6,500 references will hopefully provide a first approximation of the landslide literature for all states, territories and possessions of the United States.

GENERAL PROCEDURES

We began by using the following terms to query the GEOREF file of the American Geological Institute on February 21, 1981: landslides, rockfalls, earthflows, slumping, rockslides, mass wasting, mudflows, debris flows, earthquake-generated landslides, slope stability and slope failure. Of the 1,976 references obtained from this file, 560 were for landslides in California, 201 in Colorado, 144 in Alaska, and 128 in Washington. All the other states, Puerto Rico, Guam and the Virgin Islands had less than 100 references; Connecticut and Rhode Island had none.

The following landslide-related topics were arbitrarily not included in our search: Submarine landslides, snow avalanches, floodwater damage, sinkhole collapse, underground mine collapse, subsidence, liquefaction, and rock glaciers. Reports that do not separate bluff erosion, wave action, and soil rilling from bluff slumping and landsliding were also excluded. No attempt was made to access or include references to topical reports on landslide processes not related to a specific landslide or to the foreign literature.

To the basic GEOREF file, we added references from 656 bibliographic cards maintained by Dorothy Radbruch-Mall, U.S. Geological Survey, extensive card and reprint files kept by David Varnes, Robert Schuster, Gerald Wiczorek, David Keefer, and Robert Fleming, all of the U.S. Geological Survey, and all pertinent catalog files of the U.S. Geological Survey libraries in Menlo Park, California, Denver, Colorado, and Reston, Virginia, and the Library of Congress. All of the bibliographies and reports mentioned by Coates (1977), Dennison (1977), Hopp (1955), Rapp and Stromquist (1976) and Schuster and Krizek (1978) were scanned for additional references.

Each report was then checked to make certain it contains information about landslides that can be located within a specific state. If the article contains information about landslides in more than one state, it was listed under each appropriate state. General articles that mention many states or the entire United States are listed in a separate section. Very few articles, certainly less than one percent of the total, are double or multiple entries. References cited in each article were checked against the master file and were added if they were missing.

After many of the reports and maps that clearly mentioned landslides in the title had been found, we began a systematic search of serials, maps and other reports listed in Table 1 for information about landslides that was buried in a report on the general geology of the area or in some other topic. To save time, only volumes and maps on the shelves of the U.S. Geological Survey

library in Menlo Park were examined. Perhaps as many as 10 percent of these references were missing from the library shelves. If the report or article had a table of contents, it was examined for the following topics: Landslides or mass movement, geomorphology, Quaternary geology, geologic hazards, flood damage, and surficial geology. These sections of the report or article were then examined page by page to determine if specific information on landslides was included. Our search essentially ended with information published through 1983, although a few references published in 1984 and 1985 were included when called to our attention.

Table 1

Serials searched systematically

- Alaska Geological and Geophysical Surveys Geologic Reports, Professional Reports, and Special Reports.
- Arizona Bureau of Geology and Mining Technology Field Notes, Geologic Investigations Map Series, and Special Papers.
- Association of Engineering Geologists Bulletins, Fieldtrip Guidebooks, and Meeting Programs and Abstracts.
- Billings Geological Society Guidebooks.
- California Division of Mines and Geology Special Reports, California Geology, Geologic Maps, Open-file Maps and Reports, and Preliminary Reports.
- Colorado Geological Survey Bulletin, Information Series, Map Series, and Special Publications.
- Engineering Geology and Soils Engineering Symposium, Proceedings.
- Four Corners Geological Society Guidebooks.
- Geological Society of America Bulletins, Memoirs, Special Papers, Geology, and Meeting Abstracts with Programs.
- Highway Geology Symposium, Proceedings.
- International Association of Engineering Geologists Bulletins.
- Journal of Geology.
- Montana Bureau of Mines and Geology Bulletins, Special Publications, and Memoirs.
- Nevada Bureau of Mines and Geology Open-file Reports, Urban Maps, and Map Series.
- New Mexico Bureau of Mines and Mineral Resources Bulletins, Geologic Map Series, and Memoirs.
- New Mexico Geological Society Guidebook.
- New York Geological Survey Open-file Reports.
- North Dakota Geological Survey Circular, Bulletins, Report of Investigations, and Groundwater Studies.
- Oregon Department of Geology and Mineral Industries Bulletins, Ore Bin, Special Papers, and Geologic Map Series.
- Rocky Mountain Association of Geologists, Guidebooks.
- U.S. Geological Survey Bulletins (1-1528), Professional Papers, Monographs, Open-file Reports (approximately 15,300), Miscellaneous Field Studies Maps, Geologic Quadrangle Maps, Miscellaneous Investigations Maps, and Oil and Gas Investigations Maps (approximately 6,000 maps total), and Water-Supply Papers.
- Utah Geological and Mineral Survey Bulletins, Survey Notes, and Maps.
- Washington Division of Geology and Earth Resources Reports, Open-file Reports, Information Circulars, and Geologic Map Series.
- Wyoming Geological Association, Guidebooks.

Beginning in January 1982 and lasting until June 1985, Grabb traveled more than 60,000 miles by automobile in every state, Puerto Rico, and the Virgin Islands to evaluate the status of landslide knowledge, to determine the methodologies most likely to be successful in reducing or mitigating the consequences of landsliding, and to obtain additional landslide references. Every state geological survey and highway department was contacted, and three (Oregon Department of Geology and Material Resources, Washington Division of Geology and Earth Resources, and the Utah Geological and Mineral Survey) were funded by contract with the U.S. Geological Survey to prepare independently a bibliography on landslides for their state.

Table 3. —Comparison between bibliography in this report and bibliography prepared by state geological surveys.

<u>BIBLIOGRAPHY PREPARED BY STATE GEOLOGICAL SURVEY</u>										
	Washington		Oregon		Montana		Utah		Total	
	572	percent	321	percent	183	percent	205	percent	1281	percent
Number of landslide maps and reports, (including incidental mention of landslides)										
Number of references not reported in U.S. Geological Survey bibliography	351	61	203	63	89	49	119	58	762	59
Minus reports and maps referring to snow avalanches, coal mine subsidence or other processes not included in U.S. Geological Survey bibliography	31		27		0		28			
Minus references to maps and reports with titles that may or may not be appropriate for USGS bibliography. Maps and reports not in USGS Library	0		83		0		12			
Adjusted number of references not reported in U.S. Geological Survey bibliography	320	56	93	29	89	49	79	39	581	45
<u>Analysis of omissions</u>										
University theses	71	22	11	42	31	35	19	24	132	23
University geology and other department publications	9	3	13	14	1	1	4	5	27	5
Reports by consulting firms	21	7	15	16	0	0	0	0	36	6
Guidebook articles	17	5	5	5	5	6	6	8	33	6
U.S. Geological Survey Professional Papers, Circulars, Bulletins, and Water Supply Papers	38	12	2	2	9	10	5	6	54	9
U.S. Geological Survey published maps	13	4	0	0	15	17	12	15	40	7
U.S. Geological Survey open-file reports	27	8	1	1	0	0	3	4	31	5
State geological survey and other state agency maps and reports	58	18	14	15	7	8	11	14	90	15
U.S. Forest Service maps and reports	1	0	16	17	0	0	0	0	17	3
<u>BIBLIOGRAPHY PREPARED BY U.S. GEOLOGICAL SURVEY</u>										
Number of landslide maps and reports	232		230		65		122			
Number of maps and reports that refer to landslides incidentally	140		139		155		279			
Total number of maps and reports	372		369		220		401		1362	
Number of references not reported in state survey bibliography (for Utah, 82 post-1980 references subtracted from total)	186	50	247	67	121	55	162	40	716	53
<u>Analysis of omissions (pre-1981 for Utah)</u>										
Newspaper clippings	70	38	6	2	3	2	3	2	82	11
U.S. Forest Service maps and reports	6	3	145	59	5	4	19	12	175	24
U.S. Geological Survey Professional Papers, Circulars, Bulletins and Water Supply Papers	16	9	11	4	9	7	12	7	48	7
U.S. Geological Survey published maps	7	4	31	13	28	23	88	54	154	22
U.S. Geological Survey open-file reports	4	2	0	0	44	36	16	10	64	9
Engineering News Record and trade journals	28	15	8	3	6	4	0	0	42	6
State geological survey and other state agency maps and reports	6	3	8	3	3	2	14	9	31	4
University theses and publications	8	4	8	3	3	2	7	4	26	4

During the summer of 1982, Fred Taylor of the U.S. Geological Survey contacted every regional office and visited many local offices of the U.S. Forest Service in an attempt to obtain copies of their maps and reports on landslides. Nearly all of these landslide maps and reports were prepared for perspective timber sales and are available only for inspection in the various Forest Service offices. All of the ones Fred Taylor saw are listed in our bibliography.

The U.S. Soil Conservation Service (SCS) was contacted to determine what information they have on landslides, but very little was obtained. Beginning about 1976, a landslide symbol was added to the standard explanation for SCS Soil Surveys, but a check of a dozen of these surveys indicates very little use of the symbol. Some work on landslides is probably being conducted in local SCS offices, but we decided not to pursue the extensive effort that would be needed to determine which, if any, offices are involved.

Reports or maps about 347 landslides were obtained from all seven of the district offices of the U.S. Bureau of Reclamation; 170 of the landslides are in the Pacific Northwest Region. Most of the landslides involve dams or reservoirs owned or maintained by the Bureau; some threaten pipelines or canals. The Bureau also maintains a landslide register that includes information about the location, activity, volume, rock type, triggering agent, and cost of damage for each landslide.

During 1982, a preliminary list of references was sent to each state geologist, state highway department, and many university geology professors to determine if the list was complete. Additional references obtained from these sources were added to the bibliography.

The library of the U.S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi was visited in March 1983 to determine which of their reports mention landslides. Their card file of landslides and related topics like earthslides, rockslides, flow slides, mudflows, slope stability, mudslides, bank erosion, stream erosion, and bank protection seems to be the most extensive in the United States, but few new references were obtained.

In March, 1983, the GEOREF file was updated to cover the period after January 1980. About 400 new references were obtained, mostly abstracts of papers given at Geological Society of America meetings.

In May, 1983, C. F. S. Sharpe, Falls Church, Virginia donated a card file of approximately 1,400 references and several hundred newspaper clippings on landslides he had collected during the past 50 years. Of these, 422 references and almost all the newspaper clippings were added to our bibliography.

During the spring of 1983, we began to use the DIALOG¹ Information Retrieval System in an attempt to find landslide references in engineering and other publications not normally included in GEOREF. Of the more than 170 data bases with 75,000,000 records available in DIALOG (including GEOREF), we queried the files indicated on Table 2.

Query of the DIALOG System, performed by Jacquelyn Freeberg, U.S. Geological Survey, requires considerable knowledge of the characteristics of each file and the peculiarities of the system. For example, a query of the number of landslide references in the U.S. may show no references whereas a query of landslides in California may show many references. This is because the person preparing the index for the data file did not find the key words "United States" and "landslides" in the title or abstract whereas many references had the words "California" and "landslide."

Another difficulty in using any data base is that words like "landslide" and "mass movement" are used to describe political victories and population migrations, whereas "slump" can describe the economy. If a sampling of a data base indicated that most of the references were not likely to pertain to geology, or if the references were likely to be already in our file, the data base was not printed (See Table 2).

The staff at the U.S. Army Corps of Engineers Waterways Experiment Station library, Vicksburg, requested in the spring of 1983 a summary of all reports listed in the Defense Technical Information Center by the following key words: flow slide, flow slides, mud flow, mud flows, bank erosion, bank erosions, erosion, erosions, stream erosion, stream erosions, earth slide, earth slides, landslide, landslides, rockslide, rockslides. These data were made available to us; about 250 new references were obtained from this search.

Table 2
DIALOG¹ files queried in 1983

File 8 (COMPENDEX--Engineering Information, Inc.): 483 landslides (not printed), 32 landslides in California (not printed), 7 landslides in Oregon, 3 debris flows, 0 earth slides, 0 mass movement, 10 mass wasting (not printed), 0 mudslide, 0 rockslide, 0 mudflow, 0 slope failure, 421 slope stability (not printed).

File 14 (ISMEC--Cambridge Scientific Abstracts): 0 landslide, 2 slope failures, 6 slope stability, 5 mass movement.

File 28 (OCEANIC ABSTRACTS--Cambridge Scientific Abstracts): 23 landslides, 5 debris flows, 8 mass movement, 2 mass wasting, 7 mudslides, 7 mudflows, 1 rockslide, 57 slumping, 6 California slumping.

File 29 (METEOROLOGICAL AND GEOSTROPHICAL ABSTRACTS--American Meteorological Society and NOAA): 47 landslides (not printed), 5 U.S. landslides, 4 California landslides, 1 mudslide, 0 rockslide.

File 34 (SCISEARCH¹--Institute for Scientific Information, 1981 to present): 18 landslides.

File 35 (COMPREHENSIVE DISSERTATION INDEX--University Microfilms International): 22 landslides, 22 slope stability, 29 mass movement, 0 rockfall, 5 slope failures.

File 39 (HISTORICAL ABSTRACTS--ABC Clilo, Inc.): 13 landslides, 0 mudslide, 0 debris flow, 0 U.S. landslide, 0 California landslide.

File 40 (ENVIRONMENT¹--Environmental Information Center, Inc.): 52 landslides, 0 mudslide, 0 rockslide, 0 mudflow, 0 debris flow, 0 slope stability.

File 47 (MAGAZINE INDEX--Information Access Corp.): 9 landslides in U.S., 3 mudslides, 1 rockslide, 1 rockfall, 0 mudflow, 32 slumping (not printed).

File 49 (PAIS INTERNATIONAL--Public Affairs Information Service, Inc.): 10 landslides (not printed), 0 debris flow, 0 soil creep, 0 earthflow.

File 58 (GEODATABASE--Geosystems): 1,037 landslides (file not printed), 92 landslides in California (not printed).

File 63 (TRIS--U.S. Department of Transportation and Transportation Research Board Information Series): 454 landslide references.

File 68 (ENVIRONMENTAL BIBLIOGRAPHY--Environmental Studies Institute): 33 landslides, 0 mudslide, 0 rockslide, 0 rockfall.

File 96 (BHRA FLUID ENGINEERING--British Hydromechanics Research Association): 27 landslides, 2 mudslides, 16 mudflows and slumping, 2 mass wasting, 37 slope failures.

File 165 (E1 ENGINEERING MEETINGS--Engineering Information, Inc.): 46 landslides, 5 mudslides, 8 rockslides, 3 mudflows, 16 mass movement, 3 mass wasting.

File 211 (NEWSEARCH--Information Access Corp.): 0 landslide in U.S., 4 landslides in California, 0 mudslide, 1 rockslide, 0 rockfall.

File 421 (DIALINDEX¹--DIALOG Information Service, Inc.): 52 landslides, 0 slope stability, 0 mudslide, 0 rockslide, 0 mudflow, 0 debris flow.

COMPLETENESS OF THE BIBLIOGRAPHY

Landslide bibliographies prepared by 4 state geological surveys provided an opportunity to evaluate the completeness of our bibliography. Three of the state surveys (Washington, Oregon and Utah) prepared the bibliographies at our request under contract with the U.S. Geological Survey, and the Montana Bureau of Mines and Geology independently prepared the bibliography as part of a substantial new program to identify landslide hazards in their state. An early draft of our bibliography was provided to each state before they prepared their bibliography, whereas the completed state bibliography was not received or consulted until our work had been completed. After Table 3 was prepared, references in the state bibliographies missing from our list were added to make our bibliography as complete as possible. The bibliography prepared by the Utah Geological and Mineral Survey does not list 82 reports or maps published after 1980, so this number was subtracted from the number of missing references in order to make the comparisons in Table 3 more meaningful.

¹The use of trade names is for identification purposes only and does not constitute an endorsement by the Geological Survey.

Table 3 contains several surprises, foremost of which is the large number of references that are not common to the state and federal bibliographies. An average of 45 percent of references in bibliographies prepared by state geological surveys is missing from our bibliography and 53 percent of our references are missing from the state bibliographies. Of the 247 references missing from the Oregon Department of Geology and Mineral Industries bibliography, 145 or 59 percent were published and unpublished maps and reports prepared by the U.S. Forest Service, a source of landslide information not traditionally consulted by most geologists. Of the 186 reports not listed in the Washington Division of Geology and Earth Resources bibliography, more than one-half are newspaper clippings and articles in Engineering News Record and trade journals, again, non-traditional and difficult to locate sources for landslide information. The high percentage of U.S. Geological Survey maps and open-file reports missing from the Montana and Utah bibliographies reflects both the difficulty that librarians have keeping track of open-file reports, and the need to scan every map and report of the general geology of an area to locate those that contain references to landslides.

University theses and publications, and reports and maps prepared by state geological surveys and other state agencies dominate references missing from our bibliography. The ability of state geological surveys to locate more theses and state reports on landslides is not surprising. More disturbing is the significant number (121) of U.S. Geological Survey maps and reports missing. When viewed in the context of more than 10,000 published maps and reports and more than 15,000 open-file reports examined, however, the number missing is less than 1 percent of the total.

ORGANIZATION OF THE REFERENCES

Each state is divided into two files. Landslide maps and reports has references directly related to landsliding, plus reports containing major sections on landsliding. Maps and reports that mention landslides incidentally has material of limited landslide information, a large percentage of which are geologic maps that show landslides or landslide deposits as map units. Geologic hazards reports and engineering studies make up most of the remainder.

ACKNOWLEDGEMENTS

So many people helped us prepare this bibliography that the temptation is considerable not to mention them individually. To a large extent, however, the names of these individuals represent a substantial portion of people other than consultants who are concerned with landslide research and the application of landslide knowledge in the United States. Inasmuch as two of the goals of our work are to raise the awareness about the extent of the landslide problem and an assessment of the manpower available to cope with this problem, we gladly make their names available and acknowledge our gratitude to them.

Engineers and geologists in state departments of transportation who provided information for our bibliography are listed in Table 4. Most of these individuals are located in the materials section at each state capital. University professors and a few consulting geologists who kindly provided references and/or reviewed our bibliography for the state(s) for which they have expertise are

Table 4

Engineers and geologists in state departments
of transportation who provided information
about landslides in their state

Alabama Frank C. Holman Larry W. Lockett	Indiana Henry H. Gray William J. Sisiliano	Nevada Burt K. Replogle	South Dakota Vernon L. Bump Leroy B. Foster Jim D. Hammell Phillip D. Lidel
Alaska John E. Fritz William M. Slater	Iowa Kermit L. Dirk Lee Hansen Glenn Miller	New Hampshire Richard M. Lane Frederic E. Prior	Tennessee James H. Aycock Harry L. Moore David L. Royster William D. Trollinger
Arizona Lewis E. Scott	Kansas Richard L. McReynolds Lawrence A. Rockers	New Jersey Chester J. Andres Harold K. Apper Olaf. H. Jansson	Texas Harold Albers John E. Berks Robert E. Long Robert L. McKinney Milton Watkins James E. Williams Robert L. Yielding
Arkansas William V. Bush Jake E. Clements, Jr. M. Clavin Peavy Charles E. Venable	Kentucky Everett Gray Henry A. Mathis William E. Munson	New Mexico Warren T. Bennett	Utah Keith D. Powell Loren M. Rauscher Heber A. Viam
California Albert T. Boost Jay Fisher Jesus Garcia Heniz Heckeroth David G. Hayes Dewey W. Knittel Stan Lesneski Marvin L. McCauley Stan R. Roe Thomas Smith Raymond A. Winton Robert F. Yeager	Louisiana Leonard M. Gullbeau Ali S. Kemahit William C. Sharp	New York Clayton L. Bolton Richard H. Burns Edward A. Fernau Verne C. McGuffey	Vermont Gregg P. Batchelder-Adams Donald C. Brown Frank J. Lanza
Colorado John B. Gilmore	Maine Guy L. Baker Melvin W. Morgan	North Carolina William D. Bingham F. Russell Glass, Jr. Charles A. Slagle Leonard S. Wiener	Virginia George S. Meadows, Jr. David F. Noble
Connecticut Leon M. Alford Rino Vitelli	Maryland William B. Greene Mathew R. Kait A David Martin	North Dakota Dave E. Leftwich Patrick C. Mitzel	Washington John K. Klossell Tom V. Zimmerman
Delaware Alfred D. Donofrio, Jr.	Massachusetts Francis W. Holden Richard P. Ierardi Joseph L. Stefanik	Ohio David E. Melick Kenneth M. Miller	West Virginia Barney C. Stinnett Berke L. Thompson
Georgia David A. Mitchell Tom W. Stapler	Michigan Kent A. Allemeier	Oklahoma Curtis J. Hayes James B. Nevells	Wisconsin Richard F. Robinson
Hawaii Walter A. Kuroiwa Henry H. Uehara	Minnesota George R. Cochran G. Rudy Ford Virgil V. Mikkelsen	Oregon Edgar L. Johnson	Wyoming Frank P. Morgando William F. Sherman
Idaho Tri Buu Charles B. Humphrey E. Kenneth Montgomery	Mississippi Wendel T. Ruff	Pennsylvania Donald L. Keller	
Illinois Alan G. Goodfield	Missouri William L. Trims	Puerto Rico Charles B. Gover	
	Montana Joseph E. Armstrong Earle W. Mayberry	Rhode Island Colin Franco Robert L. Fruggiero	
	Nebraska Albert R. Kennedy	South Carolina Preston E. Bradham Richard L. Steward Alan Zupus	

Table 5

University professors and other geologists and engineers
who provided landslide information or a review of landslide
literature in the states indicated

Alabama Raymond K. Moore, Auburn University Robert J. Watters, University of Nevada	New York Sam Clemence, Syracuse University A. R. Eschner, State University of New York William H. Renwick, Rutgers University
Alaska Paul W. Adams, Oregon State University	North Carolina Ralph C. Scott, Towson University
Arizona Peter W. Hutton, University of Wyoming Troy L. Paine, Arizona State University Richard A. Young, State University of New York	Ohio Charles M. Carter, University of Akron K. R. Everett, Ohio State University Stanley P. Fisher, Ohio University Jerry E. Green, Miami University John F. Hall, Case Western Reserve University Syed E. Hasan, University of Missouri James W. Johns, City of Cincinnati Garry D. McKenzie, Ohio State University Abdul Shakoor, Kent State University
California James R. Duncan, University of California Gary B. Griggs, University of California David Huntley, San Diego State University John W. James, University of Nevada Harvey M. Kelsey, California State University Hans P. Nielsen, University of California William H. Renwick, Rutgers University Thomas K. Rockwell, San Diego State University Bing C. Yen, California State University	Oklahoma David R. Butler, Oklahoma State University Leon R. L. Wang, University of Oklahoma
Colorado William M. Hoyt, University of Northern Colorado Robert J. Walters, University of Nevada	Oregon Paul W. Adams, Oregon State University Matthew J. Brunengo, University of Washington Richard A. Marston, University of Texas Martin E. Ross, Northeastern University Lloyd W. Staples, University of Oregon
Connecticut Donald W. Groff, Western Connecticut State University Richard P. Long, University of Connecticut	Pennsylvania Reginald P. Briggs, Geomega, Inc. Norman K. Flint, University of Pittsburgh Richard E. Gray, GAI Consultants, Inc. Jerry E. Green, Miami University, OH James E. Hamel, Hamel Geotechnical Consultants Vernon A. Mast, Oklahoma State University
Georgia Donald J. Bogucki, State University of New York Ralph C. Scott, Towson State University	Puerto Rico Reginald P. Briggs, Geomega, Inc. Alejandro Soto, University of Puerto Rico
Idaho David R. Butler, Oklahoma State University Jerry D. Higgins, Washington State University Terry R. Howard, University of Idaho James K. Mitchell, Rutgers University	South Dakota Perry H. Rahn, South Dakota School of Mines and Technology
Illinois Charles L. Bartholomew, Bradley University	Tennessee Donald J. Bogucki, State University of New York Ralph C. Scott, Towson State University
Indiana Charles W. Lowell, Purdue University	Texas Richard A. Marston, University of Texas Gary Robbins, Texas A & M University Warren K. Wray, Texas Tech University
Iowa Alan J. Luttenegger, Clarkson College of Technology	USA whole James K. Mitchell, Rutgers University
Kansas William E. Powell, Pittsburg State University	Utah Dale V. Stevens, Brigham Young University
Kentucky Stanley P. Fisher, Ohio University D. Joseph Hagerty, University of Louisville	Virginia David F. Noble, Virginia Highway and Transportation Research Council R. Janardhanam, University of North Carolina Ralph C. Scott, Towson State University
Maine J. Steven Rite, West Virginia University	Washington Matthew J. Brunengo, University of Washington Jerry D. Higgins, Washington State University William H. Hoyt, University of Northern Colorado
Michigan Donald H. Gray, University of Michigan	West Virginia Stanley P. Fisher, Ohio University J. Steven Rite, West Virginia University
Missouri Sam Clemence, Syracuse University Syed E. Hasan, University of Missouri	Wisconsin D. C. Multhauf, University of Wisconsin
Montana David R. Butler, Oklahoma State University	Wyoming Larry G. Clark, Howard Donley Associates, Inc. Ronald W. Harris, University of Wyoming
Nevada John W. James, University of Nevada Robert J. Watters, University of Nevada	
New Jersey James K. Mitchell, Rutgers University Williams H. Renwick, Rutgers University	
New Mexico Robert W. Blair, Fort Lewis College	

listed in Table 5. The addresses, topics of interest and geologists who kindly provided references and/or reviewed our bibliography for the state(s) for which they have expertise are listed in Table 5. The addresses, topics of interest and geographic distribution of all the professors is included in a report by Brabb and Fitzsimmons (1984).

Geologists and engineers in state geological surveys who provided landslide information and/or reviewed our bibliography for their state are listed in Table 6. Theodore Smith, California Division of Mines and Geology was especially helpful. Individuals in Federal agencies who contributed are listed in Table 7; of these, Robert L. Schuster, Fred A. Taylor, John S. Pomeroy, Donald R. Nichols, and Dorothy Radbruch-Hall made the most significant contributions.

A special note of thanks is extended to C. F. S. Sharpe of Falls Church, Virginia, whose classic 1938 book on landslides is still widely quoted around the world. Dr. Sharpe was forced to

curtail the number of references in his book, so he welcomed the opportunity nearly 50 years later to have these references appear in our bibliography. Moreover, his newspaper and trade journal clippings collected over 50 years provided valuable references to landslides in many states.

Finally, we would like to acknowledge and thank those who helped in compiling the bibliography and entering references into our word-processing system. Lorraine Hollis is responsible for searching through thousands of U.S. Geological Survey maps and reports and several other serials and entering many references into the system. Stacey Moore, Betty Harrod, and Timothy Best performed library research and assisted in compiling references, and Mary Milan supplied her expertise and knowledge of the NBI¹ word processor in solving problems and entering data. Nancy Blair, Jacquelyn Freeberg, and William Sanders, all of the U.S. Geological Survey library in Menlo Park, provided patient, invaluable guidance in our search for new and obscure references.

Table 6

Geologists and engineers in state geological surveys who provided information about landslides in their state

Alabama Charles W. Copeland, Jr. Thornton L. Neathery Karen F. Rheams W. Everett Smith	Indiana Robert F. Blakely Henry H. Gray Robert M. Shaver	Montana Mervin J. Bartholomew Robert M. Bergantino Sidney L. Groff Marvin P. Miller	Puerto Rico Ramon M. Alonso Boris L. Oxman
Alaska Rodney A. Combellick Catherine A. Ulery Randall G. Urdike	Iowa George R. Hallberg Timothy J. Kemmis	Nebraska Duane A. Eversoll James B. Swinehart	South Carolina Paul G. Mystrom, Jr. Norman K. Olson
Arizona Susan M. DuBuis Larry D. Fellows Bruce J. Murphy H. Wesley Pierce	Kansas Frank W. Wilson	Nevada John W. Bell	South Dakota Robert A. Schoon Merlin J. Tipton
Arkansas William V. Bush Norman F. Williams	Kentucky Donald C. Haney John D. Kiefer Martin C. Knoeger	New Hampshire Robert I. Davis	Tennessee Robert A. Miller
California Allan G. Barrows Trinda Bedrossian Cliffton M. Gray Theodore C. Smith Robert H. Sydnor	Louisiana Whitney J. Autin	New Jersey David P. Harper	Texas L. Frank Brown Thomas C. Gustavson E. G. B. Wermund Charles M. Woodruff
Colorado William P. Rogers John W. Rold James M. Soule Julia E. Turney	Maine Woodrow B. Thompson	New Mexico Gary D. Johnpeer John W. Hawley Frank S. Kottowski David W. Love Robert H. Weber	Utah Genevieve Atwood Bruce N. Kalliser Don R. Mabey
Delaware Thomas E. Pickett	Maryland Emery T. Cleaves Kenneth M. Weaver	New York Robert H. Fickies Theodore J. Robak	Vermont Charles A. Ratte
Georgia Mary Lynne Pate William M. Steele	Massachusetts Joseph A. Sinnott	North Carolina Carl E. Merschat	Virginia James F. Conley Thomas M. Cathright II Robert C. Milici Eugene K. Rader Harry W. Webb, Jr.
Hawaii Eugene M. Grabbe	Michigan Tyrone J. Black Martin R. Jannereth Michael J. Scieszka Chris A. Shafer Dorothy M. Skillings Ronald D. Webster	North Dakota John P. Bluemle Gerald M. Groenewold Don L. Halvorson Edward C. Murphy	Washington Raymond Lasmanis Gerald W. Thorsen
Idaho Roy M. Breckenridge Kurt L. Othberg	Minnesota Howard C. Hobbs Matt S. Walton	Ohio Horace R. Cullins Michael C. Hansen Robert G. Van Horn	West Virginia Peter Leasing
Illinois Paul B. Dumontelle Jennifer K. Hines Myrna M. Killey	Mississippi Alvin R. Bicker, Jr. Michael B. E. Bograd Curtis W. Stover	Oklahoma Kenneth S. Johnson	Wisconsin M. E. Ostrom
	Missouri David Hoffman Gury St. Ivany Jerry D. Vineyard J. Hadley Williams	Oregon John D. Beaulieu	Wyoming James C. Case William B. Murray Kathryn L. Pivoshuk
		Pennsylvania Helen L. Delano Arthur A. Socolow J. Peter Wilshusen	

Table 7

Engineers and geologists in Federal Agencies who provided information about
landslides and/or reviewed our bibliography.

U.S. Geological Survey

Menlo Park, California: David K. Keefer, Dorothy H. Radbruch-Hall, Fred Taylor, Gerald F. Wiezorek

Denver, Colorado: Paul E. Carraro, Roger B. Colton, Jean De Woody, Robert W. Fleming, David S. Fullerton, Dolores J. Gable, Wallace R. Hansen, E. Neal Hinrichs, Robert Johnson, Peter W. Lipman, Michael N. Machette, John T. McGill, Harold E. Malde, Donald R. Nichols, Steven S. Oriel, Kenneth L. Pierce, Gerald M. Richmond, Peter D. Rowley, Edward T. Ruppel, Robert L. Schuster, Betty A. Skipp, Richard P. Snyder, David J. Varnes, Irving J. Witkind

Reston, Virginia: Charles A. Baskerville, John S. Pomeroy, Russell W. Campbell

Carson City, Nevada: Patrick A. Blancey

Seattle, Washington: James P. Minard

U.S. Army Corps of Engineers

Waterways Experiment Station, Vicksburg, Mississippi: Don C. Banks, Ellis L. Krinitzsky, James H. May, Richard W. Peterson, William E. Strohn, Jr., Victor Torrey

U.S. Bureau of Reclamation

Regional Office, Denver, Colorado: Newcomb B. Bennett, III
Regional Office, Boulder City, Nevada: William E. Green
Regional Office, Billings, Montana: Glenn Tavcher, Paul R. Worthington
Regional Office, Amarillo, Texas: Joseph L. Jackson

Regional Office, Boise, Idaho: Nelson A. Blackwell, Brent Carter
Regional Office, Sacramento, California: James L. Andrews, Robert E. Trefzger

U.S. Forest Service

Northern Region (Region 1)

Regional Office, Missoula, Montana: Robert Hinshaw, Beryl Johnston

Beaverhead National Forest, Dillon, Montana: Kathy Wilkerson
Bitterroot National Forest, Hamilton, Montana: Edward Yulefich
Clearwater National Forest, Orofino, Idaho: Thomas E. Brown, Dale Wilson

Custer National Forest, Billings, Montana: Norman Smeyers
Dearlodge National Forest, Butte, Montana: David Ruppert, Jim Sheldon

Flathead National Forest, Kalispell, Montana: Charles M. Rorvik
Gallatin National Forest, Bozeman, Montana: Carl Davis
Helena National Forest, Helena, Montana: William Straley
Idaho-Panhandle National Forests, Coeur d'Alene, Idaho: Roger Minnich

Idaho-Panhandle National Forest, Sand Point, Idaho: George Agar
Idaho-Panhandle National Forest, St. Maries, Idaho: Jim Northrup
Kootenai National Forest, Libby, Montana: Richard Young
Lewis and Clark National Forest, Great Falls, Montana: Charles Frey

Lolo National Forest, Missoula, Montana: Michael Mitchell
Nezperce National Forest, Grangeville, Idaho: Richard Kennedy

Rocky Mountain Region (Region 2)

Regional Office, Lakewood, Colorado: Martin Everitt

Southern Region (Region 3)

Regional Office, Atlanta, Georgia: Douglas Scholen

Intermountain Region (Region 4)

Regional Office, Ogden, Utah: Earl P. Olson
Bridger-Teton National Forest, Jackson, Wyoming: Melissa Blackwell
Manti-La Sal National Forest, Price, Utah

California Region (Region 5)

Regional Office, San Francisco, California: John Chatofan
Pleasant Hills Materials and Geotechnical Center, Pleasant Hill, California: Ted Stuart
Angeles National Forest, Pasadena, California: Robert Littlejohn
Cleveland National Forest, San Diego, California: Steven Winslow
Eldorado National Forest, Placerville, California: Charles Mitchell
Inyo National Forest, Bishop, California: Diori Kreske
Klamath National Forest, Yreka, California: Juan de la Fuente
Lassen National Forest, Susanville, California: Robert Michaels
Los Padres National Forest, Goleta, California: Hollis Record

Mendocino National Forest, Willows, California: John Brooks
Modoc National Forest, Alturas, California: Randy Sharp
Plumas National Forest, Quincy, California: Alan King
San Bernardino National Forest, San Bernardino, California: Michael Florey
Sequoia National Forest, Porterville, California: Richard Zupanzic
Shasta-Trinity National Forest, Redding, California: Alec Tary
Sierra National Forest, Fresno, California: Jerome V. DeGraff
Six Rivers National Forest, Eureka, California: Richard Farrington
Stanislaus-Calaveras Big Trees National Forest, Sonoma, California: Richard Wisheart
Tahoe National Forest, Nevada City, California: Ralph Phillips

Pacific Northwest Region (Region 6)

Regional Office, Portland, Oregon: John Mohney
Colville National Forest, Colville, Washington: Bruce Carr
Deschutes National Forest, Bend, Oregon: Larry Chitwood
Fremont National Forest, Lakeview, Oregon: Arlow Goehring
Gifford-Pinchot National Forest, Vancouver, Washington: Thomas Reilly

Malheur National Forest, John Day, Oregon: Ron Burgman
Mt. Baker-Snoqualmie National Forests, Seattle, Washington: Robert Snyder

Mt. Hood National Forest, Gresham, Oregon: Kathy Manning-Seyer
Ochoco National Forest, Prineville, Oregon: Roy Leen
Okanogan National Forest, Okanogan, Washington: Gerald Ames
Olympic National Forest, Olympia, Washington: Dennis Larson
Rogue River National Forest, Medford, Oregon: Billy Hicks
Siskiyou National Forest, Grants Pass, Oregon: Richard Burtet
Siskiyou National Forest, Wedderburn, Oregon: John Bloomingdale
Siuslaw National Forest, Corvallis, Oregon: Ellen Vollmer
Umatilla National Forest, Pendleton, Oregon: Roger Baker
Umpqua National Forest, Roseburg, Oregon: Roy Arnoldt
Wallawa-Whitman National Forests, Baker, Oregon: Derek Morse
Wenatchee National Forest, Wenatchee, Washington: Dan Meschter, Cal Blackburn, Richard Stearns
Willamette National Forest, Eugene, Oregon: Douglas A. Williamson
Winema National Forest, Klamath Falls, Oregon: Rex Foster

Southwest Region (Region 8)

Regional Office, Albuquerque, New Mexico: H. Gassaway Brown

Eastern Region (Region 9)

Regional Office, Milwaukee, Wisconsin: Jack B. Jacks

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